The T2™ 4K digital recorder/players from Grass Valley® are 4K DCI, 4K UHD or HD/SD audio/video playout centers.

The front-panel transport controls have the look and feel of a traditional VTR. In 4K mode (DCI or UHD), one record or one output channel supports 4K content. In HD/SD mode, one record and two output channels support SD and HD content.

The crisp, clear LCD front panel can display high-quality images and is complemented by a software application suite for managing and selecting media clips, clip editing and trimming, and playout — including playlist creation. Featuring rear-panel video/audio/remote/LTC connectivity, T2 4K can also accept files via USB 3.0, or by data transfer over a standard Gigabit Ethernet network, including Grass Valley HQX, XAVC, XAVC S, XDCAM, P2, AVC-ULTRA, Apple ProRes 422, Avid DNxHR, Avid DNxHD and MPEG-2 files.

Further, T2 4K digital recorder/players can be controlled by video production switchers, presentation mixers and audio mixers — to create a powerful presentation system. Every T2 4K has two playout HD/SD channels for independent editing and previewing, or for delivering content to two different display systems simultaneously, useful for edge-blending and displaying 3D content.
**T2 4K Series 4K/HD Digital Recorder/Players**

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*1 The 12G/6G/Plus models must be built with the I/O Card Kit (SDI x8 or 12G-SDI x4) installed into the T2 unit by a reseller in the field.

*2 Need to install the v3.45 firmware (or later).

*3 Only available in [HD/SD] 1 in 2 out mode.

*4 These are shared by input and output in 4K mode.

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**Notes:**

- The 12G/6G/Plus models must be built with the I/O Card Kit (SDI x8 or 12G-SDI x4) installed into the T2 unit by a reseller in the field.
- *2 Need to install the v3.45 firmware (or later).
- *3 Only available in [HD/SD] 1 in 2 out mode.
- *4 These are shared by input and output in 4K mode.
### Key Features

#### Recorder/Player
- **4K (2160p) ingest support** (4K: 1 in 0 out mode)
- **4K (2160p) playback support** (4K: 0 in 1 out mode)
- **4K (2160p — up to 30p) ingest and playback support** (4K: 1 in 1 out mode) *(Elite 12G and Elite Plus only)*
- **4K (2160p — up to 30p) playback support** (4K: 0 in 2 out mode) *(Elite 12G and Elite Plus only)*
- **4K (2160p) Key/Fill (Alpha) playback support** (4K: 0 in 2 out Key/Fill mode) *(Elite 12G, Pro 12G, Express 6G, Elite Plus, Pro Plus and Express Plus only)*
- **HD (1080p) ingest and playback support** (HD: 1 in 2 out mode, HD: 2 in 1 out mode)
- **HD (1080p) ingest support** (HD: 3 in 0 out mode) *(Elite and Pro only)*
- **HD (1080p) playback support** (HD: 0 in 3 out mode) *(Elite and Pro only)*
- **HD 2 channel synchronizes playback for key/fill rolls, edge blend displays, multiscreen and 3D applications**
- **Chasing playback while ingesting (HD/SD)**
- **Supports 720p to 1080p/i real-time crossconversion**
- **Direct ingest to external media/storage device**
- **Scheduled recording**
- **Ancillary data recording and playback**
- **E-to-E mode**
- **Video monitor output and on-screen display**
- **NDI IP input/output support**

#### Import/Export
- **Native import/playback for most standard formats**
- **Multicodec support** (transcoding to Grass Valley HQX AVI) for most standard and broadcast formats
- **FTP transfer rate limited to maintain playback performance**
- **Watch folder transfers**
- **Export to Sony XDCAM drive (U1/U2)**

### Editing
- **Direct access to a media folder with EDIUS and the ability to edit a growing file — AVI (Grass Valley HQX) and MXF (Grass Valley HQX/XDCAM/Apple ProRes/Avid DNxHD) (Elite only)**
- **Export a growing AVI (Grass Valley HQX) file via CIFS**
- **Export a growing MXF (Grass Valley HQX/XDCAM/Apple ProRes/Avid DNxHD) file via FTP/CIFS**
- **Import from Final Cut Pro in QuickTime format using the free Grass Valley HQ codec for Mac onto an exFAT HDD**
- **Convert and CIFS export from AVI (Grass Valley HQX) to MXF (Grass Valley HQX/XDCAM/Apple ProRes/Avid DNxHR/Avid DNxHD) or MOV (Apple ProRes)**

### Front Panel
- **Easy-to-use front panel interface and jog/shuttle**

### Workstation
- **Workstation mode included as standard**
- **Simple on-the-fly editing, including trimming, mark in/out, markers with comments, basic transition effects and insertion of placeholders for playlists**
- **Transition effect (cross dissolve) when manually switching to another clip event in a playlist**
- **Keyboard shortcuts and mouse customization on workstation**

#### Remote
- **Synchronized playback using LTC input (Timecode chasing)**
- **Synchronized playback for multiple T2s using GPI input/RS-422**
- **Integration support for third-party control (BVW, VDCP, GPIO and AMP)**

#### Device
- **SDI embedded audio (8 channels)**
- **Robust design — engineered to withstand punishing live event and mobile production environments**
- **ASIO audio input/output support**
- **2SI/SQD input/output via Quad 3G-SDI (Elite Plus, Elite, Pro Plus and Pro only)**
- **Redundant power supply (Elite only)**
- **Media card reader (Elite only) — SD, SD (UHS-II), CF, 2.5-inch SSD**

#### Maintenance
- **Full data backup and restore feature**
- **Monitoring using watchdog timer (Hardware/Software)**
**Specifications**

**T2 4K Series 4K/HD Digital Recorder/Players**

**Model Number**
- T2 4K Elite: KTR4A-ELT-CV40
- T2 4K Pro: KTR4A-PRO-CV40
- T2 4K Express: KTR4A-EXP-CV40
- T2 4K Elite Plus: KTR4A-ELT-CV00 + KTR4-IO-CV12G-KIT
- T2 4K Pro Plus: KTR4A-PRO-CV00 + KTR4-IO-CV12G-KIT
- T2 4K Express Plus: KTR4A-EXP-CV00 + KTR4-IO-CV12G-KIT
- T2 4K Elite 12G: KTR4A-ELT-CV12G-KIT
- T2 4K Pro 12G: KTR4A-PRO-CV12G-KIT
- T2 4K Elite Plus: KTR4A-ELT-CV00 + KTR4A-EXP-CV40
- T2 4K Pro Plus: KTR4A-PRO-CV00 + KTR4A-EXP-CV40

**Mode**
- T2 4K Elite: 4K: 1 in 0 out
- T2 4K Pro: 4K: 2 in 1 out
- T2 4K Express: 4K: 3 in 0 out
- T2 4K Elite Plus: 4K: 0 in 2 out (Key/Fill)
- T2 4K Pro Plus: 4K: 1 in 0 out
- T2 4K Express Plus: 4K: 0 in 2 out (Key/Fill)

**Storage**
- System: M.2 SSD 64 GB
- Data: T2 4K Elite/ELite Plus/Elite 12G: SSD (RAID-0), 2 TB
- T2 4K Pro/Pro Plus/Pro 12G: HDD (RAID-0), 2 TB
- T2 4K Express/Express Plus/Express 6G: HDD (RAID-0), 2 TB

**Capacity**
- 3.5 hours: 4K DCI (4096x2160) 59.94p @ Grass Valley HQX (1.2 Gb/s)
- 7.5 hours: 4K DCI (4096x2160) 29.97p @ Grass Valley HQX (600 Mb/s)
- 3.5 hours: 4K UHD (3840x2160) 59.94p @ Grass Valley HQX (1.2 Gb/s)
- 7.5 hours: 4K UHD (3840x2160) 29.97p @ Grass Valley HQX (600 Mb/s)
- 14 hours: HD (1920x1080) 59.94p @ Grass Valley HQX (300 Mb/s)
- 28 hours: HD (1920x1080) 59.94i @ Grass Valley HQX (150 Mb/s)
- 72 hours: HD (1920x1080) 59.94i @ XDCAM HD 422 (50 Mb/s)
- 150 hours: HD (1440x1080) 59.94i @ XDCAM HD (35 Mb/s)

**Power Supply Unit**
- T2 4K Elite/Elite Plus/Elite 12G: Redundant PSU
- T2 4K Pro/Pro Plus/Pro 12G: Single PSU
- T2 4K Express/Express Plus/Express 6G: Single PSU

**Media Card Reader**
- T2 4K Elite/Elite Plus/Elite 12G: SD, SD UHS-II, Compact Flash, 2.5 inch SSD bay

**Video Input Format**
- Format Support: 4K DCI, 4K UHD, HD, SD
- Connector (Elite/Plus/Express): BNC (3G/HD-SDI) x4
- Connector (Elite/Plus/Express Plus): DIN 1.0/2.3 (3G/HD-SDI) x8
- Connector (Elite 12G/Pro 12G): BNC (12G/6G/3G/HD-SDI) x4
- Connector (Express 6G): BNC (6G/HD-SDI) x4
- Connector: LAN (NDI)

**Codec (4K DCI/4K UHD):**
- AVI — Grass Valley HQX
- MXF — Grass Valley HQX

**Codec (HD/SD):**
- AVI — Grass Valley HQX
- MXF — Grass Valley HQX, XDCAM (HD422/HD/IMX/DV), ProRes (422 HQ/422/422 LT/422 Proxy), DNxHD (220/145/100/36)

**Bit rate (Grass Valley HQX):**
- Up to 12 Gb/s (4K DCI/4K UHD 60/59.94/50)
- Up to 600 Mb/s (4K DCI/4K UHD 30/29.97/25/23.98)
- Up to 300 Mb/s (1080p 60/59.94/50)
- Up to 150 Mb/s (HD, SD)

**Resolution/frame rate (Elite/Elite Plus/Elite 12G/Pro/Pro Plus/Pro 12G):**
- [4K DCI] 4096x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p)
- [4K UHD] 3840x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p)
- [HD] 1920x1080p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p), 1920x1080i (59.94i, 50i), 1920x1080PsF (24PsF, 23.98PsF), 1440x1080p (29.97p, 25p, 24p, 23.98p), 1440x1080i (59.94i, 50i), 1440x1080PsF (24PsF, 23.98PsF), 1280x720p (60p, 59.94p, 50p)
- [SD] 720x486i (59.94i), 720x576i (50i)

**Video Output Format**
- Format Support: 4K DCI, 4K UHD, HD, SD
- Connector (Elite/Plus/Express): BNC (3G/HD-SDI) x4
- Connector (Elite Plus/Pro Plus/Express Plus): DIN 1.0/2.3 (3G/HD-SDI) x8
- Connector (Elite 12G/Pro 12G): BNC (12G/HD-SDI) x4
- Connector (Express 6G): BNC (6G/HD-SDI) x4
- Connector: LAN (NDI)

**Codec (4K DCI/4K UHD):**
- AVI — Grass Valley HQX, Grass Valley Lossless*, Grass Valley Uncompressed*
- MXF — H.264/AVC*, Grass Valley HQX, ProRes (422 HQ/422/422 LT/422 Proxy), DNxHR (HQ, SQ, LB)
- QuickTime — ProRes (422 HQ/422/422 LT/422 Proxy), ProRes4444*, Grass Valley HQX
- MP4 — H.264/AVC
- XAVC — 4K Intra (480*/300*), QFHD Intra (480*/300*), QFHD Long (200*/140*/100*), QFHD Long (150/100/60)
- XAVC S — H.264/AVC*, Grass Valley Uncompressed*
- AVI — Targa*, Windows Bitmap*, JPEG*, TIFF*, PNG*, GIF*, DPX*, YUV Bitmap*
Codec (HD/SD):
- AVI — Grass Valley HQX, Grass Valley HQ, Grass Valley Lossless*, Grass Valley Uncompressed*, DVCPRO HD, DVCPRO50, DVCPRO25, DV
- QuickTime — ProRes (422 HQ/422 LT), DVCPRO HD, DVCPRO 50, DVCPRO 25, DV, D10/IMX, JPEG2000*

QuickTime — ProRes (422 HQ/422 LT), DVCPRO HD, DVCPRO 50, DVCPRO 25, DV, D10/IMX, JPEG2000*

Bit rate (Grass Valley HQX):
- Up to 1.2 Gb/s (4K DCI/4K UHD 60/59.94/50)
- Up to 600 Mb/s (4K DCI/4K UHD 30/29.97/25/24/23.98)
- Up to 300 Mb/s (1080p 60/59.94/50)
- Up to 150 Mb/s (HD, SD)

Resolution/frame rate (Elite/Pro):
- [4K DCI] 4096x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p)
- [4K UHD] 3840x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p), 1920x1080p (59.94p, 50p), 1920x1080Psf (24psf, 23.98Psf), 1280x720p (60p, 59.94p, 50p)
- [SD] 720x486i (59.94i), 720x576i (50i)

Bit rate (Grass Valley HQQ):
- Up to 12 Gb/s (4K DCI/4K UHD 60/59.94/50)
- Up to 600 Mb/s (4K DCI/4K UHD 30/29.97/25/24/23.98)
- Up to 300 Mb/s (1080p 60/59.94/50)
- Up to 150 Mb/s (HD, SD)

Resolution/frame rate (Elite/Pro):
- [4K DCI] 4096x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p)
- [4K UHD] 3840x2160p (60p, 59.94p, 50p, 30p, 29.97p, 25p, 24p, 23.98p), 1920x1080p (59.94p, 50p), 1920x1080Psf (24psf, 23.98Psf), 1280x720p (60p, 59.94p, 50p)
- [SD] 720x486i (59.94i), 720x576i (50i)

Audio Input Format
- Input digital: SDI embedded audio (8 ch)
- Input digital: NDI audio (8ch)

Audio Output Format
- Output digital: SDI embedded audio (8 ch)
- Output digital: NDI audio (8ch)

Monitor output: BNC x2 (for lch/rch) (shared with timecode output)

Timecode
- Input: BNC x1
- Output: BNC x2 (shared with audio monitor output)

Reference
- Input (Elite/Pro/Express/Elite 12G/Pro 12G/Express 6G): BNC x1 (analog blackburst or HD tri-level sync)
- Input (Elite Plus/Pro Plus/Express Plus): DIN 1.0/2.3 x1 (analog blackburst or HD tri-level sync)

Remote Control
- GPIO: D-Sub 25-pin x1 (8 in 8 out)
- RS-422 (BVW): RS-422 (D-Sub 9-pin) for controller x1
- RS-422 (BVW/VDCP): RS-422 (D-Sub 9-pin) for device x3

Network:
- VDCP, AMP (Advanced Media Protocol)
- LAN: RJ45 x 2 (10Base-T/100Base-TX/1000Base-T)
- USB:
  - USB 3.0 x6 (Front x2, Rear x4)
  - USB 2.0 x4 (Rear x4)

PC Display
- DisplayPort x1
- DVI-D x1

(DisplayPort and DVI-D cannot be used at the same time)

Mechanical Specifications
- Dimensions (W x D x H): 430 x 550 x 140 mm (16.9 x 21.6 x 5.5 in.)
- Weight: 16.5 kg (36.4 lbs.)
- Operating Temperature: 5°C to 35°C (41°F to 95°F)
- Operating Relative Humidity: Max. 80% (non-condensing)

Electric Power Consumption
- Up to 200W
# T2 4K Series

## T2 4K Elite
- 2 TB usable SSD storage: 1 TB SSD x2 (RAID-0)
- 4K DCI/4K UHD (up to 60p/50p) and HD 1080 (up to 60p/50p)
- Media card reader bay: SD, SD (UHS-II), CF, 2.5-inch SSD
- Redundant power supply unit
- Direct access to internal storage (CIFS)

### Package Contents
- T2 4K Elite unit
- T2 4K read me first
- AC power supply cable x6 (NA/JP x2, UK x2, EMEA x2)
- Registration card for the T2

## T2 4K Pro
- 2 TB usable HDD storage: 1 TB HDD x2 (RAID-0)
- 4K DCI/4K UHD (up to 60p/50p) and HD 1080 (up to 60p/50p)
- Single power supply unit

### Package Contents
- T2 4K Pro unit
- T2 4K read me first
- AC power supply cable x3 (NA/JP x1, UK x1, EMEA x1)
- Registration card for the T2

## T2 4K Express
- 2 TB usable HDD storage: 1 TB HDD x2 (RAID-0)
- 4K DCI/4K UHD (up to 30p/25p) and HD 1080 (up to 30p/25p or 59.94i/50i)
- Single power supply unit

### Package Contents
- T2 4K Express unit
- T2 4K read me first
- AC power supply cable x3 (NA/JP x1, UK x1, EMEA x1)
- Registration card for the T2

## T2 4K Series (No I/O card)

### KTR4A-ELT-CV00
#### T2 4K Elite (No I/O card)
Requires T2 4K I/O Card Kit (KTR4-I0-CV80-KIT or KTR4-I0-CV12G-KIT)
- 2 TB usable HDD storage: 1 TB HDD x2 (RAID-0)
- 4K DCI/4K UHD (up to 60p/50p) and HD 1080 (up to 60p/50p)
- Media card reader bay: SD, SD (UHS-II), CF, 2.5-inch SSD
- Redundant power supply unit
- Direct access to internal storage (CIFS)

### Package Contents
- T2 4K Elite unit (No I/O card)
- T2 4K read me first
- AC power supply cable x6 (NA/JP x2, UK x2, EMEA x2)
- Registration card for the T2

### KTR4A-PRO-CV00
#### T2 4K Pro (No I/O card)
Requires T2 4K I/O Card Kit (KTR4-I0-CV80-KIT or KTR4-I0-CV12G-KIT)
- 2 TB usable HDD storage: 1 TB HDD x2 (RAID-0)
- 4K DCI/4K UHD (up to 60p/50p) and HD 1080 (up to 60p/50p)
- Single power supply unit

### Package Contents
- T2 4K Pro unit (No I/O card)
- T2 4K read me first
- AC power supply cable x3 (NA/JP x1, UK x1, EMEA x1)
- Registration card for the T2

### KTR4A-EXP-CV00
#### T2 4K Express (No I/O card)
Requires T2 4K I/O Card Kit (KTR4-I0-CV80-KIT or KTR4-I0-CV12G-KIT)
- 2 TB usable HDD storage: 1 TB HDD x2 (RAID-0)
- 4K DCI/4K UHD (up to 30p/25p) and HD 1080 (up to 30p/25p or 59.94i/50i)
- Single power supply unit

### Package Contents
- T2 4K Express unit (No I/O card)
- T2 4K read me first
- AC power supply cable x3 (NA/JP x1, UK x1, EMEA x1)
- Registration card for the T2

## T2 4K I/O Card Kit (SDI x8)
- To be ordered together with T2 4K Series (No I/O card) to build the T2 4K Plus Series. Available commonly for KTR4A-ELT-CV00, KTR4A-PRO-CV00 and KTR4A-EXP-CV00. Must be installed in the field by a reseller.

## T2 4K I/O Card Kit (12G-SDI x4)
- To be ordered together with T2 4K Series (No I/O card) to build the T2 4K 12G/6G Series. Available commonly for KTR4A-ELT-CV00, KTR4A-PRO-CV00 and KTR4A-EXP-CV00. Must be installed in the field by a reseller.

## Option

### 600476
idDR2-RACK-W — T2 Rackmount Kit
Rackmount kit for T2 4K Series