

Appear *tv*

X10

X20



Near limitless capacity, extensive video awareness, enhanced security, operational simplicity and exceptionally high reliability

LIMITLESS VIDEO NETWORK OVER IP

The Appear TV X10/X20 platform is a dedicated solution for high speed video networking, enhanced IP security, video distribution and contribution. Designed for near limitless capacity, extensive video awareness, enhanced security, operational simplicity and exceptionally high reliability, the platform redefines video delivery.

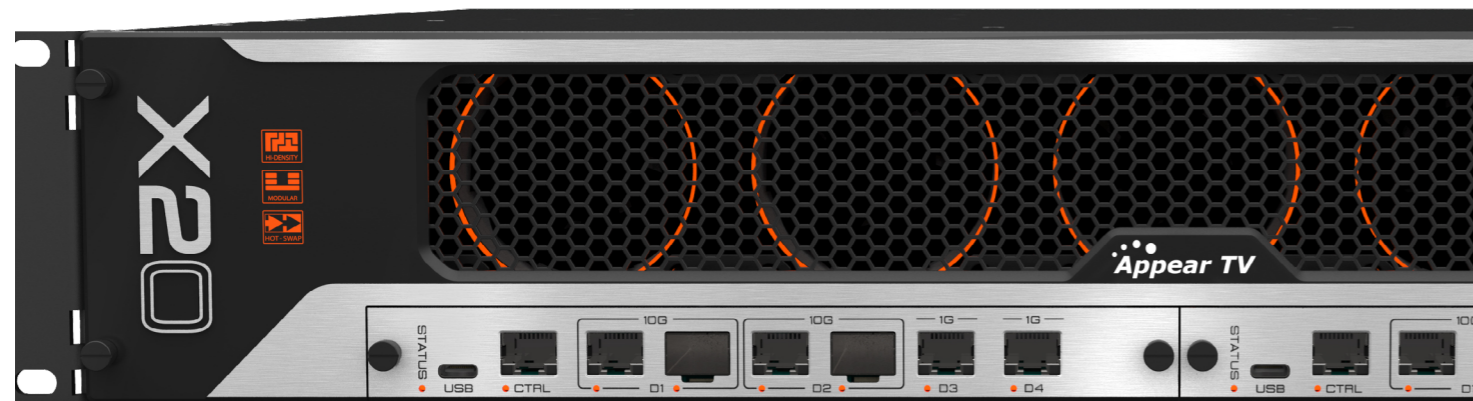
With IP network technology and infrastructure evolving, the distribution of video is changing. Legacy infrastructure are being replaced by transmission over standard IP-based networks. With 10G and 100G IP infrastructures available, broadcasters seek ways to use the added capacity, primarily for internal uncompressed or lightly compressed video contribution.

Specifically designed for IP-centric operations, the X10/X20 chassis has a significant video processing capacity. 10G bi-directional IP interfaces provide firewall-grade IP security at every connection node. Operating at a minimum internal throughput of 140G, the new backplane extends Appear TV's tradition of patented redundancy options.

The X platform supports conversion of uncompressed video from/to legacy SDI and SDI over IP with options to perform "light" compression/decompression using intra-codecs such as TICO and JPEG2000 or full encoding/decoding using AVC or HEVC. With backplane latency of less than 1ms, universal applicability for virtually any video application is ensured, as is the implementation of both current and future IP video standards, including SMPTE2110 and SMPTE2022-6.



Advanced architecture
designed to save space, energy
and resources



CHASSIS

The X platform consists of a compact 1RU - X10 as well as a capacious 2RU - X20 option. Both chassis can be used independently, or in conjunction with Appear TV's widely deployed XC5000 and XC5100 chassis. Built around an in-house developed, high capacity bus architecture that connects all modules, the X platform operates with dual hot-swappable power supplies, dual front-mounted control modules and six or twelve rear-mounted option slots. A -48VDC power supply option is also available.

Dual control modules can optionally be fitted to either model, and will operate in active/active redundancy mode with redundant backplanes to provide seamless recovery from many critical fault scenarios. All option modules mounted in the rear are interchangeable between the X10 and X20.

The product can be fitted with a range of input, processing, and output modules that enable bridging between commonly used legacy video platforms and an all IP infrastructure. With support for MPEG TS multiplexing, DVB scrambling/descrambling and dense power efficient AVC/HEVC encoding/decoding, the X platform is ideal for video processing in legacy DVB network such as cable, satellite, terrestrial and IPTV. The Control/Switch module and the Dual IP IO modules provide native 10G uni-directional and bi-directional port connectivity.

All modules are hot-swappable (including power supplies and fans). The new software architecture enables different software versions to run on different modules, allowing new functionalities to be delivered to customers faster.

Service density can be defined up to 2,000 services in and out per module, while set-up and configuration is streamlined. By enabling the organization of services and multiplexes into several groups with a set of individually defined rules for each group, the operator can quickly apply changes to multiple services or multiplexes. Extensive search capabilities allow the operator to easily locate groups, services, etc.

FEATURES

2RU - X20

- Modular configuration with up to 12 option slot boards
- WEB based configuration, LED indicators on PS and modules
- Forced air-cooling (front to back)
- Dual redundant hot-swappable PS
- Hot-swappable modules
- 100-240 V AC, 50/60 Hz
- -48VDC

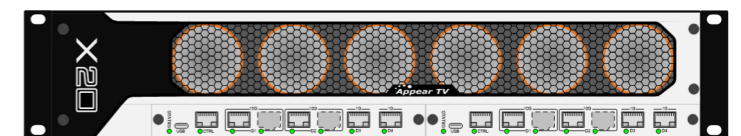
1RU - X10

- Modular configuration with up to 6 option slot boards
- WEB based configuration, LED indicators on PS and modules
- Forced air-cooling (front to back)
- Dual redundant hot-swappable PS
- Hot-swappable modules
- 100-240 V AC, 50/60 Hz

DIMENSIONS

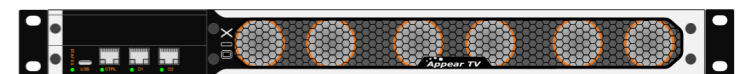
2RU (X20)

19" x 2RU x 540 mm (440 x 88 x 540 mm) (w x h x d mm)



1RU (X10)

19" x 1RU x 540 mm (440 x 44 x 540 mm) (w x h x d mm)



The X20 and X10 use the same set of modules and same SW, although the Control/Switch module differs between the two.



Designed to meet all challenges that a full IP-based infrastructure presents

HIGHLIGHTS

The X platform has been developed to exploit new opportunities driven by the increasing deployment of ultra-high speed IP networks within all areas of broadcasting. Designed to meet all challenges that a full IP-based infrastructure presents, the platform features:

HIGH SPEED

Multiple bi-directional 10G interfaces with the ability to route up to 140G of traffic internally.

DELAY

Low backplane latency (below 1ms) making overall contribution to delay negligible. Whenever delay buffers are required (such as IP de-jitter), buffer size and consequently delay is adjustable.

MPEG & NATIVE IP HANDLING

The ability to handle all commonly used video protocols provides a future proof solution. The X platform is based on flexible programmable HW, new standards not currently defined will be added when required.

IP NETWORK SECURITY

A video centric, cost-effective, easy to deploy, high-capacity firewall feature that can monitor and regenerate traffic as required.

CAPACITY

Most modules support up to 4,000 (2,000 in and 2,000 out) streams / services per module and 10G of traffic.

MONITORING & CONTROL

A management system to control a potentially vast array of linear and on-demand service traffic effectively, as traditional IPTV / OTT worlds merge.

SDI TO IP

A high-density SDI input / output module supporting SMPTE 2110 and SMPTE 2022-6 enables bridging classical SDI based coax / fibre networks to IP.

ACCESS CONTROL

A new standard of access control, user management and IP security to secure access to critical network devices. A user account with four different access levels can be defined per user.

REDUNDANCY

Designed to be as reliable and failsafe as possible, even when used stand-alone. The uniquely efficient, built for purpose hardware design is engineered for high reliability and stability. Should an internal failure take place, a range of redundancy options can take effect to keep the chassis fully operational. Dual active - active control/switch module redundancy with internal seamless traffic switching can optionally be deployed within the chassis to make recovery from many critical errors totally seamless.

ENHANCED SECURITY

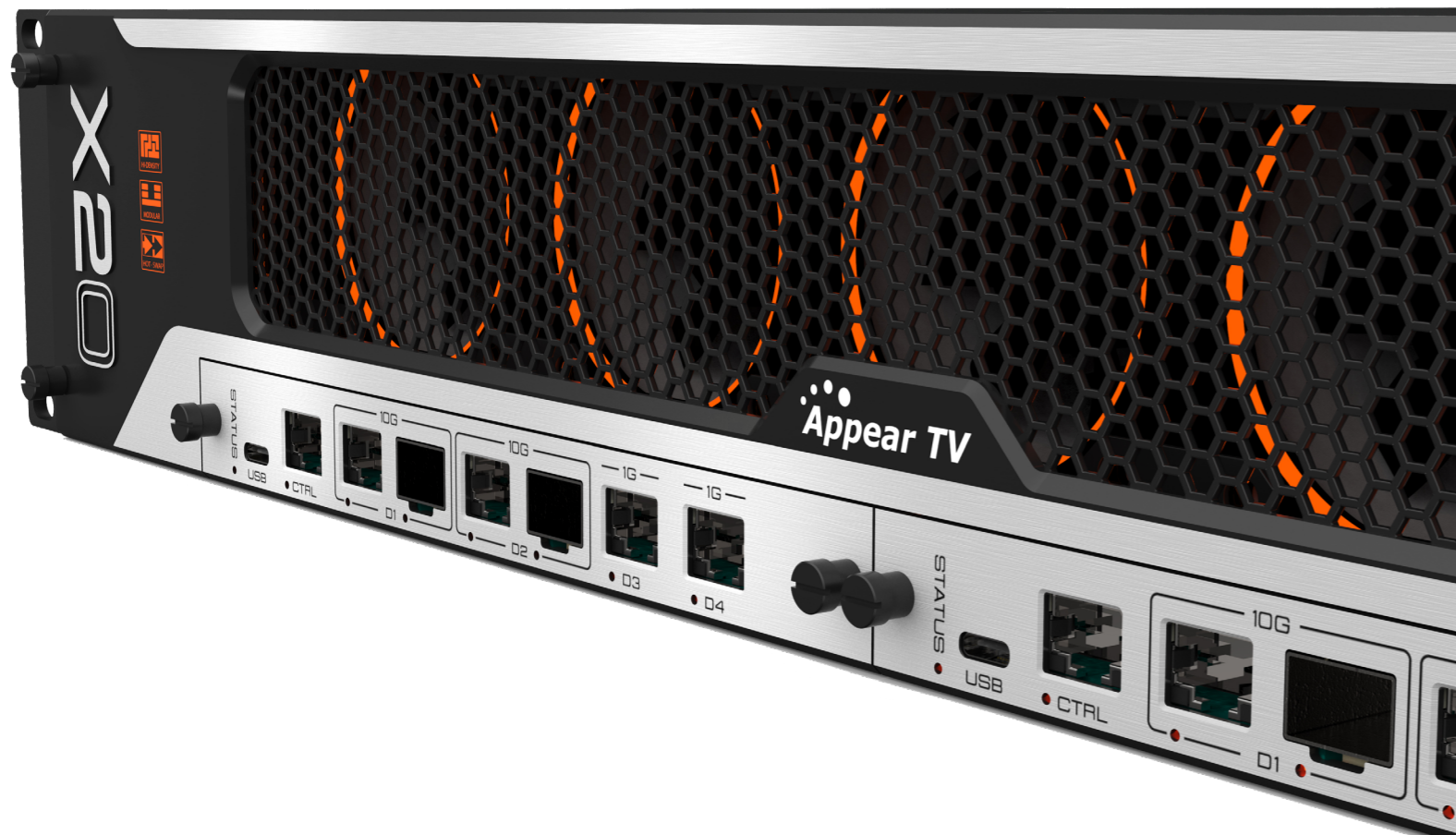
There are typically multiple locations within a modern broadcasting environment necessitating secure video interfaces between sites, especially when implemented using public networks. The high level of security needed must protect the different sites from outside attacks as well as protect the integrity of video transmission itself. Being a fully operational video firewall, the X platform maintains tight security on its control layer, supporting many advanced features encompassing Authentication, Authorisation and Audit. Security is assured by Appear TV's own FPGA based IP packet forwarding mechanism and proprietary internal network structure.

Video-centric features provided in the X series include:

- Multicast forwarding (IGMP join and forward)
- Inspect and forward MPEG-2 TS packets (deep layer 5/6 packet inspection)
- De-multiplex MPEG-2 TS streams
- Encryption and decryption of video data
- Seamless network protection according to SMPTE 2022-7
- Encode and decode SMPTE 2022-1 supplementary FEC

OVERVIEW

- Modular
- Scalable
- Compact with multiple inputs/ outputs per module
- Advanced input analysis and status information
- Easy to configure from one common web GUI interface
- Hot swappable
- Wide range of optional modules
- Mix and match card types freely, and add as many as you need



MODULES

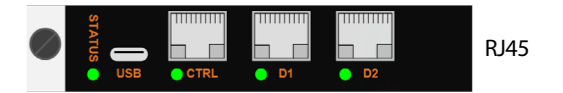
Control/Switch

X10

Total capacity	: 80 Gbps full duplex
Bitrate	: 10 Gbps routing between modules in a chassis
Interface	: 2x 1/10G Base-T Ethernet or 1G SFP/10G SFP+ (Base-T or SFP must be selected at order)
Protocols	: IPv4, IPv6, IGMP v2/v3, ICMP, ARP, 802.1Q (VLAN tag)
Data encapsulation	: TS over UDP/RTP, SDI over SMPTE 2022-6/ SMPTE 2110, AES67, etc
TS Processing	: De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation, etc.

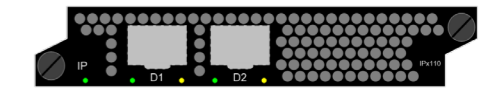
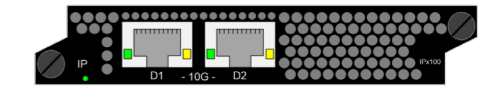
X20

Total capacity	: 140 Gbps full duplex
Bitrate	: 10 Gbps routing between modules in a chassis
Interface	: 2x 1/10G Base-T Ethernet or SFP+ 2x 1G Base-T Ethernet
Protocols	: IPv4, IPv6, IGMP v2/v3, ICMP, ARP, 802.1Q (VLAN tag)
Data encapsulation	: TS over UDP/RTP, SDI over SMPTE 2022-6/ SMPTE 2110, AES67, etc
TS Processing	: De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation, etc.



Dual 10G IP IO

Interface	: 2x 1/10G Base-T Ethernet or 1G SFP/10G SFP+ (Base-T or SFP must be selected at order)
Protocols	: IPv4, IPv6, IGMP v2/v3, ICMP, ARP, 802.1Q (VLAN tag)
Data encapsulation	: TS over UDP/RTP, SDI over SMPTE 2022-6/ SMPTE 2110, AES67, etc
TS Processing	: De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation



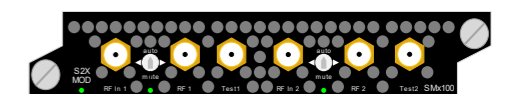
DVB-S/S2X Input

Interface	: 4 x F 75 Ohm
Demodulators	: 32 in blocks of 8 (each block must use same input port)
Satellite standards	: DVB-S EN 300 421, DVB-S2 EN 302 307 - 1, DVB-S2X EN 302 307 -2 Broadcast Services
Frequency range	: L-band (950 - 2150 MHz)
Modulation	: QPSK, 8PSK, 16APSK, 32APSK, 64 APSK, 128 APSK, 256 APSK
Symbol rate	: Up to 64 MBaud
Descrambling	: BISS 1, Biss E*, BISS CA*
TS Processing	: De-multiplexing, Service and PID filtering, PSI/SI re-generation, etc.



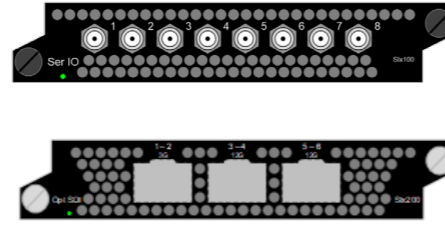
DVB-S/S2X Modulator

Number of modulators	: 2
Interface per modulator	: 1x SMA 50 Ohm output, 1x SMA 50 Ohm monitoring output, 1x SMA 50 Ohm input (redundancy)
Redundancy (optional)	: Relay switch on output for each modulator
Satellite standards	: DVB-S EN 300 421, DVB-S2 EN 302 307 - 1, DVB-S2X EN 302 307 -2 Broadcast Services
Frequency range	: IF and L-band (950 - 2150 MHz)
Modulation	: QPSK, 8PSK, 16APSK, 32APSK, 64 APSK, 128 APSK, 256 APSK
Symbol rate	: Up to 68 MBaud
Scrambling	: BISS 1, Biss E*, BISS CA*
TS Processing	: Multiplexing, PSI/SI re-generation, etc.



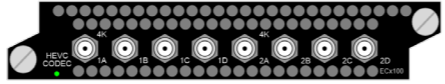
12G SDI/ASI IO

Interfaces	: 8x HD BNC 75 Ohm or 3x Video SFP+ (BNC or SFP must be selected at order)
Video Format	: 12G-SDI (SMPTE ST-2082) – two inputs only : 3G-SDI (SMPTE 424M) : HD-SDI (SMPTE 292M) : SD-SDI (SMPTE 259M)
Traffic type	: SDI or ASI (configurable)
Data flow	: Input or output
Codecs – encoding/decoding (on SDI)	: TICO, JPEG2000
TS Processing (in ASI IO mode)	: De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation, etc.



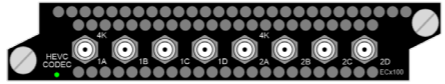
HEVC Encoder

Video Input connectors	: 8x HD BNC 75 Ohm
Number of Services	: 2x UHD, 8xFHD, HD, SD
Video Input format	: 12G-SDI (SMPTE ST-2082) – (on two of the 8 connectors) : 3G-SDI (SMPTE 424M) : HD-SDI (SMPTE 292M) : SD-SDI (SMPTE 259M)
Codecs	: AVC and HEVC
Resolutions	: SD, HD, FHD, UHD (UHD only on HEVC)
Encoding mode	: 8/10 bit, 4:2:0/4:2:2, Standard/Low delay/Ultra low delay



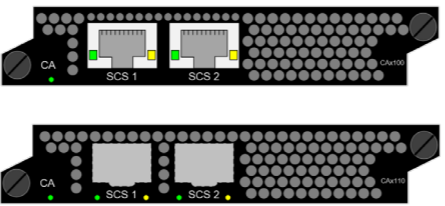
HEVC Decoder

Video output connectors	: 8x HD BNC 75 Ohm
Number of Services	: 2x UHD, 4xFHD, HD, SD
Video output format	: 12G-SDI (SMPTE ST-2082) – (on two of the 8 connectors) : 3G-SDI (SMPTE 424M) : HD-SDI (SMPTE 292M) SMPTE 259M)
Codecs	: AVC and HEVC
Resolutions	: SD, HD, FHD, UHD (UHD only on HEVC)
Decoding Modes	: 8/10 bit, 4:2:0/4:2:2, Standard/Low delay/Ultra low delay



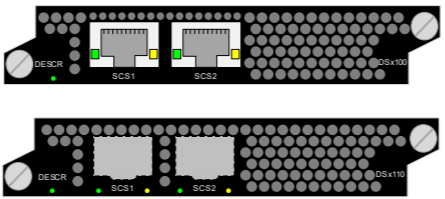
Scrambler

Scrambling capacity	: 2000 services/6 Gbit/s
Scrambling algorithm	: DVB-CSA v1 (48-bit) : DVB-CSA v2 (64-bit) : AES (128-bit)
Entropy reduction	: Yes for DVB-CSA v1 (Reduced to 48-bit), No for AES
CA system interface	: DVB simulcrypt compliant
Simulcrypt scrambling	: Up to 8 CA systems
Simulcrypt interface	: 2x 1/10G Base-T Ethernet or 1G SFP/10G SFP+ (Base-T or SFP must be selected at order)



Bulk Descrambler

Descrambling capacity	: 2000 services/6 Gbit/s (depends on crypto period)
Scrambling algorithm	: DVB-CSA v1 (48-bit) : DVB-CSA v2 (64-bit) : AES (128-bit)
CA vendors	: Verimatrix
CA authentication interface	: 2x 1/10G Base-T Ethernet or 1G SFP/10G SFP+ (Base-T or SFP must be selected at order)



SPECIFICATIONS

X10 Control/Switch module

Switch fabric	Total capacity	: 80 Gbps full duplex
	Bitrate	: 10 Gbps routing between modules in a chassis
	Placement	: Front loaded
	Interface	: 2x 1/10G Base-T Ethernet or 2x1G SFP/10G SFP+ (Base-T or SFP must be selected at order)

X20 Control/Switch module

Switch fabric	Total capacity	: 140 Gbps full duplex
	Bitrate	: 10 Gbps routing between modules in a chassis
	Placement	: Front loaded
	Interface	: 2x 1/10G Base-T Ethernet, SFP/SFP+, and 2x 1G Base-T Ethernet

Control/Switch module (common for X10 and X20)

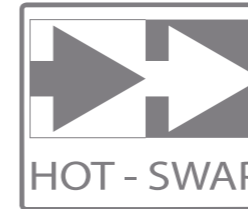
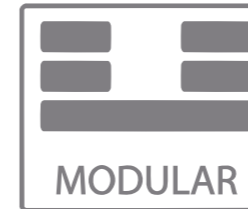
Dataports	Operational mode	: Seamless Input (SMPTE 2022-7) : Cloned Output (SMPTE 2022-7) : Seamless Input and Cloned Output (SMPTE 2022-7 Full Duplex) : Single Input and Single Output (on separate interfaces)
	Seamless buffer size (network path differential)	: Configurable up to 400ms
	Protocols	: IPv4, IPv6, IGMP v2/v3, ICMP, ARP, 802.1Q (VLAN tag)
	IO Data Rate	: 1/10Gbps Bi-directional
Control Interface	Interface	: 10/100/1000 Base-T Ethernet
	Built-in user interface	: Web
	Protocols	: IPv4, IPv6, HTTPS, SSH, ICMP, ARP
	External interface	: SNMP for alarms, JASON for configuration and status (TBD)
Generic traffic	Protocols	: UDP, RTP, SMPTE 2022-6, SMPTE 2110 VSF TR-03, VSF TR-04, AES67
	IP input de-jitter	: Yes, based on RTP timestamps or CBR bitrate
	IP input de-jitter buffer size	: Configurable up to 200ms
	Maximum number of streams per port	: 2000 input and 2000 output streams
	Transparent processing capacity	: 10 Gbps Bi-directional
MPEG TS traffic	Key reference specification	: ISO/IEC 13818-1:2015, ETSI TS 102 034 V2.1.1 ETSI TR 101 211 V1.9.1
	Protocols	: UDP, RTP Multicast, Unicast
	IP input de-jitter	: Yes, based on PCR timestamps or CBR bitrate
	IP input de-jitter buffer size	: Configurable up to 200ms
	Maximum number of streams per port	: 2000 input and 2000 output streams
	Forward Error Correction	: SMPTE 2022-1 (licensed) - later release
	Transport stream	: Single program (SPTS) and multi program (MPTS)
	MPEG TS processing capacity	: 6Gbps Bi-directional
	Service filtering	: Yes
	Video format	: MPEG-2, H.264, HEVC (Transport Stream)
	Multiplexing (MPTS output)	: Yes
	PCR regeneration	: Yes
	Tables Supported	: MPEG PSI -> PAT, PMT DVB SI -> SDT actual
	PSI/SI Table Regeneration	: Yes, based on input and operations performed
Licensed Features	Forward Error Correction (SMPTE 2022-1) - Later Release	
	Seamless Input (SMPTE 2022-7)	
	MPEG TS multiplexing (MPTS output)	
	Number of configured MPEG TS input streams	

Chassis

Physical dimensions	X10 chassis	: 19" × 1RU × 540 mm (440 × 44 × 540 mm)
	X20 chassis	: 19" × 2RU × 540 mm (440 × 88 × 540 mm)
Module slots	Number of switch modules (front)	: 1 or 2 active – active)
	X10 Number of modules (rear)	: 6
	X20 Number of modules (rear)	: 12
	Hot swap support	: Yes
Power supply	Power rating X10	: 750 W
	Power rating X20	
	Max Load	: U NOM 100 - 240 VAC /50 - 60 Hz / 12 A 1200 W @ 200 - 240 VAC / 800 W @ 100 - 200 VAC
		: U NOM 100 - 240 VAC /50 - 60 Hz / 15 A 1500 W @ 200 - 240 VAC / 800 W @ 100 - 200 VAC : -48 to -60 VDC I max: 36.2 A Max Load: 1200 W, x2
Cooling	Redundancy	: Yes, dual hot-swappable PS
	Monitoring	: Via WEB GUI and LED indicators on PS
Cooling	X10 chassis	: Single fan tray with 6 fans
	X20 chassis	: Single fan tray with 5 fans
	Airflow direction	: Front to back
	Hot swap support	: Yes, complete fan tray

Environmental Conditions

Operational conditions	Temperature	: 0 to +40 °C
	Humidity	: 5–95% (non-condensing)
Storage	Temperature	: -20 to +70 °C
	Humidity	: 5–95% (non-condensing)
Safety standards	Electric safety	: IEC 60950-1
	EMC	: EN 55032, EN55024, EN61000-3-2, EN61000-3-3, FCC CFR 47 Part 15
	RoHS	: Compliant
	WEEE	: Compliant



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