

PANASONIC AG-AF100

AVCHD format – Records high definition video onto a media card in file formats.

Memory Cards – SDHC (up to 32GB)/SDXC (starts at 64GB)

Recording/Playback – Memory card must be at least 32GB

Interchangeable Lenses

- Lumix lenses respond to electronic lens adjustments on camera
- Non-Lumix lenses require manual adjustment for iris, focus, image stabilization
- Non-Lumix lenses require a lens adapter
- Lens adapter must be set in 'closed' position, i.e. white line points to smallest circle while attached

Lens attachment

- Remove body cap on camera
- Remove lens rear cap
- For Lumix lenses (the zoom lens kit), line up the lens attachment marks – RED DOT – and turn the lens in direction of the arrows
- When you hear a ‘click’, the lens is in place
- Remove the lens cap

Detaching the lens

- Attach the lens cap
- While pressing the lens detachment button on the right-hand side of camera near the base of the lens, turn the lens in the direction of the arrows until it stops turning
- Detach lens at this point
- Attach the body cap
- Attach the lens rear cap

Lens attachment using adapter

- Remove camera body cap
- Remove cap from adapter
- Remove rear lens cap from lens
- Attach adapter to camera body – different makes have different ways to line up the adapter to the camera.
- Attach lens the adapter by lining up the Red Dot and turning until lens is tightly in place
- Turn the lens adapter to the 'closed' position - white line points to smallest circle
- Turn off camera 'lens check' :

Scene File > Other Functions > Lens Check > OFF

Power On

- Insert battery until it clicks into place
- To remove battery, press battery release button, top left corner of batter compartment
- Power ON button is on lower right-hand side of camera
- <https://www.youtube.com/watch?v=PHNnPL0Y0jY>

Insert SD card

- Turn Power to ON
- Flip up viewfinder
- Slide the card slot cover lever to the right to open
- Insert the SD card completely
- Close the card slot cover
- To remove the SD card, press SD card gently until it pops out slightly, and pull it straight out

Formatting the SD Card

- Power the camera ON
- Press the Menu button
- Select CARD FUNCTIONS > CARD FORMAT > Select Slot > Push the Operation Lever
- Select YES to format the SD card
- Press the Menu button to exit menu
- If you do not want to erase what's on the SD card, but rather want to continue adding footage/files: CARD FORMAT > NO
- Note that formatting is proprietary to the camera

Iris/Aperture Basics

Iris/Aperture adjustments

- Press the IRIS button to switch between AUTO and MANUAL
- In MANUAL, turn the IRIS dial to adjust the aperture
- The aperture setting is displayed in terms of 'f-stop' values
- The f-stop values indicate how wide the aperture is open
- F-stop always indicates aperture setting
- Aperture setting influences sharpness of image and depth of field

Focus

- Use the FOCUS switch to control focus
- A = auto; M = manual. Always use manual focus
- In Manual mode, adjust the Focus Ring by turning the focus ring by hand; a focus-puller makes it easier to focus the camera from a short distance
- If you want to focus quickly in manual mode, temporarily switch to Auto Focus by pressing PUSH AUTO button. Once you release it, you will be in manual mode again
- The FOCUS ASSIST button magnifies the center of the screen and allows you to focus sharply

Focus contd.

- The EVF DETAIL button, aka "peaking," creates an outline or highlight on an area of focus. As you focus, you can use the EVF detail to snap your image into focus
- By opening the iris and zooming in on your subject, you can focus more easily on your subject. After focusing, zoom out to the desired focal length and correct your f-stop value/aperture setting. You may have to do the zoom-in & focus method more than once for it to be accurate

Video Gain Control

Gain/ISO – electronically amplifies brightness; adds noise to image

Stated in video dB levels; used in low-light only

- Use the GAIN switch to set levels
- L - use under normal/adequate lighting situations, ISO 400dB; no noise
- M – increase gain to ISO 800dB; image loses sharpness
- H – increase gain to ISO 1600dB; image very noisy
- Use gain levels above 'L' only as a last resort

ND filters

Neutral Density (ND) filters are filters behind the lens that will reduce the amount of light getting to image sensors without changing the quality (tone, color) of the image. “Sunglasses for your camera.”

Use ND filters when shooting outside unless you are shooting at night.

Settings:

- 1. ND filter not used
- 2. Cuts light intensity by $1 / 4$
- 3. Cuts light intensity by $1/16$
- 4. Cuts light intensity by $1/64$

White Balance adjustment

White balancing the camera establishes the value for white in your scene and therefore sets all of the color values accordingly.

Red, green and blue are the primary colors. These colors mixed at their highest value (hex 255) produce white. So when you adjust correctly for the value of white, you adjust correctly for all of the colors as well.

- Place a white card in a location with the same lighting source as your scene
- The card must completely fill the frame
- Press the AWB button on the front of the camera until you get message 'AWB Ach OK'

Understanding white balance

- Basic concept – not all light is the same color
- The human eye-brain adjusts colors and they are always appropriate to the situation and are natural
- The camera is objective, however, and sees daylight as blue and cool, and indoor lighting as orange and warm
- Light color is measured in degrees Kelvin, as color temperature
- Daylight is typically around 5600K, but can vary from 3000K-10,000K
- Tungsten & most artificial light burns at 2900-3200K
- White balancing establishes 'white' and therefore all colors under each specific color temperature situation
- This makes all colors look appropriate and natural

Black balance adjustment

- Adjusts the camera for the value of true black
- Black balance when the camera is new or has been sitting idle for a long time; or you change the gain or shutter speed.
- Gets rid of stray grey pixels in your image
- Adjust the black balance by holding down the AWB button until you see the message 'ABB END.'

Set-up Menus

Use the Menus to set up recording format, frame rate(fps), and gain.
Use menus to format your SD card, select Zebra %, and to turn the Lens Check on and off.

SCENE FILE:

- OPERATION TYPE – FILM CAM (auto 24fps) or VIDEO CAM
- REC FORMAT – select PH1080/24P or 60P
- FRAME RATE

SW MODE:

- Gain control
- User 1, 2 and 3 presets

Understanding Exposure

- Proper exposure is the most important element of getting a good image.
- Exposure refers to how much light falls onto the camera's sensors, and for how long.
- Both elements (amount & duration) result in the quantity of light hitting the camera's chips.

3 Primary ways to control exposure with camera settings

1. Lens aperture/iris. The aperture is a variable-sized hole in the lens that the light flows through
 - The bigger the hole, the more light enters the lens
 - The smaller the hole, the less light enters the lens
 - The size of the aperture is called its 'f-stop,' which is depicted numerically
 - The smaller the f-stop number, the larger the hole, i.e. the more open the aperture
 - The larger the f-stop number, the smaller the hole, i.e. the less open the aperture – the aperture is 'closed down'

3 ways to control exposure contd.

2. Shutter speed. Shutter speed is about controlling the flow of light.
 - In video, there is no mechanical shutter
 - In video, shutter speed controls the amount of time that the light is allowed to enter the lens
 - More time = more light; less time = less light
 - Effects the way motion is captured
 - Usually you want to set the shutter speed once and leave it alone
 - You do not want to use shutter speed to set your exposure – use the aperture instead

3 ways to control exposure contd.

3. Neutral Density (ND) filters

- “Sunglasses for your camera”
- Darken in-coming light with no side effects
- Used in bright conditions only
- Always use when shooting in daylight outdoors
- Not usually necessary in indoor situations, even where there is natural light

Beyond camera settings, always relates to lighting conditions

How much exposure are you getting?

Use tools on the camera to gauge exposure.

- The LCD monitor will not give you any indication of exposure
Do not use the LCD monitor as an exposure guide
- The Zebra pattern indicates bright areas of the frame
- The Waveform Monitor is the tool that shows your exposure levels from white to black objectively, in terms of the IRE scale
- IRE = Institute of Radio Engineers. The IRE scale measures video brightness from 109 (pure white – never go there) to 0 (pure black – don't go there, either)
- Auto Exposure may not get it right, but will be pretty close

Under- and over-exposure

- Under-exposure means you don't have enough light on your subject
 1. Image appears grainy
 2. Black values are crushed, meaning black and darker objects will lose detail and definition
 3. Difficult to correct in post-production

- Over-exposure means your image is too bright
 1. White values are clipped meaning anything bright in your frame is blown out and loses detail and definition
 2. *Impossible* to correct in post-production – information is lost

F-stop values

- The amount of light entering the lens through the aperture is measured in terms of f-stops, numerical values based on the square root of 2.
- F-stop values vary per camera and lens.
- The range is from f/1.4 to f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16 and f/22.
- All lenses do not have the same range, but f/2 on one lens is equivalent to f/2 on another lens.
- The higher the f-stop number, the smaller the aperture opening
- Each successive higher number lets in half as much light as the previous number

Using the zebra pattern

- Button on side of camera, Zebra1 & Zebra2, that you can use to set values and zebra pre-sets (set 2 values, switch between them)
- Zebra values measure the percentage of brightness in the digital image.
- 100% = pure white; 80%= safety zone
- If your zebra pattern setting is 80%, you will see diagonal lines in the LCD monitor in bright areas of your image that represent 80% white
- These lines are not part of the recorded image
- Open the iris until you just barely begin to see the zebra pattern
- You *never* want to see zebra stripes if you have set the value to 100%

Using the Waveform Monitor

- Press the WFM button on side of camera
- Tells you everything about the image on an IRE scale from 0% to 109%
- Shows the brightness levels throughout the image on a left to right basis – it takes a little practice to learn to equate what you see on the waveform and what you see in front of the camera
- Use WFM to locate areas where the brights are blown out and to locate areas where the darks are crushed
- Best WVM readout shows a range reflected by the scene with almost no blown out whites and almost no crushed black – a balance

Shutter Speed

- Controls how long the light is hitting the sensors
- Effects amount of motion blur in your image
- Set it once for your entire shoot and leave it there
- Shutter “Off” setting switches it to a default speed for your fps (frames per second) setting
- Formula: Shutter speed = $1 \div 2 \times$ frame rate
- Setting a lower shutter speed will give you a blurry effect with pixel ‘trails’
- Setting a high shutter speed will give you a visual strobe on fast-moving objects

Shutter speed contd.

While the aperture is a hole that lets the light in, the shutter is analogous to a gate - the longer it's open, the more light it lets in, and when the gate is 'shut' the light stops coming in.

- If you cut the shutter speed in half, e.g. using 1/120 instead of 1/60, only half as much light will reach the sensors.
- To compensate, you will need to add twice as much light to get the same level of exposure. This means adding light to your scene, or opening up the aperture by one f-stop.
- If you double the shutter duration, e.g. using 1/24 instead of 1/48, then twice as much light will get through to the sensors and you will need only half as much light to get the same exposure
- However, shooting at 1/120 will give you a visual strobe effect, and shooting at 1/24 will give you blurry trails.

Back to Aperture & F-Stop: Depth of Field

- The smaller the aperture opening, the less light is getting into the lens. $f/11$ will let in less light than $f/8$ or $f/5.6$
- The smaller the aperture opening, the sharper the image, even when everything is in focus. F-stop is related to image sharpness but not image focus
- The smaller the aperture, the deeper the depth of field
- The wider the aperture, the shallower the depth of field
- Depth of Field: the zone of acceptable sharpness within a photo that will appear in focus. In every picture there is a certain area of your image in front of, and behind the subject that will appear in focus.

What is depth of field

- DoF is the area in front of the lens that is in focus
- With a shallow depth of field, there is only a small area in focus
- With a deep depth of field, more of the scene is in focus
- Controlled by f-stop settings and focal length of lens
- A wide angle lens (28mm) will have a deep depth of field
- A telephoto lens (85mm) will have a narrow depth of field

ND Filters & Depth of Field

- ND filters are very useful if you want to have a shallow depth of field in a bright outdoor situation by allowing you to use lower f-stop values
- Each ND filter reduces the amount of light by 1 f-stop, or by one-half the amount of light
- Lower f-stop values decrease depth of field
- None of this has any effect on color values or white balance

Proper panning speed – horizontal motion of the camera on axis

- Pan slowly or everything in your shot will be blurred
- Speed of panning is related to shutter speed
- Easiest way to create a correct pan is to have your camera focus on and then follow a screen-stationary object
- This means that keep one object, often a walking subject, or sometimes a moving car, in the same part of the frame throughout the pan. The background may be blurred, but the main subject will remain in focus
- Otherwise, pan slowly – practice panning speeds until you find the right one