DS-AS180HD

FULL HD 1080P INTEGRATED ENDOSCOPY SYSTEM

OPERATING   MANUAL

-Preface

Welcome to the intelligent world of endoscopy surgery solution!

Your smart choice now brings you an excellent performance, inexpensive and portable endoscopic imaging system - DS-AS180HD. It is a system with all necessary device for endoscopic diagnosis and surgeon, include 4 functional components:

❶ **Endoscopy camera**:   Full HD (1920×1080P)

❷ **LED Light source**:   long life LED light source provide just right light for endoscopy

❸ **Monitor**:   Full HD 15.6 inch, medical grade,resolution is 1920*1080

❹ **USB/Video recorder**:   USB and recording real time endoscopy operation processing

Single Sony CMOS sensor chip is equipped as the image capture. The sensor and the lens system are designed to access a transparent imaging with the assistance of built-in LED light source. Stable CPU s based micro controller is employed as the control core for the image processing and transmission module, display module, recording module and other modules. The image is displayed on an 15.6 inch LCD screen with 1920×1080 resolution, medical grade.

DS-AS180HD provides a full HD image enough for ENT Endoscopy, Urology, Arthroscope, Laparoscope, Gynecology and other endoscopic diagnosis   and surgeon, and of course can be used for veterinary, industrial application. And with integrated camera, light source, video display and recording function, it can also be used as a portable, miniature, convenience endoscopy solution.

-Technical specifications

Part 1)   Full HD camera system

Image Sensor	Single 1/3 inch Sony Cmos Sensor Chip
Resolution output	1080P*1920 FULL HD (16:9) (1080 TV lines)
Effective pixels	2,073,600 Pixels
Scanning System	Progressive Scan
Frame rate	60 FPS
While using external medical monitor for display image, the Frame rate would be Adjusted Automatically	
Camera Head Dimension	38W X 45H X 130D mm (Without optical adapter)
Camera Head weight	200 gram (Without optical adapter)
Optical adapter mounting	Standard C-mount or O-mount
Cable Length	3 meters
Camera head Sterilization	IPX 7
Camera Head Button	4 buttons

Part 2) 15.6 inch Full HD LCD Screen

Size	15.6 inch LCD Screen
Resolution	1920*1080P Full HD 16:9
Brightness	300+-1cd/m^2
Angle of View	170 degree(h/v)
Color	16.7 million colors
Image processor	Medical Grade (Endoscopic special)

Part 3) LED Cold light Source

Lamp	LED lamp
Power of lamp	40 watt
Illumination	2,000,000Lux
CRI	>= 92
Color Temperature	6000K+-1000K
Lamp lift	>= 50,000 hours

Part 4) Recording System

Recording Device	USB (Support any Capacity USB)
Recording Format	Video-MKV Image-DNP
Document Resolution	1920*1080 Full HD

-Symbol Definitions

In addition to the cautionary symbols already listed, other symbols found on the DS-AS180HD Camera and in this manual have specific meanings that clarify the proper use and storage of the DS-AS180HD Camera. The following list defines the symbols associated with this product:

	Type BF applied part		Equipotentiality
	Fuse rating		Read the manual before operation

 This symbol indicates that the waste of electrical and electronic equipment must   not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.

-Product Description and Setting Up

The DS-AS180HD   Endoscopy system is a high-definition camera used to capture and video images, displaying and recording of endoscopic surgical applications. The DS-AS180HD Endoscopy system consists of four main components:

- The system Console, camera, LED light source and monitor are integrated
- The Camera Head
- The C-Mount Coupler
- The LED light source

- *WARNING!*   **This device should be used by, or on the order of, a physician.**

***The System Console

The system console is the control center for the processes the video captured and being displayed on the monitor during the surgical procedure. The console front panel features some switches, where different menus can be accessed, including the controls for adjusting the light level, zoom, freeze and white balance, LED light source brightness adjusting, as well as allows the selection of surgical specialty settings that optimize camera performance for various, specific surgical procedures. The rear panel provides ports for connecting the DS-AS180HD to secondary viewing equipment, such as video monitors.
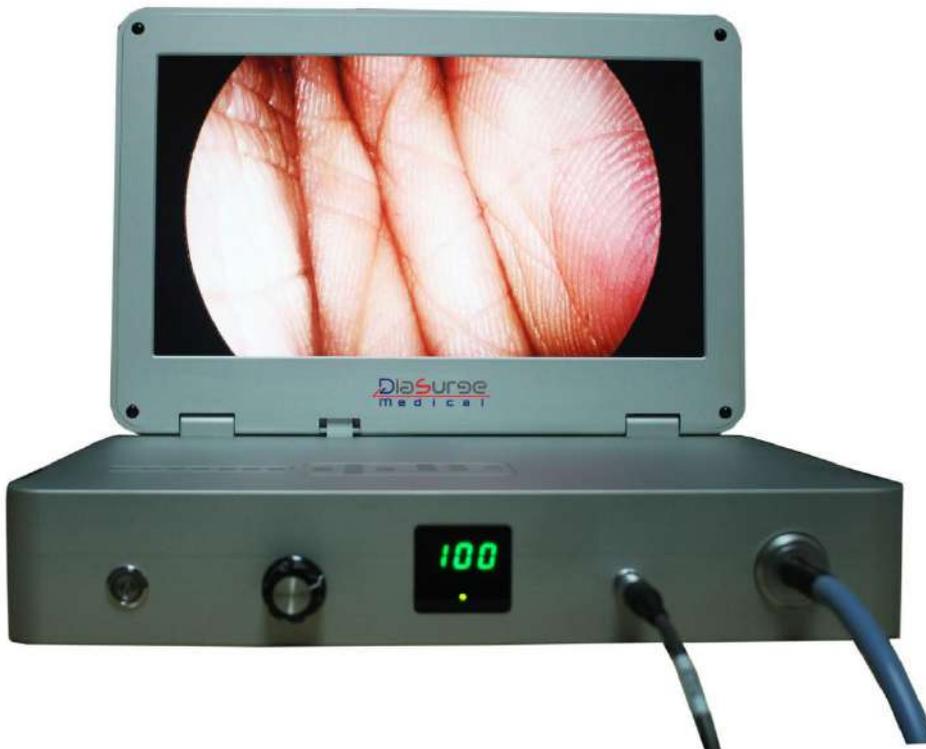
The front up and back panel   show the buttons and connectors function clearly as below:

Front Panel
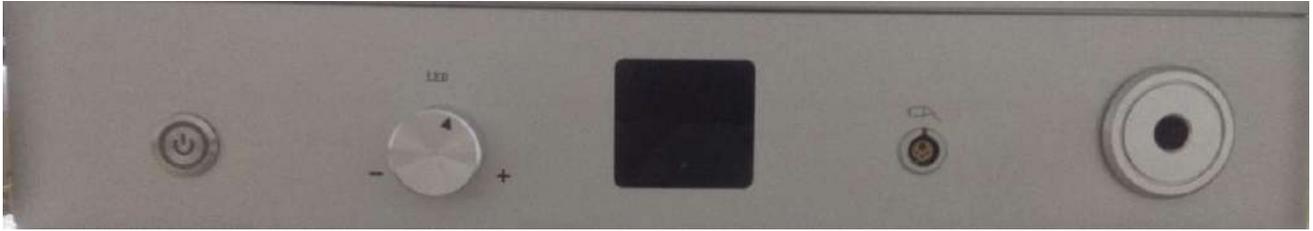
Up Panel
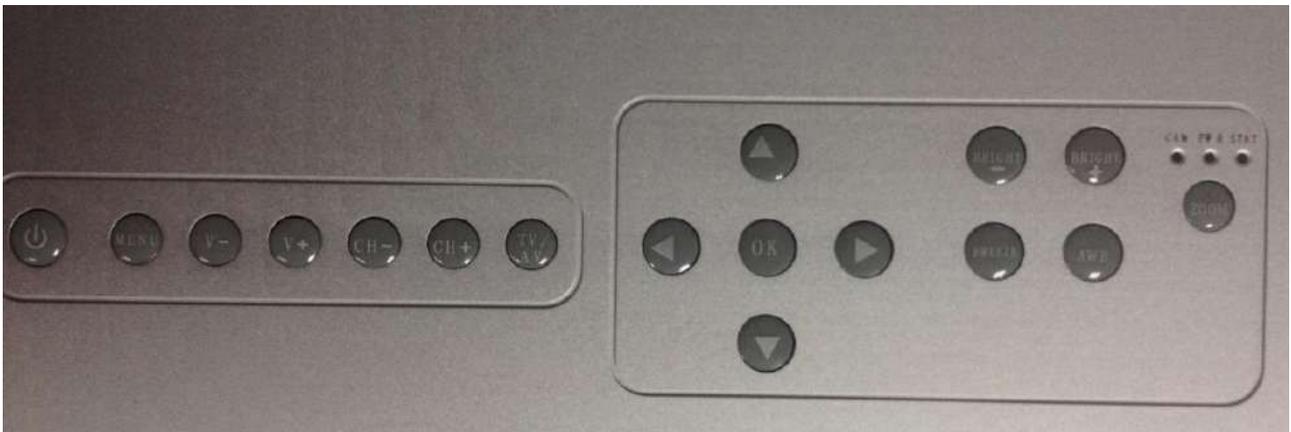
Back Panel
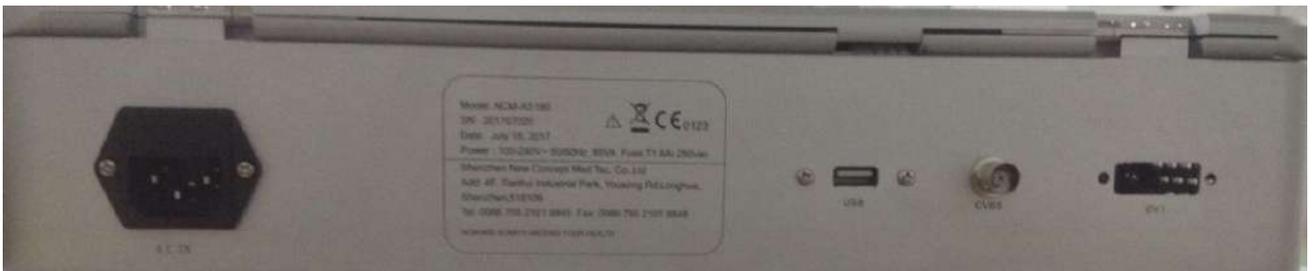
***The Camera Head

The cable end of camera head connects to camera head connector on the system console , which it relays to the camera console. It features controls that are accessible through a button keypad located on the top of the camera head (see the "Operating the DS-AS180HD " section of this manual).

***The C-Mount Coupler

The C-Mount coupler threads onto the face of the camera head, enabling a scope to be attached to the camera. It provides a focusing ring to adjust image sharpness. The features of the coupler are listed below.
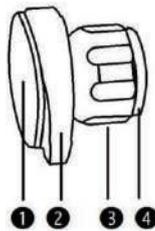
❶ **Scope End**: Receives the endoscope

❷ **Endobody Clamp**: Secures the scope to the coupler

❸ **Focusing Ring**: Adjusts the coupler focus

❹ **Camera End**: Threads onto the camera head

***Product Setting

***Setting   the Console

To set up the console, make the following connections:

1. Connect the AC power.

• Connect the AC power cord to the AC inlet on the rear console panel.

• Connect the other end to a hospital-grade outlet.

2. Connect the video output (If need a secondary monitor).

• The rear panel provides a HD digital-video outputs , which can be used to connect to a secondary monitor:

OUTPUT	CABLE
DVI-D	DVI - DVI or DVI-HDMI

Use the cables and outputs described above to connect the DS-AS180HD   to other operating-room equipment.

***Setting Up the Camera Head

Caution!   **Do not severely bend the camera cable, or damage may result.**

Caution!   **To unplug the camera from the console, <u>grasp the knobbed portion of the connector</u> and pull straight out.**

Connect the camera head to the console.

• Unscrew the soaking cap from the cable connector if necessary.

• Align the red point on the cable connector with the red point on the camera-connector port on the front panel.

• Push in the connector until it locks in place.

***Setting Up the Coupler

1. Attach the coupler to the camera head.

• Grasping the rear adapter, screw the coupler onto the camera head (clockwise) until it forms a tight seal.

> When attaching or removing the coupler,   grip only the rear adapter, as twisting other parts of the coupler may result in mechanical damage.

> Do not overtighten the coupler, as this may damage the front window of the camera.

> Do not overtighten a direct-coupled C-mount scope, as this may damage the front window of the camera.

2. Attach an endoscope to the coupler.

• Remove the dust cap of endoscope if it is present.

• Rotate the endobody clamp and insert the scope into the scope end of the coupler .

• Release the endobody clamp.

3. Attach a light cable from the light source to the light post on the endoscope.

***Setting Up the Light source connector

Connect the light source connector to the console.

• Unscrew the soaking cap from the cable connector if necessary.

• Align the red point on the cable connector with the red point on the light source-connector port on the front panel.

• Push in the connector until it locks in place.

-Operating the DS-AS180HD

***Using the Console Controls

Press the power switch on the console to power the system on or off.

The front control panel on the console provides controls for operating the system and system settings. Controls are located in a series of menus shown below and described hereafter.

CAMERA SECTION:

Using the White Balance button

The WHITE BALANCE (WB) switch is used to correct slight color differences that exist between every different surgery. Perform the white balance procedure before every surgical procedure.

1.   Point the scope at several stacked 4x4 white gauze pads, or any clean white surface.

2.   Look at the monitor and make sure that no glare is visible off of the white surface.

3.   Press the WHITE BALANCE (AWB) button

4.   Continue pointing the scope at the white surface until the video monitor indicates that white balance is"locked"(a lock symbol in the upper left corner of the screen), the video picture will change to the right color.

Using the FREEZE button

The FREEZE switch is used to temporary freeze the dynamic image. Perform the FREEZE when special inspection is needed.

1.   Press the FREEZE button for freezing the video image.
2.   Press again the button to cancel the freeze image and back to dynamic image.

Using the ZOOM Switch

The ZOOM switch supply a electronic zoom pattern for enlarging the endoscopy image.

1.   Place the observed area in the center of the screen

2.   Press the ZOOM switch, the observed area will be electronic enlarged from 1X to 10X, according to the number of times pressing on.

3.   The image will be back to original size after finished 10 times pressing.

Using the BRIGHT+/- Switch

The BRIGHT+/- Switch is used to increase or decrease the brightness of the image.

1.   Press BRIGHT + button to increase the image brightness

2.   Press BRIGHT - button to decrease the image brightness

Using the Configuration Menu

The Configuration Menu area on the console provides controls for selecting system settings of the camera.
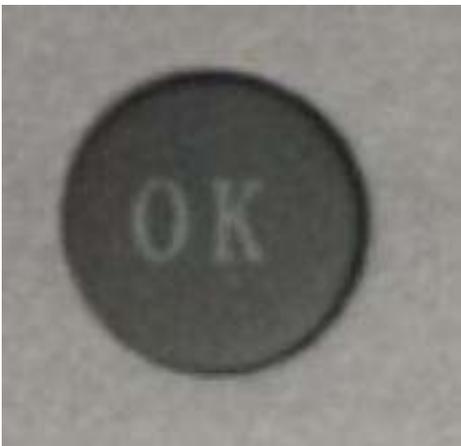
MENU switch have two function:

MENU function -- press to entering the Main Configuration Menu

ENTER function -- press to entering the submenu of specialty parameter of image

  Select the submenu

 adjust the parameter for improve the image quality or change setting

LIGHT SOURCE SECTION:
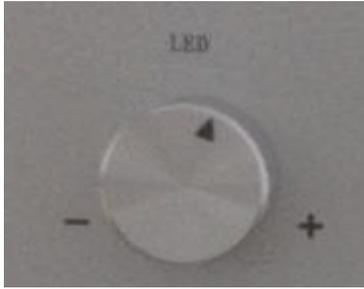
Rotate the Jog-dial knob to adjust the brightness of LED light source from 0% to 100% step-less.

VIDEO RECORDER SECTION:

Before video recording, plug the USB storage device into the USB storage USB port, <u>waiting for 20 seconds</u> for system self-testing, then recording function is available.

The recording system of DS-AS180HD is compatible with all storage device which have USB2.0 or 3.0 port, like U-disk, hard disk, SD card (with SD card reader)

Using the Camera Head Buttons
The camera head features two button keypad for controlling the DS-AS180HD . Shown below.

-Cleaning and Maintenance

The system console is not intended to come into contact with the patient. It may be cleaned, but not sterilized. The camera head and light connector may contact the patient and should both be cleaned and sterilized prior to every use.

***Cleaning the System Console

WARNING!   **Disconnect the console from the AC power source before cleaning.**

 Should the system console need cleaning, wipe it down with a sterile cloth and mild cleaning solution.

CAUTION!   **Never immerse or sterilize the camera console as this will damage the camera and void the warranty.**

***Reprocessing the Camera Head

Cleaning

WARNING! **The camera head and cable (without camera-head connector) must be cleaned and sterilized prior to the first use and after every subsequent use.**

1.   Immediately after use, unplug the camera-head connector from the console and protect it with the soaking cap. Place the cap (if have) over the connector until secure.

CAUTION! **Always install the soaking cap (if have) before rinsing the camera. Failure to properly tighten the soaking cap will corrode the connector pins and void the warranty. But we still suggest don't sock the connector with the cable if possible.**

2.   Rinse the camera head and cable(without connector) in lukewarm tap water. Use a mild enzymatic detergent and a soft brush to remove resistant debris and bio-burden from all surfaces.

3.   Rinse off all soap residue with water.

4.   Clean glass surfaces with alcohol.

5.   Dry the camera head and cable thoroughly with a soft towel or gauze surgical sponge.

6.   Prepare the camera head and cable for disinfection by coiling the camera cable into a loop about ten inches in diameter, avoiding any kinks or twists in the cable.

CAUTION! **Keep cable connector away from any water or any other liquid during cleaning.**

-Disinfecting & Sterilizing

CAUTION!   Before soaking, inspect the camera cable for cuts and breaks. Never soak a cut or a broken cable because moisture will seep into the camera head and cause damage. Return any camera with a damaged cable to our Repair Department for service (through your local sales representative).

Separate the camera head, coupler, and scope prior to disinfection. Refer to the coupler and scope product manuals for disinfection instructions.

To minimize galvanic corrosion, avoid soaking dissimilar metals in close proximity.

Avoid leaving the camera in sterilization solutions longer than necessary, as this will accelerate normal product aging. Camera life is extended by the consistent use of a single sterilization method.

If the coupler and camera head are sterilized as a single unit, disconnecting the coupler will compromise the sterility of the two products.

1. Clean and prepare the camera head and cable as recommended in the Cleaning section. Ensure the soaking cap is installed if have. Even so, as far as possible to avoid cable connector from socking.

2. Immerse the camera head and cable in glutaraldehyde solution or solution for disinfecting. Specifications for each are as follows:

  Soak time: 10 minutes minimum, as recommended by the sterilant manufacturer (24 hours maximum)

  Temperature: 25°C   (77°F)

3. After soaking, rinse the camera head and cable in sterile water, agitating them to remove all traces of glutaraldehyde solution.

4. Dry all parts thoroughly with a sterile towel.

Sterilize the camera head and cable with an ethylene oxide sterilization unit by 100% Ethylene Oxide Gas, according to the following parameters:

Temperature:	55°C (131°F)
Humidity:	70% RH±5%
Vacuum:	53.34 cmHg (21 inHg)
Preconditioning time:	60 minutes
Sterilant mixture:	100% ethylene oxide
Sterilant concentration:	600±5 mg/L ethylene oxide
Exposure time:	120 minutes (maximum 180 min.)
Aeration:	12 hours, 55°C

5.   Allow the camera head, cable, coupler, and scope to completely dry before reassembly.

Note   **Be sure the threads on the coupler are completely dry before reattaching the coupler to the camera head. Any moisture on the threads will cause the camera and coupler windows to fog during use.**

***Reprocessing the Light connector

All procedure are same as camera head

***Maintaining the DS-AS180HD

Replacing the Fuses

1. Unplug the power cord from the wall outlet and remove the cord from the camera console.

2. Unlatch the fuse holder above the AC inlet and remove it. (You may need to press the tab on the fuse holder with a slender screwdriver to release the latch.)

3. Replace the fuse with the same value and rating.

Warning!   **To avoid the risk of fire, only use fuses of the value specified on the fuse label located on the rear panel of the camera control unit.**

4. Re-install the fuse holder until the tab snaps in place.

Technical Specifications
Classification & Approvals
        Complies with medical safety standards:
        IEC 60601-1: 2005
        IEC 60601-2-18: 2007
        Complies with medical EMC standard:
        IEC 60601-1-2:2014
Class I Equipment
        Type BF Applied Part
        Water Ingress Protection, IPX0-Ordinary Equipment
        Continuous Operation

* see specification sheet for details of DS-AS180HD

***Service and Warranty

Diasurge medical warrants all products, subject to the exceptions provided herein, to be free from defects in design, materials and workmanship and to substantially conform to the product specifications contained in the documentation provided by Diasurge with the products for the period of one year from the date of purchase (the warranty period). This warranty shall apply only to the original end-user purchaser of products directly from Diasurge or a Diasurge authorized distributor. This warranty may not be transferred or assigned without the express written consent of Diasurge.

If a valid warranty claim is received within the warranty period, Diasurge will, in its sole discretion: (1) Repair the products at no charge. (2) Replace the product at no charge with a product that is at least functionally equivalent to the original product. (3) Refund the purchase price of the product. In an event, Diasurge's liability for breach of warranty shall be limited to the replacement value of the defective or non-confirming part or component.

This warranty does not apply to: (1) products that have been misused, neglected, modified, altered, adjusted and tampered with improperly installed or refurbished; (2) Products that have been repaired by any person other than Diasurge medical personnel without the prior written consent of Diasurge; (3) Products that have been subjected to unusual stress or have not been maintained in accordance with the instruments in the user manual or as demonstrated by a Diasurge representative; (4) Products on which any original serial numbers or other identification marks have been removed or destroyed; (5) Products that have been repaired with any unauthorized or non-Diasurge components including replacement lamps.

If Diasurge determines in its reasonable discretion that the claimed defect or non-conformance in the product is excluded from warranty coverage as described here under, it will notify the customer of such determination and will provide an estimate of the cost of repair of the product. In such an event, any repair would be performed at Diasurge's standard rates.

Products and product components repaired or replaced under this warranty continue to be warranted as described herein during the initial warranty period or, if the initial warranty period has expired by the time the product is repaired or replaced for thirty (30) days after delivery of the replaced or repaired product. When a product or component is replaced, the item provided in replacement will be the customer's property and the replaced item will be Diasurge's property. If a refund is provided by Diasurge, the product for which the refund is provided much be returned to Diasurge and will become Diasurge's property.

The inspection, testing, acceptance or use of the products and services furnished hereunder shall not affect Diasurge's obligation under this warranty and such warranty shall survive inspection, test, acceptance and use.

Notwithstanding the above, the following products are warranted for a period of ninety (90) days from the date of purchase: scopes, associated scope hardware, fiber optic cables, laparoscopic instruments, VCRs, monitors and printers; replacement light bulbs are warranted for a period of sixty (60) days from the date of purchase.

TO THE FULLEST EXTENT PERMITTED BY LAW, THE EXPRESS WARRANTY SET FORTH HEREIN IS THE ONLY WARRANTY APPLICABLE TO THE PRODUCTS AND IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTY BY DIASURGE, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. EXCEPT AS SPECIFICALLY PROVIDED IN THIS WARRANTY AND TO THE EXTENT PERMITTED
BY LAW, DIASURGE IS NOT RESPONSIBLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY.

For International service, call your local distributor or representative.

NOTE

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