K2 Media Server & Media Client System

No compromise, file-based server platforms for all broadcast applications

Grass Valley™ products include the most comprehensive multi-format solutions for acquisition, production, storage and playback, with a strong foundation in control and monitoring. These solutions include the Emmy® award-winning Profile® line of storage systems that have established themselves as the cornerstone of broadcast operations for more than a decade.

Supporting File-Based, IT-Centric Environments at Nearly Half the Cost of Other Servers

The nature of broadcast and production operations is changing, rapidly shifting toward widely repurposed content for mobile and other applications; taking seriously the compelling cost curves of IT technologies; and treating assets as files versus pieces of video. The basic tenets of traditional video server architectures must change to keep pace. Now.

The key to doing so is incorporating the latest enterprise server and storage technologies into a powerful-yet-simple, cost-effective solution that can be easily deployed in high-performance, networked IP environments—without compromising quality, reliability, or other issues key to broadcasters and production professionals.

We get it.

Cost-effective. Meets the budgets of all levels of media content facilities and price performance leadership on a per-channel/hour-of-storage basis.

Integral use of IT components, standards, and practices. Features standard Gigabit Ethernet and a patent-pending iSCSI implementation for networking, and connectivity; available bandwidth for high-volume IP-based file transfers; and enterprise-level server and storage components for highly affordable scalability.

Storage flexibility. All-in-one, integrated storage and shared-storage configurations feature high throughout, performance, reliability, and availability. Support for distributed, shared, and near-line storage implementations.

Workflow solutions focus. Standard operations application suite. Standard system management application. Optional workflow software applications.

System simplicity. Easy to configure and maintain. Simple channel configurability. Minimal connectors and cabling. Standard redundancy for power, networking, system drives, and cooling. Optional simple redundancy provisions for storage and system connectivity. Fast serviceability.

System scalability. Linearly priced channel count additions. Easily add greater storage bandwidth or capacity. Wide variety of configurations to match user requirements. A universal media solution.

At the heart of the K2™ system is a completely new approach: the IT connectivity of servers, and media I/O. It is this implementation that allows the system to scale from standalone, one-box systems to enterprise-wide solutions supporting hundreds of channels. This same approach also delivers three times the bandwidth of conventional server platforms, but at a significantly lower cost.

K2

Built on and extending the Emmy award-winning Profile family of media servers, the K2 media system employs an open and innovative architecture that combines the extensive video expertise of Grass Valley with the best-in-class solutions available from the IT industry.

Designed specifically for the sharing and reuse of digital media assets, the open-standards based K2 system delivers the high capacity, throughput, concurrency, and availability that media-driven environments demand—all while maintaining the quality, reliability, redundancy, and scalability for which Grass Valley is known.

With a simplified graphical user interface for operation and administration, the K2 system greatly reduces training time. Its wizard-based screens walk users through system installation and configuration, cutting down on the amount of resources required for setting up and maintaining the K2 system.

And, true to its Profile legacy, the K2 media server and client systems promise to transform the economics of the broadcast industry. They support IT-centric, file-based environments and workflows, simplify installation and operations, and provide new levels of network control—all at less cost than other servers. And the K2 system incorporates the latest enterprise server and storage technologies.

The result: a powerful-yet-simple, cost-effective solution that integrates easily into high-performance networked IP environments, one that features Gigabit Ethernet connectivity, iSCSI access protocol support, RAID 1, 3, and 5 storage, and FTP/CIFS based IP file transfers.

The powerful combination of devices with IT protocols and patent-pending optimization techniques, means that K2 systems provide deterministic availability for critical applications such as editing and playout. Your content in the format you need, when and where you need it.

Gigabit Ethernet
The K2 system uses Gigabit Ethernet to deliver real-time video. Because Ethernet technology is well understood and ubiquitous, this approach prevents you from delving into the complexities of other less used IP network technologies—and it greatly minimizes the number of connectors and cables, facilitating a much simpler approach to complex installations.

iSCSI
Using the iSCSI protocol, K2 media servers deliver assets in real-time with high-throughput, deterministic performance to multiple heterogeneous clients. This IP-based standard for linking data storage devices over a network and transferring data commands over IP networks can run using inexpensive Gigabit Ethernet network interfaces.

CIFS Protocol
A protocol defining an IP standard for remote file access using up to millions of computers at a time, the CIFS (Common Internet File System) format lets users with different platforms and computers share files.

CIFS runs over a standard Gigabit Ethernet network interface; CIFS clients connected to K2 media servers allows popular, critical applications such as Apple Final Cut Pro to open and share files across a network connection so that K2 storage is seen as a remote drive on the client.

The K2 media server can handle multiple FTP transfers simultaneously at faster-than-real-time speeds to systems such as near-line storage and archive configurations.

Different media facilities have different workflows and storage requirements. The K2 system supports a broader variety of storage configurations to match customer needs than any other server.

Featuring an enterprise-level solution that is based on open-system standards and capitalizes on the cost effectiveness of IT storage and technology, the K2 system effortlessly scales from standalone systems with multiple channels to shared-storage systems with more than 100 channels. The system provides simultaneous playout and recording, robust network support, clip editing and trimming, and playlist creation. At the same time, it provides the ability to simultaneously exchange materials with a variety of systems and applications using industry-standard protocols through dedicated bandwidth for IP-based file transfers.

Grass Valley K2 Media Server

The K2 media server is a file-based platform allowing it to be largely independent of video formats, but it has been designed with uncompromised video performance, allowing systems engineers to configure precisely its capacity, bandwidth, file formats, data rates, access, and control.

For example, a K2 media server configuration can scale and grow efficiently from a few terabytes (TB) of storage to beyond 200 TB of storage capacity—at up to 2000 MB/s of bandwidth and all RAID protected for rock-solid reliability and deterministic channel bandwidth and availability. However, for mobile and some distributed implementations which need their own integrated storage, you can configure a K2 media client with up to 1.5 TB and still transfer materials at rates up to 50 MB/s.

In fact, we haven't met a customer with a system too big to implement. With the differences and changes in channel counts, video resolution, hours of storage and audio types, the K2 system offers a wide scaling range at initial installation—and for ensuing upgrades. Its standard shared-storage configurations can scale to hundreds of TB of storage capacity and to greater than 2000 MB/s of bandwidth.

The K2 storage system can also be configured for near-line applications, where larger pools of general purpose are desired. Using standard components, such as enhanced FTP services at up to 100 MB/s, Gigabit Ethernet networking, and SATA drives, you can design cost effective and flexible storage pools for near-line use.

For ultimate peace of mind, you can configure K2 systems with redundant servers, RAID controllers, and switches for a no-single-point-of-failure design, as well as deploy them in fully mirrored configurations.

System Control

Unlike other servers that must be controlled through a direct connection, the K2 system is designed to be operated over a network via a remote workstation with user defined levels of security.

Using a PC and the K2 media client, for example, you can manage, access, control, ingest, and playout material—and see and control any content over any channel anywhere.

Equipped with an SNMP MIB, these systems integrate seamlessly into facilities using the SNMP-based Grass Valley NetCentral™ remote-monitoring application. With NetCentral software, you can monitor K2 systems to get the status of hardware resources and receive certain software alarms.

The K2 system supports SD and HD content on the same timeline, including a free mix of interlaced and progressive HD formats as well as automatic translation of closed-caption data from VBI to HD ANC data (and back) as necessary.

The K2 system also features out-of-the-box support from automation software leaders, including Crispin, Encoda, Florical, Harris, Omnibus, and Sundance, enabling instant integration and control within today's increasing IT-based broadcast operations.

Robust Software Environment

The K2 AppCenter is an operational software suite that comes standard with every K2 system. Within this intuitive environment, multiple users can simultaneously access and control individual channels on single or multiple K2 clients to record, play, make sub-clips, create playlists, and/or manage clips. The K2 operational interface runs on a standard PC workstation connected on the K2 system's Gigabit Ethernet network.

Lowering the total cost of ownership, the K2 system also includes as standard K2 Config software to aid in installing, configuring, and upgrading. With this application, you can attain multiple system and devices views. Like the AppCenter application, the management software's interface for multiple systems can be run from a networked PC workstation.

For easy connectivity, the K2 system supports the Grass Valley AMP (Advanced Media Protocol) API, a programming environment for developers to interact with Grass Valley server platforms. For facilities with a mix of systems and file-sharing support requirements, the same AMP interface is also supported by Profile servers, the Grass Valley M-Series™ intelligent video digital recorder (iVDR), Turbo™ intelligent digital disc recorder (iDDR), and Grass Valley digital news production systems.

K2 AppCenter Software Suite

- Crash Record
- Continuous Record
- Clip Playback with Cue Points
- Top/Tail Clips
- Sub-Clips
- Basic Playlist (i.e. no traffic import)
- Remote (VDCP, AMP, BVW)
- Graphics Import (.tiff, .jpeg)
- Clip Import/Export (.avi, .mov, .mxf)
- Clip Management and Transfer
- Remote Ethernet access from designated workstations
- Multiple system views: view up to 16 channels simultaneously

Flexible Format Support

The K2 system can support standard- and high-definition (SD and HD) content on the same timeline, including a free mix of interlaced and progressive HD formats as well as automatic translation of closed-caption data from VBI to HD ANC data (and back) as necessary.

While externally the K2 system accepts and delivers all common HD and SD formats—and allows for a free mix of any on the timeline—internally it is storing raw data for maximum storage efficiency and best use of the available bandwidth. Formatting, including media exchange formats like MXF, is handled in real time transparently to the user. This handling gives the K2 system unprecedented agility, supporting high bit rate HD video as comfortably as DV and AVI.

For large-scale playout applications, the K2 system can even act as an ASI interface, with or without demultiplexing the incoming stream. Pass-through channels can thus be integrated with locally controlled services without the need for a separate infrastructure.

Depending on the size of the installation, the K2 system will store content either on directly attached SCSI storage or on Fibre Channel RAID arrays. Whatever the storage configuration the content will be RAID protected, to level 10, 3 or level 5/6.

Designed for HD bandwidths, the K2 system is available in two standard forms: an SD-only system that supports four bi-directional channels at up to 50 Mb/s, and a two-channel playout version that can be configured for HD and SD and has the option of adding two more input or output channels. AES and embedded audio is included, and the unit is capable of passing through Dolby E and AC3.

In addition to up- and down-resolution conversion, the K2 media client also manages aspect ratios and ancillary data. The agile compression format support of the K2 system includes that for HD/SD MPEG-2 (4:2:2 and 4:2:0) in I-frame or Long GOP, as well as SD MPEG-2 and DV, on the same timeline. It also offers native handling of either MXF or GXF (SMPTE 360M) stream over IP as well as a universal conversion architecture for flexible support of other common formats such as AVI and QuickTime. The system also includes a full range of I/O support (SDI, ASI, and IP).

K2 Media Server & Media Client System

Key Features

- File-based, IT-centric, widely scalable storage and delivery system
- Single server bandwidth rates up to 180 MB/s with iSCSI, plus 80 MB/s for FTP/CIFS all over Gigabit Ethernet connections
- Guaranteed real-time performance with the K2 media server using iSCSI over a Gigabit Ethernet network eliminates bottlenecks and provides high operational security
- Remote client and administrative control over a Gigabit Ethernet network including playlist and clip management, recorder and other applications
- Simple redundancy at multiple levels provides configurations with no single point of failure
- Increase storage capacity and clients without downtime or losing content
- Secure storage based on RAID 10, 3 or 5/6
- SD media client version allows free mix of DV and MPEG-2 content
- Agile media client version allows free mix of SD and HD, 1080i and 720p content with up and down conversion and user definable aspect ratio management
- User choice of bit rates up to 100 Mb/s
- MXF, GXF, QuickTime, and AVI compatible
- Full multi-channel audio support
- Wide range of control interfaces, including simple integration into playout and newsroom automation
- ASI interface supported, with or without demultiplexing
- Optional applications such as time delay, asset transfer, and mirroring are available for the platform

Grass Valley K2 Media Client

The companion product to the Grass Valley K2 media server is the K2 media client. It is available in a variety of topologies, which include support for standalone as well as shared storage configurations.

The K2 media client exchanges media with the K2 media server via iSCSI over a Gigabit Ethernet network guaranteeing real time performance.

Multi-channel audio is supported, including the pass through of compressed Dolby E and AC-3.

The K2 media client can be controlled from a PC over a Gigabit Ethernet network using the AppCenter operational interface. More commonly, it will be controlled by an automation system using VDCP or by the Grass Valley AMP server protocol. GPI trigger ports are provided for simple integration with legacy devices.

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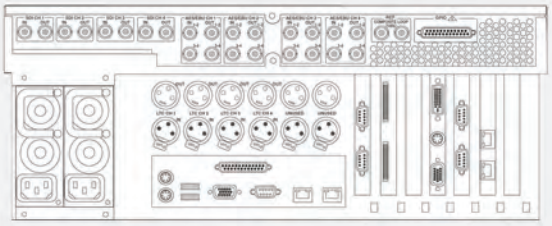

K2 Media Client Rear Panel (SD)

K2 Client Specifications

System Performance

Video

SDI: SMPTE 259M, ITU-R601, 525/625 line component, 10-bit
HD-SDI: SMPTE 292M, 720p/50, 10-bit

Audio

Embedded:

- Eight channels (4 pairs) per channel on 75 Ω BNC (future update to 16)
- Future update for up to 32 logical channels per video
- SD-SMPTE 259M
- HD-SMPTE 299
- Input: 48 kHz, 16 or 24-bit PCM
- Output: 48 kHz 24-bit
- Return loss: > 15 dB, 5 kHz to 270 kHz

Discrete AES/EBU:

- Four channels (2 pairs) audio per video channel
- Two dedicated BNC connectors per video input and output; two channels per BNC connector
- Input: 48 kHz, 16-bit, 20-bit, or 24-bit digital audio sources
- Output: 48 kHz clock derived from the video reference
- Scrub audio support
- Audio click elimination
- Compressed Audio Types: AC-3 and Dolby E pass-through

Power Requirements

- Redundant 500W maximum
- Auto-sensing, hot-swap
- 50-60 Hz
- 100-240 VAC

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)

Dimensions

- Height: 17.7cm, 7"
- Width: 45 cm, 17.75"
- Depth: 65.4 cm, 27.75"
- Weight: 31.5 kg, 69.5 lbs maximum

Reference

Genlock

- NTSC/PAL color black composite analog
- Two BNC, 75 Ω loop through
- Burst Frequency Lock: PAL, +10 Hz at subcarrier NTSC, +20 Hz at subcarrier
- Signal Amplitude Lock: +6 dB to -3 dB
- Return Loss: >40 dB to 5 mHz

Timecode

- LTC 12M
- One XLR per input and output
- 1K Ω input impedance, 50 Ω output impedance
- Read at between 1/30 and 80 times nominal rate-forward and reverse
- One VITC reader/writer per video channel
- Lines 10-21 on 525 configurations, lines 6-23 on 625 configurations

Control

Interconnects

- Four RS-422 serial ports
- 100/1000 Base-T Ethernet port
- GPIO ports: 12 inputs/12 outputs (25-pin D connector)

Protocols

- BVW VTR (w/o insert edit)
- Odetics (RS-422)
- VDCP (RS-422)
- AMP (RS-422 and Ethernet)

Ports

- Four 100/1000 Base-T Ethernet ports
- One USB 2.0 front, Two USB 2.0 rear
- Four RS-422 serial ports
- 15-pin SVGA
- Keyboard
- Mouse

Media Exchange

MXF Op1a, GXF (SMPTE 360M), AVI (DV), QuickTime (DV, DVCAM. DVCPro), MPEG-2 program stream, TIFF, BMP, JPEG import, WAV import

Remote Monitoring

Grass Valley NetCentral™ SNMP-based remote-monitoring software

Certifications

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

K2 Server Specifications

Power Requirements

- Redundant 700W maximum,
- 110-220 VAC

Environmental Characteristics

- Operating Temperature: 10° to 35° C (50° to 95° F)
- Operating relative humidity 20% to 80% from -5° to +45° C (23° to 113° F)

Dimensions

- Height: 8.656 cm, 3.38"
- Width: 44.7 cm, 17.6"
- Depth: 75.68 cm, 29.79"
- Weight: 26.76 kg, 59 lbs maximum

Ports

- Four 100/1000 Base-T Ethernet ports
- Two USB 2.0 front, Two USB 2.0 rear
- 15-pin SVGA
- Keyboard
- Mouse
- Two Fibre Channel 2 GB SFP

Remote Monitoring

Grass Valley NetCentral™ SNMP-based remote-monitoring software

Certifications

FCC Class A, ICES (Canada) Class A, CE Mark (EN 55022 Class A, EN55024, EN61000-3-2, EN61000-3-3), VCCI (Japan) Class A, BSMI (Taiwan) Class A, C-Tick (Australia/New Zealand) Class A, SABS (South Africa) Class A, CCC (China) Class A, MIC (Korea) Class A, UL 60950, CAN/CSA C22.2 No. 60950, EN 60950

About Grass Valley

If you watch TV or go to the movies, you've seen Grass Valley products at work. That's because we offer the most comprehensive, multi-format solutions for acquisition, production, storage, and playback-and a strong foundation for centralized, proactive status and activity monitoring. With Emmy® award-winning products and world-class technical and service expertise, we're the experts in professional video and film technologies-especially as broadcast, television, and film production go digital. And we've got the Emmy award-winning technologies and the top-flight customers to prove it.

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