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datasheet

Virtuoso
Media Function

ASI / TSoIP

Nevion Virtuoso
ASI and TS over IP Media Functions

High density ASI-IP conversion, Transport Stream monitoring and redundancy switching is available on Virtuoso's software-defined HBR accelerator card.

The ASI media function runs on the Virtuoso HBR accelerator card providing up to 8 ASI inputs and 8 ASI outputs. Transport Streams are routed to/from an Uplink HBR card in Virtuoso that provides high density IP aggregation of Transport Streams on 1/10 GigE.

The solution provides ultra high density ASI-IP conversion, up to 56 bidirectional channels in a single Virtuoso 1RU chassis.

TS monitoring according to ETSI TR 101 290 is included, helping broadcasters and service providers to verify the quality of the video signal at demarcation points in broadcast contribution and distribution networks.

For native IP Transport Stream gateway, monitoring and redundancy switching applications, the Uplink is used stand-alone with 4x 10GE/1GE interfaces, providing up to 32 gateways or 32 switches per card, or 256 gateways/switches per Virtuoso.

The versatility, performance and reliability of Nevion's Virtuoso makes it the perfect choice for business critical broadcast contribution and distribution applications.

Applications

- Broadcast television contribution and distribution
- Satellite & digital terrestrial distribution networks
- Service provider networks / managed services
- Ground to cloud connectivity

Key features

- High density Transport Stream gateway
- Transport Stream monitoring (ETSI TR 101 290)
- Advanced Transport Stream and PSI/SI analysis
- Alarm-based automatic input switching
- Flexible Transport Stream interfacing
  - TS over IP via 10GE/1GE SFP ports
  - ASI via electrical/optical video SFPs
  - ASI via electrical Nevion breakout cables
- IP network error protection and correction
  - SMPTE 2022-7 RTP hitless switching
  - SMPTE 2022-1/2 Forward Error Correction
- IP media firewall providing network isolation
  - 4x network interfaces (10GE or 1GE)
  - NAT and multicast/unicast conversion
- Management and control
  - Integrated with Nevion's VideoIPath for end to end service orchestration and monitoring.
  - User-friendly HTML5 web interface
  - REST API and SNMP control options

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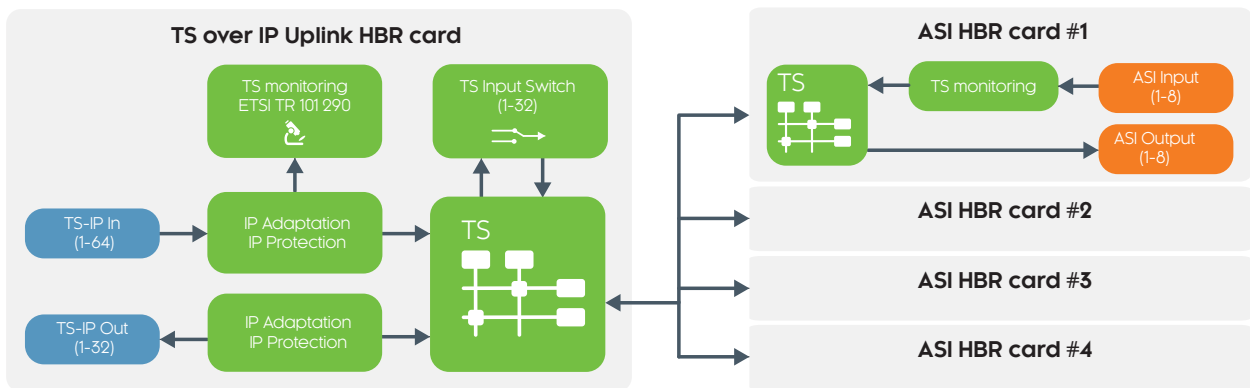
A modern high density TS gateway

For nearly two decades, Nevion have been a leading provider of ASI-IP adaptation, TS monitoring and redundancy switching solutions.

With the ASI and TS over IP gateway media functions for the Virtuoso HBR accelerator card, customers get the performance and functionality they are familiar with, in a modern and high-performance software-defined platform, with unparalleled density and flexibility.

Flexible and versatile TS interfacing

The ASI and Uplink TS-IP gateway media functions are highly flexible in terms of input and output interfaces for Transport Streams.

The Uplink has 4x SFP ports for 1GE or 10GE TS over IP/Ethernet and supports multi-gigabit per second handling of Transport Streams on IP.

For ASI input/output interfacing, add HBR cards running the ASI media function. Multiple ASI HBR cards can be combined with each Uplink. The limit is only determined by the data throughput of the Uplink module.

Future proof hardware

A major benefit of using HBR cards accelerators for both TS-IP and ASI interfacing, is that the hardware investment is future proof.

First, additional cards can be added to a Virtuoso if there is a need for more ASI ports or gateways.

Second, if the interface requirement changes from ASI to TS over IP; ASI interfacing cards can easily be changed to TS-IP gateways by changing the software from the Virtuoso web user interface.

Built-in TS monitoring probe

Monitoring of signals at demarcation points between e.g., a broadcaster and a service provider, is key to quickly identify and resolve issues.

In Virtuoso, all ASI and IP Transport Stream inputs are monitored according to ETSI TR 101 290 Pri 1 alarm conditions. The advanced monitoring option adds Pri 2 alarms, PCR validation and jitter measurements, as well as PSI/SI table analysis.
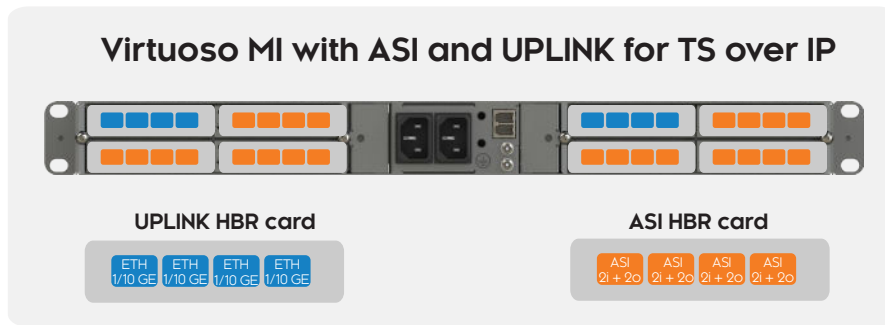
Alarm-based input switching

The TS input switch is an alarm-based automatic changeover switch, with configurable switch criteria. The switch is simple, but highly customizable through modification of input alarm profiles and alarm severities. A single Uplink HBR card supports up to 32 TS input switches, which means a fully populated Virtuoso MI can host 256 TS input switches (192 in Virtuoso RE)..

RTP hitless switching

Transmitting the same RTP/IP stream across dual, fully diverse network links enables receivers/decoders to utilize SMPTE ST 2022-7 Seamless IP Protection Switching, which gives error-free transport even in case of severe packet loss or link outages as long as a packet arrives on either of the two network links.

Forward Error Correction

Standards-based Forward Error Correction is supported with SMPTE ST 2022-1 to detect and correct intermittent packet loss.

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Virtuoso MI with ASI and UPLINK for TS over IP

UPLINK HBR card

| ETH 1/10 GE | ETH 1/10 GE | ETH 1/10 GE | ETH 1/10 GE |

ASI HBR card

| ASI 2i + 2o | ASI 2i + 2o | ASI 2i + 2o | ASI 2i + 2o |

ASI input/output

ASI interface	DVB-ASI (ETSI EN 50083-9, Annex B)
Packet length	188 / 204 bytes per TS packet
Modes	Burst/Packet and Spread/Byte mode
Bitrate	Maximum 213 Mbit/s
Number of ports	4 SFP cages available per HBR card Breakout cable: 2 in + 2 out per SFP cage Video SFP: 2 in, or 2 out, or 1 in + 1 out Maximum 8 in + 8 out per card

TS over IP input/output

TS over IP	SMPTE ST 2022-2 RTP/UDP/IP (CBR)
Number of streams	Up to 64 TS IP inputs Up to 32 TS IP outputs
TS input switching	Up to 32 alarm-based TS input switches
Throughput	JPEG-XS/JPEG 2000: Up to 8 Gbp/s TSoIP Encoder output or Decoder input only unidirectional setups Up to 10 Gbp/s aggregate bidirectinal setups ASI or TSoIP Gateway applications: Up to 2400 Mbit/s TS input & output RTP-IP uplink aggregation: Up to 6500 Mbit/s input & output Aggregate numbers, across all flows Refer to release notes for more details

TS over IP protection

Link protection	SMPTE ST 2022-7 Class C (High skew) Up to 450 ms path delay difference
Loss protection	SMPTE ST 2022-1 Forward Error Correction 1D Column only 2D Column and Row Block and Non-block aligned matrix

Property	Values
L (Min, Max)	1, 254
D (Min, Max)	4, 32
LxD (Max)	1024
L+D (Max)	254

Input signal monitoring

RTP/IP monitoring	Bit rate per flow Packet/datagram rate per flow RTP stream continuity Packet delay variation (PDV/jitter) Packet inter-arrival time (IAT)
Basic TS monitoring	ETSI TR 101 290 Pri 1 alarms Listing of services and components Listing of PIDs with bit rates and counters Listing of PSI/SI tables TS and per PID bitrate alarms
Adv. TS monitoring	ETSI TR 101 290 Pri 1 and 2 alarms PCR validation and jitter measurements PSI/SI table decoding and analysis

Media Server Appliance support

Please refer to Nevion Virtuoso Platform datasheet for details.	
Virtuoso MI	Supported in version 1.8 or higher
Virtuoso RE	Supported in version 1.0.8 or highert

HBR Media Accelerator (ASI & UPLINK)

Description	10G Media Accelerator hardware module. 4x SFP+ ports that can accommodate a combination of 1GE SFP, 10GE SFP+, ASI, SDI video or MADI audio interfaces.
Product codes	VIRTUOSO-HW-HBR-SFP4 (24204)
Connectors	Four (4) SFP+
SFP config (Uplink)	Port 1-4 individually configurable for: 10 GigE (10GBase-SR/LR) 1 GigE (1000Base-X)
SFP config (ASI)	Port 1: ASI dual TX/RX: Port 2: ASI dual TX/RX Port 3: ASI dual TX/RX Port 4: ASI dual TX/RX
ASI interfaces	Video breakout with options for: - Dual channel ASI RX + dual channel ASI TX - Dual channel ASI RX with passive loop out Video breakout support ASI/SD/HD/3G-SDI
Power consumption	Maximum 45W

IP/Ethernet networking

Number of ports	Four (4) Ethernet SFP / SFP+
Ethernet	10GBase-SR/LR (IEEE 802.3ae) 1GBase-X (IEEE 802.3z) 1GBase-T (IEEE 802.3ab)
Ethernet VLAN	IEEE 802.1Q (VLAN tag) IEEE 802.1P (VLAN priority)
Protocols	LLDP, DHCP, IPv4, IPv6
IP addressing	Static configuration or via DHCP
Unicast	Yes
Multicast	Yes (IGMP v2/v3)
IP QoS config	DiffServ Code Point (DSCP) or IP TOS

Licenses

TS input	TSOX: one in use per ASI or TS-IP input
TS output	TSOX: one in use per ASI or TS-IP output
TS adv. monitoring	AMMX: one in use on ASI/TS-IP input if enabled
TS IP protection	TSPROTX: one in use if FEC/ST2022-7 enabled
TS input switch	ISWX: one in use per TS input switch

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