SONY

The Smart IP Imaging Platform

NUCLEUS

NUCLeUS™:
Your Partner Before, During & After Surgery

Today's operating rooms are continuously evolving as new medical innovation arrives on the scene. Any future oriented hospital should consider tomorrow's expansion today. Making the move to a smart digital operating room is just the beginning. The future of healthcare is digital integration – and we can make that vision a reality.

Imagine a tool that challenges what you've come to expect from clinical workflows.

A system that provides centralized access to all of the audio/video data from any medical device, captured from any consultation or intervention.

A system that integrates and provides centralized access to all audio/video data on any medical device from any vendor in the smart digital operating room, examination room or interventional suite.

A platform offering various enhancements by providing user support through NUCLeUS Smart Applications.

A platform that is intuitive, flexible, smart and future-proof. The only cost-effective investment choice for an integrated imaging workflow.

We call it NUCLeUS – your best selection for high quality and cost efficiency.
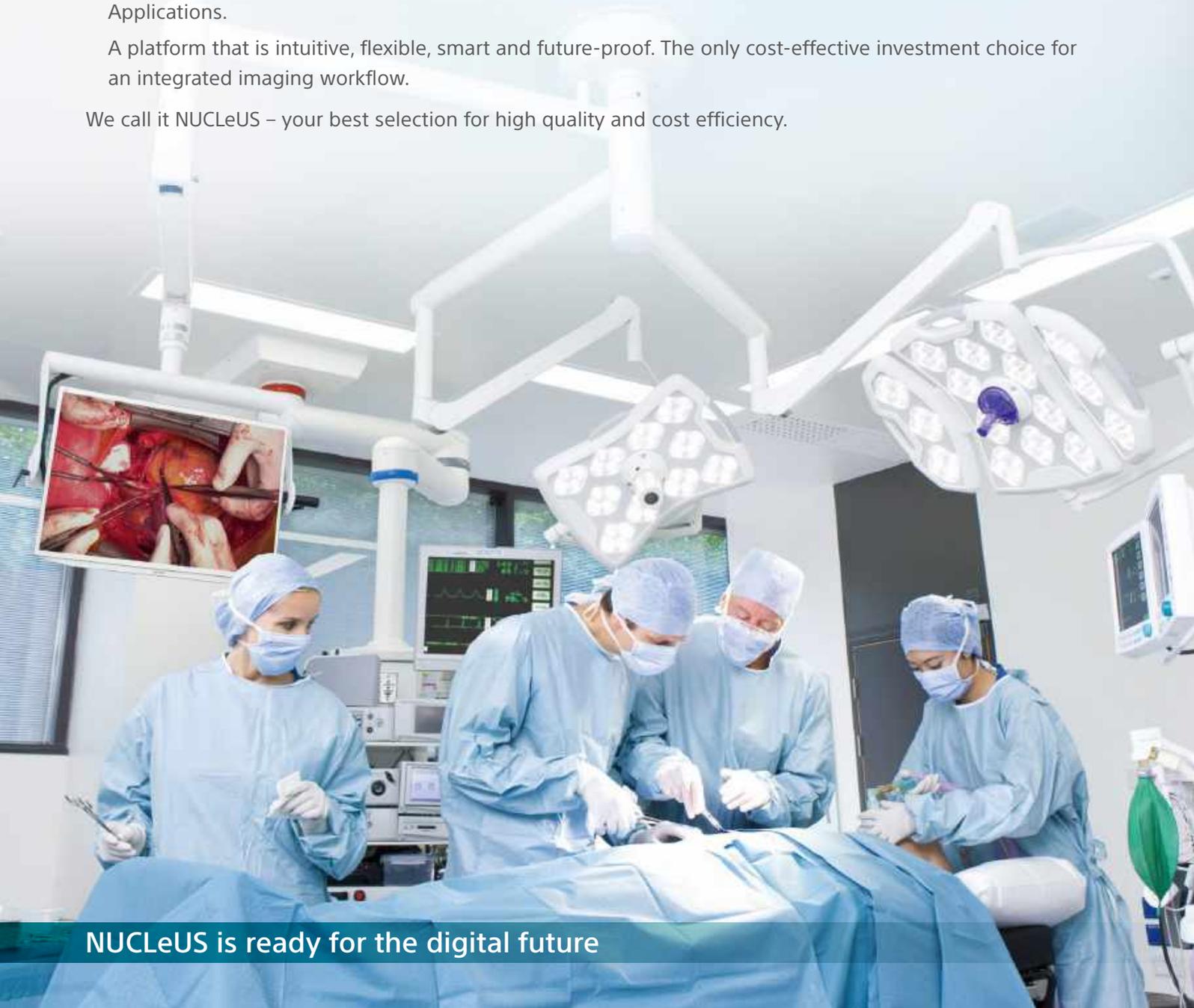
NUCLeUS is ready for the digital future

BENEFITS

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FOR CLINICIANS

Images from endoscopes, surgical microscopes, room cameras and any other image source in the OR can be routed, recorded and viewed from anywhere across hospital-wide IP networks. This makes it easier for doctors and clinical staff to repurpose content for presentations and lectures.

The end-to-end IP workflow solution allows surgeons in the OR to capture and share live high-resolution video and patient data with other doctors and medical students on the hospital campus and beyond. And delivery of the right package of key information (live, processed, and offline video, audio and data) enables doctors to keep their focus on the patient and to take faster and well-considered decisions.

FOR MEDICAL STAFF

Today's hospitals are characterized by a large number of isolated AV-systems and processes. This complexity has an impact on efficiency and reliability, forcing medical staff to spend valuable time on non-care-related tasks.

NUCLeUS integrated IP solutions streamline the modern clinical AV-workflow, replacing incompatible data formats and connectors with the simplicity, cost efficiency and resilience of a single LAN-based connection between all system elements for quick configuration and simplified support.

FOR HOSPITAL MANAGERS

Adding new medical devices and systems requires costly, time-consuming installation and training for hospital staff. What's more, extra hardware and file formats can mean headaches over the security and integrity of valuable clinical data.

Our IP workflow solutions make it easier to add new hardware and functionality as your needs grow. Moreover, NUCLeUS provides a safe and secure data management suite where recordings along with all digital assets can be stored on a secure server.
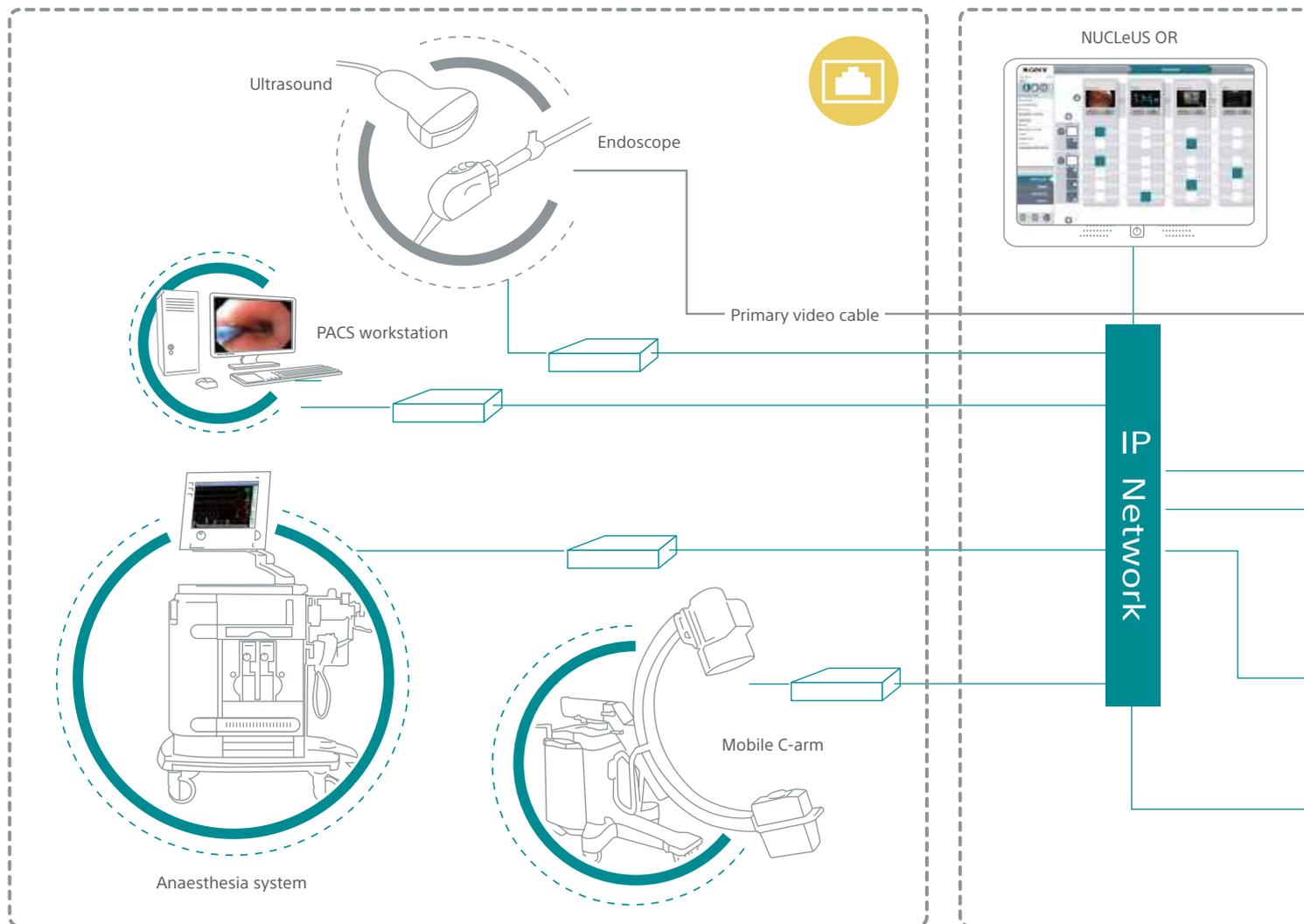
FOR SYSTEM INTEGRATORS

With video-over-IP systems, medical system integrators can offer hospitals a powerful, highly flexible video workflow solution with the capacity and versatility to meet today's and tomorrow's needs. These systems offer a low total cost of ownership and enable easy system integration and maintenance.

An all-IP architecture provides a seamless upgrade path from HD to 4K, while open APIs simplify rapid customization of OR controllers and integration with other hospital systems.

The Smart Video-Over-IP Digital Operating Room Platform

Ultrasound

Endoscope

NUCLeUS OR

PACS workstation

Primary video cable

IP Network

Anaesthesia system

Mobile C-arm

Vendor-Neutral Platform and High Image Quality

NUCLeUS is device-, format- and resolution-agnostic, handling HD and 4K sources from a wide range of modality manufacturers.

- Video, audio, and associated patient information is distributed over secure IP connections
- Compatible with virtually various video standards and formats over a wide range of modalities such as endoscopes, ultrasound scanners, light cameras, PACS, and more
- The NUCLeUS transmitter accepts 4K or HD visually lossless video with low latency through copper or fiber network interfaces

## Touch Interface for Seamless and Intuitive Imaging Workflow

- Instantly route any image source to any destination, with no need to re-plug equipment
- Switch to multiple monitors in full screen, picture-in-picture, or multi-split (quad view)
- Record multiple video sources simultaneously on the network-based application using various combinations of format and resolution

Advanced NUCLeUS Smart Applications

With the support of NUCLeUS receiver with GPU and NUCLeUS Smart Applications add powerful real-time image processing features with low latency

- Rotation correction enables the surgeon to stabilize the 'horizon' in an endoscopic video feed while rotating the scope; it also implements a method to automatically detect and undo unwanted image rotations up to 4K resolution

Displays

Sharepoints

Data Centre
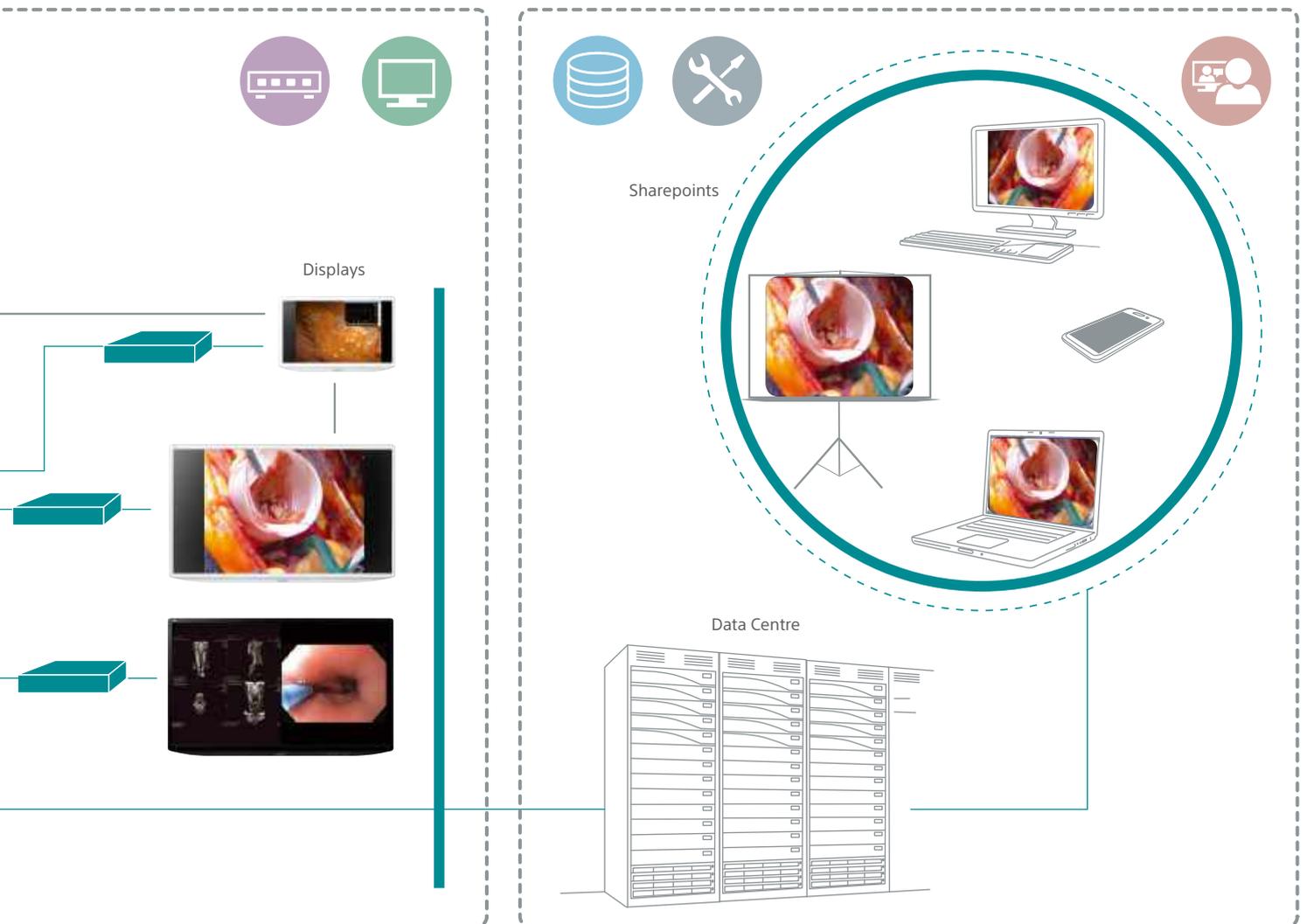
Secondary Usage to Enhance Training and Education

Achieve simultaneous recording of all OR video sources, in any combination of formats and resolutions. Reach outside the OR and share an accurate live stream of surgical interventions at conferences and lectures.

- Centralized storage and easy access across the hospital network achieving data linked to the patient ID
- Streamed video and bidirectional audio enhance collaboration between colleagues in the OR and outside.
- Shared video and metadata that goes outside the OR is encrypted for its security.

Telestration and Editing

This allows exchange of real-time video content with colleagues and remote annotation of live streams. Also video can be edited in the OR and on a client PC across campus. The annotated image is sent back in real-time from remote location.

- Integrates video editing functions such as trim/cut, creates still images from video, and adds annotations.
- Telestration function allows the remote viewer to indicate grid or highlight elements in the streaming video such as pen, text, line, square and circle.
- Easy user group management and secured log-in access

Integration with Hospital Infrastructure and Future Proofing

- Can be seamlessly integrated with HIS/RIS, PACS and EMR to create comprehensive, easily accessible patient records
- Preventive solution maintenance, including self-monitoring capabilities of the system from outside the hospital
- NUCLeUS adapts as requirements change, keeping pace with latest imaging workflow innovation by adding extra functionality

NUCLeUS Components

NUCLeUS is a unique combination of a user-friendly software platform, low-footprint hardware units, and a powerful server backend.

Switching and Routing

NUCLeUS OR

There is a lot of information to be handled within the OR, such as live video signals from an endoscope, ultrasound streams, PACS workstation data, and biplane fluoroscopes.

NUCLeUS OR provides an integrated UI of the NUCLeUS system to support OR workflows. The platform includes many flexible visualization options such as switching to multiple monitors in full screen, picture-in-picture, or multi-split.

This is advantageous for OR ergonomics and efficiency; it also delivers financial benefits.

Note: This is an image operated by a touch panel PC.

Content Management

Content Management and Editing

This is a safe and secure data management suite allowing recordings to be reviewed, edited and annotated.

NUCLeUS introduces a unique feature – a simultaneous recording function. This provides convenient archiving of all patient and image data, while recordings can be seamlessly integrated with PACS, EPR, and HIS.

The surgeon can record multiple sources at the same time.

A user-focused video editing tool on a web-browser enables you to trim/cut, create still images from video, and add annotations.

Communication Inside and Outside the OR

Broadcast

Knowledge sharing is the key to better healthcare. Broadcast supports bi-directional audio communication. Streaming in NUCLeUS is easy to access as no extra software or hardware is required. Live medical video and audio from the OR can be shared securely over a network, medical staff can access feeds from anywhere in the hospital via the data network. You can start up meetings with peers and even go outside the OR to share your surgical event with an audience.

NUCLeUS Smart Applications

Telestration Tool

This allows remote annotation of video streams and sharing these annotations in real time with the OR.

Clinicians can ask a colleague (located outside the OR) for a second opinion. Through a secure login, this colleague can access the telestration tool, annotate remotely the shared live image, and these annotations can be shown in real time within the OR. You can, for example, draw circles, lines, use colors, insert text, freeze the screen, use a grid view, and much more.

Rotation Correction

In laparoscopic surgery, angled laparoscopes are used to improve the viewing range by rotating the scope, effectively changing the viewing direction. This application compensates for shifts in the orientation of video from a handheld surgical endoscopic camera due to movements in the position of the surgeon's hand. Video remains stable and correctly oriented, irrespective of rotational movements. This is not only useful for assisting surgeons but is also a valuable asset for teaching.

IP Converter

NU-IP3T IP Converter (Transmitter)

NU-IP3T handles 4K, HD, and standard definition video and still image sources from a wide range of modality manufacturers. In addition, the transmitter accepts 4K or HD visually lossless video with low latency through copper or fiber network interfaces. A native video stream as a primary output is mainly used for live viewing by surgeons in the OR. Bandwidth-optimized streams (so-called proxy streams) as a secondary output enable medical teams in offices and lecture rooms to view the same surgical image as the surgeon in the OR.

NU-IP3R IP Converter (Receiver)

NU-IP3R visualizes video signals from 4K, HD, and standard definition souces. These video streams are consequently decoded for visualization on a (surgical) monitor in full screen, picture-in-picture or multi-split (quad view). NUCLeUS has been designed to allow for more advanced applications; the receiver has overlay capabilities and is equipped with a powerful graphical processing unit (GPU) supporting NUCLeUS system. It processes NUCLeUS Smart Applications for transparently overlaying any kind of value-added information on live video.

NUCLeUS Backend

Scalable NUCLeUS Backend

This is typically installed in the hospital's data room.

The backend has been designed according to a scale-out paradigm, meaning it can be gradually expanded when additional operating rooms are added to the installation or when additional functionality has been licensed.

Related Products

LMD-X550MD
55-inch 4K Medical LCD Monitor

LMD-X310MD
31-inch 4K Medical LCD Monitor

LMD-X2705MD
27-inch 4K Medical LCD Monitor

LMD-X2700MD
27-inch 4K Medical LCD Monitor

LMD-2735MD
27-inch Full HD Medical LCD Monitor

LMD-2435MD
24-inch Full HD Medical LCD Monitor

MCC-1000MD
HD Video Camera

MCC-500MD
HD Video Camera

SNC-WR630
1080/60p Full HD Rapid Dome Camera

BRAVIA® Professional Monitors
BRAVIA Professional 4K Color LED Display
Available in various display sizes

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