AI HD recording TS- 0650S

Embedded DSP Codec System V3.1



Description

It adopts integrated hardware design, embedded Linux operating system, highly integrated embedded ultra-high-definition video acquisition module, recording module, live broadcast module, director switching module, image segmentation and splicing module, local echo output module, and realizes multiple functions such as video live broadcast, intelligent director, ultra-high-definition recording, image recognition and tracking, multi-party interaction, etc. It is a new generation of fully automatic eight-camera audio and video recording equipment that meets the needs of conference recording, boutique, interactive teaching, etc.

Features

1.I. Hardware parameters:

2.It uses a domestically produced main control chip, an eight-core 64-bit processor, and 8GB of RAM. It has an integrated hardware design, an embedded Linux operating system, and highly integrated audio and video acquisition, encoding, decoding, professional directing, live broadcast, on-demand, recording and other system modules. It is easy to use, maintain, and has high security.

3.The controller comes with 2TB of storage space, which can store up to 2,000 lessons of recorded content. It supports frequent use of the device for more than one year, and supports automatic deletion of the files with the longest overwriting time when the hard disk memory is full, so as to perform loop recording.

4.Display module: The controller has a built-in 1.8-inch LCD display screen, which displays the operating status, parameter information, hard disk capacity, audio status, resource channel recording status, and file copy progress. The device has 4 physical buttons, which can record, stop, live broadcast, and copy recorded files with one button.

5.Video input: The controller has 4-channel SDI signal input interfaces, supporting 1080P resolution screen capture, 2-channel HDMI signal input interfaces, supporting 4K resolution screen capture, and 1-channel Type-C interface with custom configuration function. When used as screen capture, it supports 1080P resolution screen capture.

6.Video output: The controller has 4-channel HDMI signal output interfaces, 1-channel of which has 4K resolution and audio output at the same time, 2-channel HDMI output ports have custom channel screen output, and 1-channel Type-C interface has custom configuration function. When used as screen output, it supports 1080P resolution screen output.

7.Audio interface: The controller has 1-channel 3.5mm audio port and 2-channel Phoenix terminal ports for collecting audio; 1-channel 3.5mm audio port and 2 Phoenix terminal ports for outputting audio.

8.Control interface: The controller has 3-channel RS-232 Phoenix terminal interfaces and 1-channel RS-485 Phoenix terminal interface, of which 1-channel RS232 and 1 RS485 are powered by 12V voltage, which can connect to various serial port protocol devices and power the devices; it has 5-channel USB interfaces for connecting U disk to copy files or keyboard and mouse to operate the embedded director station; it has 4 short-circuit trigger I/O; it has a factory setting button, which can restore the factory settings with one click.

9.Network interface: The controller has 1-channel 802.3ab 1000Base-T Gigabit RJ45 network interface, supports 1 fiber optic network port, and supports IPv4 address and IPv6 address.

10.II. Software functions:

11.Based on the B/S architecture, you can log in to the web terminal to realize functions such as online directing, live broadcast management, signal management, group management, user management, file management, scheduled recording, central control management and system management.

12.Supports H.264/H.265 video codec protocols, and AAC, PCM, G711A, G711U, and ADPCM audio encoding protocols, ensuring high audio fidelity and precise synchronous recording of audio and video.

13.The device can realize the simultaneous access and decoding of 8-channel 4K network cameras, and can synthesize and output 4K resolution PGM images through 6-channel resource images.

14.It has the function of recording 9-channel video streams simultaneously, 1 PGM screen and 8 resource channel screens, and the recording file formats support MP4, AVI, MOV, FLV, TS and MKV formats. It has independent recording function, each recording channel can be freely bound to the audio channel, and can be recorded and controlled independently.

15.It has user mode and advanced mode settings. User settings: supports PGM one-click setting of four levels: ultra-high definition, high definition, standard definition, and smooth; advanced settings: customizable resolution, bit rate, and frame rate. The bit rate supports 256kbps~20Mbps, supports dynamic encoding and static encoding selection; supports custom resolution, different resolution ratio settings, including 9:16, 16:9, 32:9 settings, and supports 4K resolution; supports 25/30/60 frame rate settings, and also supports 15/20 low frame rate settings.

16.Supports segmented recording of video files, and can customize the segment duration. The segment duration of TS file format supports 30~480 minutes, and other file formats provide 30~240 minutes. A single recording can be up to 12 hours of uninterrupted recording, and users can end the recording early as needed.

17.Audio encoding supports multiple formats, including AAC, PCM, G.711A, G.711U, and ADPCM formats, and audio sampling rates support 48K, 44.1K, and 8K. It provides audio management functions, supports audio mixing management, and can set the mixing of 5 audio inputs and control the volume of each channel separately.

18.Supports local video preview and playback function: can preview and view the currently recorded video, provide multiple playback switching, support 0.5x, 0.75x, 1.5x, 2x, 3x video playback speed adjustment, and provide popular video modules and the latest video modules.

19.Support web-side file preview: Built-in VOD on-demand module, users can play, pause, jump and perform other operations on video files online through the network.

20.Supports multiple directing modes: It has an embedded director console, which can preview 9 channels of images, 1 PGM channel and 8 resource channels in real time; it supports web-based directing, and supports fully automatic directing mode in conjunction with the built-in automatic directing module; it supports serial port control protocol and standard network API protocol, and can be connected to various third-party directing tools for device recording and directing control; it supports built-in peripheral 4-inch control touch panel, and can realize input source image monitoring or directing switching, recording mode switching, starting and stopping recording by clicking the control screen button.

21.Support screen layout: support picture-in-picture, three-screen, four-screen, six-screen and dialogue screen, and support 10 screen layouts including 3 custom screen layouts to meet personalized needs; support custom screen layout, 6-channel layer custom overlay, free setting of overlay position.

22.Support switching special effects: including gradient, upward fly-in, downward fly-in, blinds, box state expansion, and other 12 screen switching special effects.

23.Support subtitle settings: users can customize the size of subtitles, and the font color provides red, green, blue, white, and black options. The subtitle position can be dragged at will with the mouse, and a solid color background for letters can be selected as well as slogan background images can be uploaded.

24.Support adding opening and ending credits: the opening credits can be displayed by selecting the resource channel screen or custom uploaded pictures, and the uploaded picture formats support jpg, jpeg, png, and bmp. Support adding watermark logo: users can customize the uploaded logo picture and support red, green, blue, and white transparent color selection.

25.Support real-time display of audio input volume: On the director interface, it supports real-time checking whether the audio is connected normally. Support network access detection. On the director interface, when the network is disconnected or there is no network access, the director interface icon can display the network status in real time.

26.Live broadcast management: supports web live broadcast function, supports live broadcast to 200 users at the same time in the local area network, supports streaming media protocols such as RTSP, RTMP, RTP, TS, has standard RTMP streaming function, supports 3-channel streaming at the same time, connects to third-party live broadcast platform for online live broadcast, facilitates expansion of the number of live broadcasts, and supports customized start and end time of streaming.

27.File upload: The controller supports cooperating with a third-party FTP file server to automatically upload backup files. Through the FTP server tool, you can quickly build a file server, and the courseware will be automatically pushed to the file server. File upload and download can automatically adjust the bandwidth to prevent network congestion.

28.Factory settings: The controller supports software/hardware reset function. Users can easily restore the device to factory settings through the device's physical buttons or remote commands to avoid file damage, IP address loss, administrator password loss, etc. that may cause the system to become unusable.

29.User management: The controller supports group management of B/S users, and can assign an account and password to each user. Users can watch live and on-demand files only after authentication and authorization. In addition, with the user group management function, corresponding users can only access corresponding courseware.

30.Encrypted Recording: Supports encrypted recording, enabling encrypted recording of files with two encryption methods; encrypted videos require a decryption player to play, and authorization to play encrypted videos requires a USB key or password.

31.USB flash drive recording: supports real-time USB flash drive recording, which allows you to take the recording away once it stops; supports USB flash drive read and write rate detection, and the controller can set different bit rates for recording according to the USB flash drive rate.

32.Scheduled recording: After the scheduled recording schedule is edited, the recording will be automatically performed at the scheduled time, and the file name will be automatically generated with information such as venue, speaker and topic. Web signal management supports the function of recording small resources separately.

33.Operation management: The controller automatically records basic operation functions such as power-on time, recording usage, and device interface detection, and can connect to third-party platforms to provide operation data; it supports one-click import and export of all user configuration setting files of the controller.

34.Abnormal repair: It has the function of repairing video files damaged due to abnormal power supply.The repaired file formats include but are not limited to MP4, AVI, MOV, FLV, MKV, TS and other video packaging formats.

35.With software central control, you can fill in the central control instructions in the recording and broadcasting management interface, and then perform central control operations through the interface, and connect to other devices for one-click control; support recording and broadcasting Android APP docking and control; support docking with private cloud platform servers. After successful docking, the cloud platform can uniformly control the devices, making it convenient to manage multiple recording and broadcasting devices.

36.It supports one-click upgrade function. When the system has new function iterations, the function upgrade can be achieved by importing firmware.

37.It supports docking with the public service platform for educational resources to realize resource on-demand and shared application functions; it supports selecting viewing content by platform, academic stage, subject, version and textbook, and automatically caches and plays high-definition videos; it supports on-demand, drag-and-drop, playback, jump and other video content playback operations.

38.Supports docking with a speech transcription server to implement the speech transcription function, transcribe speech into text and automatically generate subtitle files.

39.Supports multiple speech-to-text modes, requiring no additional speech-to-text host configuration. It features built-in speech-to-text functionality, generating SRT transcribed text upon activation. It can connect to speech-to-text servers to transcribe speech into text and automatically generate subtitle files. The transcription results can be viewed after recording.

40.It includes a built-in blue/green screen keying function, accurately identifying teachers and extracting them from blue/green backgrounds for composite display on the HDMI input screen. Adjustments are supported for edge smoothing, similarity, primary color leakage reduction, sharpening, and sharpness settings.

41.III. Interactive function:

42.The built-in video interactive function enables interaction between 4 recording and broadcasting controllers, and supports two interactive modes: discussion and mute. In discussion mode, the lecturers can choose to speak or mute their microphones at will; in mute mode, the lecturers cannot speak but can watch the live broadcast of the lecturer.

43.Support address book function: In discussion mode, users can enter the device name or IP address in the top search box to search for the corresponding contacts that have been added, or they can add contacts by clicking on the right side of the search box. The added contacts can be dialed, edited, deleted, etc. using the buttons on the right side.

44.Supports classroom convening function: In the interactive interface, the main classroom can directly convene the classroom terminals that have participated in the classroom interaction with one click, without the need for additional configuration, which is convenient and fast.

45.Support permission control function: In interactive mode, the lecturer in the main classroom can set the opening and closing of the terminal screen and sound in the listening classroom, and can set the screen layout of the interactive screen.

46.Support dual-screen dual-display function: In audio and video interactive mode, HDMI output of the main venue and branch venue's images can be realized. When auxiliary stream sharing is enabled in the main venue, the HDMI interfaces of the main venue and branch venue both output the computer courseware content of the main venue; when auxiliary stream sharing is not enabled in the main venue, the HDMI interface of the main venue outputs the computer courseware content of the main venue, and the HDMI interface of the branch venue outputs the computer courseware content of the branch venue.

47.It supports docking with the multimedia control unit (MCU) to enable interaction with 50 recording and broadcasting controllers. It supports multiple screen layouts, can display 16 channels of screen at the same time, and can automatically poll interactive character screens.

48.Dial-up call: supports dial-up function, and audio and video interactive function can be realized by entering the interactive terminal IP.

49.Supports customized interactive frame rate, bit rate function, dynamic or static encoding to ensure smooth interactive audio and video under various network conditions.

50.Supports the standard SIP protocol and can achieve audio and video interaction with standard SIP terminals, supporting 1080p@30fps high-definition video interaction.

51.IV. AI tracking function:

52.Built-in tracking strategy algorithm, no need to configure additional tracking analysis controller. Supports free switching of tracking strategies to meet the needs of different tracking scenarios.

53.Supports free setting of teacher image tracking screen mode, and setting the size of teacher tracking screen according to actual needs.

54.It supports setting the tracking lock release time. When the locked teacher leaves the screen tracking area, the person lock will be automatically released after the tracking lock release time is reached, and the system will return to the default state, waiting for the next person to enter the screen to start re-locking and tracking.

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55.Supports setting tracking shielding areas, such as actively shielding teacher observation areas, window curtains, classroom doors, large-screen LCD TVs and other places that are easy to interfere with the tracking effect. The system will not perform image analysis and tracking operations on the shielded areas to avoid these places interfering with the overall tracking effect.

56.Student tracking supports locking the tracking object and multiple people appearing in the shooting screen, switching to a panoramic screen.

57.Teacher tracking supports height adaptation function. After setting the close-up size, the system automatically identifies the teacher's height and centers the character in the picture.

58.It supports full-camera tracking of the teacher, always keeping the person in the center of the shot, achieving a stable tracking method without switching.

59.V. Teaching Behavior Analysis

60.Host-based student behavior analysis: Only a recording host and camera are needed to analyze, capture, and statistically analyze student behavior during the learning process. Key actions such as discussion, reading, demonstration, practice, and listening are analyzed to generate data analysis reports.

61.Host-based analysis of student classroom performance: This includes student participation, head-up rate, head-down rate, concentration level, periods of distraction, and periods of focus.

62.Host-based AI-supported real-time recording of classroom interactions, analysis of student-teacher behavior ratios, and analysis of the teaching mode for each lesson, including lecture-based, practice-based, dialogue-based, and blended learning, generating S-T and RT-CH diagrams.

63.Host-based teaching behavior analysis: Only a recording host and camera are needed to analyze teacher lecturing, student guidance, blackboard writing, teacher-student interaction, and teacher roving behavior.

Specification

AI computing power	6TOPS
Storage Space	2TB
Power supply	DC 24V/3A
Power consumption	45W
Panel buttons	1×switch button, 4×function buttons
Software reset function	Support factory reset
Indicator lights	3×LED, system operation, hard disk failure and recording indicator
Video protocol	H.264, H.265
Bit stream	256Kbps~20Mbps
Video output format	Support MP4/MOV/MKV/FLV/AVI/TS
Audio protocol	AAC, PCM, G711A, G711U, ADPCM
Live broadcast protocol	Support TS, RTSP and RTMP real-time protocol streaming
Network protocol	Support TCP, UDP, RTMP, RTSP, FTP, DHCP, HTTP protocols
Split-screen capability	Single screen, picture-in-picture, 2/3/4/6 screens
Input resolution	3840x2160@30fps, 2560*1600@60fps, 2560*1440@60fps, 2048*1152@60fps, 192 0*1200@60fps, 1920x1080@60/50/30/25fps, 1680*1050@60fps, 1280*720@60fps
Output resolution	3840x2160@30fps, 1920x1080@60/50/30fps, 1280*720@60fps
Network port	1 Gigabit network interface, 1 optical fiber network port
USB interface	5-channel USB interface, support mouse/U disk/director switch/keyboard
Control interface	3 RS-232 interfaces, 1 RS-485 interface
Video input interface	4-channel SDI video input interface, 2-channel HDMI video input interface, 1-channel Type-C video input interface
Video output interface	4-channel HDMI video output interface
Audio input interface	1-channel 3.5mm audio input interface, 2-channel Phoenix terminal audio input interface
Audio output interface	1-channel 3.5mm audio output interface, 2-channel Phoenix terminal audio output interface
Operating temperature	-10℃-55℃ (ambient temperature under good ventilation conditions)
Relative humidity of working environment	20%~80% relative humidity, no condensation
Dimensions (L x D x H)	482.6×272.7×56.5mm
Weight	4.2kg