



## Scoring & Timing Solution for Volleyball



## 1. Introduction

This is a professional solution for LED scoreboard display in volleyball stadiums.

Mainly for large-scale volleyball matches which held in professional sports venues.

The system functions conform to FIVB rules.

Match arrangement, real-time scoring & timing display, players' & referees' info display, rank statistics export & print, slow motion video record & playback, and advertising display can be realized through the coordination of Match Scoring System, Meet Management System, Sports Stats System, Video Arbitration System, etc.

It is an ideal choice for most of smart and professional stadiums.

### 2024 March, 2024 China International Snow Volleyball Invitational Tournament



## 1.1 System Architecture

The whole system is composed of several subsystems, including: Match Scoring System, Meet Management System, Volleyball Stats System and Video Arbitration System.

Each subsystem can not only work independently, but also work together to share the data.

It is flexible for customers to configure according to the actual application.

- **Match Scoring System**

Match Scoring System named ULTRA SCORE is composed of Ultra Score Software, Match Scoring & Timing Host, Referee Scoring & Timing Terminal, Buzzer, etc.

It is mainly operated by the referees to realize the scoring and timing work and real-time scoreboard display.

The system functions conform to FIVB rules.

- **Meet Management System**

It is composed of Meet Management Server, On-Venue Results Workstation, Printer, etc.

Linking with Online Registration System, Match Scoring System and Volleyball Stats System, it can realize: participants management, match schedule, result management, technical statistics, court arrangement, rank statistics, etc.

- **Volleyball Stats System**

Consists of Volleyball Stats Workstation.

The system can record the shoots, assists, owngoals, yellow card, red card and penalties data during the volleyball game. Linking with Online Registration System and Match Scoring System, the timing and scoring data will be exactly synchronized with them.

It also can generate the professional and detailed statistics report and provide data sharing for website and platform.

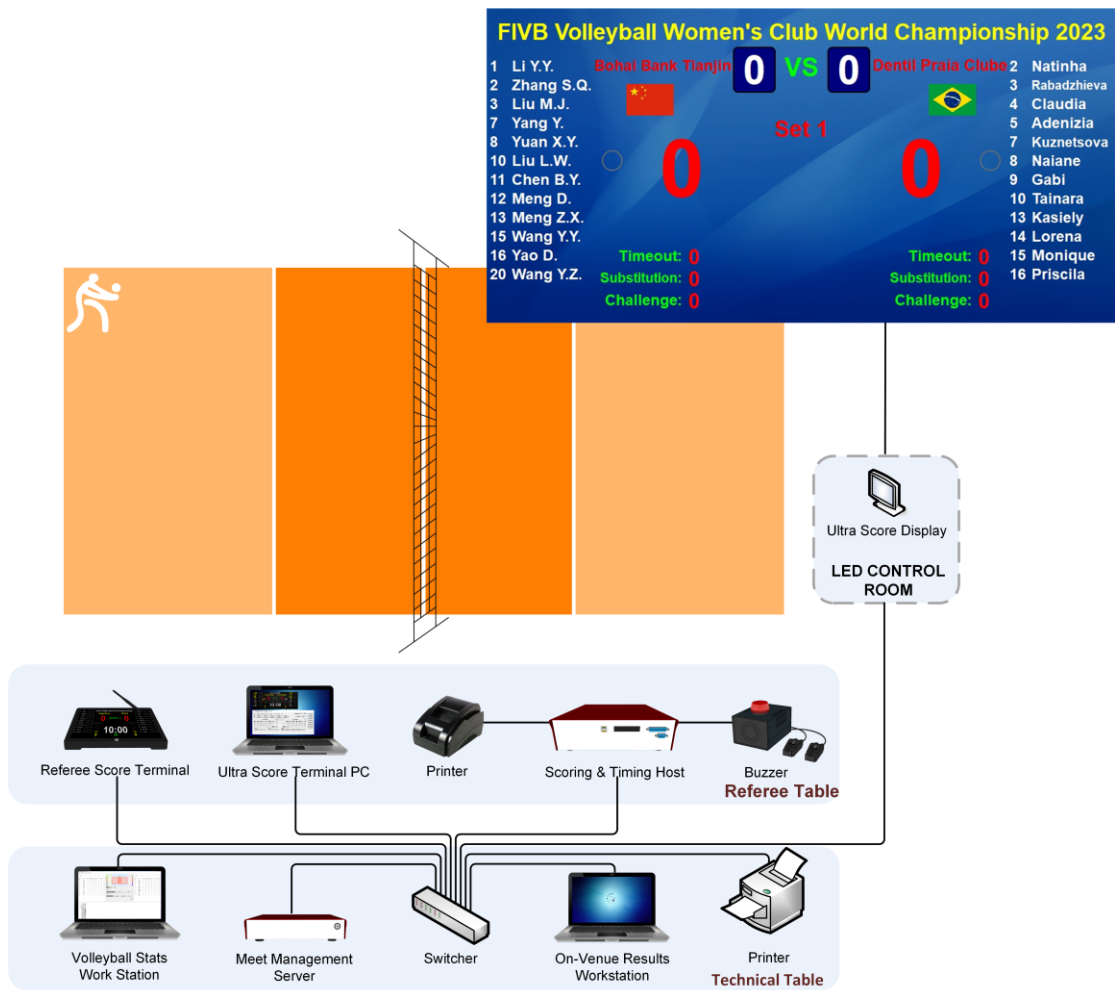
- **Video Arbitration System**

Video Arbitration System named PARROT is composed of video arbitration server, control panel and cameras.

It is operated by the referees during the match. When working with Match Scoring System, referee's score operation will be marked on the frame of video automatically, whilst playback them in slow motion with changes in speed.

It can be used to provide the technical support when dispute happens during the match so as to reduce the misjudging, to ensure fairness and justice of the match.

## 1.2 System Wiring Diagram



## 1.3 System Description

- 1) **LAN:** A LAN is set up in the stadium. Connect the LED control PC, Ultra Score Terminal PC, Match Scoring & Timing Host, Referee Scoring & Timing Terminal, Volleyball Stats Workstation, Meet Management Server, On-Venue Results Workstation and Printer to the LAN.
- 2) **LED Screen:** One or two LED screens are controlled by separate computers which connect with LED sending cards. Both of the LED screens can show the same contents or different contents as required.
- 3) **Match Scoring & Timing Host:** It is the core scoring & timing equipment which is installed in the Officials Table and has the function of hot backup. Use the special cables to connect the Buzzer and Thermal Printer to the host.
- 4) **Referee Scoring & Timing Terminal:** Installed in the Officials Table for referee's operation of score and penalty. It can be connected to the LAN through network cable or WIFI.
- 5) **Meet Management Server:** It is the core data processing equipment which is installed in the Technical Table and connected to the LAN by network cable.
- 6) **Volleyball Stats Software:** Installed in the Technical Table to work independently or connect to the LAN to obtain the match data from Ultra Score System.

## 2. Specification for Products

### 2.1 Match Scoring System

Match Scoring System named ULTRA SCORE is composed of Ultra Score Software, Match Scoring & Timing Host, Referee Scoring & Timing Terminal, Buzzer, etc.

It is mainly operated by the referees to realize:

- 1) Scoring functions: Modify the score of the team and player.
- 2) Other functions: Support period display, Pause, substitution, serves, field exchange, etc.
- 3) Real-time LED scoreboard display.

System functions conform to FIVB rules.

#### 2.1.1 Ultra Score Software

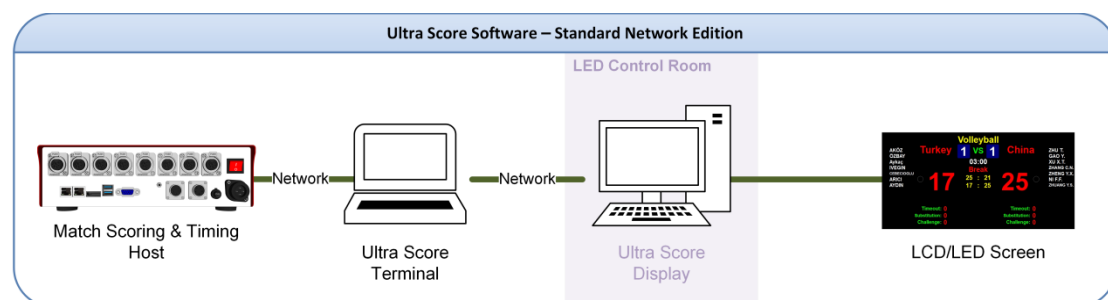
| Products                     | Details  |
|------------------------------|--|
| Standard network edition     | <ul style="list-style-type: none"> <li>◆ Terminal + 1 Display</li> <li>◆ Supports: Basketball, Football, Volleyball, Tennis, Table tennis, Badminton</li> </ul> Including 1 dongle           |
| Professional network edition | <ul style="list-style-type: none"> <li>◆ Terminal + Referee + 2 Display</li> <li>◆ Supports: Basketball, Football, Volleyball, Tennis, Table tennis, Badminton</li> </ul> Including 1 dongle |

#### Difference:

##### Standard Network Edition:

Score terminal and media player functions can be installed on 2 PCs respectively. So that one independent PC can be setup on the courtside special for referee's operation, the other PC running as media player to manage the LED display.

- It is suitable for the stadium where has one screen, needs to do the scoring and timing on the courtside.

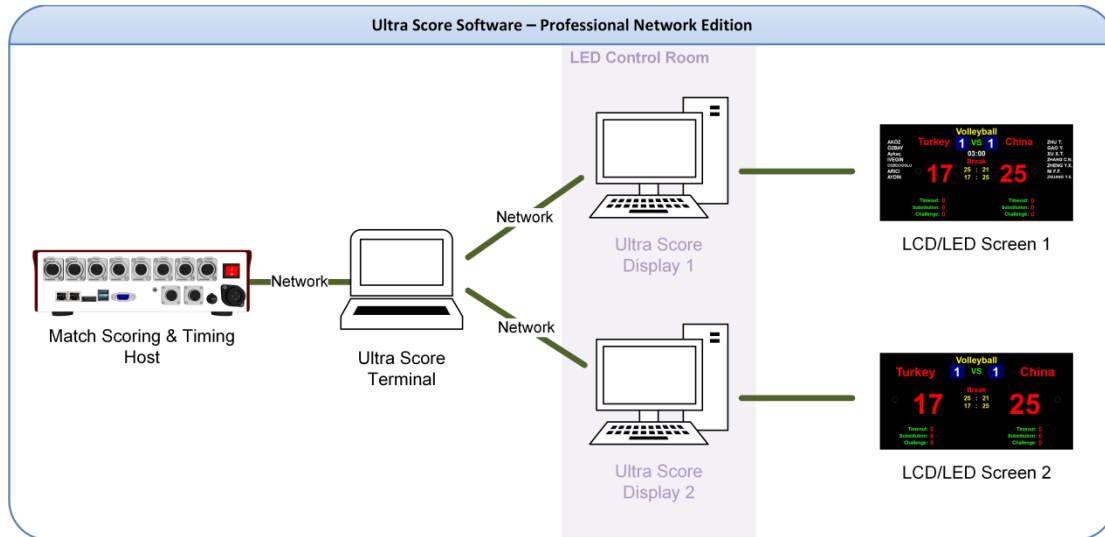




### Professional Network Edition:

Except the function of score terminal, 1-3 media players can be equipped on PCs separately, in order to display different contents on several LED screens.

- It is suitable for the stadium where has more than 2 screens where referee need to do scoring on the courtside and LED screens need to display different contents separately. (For example, one LED screen is for scoreboard and another is for advertising or player info).



### Features

- (1) Professional scoreboard display: Scoring and timing operation, layout of scoreboard can meet international game rules.
- (2) Match management: Information of match, team, team members and referees can be saved in advance. And referee's scoring operation during the match can be recorded and output.
- (3) Scoring functions: Modify the score of the team and player, operate player yellow/red card, player substitution, match timer control.
- (4) Timing functions: Include operation and display of game time, pause, break time and system time.
- (5) Convenient operation feeling: Referees can do operation on a special score console as well as by using shortcuts on the keyboard.
- (6) Powerful media player: Kinds of media formats are supported. It is easy to switch between the scoreboard and video.
- (7) Notification: Rolling to display short notice on the screen which allows to set the speed, colors, fonts freely.
- (8) Customization: All contents on the scoreboard including fonts, color and layout can be modified to meet clients' needs.
- (9) Self-adaptation: With easy configuration, score information can be displayed on kinds of LED and LCD screen by using this system which can adjust the layout to meet any sizes of screen.
- (10) Security: Auto backup function will help you recover the match immediately from the computer fault.

Display Effects:

Volleyball scoreboard 1:

**FIVB Volleyball Women's Club World Championship 2023**

Bohai Bank Tianjin **0** VS **0** Dentil Praia Clube

Set 1

0 0

Timeout: 0 Substitution: 0 Challenge: 0

Timeout: 0 Substitution: 0 Challenge: 0

1 Li Y.Y. 2 Natinha  
2 Zhang S.Q. 3 Rabadzhieva  
3 Liu M.J. 4 Claudia  
7 Yang Y. 5 Adenizia  
8 Yuan X.Y. 7 Kuznetsova  
10 Liu L.W. 8 Naiane  
11 Chen B.Y. 9 Gabi  
12 Meng D. 10 Tainara  
13 Meng Z.X. 13 Kasiely  
15 Wang Y.Y. 14 Lorena  
16 Yao D. 15 Monique  
20 Wang Y.Z. 16 Priscila

Volleyball scoreboard 2:

**FIVB Volleyball Women's Club World Championship 2023**

Bohai Bank Tianjin **0** VS **0** Dentil Praia Clube

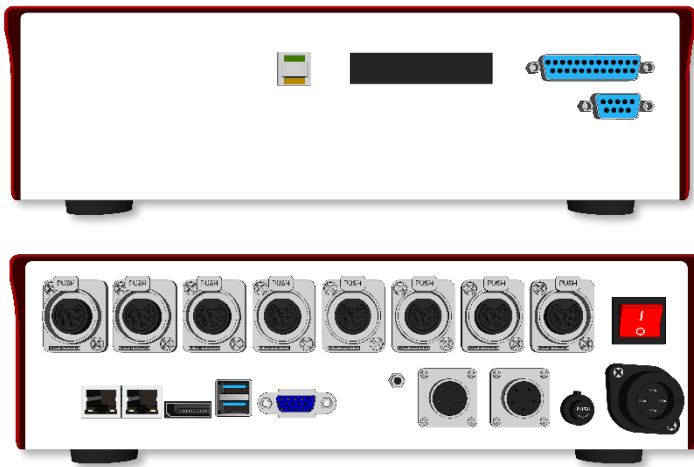
Set 1

0 0

Timeout: 0 Substitution: 0 Challenge: 0

Timeout: 0 Substitution: 0 Challenge: 0

### 2.1.2 Match Scoring & Timing Host



#### Match Scoring & Timing Host

|         |  |
|---------|--|
| Model   | KS-MONSTER   |
| Size    | 260 x 280 x 80 (mm)  |
| Support | Basketball, Volleyball,<br>Football, Futsal, Handball,<br>Water-polo, Ice-hockey |
| Other   | Supports hot switching<br>between the main and<br>backup system.                 |



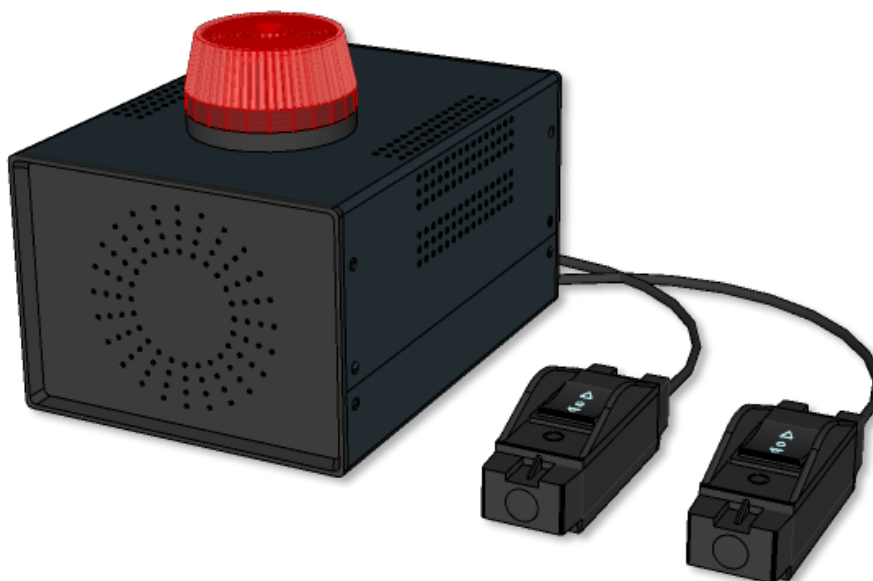
| Item             | Details  | Item              | Details                |
|------------------|--|-------------------|------------------------|
| Product          | Match Scoring & Timing Host  | Model             | KS-MONSTER             |
| Size             | 260 x 280 x 80 (mm)  | Net weight        | 3 KG                   |
| Material         | Iron   | Power             | 100W                   |
| CPU              | Intel J3160  | RAM               | 8GB                    |
| Communication    | RJ45×2   | Hard disk         | 64GB                   |
| Video output     | VGA×1, DP×1  | Input voltage     | AC 100~240V            |
| Working Temp     | 0-60°C   | Relative humidity | 5%-95%, non-condensing |
| Language         | English  | Timing accuracy   | <=10ms                 |
| Port             | G-Port×8, Shot Clock port×2, Audio×1, USB×2, Serial port×1   |                   |                        |
| Accessories      | Match Timer Handheld *1, Shot Clock Handheld *1  |                   |                        |
| Supporting games | Basketball, Volleyball, Football, Futsal, Handball, Water-polo, Ice-hockey, etc.   |                   |                        |
| Supporting rules | FIVB   |                   |                        |
| Functions        | <ol style="list-style-type: none"> <li>1. Scoring functions: Modify the score of the team and player.</li> <li>2. Penalty functions: Serves, Substitution control, Pause, etc.</li> <li>3. Supports match rule setup.</li> <li>4. Provides buzzer sound output, which can be connected to the venue's public address system or speakers.</li> <li>5. Supports hot switching of the main and backup servers. In case of the main server fails, just manually switch to the backup server to ensure the data intact. And in case of power failure, the previous screen will be restored after restarting.</li> <li>6. Supports the post-match celebration mode.</li> <li>7. Supports real-time data output, which can be used for live broadcast.</li> <li>8. Monitoring the status of scoring devices, providing convenient fault diagnosis (with a separate monitor).</li> <li>9. Anti-loose port ensures the safety of match data.</li> </ol> |                   |                        |

### 2.1.3 Referee Timing & Scoring Terminal



| Item          | Details  | Item             | Details   |
|---------------|--|------------------|-----------|
| Product       | Referee Timing & Scoring Terminal  | Model            | KS-GC18   |
| Size          | 250 x 175 x 70 (mm)  | Material         | PVC       |
| Touch LCD     | 10.8 inch  | Resolution       | 1920*1280 |
| OS            | WIN 10   | Battery Capacity | 10000mAh  |
| Communication | LAN / WLAN   | Hard disk        | 64GB      |
| Video output  | HDMI*1   | RAM              | 4GB       |
| Functions     | <ol style="list-style-type: none"> <li>1. Scoring function: Modify the score of the team and player.</li> <li>2. Penalty function: Player Substitution, Pause. etc.</li> </ol> |                  |           |

## 2.1.4 Electronic Buzzer



### Detailed parameters

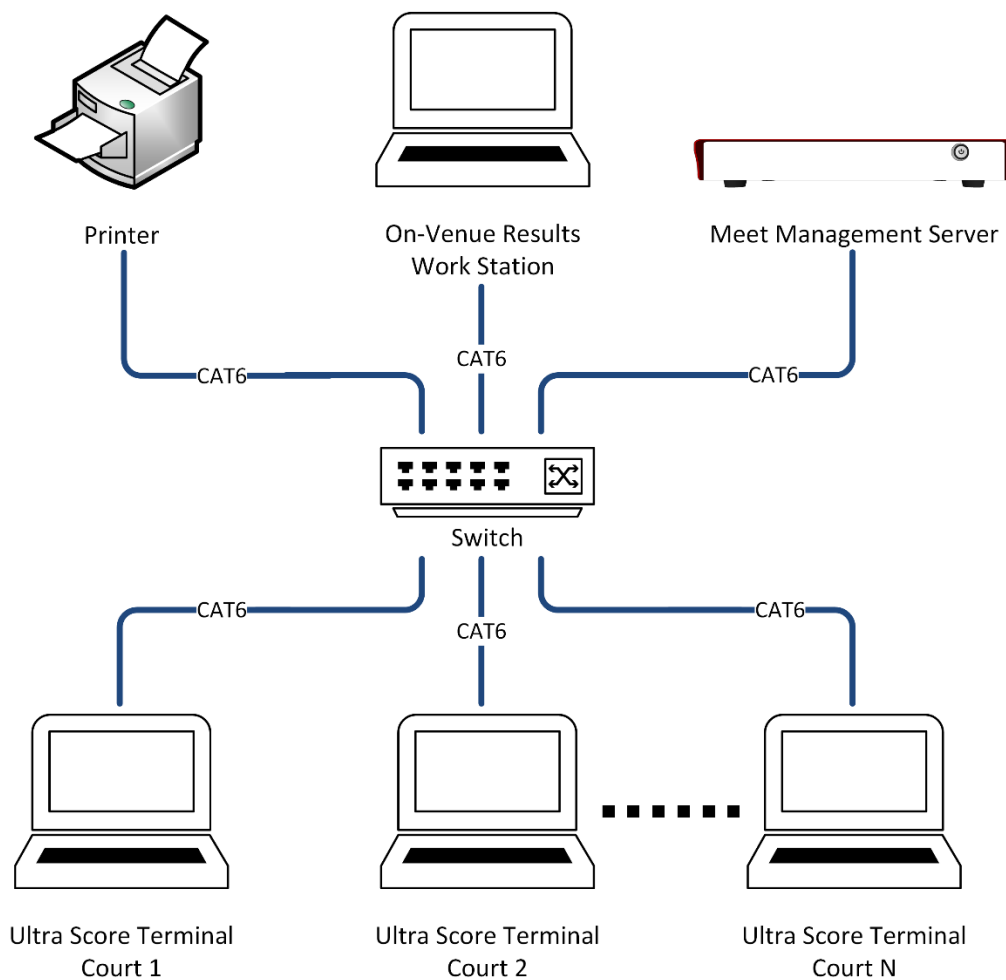
| Item                        | Details  | Item          | Details |
|-----------------------------|--|---------------|---------|
| Product                     | <b>Electronic Buzzer</b>   | Input Voltage | 12V DC  |
| Model                       | KS-BUZR  | Power         | 35W     |
| Size                        | 200x150x150 (mm)   | Color         | Black   |
| Volume                      | 110dB  | Weight        | 1KG     |
| Implementation of Standards | International Sports Competition Rules   |               |         |
| Packing List                | Host*1, Handheld*2, Power Adapter*1, Power Cable*1, User Manual*1  |               |         |
| Functions                   | <ol style="list-style-type: none"> <li>1. With two sound signals.</li> <li>2. Generate a siren sound for match timer timeout or substitution.</li> <li>3. Not only support independently use, but also access to the Match Scoring Host for linkage use.</li> <li>4. Controlled by Match Scoring Host without separate power supply under linkage mode.</li> <li>5. Anti-loose ports ensure the safety of match data.</li> </ol> |               |         |

## 2.2 Meet Management System

It is composed of Meet Management Server, On-Venue Results Workstation, Printer, etc. Linking with Online Registration System, Match Scoring System and Volleyball Stats System, it can realize:

- 1) **Participants Management:** Information management of players, teams and referees. Both import and input registration form are available. And auto generate the order form.
- 2) **Match Schedule:** Auto draw the players' lots. Multi-project arrangement makes the schedule more smoothly. Auto generate the bracket, order form and round form.
- 3) **Result Management:** Receive or record the results. Determine the players' rank, admission or elimination at each stage. Print the results announcement and send to the LED display system, TV broadcasting system and comprehensive meet manage system.
- 4) **Technical Statistics Arrangement:** Combine with the volleyball stats software, it can summarize the info of teams' score, teams' pause, players' substitution, players' foul, players' comprehensive results, and generate the integrated report.

### 2.2.1 System Diagram



## 2.2.2 Meet Management Server

| Products                      | Details  |
|-------------------------------|--|
| <b>Meet Management Server</b> | <p>Model: KS-MMS-MINI</p> <p>Size: 260*135*35 (mm)</p> <p>Weight: 1.0 KG</p> <p>Input Voltage: 12V DC</p> <p>RAM: 4GB</p> <p>CPU: Intel J3160</p> <p>Hard Disk: 64G</p> <p>Communication: LAN*1</p> <p>Port: VGA*1, DP*1, USB*2</p> <p>Features:</p> <ul style="list-style-type: none"><li>● Easy to create a match, and import the match entry information.</li><li>● Arrangement the match with variants of game systems. Including elimination, round-robin, etc.</li><li>● Provide the match information to the scoring software on each venue/court.</li><li>● Gather the real time score and statistics information from the scoring software. Monitor the progress of the match.</li><li>● Generate standard reports for the match, including start-list, results, combined results, ranking, etc.</li><li>● Print certifications with adjustable print templates.</li><li>● Print the team score report.</li><li>● Open interface with ODF compatible data feed.</li></ul> |





### 2.3 Video Arbitration System

Video Arbitration System named PARROT is composed of video arbitration server, control panel and cameras.

It is operated by the referee during the match. When working with Match Scoring System, referee's score operation will be marked on the frame of video automatically, whilst playback them in slow motion with changes in speed.

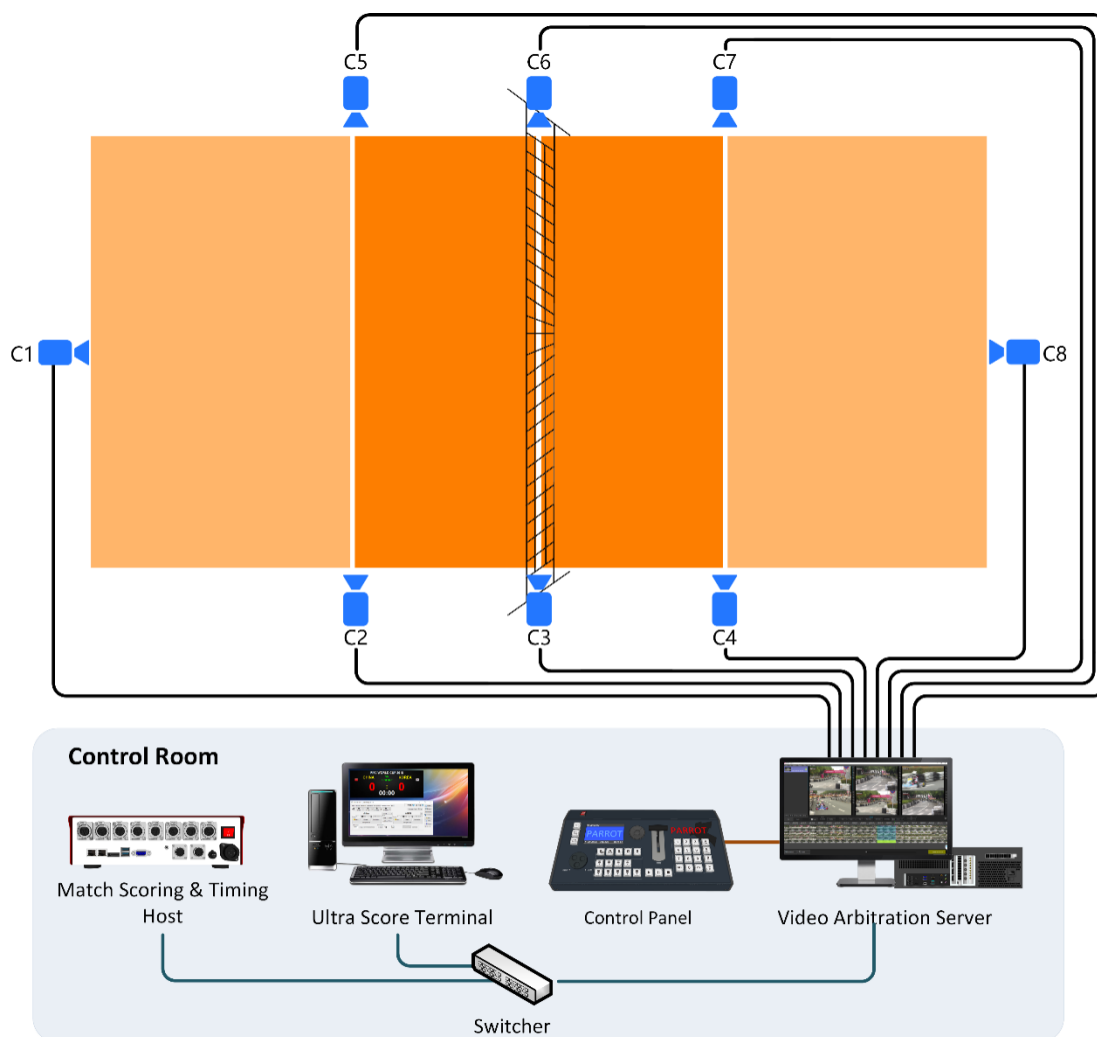
It can be used to provide the technical support when dispute happens during the match so as to reduce the misjudging, to ensure fairness and justice of the match.

#### Application:

Basketball, Volleyball, Football, Handball, Boxing, Wrestling, Wushu, Judo, Jujitsu, Karate, Taekwondo, Gymnastics, Swimming, Diving, Ice-hockey, Weightlifting, etc.



### 2.3.1 System Diagram



### 2.3.2 System Description

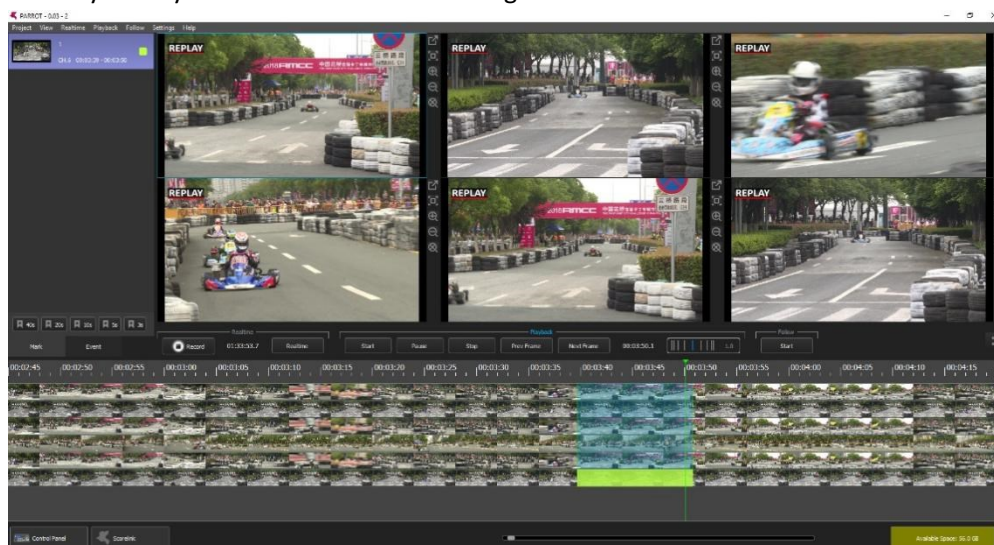
- 1) Ultra Score software is installed on the control computer. Connect the control computer and the video arbitration server to the local network.
- 2) 1-8 sets of HD cameras are installed around the count which connects to video arbitration server via SDI cable.
- 3) Control panel is connected to video arbitration server via a USB cable which makes referee easy to check the playback process and control the speed of slow motion.
- 4) Video arbitration server provides an output video signal which can be connected to LED/LCD display for live slow motion replay.

### 2.3.3 Functions

- 1) **Nonstop video recording in the background:** 1-8 channels of HD video are recorded simultaneously in the background, nonstop for 10 hours. Video retrieval and playback is unaffected.
- 2) **Synch-playback of multi-channel video:** Supports playback mode of single channel video in full screen and multi-angle video in 6 windows.
- 3) **Speed change in slow motion:** supports 20 frame/s video playback and capturing motion in a grid of 0.05s. The function of frame freeze, fast playback, 1/2 slow playback, 1/4 slow playback and dragging progress bar is available.
- 4) **Video event query:** video stream can be divided into several video events, storing in the event list, which can be renamed for retrieve easily.
- 5) **Video segment marker:** Important or controversial moments can be marked in video stream which will be replayed quickly when clicking the marked records.
- 6) **Professional playback control panel:** configuring T-bar, slow moving wheel, speed preset function keys to make the process more convenient.
- 7) **Video signal output:** provides 2 video output signals, one of which is for preview, the other of which can be connected to LED/LCD display for live slow motion replay.

#### Working with Ultra Score System to realize:

- 1) **Auto generate video event:** Video events will be generated automatically for quick query according to the match data that has been preset in Ultra Score.
- 2) Real-time match timer will be superimposed on the video.
- 3) **Referee's operation record:** Referee's every scoring and timing operation can be recorded into the video, showed below the frame when that moment happened.
- 4) **Player's point record:** Player's point can be recorded into the video, showed below the frame when that moment happened.
- 5) **Open developer API:** Just connect your own scoring system onto this Video Arbitration System, so you may record all kinds of events together with the videos.



### 2.3.4 Video Arbitration Server (up to 8 channels record and replay)



## Detailed parameter

| Item          | Details  | Item               | Details                                 |
|---------------|--|--------------------|---|
| Product       | Video Arbitration Server   | Model              | KS-PARROT-2C/4C/6C/8C                   |
| Input voltage | AC 100~240V  | Power              | 35W                                     |
| Size          | 483x430x90mm (2U)  | CPU                | Intel I7                                |
| RAM           | 2 channels: 8GB<br>4/6/8 channels: 16GB  | Hard disk          | 2/4 channels: 800GB<br>6/8 channels: 2T |
| Input         | SDI×2/4/6/8  | Communication port | LAN×2                                   |
| Output        | DP×2   | Other port         | USB×4                                   |
| Packing list  | Host*1, Power cable*1, User manual*1   |                    |   |
| Functions     | <ol style="list-style-type: none"> <li>1. Nonstop video recording in the background for 10 hours. Video retrieval and playback is unaffected.</li> <li>2. Support 50 frame/s video playback and capturing motion in a grid of 0.02s.</li> <li>3. Support playback the video of the specified channel frame by frame, or at a set speed continuously.</li> <li>4. Important or controversial moments can be marked manually or auto create video marks by linkage with Ultra Score System.</li> <li>5. Zoom the playback screen of any channel to accurately observe the details.</li> <li>6. Provide 2 video output signals, one of which is for preview, the other of which can be connected to LED/LCD display for live slow motion replay.</li> <li>7. Working with Ultra Score System can realize real-time match data displaying on the video.</li> <li>8. Automatically synchronize with the match and tag the video, so as to provide convenience to find the match sessions or sets.</li> <li>9. Each single operation of the referees will be recorded together with the videos.</li> <li>10. Unique "Follow" mode, automatically replay the most recent screen with a 5-second delay to help the referee make decisions quickly.</li> <li>11. Open external control interface which can be controlled by 3rd-part system.</li> </ol> |                    |   |



### 2.3.5 Control Panel



#### Detailed parameters

| Item               | Details  | Item       | Details             |
|--------------------|--|------------|---------------------|
| Product            | Control Panel  | Model      | KS-PARROT-CP        |
| Input Voltage      | AC 100~240V  | Net weight | 1KG                 |
| Size               | 365 x 200 x 98 (mm)  | Power      | 15W                 |
| Communication port | USB×1, RS232×1   | Display    | Color LCD (4.3Inch) |
| Packing list       | Host* 1, Power cable*1, USB cable*1, User manual*1   |            |                     |
| Functions          | <ol style="list-style-type: none"> <li>1. Support one touch replay, deferred replay, in/out replay.</li> <li>2. Preset speed button.</li> <li>3. T-Bar for dynamic slow motion.</li> <li>4. Professional dynamic jog wheel.</li> <li>5. Key to mark the last 10s/20s of the video content.</li> <li>6. Flexible select the marked video and playback.</li> </ol> |            |                     |

### 2.3.6 HD Camera



#### Detailed parameters

| Product Model    | KS-PARROT-CAMERA |
|------------------|------------------|
| Video output     | 3G-SDI           |
| Effective pixels | 3.0 million      |
| Max Resolution   | 1920*1080        |
| Max Frame rate   | 60FPS            |
| Sensor           | CMOS             |
| Focal length     | 4.2MM            |
| Size             | 62.5*50*50MM     |

## 2.4 Volleyball Stats System

Consists of Volleyball Stats Workstation.

Record the data of serve, score, fault, assist during the volleyball game. Linking with Online Registration System and Match Scoring System, the timing and scoring data will be exactly synchronized with them.

It can generate the professional and detailed statistics report and provide data sharing for website and platform.

Volleyball Stats - 0.01 FREE  
System Match Control Live Data Help

| Team A |  | 1 | 2 | 3 | 4 | 5 |
|--------|--|---|---|---|---|---|
| Team A |  | 0 | 0 | 0 | 0 | 0 |

| No | Team A  | Kill | Block | Ass | Attack | Error | allw | Car | Red Card |
|----|---------|------|-------|-----|--------|-------|------|-----|----------|
|    | Player7 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player6 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player8 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player5 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player4 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player1 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player3 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player2 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |

Set 1

| Team B |  | 1 | 2 | 3 | 4 | 5 |
|--------|--|---|---|---|---|---|
| Team B |  | 0 | 0 | 0 | 0 | 0 |

| No | Team B  | Kill | Block | Ass | Attack | Error | allw | Car | Red Card |
|----|---------|------|-------|-----|--------|-------|------|-----|----------|
|    | Player7 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player6 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player8 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player5 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player4 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player1 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player3 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |
|    | Player2 | 0    | 0     | 0   | 0      | 0     | 0    | 0   | 0        |

Team A at Team B