datasheet

Virtuoso Platform

Nevion Virtuoso

Media Processing & Transport Platform

Nevion Virtuoso is a revolutionary software-defined media function virtualization platform, offering wide-ranging functionality for live production, contribution and professional media transport applications.

The Nevion Virtuoso platform is designed to meet the challenges of live IP media production and transport, where the distinction between local and wide-area media networks is blurring, and where virtualization plays an increasing role, leading to faster time-to-production and greater cost-effectiveness.

Nevion Virtuoso runs a variety of Media Functions to perform different tasks, including video and audio processing, encoding and decoding, network and content security, confidence monitoring and IP transport protection for media and data.

The virtualization of Media Functions is achieved through flexible network-attached Media Nodes and Media Accelerator cards. Provisioning of a new Media Function is easy and future-proof thanks to a software and license-based approach.

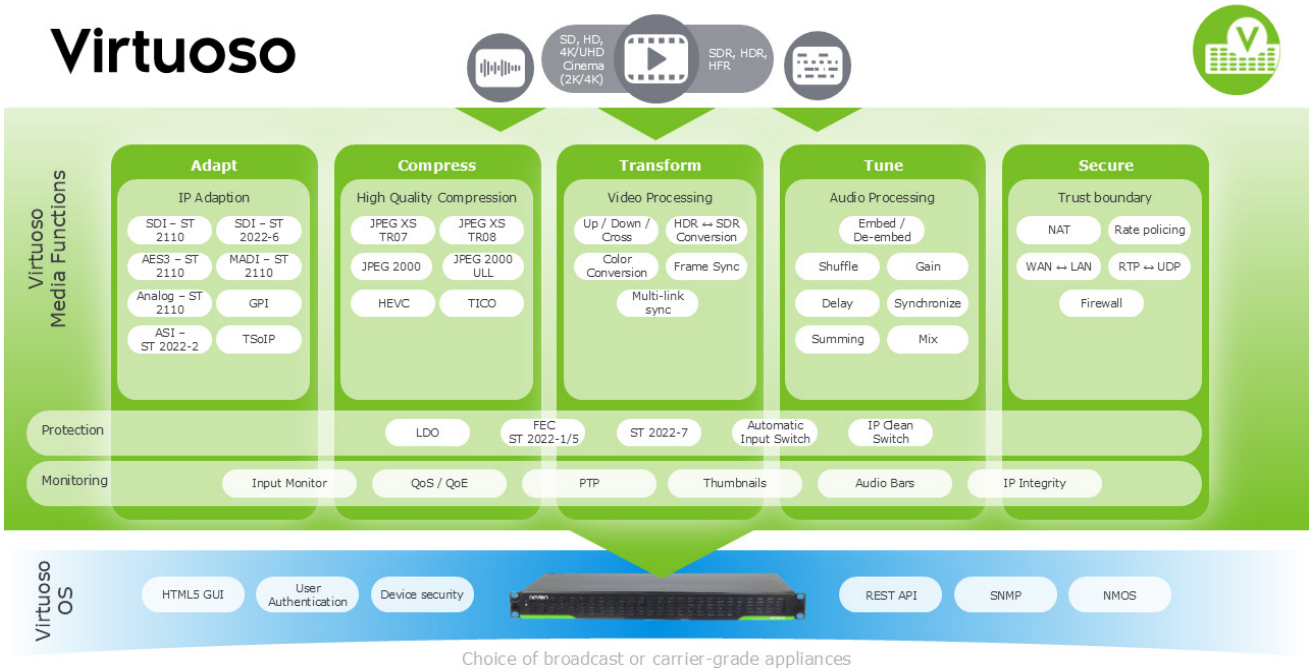
The versatile Nevion Virtuoso platform, together with Nevion's VideoIPath orchestration software, are designed to enable the full potential of IP-based lean production.

Applications

- Live production
- IP facility infrastructure
- In-house/campus media networks
- Remote and distributed production
- Outside broadcast live sports/event contribution
- Regional and wide-area contribution networks
- High-availability managed media services
- Television and radio distribution networks
- End-to-end service monitoring

Key features

- Software-defined platform for media processing
- Multi-format video and audio compression
- Adaptation of SDI, TS, audio and data signals
- Fully standards-compliant IP media transport
- Advanced audio/video processing
- Content and network security
- High-availability device and network redundancy
- Simple integration in any IT/IP network
- Powerful monitoring and alarm handling
- Easy-to-use web interface for monitoring & control
- Fully integrated with Nevion's VideoIPath orchestration and SDN control solution



Virtuoso Media Nodes

The Nevion Virtuoso platform is designed to allow for the provision of Media Nodes with different characteristics, such as size, number of Media Accelerator cards that can be accommodated and level of modularity, in order to suit virtually any deployment scenario.

The **Nevion Virtuoso MI** is a carrier-grade 1RU modular platform with dual AC load-sharing power supplies, supporting hot-swap and full internal redundancy for element management and control, high speed internal communication, and timing/sync distribution.

Nevion Virtuoso MI can hold up to 8 Media Accelerator cards, supporting for example

- 1 network uplink + 7 media function cards
- 2 network uplink + 6 media function cards
- 8 network-attached media function cards

The **Nevion Virtuoso RE** is a compact 1RU media node with dual AC load-sharing power supplies, integrated element manager and a high-speed internal communication fabric.

Nevion Virtuoso RE can hold up to 6 Media Accelerator cards, supporting

- 1 network uplink and 5 media function cards
- 6 network-attached media function cards

The Virtuoso RE is designed on the same principles as Virtuoso MI, but in a smaller, more light-weight form factor. The short depth of Virtuoso RE simplifies installation in 24-inch / 60 cm deep racks and rackmount flight cases.

Virtuoso Element Manager

The Nevion Virtuoso Element Manager software offers a set of sophisticated element management functionalities including HTML5 web user interface, RESTful API, alarm management, alarm and event notification and logging, authentication and security, and timing/sync distribution with built-in PTP best clock selection. The ease-of-use simplifies operations and allows for fast reconfiguration for occasional use applications.

Software-defined Media Functions

Nevion Virtuoso is a software-defined media node, supporting a variety of Media Functions that can be deployed in a flexible manner to meet changing production or service requirements, thereby making the Virtuoso an extremely versatile, cost-effective and future-proof investment.

Nevion Virtuoso - Media Functions

HBR10 Media Accelerator

- FPGA-based accelerator for high-bitrate media signal processing and networking applications.
- 10GE network with PTP, flexible audio and video interfacing up to 12G-SDI on 4x SFP+ ports.

HBR25 Media Accelerator

- FPGA-based accelerator for high-bitrate media signal processing and networking applications.
- 25GE network with PTP on 2x SFP28, flexible media interfacing up to 12G-SDI on SFP+ port.

LBR Media Accelerator

- FPGA-based accelerator for low-bitrate video compression and networking applications.
- 10/25GE network with flexible audio and video interfacing up to 12G-SDI on 4x SFP28 ports.

Audio Interface Adapter

- Used in combination with AUD-PROC-MADI-IP.
- AES3: 16 channels - direction configurable.
- RPRO: mix of analog audio, AES3 audio and GPIO, with output video black/tri-level sync.
- 1RU breakout panels are available for connectivity to external audio equipment.

Media Function	App Name	VIR MI	VIR RE	VIR FA	Accelerator
Network Uplink 10GE	UPLINK-10G	Yes	Yes	-	HBR-SFP4
IP Media Edge Firewall/NAT	IPME-RTP	Yes	Yes	-	HBR-SFP4
ASI gateway (8 input, 8 output)	ASI	Yes	Yes	-	HBR-SFP4
TS-IP gateway/monitor/switch	UPLINK-10G	Yes	Yes	-	HBR-SFP4
SDI-IP SMPTE 2022-6 (TR-04)	SDI-IP-2022	Yes	Yes	Yes	HBR-SFP4
SDI-IP SMPTE 2110 HD	SDI-IP-2110	Yes	Yes	Yes	HBR-SFP4
SDI-IP SMPTE 2110 UHD/HD	SDI-IP-H25	Yes	Yes	-	HBR25-SFP3
Up/Down/Cross conversion	UDC-IP-H25	Yes	Yes	-	HBR25-SFP3
MADI IP audio processor	AUD-PROC-MADI-IP	Yes	Yes	Yes	HBR-SFP4
AES3 digital audio adapter	AUD-AES3	Yes	Yes	-	AUD-AES3
RPRO mixed audio adapter	AUD-RPRO	Yes	Yes	-	AUD-RPRO
HEVC HD encoder	HEVC-TS-E4	Yes	Yes	-	LBR-SFP4
HEVC HD decoder	HEVC-TS-D4	Yes	Yes	-	LBR-SFP4
JPEG 2000 HD encoder (TR-01)	J2K-HD-E4	Yes	Yes	Yes	HBR-SFP4
JPEG 2000 HD decoder (TR-01)	J2K-HD-D4	Yes	Yes	Yes	HBR-SFP4
JPEG 2000 HD enc/dec (TR-01)	J2K-HD-E2D2	Yes	Yes	Yes	HBR-SFP4
JPEG 2000 2K DCI encoder	J2K-2K-DCI-E2	Yes	Yes	Yes	HBR-SFP4
JPEG 2000 2K DCI decoder	J2K-2K-DCI-D2	Yes	Yes	Yes	HBR-SFP4
JPEG XS UHD/HD encoder (TR-08)	JXS-E3	Yes	Yes	-	HBR-SFP4
JPEG XS UHD/HD decoder (TR-08)	JXS-D3	Yes	Yes	-	HBR-SFP4
JPEG XS UHD/HD encoder (TR-08)	JXS-E4-H25	Yes	Yes	-	HBR25-SFP3
JPEG XS UHD/HD decoder (TR-08)	JXS-D4-H25	Yes	Yes	-	HBR25-SFP3
JPEG XS UHD/HD encoder (TR-07)	JXS-TS-E3	Yes	Yes		HBR-SFP4
JPEG XS UHD/HD encoder (TR-07)	JXS-TS-D3	Yes	Yes		HBR-SFP4
TICO UHD encoder/decoder	TICO-UHD-E1-D1	Yes	Yes	Yes	HBR-SFP4
TICO UHD encoder	TICO-UHD-E2	Yes	Yes	-	HBR-SFP4
TICO UHD encoder	TICO-UHD-E2-H25	Yes	Yes	-	HBR25-SFP3
TICO UHD decoder	TICO-UHD-D2-H25	Yes	Yes	-	HBR25-SFP3

Virtuoso MI - Carrier Grade Media Node

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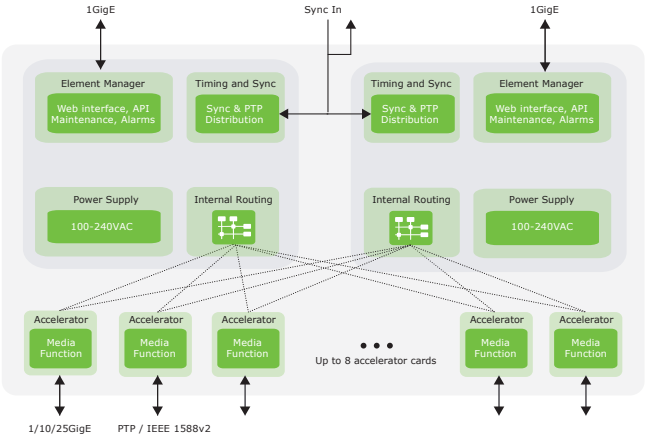
Nevion Virtuoso MI

Description	Virtuoso MI 1RU 8-slot carrier-grade media node platform with redundant load-sharing hot-swap AC power supplies. Hot-swap fans. Analog BB/TLS sync input with loop output. Redundant Element Managers, each with 100/1000Base-T Ethernet control port.
Product code	VIRTUOSO-HW-MI-MKII-AC2 (25049)
Expansion slots	Up to 8 media accelerator cards
Ethernet ports	2 x 100/1000Base-T, RJ.5 connecting to each of the frame controllers (2x RJ.5 to RJ45 cables included)
Interface type	Gigabit Ethernet, 802.3ab (electrical), Fast Ethernet (FE) 802.3u
Protocols	IPv4, DHCP/DNS, DSCP/TOS, ICMP, ARP 802.1Q (VLAN tag), 802.1P (VLAN priority) HTTP/HTTPS, FTP/SFTP, Telnet/SSH, SNMP v2c/v3, TCP, UDP, SNTP
Control features	Web user interface (HTML5-based) Open RESTful API Secure protocol support (HTTPS) Role-based user access control Centralized user authentication (LDAP) Extensive alarm management Searchable log with 100.000 entries Integrated in Nevion VideoIPath SNMP support v2c, (v3 future) Syslog support Out-of-band or in-band network access
License handling	License management for all the Media Functions supported.
Sync input	1 x multi-function sync input with passive loop out port (terminate if not used). Analog (black burst) or tri-level (TLS) 1PPS or 10 MHz external sync (future) Female HD-BNC connectors (75 Ohm) PTP / IEEE 1588v2 via HBR accelerator Timing & sync distribution in chassis
Physical dimensions	1RU 19'' rack-mount chassis WxDxH = 480 x 582 x 43 mm
Weight	11.2 kg
Rack installation	Install in clean and dust free environment. Removable front panel with fan filter. Rack rails are required for mounting. Make sure airflow is not obstructed.
Maintenance port	Micro-USB to each frame controller
Front panel LEDs	Power on (Green), Alarm status (Clear on OK, Red on critical alarm).

Power configuration	Dual load-sharing AC power supplies Hot swap, accessible via front. Future option for DC power supplies.
Input Voltage	100-240V AC +/- 10%, 50/60 Hz
Power consumption	Maximum 500W for fully populated chassis. Typically 85W-100W without accelerators. Maximum 50W per extension card in slot 1-8.
Cooling	Temperature-controlled fans. Hot-swap fan modules.
Airflow	Front to rear side
Operating temp.	0°C to 40°C
Storage temp.	-20°C to 70°C
Relative humidity	5% to 95% (non-condensing)
Noise SPL	8 accelerators 73 dB SPL(A). 2 accelerators 64 dB SPL(A) Background 39dB SPL(A)
Safety compliance	Europe: IEC/EN 62368-1:2014 + A11:2017 USA: UL Std. No. 62368-1 2nd Edition Canada: CAN/CSA-C22.2 NO. 62368-1:2014 Australia/New Zealand: AS/NZS 62368.1:2018 Japan: J62368-1 (H30)
EMC compliance	Europe: EN 55032:2015+AC:2016+A11:2020 Class B EN 55035:2017+A11:2020 EN 61000-3-2:2019 + A1:2021 EN 61000-3-3:2013+A1:2019 USA: FCC CFR 47 Part 15B Canada: ICES-003, Issue 7
RoHS compliance	IEC 63000:2016 + EN IEC 63000:2018



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Virtuoso RE - Media Node

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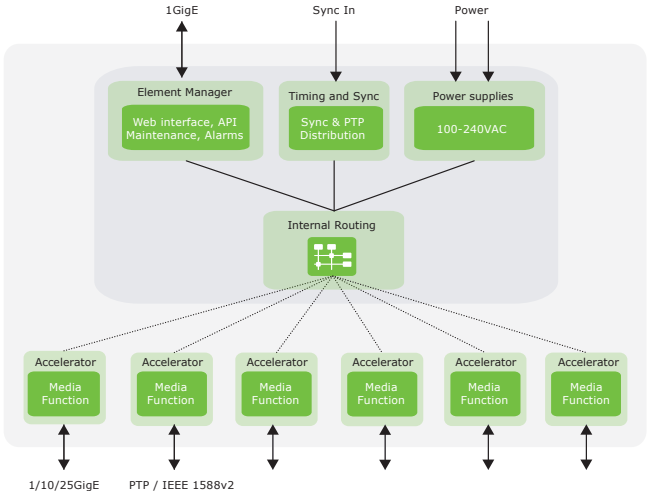
Nevion Virtuoso RE

Description	Virtuoso RE 1RU 6-slot media node platform with fixed redundant load-sharing AC power supplies. Element Manager with 100/1000Base-T RJ45 Ethernet control port. Analog BB/TLS sync input.
Product code	VIRTUOSO-HW-1U-RE-AC2
Expansion slots	Up to 6 media accelerator cards
Ethernet ports	1 x 100/1000Base-T, RJ45
Interface type	Gigabit Ethernet, 802.3ab (electrical), Fast Ethernet (FE) 802.3u
Protocols	IPv4, DHCP/DNS, DSCP/TOS, ICMP, ARP 802.1Q (VLAN tag), 802.1P (VLAN priority) HTTP/HTTPS, FTP/SFTP, Telnet/SSH, SNMP v2c/v3, TCP, UDP, SNTP
Control features	Web user interface (HTML5-based) Open RESTful API Secure protocol support (HTTPS) Role-based user access control Centralized user authentication (LDAP) Extensive alarm management Searchable log with 100.000 entries Integrated in Nevion VideoIPath SNMP support v2c,(v3 future) Syslog support Out-of-band or in-band network access
License handling	License management for all the Media Functions supported.
Sync input	1 x multi-function sync input Analog (black burst) or tri-level (TLS) 1PPS or 10 MHz external sync (future) Female BNC connector (75 Ohm) PTP / IEEE 1588v2 via HBR accelerator Timing & sync distribution in chassis
Physical dimensions	1RU 19'' rack-mount chassis WxDxH = 448 x 425 x 43 mm (excluding brackets and BNC connectors)
Weight	7,56 kg (inc. accelerator cards)
Rack installation	Install in clean and dust free environment. Rack rails are required for mounting. Make sure airflow is not obstructed.
Maintenance port	USB-C to element manager
Front panel LEDs	Power on (Green), Alarm status (Clear on OK, Red on critical alarm).
Power configuration	Dual load-sharing AC power supplies Future option for DC power supply

Input Voltage	100-240V AC +/- 10%, 50/60 Hz
Power consumption	Maximum 370W for fully populated chassis. Maximum 70W without accelerators. Maximum 50W per accelerator in slot 1-6.
Cooling	Temperature-controlled fans.
Airflow	Front to rear side
Operating temp.	0°C to 40°C
Storage temp.	-20°C to 70°C
Relative humidity	5% to 95% (non-condensing)
Noise SPL	6 accelerators 66 dB SPL(A). 2 accelerators 58 dB SPL(A) Background 39dB SPL(A)
Safety compliance	Targeting the following standards: Europe: IEC/EN 62368-1:2014 + A11:2017 USA: UL Std. No. 62368-1 2nd Edition Canada: CAN/CSA-C22.2 NO. 62368-1:2014 Australia/New Zealand: AS/NZS 62368.1:2018 Japan: J62368-1 (H30)
EMC compliance	Targeting the following standards: Europe: EN 55032:2015+AC:2016+A11:2020 Class B EN 55035:2017+A11:2020 EN 61000-3-2:2019 + A1:2021 EN 61000-3-3:2013+A1:2019 USA: FCC CFR 47 Part 15B Canada: ICES-003, Issue 7
RoHS compliance	IEC 63000:2016 + EN IEC 63000:2018



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Nevion Virtuoso Accelerators and Accessories

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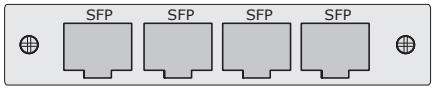
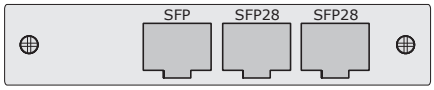
HBR Media Accelerator

Description	10G Media Accelerator hardware module. The 4x SFP+ ports can accommodate a combination of 10GE SFP+, SDI video, ASI and MADI audio interfaces. Software Media Functions are sold separately.
Product codes	VIRTUOSO-HW-HBR-SFP4 (24204)
Connectors	Four (4) SFP+ supporting 10GE, Video/MADI SFPs and breakout cables.
Ethernet network	10GE (10GBase-SR/LR) 1GE (1000Base-X)
Video SFP support	Non-MSA 270 Mb/s to 12 Gb/s SD-SDI, HD-SDI, 3G-SDI, 12G-SDI, MADI, ASI Optical and electrical variants See Media Function datasheets for details
Sync input format	PTP (IEEE 1588v2:2008, SMPTE 2059-2)
Power consumption	Maximum 45W (not including SFPs)



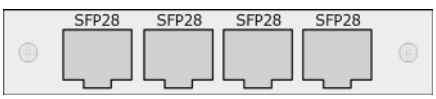
HBR25 Media Accelerator

Description	25G Media Accelerator hardware module. 2x25G SFP slots + one additional SFP port for SDI video interfaces. Software Media Functions are sold separately
Product codes	VIRTUOSO-HW-HBR25-SFP3 (24645)
Connectors	Two (2) SFP28 supporting 25GE One (1) SFP+ supporting Video SFP
Ethernet network	25GE (25GBase-SR/LR)
Video SFP support	Non-MSA up to 12 Gb/s, HD-SDI, 3G-SDI, 12G-SDI, Optical and electrical variants See Media Function datasheets for details
Sync input format	PTP (IEEE 1588v2:2008, SMPTE 2059-2)
Power consumption	Maximum 45W (not including SFPs)



LBR Media Accelerator

Description	Media Accelerator hardware module. 4x25G SFP28 ports for SDI video interfaces. Software Media Functions are sold separately
Product codes	VIRTUOSO-HW-LBR-SFP4 (25910)
Connectors	Two (2) SFP28 supporting Video SFP Two (2) SFP28 unused (future use)
Ethernet network	For future use: 10GE (10GBase-SR/LR) 25GE (25GBase-SR/LR)
Video SFP support	Non-MSA up to 12 Gb/s, HD-SDI, 3G-SDI, 12G-SDI, Optical and electrical variants See Media Function datasheets for details
Sync input format	PTP (IEEE 1588v2:2008, SMPTE 2059-2)
Power consumption	Maximum 45W (not including SFPs)



Video SFPs

Description	A selection of optical and electrical video SFPs are available for interfacing to SDI from 270 Mbit/s to 12 Gbit/s.

MADI SFPs

Description	A selection of optical and electrical SFPs are available for interfacing to MADI / AES10.

Network SFPs

Description	A selection of Ethernet SFPs are available for interfacing to 1/10/25 Gigabit Ethernet.

2-in-2-out breakout cable

Description	Quad channel electrical breakout cable supporting two input and two output 3G/HD/SD-SDI, ASI or MADI signals, with pigtail and connectors.
Connector options	BNC male, BNC female, HD-BNC male
Cable length	1 or 3 meter pigtail option available. Input max 100m Belden 1694A for 3G-SDI.
Product codes	BRK-3G-TRX2-BF1 (24323) BNC female, 1m BRK-3G-TRX2-BM1 (24182), BNC male, 1m BRK-3G-TRX2-HBM1 (24290), HD-BNC, male, 1m

2-in-2-loop-out breakout cable

Description	Two channel electrical breakout cable supporting two input and two passive loop through outputs for 3G/HD/SD-SDI, ASI or MADI signals, with pigtail and connectors.
Connector options	BNC male, BNC female
Cable length	1 m pigtail option available. Input max 100m Belden 1694A for 3G-SDI.
Product codes	BRK-PL-BF1-BF1 (24461) BNC female, 1m BRK-PL-BM1-BM1 (24460) BNC male, 1m

AES3 Digital Audio Adapter

Description	Virtuoso AES3 adapter card with 16 AES3 inputs or outputs (direction configurable on a port by port basis). 4 GPIO (direction configurable on a port by port basis). DC-37 female connector (DC-37 cable not included, supplied with Breakout Panel). An HBR card with AUD-PROC-MADI-IP software and licenses required for IP audio.
Product codes	VIRTUOSO-HW-AUD-AES3 (24772)
Number of ports	16 XLR - configurable as input or output
Digital audio	AES3, 48kHz, 24 or 32 bit Synchronized to Virtuoso clock (PTP locked) Option for AES3 input ASRC.
Power consumption	Maximum 20W
Breakout panel BNC	VIRTUOSO-HW-AUD-BRK-BNC16 (24774) 1RU passive breakout panel for AES3 digital audio with 16 unbalanced female BNC connectors (all are direction configurable). DC-37 female connector (DC-37 cable incl.).
Breakout panel XLR	VIRTUOSO-HW-AUD-BRK-XLR16 (24775) 1RU passive breakout panel for AES3 digital audio with 16 balanced XLR connectors (8 input + 8 output). DC-37 female connector (DC-37 cable included).

RPRO Digital Audio Adapter

Description	Virtuoso RPRO audio adapter card with 4 balanced analog inputs and 4 balanced analog outputs, 4 balanced AES3 inputs/outputs, 8 GPIO (direction configurable), and 2 video sync outputs. DC-37 female connector (DC-37 cable not included supplied with Breakout Panel). An HBR accelerator with AUD-PROC-MADI-IP software and licenses required for IP audio
Product codes	VIRTUOSO-HW-AUD-RPRO (24773)
Number of ports	4 balanced analog inputs 4 balanced analog outputs 4 AES3 ports (direction configurable) 8 GPI/O ports (direction configurable) 2 video sync output ports
Digital audio	48kHz, 24 or 32 bit Synchronized to Virtuoso clock (PTP locked) Option for AES3 input ASRC.
Power consumption	Maximum 20W
Breakout panel	VIRTUOSO-HW-AUD-BRK-RPRO (24776) 1RU passive breakout panel for RPRO audio interface module (1RU) with 4 input and 4 output balanced XLR connectors for analog audio, 2 input and 2 output XLR connectors for digital audio, 8x GPIO ports and 2 BNCs for analog video sync output. DC-37 female connector (DC-37 cable included).

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Nevion has a presence in all the major regions, and an extensive network of partners to reach customers anywhere in the world.

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