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|-----|-----------|---|------------|----------|
| A02 | D00056420 | Adding the software function descriptions | 2018-12-17 | Xu Lin |
| A01 | D00029319 | First Release | 2016-07-14 | Shu Rong |
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HD-500 Series Image Processor Technical Specifications



SonoScape Medical Corp.

1. General Descriptions

The HD-500 series image processor adopts the advanced technology to provide high-quality image for the endoscopic diagnosis and treatment.

The built-in workstation of the image processor is used to edit, manage and store medical records and print reports. It can well communicate with the network information system of a hospital.

System maintenance and upgrade, and performance enhancement can be completed by updating software, thus to improve product value.

The image processor complies with the international and national standards.

2. Advanced Technologies

- High-definition video imaging
- Full-digital image processing

- Image denoise and enhancement
- CHb pseudo-color display
- Automatic equalization of brightness
- Hot plugging of the endoscope
- Capacitor touch control
- Intelligent medical record management
- Endoscope identification
- Multi-spectral imaging VIST

3. Ports

- Endoscope signal input port
- Video output port:
 - DVI port (1)
 - VGA port (1)
 - S-Video port (1)
 - CVBS port (1)
 - SDI port (1)
 - HDMI(1)
 - HD-SD(1)
- High-definition video signal (DVI, SDI, VGA); the resolution of the output image is no less than 1920×1080

- Video print control port
- Footswitch port
- Gigabit Ethernet network port (IEEE 802.3)
- USB ports (4)
- RS232 ports (2)
- Light source communication port
- Grounding terminal
- Power supply port

4. Specifications

- Multi-spectral imaging VIST (used with the HDL-500X light source)
 - Function: used with the optical dyeing and electronic dyeing, the VIST can enhance the vessel contrast without brightness loss.
 - Triggering: press the **VIST** button on the keyboard, remote buttons/ footswitch (define the VIST features in advance) or press the **Filter** button

on the light source.

- Hot plugging of the endoscope
- White balance memory
- Automatic white balance
- Structural enhancement
 - The structural enhancement includes structural enhancement A and structural enhancement B.
 - The structural enhancement A enhances the vessel networks and the structural enhancement B enhances the micro-vessel network.
 - There are three modes (1-3) and the enhancement level of each mode is 0-8.
- Edge enhancement

There are three enhancement mode (1-3) and the enhancement level of each mode is 0-8.
- Color tone adjustment
 - Red: -8 - +8

- Blue: -8 - +8
- Saturation: -8 - +8
- Color enhancement

There are three enhancement mode (1-3) and the enhancement level of each mode is 0-8.
- IRIS
 - Automatic mode
 - Peak mode
 - Average mode
- Zoom: $\times 1$, $\times 1.4$, $\times 1.6$, $\times 1.8$
- Image freeze/ storage
 - Real time image freeze
 - Methods: the remote button, keyboard or footswitch
 - PBP functions: the image position and size can be adjusted.
- Display mode: standard/ full-screen
- CHb pseudo-color image display: on/off
- Local video recording and playback
- Endoscopic image and text reporting system

- Patient list management: bodymark marking, report templates with different typesettings , common diagnosis glossary, customizable diagnosis glossary and report headline, editable report content, report searching, selectable report fields, report preview, image video and report exporting
- The image can be acquired, archived, transmitted, displayed, searched and is compatible with DICOM standard.

- Storage capacity: 500GB (standard configuration)
- Support system version update
- Output format
 - Standard definition: PAL, NTSC
 - High-definition: Full-HD, WUXGA

5. Main Screen

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| <ul style="list-style-type: none">• The patient information can be entered and modified on the main screen, including patient name (50 characters are allowed and the historical entered data can be memorized), age (range: 1-99), gender (male, female and blank), DoB, applicants (32 characters are allowed and the historical entered data can be memorized), ID (32 characters are allowed and the historical entered data can be memorized), exam number (the unique identification created by the system). More than 10000 patient information can be entered into the system.• The patient information can be displayed on the main screen, including patient name, age, gender and the DoB, applicant, ID, exam number can be added into or delete from the main screen.• Work modes display, including ten public modes (1-10) and private mode (P) | <ul style="list-style-type: none">• Zoom level display• Image enhancement value display• Color enhancement value display• Color tone adjustment value display• The video function status switch indications include AGC, VIST, light control, contrast, white balance and timer• Shortcut function icons displayed on the main screen: shortcut description, report edit, desktop change and desktop switch• The hospital name can be displayed on the main switch.• Videos can be recorded, saved and played.• Thumbnails of the saved image and recorded video can be displayed on the main screen and pages can be turned.• The four status of the main screen include displaying all items, displaying the video and main switch only, hiding the right frames or the left/right frames |
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- Main video resolution: 1280×960

6. System Settings

- Video parameters

- Resolution: 1920×1080, 1920×1200 and auto
- Video format: PAL, NTSC
- Synchronous output of high-definition signal: DVI, VGA
- Synchronous output of standard-definition signal: CVBS, S-Video
- The patient information, video parameters, system time, endoscope information, hospital name and manufacturer logo can be overlaid on the standard-definition signals.
- Two information layout styles can be selected.
- Examples of the two styles can be

reviewed.

- Selectable freeze time: 0.5, 1, 2, 3, 4, 5, 6, 7, 7, 8, 9 and non.
- PBP: open/close
- PBP position configuration: left up/down, right up/down
- PBP size selection: big or small
- Image format: jpg or bmp
- Video format: mkv or flv
- Check videos to print saved image
- Video printer: close, USB and GPIO+ Video
- Video printer drive type: auto
- Several printer drive is available and the drive can be imported.
- The white balance memory can be checked.
- Contour shape: round or octagonal

- General Settings

- The hospital name can be edited and

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| displayed on the main screen and report edit screen | German, Portuguese, Spanish and Russian |
| - Full-screen display: time, date and manufacturer logo. | - Build-in lithium cell with 3-year lifespan |
| - The hospital logo can be imported and displayed on the report. The image formats include jpg, bmp and png. | <ul style="list-style-type: none"> Contextual Settings <ul style="list-style-type: none"> The patient information can be automatically matched. The report printer includes:USB printer and network printer |
| - Time format settings: <ul style="list-style-type: none"> ➤ YYYY/MM/DD ➤ MM/DD/YYYY ➤ DD/MM/YYYY ➤ YYYY/MM/DD | - Paper size: A4 (210mm×297mm) and Carta (216mm×279mm) |
| - Specific date/time setting | - The printer drive type can be set. |
| - 65 time zones can be selected. | - The printer drive type can be imported. |
| - The time service IP can be set. | - Set the network printer IP can be set and the network printer within the local area network can be researched. |
| - Time synchronous with the time service IP. | - The printer parameters can be set, including brightness and Gama (setting the visibility of the user service authority) |
| - Enable the time synchronous when powering on the device. | |
| - Languages: Chinese, English, French, | |

- The local IP can be set.
- The local Mac address can be viewed.
- DICOM settings
 - Basic setting
 - Station name
 - Local AE title
 - Timeout
 - Port
 - Storage settings
 - Enable the storage server features.
 - Upload image once it is saved
 - Server name
 - Server IP
 - Port
 - AE title
 - Commitment Storage
 - Enable the commitment storage
 - Server name
 - Server IP
 - Port

- AE title
- Worklist
 - Enable the Worklist
 - Server name
 - Server IP
 - Port
 - AE title
 - Maximum results
 - Step description
- MPPS
 - Enable the MPPS
 - Server name
 - Server IP
 - Port
 - AE title

7. Mode settings

- Modes include ten public modes and a private mode that can be bound with the account.

- Image enhancement includes edge, structural A and structural B.
- Structural enhancement includes three adjustable modes and the adjusting range is 0-8.
- Edge enhancement includes three adjustable modes and the adjusting range is 0-8.
- Color enhancement includes three adjustable modes and the adjusting range is 0-8.
- Color tone (R/B/C) adjustment range is -8 - +8
- ZOOM includes three modes and the adjustment ranges are level $\times 1$, level $\times 1.4$, level $\times 1.6$ and level $\times 1.8$.
- The customizable functions of the four remote buttons include freeze, zoom, VIST, IRIS, image enhancement, color enhancement, CHb, transparent, contrast, AGC, image size, screenshot, video print, record, timer, PBP, information display and

fast export and upload

- The functions of the left and right button can be customized by the footswitch and the customizable functions include freeze, zoom, VIST, IRIS, image enhancement, color enhancement, CHb, transparent, contrast, AGC, image size, screenshot, video print, record, timer, PBP, information display and fast export and upload
- IRIS methods: auto, average, peak
- The parameter of the present image can be saved automatically.
- Contrast: low/ medium/high

8. Work Order List

- More than 10000 work orders can be created and saved in to the work order list.
- The work order list can be selected according to the exam items.
- The information in the work order list can be

re-edited, conducted or delete directly.

- The work list information can be displayed or hidden.
- Information in the work order list includes patient name, gender, age, ID, applicant, pre-exam date and status
- The work order list can be sorted according to the table title.
- The table title on the work order list can be displayed or hidden.
- The work order list can be searched according to name, gender, age, ID, applicant and application time.
- The total number of the work order can be displayed below the work order list.
- View the DICOM queue
 - All datum in the DOCIM queue list can be sorted according to descending or ascending order by clicking the table title.

- The DICOM queue can be searched through the patient name, ID, date, type and status.
- The search condition can be reset.
- The datum in the DICOM queue can be refreshed.
- Resend the datum selected in the DICOM queue if failed to send it to the DICOM queue.

- The Worklist inquiry conditions, including name, examination device, ID, accession number and pre-exam date can be set.
- Fields in the work order list can be displayed or hidden.
- The work order list includes patient information and exam information.

9. Patient List

- The patient lists can be selected according to the examination items.

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| <ul style="list-style-type: none">• The patient list information can be viewed, including video, image and report.• Reports for each patient list can be generate.• The patient information, diagnosis images, view of exam, exam conclusion and biopsy site are included in the report.• The specific video, images and reports can be viewed.• The image can be viewed and marked, and the marker types include dot, lower/upper-right arrows and lower/upper-left arrows.• The exam can be canceled.• The patient list can be exported.• The image and report of the patient list can be uploaded.• The patient list can be searched according to the following conditions: name, ID, doctor, status and exam date.• The patient list can be deleted. | <ul style="list-style-type: none">• The information in the patient list are name, ID, exam date, doctor, endoscope mode, status and exam number.• The patient list statuses include printed, uploaded, examined and diagnosed.• The patient information is sorted according to patient name, ID, exam date, doctor, endoscope model, status and exam number.• View the DICOM queue<ul style="list-style-type: none">- All datum in the DOCIM queue list can be sorted according to descending or ascending order by clicking the table title.- The DICOM queue can be searched through the patient name, ID, date, type and status.- The search condition can be reset.- The datum in the DICOM queue can be refreshed.- Resend the datum selected in the |
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DICOM queue if failed to send it to the DICOM queue.

- Report edit:

- The patient information can be edited.
- The report and image can be edited.(At most 10 images can be stored.)
- Bodymarks and organ names can be added into the report images in the.
- The exam type can be selected according to the present exam.
- The view of exam, exam conclusion, biopsy site and suggestions can be edited.
- Select items from the glossary directly and fill them into the view of exam and exam conclusion.
- The items in the glossary can be edited.
- The operations for the glossary

include switching items, adding, editing, copying and deleting.

- The exam items in the report can be switched.
- The presently edited view of exam and exam conclusions can be saved into the glossary as new items.
- Several report templates can be selected: 1P-1×4, 1P-2×2, 1P-2×3, 1P-4×1 and general.
- The report fields can be set.
- Individualized titles can be set in the report template.
- The report preview page has 22 page scales.

10. Doctor List

- One hundred accounts can be created into the doctor list.
- Custom operations of the doctor list differ

according to different account limitations:

the admin account includes add, edit, delete, and login mode, and the doctor account includes edit and view.

- The doctor name, job ID, and title (including resident physician, physician, vice doctor and director physician), account and password, and customizable private mode (used for load private parameter settings when logging in the account) can be identified in a new account.
- The doctor list includes: job ID, name, title and account.
- The order of the doctor list datum is job ID, name, title and account.
- Custom login methods include auto and account, and the account logging has drop-down list and can also enter contents.

11. View the Endoscope Information

- The endoscope specifications can be viewed, including the endoscope mode, inner diameter of the instrument channel, outer diameter of the distal end, insertion tube outer diameter, biopsy entrance position icon and the endoscope specifications icons consist of all the first four items.
- The endoscope information can be viewed, including the date of manufacturer, endoscope series number, and using time.
- The custom information can be viewed, including the contract number and annotations.

12. Custom Service Interface

- This system can manage and control the prototypes, including the image processor management and control, as well as the assorted endoscope management and control.

- The image processor management and control includes time and endoscope match management and control.
- The endoscope control includes the endoscope using time and assorted processor management and control.
- The system can be upgraded by USB.
- The video can be imported and looped.
- The QR code including the device and manufacturer information can be displayed.
- Data restore function
- One-key restore function
- The assorted light source information can be displayed, including the series number, present main lamp service time and service time of all main lamps.
- The endoscope series number and using time can be viewed.
- The image processor series number, the rest space, video record time and picture storage

number can be viewed.

13. Applications

The image processor can be used with the endoscope manufactured by SonoScape. It is used to process endoscopic image in clinical diagnosis and supply power to the endoscope.

14. Size & Weight of the Image

Processor

- Size: 455mm × 370mm × 124mm(L×W×H)
- Weight: 9.5kg (approx.)

15. Monitor (Optional)

- LCD monitor: 24 inch color display
- Resolution: 1920×1080/1920×1200
- Video input port: S-Video (1), CVBS (1), VGA (1), DVI (1), SDI (1)
- Video output port: DVI (1), SDI (1)

16. Compatible Equipment

- Light source: HDL-500X/HDL-500E
- Endoscope: 500 series endoscopes
 - EG-500 series video gastroscope
(EG-500/EG-500L)
 - EC-500 series video colonoscope
(EC-500/EC-500T/
EC-500L/EC-500L/T)
 - EB-500 video bronchoscope
 - ENL-500 video rhinolaryngoscope

17. Safety Standards

- IEC 60601-1:2005+A1:2012
- IEC 60601-2-18:2009
- IEC 60601-1-2: 2014

18. Environment Requirements

- Operation Environment
 - Temperature: 0°C - +40°C
 - Relative humidity: 30% - 80%

- Atmosphere pressure: 700 hPa - 1060 hPa

• Storage Environment

- Temperature: -5°C - +40°C
- Relative humidity: 30% - 80%
- Atmosphere pressure: 700 hPa - 1060 hPa

• Transportation Environment

- Temperature: -20°C - +55°C
- Relative humidity: 20% - 90%
- Atmosphere pressure: 700 hPa - 1060 hPa

• Safety Types

- Type of protection against electric shock: Class I equipment
- Degree of protection against electric shock: Type BF applied part
- Power Supply Requirements
- Input voltage: AC 100V - 240V, 50/60Hz

NOTE:

- The specifications of this product may change without any prior notification.
- Some products or features may not be available in some countries.
- Please contact your local SonoScape sales representative for more information.

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