DARIM®

- ▸ Integrated Virtual Studio System
- ▸ Multi-Camera Display/Switching
- ▸ Advanced Color Keying
- ▸ Real Time 3D Rendering
- ▸ Trackless Camera Animation
- ▸ Virtual 3D Position/Zoom Control
- ▸ Easy Setup and Operation
- ▸ Optional Camera Tracking Interface

VS2000

Real-time 3D Virtual Set Solutions

VS2000

For Stunning Live/Recorded Video Effects

VS2000™ Highlights

- Trackless design reduces the need for studio space/setup time
- Provides full 3D position and zoom control for virtual cameras
- Integrated chroma keying, 3D rendering and video mixing
- Real-time switching of multiple cameras/auxiliary video sources
- Insertion of live/recorded A/V content into virtual sets
- Special enhancements for animation and presentation insertion
- Easy-to-use yet powerful virtual set control script
- Quick virtual set customization without 3D authoring software
- Interactive and remote updates to the 3D virtual set contents
- One-touch activation of animations and pre-programmed actions
- Single-person operation using keyboard/mouse/joystick
- Optional interface to camera tracking sensor systems

VS2000 Features In Depth

Virtual Studio 2000™ is a trackless virtual set management system. VS2000 does not require any expensive camera motion trackers like other systems to emulate virtual camera movements and zooming. Instead, the VS2000 uses a practically unlimited number of virtual cameras that can be moved within the 3D graphics environment or zoomed in/out without any effort while the physical camera remains still. This allows users to dramatically save on backdrop materials, sets and lighting often eliminating the need for hard sets altogether. VS2000's ease of use reduces operator training time making it ideal for small to medium-sized studios.

VS2000 uses innovative multi-channel color keying hardware and software. The unique real-time color keying module included in all models of the VS2000 family is highly sophisticated as well as forgiving of poor quality video signal. It performs extremely well even with non-professional video equipment (e.g. a consumer DV camera connected using S-Video cable) and less-than-perfect backgrounds or lighting. The keying algorithm does not get confused by translucent or ultra-fine objects such as glass, hair, smoke or shadows. And the best of all, the color keying software is amazingly easy to use. All complex calculations of the color keyer are done instantly with a single "Auto Key" button. In a few special cases when the automatic keying may not be desired, advanced users can manually tweak keying parameters using the special control panel.

VS2000 renders 3D worlds created with leading industry tools such as 3D Studio Max™ and Maya™. By being a truly 3D virtual set platform, the VS2000 is not limited to only using simple 2D images as a background or foreground around the live video of an actor. Instead, it operates with 3D mesh objects, materials, virtual lights, cameras and animation tracks created with 3D Studio Max™ and Maya™. The preloaded 3D objects, materials and animation is rendered into stunning full D1 resolution, 32-bit color video in real-time using the most powerful 3D rendering hardware in the world.

VS2000 does not require any pre-rendering. Whether using the samples supplied with VS2000 or custom-created virtual sets, they do not need to be pre-rendered to provide a fully interactive environment. This allows program producers or designers to customize the appearance and animation of the virtual set from inside the VS2000 system, without requiring the use of 3D model/animation authoring software.

VS2000 treats live and pre-recorded video in 3D set as a texture. Virtual set designers and program producers can "paste" any desired video feed onto any object surface inside the virtual set. The most advanced models in the VS2000 line can operate with 2 separate live video feeds and several AVI/MPEG video feeds at full-D1 or reduced resolutions if desired with or without Alpha-channel. A special feature called double-texturing allows virtual set designers to create realistic surfaces like glass and water ripples.

VS2000 is fully interactive and extremely easy to use. The video production process with VS2000 is fully interactive and controllable by a single operator who does not need to be an experienced video engineer. The operator may simply execute the predefined program script or alter the standard program flow in a variety of ways using a touch-screen, keyboard, mouse and joystick.

VS2000 is easily expandable and upgradeable. Options are available to the standard VS2000 configuration to expand its capabilities. As an option, the VS2000 can interface to certain physical camera tracking sensors for an added degree of realism to 3D virtual sets. Another option enables powerful 3D DVE functions in VS2000 for creation of complex animated titles, logos, animation characters, or virtual display panels.

VS2000 is compatible with any A/V recording/editing equipment. VS2000 output can be connected via its variety of analog or digital video and audio connectors to third-party consumer or professional recording/editing devices, special effects/title generators, production switchers/mixers or a real time MPEG encoder to deliver compressed digital A/V content over digital networks including the Internet.

Model Line Up:

	VS2010	VS2020
Application type *	**Standard:** Composite/S-Video video inputs only, standard 3D rendering **Professional:** up to RGB/YUV video inputs, higher quality 3D rendering **Broadcast:** RGB/YUV and SDI video inputs, genlock, highest quality 3D rendering, additional operation modes	
Max. number of live video textures:	1	2
Max. number of file video textures:	2	3
Max. number of cameras/aux inputs:	2 (max. 1 SDI)	4 (max. 2 SDI)
Video output types:	Composite, S-Video, RGB, YUV and optional SDI	
Analog audio inputs/outputs:	3 Stereo	6 Stereo

Additional Options:

Genlocked video output (Std & Pro models)
SDI video input/output (Pro model, max. 2 I/O)
XLR balanced audio input/output (Pro and above)
Additional Operation Modes (Pro model)
Camera Tracking Interface (Pro and above)

* Models differentiated by the number and quality of A/V inputs/outputs as well as 3D rendering performance
  Not all models and application types are available

Integrating VS2000 and other A/V or IT equipment

Major applications of VS2000

- News, sports and talk show programs
- Highlighting business and political events
- Corporate in-house presentations and training
- Creation of advertisement and promotional clips
- University, non-commercial broadcast departments
- Virtual classrooms for distance learning systems
- Game shows, entertainment programs, music videos
- Complex 3D graphics and DVE insertion
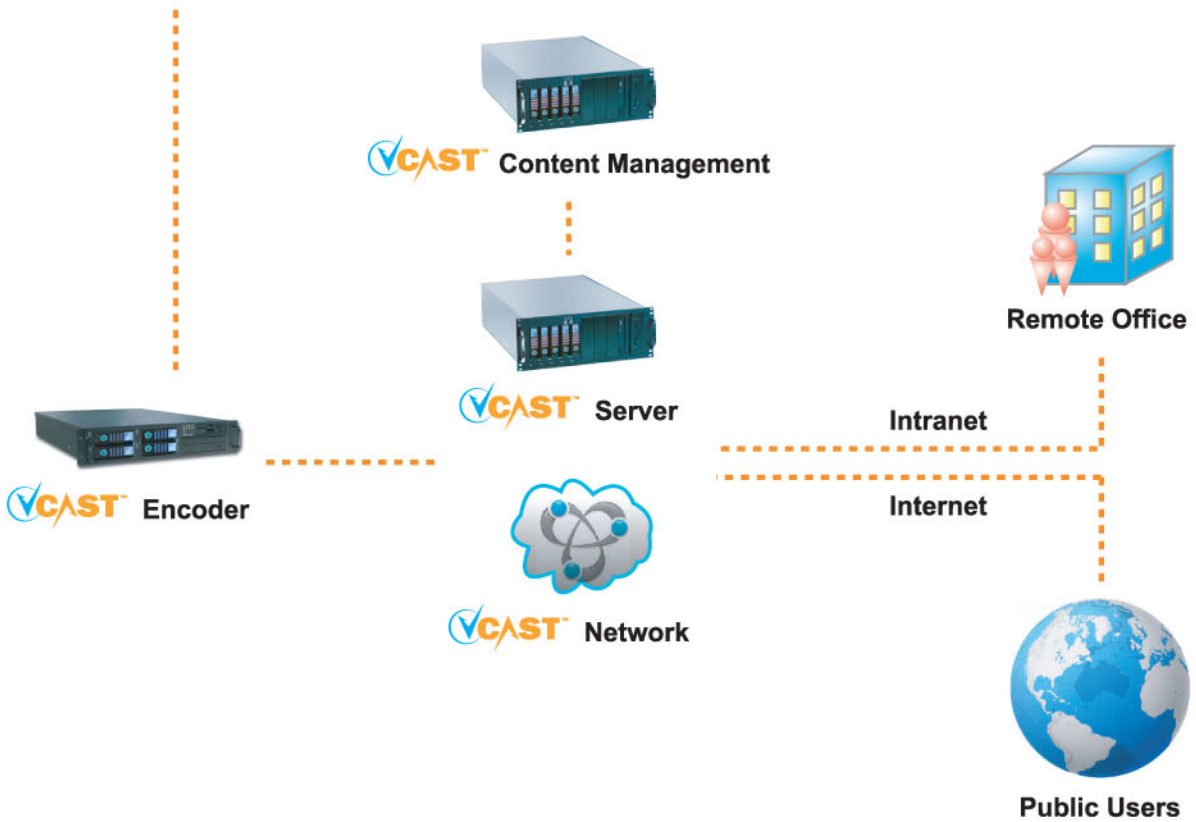- Integration of virtual sets with motion capture systems

CAM 1
(Wide angle)

CAM 2
(Close up)

3D Virtual Set

VCAST Content Management

VCAST Server

Remote Office

VCAST Encoder

Intranet

Internet

VCAST Network

Public Users

VS2000 System Specifications:

Input Video Formats:

Live analog or CCIR-656 digital video at half- or full-D1 resolution;
AVI, MPEG files at up to full-D1 resolution
NTSC, PAL or SECAM software selectable
NTSC: 720x480 or 352x480 at 29.97 fps
PAL/SECAM: 720x576 or 352x576 at 25 fps

Output Video Formats:

Full D1 or square-pixel resolution, full motion, full color analog or 4:2:2 digital video
NTSC, PAL or SECAM software selectable
NTSC: 720x480 or 640x480 at 29.97 fps
PAL, SECAM: 720x576 or 800x600 at 25 fps

Video Inputs:

Composite (BNC): up to 10 (1.0 Vp-p, 75 Ohm)
S-Video (4-pin mini-DIN): up to 4 (Y: 1.0 Vp-p, 75 Ohm; C: 0.286 or 0.3 Vp-p at burst level, 75 Ohm)
Component RGB (BNC): up to 3 (R/G/B: 1.0 Vp-p, 75 Ohm) with Int. or Ext. sync
Component YUV (BNC): up to 3 (Y: 1.0 Vp-p, 75 Ohm; U/V: 0.7 Vp-p, 75 Ohm) with Int. or Ext. sync
SDI (BNC): optional (SMPTE 259M-C, 270 Mbps)
The maximum possible number of inputs is shown, some combinations are mutually exclusive
All Inputs are software selectable except certain RGB/YUV ext. sync selections

Video Outputs:

Composite (BNC) (1.0 Vp-p, 75 Ohm),
S-Video (4-pin mini-DIN) (Y: 1.0 Vp-p, 75 Ohm; C: 0.286 or 0.3 Vp-p at burst level, 75 Ohm),
Component RGB (BNC) (R/G/B: 1.0 Vp-p, 75 Ohm) with Int. or Ext. sync
Component YUV (BNC) (Y: 1.0 Vp-p, 75 Ohm; U/V: 0.7 Vp-p, 75 Ohm) with Int. or Ext. sync
SDI (BNC) (SMPTE 259M-C, 270 Mbps) - optional

All specifications subject to change without notice.
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Audio Input/Output:

Inputs microphone- or line-level analog mono or stereo audio **(Balanced or Unbalanced)**
Outputs stereo line-level analog audio **(Balanced** or **Unbalanced)**
Inputs and outputs **S/PDIF** digital audio (RCA)
All inputs feature programmable delay (up to 1000ms) for proper A/V synchronization

Time Base Correction:

Individual Time Base Correction for each video input and common Frame Sync Buffer allow for real time switching between 2 asynchronous analog/digital video sources without dropping frames or image distortions

Color Keying:

Automatically generated (simplified) or custom table-based (advanced) color keying with color correction
Programmable spatial and temporal filtering and clipping of the keying mask

Genlock:

Analog and digital video outputs of compatible VS2000 models can be genlocked to a selected external reference video signal (analog BB generator)

Camera Tracking:

No physical camera tracking devices are required. The virtual cameras of VS2000 provide users with unlimited camera positions, pan, tilt and zoom adjustments. An optional **Physical Camera Tracking Interface** provides support for certain models of cameras and mounts with pan/tilt/zoom/position tracking sensors.

3D Graphics Rendering Performance:

Up to 130 millions triangles/sec
Full screen Anti-Aliasing (4x typical, up to 16x)
Real time Anisotropic filtering (up to 8x) and Texture Sharpening
Hardware Rendering Buffer - up to 256MB

Internal Video Processing Delay:

Fixed at 4 frame periods (132 ms in NTSC or 160 ms in PAL/SECAM)

Reseller:

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