Technologies Explained – PowerShot G12

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Genuine Canon 28mm wide-angle, 5x optical zoom lens

Developed using the same processes and high-quality standards employed to manufacture Canon's range of EF lenses, the PowerShot G12 benefits directly from Canon's heritage in lens design, capturing sharp, high resolution images with every shot. The PowerShot G12's high quality, compact 5x wide-angle lens provides photographers with true flexibility covering a range of commonly used focal lengths.

HS System

The PowerShot G12 features Canon's HS System, which represents a powerful combination of a 10 Megapixel high-sensitivity sensor and high-performance DIGIC 4 processor, and is designed to provide excellent image quality and advanced low light performance which surpasses that of its predecessor, the highly-popular PowerShot G11.

The HS System allows the user to shoot at high ISO speeds with excellent image quality. Employing a higher ISO level enables the user to utilise faster shutter speeds, capturing moving subjects with a reduced risk of blur. An extended ISO range means that users can shoot in darker conditions without engaging the flash or using a tripod, capturing correctly-exposed images using only the available light. However, when the use of flash is necessary, its range is increased as a result of the extended ISO range that's made possible with the HS System.

PowerShot G12 users will also benefit from a greater dynamic range, with the high-sensitivity sensor providing better tonal range representation when compared to conventional-type sensors. As well as the latest sensor technologies, the 10MP resolution means that each pixel is larger than on higher resolution models. Bigger pixels can capture more light, and this increased sensitivity leads to clearer, more refined images with less noise.

Allowing precise control over ISO selection, a new Auto ISO level adjustment feature allows users to pre-configure the maximum ISO setting they wish to use during shooting, allowing photographers to suit their individual preference. Users can also specify how the camera controls ISO to obtain the best balance between image quality and shutter speed to freeze subject motion.

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The ISO range can be further extended up to ISO 12800 by using Low Light mode, which further reduces the risk of subject blur in even darker conditions. Shooting at 2.5 Megapixel resolution, the camera selects an ISO speed between ISO 320 and ISO 12800, allowing users to capture a scene as they see it. Users can also manually adjust the ISO speed and fine-tune white balance to suit the conditions. Low Light mode also supports a faster continuous shooting rate of 4.2 shots per second.

Optical Image Stabilizer (4-stop) with Hybrid IS

Canon's highly-effective optical Image Stabilizer (IS) prevents image blur by dramatically reducing the effects of camera shake. In situations where image blur due to camera shake is more likely – such as in darker conditions or when shooting with the zoom extended – the optical Image Stabilizer can help images remain sharp through minute vibration gyros which detect camera movement caused by hand shake. These signals are processed by a single-chip IS controller, which discriminates between hand shake and intentional camera movements. Signals are then sent to the IS unit, which moves one of the lens elements accordingly to re-align the light rays and reduce the effect of camera shake – effectively giving photographers a 4-stop advantage.

For the first time in any G-series model, Hybrid IS technology is included in the PowerShot G12. A technology first introduced in the highly acclaimed EF 100mm f/2.8L Macro IS USM lens, Hybrid IS corrects both angular (rotational movement) and shift shake (linear shake) that becomes more pronounced when shooting at close focusing distances. An angular velocity sensor detects the extent of angular camera shake, while an acceleration sensor detects the amount of shift shake. Hybrid IS moves the lens elements to compensate for both types of movement – dramatically enhancing the effectiveness of the optical Image Stabilizer during macro shooting.

Front Dial and ISO dial

A new Front Dial has been added to provide swift access to shooting settings. Settings such as aperture, shutter speed and white balance can be quickly adjusted during shooting. A custom setting within the UI also allows the user to select whether to use the Front Dial or rear Multi-Control Dial as the main way of controlling these settings. Functions such as white balance, aspect ratio or i-Contrast can also be assigned to either the Multi-Control Dial or the Front Dial as the photographer wishes.

The PowerShot G12's dedicated ISO dial has also been revised, allowing direct control over ISO levels in 1/3 stop increments – providing photographers with fine control over ISO sensitivity.

Vari-angle Screen

Like its predecessor, the PowerShot G11, the PowerShot G12 features a 7.0cm (2.8") PureColor II VA LCD screen. The 461k-dot resolution screen provides excellent levels of on-screen detail, and the rotating Vari-angle mechanism offers easy framing to shoot from almost any angle. A wide viewing angle helps with composing and viewing shots, and an RGB histogram is also available in playback, allowing photographers to instantly check the exposure of a shot in detail.

Electronic Level

To aid with the capture of level landscapes and horizons, the PowerShot G12 features an Electronic Level. Using information from the camera's acceleration sensor, a level indicator will appear on the LCD monitor, which displays the camera's approximate angle of tilt, allowing users to adjust the position of the body as required before taking the shot – even when in portrait or landscape orientation.

HD movies with stereo sound and HDMI

The PowerShot G12 enables users to shoot HD movies in 1280x720p resolution at 24fps, allowing the capture of video content in high definition with stereo sound. Users can also view their images directly on compatible HDTVs via the mini HDMI connection port using an optional HDMI cable, with no loss of quality when playing back stills or movies.

The PowerShot G12 is also compatible with HDMI Consumer Electronics Control (HDMI-CEC), a technology that allows users to connect the PowerShot G12 to compatible HDTVs and browse images and movies using the TV remote – providing ultimate simplicity when sharing images and movies.

Miniature Effect in movie

Miniature Effect has also been extended to movie recording for the first time, providing users with the ability to capture model-like scenes in 720p resolution. Combining Time Lapse and Miniature Effect functions, the top and bottom, or the left and right (depending on orientation of the camera) of the scene are gradually blurred, emphasising perspective. The user can select the frame rate the movie is shot at (6fps, 3fps and 1.5fps options available) so that when the movie plays back at 30fps, it gives the effect of watching a movie of a time-lapse miniature model. As with time-lapse movies, sound is not captured.

Tracking AF

To track subjects that are in motion, or to help achieve a creative composition, a new Tracking AF mode has been added to the PowerShot G12. This new mode gives photographers the ability to select objects from the centre of the frame and track them if they move, or if the frame is recomposed.

High Dynamic Range mode

A High Dynamic Range shooting mode allows the user to capture an increased dynamic range when shooting on a tripod to include detail from both highlight and shadow areas of a scene. In higher contrast situations, conventional cameras aren't able to capture both dark shadows and bright highlights at the same time.
High Dynamic Range mode captures these by taking multiple exposures of the same scene before combining them back into one image in the camera. This allows the PowerShot G12 to capture the highlights, shadows, and everything in between, closer to how the photographer sees it.

Shadow and Dynamic Range Correction

Allowing users to fine-tune the corrections made to the light and dark regions of their shots, shadow and dynamic range correction thresholds included in i-Contrast can be set individually to suit the shooting conditions.

To allow fine control over the suppression of highlight blowout and shadow detail loss, Dynamic Range Correction is included in the PowerShot G12. A choice of two settings allows photographers to adjust the extent to which dynamic range corrections are made to the light and dark areas of the image in-camera. By increasing the correction made, it increases the dynamic range that is represented in the final image by 2x or 4x when compared to an uncorrected image. Allowing photographers to brighten just the

shadow areas of an image, Shadow Correction is also included, automatically brightening darker areas of the image to reveal hidden detail in shadows.

Quick Shot mode

Designed to capture fast-moving subjects or spontaneous moments, Quick Shot mode decreases shutter lag and enables faster shooting. Selectable via the mode dial, Quick Shot mode disables Live View and activates continuous auto focus, allowing photographers to frame and shoot their subjects via the optical viewfinder with reduced lag. The speed of shooting is significantly enhanced, allowing faster performance that ensures the user never misses a moment.

RAW and Digital Photo Professional (DPP)

The PowerShot G12 supports RAW shooting – allowing the capture of uncompressed image information that photographers can then adjust and use to manually create their final image using Canon's supplied DPP software.

Sharing the same editing environment with the Canon EOS System and tailored to the needs of professionals, DPP provides a range of processing options for the RAW files produced by the PowerShot G12, including Picture Style, contrast, brightness, sharpness, noise reduction, white balance and exposure. A lens correction tool is also included with the PowerShot G12, allowing the user to correct RAW files for lens distortion, peripheral illumination, chromatic aberration and colour blur.

DIGIC 4 Processor

Canon's DIGIC 4 (Digital Imaging Core) processor manages all of the camera's primary functions to optimise operating efficiency. Advanced image processing algorithms deliver superb image detail and colour reproduction with accurate white balance and minimal noise. High-speed processing results in outstanding responsiveness, rapid Auto Focus and extended continuous shooting ability.

Smart Auto with Scene Detection Technology

Smart Auto mode uses Scene Detection Technology to determine the shooting scene by analysing subject brightness, contrast, distance and overall hue. The camera then selects the scene type from 28 variables, applying the best settings for optimum results.

Six new scenes make Canon's Smart Auto even more comprehensive. Smart Auto is now able to identify and reduce the presence of strong facial shadows which can occur

in harsh lighting conditions such as indoors with bright lights above or in sunny conditions when the sun is in a high position in the sky. When these conditions are detected the flash will be used to eliminate these shadows for more natural looking shots. Furthermore, three additional scene modes capture situations where a subject is lit by a strong light source, such as a spotlight. Instead of evaluating the total exposure of the image, which could result in overexposure of the main subject because of a dark background, the new spotlight scenes automatically detect the situation and spot meter the main subject, keeping shadow detail secondary to the main subject exposure level for well balanced, correctly exposed images.

Smart Flash Exposure

Smart Flash Exposure intelligently controls the power and usage of the onboard flash to ensure natural results in a variety of conditions. By using focusing distance as well as shooting scene information, an optimum balance between the ambient light of the scene and flash power is achieved. When shooting at close distances, overexposure is avoided by sensing how reflective the subject is, as well as reducing the flash power to compensate for the close shooting distance.

Face Detection Technology

Face Detection Technology makes it easier than ever to produce superb people shots. This advanced system quickly and accurately detects faces in a scene and then optimises camera settings so that everyone looks their best. With the ability to detect up to 35 faces in one frame, it's great for group photos as well as portraits.

The PowerShot G12 features the following Face Detection Technologies:

- Face Detection AF: Sets the focus on faces in people shots – not just the closest subject
- Face Detection AE: Optimises exposure for faces in all lighting conditions – useful for backlit scenes or indoor shooting
- Face Detection FE: Guards against washed-out faces when using the camera's flash – perfect for close-up shots in restaurants, clubs or other dimly lit locations
- Face Detection WB: Optimises white balance for natural-looking skin tones which remain true to life regardless of skin colour and lighting conditions

- **Red-Eye Correction:** Automatically eliminates the unwanted effects of flash photography immediately after the shot is taken. At the touch of a button in playback, natural-looking eyes can be instantly restored

Smart Shutter

Smart Shutter mode uses Face Detection Technology to allow users to take both group shots and self-portraits more easily and in a more relaxed way. The shutter can be triggered remotely in three different ways:

- **Smile Detection:** Triggers the shutter when the camera detects a smiling face within the frame
- **Wink Self-Timer:** Triggers the shutter two seconds after the subject in the frame has winked, removing the need for a remote control
- **FaceSelf-Timer:** Allows perfect group shots or self portraits by automatically triggering the shutter two seconds after a new face has entered the frame

Multi-aspect Shooting

Multi-aspect shooting allows PowerShot G12 users to shoot in a number of different formats without the need for post-processing. Photographers now have the ability to choose to choose from 1:1, 16:9, 3:2 and 4:5, allowing them to instantly select the composition that suits their subject and desired results.

SDXC Card Support

The PowerShot G12 supports the latest SDXC memory cards, which provide up to 2TB of storage. With SDXC memory cards, more content can be stored on a single card than ever before, and movies and images can be shot without having to change cards.

Eye-Fi connected functions

For users who want to transfer content wirelessly, the PowerShot G12 includes Eye-Fi connected functions. The camera features a dedicated Eye-Fi section in the User Interface, on-screen icons, and it disables the automatic power-down function when an Eye-Fi card is detected – allowing users to transfer content easily and without interruption[1].

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[1] This product is not guaranteed to support Eye-Fi card functions (including wireless transfer). In case of an issue with an Eye-Fi card, please check with the card manufacturer. Also note that approval is required to use

Eye-Fi cards in many countries or regions. Without approval, use of the card is not permitted. If it is unclear whether the card has been approved for use in the area, please check with the card manufacturer.