



Scoring & Timing Solution for Diving



1. Introduction

This is a professional solution for LED scoreboard display in synchronized Diving competition.

The system functions conform to FINA 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, Video Arbitration System, etc.

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

Applicable rules:

- 《FINA DIVING RULES 2017 – 2021》

1.1 System Architecture

The whole system is composed of several subsystems, including: Match Scoring System, Meet Management 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, Light Indicator, Match Timer, Penalty Timer, 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 IIHF rules.

- **Meet Management System**

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

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

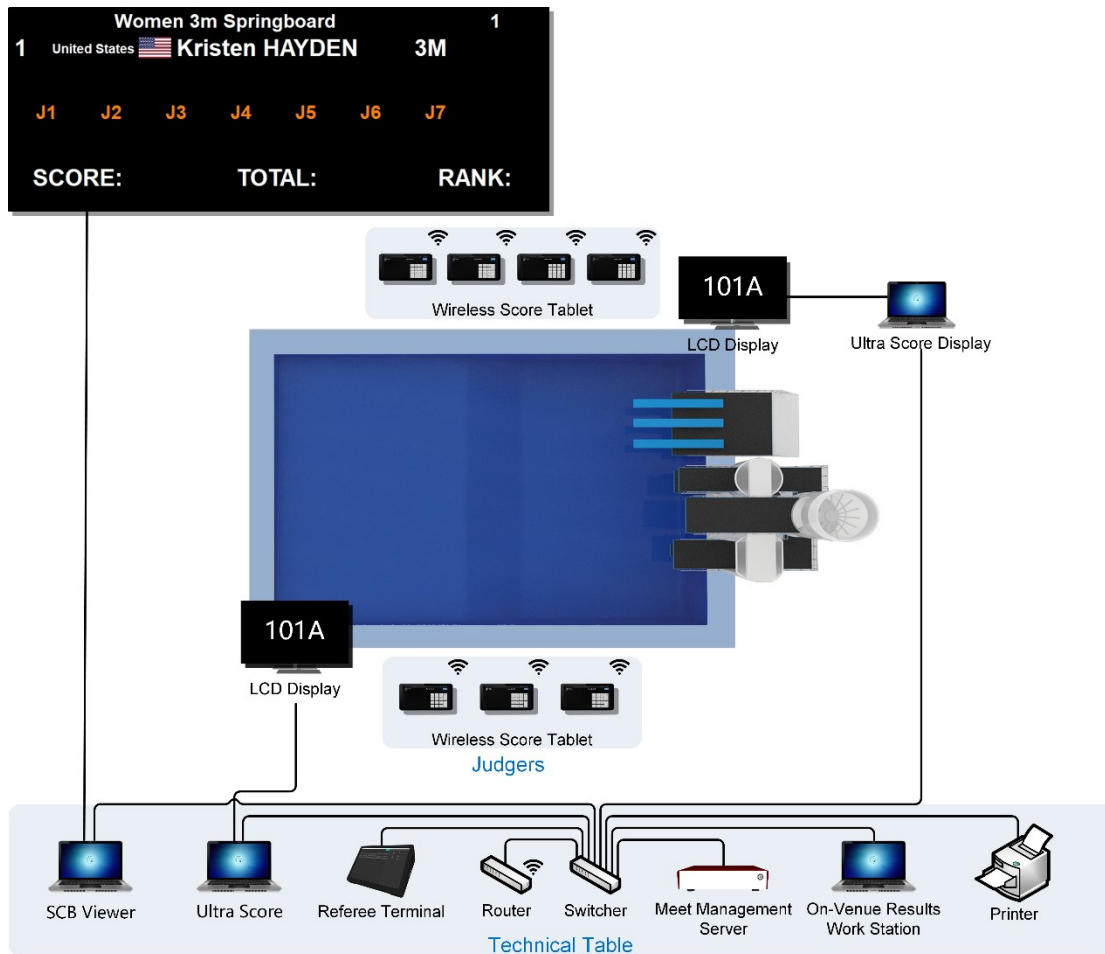
- **Video Arbitration System**

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 Structure



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, 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) **Wireless Score Tablet:** 7 Wireless Score Tablets are used together with Ultra Score software for referee scoring.
- 4) **Referee Scoring Software:** It is installed in the court side referee seat, which can monitor the scoring of referees in multiple venues in real time and correct unreasonable scoring.
- 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.

1.3 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 coaches can be saved in advance. And referee's scoring operation during the match can be recorded and output.
- (3) Scoring functions: Include operation and display of teams and players' point, foul and substitutions.
- (4) Timing functions: Include operation and display of game time, pause, break time, count down 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.

1.4 Product Configuration

(For one court)

| Product | Model | Quantity |
|---------------------------------|--------------------------|----------|
| Match Scoring System | | |
| Ultra Score Software | Standard Network Edition | 1 |
| Score Display Software | SCB VIEWER | 1 |
| Referee Terminal | KS-RETM | 1 |
| Wireless Score Tablet | KS-GC14-I8 | 7 |
| Meet Management Server | KS-MMS-MINI | 1 |
| PC | / | 2 |
| Printer | / | 1 |
| Video Arbitration System | | |
| Video Arbitration Server | KS-PARROT-4C | 1 |
| Control Panel | KS-PARROT-CP | 1 |
| HD Camera | KS-PARROT-CAMERA | 4 |
| Tripod for HD Camera | TRIPOD STANDARD | 4 |
| SDI Cable | 15m | 4 |
| LCD Monitor | 21.5 inch | 1 |

2. Specification for products

2.1 Ultra Score Software

| Products | Detail |
|------------------------------|--|
| Standalone edition | <ul style="list-style-type: none">◆ Installed on one PC.◆ Supports: Diving◆ English version◆ Including 1 dongle |
| Standard network edition | <ul style="list-style-type: none">◆ Terminal + 1 Display◆ Supports: Diving◆ English version◆ Including 1 dongle |
| Professional network edition | <ul style="list-style-type: none">◆ Terminal + Referee + 2 Display◆ Supports: Diving◆ English version◆ Including 1 dongle |

Difference:

Standalone Edition:

Match management, Scoring, and Media display functions, all in one installed on a PC. Referee must do operation on the PC for display directly.

It is suitable for the stadium where has just one screen, which doesn't have strict needs of the scoring and timing accuracy.

Network Standard 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.

Network Professional 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).

Individual scoring interface:

| | | | | | | |
|--------|-----------|--------------------------|----|-------|----|----|
| 1 | Guangdong | Individual Yang Biyun | 3M | 1/0 | | |
| J1 | J2 | J3 | J4 | J5 | J6 | J7 |
| SCORE: | | TOTAL: | | RANK: | | |

Synchronized scoring interface:

| Rank | Team | Individual Players | Score |
|------|-----------|-----------------------|-------|
| | Guangdong | Yang Biyun | |
| | Hainan | Xie Yuanyu | |
| | Sichuan | Zheng Shuangxue | |
| | Jiangsu | Chen Jiayu | |
| | Zhejiang | Yu Miao | |
| | Shandong | Huang Hui | |

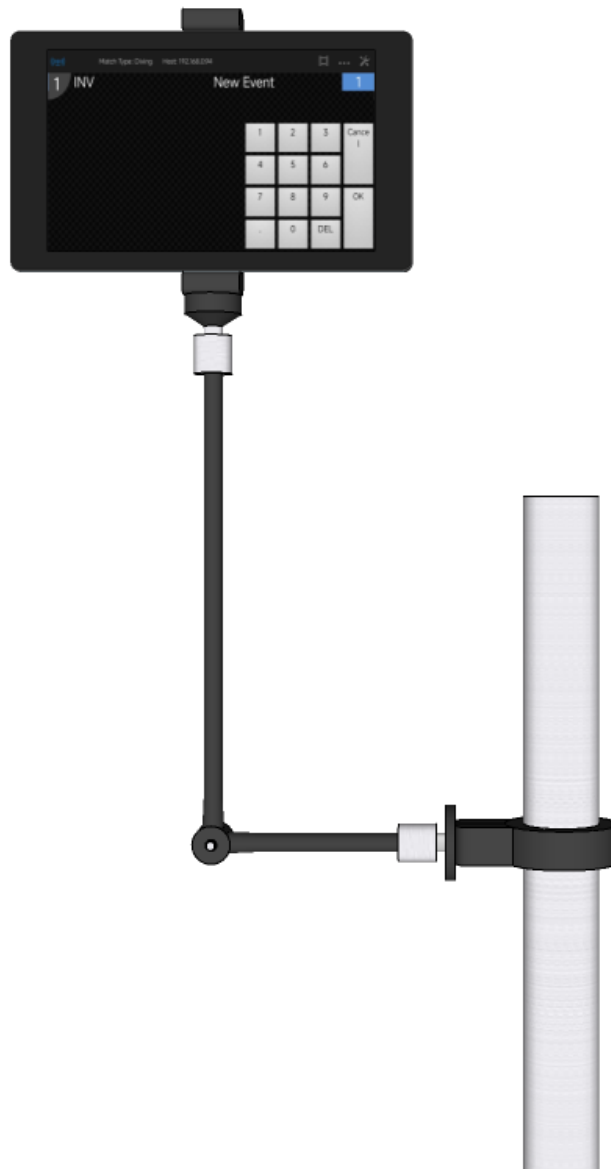
2.2 Referee Terminal

| Products | Details |
|------------------|---|
| Referee Terminal | <p>Model: KS-RETM</p> <ul style="list-style-type: none"> ◆ Monitor the scores of judges on the court in real time. ◆ Modify or remind the unreasonable grades. ◆ Achieve the overall control of the display score. ◆ View the current real-time ranking info. |



2.3 Wireless Score Tablet

| Products | Details |
|-----------------------|--|
| Wireless Score Tablet | <p>Model: KS-GC14-I8</p> <ul style="list-style-type: none">◆ Including one license of Lightscore software◆ Screen: 8"inch◆ Size: 211*126*9.2 (mm)◆ Pixel: 1280*800IPS◆ Ram: 4GB◆ Storage: 64GB◆ System: Android◆ Supports: Diving◆ Communication: WIFI◆ Full colored touch screen, including fixed bracket. |

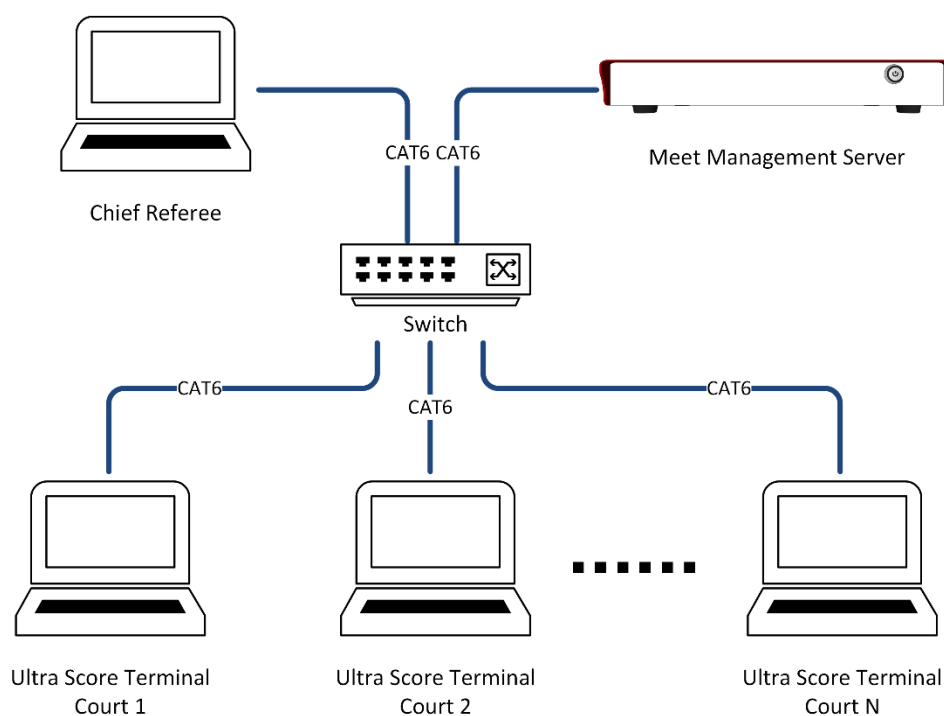


2.4 Meet Management System

It is composed of Meet Management Server, On-Venue Results Workstation, Printer, etc. Linking with Online Registration System, Match Scoring System and Basketball 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 make 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 basketball stats software, it can summarize the info of teams' score, teams' timeout, teams' foul, players' substitution, players' foul, players' comprehensive results, and generate the integrated report.

2.4.1 System Diagram



2.4.2 Meet Management Server

| Products | Details |
|------------------------|--|
| Meet Management Server | <p>Model: KS-MMS-MINI</p> <p>Size: 260x135x35 (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">● Multi-court arrangement, auto generate the order form.● Multi-project arrangement, make the schedule more smoothly.● Monitor the status of each court in real time, including the current field, rotation and player info.● Court adjustment, can manually modify the match court and session info.● Summary and print integrated report. |



2.5 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.

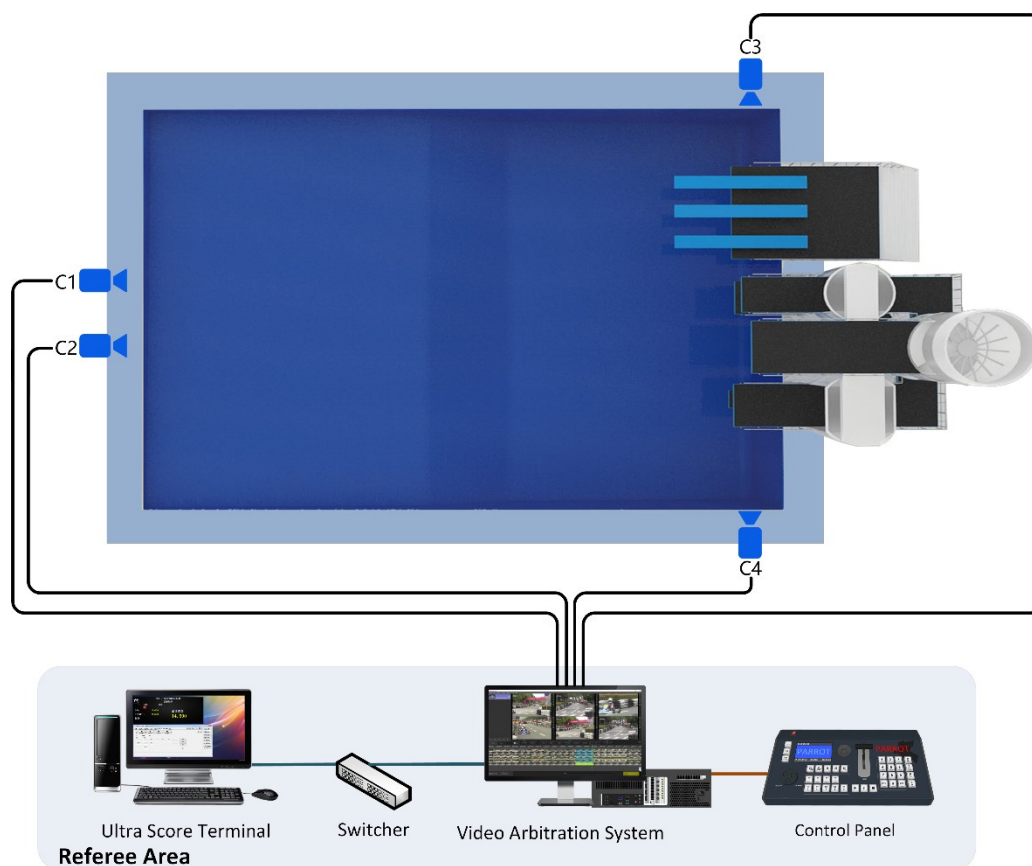
It can be used to provide the technical support when dispute happens during the match so as to reduce the misjudging, to ensure fairness and justice of the match.

Application:

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



2.5.1 System Diagram



System Description

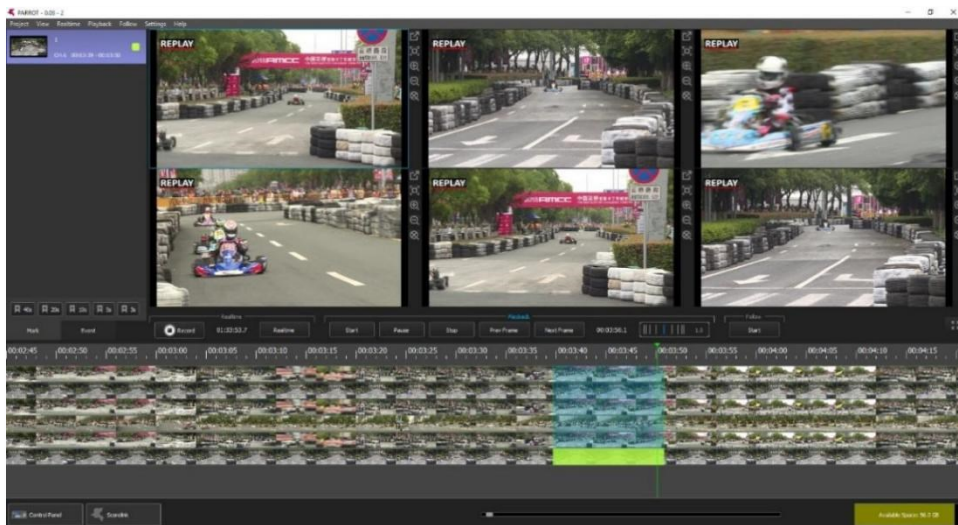
- 1) Ultra Score software is installed on the control computer. Connect the control computer and the video arbitration server to the local network.
- 2) 1-8 sets of HD cameras are installed around the court which connects to video arbitration server via SDI cable.
- 3) Control panel is connected to video 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.

2.5.2 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:

- **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.
- Real-time match timer will be superimposed on the video.
- **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.
- **Player's point record:** Player's point can be recorded into the video, showed below the frame when that moment happened.
- **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.



2.5.3 Video Arbitration Server

| Products | Details |
|--------------------------|---|
| Video Arbitration Server | <p>Model: KS-PARROT-2C/4C/6C/8C</p> <p>Video Input: 2/4/6/8 channels input synchronously;</p> <p>Input port: SDI;</p> <p>Output port: DP*2;</p> <p>Video Format: 1080P;</p> <p>Recording capacity: ≥ 10 hours;</p> <p>Multi-screen monitoring: supported;</p> <p>Weight: 8kg.</p> |



Software interface



Device Specification

| | |
|---|------------------------------|
| Model | KS-PARROT-2C/4C/6C/8C |
| Size | 485x480x90(mm) |
| Net Weight | 8 KG |
| Color | Black |
| Cabinet | Iron |
| Interface | |
| Input | SDI*2/4/6/8 |
| Output | DP*2 |
| Environmental | |
| Operating Temp | -5°C~45°C |
| Storage Temp | -40°C~80°C |
| Relative Humidity | 5%~95%, non-condensing |
| Input Voltage | AC 100V~240V |
| Functions | |
| <ul style="list-style-type: none">● Nonstop video recording in the background: 2/4/6/8 channels of HD video are recorded simultaneously in the background, nonstop for 10 hours. Video retrieval and playback is unaffected.● Synch-playback of multi-channel video: Supports playback mode of single channel video in full screen and multi-angle video in 2/4/6/8 windows.● Speed change in slow motion: support 50 frame/s video playback and capture motion in a grid of 0.02s.● Video event query: video stream can be divided into several video events, storing in the event list, which can be renamed for retrieve easily.● Video segment marker: Important or controversial moments can be marked in video stream which will be replayed quickly when clicking the marked records.● 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. | |

2.5.4 Control Panel

| Products | Details |
|---------------|---|
| Control Panel | <p>Model: KS-PARROT-CP</p> <p>Function:</p> <ul style="list-style-type: none">◆ Support one touch replay, deferred replay, in/out replay.◆ Preset speed button.◆ T-Bar for dynamic slow motion.◆ Professional dynamic jog wheel.◆ Key to mark the last 10s/20s of the video content.◆ Flexible select the marked video and playback. |



Device Specification

| | |
|----------------------|------------------------|
| Model | KS-PARROT-CP |
| Size | 365 x 200 x 98 (mm) |
| Net Weight | 1 KG |
| Cabinet | Iron |
| Display | Color LCD(4.3Inch) |
| Sound | None |
| Communication | |
| USB | ≤5m |
| RS232 | ≤10m |
| Environmental | |
| Operating Temp | -5~45°C |
| Relative Humidity | 5~95 %, non-condensing |
| Storage Temp | -40~80°C |
| Input Voltage | AC 100V-240V |
| Total Power | 15W |

2.5.5 HD Camera

| Products | Details |
|-----------|-------------------------|
| HD Camera | Model: KS-PARROT-CAMERA |



Device Specification

| 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 |