

K2 Summit Production Client

K2 MULTI-FORMAT MEDIA CLIENT
WITH UP TO 4 HD/SD BI-DIRECTIONAL
CHANNELS

NOW WITH
CHANNELFLEX™



The K2 Summit Production Client is optimized for a broad range of production and broadcast applications. K2 Summit is the only server that supports end-to-end SD/HD workflows in DVCPRO, MPEG-2, and AVC-Intra formats.

The K2 Summit™ Production Client is a major enhancement to the K2 family. It is optimized for production and live event workflows as well as broadcast applications. Teamed with the K2 Dyno™ replay controller, it offers an ideal solution for live events such as sports, concerts, and any application that requires quick access to recorded media.

As with all K2 media clients, you can configure a K2 Summit as part of a SAN solution comprised of multiple media clients, K2 media server, and K2 RAID storage—or deploy a standalone client with internal or external storage and built-in server for use in a distributed environment. Both the SAN and standalone systems are optimized to work in a file-based environment.

K2 Platform – Overview

The K2 platform is comprised of one or more K2 media clients connected to one

or more K2 media servers and K2 RAID-protected storage. The K2 media client performs all video and audio I/O using built-in encoders and decoders. You can attach more than 100 media client channels to the K2 media servers and RAID system.

For its part, the K2 media server manages the file system and controls file transfer protocol (FTP) operations. K2 storage offers options for internal drives or external RAID systems that can scale to more than 50 terabytes.

K2 Summit Production Client

The K2 Summit Production Client is a 2 RU platform with redundant hot-swappable power supplies, and redundant Ethernet ports. It includes an Embedded OS that runs off of a CompactFlash system drive providing fast and reliable operation. To provide a cost-effective design with no single point

of failure, each K2 Summit SAN client offers two iSCSI or Fibre Channel ports to provide a backup data path in case of a failure.

To this architecture we've added our Emmy® Award-winning core video technology. Each channel is built around a high-performance RISC processor, an embedded real-time operating system, and performs video/audio processing in the robust and secure manner needed for a 24/7, frame-accurate environment.

K2 Production Features

The K2 Summit Production Client has been specifically designed for the needs of live event productions such as sporting events where instant replays need to be available immediately at the push of a button.

All channels are bi-directional and can easily and quickly switch between record and play.

KEY FEATURES

- Two- or four-channel configurations:
 - SD: DV, IMX, and MPEG-2 I-Frame & Long GOP
 - HD: DV, XDCAM HD, XDCAM EX, MPEG-2 I-Frame & Long GOP, and AVC-Intra
- Play different formats back-to-back:
 - SD and HD clips
 - 720p/1080i
 - DV/MPEG/AVC-Intra
- Instant replay capability
- ChannelFlex™-compatible with AppCenterElite:
 - Multicam mode
 - Super SloMo mode
 - 3D mode
 - Video + key mode
- HD/SD-SDI monitor output with timecode burn-in and custom text overlays
- Multiviewer monitor mode with custom text overlays
- iSCSI or Fibre Channel connection to K2-SAN shared storage
- Built-in mix effects on each channel:
 - Video dissolves and audio cross fades supported via APIs and AppCenterPro playlist
- Fast boot times with embedded OS on CompactFlash
- Up to 8 internal hard disk drives or solid state drives (SSD)
- Import/export all formats as MXF OP1a, SMPTE 360M (GXF), or QuickTime
- File system enables edit-in-place of QuickTime files

K2 SUMMIT PRODUCTION CLIENT STANDARD FEATURES



Internal multiviewer output on VGA provides a quad split display of the all channels in real time (Requires optional AppCenterPro).

- Automatic upconversion and downconversion, user-definable aspect ratio conversion, and closed caption preservation
- Configurable as SAN or standalone solution
- ANC data preserved and full AFD processing
- Standard redundant power supplies, cooling, and Ethernet ports
- Embedded operating system on flash memory
- Scales from two to four channels to more than one hundred channels in a SAN configuration
- Open-system design enables interoperability with other devices via standard protocols
- Full multi-channel audio support – 16 SDI audio tracks per video channel (32 audio tracks per clip on disk)
- Remote SNMP monitoring via NetCentral™ SNMP-based facility-monitoring software
- Security options enable protection from accidental on-air channel mistakes

ChannelFlex-Compatible

ChannelFlex^{*1} doubles K2 Summit's capability from four bi-directional channels to application-specific configurations equivalent to eight channels:

- Record up to 8 camera feeds
- Record up to two 2X/3X super slo-mo cameras
- Record up to four 3D cameras or video+key pairs
- Play up to four 3D files or video+key pairs

Flexible Monitoring Options

With the built-in VGA multiviewer^{*2}, all four channels can be monitored in normal mode or up to eight channels when ChannelFlex^{*1} is in operation. An SDI monitor output is available with timecode burn-in for each channel.

A user-definable text overlay option^{*2} is available for both monitor displays that enables various information such as

channel/clip name, transport controls, play speed, audio meters etc. to be displayed in any location with various text sizes and colors.

Built-in Mix Effects

For generating quick highlight packages, often all that is required is simple dissolves or fades between two clips. Each channel has this capability built-in (most servers require two channels to do a mix effect). An integrated mixer dissolves between two clips or to a matte color. The color and transition times are user-definable.

Multiple Format Capabilities

The K2 Summit Production Client is the only server that provides agile codecs enabling playback of SD or HD content seamlessly on the same timeline with any supported format (DV/DVCPRO, MPEG-2, or AVC-Intra). It automatically up-, down-, or crossconverts a clip to the desired output resolution providing

full support for all SD and HD formats. The K2 Summit Production Client also supports the industry AFD standard for aspect ratio conversion. As a result, you only need to store a single-format version of a clip in order to play it out in the appropriate SD or HD format.

Advanced Video Playback Features

The K2 Summit Production Client features smooth, high-quality, bi-directional, slow-motion playback, and enhanced jog/shuttle control for all formats including MPEG-2 Long GOP. Playback trails recording by a fraction of a second so replay is virtually instantaneous^{*2}. Slo-mo playback and freeze frames are jitter-free at even the slowest speeds due to the use of line interpolation technology.

*1 – requires AppCenterElite

*2 – requires AppCenterPro

K2 SUMMIT AND K2 DYN0 REPLAY SYSTEM



The K2 Dyno replay controller is a powerful and cost-effective system to address sports replay and other live events. The K2 Dyno controller offers a highly intuitive control panel and user interface, high-quality T-bar and jog knob, touchscreen display, and the ability to attach an optional VGA monitor for dual-screen operation. All of the advanced features of the K2 Summit Production Client are available through the K2 Dyno control panel including the built-in mix effects on each of the four channels, smooth slo-mo playback, and instant replay at the push of a button.

The K2 Dyno application has been optimized for a typical live event workflow and includes:

- Pre-production features for easy setup and import of previous highlights, material, setups, and graphics
- On-air features for instant replay, highlights (shotbox) creation with metadata, and playlist package with mix effects
- Post-production features for quick "melt" and take-away on a standard USB disk for editing

Audio and Closed Caption/Teletext Multilingual Support

Each video channel has up to 8 AES/EBU or 16 embedded channels of PCM or compressed audio. For easy track management, each audio track can be identified with a language descriptor*2.

Additional audio features include scrub audio up to 2X, audio meters for each channel, an internal audio delay capability, and the ability to adjust levels during recording or playback. It also performs an audio ramp down/ramp up between clips to eliminate audio clicks and/or pops.

Additional audio tracks can be imported into a clip*2 to easily add additional languages. In addition multiple closed captions or teletext files can be imported from third-party captioning editors for additional language support.

Rear View – K2 Summit Production Client



*2 – requires AppCenterPro

SPECIFICATIONS

Specification	K2-XDP	K2-XDP-xxx-AVC	K2-XDP-xxx-MPG
Channels	2 or 4 independent bi-directional channels: <ul style="list-style-type: none"> Record DV Play DV and MPEG-2 Any channel can be any format 	2 or 4 independent bi-directional channels: <ul style="list-style-type: none"> Record DV and AVC-Intra Play DV, AVC-Intra and MPEG-2 Any channel can be any format 	2 or 4 independent bi-directional channels: <ul style="list-style-type: none"> Record DV and MPEG-2 Play DV and MPEG-2 Any channel can be any format
Formats	SD: <ul style="list-style-type: none"> DV, DVCAM, DV25, DV50 MPEG-2@ML 4:2:0, I-Frame & Long GOP, 2-15 Mb/s MPEG-2@ML 4:2:2, I-Frame & Long GOP, 4-50 Mb/s D10/IMX30/40/50 HD: <ul style="list-style-type: none"> MPEG-2@HL 4:2:0, I-Frame & Long GOP, 12-80 Mb/s MPEG-2@HL 4:2:2, I-Frame & Long GOP, 20-100 Mb/s XDCAM HD (18, 25, 35 Mb/s) XDCAM HD 4:2:2 (50 Mb/s) HDV payout XDCAM EX 	SD: <ul style="list-style-type: none"> DV, DVCAM, DV25, DV50 MPEG-2@ML 4:2:0, I-Frame & Long GOP, 2-15 Mb/s MPEG-2 @ ML 4:2:2, I-Frame & Long GOP, 4-50 Mb/s D10/IMX30/40/50 HD: <ul style="list-style-type: none"> MPEG-2@HL 4:2:0, I-Frame & Long GOP, 12-80 Mb/s MPEG-2@HL 4:2:2, I-Frame & Long GOP, 20-100 Mb/s XDCAM HD (18, 25, 35 Mb/s) XDCAM HD 4:2:2 (50 Mb/s) HDV payout XDCAM EX AVC-Intra 50/100 	SD: <ul style="list-style-type: none"> DV, DVCAM, DV25, DV50 MPEG-2@ML 4:2:0, I-Frame & Long GOP, 2-15 Mb/s MPEG-2 @ ML 4:2:2, I-Frame & Long GOP, 4-50 Mb/s D10/IMX30/40/50 HD: <ul style="list-style-type: none"> MPEG-2@HL 4:2:0, I-Frame & Long GOP, 12-80 Mb/s MPEG-2@HL 4:2:2, I-Frame & Long GOP, 20-100 Mb/s XDCAM HD (18, 25, 35 Mb/s) XDCAM HD 4:2:2 (50 Mb/s) HDV payout XDCAM EX

Description

- 2 or 4 SD/HD channels
- All channels are bi-directional

Video Channels

- 2 or 4 bi-directional HD/SD-SDI record/play channels
- BNC, 75Ω
- SD SDI: SMPTE 259M, ITU-R601, 525/625 line component, 10-bit
- HD-SDI: SMPTE 292M, 10-bit

ChannelFlex Modes (with AppCenter Elite)

- Multicam (up to 4 channels)
- Super slo-mo (1 or 2 channels)
- 3D (up to 4 channels)
- Video+key (up to 4 channels)

Monitor Modes

- SDI monitor out with timecode burn-in
- VGA multiviewer (AppCenterPro)
- Definable text overlay for above displays including channel name, clip name, transport status, play speed, audio meters, and other status (AppCenterPro)

Video Playback Output

- Any supported format can be played seamlessly back-to-back
- Output can be delayed at pixel resolution within a range of one frame
- Freeze mode – frame or field
- Off-speed play – line interpolation provides jitter free slow-motion playback in both directions

Video Mix Effects (w/AppCenterPro)

- Dissolves between two video tracks on same channel
- Fade up/down to matte color (default is black)
- Max duration per transition – user selectable

Up/Down/Crossconversion and Aspect Ratio

- 525↔1080i, 525↔720p, 625↔1080i, 625↔720p
- 720p↔1080i crossconversion
- AFD support for 4:3-16:9 aspect ratio conversion with format specified on a channel basis with clip by clip override capability
- Bar, half-bar, crop and stretch options configurable via UI, AMP protocol or K2.net (native protocol)

E-to-E Mode

- Less than one frame delay
- No re-timing applied

Audio

- Record or play up to 16 tracks per channel
- 32 audio tracks per clip stored on disk

Embedded Audio Tracks (per video channel)

16 tracks embedded

Discrete AES/EBU Audio Tracks (per video channel)

- 8 input and 8 output tracks (4 AES pairs) audio
- DB25 pin connector (optional) – Yamaha AES D-sub pinout (CD8AES & MY8AE)

Audio Specifications

- Input: 48 kHz, 16-, or 24-bit digital audio PCM
- Sample rate conversion on inputs (32 kHz to 96 kHz) to 48 kHz
- Output: 48 kHz clock derived from video reference, 16- or 24-bit
- Compliant with SD-SMPTE 259M, HD-SMPTE 292M
- Compressed audio types: AC-3 and Dolby E pass-through
- Audio delay adjustable ±200 ms relative to output video

SPECIFICATIONS (CONT.)

Audio Special Features

- Scrub audio support (±2X)
- Audio click elimination
- Agile playback of clips with different supported audio formats
- Audio tagging and audio mapping (with K2 AppCenterPro)
- Audio mix effects (PCM only):
 - Cross fade between tracks
 - Fade up/down

Power Requirements

- Dual redundant 500W maximum, 300W typical
- Auto-sensing, hot-swap
- 100-240VAC, 50-60 Hz

Dimensions

- Height: 9 cm (3.5 in.) – 2 RU
- Width: 44.5 cm (17.5 in.)
- Depth: 61.6 cm (24.3 in.)
- Weight: 24 kg (52.9 lbs.) maximum

Environmental Characteristics

- Operating temperature: 10° to +40°C (50° to 104°F)
- Non-operating temperature: -40° to +60°C (-40° to 140°F)
- Operating relative humidity: 20% to 80% from -5° to +45°C (23° to 113°F)
- Non-operating relative humidity: 10% to 80% from -30° to +60°C (-22° to 140°F)

Redundancy

- Redundant power supplies (hot-swap)
- Redundant cooling

GPI

12 in, 12 out – 25-pin D connector (DB25)

Reference Genlock

- NTSC/PAL black composite analog
- Two BNC, 75Ω passive loop through
- Burst frequency lock: PAL, +10 Hz at subcarrier NTSC, +20 Hz at subcarrier

Timecode

- LTC SMPTE 12M one per channel
- One mini-XLR per input and one mini-XLR with input and output
- 1 kΩ input, 50Ω output impedance
- One VITC reader/writer per video:
 - Lines 10-21 on 525 configurations, lines 6-23 on 625 configurations
- Ancillary timecode

Control

Interconnects:

- Four RS-422 serial ports
- 100/1000Base-T Ethernet port

Protocols:

- BVW (RS-422) (w/o insert edit)
- Odetics (RS-422)
- VDCP (RS-422)
- AMP (RS-422 and Ethernet)
- K2.net native API

Media Exchange

MXF Op1a, GXF (SMPTE 360M), AVI, and QuickTime

Ports

- Four 100/1000Base-T Ethernet ports
- One USB 2.0 front, two USB 2.0 rear
- One RS-422 serial port per channel
- 15-pin SVGA
- USB keyboard
- USB mouse

Remote Monitoring

Grass Valley™ NetCentral SNMP-based remote facility-monitoring software

Certifications

UL 60950, FCC Class A, EMC Class A, CE, C-Tick, CSA 60950, IEC 950, EN 60950

Included in Package

- Power cords (2)
- LTC cables (4)
- Documentation CD
- QuickStart guide
- USB stick with recover image

K2 Summit Production Clients With Internal Storage (in hours*)

Format Data Drives	Drive Type	DVCPRO 25	DVCPRO 50 AVC-INTRA 50	DVCPRO HD AVC-INTRA 100	IMX 30	XDCAM HD	XDCAM HD 50
600 GB RAID-1 (4/4)	HDD	160	80	40	138	122	88
600 GB RAID-0 (8/0)	HDD	320	160	80	272	244	176
450 GB RAID-1 (4/4)	HDD	120	60	30	103	91	66
450 GB RAID-0 (8/0)	HDD	240	120	60	204	182	132
200 GB RAID-0 (2/0)	SSD	27	13	7	23	20	15
200 GB RAID-0 (4/0)	SSD	53	27	13	46	41	29
200 GB RAID-1 (4/4)	SSD	53	27	13	46	41	29
200 GB RAID-0 (8/0)	SSD	107	53	27	91	81	59

RAID-1 = 4 data drives and 4 parity drives. RAID-0 = 8 data drives

*Time for video with four 16-bit audio channels, no ancillary data. Times are estimated and can vary up to ±10%.

ORDERING INFORMATION

K2-XDP-2SD/K2-XDP-4SD

2/4 SD channels with DV25/50 & MPEG-2 SD playout and DV25/50 record

K2-XDP-2HD/K2-XDP-4HD

2/4 SD/HD channels with DV25/50, DVCPRO HD & MPEG-2 SD/HD playout and DV25/50, DVCPRO HD record

**K2-XDP-2SD-MPEG/
K2-XDP-4SD-MPEG**

2/4 SD channels with DV25/50 & MPEG-2 SD playout and record

**K2-XDP-2HD-MPEG/
K2-XDP-4HD-MPEG**

2/4 SD/HD channels with DV25/50, DVCPRO HD & MPEG-2 SD/HD playout and record

**K2-XDP-2HD-AVCI/
K2-XDP-4HD-AVCI**

2/4 SD/HD channels with DV25/50, DVCPRO HD & AVC-Intra playout and record

Options

K2-XDP-80600R0

Eight 600 GB 15K SAS drives for internal storage configured as 8 data and no parity drives

K2-XDP-80600R1

Eight 600 GB 15K SAS drives for internal storage configured as 4 data and 4 parity drives

K2-XDP-8045R0

Eight 450 GB 15K SAS drives for internal storage configured as 8 data drives

K2-XDP-80450R1

Eight 450 GB 15K SAS drives for internal storage configured as 4 data and 4 parity

K2-APP-PRO

K2 AppCenterPro for advanced features

K2-APPCENTER-ELITE

Adds ChannelFlex capability

K2-XDP-AES-CABLES

AES DB25 to XLR break-out cables (2). Each cable provides 8 input and 8 output AES XLR connectors for one channel

K2-XDP-SSD2200R0

Two 200 GB SSD drives configured as RAID-0 for internal storage

K2-XDP-SSD4200R0

Four 200 GB SSD drives configured as RAID-0 for internal storage

K2-XDP-SSD8200R0

Eight 200 GB SSD drives configured as RAID-0 for internal storage

K2-XDP-SSD8200R1

Eight 200 GB SSD drives configured as RAID-1 for internal storage
Other upgrade kits, spare parts, external storage, SAN configurations, and service options are available.

CUSTOMER SUPPORT & PROFESSIONAL SERVICES

Our customer support and professional services offerings ensure optimal system performance and maximize uptime. These services include call centers staffed around the clock, commissioning, professional training courses, and technical maintenance programs and service agreements.

www.grassvalley.com/support

