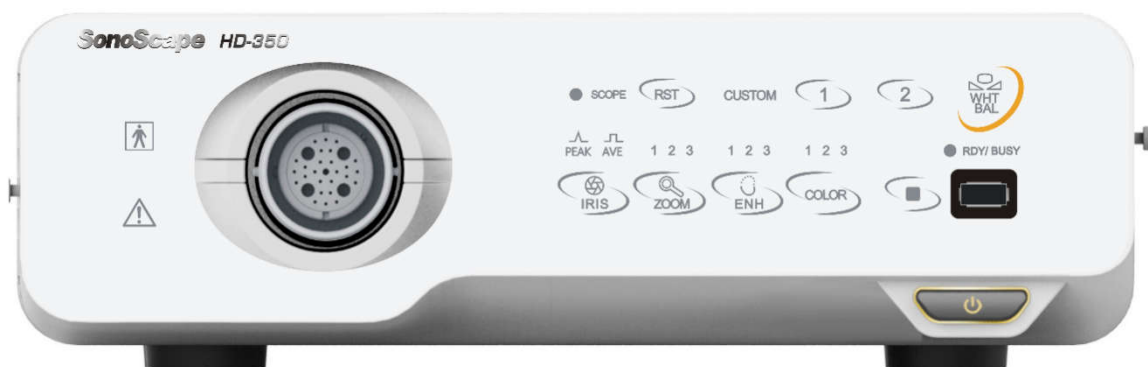


REV	ECN	Revision History		Date	Editor
A02	D00059410	1. Add software function description. 2. Delete the 500 series endoscopes. 3. Update the manufacture address.		2019-06-24	Xu Lin
A01	D00038418	First Release		2017-06-29	Kang Jiajun
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HD-350 Series Image Processor

Technical Specifications



SonoScape

SonoScape Medical Corp.

1 Overview

The HD-350 series image processor (including HD-350, HD-320Plus and HD-350S) adopts the advanced technologies to provide high-quality endoscopic images and videos for diagnosis and treatment.

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

The image processor can be maintained and upgraded by updating software to improve product performance.

The image processor is designed to comply with applicable international standards and regulations.

2 Advanced Technologies

- High-definition video and imaging
- Full digital image processing
- Image denoise and enhancement
- Color enhancement

- Automatic equalization of brightness
- Hot plugging of the endoscope
- Capacitor touch control
- Intelligent medical record management
- Endoscope identification

3 Ports

- Connector port (1)
- Video output port:
 - Digital signal:
 - DVI (1)
 - SDI (1)
 - Analog signal:
 - S-Video (1)
 - CVBS (1)
 - VGA (1)
- Remote video print control port (1)
- Footswitch port (1)
- Gigabit Ethernet port (IEEE 802.3) (1)
- USB ports (4)
- Light source communication port (1)
- Equipotential terminal (1)
- Power supply port (1)

4 Specifications

- Resolution:

- Resolution of the output high definition

video: $\geq 1920 \times 1080$ (1080P)

- Resolution of the effective video area: $\geq 960 \times 720$

- 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

routine structures and the structural

enhancement B enhances micro

structures.

- There are three modes (1–3) and the

enhancement levels of each mode

are 0–15.

- Edge enhancement

There are three enhancement modes (1–3)

and the enhancement levels of each mode

are 0–15.

- Color tone adjustment

- R (red): -15 – +15

- B (blue): -15 – +15

- C (chroma): -15 – +15

- Color enhancement

There are three enhancement modes (1–3)

and the enhancement levels of each mode

are 0–15.

- IRIS

- Automatic mode

- Peak mode

- Average mode

- Zoom

There are three zoom levels (1–3),

including $\times 1.0$, $\times 1.2$, $\times 1.4$, $\times 1.6$, $\times 1.8$,

and $\times 2.0$

- Image freeze/ storage

- Real time image freeze

- Methods: remote buttons, keyboard or footswitch

- PBP function: the image position and size can be adjusted.
- Display modes: standard/full-screen
- CHb: on/off
- Local video recording and playback
- Endoscopic image and text reporting system
 - Patient list management: report viewing, editing, saving, previewing printing and searching
 - Digital image management
 - The image can be acquired, archived, transmitted, displayed, searched and is compatible with the DICOM standard protocol (except the HD-350S image processor).
- Storage capacity: 500GB (standard configuration)
- Support system version update

- Output format
 - Standard definition: PAL, NTSC
 - High-definition: Full-HD, WUXGA

5 Main Screen

- 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 – 199), 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 and exam number can be added into or deleted from the main screen.

- Work modes display, including ten public modes (1–10) and one private mode (P)
- Zoom level display
- Image enhancement value display
- Color enhancement value display
- Color tone adjustment value display
- The switch indications for the video function status include AGC, light control, contrast, white balance and timer
- Shortcut function icons displayed on the main screen: shortcut description, report edit, screen change and screen switch
- The hospital name can be displayed on the main screen.
- Videos can be recorded, saved and played.
- Thumbnails of the saved images and recorded videos can be displayed on the

main screen and pages can be turned.

- The four kinds of status displayed on the main screen include displaying all items, displaying the video and main switch only, hiding the right frame or hiding the left/right frame

6 System Settings

- Video parameters
 - Resolution: 1920 × 1080, 1920 × 1200 and auto
 - Video format: PAL and NTSC
 - Synchronous output of high-definition signal and standard-definition signal
 - The patient information, video parameters, exam time, doctors, endoscope information, hospital name and manufacturer logo can be overlaid on the standard-definition signals. Two information layout

styles can be selected and examples

of the two styles can be viewed.

- The freeze time can be selected, including: 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9 and Inf.
- PBP: open/close
- PBP position configuration: left up/down.
- PBP size selection: big or small
- Image format: jpg or bmp
- Video format: mkv or flv
- Saved printed image
- Video printer: close, USB and GPIO + Video
- The video printer drive type can be set.
- Several printer drives are available and the drives can be imported.
- The white balance memory can be checked.

- Contour shape: round or octagonal

- General Settings

- The hospital name can be edited and displayed on the main screen and report edit screen
- Full-screen display: time, date and manufacturer logo.
- The hospital logo can be imported and displayed on the report. The image formats include jpg, bmp and png.
- Time format settings:
 - YYYY/MM/DD
 - MM/DD/YYYY
 - DD/MM/YYYY
 - YYYY/MM/DD
- Specific date/time setting
- 65 time zones can be selected.
- The time service IP can be set.
- Time synchronous with the time

service IP

area network can be searched.

- The time synchronous can be enabled when powering on the device.

- The printer parameters can be set, including brightness, Gama and image optimizing (setting the visibility of the user service authority)

- Languages: Chinese, English, French, Portuguese, Spanish, Russian, Polish and Korean

- The local IP can be set.

- Build-in lithium cell with 3-year service time

- The local Mac address can be viewed.

- Contextual Settings

- The patient information can be automatically matched.
- The report printer includes USB printer and network printer
- Paper size: A4 (210mm × 297mm) and Carta (216mm × 279mm)
- The printer drive type can be set.
- The printer drive type can be imported.
- The network printer within the local

- DICOM Settings (Not supported in the HD-350S image processor)

- Basic setting
 - Station name
 - Local AE title
 - Timeout
 - Port
- Storage settings
 - The storage server features can be enabled.
 - The saved image uploading

- feature can be checked.
- Server name
- Server IP
- Port
- AE title
- Commitment storage
 - The commitment storage feature can be enabled.
 - Server name
 - Server IP
 - Port
 - AE title
- Worklist
 - The Worklist feature can be enabled.
 - Server name
 - Server IP
 - Port
 - AE title
 - Maximum results

➤ Requested Procedure

Description

– MPPS

➤ The MPPS feature can be enabled.

➤ 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 ranges are 0 – 15.
- Edge enhancement includes three adjustable modes and the adjusting ranges

are 0 – 15.

- Color enhancement includes three adjustable modes and the adjusting ranges are 0 – 15.

- Color tone (R/B/C) adjustment ranges are -15 – +15

- Zoom includes three modes and the adjustment ranges include $\times 1.0$, $\times 1.2$, $\times 1.4$, $\times 1.6$, $\times 1.8$ and $\times 2.0$.

- The customizable functions of the four remote buttons include freeze, zoom, IRIS, image enhancement, color enhancement, CHb, transillumination mode, contrast, AGC, image size, screenshot, video print, record, timer, PBP, information display, fast export and fast upload.

- The functions of the left and right buttons can be customized by the footswitch and the customizable functions include freeze, zoom, IRIS, image enhancement, color

enhancement, CHb, transillumination

mode, contrast, AGC, image size,

screenshot, video print, record, timer, PBP,

information display and fast export and

fast upload.

- IRIS methods: auto, average, peak

- The parameters of the present images can be saved automatically.

- Contrast levels: low/medium/high

8 Work Order List

- More than 10000 work orders can be created and saved into the work order list.
- The work order list can be selected according to exam items.
- The information in the work order list can be re-edited, conducted or deleted 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, application time and accession number.
- The total number of the work order can be displayed below the work order list.
- The DICOM queue can be viewed.
 - The 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.
- The datum selected in the DICOM queue can be resent if failed to send it to the DICOM queue.
- The Worklist inquiry conditions can be set, including name, examination device, ID, accession number and pre-exam date.
- 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 list can be selected according to the examination items.
- 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.
- The information in the patient list are name, ID, exam date, doctor, endoscope model, status and exam number.
- The patient list statuses include printed, uploaded, examining, examined, diagnosed, revoking examination and printed & uploaded.
- The patient information is sorted according to patient name, ID, exam date, doctor, endoscope model, status and exam number.
- The DICOM queue can be viewed.
 - The 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 conditions can be reset.
 - The datum in the DICOM queue can be refreshed.
 - The datum selected in the DICOM

queue can be resent if failed to send it to the DICOM queue.

- Report edit (available only in the HD-350 image processor)

- The patient information can be edited.
- The reports and images can be edited and at most 10 images can be stored.
- Bodymarks and organ names can be added into the report images.
- The view of exam, exam conclusion, biopsy site and suggestions can be edited.
- The items can be selected directly from the glossary and filled 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.
- Customer 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.
- Customer 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 model, inner diameter of the instrument channel, outer diameter of the distal end, outer diameter of the insertion tube, biopsy entrance position icon, work length, endoscope type and the endoscope specifications icons consist of all the first four items.
- The endoscope information can be viewed, including the date of manufacturer (available only with the factory permission), adaptive image processor (available only with the customer service permission and its upper permissions) endoscope series number, and using time.
- The customer information can be viewed, including the contract number and annotations.

12 Customer 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 can be displayed, including the device and manufacturer information.
- 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.
- CVBS adjustment function
- Log backup and viewing functions
- AHS algorithm enabling
- QR code enabling
- Saving of the image-save algorithm status
- DICOM adjustment log viewing function

13 Applications

The image processor is used with the endoscope manufactured by the manufacturer. It is used to process endoscopic images for clinical diagnosis and supply power for the endoscope.

14 Size& Weight

- Size: 455 mm (L) × 370mm (W) ×

124mm (H)

- Weight: approx. 9.5 kg

15 Monitor

- DSS-22W (standard configuration)
 - Size: 21.5-inch color display LCD
 - Resolution: 1920×1080
 - Video input port:
 - S-Video (1)
 - CVBS (1)
 - VGA (1)
 - DVI (1)
 - SDI (1)
 - Video output port: SDI (1)
- DSS-24W (Optional)
 - Size: 24-inch color display LCD
 - Resolution: 1920×1200@60HZ
 - Video input port:
 - S-Video (1)
 - Video (1)
 - VGA (1)
 - DVI (1)
 - SDI (1)
 - Video output port: DVI (1) and SDI (1)

16 Compatible Equipment

- Light source: HDL-35E
- Endoscopes: EG-430 series gastroscope and EC-430 series colonoscope
- Trolley: HDT-330

17 Safety Standards

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

18 Environment Requirements

- Operation environments
 - Temperature: 0°C - +40°C
 - Relative humidity: 30% - 80% (non-condensing)
 - Atmospheric pressure: 700 hPa - 1060 hPa
- Storage environments
 - Temperature: -5°C - +40°C
 - Relative humidity: 30% - 80% (non-condensing)
 - Atmospheric pressure: 700 hPa - 1060 hPa
- Transportation environments

- Temperature: -20°C - +55°C
- Relative humidity: 20% - 90%
(non-condensing)
- Atmospheric 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
 - Input power: 160 VA

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 the local distributor for more information.

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