SONY

NU-IP3R
IP Converter

Receives NUCLeUS 4K*[1], HD, and SD*[2] video streams and shows them with a low latency of less than 1 frame*[3] on a surgical display.

The NU-IP3R, IP converter (receiver) receives IP data for 4K*[1], HD and SD*[2] video and control signals from a NU-IP3T converter (transmitter). The IP data comprises visually lossless video and the NU-IP3R receives these data with high quality and low latency of less than 1 frame*[3] through copper or fiber network interfaces.
The video can be displayed in multiple layouts using image processing technology. This is efficient for the surgeon who wants to see multiple images at the same time, and it can support planned surgical progress.

*1. Optional license is required for 4K.
*2. SD video is sent as HD with black bars around.
*3. This is for native stream. Based on Sony internal testing. Latency varies and depends on usage conditions.

Key Features

Support of Different Network Architectures

The NU-IP3R, IP converter receiver reads any video stream from the NU-IP3T, IP converter transmitter or IP camera over CAT5e or higher copper cable, or fiber network cable. Copper cable can be used with the existing infrastructure under a low network load outside the OR. Fiber cable can be used if it is necessary to reduce electromagnetic interference artifacts (e.g., image distortion caused by electronic scalpels).

The Large Video Format Support*[4]

NU-IP3R supports from HD, up to 4K*[1]@60fps 4:4:4*[5] video output.

Data Safety

Data and command interfaces to the NU-IP3R are encrypted using SSL. Bandwidth optimized streams are always secured with AES128 encryption used with a GCM rolling key scheme. This prevents third-party eavesdropping, spoofing, data tampering. Encrypted communication between the transmitter, receiver and server ensures safe handling of information.

Display options for Dual View Mode

: Native stream
: Proxy stream

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

Display options for Quad View Mode*[7]

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

Multiple Display Layouts

The NU-IP3R can receive additional HD proxy streams (max 4 streams in total) on top of the 4K native stream*[6] and can display these in different layouts. A set of preconfigured layouts include quad-view*[7], 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.

Primary Cabling

The NU-IP3R can control an attached monitor via serial communication (RS-232C). If IP transmission stops, the NU-IP3R can automatically switch the display to a primary cable via RS-232. This is a safety mechanism.

User Feedback

The digital operating room provides users with feedback on various system levels. The NU-IP3R provides valuable operational feedback for medical users. The system LED indicates whether the receiver has power, and shows whether the unit is working properly.
The system LED displays specific blinking patterns which indicate the loss of a network and the absence of an IP address, making it easy for users to diagnose any problem. The receivers have a semitransparent overlay capability which shows any additional information on the display. Examples are recording and broadcasting indicators.

Designed for Simple Setup and Installation

- Small unit size; fits easily onto a monitor
- Optional IP converter bracket for smart monitor installation
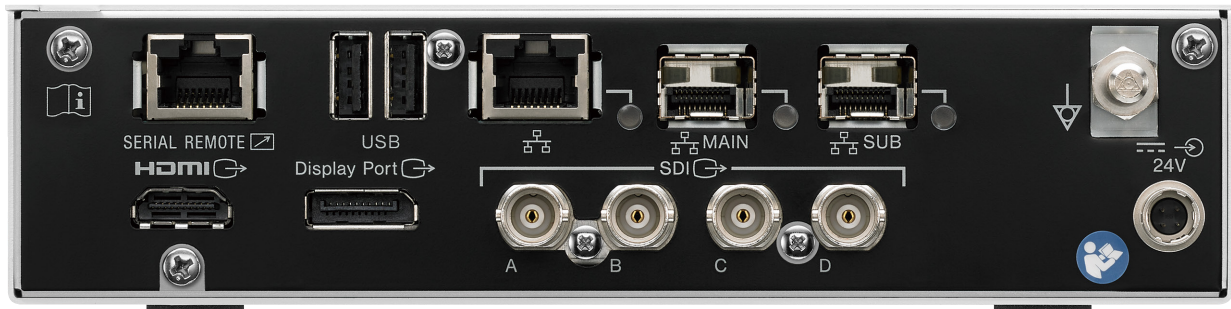- Chemical-resistant exterior in a medical white color

*4. Please contact your nearest Sony dealer.
*5. Support signal type, resolution and frequency are limited.
*6. NU-IP3R can receive 4K or HD native stream. Resolution depends upon the image source.
*7. Optional license is necessary for quad-view functionality.
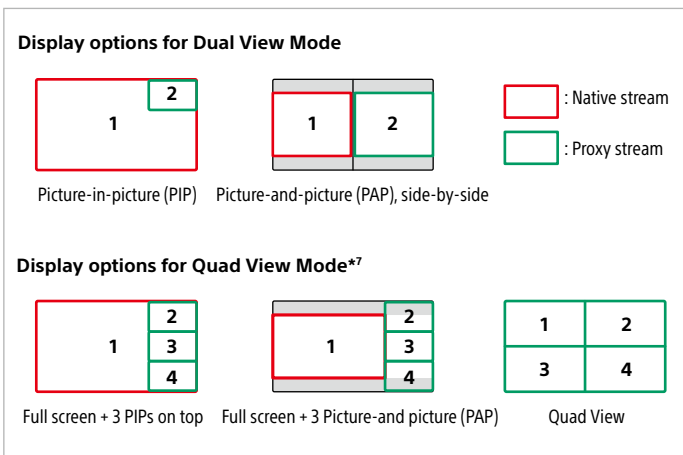
Rear Panel

Specifications

Video Specifications	
Inputs	Native and proxy streams
Outputs	Up to 4K[1] @60 fps 4:4:4[2]

Connectivity	
USB	USB Type A (Reserved for future use) (2)
Control and Data	SFP+ (Ethernet network)[3] (2)
	RJ-45 (Ethernet network) (1)
	RJ-45 (for serial control) (1)
Video Connectors (out)	3G-SDI (4), Display Port 1.2 (1), HDMI 2.0 (1) DVI[4]/VGA[4]/Component[4]/YC[4]/Composite video[4]
Power	Medical grade power supply (AC-82MD) is optional
Display Control	RS-232 (RJ-45) serial interface for control to other devices and configuring the connected display[5]

Functions	
Encryption	SSL + AES128 with GCM rolling key scheme[6]

General	
Power Requirements	+24 V DC
Input Current	2 A
Operating Temperature	0 °C to +40 °C (32 °F to 104 °F)
Operating Humidity	30% to 85% (No condensation allowed)
Operating Pressure	700 hPa to 1,060 hPa
Storage and Transport Temperature	-20 °C to +60 °C, -4 °F to 140 °F
Storage and Transport Humidity	20% to 90%
Storage and Transport Pressure	700 hPa to 1,060 hPa
Noise Level	28 dBA (20 °C (68 °F), 1 m)
Mass	1.2 kg (2 lb 10 oz)
Dimensions (W x H x D)	189 x 47 x 157 mm (excluding projection) (7 1/2 x 1 7/8 x 6 1/4 inch)
Supplied Accessories	HDMI Cable Clamper (1), Before Using This Unit (1), CD-ROM (1), Service Contact List (1)

*1. Optional license is required for 4K.
*2. Support signal type, resolution and frequency are limited.
*3. Optional SFP+ module is required.
*4. Exchange adaptor is required.
*5. Serial control is only supported on selected surgical display models. Contact nearest Sony dealer for details.
*6. For proxy stream only.

This product is distributed to EU as a medical device. (Before the submission of 510 (k) notice in US)

Related Products

IP Converter (Transmitter)
NU-IP3T

IP Converter 4K License
NU-IP3TE

IP Converter 4CH License
NU-IP3RE

Switching & Routing
Pro License
NU-SR30E

Pro+ License
NU-SR30F

Network System Manager
NU-NM30E

AC Adaptor
AC-82MD

SFP+ Transceiver Module
OTM-10GSR1

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