# grass valley

# APPLICATION NOTE

## RT Software Graphics Integration with K2 Summit 3G, K2 Summit, K2 Solo, and K2 Dyno for Sports Analysis and Telestration

**Partner Name:** RT Software Ltd. www.rtsw.co.uk

**Application Type:** Graphic Application/Solution for Sports Analysis and Telestration

**Integration:** Integrated with K2 Summit™ 3G, K2 Summit, K2 Solo™, and K2 Dyno™ Replay Controller

**Product Names:** GV – tOG-Sports Lite, GV – tOG-Sports Pro

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Grass Valley™ is able to offer sports enhancement graphics solutions that are compatible with the K2 product line through a partnership with RT Software (RTSW).

software

# Overview

The combination of the K2 product family and RT Software's tOG-Sports third-party telestration sports graphics application gives superior functionality along with a better cost/value proposition than competitive offerings, allowing broadcasters to significantly enhance their sports programs.

The system is extremely flexible and can be used:

• By the presenter in a studio show, typically with a touchscreen interface. This can include a virtual stadium view

• To insert live graphics such as advertising to monitors, including stadium large screens during a game

• To enhance quick replays featuring events such "offsides" and "distance to goal" graphics during a game

• To play out more elegant graphics clips during breaks, half-time, highlight shows, and end of game. Typically these will include player trails, highlighted regions, and virtual stadium views

Turnkey packages including Grass Valley K2 storage and K2 Dyno replay control systems, integrated with RT Software's tOG-Sports software, are available directly from RT Software.

# RT Software Solution Overview

Grass Valley offers K2-compatible (K2 Summit 3G, K2 Summit, K2 Solo, K2 Dyno Replay Controller) sports enhancement graphics solutions through a partnership with RT Software. The solutions are based on the popular and proven tOG-Sports product line that is in use by Tier 1 broadcasters around the world including the BBC, IMG for the Premier League show, Sky in UK/Australia/New Zealand, Fox Sports, and many more.

The solutions are based on two standard RT Software products, but with an additional Grass Valley-specific user interface and AMP clip control protocol:

• tOG-Sports Lite

• tOG-Sports Pro

These solutions include the proven tOG-Sports functionality, while also providing a unique and flexible approach to sports enhancement graphics:

• The Lite version delivers operator-driven telestration that adds split-screen video, lines, circles, arrows, and more to clips residing on K2 systems

• A 22" touchscreen interface for ease of use

• Integration with the K2 Dyno for channel control and support of K2 protocols for file-based workflow

• The more powerful Pro product adds "tied to pitch" graphics and sophisticated virtual views

• Both versions share a common hardware platform with an easy software license upgrade from Lite to Pro

These systems can be turnkey solutions consisting of a broadcast specification PC, the licensed software, first year annual software support, documentation, online video tutorials, and an on-site installation and training package.

# RT Software Solution Overview (cont.)

### Standard Features Across Both Products

- A set-up or operator interface that provides access to advanced menus that are usually used prior to a game or show

- A live touchscreen interface for use by the operator during the game to allow predominantly keyboard-less operation

- The system can be hot-keyed between the interfaces, meaning only one screen need be installed in a truck

- An optional second live touchscreen interface can be added that would be used in a commentary position or in a half-time/full-time studio show (the interface with touchscreen-based channel control is useful for this environment)

- SDI connection to the K2, with dual SDI input channels needed for the split screen function

- Network connection to the K2 for file-based production and timecode

- Internal linear keyer—the output is ready for transmission, there is no need to key separately

- Both products can use a K2 Dyno Replay Controller for channel control, or channel control can be achieved in software via the touchscreen controls (this is particularly useful for the optional remote screen)



**Figure 1** – *Live touchscreen with channel control.*



**Figure 2** – *Live touchscreen with K2 Dyno control.*

### K2 Dyno Replay Controller

The K2 Dyno Replay Controller can be used to control the video that is seen in the preview window of the touchscreen. This includes selection of the channel and transport control. This gives the operator a familiar control environment and facilitates adding telestration capabilities into a single station—a crucial factor for OB trucks.

Note: The only way to cue up the split-screen video is to use the K2 Dyno Replay Controller.



**Figure 3** – *Live touchscreen with split screen effect.*

# RT Software Solution Overview (cont.)

### File-Based Workflow

The products offer a file-based workflow between the networked K2 and the tOG-Sports system. This has the obvious benefits of freeing up broadband/SDI channels in the truck and in the studio, along with making it easier to relocate the tOG-Sports system, if desired.

It is suitable for:

• Live manual analysis, played out by the tOG-Sports PC

• Studio analysis on an optional second touchscreen

• Batch-based preparation of analysis for later use

Note: The preparation of analysis clips and saving back to the K2 is not in real time.

### Product Introduction tOG-Sports Lite

This is the entry level, second screen composer, or telestrator—yet has many advanced features not found in any competitive product, including:

• Split Screen: Either side-by-side, or above-and-below. Use the touchscreen to centre the individual split screen views on the action. Requires two SDI video in connections from the K2 media server

• Target Track: A tool to either highlight or magnify a region of the screen with manual live tracking via the touchscreen

• Telestrator: Screen writing tools that allow the operator to add simple annotations to video clips. Not just different colored lines, arrows, and circles, but also:

— More line, circle, and arrow styles than any other competitor

— Quickly set up home, away, and neutral colors for the tools

• Add text to graphics, such as the naming tool

• Virtual stadium views, with simple static player models

• K2 media sever transport control when no K2 Dyno Replay Controller is being used

• The ability to drive an additional touchscreen for live use by a commentator/presenter

### Product Introduction tOG-Sports Pro

This includes all the functionality of the Lite product, but adds the ability to deliver live or near-live "tied to pitch" graphics, such as off-side or advantage lines, nine-meter circles, and even virtual advertising.

These capabilities are achieved through use of state-of-the-art line tracking camera positioning technology—meaning no special camera heads are required, everything is all done in virtual space.

In addition to the features of tOG-Sports Lite, the tOG-Sports Pro product adds:

• Graphics: Off-side line, nine meter circle, distance to the goal, on-pitch scores, and logo advertising inserts

• Software chromakeying to key graphics on grass with the players on top

• tOG-Sports Lite telestrator graphics: lines, circles, and arrows

• Telestration graphics tied to the pitch in 3D, while the video channel is playing

• Keyframe-based player and ball trails

• Player movement

• Adding of a virtual large screen display into the real stadium

• Cutting players from the video and taking them into the virtual stadium to create virtual views

• Quick preparation and playout of complex analysis stacks

• Tracking technology support for up to five cameras

The primary benefit is that tOG-Sports Pro uses video-based techniques for putting the graphics on the pitch in 3D. This can transform sports programming with 3D tied to pitch graphics whether a user is managing production at an event, taking remote feeds, working on clips, or even re-packaging archives.

# RT Software Solution Overview (cont.)

### At Venue Truck Configuration

It is envisioned that the K2 Dyno operator will have the 22" touchscreen mounted at the station and will hot key between the Set Up and Live screens as required. Many functions can be achieved without a keyboard and mouse, however some advanced functions will require a keyboard and mouse. The maximum distance from PC to screen without additional "black boxes" is 3 meters.

### At Venue Optional Commentator/Live Studio Configuration

Clients can add an additional touchscreen for commentator positions or for live studio analysis. Please contact RTSW for advice on supported touchscreens, cabling recommendations, and general advice.

### Studio Configuration

In the studio, there would normally be a graphics operator station running the system on the touchscreen with a keyboard and mouse. Optionally there may be one or more touchscreens added for live studio use. Please contact RTSW for advice on supported touchscreens, cabling recommendations, and general advice.
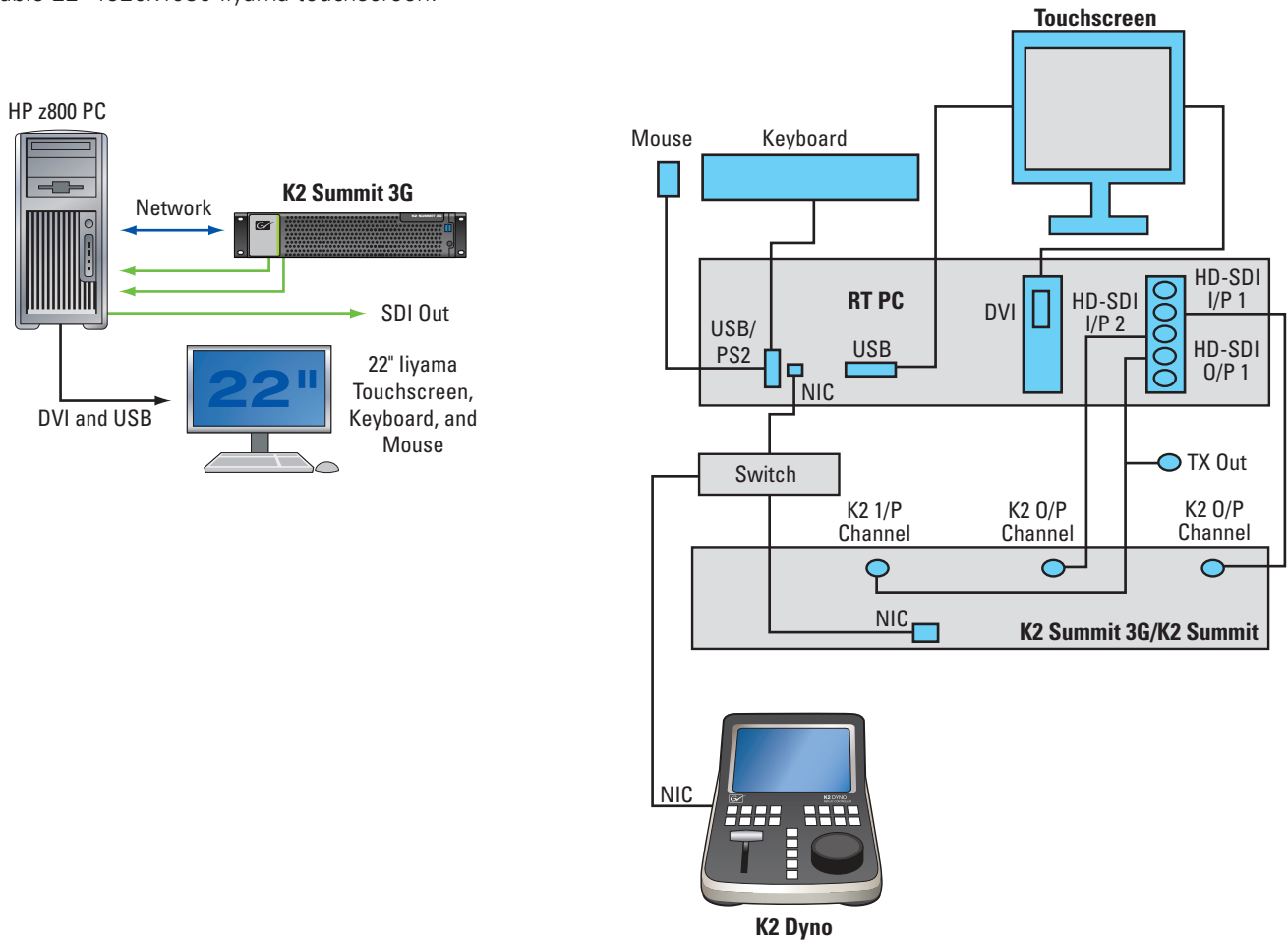
### Key Benefits

- 50% of the cost of competitive products. Cost-effectively provides the "added value" live, near live, and analysis graphics that sports channels are looking for

- Extremely easy to set up and use. The full training course is just one day

- Integrates with K2 media server to provide client with a cost effective turnkey solution

- Turn on and go – it comes complete with a full suite of all the popular telestration graphics (lines, arrows, circles, areas, player trail, and virtual stadiums)

- Fully customized graphics can be created on a separate tOG-Edit system (not supplied) and then played out live on the tOG-Sports system

- Players from the video replay are keyed on top of the on pitch graphics. Includes in the box software based chromakeyer, segment, and linear keyer

- Superior functionality over competitive products (contact sales@rtsw.co.uk for more information)

# RT Software Solution Overview (cont.)

## Hardware

The recommended hardware consists of a either an HP or Supermicro rack mountable PC, along with a VESA mountable 22" 1920x1080 liyama touchscreen.

# Options

## Option 1 – 5 RU HP z800

### HP Parts

Higher speed CPUs and larger capacity (15,000 RPM SAS disks) are both supported.

| Description | Quantity |
|---|---|
| HP Z800 Workstation Base Unit | 1 |
| HP Linux Installer Kit Software | 1 |
| Intel Xeon X5650 2.66 12 MB/1333 6C CPU | 2 |
| HP 6 GB (6x1 GB) DDR3-1333 ECC Memory | 1 |
| NVIDIA Quadro 4000 2.0 GB Graphics | 1 |
| HP 300GB SAS 15K HDD | 2 |
| HP 16X DVD+/-RW SuperMulti SATA | 1 |
| HP Air Cooling Solution | 1 |
| HP 2 X Standard Heatsink Thermal Kit | 1 |

### DVS Parts

DVS "Atomix LT Bundle" with Second Input Channel Option

### Red Hat Operating System

Red Hat Enterprise level 5.5 64-bit

### Iiyama 22" Touchscreen

Model T2250MTS

### Touchbase Touchscreen Driver

Touchbase UPDD Linux RH driver

## Option 2 – 3 RU Supermicro

### Supermicro Parts

There is no chassis in this list – a Supermicro dealer can discuss chassis options. Different chassis may require different cooling than specified below. Higher speed CPUs and larger capacity (15,000 RPM SAS disks) are both supported.

There is no consistency across Supermicro system builders, so RTSW is unable to guarantee compatibility and instead requests that you work closely with us to confirm a specification that is right for the end user client.

| Quantity | Description |
|---|---|
| 1 | Supermicro X8DAL-i Rev 2.0 Dual Xeon 55/56 series Workstation Motherboard |
| 2 | Intel Xeon X5650 Processor, 2.66 GHz (6 Core/12 Thread SMT) 2.66 GHz 6 Core processor for Dual socket systems, 0.32 nm technology |
| 1 | Intel STS100C - Xeon W55xx LGA1366 130W CPU Coolers (PAIR) |
| 6 | 1 GB DDR3-1333 ECC Registered SDRAM Module |
| 2 | Fujitsu 147 GB 15K SAS Hard Drive (Model No. MBA3147RC) |
| 1 | LSI SAS3041e-R 4-Port Low Profile SAS 3 Gb/s PCIe Host Adapter |
| 1 | Sony NEC Optiarc Multi-Format DVD Writer (SATA) |
| 1 | ARX 3HDDKIT for mounting up to 3 x 3.5" HDDs, 1 x 8 cm Fan (will fit in any 2 x 5.25" drive bays) |
| | |
| 1 | Supermicro CBL-0097L-02 (SFF-8087 to SAS with sideband signaling) 45 cm. Suitable to connect to Supermicro SAS backplanes with discreet SAS ports |
| 1 | NVIDIA Quadro 4000 2.0 GB Graphics |

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### Iiyama 22" Touchscreen

Model T2250MTS

### Touchbase Touchscreen Driver

Touchbase UPDD Linux RH driver

Hardware information from RTSW http://rtsw.co.uk/partners/qualified-pc-specifications/

Build information from support@rtsw.co.uk

# Pricing

## Reference Customers

RT Software's standard tOG-Sports products are in use by Tier 1 broadcasters around the world including BBC, Sky UK, Australia and New Zealand, Fox Sports, and many more.

## List Prices

| | UK£ | US$ | Euro |
|---|---|---|---|
| **tOG-Sports Lite System** | | | |
| Perpetual GV tOG-Sports Lite Software License | £19,000 | $30,400 | € 21,850 |
| Annual software support | £1,900 | $3,040 | € 2,185 |
| On-site installation and training | £1,900 | $3,040 | € 2,185 |
| RTSW Bundle Price Including PC and Touchscreen | £28,000 | $44,800 | € 32,200 |
| **tOG-Sports Pro System** | | | |
| Perpetual GV tOG-Sports Pro Software License | £39,000 | $62,400 | € 44,850 |
| Annual software support | £3,900 | $6,240 | € 4,485 |
| On-site installation and training | £1,900 | $3,040 | € 2,185 |
| RTSW Bundle Price Including PC and Touchscreen | £48,000 | $76,800 | € 55,200 |

# Product Ordering

The Grass Valley editions of these products are available around the world from RT Software directly.

Contact:

sales@rtsw.co.uk

+44 (0) 207 168 8820 (UK Office 09:00 to 18:00)

+44 (0) 7787 551541 (after hours sales support)

# Competitive Information – Detail

### How does tOG-Sports Lite compare to the basic offering of the leading competitor?

- **Split Screen.** Either side-by-side, or above-and-below. Our solution provides this functionality, and in addition allows use of the touchscreen to centre the individual split screen views on the action instantly and intuitively

- **Telestrator.** Second screen writing tools that allow the operator to add simple annotations to video clips. The leading competitor provides basic lines, arrows, and circles, with limitations in operation. RTSW does this and the solution offers more functionality (see "Product Features")

- **Target Track.** A tool to either highlight or magnify a circular region of the screen and keyframe its movement while the clip is playing. RTSW does this, and with a variety of additional options (see "Product Features")

- The basic competitive offering does not have virtual stadium views, the ability to add a presenter touchscreen, and cannot be upgraded to handle tied to pitch graphics at a later date

### How does tOG-Sports Pro compare to the advanced offering of the leading competitor?

- Off-side line. Both do this

- 9 meter/10 yard circle. Both do this

- Distance to the goal. Both do this

- On pitch scores and logo inserts. Both do this

- The advanced competitive offering does not offer the functionality included even their basic toolset, or indeed the superior functionality of the tOG-Sports Lite system

Note: The competitive offering and the RTSW solution exhibit many similarities in that they are both using a video based technique to apply graphics to the field of play, both require setting up and calibration by a trained operator.

## GLOBAL SERVICES

Grass Valley Global Services specializes in the defining of, deployment of, and support of today's dynamic file-based workflows, based on Grass Valley and third-party solutions. With Grass Valley Global Services, you can achieve your operational goals in the most efficient and cost-effective way possible with a partner you can trust.

**www.grassvalley.com/support**

**Define:** We help you to define your business and technology requirements and then design solutions to meet them.
**Deploy:** Our professional service organization, backed up with proven project management methodologies, can take you from design through deployment, commissioning, and training.
**Support:** We offer a complete Support Agreement portfolio to keep your systems running and help plan for your long-term maintenance needs.

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