# K2 Summit 3G+

## 4K UHD/3G/HD/SD Media Server & Storage Platform

The K2 media server and storage platform from Grass Valley is the most extensive and flexible line of media servers, storage and integrated playout devices in the industry. Leveraging open-standard IT components and technologies, the K2 platform brings the benefits of mainstream computer industries to the broadcast enterprise — including the latest advances in processing power and storage capacity with ease of integration, and streamlined operation and management, for formats ranging from SD to 4K UHD.

K2 systems can be deployed in a variety of configurations depending on user requirements. Systems are scalable for more channels, bandwidth and storage capacity. Systems can be designed with various levels of redundancy.

The K2 platform's open storage architecture easily integrates with Grass Valley and many third-party products and applications. Its file system is compatible with QuickTime and MXF to enable easy integration with NLEs, including Grass Valley EDIUS and popular third-party solutions including Apple Final Cut Pro, Adobe Premiere Pro CC and Avid Media Composer/ NewsCutter. The open file system provides interoperability with archive and other smart appliances via industry-standard formats including MXF, Quick-Time and GXF.

Crucial to a file-based infrastructure is bandwidth. The K2 platform has the highest bandwidth capability of any system in the industry, and is proven at the largest real-world system installations. Equally important, the K2 platform features a Quality of Service algorithm with dynamic allocation of bandwidth where it's needed, guaranteeing that on-air channels never drop a frame of video. High-bandwidth FTP capabilities permit the K2 platform to adapt to a wide variety of workflows.

With hundreds of K2 installations around the world, it is a solution proven in many 24/7/365 mission-critical environments including ingest, playout, news and live event production.

| K2 Summit Version | K2 Summit 3G | K2 Summit 3G+ |
|---|---|---|
| System Drive | mSATA | M.2 |
| Internal HD Storage | 7.2 TB | 16 TB |
| Opearting System | Windows 7 Embedded | Windows 10 |
| Format Data Drives | RAID-0/1 | RAID-5 |
| Multiviewer Port | VGA | Display Port |
| 10 Gb/s Location | Card Insertion | Motherboard |

# K2 Summit 3G+ Production Client

The **K2 Summit 3G+ Production Client** is optimized for a broad range of production and broadcast applications and is the only server that supports end-to-end SD/HD/3G/4K UHD workflows in DVCPRO, MPEG-2, AVC-Intra, H.264/AVCHD, DNxHD and ProRes formats.

The Grass Valley K2 Summit 3G+ Production Client is a major enhancement to the K2 media server family. It is optimized for production, live event workflows and broadcast applications. Teamed with the K2 Dyno Replay Controller, K2 Summit 3G+ offers an ideal solution for live events such as sports and concerts, studio production, news and any application that requires quick access to recorded media.

## K2 Summit 3G+ Production Client

The K2 Summit 3G+ Production Client is a 2 RU platform with redundant hot-swappable power supplies, as well as redundant Ethernet ports. Included with the 3G+ is a new modern OS, Windows 10, that providers users with a more reliable, modern day operating system. To this architecture Grass Valley has added its 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 3G+ Production Client has been specifically designed for the needs of SD/HD/3G/4K UHD live event productions such as sporting events where instant replays need to be available immediately at the push of a button. Highlights, playlists and resources such as record channels from multiple systems can be shared by users. All channels are bidirectional and can easily and quickly switch between record and play.

## ChannelFlex

ChannelFlex doubles the K2 Summit 3G+'s capability from supporting four video streams to eight video streams in application-specific configurations:
- Record up to 8 camera feeds in DV, XDCAM HD, AVC-Intra, DNxHD or ProRes formats
- Record up to two 2X/3X super slo-mo cameras in DVCPRO HD, AVC-Intra or DNxHD formats
- Record up to four 3D cameras or video+key pairs: HD in AVC-Intra/SD in IMX30
- Play up to four 3D files or video+key pairs: HD in AVC-Intra/SD in IMX30

## Proxy Encoding

Low-resolution proxy versions of media can be encoded and either streamed over IP networks or stored for use in distributed workflows. This enables extending access to more users to produce content and to remotely monitor playback channels while conserving system resources.

## Flexible Monitoring Options

With the built-in VGA multiviewer, all four channels can be monitored in normal mode or up to eight streams when ChannelFlex* is in operation. An SDI monitor output is available with timecode burn-in for each channel. A user-definable text overlay option** is available for both monitor displays, enabling various information such as channel/clip name, transport controls, play speed, audio meters and more to be displayed in any location with various text sizes and colors. A truly unique feature allows a streaming proxy of either input or output video and audio to allow monitoring using an IP network and a standard client viewer.

**FEATURING**

## CHANNELFLEX®

## 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, DVCPRO HD, AVC-Intra, DNxHD and ProRes
- Play different formats back-to-back:
  – SD/HD/3G/4K UHD clips
  – 720p/1080i
  – 1080p 3G
  – 2160p 4K UHD
  – DV/MPEG/AVC-Intra/H.264/AVCHD
- Optional low-resolution proxy encoding for streaming monitor and  distributed workflows
- Instant replay capability

- ChannelFlex — part of AppCenter Elite:
  – Multicam mode
  – Synchronized multichannel record and play to support two 4K UHD channels
  – Super slo-mo 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
- Fast boot times with Windows 10 on M.2 solid state drive (SSD)
- Option for up to 12.8 TB of internal hard disk storage
- Built-in mix effects on each channel:
  – Video dissolves and audio crossfades supported via APIs and AppCenter Pro playlist
- Import/export all formats as MXF OP1a, SMPTE ST 360 (GXF) or QuickTime

- File system enables edit-in-place of QuickTime files
- Software-based codecs for agile playback and easy configuration
- Increased bandwidth to support more channels, higher bit rates, faster file transfers
- Super slow-motion support in DVCPRO HD, AVC-Intra and DNxHD formats
- Full XDCAM HD workflow support including multicam mode
- 1080p50/60 Level A support using AVC-Intra
- Simultaneous high-resolution and low-resolution "proxy" encoding for recording or streaming
- Automatic up/downconversion, user-definable aspect ratio conversion, and closed caption preservation
- ANC data preserved and full AFD processing
- Full multichannel audio support —16 SDI audio tracks per video channel (32 audio tracks per clip on disk)

## Built-in Mix Effects

For generating quick highlight packages, often all that is required are 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 3G+ Production Client is the only server that provides agile codecs enabling playback of SD, HD, 3G and 4K UHD content seamlessly on the same timeline with any supported format (DV/DVCPRO, MPEG-2, AVC-Intra, H.264 or DNxHD). With seamless and automatic up/down/cross-conversion of clips to your desired output resolution, the K2 Summit 3G+ Production Client provides full support for all SD and HD formats. The K2 Summit 3G+ Production Client also supports the industry-wide 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. The K2 Summit 3G+ Production Client is capable of simultaneously encoding a low-resolution proxy along with the high-resolution recording to extend work-flows to the user's desktop. The K2 Summit 3G+ Production Client features smooth, high-quality, bidirectional, 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**. Slo-mo playback and freeze frames are jitter-free at even the slowest speeds due to the use of line interpolation technology.

## Audio and Closed Caption/Teletext Multilingual Support

Each video channel has up to eight 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*.

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* 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.

* Requires AppCenter Pro or Elite.
** Requires AppCenter Elite.

Internal multiviewer output on Display Port provides a display of up to eight channels in real time when used with ChannelFlex.

## SPECIFICATIONS

### Description

2 or 4 SD/HD channels

All channels are bidirectional

### Video Channels

2 or 4 bidirectional HD/SD-SDI record/ play channels BNC, 75Ω

**SD SDI:** SMPTE ST 259, ITU R601, 525/625 line component, 10-bit

**HD-SDI:** SMPTE ST 292, 10-bit

**HD:** SMPTE ST 424

### Formats

**SD:**

    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

**HD:**

    MPEG-2@HL 4:2:0, I-Frame & Long GOP 12-100 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)

    XDCAM EX

    DVCPRO HD

    AVC-Intra 50/100 (optional)

    AVC-Intra Class 100 1080p50/60 Level A (optional)

    H.264/AVCHD playback (optional)

    DNxHD 115, 120, 145, 175, 185, 222 Mb/s

    720p and 1080i (optional)

    ProRes 45, 102, 147 and 220

### Proxy Encoding

4 or 8 streams (licensed through AppCenter Pro and AppCenter Elite)

Each stream includes 1 video and up to 8 audio tracks for recording

Any audio tracks can be selected when streaming

**Compression:**

    Video: MPEG-4 part 2

    Audio: AAC

### ChannelFlex Modes (optional)

Multicam (up to 4 channels)

Super slo-mo (1 or 2 channels)

3D (up to 4 channels)

Video+key (up to 4 channels)

### 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 AppCenter Pro)

Audio mix effects (PCM only)

Cross fade between tracks

Fade up/down

### Power Requirements

Dual redundant 600W maximum, 400W typical

Auto-sensing, hot-swap

100-240 VAC, 50-60 Hz

### Monitor Modes

SDI monitor out w/timecode burn-in

Display Port multiviewer — w/definable text overlay for above displays including channel name, clip name, transport status, play speed, audio meters and other status

### 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 (optional)

Dissolves between two video tracks on same channel

Fade up/down to matte color (default is black)

Max duration per transition: user selectable

### 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)

### GPI

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

### Dimensions

**Height:** 9 cm (3.5 in.) – 2 RU

**Width:** 44.5 cm (17.5 in.)

**Depth:** 61.6 cm (24.5 in.)

**Weight:** 24 kg (53 lbs.) maximum

### Redundancy

Redundant power supplies (hot-swappable)

Redundant cooling

### Up/Down/Cross Conversion and Aspect Ratio

525 to 1080i, 525 to 720p, 625 to 1080i, 625 to 720p

720p to 1080i cross conversion

AFD support for 4:3 to 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

### 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

16 tracks embedded, per video channel

### 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

Tri-Level sync conforms to SMPTE ST 296 for 1280x720P systems and SMPTE ST 274 for 1920x1080

### Timecode

LTC SMPTE ST 12, 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

### Media Exchange

MXF OP1a, GXF (SMPTE ST 360), AVI and QuickTime

### 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 pin out (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 ST 259, HD-SMPTE ST 292

Compressed audio types: AC-3 and Dolby E pass-through

Audio delay adjustable ±200 ms relative to output video

### Remote Monitoring

Grass Valley 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)

Quick Start guide

USB stick with documentation

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### K2 Summit 3G+ Production Clients with Internal Storage (in hours)

|  | DV 25 | DV 50 | DV 100 | AVCI 50 | AVCI 100 | 6x SSM | 4K UHD |
|---|---|---|---|---|---|---|---|
| **800 GB RAID-5 (10)** | 402 | 216 | 114 | 255 | 131 | 22 | 15 |
| **1.6 TB RAID-5 (10)** | 801 | 432 | 227 | 509 | 262 | 45 | 31 |

## ORDERING

### K2-XDP3-02

K2 Summit 3G+ Production Client – 2 RU platform with 2 bidirectional HD/SD channels. Supports DV, DVCPRO, DVCPRO 50, DVCPRO HD and HD/SD MPEG-2 record and agile playback of DV, DVCPRO, DVCPRO 50, DVCPRO HD, DNxHD, ProRes and HD/SD MPEG-2 playback. Includes dual hot-swappable power supplies, hot-swappable fans, and AppCenter control and configuration application.

### K2-XDP3-04

K2 Summit 3G+ Production Client – 2 RU platform with 4 bidirectional HD/SD channels. Supports DV, DVCPRO, DVCPRO 50, DVCPRO HD and HD/SD MPEG-2 record and agile playback of DV, DVCPRO, DVCPRO 50, DVCPRO HD, DNxHD, ProRes and HD/SD MPEG-2 playback. Includes dual hot-swappable power supplies, hot-swappable fans, and K2 AppCenter control and configuration application.

### Options

### K2-XDP3-10-S800R5

K2 Summit 3G+ internal media storage, includes 10 x 800 GB SSD media drives and RAID controller. Configured as RAID-5 (8 data/2 parity). Select one internal media storage option only.

### K2-XDP3-10-S1600R5

K2 Summit 3G+ internal media storage, includes 10 x 1.6 TB SSD media drives and RAID controller. Configured as RAID-5 (8 data/2 parity). Select one internal media storage option only.

### K2-XDP3-AVC-2CH

K2 Summit 3G+ 2-channel AVC-Intra codec and H.264 playback license. Includes AVC-Intra level 50 and 100 and encoding and decoding and H.264 L4.2 AVCHD playback. Two required for 4-channel model (K2-XDP2-04) Factory installed.

### K2-XDP3-MPG2-MC

K2 Summit 3G+ MPEG-2 multicam encoding factory option. Adds the ability to record up to 4 video streams per codec module using MPEG-2 compression when used in ChannelFlex mode. Includes hardware and additional MPEG encoding license. Two K2-XDP3-MPG2 options are required for the K2-XDP3-04 and enables up to 8 video streams to be recorded. Also requires factory installed AppCenter Elite license (see K2- APPCTNR-ELTE-FO below).

### K2-APPCNTR-PRO-FO

K2 AppCenter Pro for the K2 Summit Platform extends the feature set of standard AppCenter and includes such features as audio track tagging, super out and proxy encoding licenses for 4 channels of low-resolution proxy generation. Factory installed.

### K2-APPCTNR-ELTE-FO

K2 AppCenter Elite for the K2 Summit Platform extends the feature set of standard AppCenter and includes all AppCenter Pro features plus ChannelFlex and proxy encoding licenses for 8 channels of low-resolution proxy generation. ChannelFlex includes 2X and 3X super slo-mo record, key plus fill record and play, and multicam recording. Factory installed.

### Field Kits

### K2-APPCNTR-PRO-FK

K2 AppCenter Pro for the K2 Summit Platform extends the feature set of standard AppCenter and includes such features as audio track tagging and proxy encoding licenses for 4 channels of low-resolution proxy generation. Field kit.

### K2-APPCTNR-ELTE-FK

K2 AppCenter Elite for the K2 Summit Platform extends the feature set of standard AppCenter and includes all AppCenter Pro features plus ChannelFlex and Proxy encoding licenses for 8 channels of low-resolution proxy generation. ChannelFlex includes 2X and 3X super slo-mo record, key plus fill record and play, and multicam recording. Field kit.
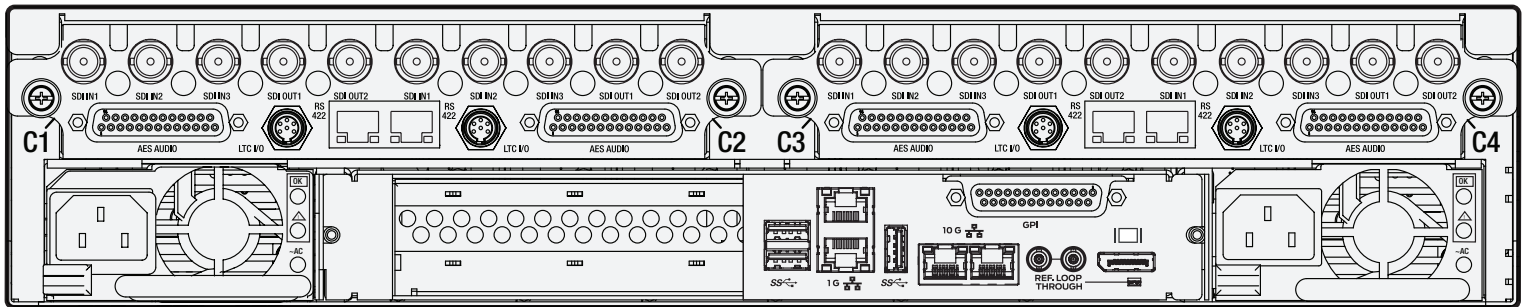
### K2-XDP3-AVC-2CH-FK

K2 Summit 3G+ 2-channel AVC-Intra codec and H.264 playback license. Includes AVC-Intra level 50 and 100 and encoding and decoding and H.264 L4.2 playback. Two required for 4-channel model (K2-XDP3-04). Field kit.

### K2-XDP3-MPG2-MC-FK

K2 Summit 3G+ MPEG-2 multicam encoding field kit. Adds the ability to record up to 4 video streams per codec module using MPEG-2 compression when used in ChannelFlex mode. Includes hardware and additional MPEG encoding license. Two K2-XDP3-MPG2-FK kits are required for the K2-XDP3-04 and enables up to 8 video streams to be recorded. Also requires AppCenter Elite license (see K2-APPCTNR-ELTE-FK above).

### K2-XDP3-DNX-2CH-FK

K2 Summit 3G+ DNxHD license. Includes DNxHD encoding and decoding. Two required for 4-channel model (K2-XDP3-04). Field kit.



Rear View K2 Summit 3G+ Production Client

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