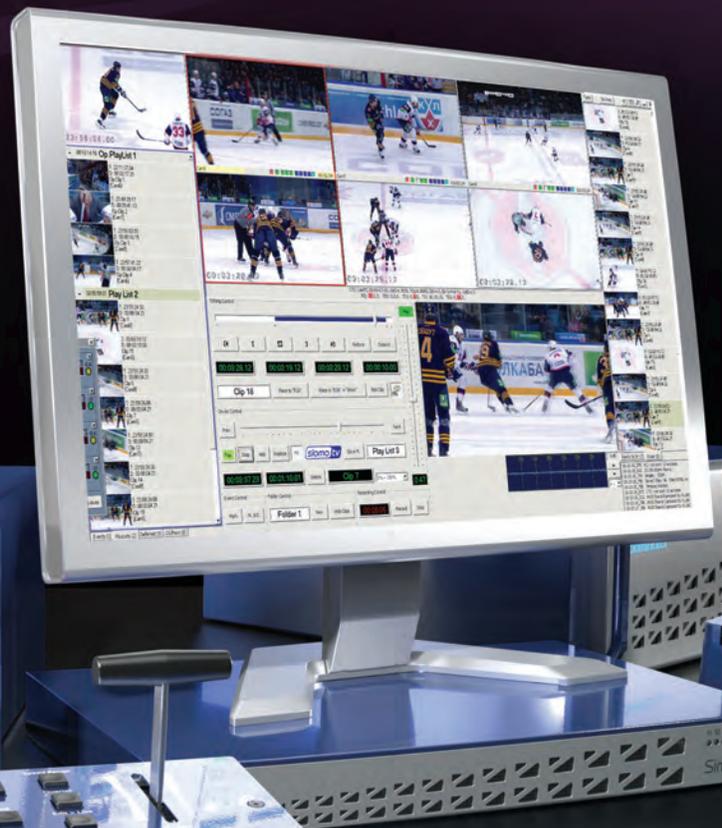




The Best Tapeless!





**The choice is yours,  
but remember,  
we are the best!**

Our mission is to provide slomo.tv equipment to  
broadcast community all over the world,  
saving TV professionals money, time and nerves.



## WE SAVE YOU



### TIME

Full integration with non-linear systems allows editing right after command "CUT!"



### MONEY

Use of slomo.tv technology in multi-channel recording can reduce the cost of equipment and media in more than half



### NERVES

Absolute safety of recorded material due to parallel recording to internal storage and removable DMR™ cassette (SATA Hard Drive)



### SPACE

One 4U server replaces 6/8 Digital Betacam/HDCAM tape recorders. One hard drive stores 18 hrs SD or 8 hrs Full HD video of broadcast quality

# Table of Contents

**04 Simple R** The world's smallest replay machine.

**08 DMR™** (Direct Movie Record) technology.

**11 Replay Systems**

**Multichannel video recorders with DMR™ and instant replay/slow motion.**

**12 Fulcrum** Entry-level systems, 4-channel SD/HD, 4U chassis.

**16 Dominator** 6-channel recording and instant replay stations.

**20 Dominator AT** (Advanced Technology).

**22 BlackJack** Up to 12 Full HD recording channels in one unit.

**Systems for sports officiating.**

**26 videoReferee®**

**32 GoalNetCam** Wireless camera.

**36 vR-Cam** (videoReferee® camera).

**38 Star<sup>2</sup>** TV Technologies in Cinematography.

**40 The Academy** Skill building training in simulated environment.

# 04 Simple R

The world's smallest  
replay machine



Mini 1 U, 29 cm. Weight - 4.8 kg.  
3 recording channels. 33 hours of  
recording in HD

In industry terms Simple R is an  
8-channel system - simultaneous  
recording of 3 video channels,  
search on all 3 recorded channels  
and playback of 2 channels with  
transitions between them.

Industry-leading codec DVCPro 50/

DVCPro HD.  
Support of high-speed SuperMotion  
cameras 3x

Export of recorded material into  
Apple Final Cut and Avid MC  
formats.

Optional: 4-channel recording with  
subsequent MXF / Quick Time  
export to a network file server  
via 1GbE interface or to external

trayless dual 3.5» SATA HDD rack.

2x and 4x storage expansion (up to  
132/250 hours of recording in SD or  
66/125 hours of recording in HD)

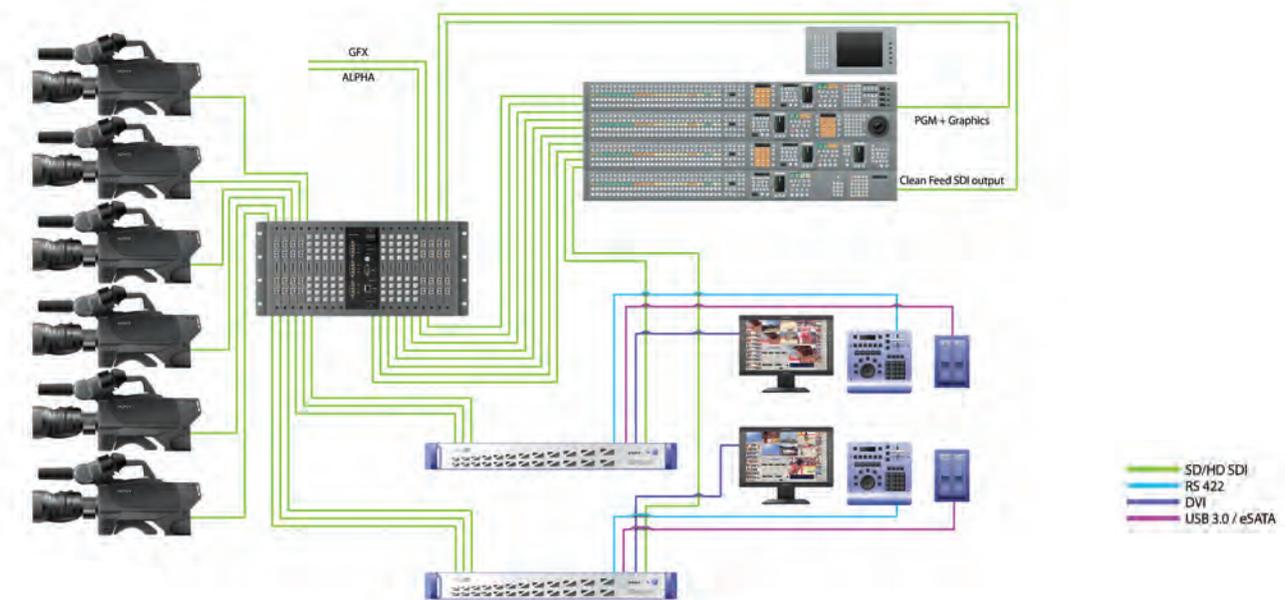


The world's smallest  
replay machine.

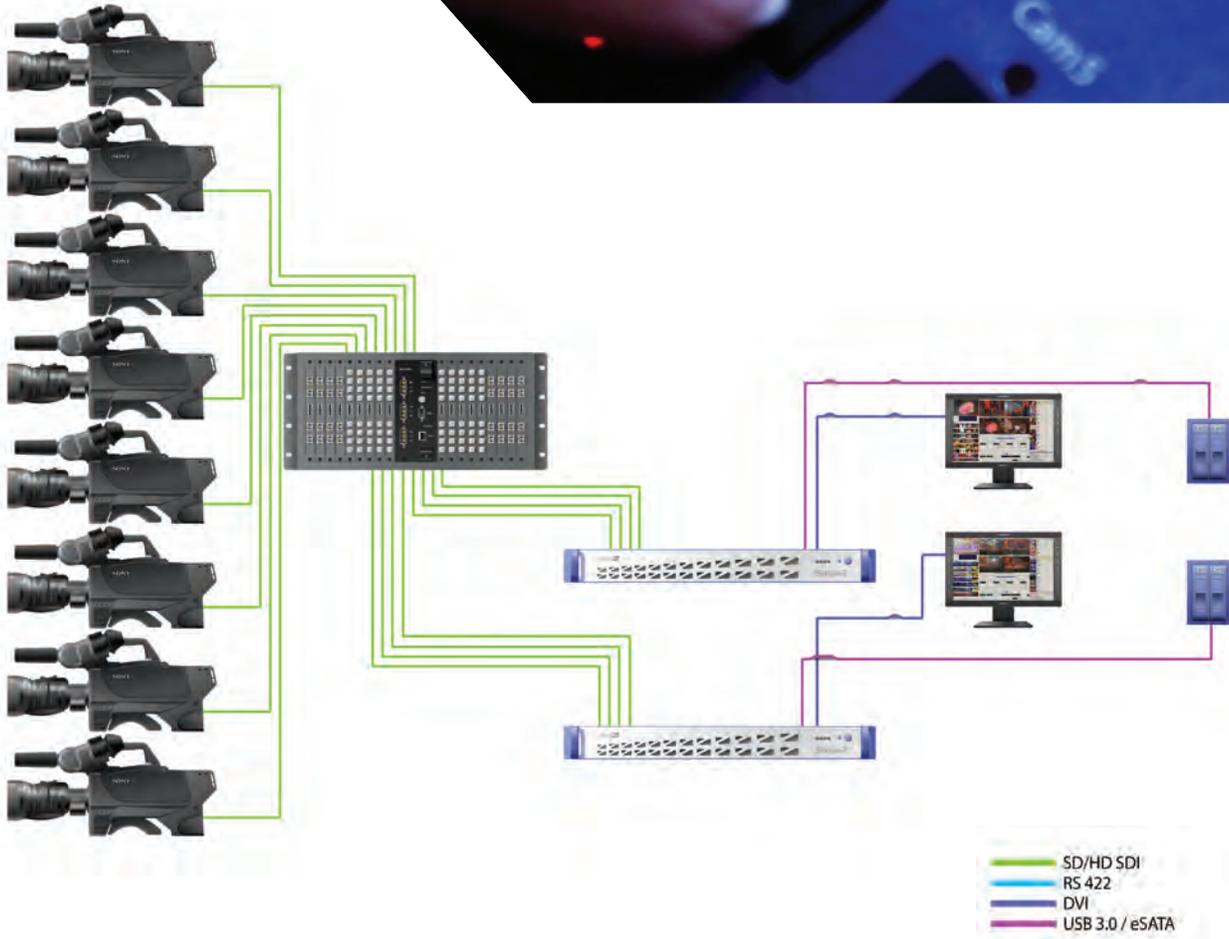




Minimal replay configuration



6 channels Replay configuration



8 channels NLE Recording configuration

# 08 DMR



# Multi-channel recording with DMR™ technology

One server replaces 4 to 32 broadcast-grade VCR (SD/HD)

Integration with non-linear editing systems in native formats (Avid MC, Apple Final Cut, Liquid Chrome, Canopus, Adobe Premiere, etc.).

Full range professional and broadcast codecs from dv25 to Apple Prores®

No time consuming digitizing of recorded material. Begin editing right after command “stop”

Parallel recording to a built-in video RAID and external file server

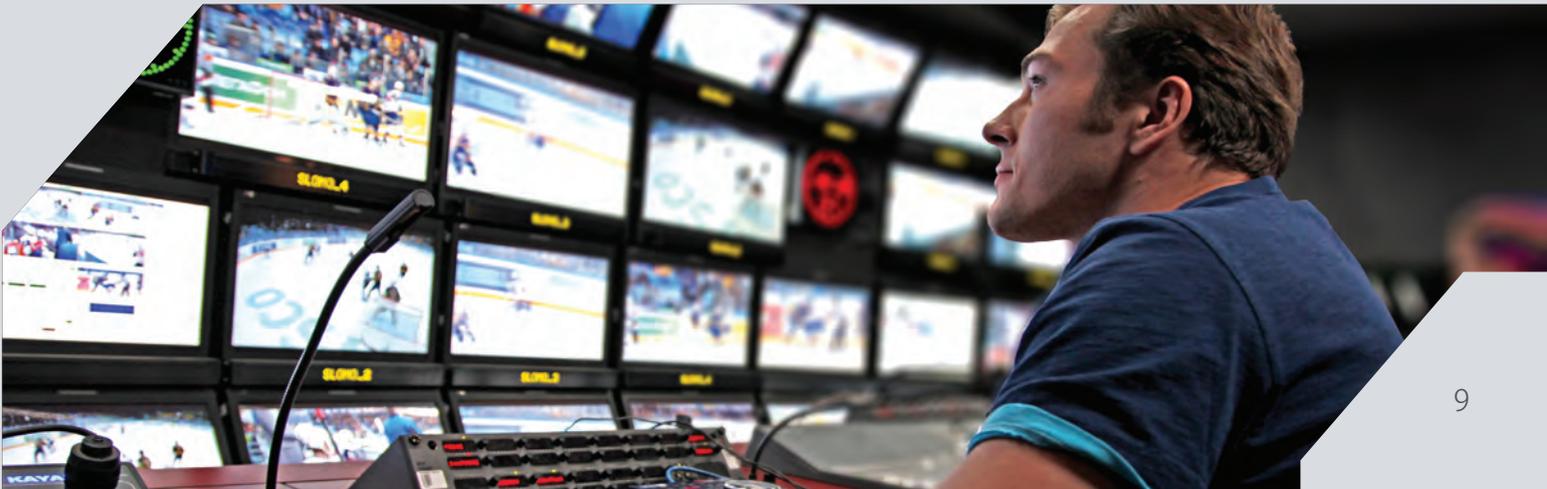
increases the system reliability and assures safety of recorded material.

Up to 64 audio channels. Absolute synchronization of video and audio.

One SATA hard drive (1Tb), used as video cassette, stores up to 12 hours of HD video with SD Proxy/ or 36 hours for SD systems. It allows to record video to build-in RAID storage and simultaneously record in “native” format of most non-linear editing (NLE) systems. It also allows parallel recording of HD video and its SD proxy in NLE format. DMR™ (Direct Movie Record) technology developed by our company is

supported by all slomo.tv for recording to any media.

DMR™ is practically useful only if recorded material is readily accessible by NLE stations. This is achieved by recording on removable hard drives (HD) or to shared network storage.





## DMR™ Station

The hot-swappable DMR™ «trayless - toolless» cassette contains standard SATA hard drive. Cassettes are installed directly into the unit or external DMR™ Station, connected via SAS interface. DMR™ Station supports up to 10 cassettes. The number of installed cassettes depends on model and configuration of the particular multichannel recorder.

Recording is carried out directly in selected NLE “native” format (Avid MC, Apple Final Cut, Liquid Chrome, Discreet Edit, etc.), bypassing time-consuming step of export and conversion.

With the advent of DMR2™ technology all our machines can record in real time not only Full HD, but also an SD resolution proxy. Proxy allows video editors



to use low-powered equipment for preliminary editing and then move to final editing in full resolution, using the proxy generated edit list.

Removable DMR™ cassettes do allow fast and simple transfer of recorded material, at the same time recording to a shared with NLE stations NAS and SAN practically removes all recorded volume limitations and integrates recording

and editing processes. Editing can begin immediately after command “Stop”. Our new systems Dominator AT and BlackJack support this integration.

Any one of the above described features, taken individually, greatly reduces production casts. Being implemented together, the effect can not be overestimated.

# Replay Systems

3,4,6 recording channels in one system

True Triplex mode - simultaneous recording up to 6 video channels, replay of 2 channels with transitions, search on 4 channels

Revolutionary graphical interface with Multiviewer

Support of super-motion cameras (2x/3x)

Smart Instant Replay mode with automatic Playlist Creation

Flexible editing clips/playlist mode

Direct Connect Option for Networking

Semi-automatic Summary creation

Wide choice of options

Export/Import for Clips and Playlists



We support up to 2,000 playlists and up to 4,000 clips. We support operational replays without marks. Our customers have the ability to save an operational replay without creating a deferred clip. This feature was found extremely useful when marking and saving a clip for subsequent use was not needed.

Our replay machines can be networked by DirectConnect™.

The same network can include our sport video adjudication system videoReferee®. As a result, it became possible to transfer data from a variety of cameras and other video materials necessary for creating replays and broadcast video effects.

All of our machines are constructed as single units, a collection of modules. The high channel density

of the unit lowers space and power requirements, simplifies connectivity and improves process control.



# 12 Fulcrum

4-channel SD/HD

4U chassis

Direct recording into native NLE file formats

Use of DMR™ (Direct Movie Record) technology

Scalable architecture and networking

Absolute protection of recorded video



Each Fulcrum replaces 4 Digital Betacam/HDCAM-class tape recorders at attractive price.

A single standard capacity hard drive (HD) holds 36 hours of SD video with DigiBeta quality or 18 hours of Full HD video.

Provides 32 audio channels with absolute synchronization of video and audio.

All systems are equipped with replay control console. Special pushbutton optimized interface provides instant access to frequently used functions.

True triplex mode - simultaneous recording of 4 video channels, search on one or all 4 channels and

replay of 2 channels with transitions between them.

Advanced instant replay mode provides automatic clip marking and playlist creation.

Clip/Playlist editing mode is tightly integrated with the advanced instant replay. This integration makes Final Summary available in seconds.

As all our multi channel professional video recording stations, Fulcrum can be integrated with a variety of NLE systems on a native level by using DMR™ (Direct Movie Record) technology. This eliminates the step of converting video into desired NLE format and allows to start editing within minutes after command «Stop

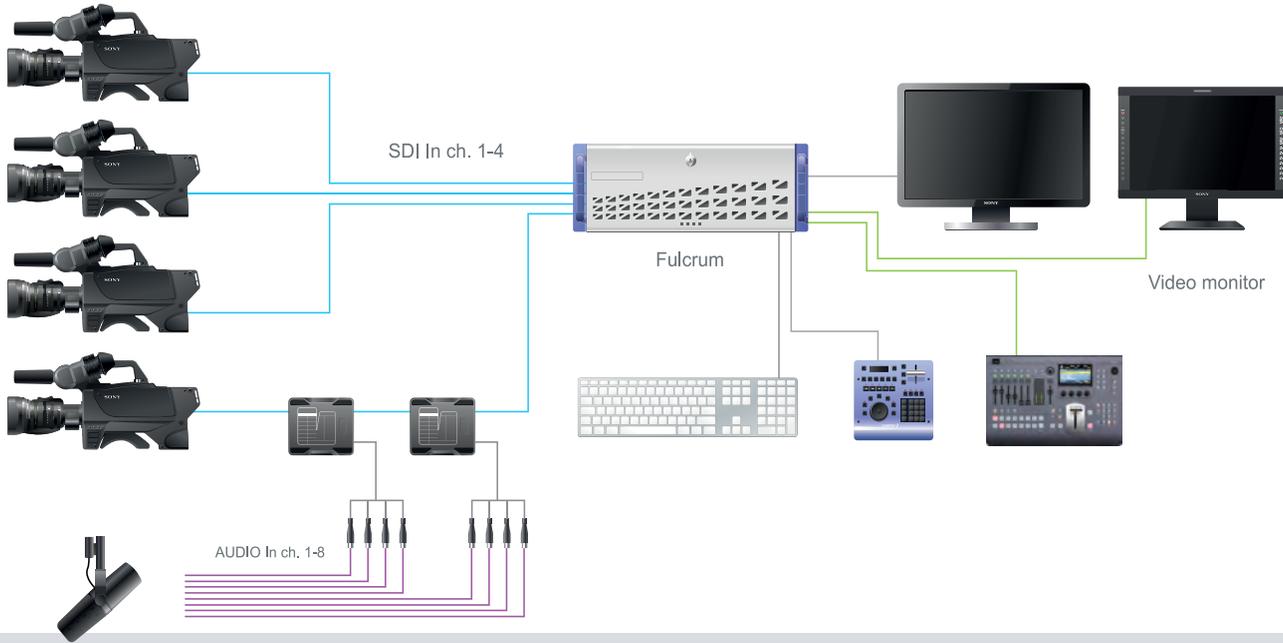
Record»

Our implementation of DMR™ technology supports a wide range of containers (MXF, QT-Quicktime, AVI, MPEG, M2V, DIFF) and Codecs (MJPEG, MPEG2, DV25, DV50, DVCPro50, DVCPro HD, AVID DNXHD, Apple Prores)

Built-in DMR™ rack is designed for trayless operation and provides quick replacement of recordable media (SATA Hard Drives) without tools.

Safety of video is assured by parallel recording to a built-in storage and DMR™ rack and/or to external file storage (DAS, NAS, SAN, IP, FC, SAS, eSATA, SCSI).

## Typical Configuration



### Fulcrum HD

HD/SD 4-channel video recording station with Slow Motion/Instant Replay. Compatible with most NLE systems; advanced replay management; network-enabled. The basic version includes 4Tb storage and two DMR™ cassettes.

### Fulcrum SD

4-channel recording station with slow motion / instant replay for working with SD signals only. Advanced replay management; compatible with most NLE systems; network-enabled.

### Fulcrum SM

System for use with Supermotion 2x/3x cameras. Supports two 2x cameras or a single 3x camera and one standard speed camera. Includes Direct Connect (DC) option for networking with other slomo.tv systems.

### Fulcrum 3D

System for working with 3D HD signals, as well as for 3D replays. Provides a 3D HD SDI video output. Includes additional 3D video monitor and 2 pairs of 3D glasses NVIDIA.



# Technical Characteristics

## Video Formats

NTSC: 1080/29.97p, 1080/59.94i, 480/59.94i  
PAL 1080/25p, 1080/50i, 576/25i  
Supports 16:9 and 4:3 aspect ratios

## Supported Compression Formats

### HD

JPEG HD basic for replays  
Optional:  
Uncompressed (for Cinema)  
Apple Prores®  
MPEG 2 I Frames up to  
220Mbit/sec  
MPEG 2 IBP Long GOP 2I -  
100Mbit/sec  
DVCPHD100  
Avid DNxHD

### SD

MJPEG 5-10MByte/sec;  
DV2I A  
Optional:  
DV50; MPEG 2 I Frames  
50Mbit/sec  
IMX HD/40/50  
Apple Prores®;  
Uncompressed

## INPUTS

4 SD/HD SDI Inputs SMPTE  
2I 9M /SMPTE 292M  
Genlock – analog input for  
synchronization - BlackBurst  
or TriSync.  
Support up to 32 channels  
SD/HD Embedded SDI  
Audio or (optional) 4-I  
Balanced Analog Audio  
Inputs (via Canon XLR)  
4I KHz x 16/24bit sampling  
LTC Balanced Analog (via Canon XLR)  
4 GPIO lines

## OUTPUTS

2 HD/SD SDI Genlocked Outs:  
Program 1 + Program 2/Alpha  
GPIO - 4 universal  
programmable out

## Supported NLE systems

Avid MC; Avid Liquid; Apple Final Cut, DPS Velocity; Adobe  
Premiere; Matrox Digisuite based Discreet edit 6.0; Incite  
online 2.xx-Hxx.

## Supported File Formats

Microsoft AVI; Apple QuickTime; MXF; DIF

## TV Standards

SD SDI video conforms to SMPTE 259M  
HD SDI video conforms to SMPTE 292M  
LTC - SMPTE 12M-1. Drop Frame and Non-Drop Frame Timecode supported

## Built-in Storage

4 T0  
66 hours of HD video with DVCPHD quality per channel.  
125 hours of SD video with Digital Betacam quality per  
channel

## Mechanical Characteristics

1U chassis, 16 cm length. Redundant Power Supply  
500Wt x 2.

## Visualization of video and controls

19" LCD Monitor 1920x1080

## Controls

Keyboard  
Mouse  
Jog/Shuttle and T-Bar Console

## Data exchange

Built-in DVD ± R/RW  
1Gb/10Gb Ethernet  
Optional — eSATA/FC/SAS

## Networking

Several systems can be aggregated into up-to 12 servers cluster with standard networking replay functional.



**The best and most affordable instant replay machines in the world! New HD-L family. HD at a price of SD.**

HD / SD multichannel recording system with instant replay / slow motion and advanced management.

# 16 Dominator



Multi-channel HD/SD video recording station with Slow Motion/Instant Replay.

Each video server replaces 6-8 Digital Betacam/HDCAM-class cassette decks.

True triplex mode for Instant Replay provides simultaneous recording of 6 video channels, search on one or all 6 channels, and replay of 2 channels with transitions between them. Dominator has also 48 audio channels.

All systems are equipped with replay control console. Special pushbutton optimized interface provides instant access to frequently used functions.

Advanced instant replay mode provides automatic clip marking and playlist creation.

Clip/Playlist editing mode is tightly integrated with the advanced instant replay. This integration makes Final Summary available in seconds.

Dominator can be integrated with a variety of NLE systems on a native level by using DMR™ technology. It eliminates the step of converting video into desired NLE format and allows starting editing within minutes after command «Stop»

Our DMR™ technology supports a wide range of containers (MXF, QT-Quicktime, AVI, MPEG, M2V, DIFF) and Codecs (MJPEG, MPEG2, DV25, DV50, DVCPro 50, DVCPro HD, AVID DNXHD, Apple Prores).

Built-in DMR™ trayless rack assures quick replacement of Recordable Tapeless Media (SATA Hard Drives) without tools.

One video server replaces up to 8 Digital Betacam/HDCAM-class cassette decks

Support of simultaneous multi resolution recording in Full HD and SD proxy movie files (HD DMR™ option).

Integration with a variety of NLE systems (Avid MC, Apple Final Cut, Liquid Chrome, Discreet \*edit, Canopus Edius, etc.) on a native level.

Opportunity to begin editing within minutes after command "stop". Phase of digitizing video is completely absent.

Absolute safety of video due to parallel recording to built-in storage and DMR™ cassettes or additional external file storage.

48 audio channels. Absolute synchronization of video and audio.

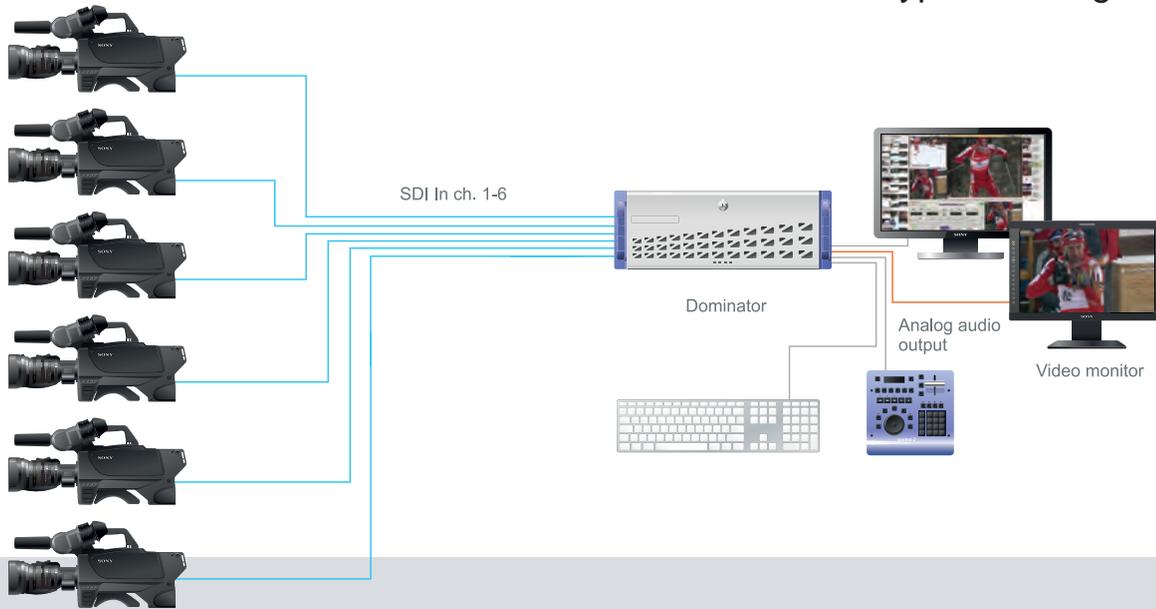
A single standard capacity hard drive (HD) holds 36 hours of SD video with DigiBeta quality or 18 hours of Full HD video.

DMR2™ allows performing replays simultaneously with recording of NLE files.

Parallel recording of DMR™ and proxy videos together with metadata files for use in archives or for preliminary video editing (option).

Absolute safety of recorded video due to parallel recording to a built-in storage and DMR™ cassette and/or to external file storage (DAS, NAS, SAN, IP, FC, SAS, eSATA, SCSI).

## Typical Configuration



### Dominator HD

Multi-channel video recording station for working with HD/SD SDI inputs. Supports Slow Motion / Instant Replay. Basic configuration includes 6Tb internal storage and 3 DMR™ Rack. Functionality can be expanded using variety of available options. Can be factory upgraded to a Plus system.

### Dominator SD

Unlike the HD it works only with SD inputs and has a smaller internal storage capacity. Unit can be factory upgraded to HD system.  
Dominator Plus

Supports the most flexible configuration. Base configuration

includes Alpha-channel and Flexible Storage options. Provides high storage capacity for operation in MCR mode. Incorporates a high speed SSD, used for replays.

### Dominator 3D

System for recording 3D HD signals, as well as for 3D replays. Provides a 3D HD SDI video output. Includes additional 3D video monitor and 2 pairs of 3D glasses NVIDIA.

### Dominator SM

System for use with Supermotion 2x/3x cameras. Supports three 2x cameras or two 3x cameras. Supports Slow Motion / Instant Replay mode. Includes Direct Connect (DC) option for networking with other slomo.tv systems.



# Technical Characteristics

## Video Formats

NTSC: 1080/29.97p, 1080/59.94i, 480/59.94i  
PAL 1080/25p, 1080/50i, 576/25i  
Supports 16:9 and 4:3 aspect ratios

## Supported Compression Formats

### HD

JPEG HD basic for replays  
Optional:  
Uncompressed (for Cinema)  
Apple ProRes®  
MPEG 2 I Frames up to  
220Mbit/sec  
MPEG 2 IBP Long GOP 25-  
100Mbit/sec  
DVCPProHD100  
Avid DNxHD

### SD

MJPEG 5-10MByte/sec;  
DV25  
Optional:  
DV50; MPEG 2 I Frames  
50Mbit/sec  
IMX 30/40/50  
Apple ProRes®;  
Uncompressed

## INPUTS

6 SD/HD SDI Inputs SMPTE  
259M /SMPTE 292M  
Genlock – analog input for  
synchronization - BlackBurst  
or TriSync  
Support up to 48 channels  
SD/HD Embedded SDI  
Audio  
OR (optional) 4-8 Balanced  
Analog Audio Inputs (via  
Canon XLR) 48KHz x  
16/24Bit sampling  
LTC Balanced Analog (via Canon XLR)

## OUTPUTS

2 HD/SD SDI Genlocked Outs:  
Program 1+Program 2 /Alpha  
GPIO - 4 universal  
programmable out

## Supported NLE systems

Avid MC; Avid Liquid; Apple Final Cut, DPS Velocity; Adobe  
Premiere; Matrox Digisuite based Discreet edit 6.0; Incite  
online 2.xx-3.xx.

## Supported File Formats

Microsoft AVI; Apple QuickTime; MXF; DIF

## TV Standards

SD video conforms to SMPTE 259M  
HD-SDI video conforms to SMPTE 292M  
LTC (SMPTE 12M-1) Drop Frame and Non-Drop Frame Timecode supported

## Built-in Storage

6/12 TB  
100/200 hours of HD video with DVCPPro HD quality per channel.  
200/400 hours of SD video with Digital Betacam quality per  
channel

## Mechanical Characteristics

19" 4U chassis, 56 cm length. Redundant Power Supply  
500Wt x 2.

## Visualization of video and controls

19" LCD Monitor 1920x1080

## Controls

Keyboard  
Mouse  
Jog/Shuttle and T-Bar Console

## Data exchange

Built-in DVD ± R/RW  
1Gb/10Gb Ethernet  
Optional — eSATA/FC/SAS

## Networking

Several systems can be aggregated into up-to 12 servers  
cluster with standard networking replay functional.

# Record, Replay, Edit in Apple Final Cut!

Dominator HD-3D3 - full HD 3D professional system  
with 3 stereo video-recording channels.



## SIMULTANEOUSLY:

Recording of 6  
channels in full HD  
/ 3 channels 3D Full  
HD

Replay of 2 Full HD  
channels / 1 Full  
HD 3D channel

Search on all  
channels

26 hours recording  
on each channel.

4U



# 20 Dominator AT

Up to 8 recording, 2 playback and 6 searchable channels. Up to 64 audio recording channels.

Parallel recording on built-in, removable and network storage, up to 1100 MB per second.

Built-in DMR2™ TT media. Direct support of DMR2™ recording to SAS, NAS, SAN.

Two-way exchange of video. No technological delays for data export, import and conversion.

Absolute safety of recorded video.

Stand-alone operation or integration into a cluster with other slomo.tv units.

## Solution for any project in any environment

Dominator AT represents the next step in development of our full size (4U) popular Dominator line. It supports 6-8 recording channels, 2 playback channels and search on 6 channels without disrupting recording and playback. Preserving the unmatched characteristics of previous Dominator systems, the AT line offers a new level of integration into a complex broadcast or video editing environment.

Dominator AT can be connected via two 10GbE and two 1GbE channels

to a network attached storage (NAS) or directly to storage area network (SAN), using built-in 4G fibre channel interface. Beside this, any Dominator AT can be connected to SAS-compatible storage. Dominator AT can be networked in various ways with other slomo.tv systems by using Direct Connect option.

All Dominators provide recording directly in "native" file formats of various NLE systems, avoiding additional time-consuming export of files. Video is recorded on DMR™

cassettes and simultaneously to internal RAID. In contrast to standard systems with one DMR™ cassette, AT systems have three cassettes and can also be connected to SAN or NAS practically unlimited storage, providing data transfer rates up to 320-700 megabytes per second. If necessary to use more than 3 DMR™ discs, DMR™ Station of 8 to 15 disks can be used.

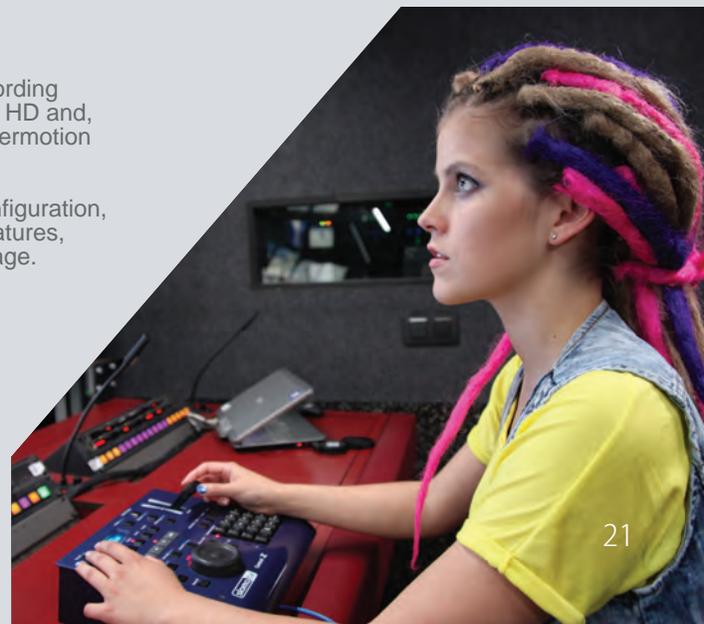


This is the case when quantity transforms into quality and creates entirely new possibilities. As before, cassettes are ready to be transferred to NLE stations immediately after «Stop» command. Now, however, if editing stations are on the same network, physical media transfer is not necessary. In turn, Dominator AT gets access to extensive video library of clips, which can be used in broadcasts.

A high speed SAN removes practical limits of recorded video, which

is important in case of recording from multiple cameras, full HD and, particularly, in case of Supermotion and 3D cameras.

Dominator in AT PLUS configuration, in addition to described features, includes configurable storage.



# 22 BlackJack

Up to 12 Full HD channels in on unit. Up to 50 recording channels in one cluster.

Configurable channels.

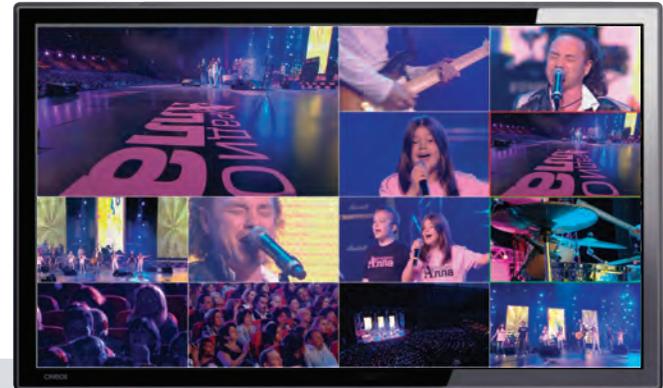
Smooth integration into OB Van, broadcast and editing environments.

Integration with other slomo.tv units into clusters.

Total safety of recorded video.

The best multi-channel recording solution for non-linear editing.

## Big gun of the multi-channel recording



BlackJack offers in one unit all of the advances achieved in slomo.tv multi-channel recorders. Together with Arrow it offers the most number of recording channels in one unit.

All channels are configurable, which allows changing the ratio between input and output channels, as may be required.

Searches can be carried out simultaneously on six channels. This is not a technological limitation, it is due to limits of human perception.

Being a full-sized 4U system, the standard BlackJack provides a maximum possible number of external connections, practically does not have limitations to internal storage, and can have up to 3 DMR™ bays. The system is also available in PLUS modification with configurable storage.

All network storage connectivity features of Dominator AT family are present in BlackJack, making it an important link in recording-editing process.

Using uncompromising BlackJack system eliminates the need to choose between the number of channels, multifunctionality, and integration into any technological infrastructure. Who says you can't get everything at once?

## First in the world 16-channel HD/SD video recording system!



## We save you up to 60U of rack space!

4U Chassis  
16 completely reversible HD/SD channels  
16Tb built-in storage + 4 DMR™  
HD SATA RACK  
Two 10GbE and two SAS 6Gb  
interfaces for  
expansion capabilities

and work in Studio and Broadcast  
environments

Simultaneously:  
Recording of 16 HD + 16 SD Proxy  
channels or 16 channels  
and up to 128 audio channels.

Integration with:  
miXpace - on the fly editing  
Mediateka - network media  
management and scheduling  
control

# 24

Systems for sports officiating (ice hockey, basketball, etc.)



PRICE

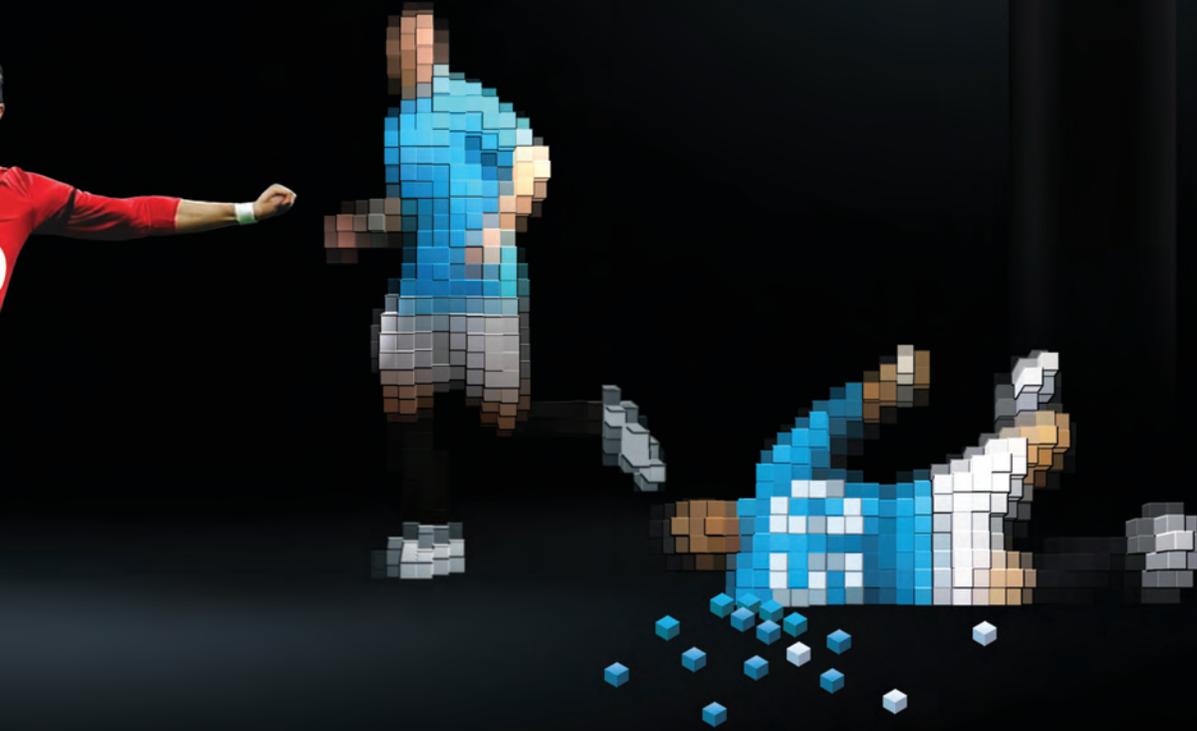
0

0

HD

SD

slomoTV



# 26

## videoReferee®

Available in SD and HD configuration.

Up to 11 recording channels in full HD resolution (SDTV availability for some channels)

Automatic marking of important game moments.

Up to 3 Referee's work-sites

Creation of DVD with all score changing moments

Special versions for Speed Skating, Fencing and Short Track.

### Systems for sports officiating (ice hockey, basketball, etc.)

videoReferee® is a class of specialized multi-channel systems for officiating sport events, providing a way to resolve complicated game situations. The system works with official time, score and game log from scoreboard control system and is compatible with most controllers (Nautronic, Westerstrand, Megalux, Omega). Presently it is mainly used in ice hockey and basketball games and fully complies with provisions of International Ice Hockey Federation (IIHF) and NBA. There are also modifications for fencing and speed skating. The system is fully compatible with our GoalNetCam Kits that are most useful in ice hockey.

The system supports up to 2 sites for referees (including video monitor and remote control console), which allow a detailed view of all disputed moment, mark them, zoom in, and

follow the game action in real time from 4 cameras simultaneously. In addition, there is an engineering control panel from which video engineer can fully control the system.

Allows to record, search and playback at the same time. Marking of events can be created automatically, using intelligent algorithms, or manually, by the operator. Navigation between marks is intuitively simple. A semi-automatic creation of DVD with selected moments and official scoreboard information became a popular feature for post-event analysis by the competing teams.

videoReferee® is based on our standard multi-channel system, assuring the excellent quality and reliability of recorded material. The simple, powerful and intuitive

interface makes it possible to master its operation with just with a few minutes of instructions.

The system provides:

- Continuous synchronous recording from 6 to 11 HD/SD cameras
- Capturing of official Match Controller data
- Marking of important or questionable moments "live" or during replay
- Automatic marking at score changes
- Simultaneous search and replay of recorded material from any camera
- Ability to add a second remote video control station
- Ability to use full HD panoramic camera
- Ability to create a DVD for archiving key moments



### videoReferee®

6-channel SDI system designed for ice hockey, basketball and speed skating short track.

Records 6 channels of professional quality video (MJPEG 50 Megabit), synchronized with official data from Match Controller.

Referee's workplace is supplied with standard SD monitor and special control console. The system supports up to 2 control cities.

The system can also be integrated into a network with slomo.tv replay machines for use in broadcasts.

### videoReferee®-IIM

In contrast to a videoReferee®-II, IIM system has one additional HD

SDI video input for connecting a Full HD panoramic camera. That guarantees a much better puck tracking. This system features Full HD referee's monitor.

### videoReferee®-IIM2

The most advanced system to date.

Provides all the features described above, a Full HD referee's monitor,

as well as 11 universal HD/SD SDI inputs. Each input can be configured to work in SD or HD resolution. This assures a smooth transition from systems working with the SD signals to HD.

Recommended camera layout: 6 cameras at the vicinity of goal-net, 4 cameras around the ice field and 1 panoramic ceiling camera

# Technical Characteristics

## TV Standards

SD — PAL/NTSC

|                                      | videoReferee®   | videoReferee®-IIM   | videoReferee®-IIM2 |
|--------------------------------------|---|---|--------------------|
| <b>Number of Inputs</b>              |   |   |                    |
| ANALOG (composite)*                  | 6   | 8   | 11                 |
| HD SDI                               |   |   | Up to 11           |
| <b>Output to Monitor</b>             | Analog/SDI  | Analog/SDI  | DVI                |
| <b>Number of recording channels</b>  |   |   |                    |
| SD                                   | 6   | 8   | Up to 11           |
| HD                                   |   | 1   | Up to 11           |
| <b>Compression formats</b>           | SD: MJPEG 5-10 Mbyte/sec;<br>DV25;<br>MPEG2 Long GOP for Export                 | SD: MJPEG 5-10Mbyte/sec;<br>DV25;<br>HD: JPEG HD basic f100-200Mbit/sec;<br>MPEG2/4 Long GOP for Export |                    |
| <b>Storage capacity (in games)**</b> | 8-16 (24/28 hrs per channel)  |   |                    |
| <b>Number of control sites</b>       | 1 + 1 optional  | 1 + 1 optional  | 1 + 2 optional     |
| <b>Supported file formats</b>        | AVI, DVD  | AVI, DVD, MP4, BRD  | AVI, DVD, MP4, BRD |
| <b>Mechanical characteristics</b>    | 19» 4U chassis, length 56 cm; 700Wt redundant power supply                      |   |                    |
| <b>Control</b>                       | Special Jog/shuttle console, keyboard, mouse                                    |   |                    |
| <b>Maximum connection distance</b>   | Analog Composite -150m ; SDI -110m; HD SDI -110m; control - up to 150m***       |   |                    |
| <b>Data exchange</b>                 | Build-in DVD+RW, Gigabit Ethernet   |   |                    |
| <b>Networking</b>                    | Ability to work in a network with all slomo.tv multi-channel recording systems. |   |                    |

\* requires converters

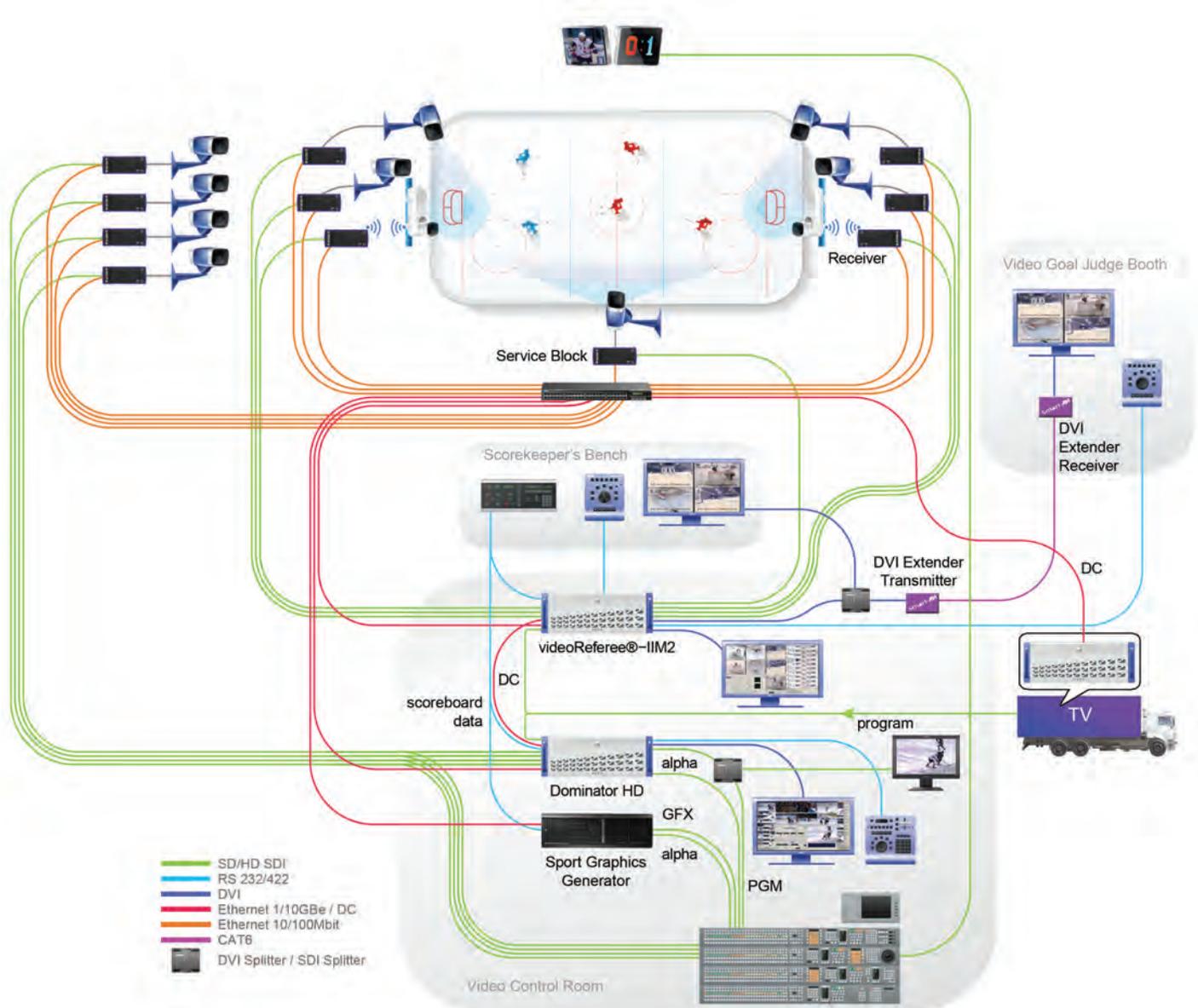
\*\* average game - 3hrs

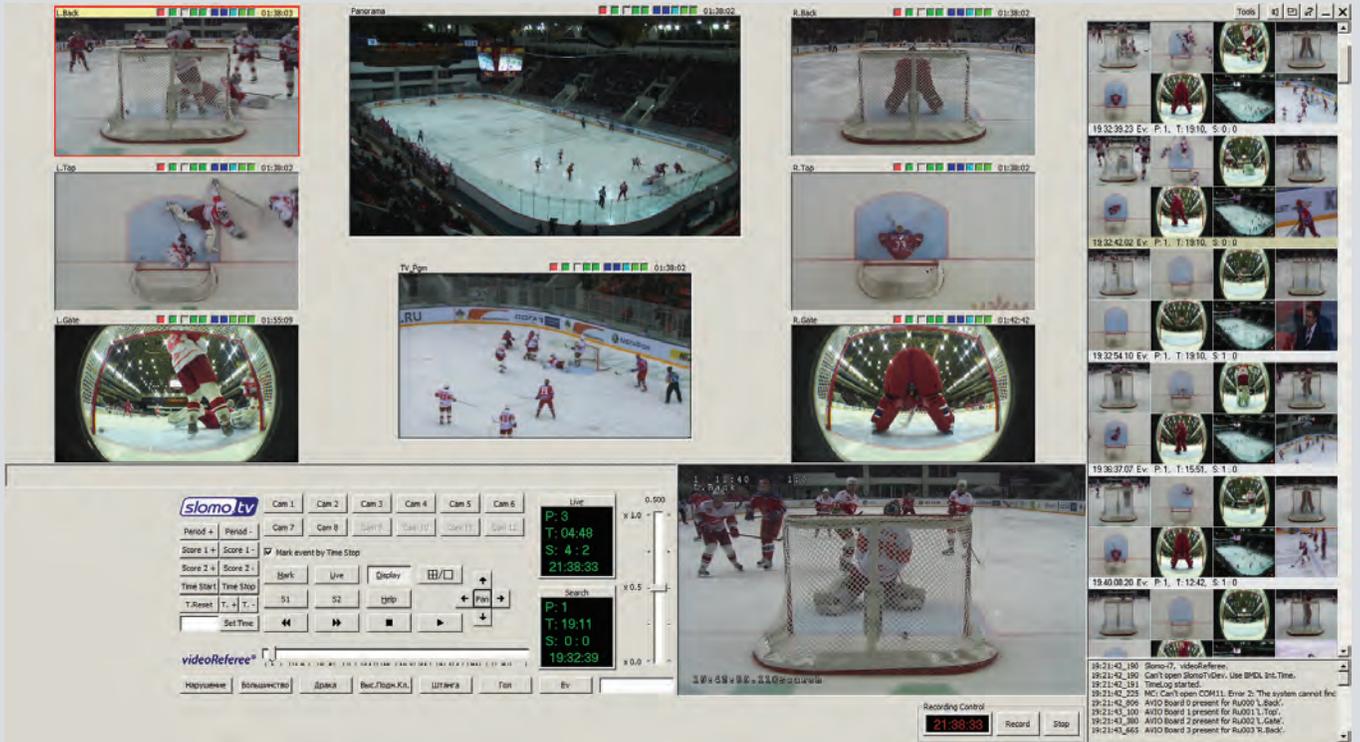
\*\*\* with optional distributional Amplifier



**First in the world Official specialized instrument For sport video adjudication**

# Typical Configuration





Video engineer's interface



4 cameras videoreferee's screen



1 camera videoreferee's screen



Zoom mode for videoreferee's screen

# 32 GoalNetCam



Full HD

High protection

Integration with videoReferee®

Easy and fast installation and replacement

Extra wide-angle lens

Wireless control

The puck's speed and battles in front of the goal-net make it virtually impossible to provide quality, objective refereeing without technical means. That's why the use of video replays by Goal Judges and referees became an integral part of ice hockey and other sports.

Cameras are a vital part of the system where quality cannot be compromised. The task becomes especially challenging for monitoring from inside the goal-net. This camera cannot be connected by power, video and control cables, and still must provide secure, reliable view of total goal net area.

Our full HD GoalNetCam contains a super wide-angle lens totally covering desired area. It is protected from mechanical damage, condensation and operates at low temperatures. Kevlar-reinforced plastic provides survivability from multiple contacts with the puck. If necessary, camera protective glass can be replaced within minutes. The shape of camera body was specially designed to minimize injury to players in case of collisions.

Camera power is provided by a removable Anton Bauer battery, which can be replaced in 30 seconds.



All this, however does not mean that the camera should be used as target. It should be installed just before the game and removed at the end. A quick, 5 seconds installation and removal is assured by bayonet mechanism, which secures the camera to the mounting assembly, permanently installed at the bottom of central goal bar. Mounting mechanics also allows adjusting camera angles.

In contrast to previously used radio transmission of MPEG video

resulting in delay of about 12 frames, the current technology transmitting uncompressed Full HD signal from the camera provides zero frame delay. This real time video completely meets the needs of sport video adjudication.

A separate radio channel is used to communicate with on board camera computer for controlling zoom, focus, diaphragm, depth of field, color temperature, and sensitivity. It is also used for collection of diagnostic data like remaining battery power. All

settings can also be made directly on installed camera and saved in memory as different profiles, to be loaded as necessary. At break time the camera can be remotely switched to a sleep mode.

Due to availability of color correction, picture from the camera can be used not only for video adjudication, but also for television broadcasts.



Each camera is paired with an individual receiver, usually mounted on the same post as behind the goal camera. Receiver, in turn, is connected to the videoReferee® system via a standard 10-00 Mbit Ethernet or fiber optics or Wi- Fi. This allows, if necessary, the use of existing network infrastructure in the arena.

The receiver can be powered by either 110/220 volts AC or by internal Anton Bauer battery, which

assures a quick setup in new sport venues. For transportation and storage camera and receiver are supplied in a protective custom foam case.

GoalNetCam is fully integrated with videoReferee® system.

## GOAL-NET CAMERA for Sport Video Adjudication



### COMPONENTS

Super wide-angle lens with viewing angle over 160 degrees. Zero Time Delay Uncompressed Full HD radio channel. Impact resistant housing, providing moisture and temperature protection. Camera, receiving module, batteries, charger, HD SDI Monitor and Netbook with software for adjusting parameters and optional Fiber Optics interfaces are supplied in a custom foam protective case.

### MAINTENANCE

Original design of mounting elements provides camera installation and removal with battery replacement in less than 30 seconds. Protective glass can be quickly replaced when needed. A separate service radio channel provides remote monitoring and control of camera parameters.

### FUNCTIONALITY

Over 4-hour battery operation. Full integration with videoReferee® system. Remote control of zoom, focus, diaphragm, depth of field, color temperature, and sensitivity allows the use of transmitted video in television broadcasts. Ability to use existing standard Ethernet infrastructure for camera control.

# 36 vR-Cam

Full HD

Reasonable price

Integration with videoReferee®

Convenient universal mounting mechanism

Remote set-up of camera parameters

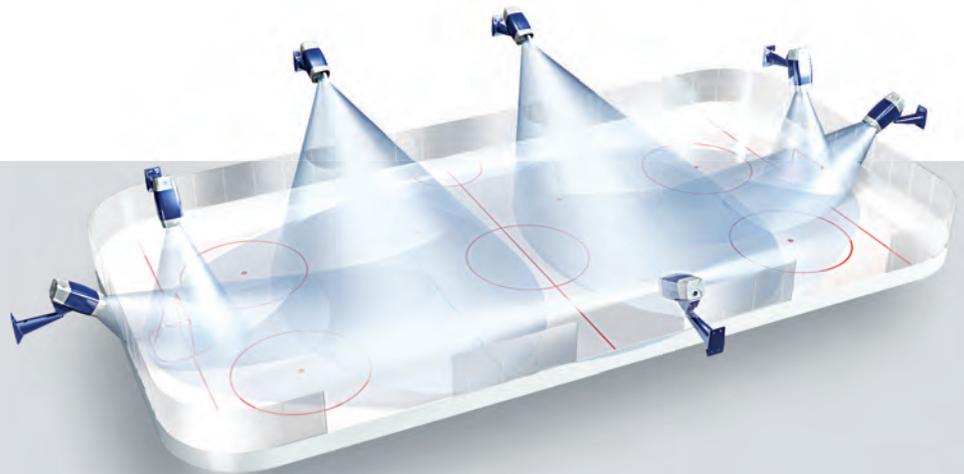
Flexible color control

## Video refereeing in sports

vR-Cam (videoReferee® camera) was created in response to pressing need for high quality Full HD affordable cameras for video adjudication in sport arenas.

vR-Cam is based on Sony Exmor sensor, which provides SD and Full HD video resolution. The easy to mount camera is enclosed in a shock-resistant housing and has an HD quality 10x zoom lens. It can be powered either by 110/220 volts or by internal Anton Bauer battery. Focus, aperture, shutter speed, white balance, sensitivity, and other optical parameters are remotely controlled.

For transmitting video signal and parameter values from the camera it connects directly to the receiver module by an up to 30m long cable. The same cable transmits control commands from the module to camera. The receiver also communicates with the «outside



world» via a standard Ethernet 10-100 Mbit or fiber optics or WiFi. This allows, when necessary, the use of existing venue network infrastructure. Receiver module is also powered either by AC or battery, which provides for a flexible and quick set up at new locations. For «forwarding» video over long distances, a receiver module with fiber optics interface can support distances of up to 10km.

All of this make it possible to meet the needs of video replays at

different sport venues for a variety of sports - hockey, basketball, etc.

In an ice hockey arena 4 cameras usually are set over the goal net area and used by Goal Judges, additional cameras provide field overview from other angles.

vR-Cam cameras are integrated with our video adjudication system videoReferee®.



## **Special Full HD camera for sport arenas and videoReferee<sup>®</sup> solutions. Professional features and budget price.**

High sensitivity; 18 x optical zoom lens; 110/220V or Anton Bauer Gold Mount Battery as power source. Auto iris and auto White balance mode. Remote control of Focus, Zoom, Iris, Exposition, Color

and White balance via 10/100mbit Ethernet IP network. Optional optical interface for working at long distances. All slomo.tv servers can remotely control vR-CAM cameras.

Camera kit includes: camera, service module, mounting hardware. Optional: battery for autonomous operation, optical HD /SDI interface and Ethernet

# 38 Star<sup>2</sup>

Support of ARRI ALEXA. One STAR supports up to 4 cameras in mono mode

ARRIRAW native format

Parallel recording of ARRIRAW and Full HD proxy.

Stereo playback in real time

Real time Color Correction

Absolute protection of recorded material



## TV Technologies in Cinematography

Close cooperation with ARRI Group and access to its internal specifications helped us in developing the raw data recording system STAR2.

Using the T-Link interface, STAR2 records in ARRIRAW format parallel to internal as well as removable DMR™ media, thus preserving the highest image quality provided in 2880 x 1620 resolution by ARRI ALEXA camera. STAR2 also provides a 1980 x 1080 proxy recording.

Resolution of uncompressed video stream (2880 x 1620 with 16-bit color representation) requires a lot recording bandwidth and speed. Nevertheless, STAR2 is able to support simultaneously up to 4 mono cameras, and provide for all our machines multi-channel television recording - DMR2™. The proxy with metadata is recorded not in SD, but in Full HD format.

Unlike competing solutions, which require connecting the recorder to the camera for playback, and therefore increasing weight and

power consumption; or require media removal for viewing video material on a single computer, we provide the opportunity of direct playback. Playback on STAR2 is in real time and, when required, in stereo. That feature permits Colorist and Stereo Supervisor to work in real-time on the set.

STAR2 received high marks from «Stalingrad» film crew, who compared it with alternatives.



ROLL

4

SCENE

4B

TAKE

2

04:00:30.00

PROD

DIRECTOR

CAMERA

Slomo.tv

STAR3, 4K Cinema Recorder, 16bit Uncompress

# 40 Academy

Training with real equipment

Training with real data

Training in the real and complicated conditions

Individual and team training

You can play multiple some moments and form a whole training program

For beginners and masters

## Training in the real environment Individual and team skill building

The Academy system is designed by slomo.tv to solve staff problems of TV studios through individual training, team training and group analysis of completed recording sessions.

The Academy is a complex of systems, special software and library of training materials prepared by the training center. The Academy uses real events ( sports broadcasts, shows, etc.) to recreate close to real work environment , but with the option to make mistakes and fix them. In this training process you use the same hardware and the same materials as in the real world.

In The Academy system you can create conditions obviously more complex than real and with higher density than the actual flow of events. For example, you can prepare a series of clips with dozens of goals, one every minute, this will help quickly to gain dynamic skills, or, it can be a serious test for a specialist.

The Academy gives you the unique opportunity to improve team cooperation. Part of the learning process is the analysis of the student recorded program. You can return to a problematic moment and replay it, or you can create a completely new program from scratch.

The Academy can also benefit experienced director in evaluating results. You can rate jobs of operators and assistants, their mistakes, analyze how else it could have been done, what opportunities were missed, generate alternative program version, find new tricks and moves.

The Academy is a tool for testing both individual skills and the teamwork, useful both for training in sports replays and live broadcasting, and in analysis of programs and shows. The Academy will provide effective initial training for beginners and continuing training for already skilled specialists.



## **A TRAINING SIMULATOR FOR YOUR OB VAN (Now it is not just the Airlines who have them)**

Academy - a system for training directors and operators of live broadcasts and instant replays. Emulation of OB Van with 6-24 cameras SD/HD. Built-in controls of subjects, control and analysis of student performance, ability to create training materials



**slomo.tv, Inc. 2281 W. 205th Street, Suite 102, Torrance, CA 90501 USA**

Tel. (310) 285 8190  
info@slomo.tv  
sales@slomo.tv  
www.slomo.tv

©2013 SLOMO.TV, Inc. All rights reserved. Reproduction in whole or in part without the written permission of SLOMO.TV, Inc. is prohibited.  
Design, features and specifications are subject to change without notice. DMR™ and videoReferee® and the SLOMO.TV logo are trademarks of SLOMO.TV, Inc.  
All other brand names, product names or trademarks belong to their respective holders.

