SONY

IP Live Production

Over recent decades, information technology (IT) capabilities have expanded to revolutionize and deliver efficiency in every industry. However, the video content creation industry has been relatively slow to embrace and adopt IT transformation. This is because the massive amount of data in video content tends to prevent smooth transfer via Ethernet connections. But now the latest technological developments have answered this challenge, enabling the adoption of IP-based video and audio streams for use even in live production environments which demand real-time operation without delay.

Experts you can trust to transform your production.

Broadcasters and productions face the challenges of delivering more with less. Sony is making live production more agile, flexible and cost effective with our end-to-end IP Live solutions based on open standards. From optimised use of studio facilities, control rooms, Outside Broadcast vehicles to remote production and shared production with IP routing and network allocation,
Sony can help customers realise the benefits of IP and drive workflow efficiency in every live production application, on any scale.

Benefit of End-to-end IP Live Production Solution

IP Live brings innovation to production workflow by dramatically improving production efficiency. Sony has been delivering the best-in-class and truly interoperable IP live production products and solutions to sports and entertainment customers for many years. By being format agnostic and SMPTE ST 2110/AMWA NMOS compliant, our IP Live Solutions can adapt to the varied demands of the market. As a result, we now have more than 100 OB trucks and studios in operation, making us the leading provider of IP live solutions in the world.
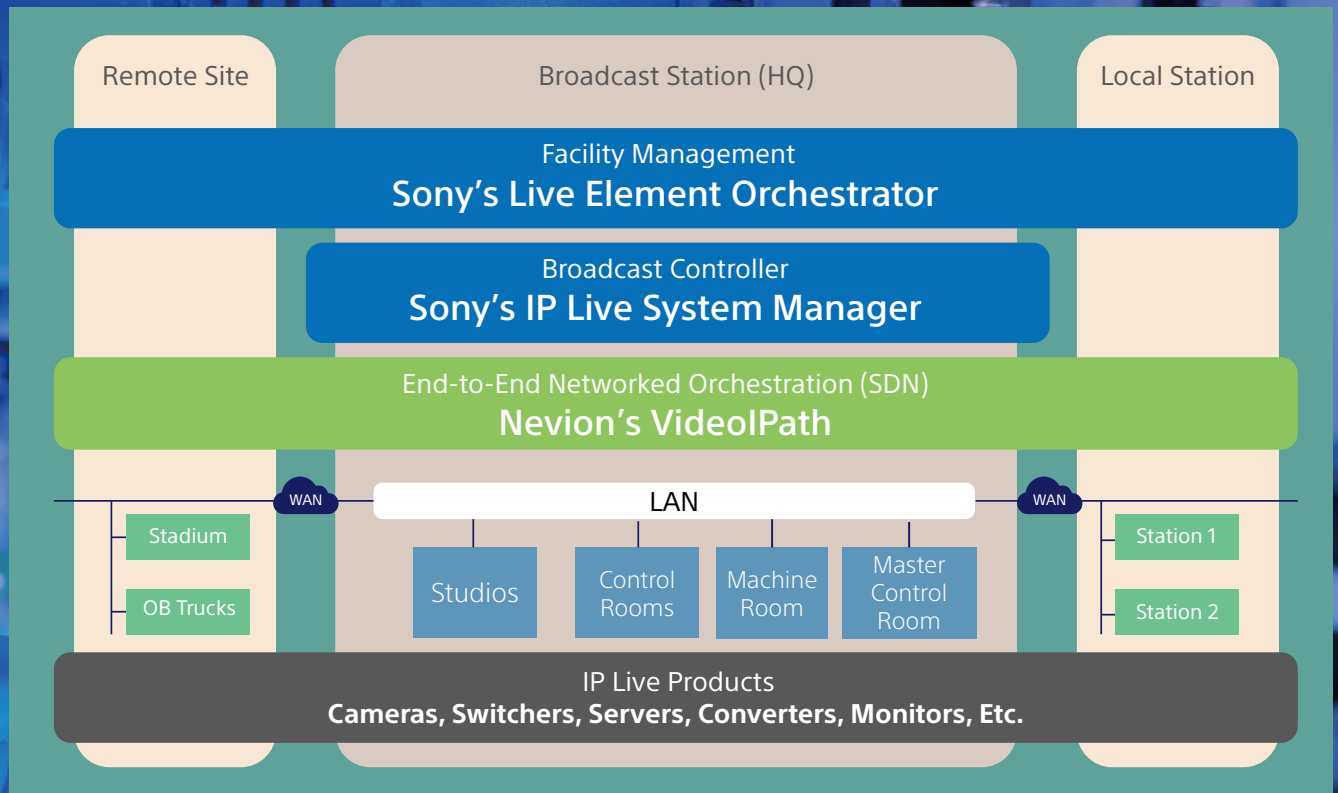
Our remote production solution, which integrates our robust portfolio IP live products with our efficient orchestration, management, and monitoring of production software, has given our customers the ability to produce very high-quality remote events while keeping their operations centralized at a NOC. This enables content creators to maximize their production efficiency and minimize cost, so they can produce many more events within the same budget.

By partnering with Nevion, which has innovative and award-winning orchestration and Software Defined Network control technology, Sony is able to offer an enhanced end-to-end IP Live production solution within and across multiple locations.
SDN technology enables us to provide highly scalable multi-point to multi-point connection flexibly, giving customers access to as many sources as needed, even if the available bandwidth to remote sources is limited. This makes it possible for remote productions to have the same operational capabilities as a local site.

With Sony and Nevion's remote integration solution, which is backed by state-of-the-art technology, expertise and experience, we can support any project regardless of scale or size. Content Creators and Broadcasters can now feel confident to move forward with implementing their IP strategy and to fully realize the long term operational and financial benefits.

The concept of Sony's End-to-end IP Live Production solutions

Remote Site	Broadcast Station (HQ)	Local Station

Facility Management
Sony's Live Element Orchestrator

Broadcast Controller
Sony's IP Live System Manager

End-to-End Networked Orchestration (SDN)
Nevion's VideoIPath

WAN — LAN — WAN

Stadium	Studios	Control Rooms	Machine Room	Master Control Room	Station 1
OB Trucks					Station 2

IP Live Products
Cameras, Switchers, Servers, Converters, Monitors, Etc.

IP Live takes an industry-wide interoperability approach, and this has been and will continue to be driven by Sony. The company works closely with standardization committees, alliance partners, and customers. Sony ensures the standardization of IP technologies by participating in many different alliances and interop activities. Sony supports the open standard format SMPTE ST2110[1] in the product lineup as the media transport protocol, and AMWA NMOS which ensures device discovery and registration, helping to enhance the interoperability of IP live production.
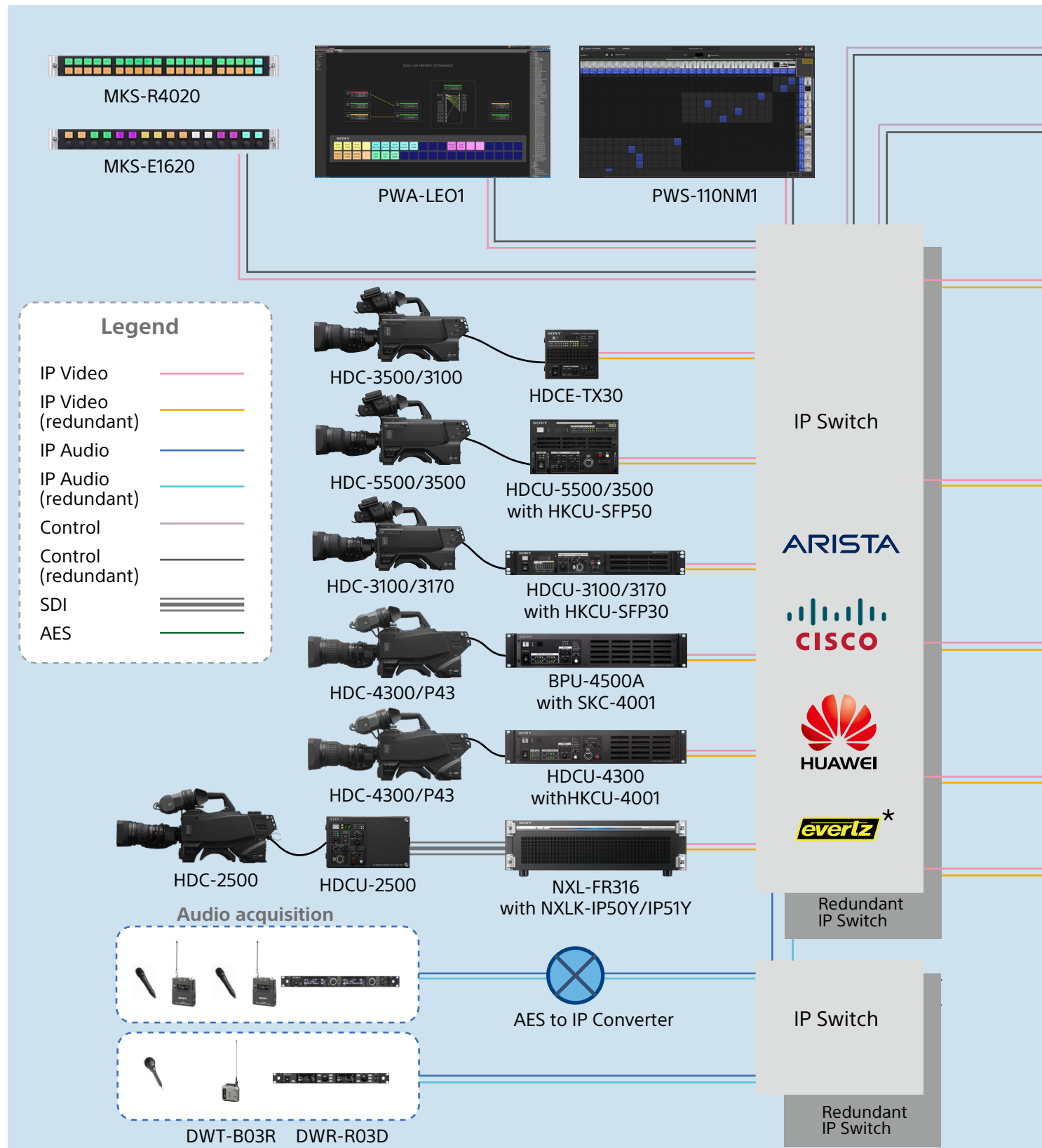
JT-NM[2]
SMPTE
VSF VIDEO SERVICES FORUM
AMWA Networked Media. Working.
AIMS Alliance for IP Media Solutions

*1 As of April 2020, ST2110 is a draft, pending/under development as the SMPTE standard.
*2 Joint Task Force on Networked Media

Sony's IP Live Solution for ST 2110

IP Live Production System Overview

MKS-R4020

MKS-E1620

PWA-LEO1

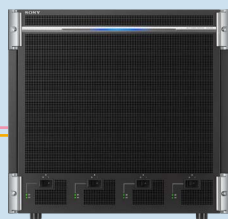PWS-110NM1

Legend

IP Video	
IP Video (redundant)	
IP Audio	
IP Audio (redundant)	
Control	
Control (redundant)	
SDI	
AES	

HDC-3500/3100

HDCE-TX30

HDC-5500/3500

HDCU-5500/3500 with HKCU-SFP50

HDC-3100/3170

HDCU-3100/3170 with HKCU-SFP30

HDC-4300/P43

BPU-4500A with SKC-4001

HDC-4300/P43

HDCU-4300 withHKCU-4001

HDC-2500

HDCU-2500

NXL-FR316 with NXLK-IP50Y/IP51Y

Audio acquisition

AES to IP Converter

DWT-B03R   DWR-R03D

IP Switch

ARISTA

CISCO

HUAWEI

evertz *

Redundant IP Switch

IP Switch

Redundant IP Switch

PWS-110NM1

MKS-R3210/R1620/R1630/R4020/E1620

HDCE-RX30　　HDCU-3500/3100

SDI System

XVS-9000/8000/7000/6000
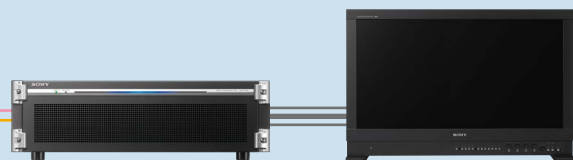w/ C8111/C8166/C9111/C9121

PWS-4500
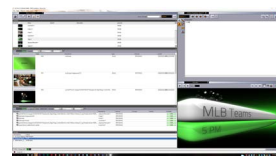w/ PWSK-4509

PWS-110MG1　　USB3.0

ODS-D280U

BVM-HX310

IP Live Alliance Products

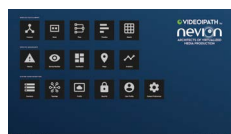Telestream
PTP Grand Master

Vizrt
Graphix

LEADER
Wave Form Monitor
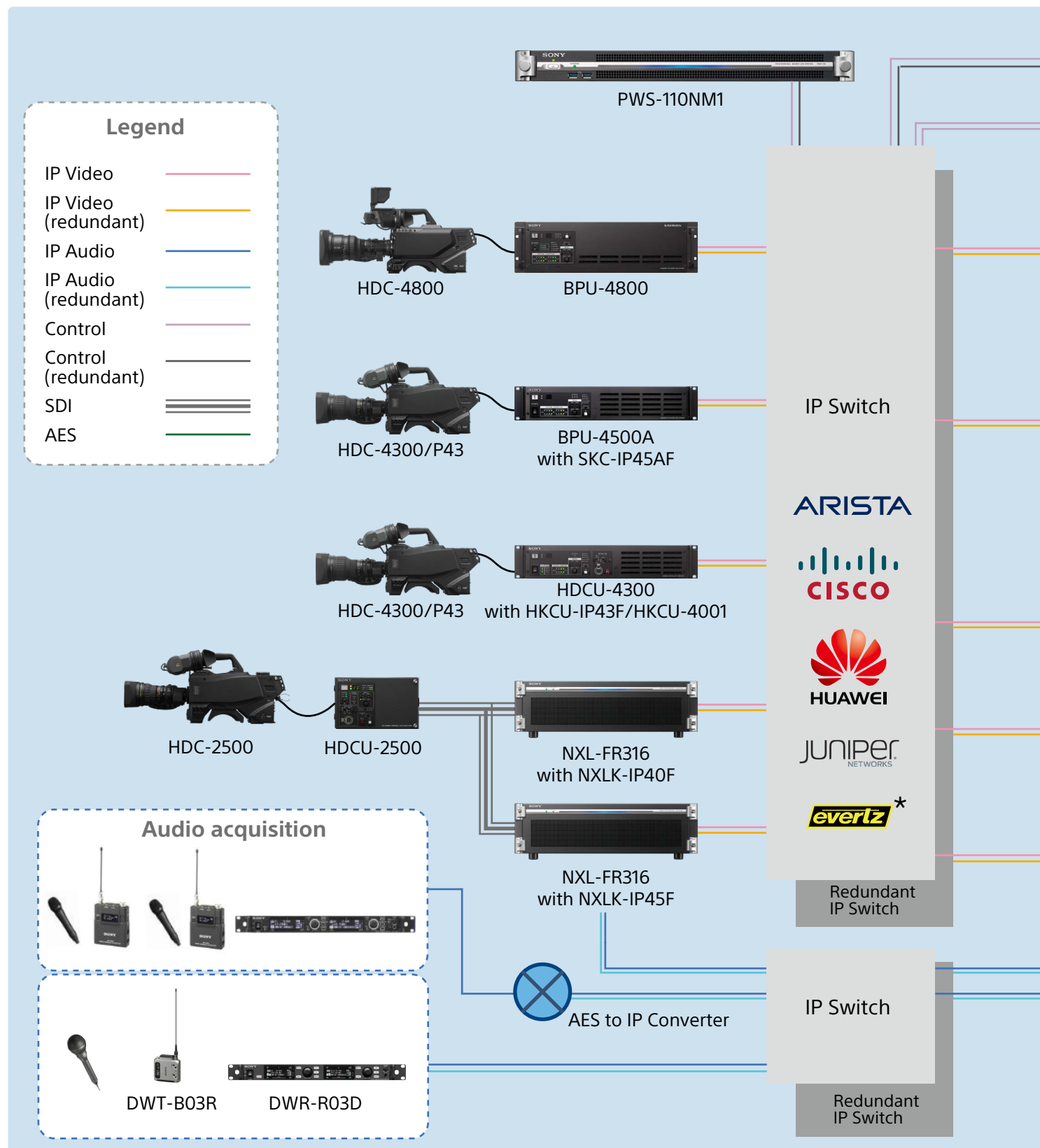
Telestream
Wave Form Monitor

Nevion
Video IPath

Nevion Virtuoso

*For the IP switch manufactured by Evertz, please contact Evertz Microsystems Ltd.

Sony's IP Live Solution for NMI

IP Live Production System Overview

PWS-110NM1

Legend

IP Video	
IP Video (redundant)	
IP Audio	
IP Audio (redundant)	
Control	
Control (redundant)	
SDI	
AES	

HDC-4800   BPU-4800

HDC-4300/P43   BPU-4500A with SKC-IP45AF

HDC-4300/P43   HDCU-4300 with HKCU-IP43F/HKCU-4001

HDC-2500   HDCU-2500   NXL-FR316 with NXLK-IP40F

NXL-FR316 with NXLK-IP45F

IP Switch

ARISTA

CISCO

HUAWEI

JUNIPER NETWORKS

evertz *

Redundant IP Switch

Audio acquisition

AES to IP Converter

IP Switch

DWT-B03R   DWR-R03D

Redundant IP Switch

MKS-R3210/R1620/R1630/R4020/E1620

XVS-9000/8000/7000/6000
with XKS-Q8111/Q8166

PWS-4500
with PWSK-4506F

PWS-110MG1

USB3.0

ODS-D280U

NXL-FR316
with NXLK-IP40F

BVM-HX310

NXL-FR316
with NXLK-IP45F

SDI-Out

IP Live Alliance Products

Controllers

KSC Panel

MAGNUM Orchestration and
Control for Facilities

BFE

evertz

Magellan Panel

VSM Broadcast Control &
Monitoring System

Cerebrum Control
& Monitoring

Imagine COMMUNICATIONS

LAWO

AXON

IP Video Device

4K VoIP PCIe Card

ADVANTECH
Enabling an Intelligent Planet

4K Video Server

4K NMI RXTX Gateway &
VoIP Bridge Converter

IP Gateway on USF frame

FOR.A
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

Imagine COMMUNICATIONS
Up/Down
Converter

Leader
Waveform Monitor

MACNICA
VIPA™ PCIe
Accelerator

NEC
4K/IP Converter
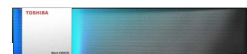
TOSHIBA
Next VIDEOS

IP Audio Device

YAMAHA
IP Audio Mixer

TAMURA
IP Audio Mixer

*For the IP switch manufactured by Evertz, please contact Evertz Microsystems Ltd.

IP Live Remote Production

HDCE-TX30 and HDCE-RX30

Currently you need many people and a lot of equipment at each venue when shooting for an outside broadcast. Remote live production with the HDCE-TX30 in IP direct mode increases your workflow flexibility and saves the cost and time of transporting equipment to all of your venues. Following a typical studio workflow, producers and directors at the broadcasting station can easily give directions to camera operators at the remote venue on a real-time basis using IP intercom technology.

HDCE-TX30

Camera system settings can be done at the venue to match the usual workflow or even from the broadcasting RCP/MSU.

AMWA NMOS regulations IS-04 (Discovery & Registration) and IS-05 (Device Connection Management) are also supported as standard. If you install the dedicated optional software license, you can monitor SNMP devices and control devices using the Ember+ protocol.
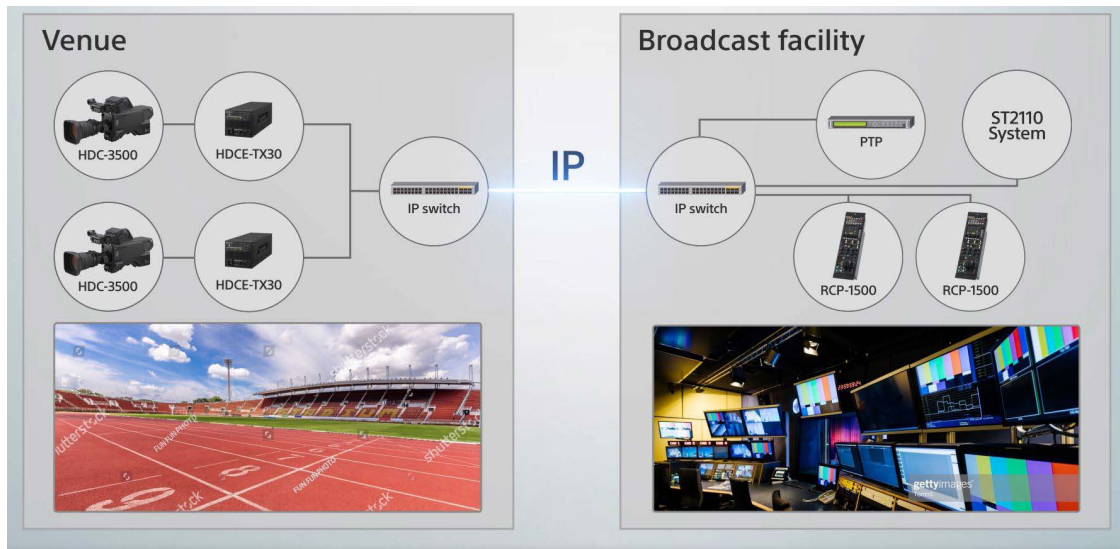
Sony's IP solution supports current systems with SMPTE cables. If you update your system with the HDCE-TX30 and HDCE-RX30, the routing system between your camera and CCU will be changed to IP routing. Currently the transfer distance is determined by the performance of the SMPTE cable and transmission method. On the other hand, remote live production is available even across continents because IP technology overcomes the constraints of distance.

HDCE-RX30

Quick-to-configure control and monitoring devices are available with the Sony IP solution – Live Element Orchestrator (LEO) software – without any physical layout changes. You will have centralized control of the setup and monitoring of each device and of allocation between cameras and remote controllers. .

This is also available at any place where bandwidth is limited, because it supports compressed transmission via a third-party encoder and decoder.

All of these IP remote live production functions are included in Sony's top-end camera system – these functions are not due for future release; they are already available. Sony provides an end-to-end IP remote live solution now!
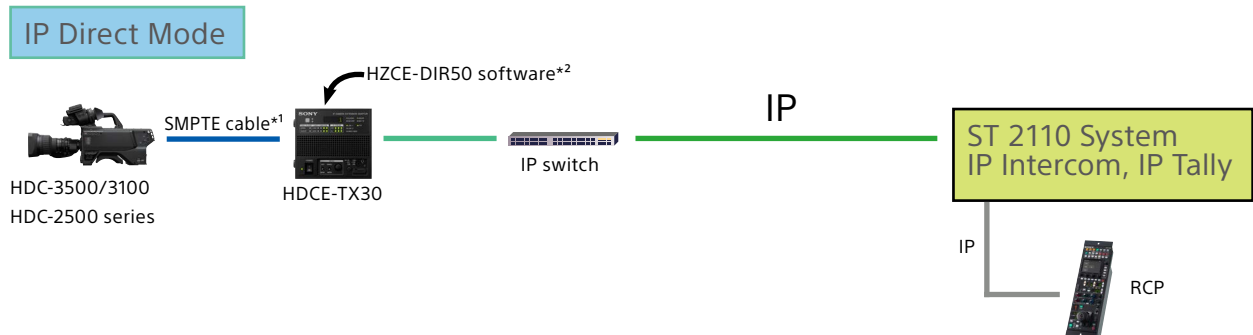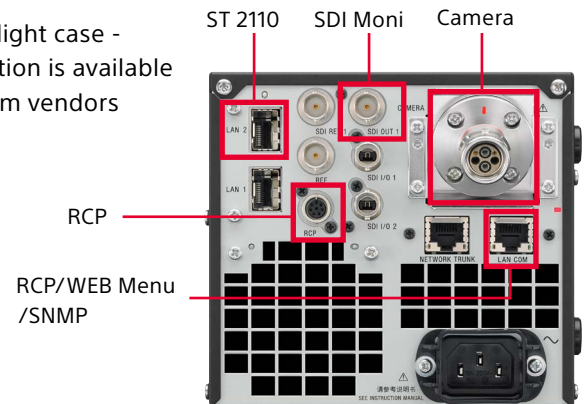
IP Live Remote Production

## HDCE-TX30 IP Camera Extension Adaptor `ST 2110` `NMOS`

Features

- 3U 1/3 of 19-inch rack compact size adaptor, easily carried in a flight case -
  Same operation as the CCU+IP option and third-party collaboration is available
- SMPTE ST 2110 interface as standard, compatible with IP intercom vendors
- Cross-compatibility with the HDC-2500/1700 Series as well as
  the HDC-3500/3100
- Enables you to start setup before network paring, trunk
  operation, etc., which is ideal for field operation

IP Direct Mode

HDCE-RX30 IP CCU Extension Adaptor `ST 2110` `NMOS`

Features

- 3U 1/3 of 19-inch rack compact size adaptor, easily carried in a flight case
- Provides the ideal migration path from a current SMPTE fiber system to IP
  remote production
- The HDCE-TX30 powers the camera head; the HDCE-RX30 is powered by the CCU
- SMPTE ST 2110 interface as standard, compatible with IP intercom vendors
- Cross-compatibility with the HDCU-2500/1700 Series as well as the HDCU-3500/3100

IP Pair Mode
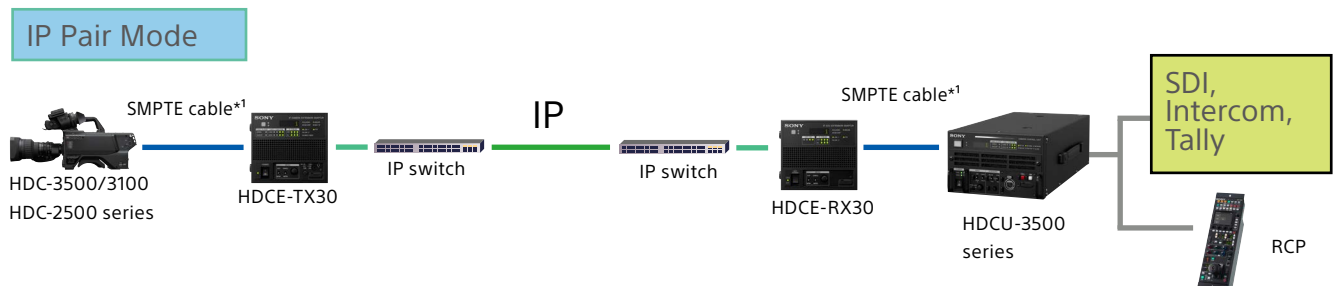
*1 Power is supplied through a SMPTE cable. *2 Optional HZCE-DIR50 software is required.

IP Live Interfaces of Sony's High-End Live Products

IP Live Interfaces of System Camera

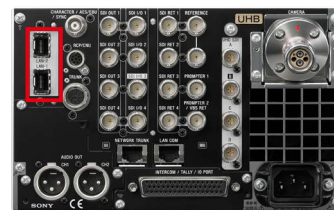### HKCU-SFP50 (HDCU-5500/HDCU-5000/HDCU-3500 option)

ST 2110 **NMOS**

[ST 2110 LAN]
- Number of Video output: HD x3
- Number of Video input: HD x3(return)
- Audio: Input x3/ Output x2
- Intercom: 2ch
- Connector: SFP+/SFP28
- Number of port: 2
- Signal formats:10G/25GBASE-**
- (Depends on SFP+/SFP28 transceiver module)
- Recommended transceiver:OTM-10GSR1, OTM-25GSR
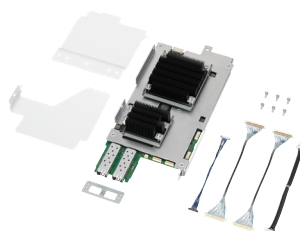
HKCU-SFP50

HDCU-5500

*1

HKCU-SFP30 (HDCU-3100/HDCU-3170 option)

ST 2110 **NMOS**

[ST 2110 LAN]
- Number of Video output: HD x3
- Number of Video input: HD x3 (Return)
- Audio: Input x2 / Output x2
- Intercom: 2ch
- Connector: SFP+/SFP28
- Number of port: 2
- Signal formats: 10G/25GBASE-**
  (Depends on SFP+/SFP28 transceiver module)
- Recommended transceiver: OTM-10GSR1, OTM-25GSR

HDCU-3100/HDCU-3170

*1

HKCU-SFP30

HKCU-4001 (HDCU-4300 option) **ST 2110**

[ST 2110 LAN]
- Number of Video output: HD x3
- Number of Video input: HD x2 (Return)
- Audio:Input x2/Output x2
- Intercom: 2ch
- Connector: SFP+/SFP28
- Number of port: 2
- Recommended transceiver: OTM-10GSR1, OTM-25GSR

HDCU-4300

SKC-4001 (BPU-4500A option) **ST 2110**

[ST 2110 LAN]
- Number of Video output: 4K x1/ HD x2*²
- Number of Video input: HD x3(return)*²
- Audio: MiC x1/ AES x2
- Intercom: 2ch

- Connector: SFP+/SFP28
- Number of port: 4
- Signal formats:10G/25GBASE-**
  (Depends on SFP+/SFP28 transceiver module)
- Recommended transceiver:OTM-10GSR1, OTM-25GSR

*1 Sponsored by the JT-NM and administered by the EBU and IRT — two topEuropean technical bodies — the JT-NM Tested program offers prospectivepurchasers of IP based equipment greater, more documented insight into howvendor equipment aligns to the SMPTE ST 2110, SMPTE ST 2059 standards and theJT-NM TR-1001-1 and AMWA NMOS IS-04 & IS-05 specifications. Vendors whosubmitted equipment to be tested and agreed to make their results public are listed,with their products' test results in the JT-NM Tested catalog which is publiclyavailable at the IP Showcase booth at IBC 2019 and at http://jt-nm.org/jt¬nm_tested. This catalog provides transparency, describing the test criteria andtesting methodology, as well as the hardware and software versions of the productsthat were tested. While JT-NM Tested is not a certification program, it will provide asnapshot in time of how vendor equipment aligns to key parts of SMPTE standardsand the JT-NM TR-1001-1 and NMOS specifications, providing prospectivepurchasers and users with a reference as they begin their equipment evaluation andqualification process.
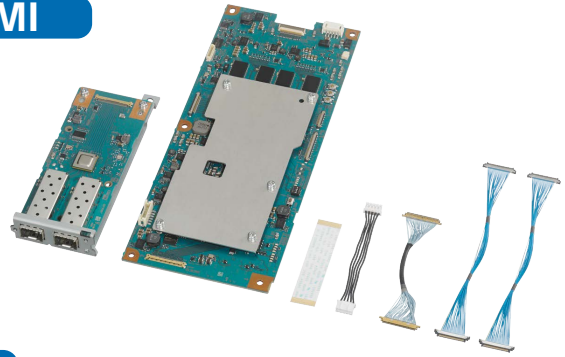*2 Input and output signals are via the HDCU-3100 in which the HKCU-SFP30 is installed.
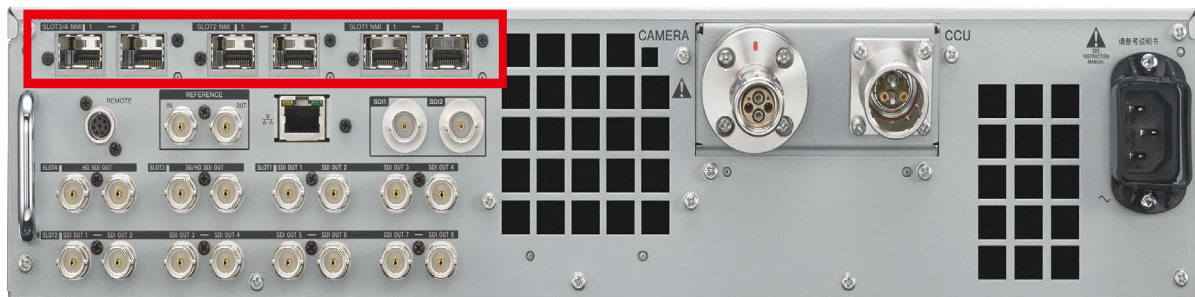
HKCU-IP43F (HDCU-4300 option)   NMI

[NMI LAN]
• Number of streams: 4K x 1 or HD x1
• Connector: SFP+
• Number of port: 2
• Signal formats: 10GBASE-**

  (Depends on SFP+ transceiver module)
• Recommended Transceiver: OTM-10GSR1

BPU-4500A with SKC-IP45AF   NMI

[NMI LAN]
• Number of streams: 4K x2, HD x1
• Connector: SFP+
• Number of port: 6
• Signal formats: 10GBASE-**

  (Depends on SFP+ transceiver module)
• Recommended Transceiver: OTM-10GSR1

BPU-4800   NMI

[NMI LAN]
• Number of streams: 4K x2, HD x1
• Connector: SFP+
• Number of port: 6
• Signal formats: 10GBASE-
    ** (dependent on SFP+ transceiver module)
• Recommended Transceiver: OTM-10GSR1

IP Live Interfaces of Production Server

PWSK-4509 - ST 2110 Interface Board `ST 2110` `NMOS`

- Number of streams: 4K x4 or HD x 8
- Connector: SFP28
- Number of port : 8 (redundancy for 4 ports)
- Signal formats: 25GBASE
- HD Monitor: Output from ST 2110 ports with OSD

PWSK-4509

PWSK-4506F - Networked Media Interface Board (PWS-4500 option) `NMI`

[NMI LAN]
- Number of streams: 4K x4 or HD x8 (6 in / 2 out)
- Connector: SFP+
- Number of port: 8
- Signal formats: 10GBASE-**
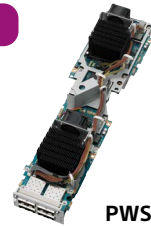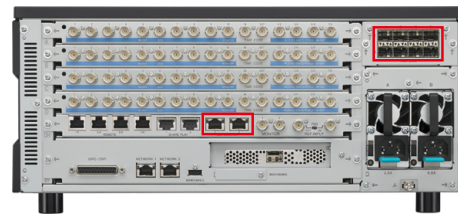 (Depends on SFP+ transceiver module)
- Recommended Transceiver: OTM-10GSR1

[NMI Monitor]
- Number of streams: HD LLVC x4
- Connector: RJ-45 (1G)
- Number of port: 2

PWSK-4506F

PWS-4500

IP Live Interfaces of Production Switcher

XKS-C9111/C9121 (XVS-9000 Option) `ST 2110` `NMOS` [*1]

- XKS-C9111: 4K/HD ST2110 Input
- XKS-C9121: 4K/HD ST2110 Input and Output
- Connector: QSFP28
- Number of port: 4
- Signal formats: 100GBASE-**
  (Depends on QSFP28 transceiver module)

XKS-C9111

XKS-C9121

XKS-C8111/C8166 `ST 2110` `NMOS` [*1]
(XVS-8000/7000/6000 Option)

- XKS-C8111: 4K/HD ST2110 Input
- XKS-C8166: 4K/HD ST2110 Output
- Connector: QSFP28
- Number of port: 2
- Signal formats: 100GBASE-**
  (Depends on QSFP28 transceiver module)

XKS-C8111

XKS-C8166

XKS-Q8111 (Input) `ST 2110` `NMI`
XKS-Q8166 (Output) `ST 2110` `NMI`
(XVS-8000/7000/6000 option)

- XKS-Q8111: HD ST2110, 4K/HD NMI Input
- XKS-Q8166: HD ST2110, 4K/HD NMI Output
- Connector: QSFP+
- Number of port: 2
- Signal formats: 40GBASE-**
  (Depends on QSFP+ transceiver module)
- Recommended Transceiver: AVAGO AFBR-79EIDZ /AFBR-79EQDZ

XKS-Q8111

XKS-Q8166

*1 AMWA NMOS regulations will be supported after version 3.4.

PWS-110NM1 – IP Live System Manager Station   NMOS

The PWS-110NM1 IP Live System Manager Station comes
with IP Live System Manager software that allows you
to setup, control, and reconfigure an IP live production
system.

System Configuration

The IP Live System Manager provides a variety of configuration
functionalities such as router setting, monitoring setting,
redundancy setting, device registration, workgroup registration,
and user registration. These configuration settings can be flexibly
modified, and the user can build several production systems
under one networked system of AV devices.
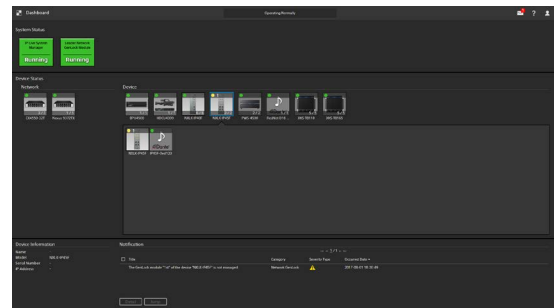
Video and Audio Routing and Tally Capability

IP Live System Manager software provides video and audio
routing functionality that is similar to video routers. You can
choose how to assign control buttons and configure the layout,
according to your needs and preferences.
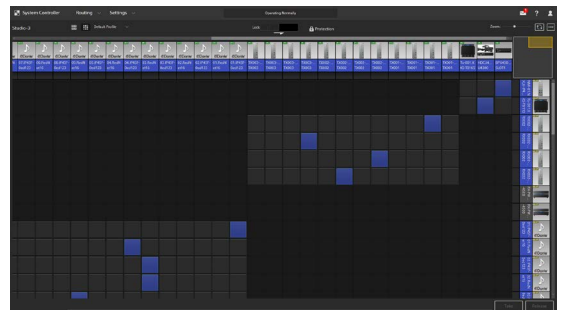
Network Monitoring

You can monitor device status with a network topology view; this
helps you to intuitively understand where any error is occurring.
A variety of status indicators are available such as network switch
status indication and device status indication.
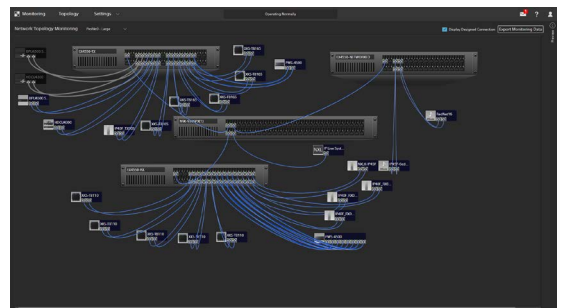
System Maintenance Functionality

The PWS-110NM1 collects status logs from AV and network devices, providing basic system maintenance functionality. By using Sony's remote maintenance service, the PWS-110NM1 can communicate with a remote maintenance server allowing remote users and Sony's support team to detect and investigate system issues.

Software Licenses Extend Functionality

You can extend the variety of IP Live System Manager functionality by installing software license keys, configuring the IP Live System Manager by choosing functionalities that precisely fit your system requirements.

Licenses	Description
PWSL-NM10	**IP Live System Manager License** - Basic license - Up to 128 I/O - Up to 20 simultaneous user access
PWSL-NM11	**128 I/O Port License** - Additional 128 I/O
PWSL-NM12	**Redundant System License** - Necessary for redundant LSM configuration
PWSL-NM13	**10 User License** - Additional 10 simultaneous user access
PWSL-NM14	**UHD License** - Enables 4K/8K
PWSL-NM15	**Audio Control License** - Provides Audio over IP control
PWSL-NM16	**Gateway License for Ember+** - Enables controllers w/Ember+ protocol such as VSM to control LSM
PWSL-NM17	**Tally License** - to support TSL UMD Protocol
PWSL-NM18	**NMOS License** - to support NMOS proxy
PWSL-NM20	**System Controller License** - Activate NS-BUS devices (necessary for more than 3 NS-BUS devices) - Control XVS Switcher and SDI Router matrix from LSM *2 - Activate NS-BUS Tally *3

*1 All licenses are varid for 5 years. One-year extention licenses are available which can be installed any time the original licenses are effective.

*2 Available when XVS Switcher and 3rd party SDI Router supports NS-BUS   *3 Available when receiving devices supports NS-BUS Tally

General specifications		
Power requirement	100 V to 240 V AC	
	50/60 Hz	
Power consumption	235 W	
Standby power consumption	3 W or lower	
Operating temperature	5 °C to 35 °C (41 °F to 95 °F)	
Storage temperature	-20 °C to +60 °C (-4 °F to +140 °F)	
Operating humidity	20% to 90% (relative humidity)	
Storage humidity	5% to 80%	
Mass	10.4 kg (22 lb 15 oz)	
Dimensions (W x H x D)	440 × 43.6 × 507 mm (17 3/8 × 1 3/4 × 20 in)	
CPU	Processor	Intel Core i7-3770 (3.4 GHz)
	Memory	8 GBytes
		SO-DIMM (DDR3) (×2)
	Drive (m-SATA)	120 GBytes
	Expansion bus	PCIe Gen2 8Lane (30 W) (×2)

Inputs/outputs	
LAN	RJ-45 (×2)
	1000BASE-T
	100BASE-TX
USB (front panel/rear panel)	Super Speed USB (USB 3.0) Type A (6, 2 on front and 4 on rear)
	Front: Power delivery support (900 mA/port)
	Rear: Power delivery support on bottom right port (900 mA), not supported on other three ports
HDMI	Type A (×1)
	HDMI Ver. 1.4a, 1920 × 1200 maximum resolution, 60 Hz
DisplayPort	DisplayPort (×1)
	DisplayPort Ver. 1.1a, 2560 × 1600 maximum resolution, 60 Hz

Supplied accessories	
	Operation manual (1), Installation manual (1), Operation guide (1)

PWA-LEO1 - Live Element Orchestrator

System orchestration and management software for IP Live production

Live Element Orchestrator is a strong orchestration software to increase the performance and utilization of resources, as well as to reduce the system downtime, further improving productivity in content production. This application provides overall system management of an IP-based production system. By supporting major industry protocols, both Sony and third-party solutions can be equally supported. Enabling resources to be shared across multiple locations, configurations to be set-up centrally and operations across all equipment to be monitored, the solution optimises system performance. Sony developed its Live Element Orchestrator in collaboration with Skyline Communications (Belgium) adopting the company's DataMiner, an end-to-end management and orchestration solution, as a core technology. DataMiner has been adopted by numerous media companies and organizations globally and is yet another collaboration which will offer further value and operability to broadcasters who are investing in IP-based live production.
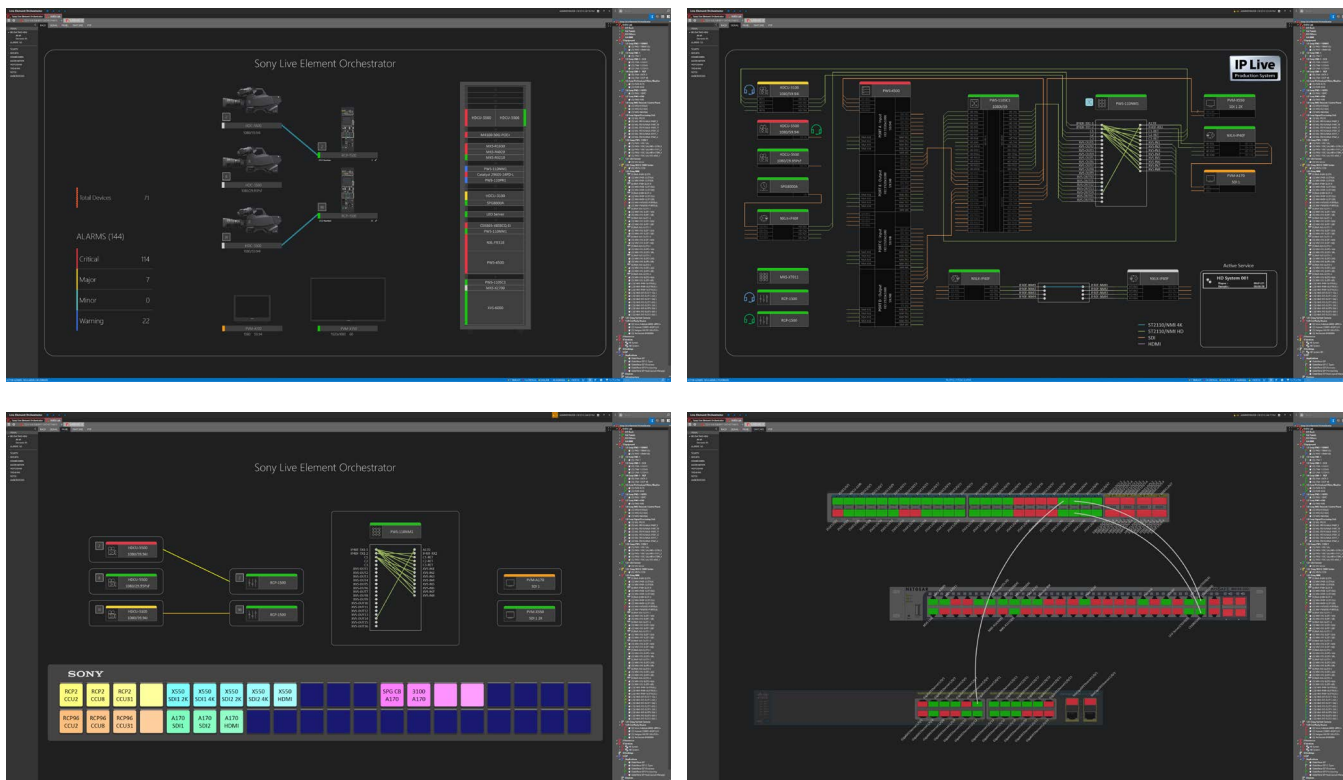
Live Element Orchestrator

System orchestration and management software for IP Live production

Key Benefits
- Centralized Device Configuration & Setup
  e.g. 4K / HD format change, Resource re-allocation in system level
- Centralized Monitoring: Monitor the entire system regardless of location
- Multi-vendor Support: Able to support any 3rd party device, standard or proprietary
- Panel Operation: Easy operation from software & hardware panels
- COTS Server: Utilized with Commercial Off-The-Shelf hardware
- Robustness: Supports redundancy and clustering configuration
- Scalable: Scalable from small system to large scaled deployment

Recommended Server Specification

Item	Specification Requirement
Processor	Intel Xeon or similar (Passmark CPU mark > 10000)
Memory	32GB (min. 16GB)
Hard Disk	Disk for OS: 600 GB SAS (10k RPM) (RAID 1, hot-pluggable) Disk for Cassandra database: 600 GB SAS (10k RPM) (RAID 1, hot-pluggable)
Network	Dual Ethernet interfaces recommended
Power Supply	Redundant (hot-pluggable) recommended
Supported OS	Windows Server 2016 Standard Edition

MKS-R3210 /MKS-R1620/ MKS-R1630

The MKS-R series remote panel controls matrix cross points of both IP and SDI routers connected to NS-BUS system.

MKS-R3210

MKS-R1620

MKS-R1630

Multiple buttons and functionalities

MKS-R3210 has 32 buttons for source and destination switching, where MKS-R1620 has 16 buttons with source and destination display. MKS-R1630 has 2 inch display for status indication, showing source, destination and levels, and used for easy configuration of the remote panel. All products support multiple functions such as Salvo, Chop, Protect, Lock, etc. User friendly web menu for configuration.

MKS-R4020/ MKS-E1620

MKS-R4020 is a hardware control panel which has 40 LCD buttons to provide multiple functions that are freely assigned from Live Element Orchestrator. This control panel can also operate as a routing control panel of IP Live System Manager Station.
MKS-E1620 is a unique control surface that has 16 rotary knobs with 16 LCD displays. The mission of this control panel is to adjust device parameters such as audio gain of HDCU-3000 and 5000 series and HDR parameters for NXLK-IP50Y/51Y which are executed through Live Element Orchestrator.

MKS-R4020

MKS-E1620

Redundant network and power supply

Redundant power supply by DC IN and PoE. Network redundancy supported by two network ports.

General	
Power supply	37V, 57V (PoE), DC IN 12V
Current consumption	0.3A, 0.2A (PoE), 0.7A DC
Dimensions (W x H x D)	440 x 43.6 x 90 mm (17 3/8 x 1 3/4 x 3 5/8 in)
Mass	MKS-R3210: Approx. 1.2 kg (2 lb 10 oz), MKS-R1620: Approx. 1.3 kg (2 lb 14 oz), MKS-R1630: Approx. 1.3 kg (2 lb 14 oz), MKS-R4020: Approx. 1.4 kg (3 lb 1.4 oz), MKS-E1620: Approx. 1.5kg (3 lb 4.9 oz)
Temperature ranges	Operational temperature: 5°C to 40°C (41°F to 104°F) Storage temperature: -20°C to +60°C (-4°F to +140°F)

Inputs/outputs	
LAN	RJ-45 (×2) (PoE x1)
	1000BASE-T

PWS-110RS1 - Routing Control System

The PWS-110RS1 Routing Control Station is a system controller for a 4K/HD SDI router in the NS-BUS system. In addition to a software-based panel which is featured by default, the system can utilize MKS-R3210/MKS-R1620 /MKS-R1630 device controllers for cross-point switching. System redundancy is available when two PWS-110RS1 units are configured.

NXL-FR316 - Frame for SDI-IP Conversion Option Boards

The NXL-FR316 is a 3RU-sized rack-mountable frame which provides the power supply for optional boards.

16 Flexible Slots For SDI-IP Conversion Option Boards

With 16 open slots, the NXL-FR316 signal processing unit enables flexible loading and combination of optional NXLK-IP40F or NXLK-IP45F boards. This means you can configure the system to fit your precise requirements.

Redundant Power Supply

The NXL-FR316 comes with two power supply modules for redundancy.

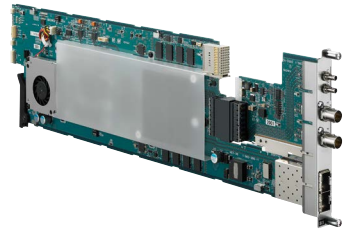| General specifications		
Power supply	AC 100 V to 240 V $\pm$10% 50/60 Hz, dual	
Power consumption	800 W	
Dimensions (W x H x D)	440 × 132 × 440 mm (17 3/8 × 5 1/4 × 17 3/8 in)	
Mass	Approx. 14 kg (30 lb 14 oz)	
	Operation guaranteed temperature: 5 °C to 40 °C (41 °F to 104 °F)	
Temperature ranges	Performance guaranteed temperature: 10 °C to 35 °C (50 °F to 95 °F)	
	Storage temperature: -20 °C to +60 °C (-4 °F to +140 °F)	
I/O specifications		
	Connector	BNC (×2), loop through 75 Ω
REFERENCE IN	Number of lines	1 (loop through)
	Signal formats	HD tri-level sync signal, analog black burst signal, analog SYNC signal
STATUS OUT	Connector	D-sub 15-pin (female)
	Signal formats	Open collector
	Connector	RJ-45
NETWORK	Number of lines	1
	Signal formats	Ethernet 100BASE-TX compliant
AUX-IN	Connector	BNC (×1)
Supplied accessories		
	Operation manual (1)	
Optional accessories		
	RMM-10 rack mount bracket, Power cord	

NXLK-IP50Y - SDI-IP Converter Board ST 2110

The NXLK-IP50Y SDI-IP Converter Board offers eight 1.5/3G-SDI bi-directional ports plus SFP+(10Gb Ethernet) or SFP28 (25Gb Ethernet) port for network connection redundancy. Compatible with ST 2110-20/30/40 streaming formats and offering very low latency signal conversion, it's ideal for integration in real-time IP Live production environments.
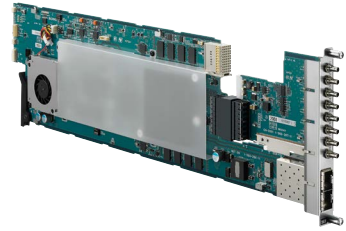
NXLK-IP51Y - 12G SDI-IP Converter Board ST 2110

The NXLK-IP51Y 12G SDI-IP Converter Board offers two 1.5/3G-SDI bi-directional and two 12G-SDI x2 bi-directional ports, plus dual SFP28 (25-Gb Ethernet) ports for network connection redundancy. Compatible with ST 2110-20/30/40 streaming formats and offering very low latency signal conversion, it's ideal for integration in real-time IP Live production environments.

General specifications		NXLK-IP50Y	NXLK-IP51Y
Power supply		DC 12 V (supplied from NXL-FR316)	
Power consumption		3.3 A 40 W	
Dimensions (W × H × D)		Main board: 114.5 × 13.1 × 408.7 mm (4 5/8 × 17/32 × 16 1/8 in)	
		Connector board: 131 × 17.7 × 95.4 mm (5 1/4 × 23/32 × 3 7/8 in)	
Mass		Main board: 370 g (13 oz), Connector board: 100 g (3.5 oz)	
Temperature ranges		Operation guaranteed temperature: 5 °C to 40 °C (41 °F to 104 °F)	
		Performance guaranteed temperature: 10 °C to 35 °C (50 °F to 95 °F)	
		Storage temperature: -20 °C to +60 °C (-4 °F to +140 °F)	
I/O specifications			
SDI	Connector	DIN 1.0/2.3 (x1) 75 Ω	DIN 1.0/2.3 (x1) 75 Ω, BNC (x1) 75 Ω
	Number of lines	4 inputs	4 inputs, 4 input/outputs
	Signal formats	SMPTE ST 424, SMPTE ST 292-1	SMPTE ST 424, SMPTE ST 292-1, SMPTE ST 2082
Network (LAN)	Connector	SFP28	
	Number of lines	2	
	Signal formats	25GBASE-** (using an SFP28 transceiver module)	
		For details on supported SFP28 transceiver modules (such as OTM-25GSR/OTM-25GLR), contact your local Sony representative.	
Supplied accessories			
		Operating Instructions (1)	

NXLL-MC50

NXLL-MC50 is a software license to activate Up & Down conversion and SDR & HDR conversion functionality of NXLK-IP50Y/51Y.

NXLL-SN50

NXLL-SN50 is a software license to activate SNMP functionality of NXLK-IP50Y/51Y.

NXLL-AM50

NXLL-AM50 is a software license to activate audio delay functionality. Delay can be set for an IP audio input and output as SDI signal.

NXLK-IP40F - SDI-IP Converter Board [NMI]

The NXLK-IP40F SDI-IP converter board provides four 3G-SDI ports and two SFP+ ports for redundancy in network connection. The NXLK-IP40F can convert signals in very low latency which enables live production.
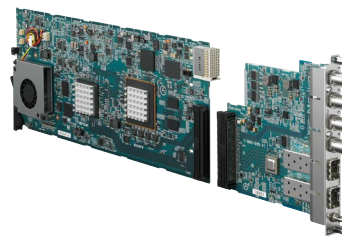
Support SDI-IP Conversion Of 4K/HD Signals

Supporting both 4K and HD video signals, the NXLK-IP40F is equipped with four 3G-SDI I/O ports and can convert signals from SDI to IP and from IP to SDI.

Long-Distance Signal Transmission By SFP+ Interface

The NXL-IP40F can transmit up to 300 meters using multi-mode fiber cable with the optional OTM-10GSR1 SFP+ transceiver.

General specifications		
Power supply		DC 12 V (supplied from NXL-FR316)
Power consumption		2.0 A 24 W
Dimensions (W × H × D)		Main board: 114.5 × 16.15 × 275.8 mm (4 5/8 × 21/32 × 10 7/8 in)
		Connector board: 131 × 17.68 × 117.25 mm (5 1/4 × 23/32 × 4 5/8 in)
Mass		Main board: 220 g (2.8 oz)
		Connector board: 150 g (5.3 oz)
Temperature ranges		Operation guaranteed temperature: 5 °C to 40 °C (41 °F to 104 °F)
		Performance guaranteed temperature: 10 °C to 35 °C (50 °F to 95 °F)
		Storage temperature: -20 °C to +60 °C (-4 °F to +140 °F)
I/O specifications		
SDI	Connector	BNC 75 Ω
	Number of lines	4
	Signal formats	SMPTE ST 424, SMPTE ST 292-1
REF OUT	Connector	DIN 1.0/2.3, 75 Ω
	Number of lines	1
	Signal formats	HD tri-level sync signal, black burst signal (NTSC, PAL), SYNC signal (NTSC, PAL)
NMI LAN	Connector	SFP+
	Number of lines	2
	Signal formats	10GBASE-** (dependent on SFP+ transceiver module)
		For details on supported SFP+ transceiver modules, contact your local Sony service representative.
Supplied accessories		
		Operation manual (1)
Supported formats		
SDI input/output		1920 x 1080 59.94i, LLVC compression or uncompressed
		1920 x 1080 50i, LLVC compression or uncompressed
		3840 x 2160 59.94p Level-A, 2SI or SQD, LLVC compression
		3840 x 2160 50p Level-A, 2SI or SQD, LLVC compression

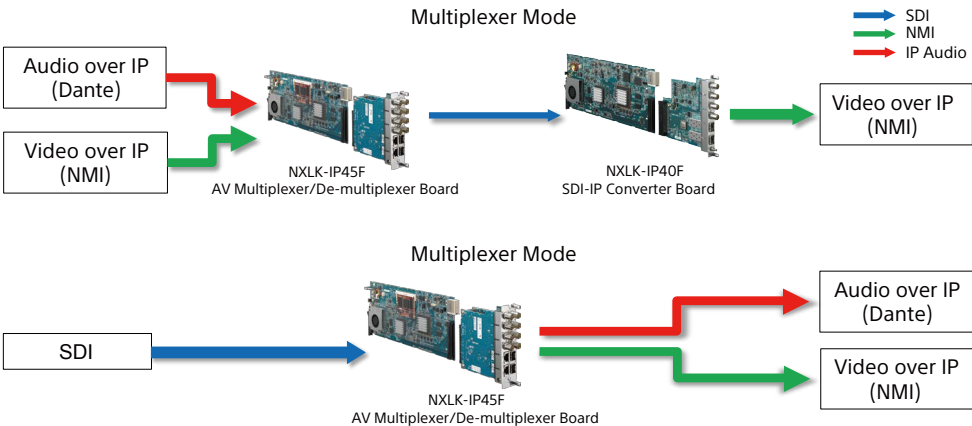# NXLK-IP45F - AV Multiplexer/Demultiplexer Board `NMI`

The NXLK-IP45F is an IP interface board for audio, allowing multiplex and demultiplex of audio signal onto video signals, in addition to the SDI-to-IP and IP-to-SDI conversion capability of the NXLK-IP40F.
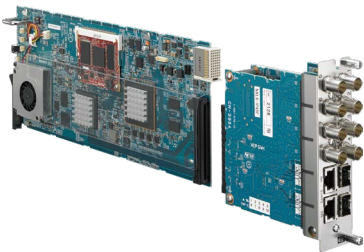
Multiplexing & Demultiplexing Audio And Video over IP

The NXLK-IP45F can multiplex the audio and video over IP signals, and output to the SDI interface. And conversely, it can demultiplex the audio and video on SDI, and output them as separated signals on IP.

Multiplexer Mode

→ SDI
→ NMI
→ IP Audio

Audio over IP (Dante)
Video over IP (NMI)

NXLK-IP45F
AV Multiplexer/De-multiplexer Board

NXLK-IP40F
SDI-IP Converter Board

Video over IP (NMI)

Multiplexer Mode

SDI

NXLK-IP45F
AV Multiplexer/De-multiplexer Board

Audio over IP (Dante)
Video over IP (NMI)

Supports Dante

For the audio format over IP, the NXLK-IP45F supports Dante format that is widely adopted as standard.

General specifications		
Power supply	DC 12 V (supplied from NXL-FR318)	
Power consumption	2.5 A 30 W (3 slot occupancy)	
Dimensions (W × H× D)	Main board: 114.5 × 28 × 275.8 mm (4 5/8 × 1 1/8 × 10 7/8 in)	
	Connector board: 131 × 35.2 × 117.25 mm (5 1/4 × 1 7/16 × 4 5/8 in)	
Mass	Main board: Approx. 244 g (8.6 oz)	
Connector board	Approx. 250 g (8.8 oz)	
Temperature ranges	Operation guaranteed temperature: 5 °C to 40 °C (41 °F to 104 °F)	
	Performance guaranteed temperature: 10 °C to 35 °C (50 °F to 95 °F)	
	Storage temperature: -20 °C to +60 °C (-4 °F to +140 °F)	
I/O specifications		
SDI	Connector	BNC 75 Ω
	Number of lines	Input/output: 4
		Output: 4
Signal formats		SMPTE ST 424
NMI LAN	Connector	SFP+
	Number of lines	2
	Signal formats	10GBASE-** (dependent on SFP+ transceiver module)
		For details on supported SFP+ transceiver modules (e.g., OTM-10GSR1), contact your local Sony service representative.
DANTE LAN	Connector	RJ-45
	Number of lines	2
	Signal formats	1000BASE-T
Supplied accessories		
	Operation manual (1)	
Supported formats		
SDI input/output	3840 x 2160 59.94p Level-A, 2SI or SQD, LLVC compression	
	3840 x 2160 50p Level-A, 2SI or SQD, LLVC compression	

OTM-10GSR1, OTM-25GSR, OTM-25GLR, OTM-100GSR

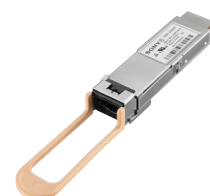Optical transceiver modules for 10G, 25G and 100G interfaces.

OTM-10GSR1	**OTM-25GSR**	**OTM-25GLR**	**OTM-100GSR**

General specifications				
	OTM-10GSR1	OTM-25GSR	OTM-25GLR	OTM-100GSR
Connector	LC Duplex optical connector	LC Duplex optical connector	LC Duplex optical connector	MPO optical connector
Signal Format	10GBASE-SR	25GBASE-SR	25GBASE-LR	802.3bm 100GBASE-SR4
Media Type	Multi Mode	Multi Mode	Single Mode	Multi Mode

Verified IP Switches

Sony's IP Live supports IP switches made by the major manufacturers listed below.

Manufacturer	Model	Description
ARISTA	DCS-7280CR2-60	240x 10/25 Gbps ports and 60x 40/100 Gbps ports, 2 RU
ARISTA	DCS-7280SR2-48YC6	48x 1/10/25 Gbps ports and 6x 40/100 Gbps ports, 1 RU
CISCO	Nexus93180YC-FX	48x 1/10/25 Gbps ports and 6x 40/100 Gbps ports, 1 RU
CISCO	Nexus92160YC-X	48x 1/10/25 Gbps ports and 6x 40/100 Gbps ports, 1 RU
CISCO	Nexus9336C-FX2	36x 40/100 Gbps ports, 1 RU
CISCO	Nexus9364C	64x 40/100 Gbps ports, 2 RU
CISCO	Nexus9236C	36x 40/100 Gbps ports, 1 RU
CISCO	Nexus9332PQ	32x 40 Gbps ports, 1 RU
CISCO	Nexus9272Q	72x 40 Gbps ports, 2 RU
CISCO	SG300 series	10 to 50x 1 Gbase-T ports, 1 RU for Dante IP Audio
CISCO	Catalyst2960-X series	24x or 48x 1 Gbase-T, SFP or SFP+ ports, 1 RU for Control
HUAWEI	CE6865-48S6CQ-EI	48x 1/10/25 Gbps ports and 6x40/100 Gbps ports, 1 RU
HUAWEI	CE6870-48S6CQ-EI	48x 1/10 Gbps ports and 6x40/100 Gbps ports, 1 RU
HUAWEI	CE6851-48S6Q-HI	48x 1/10 Gbps ports and 6x40 Gbps ports, 1 RU
HUAWEI	CE8850-32CQ-EI	32x 40/100 Gbps ports, 1 RU
HUAWEI	CE8850-64CQ-EI	64x 40/100 Gbps ports, 2 RU
JUNIPER	EX4550-32F	32x 1/10 Gbps SFP+ ports, 1 RU, Expansion module is required for uplink
JUNIPER	EX4550-32T	32x 1/10 Gbase-T ports, 1 RU, Expansion module is required for uplink
JUNIPER	EX4550-EM-2QSFP	2x 40 Gbps ports expansion module for EX4550
JUNIPER	EX4550-EM-8XT	8x 1/10 Gbase-T ports expansion module for EX4550
JUNIPER	EX4550-EM-8XSFP	8x 1/10 Gbps SFP+ ports expansion module for EX4550
JUNIPER	QFX5100-24Q	24x 40 Gbps ports, 1 RU
JUNIPER	QFX-EM-4Q	4x 40 Gbps ports expansion module for QFX5100

Note:The above descriptions are only verified by Sony, not all specifications of the manufacturers.

The information is as of April 2020 and subject to change without notice.

For the IP switch manufactured by Evertz, please contact Evertz Microsystems Ltd.

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