

Glossary for Sony's Video Security Network Cameras

Picture Quality

Wide-D Technologies

These are technologies to expand a camera's video dynamic range; they improve the visibility of images, even in extremely high-contrast environments. Sony's powerful Wide-D feature enables cameras to be used under severe lighting conditions.

View-DR



View-DR is Sony's innovative technology to produce images with an extremely wide dynamic range. View-DR is a combination of Sony's full-capture Wide-D technology, the high-speed Exmor™ CMOS sensor, and Visibility Enhancer (VE) technology. The full-capture Wide-D technology in View-DR uses an electronic shutter to capture multiple images and reproduce each frame. One image is taken using a standard exposure time and either one or three images are taken using very short exposure times, depending on the camera type. With the newly developed View-DR algorithm, all of the electrons converted from the captured light are fully used by the imager, which is quite different to some other Wide-D technologies in the industry that discard approximately half of these electrons. As a result, View-DR nearly doubles sensitivity compared to conventional Wide-D technologies. To capture multiple HD resolution images at a very high speed, the Exmor CMOS sensor is used because of its high-speed readout characteristics. During the process of combining multiple images, the Visibility Enhancer (VE) is employed to provide a high level of chrominance and luminance. With View-DR, the monitored image become very visible – sometimes it is even more visible than when viewed with the naked eye.

Visibility Enhancer (VE)

VE is one of Sony's advanced technologies that optimizes contrast and makes a scene more visible. It is ideal for scenes in which objects are difficult to recognize due to severe backlight or shadows. VE optimises the brightness and colour reproduction of an image dynamically on a pixel-by-pixel basis, while continuously adapting to the scene. Technically, VE stretches the contrast in both the backlit portions and the shadows within a given dynamic range, which is different to Wide-D. VE also contributes to the camera's high sensitivity. By combining VE with XDNR, the camera can reproduce clear and bright images in very low-light conditions, while keeping noise at a minimal level.

DynaView

DynaView

DynaView is one of Sony's Wide-D technologies. With DynaView technology, the camera captures two images for each frame using an electronic shutter – the first image is taken with a standard exposure time and the second image is taken with a very short exposure time. The dark areas in the scene are clearly reproduced in the first image, and the bright areas are reproduced without appearing 'washed out' in the second image. The two images are then combined into one, using an advanced DSP LSI, to reproduce a high-contrast image.

Defog Image Processing

The Defog Image Processing feature is capable of clearing up fog, mist, and haze in a scene to achieve more visible images.

Highlight Compensation (HLC)

The HLC function detects any strong light spots such as car headlights and flashlights in the dark and masks them in the captured images. This can relieve operator eye strain, making the monitoring task easier.

Flicker Reduction

Flicker Reduction minimises flicker phenomena that are seen as blinks or horizontal stripes caused by differences in brightness on the monitor when shooting video under fluorescent, sodium, or mercury lamps. This function analyses brightness of the captured images and compensates for differences in brightness with image processing to maintain picture quality with fewer flickers.

Distortion Correction

Distortion Correction is a camera function that compensates for image distortion that occurs mainly at the periphery of the lens typically appearing as barrel distortion by using the camera's image processing engine. It provides high picture quality with less distortion.

XDNR (eXcellent Dynamic Noise Reduction)

XDNR is Sony's noise reduction technology for network security cameras. XDNR utilises 2D and 3D noise reduction methods adaptively to scenes. 2D noise reduction (2DNR) reduces noise on the image by maintaining a smooth edge on moving objects, while 3D noise reduction (3DNR) drastically reduces noise on the

image of still objects. Under low-light conditions, XDNR provides clear images for both moving objects and still portions of the image, using 2DNR and 3DNR respectively. This method provides clear images while minimising motion blur, which is a typical challenge in outdoor surveillance monitoring applications such as in parking lots.

Electronic Image Stabilizer

Electronic Image Stabilizer electronically compensates for movement in captured images using image processing. Two images captured back and forth by the camera are recorded to its buffer memory, in which the camera's image processor calculates their distance and compensates for movement. This helps to minimise the effect of camera shake or vibration and achieve less blurry images.

Optical Image Stabilizer

Optical Image Stabilizer incorporates a lens element with gyroscopic sensors in the camera's lens unit and optically compensates for movement in captured images. After detection of camera shake and vibration with the gyroscopic sensors, this function makes the lens element shift direction to cancel the camera's movement so that the optical axis can be kept in the optimal position. This helps to minimise the effect of camera shake or vibration, achieving less blurry images. Unlike some electronic image stabilizers, this function maintains original picture quality without reducing image resolution.

Picture Mode

Picture modes are selectable from a range of camera scenes in the setting menu to optimise picture quality in various applications.

Intelligent Scene Capture

Intelligent Scene Capture is a function to provide the best picture quality for the scene, 24/7. It analyses captured images and automatically adjusts parameters such as shutter speed and gain, responding to environmental factors such as weather, time, and lighting conditions. In addition to Standard mode, you can select Motion Priority mode (ideal for capturing moving objects) and Low Noise Priority mode (ideal for noise reduction). You can use a scheduling function to switch Intelligent Scene Capture modes and manual setting modes.

Evidence Shot

Evidence Shot records high-quality JPEG images with the camera's maximum resolution at a low frame rate, simultaneously providing an overview video stream with smaller size images in H.264. This function is useful for applications where forensic analysis is required to identify people's faces and car license plates in city streets and car parks. The high resolution (20 megapixels with the SNC-VM772R)

allows for enlargement of specific areas of interest in the scene to examine details more precisely.

Lowlight Performance

IR Illuminator

The IR illuminators built in Sony's cameras consist of multiple high-performance IR LEDs located around the camera lens; this enables each camera to project powerful and uniform IR light to a great distance. Combined with the True D/N function, IR illuminators enable each camera to produce clear B/W images even in complete darkness (0 lx).

White-light LED Illuminator

The white-light LED illuminators built in Sony's cameras emit visible light; they illuminate a scene in an extremely wide range, enabling each camera to capture clear colour images in low-light conditions.

Dual-light System

The dual-light system offers effective surveillance and crime deterrence/ safety with a combination of IR and white-light illuminators. When darkness falls, the camera's on-board infrared (IR) illuminator switches on automatically to capture clear black and white images. Then if there's movement within its field of view, the camera automatically triggers its integrated white LED illuminator, bathing the immediate scene in light; the illuminator can also be spotted clearly from far away. The illuminator's sudden switch-on also provides a powerful visual warning to unexpected visitors. At the same time, the camera switches automatically to colour video mode, capturing detail-packed images in colour to assist with positive identification of the subject.

Adaptive IR

Adaptive IR analyses the camera's captured images and adjusts brightness intensity of the camera's built-in IR LEDs to prevent overexposure of close object images. The SNC-VM772R 4K camera adopts a new version of Adaptive IR – it is equipped with two types of IR LED, each for short and long distances, and adjusts these independently to match the zoom setting, providing the best IR images with appropriate exposure even for near and far objects.

Advanced IR

Advanced IR provides high-quality IR images without overexposure, delivering clear B/W images of close and distant objects.

True D/N (Day/Night)

A True D/N camera has two modes of operation: a day mode and

a night mode. The camera switches from day mode (colour) to night mode (B/W) by replacing its infrared-cut filter with a clear filter. In night mode, the camera becomes sensitive to near-IR light and is capable of reproducing images even when the scene is not visible to the naked eye.

Electronic D/N

Electronic D/N is a technology to make the image more visible in low-light conditions by removing the chroma or colour signal to produce a B/W image.

Storage & Bandwidth Management

Edge Storage(on board recording with memory cards)

The Edge Storage function records video and audio data with memory cards (such as SD and micro SD cards) attached to the camera. It can be used for fail-over data backup if the network is disconnected due to unstable network conditions or other difficulties. It can also be used for event recording when the recording is started by an alarm signal triggered by the camera's video analytics functions (such as Intelligent Motion Detection and Tamper Alarm), as well as by user-defined rules of DEPA and DEPA Advanced technologies. This function also enables scheduled recording, for convenient local storage. The recorded data can be transmitted to network video recorders (NVR)/video management software (VMS) and merged with data saved on the NVR/VMS storage. SD cards capable of an Edge Storage Maintenance Notification function* are recommended for these applications.

* Memory cards have a finite lifespan that is reduced over time by recording. With the Edge Storage Maintenance Notification function, users can obtain remotely the lifespan information of cards attached to the camera.

Edge Storage Maintenance Notification

When using SD cards with an Edge Storage Maintenance Notification function, users can obtain the lifespan information of an SD card attached to the camera via various methods such as web browsers, e-mail notification, alarm output, CGI commands, and system logs in a timely manner.

Bit Rate Control Mode

Constant Bit Rate (CBR)

Sony's constant bit rate (CBR) algorithm optimises image quality while maintaining a constant bit rate from the camera. It allows users to easily predict required data storage and network capacity since the amount of data can be calculated based on the predefined bit rate value.

Variable Bit Rate (VBR)

Variable bit rate (VBR) is an encoding method where the bit rate varies proportionally to the amount of movement and detail in the scene. In a simple scene (such as an empty corridor), the compression ratio can be higher, providing a lower bit rate. As the level of detail and movement increases, the compression ratio can be reduced to maintain high image quality; this creates much higher bit rates, and provides the best image.

Variable Bit Rate with Cap (VBR with Cap)

Sony's variable bit rate with cap (VBR with cap) is an advanced version of the VBR method. Users can set a maximum target bit rate (cap) for encoding, but the bit rate is unrestricted and can vary, responding to changes in image complexity. When the bit rate exceeds the cap value, the compression ratio is automatically adjusted to drop the bit rate below the target value, reducing network load while maintaining high picture quality. For planning purposes, by referring to the cap value, users can plan storage resources in a similar manner as with CBR encoding.

Intelligent Coding

Intelligent Coding is a function to efficiently manage network bandwidth and storage costs. It keeps specific areas of interest*1 in the scene clear and crisp with original high image quality, while encoding the other parts of the image with a higher compression ratio, reducing the data size by up to 50%*2. Auto mode can be selected to scale areas of interest according to the size of an object.

*1 The specific areas of interest can be selected from Static (fixed area) or Dynamic (movable area in combined use with a Multi Tracking function).
*2 The conditions: 4K/30 fps video footage with 30% of areas of interest.

Intelligent Cropping

Intelligent Cropping is a function to observe specific areas of interest* in any captured image with a 4K resolution, while overlooking the entire image with a lower Full HD resolution. It can reduce the data size by up to 50% to efficiently manage network bandwidth and storage costs. This function provides a Full HD resolution overview, in parallel with four separate close-ups at a VGA-cropped view or two separate close-ups at Full HD with an original 4K resolution.

*The specific areas of interest can be selected from Static (fixed area) or Dynamic (movable area in combined use with a Multi Tracking function)

Installation/Maintenance

Clear Image Zoom

Thanks to Sony's proprietary By Pixel Super Resolution Technology, the Clear Image Zoom feature can enlarge an image by up to 2x without degrading picture quality (a problem that is often seen with a conventional digital zoom). Combine the SNC-VM772R 4K camera with its optical 2.9x lens, and you can achieve a high-quality zoom of up to 5.8x.

Easy Zoom

Zoom ratio adjustments can be performed using the Easy Zoom button built in Sony's cameras for easy installation. These adjustments can also be made from a PC.

Easy Focus

Focus adjustments can be performed using the Easy Focus button built in Sony's cameras for easy installation. These adjustments can also be made from a PC.

Smartphone Viewer

The Smartphone Viewer enables an image of the camera to be displayed on a smartphone screen. In addition, the camera's pan, tilt, and zoom functions can be controlled by simple touch-panel manipulation.

e-Varifocal

The e-Varifocal feature allows the installer to adjust the fixed-lens camera's field of view in a similar way to adjusting the field of view on a varifocal lens camera at installation. The fixed-lens camera maintains the selected resolution, while also allowing digital zoom, pan and tilt operation to fine tune the angle of view. After installation, precise adjustments can be made to the fixed-lens camera's field of view. This can be done on a remote basis, reducing the cost of maintenance.

Solid PTZ

Solid PTZ can navigate the camera's visible area in the captured images by its digital pan, tilt, and zoom functionalities. This can be used to monitor particular points of interest during the operation.

SNC toolbox mobile

SNC toolbox mobile is a convenient smartphone/tablet app (supported by Android and iOS) that is intended for use in installation of a camera. It allows you to view*1 live camera images and adjust the field of view with your camera's zoom and focus control buttons. In addition to live image viewing, this app allows you to control*2 zoom and focus as well as other view-related features of the SNC-VM772R 4K camera on your smartphone touchscreen.

*1 A Wi-Fi router must be installed in the network.

*2 The optional IFU-WLM3 USB wireless LAN module must be attached to the camera.

Analytics

DEPA

With a DEPA system from Sony, DEPA-enabled cameras send not only video images but also related metadata (including object size and position data) to a DEPA-enabled recorder. Since part of the image processing is done on the camera side, the load to the recorder is reduced, enabling camera expansion. This is different to conventional video analytic systems – these process images solely on the recorder side and this typically causes CPU overload.

DEPA Advanced



DEPA Advanced is an enhanced DEPA technology. Unlike DEPA, a camera incorporating DEPA Advanced completes the entire DEPA analysis (such as intrusion detection with a virtual borderline) on the camera side, and sends only an alarm to the recorder. Since analytic processing is completed in the camera, DEPA Advanced provides the user benefit of easy camera integration with the widest variety of recorders and/or video management solutions.

Multi Tracking*



Multi Tracking is a useful function to chase and observe multiple moving objects in the image captured with a single 4K camera. It can chase moving objects such as people or cars in the captured image from the position designated with Intelligent Cropping or Intelligent Coding. The operation starts with a trigger from the camera's VMD (video motion detection) function. This allows a single 4K camera to track and follow up to four moving objects – useful for a scene in which multiple PTZ cameras are used. Thanks to Sony's proprietary technology, this function realizes a precise tracking capability; for example, it can keep tracking two moving objects even if they cross each other.

*1 Multi Tracking is used in combination with Intelligent Coding or Intelligent Cropping.

Others

IK10

The IK rating system (defined in the IEC 62262 standard) classifies the level of protection provided by electrical appliances against external impacts (i.e., physical impact on the outside of the camera). An IK10-rated camera is capable of withstanding the impact of 20 joules; this is equivalent to withstanding the impact of a 5 kg weight dropped from a height of 40 cm.

IK8

The IK rating system (defined in the IEC 62262 standard) classifies the level of protection provided by electrical appliances against external impacts (i.e., physical impact on the outside of the camera). An IK8-rated camera is capable of withstanding the impact of 5 joules; this is equivalent to withstanding the impact of a 1.7 kg weight dropped from a height of 29.5 cm.

IP66

The "IP" of IP66 stands for ingress protection (defined in the IEC 60529 standard), and its two-digit number shows the durability rating of equipment for outdoor use. The first digit of IP66 relates to ingress protection against dust, and "6" means "dust tight". The second digit of IP66 relates to ingress protection against water, and "6" means protected against "heavy jet sprays", such as conditions encountered during hurricanes.

ONVIF Profile S



ONVIF defines a common protocol for the exchange of information between different network video devices regardless of manufacturer, and achieves greater interoperability in multi-vendor network video systems.

Profile S is the latest specification (issued by ONVIF in 2012), which improves interoperability between ONVIF-compatible devices and simplifies device management.

PoE (Power-over-Ethernet, IEEE 802.3af)

PoE enables networked devices to receive power (up to 12.95 W) from PoE-enabled equipment through the same Ethernet cable that transports data. It provides substantial installation cost savings, and can simplify the installation process.

HPoE/PoE+ (High PoE/PoE Plus, IEEE 802.3at)

HPoE/PoE+ enables networked devices to receive power (up to 25.5 W) from HPoE/PoE+-enabled equipment through the same Ethernet cable that transports data. HPoE/PoE+ is useful especially for PTZ/Rapid Dome cameras that require motor control, and outdoor dome cameras that operate a heater in low-temperature conditions.

HPoE+ (HPoE Plus)

HPoE+ enables devices to receive power (up to 60 W) from HPoE+-enabled equipment such as a PowerDsine® 9501G/B power injector from Microsemi Corporation through the same Ethernet cable that transports data by using 4 wires. HPoE+ is useful especially for PTZ/Rapid Dome cameras that require motor control, and outdoor dome cameras that operate a heater in low-temperature conditions.

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