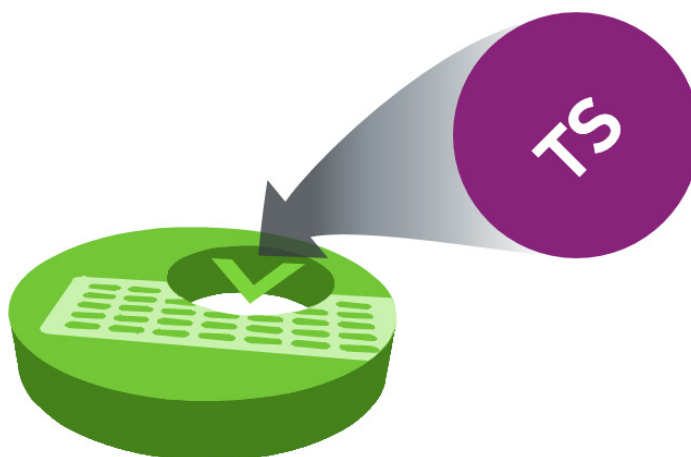




datasheet

Virtuoso
Media Function

nevision



Nevision Virtuoso

TS Adaptation and Switching

The Virtuoso Transport Stream Adaptation and Switching Media Function enables broadcasters and service providers to take advantage of the flexibility and scalability of IP.

Virtuoso provides bidirectional high-density transmission of MPEG-2 Transport Streams (TS). Configurable interfacing and support for ASI and Ethernet, creates efficient, affordable and scalable solutions for professional quality video contribution and distribution.

The TS switching Media Function uses alarm-based automatic switching. In combination, with the monitoring, protection and redundancy functions, enable cost-effective and high availability video transport solutions.

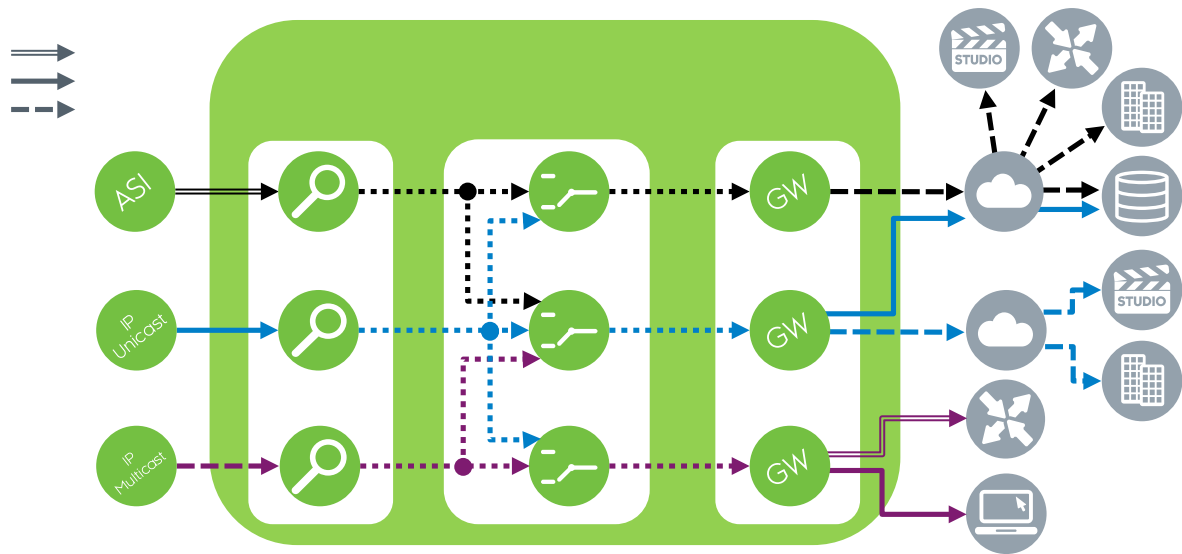
Optional ASI Accelerator are available to increase port density.

Applications

- Professional broadcast product contribution and distribution
- Transport Stream interface adaptation
- Managed video services over IP
- FEC insertion
- DVB-T, DVB-T2, SFN/MFN and ATSC distribution over IP

Key features

- High density standards-compliant adaptation of Transport Streams (TS) over IP
- High density TS redundancy switching
- Configurable interfacing to ASI and IP/Ethernet
- Bidirectional operation on a port-by-port basis
- Content protection with AES 128-bit encryption and decryption (DVB-CISSA compliant)
- BISS-1 descrambling
- Built-in TS monitoring (ETSI TR 101 290 Priority 1), with option for Pri 2 and Pri 3 monitoring including PCR validation
- Supports FEC, SIPS / SMPTE 2022-7 and Launch Delay Offset (LDO) IP protection mechanisms
- IP multicast, unicast and multiple unicast output
- Integrated VLAN, QoS configuration, IP and RIP-2 routing for multicast source redundancy
- Software license approach ensures easy and future-proof upgrade path
- User-friendly web GUI for monitoring & control



Versatile interfacing

The TS Adaptation Media Function is extremely flexible in terms of input and output interfaces for Transport Streams. Additional ports can be added using Accelerators. Supported interfaces include DVB-ASI and IP over Ethernet. ASI ports can be used as input, output, or output copies, and can be reconfigured on-the-fly on a port by port basis without affecting the operation of the unit.

Built-in input signal monitoring

All input Transport Streams are monitored according to ETSI TR 101 290 Pri 1, 2 and 3 alarm conditions. DVB/ATSC service and table information is shown in the web user interface. The input signal monitoring is helpful for broadcasters and service providers to verify the quality of the video signal at demarcation points in a broadcast distribution network.

Reliable transmission over IP

Virtuoso includes a number of features to ensure robust operation and graceful degradation in the presence of IP transport impairments; buffering for IP jitter compensation and packet reordering.

Automatic input switching

The TS Adaptation Media Function offers high density of TS redundancy switches with automatic switching on loss of signal or critical input signal alarms. Any alarm condition in ETSI TR 101 290 Pri 1, 2 or 3 can be used to trigger a switch. Each switch can have up to 4 inputs, streams can be combination of ASI and IP inputs.

Ideal for DVB-T/T2 SFN distribution

The TS packet handling in the Virtuoso is fully transparent in order to support DVB-T/T2 signal distribution in SFN networks. In addition, the bitrate of the output TS can be resynchronized to a 1PPS or 10 MHz external reference to remove all jitter from the incoming IP stream and present a perfect TS to the DVB-T/T2 modulator.

Protection and reliability

Transport stream adaptation and switching can be combined with Forward Error Correction (FEC), Seamless IP Protection Switching (SIPS) compliant to SMPTE 2022-7, as well as Launch Delay Offset (LDO).

Content protection with DVB-CISSA 128-bit encryption decryption and BISS-1 descrambling.

Seamless IP protection switching (SIPS)

Transmitting the same RTP/IP stream across dual, fully diverse network links enables receivers/decoders to utilize Seamless IP Protection Switching (SIPS), which gives perfectly 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. SIPS is compliant to SMPTE 2022-7.

Launch Delay Offset (LDO)

Virtuoso can send multiple IP output streams (unicast and/or multicast). With the LDO license option, an RTP stream copy can be transmitted after a configurable delay on the sender, thereby enabling SIPS-based seamless switching and error free transport on single-ended network links that may suffer from short outages (e.g. 50 ms outages).

MPEG-2 Transport Stream

DVB-ASI	ETSI EN 50083-9, Annex B, 188 bytes/pkt
TS over IP	SMPTE 2022-2 RTP/JDP/IP (CBR)
Max # of TS	Up to 80 Transport streams
TS bitrate throughput	Up to 1400 Mbps (no FEC) Up to 1200 Mbps (column FEC) Up to 800 Mbps (column + row FEC)
TS Switches	Up to 50 Alarm-based TS redundancy switches, 4 inputs each. Up to 400 Mbps aggregated output
Program information	Encoder output: PAT, PMT, SDTa, NIT

IP transport and protection

Protocols	RTP, UDP, IP, ICMP, ARP, IGMPv2/v3, Diffserv/TOS, 802.1Q (VLAN tag), 802.1P (VLAN priority), RIP-2
FEC	Forward error correction for TS over IP (compliant to SMPTE 2022-1 FEC)
Extended FEC	Support for extended matrix size (L*D < 1024, e.g. 250 x 4)
SMPTE ST 2022-7	Seamless IP protection Switching (SIPS) SMPTE ST 2022-7:2013
LDO	Launch delay offset for network redundancy using single path and SMPTE 2022-7 (SIPS)

Content protection

AES Encryption	DVB-CISSA 128-bit Encryption. Up to 50 Mbps per TS and maximum four (4) TS per Virtuoso Appliance.
BISS-1 Descrambling	Up to 100Mbps aggregated TS bandwidth per Virtuoso appliance

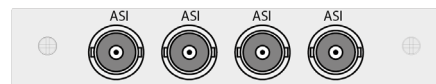
Monitoring

ETSI TR 101 290 Priority 1 alarms (option for Pri 2 and 3)
Thumbnails for confidence monitoring
Detailed alarm log with 100,000 entries

Optional Accelerator

ASI Adapter

Number of ports	4 - configurable as input or output
Interface Type	DVB-ASI ETSI EN 50083-9, Annex B, 188 B/pkt
Connector type	Female BNC (75 Ohm)



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Ordering Options

VIRTUOSO-HW-ASI-X4	ASI input/output module with four (4) ports (BNC, 75 Ohm). The direction of each port can be configured by the user.
VIRTUOSO-SW-TS-GWI	License option enabling transport of one (1) MPEG-2 Transport Stream. ASI or TS over IP (SMPTE 2022-2) input/output. Each TS can be sent to multiple ASI ports and IP unicast/multicast destinations.
VIRTUOSO-SW-TS-ADVMON1	License option enabling advanced TS monitoring according to ETSI TR 101 290 Priority 2 alarms (e.g. PCR accuracy/overall jitter) and Pri 3 DVB-SI and ATSC A/78. Note that Priority 1 alarms is included with the TS related media functions. Licensed per service.
VIRTUOSO-SW-TS-PROT1	License option enabling IP protection features for one (1) TS input or output service, including SMPTE 2022-7 Seamless IP Protection Switching (SIPS) for RTP/IP transport over dual diverse network links (license only needed on receiver), Launch Delay Offset (LDO) (license needed in both sender and receiver) and SMPTE 2022-1 Forward Error Correction (FEC) for TS over IP (license needed in both sender and receiver). Note that protection for TS over IP input + output requires 2x TS-PROT licenses.
VIRTUOSO-SW-TS-ISWX1	License option enabling one (1) alarm-based automatic TS switch with up to 4 inputs and 1 output. The TS output can be sent to multiple ASI ports and IP unicast/multicast destinations. Licensed per switch.
VIRTUOSO-SW-TS-CCP1	License option enabling one (1) cryptographic content protection (CCP) engine. Supports DVB-CISSA 128-bit AES scrambling or descrambling of Transport Streams up to a maximum of 50 Mbps per TS. Licensed per scrambling engine/TS.
VIRTUOSO-SW-TS-BISS1	License option enabling BISS descrambling of one (1) service. Supports BISS-1 with multi-key handling on decoder (per service/PID configuration), up to a maximum of 100 Mbps per unit. Licensed per TS service. Maximum 4 per unit.

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