

E3X User Manual

Picture Perfect Measurements™



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D1X Manual Information

D1X User Manual

Most of the D1X information provided in this manual has been reproduced from the Nikon DIGITAL CAMERA D1X User's Manual supplied with your system. For the sake of clarity, items not relating to the direct use of the D1X as a photogrammetric system have been omitted. For more information on the D1X and its use, please refer to the D1X User Manual supplied with your system.



Caring for the Camera and Battery

Do Not Drop

The camera and lens may malfunction if subjected to strong shocks or vibration.

Keep Dry

This product is not waterproof, and may malfunction if immersed in water or exposed to high levels of humidity. Rusting of the internal mechanism can cause irreparable damage.

Avoid Sudden Changes in Temperature

Sudden changes in temperature, such as occur when entering or leaving a heated building on a cold day, can cause condensation inside the device. To prevent condensation, place the device in its carrying case or a plastic bag before exposing it to sudden changes in temperature.

Keep Away from Strong Magnetic Fields

Do not use or store this device near equipment that produces strong electromagnetic radiation or magnetic fields. Strong static charges or the magnetic fields produced by equipment such as radio transmitters could interfere with the color LCD monitor, damage data stored on the flash memory card, or affect the product's internal circuitry.

Do Not Touch Shutter Curtain

The shutter curtain is made of extremely thin material and is easily damaged. Under no circumstances should you exert pressure on the curtain, poke it with cleaning tools or other implements, or subject it to strong air currents from a blower. Any of these actions could scratch, deform, or tear the curtain.

Cleaning

When cleaning the camera body, use a blower to remove dust and lint, then wipe gently with a soft, dry cloth. After using your camera at the beach or seaside, wipe off any sand or salt using a cloth lightly dampened with pure water and then dry your camera thoroughly. In rare instances, static electricity produced by a brush or cloth may cause the LCD displays to light up or darken. This does not indicate a malfunction, and the display will shortly return to normal.

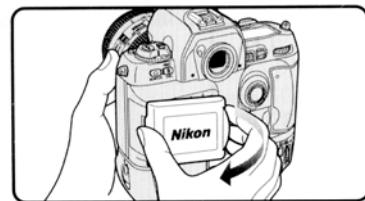
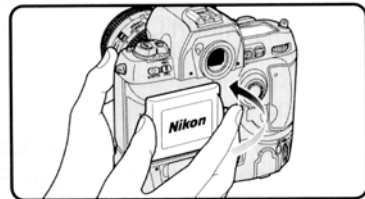
When cleaning the lens and mirror, remember that these elements are easily damaged. Dust and lint should be gently removed with a blower. When using an aerosol blower, keep the can vertical (tilting the can could result in liquid being sprayed on the mirror). If you do get a fingerprint or other stain on the lens, apply a small amount of lens cleaner to a soft cloth and wipe the lens carefully.

Storage

To prevent mold or mildew, store the equipment in a dry, well-ventilated area. Do not store it with naphtha or camphor mothballs, close to equipment that produces strong magnetic fields, or in areas subject to high temperatures, for example near a kerosene heater or in a car on a hot day. When leaving the product unattended for a long period of time, remove the battery to prevent leakage and store the camera in a plastic bag containing desiccant. Do not however store the camera case in a plastic bag, as this may cause the material to deteriorate. Note also that desiccant loses its ability to absorb moisture after a period of time, and should be replaced at regular intervals. To prevent mold or mildew, take the camera out at least once a month to turn it on and release the shutter a few times. Store the battery in a cool, dry place.

Color LCD Monitor

- The monitor may contain a few pixels that are always lit or that do not light. This is a characteristic common to all TFT LCD monitors and does not indicate a malfunction. Images recorded with the camera will not be affected.
- Images in the monitor may be difficult to see in a bright light.
- The monitor is lit by a fluorescent backlight. Should the monitor begin to dim or flicker, contact your Nikon service representative.
- Do not apply pressure to the LCD monitor, as this could cause damage or malfunction.
- Dust or lint adhering to the monitor can be removed with a blower brush. Stains can be removed by rubbing the surface lightly with a soft cloth or chamois leather.
- Should the monitor break, care should be taken to avoid injury due to broken glass and to prevent the liquid crystal from the monitor touching the skin or entering the eyes or mouth.
- Replace the monitor cover when transporting the camera or leaving it unattended



Turn Camera off Before Removing Battery or Unplugging AC Adapter

Do not unplug the product or remove the battery while the camera is on, or while images are being recorded or deleted from memory. Forcibly cutting power to the product in these circumstances could result in loss of data or in damage to internal circuitry or memory. To prevent an accidental interruption of power, avoid carrying the product with you while the AC adapter is connected.

Observe Proper Precautions When Handling Batteries

- Batteries may leak or explode if improperly handled. Observe the following precautions when handling batteries for use in this product:
- Be sure the product is off before inserting or removing the battery. If you are using the AC adapter, be sure it is unplugged.
- Foreign matter on the battery terminals – for example, sweat or oil – may prevent a contact from being formed. Before installing the battery, clean it thoroughly with a soft, dry cloth.
- When the product is used continuously on battery power for an extended period, the battery may become hot. Due caution should be observed when removing the battery.
- Use only batteries approved for use in this equipment.
- Do not expose the battery to flame or to excessive heat or moisture.
- Do not short-circuit or disassemble the battery.

Spare Batteries

- Keep a spare battery fully charged when taking photographs on important occasions. Depending on your location, you may find it difficult to purchase replacement batteries on short notice.
- On cold days, the capacity of the battery tends to decrease. Be sure the battery is fully charged before taking photographs outside in cold weather. Keep a spare battery in a warm place and exchange the two as necessary. Once warmed, a cold battery may recover some of its charge.

Specifications

Camera

- Size (mm): 157(W) x 153(H) x 85(D) (not including lens and strobe) (6.2 x 6.1 x 3.4 in.)
- Weight: less than 2.5 pounds (not including battery, lens and strobe)
- Power Source: EN-4 Ni MH Battery Pack, 7.2V DC. EH-4AC adapter, 100-240 V AC
- Sensor: 23.7 x 15.6mm, 12-bit RGB CCD with 5.47M pixels, effective pixel count 5.33M pixels (4,024 x 1,324)
- Media: Compact Flash Card (Type I/II)

Temperature Range

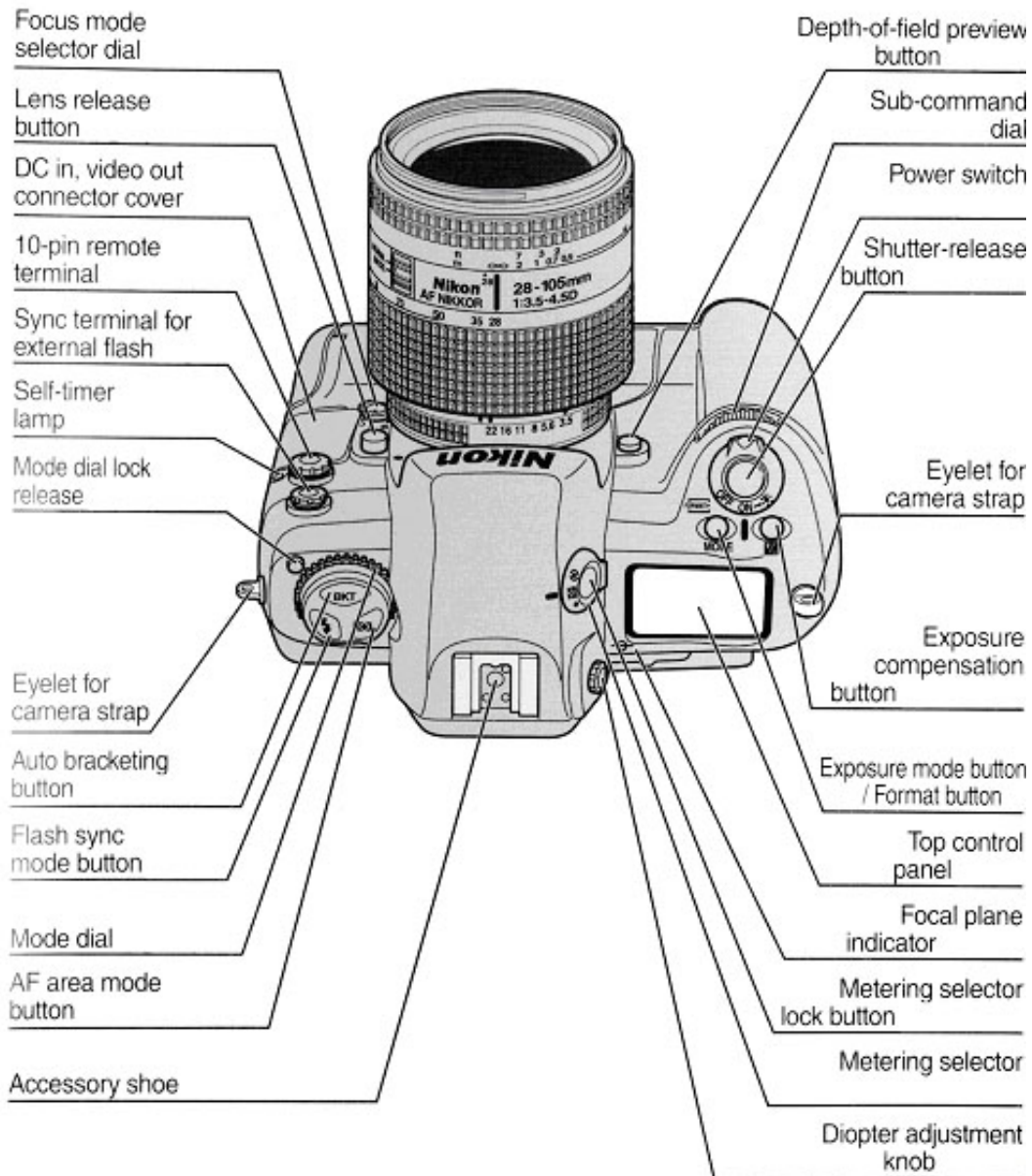
Temperature Range: 0-35° Celsius. **Exceeding this temperature range may damage the camera.**

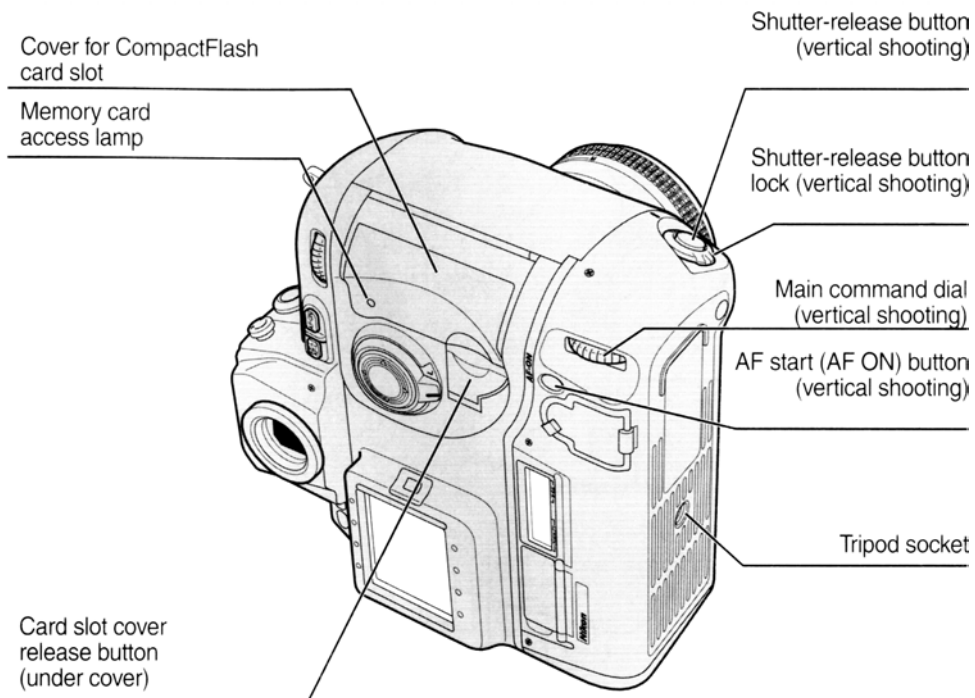
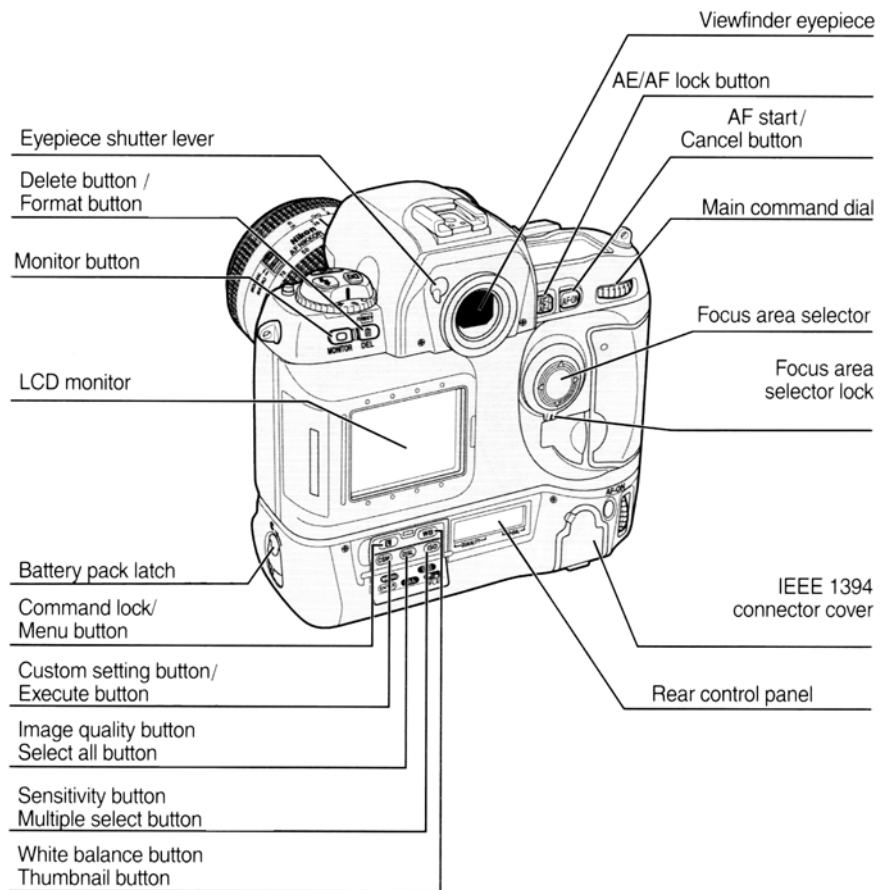
NOTE: Due to ongoing product improvements, specifications are subject to change.

Getting to Know the D1X

D1X

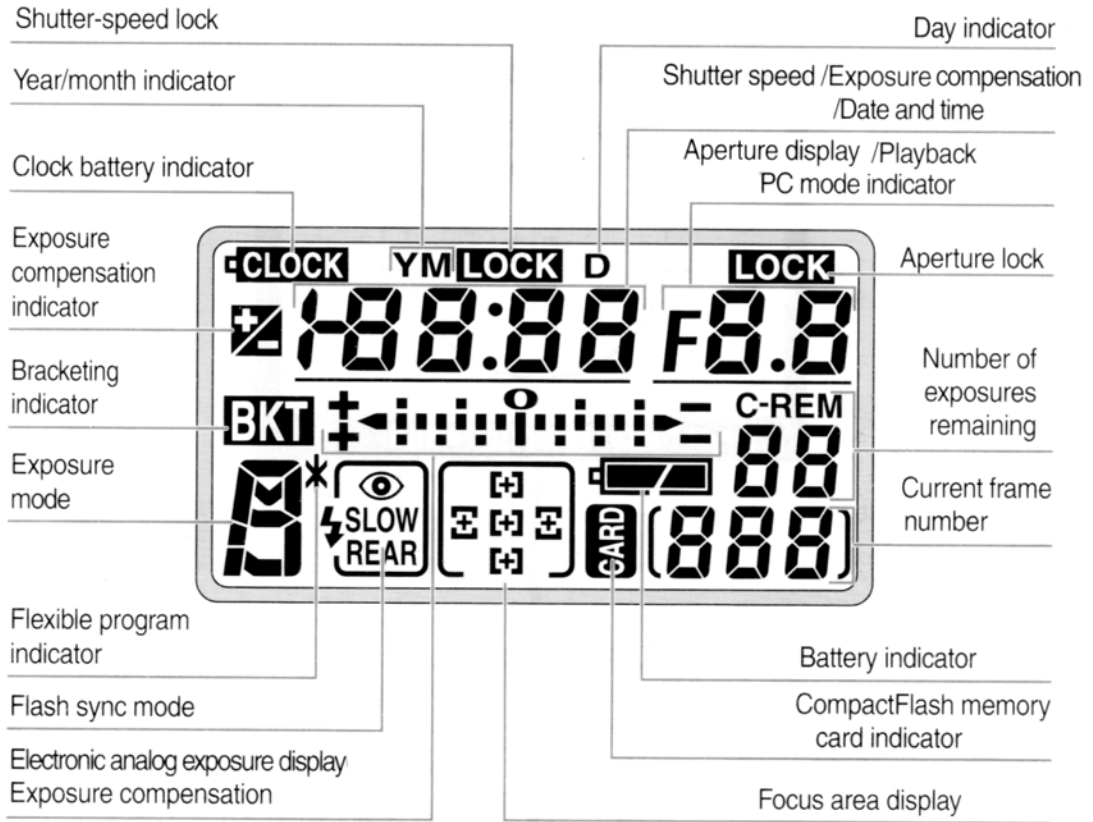
Parts of the D1x



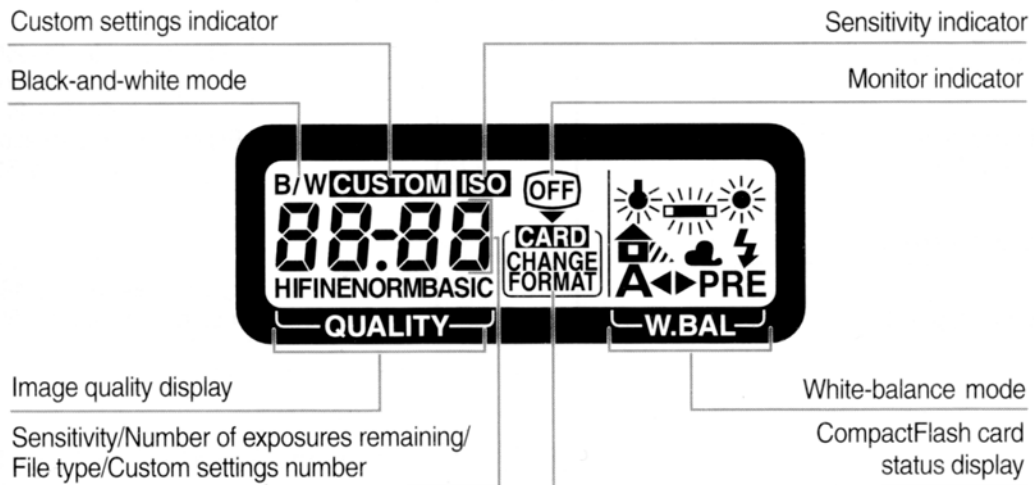


Instrument Panels

Top Control Panel



Rear Control Panel



Handling

Handling the D1X

The D1X camera is a precise measuring instrument. You should store it in its carrying case and keep it in a clean and dry environment when not in use. Hold the camera with both hands when possible, and always use the hand strap when holding the camera.

Lens Handling

The D1X camera uses a standard 17mm lens. The lens is fixed focus so there is no need to ever adjust the focus. The lens f-number can be adjusted, but it is strongly recommended that you leave the lens at the default setting of f11. This will give you the best results, and will make exposure easier.

Checking and Cleaning the Lens

The camera lens must be kept clean to achieve the optimal system accuracy. Follow the guidelines below to ensure the lens is clean.

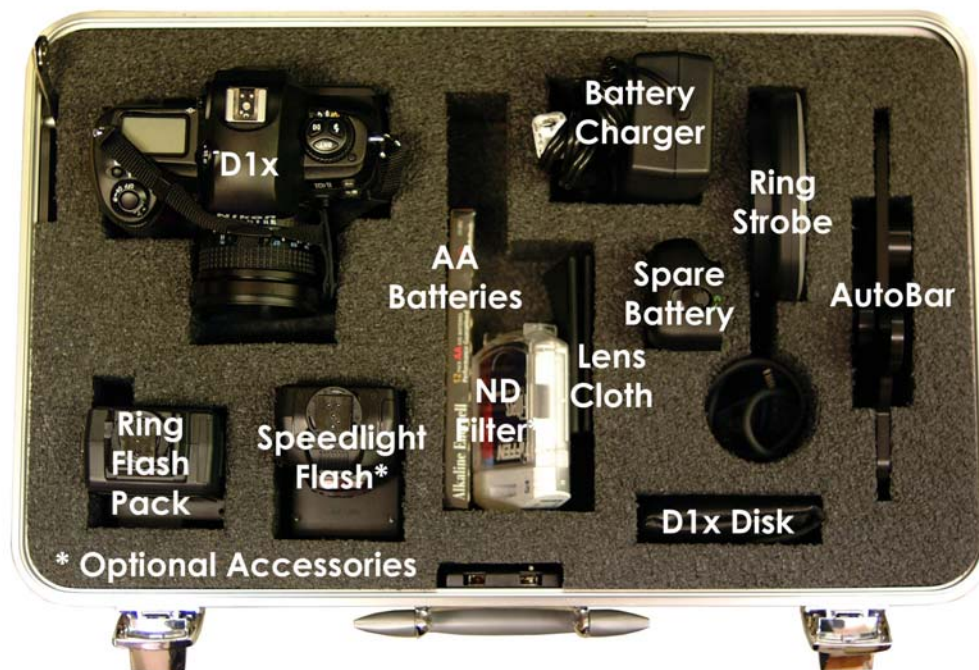
1. Keep the lens cap on the lens when the camera is not in use. Always place the lens cap in the camera case so you do not lose it.
2. Avoid touching the glass parts of the lens.
3. Visually, check the lens for dirt, dust, smudges, etc. before use.
4. If necessary, clean the lens. First, use a clean, dry air source (such as an air gun) to blow any particles off the lens. If this does not work, use a clean, dry lens cloth (several are provided with the system) to gently clean the lens. The surface of the lens is optically coated. **Do NOT** use tissues or napkins to clean the lens as they may damage the coating. **Do NOT** use alcohol or other solvents as this will also damage the coating. Rub the lens gently using circular motions until the lens is clean. You should not clean the lens unless it is necessary. Excessive cleaning can eventually damage a lens.
5. If the lens will not clean up, you can use the lens, but accuracy may suffer depending on the extent of the damage. A damaged lens should be replaced as soon as possible.

D1X Operation

Packing and Unpacking

The D1X camera case is used to store the camera and its accessories.

A typical case is shown in the diagram below. Your case may appear slightly different depending on the system configuration and accessories purchased.



Turning off and Packing the D1X Camera

When you are done using the camera, turn off the camera power using the power switch.

Once again, make sure the Card Busy light on the top of the camera is out before you turn off camera power (or remove the disk) or else you will lose data and possibly corrupt the disk.

To pack the system, reverse the strobe and camera setup procedures. [See Hand-held Strobe Setup](#), and [Camera Setup](#) for these instructions.

When removing the strobe connector from the power pack be sure to press and pull up on the connector release button.

Setting Up the Camera

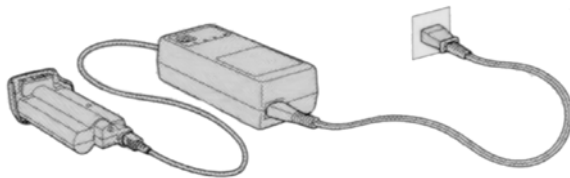
Battery

Insert the battery

Insert the battery and check the battery indicator.

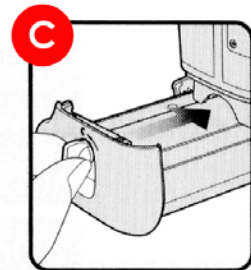
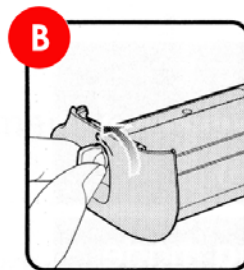
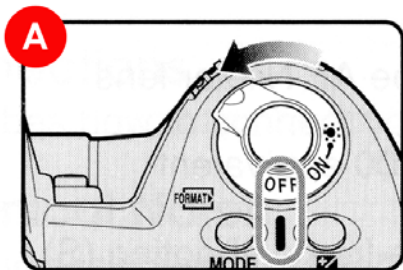
Charge the battery

The D1X uses rechargeable EN-4 Ni-MH battery packs (available separately). Be sure the battery is fully charged before inserting it in the camera.



Batteries can be charged in about 90 minutes using the MH-16 Quick Charger. See the documentation provided with the MH-16 for details.

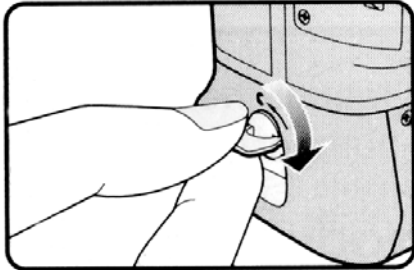
Insert the battery in the camera



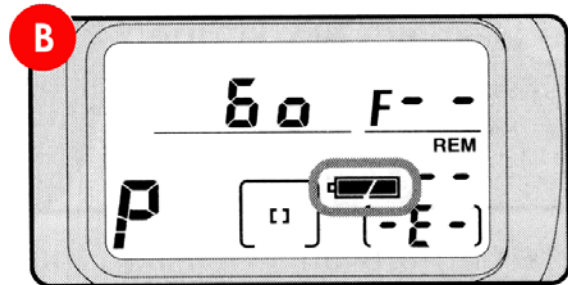
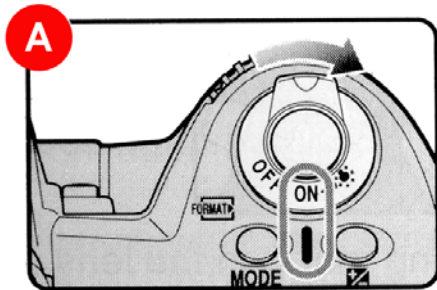
Be sure the camera is off before inserting or removing the battery pack (A). Turn the battery pack latch to the open position (B) and insert the battery in the camera (C).

The EN-4 rechargeable battery pack can also be recharged using the MH-15 Quick Charger for the F100 film camera or the EH-3 Quick Charger for the E3/E3s digital cameras.

Turn the battery pack latch to the locked position



Check the battery indicator



Turn the camera on (A) and confirm the battery level in the control panel on top of the camera (B).

 **Battery fully charged**

 **Low battery**

Ready a fully-charged spare battery. (The display in the viewfinder turns off to save power when no operations are being performed.)

 **Battery exhausted**

No photographs can be taken until the battery has been replaced.


All indicators in the viewfinder and rear control panel, and all indicators in the top control panel other than the exposure mode, battery indicator, and exposure counter, disappear six seconds after the camera is turned on (automatic meter switch-off).

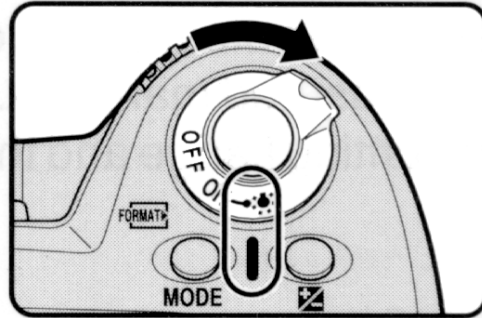
Reactivating the display

Lightly press (half-press) the shutter-release button to reactivate the display in the control panel and viewfinder. Indicators will be displayed for six seconds after you remove your finger from the button. Note that when using the shutter-release button for vertical shooting, you will need to set the shutter-release button lock release for vertical shooting to the unlocked position.

LCD Illuminator

The rear control panel and the control panel on top of the camera are equipped with an illuminator so that you can view camera settings in the dark.

To turn the illuminator on, rotate the power switch to . The illuminator will remain on while the switch is held in this position. After the switch is released, the illuminator will remain on while exposure indicators are displayed, or until the shutter is released.

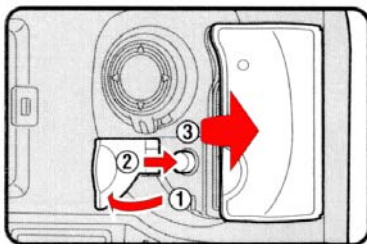


Memory Card

Insert the memory card

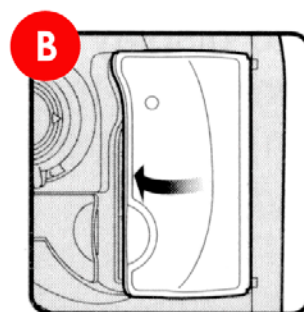
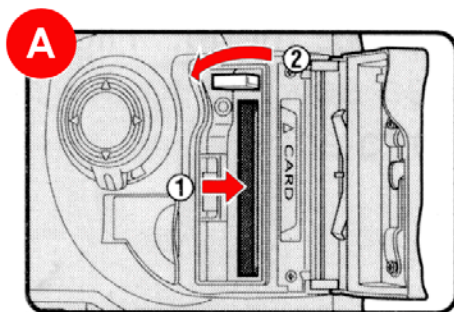
The D1X digital camera uses compact flash-memory cards to record photographs and other information. Before taking photographs, you will need to insert a memory card in the camera's card slot.


Open the card slot



After making sure the camera is off, open the door covering the card-slot cover release button (1) and press the card-slot cover release button (2) to open the card slot (3).

Insert the memory card, fold the eject button over, and close the cover



Insert the memory card in the slot (A), being sure that the card terminals are fully inserted in the connector at the back of the slot. The card should be inserted facing the CARD label next to the card slot.

Important: Do not attempt to insert the card upside down or backwards. Do not use force when inserting the card. Either action could damage your camera.

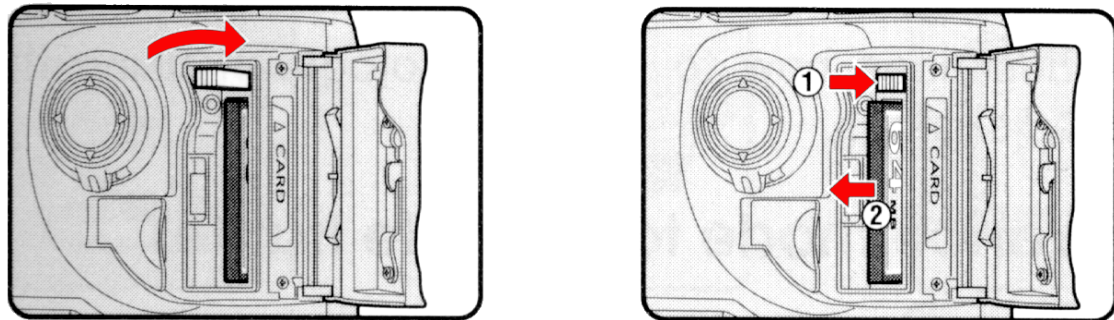
Fold the eject button over and close the cover (B). If the button is not folded over when the cover is closed, closing the door may partially eject the card, causing errors in recording photographs or during playback.

The following Compact Flash memory cards have been tested and approved for use in the D1X:

- Nikon EC-CF Compact Flash memory cards
- SanDisk Corporation SDCFB-4/8/15/30/40/48/64/96 Compact Flash memory cards

Operation is not guaranteed with other cards.

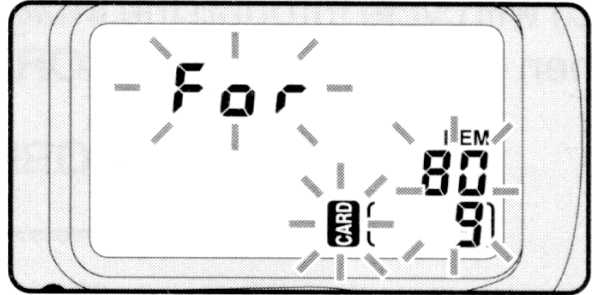
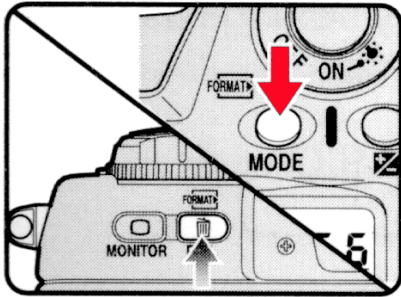
Removing memory cards



When removing memory cards, turn the camera off and open the card-slot cover. After confirming that the access lamp is off, stand the eject button up and press it down to eject the card. Do not attempt to remove the card while the access lamp is on. Doing so could result in loss of data or in damage to the camera or the card.

Important: The compact flash card may become hot while in use. Observe due caution when removing memory cards from the camera.

Formatting memory cards

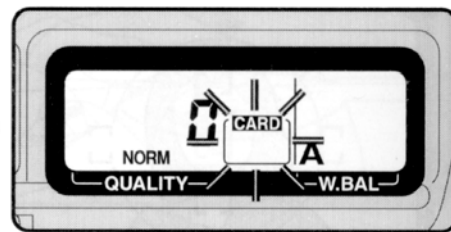
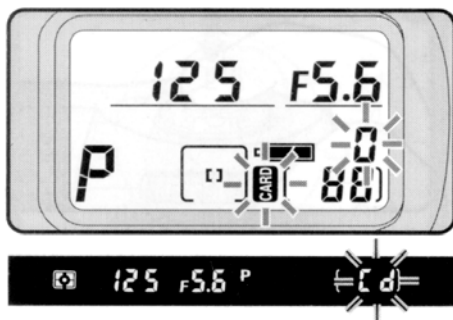


Memory cards must be formatted before they can be used to record photographs. When formatting memory cards, first make sure the camera is on, and then hold the **FORMAT** buttons down simultaneously for two seconds. A blinking **FOR** indicator will appear in the top control panel. To format the memory card, press the two buttons again.

Note: Formatting memory cards permanently erases any data they may contain. Before formatting the card, be sure to make copies of data you would like to keep.

When the card is formatted, the frame-number display in the control panel on top of the camera will show 1, and the number of exposures remaining will appear in both control panels (when a hundred or more exposures remain, the control panels will show **FL**).

When the exposure count reaches 0



When there is not enough memory available on the compact flash-memory card to store further photographs at current settings, the exposure count will show zero and the **cd** (card) indicator in the viewfinder and the **CARD** indicators in the control panels will flash. In this case, you will need to delete photographs (see "Playback") or insert another memory card (see "Insert the Memory Card") before more photographs can be taken.

The frame number shown in the control panel on top of the camera corresponds to the number of photographs in the current folder. When a new folder is created, the current frame number will return to 1. New folders are created when:

- the number of photographs in the current folder reaches the maximum of 999
- a file number of 999 is reached in sequential numbering mode
- you create a new folder using the menu option.

D1X Strobes

Description

A strobe illuminates the retro-reflective targets used with the system. Two strobe systems are currently available. The Hand-held ring strobe is a lightweight, battery operated unit whose intensity is controlled by a dial on the back of the power pack. The unit uses AA batteries that must be replaced when depleted. However, the batteries have enough capacity (over 1000 flashes typically) for single-camera measurements. The strobe's power pack is normally attached and detached from the camera every time the camera is used. The Hand-held strobe is mostly used with the single-camera V-STARS/S system for ranges typically less than 10m (30 feet). For distances exceeding this range the Nikon SB-28DX Speedlight is recommended. This is also a hand-held flash, but it has a greater flash intensity.

Hand-held Strobe Setup

The E3X system normally uses the Hand-held ring strobe. It is used to illuminate the retro-reflective targets used by the system. The strobe is lightweight, portable, and battery powered. It consists of a ring strobe that is attached to the camera, and a power pack that is connected to the ring strobe. A dial on the back of the strobe power pack controls the power level. There are 11 (0-10) power levels ranging from 1/32nd to full with increments of 1/2 F-Stop.



To setup the Hand-held strobe, do the following:

If the ring mount is not attached to the lens, attach it.

1. To attach the ring strobe, do the following:

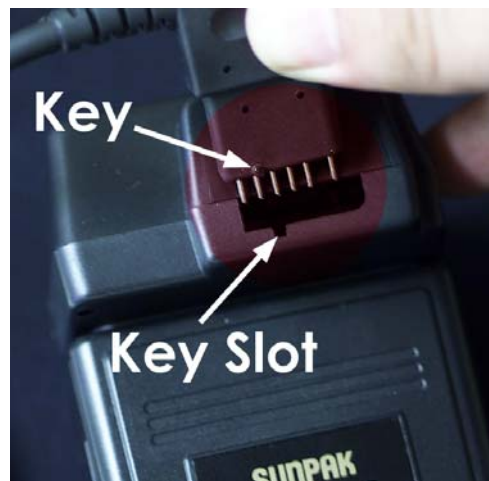
Before attaching the ring strobe, wrap the cord around the ring mount once to make sure it does not fall in front of the lens. Hold the cord in place with the cord clips provided with the system. Place the ring strobe around the ring mount while pressing the two spring loaded buttons on the side of the ring strobe. Release the buttons so the ring strobe catches on the lip of the lens protection mount. Pull on the ring strobe to make sure it is firmly attached. If it is not, try re-mounting it until it is.



2. Remove the strobe power pack from the camera case, and attach it to the mount on the top of the camera handle. The unit's power switch should face the back of the camera.
3. Slide the unit in until it stops, then turn the locking nut at the bottom of the unit to hold the unit firmly in place.
4. Plug the connector from the ring strobe into the power pack. The connector is keyed so you cannot insert it the wrong way. Refer to the diagram below:



5. Slide the power switch to the BATT position. The ready light should come on in ten to twenty seconds. If the ready light takes more than twenty seconds to come on, you should replace the batteries. See Changing Hand-held Strobe Batteries for how to do this. You can press the ready light to test fire the flash. Remember to turn the power switch to the OFF position when done, to keep the batteries from draining.



6. Set the power control dial to the correct setting for the job. The Hand-held Strobe is now setup.

Packing the Hand-held Ring Strobe

To re-pack the strobe:

1. Turn the power pack off, by sliding the power switch from the BATT position to the OFF position.
2. Push the cable "release" button to the up position and remove the cable.
3. Unscrew the mount locking nut and remove the flash from the shoe.
4. Re-pack the strobe into the E3X case.
5. Depress the two buttons on the strobe and remove it from the strobe mount. Replace the strobe in the case.

Changing Hand-held Strobe Batteries

The Hand-held Strobe uses four AA batteries. If the ready/test light takes more than about 20 seconds to come on after the power is first switched on, they should be replaced.

To replace the batteries:

1. Turn the power pack off, by sliding the power switch from the BATT position to the OFF position.

2. Open the battery holder door on the bottom side of the power pack by pulling down on the door to release the latch. The door is hinged.



3. Remove the four batteries. Always replace all four batteries.
 4. Insert the new batteries. The battery compartment has a diagram showing how to orient the batteries. The adjacent illustration also shows the orientation.
 5. Close the door, and push up on it to latch it closed.
6. Turn the power pack on by sliding the power switch to the **BATT** position. The ready/test light should come on in ten seconds or so.

Troubleshooting the Hand-held Strobe

If the Hand-held strobe does not flash when you take a picture, check the following:

1. Is the strobe turned on? The power switch should be set to the **BATT** position.
2. Is the ring strobe cable connected?
3. Is the **ready/test** light on? If not, the batteries may be depleted. See Changing Hand Held Strobe Batteries.

If the strobe still does not work, press the **ready/test** light to fire the strobe manually. If the strobe still does not flash, the power pack or ring strobe is damaged, and must be replaced. If the ring strobe will flash by pressing the ready/test light, the strobe is ok, but the unit is not receiving the sync signal. Call GSI for assistance.

D1X Exposure

Camera Exposure

For photogrammetry purposes, it is desirable to set the targets bright and the background dim. When retro-reflective targeting is used, the target and background exposures are almost completely independent of each other. The target exposure is completely determined by the flash power while the background exposure is determined by the ambient illumination. The amount of background exposure is controlled by the shutter time.

Eliminating the background exposure makes the targets easier to find and measure. However, if there is no background image whatsoever, trying to figure out which target is which can be difficult. Usually, a compromise is reached and the background exposure is set so the object is dim enough to not interfere with target measurement, but still bright enough that it can be seen when enhanced.

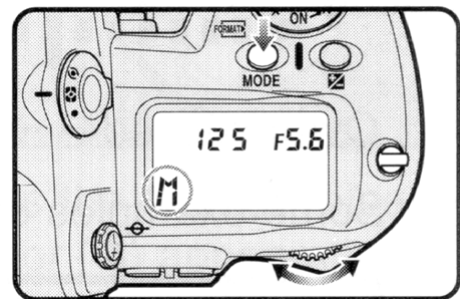
Background Exposure

The shutter time is used to control the background exposure. In manual exposure mode, you control the camera's shutter speed. Shutter speeds are typically set depending on the amount of light in the object area. Typically, the shutter speed is set to 1/160th or 1/200th. For outdoor use, the speed can be raised to as high as 1/640th. Don't exceed this speed as you may have problems with flash synchronization. In bright environments, it is advisable to use a Neutral Density Filter.

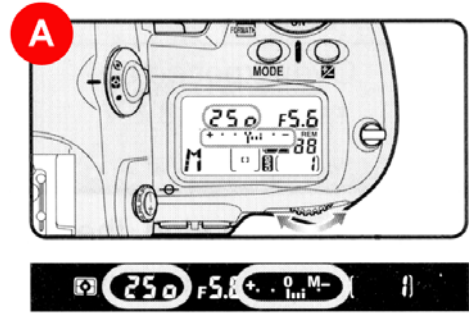
M Setting the Shutter Speed

If the control panel is not already displaying an **M**

Holding the MODE button down, rotate the main command dial until **M** appears in the control panel on top of the camera.



Rotate the main command dial to choose a shutter speed (A).

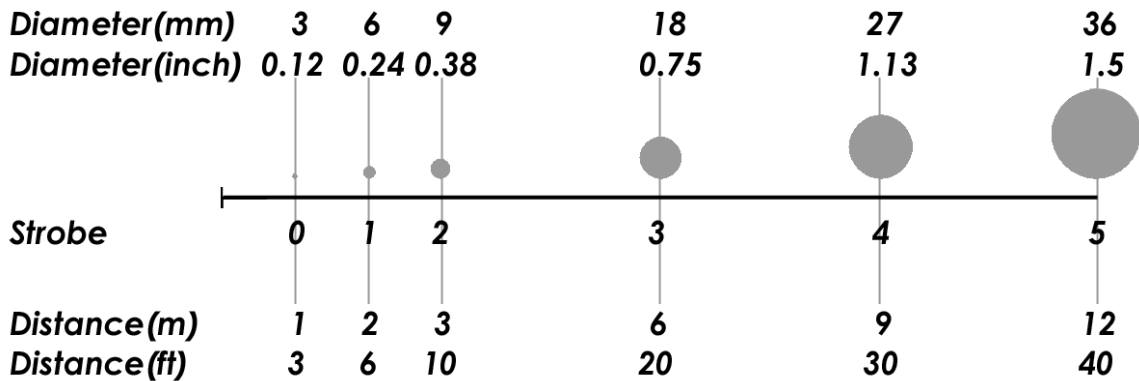


Target Exposure

The flash power setting for the target exposure depends on the distance from the camera to the targets, and the target size.

The following diagram gives recommended flash power settings at varying distances. If you are shooting the object in sections, use the size of the sections. The tables assume the recommended target size (which is also listed) is used. If the targets are smaller than this, you may want to increase the flash power setting one step to help compensate.

The tables assume the default lens f-number is used so it is important to check the lens and make sure it is set to f11, the default setting for the lens.



If you are shooting the object in sections, use the size of the section.

Neutral Density Filters



In bright conditions or outdoors Neutral Density (ND) filters can be used to reduce the amount of light that reaches the sensor. The filter is screwed into the lens. The strobe ring is then screwed into the filter. Only used GSI approved filters as some filters will cause degradation in system accuracy.

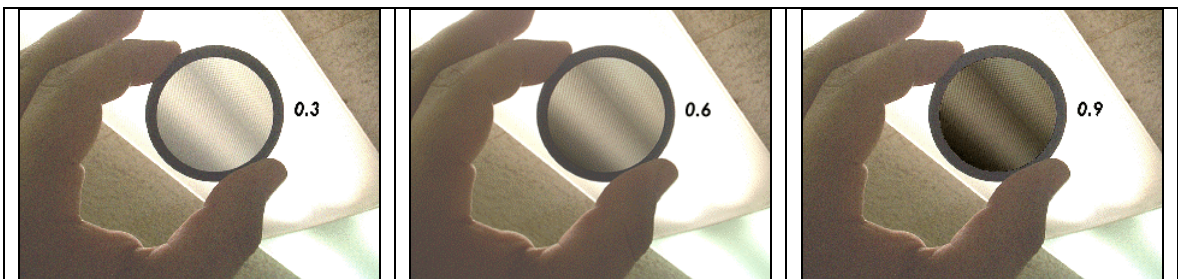


1. Screw ND filter to lens barrel



2. Screw strobe ring into ND filter.

The ND filters are rated logarithmically. The common filters are a 0.3, 0.6 and a 0.9. A 0.3 filter will let in $\frac{1}{2}$ th the light, 0.6 $\frac{1}{4}$ th the light and 0.9 $\frac{1}{8}$ th the light. If a filter or a combination of filters is used then the flash intensity needs to be increased accordingly. Each number on the flash represents a $\frac{1}{2}$ th F-Stop. You must increase the intensity setting by 2 for the $\frac{1}{2}$ th filter, 4 for the $\frac{1}{4}$ th filter and 6 for the $\frac{1}{8}$ th filter.

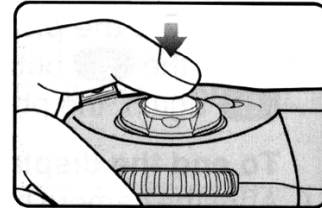


Playing Photographs Back

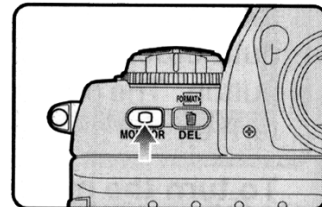
Photographs already stored on the memory card can be played back without setting the camera to playback (PLAY) mode. This playback feature can be used in single-frame shooting, continuous shooting, and self-timer modes.

To play photographs back

Press the shutter-release button half way to wake the camera up.



Press the Monitor button.



The most recent photograph in memory will be displayed. If the camera has been set to display the histogram and image highlights (see "Playback"), these will be shown as well. If the camera is connected to a television set, photos will also be displayed on the television screen (the camera's LCD monitor must be on for photographs to be displayed).




If no photographs have been stored in the memory card, the message "CARD CONTAINS NO IMAGES" will be displayed.

The focus area selector cannot be used to select the focus area while playback is in progress.

Photographs cannot be played back in PC mode.


The operations that can be performed while playing photographs back are as follows:

To end playback





Press the  button or half-press the shutter-release button. The photograph currently on display will disappear and the monitor will turn off.

To stop the monitor from turning off automatically

If no other operation is performed, the monitor will stay on for the length of time specified in the Custom Setting menu or the playback menu "Auto Off" option. The monitor will then turn off automatically to save power.

After the monitor has turned off, the display can be restored by pressing the  button before automatic meter switch-off.



To delete the photograph currently displayed

Press the  button. A confirmation dialog will be displayed; press  again to delete the photograph. To return to single-image playback without deleting the photograph, press any of the buttons on the rear of the camera except the  and  buttons.

To view other photographs in memory

Press the focus area selector up () or down () .

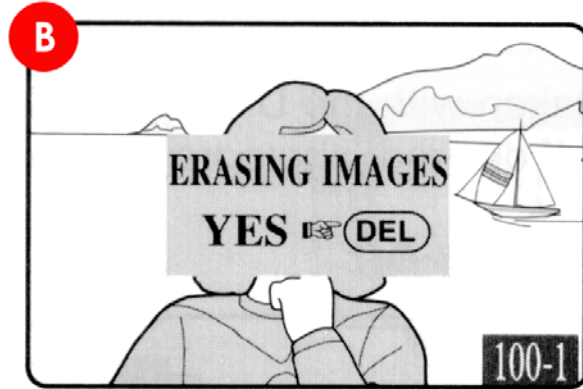
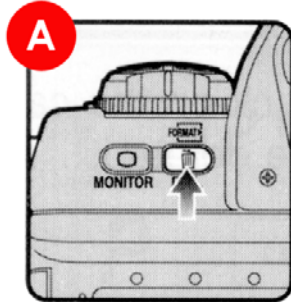
To view information on the current photograph


Press the focus area selector to the left () or right () to hide or display information on the current photograph.

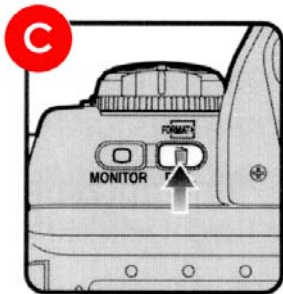
Record-and-Review





When the camera is set to single-frame shooting, or the self-timer is used, you can choose to have photographs displayed automatically in the monitor immediately after they have been saved to the memory card. This allows you to delete unwanted photographs immediately after they have been taken. Refer to the D1x Manual for more information.

Delete a photograph



To delete the photograph currently displayed in the LCD monitor, press the  button (A). A confirmation dialog will be displayed (B).




Press the  button again (C) to delete the photograph and return to single image playback, where the next photograph in memory will be displayed. To return to playback without deleting the photograph, press any of the buttons on the rear of the camera except the  and  buttons. Press the  button or lightly press the shutter-release button to end playback without deleting the photograph.

To end the display

After the camera has finished recording or deleting the photograph and the memory card access lamp has gone out, press any button other than the auto-bracketing button, the flash-sync mode button, or the AF-area mode button. The photograph will disappear from the display and the monitor will turn off.

To turn the monitor on or off

Press the  button to turn the monitor on or off. When the monitor is turned off, a monitor indicator will appear in the rear control panel, indicating that the photograph is still on display. The photograph will appear again when the monitor is turned on.

Record-and-review is only available in single-frame shooting or self-timer modes. Photographs are not displayed when the camera is set to continuous shooting or PC mode.

If, after the monitor has been turned off, another photograph is taken while the monitor indicator is displayed in the rear control panel, the current photograph will be cleared from the display, and the photograph just taken will appear in the monitor. The current photograph is not deleted when cleared from the display.

E3X Summary

Checklist

The checklist below has been prepared to help with photography using the E3X camera for off-line measurements. It is advisable to use it on every project until it has been memorized.

E3X Picture Checklist

1. Camera Checklist
 - a. Check default settings.
 - b. Check battery level.
 - c. Check disk.

2. Lens Checklist
 - a. Inspect Lens (Clean, if necessary).
 - b. Check F-number (normally not changed).

3. Strobe Checklist
 - a. Connect strobe.
 - b. Check battery level.

4. Set the background exposure (dark, but not too dark)
5. Set the target exposure (bright, but not too bright).

6. Take pictures. The distance you are from the object approximates the width of the field of view.

7. Wrap-up
 - a. Attach lens cap.
 - b. Re-pack camera.

Additional D1X Settings

Set the Time and Date

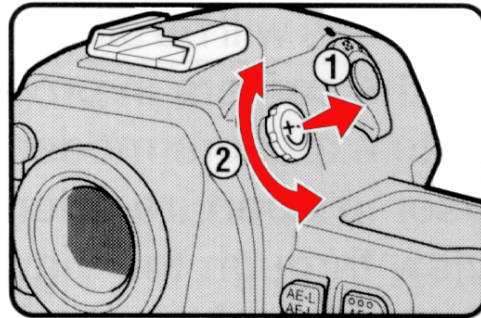
The D1X records the time and date for each photograph taken. Before using your camera, set the internal clock-calendar to the current time and date. Refer to the D1X manual for more information.

Dioptr Adjustment

The viewfinder is equipped with diopter adjustment to accommodate individual differences in vision.

Pull the diopter knob out and rotate it until the focus brackets in the viewfinder are in sharp focus.

Diopter can be adjusted between -3DP and $+1\text{DP}$. Corrective lenses (available separately) allow diopter to be adjusted between -5DP and $+3\text{DP}$.



Important: Be careful not to accidentally put your finger in your eye when operating the diopter dial.

Changing the Image Quality

The image quality setting controls the image type (color or black-and-white), file type (RGB TIFF, YCbCr TIFF, RAW data, or JPEG), and compression ratio. The image **MUST** be in the RAW format to be accepted by V-STARS. It is highly recommended that the image quality settings are not changed.

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