Switching & Routing

The switching and routing software is part of the NUCLeUS™ application stack. Surgical images, modality images, planning data, and more are switched or routed to any connected display in the operating room (OR), catheter lab, or endoscopic examination room. Bring any image source to any monitor and bridge extended distances with low latency of less than 1 frame*¹ and visually lossless images using a single and standardized cable type.

In today's most advanced operating rooms, surgeons require immediate access to multiple types of visual data. NUCLeUS provides the capability to seamlessly integrate medical devices and to visualize any of their medical images, at any time on any of the screens.

• More and richer data enables faster intervention
• Flexible display layouts increase data availability and facilitate interpretation
• An open platform: any brand*², any device*², any standard*²
• Better ergonomics: more easily accessible visual data

Key Features

Consolidation on IP: Flexible Video-data Combination

NUCLeUS is an IP solution. All video and supplementary data such as patient monitoring are transmitted through NUCLeUS and are converted to data feeds. The receiver re-assembles these data packets and displays images on screen.
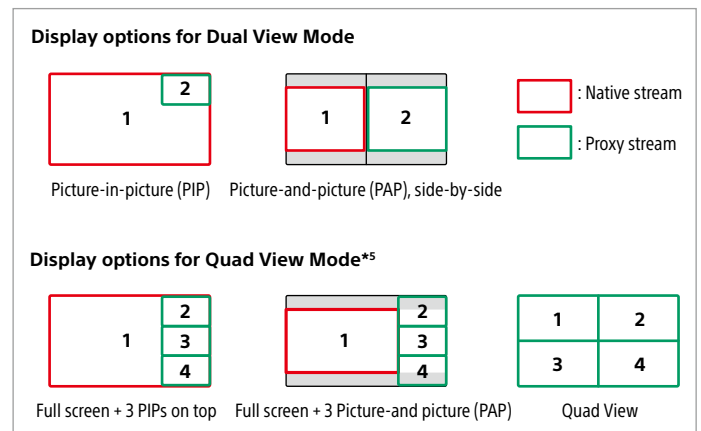
Single Digital Pass-through Input to Output

The NU-IP3T, IP converter transmitter converts medical imaging signals to IP data equivalent to 4K*³ HD or SD video. Artifact-free and visually lossless image feeds are transferred over 1G or 10G networks with high quality and low latency of less than 1 frame*¹.

There is no perceivable image degradation with NUCLeUS because all data is digitized directly at source using Sony's unique technology.

Multiple Display Layouts with GPU Power

NUCLeUS digitally routes video signals from any type of equipment – including an endoscope, boom arm camera, ultrasound, PACS workstation, and biplane fluoroscope – to any monitor or multiple monitors. Every monitor can show multiple video streams at the same time through a picture-in-picture or a multi-split view, which results in visually no delay with GPU processing technology implemented in the IP converter (receiver).

This unit can receive additional HD proxy streams (max 4 streams in total) on top of the 4K native stream*⁴ and can display these in different layouts. A set of preconfigured layouts include quad-view*⁵, PIP, and PAP, and these can be configured symmetrically or asymmetrically. Typically used for boom-mounted surgical displays, the receiver can be 'invisibly' mounted between the boom and the display or as a larger (in-wall) overview screen.

Display options for Dual View Mode

Picture-in-picture (PIP)   Picture-and-picture (PAP), side-by-side

: Native stream
: Proxy stream

Display options for Quad View Mode*⁵

Full screen + 3 PIPs on top   Full screen + 3 Picture-and picture (PAP)   Quad View

The layout for PIP/PAP can be dynamically selected from the GUI of NUCLeUS OR*⁶.

*1 This is for native stream. Based on Sony internal testing. Latency varies and depends on usage conditions.

*2 Please contact your nearest Sony dealer

*3 Optional license is required for 4K

*4 NU-IP3R can receive 4K or HD native stream. Resolution depends upon the image source.

*5 Optional license is required for quad-view functionality.

*6 NUCLeUS OR is an application software of NUCLeUS system. This is implemented in NUCLeUS Core.

Simple Cabling, Easy Upgrades, and Zero OR Footprint

NUCLeUS overcomes the problem of direct video cabling. This reduces system complexity and eliminates the web of cables from sources to screens. NUCLeUS makes the operating room truly reconfigurable. With an IP cable solution, there is no need for total re-cabling to upgrade or add medical devices. There is also no requirement for computing and switching devices to be located in the operating room. NUCLeUS solves these problems by incorporating an IP interface, maintaining all computing resources outside the OR.

As an ICT-based system, NUCLeUS does not age and remains state-of-the-art, resulting in a lower overall TCO.
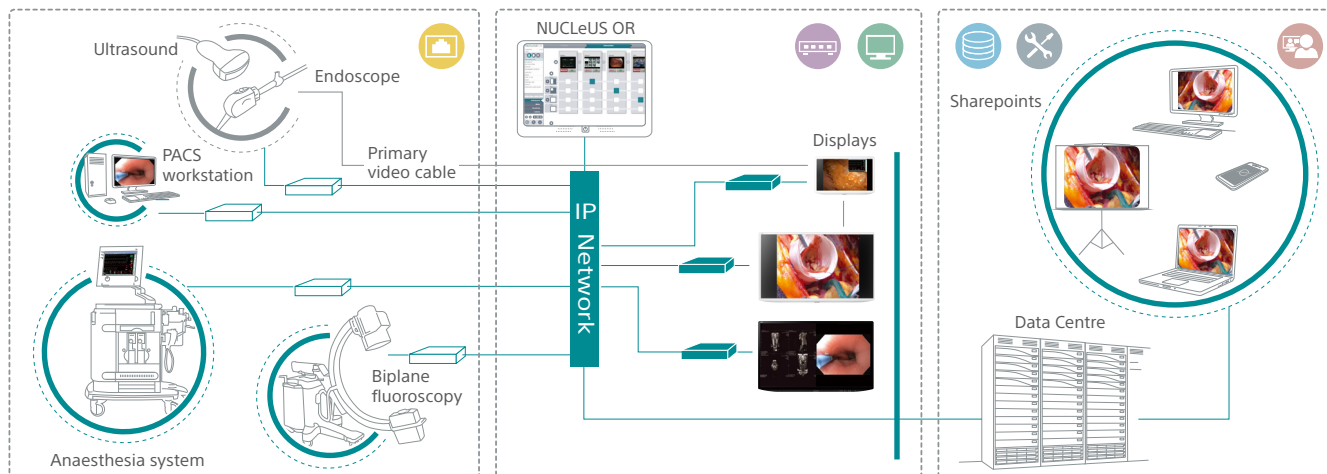
Sources are connected via the data network to a set of displays. Multiple points of control (a touch screen, PC interface, and bio technician's service interface) can be used simultaneously and in different locations.

Plug-and-Play

Mobile (trolley) units can be 'plug-and-play' configured. Plug in the unit and, after a limited period of time, the unit appears in the control interface. Fully plug-and–play enabled, this system lets you add or remove a source from the operating room and it automatically appears or disappears from the interface.

As the IP connector is common for input or output, there is no need to worry about mistakes to insert the cable to the wrong connector. The IP-network flexibility makes operator reassuring and helps to reduce workload. This system results in minimal video cabling and easy setup.

Specifications

Features	
Video Signal	Up to 4K*1 @ 60 fps 4:4:4*2
Video Stream	Output from IP converter, NUCLeUS Link, IP camera source*3
Number of Video Sources per OR	Technically unlimited; tested up to 10
Number of Video Displays per OR	Technically unlimited; tested up to 10 ; typically 3 surgical displays and 1 overview screen
Bandwidth Consumption	1Gbps, 10Gbps

Network Switch	
Requirements*4	
	IGMP Version 3 (IGMP Snooping, IGMP Snooping Querier, Immediate Leave/Fast Leave, Source Specific Multicast, Explicit Host Tracking)

*1 Optional license is required for 4K.
*2 Support signal type, resolution and frequency are limited.
*3 List of tested IP cameras available.
*4 List of tested switches available.

Ordering Information

Product reference;
Switching & Routing

Pro License
NU-SR30E

Pro+ License
NU-SR30F

For more details, please contact your nearest Sony dealer.
These products are non-medical devices.

Related Products

IP Converter (Transmitter)
NU-IP3T

IP Converter (Receiver)
NU-IP3R

NUCLeUS Link
NU-LN30E

NUCLeUS Core
NU-CR30B

NUCLeUS Compute
NU-CP30B