Datasheet

X10
X20

appear.net

Version 3.0

appear

«The ultimate solution for high-performance live media production.»

Near limitless capacity

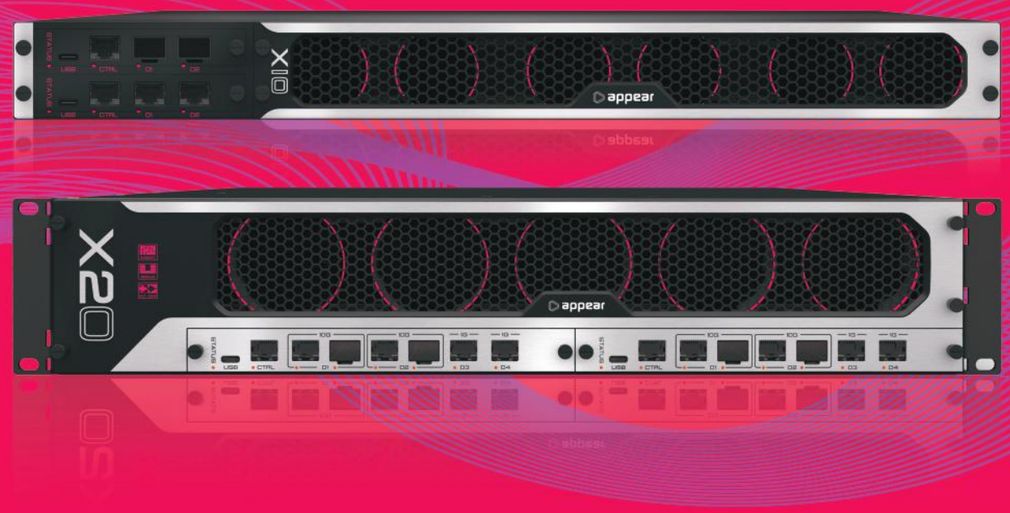
The Appear X10/X20 Platform is a dedicated solution for high-speed video networking, ideal for premium live video contribution and distribution. Designed for near limitless capacity, enhanced security, operational simplicity and exceptionally high reliability, the platform redefines video delivery.

With IP network technology and infrastructure evolving, the distribution of video is changing. Legacy infrastructure is being replaced by transmission over standard IP-based networks. The emergence of 100G IP infrastructures enables high-bitrate workflows, including uncompressed video and JPEG-XS.

Specifically designed for IP-centric operations, the X10/X20 chassis has a significant video processing capacity. Bi-directional IP interfaces provide firewall-grade IP security at every connection node.

The X Platform supports conversion of uncompressed video from/to SDI, ST2022-6 and ST2110 with options to perform “light” compression/decompression using intra-codecs such as JPEG XS 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.

Service density can be defined up to 2,000 services in and out per X Platform module, while set-up and configuration is streamlined for simple operation. The user interface offers a modular way of configuring all functions provided by the platform.



« Advanced architecture designed to save space, energy and resources. »

Chassis overview

The X Platform now includes the new compact X5, the 1RU X10, and the capacious 2RU – X20 (further details on the X5, including a datasheet are available at appear.net). 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. All modules are hot-swappable (including power supplies and fans).

Unlike other compression products, the X10/X20 Platform solves many different problems by covering a wide range of technologies. The custom hardware and high density makes the platform extremely reliable and reduces the need for rack space, cabling, cooling, power and packaging compared to server-based solutions, ensuring the lowest TCO and carbon footprint in the market..

The X software architecture enables alternate software versions to run on different modules, allowing new functionalities to be delivered to customers faster.

Features

2RU - X20

- Modular configuration with up to 12 option slot boards
- WEB-based configuration, LED indicators on PS ad 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.

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 hardware, new standards not currently defined will be added when required.

AVC, HEVC, JPEG XS AND JPEG2000 COMPRESSION
All common compression technologies used in professional broadcasting are supported, making the X Platform adaptable to all operational requirements within contribution, remote production, video networking and distribution.

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

CAPACITY
IP-GW modules support up to 4,000 streams per module. X20 can compress up to 96 HD channels per chassis.

MONITORING & CONTROL
A built-in management system to control all services in the unit. A wide range of external monitoring and control options including SNMP and Prometheus support.

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. If an internal failure occurs, built-in redundancy options ensure the chassis remains fully operational. Optional dual active-active control and switch modules enable seamless recovery from critical errors.

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'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 configuration from a single common web GUI interface
- Hot swappable
- Wide range of optional modules
- Mix and match card types freely - add as many as you need, when you need them

Modules

X10

X20

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

Control/Switch

X10	
Total capacity	80 Gbps full duplex
Bitrate	10 Gbps routing between modules in a chassis
Interface	21/10G 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, L2TP (Output)
Scrambling/descrambling	BISS2 Mode 1/E, BISS CA
TS Processing	De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation
Clock Options	Free running, PTP, Genlock (PAL/NTSC Black Burst signal)*, GPS**

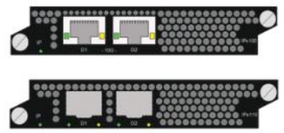
X20 10G	
Total capacity	140 Gbps full duplex
Bitrate	10 Gbps routing between modules in a chassis
Interface	21/10G Base-T Ethernet or SFP+ 2x 1G Base-T Ethernet
Protocols	IPv4, IPv6, IGMP v2/v3, ICMP, ARP, 802.1Q (VLAN tag)
Data encapsulation	TS over UDP/RTP, SDI over SMPTE 2022-6 / SMPTE 2110, AES67, L2TP (Output), Port data tunneling
Scrambling/descrambling	BISS2 Mode 1/E, BISS CA
TS Processing	De-multiplexing, Multiplexing, Service and PID filtering, PSI/SI re-generation
Clock Options	Free running, PTP, Genlock (PAL/NTSC Black Burst signal)*, 10MHz, GPS**

(PAL/NTSC Black Burst signal) support

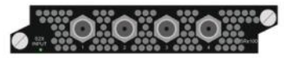
* Must be selected at order. ** Future, requires hardware options

X20 100G	
Total capacity	400 Gbps full duplex
Bitrate	10 Gbps bi-directional autosensing routing between modules 100 Gbps bi-directional between switch modules
Interface	2 x QSFP28, 10/100/1000G Base-T Ethernet
Protocols	IPv4, IPv6, HTTPS, SSH, ICMP, ARP, LLDP
Data encapsulation	RTP Mapping - SMPTE 2022-2, 2022-6 & 2110
Clock Options	Free running, PTP

Dual 10G IP IO	
Interface	21/10G 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, L2TP (Output), SRT, Zixi
TS Processing	De-multiplexing, Multiplexing, Service and PIDfiltering, PSI/SI re-generation



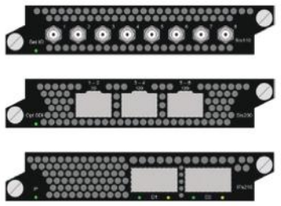
DVB-S/S2X Input	
Connectors	4 x F 75 Ohm
Demodulators	32 in blocks of 16 (each block has 2 RF inputs)
Satellite standards	DVB-S EN 300 421, DVB-S2 EN 302 307 – 1, DVB-S2X EN 302 307 -2 Broadcast Services
Frequency range	L-band (950 – 2150 MHz)
Modulation	QPSK, 8PSK, 16APSK, 32APSK, 64 APSK, 128 APSK, 256 APSK
Symbol rate	Up to 64 MBaud
Descrambling	BISS 1 Mode 1/E, BISS2 Mode 1/E, BISS CA
TS Processing	De-multiplexing, Service and PID filtering, PSI/SIre generation



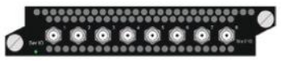
DVB-S/S2X Modulator	
Number of modulators	2
Interface per modulator	1x SMA 50 Ohm output, 1x SMA 50 Ohm monitoring output, 1x SMA 50 Ohm input (redundancy)
Redundancy (optional)	Relay switch on output for each modulator
Satellite standards	DVB-S EN 300 421, DVB-S2 EN 302 307 – 1, DVB-S2X EN 302 307 -2 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 72 MBaud
Scrambling	BISS 1 Mode 1/E, BISS2 Mode 1/E, BISS CA, Servive level descrambling
TS Processing	Multiplexing, PSI/SI re-generation

SDI/2110/2022-6 IO	
Connectors	8x HD BNC 75 Ohm (SIx110/SIx130) 3x Video SFP (Non-MSA Dual rx/ Dual Tx) (SIx200) 2x QSFP (10GbE, 25GbE or 40GbE) (IPx210)
Video Format	12G-SDI (SMPTE 2082) 3G-SDI (SMPTE 424M) HD-SDI (SMPTE 292M) SD-SDI (SMPTE 259M)
Data flow	Input or output
Codecs – encoding/decoding	Uncompressed, JPEG XS, JPEG2000*
Video encapulation	SMPTE 2110-20 (VSF TR-08), SMPTE 2022-6, TS (VSF TR-07)

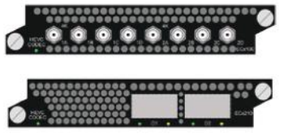
* Not supported on IPx210



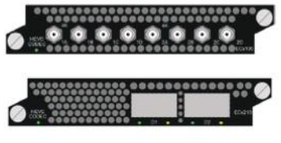
ASI IO	
Connectors	8x HD BNC 75 Ohm (SIx110, SIx130) 16x HD BNC 75 Ohm (SIx120)
ASI Format	188 byte TS – spread and burst mode
Video encapulation	TS
TS Processing	De-multiplexing, Multiplexing, Service and PID filtering, PSI SI re-generation
Scrambling	BISS 1 Mode 1/E, BISS2 Mode 1/E, BISS CA, Service level descrambling



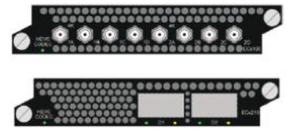
HEVC Encoder	
Video Input connectors	8x HD BNC 75 Ohm or 2x QSFP (10GbE, 25GbE or 40GbE) or 4 x SFP28
Number of Services	2x UHD, 8xFHD, HD,
Video Input format	12G-SDI (SMPTE 2082) 3G-SDI (SMPTE 424M) HD-SDI (SMPTE 292M) SD-SDI (SMPTE 259M)
Input	SDI, ST2110 or ST2022-6
Codecs	AVC and HEVC
Resolutions	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
Audio leveling	Long-term and short-term loudness leveling, peak limiting
	Operational mode: Broadcast or ABR



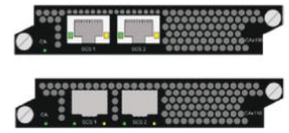
HEVC Transcoder	
Number of Services	Up to 2x UHD or 8xFHD, HD, SD
Decoder	MPEG-2, AVC and HEVC
Encoder	AVC and HEVC
Operation modes	Combined Multiscreen and broadcast
Component	Passthrough with PCR/PTS sync
Audio leveling	Long-term and short-term loudness leveling, peak limiting



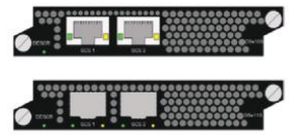
HEVC Decoder	
Video output connectors	8x HD BNC 75 Ohm or 2x QSFP (10GbE, 25GbE or 40GbE)
Number of Services	2x UHD, 4xFHD, HD, SD
Video output format	12G-SDI (SMPTE 2082) 3G-SDI (SMPTE 424M) HD-SDI (SMPTE 292M) SD-SDI (SMPTE 259M)
Output	SDI or ST2110
Codecs	MPEG2, AVC and HEVC
Resolutions	SD, HD, FHD, 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
Input	MPEG-2 Transport Streams
Scrambling modes	CA systems, BISS 1 Mode 1, Fixed key
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	Simulcrypt interface with optional backup connection



Bulk Descrambler	
Descrambling capacity	2000 services/6 Gbit/s (depends on crypto period)
Scrambling algorithm	DVB-CSA (64-bit) AES (128-bit)
CA systems	Verimatrix, BISS1 Mode 1/E, BISS2 Mode 1/E
CA authentication interface	21/10G Base-T Ethernet or 1G SFP/10G SFP+ (Base-T or SFP must be selected at order)



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