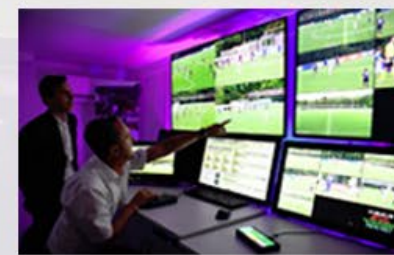
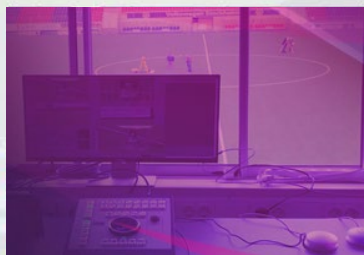
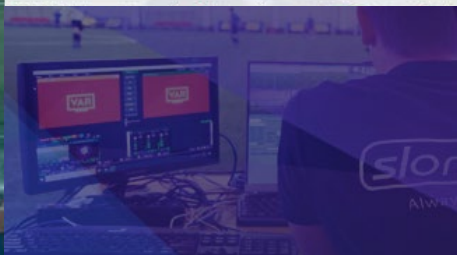


videoReferee[®] VAR

Easy cost-effective way to VAR implementation



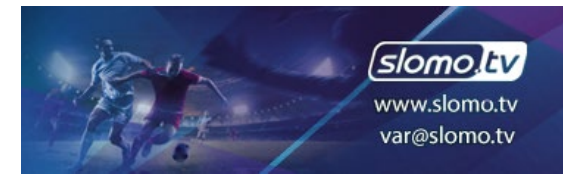
Sports video-refereeing system

Slomo.tv is a pioneer in modern video-refereeing

Established in 2007, **SLOMO.TV** produces and supplies cost-effective integrated solutions for video-refereeing in many sports (football, hockey, basketball, water polo, handball, wrestling, canoe slalom, etc.).

THE videoReferee® SYSTEMS ARE CERTIFIED BY FIFA AND SELECTED BY FIBA, FINA, UWW

We cooperate with clubs and federations of more than 20 countries and provide assistance at every stage of system implementation.

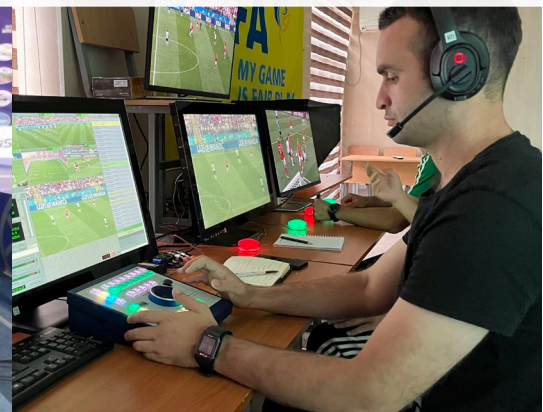
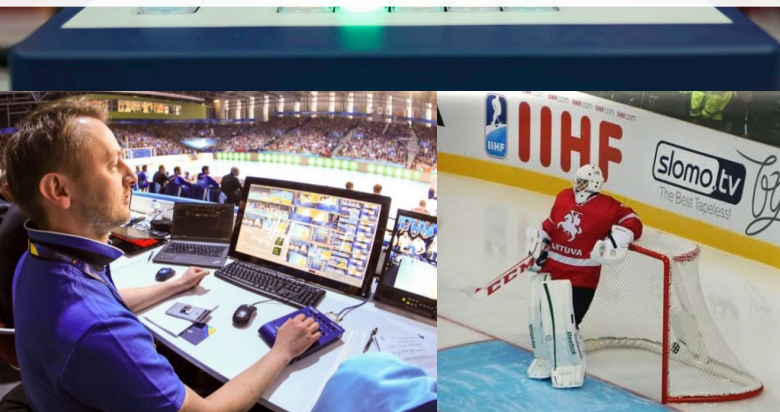




OVER 12 SPORTS

MORE THAN 300 **videoReferee®** SYSTEMS WORLDWIDE

2007: FIRST INSTALLATION OF **videoReferee®** SOLUTION



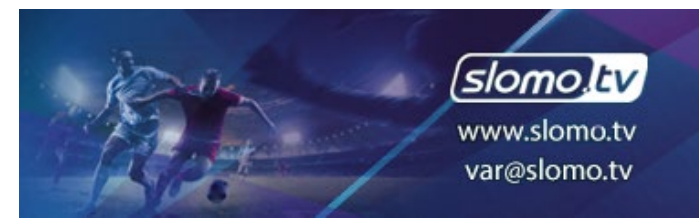
Why slomo.tv?

Experienced technology provider. SLOMO.TV created the first specialized video-refereeing server, using the main ideas, technical and interface solutions, which are the de-facto the industry standards now.

Complete affordable VAR solution. As a manufacturer of the whole refereeing complex, SLOMO.TV is responsible for the performance of the equipment.

Successful projects in various sports. Engagement in the implementation of video-refereeing, striving to reduce the price and increase the likelihood of correct analysis.

Individual approach. SLOMO.TV takes an individual approach to each project and sport, taking into account all its features, and does the best to create an ideal video assistant solution that meets all the needs.





UNITED WORLD
WRESTLING



international
canoe
federation



WORLD
AQUATICS



Video-refereeing. Our experience

THE EQUIPMENT REFLECTS THE HIGHEST MODERN STANDARDS

- United World Wrestling (UWW)
- International Canoeing Federation (ICF)
- Korean Basketball League (KBL)
- Kazakhstan Football Federation (KFF)
- Tajikistan Football Federation (TFF)
- World Aquatics
- Georgian Football Federation (GFF)
- Lithuanian Basketball League (LKL)
- Philippine Basketball Association (PBA)
- and others...

Recent projects

- **VAR Technology implementation in** Kazakhstan (KFF), Georgia (GFF) and Tajikistan (TFF)
- **Tokyo Olympics 2020:** The first-ever use of Video Assisted Review system (VAR) for water polo at Olympic Games
- **Tokyo Olympics 2020:** Implementation of the technology into two new sports: Greco-Roman Wrestling and Freestyle Wrestling
- **Tokyo Olympics 2020:** ICF used the **videoReferee®** for the second Olympics in a row



Video Assistant Referee

Overview & Technology



videoReferee[®]

slomo.tv



8 channels



8 channels



12 channels



16 channels



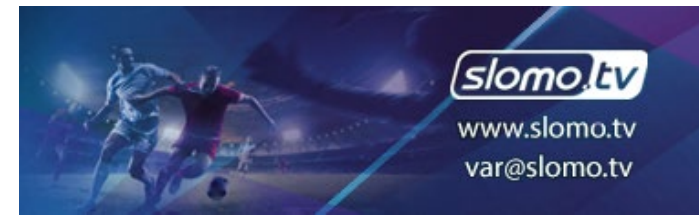
24 channels



32 channels

Slomo.tv VAR. General advantages

- **Hand-to-hand cooperation on your implementation of VAR.** SLOMO.TV provides training and support at every stage of the implementation.
- **Affordable price.** The **videoReferee®**-based solution is the most affordable among certified comprehensive systems.
- **Powerful and reliable inside – compact outside.** SLOMO.TV has a wide range of servers to meet any need – from 4 to 32 channels in one device (1U - 4U).
- **Permanent licenses.** SLOMO.TV VAR servers include permanent software license.
- **Academy training.** SLOMO.TV's unique technology of intensive training which allows to quickly master all necessary functions.

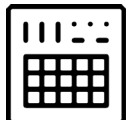


Slomo.tv VAR. Operational advantages



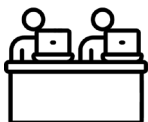
User-Native Interface

The industry's fastest high-performance referee interface



Remote control

Remote control panel Control-VR with 35 RGB-lit buttons



Independent workplaces

Supports completely independent additional workplaces



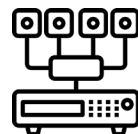
SLS Intercom

Optional referee communication system embedded into the server



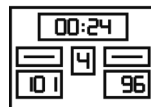
Gesture interface

Quick search, selection and display of 1-4 cameras, playback control and zoom



Camera synchronization

Server synchronizes non-synchronized cameras for accurate analysis



Access to game data

Integration with Control-MC scoreboard controller and popular market analogues



Quick review and replay loop playback

Replay is ready for review in 1-5 seconds



Remote workplaces

Supports fully independent remote workplaces via LAN or Internet (including for medical tracking and team analytics)



Referee tablet

Wireless RRA monitor significantly speeds up the officiating process



VAR solutions for football

Overview



Video Assistant Referee system

**videoReferee® has been tested and certified to the
"FIFA QUALITY PROGRAMME for VAR technology"**



VAR TECHNOLOGY CERTIFICATE

FIFA is pleased to confirm that the Video Assistant Refereeing Technology

videoReferee®

of the company

Slomo.TV, Inc.

has been tested and certified to the

"FIFA QUALITY PROGRAMME for Video Assistant Refereeing (VAR) technology".

Validity Period: **30.08.2023 to 31.12.2027**

Authorisation No. **1007653**

Zurich, 30.08.2023

The official information is available on the [FIFA website](https://www.fifa.com)

videoReferee®

Provider

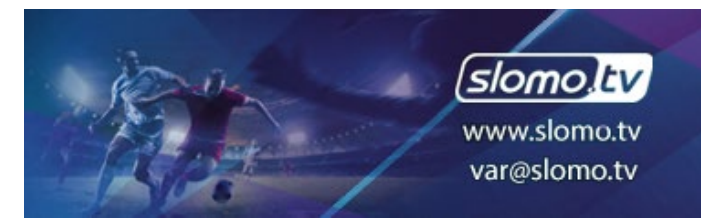
Slomo.TV, Inc.

Authorization Number

1007653

Certification Period

30 Aug 2023 - 31 Dec 2027



videoReferee® -8F

Affordable VAR system

- Up to 8 recording channels
- VAR+AVAR+RO workplaces
- Integration with VOL
- Integration with Referee Intercom
- 2U, 12 kg

Control-VR control panel included



videoReferee® -ST

Optimal VAR system

- Up to 16 recording channels
- VAR+AVAR+RO workplaces
- Additional independent workplace (AVAR2 or RO2)
- Integration with VOL
- Integration with Referee Intercom
- Support for SSM cameras
- 4U, 19.5 kg

Control-VR control panel included



videoReferee® -FC

Large-scale VAR solution

- Up to 32 recording channels
- VAR+AVAR+RO workplaces
- 3 additional independent workplaces (AVARs + ROs)
- Integration with VOL
- Integration with Referee Intercom
- Support for SSM cameras
- 4U, 19.5 kg

Control-VR control panel included





Slomo.tv VAR for football. Features

MIDO-RRA OPTION WITH VENUE INFORMATION GRAPHICS CAPABILITY

The system outputs VAR interface to TV broadcasters and to the Referee Review Area (RRA). Video from the VAR monitor is switched on only when the on-field review is in process.

In addition, prepared graphic files with VAR information can be outputted from the server to video walls in the arena and to TV broadcasters.

VIRTUAL OFFSIDE LINE. Proprietary embedded **VOL option** by SLOMO.TV. Seamless integration with 2D/3D Delta-offside (by Deltacast) VOL solutions.

REFEREE INTERCOM. *SLS Intercom* option – embedded communication system. Integration with the most popular Referee Intercoms (e.g., Vokkero). All communications between VAR and referee on the pitch are recorded to the system.

GESTURE-BASED INTERFACE. Full-featured gesture-based interface for VAR monitor and Multiviewer. The system can be operated with simple intuitive gestures.



Slomo.tv VAR for football. VOL

Virtual Offside Line technology by SLOMO.TV

SLOMO.TV has developed its own embedded VOL system, which reduces the amount of equipment and allows one operator to work with the same controls in both VAR and VOL systems.

The VOL system uses the video recorded by the VAR system to determine the moment of impact/pass, analyzing the video from all relevant cameras - to create lines responsible for the position of players relative to each other.

The system has the ability for both automatic detection and manual override interface for dealing with complex situations.

The VOL system also includes an information output function that allows the following to be transmitted: standard lines, distance between player positions and offside/no offside decisions.

VOL option is provided on the basis of a permanent license without time restrictions.



The Kazakhstan Football Federation uses slomo.tv VAR systems

The successful testing of the **videoReferee®** system in July 2021 led to FIFA's approval of the use of slomo.tv VAR technology in regular football competitions in Kazakhstan.

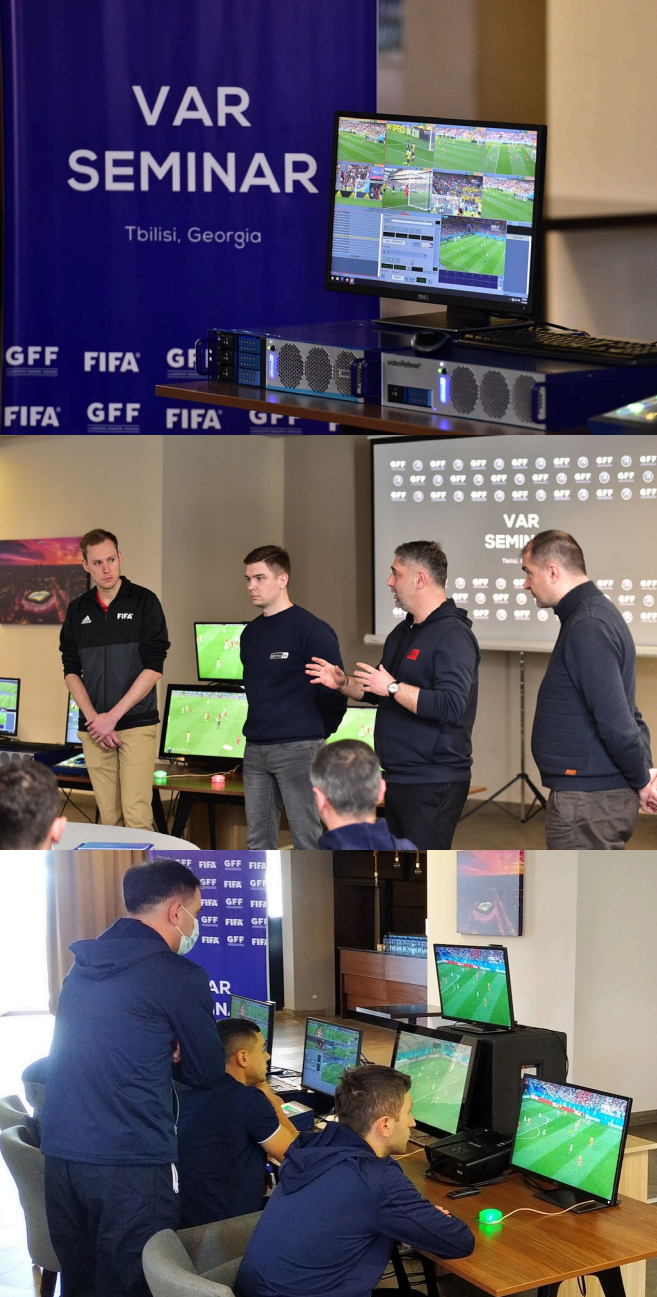
In total, the Kazakhstan Football Federation uses 14 VAR complexes: **videoReferee®**-8F servers and mini-II-vR-Cam cameras.

"This is a very significant and important step for the Federation and the Football Leagues of Kazakhstan."

Oleg Kungurov,

Technical Director at the Professional Football League of Kazakhstan





The Georgian Football Federation implemented videoReferee®-based VAR

The Georgian Football Federation uses slomo.tv VAR technology: **videoReferee®**-based VAR Van.

In March 2022, an intensive training session for future video match officials was held in Tbilisi with slomo.tv technicians and FIFA instructor. The practice was carried out on the **videoReferee®** system and slomo.tv Academy training simulator.

The Federation has received FIFA's approval for the use of the VAR in official matches.

In 2023, the GFF has expanded its VAR Van fleet by two more vehicles, equipping them with full VAR sets produced by slomo.tv.





The Tajikistan Football Federation uses slomo.tv VAR technology

The Tajikistan Football Federation has selected **videoReferee®** VAR technology as the option that met all their requirements and objectives.

An intensive training for VMOs was carried out in Dushanbe using the Academy and **videoReferee®**-8F, on the basis of which the VAR Van was subsequently equipped.

The VAR implementation project was successfully completed in the fall of 2023 and the technology is now officially used in Tajikistan Higher League matches.





Kyrgyz Football Union chooses SLOMO.TV solution for VAR implementation

In the summer of 2024, the Kyrgyz Football Union (KFU) has chosen SLOMO.TV as the technology provider for its national project to introduce a Video Assistant Referee (VAR) system.

A VAR van based on the FIFA-certified **videoReferee®-8F** solution - has now become the first VAR system in Kyrgyzstan. A SLOMO.TV training course on the VAR system installation and management was held at the KFU office.

Introduction of VAR in Kyrgyzstan is a historic event for the country and Central Asian Football Association (CAFA). In the near future, the VAR systems will be implemented in a number of stadiums throughout Kyrgyzstan.





VAR solutions for ice hockey

Overview



videoReferee® Video Goal Judge Systems

Complete reliable solutions for hockey clubs of any scale

- Powerful 2U/4U servers supporting up to 24 3G/HD recording channels
- Compatible with SSM cameras
- Automatic marking of important game moments
- Optional gesture control
- Additional independent workplaces for replay operators, coaches or analysts
- Fast export of recorded material for further analysis or submission to the League's office



Wireless in-goal mini-II-GoalNetCam

DESIGNED FOR ICE HOCKEY

These wireless cameras are installed in the goal and provide a view of the area inaccessible to other cameras.

The special housing protects the camera from physical damage, temperature fluctuations and moisture.



The background is a collage of images related to Video Assistant Referee (VAR) technology. The top left shows a person from behind wearing a 'slomo.tv' shirt, sitting at a desk with multiple computer monitors displaying sports footage. The top right shows a control room with a large window overlooking a soccer field, with several monitors and control equipment on the desk. The bottom left shows two people in a control room, one pointing at a monitor. The bottom right shows two people working at a desk with multiple monitors. The entire image has a semi-transparent white overlay in the center where the text is located.

Compact and mobile VAR solutions

Overview for various sports

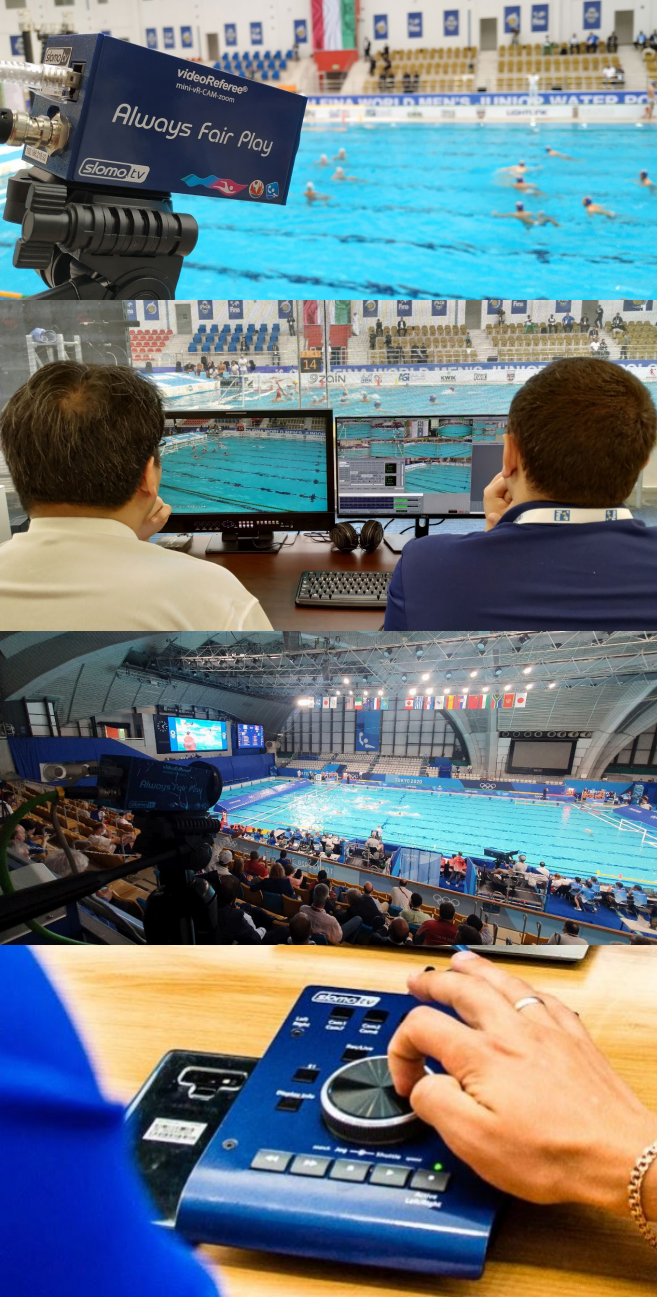
Compact and portable VAR systems

MOBILE RACK VAR SOLUTION

Mobile sports video-refereeing systems **videoReferee®** can be used in basketball, handball, water polo, wrestling, canoe slalom, speed skating, short track, etc.

Their format makes it possible to easily place the equipment and the VAR workplace near the arena or in the VOR.





VAR solutions for water polo

videoReferee® solution for Water Polo includes:

- Compact and powerful 1U/2U **videoReferee®** server
- Mini-vR-Cam cameras adapted for water sports due to the polarization filters
- Specialized control panel Control-VR

The cooperation between World Aquatics and slomo.tv has resulted in the implementation of video-refereeing in water polo with **videoReferee®**-SR system at international competitions.





VAR solutions for wrestling

United World Wrestling (UWW) has selected slomo.tv as its video-refereeing technology partner for all matches.

With **videoReferee®** independent workstations, multiple referees can work simultaneously when separate wrestling bouts are taking place at the same time.



**WORLD
CHAMPIONSHIPS**



**WORLD
CHAMPIONSHIPS**
Budapest 2018



**FREESTYLE
WORLD CUP**



**UNITED WORLD
WRESTLING**



**ASIAN
CHAMPIONSHIPS**



**EUROPEAN
CHAMPIONSHIPS**
BUCHAREST 2019



VAR solutions for handball

videoReferee® meets all the requirements of modern video-refereeing in handball and has been selected as the complete video-refereeing system for the IHF Men's Handball World Championship 2017 in France.

Our 1U/2U VAR systems allow referees to monitor the game in close proximity to the handball court.





VAR solutions for canoe slalom

International Canoe Federation (ICF) is using customized **videoReferee®** solutions that meet all the requirements for safe, reliable and error-free refereeing of canoe slalom.

ICF has utilized **videoReferee®** systems at the 2016 Rio de Janeiro Olympics, 2020 Tokyo Olympics and international competitions.





VAR solutions for basketball

videoReferee®-B is a specialized Instant Replay System (IRS) mobile solution series for basketball, meeting all FIBA requirements.

The IRS hardware in the mobile rack is installed next to the OB Van or in a technical room, and the compact **videoReferee®** Box is placed in the arena creating a complete workplace for a replay operator. Fiber Optics connection of the units makes it possible for the system modules to be installed up to 20 km apart from each other. This provides the customer with a flexible solution that works with any OB Van and allows the IRS to be installed in any arena.

Thanks to the integration of the match controller into system, the referee can access the game information at any time, effectively resolving the "24 seconds" issue.



VAR solutions: additional devices overview

BlackJack Trinity

web 2.0 dc media server with up to 3 operator workplaces

slomo.tv

New Look at 1000 FPS footage

All-remote setup server for 1000 FPS HD *myMotion*



SLOMO.TV broadcasting system

Complete solutions for arenas, concert halls and live events

Components:

- Video judging systems — ensure the objectivity and transparency of judging
- Multichannel replay and recording systems — analyze and edit video footage
- Cameras — high quality cameras for filming and video recording
- Scoreboard controller **Control-MC**
- Media graphics system *rapier.gfx*
- Venue-based media control system - **Arena Media Manager**

SLOMO.TV offers a wide range of solutions for various venues including sports facilities, concert and entertainment venues, providing world-class sports and live broadcasting.



mini-II-vR-Cam

SYNCHRONOUS REFEREE CAMERAS FOR VIDEOREFeree®

mini-II-vR-Cam-zoom

3G/HD cameras, built-in 10x zoom lens, up to 54° angle.

mini-II-vR-Cam-zoom-Wide

3G/HD wide-angle cameras, built-in 3x zoom lens, up to 105° angle.

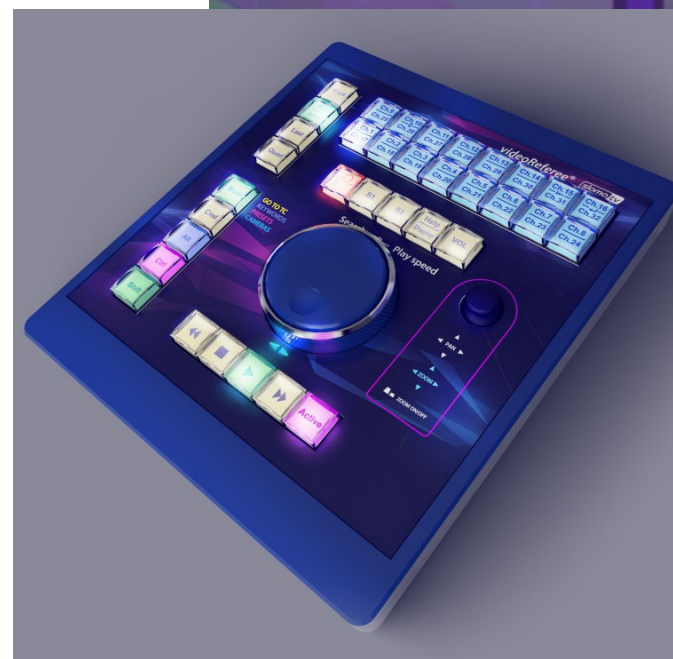
- CloudlyGenLock® technology – synchronization of cameras by motion phase (less than 0.1 ms) via Ethernet
- 3G and HD modes
- Power over Ethernet (remote control of zoom, focus, exposure)
- 3D LUT colour correction
- GenLock support (requires additional external module)
- Analog sound input with sound level display
- Suits for TV broadcasts



Control-VR control panel

DESIGNED, MANUFACTURED AND TESTED BY SLOMO.TV

- Direct access to 32 cameras and main functions
- User-friendly, intuitive and fast interface
- 35 large reliable buttons with RGB backlighting and color prompts
- Keywords assignment, search by tags and timecode, creation of presets and split-screens for video referees
- Reliable and responsive Jog/Shuttle
- Shuttle wheel to control search speed and slow motion playback with an accuracy of 2%
- "Active" control transfer when using multiple replay operator workplaces
- Versatile connectivity: Ethernet, USB, RS-422/232





NEW

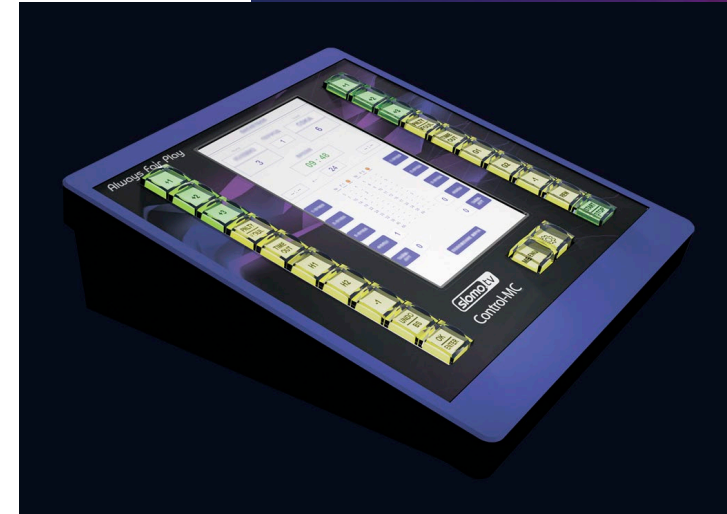
Control-MC scoreboard controller

videoReferee® supports integration with all popular scoreboard controllers.

Control-MC — multifunctional timing in-game event registration system with informational and graphics support for arenas and TV developed by slomo.tv.

- Fast and intuitive interface with 22 large, highly reliable RGB pushbuttons and 7" color TFT touchscreen interface
- Technology for synchronous transmission of scoreboard controller data with the video broadcast. The broadcaster gets the ability to overlay the graphics with maximum accuracy
- Smart Whistle – start and stop time by referee's whistle. The system logs whose whistle was used

**SEAMLESS AND EASY REPLACEMENT
OF PRE-GENERATION SCOREBOARD CONTROLLERS**

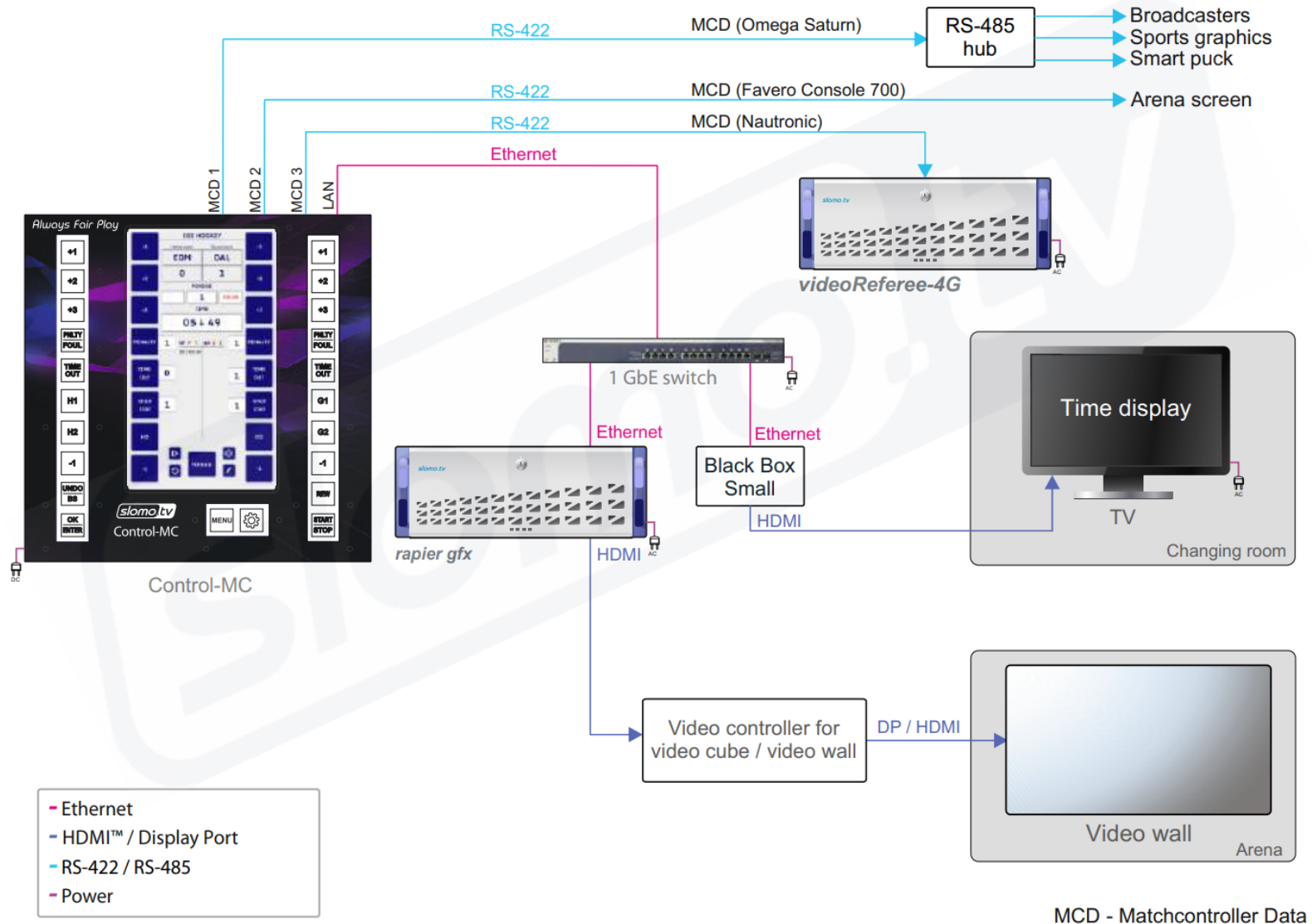


Control-MC. Back panel

Supports a wide variety of interfaces that allows connection of a large volume of peripherals via different protocols



Basic use of Control-MC Scoreboard



Referee buttons

Multifunctional referee buttons by SLOMO.TV

For each RGB button it's allowed to assign a usage scenario and active/inactive color.

According to FIFA requirements, in the standard configuration the referee buttons are used to control communication between the video referee and the on-field referee, event marking and timer control.

The colors in most cases are assigned as follows:

- green color for event marking;
- red for control of the referee communication system;
- blue color for timer control.

It is possible to connect up to 4 buttons to the system via USB.



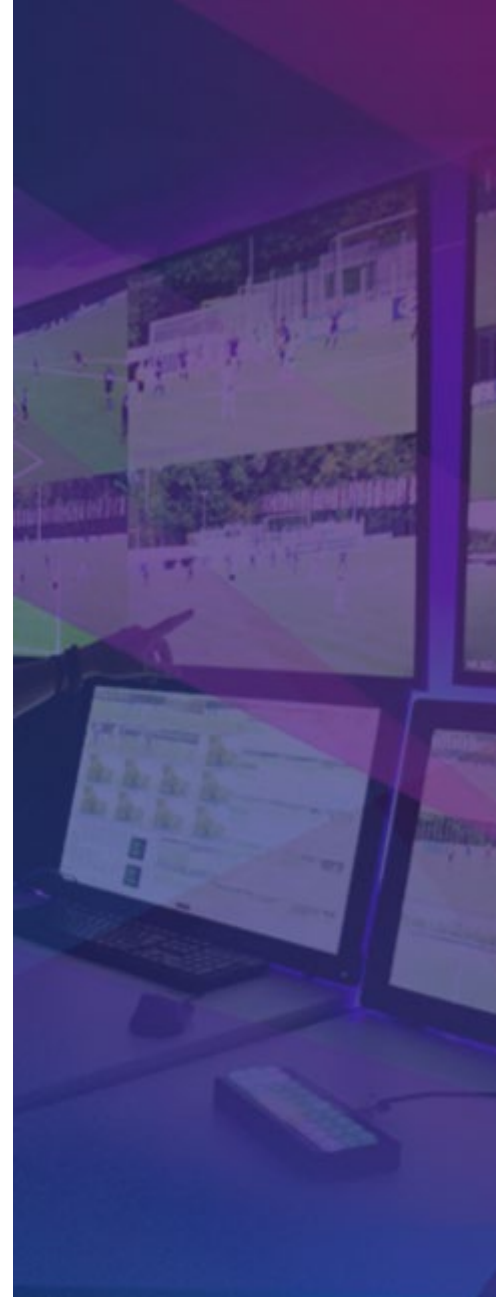
Remote workplace

Solution for remote system operation via LAN/Internet

Supports fully independent remote workplaces

The option is available on all modern SLOMO.TV servers and requires only a stable Internet connection to work.

Ideal for working from a remote office, VAR center, “situation room” and remote supervision. The option can also be used with a tablet connected via Wi-Fi for medical tracking and analytics.





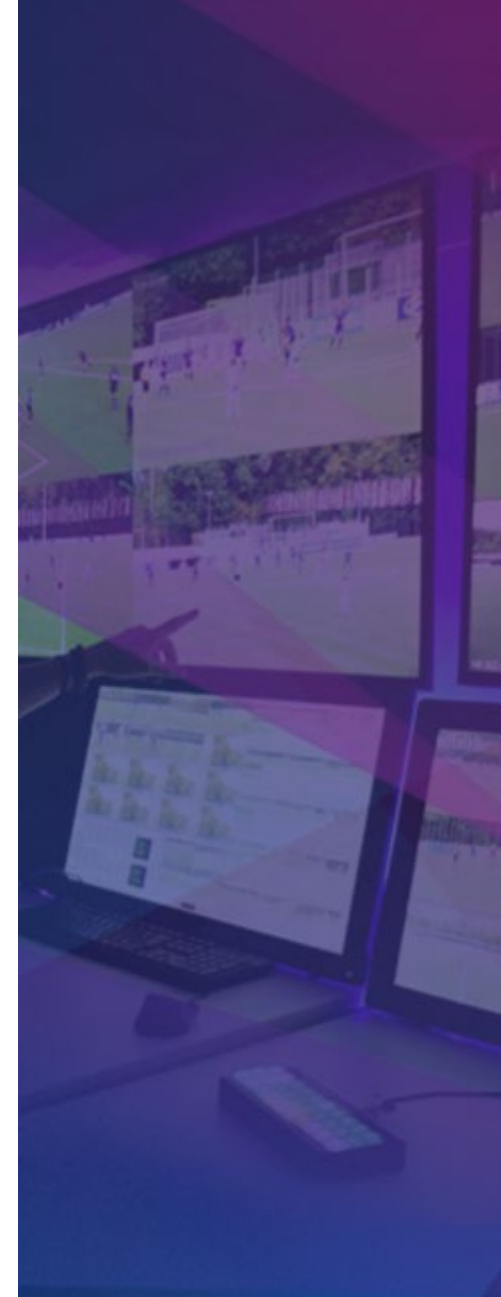
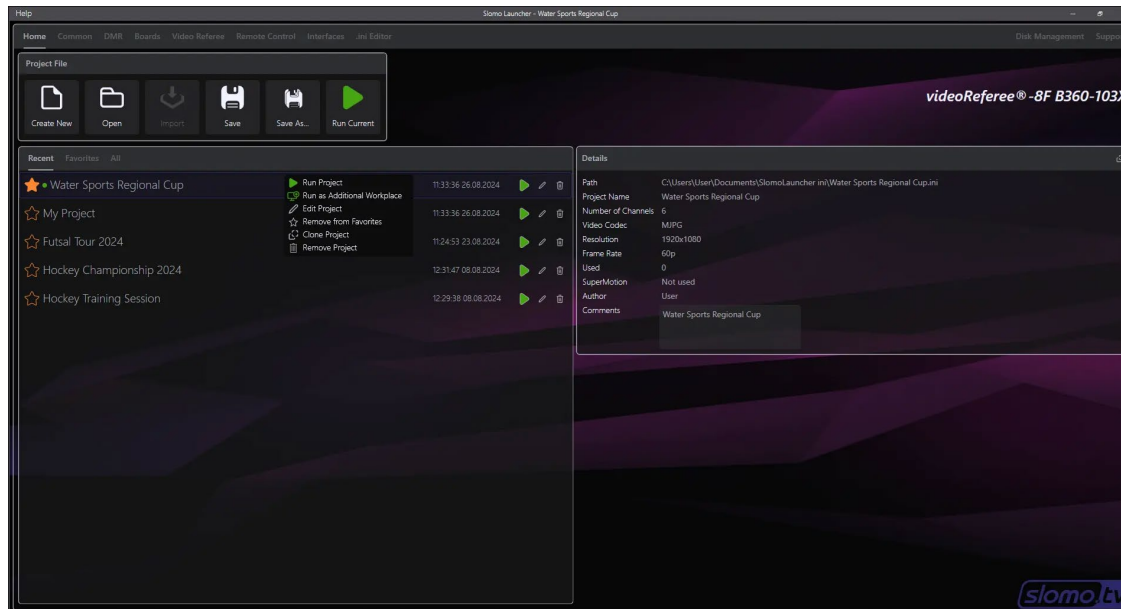


Slomo Launcher

Configuration and project management tool

Slomo Launcher – is an application for managing, editing and working with configurations and projects on any SLOMO.TV server.

Slomo Launcher allows configuring the server to meet specific needs within the capabilities supported by the system hardware and software licenses, managing projects, fine-tuning settings and performing diagnostic tests.



Slomo Launcher Video Referee tab

Help Slomo Launcher - Water Sports Regional Cup (not saved) —

Home Common DMR Boards **Video Referee** Remote Control Interfaces .ini Editor Disk Management Support

Common

☒ Enable Video Referee Mode

Sports
Ice Hockey

Referee Intercom COM Port
☒ Standard ☐ Ethernet
6

Export Parameters

Export Format
TS

Export Channel
6

Export Audio Mix
☐ Ch1 ☐ Ch2 ☐ Ch3 ☐ Ch4
☐ Ch5 ☐ Ch6 ☐ Ch7 ☐ Ch8

Video Referee Interfaces Enable shared JLC control

Interface #1

Main Device
Not Defined

☐ Use RRA Output Not Defined

Referee Controller Connection
☒ Standard ☐ Ethernet
0

Interface #2

Main Device
Not Defined

☐ Use RRA Output Not Defined

Referee Controller Connection
☒ Standard ☐ Ethernet
0

Interface #3

Main Device
Not Defined

☐ Use RRA Output Not Defined

Referee Controller Connection
☒ Standard ☐ Ethernet
0

Interface #4

Main Device
Not Defined

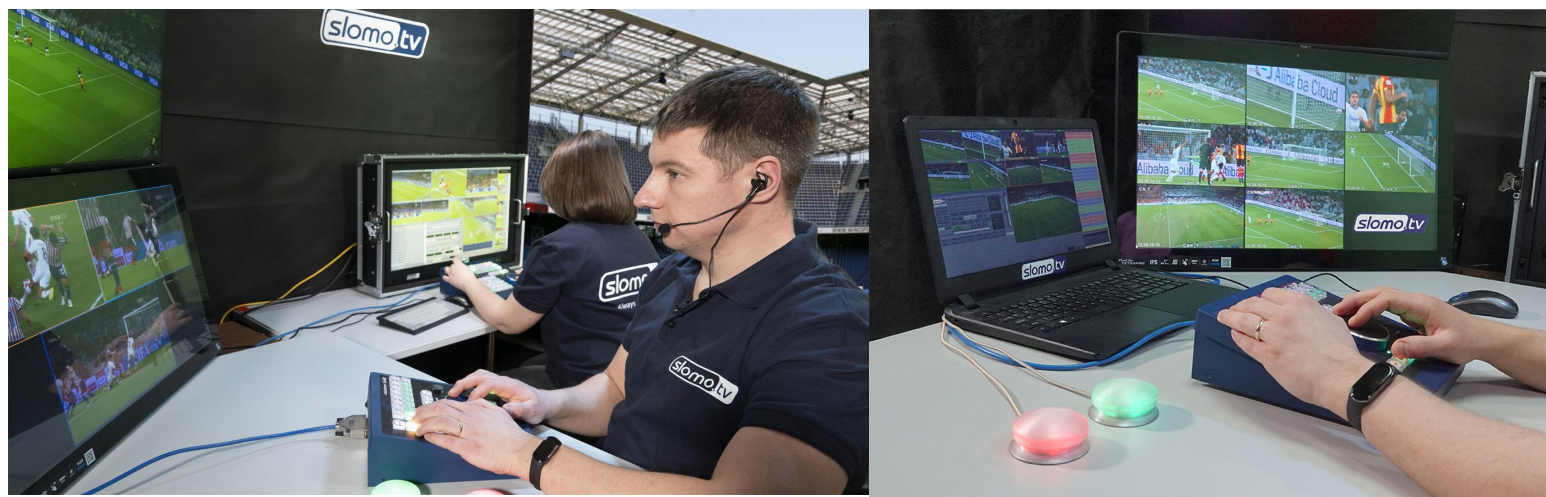
☐ Use RRA Output Not Defined

Referee Controller Connection
☒ Standard ☐ Ethernet
0

R-vR solution

R-vR — a combination of a replay server and a **videoReferee®** VAR system in a single compact chassis.

- Supports 8 or 16 SDI I/O channels, 7 to 15 cameras
- Mobile rack ensures fast system implementation
- 2 fully independent workplaces — for a replay operator and a VAR/video judge
- **Display Extension Option** allows to add 2 more monitors to the system if required
- Supports **remote workplaces**



rapier.gfx

SLOMO.TV's real time graphics multi-channel server for broadcast and sports

rapier.gfx is a versatile toolset for creating and managing all types of real-time graphics in broadcast and sports environments, supporting 1 to 16 synchronous UHD/HD/SD playback channels.

Key features:

- Creation of multi-layered graphic compositions with an unlimited number of 2D/3D objects, animations, and effects
- A comprehensive set of 2D and 3D effects
- Dynamic text objects that can receive updates from external sources (including scoreboard controllers such as Control-MC) for automated data integration.
- Seamless integration with various equipment and data sources through additional module connections
- Customizable interfaces tailored to different sports, competitions, and other purposes
- Programmable control panel that allows graphics operators to increase their efficiency and speed



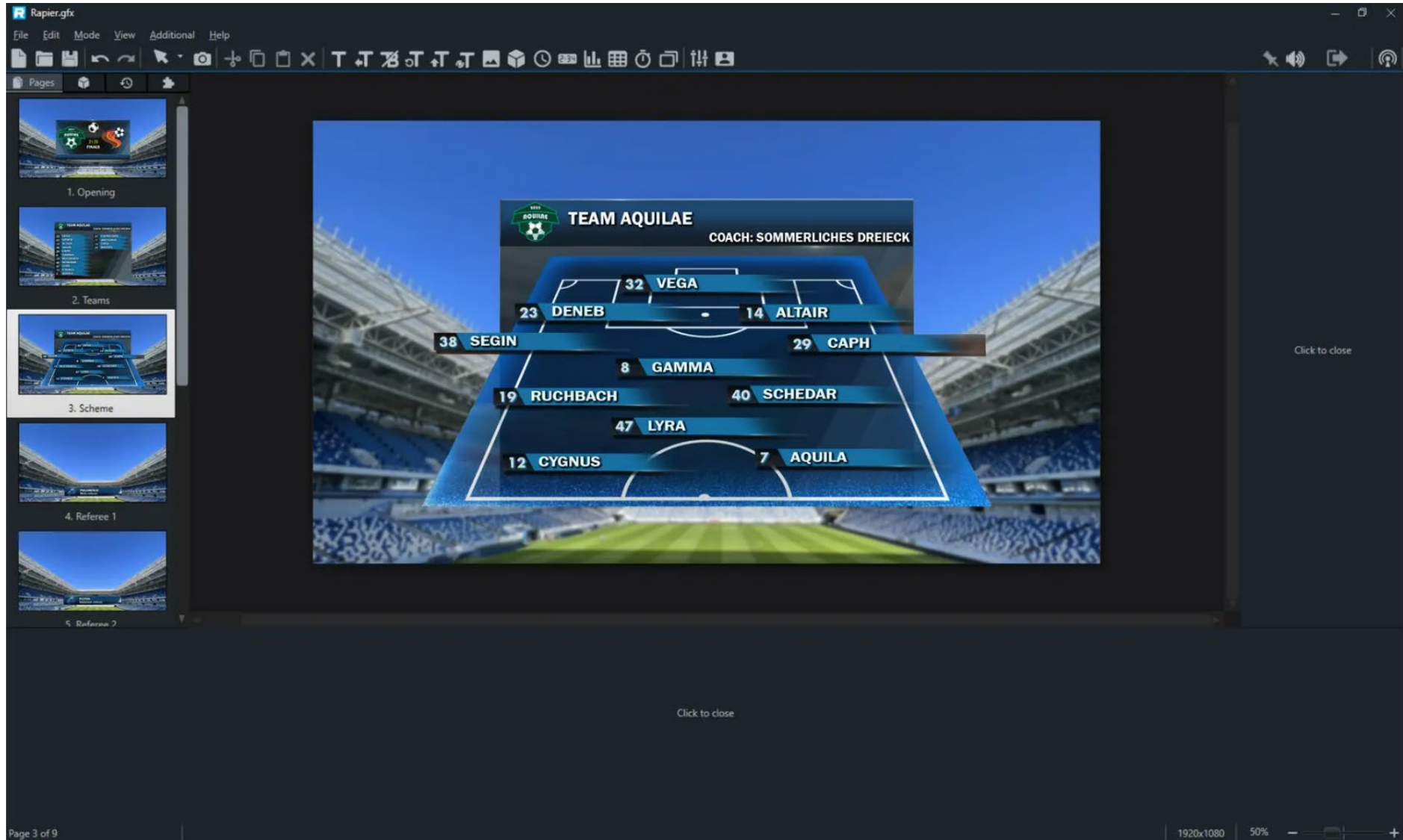
rapier.gfx server



rapier.gfx programmable control panel



rapier.gfx interface in Editor Mode



Arena Media Manager

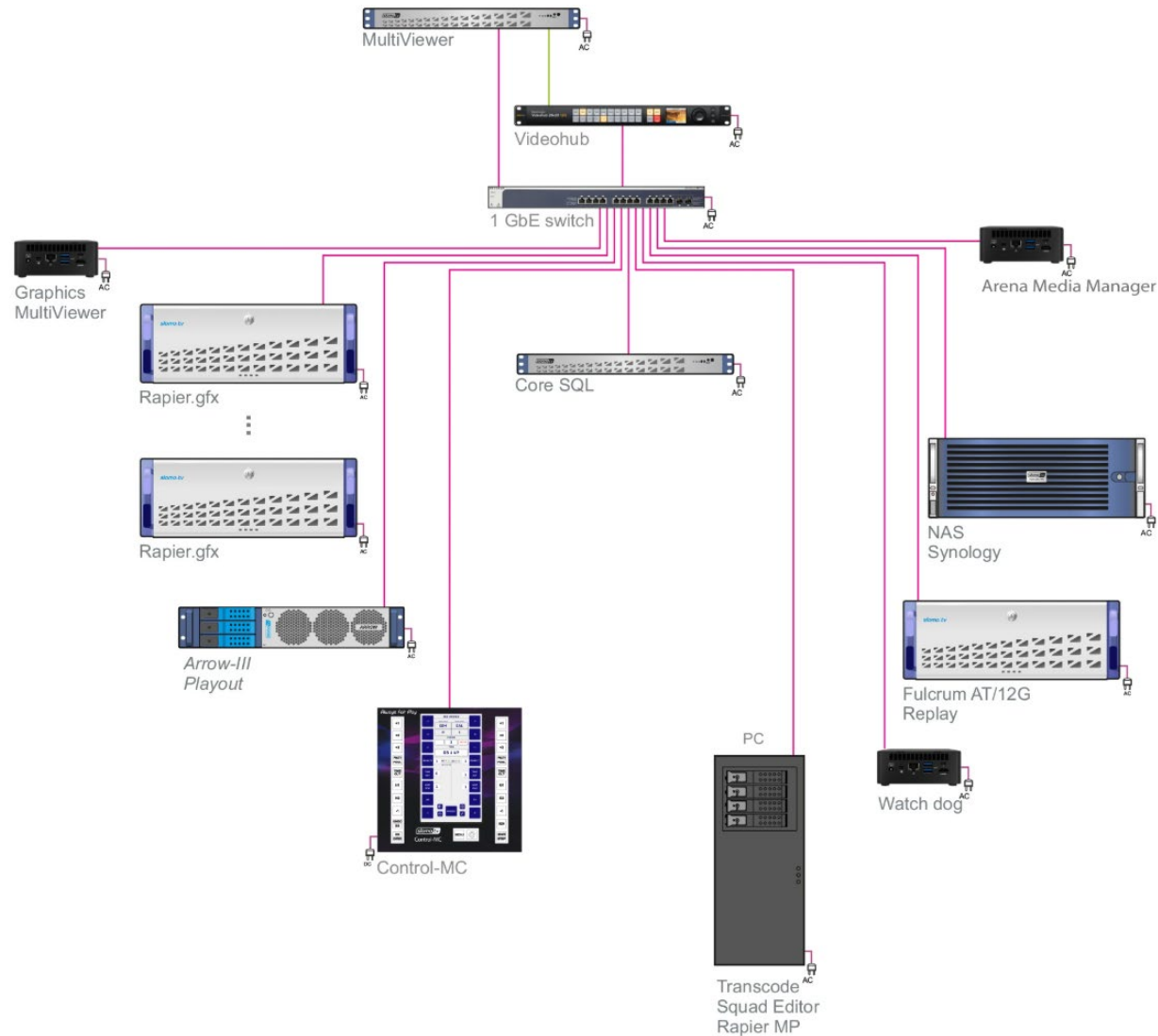
Venue-based media control system

The SLOMO.TV **Arena Media Manager** system is created to manage media content on large screens in public spaces such as sports arenas. The **Arena Media Manager** system is based on IPTV technology and operates over a local area network (LAN) or over the internet. It enables easy sharing of various types of information, including videos, throughout the venue.

Arena Media Manager ensures a dynamic and synchronized display of information, whether pre-prepared or generated in real time, across all media surfaces – both internal (LED video cubes, large high-definition screens, video walls, perimeter boards, etc.) and external (media facades, LED pillars, large outdoor screens, etc.).



SLOMO.TV System Connection with Arena Media Manager



The background is a collage of images showing people working at computers. In the top left, a person is seen from behind wearing a dark t-shirt with the 'slomo.tv' logo and the tagline 'Always Fast Play'. They are sitting at a desk with multiple monitors displaying various data and video feeds. In the top right, another person is working at a desk with a large window in the background showing a soccer field. The bottom half of the image shows two more people working at computers, with one person pointing at a screen. The entire image has a semi-transparent white banner across the middle containing the title and subtitle.

Training of VMOs and TV personnel

Academy training simulator



Academy training simulator

Video match officials and TV personnel (individually or in groups) are trained by slomo.tv specialists using **Academy – unique technology of intensive training**.

The **Academy** system simulates "live" synchronous video signals from cameras or OB Van and allows the trainees to immerse themselves into working conditions as close to real as possible.

With the **Academy**, a **Quality Loop** can be achieved – continuous improvement of referee's skills and additional training with controversial moments not included in the original set of training clips.

To date, more than 700 replay operators, video referees and TV specialists have been trained.







videoReferee® -FSK: Football Starter Kit

Comprehensive VAR solution by SLOMO.TV

The **videoReferee®**-FSK system is ideal for leagues and associations at all levels, providing both a solution to existing needs and new opportunities for growth.

The system is unique in that it combines two functions: it can act both as an 8-channel **videoReferee®** VAR server and as an **Academy** training simulator.

All standard licenses are available for **videoReferee®**-FSK – SSM camera support, 3G support, RRA option, remote workplaces and others.

videoReferee®-FSK can be used as:

- 2 separate 8-channel servers – **videoReferee®**-8F and 8-channel **Academy** system
- **videoReferee®**-8F VAR system for full-fledged video refereeing;
- **videoReferee®**-AV/AVM – VAR system with 12/16 recording channels (when a temporary or permanent license is purchased)

