Nikon

DIGITAL CAMERA

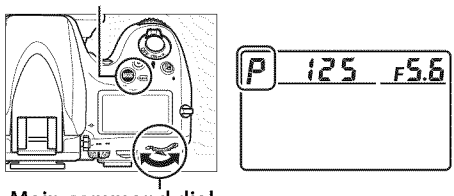
D800
D800E

User's Manual

En

Exposure Mode

To determine how the camera sets shutter speed and aperture when adjusting exposure, press the **MODE** (FORMAT) button and rotate the main command dial until the desired option appears in the control panel.



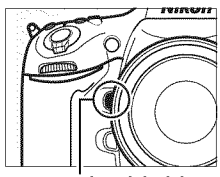
Lens Types

When using a CPU lens equipped with an aperture ring (📖 373), lock the aperture ring at the minimum aperture (highest f-number). Type G lenses are not equipped with an aperture ring.

Non-CPU lenses can only be used in exposure mode **A** (aperture-priority auto) and **M** (manual). In other modes, exposure mode **A** is automatically selected when a non-CPU lens is attached (📖 371, 374). The exposure mode indicator (**P** or **S**) will blink in the control panel and **A** will be displayed in the viewfinder.

Depth-of-Field Preview

To preview the effects of aperture, press and hold the depth-of-field preview button. The lens will be stopped down to the aperture value selected by the camera (modes **P** and **S**) or the value chosen by the user (modes **A** and **M**), allowing depth of field to be previewed in the viewfinder.



Custom Setting e4—Modeling Flash

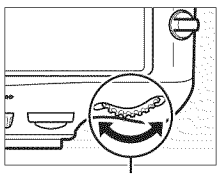
This setting controls whether the built-in flash and optional flash units such as the SB-910, SB-900, SB-800, SB-700, and SB-600 (📖 381) will emit a modeling flash when the depth-of-field preview button is pressed. See page 307 for more information.

P: Programmed Auto

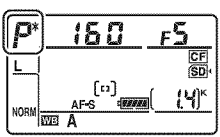
In this mode, the camera automatically adjusts shutter speed and aperture according to a built-in program to ensure optimal exposure in most situations. This mode is recommended for snapshots and other situations in which you want to leave the camera in charge of shutter speed and aperture.

Flexible Program

In exposure mode P, different combinations of shutter speed and aperture can be selected by rotating the main command dial while the exposure meters are on ("flexible program"). Rotate the dial to the right for large apertures (small f-numbers) that blur background details or fast shutter speeds that "freeze" motion. Rotate the dial to the left for small apertures (large f-numbers) that increase depth of field or slow shutter speeds that blur motion. All combinations produce the same exposure. While flexible program is in effect, an asterisk ("✱") appears in the control panel. To restore default shutter speed and aperture settings, rotate the dial until the asterisk is no longer displayed, choose another mode, or turn the camera off.



Main command dial



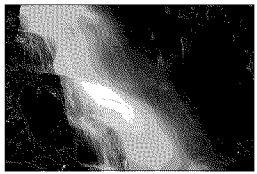
See Also

See page 411 for information on the built-in exposure program. For information on activating the exposure meters, see "Auto Meter Off" on page 42.

S: Shutter-Priority Auto

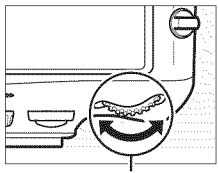
In shutter-priority auto, you choose the shutter speed while the camera automatically selects the aperture that will produce the optimal exposure. Use slow shutter speeds to suggest motion by blurring moving objects, fast shutter speeds to "freeze" motion.

Fast shutter speed (1/1,600 s)

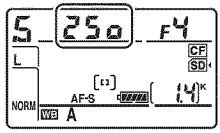


Slow shutter speed (1/6 s)

To choose a shutter speed, rotate the main command dial while the exposure meters are on. Shutter speed can be set to "x 250" or to values between 30 s and 1/8,000 s. Shutter speed can be locked at the selected setting (📖 126).



Main command dial



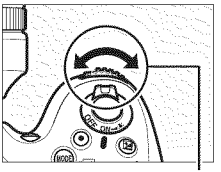
A: Aperture-Priority Auto

In aperture-priority auto, you choose the aperture while the camera automatically selects the shutter speed that will produce the optimal exposure. Large apertures (low f-numbers) increase flash range (📖 187) and reduce depth of field, blurring objects behind and in front of the main subject. Small apertures (high f-numbers) increase depth of field, bringing out details in the background and foreground. Short field depths are generally used in portraits to blur background details, long field depths in landscape photographs to bring the foreground and background into focus.

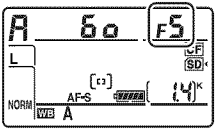
Small aperture (f/36)

Large aperture (f/2.8)

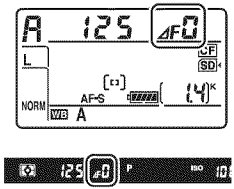
To choose an aperture between the minimum and maximum values for the lens, rotate the sub-command dial while the exposure meters are on. Aperture can be locked at the selected setting (📖 126).



Sub-command dial



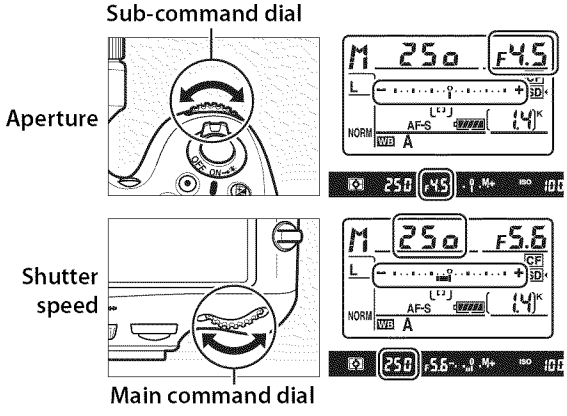
Non-CPU Lenses (📖 371, 374)



Use the lens aperture ring to adjust aperture. If the maximum aperture of the lens has been specified using the **Non-CPU lens data** item in setup menu (📖 213) when a non-CPU lens is attached, the current f-number will be displayed in the viewfinder and control panel, rounded to the nearest full stop. Otherwise the aperture displays will show only the number of stops (**AF**, with maximum aperture displayed as **AF0**) and the f-number must be read from the lens aperture ring.

M: Manual

In manual exposure mode, you control both shutter speed and aperture. While the exposure meters are on, rotate the main command dial to choose a shutter speed, and the sub-command dial to set aperture. Shutter speed can be set to "x 250" or to values between 30 s and 1/8,000 s, or the shutter can be held open indefinitely for a long time-exposure (bulb, □ 124). Aperture can be set to values between the minimum and maximum values for the lens. Use the exposure indicators to check exposure.



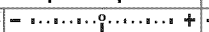
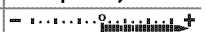
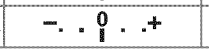
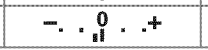
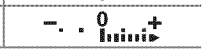
Shutter speed and aperture can be locked at the selected setting (□ 126).

AF Micro NIKKOR Lenses

Provided that an external exposure meter is used, the exposure ratio need only be taken into account when the lens aperture ring is used to set aperture.

Exposure Indicators

The exposure indicators in the viewfinder and control panel show whether the photograph would be under- or over-exposed at current settings. Depending on the option chosen for Custom Setting b2 (**EV steps for exposure cntrl**, □ 287), the amount of under- or over-exposure is shown in increments of 1/3 EV, 1/2 EV, or 1 EV. If the limits of the exposure metering system are exceeded, the exposure indicators and the shutter speed (modes *P* and *A*) and/or aperture (modes *P* and *S*) displays will flash.

	Custom Setting b2 set to 1/3 step		
	Optimal exposure	Underexposed by 1/3 EV	Overexposed by over 3 EV
Control panel			
Viewfinder			

See Also

For information reversing the exposure indicators so that negative values are displayed on the right and positive values on the left, see Custom Setting f12 (**Reverse indicators**, □ 319).

Long Time-Exposures

At a shutter speed of **bulb**, the shutter will remain open while the shutter-release button is held down. Use for long time-exposure photographs of moving lights, the stars, night scenery, or fireworks. A tripod and optional remote cord (📖 390) are recommended to prevent blur.

Shutter speed: 35 s; aperture: f/25

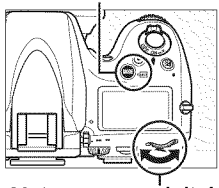
1 Ready the camera.

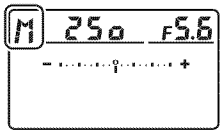
Mount the camera on a tripod or place it on a stable, level surface. If you are using an optional remote cord, attach it to the camera.

> **Long Time-Exposures**
> Close the viewfinder eyepiece shutter to prevent light entering via the viewfinder from appearing in the photograph or interfering with exposure. Nikon recommends using a fully charged EN-EL15 battery or an optional EH-5b AC adapter and EP-5B power connector to prevent loss of power while the shutter is open. Note that noise (bright spots, randomly-spaced bright pixels or fog) may be present in long exposures; before shooting, choose **On** for the **Long exposure NR** option in the shooting menu (📖 277).

2 Select exposure mode M.

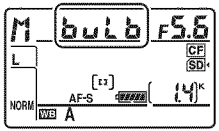
Press the **MODE** (FORMAT) button and rotate the main command dial until M is displayed in the control panel.





3 Choose a shutter speed.

While the exposure meters are on, rotate the main command dial until "bulb" appears in the shutter-speed displays. The exposure indicators do not appear when "bulb" is selected.



4 Press the shutter-release button all the way down.

Press the shutter-release button on the camera or remote cord all the way down. The shutter will remain open while the shutter-release button is pressed.

5 Release the shutter-release button.

Remove your finger from the shutter-release button to record the photograph.

Shutter-Speed and Aperture Lock

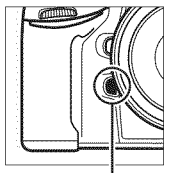
Shutter speed lock is available in shutter-priority auto and manual exposure modes, aperture lock in aperture-priority auto and manual exposure modes. Shutter speed and aperture lock are not available in programmed auto exposure mode.

1 Assign shutter speed and aperture lock to a camera control.

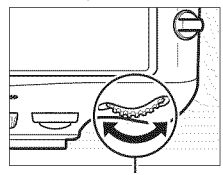
Select **Shutter spd & aperture lock** as the "button + command dials" option in the Custom Settings menu (🕮 314). Shutter speed and aperture lock can be assigned to the **Fn** button (Custom Setting f4, **Assign Fn button**, 🕮 311), the depth-of-field preview button (Custom Setting f5, **Assign preview button**, 🕮 315), or the AE-L/AF-L **AE-L/AF-L** button (Custom Setting f6, **Assign AE-L/AF-L button**, 🕮 315).

2 Lock shutter speed and/or aperture.

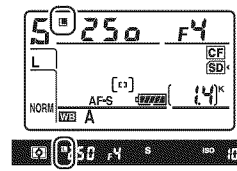
Shutter speed (exposure modes S and M): Press the selected button and rotate the main command dial until **L** icons appear in the viewfinder and control panel.



Fn button

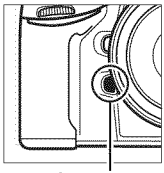


Main command dial

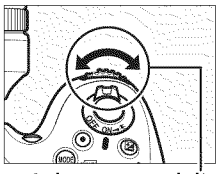


To unlock shutter speed, press the button and rotate the main command dial until the **L** icons disappear from the displays.

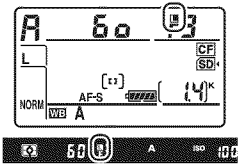
Aperture (exposure modes A and M): Press the selected button and rotate the sub-command dial until L icons appear in the viewfinder and the control panel.



Fn button



Sub-command dial



To unlock aperture, press the button and rotate the sub-command dial until the L icons disappear from the displays.

See Also

Use Custom Setting f7 (**Shutter spd & aperture lock**; 316) to keep shutter speed and/or aperture locked at the selected values.

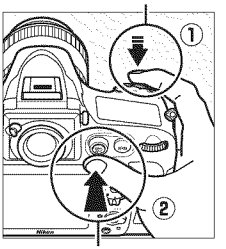
Autoexposure (AE) Lock

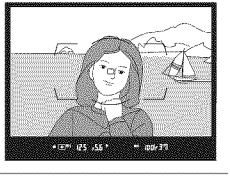
Use autoexposure lock to recompose photographs after using center-weighted metering and spot metering to meter exposure. Note that matrix metering will not produce the desired results.

1 Lock exposure.

Position the subject in the selected focus point and press the shutter-release button halfway. With the shutter-release button pressed halfway and the subject positioned in the focus point, press the AE-L/AF-L **AE-L/AF-L** button to lock exposure (if you are using autofocus, confirm that the ● in-focus indicator appears in the viewfinder).

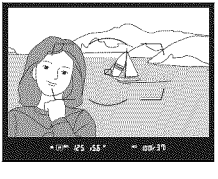
While exposure lock is in effect, an **AE-L** indicator will appear in the viewfinder.





2 Recompose the photograph.

Keeping the AE-L/AF-L **AE-L/AF-L** button pressed, recompose the photograph and shoot.



Metered Area

In spot metering, exposure will be locked at the value metered in a 4-mm (0.16 in.) circle centered on the selected focus point. In center-weighted metering, exposure will be locked at the value metered in a 12-mm circle in the center of the viewfinder.

Adjusting Shutter Speed and Aperture

While exposure lock is in effect, the following settings can be changed without altering the metered value for exposure:

Exposure mode	Setting
P	Shutter speed and aperture (flexible program; 🕮 118)
S	Shutter speed
A	Aperture

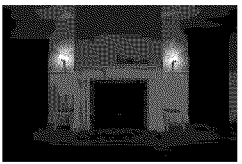
The new values can be confirmed in the viewfinder and control panel. Note that the metering method can not be changed while exposure lock is in effect (changes to metering take effect when the lock is released).

See Also

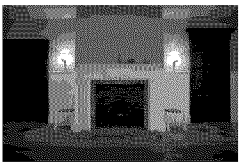
If **On** is selected for Custom Setting c1 (**Shutter-release button AE-L**, 🕮 290), exposure will lock when the shutter-release button is pressed halfway. For information on changing the role of the AE-L/AF-L **AE-L/AF-L** button, see Custom Setting f6 (**Assign AE-L/AF-L button**, 🕮 315).

Exposure Compensation

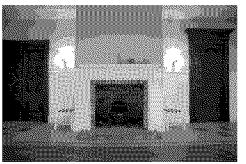
Exposure compensation is used to alter exposure from the value suggested by the camera, making pictures brighter or darker. It is most effective when used with center-weighted or spot metering (📖 115). Choose from values between –5 EV (underexposure) and +5 EV (overexposure) in increments of 1/3 EV. In general, positive values make the subject brighter while negative values make it darker.



–1 EV

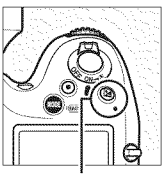


No exposure compensation

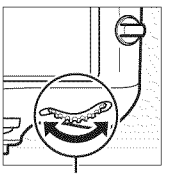


+1 EV

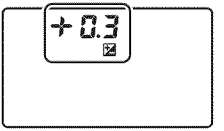
To choose a value for exposure compensation, press the ⊠ button and rotate the main command dial until the desired value is displayed in the viewfinder or control panel.

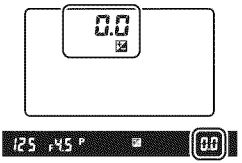


⊠ button

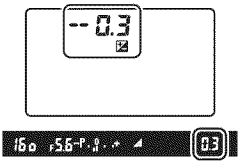


Main command dial

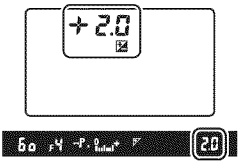




±0 EV
(⊠ button pressed)

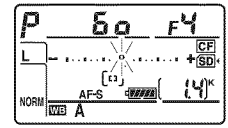


–0.3 EV



+2.0 EV

At values other than ±0.0, the 0 at the center of the exposure indicators will flash (exposure modes **P**, **S**, and **A** only) and a ± icon will be displayed in the viewfinder and control panel after you release the ± button. The current value for exposure compensation can be confirmed in the exposure indicator by pressing the ± button.



Normal exposure can be restored by setting exposure compensation to ±0.0. Exposure compensation is not reset when the camera is turned off.

Exposure Mode M

In exposure mode **M**, exposure compensation affects only the exposure indicator; shutter speed and aperture do not change.

Using a Flash

When a flash is used, exposure compensation affects both background exposure and flash level.

See Also

For information on choosing the size of the increments available for exposure compensation, see Custom Setting b3 (**Exp./flash comp. step value**, 📖 287). For information on making adjustments to exposure compensation without pressing the ± button, see Custom Setting b4 (**Easy exposure compensation**, 📖 288). For information on automatically varying exposure, flash level, white balance, or Active D-Lighting, see page 132.

Bracketing

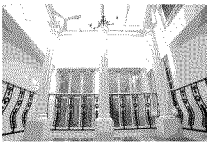
Bracketing automatically varies exposure, flash level, **A**ctive **D**-**L**ighting (ADL), or white balance slightly with each shot, "bracketing" the current value. Choose in situations in which it is difficult to set exposure, flash level (i-TTL and, where supported, auto aperture flash control modes only; see pages 185, 301, and 382), Active D-Lighting, or white balance and there is not time to check results and adjust settings with each shot, or to experiment with different settings for the same subject.

■■ *Exposure and Flash Bracketing*

To vary exposure and/or flash level over a series of photographs:

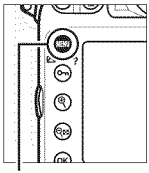
Exposure modified by: 0 EV

Exposure modified by: −1 EV

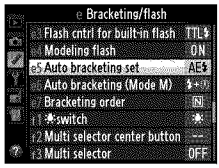


Exposure modified by: +1 EV

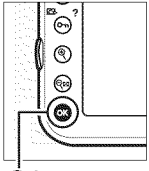
1 Select flash or exposure bracketing for Custom Setting e5 (**Auto bracketing set**) in the Custom Settings menu.



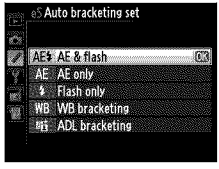
MENU button



To display the menus, press the MENU button. Select Custom Setting e5 (**Auto bracketing set**) in the Custom Settings menu, highlight an option, and press ⊛. Choose **AE & flash** to vary both exposure and flash level, **AE only** to vary only exposure, or **Flash only** to vary only flash level.

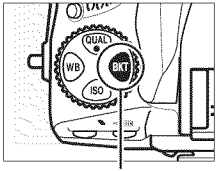


⊛ button

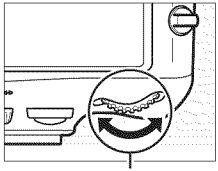


2 Choose the number of shots.

Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence. The number of shots is shown in the control panel.

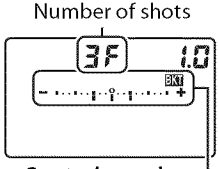


BKT button



Main command dial

Number of shots



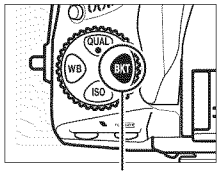
Control panel

Exposure and flash bracketing indicator

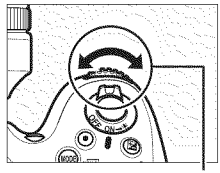
At settings other than zero, a BKT icon and exposure and flash bracketing indicators will appear in the control panel and **BKT** will be displayed in the viewfinder.

3 Select an exposure increment.

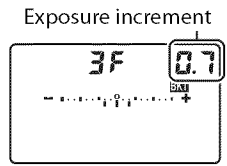
Pressing the **BKT** button, rotate the sub-command dial to choose the exposure increment.



BKT button



Sub-command dial



Control panel

At default settings, the size of the increment can be chosen from 1/3, 2/3, and 1 EV. The bracketing programs with an increment of 1/3 EV are listed below.

Control panel display	No. of shots	Bracketing order (EVs)
0F 0.3	0	0
+3F 0.3	3	0/+0.3/+0.7
--3F 0.3	3	0/–0.7/–0.3
+2F 0.3	2	0/+0.3
--2F 0.3	2	0/–0.3
3F 0.3	3	0/–0.3/+0.3
5F 0.3	5	0/–0.7/–0.3/+0.3/+0.7
7F 0.3	7	0/–1.0/–0.7/–0.3/+0.3/ +0.7/+1.0
9F 0.3	9	0/–1.3/–1.0/–0.7/–0.3/ +0.3/+0.7/+1.0/+1.3

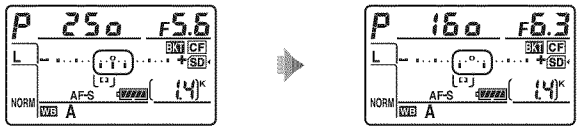
See Also

For information on choosing the size of the exposure increment, see Custom Setting b2 (**EV steps for exposure cntrl**, 287). For information on choosing the order in which bracketing is performed, see Custom Setting e7 (**Bracketing order**, 308). For information on choosing the role of the **BKT** button, see Custom Setting f8 (**Assign BKT button**, 316).

4 Frame a photograph, focus, and shoot.

The camera will vary exposure and/or flash level shot-by-shot according to the bracketing program selected. Modifications to exposure are added to those made with exposure compensation (see page 130), making it possible to achieve exposure compensation values of more than 5 EV.

While bracketing is in effect, a bracketing progress indicator will be displayed in the control panel. A segment will disappear from the indicator after each shot.



No. shots: 3; increment: 0.7 Display after first shot

Canceling Bracketing

To cancel bracketing, press the **BKT** button and rotate the main command dial until the number of shots in the bracketing sequence is zero (OF) and BKT is no longer displayed. The program last in effect will be restored the next time bracketing is activated. Bracketing can also be cancelled by performing a two-button reset (🕮 193), although in this case the bracketing program will not be restored the next time bracketing is activated.

Exposure and Flash Bracketing

In continuous low speed and continuous high speed modes, shooting will pause after the number of shots specified in the bracketing program have been taken. Shooting will resume the next time the shutter-release button is pressed. In self-timer mode, the camera will take the number of shots selected in Step 2 on page 133 each time the shutter-release button is pressed, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** (📖 291); the interval between shots is however controlled by Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other modes, one shot will be taken each time the shutter-release button is pressed.

If the memory card fills before all shots in the sequence have been taken, shooting can be resumed from the next shot in the sequence after the memory card has been replaced or shots have been deleted to make room on the memory card. If the camera is turned off before all shots in the sequence have been taken, bracketing will resume from the next shot in the sequence when the camera is turned on.

Exposure Bracketing

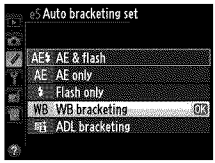
The camera modifies exposure by varying shutter speed and aperture (programmed auto), aperture (shutter-priority auto), or shutter speed (aperture-priority auto, manual exposure mode). If **On** is selected for **ISO sensitivity settings > Auto ISO sensitivity control** (📖 111) in modes **P**, **S**, and **A**, the camera will automatically vary ISO sensitivity for optimum exposure when the limits of the camera exposure system are exceeded. Custom Setting e6 (**Auto bracketing (mode M)**, 📖 308) can be used to change how the camera performs exposure and flash bracketing in manual exposure mode. Bracketing can be performed by varying flash level together with shutter speed and/or aperture, or by varying flash level alone.

White Balance Bracketing

The camera creates multiple copies of each photograph, each with a different white balance. For more information on white balance, see page 145.

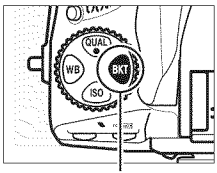
1 Select white balance bracketing.

Choose **WB bracketing** for Custom Setting e5 **Auto bracketing set**.

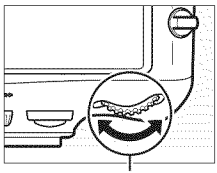


2 Choose the number of shots.

Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence. The number of shots is shown in the control panel.

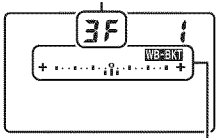


BKT button



Main command dial

Number of shots



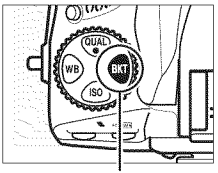
Control panel

WB bracketing indicator

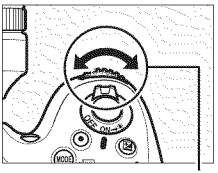
At settings other than zero, a WB·BKT icon and WB bracketing indicator will appear in the control panel and **BKT** will be displayed in the viewfinder.

3 Select a white balance increment.

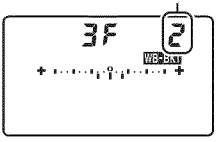
Pressing the **BKT** button, rotate the sub-command dial to choose the white balance adjustment. Each increment is roughly equivalent to 5 mired.



BKT button


Sub-command dial

White balance increment



Control panel

Choose from increments of 1 (5 mired), 2 (10 mired), or 3 (15 mired). Higher **B** values correspond to increased amounts of blue, higher **A** values to increased amounts of amber (🕮 149). The bracketing programs with an increment of 1 are listed below.

Control panel display	No. of shots	White balance increment	Bracketing order
0F	0	1	0
b3F	3	1 B	1 B / 0 / 2 B
A3F	3	1 A	1 A / 2 A / 0
b2F	2	1 B	0 / 1 B
A2F	2	1 A	0 / 1 A
3F	3	1 A, 1 B	0 / 1 A / 1 B
5F	5	1 A, 1 B	0 / 2 A / 1 A / 1 B / 2 B
7F	7	1 A, 1 B	0 / 3 A / 2 A / 1 A / 1 B / 2 B / 3 B
9F	9	1 A, 1 B	0 / 4 A / 3 A / 2 A / 1 A / 1 B / 2 B / 3 B / 4 B

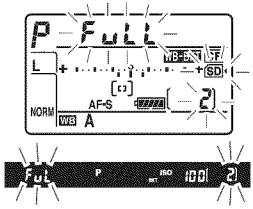
See Also

See page 150 for a definition of "mired."

4 Frame a photograph, focus, and shoot.

Each shot will be processed to create the number of copies specified in the bracketing program, and each copy will have a different white balance. Modifications to white balance are added to the white balance adjustment made with white balance fine-tuning.

If the number of shots in the bracketing program is greater than the number of exposures remaining, FuLL and the icon for the affected card will flash in the control panel, a flashing FuL icon will appear in the viewfinder as shown at right, and the shutter release will be disabled. Shooting can begin when a new memory card is inserted.



Canceling Bracketing

To cancel bracketing, press the **BKT** button and rotate the main command dial until the number of shots in the bracketing sequence is zero (**OFF**) and **WB-BKT** is no longer displayed. The program last in effect will be restored the next time bracketing is activated. Bracketing can also be cancelled by performing a two-button reset (🕮 193), although in this case the bracketing program will not be restored the next time bracketing is activated.

White Balance Bracketing

White balance bracketing is not available at an image quality of NEF (RAW). Selecting **NEF (RAW)**, **NEF (RAW)+JPEG fine**, **NEF (RAW)+JPEG normal**, or **NEF (RAW)+JPEG basic** cancels white balance bracketing.

White balance bracketing affects only color temperature (the amber-blue axis in the white balance fine-tuning display, 🕮 149). No adjustments are made on the green-magenta axis.

In self-timer mode, the number of copies specified in the white-balance program will be created each time the shutter is released, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** (🕮 291).

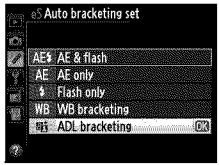
If the camera is turned off while the memory card access lamp is lit, the camera will power off only after all photographs in the sequence have been recorded.

ADL Bracketing

The camera varies Active D-Lighting over a series of exposures. For more information on Active D-Lighting, see page 174.

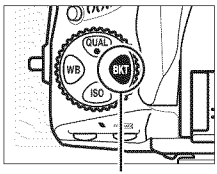
1 Select ADL bracketing.

Choose **ADL bracketing** for Custom Setting e5 **Auto bracketing set**.

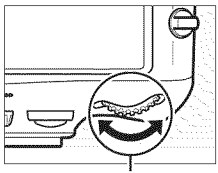


2 Choose the number of shots.

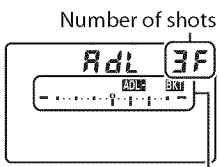
Pressing the **BKT** button, rotate the main command dial to choose the number of shots in the bracketing sequence. The number of shots is shown in the control panel.



BKT button



Main command dial



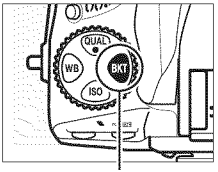
Control panel

ADL bracketing indicator

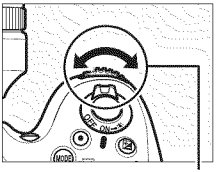
At settings other than zero, a ADL BKT icon and an ADL bracketing indicator will appear in the control panel and **BKT** will be displayed in the viewfinder. Choose two shots to take one photograph with Active D-Lighting off and another at a selected value. Choose three to five shots to take a series of photographs with Active D-Lighting set to **Off**, **Low**, and **Normal** (three shots), **Off**, **Low**, **Normal**, and **High** (four shots), or **Off**, **Low**, **Normal**, **High**, and **Extra high** (five shots). If you choose more than two shots, proceed to Step 4.

3 Select Active D-Lighting.

Pressing the **BKT** button, rotate the sub-command dial to choose Active D-Lighting.

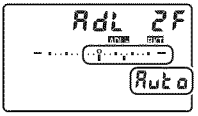
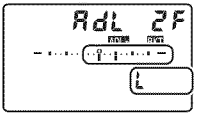
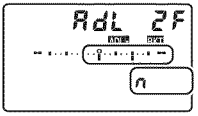
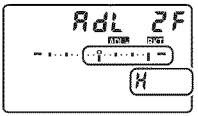
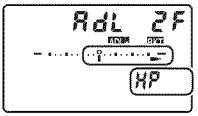


BKT button



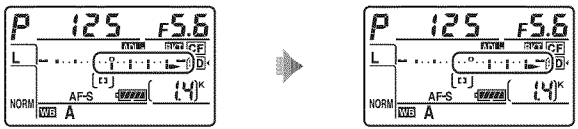
Sub-command dial

Active D-Lighting is shown in the control panel.

Control panel display	Active D-Lighting	
	A	Auto
	L	Low
	N	Normal
	H	High
	H+	Extra high

4 Frame a photograph, focus, and shoot.

The camera will vary Active D-Lighting shot-by-shot according to the bracketing program selected. While bracketing is in effect, a bracketing progress indicator will be displayed in the control panel. A segment will disappear from the indicator after each shot.



Canceling Bracketing

To cancel bracketing, press the **BKT** button and rotate the main command dial until the number of shots in the bracketing sequence is zero (**□F**) and **ADL BKT** is no longer displayed. The program last in effect will be restored the next time bracketing is activated. Bracketing can also be cancelled by performing a two-button reset (□ 193), although in this case the bracketing program will not be restored the next time bracketing is activated.

ADL Bracketing

In continuous low speed and continuous high speed modes, shooting will pause after the number of shots specified in the bracketing program have been taken. Shooting will resume the next time the shutter-release button is pressed. In self-timer mode, the camera will take the number of shots selected in Step 2 on page 141 each time the shutter-release button is pressed, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** (□ 291); the interval between shots is however controlled by Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other modes, one shot will be taken each time the shutter-release button is pressed.

If the memory card fills before all shots in the sequence have been taken, shooting can be resumed from the next shot in the sequence after the memory card has been replaced or shots have been deleted to make room on the memory card. If the camera is turned off before all shots in the sequence have been taken, bracketing will resume from the next shot in the sequence when the camera is turned on.

White Balance

White Balance Options

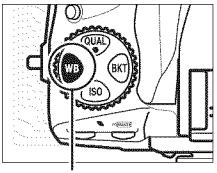
White balance ensures that colors are unaffected by the color of the light source. Auto white balance is recommended with most light sources. If the desired results can not be achieved with auto white balance, choose an option from the list below or use preset white balance.

Option		Color temp.*	Description
AUTO	**Auto**	3,500–8,000 K	White balance is adjusted automatically. For best results, use type G or D lens. If built-in or optional flash fires, results are adjusted appropriately.
	Normal		
	Keep warm lighting colors		
☀	**Incandescent**	3,000 K	Use under incandescent lighting.
	Fluorescent		Use with:
	Sodium-vapor lamps	2,700 K	• Sodium-vapor lighting (found in sports venues).
	Warm-white fluorescent	3,000 K	• Warm-white fluorescent lights.
	White fluorescent	3,700 K	• White fluorescent lights.
	Cool-white fluorescent	4,200 K	• Cool-white fluorescent lights.
	Day white fluorescent	5,000 K	• Daylight white fluorescent lights.
	Daylight fluorescent	6,500 K	• Daylight fluorescent lights.
	High temp. mercury-vapor	7,200 K	• High color temperature light sources (e.g. mercury-vapor lamps).
☀	**Direct sunlight**	5,200 K	Use with subjects lit by direct sunlight.
ϟ	**Flash**	5,400 K	Use with built-in or optional flash units.
☁	**Cloudy**	6,000 K	Use in daylight under overcast skies.
⌂	**Shade**	8,000 K	Use in daylight with subjects in the shade.

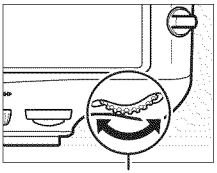
Option	Color temp.*	Description
K Choose color temp.	2,500–10,000 K	Choose color temperature from list of values (📖 152).
PRE Preset manual	—	Use subject, light source, or existing photograph as reference for white balance (📖 154).

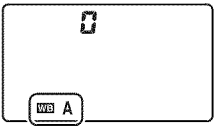
* All values are approximate and do not reflect fine-tuning (if applicable).

White balance can be selected by pressing the **WB** button and rotating the main command dial until the desired setting is displayed in the control panel.



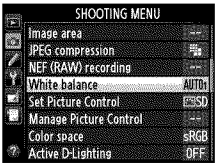
WB button


Main command dial



Control panel

The Shooting Menu



White balance can also be adjusted using the **White balance** option in the shooting menu (📖 268), which also can be used to fine-tune white balance (📖 148) or measure a value for preset white balance (📖 154). The **Auto** option in the **White balance** menu offers a choice of **Normal** and **Keep warm lighting colors**, which preserves the warm colors produced by incandescent lighting, while the **Fluorescent** option can be used to select the light source from the bulb types.

Studio Flash Lighting

Auto white balance may not produce the desired results with large studio flash units. Use preset white balance or set white balance to **Flash** and use fine-tuning to adjust white balance.

See Also

When **WB bracketing** is selected for Custom Setting e5 (**Auto bracketing set**, 📖 307), the camera will create several images each time the shutter is released. White balance will be varied with each image, "bracketing" the value currently selected for white balance. See page 137 for more information.

Color Temperature

The perceived color of a light source varies with the viewer and other conditions. Color temperature is an objective measure of the color of a light source, defined with reference to the temperature to which an object would have to be heated to radiate light in the same wavelengths. While light sources with a color temperature in the neighborhood of 5,000–5,500 K appear white, light sources with a lower color temperature, such as incandescent light bulbs, appear slightly yellow or red. Light sources with a higher color temperature appear tinged with blue. The camera white balance options are adapted to the following color temperatures:

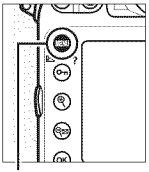
- (sodium-vapor lamps): **2,700 K**
- (incandescent)/ (warm-white fluorescent): **3,000 K**
- (white fluorescent): **3,700 K**
- (cool-white fluorescent): **4,200 K**
- (day white fluorescent): **5,000 K**
- (direct sunlight): **5,200 K**
- (flash): **5,400 K**
- (cloudy): **6,000 K**
- (daylight fluorescent): **6,500 K**
- (high temp. mercury-vapor): **7,200 K**
- (shade): **8,000 K**

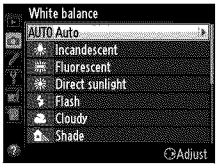
Fine-Tuning White Balance

White balance can be "fine-tuned" to compensate for variations in the color of the light source or to introduce a deliberate color cast into an image. White balance is fine-tuned using the **White balance** option in the shooting menu or by pressing the **WB** button and rotating the sub-command dial.

The White Balance Menu

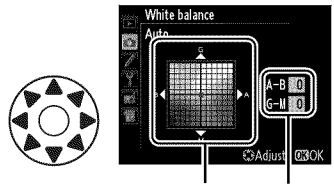
1 Select a white balance option in the shooting menu.


MENU button

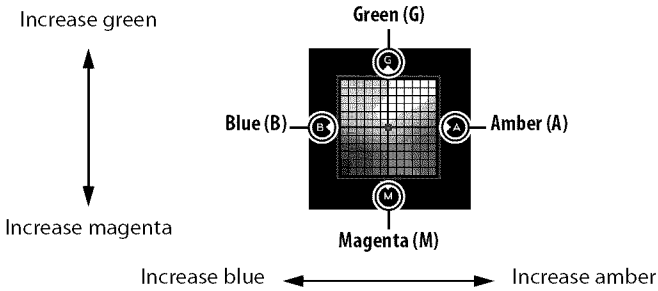


To display the menus, press the MENU button. Select **White balance** in the shooting menu, then highlight a white balance option and press ▶. If an option other than **Auto**, **Fluorescent**, **Choose color temp.**, or **Preset manual** is selected, proceed to Step 2. If **Auto** or **Fluorescent** is selected, highlight a lighting type and press ▶. For information on fine-tuning preset white balance, see page 159.

2 Fine-tune white balance.

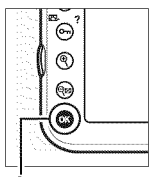


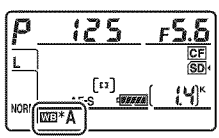
Use the multi selector to fine-tune white balance. White balance can be fine-tuned on the amber (A)–blue (B) axis and the green (G)–magenta (M) axis. The horizontal (amber-blue) axis corresponds to color temperature, with each increment equivalent to about 5 mired. The vertical (green-magenta) axis has the similar effects to the corresponding color compensation (CC) filters.



3 Press ⓞⓚ.

Press ⓞⓚ to save settings and return to the shooting menu. If white balance has been fine-tuned, an asterisk ("✱") will be displayed in the control panel.





White Balance Fine-Tuning

The colors on the fine-tuning axes are relative, not absolute. For example, moving the cursor to **B** (blue) when a "warm" setting such as ☀ (**Incandescent**) is selected for white balance will make photographs slightly "colder" but will not actually make them blue.

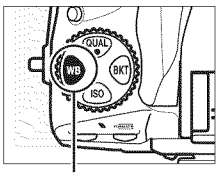
"Mired"

Any given change in color temperature produces a greater difference in color at low color temperatures than it would at higher color temperatures. For example, a change of 1000 K produces a much greater change in color at 3000 K than at 6000 K. Mired, calculated by multiplying the inverse of the color temperature by 10^6, is a measure of color temperature that takes such variation into account, and as such is the unit used in color-temperature compensation filters. E.g.:

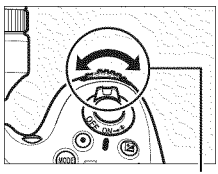
- 4000 K–3000 K (a difference of 1000 K)=83 mired
- 7000 K–6000 K (a difference of 1000 K)=24 mired

The WB *Button*

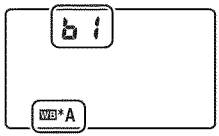
At settings other than K (**Choose color temp.**) and PRE (**Preset manual**), the **WB** button can be used to fine-tune white balance on the amber (A)–blue (B) axis (📖 149; to fine-tune white balance when **PRE** is selected, use the shooting menu as described on page 148). Six settings in both directions are available; each increment is equivalent to about 5 mired (📖 150). Press the **WB** button and rotate the sub-command dial until the desired value is displayed in the control panel. Rotating the sub-command dial to the left increases the amount of amber (A). Rotating the sub-command dial to the right increases the amount of blue (B). At settings other than 0, an asterisk ("✱") appears in the control panel.



WB button



Sub-command dial



Control panel

Choosing a Color Temperature

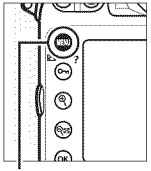
When K (**Choose color temp.**) is selected for white balance, color temperature can be selected using the **White balance** option in the shooting menu or by using the **WB** button, multi selector, and sub-command dial.

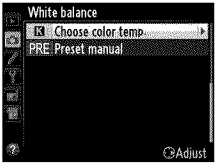
The White Balance Menu

Enter values for the amber-blue and green-magenta axes (🕮 149).

1 Select **Choose color temp.**

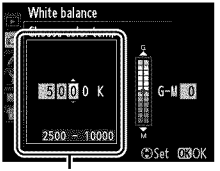
Press the MENU button and select **White balance** in the shooting menu. Highlight **Choose color temp.** and press ▶.





2 Select a value for amber-blue.

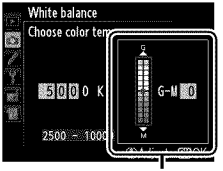
Press ◀ or ▶ to highlight digits and press ▲ or ▼ to change.



Value for amber (A)-blue (B) axis

3 Select a value for green-magenta.

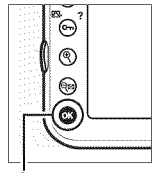
Press ◀ or ▶ to highlight the G (green) or M (magenta) axis and press ▲ or ▼ to select a value.



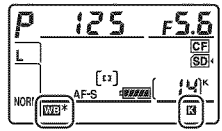
Value for green (G)-magenta (M) axis

4 Press ⊛.

Press ⊛ to save changes and return to the shooting menu. If a value other than 0 is selected for the green (G)–magenta (M) axis, an asterisk ("✱") will be displayed in the control panel.

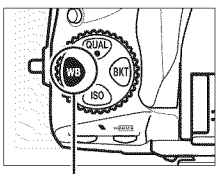


⊛ button

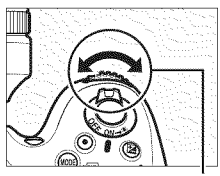


The WB *Button*

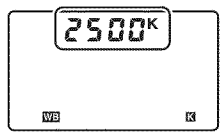
The **WB** button can be used to select the color temperature for the amber (A)–blue (B) axis only. Press the **WB** button and rotate the sub-command dial until the desired value is displayed in the control panel (adjustments are made in mireds; 🕮 150). To enter a color temperature directly in increments of 10 K., press the **WB** button and press ◀ or ▶ to highlight a digit and press ▲ or ▼ to change.



WB button



Sub-command dial



Control panel

Choose Color Temperature

Note that the desired results will not be obtained with flash or fluorescent lighting. Choose ϟ (**Flash**) or ☀ (**Fluorescent**) for these sources. With other light sources, take a test shot to determine if the selected value is appropriate.

Preset Manual

Preset manual is used to record and recall custom white balance settings for shooting under mixed lighting or to compensate for light sources with a strong color cast. The camera can store up to four values for preset white balance in presets d-1 through d-4. Two methods are available for setting preset white balance:

Method	Description
Direct measurement	Neutral gray or white object is placed under lighting that will be used in final photograph and white balance is measured by camera (🕮 155).
Copy from existing photograph	White balance is copied from photo on memory card (🕮 158).

White Balance Presets

Changes to white balance presets apply to all shooting menu banks (🕮 269). A confirmation dialog will be displayed if the user attempts to change a white balance preset created in another shooting menu bank.

Measuring Preset White Balance

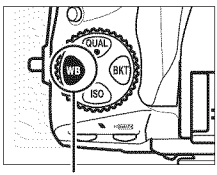
Preset manual white balance can not be measured during live view (🕮 45, 59), while you are shooting an HDR photograph (🕮 176) or multiple exposure (🕮 195), or when **Record movies** is selected for Custom Setting g4 (**Assign shutter button**, 🕮 324).

1 Light a reference object.

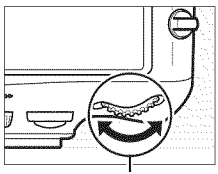
Place a neutral gray or white object under the lighting that will be used in the final photograph. In studio settings, a standard gray panel can be used as a reference object. Note that exposure is automatically increased by 1 EV when measuring white balance; in exposure mode M, adjust exposure so that the exposure indicator shows ±0 (🕮 123).

2 Set white balance to PRE (Preset manual).

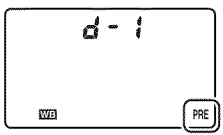
Press the **WB** button and rotate the main command dial until **PRE** is displayed in the control panel.



WB button



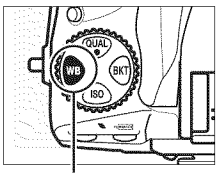
Main command dial



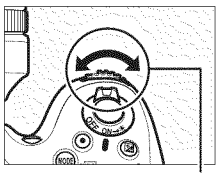
Control panel

3 Select a preset.

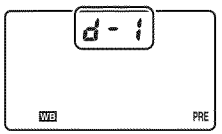
Press the **WB** button and rotate the sub-command dial until the desired white balance preset (d-1 to d-4) is displayed in the control panel.



WB button



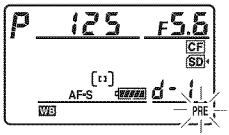
Sub-command dial



Control panel

4 Select direct measurement mode.

Release the **WB** button briefly and then press the button until the **PRE** icon in the control panel starts to flash. A flashing PrE will also appear in the viewfinder. The displays will flash for about six seconds.



Control panel

Viewfinder

5 Measure white balance.

Before the indicators stop flashing, frame the reference object so that it fills the viewfinder and press the shutter-release button all the way down. The camera will measure a value for white balance and store it in the preset selected in Step 3. No photograph will be recorded; white balance can be measured accurately even when the camera is not in focus.

Protected Presets

If the current preset is protected (161), PrE will flash in the control panel and viewfinder if you attempt to measure a new value.

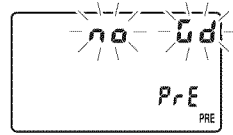
6 Check the results.

If the camera was able to measure a value for white balance, **Good** will flash in the control panel for about six seconds, while the viewfinder will show a flashing **Gd**.

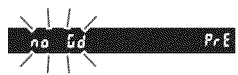
Control panel

Viewfinder

If lighting is too dark or too bright, the camera may be unable to measure white balance. A flashing **no Gd** will appear in the control panel and viewfinder for about six seconds. Press the shutter-release button halfway to return to Step 5 and measure white balance again.



Control panel



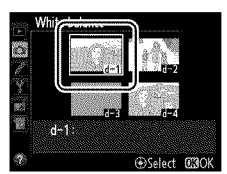
Viewfinder

Direct Measurement Mode

If no operations are performed while the displays are flashing, direct measurement mode will end in the time selected for Custom Setting c2 (**Auto meter-off delay**, □ 291).

Selecting a Preset

Selecting **Preset manual** for the **White balance** option in the shooting menu displays the dialog shown at right; highlight a preset and press ⊛. If no value currently exists for the selected preset, white balance will be set to 5,200 K, the same as **Direct sunlight**.

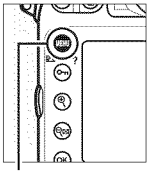


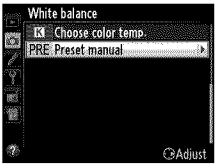
Copying White Balance from a Photograph

Follow the steps below to copy a value for white balance from an existing photograph to a selected preset.

1 Select PRE (Preset manual) for White balance in the shooting menu.

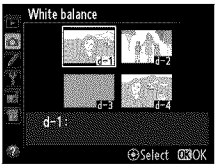
Press the MENU button and select **White balance** in the shooting menu. Highlight **Preset manual** and press ▶.





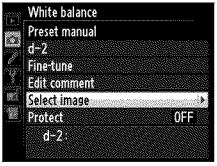
2 Select a destination.

Highlight the destination preset (d-1 to d-4) and press the center of the multi selector.



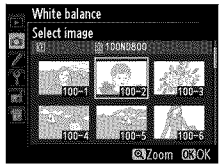
3 Choose Select image.

Highlight **Select image** and press ▶.

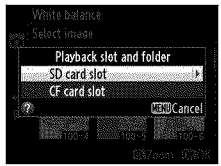


4 Highlight a source image.

Highlight the source image. To view the highlighted image full frame, press the 🔍 button.

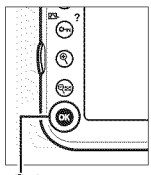


To view images in other locations, press 🔍 and select the desired card and folder (📖 221).



5 Copy white balance.

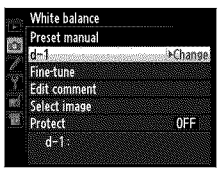
Press Ⓚ to copy the white balance value for the highlighted photograph to the selected preset. If the highlighted photograph has a comment (📖 333), the comment will be copied to the comment for the selected preset.



Ⓚ button

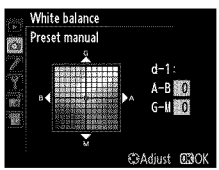
Choosing a White Balance Preset

Press ▲ to highlight the current white balance preset (d-1 – d-4) and press ▶ to select another preset.



Fine-Tuning Preset White Balance

The selected preset can be fine-tuned by selecting **Fine-tune** and adjusting white balance as described on page 149.



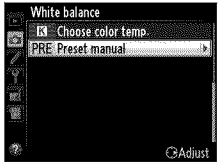
WB

Entering a Comment

Follow the steps below to enter a descriptive comment of up to thirty-six characters for a selected white balance preset.

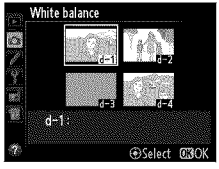
1 Select PRE (Preset manual).

Highlight **Preset manual** in the white balance menu (🕮 158) and press ▶.



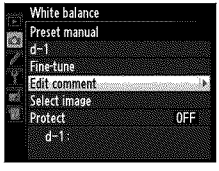
2 Select a preset.

Highlight the desired preset and press the center of the multi selector.



3 Select Edit comment.

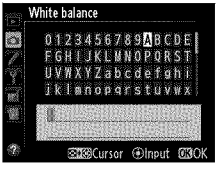
Highlight **Edit comment** and press ▶.



WB

4 Edit the comment.

Edit the comment as described on page 170.

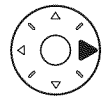


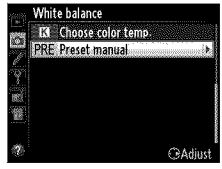
Protecting a White Balance Preset

Follow the steps below to protect the selected white balance preset. Protected presets can not be modified and the **Fine-tune** and **Edit comment** options can not be used.

1 **Select PRE (Preset manual).**

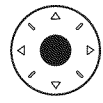
Highlight **Preset manual** in the white balance menu (🕮 158) and press ▶.

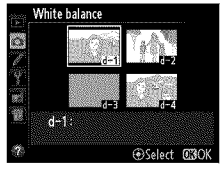




2 **Select a preset.**

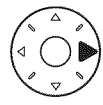
Highlight the desired preset and press the center of the multi selector.

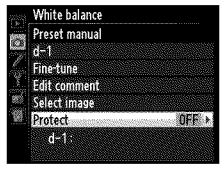




3 **Select Protect.**

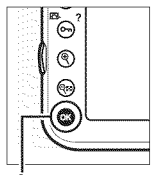
Highlight **Protect** and press ▶.





4 **Select On.**

Highlight **On** and press Ⓚ to protect the selected white balance preset. To remove protection, select **Off**.



Ⓚ button

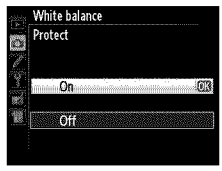


Image Enhancement

Picture Controls

Nikon's unique Picture Control system makes it possible to share image processing settings, including sharpening, contrast, brightness, saturation, and hue, among compatible devices and software.

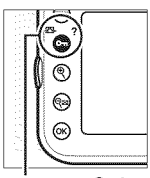
Selecting a Picture Control

The camera offers a choice of preset Picture Controls. Choose a Picture Control according to the subject or type of scene.

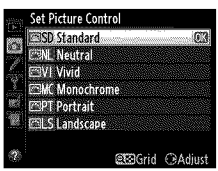
Option	Description
SD **Standard**	Standard processing for balanced results. Recommended for most situations.
NL **Neutral**	Minimal processing for natural results. Choose for photographs that will later be extensively processed or retouched.
VI **Vivid**	Pictures are enhanced for a vivid, photoprint effect. Choose for photographs that emphasize primary colors.
MC **Monochrome**	Take monochrome photographs.
PT **Portrait**	Process portraits for skin with natural texture and a rounded feel.
LS **Landscape**	Produces vibrant landscapes and cityscapes.

1 Press (/?).

A list of Picture Controls will be displayed.

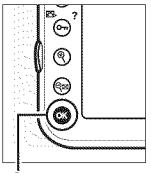


(/?) button



2 Select a Picture Control.

Highlight the desired Picture Control and press ⊛.



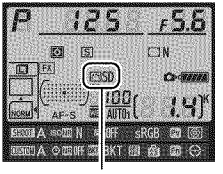
⊛ button

Preset Picture Controls Versus Custom Picture Controls

The Picture Controls supplied with the camera are referred to as *preset Picture Controls*. *Custom Picture Controls* are created through modifications to existing Picture Controls using the **Manage Picture Control** option in the shooting menu (📖 169). Custom Picture Controls can be saved to a memory card for sharing among other D800 cameras and compatible software (📖 172).

The Picture Control Indicator

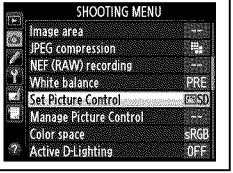
The current Picture Control is shown in the information display when the info button is pressed.



Picture Control indicator

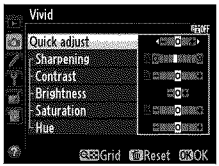
The Shooting Menu

Picture Controls can also be selected using the **Set Picture Control** option in the shooting menu (📖 268).



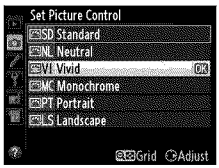
Modifying Existing Picture Controls

Existing preset or custom Picture Controls (🕮 169) can be modified to suit the scene or the user's creative intent. Choose a balanced combination of settings using **Quick adjust**, or make manual adjustments to individual settings.



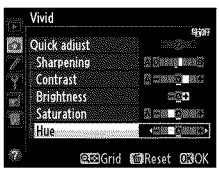
1 Select a Picture Control.

Highlight the desired Picture Control in the Picture Control list (🕮 163) and press ▶.



2 Adjust settings.

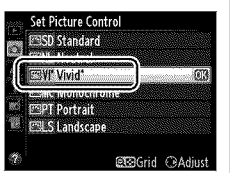
Press ▲ or ▼ to highlight the desired setting and press ◀ or ▶ to choose a value (🕮 166). Repeat this step until all settings have been adjusted, or select **Quick adjust** to choose a preset combination of settings. Default settings can be restored by pressing the 🗑 (FORMAT) button.



3 Press OK.

Modifications to Original Picture Controls

Picture Controls that have been modified from default settings are indicated by an asterisk ("✱") in the **Set Picture Control** menu.

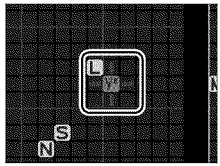


■■ Picture Control Settings

Option		Description
Quick adjust		Choose from options between **–2** and **+2** to reduce or exaggerate the effect of the selected Picture Control (note that this resets all manual adjustments). For example, choosing positive values for **Vivid** makes pictures more vivid. Not available with **Neutral**, **Monochrome**, or custom Picture Controls.
Manual adjustments (all Picture Controls)	**Sharpening**	Control the sharpness of outlines. Select **A** to adjust sharpening automatically according to the type of scene, or choose from values between **0** (no sharpening) and **9** (the higher the value, the greater the sharpening).
	Contrast	Select **A** to adjust contrast automatically according to the type of scene, or choose from values between **–3** and **+3** (choose lower values to prevent highlights in portrait subjects from being "washed out" in direct sunlight, higher values to preserve detail in misty landscapes and other low-contrast subjects).
	Brightness	Choose **–1** for reduced brightness, **+1** for enhanced brightness. Does not affect exposure.
Manual adjustments (non-monochrome only)	**Saturation**	Control the vividness of colors. Select **A** to adjust saturation automatically according to the type of scene, or choose from values between **–3** and **+3** (lower values reduce saturation and higher values increase it).
	Hue	Choose negative values (to a minimum of **–3**) to make reds more purple, blues more green, and greens more yellow, positive values (up to **+3**) to make reds more orange, greens more blue, and blues more purple.
Manual adjustments (monochrome only)	**Filter effects**	Simulate the effect of color filters on monochrome photographs. Choose from **OFF**, yellow, orange, red, and green (📖 167).
	Toning	Choose the tint used in monochrome photographs from **B&W** (black-and-white), **Sepia**, **Cyanotype** (blue-tinted monochrome), **Red**, **Yellow**, **Green**, **Blue Green**, **Blue**, **Purple Blue**, **Red Purple** (📖 168).

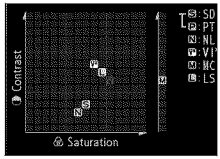
"A" (Auto)

Results for auto sharpening, contrast, and saturation vary with exposure and the position of the subject in the frame. Use a type G or D lens for best results. The icons for Picture Controls that use auto contrast and saturation are displayed in green in the Picture Control grid, and lines appear parallel to the axes of the grid.



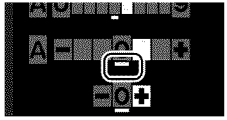
The Picture Control Grid

Pressing the ⊖ button in Step 2 on page 165 displays a Picture Control grid showing the contrast and saturation for the selected Picture Control in relation to the other Picture Controls (only contrast is displayed when **Monochrome** is selected). Release the ⊖ button to return to the Picture Control menu.



Previous Settings

The line under the value display in the Picture Control setting menu indicates the previous value for the setting. Use this as a reference when adjusting settings.



Filter Effects (Monochrome Only)

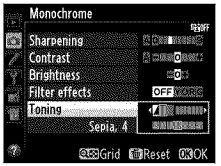
The options in this menu simulate the effect of color filters on monochrome photographs. The following filter effects are available:

Option		Description
Y	Yellow	Enhances contrast. Can be used to tone down the brightness of the sky in landscape photographs. Orange produces more contrast than yellow, red more contrast than orange.
O	Orange	
R	Red	
G	Green	Softens skin tones. Can be used for portraits.

Note that the effects achieved with **Filter effects** are more pronounced than those produced by physical glass filters.

Toning (Monochrome Only)

Pressing ▼ when **Toning** is selected displays saturation options. Press ◀ or ▶ to adjust saturation. Saturation control is not available when **B&W** (black-and-white) is selected.



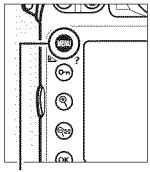
Custom Picture Controls

The options available with custom Picture Controls are the same as those on which the custom Picture Control was based.

Creating Custom Picture Controls

The preset Picture Controls supplied with the camera can be modified and saved as custom Picture Controls.

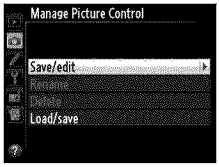
1 Select **Manage Picture Control** in the shooting menu.



To display the menus, press the MENU button. Highlight **Manage Picture Control** in the shooting menu and press ▶.

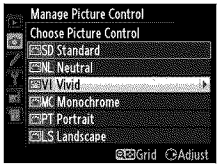
2 Select **Save/edit.**

Highlight **Save/edit** and press ▶.

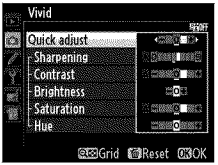


3 Select a Picture Control.

Highlight an existing Picture Control and press ▶, or press ⊛ to proceed to Step 5 to save a copy of the highlighted Picture Control without further modification.



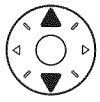
4 Edit the selected Picture Control.

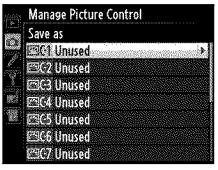


See page 166 for more information. To abandon any changes and start over from default settings, press the 🗑 (FORMAT) button. Press OK when settings are complete.

5 Select a destination.

Choose a destination for the custom Picture Control (C-1 through C-9) and press ▶.





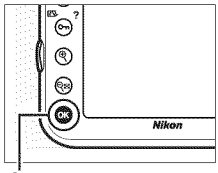
6 Name the Picture Control.

The text-entry dialog shown at right will be displayed. By default, new Picture Controls are named by adding a two-digit number (assigned automatically) to the name of the existing Picture Control; to use the default name, proceed to Step 7. To move the cursor in the name area, hold the ⍰ button and press ◀ or ▶. To enter a new letter at the current cursor position, use the multi selector to highlight the desired character in the keyboard area and press the center of the multi selector. To delete the character at the current cursor position, press the 🗑 (FORMAT) button.

Custom Picture Control names can be up to nineteen characters long. Any characters after the nineteenth will be deleted.

7 Save changes and exit.

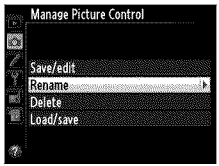
Press ⊛ to save changes and exit. The new Picture Control will appear in the Picture Control list.



⊛ button

Manage Picture Control > Rename

Custom Picture Controls can be renamed at any time using the **Rename** option in the **Manage Picture Control** menu.



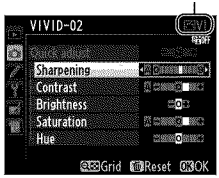
Manage Picture Control > Delete

The **Delete** option in the **Manage Picture Control** menu can be used to delete selected custom Picture Controls when they are no longer needed.

The Original Picture Control Icon

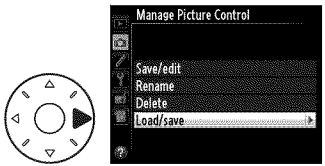
The original preset Picture Control on which the custom Picture Control is based is indicated by an icon in the top right corner of the edit display.

Original Picture Control icon



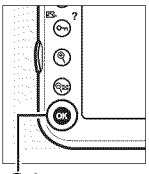
Sharing Custom Picture Controls

Custom Picture Controls created using the Picture Control Utility available with ViewNX 2 or optional software such as Capture NX 2 can be copied to a memory card and loaded into the camera, or custom Picture Controls created with the camera can be copied to the memory card to be used in other D800 cameras and compatible software and then deleted when no longer needed (if two memory cards are inserted, the card in the primary slot will be used; □ 89).



To copy custom Picture Controls to or from the memory card, or to delete custom Picture Controls from the memory card, highlight **Load/Save** in the **Manage Picture Control** menu and press ▶. The following options will be displayed:

- **Copy to camera:** Copy custom Picture Controls from the memory card to custom Picture Controls C-1 through C-9 on the camera and name them as desired.
- **Delete from card:** Delete selected custom Picture Controls from the memory card. The confirmation dialog shown at right will be displayed before a Picture Control is deleted; to delete the selected Picture Control, highlight **Yes** and press ⊛.



⊛ button

- **Copy to card:** Copy a custom Picture Control (C-1 through C-9) from the camera to a selected destination (1 through 99) on the memory card.

Saving Custom Picture Controls

Up to 99 custom Picture Controls can be stored on the memory card at any one time. The memory card can only be used to store user-created custom Picture Controls. The preset Picture Controls supplied with the camera (📖 163) can not be copied to the memory card, renamed, or deleted.

Preserving Detail in Highlights and Shadows

Active D-Lighting

Active D-Lighting preserves details in highlights and shadows, creating photographs with natural contrast. Use for high contrast scenes, for example when photographing brightly lit outdoor scenery through a door or window or taking pictures of shaded subjects on a sunny day. It is most effective when used with matrix metering (📖 115).

Active D-Lighting off

Active D-Lighting: AUTO Auto

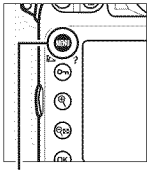
"Active D-Lighting" versus "D-Lighting"

The **Active D-Lighting** option in the shooting menu adjusts exposure before shooting to optimize the dynamic range, while the **D-Lighting** option in the retouch menu optimizes dynamic range in images after shooting.

To use Active D-Lighting:

1 Select **Active D-Lighting** in the shooting menu.

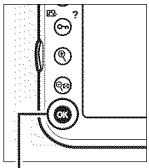
To display the menus, press the MENU button. Highlight **Active D-Lighting** in the shooting menu and press ▶.



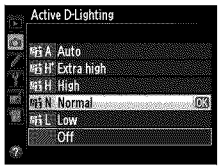
MENU button

2 Choose an option.

Highlight the desired option and press ⓚ. If **A Auto** is selected, the camera will automatically adjust Active D-Lighting according to shooting conditions (in exposure mode M, however, **A Auto** is equivalent to **N Normal**).



ⓚ button



Active D-Lighting

Active D-Lighting can not be used with movies. Noise (randomly-spaced bright pixels, fog, or lines) may appear in photographs taken with Active D-Lighting. Uneven shading may be visible with some subjects. Active D-Lighting can not be used at ISO sensitivities of Hi 0.3 or above.

See Also

When **ADL bracketing** is selected for Custom Setting e5 (**Auto bracketing set**, □ 307), the camera varies Active D-Lighting over a series of shots. See page 141 for more information.

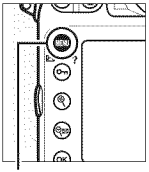
High Dynamic Range (HDR)

High **D**ynamic **R**ange (HDR) combines two exposures to form a single image that captures a wide range of tones from shadows to highlights, even with high-contrast subjects. HDR is most effective when used with matrix metering (📖 115; with other metering methods, an exposure differential of **Auto** is equivalent to about 2 EV). It can not be used to record NEF (RAW) images. Movie recording (📖 59), flash lighting, bracketing (📖 132), multiple exposure (📖 195), and time-lapse photography (📖 207) can not be used while HDR is in effect and a shutter speed of **bulb** is not available.

First exposure (darker) | Second exposure (brighter) | Combined HDR image

1 Select HDR (high dynamic range).

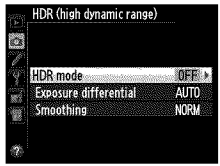
Press the MENU button to display the menus. Highlight **HDR (high dynamic range)** in the shooting menu and press ▶.



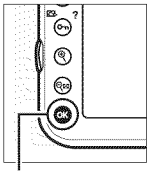
MENU button

2 Select a mode.

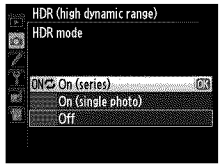
Highlight **HDR mode** and press ▶.



Highlight one of the following and press ⊛.

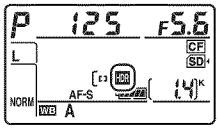


⊛ button

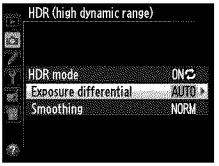


- **To take a series of HDR photographs**, select ON **On (series)**. HDR shooting will continue until you select **Off** for **HDR mode**.
- **To take one HDR photograph**, select **On (single photo)**. Normal shooting will resume automatically after you have created a single HDR photograph.
- **To exit without creating additional HDR photographs**, select **Off**.

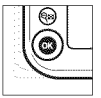
If **On (series)** or **On (single photo)** is selected, a HDR icon will be displayed in the control panel.

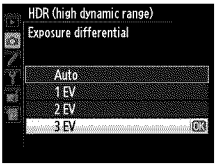


3 Choose the exposure differential.



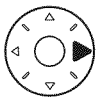
To choose the difference in exposure between the two shots, highlight **Exposure differential** and press ▶.

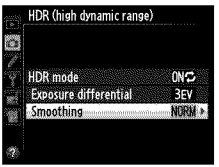




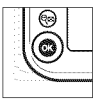
The options shown at right will be displayed. Highlight an option and press ⊛. Choose higher values for high-contrast subjects, but note that choosing a value higher than required may not produce the desired results; if **Auto** is selected, the camera will automatically adjust exposure to suit the scene.

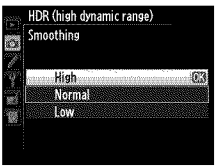
4 Choose the amount of smoothing.





To choose how much the boundaries between the two images are smoothed, highlight **Smoothing** and press ▶.

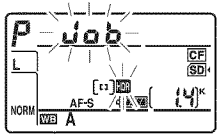




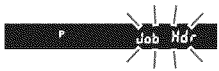
The options shown at right will be displayed. Highlight an option and press ⊛. Higher values produce a smoother composite image. Uneven shading may be visible with some subjects.

5 Frame a photograph, focus, and shoot.

The camera takes two exposures when the shutter-release button is pressed all the way down. HDR will be displayed in the control panel and HDR in the viewfinder while the images are combined; no photographs can be taken until recording is complete. Regardless of the option currently selected for release mode, only one photograph will be taken each time the shutter-release button is pressed.



Control panel



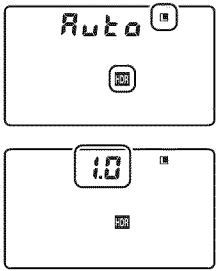
Viewfinder

If **On (series)** is selected, HDR will only turn off when **Off** is selected for **HDR mode**; if **On (single photo)** is selected, HDR turns off automatically after the photograph is taken. The HDR icon clears from the display when HDR shooting ends.

Framing HDR Photographs

The edges of the image may be cropped out. The desired results may not be achieved if the camera or subject moves during shooting. Use of a tripod is recommended. Depending on the scene, shadows may appear around bright objects or halos may appear around dark objects; this effect can be reduced by adjusting the amount of smoothing.

The BKT Button



If **HDR (high dynamic range)** is selected for Custom Setting f8 (**Assign BKT button**; 🕮 316), you can select the HDR mode by pressing the **BKT** button and rotating the main command dial and the exposure differential by pressing the **BKT** button and rotating the sub-command dial. The mode and exposure differential are shown in the control panel: HDR and L appear when **On (series)** is selected and HDR when **On (single photo)** is selected; no icon appears when HDR is off.

Interval Timer Photography

If **On (series)** is selected for **HDR mode** before interval timer shooting begins, the camera will continue to shoot HDR photographs at the selected interval (if **On (single photo)** is selected, interval timer shooting will end after a single shot). Ending HDR photography ends interval timer shooting.

Shooting Menu Banks

HDR settings can be adjusted separately for each bank (🕮 269), but switching to a bank in which HDR is active during multiple exposure (🕮 195) or interval timer shooting (🕮 201) disables HDR. HDR is also disabled if you switch to a bank in which an NEF (RAW) option is selected for image quality.

Flash Photography

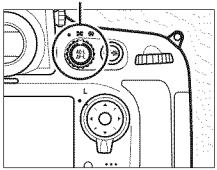
Using the Built-in Flash

The built-in flash has a Guide Number (GN) 12/39 (m/ft, ISO 100, 20 °C/68 °F) and provides coverage for the angle of view of 24 mm lens, or a 16 mm lens in DX format. It can be used not only when natural lighting is inadequate but to fill in shadows and backlit subjects or to add a catch light to the subject's eyes.

1 Choose a metering method (📖 115).

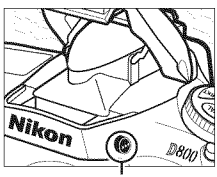
Select matrix or center-weighted metering to activate i-TTL balanced fill-flash for digital SLR. Standard i-TTL flash for digital SLR is activated automatically when spot metering is selected.

Metering selector



2 Press the flash pop-up button.

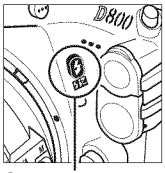
The built-in flash will pop up and begin charging. When the flash is fully charged, the flash-ready indicator (ϟ) will light.



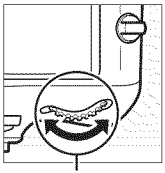
Flash pop-up button

3 Choose a flash mode.

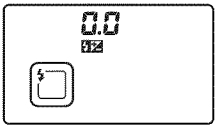
Press the ϟ (ϟ/▦) button and rotate the main command dial until the desired flash mode icon is displayed in the control panel (📖 183).



ϟ (ϟ/▦) button



Main command dial



Control panel

4 Check exposure (shutter speed and aperture).

Press the shutter-release button halfway and check shutter speed and aperture. The settings available when the built-in flash is raised are listed in "Shutter Speeds and Apertures Available with the Built-in Flash" (📖 184).

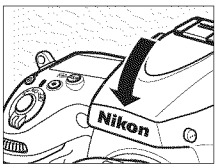
The effects of the flash can be previewed by pressing the depth-of-field preview button to emit a modeling flash (📖 307).

5 Take the picture.

Compose the photograph, focus, and shoot.

Lowering the Built-in Flash

To save power when the flash is not in use, press it gently downward until the latch clicks into place.



Flash Modes

The D800 supports the following flash modes:

Flash mode	Description
 Front-curtain sync	This mode is recommended for most situations. In programmed auto and aperture-priority auto modes, shutter speed will automatically be set to values between 1/250 and 1/60 s (1/8,000 to 1/60 s when an optional flash unit is used with Auto FP High-Speed Sync; 📖 299).
 Red-eye reduction	Red-eye reduction lamp lights for approximately one second before main flash. Pupils in subject's eyes contract, reducing "red-eye" effect sometimes caused by flash. Owing to one-second shutter-release delay, this mode is not recommended with moving subjects or in other situations in which quick shutter response is required. Avoid moving camera while red-eye reduction lamp is lit.
 Red-eye reduction with slow sync	Combines red-eye reduction with slow sync. Use for portraits taken against a backdrop of night scenery. Available only in programmed auto and aperture-priority auto exposure modes. Use of a tripod is recommended to prevent blurring caused by camera shake.
 Slow sync	Flash is combined with shutter speeds as slow as 30 s to capture both subject and background at night or under dim light. This mode is only available in programmed auto and aperture-priority auto exposure modes. Use of tripod is recommended to prevent blurring caused by camera shake.
 Rear-curtain sync	In shutter-priority auto or manual exposure mode, flash fires just before the shutter closes. Use to create effect of a stream of light behind moving objects. In programmed auto and aperture-priority auto, slow rear-curtain sync is used to capture both subject and background. Use of tripod is recommended to prevent blurring caused by camera shake.

Shutter Speeds and Apertures Available with the Built-in Flash

Mode	Shutter speed	Aperture	See page
P	Set automatically by camera ($^1/_{250}$ s–$^1/_{60}$ s) [1, 2]	Set automatically by camera	118
S	Value selected by user ($^1/_{250}$ s–30 s) [2]		119
A	Set automatically by camera ($^1/_{250}$ s–$^1/_{60}$ s) [1, 2]	Value selected by user [3]	120
M	Value selected by user ($^1/_{250}$ s–30 s, bulb) [2]		122

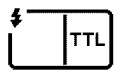
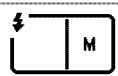
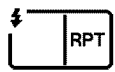
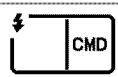
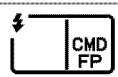
1 Shutter speed may be set as slow as 30 s in slow sync, slow rear-curtain sync, and slow sync with red-eye reduction flash modes.
2 Speeds as fast as $^1/_{8,000}$ s are available with optional flash units (🕮 382) when **1/320 s (Auto FP)** or **1/250 s (Auto FP)** is selected for Custom Setting e1 (**Flash sync speed**, 🕮 299).
3 Flash range varies with aperture and ISO sensitivity. Consult table of flash ranges (🕮 187) when setting aperture in A and M modes.

Flash Control Mode

The camera supports the following i-TTL flash control modes:

- **i-TTL balanced fill-flash for digital SLR**: Flash emits series of nearly invisible preflashes (monitor preflashes) immediately before main flash. Preflashes reflected from objects in all areas of frame are picked up by RGB sensor with approximately 91K (91,000) pixels and are analyzed in combination with range information from matrix metering system to adjust flash output for natural balance between main subject and ambient background lighting. If type G or D lens is used, distance information is included when calculating flash output. Precision of calculation can be increased for non-CPU lenses by providing lens data (focal length and maximum aperture; see 🕮 212). Not available when spot metering is used.
- **Standard i-TTL flash for digital SLR**: Flash output adjusted to bring lighting in frame to standard level; brightness of background is not taken into account. Recommended for shots in which main subject is emphasized at expense of background details, or when exposure compensation is used. Standard i-TTL flash for digital SLR is activated automatically when spot metering is selected.

The flash control mode for the built-in flash can be selected using Custom Setting e3 (**Flash cntrl for built-in flash**, 🕮 301). The information display shows the flash control mode for the built-in flash as follows:

	Flash sync	Auto FP (🕮 299, 300)
i-TTL		—
Manual		—
Repeating flash		—
Commander mode		

The Built-in Flash

Use with lenses with focal lengths of 24–300 mm in FX format (📖 375). Remove lens hoods to prevent shadows. The flash has a minimum range of 0.6 m (2 ft) and can not be used in the macro range of macro zoom lenses.

i-TTL flash control is available at ISO sensitivities between 100 and 6400; at other sensitivities, the desired results may not be achieved at some ranges or aperture values.

If the flash fires in continuous release mode (📖 103), only one photograph will be taken each time the shutter-release button is pressed.

The shutter release may be briefly disabled to protect the flash after it has been used for several consecutive shots. The flash can be used again after a short pause.

See Also

See page 190 for information on locking flash value (FV) for a metered subject before recomposing a photograph.

For information on auto FP high-speed sync and choosing a flash sync speed, see Custom Setting e1 (**Flash sync speed**, 📖 299). For information on choosing the slowest shutter speed available when using the flash, see Custom Setting e2 (**Flash shutter speed**, 📖 300). For information on flash control and using the built-in flash in commander mode, see Custom Setting e3 (**Flash cntrl for built-in flash**, 📖 301).

See page 380 for information on using optional flash units.

Aperture, Sensitivity, and Flash Range

The range of the built-in flash varies with sensitivity (ISO equivalency) and aperture.

Aperture at ISO equivalent of							Range	
100	200	400	800	1600	3200	6400	m	ft
1.4	2	2.8	4	5.6	8	11	0.7–8.5	2ft 4in.–27ft 11in.
2	2.8	4	5.6	8	11	16	0.6–6.0	2ft 0in.–19ft 8in.
2.8	4	5.6	8	11	16	22	0.6–4.2	2ft 0in.–13ft 9in.
4	5.6	8	11	16	22	32	0.6–3.0	2ft 0in.– 9ft 10in.
5.6	8	11	16	22	32	—	0.6–2.1	2ft 0in.– 6ft 11in.
8	11	16	22	32	—	—	0.6–1.5	2ft 0in.– 4ft 11in.
11	16	22	32	—	—	—	0.6–1.1	2ft 0in.– 3ft 7in.
16	22	32	—	—	—	—	0.6–0.8	2ft 0in.– 2ft 7in.

The built-in flash has a minimum range of 0.6 m (2 ft).

In exposure mode **P**, the maximum aperture (minimum f-number) is limited according to ISO sensitivity, as shown below:

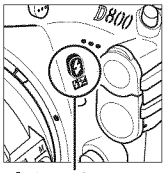
Maximum aperture at ISO equivalent of:						
100	200	400	800	1600	3200	6400
2.8	3.5	4	5	5.6	7.1	8

If the maximum aperture of the lens is smaller than given above, the maximum value for aperture will be the maximum aperture of the lens.

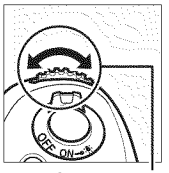
Flash Compensation

Flash compensation is used to alter flash output by from –3 EV to +1 EV in increments of 1/3 EV, changing the brightness of the main subject relative to the background. Flash output can be increased to make the main subject appear brighter, or reduced to prevent unwanted highlights or reflections. If flash compensation is combined with exposure compensation (📖 130), the exposure values will be added together.

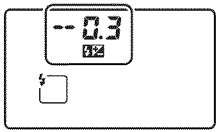
To choose a value for flash compensation, press the ⚡ (⚡±) button and rotate the sub-command dial until the desired value is displayed in the control panel.



⚡ (⚡±) button



Sub-command dial



±0 EV (⚡ (⚡±) button pressed)

–0.3 EV

+1.0 EV

At values other than ±0.0, a ⚡± icon will be displayed in the control panel and viewfinder after you release the ⚡ (⚡±) button. The current value for flash compensation can be confirmed by pressing the ⚡ (⚡±) button.

Normal flash output can be restored by setting flash compensation to ±0.0. Flash compensation is not reset when the camera is turned off.

Optional Flash Units

The SB-910, SB-900, SB-800, SB-700, and SB-600 also allow flash compensation to be set using the controls on the flash unit; the value selected with the flash unit is added to the value selected with the camera.

See Also

For information on choosing the size of the increments available for flash compensation, see Custom Setting b3 (**Exp./flash comp. step value**, □ 287). For information on automatically varying flash level over a series of shots, see page 132.

FV Lock

This feature is used to lock flash output, allowing photographs to be recomposed without changing the flash level and ensuring that flash output is appropriate to the subject even when the subject is not positioned in the center of the frame. Flash output is adjusted automatically for any changes in ISO sensitivity and aperture.

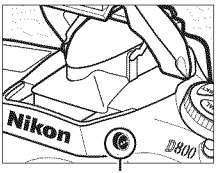
To use FV lock:

1 Assign FV lock to the Fn button.

Select **FV lock** for Custom Setting f4 (**Assign Fn button** > **Fn button press**, □ 311).

2 Press the flash pop-up button.

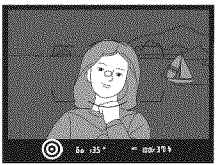
The built-in flash will pop up and begin charging.



Flash pop-up button

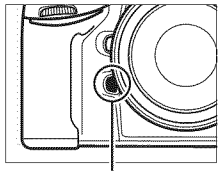
3 Focus.

Position the subject in the center of the frame and press the shutter-release button halfway to focus.



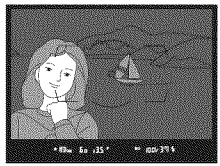
4 Lock flash level.

After confirming that the flash ready indicator (⚡) is displayed in the viewfinder, press the **Fn** button. The flash will emit a monitor preflash to determine the appropriate flash level. Flash output will be locked at this level and FV lock icon (FL) will appear in the viewfinder.



Fn button

5 Recompose the photograph.



6 Take the photograph.

Press the shutter-release button the rest of the way down to shoot. If desired, additional pictures can be taken without releasing FV lock.

7 Release FV lock.

Press the **Fn** button to release FV lock. Confirm that the FV lock icon (FL) is no longer displayed in the viewfinder.

Using FV Lock with the Built-in Flash

FV lock is only available with the built-in flash when TTL is selected for Custom Setting e3 (**Flash cntrl for built-in flash**, 301).

Using FV Lock with Optional Flash Units

FV lock is also available with optional flash units in TTL and (where supported) monitor pre-flash AA and monitor pre-flash A flash control modes. Note that when commander mode is selected for Custom Setting e3 (**Flash cntrl for built-in flash**, 301), you will need to set the flash control mode for the master or at least one remote group to TTL or AA.

Metering

The metering areas for FV lock when using optional flash unit are as follows:

Flash unit	Flash mode	Metered area
Stand-alone flash unit	i-TTL	6-mm circle in center of frame
	AA	Area metered by flash exposure meter
Used with other flash units (Advanced Wireless Lighting)	i-TTL	Entire frame
	AA	Area metered by flash exposure meter
	A (master flash)	

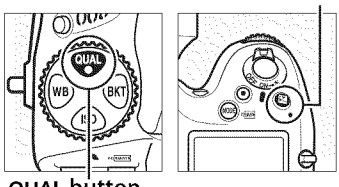
See Also

For information on using the depth-of-field preview button or **AE-L/AF-L** button for FV lock, see Custom Setting f5 (**Assign preview button**, 315) or Custom Setting f6 (**Assign AE-L/AF-L button**, 315).

Other Shooting Options

Two-Button Reset: Restoring Default Settings

The camera settings listed below can be restored to default values by holding the **QUAL** and ⊠ buttons down together for more than two seconds (these buttons are marked by a green dot). The control panel turns off briefly while settings are reset.



■ *Settings Accessible from the Shooting Menu* [1]

Option	Default
Image quality	JPEG normal
Image size	Large
White balance	Auto > Normal
Fine-tuning	A-B: 0, G-M: 0
Picture Control settings [2]	Unmodified
HDR (high dynamic range)	Off [3]
ISO sensitivity	100
Auto ISO sensitivity control	Off
Multiple exposure	Off [4]
Interval timer shooting	Off [5]

1 With the exception of multiple exposure and interval timer settings, only settings in the bank currently selected using the **Shooting menu bank** option will be reset (🕮 269). Settings in the remaining banks are unaffected.
2 Current Picture Control only.
3 Exposure differential and smoothing are not reset.
4 If multiple exposure is currently in progress, shooting will end and multiple exposure will be created from exposures recorded to that point. Gain and number of shots are not reset.
5 If interval timer shooting is currently in progress, shooting will end. Starting time, shooting interval, and number of intervals and shots are not reset.

Other Settings

Option	Default
Focus point [1]	Center
Exposure mode	Programmed auto
Flexible program	Off
Exposure compensation	Off
AE lock hold	Off
Aperture lock	Off
Shutter-speed lock	Off
Autofocus mode	AF-S

Option	Default
AF-area mode	
Viewfinder	Single-point AF
Live view/movie	Normal-area AF
Bracketing	Off [2]
Flash mode	Front-curtain sync
Flash compensation	Off
FV lock	Off
Exposure delay mode [3]	Off
+ NEF (RAW)	Off

1 Focus point not displayed if auto-area AF is selected for AF-area mode.
2 Number of shots is reset to zero. Bracketing increment is reset to 1 EV (exposure/flash bracketing) or 1 (white balance bracketing). **Auto** is selected for the second shot of two-shot ADL bracketing programs.
3 Only settings in the bank currently selected using the **Custom settings bank** option will be reset (📖 280). Settings in the remaining banks are unaffected.

See Also
See page 405 for a list of default settings.

Multiple Exposure

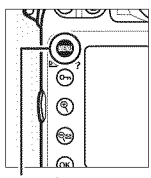
Follow the steps below to record a series of two to ten exposures in a single photograph. Multiple exposures can make use of RAW data from the camera image sensor to produce colors noticeably superior to those in software-generated photographic overlays.

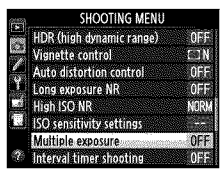
Creating a Multiple Exposure

Multiple exposures can not be recorded in live view. Exit live view before proceeding. Note that at default settings, shooting will end and a multiple exposure will be recorded automatically if no operations are performed for 30 s.

> **Extended Recording Times**
> For an interval between exposures of more than 30 s, extend the meter-off delay using Custom Setting c2 (**Auto meter-off delay**, □ 291). The maximum interval between exposures is 30 s longer than the option selected for Custom Setting c2. If no operations are performed for 30 s after the monitor has turned off during playback or menu operations, shooting will end and a multiple exposure will be created from the exposures that have been recorded to that point.

1 Select **Multiple exposure** in the shooting menu.

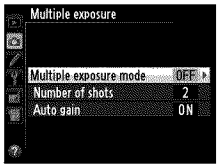




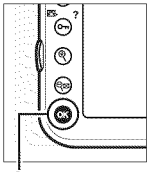
Press the MENU button to display the menus. Highlight **Multiple exposure** in the shooting menu and press ▶.

2 Select a mode.

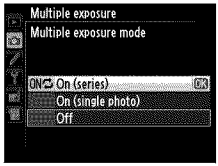
Highlight **Multiple exposure mode** and press ▶.



Highlight one of the following and press ⓞⓚ:

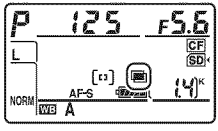


ⓞⓚ button



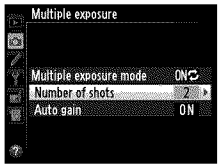
- **To take a series of multiple exposures**, select ON **On (series)**. Multiple exposure shooting will continue until you select **Off** for **Multiple exposure mode**.
- **To take one multiple exposure**, select **On (single photo)**. Normal shooting will resume automatically after you have created a single multiple exposure.
- **To exit without creating additional multiple exposures**, select **Off**.

If **On (series)** or **On (single photo)** is selected, a ▣ icon will be displayed in the control panel.

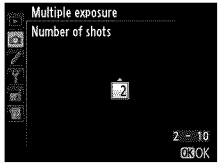


3 Choose the number of shots.

Highlight **Number of shots** and press ▶.

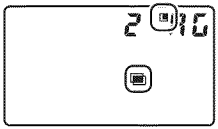


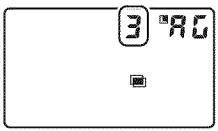
Press ▲ or ▼ to choose the number of exposures that will be combined to form a single photograph and press ⊛.



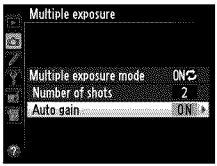
The BKT Button

If **Multiple exposure** is selected for Custom Setting f8 (**Assign BKT button**; 🕮 316), you can select the multiple exposure mode by pressing the **BKT** button and rotating the main command dial and the number of shots by pressing the **BKT** button and rotating the sub-command dial. The mode and number of shots are shown in the control panel: ▬ and L appear when **On (series)** is selected and ▬ when **On (single photo)** is selected; no icon appears when multiple exposure is off.



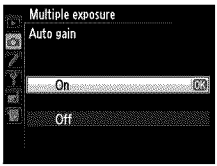


4 Choose the amount of gain.



Highlight **Auto gain** and press ▶.

The following options will be displayed. Highlight an option and press ⊛.

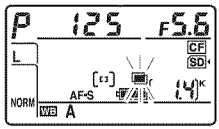


- **On**: Gain is adjusted according to number of exposures actually recorded (gain for each exposure is set to 1/2 for 2 exposures, 1/3 for 3 exposures, etc.).
- **Off**: Gain is not adjusted when recording multiple exposure. Recommended if background is dark.

5 Frame a photograph, focus, and shoot.

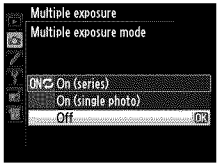
In continuous high-speed and continuous low-speed release modes (📖 103), the camera records all exposures in a single burst. If **On (series)** is selected, the camera will continue to record multiple exposures while the shutter-release button is pressed; if **On (single photo)** is selected, multiple exposure shooting will end after the first photograph. In self-timer mode, the camera will automatically record the number of exposures selected in Step 3 on page 197, regardless of the option selected for Custom Setting c3 (**Self-timer**) > **Number of shots** (📖 291); the interval between shots is however controlled by Custom Setting c3 (**Self-timer**) > **Interval between shots**. In other release modes, one photograph will be taken each time the shutter-release button is pressed; continue shooting until all exposures have been recorded (for information on interrupting a multiple exposure before all photographs are recorded, see page 199).

The ▣ icon will blink until shooting ends. If **On (series)** is selected, multiple exposure shooting will only end when **Off** is selected for multiple exposure mode; if **On (single photo)** is selected, multiple exposure shooting ends automatically when the multiple exposure is complete. The ▣ icon clears from the display when multiple exposure shooting ends.



■■ *Interrupting Multiple Exposures*

To interrupt a multiple exposure before the specified number of exposures have been taken, select **Off** for multiple exposure mode. If shooting ends before the specified number of exposures have been taken, a multiple exposure will be created from the exposures that have been recorded to that point. If **Auto gain** is on, gain will be adjusted to reflect the number of exposures actually recorded. Note that shooting will end automatically if:



- A two-button reset is performed (🕮 193)
- The camera is turned off
- The battery is exhausted
- Pictures are deleted

Multiple Exposure

Do not remove or replace the memory card while recording a multiple exposure.

Multiple exposures can not be recorded in live view. Taking photographs in live view resets **Multiple exposure mode** to **Off**.

The information listed in the playback photo information display (including date of recording and camera orientation) is for the first shot in the multiple exposure.

Interval Timer Photography

If interval timer photography is activated before the first exposure is taken, the camera will record exposures at the selected interval until the number of exposures specified in the multiple exposure menu have been taken (the number of shots listed in the interval timer shooting menu is ignored). These exposures will then be recorded as a single photograph and interval timer shooting will end (if **On (single photo)** is selected for multiple exposure mode, multiple exposure shooting will also end automatically). Cancelling multiple exposure cancels interval timer shooting.

Other Settings

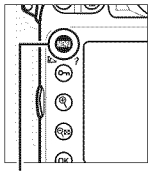
While a multiple exposure is being shot, memory cards can not be formatted and some menu items are grayed out and can not be changed.

Interval Timer Photography

The camera is equipped to take photographs automatically at preset intervals.

1 Select **Interval timer shooting** in the shooting menu.

Press the MENU button to display the menus. Highlight **Interval timer shooting** in the shooting menu and press ▶.

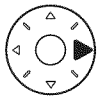


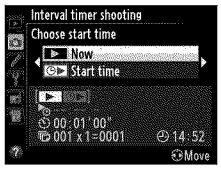
MENU button

2 Choose a starting time.

Chose from the following starting triggers.

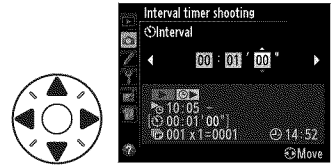
- **To start shooting immediately**, highlight **Now** and press ▶. Shooting begins about 3 s after settings are completed; proceed to Step 3.
- **To choose a starting time**, highlight **Start time** and press ▶ to display the start time options shown at right. Press ◀ or ▶ to highlight hours or minutes and press ▲ or ▼ to change. Press ▶ to continue.





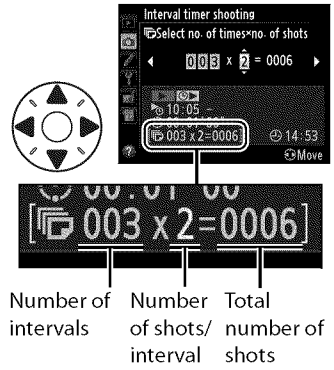
3 Choose the interval.

Press ◀ or ▶ to highlight hours, minutes, or seconds; press ▲ or ▼ to change. Choose an interval longer than the slowest anticipated shutter speed. Press ▶ to continue.



4 Choose the number of intervals and number of shots per interval.

Press ◀ or ▶ to highlight number of intervals or number of shots; press ▲ or ▼ to change. Press ▶ to continue.



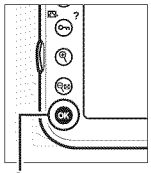
Before Shooting

Select a release mode other than self-timer (⏲) or **MUP** when using the interval timer. Before beginning interval timer photography, take a test shot at current settings and view the results in the monitor.

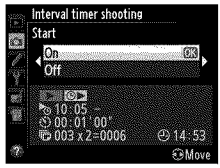
Before choosing a starting time, select **Time zone and date** in the setup menu and make sure that the camera clock is set to the correct time and date (📖 27).

Use of a tripod is recommended. Mount the camera on a tripod before shooting begins. To ensure that shooting is not interrupted, be sure the camera EN-EL15 battery is fully charged. If in doubt, charge the battery before use or use an EH-5b AC adapter and EP-5B power connector (available separately).

5 Start shooting.



Ⓚ button



Highlight **On** and press Ⓚ (to return to the shooting menu without starting the interval timer, highlight **Off** and press Ⓚ). The first series of shots will be taken at the specified starting time, or after about 3 s if **Now** was selected for **Choose start time** in Step 2. Shooting will continue at the selected interval until all shots have been taken. Note that because shutter speed and the time needed to record the image to the memory card may vary from shot to shot, the interval between a shot being recorded and the start of the next shot may vary. If shooting can not proceed at current settings (for example, if a shutter speed of **bULb** is currently selected in manual exposure mode or the start time is in less than a minute), a warning will be displayed in the monitor.

Cover the Viewfinder

To prevent light entering via the viewfinder interfering with exposure, close the viewfinder eyepiece shutter (🕮 106).

Out of Memory

If the memory card is full, the interval timer will remain active but no pictures will be taken. Resume shooting (🕮 205) after deleting some pictures or turning the camera off and inserting another memory card.

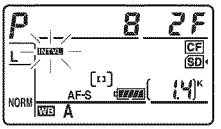
Interval Timer Photography

Interval timer photography can not be combined with long time-exposures (bulb photography, 🕮 124) or time-lapse photography (🕮 207) and is not available when **Record movies** is selected for Custom Setting g4 (**Assign shutter button**, 🕮 324).

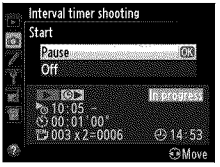
Bracketing

Adjust bracketing settings before starting interval timer photography. If exposure, flash, or ADL bracketing is active while interval timer photography is in effect, the camera will take the number of shots in the bracketing program at each interval, regardless of the number of shots specified in the interval timer menu. If white balance bracketing is active while interval timer photography is in effect, the camera will take one shot at each interval and process it to create the number of copies specified in the bracketing program.

During Shooting



During interval timer photography, the INTVL icon will blink in the control panel. Immediately before the next shooting interval begins, the shutter speed display will show the number of intervals remaining, and the aperture display will show the number of shots remaining in the current interval. At other times, the number of intervals remaining and the number of shots in each interval can be viewed by pressing the shutter-release button halfway (once the button is released, the shutter speed and aperture will be displayed until the exposure meters turn off).



To view current interval timer settings, select **Interval timer shooting** between shots. While interval timer photography is in progress, the interval timer menu will show the starting time, the shooting interval, and the number of intervals and shots remaining. None of these items can be changed while interval timer photography is in progress.

Pictures can be played back and shooting and menu settings can be adjusted freely while interval timer photography is in progress. The monitor will turn off automatically about four seconds before each interval.

■■ *Pausing Interval Timer Photography*

Interval timer photography can be paused by:

- Pressing the ⓞⓚ button between intervals
- Highlighting **Start** > **Pause** in the interval timer menu and pressing ⓞⓚ
- Turning the camera off and then on again (if desired, the memory card can be replaced while the camera is off)
- Selecting self-timer (⏲) or **MUP** release mode

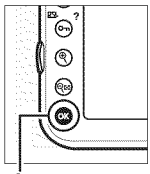
To resume shooting:

1 Choose a new starting time.

Choose a new starting time as described on page 201.

2 Resume shooting.

Highlight **Restart** and press ⓞⓚ. Note that if interval timer photography was paused during shooting, any shots remaining in the current interval will be canceled.



ⓞⓚ button

■■ *Interrupting Interval Timer Photography*

Interval timer shooting will end automatically if the battery is exhausted. Interval timer photography can also be ended by:

- Selecting **Start** > **Off** in the interval timer menu
- Performing a two button reset (🕮 193)
- Resetting settings for the current shooting menu bank using the **Shooting menu bank** item in the shooting menu (🕮 270)
- Changing bracketing settings (🕮 132)
- Terminating HDR (🕮 176) or multiple exposure shooting (🕮 195)

Normal shooting will resume when interval timer photography ends.

■■ *No Photograph*

The camera will skip the current interval if any of the following situations persist for eight seconds or more after the interval was due to start: the photograph or photographs for the previous interval have yet to be taken, the memory buffer is full, or the camera is unable to focus in **AF-S** (note that the camera focuses again before each shot). Shooting will resume with the next interval.

Release Mode

Regardless of the release mode selected, the camera will take the specified number of shots at each interval. In **CH** (continuous high speed) mode, photographs will be taken at the rate given on page 104. In **S** (single frame) and **CL** (continuous low-speed) modes, photographs will be taken at the rate chosen for Custom Setting d2 (**CL mode shooting speed**, 🕮 293) in mode **Q**, camera noise will be reduced.

Shooting Menu Banks

Changes to interval timer settings apply to all shooting menu banks (🕮 269). If shooting menu settings are reset using the **Shooting menu bank** item in the shooting menu (🕮 270), interval timer settings will be reset as follows:

- Choose start time: Now
- Interval: 00:01':00"
- Number of intervals: 1
- Number of shots: 1
- Start shooting: Off

Time-Lapse Photography

The camera automatically takes photos at selected intervals to create a silent time-lapse movie using the options currently selected for **Movie settings** in the shooting menu (📖 70).

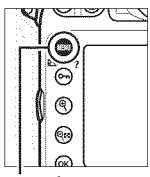
Before Shooting

Before beginning time-lapse photography, take a test shot at current settings (framing the photo in the viewfinder for an accurate exposure preview) and view the results in the monitor. To record changes in brightness, choose manual exposure (📖 122); for consistent coloration, choose a white balance setting other than auto (📖 145). We recommend that you briefly switch to movie live view and check the current image area crop in the monitor (📖 59); note, however, that time-lapse photography is not available in live view.

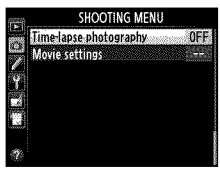
Use of a tripod is recommended. Mount the camera on a tripod before shooting begins. To ensure that shooting is not interrupted, use an optional EH-5b AC adapter and EP-5B power connector or a fully-charged EN-EL15 battery.

1 Select **Time-lapse photography** in the shooting menu.

Press the MENU button to display the menus. Highlight **Time-lapse photography** in the shooting menu and press ▶.

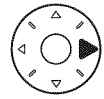


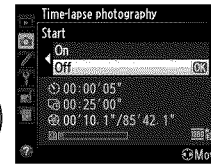
MENU button



2 Press ▶.

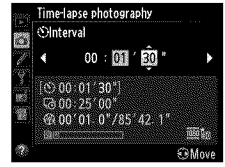
Press ▶ to proceed to Step 3 and choose an interval and shooting time. To record a time-lapse movie using the default interval of 5 seconds and shooting time of 25 minutes, proceed to step 5.





3 Choose the interval.

Press ◀ or ▶ to highlight minutes or seconds; press ▲ or ▼ to change. Choose an interval longer than the slowest anticipated shutter speed. Press ▶ to continue.

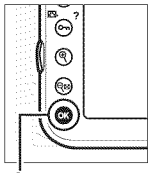


4 Select the shooting time.

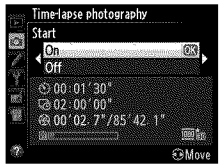
Press ◀ or ▶ to highlight hours or minutes; press ▲ or ▼ to change. The maximum shooting time is 7 hours and 59 minutes. Press ▶ to continue.

5 Start shooting.

Highlight **On** and press ⓞ (to return to the shooting menu without starting time-lapse photography, highlight **Off** and press ⓞ).



ⓞ button



Time-lapse photography starts after 3 s. The camera takes photographs at the interval selected in Step 3 for the time selected in Step 4. The memory card access lamp lights while each shot is recorded; note that because shutter speed and the time needed to record the image to the memory card may vary from shot to shot, the interval between a shot being recorded and the start of the next shot may vary. Shooting will not begin if a time-lapse movie can not be recorded at current settings (for example, if the memory card is full, the interval or shooting time is zero, or the interval is longer than the shooting time).

When complete, time-lapse movies are recorded to the memory card selected for **Movie settings** > **Destination** (🕮 70).

Time-Lapse Photography

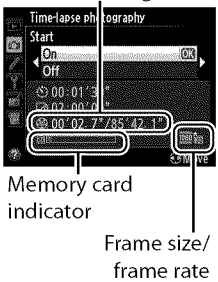
Time-lapse is not available in live view (🕮 45, 59), at a shutter speed of **bulb** (🕮 124), when bracketing (🕮 132), High Dynamic Range (HDR, 🕮 176), multiple exposure (🕮 195), or interval timer photography (🕮 201) is active.

Release Mode

Regardless of the release mode selected, the camera will take one shot at each interval. The self-timer can not be used.

Calculating the Length of the Final Movie

The total number of frames in the final movie can be calculated by dividing the shooting time by the interval and rounding up. The length of the final movie can then be calculated by diving the number of shots by the frame rate selected for **Movie settings** > **Frame size/frame rate**. A 48 frame movie recorded at **1920 × 1080; 24 fps**, for example, will be about two seconds long. The maximum length for movies recorded using time-lapse photography is 20 minutes.

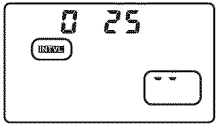


Cover the Viewfinder

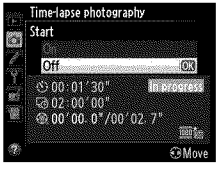
To prevent light entering via the viewfinder interfering with exposure, close the viewfinder eyepiece shutter (📖 106).

During Shooting

During time-lapse photography, a NTVL icon will blink and the time-lapse recording indicator will be displayed in the control panel. The time remaining (in hours and minutes) appears in the shutter-speed display immediately before each frame is recorded. At other times, the time remaining can be viewed by pressing the shutter-release button halfway. Regardless of the option selected for Custom Setting c2 (**Auto meter-off delay**, 📖 291), the exposure meters will not turn off during shooting.



To view current time-lapse photography settings, press the MENU button between shots. While time-lapse photography is in progress, the time-lapse photography menu will show the interval and the time remaining. These settings can not be changed while time-lapse photography is in progress, nor can pictures be played back or other menu settings adjusted.



■■ *Interrupting Time-Lapse Photography*

Time-lapse photography will end automatically if the battery is exhausted. The following will also end time-lapse photography:

- Selecting **Start** > **Off** in the **Time-lapse photography** menu
- Pressing the ⊛ button between frames or immediately after a frame is recorded
- Turning the camera off
- Removing the lens
- Connecting a USB or HDMI cable
- Inserting a memory card into an empty slot
- Pressing the shutter-release button all the way down to take a photograph

A movie will be created from the frames shot to the point where time-lapse photography ended. Note that time-lapse photography will end and no movie will be recorded if the power source is removed or disconnected or the destination memory card is ejected.

■■ *No Photograph*

The camera will skip the current frame if the camera is unable to focus in **AF-S** (note that the camera focuses again before each shot). Shooting will resume with the next frame.

Image Review

The ▶ button can not be used to view pictures while time-lapse photography is in progress, but the current frame will be displayed for a few seconds after each shot if **On** is selected for **Image review** in the playback menu (🕮 265). Other playback operations can not be performed while the frame is displayed.

See Also

For information on setting a beep to sound when time-lapse photography is complete, see Custom Setting d1 (**Beep**, 🕮 292).

Non-CPU Lenses

By specifying lens data (lens focal length and maximum aperture), the user can gain access to a variety of CPU lens functions when using a non-CPU lens.

If the focal length of the lens is known:

- Power zoom can be used with optional flash units (📖 382)
- Lens focal length is listed (with an asterisk) in the playback photo info display

If the maximum aperture of the lens is known:

- The aperture value is displayed in the control panel and viewfinder
- Flash level is adjusted for changes in aperture
- Aperture is listed (with an asterisk) in the playback photo info display

Specifying both the focal length and maximum aperture of the lens:

- Enables color matrix metering (note that it may be necessary to use center-weighted or spot metering to achieve accurate results with some lenses, including Reflex-NIKKOR lenses)
- Improves the precision of center-weighted and spot metering and i-TTL balanced fill-flash for digital SLR

Focal Length Not Listed

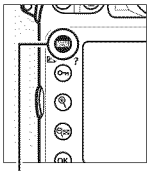
If the correct focal length is not listed, choose the closest value greater than the actual focal length of the lens.

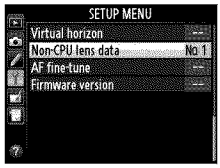
Teleconverters and Zoom Lenses

The maximum aperture for teleconverters is the combined maximum aperture of the teleconverter and the lens. Note that lens data are not adjusted when non-CPU lenses are zoomed in or out. The data for different focal lengths can be entered as separate lens numbers, or the data for the lens can be edited to reflect the new values for lens focal length and maximum aperture each time zoom is adjusted.

The camera can store data for up to nine non-CPU lenses. To enter or edit data for a non-CPU lens:

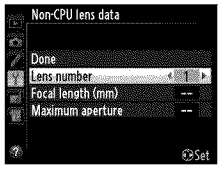
1 Select **Non-CPU lens data** in the setup menu.





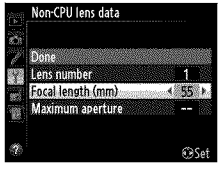
Press the MENU button to display the menus. Highlight **Non-CPU lens data** in the setup menu and press ▶.

2 Select a lens number.



Highlight **Lens number** and press ◀ or ▶ to choose a lens number between 1 and 9.

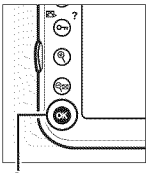
3 Enter the focal length and aperture.

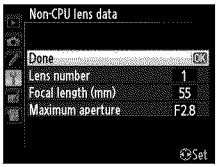


Highlight **Focal length (mm)** or **Maximum aperture** and press ◀ or ▶ to edit the highlighted item. Focal length can be selected from values between 6 and 4,000 mm, maximum aperture from values between f/1.2 and f/22.

4 Select **Done**.

Highlight **Done** and press ⊛. The specified focal length and aperture will be stored under the chosen lens number.





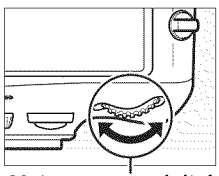
To recall lens data when using a non-CPU lens:

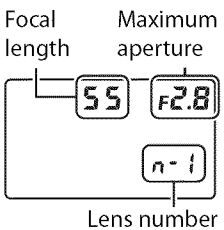
1 Assign non-CPU lens number selection to a camera control.

Select **Choose non-CPU lens number** as the "button + command dials" option for a camera control in the Custom Settings menu (🕮 314). Non-CPU lens number selection can be assigned to the **Fn** button (Custom Setting f4, **Assign Fn button**, 🕮 311), the depth-of-field preview button (Custom Setting f5, **Assign preview button**, 🕮 315), or the **AE-L/AF-L** button (Custom Setting f6, **Assign AE-L/AF-L button**, 🕮 315).

2 Use the selected control to choose a lens number.

Press the selected button and rotate the main or sub-command dial until the desired lens number is displayed in the control panel.





Using a GPS Unit

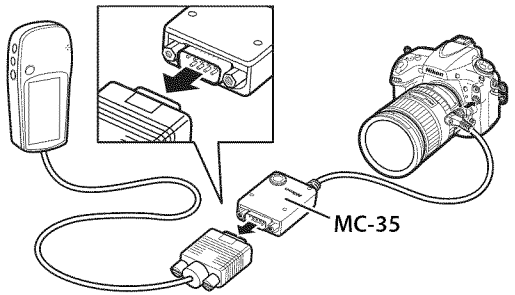
A GPS unit can be connected to the ten-pin remote terminal, allowing the current latitude, longitude, altitude, Coordinated Universal Time (UTC), and heading to be recorded with each photograph taken. The camera can be used with an optional GP-1 GPS unit (see below; note that the GP-1 does not provide the compass heading), or with third-party units connected via an optional MC-35 GPS adapter cord (🕮 216).

■■ *The GP-1 GPS Unit*

The GP-1 is an optional GPS unit designed for use with Nikon digital cameras. For information on connecting the unit, see the manual provided with the GP-1.

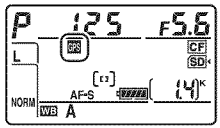
■■ *Other GPS Units*

Garmin GPS units that conform to version 2.01 or 3.01 of the National Marine Electronics Association NMEA0183 data format can be connected to the camera's ten-pin remote terminal using an MC-35 GPS adapter cord (available separately; □ 390). Operation has been confirmed with Garmin eTrex and Garmin geko series devices equipped with a PC interface cable connector. These devices connect to the MC-35 using a cable with a D-sub 9-pin connector provided by the manufacturer of the GPS device. See the MC-35 instruction manual for details. Before turning the camera on, set the GPS device to NMEA mode (4800 baud); see the documentation provided with the GPS device for more information.



The GPS Icon

Connection status is shown by the GPS icon:

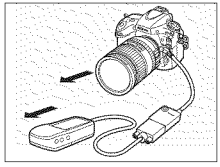


- **GPS (static)**: Camera has established communication with a GPS device. Photo information for pictures taken while this icon is displayed include an additional page of GPS data (📖 229).
- **GPS (flashing)**: The GPS device is searching for a signal. Pictures taken while the icon is flashing do not include GPS data.
- **No icon**: No new GPS data have been received from the GPS device for at least two seconds.

Pictures taken when the GPS icon is not displayed do not include GPS data.

Heading

The heading is only recorded if the GPS device is equipped with a digital compass (note that the GP-1 is not equipped with a compass). Keep the GPS device pointing in the same direction as the lens and at least 20cm (8 in.) from the camera.



Coordinated Universal Time (UTC)

UTC data is provided by the GPS device and is independent of the camera clock.

■■ *Setup Menu Options*

The **GPS** item in the setup menu contains the options listed below.

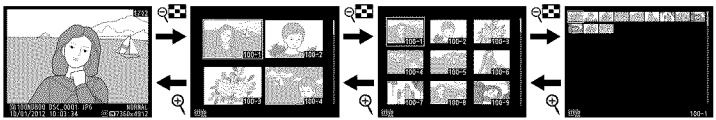
- **Auto meter-off**: Choose whether or not the exposure meters will turn off automatically when a GPS unit is attached.

Option	Description
Enable	Exposure meters will turn off automatically if no operations are performed for the period specified in Custom Setting c2 (**Auto meter-off delay**, 🕮 291; to allow the camera time to acquire GPS data when a GP-1 is connected, the delay is extended by up to one minute after exposure meters are activated or the camera is turned on). This reduces the drain on the battery.
Disable	Exposure meters will not turn off while a GPS unit is connected; GPS data will always be recorded.

- **Position**: This item is only available if a GPS device is connected, when it displays the current latitude, longitude, altitude, Coordinated Universal Time (UTC), and heading (if supported) as reported by the GPS device.
- **Use GPS to set camera clock**: Select **Yes** to synchronize the camera clock with the time reported by the GPS device.

More About Playback

Viewing Images

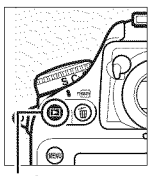


Full-frame playback

Thumbnail playback

Full-Frame Playback

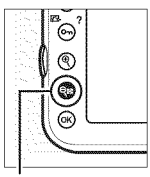
To play photographs back, press the ▶ button. The most recent photograph will be displayed in the monitor. Additional pictures can be displayed by pressing ◀ or ▶; to view additional information on the current photograph, press ▲ or ▼ (🕮 222).



▶ button

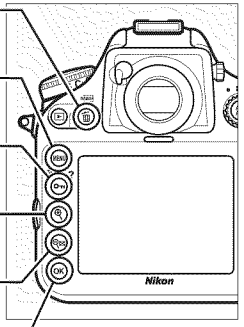
Thumbnail Playback

To view multiple images, press the 🔍 button when a picture is displayed full frame. The number of images displayed increases from 4 to 9 to 72 each time the 🔍 button is pressed, and decreases with each press of the 🔍 button. Use the multi selector to highlight images and press the center of the multi selector to view the highlighted image full frame.



🔍 button

Playback Controls



(FORMAT): Delete the current picture (📖 234)

MENU: View the menus (📖 259)

(🔒/?): Protect the current picture (📖 233)

: Zoom in (📖 231)

: View multiple images (📖 219)

OK: Display retouch options (for the options available with photographs, see page 341, or see page 74 for the options available with movies)

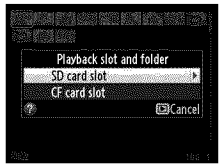
Rotate Tall

To display "tall" (portrait-orientation) photographs in tall orientation, select **On** for the **Rotate tall** option in the playback menu (📖 266).

Image Review

When **On** is selected for **Image review** in the playback menu (📖 265), photographs are automatically displayed in the monitor after shooting (because the camera is already in the correct orientation, images are not rotated automatically during image review). In continuous release mode, display begins when shooting ends, with the first photograph in the current series displayed.

Two Memory Cards



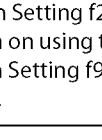
If two memory cards are inserted, you can select a memory card for playback by pressing the button when 72 thumbnails are displayed. The dialog shown at right will be displayed; Highlight the desired slot and press ▶ to display a list of folders, then highlight a folder and press OK to view the pictures in the selected folder. The same method can be used to choose a slot when selecting images for operations in the playback (□ 259) or retouch menus (□ 341) or when choosing an image as the source for preset white balance (□ 159).

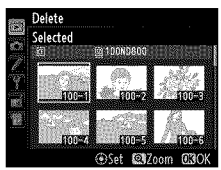
Resuming Shooting

To turn the monitor off and return to shooting mode, press ▶ or press the shutter-release button halfway.

The Multi Selector

The multi selector can be used to highlight pictures in the thumbnail display and in displays like that shown at right.



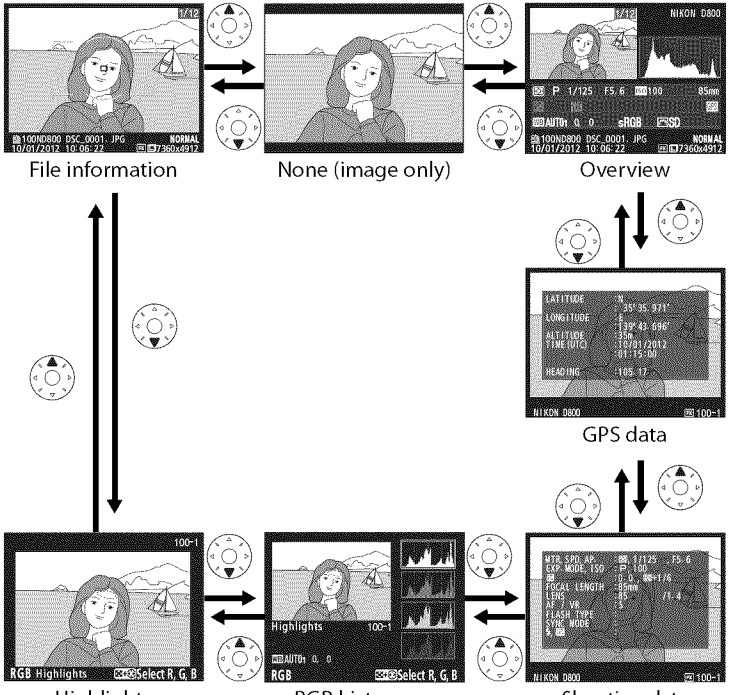


See Also

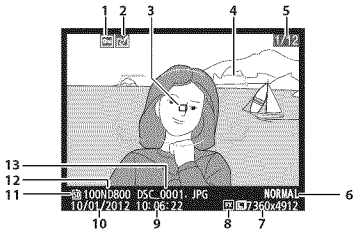
For information on choosing how long the monitor will remain on when no operations are performed, see Custom Setting c4 (**Monitor off delay**, □ 292). For information on choosing the role played by the center of the multi selector, see Custom Setting f2 (**Multi selector center button**, □ 309). For information on using the command dials for image or menu navigation, see Custom Setting f9 (**Custom command dials**) > **Menus and playback** (□ 318).

Photo Information

Photo information is superimposed on images displayed in full-frame playback. Press ▲ or ▼ to cycle through photo information as shown below. Note that "image only", shooting data, RGB histograms, and highlights are only displayed if corresponding option is selected for **Playback display options** (🕮 261). GPS data are only displayed if a GPS device was used when the photo was taken.



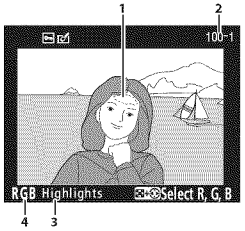
File Information



1	Protect status	233
2	Retouch indicator	341
3	Focus point [1, 2]	96
4	AF-area brackets [1]	35
5	Frame number/total number of frames	
6	Image quality	84
7	Image size	87
8	Image area [3]	79
9	Time of recording	27
10	Date of recording	27
11	Current card slot	31
12	Folder name	271
13	File name	273

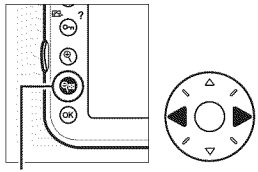
1 Displayed only if **Focus point** is selected for **Playback display options** (□ 261).
2 If photograph was taken using **AF-S**, display shows point where focus first locked. If photograph was taken using **AF-C**, focus point is only displayed if option other than auto-area AF was selected for AF-area mode and camera was able to focus.
3 Displayed in yellow if picture is in non-FX format (including DX-based movie format; □ 67, 79).

Highlights



1 Image highlights [1]
2 Folder number–frame number [2]..... 271
3 Highlight display indicator
4 Current channel [1]

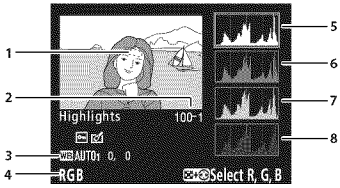
1 Blinking areas indicate highlights (areas that may be overexposed) for current channel. Hold button and press ◀ or ▶ to cycle through channels as follows:



RGB (all channels) ⟷ R (red) ⟷ G (green) ⟷ B (blue)

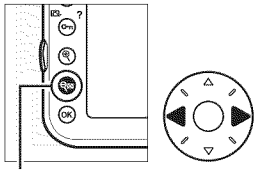
2 Displayed in yellow if picture is in non-FX format (including DX-based movie format; 67, 79).

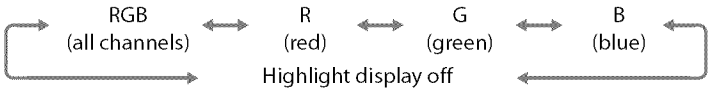
■■ RGB Histogram



1 Image highlights [1]
2 Folder number–frame number [2] 271
3 White balance 145
Color temperature 152
White balance fine-tuning 148
Preset manual 154
4 Current channel [1]
5 Histogram (RGB channel). In all histograms, horizontal axis gives pixel brightness, vertical axis number of pixels.
6 Histogram (red channel)
7 Histogram (green channel)
8 Histogram (blue channel)

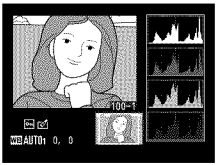
1 Blinking areas indicate highlights (areas that may be overexposed) for current channel. Hold ⊖ button and press ◀ or ▶ to cycle through channels as follows:





2 Displayed in yellow if picture is in non-FX format (including DX-based movie format; 67, 79).

Playback Zoom

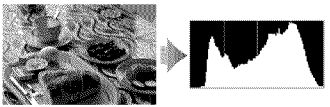


To zoom in on the photograph when the histogram is displayed, press 🔍. Use the 🔍 and 🔍 buttons to zoom in and out and scroll the image with the multi selector. The histogram will be updated to show only the data for the portion of the image visible in the monitor.

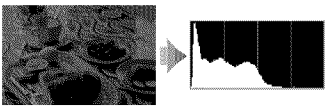
Histograms

Camera histograms are intended as a guide only and may differ from those displayed in imaging applications. Some sample histograms are shown below:

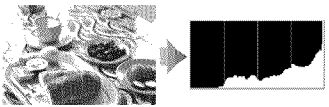
If the image contains objects with a wide range of brightnesses, the distribution of tones will be relatively even.



If the image is dark, tone distribution will be shifted to the left.

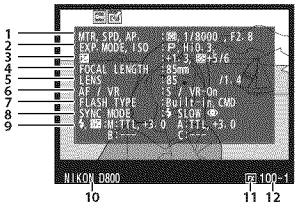


If the image is bright, tone distribution will be shifted to the right.



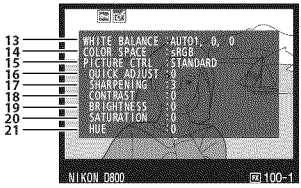
Increasing exposure compensation shifts the distribution of tones to the right, while decreasing exposure compensation shifts the distribution to the left. Histograms can provide a rough idea of overall exposure when bright ambient lighting makes it difficult to see photographs in the monitor.

■■ Shooting Data



1 Metering method 115
Shutter speed 119, 122
Aperture 120, 122

2 Exposure mode 117
ISO sensitivity [1] 109



13 White balance 145
Color temperature 152
White balance fine-tuning 148
Preset manual 154

3 Exposure compensation 130
Optimal exposure tuning [2] 290

4 Focal length 212, 379

5 Lens data 212

6 Focus mode 91
Lens VR (vibration reduction) [3]

7 Flash type 181, 380
Commander mode 303

8 Flash mode 183

9 Flash control 301
Flash compensation 188

10 Camera name

11 Image area [4] 79

12 Folder number–frame number [4] 271

14 Color space 274

15 Picture Control 163

16 Quick adjust [5] 166
Original Picture Control [6] 163

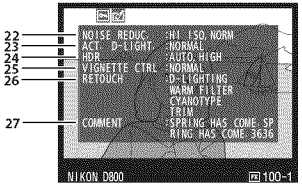
17 Sharpening 166

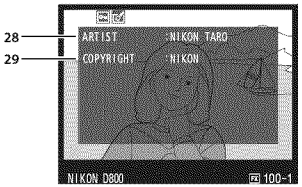
18 Contrast 166

19 Brightness 166

20 Saturation [7] 166
Filter effects [8] 166

21 Hue [7] 166
Toning [8] 166

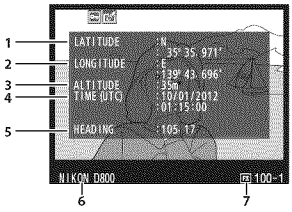




The fourth page of the shooting data is only displayed if copyright information was recorded with the photograph as described on page 334.

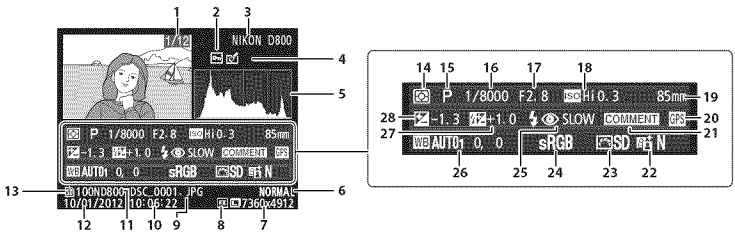
1 Displayed in red if photo was taken with auto ISO sensitivity control on.
2 Displayed if Custom Setting b6 (**Fine-tune optimal exposure**, 290) has been set to a value other than zero for any metering method.
3 Displayed only if VR lens is attached.
4 Displayed in yellow if picture is in non-FX format (including DX-based movie format; 67, 79).
5 **Standard Vivid**, **Portrait**, and **Landscape** Picture Controls only.
6 **Neutral**, **Monochrome**, and custom Picture Controls.
7 Not displayed with monochrome Picture Controls.
8 Monochrome Picture Controls only.

■■ *GPS Data*[1]



1 Latitude
2 Longitude
3 Altitude
4 Coordinated Universal Time (UTC)
5 Heading[2]
6 Camera name
7 Image area[3] 79

1 Data for movies are for start of recording.
2 Displayed only if GPS device is equipped with electronic compass.
3 Displayed in yellow if picture is in non-FX format (including DX-based movie format; □ 67, 79).

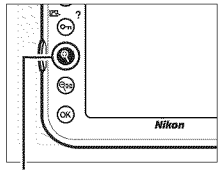


1 Frame number/total number of frames
2 Protect status 233
3 Camera name
4 Retouch indicator 341
5 Histogram showing the distribution of tones in the image (□ 226).
6 Image quality 84
7 Image size 87
8 Image area [1] 79
9 File name 273
10 Time of recording 27
11 Folder name 271
12 Date of recording 27
13 Current card slot 31
14 Metering method 115
15 Exposure mode 117
16 Shutter speed 119, 122
17 Aperture 120, 122
18 ISO sensitivity [2] 109
19 Focal length 212, 379
20 GPS data indicator 215
21 Image comment indicator 333
22 Active D-Lighting 174
23 Picture Control 163
24 Color space 274
25 Flash mode 183
26 White balance 145
Color temperature 152
White balance fine-tuning 148
Preset manual 154
27 Flash compensation 188
Commander mode 303
28 Exposure compensation 130

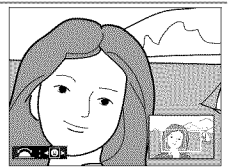
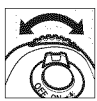
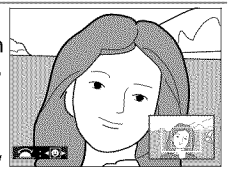
1 Non-FX formats (including DX-based movie format) displayed in yellow (□ 67, 79).
2 Displayed in red if photo was taken with auto ISO sensitivity control on.

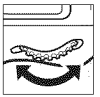
Taking a Closer Look: Playback Zoom

Press the 🔍 button to zoom in on the image displayed in full-frame playback or on the image currently highlighted in thumbnail playback. The following operations can be performed while zoom is in effect:



🔍 button

To	Use	Description
Zoom in or out	🔍 / 🔍	Press 🔍 to zoom in to maximum of approximately 46× (large images in 36 × 24/3 : 2 format), 34× (medium images) or 22× (small images). Press 🔍 to zoom out. While photo is zoomed in, use multi selector to view areas of image not visible in monitor. Keep multi selector pressed to scroll rapidly to other areas of frame. Navigation window is displayed when zoom ratio is altered; area currently visible in monitor is indicated by yellow border. 
View other areas of image		
Select faces		Faces (up to 35) detected during zoom are indicated by white borders in navigation window. Rotate sub-command dial to view other faces. 

To	Use	Description
View other images		Rotate main command dial to view same location in other images at current zoom ratio. Playback zoom is cancelled when a movie is displayed.
Change protect status	O-n (🖼/?)	See page 233 for more information.
Return to shooting mode	 / ▶	Press the shutter-release button halfway or press the ▶ button to exit to shooting mode.
Display menus	MENU	See page 259 for more information.

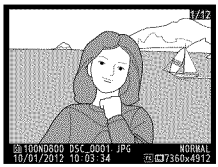
Protecting Photographs from Deletion

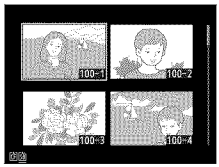
In full-frame, zoom, and thumbnail playback, the O-n (🖼/?) button can be used to protect photographs from accidental deletion. Protected files can not be deleted using the 🗑 (FORMAT) button or the **Delete** option in the playback menu. Note that protected images *will* be deleted when the memory card is formatted (📖 32, 326).

To protect a photograph:

1 Select an image.

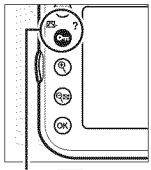
Display the image in full-frame playback or playback zoom or highlight it in the thumbnail list.



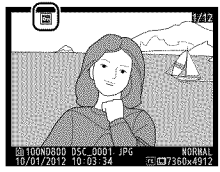


2 Press the O-n (🖼/?) button.

The photograph will be marked with a O-n icon. To remove protection from the photograph so that it can be deleted, display the photograph or highlight it in the thumbnail list and then press the O-n (🖼/?) button.



O-n (🖼/?) button



Removing Protection from All Images

To remove protection from all images in the folder or folders currently selected in the **Playback folder** menu, press the O-n (🖼/?) and 🗑 (FORMAT) buttons together for about two seconds during playback.

Deleting Photographs

To delete the photograph displayed in full-frame playback or highlighted in the thumbnail list, press the 🗑 (FORMAT) button. To delete multiple selected photographs or all photographs in the current playback folder, use the **Delete** option in the playback menu. Once deleted, photographs can not be recovered. Note that pictures that are protected or hidden can not be deleted.

Full-Frame and Thumbnail Playback

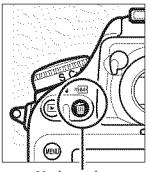
Press the 🗑 (FORMAT) button to delete the current photograph.

1 Select an image.

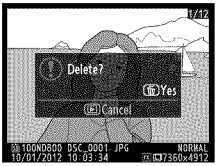
Display the image or highlight it in the thumbnail list.

2 Press the 🗑 (FORMAT) button.

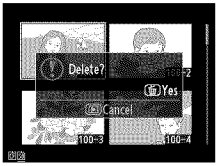
A confirmation dialog will be displayed.



🗑 (FORMAT) button



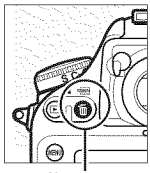
Full-frame playback



Thumbnail playback

3 Press the 🗑 (FORMAT) button again.

To delete the photograph, press the 🗑 (FORMAT) button. To exit without deleting the photograph, press the ▶ button.



🗑 (FORMAT) button

See Also

The **After delete** option in the playback menu determines whether the next image or the previous image is displayed after an image is deleted (📖 266).

The Playback Menu

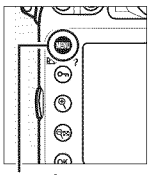
The **Delete** option in the playback menu contains the following options. Note that depending on the number of images, some time may be required for deletion.

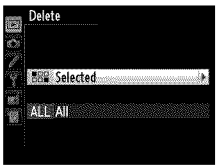
Option	Description
Selected	Delete selected pictures.
ALL **All**	Delete all pictures in the folder currently selected for playback (📖 260). If two cards are inserted, you can select the card from which pictures will be deleted.

Selected: Deleting Selected Photographs

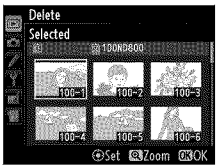
1 **Choose Selected for the Delete option in the playback menu.**

Press the MENU button and select **Delete** in the playback menu. Highlight **Selected** and press ▶.

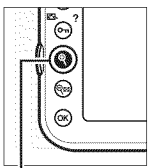




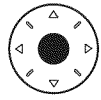
2 **Highlight a picture.**

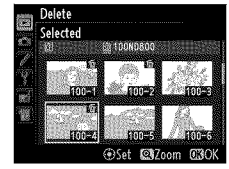


Use the multi selector to highlight a picture (to view the highlighted picture full screen, press and hold the 🔍 button; to view images in other locations, press 🔍 and select the desired card and folder as described on page 221).



3 Select the highlighted picture.

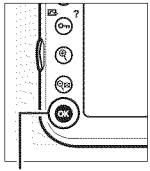




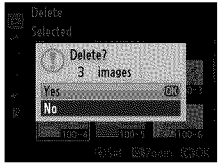
Press the center of the multi selector to select the highlighted picture. Selected pictures are marked by a 🗑 icon. Repeat steps 2 and 3 to select additional pictures; to deselect a picture, highlight it and press the center of the multi selector.

4 Press OK to complete the operation.

A confirmation dialog will be displayed; highlight **Yes** and press OK.



OK button



Connections

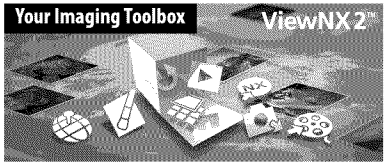
Connecting to a Computer

This section describes how to use the supplied UC-E14 USB cable to connect the camera to a computer.

Before Connecting the Camera

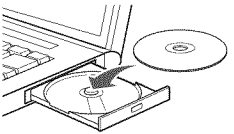
Before connecting the camera, install the software on the supplied ViewNX 2 installer CD. To ensure that data transfer is not interrupted, be sure the camera EN-EL15 battery is fully charged. If in doubt, charge the battery before use or use an EH-5b AC adapter and EP-5B power connector (available separately).

■ *Supplied Software*



ViewNX 2 includes a "Nikon Transfer 2" function for copying pictures from the camera to the computer, where ViewNX 2 can be used to view and print selected images or to edit photographs and movies. Before installing ViewNX 2, confirm that your computer meets the system requirements on page 242.

1 Start the computer and insert the ViewNX 2 installer CD.



Windows

Mac OS

Double-click icon on desktop

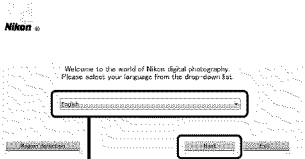
Welcome

Double-click **Welcome** icon

2 Select a language.

If the desired language is not available, click **Region Selection** to choose a different region and then choose the desired language (region selection is not available in the European release).

① Select region (if required)



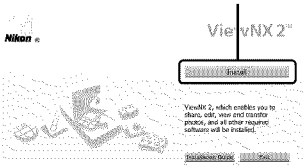
② Select language

③ Click **Next**

3 Start the installer.

Click **Install** and follow the on-screen instructions.

Click Install

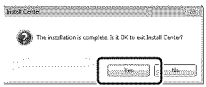


> **Installation Guide**
> For help installing ViewNX 2, click Installation Guide in Step 3.

4 Exit the installer.

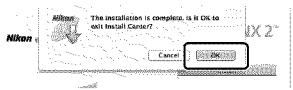
Click **Yes** (Windows) or **OK** (Mac OS) when installation is complete.

Windows



Click **Yes**

Mac OS



Click **OK**

The following software is installed:

- ViewNX 2
- Apple QuickTime (Windows only)

5 Remove the installer CD from the CD-ROM drive.

Connecting Cables

Be sure the camera is off when connecting or disconnecting interface cables. Do not use force or attempt to insert the connectors at an angle. Close the connector cover when the connector is not in use.

Windows

To visit the Nikon website after installing ViewNX 2, select **All Programs** > **Link to Nikon** from the Windows start menu (Internet connection required).

System Requirements

Windows	
CPU	• **Photos/JPEG movies**: Intel Celeron, Pentium 4, or Core series, 1.6 GHz or better • **H.264 movies (playback)**: 3.0 GHz or better Pentium D; Intel Core i5 or better recommended when viewing movies with a frame size of 1,280 × 720 or more at a frame rate of 30 fps or above or movies with a frame size of 1,920 × 1,080 or more • **H.264 movies (editing)**: 2.6 GHz or better Core 2 Duo
OS	Pre-installed versions of Windows 7 Home Basic/Home Premium/ Professional/Enterprise/Ultimate (Service Pack 1), Windows Vista Home Basic/Home Premium/Business/Enterprise/Ultimate (Service Pack 2), or 32-bit editions of Windows XP Home Edition/ Professional (Service Pack 3). All installed programs run as 32-bit applications in 64-bit editions of Windows 7 and Windows Vista.
RAM	• **Windows 7/Windows Vista**: 1 GB or more (2 GB or more recommended) • **Windows XP**: 512 MB or more (2 GB or more recommended)
Hard-disk space	A minimum of 500 MB available on the startup disk (1 GB or more recommended)
Monitor	• **Resolution**: 1024 × 768 pixels (XGA) or more (1280 × 1024 pixels (SXGA) or more recommended) • **Color**: 24-bit color (True Color) or more

Mac OS	
CPU	• **Photos/JPEG movies**: PowerPC G4 (1 GHz or better), G5, Intel Core, or Xeon series • **H.264 movies (playback)**: PowerPC G5 Dual or Core Duo, 2 GHz or better; Intel Core i5 or better recommended when viewing movies with a frame size of 1,280 × 720 or more at a frame rate of 30 fps or above or movies with a frame size of 1,920 × 1,080 or more • **H.264 movies (editing)**: 2.6 GHz or better Core 2 Duo • GPU that supports QuickTime H.264 hardware acceleration recommended
OS	Mac OS X version 10.5.8, 10.6.8, or 10.7.2
RAM	512 MB or more (2 GB or more recommended)
Hard-disk space	A minimum of 500 MB available on the startup disk (1 GB or more recommended)
Monitor	• **Resolution**: 1024 × 768 pixels (XGA) or more (1280 × 1024 pixels (SXGA) or more recommended) • **Color**: 24-bit color (millions of colors) or more

Direct USB Connection

Connect the camera using the supplied UC-E14 USB cable.

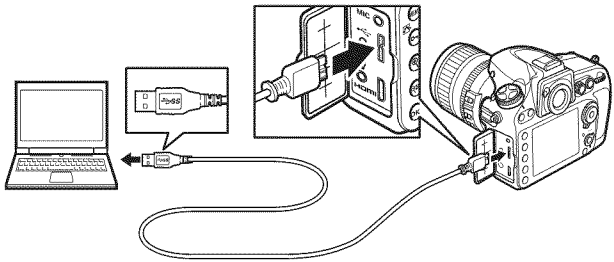
1 Turn the camera off.

2 Turn the computer on.

Turn the computer on and wait for it to start up.

3 Connect the USB cable.

Connect the USB cable as shown.

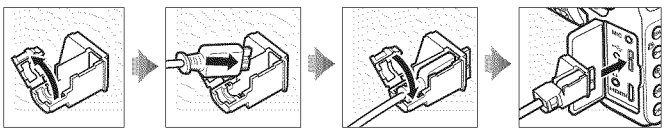


USB Hubs

Connect the camera directly to the computer; do not connect the cable via a USB hub or keyboard.

The USB Cable Clip

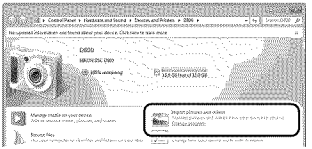
To prevent cable from being disconnected, attach the clip as shown.



4 Turn the camera on.

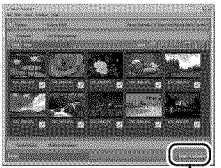
5 Start Nikon Transfer 2.

If a message is displayed prompting you to choose a program, select Nikon Transfer 2.

> **Windows 7**
> If the following dialog is displayed, select Nikon Transfer 2 as described below.
>
> 1 Under **Import pictures and videos**, click **Change program**. A program selection dialog will be displayed; select **Import file using Nikon Transfer 2** and click **OK**.
>
> 
>
> 2 Double-click **Import file**.

6 Click Start Transfer.

At default settings, all the pictures on the memory card will be copied to the computer (for more information on using Nikon Transfer 2, start ViewNX 2 or Nikon Transfer 2 and select **ViewNX 2 Help** from the **Help** menu).



Start Transfer

7 Turn the camera off and disconnect the USB cable when transfer ends.

Nikon Transfer 2 will close automatically when transfer is complete.

> **During Transfer**
> Do not turn the camera off or disconnect the USB cable while transfer is in progress.

Ethernet and Wireless Networks

If the optional WT-4 wireless transmitter (📖 387) is attached, photographs can be transferred or printed over wireless or Ethernet networks and the camera can also be controlled from network computers running Camera Control Pro 2 (available separately). The WT-4 can be used in any of the following modes:

Mode	Function
Transfer mode	Upload new or existing photographs to computer or ftp server.
Thumbnail select mode	Preview photographs on computer monitor before upload.
PC mode	Control camera from computer using Camera Control Pro 2 (available separately).
Print mode	Print JPEG photographs on printer connected to network computer.

For more information, see the WT-4 user's manual. Be sure to update to the latest versions of the wireless transmitter firmware and supplied software.

Transfer Mode

When **Wireless transmitter** > **Mode** > **Transfer mode** is selected in the camera setup menu, the ⊛ button is used during playback to select pictures for upload, preventing it from being used to select pictures for other operations, such as side-by-side comparison (📖 364). To restore normal operation, select another option for **Wireless transmitter** > **Mode**.

Recording and Viewing Movies During Transfer

Movies can not be recorded or played back in image transfer mode when a WT-4 is connected to the camera ("image transfer mode" applies when images are being transferred and when images remain to be sent).

Movies

The WT-4 can be used to upload movies in transfer mode if **Auto send** or **Send folder** is not selected for **Transfer settings**. Movies can not be uploaded in thumbnail select mode.

Thumbnail Select Mode

Camera settings can not be changed from the computer in thumbnail select mode.

Camera Control Pro 2

Camera Control Pro 2 software (available separately; 📖 389) can be used to control the camera from a computer. When Camera Control Pro 2 is used to capture photographs directly to the computer, the PC connection indicator (PC) will appear in the control panel.

Printing Photographs

Selected JPEG images can be printed on a PictBridge printer (📖 433) connected directly to the camera.

Selecting Photographs for Printing

Images created at image quality settings of NEF (RAW) or TIFF (RGB) (📖 84) can not be selected for printing. JPEG copies of NEF (RAW) images can be created using the **NEF (RAW) processing** option in the retouch menu (📖 353).

Printing Via Direct USB Connection

Be sure the battery is fully charged or use an optional EH-5b AC adapter and EP-5B power connector. When taking photographs to be printed via direct USB connection, set **Color space** to **sRGB** (📖 274).

See Also

See page 422 for information on what to do if an error occurs during printing.

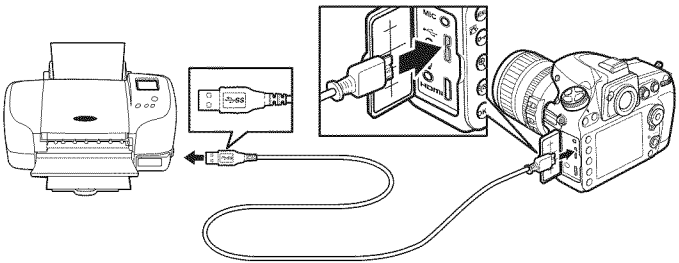
Connecting the Printer

Connect the camera using the supplied UC-E14 USB cable.

1 Turn the camera off.

2 Connect the USB cable.

Turn the printer on and connect the USB cable as shown. Do not use force or attempt to insert the connectors at an angle.

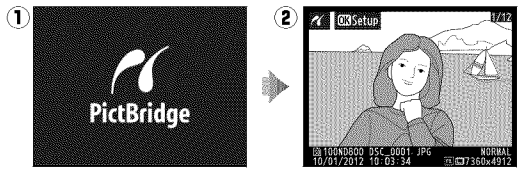


USB Hubs

Connect the camera directly to the printer; do not connect the cable via a USB hub.

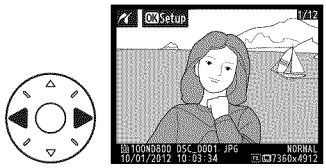
3 Turn the camera on.

A welcome screen will be displayed in the monitor, followed by a PictBridge playback display.



Printing Pictures One at a Time

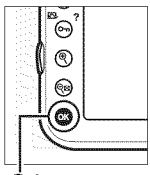
1 Select a picture.



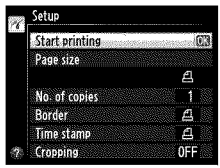
Press ◀ or ▶ to view additional pictures. Press ▲ or ▼ to view photo information (🕮 222), or press the 🔍 button to zoom in on the current frame (🕮 231, press ▶ to exit zoom). To view six pictures at a time, press the center of the multi selector. Use the multi selector to highlight pictures, or press the center of the multi selector again to display the highlighted picture full frame. To view images in other locations, press 🔍 when thumbnails are displayed and select the desired card and folder as described on page 221.

2 Display printing options.

Press ⓚ to display PictBridge printing options.



ⓚ button



3 Adjust printing options.

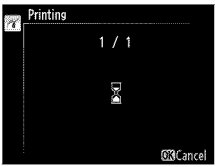
Press ▲ or ▼ to highlight an option and press ▶ to select.

Option	Description
Page size	Highlight a page size (only sizes supported by the current printer are listed) and press ⓚ to select and exit to the previous menu (to print at the default page size for the current printer, select **Printer default**).
No. of copies	Press ▲ or ▼ to choose number of copies (maximum 99), then press ⓚ to select and return to the previous menu.

Option	Description
Border	This option is available only if supported by the printer. Highlight **Printer default** (use current printer settings), **Print with border** (print photo with white border), or **No border** and press ⓞ to select and exit to the previous menu.
Time stamp	Highlight **Printer default** (use current printer settings), **Print time stamp** (print times and dates of recording on photos), or **No time stamp** and press ⓞ to select and exit to the previous menu.
Cropping	This option is available only if supported by the printer. To exit without cropping, highlight **No cropping** and press ⓞ. To crop the current picture, highlight **Crop** and press ▶. Selecting **Crop** displays the dialog shown at right. Press 🔍 to increase the size of the crop, 🔍 to decrease. Position the crop using the multi selector and press ⓞ. Note that print quality may drop if small crops are printed at large sizes. 

4 Start printing.

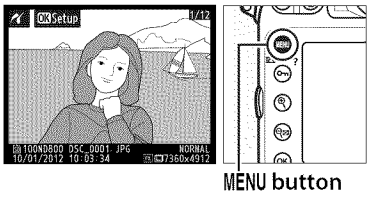
Select **Start printing** and press ⓞ to start printing. To cancel before all copies have been printed, press ⓞ.



Printing Multiple Pictures

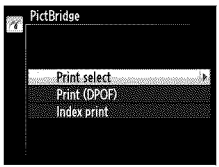
1 Display the PictBridge menu.

Press the MENU button in the PictBridge playback display (see Step 3 on page 248).



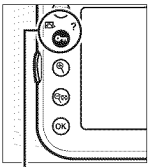
2 Choose an option.

Highlight one of the following options and press ▶.



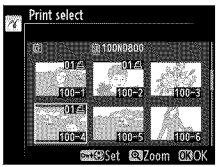
- **Print select**: Select pictures for printing.
- **Print (DPOF)**: Print an existing print order created with the **DPOF print order** option in the playback menu (📖 254). The current print order will be displayed in Step 3.
- **Index print**: To create an index print of all JPEG pictures on the memory card, proceed to Step 4. Note that if the memory card contains more than 256 pictures, only the first 256 images will be printed.

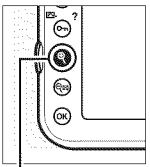
3 Select pictures.



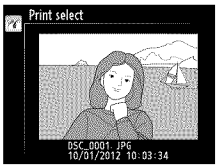
(/?) button

Use the multi selector to scroll through the pictures on the memory card (to view images in other locations, press and select the desired card and folder as described on page 221). To display the current picture full screen, press and hold the button. To select the current picture for printing, press the (/?) button and press ▲. The picture will be marked with a icon and the number of prints will be set to 1.



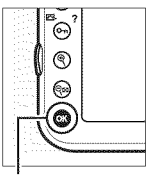


button

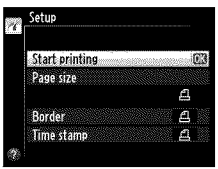


Keeping the (/?) button pressed, press ▲ or ▼ to specify the number of prints (up to 99; to deselect the picture, press ▼ when the number of prints is 1). Continue until all the desired pictures have been selected.

4 Display printing options.



button



Press to display PictBridge printing options.

5 Adjust printing options.

Choose page size, border, and time stamp options as described on page 249 (a warning will be displayed if the selected page size is too small for an index print).

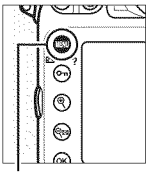
6 Start printing.

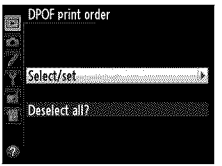
Select **Start printing** and press ⓞⓚ to start printing. To cancel before all copies have been printed, press ⓞⓚ.

Creating a DPOF Print Order: Print Set

The **DPOF print order** option in the playback menu is used to create digital "print orders" for PictBridge-compatible printers and devices that support DPOF (📖 433).

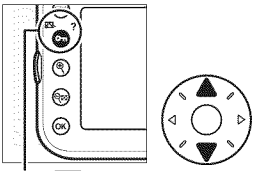
1 Choose Select/set for the DPOF print order item in the playback menu.

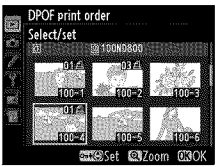




Press the MENU button and select **DPOF print order** in the playback menu. Highlight **Select/set** and press ▶ (to remove all photographs from the print order, select **Deselect all?**).

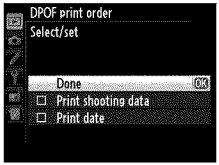
2 Select pictures.





Use the multi selector to scroll through the pictures on the memory card (to view images in other locations, press and select the desired card and folder as described on page 221). To display the current picture in full screen, press and hold the button. To select the current picture for printing, press the (/?) button and press ▲. The picture will be marked with a icon and the number of prints will be set to 1. Keeping the (/?) button pressed, press ▲ or ▼ to specify the number of prints (up to 99; to deselect the picture, press ▼ when the number of prints is 1). Press when all the desired pictures have been selected.

3 Select imprint options.

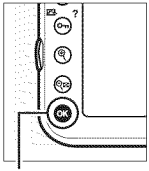


Highlight the following options and press ▶ to toggle the highlighted option on or off (to complete the print order without including this information, proceed to Step 4).

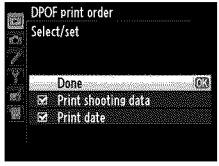
- **Print shooting data**: Print shutter speed and aperture on all pictures in print order.
- **Print date**: Print date of recording on all pictures in print order.

4 Complete the print order.

Highlight **Done** and press ⓞ to complete the print order.



ⓞ button



Print Set

To print the current print order when the camera is connected to a PictBridge printer, select **Print (DPOF)** in the PictBridge menu and follow the steps in "Printing Multiple Pictures" to modify and print the current order (📖 251). DPOF date and shooting data imprint options are not supported when printing via direct USB connection; to print the date of recording on photographs in the current print order, use the PictBridge **Time stamp** option.

The Print Set option can not be used if there is not enough space on the memory card to store the print order.

Images created at image quality settings of NEF (RAW; 📖 84) can not be selected for printing using this option.

Print orders may not print correctly if images are deleted using a computer or other device after the print order is created.

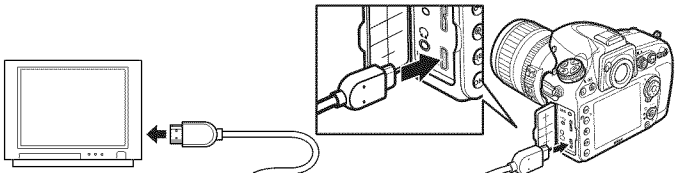
Viewing Photographs on TV

A type C mini-pin **H**igh-**D**efinition **M**ultimedia **I**nterface (HDMI) cable (available separately from commercial sources) can be used to connect the camera to high-definition video devices.

1 Turn the camera off.

Always turn the camera off before connecting or disconnecting an HDMI cable.

2 Connect the HDMI cable as shown.



Connect to high-definition device (choose cable with connector for HDMI device)

Connect to camera

3 Tune the device to the HDMI channel.

4 Turn the camera on and press ▶ button.

During playback, images will be displayed both in the camera monitor and on the high-definition television or monitor screen.

Close the Connector Cover

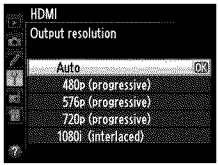
Close the connector cover when the connectors are not in use. Foreign matter in the connectors can interfere with data transfer.

HDMI Options

The **HDMI** option in the setup menu (📖 325) controls output resolution and other advanced HDMI options.

■■ *Output Resolution*

Choose the format for images output to the HDMI device. If **Auto** is selected, the camera will automatically select the appropriate format. Regardless of the option selected, **Auto** will be used for movie live view, movie recording, and playback.



■■ *Advanced*

Option	Description
Output range	**Auto** is recommended in most situations. If the camera is unable to determine the correct RGB video signal output range for the HDMI device, you can choose from the following options: • **Limited range**: For devices with an RGB video signal input range of 16 to 235. Choose this option if you notice loss of detail in shadows. • **Full range**: For devices with an RGB video signal input range of 0 to 255. Choose this option if shadows are "washed out" or too bright.
Output display size	Choose horizontal and vertical frame coverage for HDMI output from 95% or 100%.
Live view on-screen display	If **Off** is selected when the camera is connected to an HDMI device, shooting information will not be displayed in the monitor during live view photography.

Television Playback

Use of an EH-5b AC adapter and EP-5B power connector (available separately) is recommended for extended playback. Note that the edges may not be visible when photographs are viewed on a television screen.

Slide Shows

The **Slide show** option in the playback menu can be used for automated playback (📖 267).

Audio

Stereo sound recorded with optional ME-1 (📖 65, 389) stereo microphones plays in stereo when movies are viewed on HDMI devices using a camera connected via an HDMI cable (note that audio will not be played back over headphones connected to the camera). Volume can be adjusted using television controls; the camera controls can not be used.

HDMI and Live View

When the camera is connected via an HDMI cable, HDMI displays can be used for live view photography and movie live view (📖 57, 67). During movie live view and movie recording and playback, HDMI output will be adjusted according to the option selected for **Movie settings** > **Frame size/frame rate** in the shooting menu (📖 70). Note that some HDMI devices may not support the selected setting; in this case, select **1080i (interlaced)** for **HDMI** > **Output resolution** (📖 257).

Nikon

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