SONY

Quick Reference Guide

PXW-**FX9**

pro.sony/FX9

This guide has been optimised for
mobile viewing and is fully interactive

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A. Introduction to this guide

This guide does not replace the user manual. It is intended to be used in conjunction with the user manual and it is recommended that you read both this guide and the user manual to get the very best from the camera.

Where you see text in bold it indicates a menu setting, button or switch setting. For example:

(MENU: Project – Base Setting – Shooting Mode).

Indicates: refer to the camera menu, Project page, Base Setting page, Shooting mode sub page.

Where there are multiple menu choices a suggested or recommended setting will be given as an initial starting point to get you going. These settings should give good results in the majority of cases.

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B1. APR and Bright Pixels

After switching the camera on you may see a message saying "Please Execute APR". This is not an error or malfunction. The APR (Automatic Pixel Restoration) function minimizes the appearance of bright or dark sensor pixels and minimizes sensor noise.
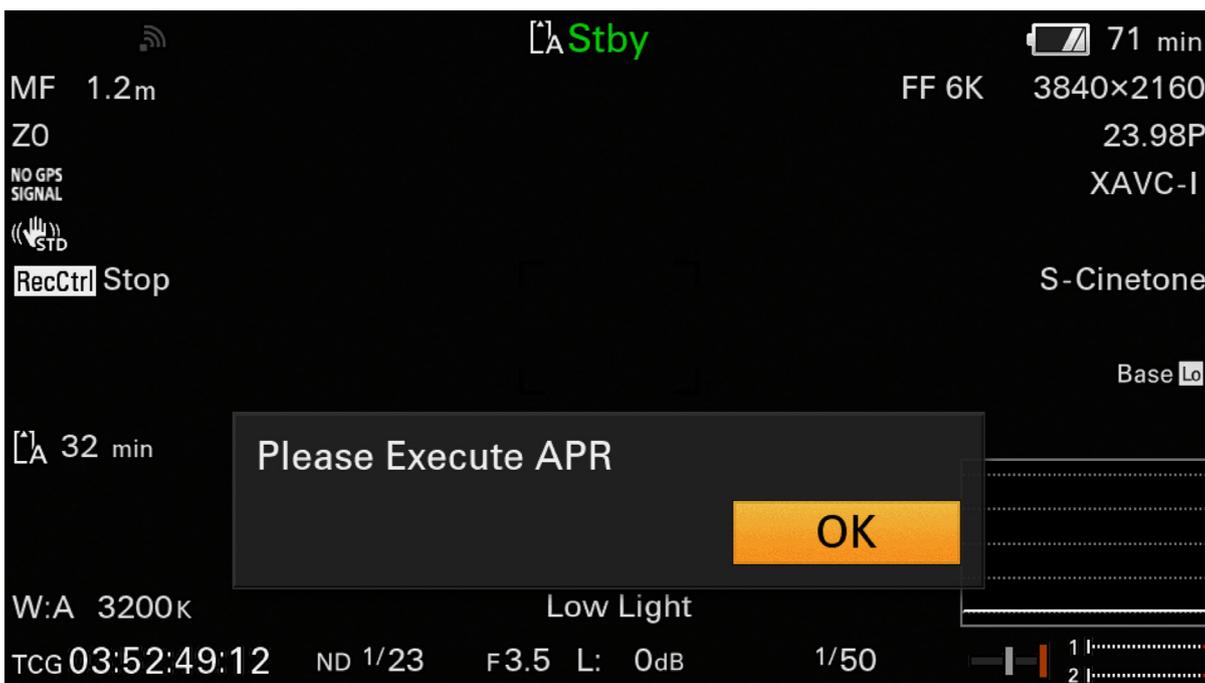
Cover/cap the lens so that all light is excluded and press the Multi-function Dial, the handgrip thumbstick or the set button to execute the APR function.

If you do not perform APR you will be reminded to perform APR the next time the camera is turned on. You should perform APR regularly to maintain the best possible image quality or if you notice tiny bright dots (bright pixels) within in the cameras output.

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B2. Multi-Function Dial

The multi-function dial at the front of the camera is very useful for navigating through the camera's menus. In addition, it can be used in conjunction with the push buttons for ISO/Gain, White Balance, shutter, iris etc. to quickly change these settings.

You can also set the Multi-Function dial to control some of these functions directly without having to first press a button.

If you go to **(MENU: Project – Multi Function Dial – Default Function)** you can add a default function for the dial for when the camera menu is not activated or when a function button has not been previously pressed. My personal preference is to set this to "Iris". Do note however that control of the iris via the Multi-Function Dial is in 1/3rd of a stop steps. Iris control is possible via the Assignable Dial on the handgrip.

Multifunction Dial   Status Button   Menu Navigation Controls
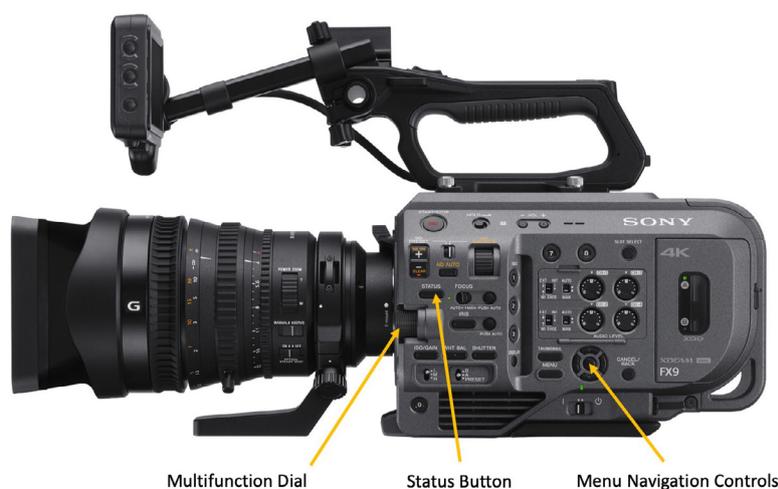
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B3. Assignable Buttons

The FX9 has 10 assignable buttons plus the ability to assign an alternate function to the focus hold button that is found on certain Sony lenses. By default, nothing is assigned to buttons 2, 3, 6. 7, 8, 9 and 10. So there is plenty of scope to add new functions to these buttons.

Functions are assigned to the buttons via **(MENU: Project – Assignable Button)**.

A suggestion is to assign the "Base ISO /Sensitivity" and "Video Signal Monitor" options to two of the buttons as these will likely be commonly used functions. In addition, if you shoot using S-Log3 you may want to assign "Gamma Display Assist" to another of the assignable buttons (see section 6 for more details on this).

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B4. User Menu

The FX9 has a user menu that can be customized to include the menu items that you use most often. This allows you to go directly to the items in the user menu with no need to scroll through the menu systems different sub sections.

Up to 20 items can be included in the user menu. The factory settings include 20 pre-installed items. In order to add or change an item you must first delete at least 1 item from the user menu before the new item can be added.

The user menu can be edited by going to **(MENU: User Menu – Edit User Menu)**. As well as adding and removing items from the User Menu you can also change the display order by using the "Move" option to move each item up or down the item list.

In addition, it is also possible set the camera so that only the User Menu is active. This is done via **(MENU: User Menu – Menu Settings –User Menu Only)**. When set to "ON" you can only access and scroll through the user menu. To restore the ability to scroll down to other the other menu sections you can return this back to "OFF" at any time.

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There is an additional password protected method for locking out all menu pages other than the User Menu. To enable this normally hidden option in the menu system you must press and hold the Multi-Function Dial, then while still pressing the Multifunction Dial press the Menu button to enter the cameras menu system. Now you will find the following menu item **(MENU: Technical – Menu settings– User Menu With Lock)**. When you select "ON" you will be prompted to enter a 4 digit security code to enable the User Menu only locked function.

> **WARNING:** Be sure to make a record of this security code as it is required to unlock the full menu system. You cannot unlock the menu system if you lose this code number and will need to contact your local Sony office for assistance.

To unlock the full menu system, press and hold the Multi-Function Dial, then while still pressing the Multifunction Dial press the Menu button to enter the cameras menu system. Then go to **(MENU: Technical – Menu settings– User Menu With Lock)**. Select OFF and enter the passcode.

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B5. Direct Menu

Direct menu allows you to quickly access the many of the cameras settings without the need to enter the main menu system. The direct menu system can be access by pressing the "Direct Menu" button on the hand grip or by pressing the Multi-function Dial.

Once activated you will see the direct menu items highlighted in orange in the viewfinder. You can then scroll through the direct menu items using the Multi-function Dial or by using the Thumbstick on the handgrip. Direct Menu items can then be selected and adjusted directly. For full details on the items that can be adjusted please refer to the User Manual.

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B6. Saving your preferred camera settings

If you have made any changes to the user menu, you can save those changes to an SD or Card or Memory Stick in the Utility card slot by going to **(MENU: Project – User File)**. This may be useful should you wish to copy your preferred user menu layout to another camera. User Files also save the settings of the functions included within the user menu, this allows you to use user files to save settings such as scan mode or frame rate provided those menu items are included in the user menu.

You can also use "All Files" to save not only the User Menu settings but also a snapshot of the camera's setup including any other menu settings such as configuration of the assignable dial, operating mode and scan mode etc. All Files are very useful for switching quickly between different frame rates and scan modes by saving an All File for each preferred setup or to copy your preferred camera settings from on camera to another. Be aware however that "All Files" overwrite the cameras white balance settings each time one is loaded. It may be preferable to use a user file as an alternative to an All File to save your preferred settings as User Files can be set not to overwrite white balance settings.

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All files are saved to an SD card in the Utility Card slot by going to **(MENU: Project – All File)**.

See the user manual for full details of what is saved in the different file types.

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B7. The Status Pages

By pressing the "Status" button on the camera you can view a series of pages that show the current status and setup of the camera. These pages are very useful for quickly checking things like recording setup, audio levels, scan mode, network and monitoring status. It is recommended that you familiarize yourself with the status pages as they are a useful way to quickly determine how the camera is configured.

⚙A **Stby**		DC IN 19.4 V
Main Status		1/13
S&Q Frame Rate **Fixed**	ISO/Gain/EI **800EI / 6.0E**	Shutter **1/50**
Frequency/Scan **23.98P**	Base ISO/Sensitivity **ISO 800**	Iris **F5**
Imager Scan **FF 6K**	Codec **XAVC-I**	Picture Size **3840×2160**
Media Remain (A) **60min**	Media Remain (B) **31min**	
ND Filter **1/4**	Monitor LUT **- - -**	White Balance **3200K, T+0**

⚙A **Stby**		DC IN 19.4 V
Camera Status		2/13
White Switch<B> **3220K**	ISO/Gain<L> **800EI / 6.0E**	Zebra1 **70%±5%**
White Switch<A> **3200K**	ISO/Gain<M> **1000EI / 6.3E**	Zebra2 **Off**
White Switch<P> **3200K**	ISO/Gain<H> **1250EI / 6.7E**	Gamma **S-Log3**
	Base ISO/Sensitivity **ISO 800**	
ND<Preset> **1/4, 1/16, 1/64**		Scene File **- - -**

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What's the difference? ›

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C1. Custom Mode with S-Cinetone and the Cine EI mode – What is the difference?

The PXW-FX9 has two distinctly different operating modes which are called "Custom" and "Cine EI". The camera will create high quality images at all available frame rates and resolutions in both modes.

In **Custom Mode** the PXW-FX9 behaves much like any other conventional video camera where the picture you see in the viewfinder is the picture that is recorded to the XQD cards. In the **Cine EI** mode the camera operates using optimized settings that allow it to capture the widest possible dynamic range and colour range. This wide range image will look flat and washed out if viewed directly on a conventional monitor. But it contains a huge amount of picture information that can be manipulated and adjusted on a computer in post-production to achieve a highly refined final look. To make shooting this way easier the camera incorporates a system of LUT's (Look Up Tables) that allow the operator to see in the viewfinder or on a monitor an approximation of how the footage being shot will look after it has been adjusted in post-production.

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Previous generations of Sony cameras have created images with a default look based on the Rec-709 standard for television cameras. When Sony's VENICE digital cinema camera was introduced it came with a new default look tailored for high end, film style production. This new look produces very pleasing images with warm skin tones and very smooth film-like highlights.

S-Cinetone	Rec-709 (STD5)

The two different base operating modes can be selected via **(MENU: Project – Base Setting)**.

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C2. Custom Mode and S-Cinetone: The default operating mode

Custom mode is the easiest way to use the camera. In Custom Mode the camera operates much like any other traditional video camera where the pictures you see in the viewfinder or on a monitor are the same as the images that are recorded. In this mode you have the ability to change many of the camera's image quality settings including:

White Balance and tint, which changes the camera's colour response to match the colour temperature of the light in the scene so that white objects appear white.

Gain or ISO, which changes the brightness of the image.

Gamma and Knee alters the cameras dynamic range and contrast of the recorded images.

The Matrix which alters the colour range, hue and colour saturation.

Detail and Aperture which alter the apparent image sharpness.

The FX9's default look in custom mode is called "S-Cinetone" this is a combination of a gamma curve called "S-Cinetone" and a colour matrix called "S-Cinetone". S-Cinetone is designed to look great straight from the

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camera. While sharing many characteristics of the Venice look, it is different as it is tailored for great looking video direct from the camera with minimal effort for many types of video productions rather than film or movie production that may include post production grading.

In addition, in Custom mode it is also possible to use other gamma and matrix combinations to match the FX9 to other Sony cameras.

See sections 12, 13 and 14 for more details on using Custom Mode and its various settings.

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C3. Cine EI and s709: For shooting using S-Log3 with post-production grading

The other base operating mode is the "Cine EI" mode. This mode is tailored for obtaining the largest possible dynamic range and colour range from the PXW-FX9. In this mode you shoot using the S-Log3 gamma curve and either the SGamut3 or SGamut3.cine colour space. When viewed on a conventional monitor this S-Log3 material will often look flat and washed out. Footage captured this way will need to then be colour graded in post-production to produce the desired end look. This is a more complex workflow compared to shooting a direct final image using Custom Mode but it does offer more creative possibilities.

As a result, the Cine EI mode tends to be used more for productions where image quality is the primary consideration rather than ease of use or production turnaround speed.

When using the Cine EI mode, depending on how the camera is set-up, it can apply a Monitor LUT (Look Up Table) to the Viewfinder, HDMI and SDI outputs to simulate how the footage may look after it has been colour graded. The default LUT in the FX9 is the same "s709" LUT as used by the VENICE camera. As a result, when this MLUT is applied to the viewfinder or outputs the video will look very similar to footage from a VENICE camera.

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S-Cinetone

S-LOG3 + s709 MLUT

RECOMMENDATION: For straight forward projects or where a fast turnaround is needed use Custom Mode. For film-style productions, where image quality is paramount and there will be the time and budget for post-production grading use the Cine EI mode.

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D. Section Introduction

The PXW-FX9 features a 6K Full Frame sensor. With this sensor it is possible to select various scan modes and frame sizes. It is important to understand what these mean and which scan modes can be used with which frame rates and recording formats.

There are two selectable frame sizes, Full Frame (FF) and Super 35 (S35). Full Frame is the larger of the two sensor scan sizes. When Full Frame is selected the sensor area is similar to that of a Full Frame photo camera. In the Full Frame mode you will need to use lenses designed for Full Frame. The frame size in Full Frame scan mode is also similar to the VistaVision film format.
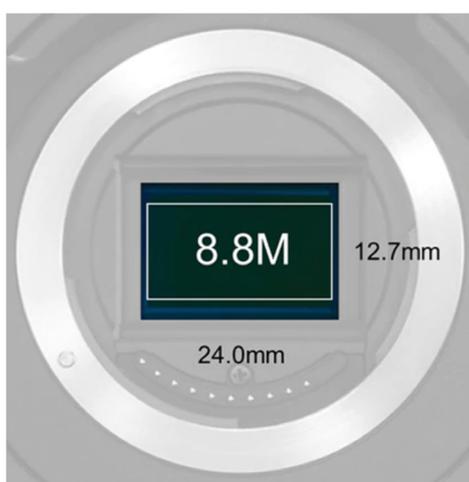

4K Super 35

Super35 17:9 mode with PXW-FS7M2.

6K full-frame

Full-frame 17:9 mode with PXW-FX9.

D. Scan Modes, frame rates and codecs

VistaVision

18.3mm

36mm

PXW-FX9

19.0M

18.8mm

35.7mm
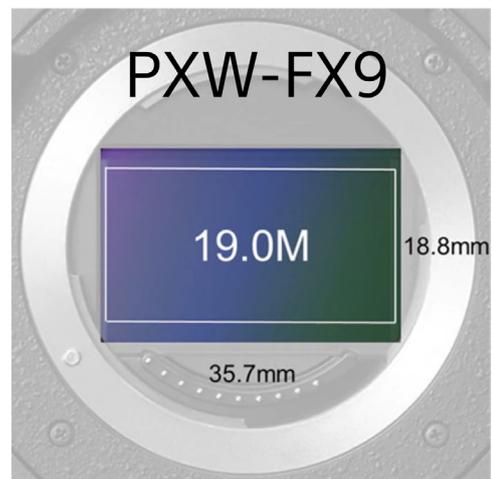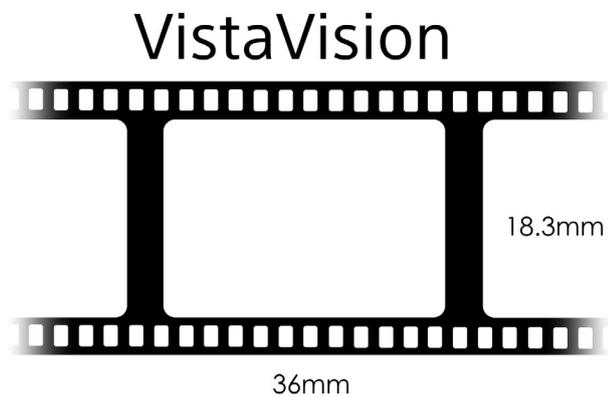
The Super 35mm modes use a smaller, central part of the sensor that is of a similar size to a frame of super 35mm movie film (S35). This is the same frame size as cameras such as the PXW-FS7 or FS5. In this mode you can use lenses designed for APS-C, S35mm, as well as lenses designed for Full Frame. In the S35 mode, if you use a Full Frame lens the field of view will be narrower than it would be in the Full Frame mode by a factor of 1.5.

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Picture: When using the same 35mm full frame lens the field of view will be wider when the camera is set to Full Frame Scan.

The use of a Full Frame sensor with Full Frame lenses has become desirable for film style productions as you can achieve a wider field for any given focal length than would be achievable using a super 35mm sized sensor. The longer focal length can be used to obtain a shallower depth of field.

D1. Scan Modes Overview

The Imager Scan Mode settings are found at **(MENU: PROJECT – IMAGER SCAN MODE)**.

As the recording format and frame rate choices are governed by the imager scan mode, in most cases the imager scan mode should be set prior to setting the recording codec, frame rate or video format.

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D. Scan Modes, frame rates and codecs

D2. Full Frame Scan Modes, FF 6K and FF 2K

FF 6K Scan: Optimised for image quality.

FF 6K Scan is the highest quality scan mode available in the FX9. The sensor operates in the Full Frame format and a full 6K scan is used, reading 19 million pixels from the sensor. The 6K image is then down-sampled to UHD for recording.

6K Oversampled   UHD(4K) Recording

By starting at 6K, and down-sampling the quality of the UHD, recordings will be higher than possible from a 4K scan. Noise in the image is reduced and the resolution and colour sampling is maximised. However, reading 19 million pixels from the sensor takes some time and as a result there are some frame rate limitations in FF 6K scan. The highest frame rate that can be selected when using FF 6K scan is 30 frames per second. You can record both UHD and HD at up to 30 frames per second[*] from FF 6K.

[*] Future update will enable FF 4K 60p/50p recording with oversampling (image sensor scan size is around 5K).

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FF 2K Scan: Optimised for speed.

FF 2K scan uses the same Full Frame sized sensor area as FF 6K. However, the sensor is read at 2K instead of 6K. The reduced resolution allows the sensor to be read out much faster. The FF 2K scan mode can operate at up to 120fps[**]. However, in this mode, the camera's optical filtering is less optimal and this means that the image quality is somewhat reduced compared to the FF 6K scan. This scan mode is best suited to high frame rate shooting where the ability to shoot at a high frame rate is the main priority. You can only record HD from FF 2K scan.

[**] Future update will enable FHD 180fps shooting in FF 2K scanning mode.

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D3. S35 Scan Modes, S35 4K and S35 2K

S35 4K: A Good Balance Between Quality and Frame Rates.

S35 4K operates the sensor using the smaller Super 35mm frame area. In this mode the full 4K wide, 8.8 mega pixels that make up this area are read out. This is similar to the scan area and number of pixels of a PXW-FS7 or FS5. As a result the resolution of the recordings will be similar to that of other 4K S35 cameras. Because there is no downsampling in this mode the image quality is not quite as high as can be achieved from the FF 6K scan mode. But the reduced number of pixels that need to be read means that S35 4K can be used to record both UHD and HD at frame rates up to 60fps.

S35 2K: Optimised for speed with S35mm and APS-C lenses.

In S35 2K mode, 2K scan as above uses the smaller Super 35mm frame area. However, the sensor is read at 2K instead of 4K. The reduced resolution allows the sensor to be read out much faster. The S35 2K scan mode can operate at up to 120fps. In this mode the camera's optical filtering is less optimal and this means that the image quality is somewhat reduced compared to the FF 6K or S35 4K scan. This scan mode is best suited to high frame rate

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shooting where the ability to shoot at a high frame rate is the main priority and only Super 35mm or APS-C lenses are available. You can only record HD from S35 2K.

* In this S35 2K mode, you are recommended to use the settings below,

- CineEI mode: Set EI ISO lower and exposure level higher instead.

- Custom mode: Choose the gamma category setting of Original (S-Cinetone) or STD (STD1 to 6).

Image Scan Mode	UHD Recording	HD Recording	Quality
FF 6K	3840x2160 - 30fps	1920x1080 - 30fps	Highest
S35 4K	3840x2160 - 60fps	1920x1080 - 60fps	High
FF 2K	-	1920x1080 - 120fps	Lower
S35 2K	-	1920x1080 - 120fps	Lower

* This diagram is at Ver1.0. Future update will enable FF 4K 60p/50p recording (image sensor scan size is around 5K) and FHD 180fps shooting in FF 2K scanning mode.

D. Scan Modes, frame rates and codecs

D4. Codecs: XAVC-I, XAVC-L and MPEG HD

The FX9 has 3 primary codecs plus H.264 for proxy recording.

The codec choices are:

XAVC-I: Best quality, 10 bit 4:2:2 UHD and HD.

XAVC-I offers an excellent balance between image quality and file size. It is the highest quality codec available in the FX9. It records using 10 bit 4:2:2 sampling at all the available resolutions and frame rates. It should be your primary choice of recording codec. XAVC-I is an I frame only codec and as a result is easy to work with in post production on modest computers.

XAVC-L: High quality, small file size, 10 bit 4:2:2 HD and 8 bit 4:2:0 UHD.

XAVC-L HD/UHD XAVC-L is a long GOP codec offering similar image quality to XAVC-I but with a smaller file size. In HD it is 10bit 4:2:2. In UHD it is 8bit 4:2:0 (not recommended for S-Log3).

In HD there are three bit rate choices of 50, 35 and 25Mbps. 50Mbps offers image quality comparable to XAVC-I. 35Mbps is comparable to MPEG2 HD 4:2:2 50Mbps. 25Mbps is suitable for corporate or other professional non broadcast applications.

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XAVC-L requires more processing power in postproduction than XAVC-I, so a high-performance computer is recommended.

MPEG HD 422 is an 8 bit HD only codec that has been used for HD television production for a very long time. As a result, it is extremely widely supported, even when using older editing hardware. It is still very popular with many broadcasters because it is very easy to work with. However, the image quality is not as good as the more modern XAVC codec. MPEG HD 422 may be a good choice where the priority is to have maximum backwards compatibility or when editing using older low powered computers.

D. Scan Modes, frame rates and codecs

D5. HD Sub Recording and Proxy Recording

It is possible to make a secondary recording alongside the main recording. There are several ways to do this, 4K with an HD sub recording or proxy recording or HD Simul Rec. You can only do one or the other, not both at the same time.

4K & HD (Sub) Rec: Useful for recording both UHD and broadcast quality HD at the same time.

4K & HD (Sub) Rec can be enabled when the main recording format is UHD XAVC-I at up to 30fps or UHD XAVC-L at 50/59.98p. When enabled an MPEG HD 422 clip is recorded on the same XQD card as the main recordings. In the Cine EI mode this could be particularly useful as it gives the ability to record S-Log3 UHD as well as an easy to edit HD recording with the option to have a LUT baked in to the HD recording. "MENU – PROJECT – 4K & HD (Sub) Rec".

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D6. Proxy Recording

Great for recording a small compact file that can be uploaded over the internet.

Proxy Recording allows a compact H264 file, with timecode that matches the main recording, to be recorded on to an SD card or Memory Stick in the Utility Card slot. You can choose between 1920 x 1080 (9Mbps), 1280 x 720 (9Mbps/6Mbps) and 640 x 360 (3Mbps). The quality of the 1920 x 1080 (9Mbps) is generally considered good enough for the coverage of breaking news stories.

Like the HD (Sub) recording mode, when recording UHD S-Log3 in the Cine EI mode and using a monitor LUT the LUT is baked into the Proxy recording. "MENU – PROJECT – PROXY REC".

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D7. Base Frame Rate

The setting **(MENU – Project – Rec Format – Frequency)** is used to determine the camera's base frame rate. Unlike some other Sony cameras there is no PAL or NTSC region setting. As a result, you can now quickly choose any of the cameras base recording and playback frame rates with this single menu setting. The frequency chosen here will then determine the range of frame rates available in the cameras S&Q mode and the frame rate at which footage shot in the S&Q mode will play back.

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It is recommended that to avoid issues with flicker from some types of light fixtures that the shutter speed is set to a multiple of the local mains electricity frequency. Please check the mains frequency of the country you are shooting in to determine the most appropriate shutter speed. In a 50Hz country 1/50 or 1/100 is recommended. In a 60Hz country 1/60 or 1/120 is recommended.

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E1. Choosing between shutter speed or shutter angle

The shutter speed or shutter angle effects how motion is portrayed in the recordings. A very fast shutter will freeze rapid movements in each frame of the recording making them crisper but possibly adding judder or jitter. Too slow a shutter speed will result in blurred motion and handheld camera wobble can result in soft looking pictures. In addition, a fast shutter speed reduces the amount of captured by the sensor.

The camera can display the shutter time period as either fractions of a second (shutter speed) or in degrees. In either case the operation of the shutter is identical, there is no difference in the quality of the images captured.

Shutter speed is the easiest to understand and is similar to how the shutter period would be expressed in a stills camera. With Shutter Speed the shutter timing remains fixed at the speed set even if you change the recording frame rate (unless the shooting frame rate is increased beyond the set shutter speed, in which case the shutter speed will become set to the slowest possible speed for the shooting rate chosen).

The Shutter Angle setting mimics the way the shutter period of a movie film camera would be expressed. The shutter in a film camera is a spinning circular disc, part

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of which is cut away to allow light to fall on the film. The most commonly used shutter angle is 180 degrees, which is half of the 360 degrees of a full circle. So a 180 degree shutter on a film camera would allow light to fall on the film for half of the shutter's rotation period. In a video camera this means that the sensor will capture light for half of the recording frame rate. For example, if shooting at 24fps a 180 degree shutter will be open for half of 1/24 which is 1/48th of a second. With shutter angle, if you change the recording frame rate the shutter speed will also change as it will always be the same fraction of the recording rate.

To change the shutter period indication between Speed and Degrees go to **(MENU: Shooting – Shutter – Mode)**.

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E2. Setting the shutter speed

To change the shutter speed: Press the Shutter button on the side of the camera body and use the scroll wheel to choose your desired shutter speed or angle.

If the shutter is set to "Off" or if you wish to set the Shutter to "Auto" or "ECS" press and hold the shutter button for approximately 2 seconds. This will bring up a small sub menu (direct menu) in the viewfinder where you can select the required mode.

Suggested settings are 180 degrees or for 50Hz countries 1/50 and for 60Hz countries 1/60.

E. Shutter, Shutter Speed and Shutter Angle

E3. ECS Shutter

The ECS Shutter is useful for shooting computer displays or devices where it is necessary to finely tune the shutter speed to match a particular frequency. For example, when shooting a computer monitor you may see a dark band rolling down the computer screen. By adjusting the shutter speed while pointing the camera at the computer screen and using the ECS function it is normally possible to eliminate or minimize these dark bands. Do note, however, that in an office environment where there may be multiple computer screens you may only be able to synchronize the shutter with one monitor at a time.

E4. Auto shutter

The shutter speed will be set automatically by the camera's auto exposure system to provide the optimum exposure level. It is recommended that this should only be used when other forms of exposure control are unavailable.

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F. ISO, Gain and Dual ISO

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The PXW-FX9 features a Dual ISO function. This function gives the camera the ability to operate at two different sensitivity levels, Hi or Low. This is different from adding gain and has only a very minimal impact on image quality. The camera's full dynamic range and full colour response is preserved whether you use the low or high base sensitivity (ISO) mode. There is a very small increase in noise when you use the Hi sensitivity mode, so where possible you should normally use the Lo sensitivity mode unless you are shooting in very low light levels. Please see section 6.3 for more information on Dual ISO.

In addition to this the signal that comes from the camera's sensor can be made brighter by adding additional gain (amplifying the signal). This may be useful when shooting in low light situations where it is difficult to obtain a sufficiently bright image. However, it should be noted that when you increase the camera's gain, as well as making the desirable image brighter you will also increase the noise seen in the image. Because of this it is normally desirable to use the lowest possible amount of gain for the best results.

In custom mode gain setting of the camera can be displayed as "gain" in dB or as the equivalent ISO rating of the camera. The operation of the camera is the same in both cases, there is no image quality difference form using one over the other.

SONY

F. ISO, Gain and Dual ISO

F1. Understanding Gain as dB or ISO

dB gain is easy to understand. 0dB is no added gain and is always the optimum setting for the best possible image quality. Every time you increase the gain by 6dB you are making the picture twice as bright, the equivalent of opening the lens aperture by 1 stop. But adding 6dB of gain also increases the noise in the image by a factor of 2. Adding +6dB gain makes the picture twice as bright but also twice as noisy. Adding +12dB will mean a picture is 4 times brighter than 0dB but also 4 times noisier and so on.

ISO can be a little more confusing. Every time you double the ISO value you make the image twice as bright, the equivalent of opening the aperture by 1 stop. But in addition, every time you double the ISO value you also double the amount of noise. ISO values are used to determine the correct exposure for a camera when using an external light meter. As different gamma curves require slightly different exposure levels the optimum ISO (native sensitivity and equivalent to 0dB gain) will vary depending on the gamma curve used.

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F. ISO, Gain and Dual ISO

The optimum ISO levels are:

Gamma	Lo Base Lowest	Lo Base Highest ISO	High Base Lowest	High Base Highest ISO
S-Cinetone STD Gamma HG1 - HG4	320 ISO	2500 ISO	1600 ISO	12800 ISO
HG7, HG8	500 ISO	4000 ISO	2500 ISO	20000 ISO
S-Log3	800 ISO	6400 ISO	4000 ISO	32000 ISO

RECOMMENDATION: I recommend that to avoid confusion when in custom mode you should use dB gain rather than ISO.

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F2. Selecting gain or ISO (Custom Mode)

To select the use of gain or ISO:
(MENU: Shooting – ISO/Gain/EI – Mode).

There are several ways to change the gain/ISO of the PXW-FX9.

You can use the ISO/Gain push button to quickly set the gain simply by pressing the button and then using the multi-function dial to quickly set the desired gain/ISO level.

You can use direct menu to select the gain/ISO indication on the viewfinder screen and set a new gain/ISO value or set the gain to automatic (AGC).
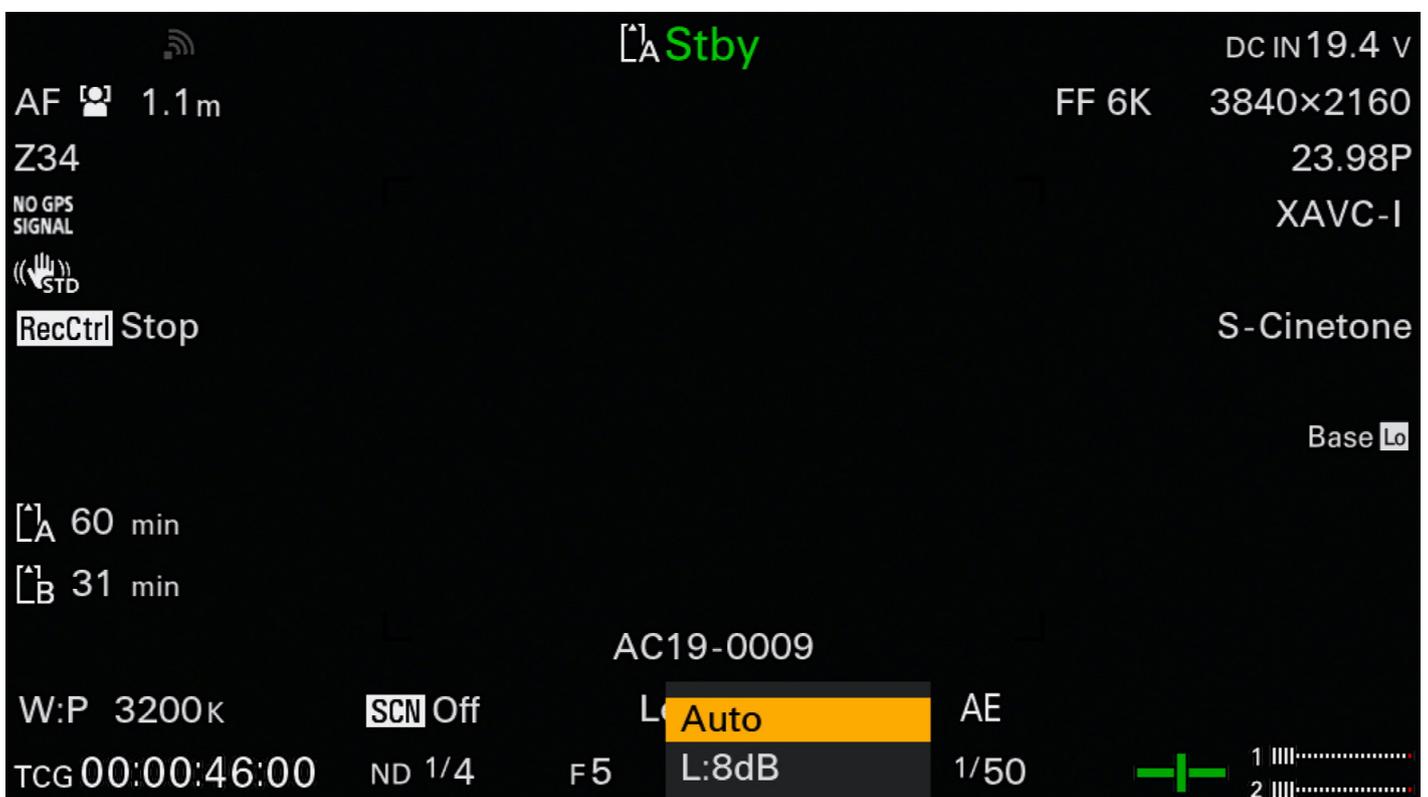
F. ISO, Gain and Dual ISO

You can also assign 3 different gain levels to the L/M/H gain switch via: **(MENU: Shooting – ISO/Gain/EI – ISO/Gain<L>)** etc. It should be noted that if you then use the gain/ISO button and Multi-Function dial to set a new gain or ISO level, this new level will be assigned to the currently set L/M/H switch position, overriding the value set via the menu.

To enable/disable automatic gain control press and hold the gain button for at least 2 seconds or use direct menu to active the gain direct menu sub menu. From here you can set the gain to "auto". The ISO/Gain button will illuminate when the AGC mode is activated.

NOTE: If using Auto gain you can set an upper gain for the auto gain via **(MENU: Shooting – Auto Exposure – AGC Limit)**. This may be useful to prevent excessive amounts of gain being added automatically.

NOTE: In Custom Mode with "dB" selected the camera can be set between -3dB and +18dB and the smallest step is 1dB. There is no equivalent to -3dB in ISO mode. In ISO mode the smallest step is 1/3rd of a stop (2dB).

If using the Cine EI mode, please see the section on "Exposure Index".

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F. ISO, Gain and Dual ISO

F3. More information on the Dual ISO function

The FX9 has a very useful Dual ISO function that allows the camera's sensor to operate at two base sensitivity levels. In Custom mode the two levels are denoted as Hi and Low and in the Cine EI mode the two sensitivities are 800 ISO and 4000 ISO.

Dual ISO is very different to the conventional addition of gain used in most cameras to change the brightness of the recorded video. In conventional cameras, when you add gain to increase the ISO, not only does this make the images brighter but it also increases the noise levels. Adding 6dB of gain or doubling the ISO via gain will make the recordings twice as bright but it will also make them twice as noisy. Adding gain may also result in decreased dynamic range.

Because the Dual ISO function works by altering the operation of the sensor to make the sensor more or less sensitive, when you use the Hi Base ISO function the images do not become significantly nosier, nor is there any change to the dynamic range or colour response. The image quality is almost exactly the same whether you choose the Lo Base or Hi Base mode. The only difference is a very small increase in noise in Hi base compared to Lo base.

F. ISO, Gain and Dual ISO

Lo Base ISO

Hi Base ISO

This gives you the flexibility to choose the most appropriate base sensitivity for the scenes that you are shooting, including using a mix of both Hi and Lo base within the same project. Where you have good light levels you should choose Lo Base as this has the very lowest noise levels and where your light levels are lower you should choose Hi Base.

RECOMMENDATION: I suggest adding the Base ISO Hi/Lo function to an assignable button so that you can quickly switch between Hi and Lo Base as needed.

You should also note that if operating the camera in Custom Mode with the camera set to ISO (rather than dB gain) it can be a little confusing as to how much gain you may be adding as it is possible to achieve the same ISO rating in both Hi Base and Low Base.

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F. ISO, Gain and Dual ISO

F4. When to switch to Hi Base ISO?

RECOMMENDATION: I suggest that whenever you add more than +8dB of gain in the Low Base ISO mode you should switch over to Hi Base ISO for a picture with less noise. I strongly advise that you should never add more than +14 dB of gain in the Low Base ISO mode as this much gain adds a lot of extra noise. You are better of selecting Hi Base ISO as this produces an image of the same brightness but without such a significant noise increase. Please refer to the table below.

Gamma	Lo Base Lowest	Suggest Switch to Hi Base	Always switch to Hi Base for best results	Lo Base Highest ISO don't use, use hi base instead	High Base Lowest	High Base Highest ISO
S-Cinetone STD Gamma HG1 - HG4	320 ISO 0dB	800 ISO +8dB	1600 ISO +14dB	2500 ISO +18dB	1600 ISO 0dB	12800 ISO +18dB
HG7, HG8	500 ISO 0dB	1250 ISO +8dB	2500 ISO +14dB	4000 ISO +18dB	2500 ISO 0dB	20000 ISO +18dB
S-Log3	800 ISO 0dB	2000 ISO +8dB	4000 ISO +14dB	6400 ISO +18dB	4000 ISO 0dB	32000 ISO +18dB

G. White Balance and Tint

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G1. Preset White Balance >

G2. Auto White Balance >

G3. ATW (Auto Tracking White Balance, Custom Mode only) >

G4. Tint >

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G. White Balance and Tint

Section Introduction

Setting the white balance correctly ensures that white objects in the scene appear white and that the overall colour response of the camera is true to life. There are several ways of setting the white balance. You can select the option to White Balance using a white or grey card, to dial in a user selectable Preset White Balance and additionally in Custom Mode there is an Automatic Tracking White balance option. In addition to the white balance adjustments you can add a tint offset to help deal with different light sources or to alter the hue of the captured images.

In previous generations of Sony cameras you were only able to use white balance presets in Cine EI. The FX9 has greatly improved white balance flexibility in the Cine EI mode and you are able to set the white balance of your choice.

G. White Balance and Tint

G1. Preset White Balance

The white balance can be fixed to a fix value that is selected when the WHT BAL switch is set to Preset. To change the preset value set the switch to Preset and go to **(MENU: Shooting – White – Preset White)** and select the desired colour temperature.

It is possible to manually enter a white balance colour temperature setting into the WHT BAL switch A and B positions. To do this go place the switch into either the A or B position and go to **(MENU: Shooting – White – Color Temp <A>)** or **(MENU: Shooting – White – Color Temp <B>)** and set the desired colour temperature.

G. White Balance and Tint

In addition pressing white balance button on the camera or selecting the colour temperature indication in the viewfinder using direct menu allows you to dial in the colour temperature manually using either the Multi-function Dial, Thumbstick on the hand grip or the Up/Down menu buttons. When changing the white balance colour temperature this way the new setting replaces any value previously set via the menu

G. White Balance and Tint

G2. Auto White Balance A and B

There are two memories in the camera that will remember the white value for a white target. To set the white balance correctly aim the camera at a white target such as a piece of white paper that is under the same lighting as the rest of the scene. Expose correctly and then press the WB SET button on the front of the camera. This will store the white balance in the memory selected by the switch.

G3. ATW (Custom Mode only)

The camera can determine the correct white balance automatically by continuously analyzing the scene being shot and adjusting the white balance while you shoot. This function is called ATW – Auto Tracking White Balance. Generally, this works well but under most situations you may occasionally see a shift in colours while shooting.

To enable ATW the WHT BAL switch must be set to either the A or B position. Then press and hold the WHT BAL button for at least 2 seconds or use Direct Menu to select the White Balance options in the viewfinder. Then select ATW. This will enable the ATW function for the A or B WHT BAL switch position. The WHT BAL button will illuminate when the ATW mode is activated.

G. White Balance and Tint

G4. Tint

As well as adjusting the White Balance you can also add a tint to compensate for different lighting conditions or to adjust the overall hue of the image. Like White Balance, you can have separate tint settings for both the A and B WHT BAL switch positions. To add a Tint go to **(MENU: Shooting – White – Tint<A>)** or **(MENU: Shooting – White – Tint<B>)**.

HINT: Adding a small tint + value, for example +10 to +15, can be very useful for dealing with lighting that is too green.

RECOMMENDATION: Return the any Tint offset to 0 when you no longer need to add a Tint as the Tint setting may have a different effect under differing lighting conditions.

H. Exposure, Zebras, Waveform and Histogram

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H1. Using Zebras	>

H2. Using the Waveform or Histogram	>

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H. Exposure, Zebras, Waveform and Histogram

Section Introduction

Exposure is controlled through a combination of shutter speed, gain/ISO, iris (aperture) and ND filter. The camera includes a number of tools for measuring exposure.

H1. Using Zebras

Zebras are commonly used to measure the brightness of either skin tones or highlights. Zebra 1 is designed to be used for skin tones. **(MENU: Monitoring – Zebra)**. For the Original (S-Cinetone) and STD gammas the default level of 70% works well in most cases, a small amount of zebras appearing across a typical face. For the Hypergammas the zebra level should be reduced to 60% for optimum results.

Zebra 1 at 100% is used to indicate highlights approaching over exposure or clipping.

In **(MENU: Monitoring – Zebra – Zebra Select)** you can choose whether to show zebra 1, zebra 2 or both in the viewfinder. The zebras can be turned on and off via the push button on the side of the viewfinder or with **(MENU: Monitoring – Zebra - Setting)**

H. Exposure, Zebras, Waveform and Histogram

H2. Waveform and Histogram

These are selected via **(MENU: Monitoring- Display On/Off – Video Signal Monitor)**.

Waveform: The waveform display measures the brightness of the recorded image and displays the brightness levels on a vertical scale that goes from 0% or black at the lower dotted line at the bottom to 109% (clipping point) at the top. There are additional dotted reference lines at 25, 50 75 and 100%. The left side of the waveform meter represents the left side of the image being recorded while the right side of the waveform meter is the right side of the image.
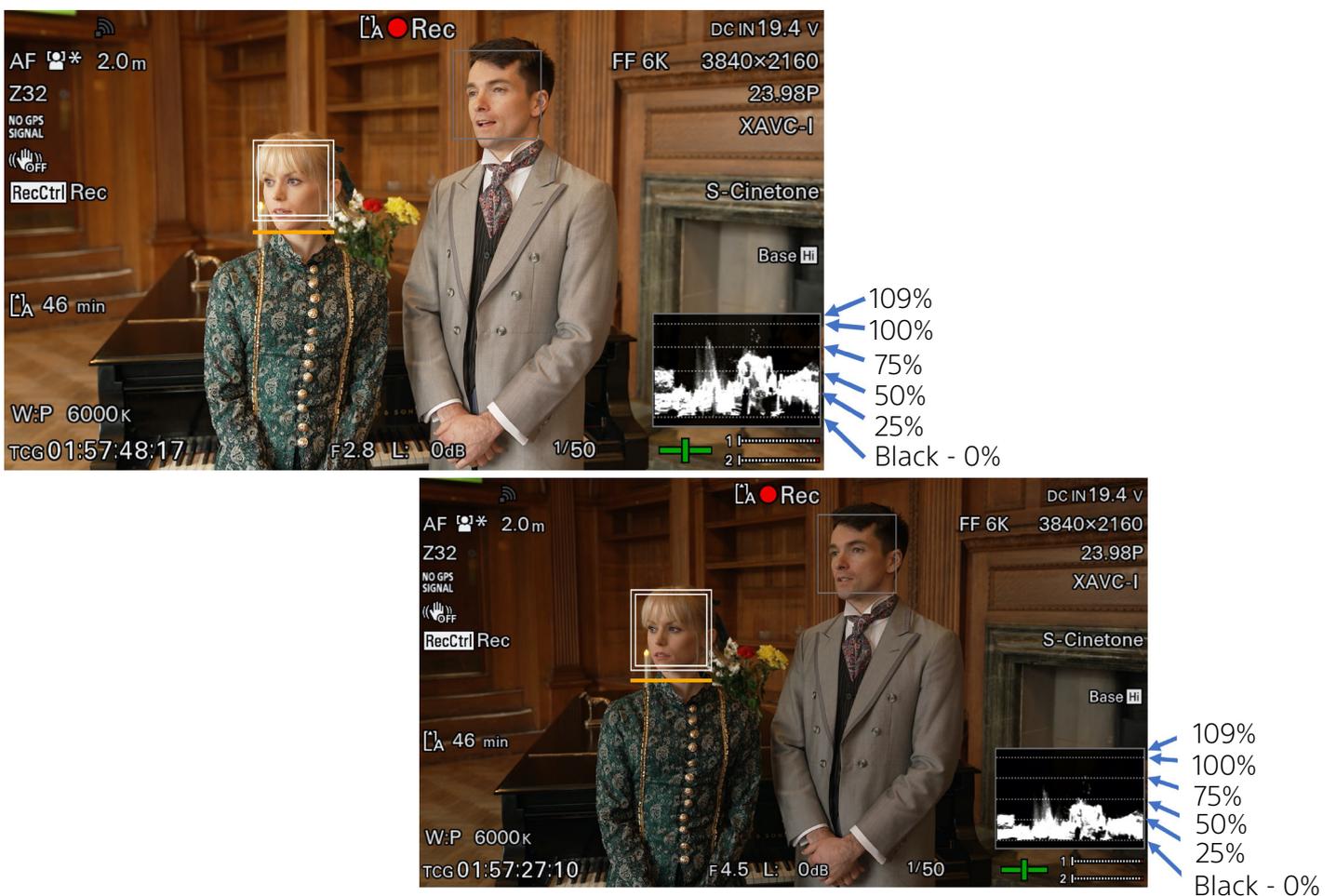
H. Exposure, Zebras, Waveform and Histogram

Histogram: The histogram displays the exposure brightness on a horizontal scale where black is at the left and 109% (clipping point) is on the right. The vertical height of the indicated level represents the amount of the image that is exposed at that brightness.

Histogram Good Exposure   Dark   Bright

Histogram Low Exposure   Dark   Bright
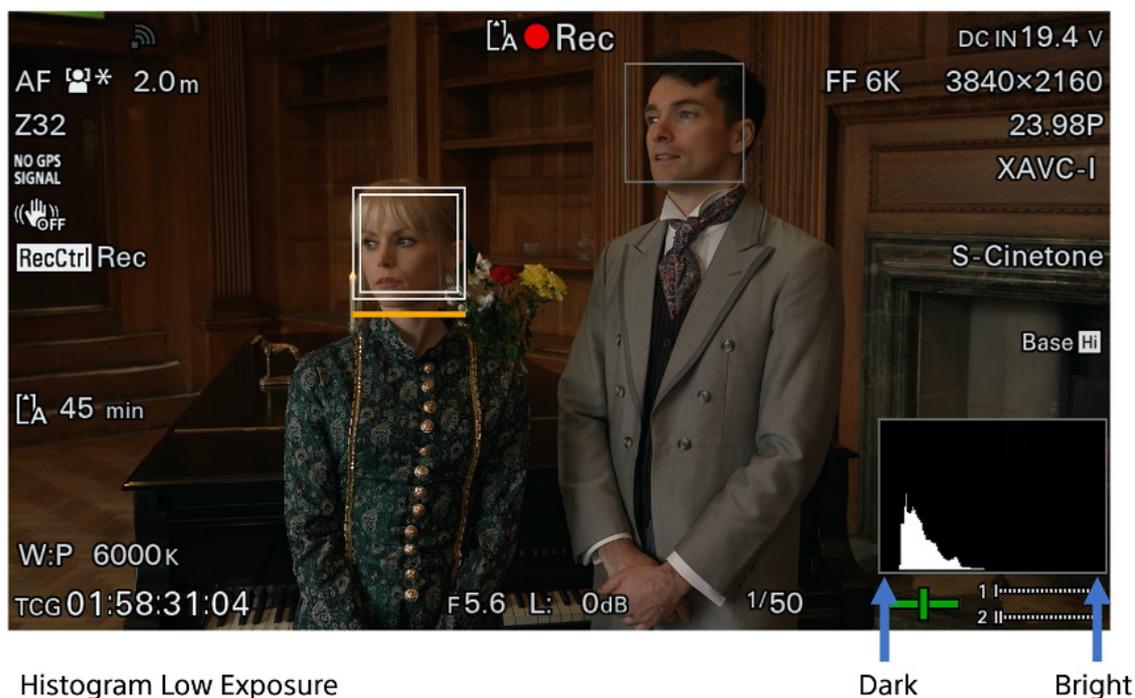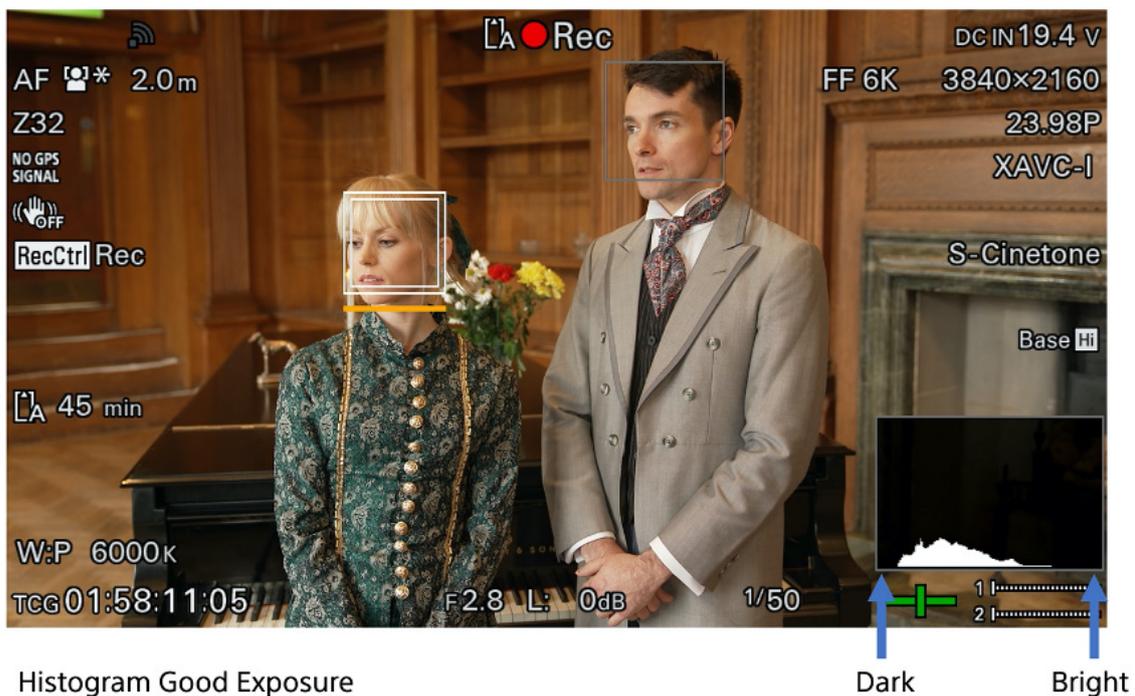
I. Aperture/Iris and Auto Exposure

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I. Aperture/Iris and Auto Exposure

I1. Iris in Custom Mode

The iris of a lens with an electronically controlled iris can be controlled automatically or manually.

By pressing the Iris button on the side of the camera for at least 2 seconds or using Direct Menu to select the iris indication in the viewfinder allows you to toggle the camera between manual iris and auto iris. When Iris control is set to Auto the camera will automatically adjust the iris for the optimum exposure.

When manual iris control is selected the Iris Push Auto button can be used to momentarily set the iris automatically.

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I. Aperture/Iris and Auto Exposure

I2. Auto Exposure Offsets

When using auto iris or any other auto exposure function it is possible to include an offset to the auto exposure to brighten or darken the image. There are presets for backlit scenes or scenes where the main focus of the scene is under a spotlight. These offsets can be chosen via direct menu or via **(MENU: Shooting – Auto Exposure – Mode)**.

You can also enter your own offset to the Auto Exposure system using direct menu or via **(MENU: Shooting – Auto Exposure – Level)**. The values indicated are fractions of

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I. Aperture/Iris and Auto Exposure

stops. A plus value will make the images brighter and a minus value will make them darker.

I. Aperture/Iris and Auto Exposure

I3. Getting a shallow depth of field for the filmic look

For a shallow depth of field, film-like look it is often desirable to use a large iris (f1.4 – f4). With large iris settings you will get the greatest difference between the in focus and out of focus areas of your footage. If you find that your footage becomes over exposed when using a large iris you should consider introducing the ND filter to reduce the exposure level.

In very bright scenes you may observe softening of your footage if you use a very small iris. This is due to diffraction effects and as a result you should avoid using very small iris values (f16, f22 etc). Most lenses provide the best performance in the middle of their iris (aperture) range. Use the camera's built in ND filters to maintain your desired exposure rather than very a very small iris when there are high light levels.

J. The ND Filter System

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J. Section Introduction >

J1. The electronicaly controlled Variable ND Filter >

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J. The ND Filter System

Section Introduction

Neutral Density filters are used to reduce and control the amount of light falling on the sensor in bright filming conditions. They allow the use of larger apertures than would otherwise be possible in high light level scenes.

ND Filter Preset Controls   ND Auto Button   ND Filter Dial

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J. The ND Filter System

J1. The Electronicaly Controlled Variable ND filter

The PXW-FX9 has an advanced electronically controlled variable ND filter system. When the filter system is set to the clear position there is no additional filtration in the optical path. When you set the ND filter to ON, the neutral density filter system is introduced into the camera's optical system ahead of the sensor and allows you to reduce the amount of light that reaches the sensor.

When the ND filter mode switch is set to preset the ND filter provides 3 preset levels of ND filtration. The default values are: 1 = 1/4ND (2 stops), 2 = 1/16ND (4 stops) and 3 = 1/64ND (6 stops). However, if you wish you can change these preset ND levels in the menu **(MENU: shooting - ND Filter)**.

Switching the ND filter switch to Variable allows you to use the ND Variable wheel to vary the amount of ND filtration smoothly and seamlessly from 1/4ND (2 stops) to 1/128ND (7 stops). The variable ND function allows you to use the iris (aperture) you desire for the best depth of field or lens performance and then finely control the exposure via the variable ND filter.

J. The ND Filter System

J2. Auto ND Filter

The Variable ND filter can also be made to operate automatically by first enabling the ND filter system by pressing the ND+ button and the pressing and holding the ND Auto button for at least 2 seconds. The button will illuminate when the Auto mode is activated.

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K. Auto Focus and Focus Aids

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| K5. Peaking | ⟩ |

| K6. Focus Magnification | ⟩ |

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K. Auto Focus and Focus Aids

Section Introduction

Auto Focus, Peaking, Focus Indicator and Focus Magnification.

The PXW-FX9 has an advanced, highly sophisticated auto focus (AF) system purpose designed for video applications. This AF system is called as Fast Hybrid AF. It combines phase detection AF for fast, accurate subject tracking with contrast AF for exceptional focus accuracy. The speed and responsiveness of the AF system can be tailored to suit different shooting scenarios. It also has the ability recognize and to track individual faces.

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K. Auto Focus and Focus Aids

K1. Auto Focus Controls

When fitted with a suitable auto focus capable Sony E-mount lens the camera can be set to Auto focus using the Focus Auto/Manual switch. In addition, the Focus Push Auto button can be used to momentarily engage the auto focus system. Otherwise the camera can be focused manually.

AF On/Off Switch   AF Push Auto Button

In order for the cameras auto focus functions to operate correctly if the lens has an AF/MF switch it must be set to AF. If using a lens with a focus ring that slides between AF/MF it must be in the AF position.

Some Sony lenses have a Focus Hold button on the lens itself. When AF is enabled and this button is pressed the auto focus function is temporarily halted until the button is released. It is also possible to assign different functions to the Focus Hold button by going to **(MENU: Project – Assignable Button – Focus Hold Button)**.

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K. Auto Focus and Focus Aids

K2. Auto Focus Detection Area

The focus detection area of the auto focus system can be altered by going to **(MENU: Shooting – Focus – Focus Area)**. By default, both the Focus switch and the AF Push Auto button will use the same focus area. But it is also possible to set one type of focus area to the Focus switch and an alternate focus area to the Push Auto AF button.

In order to have a different focus area for the AF Push Auto button you should go to **(MENU: Shooting – Focus – Push AF Mode)** and select **Single-shot AF(AF-S)**. Now you can select a different focus area for the AF Push Auto button by going to **(MENU: Shooting – Focus – Focus Area AF-S)**.

There are 3 different focus areas to choose from. When using Face Detection or Face Priority these will only function within the selected focus area.

Wide: Covers almost the entire sensor.

94%

561 AF detection points

96%
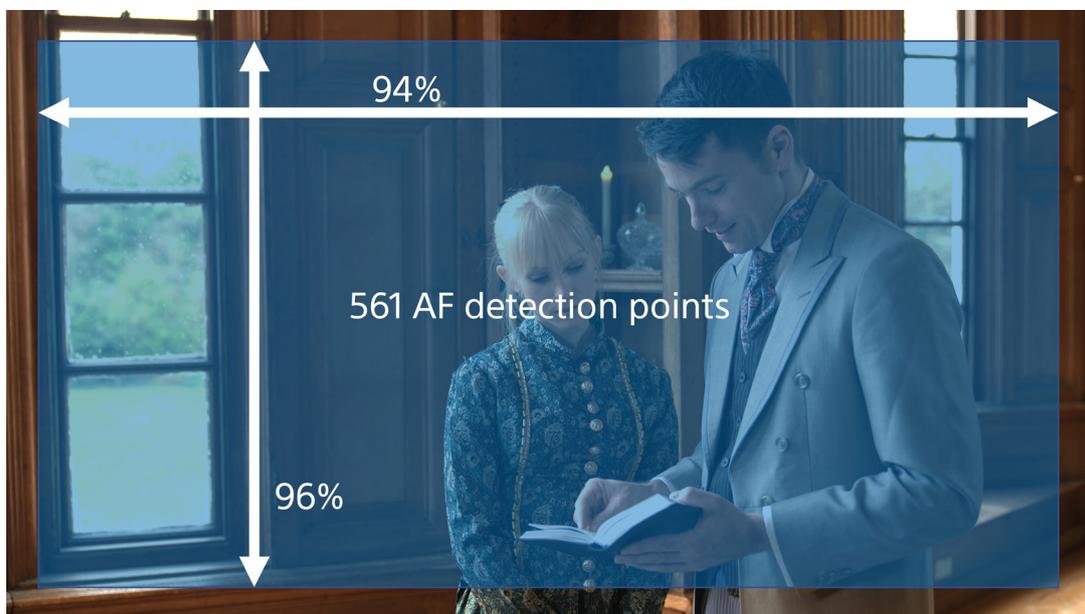
K. Auto Focus and Focus Aids

Zone: This is a smaller area that can be moved around the image using the thumbstick on the hand grip or the up/down/left/right menu button.
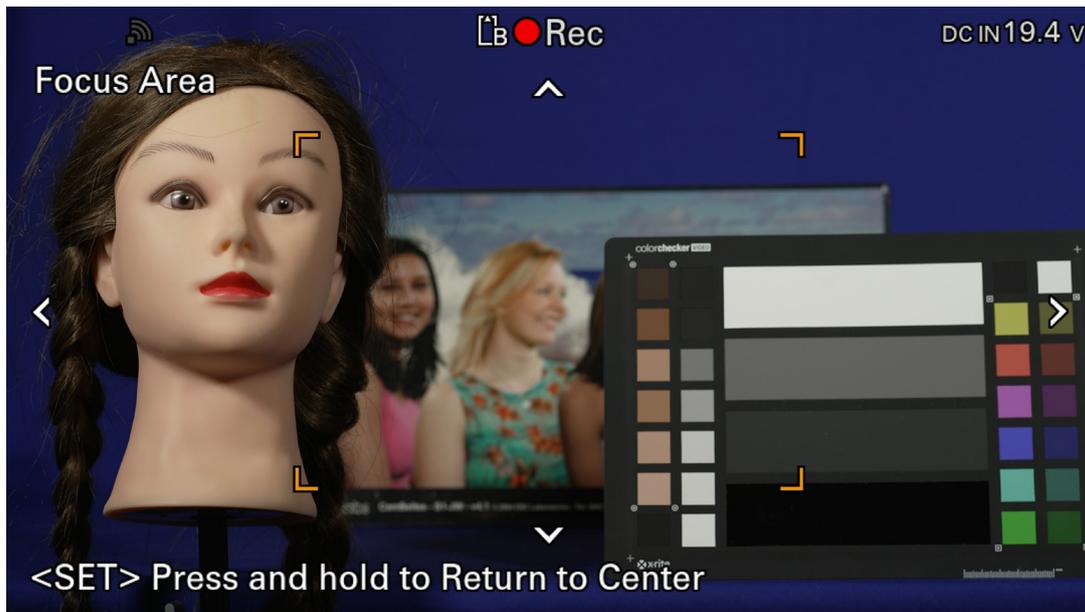
Flexible Spot: This is a much smaller area, useful for isolating a single object or very small part of the image. The flexible spot can be moved around the image using the thumbstick on the hand grip or the up/down/left/right menu button.

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K. Auto Focus and Focus Aids

RECOMMENDATION: I suggest using Wide area for the Focus switch and then setting up the AF Push Auto button to use AF-S and the flexible spot. This way you can quickly alternate between Wide area and Flexible Spot.

You should also consider assigning the ability to change the focus area to one of the assignable buttons.

K. Auto Focus and Focus Aids

K3. Changing the AF speed and responsiveness

You can use the AF Transition Speed setting **(MENU: Shooting – Focus – AF Transition Speed)** to adjust how quickly the focus adjusts. When set to 7 (Fast) the focus will move very quickly from one focus distance to another, this may be useful for following fast moving objects and action. When set to 1 (Slow) the focus will change from one distance to another very slowly. This may be more appropriate for drama.

RECOMMENDATION: If the focus is set to a very fast transition speed the focus can sometimes look unnatural as the focus flicks quickly from one object or subject to another. For more natural looking focus, I recommend using a slightly slower setting than default, perhaps 3.

The AF Subject Shift Sensitivity setting allow you to adjust how strongly the AF will hold on to the object it is focused on before releasing and focusing on another object **(MENU: Shooting – Focus – AF Subj.Shift Sens)**. When set to 5(Responsive) if a new object comes into the shot the AF will respond quickly and move the focus to the new object. When set to 1(Locked On) the AF will remain focused on

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K. Auto Focus and Focus Aids

the original object even if a new object temporarily enters or crosses through the scene. As an example, 1(Locked On) is useful for shooting across a street where traffic may be passing between the camera and the subject on the other side of the street. In 1(Locked On) the AF will ignore the traffic passing through the shot. If you were to set the camera to 5(Responsive) the AF may attempt to quickly shift to the traffic as it passes through the shot.

RECOMMENDATION: For general shooting the default setting of 3 works well. For interviews or similar shots using 1(Locked On) will stop the AF from being distracted by objects that may cross the foreground or background of the shot.

On the other hand, 5(Responsive) can be used for capturing car racing where multiple cars are coming one after another and you'd like to easily change the focus from one to the other.

K. Auto Focus and Focus Aids

K4. Face Detection AF

The FX9's auto focus system is able to recognize faces and it can be set to prioritize faces over other objects within a scene. In addition, the camera has the ability to differentiate between different faces allowing you to select, memorize and then prioritize an individual face out of a group of people.

**(MENU: - Shooting – Focus – Face Detection AF). Or via Direct Menu.**
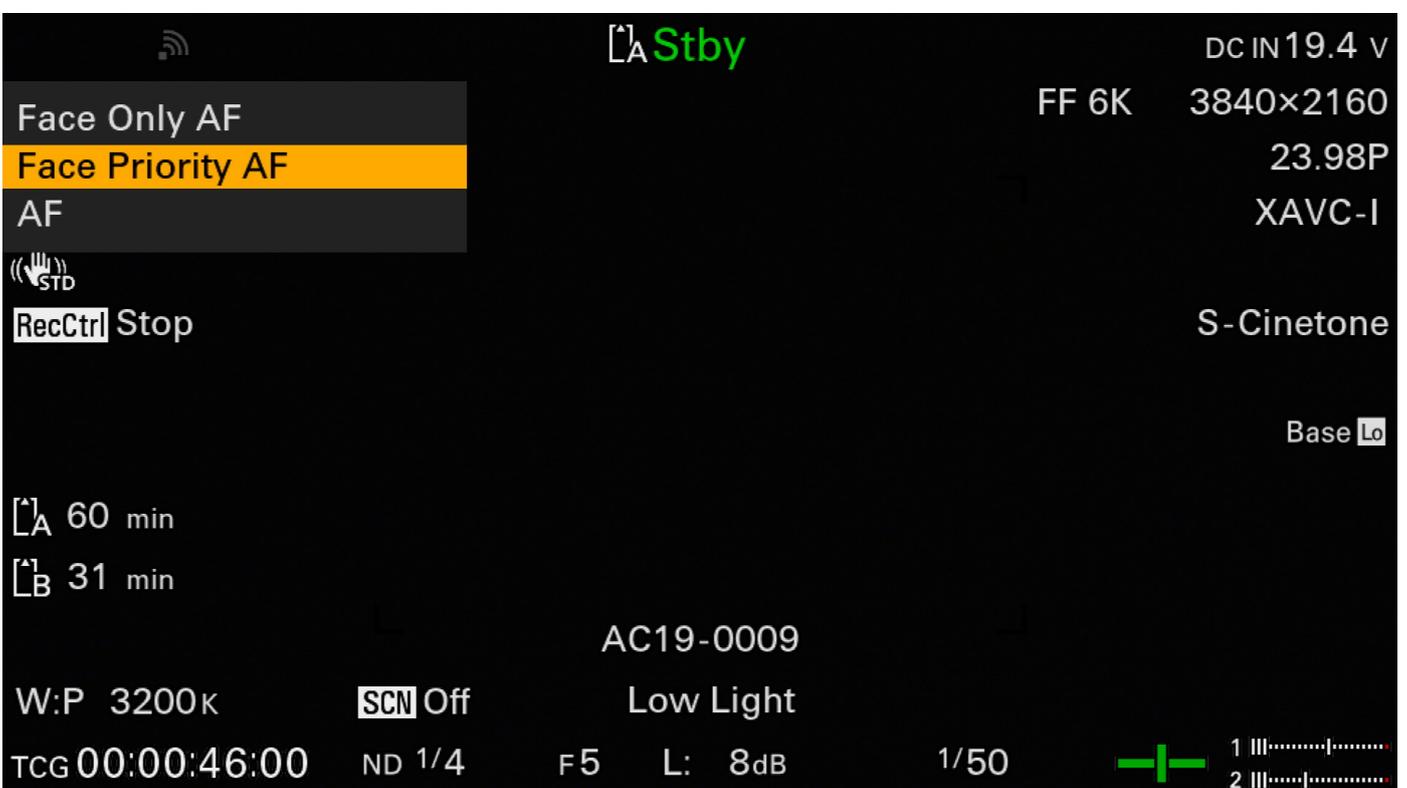
When set to OFF ("AF" if via Direct Menu) the autofocus system will focus on whatever object appears to be the main object in the shot, whether that is a face or something else.

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K. Auto Focus and Focus Aids

When set to Face Priority the AF operates as normal but as soon as the camera sees a face within the shot the camera will automatically focus on the face. In the viewfinder a box will be displayed around any detected faces and an orange cursor will appear under one of the boxes.

The cursor can be moved between faces using the thumbstick on the hand grip or the menu up/down/left/right buttons. By placing the cursor under a preferred face and pressing the thumbstick or the select button the box around that face will become a double white box and the camera will register that face in its memory and prioritize it.
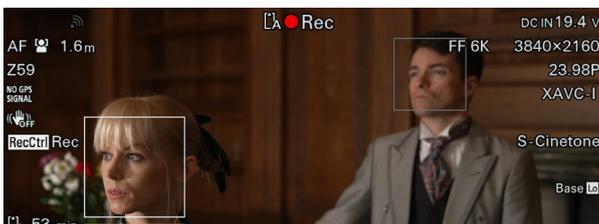
1: Boxes appear over faces.

2: Move Orange Cursor.

3: Select Desired Face.

K. Auto Focus and Focus Aids

Even if that face now passes out of the shot, once the face re-enters the shot the AF will again recognize it and prioritize it.

To clear the selected face simply move the orange cursor back to the selected face and select it again, this will cancel the selection.

When the AF is set to Face Only AF the camera will only alter the focus when the camera detects a face within the shot. When there is no face, the focus distance will remain fixed until another face is detected. If an individual face has been selected, then the AF will only operate when this particular face is detected.

Note that if you have selected Face Only AF and then turn the camera off the focus will revert to Face Priority AF.

HINTS AND TIPS: Faces must be looking straight at the cameras for the best results. Beards, facial hair and spectacles may prevent the detection of a face. When shooting with a very shallow depth of field, faces in the out of focus areas may be too blurred to be recognized. While the AF system does work even at very low light levels the best performance will only be obtained when there is sufficient light for a good exposure. When using the Cine EI mode the autofocus operation is best when you use a Monitor LUT.

K. Auto Focus and Focus Aids

NOTE: Auto Focus does not function when using the S&Q mode.

To assist with obtaining the best possible focus there are a number of focus aids.

K. Auto Focus and Focus Aids

K5. Peaking

The camera's peaking function can be turned on and off via the peaking button on the side of the viewfinder LCD screen. The peaking settings can be changed in **(MENU: – Monitoring – Peaking)**. You can change the peaking type between Normal or Colour. Sometimes coloured peaking is easier to see than normal black and white peaking so consider setting the peaking type to colour and choosing a colour such as Red. Avoid using an excessively high peaking level.

HINTS AND TIPS: Peaking works by enhancing the appearance of high contrast edges within the image by adding coloured or black or white (normal peaking) highlights to the high contrast areas. This makes it easier to determine which parts of the image are in focus. However, it should be noted that as peaking is contrast based, in high contrast scenes the peaking signal may be seen across large areas of the image, even areas not quite in focus. As a result, peaking should be used with caution and high peaking levels should be avoided.

K. Auto Focus and Focus Aids

K6. Focus Magnification

The Focus Magnification Function allows you to magnify the image seen in the viewfinder to closer inspect the focus. By default, pressing assignable button 4 on the hand grip magnifies the image by 3x, pressing it a second time by 6x and the third press returns the image to normal. Focus Magnification has no effect on the recordings or HDMI or SDI outputs so can be used at any time. When Focus Magnification has been activated the thumbstick on the handgrip can be used to select which part of the full image is magnified. The Focus Magnification function can also be assigned to an assignable button in case you are not using the handgrip **(MENU: Project – Assignable Button)**.

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L. Gamma Settings In Custom Mode

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L3. Standard Gamma (STD)   ❯

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L. Gamma Settings In Custom Mode

L1. What are Gamma Curves

In custom mode you can change the gamma curve of the camera to alter the contrast and dynamic range of the captured image **(MENU: PAINT - GAMMA)**.

By using different gamma curves you can dramatically alter the look of the recorded image. There is no requirement to use any specific gamma curve. You should use the gamma curve that provides what you regard as the best looking image. It is worth experimenting with different gamma curve settings to achieve different looks.

A gamma curve with a large dynamic range will capture a larger scene brightness range but result in a flatter on screen image. A gamma curve with a smaller dynamic range will result in a higher contrast image but is only capable of capturing a narrower scene brightness range before the recorded image becomes over exposed.

The PXW-FX9 Gammas are split in to 4 categories: Original/STD/HG/S-Log3 **(MENU: Paint – Gamma – Gamma Category)**.

L. Gamma Settings In Custom Mode

L2. Original Gamma (S-Cinetone)

This is the default setting and selects the S-Cinetone gamma curve which produces a film-like look with a very smooth highlight roll-off.

The S-Cinetone gamma curve behaves slightly differently to most conventional gamma curves such as Rec-709. This behaviour allows you to adjust the amount of contrast in your footage through small changes in exposure.

The contrast in the S-Cinetone gamma curve changes as you go up in brightness. In the shadow and darker areas of the image contrast is increased. Starting from around 70IRE or 70% brightness a gradual change in the gamma curve occurs that gradually reduces contrast all the way up to the clipping point.

This roll-off results in smooth looking highlights In addition S-Cinetone's highlight roll off has been carefully designed to retain details and textures even in the brightest highlights in a manner similar to film. Most conventional gammas have an aggressive knee or highlight roll off that often lacks texture and as a result this gives them that classic video look. S-Cinetone avoids this and renders highlights in a very pleasing manner. While it does have a very large dynamic range, around 460%, about 11 stops, if you really do need the greatest possible dynamic range you should still consider using the FX9's CineEI mode and shooting with S-Log3.

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L. Gamma Settings In Custom Mode

So how should you expose S-Cinetone?

It's actually very easy, generally you expose it no differently to any other standard rec-709 or similar gamma curve. If using the image in the viewfinder to assess your exposure simply expose it so it looks right, it really is that simple.

But do note that the design of the curve means that if you expose a touch brighter the image will become very slightly flatter and less contrasty. Expose a touch lower and the contrast increases giving you the ability to quickly tweak the way your images look.

S-Cinetone Exposure

| Low | Medium | Bright |

If you wish to use zebras or the waveform display to assist with getting the right exposure, as a starting point I recommend exposing typical skin tones at around 65% for a

L. Gamma Settings In Custom Mode

normal looking image. If you expose skintones at 70% then the image will be a touch flatter. If you expose skin tones at 60% the image will be more contrasty.

Personally for a more film like look, I really like the results you get when you expose skin tones in the 60 to 65% range. But you should experiment for yourself with different exposure levels to see what suites your shooting style and the look you wish to achieve.

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L. Gamma Settings In Custom Mode

L3. Standard Gamma (STD)

The gamma curves available under this category are all variations on standard television gamma. These curves will all provide realistic and true to life contrast when viewed on a conventional TV or monitor. However, these curves have a limited dynamic range. The scene brightness range that can be captured is restricted to maintain compatibility with normal TV displays. STD gamma curve STD5-R709 is the standard gamma for HDTV production. A white card would be exposed at around 90% and average skin tones around 70%.

L. Gamma Settings In Custom Mode

L4. Hypergamma (HG)

These advanced gamma curves are designed to capture a wider dynamic range than the standard gammas with only a small reduction in screen contrast (normally the higher the camera's capture dynamic range the lower the on screen contrast will be). This is achieved through the careful addition of highlight compression. The different curves offer different dynamic ranges and as a result should be exposed slightly differently to standard gammas for the very best results. The capture range and optimum exposure levels are indicated in the full name of the hypergamma curve, for example:

HG4609G40 = HG – 460 – 9 – G40, which indicates HG (Hypergamma), with an over exposure range 460% greater than standard TV gamma. Recording to 109% (the other option being a "0" which indicates recording to 100%). G40 being the optimum exposure for a 18% middle grey card of 40%.

In practice a Hypergamma with a lower "G" middle grey number, G33, G30 etc will be better suited to brighter situations. A higher "G" number, G40 etc will be better suited to darker scenes. A larger dynamic range 460 or 800 will be good for high contrast scenes while a smaller dynamic range (360) will be better suited to controlled lighting.

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L. Gamma Settings In Custom Mode

L5. S-Log3

You can use the S-Log3 gamma curve in Custom Mode to capture an extremely large scene brightness range of over 15 stops. This will result in a very flat on-screen image. Note that the peak recording level for S-Log3 is 94%.The PXW- FX9 is primarily designed to use S-Log recording in the Cine EI mode and it is recommended that if you wish to shoot S-Log3 that you use Cine EI rather than Custom Mode.

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M. The MATRIX: How to change the colour ranges

M1. The Preset Matrix Options

There are 6 different preset matrix options.

S-Cinetone: The cameras default colour matrix, normally used with the S-Cinetone gamma curve, but it can be used with other gamma curves. It gives film style colours with warm skin tones.

Standard: This reproduces the colours typically found from a Sony broadcast television camera or earlier generation of large sensor camera such as the PXW-FS7, but having an improvement for daylight shooting.

FL Light: This is fine-tuned with the assumption that it will be used under some types of Florescent or LED lights. It is very effective at producing a pleasing image under these types of lights.

Cinema: Similar to the Cinema matrix in some other Sony cameras. It gives slightly muted colours with a colour range designed to provide a more film like look.

BT.709: A standard Rec-709 compatible colour matrix for HD broadcast television production.

BT.2020: A standard Rec-2020 compatible colour matrix for UHD television production. It should be noted that if you shoot using the BT.2020 colour matrix and then view the footage on a conventional Rec-709 TV or monitor the colours will be desaturated and the hues will look

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M. The MATRIX: How to change the colour ranges

incorrect. You should only use the BT.2020 matrix if you are delivering material to be viewed on Rec 2020 devices.

M. The MATRIX: How to change the colour ranges

M2. Adaptive Matrix

When shooting strong blue lights, such as blue LED stage lights, the blue light may create unpleasant, over saturated blue areas within the image. Activating the adaptive matrix reduces the undesirable effects of bright blue lighting within the image. It is recommended that it is turned back off again when not needed.

M3. User Matrix

The user matrix allows you to alter the way the camera combines colours to give accurate hues and shades. Difficult to adjust unless you know what you are doing. **(MENU: Paint – Matrix – User Matrix)**.

M4. Multi Matrix

An easier to use way of adjusting the colours the camera reproduces. You can take multiple colours by selecting several different AXIS settings and adjust the saturation and hue of those colours. Be careful as this can sometimes result in odd behaviour on colours that sit on the boundary between two axis. **(MENU: Paint – Multi matrix)**.

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N. Custom Mode Other Settings (use with caution)

N1. White Clip

Sets the clipping point of the camera. Normally ON and set to 109%. If going direct to air for broadcast you may want to set this to 104% for digital or 100% for analog broadcasters. Note that changing this will have an impact on the optimum knee settings. **(MENU: Paint – White Clip)**.

N2. Detail

Detail boosts the contrast around edges making the image making them appear sharper. May look artificial if set too high. If doing any post production grading it is recommend that you turn Detail OFF (default) as you can always sharpen in post and excessive in camera sharpening can restrict how much you can grade your footage. There are separate detail settings for HD and UHD **(MENU: Paint – Detail)**.

N3. Aperture

A frequency-based edge sharpening effect that makes the image look sharper. Tends to be less aggressive and more natural looking than detail correction but don't turn it up too high as it can accentuate noise. **(MENU: Paint – Aperture)**.

N4. Black Gamma

Can be used to adjust the slope of the darker part of the standard gamma curves. This lowers or increases the contrast in the darker parts of the image. **(MENU: Paint – Black Gamma)**.

N5. Knee

Adjusts the point where the knee starts to compress and the compression ratio of highlights in the standard gammas. Done to increase dynamic range. **(MENU: Paint – Knee)**. Best left alone unless you have a waveform monitor to get the settings just right. If shooting a scene with a very low dynamic range you can turn the knee off to eliminate sometimes electronic looking highlights, but highlight range will be dramatically decreased.

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O. Using the Cine EI Mode (in detail)

Section Introduction

The Cine EI mode is quite different to custom mode and the way a conventional video camera works. In the Cine EI mode the camera always records using the S-Log3 gamma curve at either the Hi (800 ISO) or Low (4000 ISO) base sensitivity. You cannot add gain in the Cine EI mode as this would reduce the dynamic range. Instead you have the ability to alter the EI – Exposure Index.

NOTE: The FX9 has a very large dynamic range. Too large for S-Log2 to record so there is no S-Log2 option, only S-Log3.

The base exposure level for S-Log3 is:

Middle Grey	White Grey
41%	61%

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O. Using the Cine EI Mode (in detail)

O1. Setting the color gamut

When using the Cine EI mode by default the camera is set to use the S-Gamut3.Cine color gamut. This is a good choice for most applications but should you wish to change this you can do so via (MENU: Project – Cine EI Setting).

S-Gamut3: A very wide range colour gamut suitable for high end productions that have good colour management.

S-Gamut3.Cine: A wide range colour gamut suitable for most types of productions. It is a slightly smaller gamut than S-Gamut3 and the colour primaries are closely aligned with the DCI-P3 colourspace. This makes it very easy to use in post-production and is the recommended colour gamut.

O. Using the Cine EI Mode (in detail)

O2. Monitor LUT's

When using the Cine EI mode, depending on how the camera is setup, it can apply a Monitor LUT (Look Up Table) to the Viewfinder, HDMI and SDI outputs to simulate how the footage may look after it has been colour graded. The default LUT in the FX9 is the same "s709" LUT as used by the VENICE camera. As a result when this MLUT is applied to the viewfinder or outputs the video will look very similar to footage from a VENICE camera. While in many respects similar to S-Cinetone the s709 LUT is different as s709 was designed as a post production starting point for film style productions. As a result it has less contrast and a slightly different colour palette to S-Cinetone.

S-Log3   S-LOG3 + s709 MLUT

O. Using the Cine EI Mode (in detail)

S-Log3   S-LOG3 + s709 MLUT

MLUT's can only be enabled when the recording format is set to 3840x2160 (UHD). They are enabled via **(MENU: Shooting – Monitor LUT Setting)**.

> **WARNING:** Do not enable an MLUT for internal rec unless you no longer wish to record S-Log3 and instead wish to record the MLUT as a baked in look.

If you wish to use a different MLUT you can change the MLUT by going to **(MENU: Shooting – Monitor LUT)**.

If the camera is set to output 1920 x 1080 HD over SDI or HDMI then the MLUT will be added to the output signal. If the camera is set to output 3840 x 2160 UHD then the MLUT will only be applied to the viewfinder and if enabled the streaming output, HD Sub recording or Proxy recording. It will not be applied to the output which will remain as S-Log3.

O. Using the Cine EI Mode (in detail)

A full list of the MLUT recording and output options is displayed on the **(MENU: Shooting – Monitor LUT Setting)** page. The Viewfinder, HDMI and SDI output status can be viewed via page 3 of the Status pages (press the Status button to activate).

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O. Using the Cine EI Mode (in detail)

O3. Using Exposure Index

Exposure Index allows you to easily offset your S-Log3 exposure in a controlled way so that you can move the mid-point of your recordings up or down to alter the highlight and shadow ranges as well as change the signal to noise ratio.

When you have enabled an MLUT for the viewfinder the Exposure Index (EI) function will change the brightness of the MLUT. EI only changes the MLUT, the camera always continues to record at the base ISO of either 800 ISO or 4000 ISO in order to preserve the cameras full dynamic range.

To change the Exposure Index select a different position for the L/M/H gain switch or press the ISO/Gain button and use the Multi-function Dial or use Direct Menu to select the EI value displayed in the viewfinder.

When you lower the Exposure Index the brightness of the MLUT is decreased. When you increase the EI value the MLUT becomes brighter. If you are using a light meter to determine your exposure you would change the light meters ISO value to match your new EI value.

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O4. Cine EI example (Using the s709 MLUT)

I recommend the use of the built in Waveform Display to assist with monitoring and setting the exposure in the CineEI mode. This can be enabled via (MENU: Monitoring – Display On/Off – Video signal Monitor).

When the SDI/HDMI output is set to HD the waveform display will be measuring the brightness of the chosen LUT. When the SDI/HDMI output is set to 3840x2160 UHD the waveform display will show the brightness of the S-Log3 recordings. What the waveform is measuring is indicated immediately above the waveform display.

O. Using the Cine EI Mode (in detail)

When viewing the s709 MLUT and you are exposed correctly the picture in the viewfinder should look normal. When the MLUT looks to be correctly exposed then the S-Log3 recording will also be exposed correctly according to the chosen Exposure Index.

When viewing the s709 MLUT You can use Zebras at 70% for typical skin tones just as you would with a conventional camera.

If the base ISO of the camera is set to 800 ISO and the EI is set to 800 EI then this would be considered to be the base or normal exposure level.

If you were to now lower the Exposure Index to 400 EI the image in seen in the viewfinder via the MLUT will become 1 stop darker and appear to be under exposed. To compensate for this, you should adjust your exposure so that 1 stop more light falls on the sensor. This brings the brightness of the images seen in the viewfinder back to a normal looking level. It also means that the S-Log3 recording will become 1 stop brighter. If using the waveform and it is measuring the S-Log3 you will see the levels on the waveform increase.

As the recording is now brighter by one stop you will gain an extra stop of shadow information and noise will appear

O. Using the Cine EI Mode (in detail)

to be reduced in the final images. But your highlight range will be reduced by 1 stop.

	Middle Grey	White Grey	Highlight/Shadow Range
Base S-Log3 800/4000EI	41%	61%	+6 / -9%

Because of the brighter S-Log3 exposure the use of an EI lower than the base ISO may helpful for reducing noise in the final graded images. Because of the darker S-Log3 exposure using an EI higher than the base ISO will increase noise in the final images so should be used with caution.

Base Exposue at 800EI 800 Base ISO
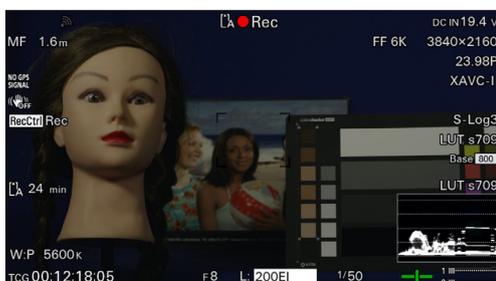
Exposure index is reduced to 200EI, image via the LUT becomes 2 stops darker

Exposure is adjusted 2 stops brighter to bring brightness to MLUT image to the same base setting. The recording becomes brighter as a result

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O. Using the Cine EI Mode (in detail)

RECOMMENDATION: For most applications using an Exposure Index that matches the base ISO will produce good results.

Exposure Index ratings higher than the base ISO should be used with caution due to concerns over increasing noise levels in the final graded material

O. Using the Cine EI Mode (in detail)

O5. When you can't use MLUT's - Gamma Display Assist

MLUT's cannot always be used just for the viewfinder for example when the camera is set to record HD.

When shooting in the Cine EI mode as an alternative to using an MLUT the FX9 has a function called Gamma Display Assist **(MENU: Monitoring – Gamma Display Assist)**. When Gamma Display Assist is enabled a normal rec-709 look is applied to the viewfinder. This look is very similar to the 709(800) MLUT, but it is only applied to the viewfinder, it cannot be added to any of the outputs.

In addition, because this is a viewfinder function its brightness does not change if you change the exposure index.

Because in most cases with the FX9 you do not need to use an exposure index offset to get a good end result the viewfinder Gamma Display Assist can be very useful for assisting with exposure assessment when shooting S-Log3. When Gamma Display Assist is enabled, if the image in the viewfinder looks correct then the S-Log3 exposure will also most likely be correct.

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O. Using the Cine EI Mode (in detail)

Viewfinder with Display Gamma Assist

Viewfinder without MLUT or Gamma Assist

Viewfinder with s709 MLUT

IMPORTANT: It is possible to have both a viewfinder MLUT and Gamma Display Assist enabled at the same time. Please ensure that you only use one or the other, do not use both together.

IMPORTANT: When using Gamma Display Assist, even though the images in the viewfinder look like normal Rec-709 images it is important to realize that if you are using zebras, the histogram or waveform display to measure the exposure these will all be measuring the S-Log3 recording levels.

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O. Using the Cine EI Mode (in detail)

RECOMMENDATION: If you shoot using the Cine EI mode regularly consider assigning the Gamma Display Assist function to an assignable button.

RECOMMENDATION: When using Gamma Display Assist with S-Log3 if you wish to use Zebras to check the exposure you should set the Zebra level to 52% for typical skin tones or to 61% to check the exposure using a white card as the zebras will be measuring the levels of the S-Log3 recordings.

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P. Slow and Quick Motion, Interval Record and Picture Cache Record

Section Introduction

S&Q motion allows the camera to shoot at a frame rate that is faster or slower than the play back frame rate. By shooting at a lower frame rate than the base frame rate action can be sped up, by shooting at a higher frame rate action can be slowed down. When shooting UHD the camera can shoot at between 1fps and 60fps. When set to HD the camera can record HFR (High Frame Rate) slow motion footage at up to 120fps.*

* As of Ver1.0. Future updates will enable 180fps shooting in HD mode.

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P. Slow and Quick Motion, Interval Record and Picture Cache Record

P1. Setting up for S&Q motion

Start by choosing the optimum Image Scan Mode based on the highest frame rate that you wish to shoot at **(MENU: Project – Rec Format – Imager Scan Mode).**

1 to 30fps: Select FF 6K for the best image quality. If you do not have a Full Frame lens then choose S35 4K.

30 to 60 fps: Select S35 4K.

100 or 120 fps: Select either FF 2K or S35 2K. Be aware that image quality will be reduced when using either of the 2K scan modes.

Next select the recording codec. In order to use S&Q motion the XAVC-L or XAVC-I codec must be selected **(MENU: Project – Rec Format - Codec)**.

Next select the base frame rate, which will be the frame rate at which the footage will play back **(MENU: Project – Rec Format – Frequency)**. If you have previously selected FF 6K scan and you choose a base frame rate (frequency) greater than 30fps then the Sensor Scan Mode will revert to S35 4K.

To enable the S&Q mode press the assignable S&Q button or turn it on in the menu **(MENU: Shooting – S&Q Motion)**. The frame rate can be set either via the menu or by pressing and holding the S&Q button until the frame rate selection menu appears and use the handgrip

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P. Slow and Quick Motion, Interval Record and Picture Cache Record

thumbstick or Multi-function Dial to select the desired frame rate. The range of frame rates available will depend on the selected Imager Scan Mode.

FF 6K Scan Mode: 1 to 30 fps. (Best Quality).

S35 4K Scan Mode: 1 to 60 fps (High Quality).

FF 2K or S35 2K: 1 to 60 fps plus 100 fps and 120 fps (Reduced Quality).*

* S35 2K imager scan mode prioritizes frame rates, so image quality may be reduced depending on the shooting environment. In this instance, the settings below are recommended.

- Cine EI mode: Set EI gain lower and exposure level higher instead.

- Custom mode: Choose the gamma category setting of Original (S-Cinetone) or STD (STD1 to 6).

NOTE: Auto Focus and Auto Iris are disabled, and audio is not recorded when using S&Q. MLUT's are not available at frame rates above 60fps (as an alternative, Display Gamma Assist is available at all frame rates).

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P. Slow and Quick Motion, Interval Record and Picture Cache Record

RECOMMENDATION: Whenever possible, including when recording HD, use FF 6K Scan or S35 4K scan as these scan modes offer the best image quality. Only use FF 2K or S35 2K when you need to shoot at 100 or 120fps.

RECOMMENDATION: If you use S&Q motion regularly consider saving your preferred S&Q settings as an "All File". This will then allow you to recall the All File to quickly setup the camera for your preferred S&Q mode.

NOTE: Be aware that when shooting at high frame rates under some types of artificial light sources that flicker from the lights can be introduced into the footage. This may not always be obvious in the viewfinder while shooting. I recommend that when shooting at high frame rates that you play back some of the clips to check for this problem.

P. Slow and Quick Motion, Interval Record and Picture Cache Record

P2. Interval Record - Time lapse recording

Interval record can be used to capture frames at a preset interval. The frames are then combined into a single video clip which can then be played back as a video clip that significantly speeds up the action in the scene recorded. You can shoot using UHD or HD. Audio is not recorded when using Interval record.

In order to use Interval Record a progressive record format must be used (p) and the playback rate of the footage is determined by the selected record format **(MENU: Project – Rec Format - Frequency)**.

Interval record is enabled and set via the menu **(MENU: Project – Interval Rec - Setting)** or it can be assigned to an assignable button.

RECOMMENDATION: Set the Interval Time to 1 second and the Number of Frames to 1. Increasing the number of frames beyond 1 typically results in jerky motion. A 1 second interval works well for scenes up to 30 minutes long, footage can always be sped up further in postproduction if required. For longer shooting periods use a longer interval.

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P. Slow and Quick Motion, Interval Record and Picture Cache Record

TIP: Consider setting the shutter to 1/3 of a second or to 360 degrees, especially when shooting night scenes to add a pleasing blur to movement (If shooting during daylight you may need addition ND filters to control the exposure).

P. Slow and Quick Motion, Interval Record and Picture Cache Record

P3. Picture Cache Record

The Picture Cache Record function allows you to capture action that has occurred in the few seconds prior to the moment when you pressed the cameras record button. This is very useful for capturing unpredictable events, for example filming an event that may occur unexpectedly or suddenly without warning.

The maximum length of the cache period depends on the recording format that is being used. It will be longer for HD recordings than UHD recordings.

To enable Picture Cache Record go to **(MENU: Project – Picture Cache Rec -Setting)**. The cache time period is selected via **(MENU: Project – Picture Cache Rec – Cache Rec Time)**.

> **NOTE:** To quickly turn Picture Cache on and off you can assign the function to an assignable button.

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Q. SteadyShot and Post Production Image Stabilization

Section Introduction

The PXW-FX9 can use lenses that feature optical image stabilization (SteadyShot) or has the ability to add motion metadata to the internally recorded XAVC clips so that image stabilization can be performed in postproduction. You can use one or the other but not both together.

Q. SteadyShot and Post Production Image Stabilization

Q1. SteadyShot, Optical Stabilisation

When a lens that includes a compatible optical stabilisation system is attached to the camera you can enable the the SteadyShot function to make use of the lenses stabilization function **(MENU: Shooting – SteadyShot – Setting – Standard)**. In addition, if the lens has a separate SteadyShot or Image Stabilisation switch you will need to set this to ON in order to active the stabilization. The performance of the stabilization will be dependent on the lens that is being used. Steadyshot can also be turned on and off via Direct Menu.

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Q. SteadyShot and Post Production Image Stabilization

Q2. Postproduction Stabilization via motion metadata

As an alternative to optical Stabilization you can stabilize your footage on a computer or in postproduction using metadata that the camera records about the way it is moving while the shot is being taken. Sony's Catalyst Browse application can be used to quickly perform the stabilization process (it is expected that this function will become available in most of the major editing applications in the near future).

In order to use the postproduction stabilization feature you must ensure that any optical stabilization is turned off. You must set **(MENU: Shooting – SteadyShot – Setting)** to OFF. In addition, the lens that you are using must be Sony E-mount lens capable of sending valid focal length data to the camera because the metadata combines not only FX9's built-in gyro information but also lens information.

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Q. SteadyShot and Post Production Image Stabilization

TIPS: Optical stabilization is normally preferable as you can see the stabilization effect while you are shooting. However, the postproduction stabilization is also very effective and you have the ability to adjust the amount of stabilization that is applied. If you intend to use the postproduction stabilization it is suggested that you use a fast shutter speed to prevent blurring of the image during any rapid camera movement. I suggest a minimum shutter speed of 1/100th of a second or a 90 degree shutter.

The metadata based postproduction stabilisation is very advanced and incorporates geomoteric corrections to provide a very natural looking image after stabilisation. Due to the geometric corrections, in many instances the stabilisation effect will be superior to what can be achieved via other software stabilisation processes.

R. Audio Options

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R. Audio Options

Section Introduction

The PXW-FX9 can record up to 4 channels of audio. There are switches to control the input options for audio channels 1 and 2 as well as a separate audio level control dial for each of the 4 audio channels. There is a basic built in microphone on the right side of the camera body and a small loudspeaker on the left side. In addition, there are further audio controls in the menu **(MENU: Audio – Audio)**.

R. Audio Options

R1. Audio Input Options

As well as the two XLR connectors on the camera body you can input up to another 2 channels of audio either via the MI Shoe on the cameras handle or via the drop in radio mic slot in the optional XDCA-FX9. In addition, you can also select the camera's internal microphone as a recording source for any of the 4 audio channels.

The input source settings for audio channels 1 and 2 are on the side of the camera. The input source settings for channels 3 and 4 are found at **(MENU: Audio – Audio Input)**. There is an additional input source setting for channel 2 in the audio menu that allows you to select Input 1 as the source for channel 2. This allow you to record a single audio source such as an external microphone on both channel 1 and channel 2 at the same time.

MI Shoe

XLR Inputs

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R. Audio Options

R2. Audio Input Level

There are several ways of adjusting the audio input levels. There is a manual audio level control dial for each of the 4 audio channels. On the side of the camera there is a switch to select between auto and manual audio control on the side of the camera. To switch between auto and manual for channels 3 and 4 you should go to **(MENU: Audio – Audio Input – CH3(CH4) Level Control)**.

Wireless Radio Mic Attached via MI Shoe URX-P40 with SMAD-P5 adapter

Audio Level Controls

Input Settings For Ch1/Ch2

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R. Audio Options

As well as the individual controls for each channel there is also a global audio input level control that affects the recording level of all 4 channels by the same amount. **(MENU: Audio – Audio Input – Audio Input Level)**. Normally this should be left at the default setting of 99 but it can be useful for globally changing the recording level of all 4 audio channels together.

If you do not wish to allow the global Audio Input Level control to affect one or more of the 4 audio channels go to **(MENU: Audio – Audio Input – CH1 level (CH2,3,4 etc))** and select Side. If you wish to have the audio channel only controlled by the global Audio Input Level control then set this to Audio Input Level.

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R. Audio Options

R3. Monitoring Audio Levels

In order to view the audio levels of channels 3 and 4 you need to select Status Screen page 3 by pressing the Status button and using the Multi-function Dial, Up/Down buttons or thumbstick. If you need to frequently view the Status screen pages consider assigning Status to an assignable button.
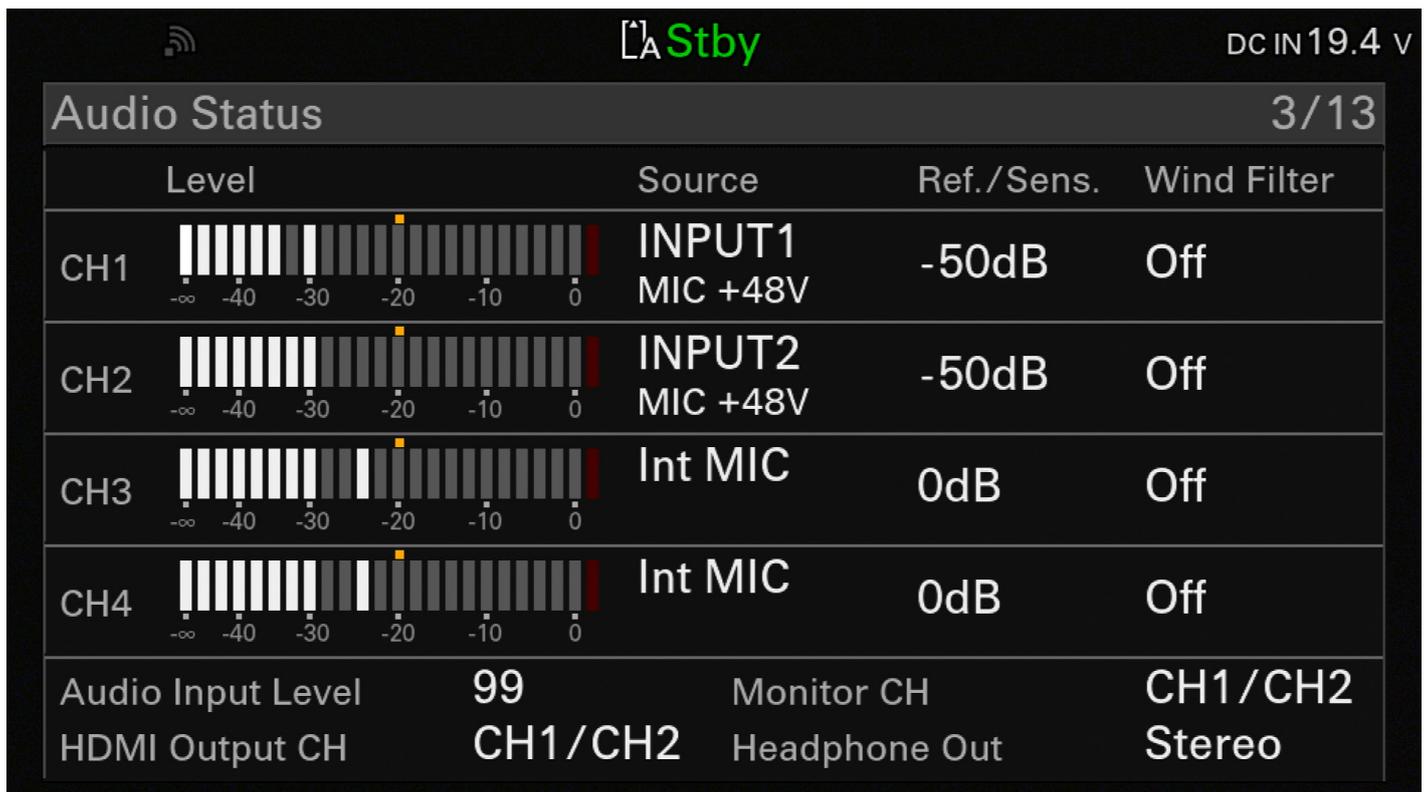
By going to **(MENU: Audio – Audio Output)** you can select which channels of audio are fed to the headphones. When the Headphone Out is set to mono the audio channels are mixed together. When set to Stereo and CH1/CH2 or CH3/CH4 selected each channel will be fed independently to the left and right headphone channels.

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S. Recording, Recording Media and Backups

Section Introduction

The PXW-FX9 records on to XQD memory cards. While a wide variety of XQD cards can be used, it is recommended that Sony's "G" series cards are used to ensure the greatest compatibility and reliability. You should store the cards in the supplied plastic case or another suitable media case when not in use to prevent dirt or other foreign objects from becoming lodged in the cards' connectors.

Do not apply stickers or labels to the faces of the cards as these may become detached and can cause the card to get stuck in the card slot.

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S. Recording, Recording Media and Backups

S1. Simultaneous Record

When recording, by default once the XQD card in the first slot becomes full the camera will automatically switch to the other slot. When shooting in 1920 x 1080 HD it is also possible to record simultaneously to both XQD card slots. By default, both slots will enter record mode when any record button on the camera is pressed. But it is also possible to control each slot independently using the record button on the side of the camera to control one slot and the handle record button to control the other slot. This may be useful when you need to record a long event or performance without any breaks onto one card while using the second card to capture highlight clips. See **(MENU: PROJECT – SIMUL REC)**.

Also, as mentioned in 4.5 chapter, you can simultaneously record a 4K (QFHD) video as a main clip and an MPEG HD422 video as a sub-clip, which can be used for editing, to a single XQD memory card. The sub-clip recording format varies, depending on the system frequency of the main clip.

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S. Recording, Recording Media and Backups

S2. Utility Card Slot

The camera has two XQD card slots plus an additional "Utility" card slot that accepts either an SD cards or Memory Stick. Cards inserted into the Utility slot it can be used to store setup files such as "User Files", "All Files" or "Scene Files". In addition, H.264 proxy files can be recorded on to and SD card or Memory Stick.

S3. Formatting Media

Before it can be used for the first time you will need to format your media. It is recommended that media cards are formatted in the camera. The format function can be found at **(MENU: TC/MEDIA – FORMAT MEDIA)**.

WARNING: If a card is formatted in the camera, as a security feature, all files on the card are permanently erased and cannot be recovered.

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S4. Safely Ejecting and Removing Media

The XQD memory cards can be removed from the camera at any time provided the access indicator LED next to the card slot is green. If the access indicator LED is red the card must not be removed.

Removing a memory while it is being accessed can result in the loss of footage or corruption of the data on the card. Should you remove a card that is being accessed in error you should immediately place the card back in the camera. The camera will perform an integrity check of the data on the card and if any errors are found you will see a message in the viewfinder saying "Restore Media".

S. Recording, Recording Media and Backups

S5. Restore Media

If you see the message "Restore Media" in the viewfinder it is an indication that the camera has identified an issue with the files on one of the media cards. Don't Panic! In most cases allowing the camera to complete the restore media process will fix any file problems. Follow the on screen prompts and allow the camera to complete the restore media process.

In some cases, it can take more than one attempt to restore the media. By ejecting the card from the camera and re-inserting it back into the camera, the camera will again perform a media check and if the problem persists the restore media function can be attempted again.

If after several restore media attempts you still see a message saying "Could Not Restore Some Clips" you may still be able to salvage the remainder of the material on the card by putting the camera into the Thumbnail mode (press the Thumbnail button) and copying the clips from the corrupt card to a newly formatted card in the other card slot. See **(MENU: THUMBNAIL – COPY CLIP)**.

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S. Recording, Recording Media and Backups

S6. Backing up media

It is a good idea to always check your material before the original files are permanently removing from the XQD cards. Sony's free Catalyst Browse application can be used to play back, copy and manage the files recorded by the FX9. When backing up or making a copy of the XQD cards, I recommend that you use Catalyst Browse to make the copies. This way you can use Catalyst to view and play back the copies of clips to ensure there are no problems before you erase or format the XQD card.

Once you have copied your clips from the XQD card to your computer, do ensure that you correctly eject the card from the computer to prevent corruption of the card. You must always use the computer's eject function before physically disconnecting the card from the computer to prevent corruption of the data on the card.

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T. Networking and Wi-Fi Overview

Section Introduction

The PXW-FX9 has built-in Wi-Fi and NFC. Via Wi-Fi the camera can connect directly to Android and Apple mobile devices for remote control and monitoring. In addition, the camera can be connected to a wireless network for remote control via a web browser as well as file upload via FTP. If you wish to use an Android or Apple mobile device with the camera you should first download and install the latest version of Sony's Content Browser Mobile application from the Apple Store or Google Play store.

T1. First you must set up a password

Before you can use any of the cameras network capabilities you must first set up a password. Until you set up a password you will not be able to access any of the other network functions. You can also change the default username if you wish. This is done via **(MENU: Network – Access Authentication)**.

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T2. Access Point Mode or Station Mode

Once you have set your username and password you next need to decide on which connection mode to use **(MENU: Network – Wireless Lan – Setting)**. When the camera is set to Access Point mode you will connect your device to the camera. When you set it to Station Mode you connect the camera to a network and then you can connect other devices to the camera via the network

Generally, you would use Access Point mode when you want to connect a mobile device running the Content Browser Mobile application (CBM) to the camera. This is the easiest way to connect a mobile device to the camera and if your device has NFC you can use NFC to establish the connection.

Access Point Mode

Device Connects Directly To Camera

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However, in some cases you may find that you can get a more stable and more reliable connection by setting the camera to Station Mode and connecting the camera to the mobile device.

Station Mode

Router/Access Point
Or
Phone With Hotspot
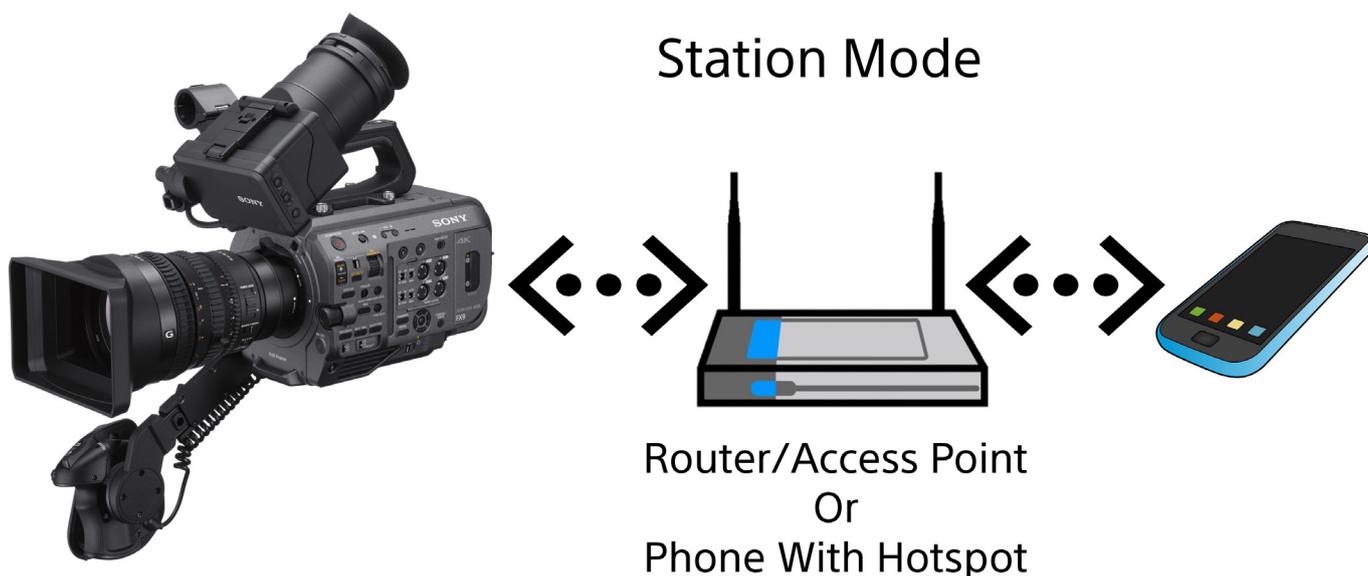
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T. Networking and Wi-Fi Overview

T3. Using Access Point mode to connect a mobile device to the camera

NFC. The simplest method is to use NFC if your mobile device has this. Ensure that Wi-Fi and NFC are enabled on the mobile device. Then go to **(MENU: Network – Wireless Lan – NFC)** select Execute and place the mobile device against the NFC symbol on the upper left side of the camera. When the mobile device detects the camera, the Content Browser Mobile app will open and you will be prompted to enter the username and password for the camera that you set previously.
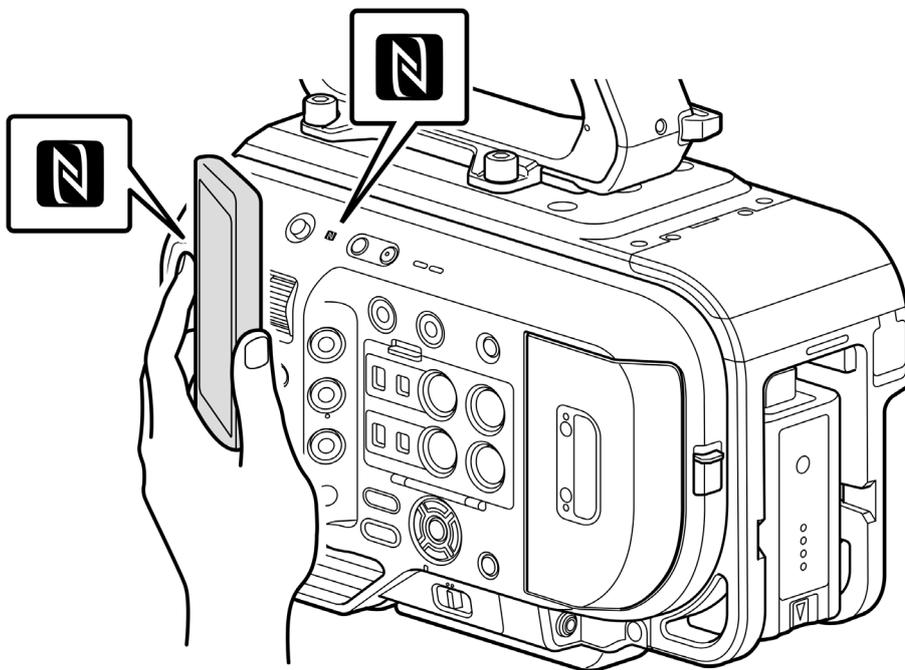
T. Networking and Wi-Fi Overview

WPS. Go to **(MENU: Network – Wireless Lan – WPS)** and select Execute. Now on the mobile device go to the Wi-Fi settings and select the SSID of the camcorder, it will be something similar to "DIRECT*****:PXW-FX9_********". Now select the WPS option on the mobile device to connect. Once connected open the CBM app to complete the connection.

Manual Connection. You can connect to the camera manually by going to the mobile devices Wi-Fi settings and manually connecting to the camera. To find the cameras SSID and Wi-Fi password got to **(MENU: Network – AP Mode Settings – Camera SSID & Password)**. Once connected open the CBM app to complete the connection.

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T. Networking and Wi-Fi Overview

T4. Connecting the camera to a network using Station mode

WPS. Go to **(MENU: Network – Wireless Lan – WPS)** and select Execute. Now on the access point or router press the WPS button. When the connection is successful, the network status indicator icon will show a strength of 1 or higher on the viewfinder screen.

Manual Connection. Go to **(MENU: Network – ST Mode Settings -Scan Networks)** and select Execute to scan for available wireless networks. Select your desired network from the network list. In the next page scroll down to Password and enter the networks password. Once you have entered the password scroll down and select Connect. Once the connection is successfully established the Connected Network should be shown on **(MENU: Network – ST Mode Settings)**.

If your mobile device is connected to the same network as the camera you can use the CBM app on the device to connect to the camera.

T. Networking and Wi-Fi Overview

TIP: If you find that the Wi-Fi connection to the camera from your mobile device drops out when you connect using Station Mode, try using Access Point mode instead. If there is no Wi-Fi network available, consider setting up a Wi-Fi Hotspot on the mobile device and connecting the camera to the Hotspot. If the mobile device has a good cellular network connection you can also upload files via FTP using the phone as the internet connection.

See the PXW-FX9 user manual for more information on the cameras network functions.

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U. Error messages and common problems

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U. Error messages and common problems

U1. Restore Media

If on switching on the camera or inserting an XQD card you see the message "Restore Media" do not worry. This is the camera performing routine maintenance on the card to keep the file system tidy and free from corruption. Always allow the camera to perform the Restore Media function. It is not an error or fault, just housekeeping.

U2. Execute APR

After switching the camera on you may see a message saying "Execute APR". This is not an error or malfunction. The APR function minimizes the appearance of bright or dark sensor pixels and minimizes sensor noise.

Cover/cap the lens and press SEL/SET to execute the APR function.

If you do not perform APR you will be reminded to perform APR the next time the camera is turned on. You should perform APR regularly to maintain the best possible image quality.

U. Error messages and common problems

U3. Audio is not being recorded

When using S&Q motion or Interval Record audio recording is not possible.

If the audio levels are low or there is no audio check the level set at **(MENU: Audio – Audio Input – Audio Input Level)** and return this to the default value of 99.

U4. Unable to enable MLUTS

An MLUT can only applied when the camera is set to record UHD in the CineEI mode.

U5. Using an external recorder connected via HDMI

To remotely control the record function of the external recorder you have to enable the record control via HDMI in the Project Menu. But you ALSO have to enable the HDMI timecode output in the Timecode menu. This is not obvious and took me a while to figure out. Also remember to turn off the text overlays via "Monitoring - Output Display - HDMI" if you want a clean output.

U. Error messages and common problems

U6. Unable to change the SDI or HDMI output format

If Picture Cache is turned on you may not be able to change the monitoring output format settings. Temporarily turn off the picture cache function to change the output settings.

U7. Can't access any network functions

Before you can use any of the camera's network capabilities you must first set up a password. Until you set up a password you will not be able to access any of the other network functions.

U8. System Reset

If the camera is not performing as expected try a system reset to restore the factory defaults **(MENU: Maintainance – All Reset)**.

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