



## Digital cameras

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## Glossary *Digital cameras*

### **35mm Equivalent Zoom Ratio**

All digital camera manufacturers publish this "35mm equivalent" focal length simply because people are used to hearing it and knowing what kind of image a 28mm lens produces compared to a 50mm lens.

### **AA Batteries**

Indicates whether the camera accepts AA batteries. This options allows you to use disposable or rechargeable batteries.

### **Aperture Modes**

The number or range of settings for aperture: the opening in the lens that controls how much light hits the camera's image sensor. Apertures are stated as f-stops or f-numbers (e.g., f/2). The smallest number in this range is the most important. The smaller that number, the larger the maximum aperture, and the less light the camera requires to take a picture. A maximum aperture of f/2.8 is typical for a digital camera.

### **Autofocus**

Automatically brings the subject into sharp focus. Some cameras offer manual focus in addition to auto focus.

### **Brand**

The "nameplate" on the camera.

### **Burst Mode**

Allows you to take multiple, rapid-fire shots with one touch of the shutter button. This can be useful when shooting a subject in motion. The number of shots that can be taken in burst mode varies from camera to camera. Burst mode may not be available in a camera's highest-resolution mode. Also called "continuous shooting" or "rapid-fire shots."

### **Camera Connections**

Input or output connections for data transfer, power, display of images on a video monitor and/or addition of an external flash unit.

### **Camera Size**

The relative size of the camera - compact, average, or large.

### **Charger**

Indicates whether the camera comes with a charger.

### **Delay Between Shots**

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#### SPECIAL SECTION



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The time, in seconds, it takes the camera to ready itself for another picture when shooting in normal mode (non-burst), at the camera's highest-resolution, lowest-compression, JPEG setting. The delay may vary if other resolution and compression settings are chosen. Also called lag time or maximum-recycle time.

**Depth**

Expressed in inches.

**Digital Zoom**

Magnifies the central portion of an image by interspersing additional pixels between those captured by the image sensor. This makes the image larger, but does not add detail or improve sharpness. You could get the same effect by trimming or cropping the full image later, on the computer. Always use the maximum optical zoom before resorting to digital zoom.

**Ease of Download**

How the camera transfers images to your computer or printer. Most digital cameras offer more than one means of transferring images. Some require that you purchase special accessories.

**Via 3.5" Diskette** The camera stores its images on the same type of diskette used in your PC or Macintosh. You take the diskette out of the camera, put it into your computer, and copy the images onto the computer's hard drive. Diskettes have only 1.44 MB capacity, far less than that available with removable memory cards and other types of disk media.

**Via Removable Memory** Many digital cameras store images on removable memory cards that go in and out of the camera like a roll of film (Compact Flash and SmartMedia are two common types). These can then be used with a variety of memory card readers sold as computer accessories. A few models store images on CD-R or CD-RW optical disks that can be read in a computer's CD-ROM drive.

**Via Infrared Port** Infrared transmission uses invisible light to transfer image files to your computer or printer. Also known as "IrDA," this technology lets you transfer images without using cables or wires.

**Via Serial Port** This method is relatively slow, compared with a USB connection, but it is quite common. Digital cameras require a special serial cable (usually included) because the camera has a tiny jack instead of the larger connector a standard serial cable requires.

**Via USB Port** A USB (Universal Serial Bus cable) transfers image files from your digital camera via a newer, fast type of serial connection. On computers with USB ports, camera manufacturers generally support USB only with Windows 98 or a later operating system.

**Exposure Compensation**

Allows for minor adjustments to the automatic-exposure settings. When a scene has high contrast, as in a backlit scene, automatic exposure may not achieve the effect you want. It helps to be able to alter the settings so that the subject of the photo does not appear too dark or too light.

**Eyeglasses**

Denotes cameras with a viewfinder diopter adjustment, which allows some eyeglass wearers to take off their glasses when using the camera.

**Flash Modes**

Like film cameras, most digital cameras have a built-in flash for shooting indoors or

in other low-light conditions. Many cameras have an automatic-flash mode, which automatically fires the flash when more light is needed. The flash built into most digital cameras has a fairly limited range (up to 10 to 13 feet on most models), compared with external flash units, which can be much more powerful. A camera with an external "flash sync" or "hot shoe" will usually have a built-in flash as well.

### **Flash Type**

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### **Height**

Expressed in inches.

### **High Image Capacity**

The number of pictures you can take before you run out of storage space. It varies, depending on the capacity of the memory card and on the resolution and file compression settings in use. The more storage available, the more pictures you can take before having to transfer images to a computer or erase them. The higher the resolution setting and the less the image is compressed, the more memory is required.

### **High Recycle Time**

The time, in seconds, it takes the camera to ready itself to take another picture when shooting in normal mode (non-burst), at the camera's highest-resolution, lowest-compression, JPEG setting. The delay may vary if other resolution and compression settings are chosen. Also called lag time or delay between shots.

### **Image stabilizer**

This feature minimizes the effect of camera shake.

### **In Camera Editing**

All but universal, this feature allows you to decide to keep or erase pictures you've taken. You can review the pictures on the LCD display and delete those you don't want, to free up memory for more pictures.

### **ISO Equivalent**

Conventional camera film speed is rated using a standard from the International Standards Organization (ISO). The higher the ISO film speed, the more sensitive, or "faster," the film--meaning that less light is needed to take a picture. Although digital cameras don't use traditional film, the industry uses an ISO equivalency rating to describe their light sensitivity. For example, a digital camera with an ISO 100 rating could be used for outside shots in the sun or indoors with a flash, while an ISO 800 camera could take shots indoors with no flash.

### **LCD Size (in.)**

Digital cameras have a small liquid-crystal display (LCD) screen on the back so you can see the images and decide which to keep. You can also use the LCD to help frame photos, but that's a sure way to run down the battery in a hurry. Most LCD screens are too dim for viewing clearly in sunlight. Many cameras also use the screen for displaying menus and camera settings. It is desirable to have both an LCD display and a viewfinder with an eyepiece.

### **Low Recycle Time**

The time it takes the camera to process and store an image when shooting in normal (non-burst) mode, at the camera's lowest-resolution, highest-compression

setting.

### **Macro Focus**

This is a setting that allows you to take extreme close-ups, from a few inches to only 1 or 2 feet away from the subject. test

### **Manual Controls**

Some cameras allow the user to set the aperture (f-stop), shutter speed, or (usually) both. This feature is used to override the automatic exposure settings when more control is needed. During a sporting event for example, you may want to use a high shutter speed to freeze the action. Or, you may want to use a low shutter speed to blur moving objects (like a waterfall) while keeping stationary objects sharp. Using shallow depths of field can be used to blur the background of photos while keeping the foreground in focus. Typically up/down arrow keys are used to change settings displayed on the LCD or in the viewfinder. These controls are not as easy to use as on conventional film cameras.

### **Manual Features**

Most digital cameras have a mode for automatic operation, which should usually be sufficient. Some also have controls that allow you to manually adjust the focus, exposure settings, or white balance to handle special situations. The degree of manual functionality varies from camera to camera.

**Manual aperture.** Gives user more control over how much light hits the lens. Manual exposure compensation (see below) can serve the same function.

**Manual exposure.** Allows the user to control both the shutter speed and the aperture settings. Most digital cameras offer fully automatic exposure, often with an exposure-compensation option. While these options cover most situations, direct control of the shutter-speed setting is desirable when going for more specialized effects, such as a blurred image.

**Manual exposure compensation.** Not to be confused with manual exposure, this allows for minor adjustments to the automatic-exposure settings. When a scene has high contrast, as in a backlit scene, automatic exposure may not achieve the wanted effect. Being able to lighten or darken the scene is an important option.

**Manual focus.** Digital cameras provide greater depth of field than cameras with longer focal-length lenses, such as 35 mm or APS cameras; therefore, manual focusing will rarely be needed. Manual focus options vary; a few cameras provide a continuously adjustable manual focus ring, others only a limited number of discrete focus distance settings.

**Manual shutter.** Controlling the speed of the shutter allows for more creative control over how motion is expressed in your pictures.

**Manual white balance.** Corrects for differences in lighting (daylight/flash, fluorescent, or incandescent) so white objects remain white and colors appear the same as they do by eye. Most digital cameras have automatic white balance, which works well for most scenes. A manual white balance control allows the user to set the

### **Manual Focus**

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**Max Aperture**

The aperture is the opening in the lens that controls how much light hits the camera's image sensor. Apertures are stated in f-stops or f-numbers (e.g., f/2). The smaller the f-stop number, the larger the aperture, and the less light the camera requires to take a picture. A maximum aperture of f/2.8 is typical for a digital camera.

**Max Focal Length (35mm)**

When set to its maximum (longest) focal length, a lens gives its narrowest, most telephoto-like angle of view. For comparison purposes, it is often given in terms of the 35 mm camera lens focal length that would cover the same angle of view.

**Max Horizontal Pixels**

The number of pixels along the longer (horizontal) dimension of the image when the camera is set to its highest resolution.

**Max Image Quality**

An indication of the color intensity of the camera's images. The more bits a camera uses to indicate the intensity of the three colors for each pixel, the more precisely the pixel's color can be specified. Almost all digital cameras have 24-bit color depth (8 bits each for red, green, and blue, for each pixel), and are capable of reproducing millions of different colors.

**Max Shutter Speed**

The fastest shutter speed provided, often 1/1000 of a second or less. Being able to control shutter speed lets you decide if a moving object will appear sharp or blurred in the image. A faster shutter speed allows you to freeze faster action.

**Max Vertical Pixels**

The number of pixels along the shorter (vertical) dimension of the image when the camera is set to its highest resolution.

**Maximum Aperture**

The maximum aperture (lens opening) for wide and telephoto shots. A single number indicates that the camera does not have a zoom lens.

**Megapixels (MB)**

This shows how many million pixels the image sensor has. As a rule, with more megapixels, you can make larger prints or enlarge parts of an image without losing detail or image quality.

**Min Focal Length (35mm)**

When set to its minimum (shortest) focal length, a lens gives its widest angle of view. For comparison purposes, it is often given in terms of the 35mm camera lens focal length that would cover the same angle of view. Together, the camera's minimum and maximum focal length give an indication of the angles of view that the camera can cover. As the focal length increases, the field of view decreases. For example, a 28-mm focal length covers a 65-degree field of view; a 50-mm focal length covers a 40-degree field of view.

**Min Shutter Speed**

The slowest shutter speed provided, often 1/2 or 1/4 of a second or less. Being able to control shutter speed lets you decide if a moving object will appear sharp or blurred in the image.

**Movie Mode**

This feature allows you to record short video clips using your digital camera; some models record with sound while others do not.

**MSRP Price**

The Manufacturer's Suggested Retail Price. Generally, the price that you will pay at the store is 10 to 30 percent lower. When an MSRP is not available we list the average retail price and note it in the description.

**Optical Zoom**

Magnifies the image using a real multifocal-length lens, whereas a digital zoom uses electronics to enlarge the center portion of the image using interpolation. Some cameras have both optical and digital zoom. The optical-zoom range is what really matters; image quality decreases the further one goes into the digital-zoom range. The magnification ratio available for optical zoom is expressed by a value such as 2x or 3x. A 2x optical zoom with a minimum focal length of 7 mm would have a maximum focal length of 14 mm.

**Platform**

Whether the camera software provided is compatible with a Windows-based PC, a Macintosh, or both.

**Price**

An approximate retail price.

**Rapid-Fire Shots**

Allows you to take multiple shots in quick succession with one touch of the shutter button. This can be useful when shooting a subject in motion. The number of shots a digital camera can take in this mode varies by camera and with resolution setting. Also called continuous shooting or burst mode.

**Red Eye reduction**

Reduces the chances that the pupils of your subject's eyes will appear red in flash photos. With red-eye reduction, the camera emits a burst of light just before the main flash, causing the pupils to contract. Most cameras with a flash have this feature. Image-editing software often offers red-eye correction.

**Replaceable Battery**

Many digital cameras use two or four AA batteries. Nonrechargeable batteries, such as alkaline and lithium, or rechargeable batteries, such as nickel-metal hydride (NiMH) or lithium-ion, may be used. Some cameras that use rechargeable batteries come with a charger and a set of rechargeable batteries..

**Resolution**

A digital image is made up of hundreds of thousands or even millions of tiny dots called pixels (short for picture elements). The resolution of the camera's sensor is the number of pixels horizontally multiplied by the number of pixels vertically. The more pixels the sensor has, the sharper and more detailed the picture. Resolution may range from 1,280x960 pixels (1-megapixel model) to as much as 2,560 x 1,920. (5-megapixel model) While desirable, high resolution is expensive and requires much more memory per picture.

**Resolution Modes**

The number of levels, or modes, of resolution the camera offers.

**Screen shape**

The ratio of the lengths of the horizontal and vertical edges of the image. For example, the aspect ratio of a 640x480-pixel image may be indicated as 4:3 or 1.33.

**Secure Grip**

Denotes cameras designed with room for your fingers, so you can hold the camera

steady and keep your fingers clear of the flash, lens, or auto-focus sensor. The grip is especially important on the smallest cameras, which by their nature, have little room for a handhold.

**Self Timer**

A self-timer allows you to easily take shots that include yourself. A countdown timer delays the shot by 10 seconds or more, giving you time to scurry from behind the camera to within its field of view. A remote control provides the same function without the scurrying.

**Sensor Type**

The sensor is the chip (CCD or CMOS) which records light falling on it as it travels through the lens. It is the device that actually captures the image.

**Shutter Range**

The minimum and maximum shutter speeds available.

**Special Features**

The bells and whistles that distinguish one digital camera from another:

**Add-on lens.** Attaches to the lens built into the digital camera. Though not as versatile as an interchangeable lens, an add-on does extend your options for composing a shot by providing an extended telephoto or wide-angle view. To date, few models offer this feature.

**Audio recording.** Allows you to record a short sound bite with each image, say, to make notes for future reference. May also provide sound with any mini-movie feature.

**DPOF.** Digital print-order format allows you to store information on the memory card indicating how many prints to make of each image. Intended for use when having prints made at a digital photo kiosk or when printing images on certain inkjet printers.

**Interchangeable lens.** Allows you to physically change the lens being used. Rarely found on digital cameras; when it is, you can expect a hefty price tag.

**Macro.** A lens feature that allows you to take close-up shots, usually within 1 foot or less; good for taking pictures of small objects such as a stamp or an insect.

**Mini-movie.** Allows you to create a short, low-frame-rate, low-resolution movie (with sound on some models, silent on others).

**Remote control.** Allows you to take a picture without touching the camera; an alternative to using a self-timer.

**Rotatable lens.** A lens that tilts up or down. Some can rotate nearly 360 degrees, allowing you to compose a self-portrait while viewing yourself on the LCD monitor.

**Still Image File Formats**

File output, (Extension) that the camera generates. TIFF and JPEG are the most common.

**Still Image Resolution Settings**

The number of levels, or modes, of resolution the camera offers.

**Storage Size (MB)**

Digital cameras store images as data files, like those on the hard drive of a

computer. The more storage space, the more images the camera can store. Like computer storage, digital camera storage is stated in megabytes (MB). Most cameras have a few megabytes of internal storage, but many also accept removable memory cards or other media that can store as much as 1 gigabyte (GB). In this guide, storage size refers to the capacity of the memory card shipped with the camera or to the capacity of the camera's internal memory if it does not use memory cards.

### **Storage Type**

**SmartMedia.** Also known as Solid State Floppy Disk Cards (SSFDC), use flash memory. They are about the size of a large postage stamp and about as thick as a credit card.

**CompactFlash.** CompactFlash (CF) memory cards are about the size of a matchbook. Most cameras equipped with a type II CF slot can also accept the high-capacity IBM Microdrives.

**CD-R and CD-RW.** A few cameras use small size versions of these optical disks to store images. The disks are about 3 inches in diameter and hold 165 MB of data, and can be read in a computer's CD-ROM drive.

**3.5-in. floppy diskette.** Standard computer floppy diskette. However, memory capacity is only 1.4 MB and write speed is relatively slow.

**PCMCIA.** These flash memory cards (also known as PC cards) are about the size of a credit card. You can insert them directly into most laptop computers.

**Memory Stick.** A type of digital data storage card, introduced by Sony, which is smaller than a stick of chewing gum. A diskette-shaped adapter is also available for using Memory Stick cards in a computer or in some Sony cameras that use diskette storage.

**Memory Stick with Select Function.** This card provides higher capacity for other Memory Stick devices by providing two banks of 128 MB on a standard Memory Stick which can be selected with a manually operated switch.

**Sony Memory Stick Pro.** Memory Stick Pro has the same form factor as the original Memory Stick but with twice the number of connectors as the original.

**Secure Digital (SD), MultiMedia (MM) Card.** The SecureDigital (SD), MultiMedia Card (MM) is a highly secure stamp-sized flash memory card that weighs approximately two grams.

**xD-Picture Card.** Ultra-compact memory media, (20.0 x 25.0 x 1.7mm size), developed jointly by Fuji Photo Film and Olympus Optical.

### **Video Out**

Allows you to connect a digital camera directly to a TV or VCR and view your images on the TV screen or record your images onto a videotape.

### **Viewfinder**

Found on virtually all models, this optical device allows you to look through an eyepiece to frame the subject before taking a picture. Not to be confused with the LCD image display found on the back of the camera, which is mainly to view photos you've already taken.

### **Warranty-parts/labor/home**

The length of time the camera is covered by warranty. Some are divided into Parts and Labor coverage, with different time periods for each.

### **Weight**

How much the camera weighs in pounds. Note that the weight of the battery or memory card usually isn't included here, as it is in the weights Consumer Reports provides from its tests of digital cameras.

### **Wide angle**

This shows which model has a lens that can zoom as wide as a 28 mm lens.

**Width**  
Expressed in inches.

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