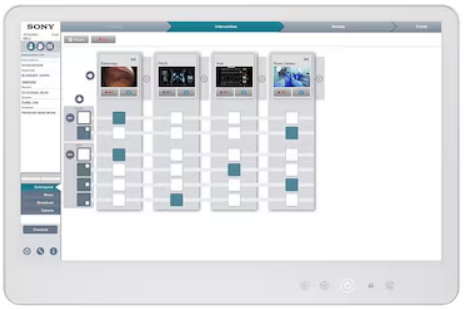
SONY

# NUCLeUS

The smart digital imaging platform for medical environments



## Overview

**Manage, share and store 4K/HD/SD, and 3D* video content across hospital networks and improve workflows**

NUCLeUS™ is the scalable, future-proof and modality-neutral platform that streamlines the aggregation, management, and distribution of video content, up to 4K resolution, across a hospitals' network.

Developed in consultation with leading surgeons, NUCLeUS guides clinical staff through the planning, recording and sharing of any type of video, still images and other patient-related data in the Operating Room, ICUs and Endoscopy Suites. NUCLeUS can be deployed in many other clinical areas of a hospital including Cath labs, Pathology labs and stroke assessment clinics linking to classrooms and lecture halls, physician offices - anywhere across the hospital campus and beyond. Seamlessly linking devices, applications, video and most importantly, people, NUCLeUS focuses on hospital staff requirements and use cases - adding value to imaging workflows, enabling new possibilities, and supporting decisions by all stakeholders. The focus is patient care.

The intuitive interface is accessed via a touch screen, letting clinical staff route live video from any source to any destination, display information on surgical monitors and large displays within the OR, or send images elsewhere on site. Critical care nursing staff can initiate video communications with other ICU team members. ICU clinicians can also view video data from the bedside or send video elsewhere on site to remotely monitor ICU patients.

NUCLeUS has new enhanced features to view and arrange multiple live video streams simultaneously, allowing the viewer to select and enlarge which sources they are interested in. Simply access the video content needed with a few mouse clicks from a PC screen anywhere on campus. Multiple video feeds from endoscopes, surgical microscopes, C-Arms, room cameras, ultrasound, and anaesthesia systems and other sources can be recorded simultaneously in any combination of formats and resolutions.

NUCLeUS supports surgical teams with an expanding range of powerful image processing applications, including new **Colour and Structure Enhancement** to improve visibility of live surgical video in 4K resolution, and a new Resolution Enhancer to boost the sharpness and resolution of the video feed. Simple video editing functions are included within NUCLeUS as a part of the workflow, with no need for external editing software or special skills.

NUCLeUS gives surgeons the ability to share live video with their peers as well as other team physicians, doctors, staff and students. Captured content can be associated with other patient records stored centrally (on a secure basis) and accessed from anywhere across the hospital-wide IP-network for secondary use e.g., consultations, conferences, and educational purposes.

NUCLeUS allows hospital staff to monitor ICU patients remotely, sending video data from the bedside to a remote clinician elsewhere on site. Both the ICU nursing staff and the clinician can start a video call linking the patient’s bedside to the monitoring room

whenever necessary, to request support, share advice, and communicate. NUCLeUS ICU gives efficient and effective communication and the complete picture to the ICU team.

* 3D is available in both Line by Line and Top and Bottom format in 4K/HD resolution.

*Note: Image shown above represents Sony NUCLeUS™ software GUI displayed on a touch panel display that is manufactured by a 3rd party. Touch panel display is available for purchase from Sony.*

## Features

**Seamless, intuitive image workflow**
NUCLeUS features an intuitive touch interface that simplifies imaging workflow and reduces the operational steps, which is helpful for clinical staff who want to concentrate on the surgery. Users can route any image source to any destination, with no need to unplug and reconnect equipment, and record multiple video sources simultaneously while maintaining the highest quality in real time.

In addition, for even greater flexibility, NUCLeUS now provides wireless video streaming which allows clinical staff to access images from any modality via an iPad in virtually real time within the OR. This enables medical staff in the OR to follow the intervention on their handheld device.

**Scalable, modality neutral and future-proof**
NUCLeUS is device, format, and resolution-agnostic - handling 4K, HD and Standard Definition video and still image sources from any modality. Live video and audio streams are distributed over secure, standard IP connections outside the OR environment. NUCLeUS is a scalable platform that can be implemented with an efficient small footprint for a few OR's, or it can then be scaled up by adding more processing power where needed to control and distribute images for large scale projects involving hundreds of OR's.

**Compatible with medical image sources**
NUCLeUS provides surgeons and clinicians direct, fingertip access to a wide range of medical image sources including live video signals from endoscopes, ultrasound scanners, in-light cameras, PACS workstations and many more.

**High quality 4K conversion**
Any HD resolution video content can be converted into 4K using advanced resolution-augmentation algorithms far superior compared to conventional upscaling, giving a crisp ultra high-resolution view of converted video footage.

**Remote monitoring and communication**
In an ICU ward, critically ill patients' conditions change from moment to moment, requiring constant monitoring. NUCLeUS ICU allows the ICU Team to monitor patients remotely, sending video data from the bedside to any location within the ICU, or elsewhere on site. Remote staff can monitor many patients simultaneously, switching from an overview screen of multiple beds to focus on a single patient with just a single click. ICU Staff can also start a video call between the bedside and monitoring room to request support or share advice. NUCLeUS ICU gives efficient and effective communication and the complete picture to the ICU Team.

**User-focused video editing**
NUCLeUS integrates video editing functions commonly used in clinical environment - such as trim/cut/save, merge, and create still images from video and adding annotations. With NUCLeUS, making a video-clip based on a specific part of a surgery is simple compared to other systems where third-party software and hardware are required.

**Flexible display options**
NUCLeUS offers a wide range of display modes and customised screen layouts, including switching to multiple monitors in full screen, picture-in-picture or multi-split (quad view) modes on any specified display. A simplified surgical monitor

preset function is now also available enabling quick adjustment of parameters before or during procedures. This flexibility supports improved workflow; designed to suit the needs of surgeons, physicians, and staff - through all phases of a surgical procedure. Static Mosaic view presents video streams from image sources in multiple Operating Rooms and ICUs simultaneously on a single display in a mosaic format – ideal for providing a situational overview of activity in managers' offices and staff rooms. The new NUCLeUS Tiles feature automatically selects an optimised view of multiple streams from a particular room or area, giving users the flexibility to simply drag and drop to expand the video stream they wish to view.

**Smart applications**
A growing range of NUCLeUS applications add powerful real-time image processing features to assist surgeons and clinical staff. Rotation Correction enables the surgeon to stabilise the 'horizon' in an endoscopic video feed while the scope is rotated. Easy to use new Colour and Structure Enhancement uses powerful algorithms to emphasise different colour tones of body tissue and enhance structural details on live surgical video in 4K resolution. New Resolution Enhancer improves sharpness and uses digital zoom with Sony's unique image algorithms for blur suppression to increase visibility.

**KVM function**
NUCLeUS can remotely control devices in the OR using the KVM (keyboard, Video and Mouse) function. The NUCLeUS IP converters can not only transmit video but also send keyboard and mouse commands to enable a remote user to view and control the device user interface without requiring extra hardware or cabling. OR staff can flexibly control multiple devices by switching video from each source to the viewing display with connected keyboard and mouse.

**Telestration enriches teaching and consultation**
Ideal for teaching and real-time consultation with other physicians outside the OR, new improved Bi-directional telestration allows multiple remote users to simultaneously annotate, draw or highlight areas of interest in the live stream video which is shared by viewers in all locations and discuss as a group in real time.

**Streamlined information management**
NUCLeUS integrates with Hospital Information Systems (HIS), for a seamless workflow. Multiple image sources used during surgery can be integrated with patient information gained through HIS/RIS, PACS and EMR to create comprehensive, easily accessible patient records.

**Integration and control of IP camera sources**
IP Camera Source software converts signals from IP room cameras to a NUCLeUS stream, enabling switching, recording, and broadcasting of camera images just like any other NUCLeUS source. Clinicians can also control camera pan/tilt and zoom functions directly from the NUCLeUS interface. Up to five camera pre-sets can be registered per person per OR, and up to three IP cameras can be deployed in the same room.

**Printing for enhanced documentation workflow, during or after surgery**
Hard copies of still images captured by NUCLeUS can be created using an optional UP-DR80MD A4 digital colour printer. 1, 2, 4 or 8 eight images can be selected per sheet, with optional inclusion of printing metadata. Auto Print extends CMS (Content Management System) print functionality to store and collect a preconfigured number of stills, printing them automatically when this number of images has been received.

**Integrated support for Sony HVO recorders**
Sony HVO-series medical recorders* can be operated directly with KVM (keyboard, video, mouse) control from the NUCLeUS touchscreen. Video files captured on an HVO recorder are recorded on the hospital's NAS. The CMS imports files from their folders and makes them available in the web app.

* Supported models: HVO-550MD, HVO-3300MT, HVO-4000MT.

**Maintain standards with surgical safety checklist**
Checklists simplify monitoring of safety standards at the start, during and at the end of an operation. After the patient and surgeon are selected, NUCLeUS automatically displays the checklist on the system's touch panel monitor and on OR portal PCs. Checklists can also be manually activated at any moment during the intervention.

**Flexible integration and remote support**
NUCLeUS offers hospital IT departments the benefit of low maintenance and peace of mind. Facilities can rest easy knowing that any hardware, software, or network issues are monitored by Sony around the clock allowing for remote maintenance system to prevent costly OR downtime interruptions. Add on features and enhancements can also be installed remotely, without ever sending a technician into the room.

**Open for developers**
Open API (Application Program Interface) protocols simplify rapid integration with modality manufacturers' OR controllers and other hospital systems. This offers an attractive environment for modality makers, Integrators and/or developers to create their own specific applications that can be hosted on the NUCLeUS platform. Integrating the system at this level can provide a unique experience for an end user working within the confines of a specific system as needed - such as Interventional Radiology Systems, Robotic surgery systems and a number of other possibilities.

**Reducing patient anxiety in the OR**
Many patients are likely to feel very anxious when entering the operating room. Especially useful in paediatrics and obstetrics cases, surgical staff can use the Patient Distraction function thus helping to reduce patient anxiety. Music tracks and video imagery can be played in the OR to create a more relaxing and comfortable atmosphere. By programming items in advance, staff can easily select the most suitable content for each patient and there are even 5 pre-sets for both music and video – for quick and easy playback.

**Protecting patient privacy**
Privacy Mode enables surgical staff to stop recording or broadcasting content to protect patient privacy when there is a risk that the patient can be identified. Recording and broadcasting can be quickly disabled with one button.

## Related products



**SRG-X120**
Standard 4K30P IP PTZ Camera with 12x optical zoom and NDI®|HX capability for a wide range of applications



**LMD-X2705MD**
27-inch 4K 2D LCD medical monitor with 3G-SDI

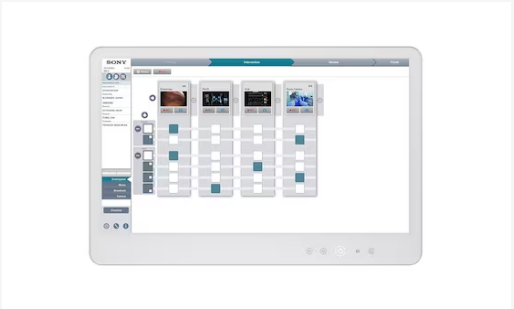


**UP-DR80MD**
A4 Digital Colour Printer



**LMD-XH550MT**
55-inch 4K 3D/2D LCD medical monitor

Gallery







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