Software Manual

HIS-5000U (Huvitz Imaging System)



Huvitz
Pacing Progress toward People

IMPORTANT NOTICE

WARNING

Potential electromagnetic or other interference between medical equipments and other devices being operated together in the same environmental may expert an adverse influence on functioning of the medical equipment. Non-medical equipments not in compliance with the requirements of EN 60601-1 and EN 60601-1-2 should not be used together in the same environmental as the medical equipments

This equipment has been tested and found to comply with the limits for medical devices in IEC 60601-1-2:2014 These limits are designed to provide reasonable protection against harmful interference in a typical medical installation

This product may malfunction due to electromagnetic waves caused by portable personal telephones, transceivers, radio-controlled toys, etc. Be sure to avoid having objects such as, which affect this product, brought near the product.

The information in this publication has been carefully checked and is believed to be entirely accurate at the time of publication. HUVITZ assumes no responsibility, however, for possible errors or omissions, or for any consequences resulting from the use of the information contained herein.

HUVITZ reserves the right to make changes in its products or product specifications at any time and without prior notice, and is not required to update this documentation to reflect such changes.

This manual is supplied with the CD (9000ENG0090-C)
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1 Introduction

1.1 Outline of the instrument

HIS-5000(U) (Huvitz Imaging System) is a digital imaging system for slit lamp applying high resolution digital camera and PC based imaging software to examine patient's eye, and manage slit lamp images with patient information. HIS-5000 package is composed of imaging software, C-mount typed camera module with CCD or CMOS camera, some accessories like IEEE-1394 or USB data link cable, auxiliary light cable, and a PCB board add-on for HS-5000 slit lamp developed by Huvitz.

HIS-5000U software supports networking function to share patient information and examination images between multiple PCs existing on the local network or internet via TCP/IP protocol. Also, this version use SQLite server solution as more reliable database, and includes additional HIS Server Management software to support to back up or restore patient and imaging data.

1.2 Classification

Class I

2 Safety Information

2.1 Introduction

Safety is everyone's responsibility. The safe use of this equipment is largely dependent upon the installer, user, operator, and maintainer. It is imperative that personnel study and become familiar with this entire manual before attempting to install use, clean, service or adjust this equipment and any associated accessories. It is paramount that the instructions contained in this manual are fully understood and followed to enhance safety to the patient and the user/operator. It is for this reason that the following safety notices have been placed appropriately within the text of this manual to highlight safety related information or information requiring special emphasis. All users, operators, and maintainers must be familiar with and pay particular attention to all Warnings and Cautions incorporated herein.

WARNING

"Warning" indicates the presence of a hazard that could result in severe personal injury, death or substantial property damage if ignored.

INFORMATION

"Information" describes information for the installation, operation, or maintenance of which is important but hazard related if ignored.

CAUTION

"Caution" indicates the presence of a hazard that could result in minor injury, or property damaged if ignored.

3 Features

- HIS-5000U software manages personal & examination information and eye images by database, and supports powerful search function by multiple conditions like diagnosis, disease, patient history, etc.

- Recent patient list implementing tree structured user interface shows the patients and their exams as a sequence of date or name in the time period. User can easily navigate among them, and choose one with interest

- High quality CCD or CMOS camera using progressive scan method lively shows the same view with eye pieces of slit lamp on the screen of PC monitor, it can be captured as frame image or recorded as movie file by the joystick button of slit lamp or imaging software. (depending on the model of the camera, the detailed specifications may vary.)

- HIS-5000U software implements variable image processing functions like changing Bright, Contrast, Color Channel, Saturation, Invert, Sharpen, Red-Free, etc., and saves or loads the image file as variable format, by Lead Tool graphic library engine, which supports advanced image processing with good performance.

- HIS-5000U software supports additional Image manipulation functions like comparison between selected eye images from the different examination dates, overlaying them using animation, making a reference image, etc., it helps user to fully utilize digital imaging system for effective examination.

- Special functions of HIS-5000U supports automatic report generation as a Microsoft Word format document importing patient & examination information and images, full screen display of the image for presentation, printing just by one click, etc.

- HIS-5000U software supports network database function to connect with another HIS-5000U system installed on the different PC via TCP/IP protocol, and load or save digital images with patient information from it. This enables to implement server-client model, so one PC having the highest performance and storage can manage all imaging files and database, the other PCs can access to it.

- HIS-5000U software package includes additional HIS Server Management tool to control HIS Server Windows service, and backup database records like patient or examination information and digital imaging files during the specific time period into simple archiving formatted file, then restore them into database.

- a warning that the ME EQUIPEMENT or ME SYSTEM should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the ME EQUIPMENT or ME SYSTEM should be observed to verify normal operation in the configuration to be used [IEC 60601-1-2:2007 Clause 5.2.2.1 d]

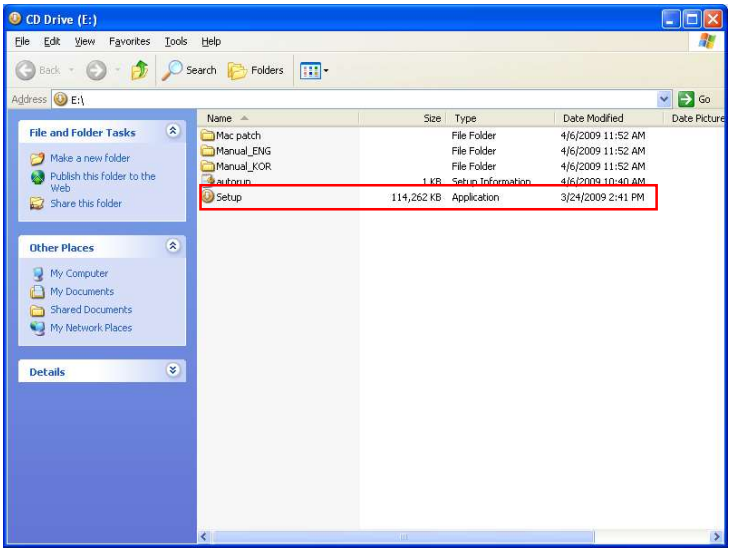
- the performance of the ME EQUIPEMENT or ME SYSTEM that was determined to be ESSENTIAL PERFORMANCE.

4 System Installation

4.1 Software Installation

Step 1. Running Setup program

HIS setup program will automatically start by auto-run when you insert the installation CD into CD-ROM on PC. If it doesn't work or is installing from local or network drive, open the installation folder and manually run Setup.exe.



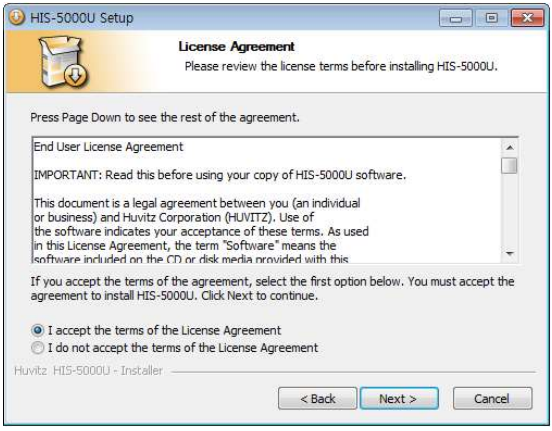
Step 2. Setup Program Window

Click ‘Next’ button.



Step 3. End User License Agreements

After reading End User License Agreement, click ‘I accept…’ option, and click ‘Next’ button.



Step 4. Choose Components

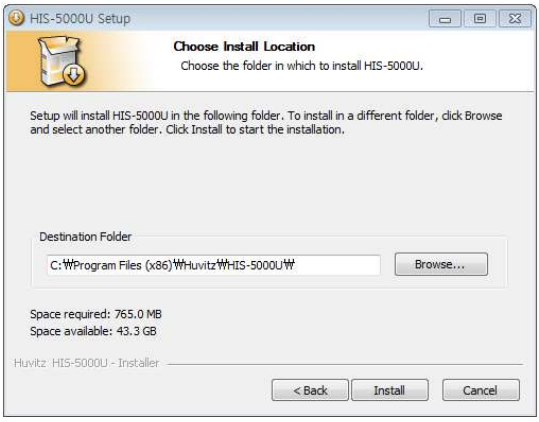
All components are checked as default, click 'Next' button.



Step 5. Choose Install Location

Select a folder to install HIS software. It will be 'C:\Program Files(x86)\Huvitz\HIS-5000 U' as default.

If you want to change the installation folder, click 'Browse' button and choose any folder in the dialog box. Click 'Install' button to start.

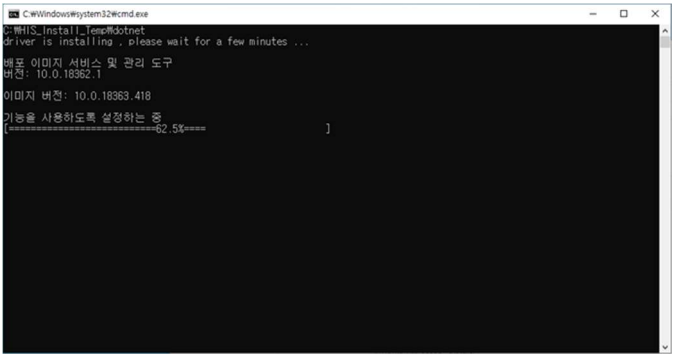


Step 6. Install Visual C++ Runtime Redistribution Packages

Install runtime components of Visual C++ Libraries required to run HIS software. If already installed, this process will be skipped.

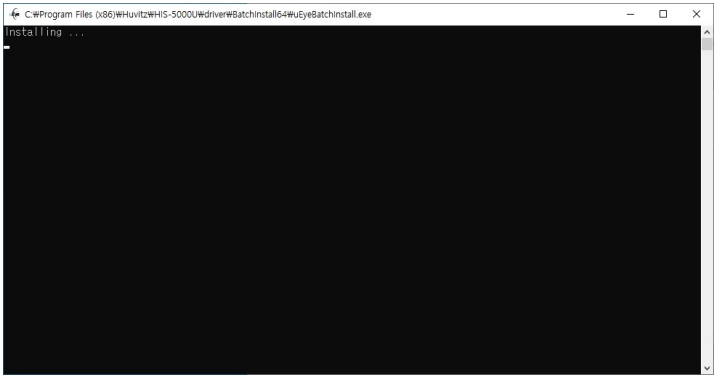
Step 7. Install Microsoft .Net Framework 3.5

Install Microsoft .Net Framework Version 3.5 required to run HIS software. If already installed, this process will be quit quickly. If ask restart computer, input “N”.



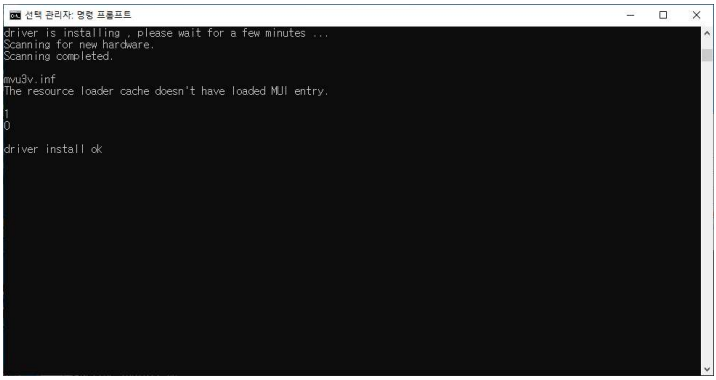
Step 9. Install Camera Driver (uEyeCam)

The uEyeCam driver is installed automatically.



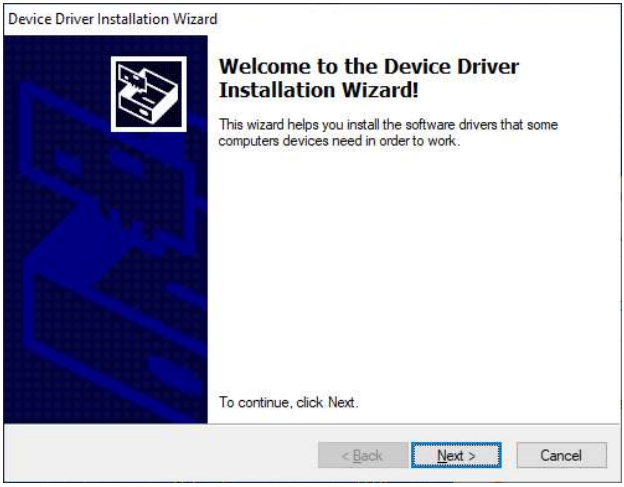
Step 10. Install Camera Driver (Hikvision USB3.0)

The USB 3.0 Camera driver is installed automatically.



Step 11. Install COMM Port Driver

Silicon Laboratories CP2105 VCP driver is installed, press the Next button.



Click the ‘Finish’ button to complete.



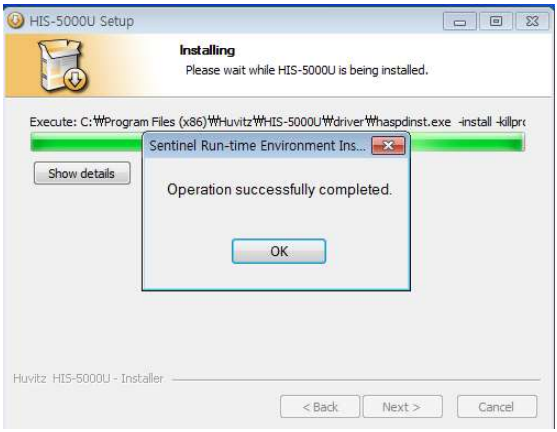
Step 12. Install USB FT232 Driver

USB FT232 driver is installed automatically.

Step 13. Install Sentinel Run-time Environment for use Dongle (Dicom)

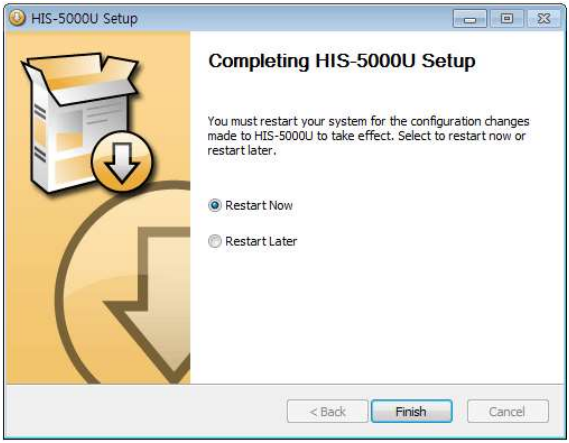


Click ‘Ok’ button, Sentinel Run-time Environment Installation Complete.



Step 14. Installation Complete

Click ‘Finish’ button. HIS-5000U requires rebooting of Windows.

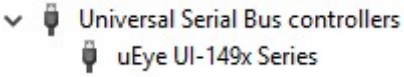


4.2 Camera Installation (USB cam)

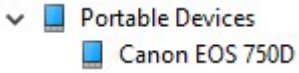
Step 1 Check Camera Access

Check out the access of a Camera at the Device Manager.

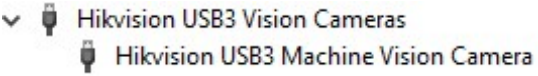
Case of 10M pixel uEyeCam(USB2.0)



Case of Canon DSLR(USB2.0)

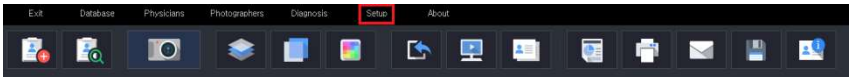


Case of 5M pixel HikvisionCam(USB3.0)



Step 2 Setup HIS-5000U

Run HIS-5000(U).exe, then click ‘Setup’ button in menu bar.

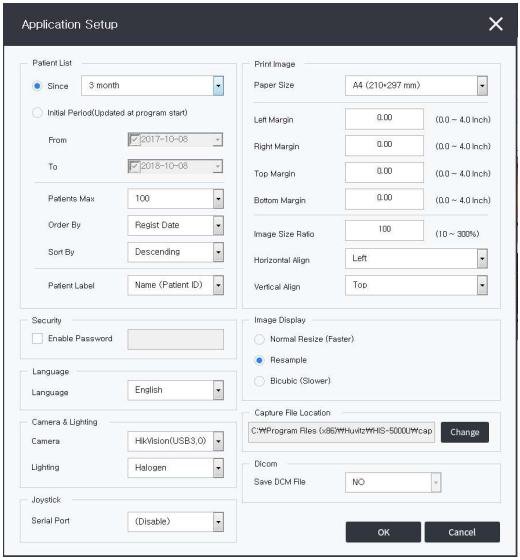


Application Setup Dialog will be show up. Choose Camera as

10M Camera(USB2.0) when your camera is 10M Pixel USB 2.0 Camera,

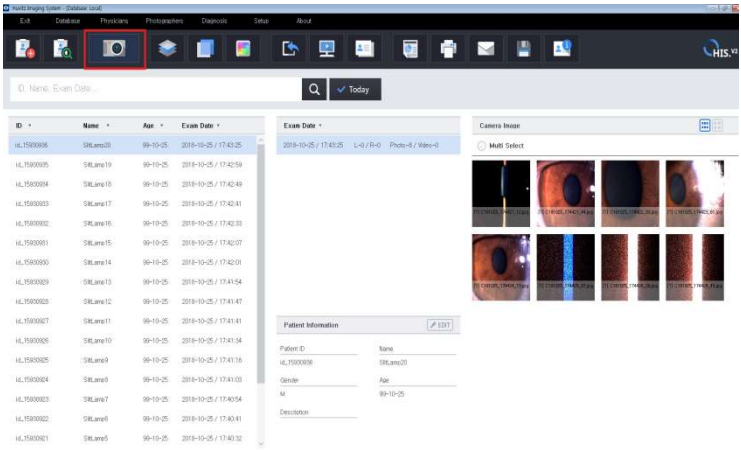
and CanonDSLR(USB2.0) when your camera is Canon DSLR Camera,

and 5M Camera(USB3.0) when your camera is 5M USB3.0 Camera.

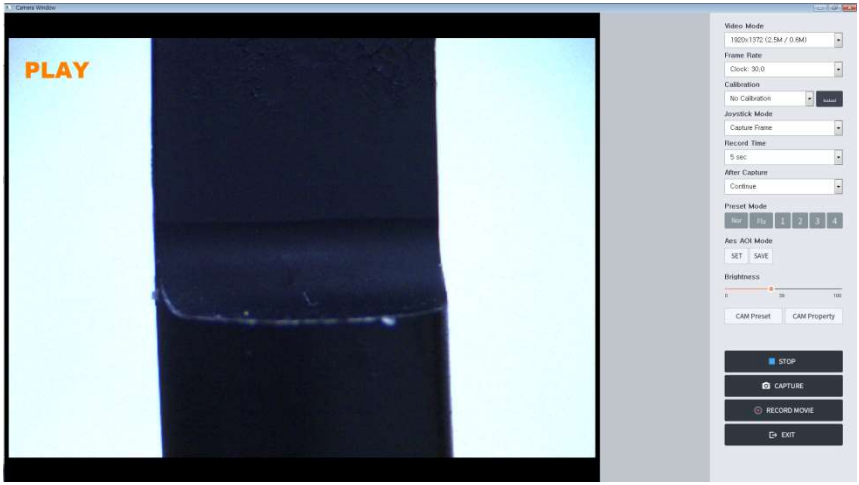


Step 3 Starting Camera Display

Click ‘Start Camera’ button in menu bar.



Camera Window will start camera display automatically (this could take a few seconds), if not, click ‘Start Camera’ or ‘Stop Camera’ button on control bar.



INFORMATION

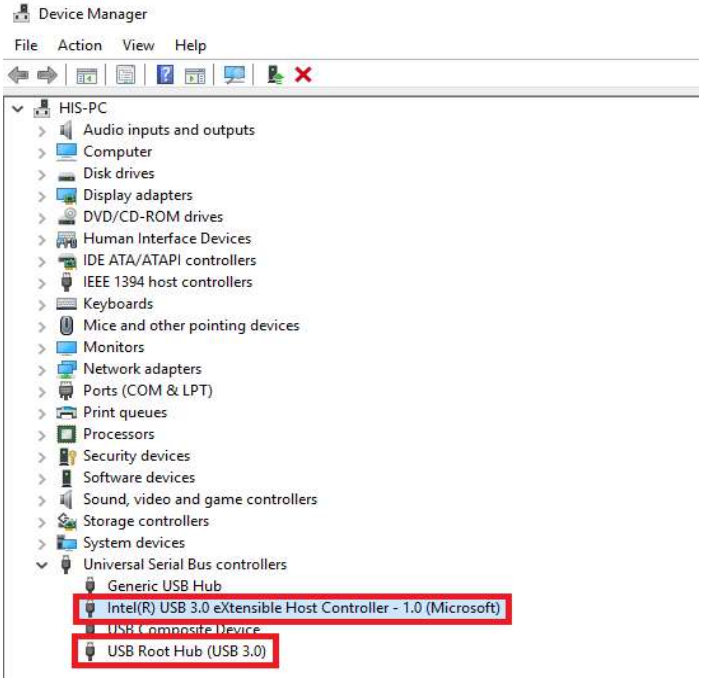
Most USB ports are usually provide up to 500 mA(Milliamps) at 5 V (Volts) current to the USB peripherals attached. but some USB ports don't. this may vary by motherboard specification or configurations of USB peripherals.

USB cameras may have unique power requirement, that varies on image resolution and data bandwidth needed to transport image data. therefore the USB power current may not be enough to get full performance of your USB camera. in that case you should plug your USB camera on auxiliary powered USB hub, nor you get slow frame rate or stucked frame.

More detailed informations on USB power allotment of your device may be found on your PC's technical manual, or on manufacturer’s homepages.

INFORMATION

There is a problem with using a USB2.0 camera on a USB 3.0 Host Controller based PC. The high frame becomes unusable. USB2.0 camera should be used with USB2.0 Host Controller based PC.



In the Windows 10 OS, USB power control has been enhanced. Therefore, the higher the Pixel Clock of the USB2.0 camera, the more power it consumes, and the black screen capture symptom may occur by momentarily cutting off the power from the OS when capturing.

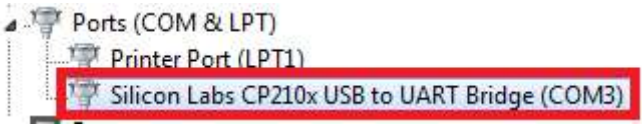
In addition, USB 2.0 cameras experience transmission errors as pixel clock increases.

Therefore, it is necessary to change the existing various pixel clock support UI to support only one 16Clock.

4.3 Joystick Setup

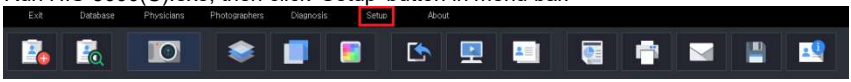
Step 1 Check Joystick Access

Check out the access of a Joystick at the Device Manager.



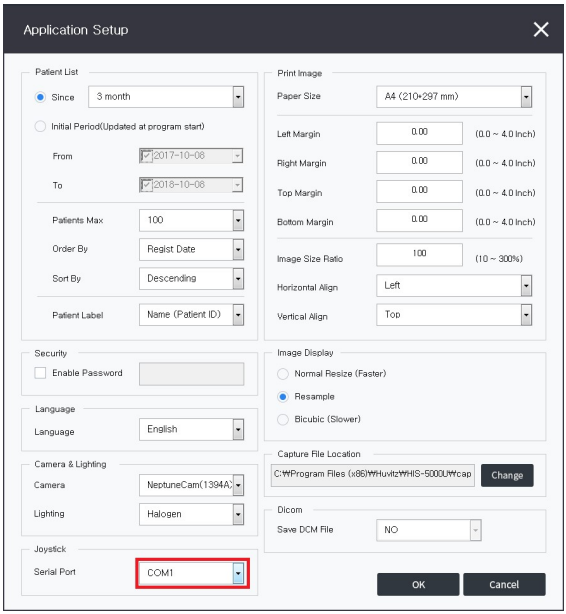
Step 2 Setup HIS-5000U

Run HIS-5000(U).exe, then click ‘Setup’ button in menu bar.



Application Setup Dialog will be show up.

Choose COM port as COM number you checked above



4.4 Foot Switch Installation

Foot switch can be used to trigger camera capturing as like pressing joystick button on Slit Lamp. HIS-5000U software supports Delcom USB Foot Switch, which is connected to PC via USB Interface. The website for purchasing it is like this:

http://www.delcom-eng.com/productdetails.asp?productnum=803600

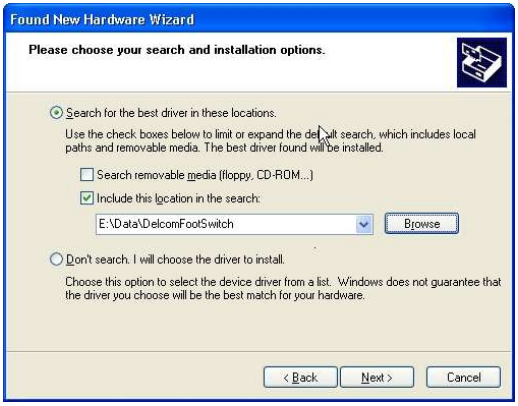
It needs to install the foot switch driver at the time it is firstly connected as following process.

Step 1 Select ‘Install from a list or specific location (Advanced), then press ‘Next’ button.

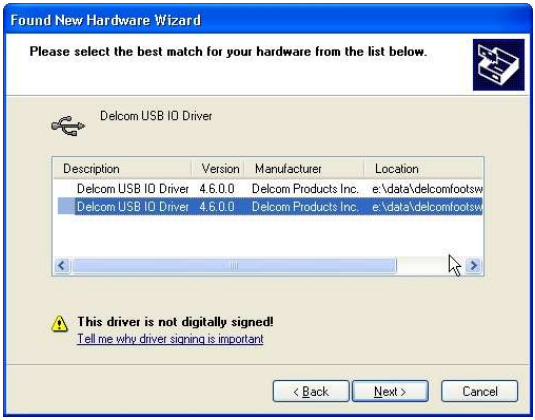


Step 2 Select 'Search for the best driver in these locations', and check 'Include this location in the search', then press 'Browse' button to assign the foot switch driver file named 'USBIODS.inf' which exists in the HIS driver directory ('C:\Program Files\Huvitz\HIS-5000U\driver\delcom' as default), or you could download the latest version of driver from the Delcom website.

Then click 'Next' button.



Step 3 Select 'Delcom USB IO Driver', then click 'Next' button.



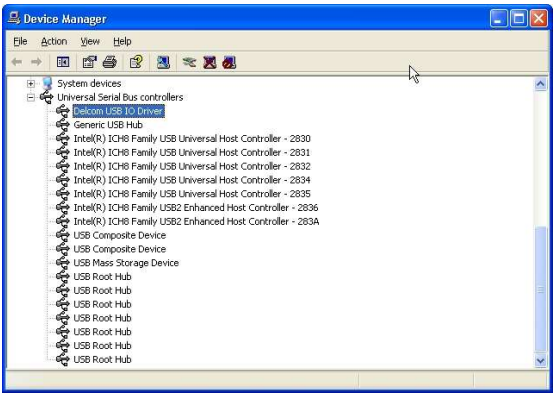
Step 4 Press 'Continue Anyway' button.



Step 5 Press 'Finish' button to complete driver installation.



Step 6 You can confirm that the foot switch driver is properly installed in Windows Device Manager. Check 'Delcom USB IO Driver' under 'Universal Serial Bus controllers' node.



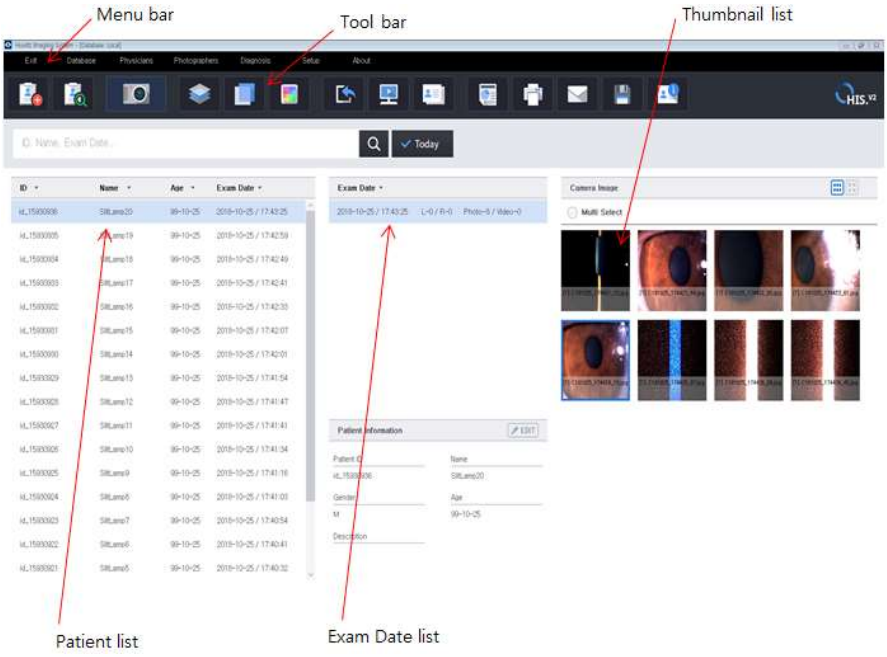
Step 7 Run HIS-5000(U).exe, and start Camera Window. Confirm that the camera display is captured by pressing the foot switch.

5 Main Window

After HIS-5000U program runs, Main Window is the starting point of the other windows, which is composed of Menu bar, Tool bar, Thumbnail List, and Patient List.

Note that if password option was checked in Application Setup, it needs to input the password to continue.

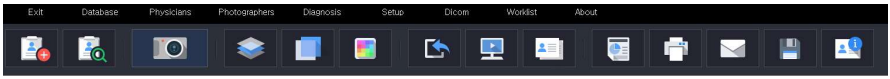
HIS-5000U program automatically tries to make a connection with the previous database lastly connected, and loads patient information and the related image files from it. If this process is successful, Patient List will show up the loaded items of patients and examinations, and the current database information will appear on title bar.



[Main Window]

5.1 Main Menu

Main Menu is composed of the following menu items.



[Main Menu & Tool Bar]

[Exit]

Stop the running process of HIS-5000U program, and exit it.
Before exiting, all changes in patient, examination and image information are automatically saved into database.

[Database]

Connect to HIS database instance of MS SQL Server Database on the same PC which HIS-5000U software package installed or the Remote PC in network, and load image files with patient information from it.

[Physicians]

Open Physician Management Window to add or change physician information.
Physician can be assigned for exam.

[Photographers]

Open Photographer Management window to add or edit photographer information.
Photographer can be assigned for exam.

[Diagnosis]

Open Diagnosis Management window to add or edit diagnosis information. Diagnosis information can be assigned for exam or reference image.

[Dicom]

Open Dicom Option window to access to worklist and storage server and create a DICOM file.

[Diagnosis]

Open Worklist Patient Data window to search worklist patient data.

[Setup]

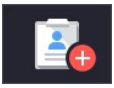
Open Application Setup window to configure application settings.

[About]

Open About window which shows the software version information of the currently running HIS-5000U program.

5.2 Main Toolbar

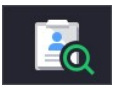
Main Toolbar is composed of the following menu buttons.



[New Patient]

Open New Patient window to register new patient.

New exam named the date of today for registered patient is automatically created, and shown up at the top of Patient List.



[Search Patient]

Open Search Patient window to find patient or exam from database.

Found patient in Search Patient window is changed into the selected state in Patient List in Main window, and the images of his last exam will show up in Thumbnail List.
If Patient List didn't have the found patient before searching, he is added at the top of Patient List.



[Start Camera]

Open Camera Window to display camera and capture image or movie.

Confirm that camera module is connected to PC before starting camera. If any camera installed and connected isn't recognized, 'No compatible camera' error message will show up.



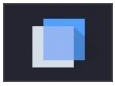
[Overlay Images]

Open Overlay Window to examine different images using overlay effect.

Note that more than two images need to be selected from Thumbnail List before starting Overlay Window.

INFORMATION

It is allowed to select several images from all exams for the same patient, so it is possible to overlay or compare the images selected from the different exams. However, all selections are cleared when the current patient is changed to another in Patient List.



[Compare Images]

Open Compare Window to examine different images side by side.

Note that more than two images need to be selected from Thumbnail List before comparing images.



[Adjust Color]

Close Thumbnail mode and start Adjust Color mode.

In Adjust Color mode, Patient List is replaced with Color Tools, and the selected image is shown up as window size instead of thumbnail. Note that more than one image need to be selected in Thumbnail List before adjusting image.



[Import Image]

Open File Dialog box to import image files to the current exam.

Imported images are added to the exam currently selected, and are shown up in Thumbnail List.



[Slide Show]

Open Slideshow Window to display image as full screen.

Note that more than one image need to be selected from Thumbnail List before slide show.



[Reference Image]

Open Reference Image Window.



[Make Report]

Generate a report including the current patient & examination information and eye images selected in Thumbnail List as Microsoft Word format, and execute Microsoft Word with it.

Note that it needs to install Microsoft Word Application.



[Print Image]

Print the images selected in Thumbnail List.

This prints without opening Print Dialog box, the size and alignment of printed image on paper can be assigned in Setup Window of Main Menu. Note that more than one image need to be selected from Thumbnail List before printing.



[Send Email]

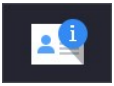
Send the images selected in Thumbnail List by Email.

Default Mail executes Microsoft Outlook Express or Microsoft Office Outlook, then generate a mail including the current patient & examination information and eye images selected in Thumbnail List. If it was configured Mail address on the Desktop PC, Open Mail message window. Otherwise, Open configuration wizard window.



[Save Image]

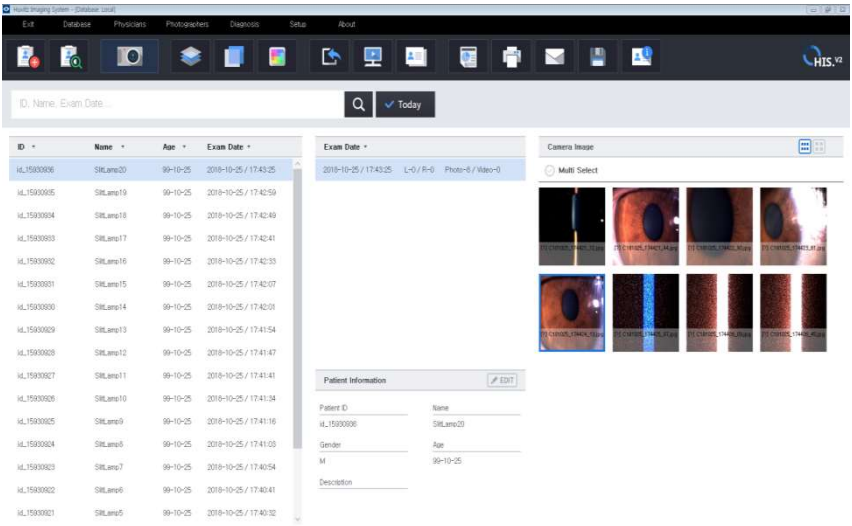
Save Image Files selected in Thumbnail List.



[Show Visit Info]

Open Visit Information Window to manage examination information.

5.3 Patient List



[Patient List]

Patient List shows the recent patients as name and patient ID, each patient has its own examinations as visit date. When any of it is clicked in Patient List, it's state will be changed to the currently selected, and Thumbnail List will shows all images for the examination.

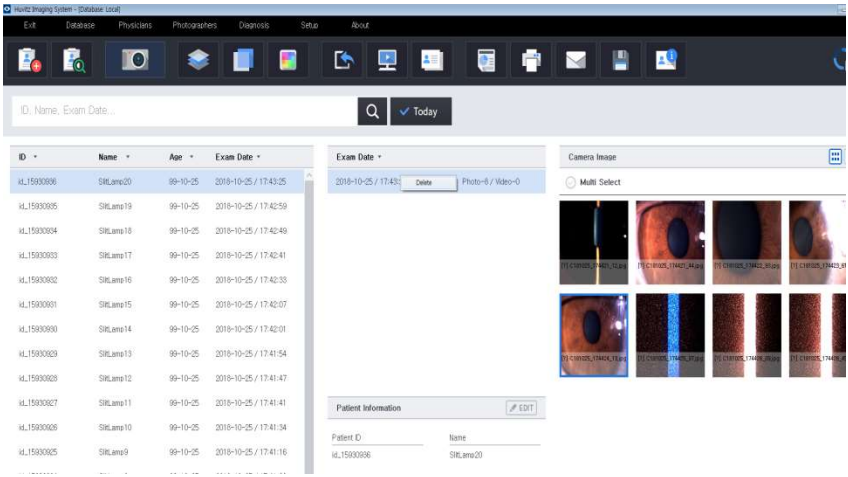
The ordering policy, number of patients, and time period to show patients and examinations in Patient List can be changed in Setup Window of Main Menu and can be changed in Pop up menu by pressing the right button of mouse.
Then Patient List will update all patients and examinations by the new rule.

To add new patient, press New Patient of Tool Bar. Then new patient and examination as today will be inserted into Patient List. At the first time, the examination has no images, so Thumbnail List is empty.
User can choose any examination of the patients in Patient List by clicking, then the states of patient and examination are changed into 'currently selected', after that, all of your operations like capturing images, image processing, etc, will be applied for the selected patient and examination.

To get captured images from camera, press Start Camera of Tool Bar. If the currently selected patient has no examination of today, new examination will be added under the patient in Patient List. Note that if there is no patient selected in Patient List, new patient with named 'Unknown' will be automatically created.

Whenever user selects another exam from the empty exam, message box asking deletion of it will appear. If click 'Yes', the exam will be removed from Patient List. Note that the patient of it hasn't another exam, then the patient will be removed too.

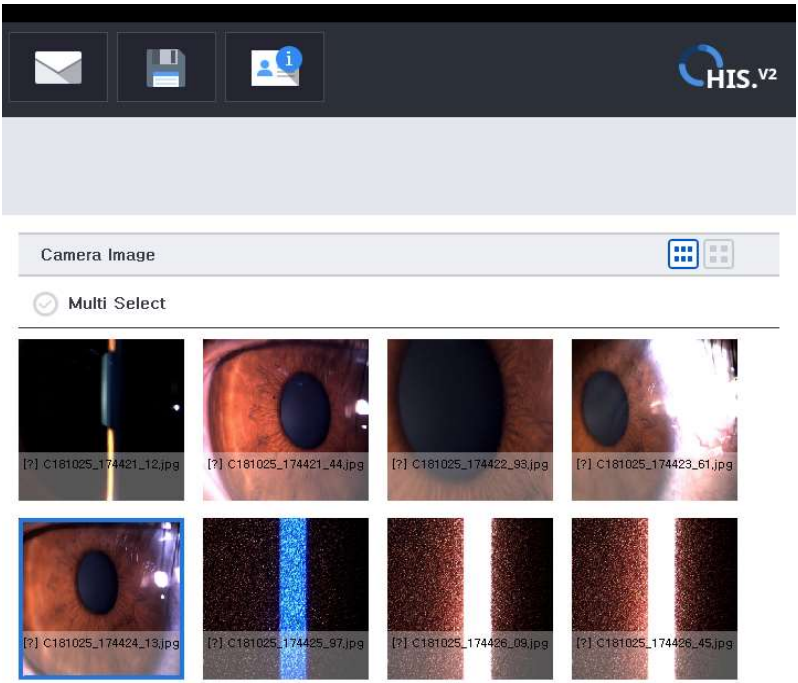
To delete any exam not empty, select it and press right button of mouse to Pop up menu, then press 'Delete' menu item. Note that all image files of the exam are removed from directory on disk too. Included in test history to delete the disk image files on the drive will be deleted.


Exit
Database
Physicians
Photographers
Diagnosis
Setup
About
ID, Name, Exam Date...
Today
ID
Name
Age
Exam Date
Exam Date
Delete
Photo-6 / Video-0
Camera Image
Multi Select
Patient Information
EDIT
Patient ID
Name

[Delete Exam]

5.4 Thumbnail List

Thumbnail List shows all images of the selected exam in Patient List as thumbnail size. Each thumbnail has the label to show its eye side (OS – left side, OD – right side, ? – unknown), file name, and note. Thumbnail List is changed to window sized image by double clicking on any thumbnail or pressing Adjust Color button of Main Menu.



[Thumbnail List]

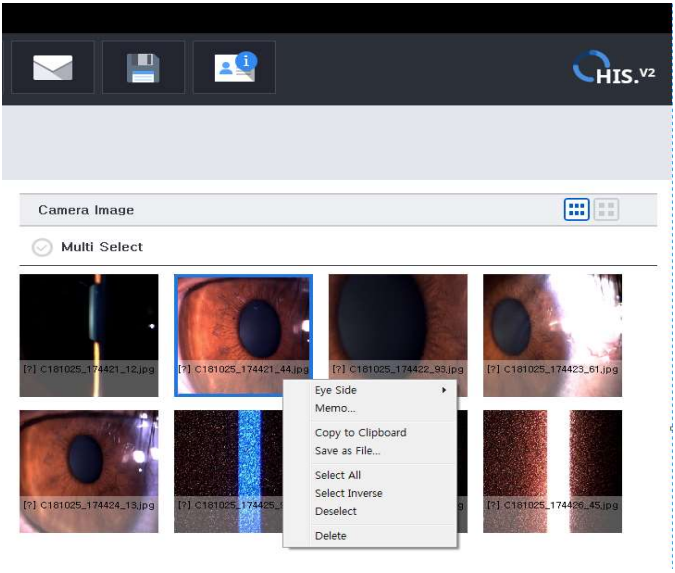
User can select thumbnail to work by clicking on it, which are highlighted as bright color, and it is allowed to select several images from different exams of the same patient. The selections are cleared when the processing on image are completed.

The following Shortcut keys make the selection easier.

- **CTRL + A** : select all images in the exam.
- **ESC** : clear selections

To work on thumbnail, Pop-up menu shows up when the selected thumbnail is clicked by the right button of mouse. It includes the following menu items, and its result is applied to all images selected. Note that the deleted image is removed on the exam, also its file is removed on disk.

- **Eye Side** : change the eye side, OS, OD, Unknown.
- **Memo** : add description for image.
- **Copy to Clipboard** : copy image to clipboard.
- **Save as File** : save image or movie as file.
- **Select All** : select all images.
- **Deselect** : clear selections.
- **Delete** : delete image or movie from exam.



[Pop-up Menu on Thumbnail]

6 Patient Management

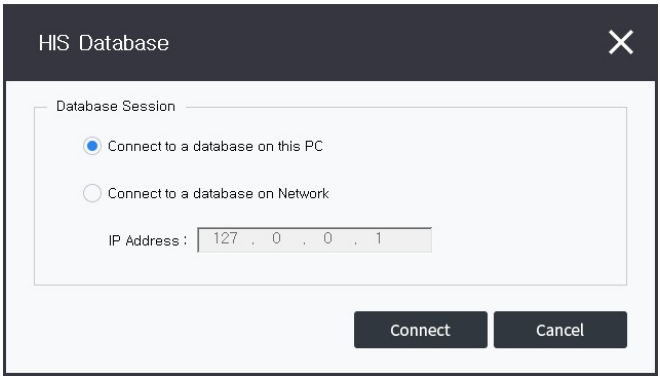
6.1 Database Configuration

HIS-5000U program use MS-SQL database to save patient information and images, which is installed with HIS-5000U package. If there are multiple PCs which HIS-5000U program installed, HIS-5000U instance running on each PC can make a connection to not only local database installed, but also remote database installed on another PC existing on accessible network.

This feature lets all HIS-5000U programs running on multiple PCs be able to manage patient information and images by specific database installed on the most powerful PC as a server, also share them each other.

When HIS-5000U program starts, it tries to connect to the previous database, and load patient information and images from it. If the connection is made successfully, its database name is displayed on Main window title bar.

To connect into another database, press 'Database' menu of Main Menu.



[Database Window]

① Connect to a database on this PC

- Local Database (IP Address: 127.0.0.XXX)

② Connect to a database on Network

- Remote Database installed on another PC indentified with IP Address.

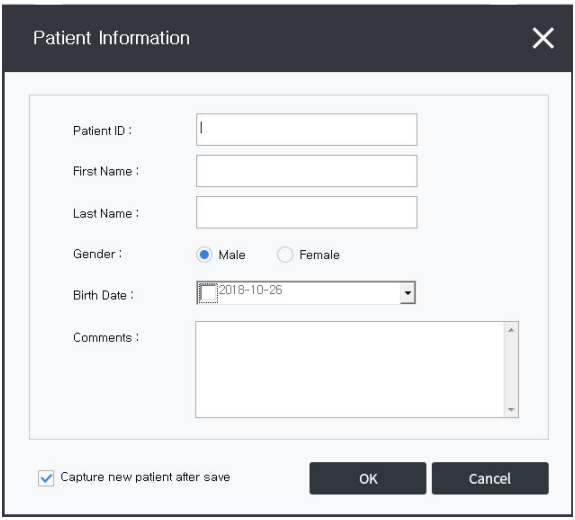
After selecting that, click 'Connect' button to connect to database.
Note that if the connection is made, Patient List and Thumbnail list are updated as the database information newly loaded, and if failed, they will be empty.

⚠ INFORMATION

When connecting to the database of a remote PC, the latest version of HIS-5000U must also be installed on the remote PC. If the HIS-5000N version is installed on the remote PC, the database is not linked.

6.2 Patient Registration

To register a new patient, press New Patient button of Main Toolbar.



[New Patient Window]

① First Name

- Surname of the patient.

② Last Name

- Name of the patient.

③ Patient ID

- Identifier of the patient. Patient ID can be inputted freely as a text string including character or number, and will show up at the next of Patient Name in Patient List. (optional)

④ Gender

- Male or female, and unknown if not selected. (optional)

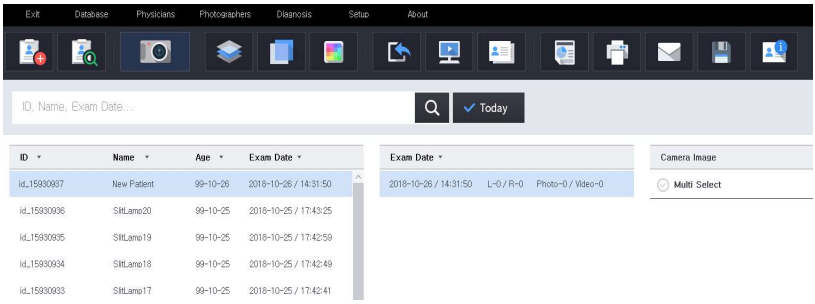
⑤ Birth Date

- Birth date of the patient, this is today as default. (optional)

⑥ Comments

- Description about the patient.
-

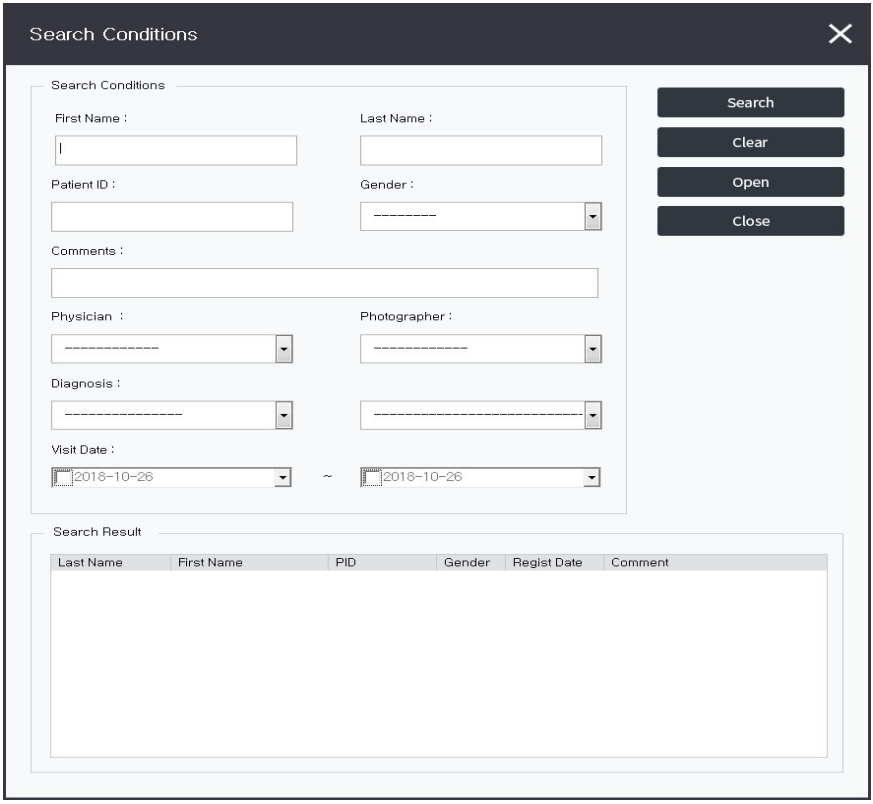
After inputting patient information, click Save button to register to database.
If it is successful, it is shown up at the top of Patient List as First Name, Last Name, and Patient ID, also new exam is automatically created under the patient as today.



[New Patient in Patient List]

6.3 Patient Search

To find any patient registered in the database currently connected, press Search Patient button of Main Toolbar.



[Search Patient Window]

Input the following fields to make a search condition, which are joined as AND operation as a description about the target patients. Note that it is allowed to input the substring of the field as a part of its value.

① First Name
: Part of first name of patient.

② Last Name
: Part of last name of patient

③ Patient ID
: Part of patient ID.

④ Gender
: Gender of patient.

⑤ Comments
: Description in patient information.

⑥ Physician
: Physician assigned to the exam of patient.

⑦ Photographer
: Photographer assigned to the exam of patient.

⑧ Diagnosis
: Diagnosis in the exam of patient.

⑨ Visit Date
: Exam date of patient.

- To start searching, press Search button, if there are several patients corresponding to the search condition, they will be shown up in Search Result List.

- To open any of the found patients to see the exam and images, select it in Search Result List, then press Open button. If the opened patient already exists in Patient List before searching, it becomes the currently selected. If not, it is newly inserted at the top of Patient List.

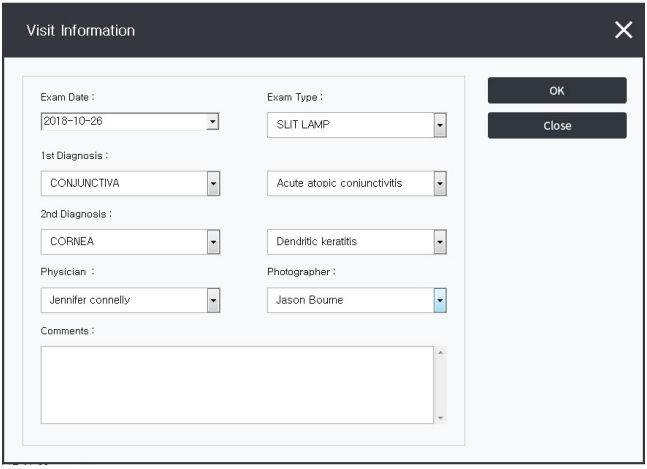
- To clear fields of search conditions inputted or the content of search result list, press Clear button.

6.4 Patient Information

To modify or confirm patient information selected in Patient List, press Patient Information button of Main Toolbar, then Patient Information Window will show up, which looks like New Patient Window. After changing of fields in the window, press Save button to update database.

6.5 Examination Information

To modify or confirm information about the exam selected in Patient List, press Visit Information button of Main Toolbar, then Visit Information Window will show up.



[Visit Information Window]

The exam of patient is created as a date when the patient visits at the hospital, so each exam on the same patient can be identified with Exam Date.

① Exam Date

- Visit date to examine.

② Exam Type

- Device type used in the exam, now only Slit Lamp is selectable. (optional)

③ 1st Diagnosis

- The primary diagnosis as the result of examination. (optional)

④ 2nd Diagnosis

- The secondary diagnosis as the result of examination. (optional)

⑤ Physician

- Physician assigned to the exam, which must be registered before this in Physician Management Window. (optional)

⑥ Photographer

- Photographer assigned to the exam, which must be registered before this in Photographer Management Window (optional)

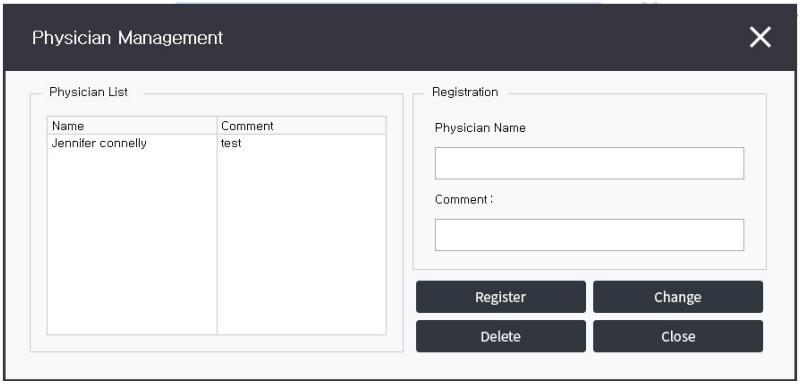
⑦ Comments

- Description about the exam. (Optional)

Press Save button to store the patient information into the database currently connected.

6.6 Physician Registration

To register a new physician or update, press Physicians menu of Main Menu, then Physician Management Window shows up.



[Physician Management Window]

Registered physicians can be assigned for exam in Visit Information Window.

① Physician List

: Physicians already registered in database.

② Physician Name

: Physician name to register or update.

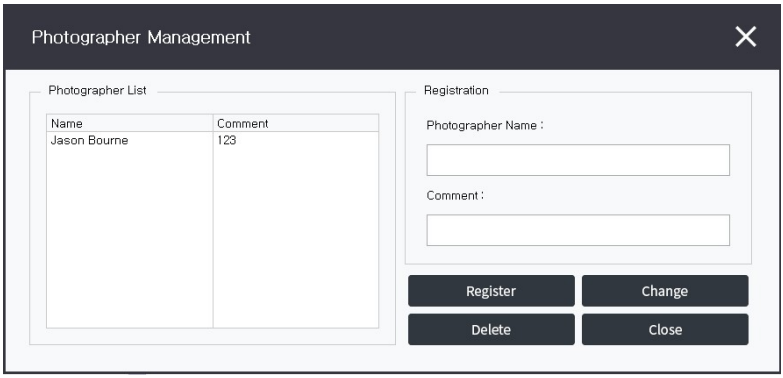
- To register a new physician, input Physician Name and Comment (optional), then press Register button, then confirm that it is inserted into Physician List.

- To change a physician name, select it by click in Physician list, then change it in Physician Name, then press Change button.

- To delete a physician in list, select it by click in Physician list, then press Delete button.

6.7 Photographer Registration

To register a new photographer or update, press Photographers menu of Main Menu, then Photographer Management Window shows up.



[Photographer Management Window]

Registered photographers can be assigned for exam in Visit Information Window.

① Photographer List

: Photographers already registered in database.

② Photographer Name

: Photographer name to register or update.

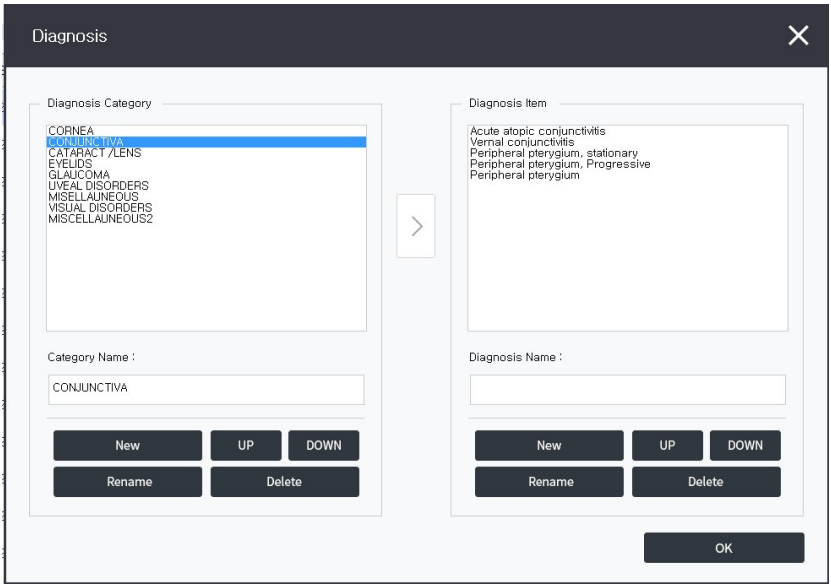
- To register a new photographer, input Photographer Name, then press Register button. Confirm that it is inserted to Photographer list.

- To change photographer name, click in Photographer list, and change it in Photographer Name, then press Change button.

- To delete registered photographer, click in Photographer list, then press Delete button.

6.8 Diagnosis Registration

To register a new diagnosis or update, press Diagnosis menu of Main Menu, then Diagnosis Management Window shows up.



[Diagnosis Management Window]

Registered diagnosis can be assigned for exam in Visit Information Window.

① Diagnosis Category

: Diagnosis category already registered in database.

② Diagnosis Item

: Diagnosis Item of Category already registered in database.

③ Category Name

: Diagnosis category Name.

④ Diagnosis Name

: Diagnosis Name.

- To register a new category name, input Category Name, then press New button. Confirm that it is inserted to Diagnosis Category.

- To register a new diagnosis name, input Diagnosis Name, then press New button. Confirm that it is inserted to Diagnosis Item.

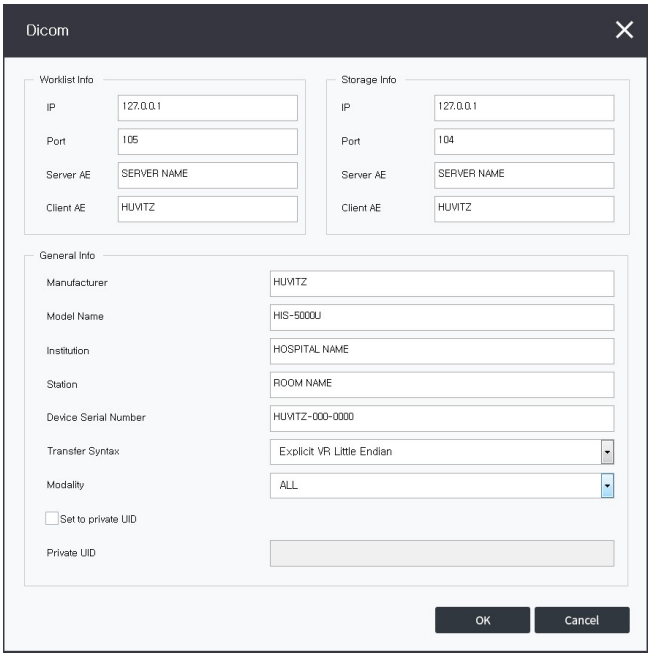
- To change Category or Diagnosis name, click in the List, and change it in name field, then press Rename button.

- To change display order of Diagnosis or category in list, select it in list, then press UP or DN (Down) button.

- To delete name, click in the List, then press Delete button.

6.9 Dicom Information

DICOM option affects access to worklist and storage servers and creates a DICOM file. Worklist Info is the part of the server information that will receive Worklist data. Storage Info is the part of the server information that stores the DICOM file created. General Info is the value of the information entered when generating the DICOM file.



1) Worklist Info

① IP
Sets the worklist server IP address to connect to.

② Port
Sets the worklist server port to connect to.

③ Server AE
Sets the worklist server AE(Application Entity) Title to connect to.

④ Client AE
Sets the worklist client AE Title.

2) Storage Info

① IP
Sets the storage server IP address to connect to.

② Port
Sets the storage server port to connect to.

③ Server AE
Sets the storage server AE(Application Entity) Title to connect to.

④ Client AE
Sets the storage client AE Title.

3) General Info

① Manufacturer
Sets the manufacturer of the equipment.

② Model Name
Sets the model name of the equipment.

③ Institution
Sets the Institution name where the equipment is located.

④ Station
Set where the equipment is located.

⑤ Device Serial Number
Sets the device serial number of the equipment.

⑥ Transfer Syntax
Sets the transfer syntax used to encode the encrypted content.

- Explicit VR Little Endian
  Sets the transfer syntax UID of the DICOM file to explicit little endian.

- Explicit VR Big Endian
  Sets the transfer syntax UID of the DICOM file to explicit big endian.

- Implicit VR Little Endian
  Sets the transfer syntax UID of the DICOM file to implicit little endian.

- JPEG 2000
  Sets the transfer syntax UID of the DICOM file to JPEG 2000.

⑦ Modality
Sets the type of equipment that originally acquired the data.

- OP
  OP(Ophthalmic Photography).

- OPT
  OPT(Ophthalmic Tomography Image Storage).

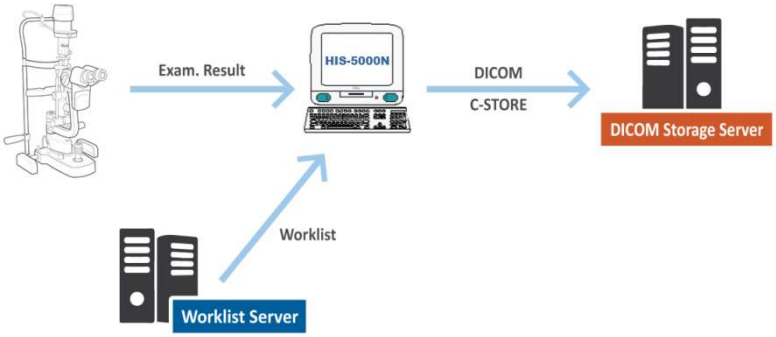
- SC
  SC(Secondary Capture).

⑧ Set to private UID
Some DICOM storage servers need to be prefixed with a private UID. If so, check Set private UID.

⑨ Private UID
Set private prefix UID in Instance UID.

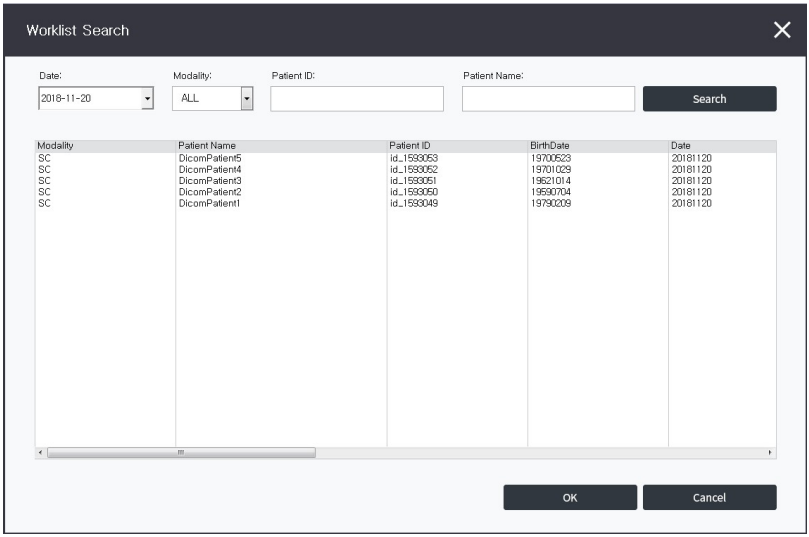
6.10 Worklist Search

You can use HIS-5000U to get the worklist from the DICOM worklist server and combine the captured results into a DICOM file and send it to the DICOM storage server. To do this, you need to configure the worklist server to receive the worklist and configure the storage server to store the DICOM files from the DICOM Information Dialog.

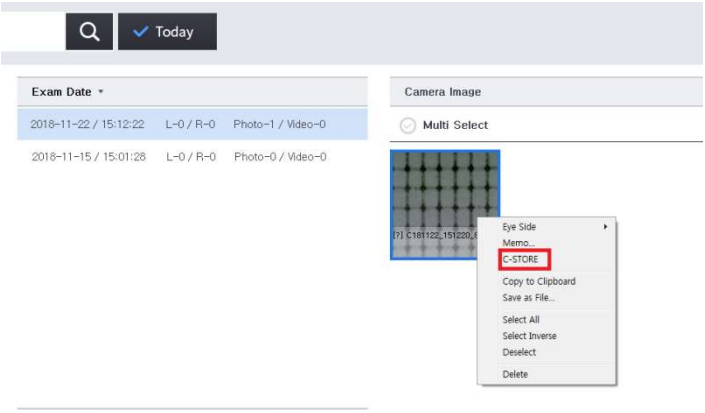


NOTE

To use the DICOM function with HIS-5000U, you must purchase a USB Dongle that can turn on the DICOM function. For more detailed information, please contact our Customer Service Department or one of our authorized representatives.



- If you select the Worklist menu, a worklist search window is displayed where you can search for worklist by connecting to the worklist server.
  - [Date]
    Select the date on which the worklist was created from worklist server.
  - [Modality]
    Set search modality.
  - [Patient ID]
    Search for worklist by adding patient id.
  - [Patient Name]
    Search for worklist by adding patient name.
  - [Search]
    Click the search button to search worklist.
  - [OK]
    Select the desired work in the list and click the OK button. Pressing the OK button will automatically create a dcm file in DICOM format.
  - [Cancel]
    Click the Cancel button to stop searching worklist.



- [C-STORE]
  Click the C-STORE of Camera Image list and transfer DICOM file to DICOM storage server. When a DICOM file is created, it is possible to transfer the file to the server.

7 Camera Display

7.1 Start Camera

Before starting camera, confirm that camera module of Slit Lamp is connected with PC, and turning on its LED light. To start camera display, press Start Camera button of Main Menu, then Camera Window will show up, automatically start displaying images from the camera module. If error message saying “No compatible camera” appears instead of it, check that camera driver has been installed well referring to Camera Installation part in this manual.



[Camera Window]

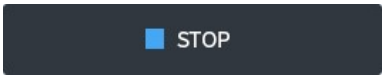
When it is playing and displaying camera, the screen area appears on Camera Window, and the caption on the top – left side explains the state of camera.

- **PLAY** : showing picture from camera.
- **REC** : recording movie.

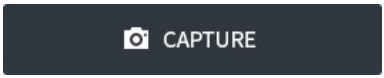
Camera Window has the following buttons to control camera working.

① 

Start Camera
: start displaying camera.

② 

Stop Camera
: stop displaying camera.

③ 

Capture Image
: capture a frame image from camera.

④ 

Record Movie
: record a movie from camera.

⑤ 

Exit
: exit from camera window.

⑥ 

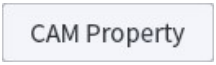
Time Machine
: history capture frame images(30images) from camera(only 3.0 USB Camera).

⑦ 

Flicker
: flicker history capture frame images(30images) from camera(only 3.0 USB Camera).

⑧ 

Camera Preset
: preset the settings of camera.

⑨ 

Camera Property
: show camera property dialog box.

⑩ 

Normal Image
: set to Normal Image Mode in the camera preset.

⑪ 

Fluorescent Image
: set to Fluorescent Image Mode in the camera preset.

⑫ 

AES AOI Mode
: set to Auto Exposure Shutter AOI Mode.

⑬ 

AES AOI Mode Stop
: stop the Auto Exposure Shutter AOI Mode.

⑭ 
Calibration
: show Calibration dialog.

- To stop camera display, press Stop Camera button on control panel, then screen area will be hidden and the previously captured image or movie will be shown up.

- To restart camera display, press Camera Start button, then screen area

will be shown up again. Check PLAY caption text on it.

- To change the resolution, select it in Video Mode combo box, then it will be applied immediately if camera is playing.

- To change the frame rate, select it in Frame Rate combo box, then it will be applied immediately, if camera is playing. Note that the selectable frame rates are changed according to the current resolution. The higher resolution is just able to support the lower frame rates.

- To change the setting of camera displaying quickly, press one of button number labeled under Preset Mode, Note that the above changes will not affect the current settings of camera, if you want to do permanently, refer to Camera Preset.

- In auto exposure Mode, if you want set the AOI area for brightness, press AES AOI Mode button. If you draw rectangle by drag on the image, then camera change brightness of image. Then, press AES AOI Mode Stop button, current AES AOI setting is affected permanently.

- To exit Camera Window, press EXIT button.

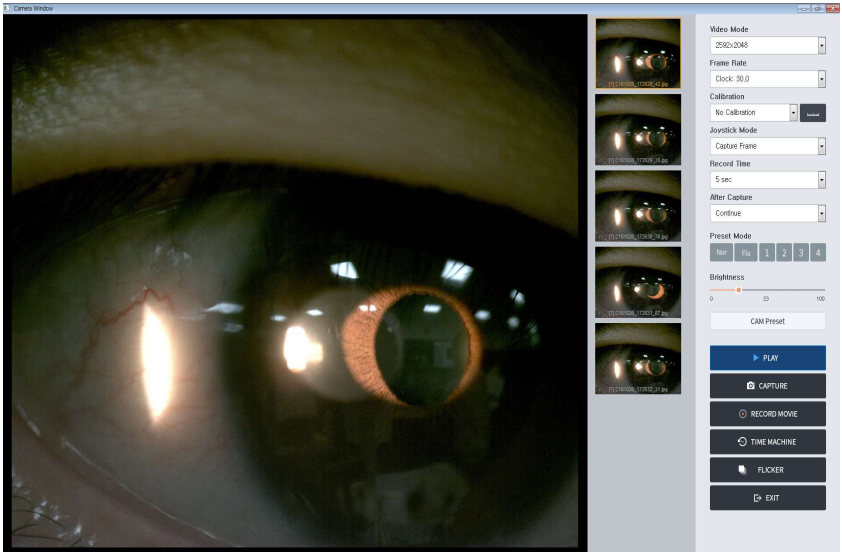
- DSLR camera enters sleep mode, the picture does not appear when pressing the shutter button, the camera's recovery will recover and then press the Play button.

INFORMATION

When the computer is in sleep mode, the camera image recovery does not recover, camera, close the window again.

7.2 Capture Image

Camera captures a frame image as the size of resolution playing, the captured images are placed in Thumbnail List at the bottom of Camera Window.



[Frame Capture]

The captured image has file name as the captured date and time, for example, at the time of 2008-06-21, 14:30:30, 20 (micro seconds) it will be C080621_143030_20.jpg. Eye side of the captured image is assigned automatically as OS (left) or OD (right).

All captured images are added into the current exam of the patient when Camera Window is closed, their files are copied to the exam directory on disk.

- To capture a frame image or record a move, press joystick button of Slit Lamp. Note that it needs to select Joystick Mode as Capture Frame or Record Move.

- To capture a frame image, press Capture Image button.

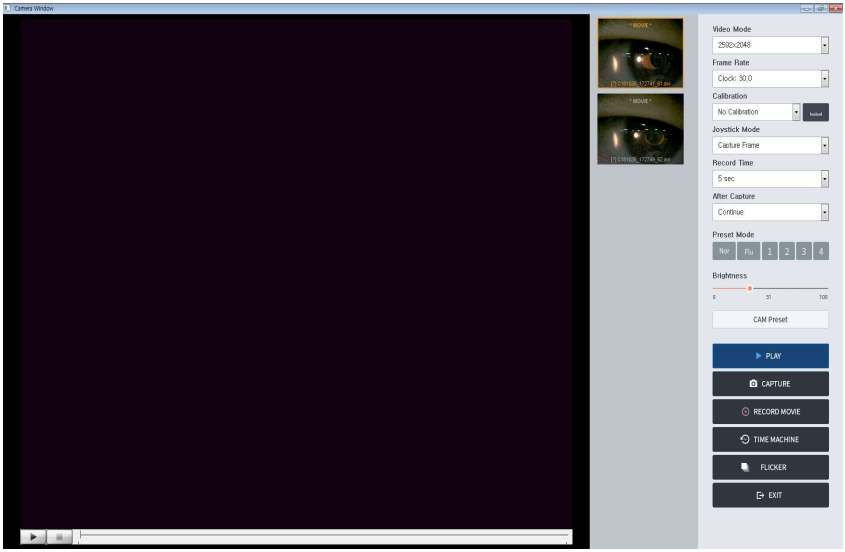
- To record a move, confirm Record Time, and press Record Movie button.

- To see the captured image on Camera Window immediately, select Stop & Show in After Capture mode. It doesn't need to press Stop Camera button to see it. To capture several images continuously before confirming, select Continue.

- It can be zoomed by clicking left or right button or wheeling on mouse.

7.3 Record Movie

Camera records a movie from real time pictures of camera using compressing video codec as AVI video format. The recorded movie is placed as a thumbnail of the first frame in the movie, and labeled as “* Movie *” on it in Thumbnail List.



[Movie Record]

When it is recording, the caption on camera screen is changed to REC. Now, HIS-5000 software records movie using DV video codec, which is the very popular, but it might not be able to play the movie on PC which the codec is not installed. You can get the codec install files in driver directory of HIS-5000 installation directory.

- To record a movie, press joystick button of Slit Lamp. Note that it needs to select Joystick Mode as Record Movie before recording. Also it can capture by pressing Record Movie button.

- To record during specific time, select it in Record Time combo box before recording. After that time, it will be automatically ended. Note that if Record Movie button is pressed again on recording, it stops recording too.

- To see the recorded movie in Camera Window, if it is selected Stop & Show of After Capture, as soon as record movie, stop camera and play the movie. If it is selected Continue of After Capture, press Stop Camera button, and click one of thumbnails labeled as "*Movie*" on it, then starts playing the movie. It can be replayed or paused using play bar.

INFORMATION

In 5M Camera(USB 3.0), when you record 2592X2048(5M/5M) resolution, it records with 17 frames because of bandwidth limit.

But You can record with max(30) frames in the 1280x1024(1.2M/1.2M) resolution and 2592X2048(5M/1.2M) resolution.

In the above two modes, movie recording is done at 1280x1024 resolution.

7.4 Time Machine & Flicker(only 5M Camera)

Once an image is captured, the Timemachine & Flicker offers the possibility of going back frame by frame to select the best picture.
When the Timemachine & Flicker button is pressed, 30 frames are stored.

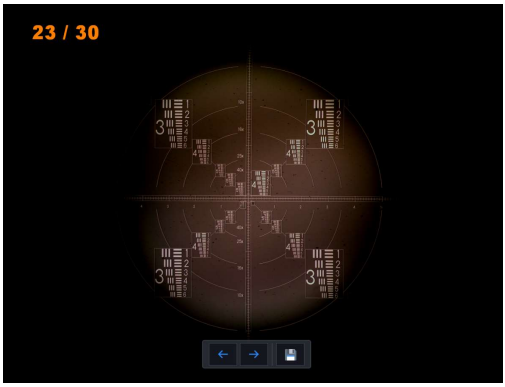
To go through the captured pictures the  and  buttons in the image screen can be used. The current picture is always displayed in the image screen.

When the  button is pressed on the current image, the image is saved in the image list.

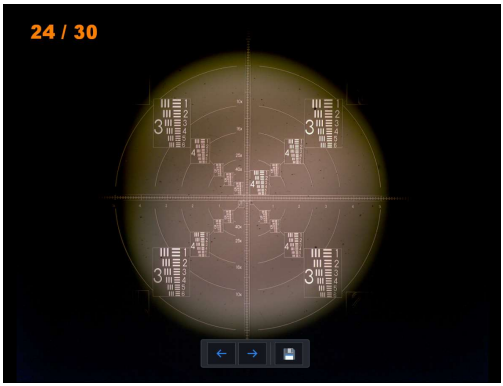


[Time Machine]

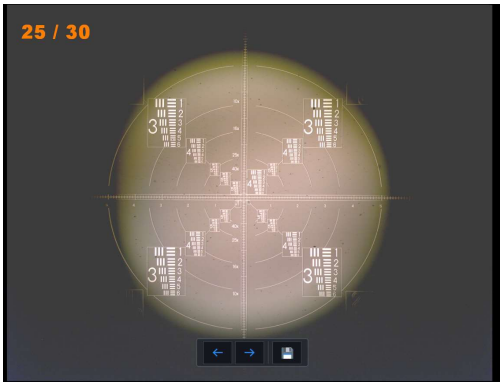
The Flicker offers the possibility of going back and selecting the picture with the best brightness setting.(Darker image, Standard image, Brighter image)



[Dark image]



[Standard image(as displayed in the live window)]

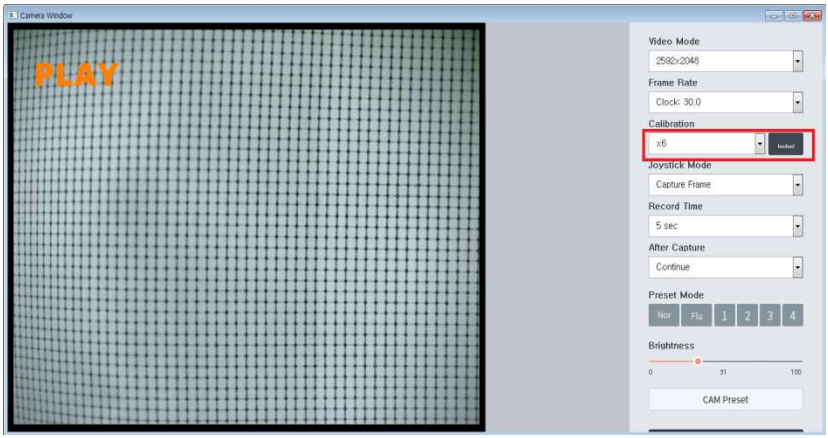


[Bright image]

7.5 Calibrate Camera

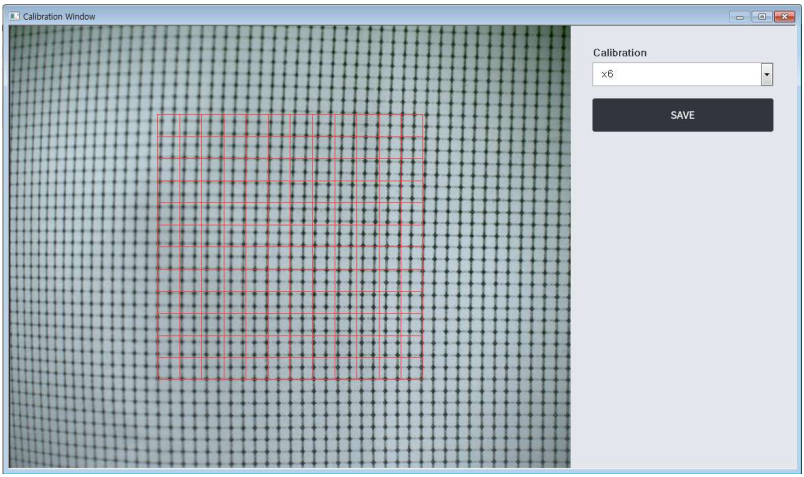
To compensate for the length of the picture that can be substituted for the actual length of the data is stored.

Samples are available to install grid scale on the camera screen after setting the correct calibration button to start the calibration.



Calibration window captured image will be displayed with a red square lattice.

Adjust the size and position of the square lattice match the shape of the grid after moving to Excute press calibration is complete.



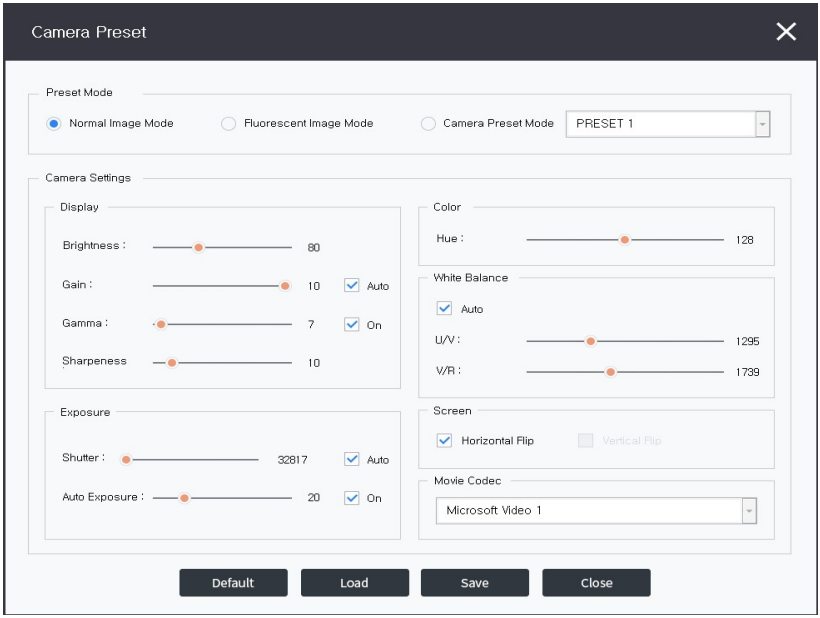
[Calibration Window]

Calibrated scale on the screen, select the data captured by the camera, you will be automatically saved in Photos. This measurement is used for the calibration data.

- The current scale of the slit lamp, please select the drop box.
- In line with the image of the grid to adjust the size of the red square.
- Excute button to save the calibration data.
- Close button on the screen without running camera calibration screen.

7.6 Camera Preset

Camera Presetting are changed in detail in Camera Preset dialog box. It is composed Normal Image Mode, Fluorescent Image Mode and Camera Preset Mode(PRESET 1~5).
As each of mode, you can configure the camera setting and use its mode. Therefore, When it is measuring, you can select suitable mode as kinds of situation.



[Camera Preset]

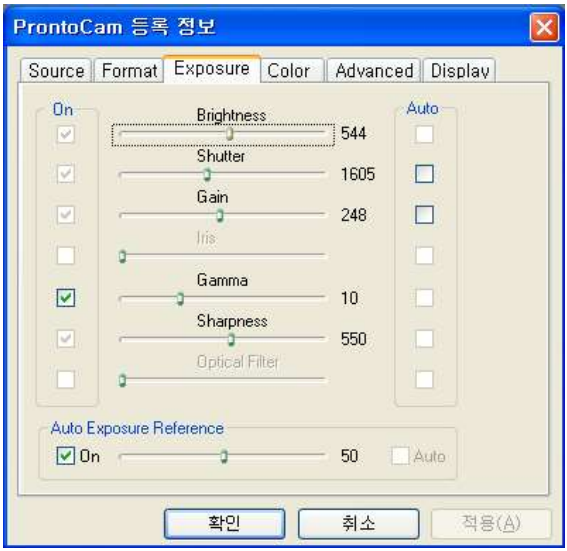
- To open Camera Preset dialog box, press Camera Preset button, after changing the settings, press Save button to apply.

- To restore the default settings after change, press Default button.

- To save compressive Movie, select Compression Code in the Movie Codec.

7.7 Camera Property

Camera settings are changed in detail in Camera Property dialog box, except that necessary items for examination like brightness, gain, etc, there are some complicate items to control at hardware level, So it is recommended not to change them without enough knowledge about camera.



[Camera Property]

Although camera settings has been changed, the following necessary items among them are changed permanently, remained when camera restarts.

① **Brightness (= 590)**
② **Sharpen (= 550)**
③ **Gamma (= 10)**
④ **White UB (= 90)**
⑤ **White VR (= 98)**

⑥ **Hue (= 10)**
⑦ **Shutter (=1605)**
⑧ **Gain (= 120)**
⑨ **Flip (= Horizontal)**
⑩ **Frame Rate (= 1024 x 768)**
⑪ **Frame Mode (15 fps)**

The values in parenthesis are default for each item.

- To open Camera Property dialog box, press Camera Property button, after changing the settings, press OK button to apply.

- To restore the default settings after change, press Default Setting button.

8 Image Manipulation

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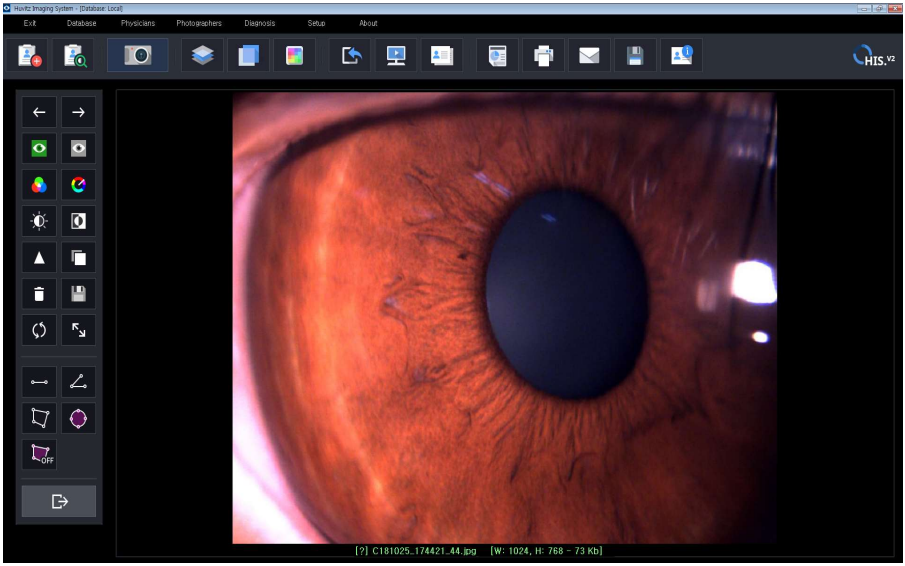
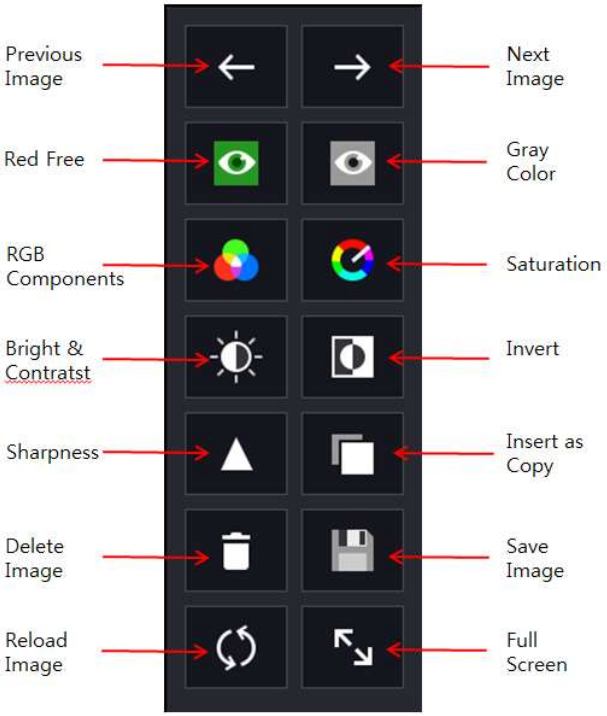
8.1 Adjust Color

Adjust Color mode shows one image in the exam instead of Thumbnail List, which is able to modify the detail of image color using various image processing functions for the best look. To start Adjust Color mode, double click on any thumbnail.



[Adjust Color Mode]

In Adjust Color mode, Patient List in Thumbnail Mode is replaced with Adjust Color Toolbar which contains the following buttons to control image.



[Adjust Color Toolbar]

① **Previous Image**
show the previous image in the exam.

② **Next Image**
show the next image in the exam.

③ **Red Free**
remove red color component.

④ **Gray Color**
make a 12 bits grayed color image.

⑤ **RGB Components**
change red, green, blue color components separately.

⑥ **Saturation**
change saturation level of image color

⑦ **Bright & Contrast**
change brightness and contrast.

⑧ **Invert**
invert image color.

⑨ **Sharpen**
apply sharpening to emphasize detail of image.

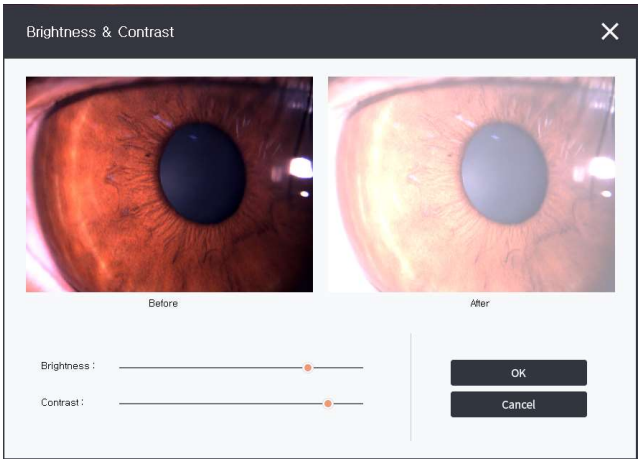
⑩ **Insert As Copy**
insert a copy of image into the exam.

⑪ **Delete Image**
remove image file from the exam.

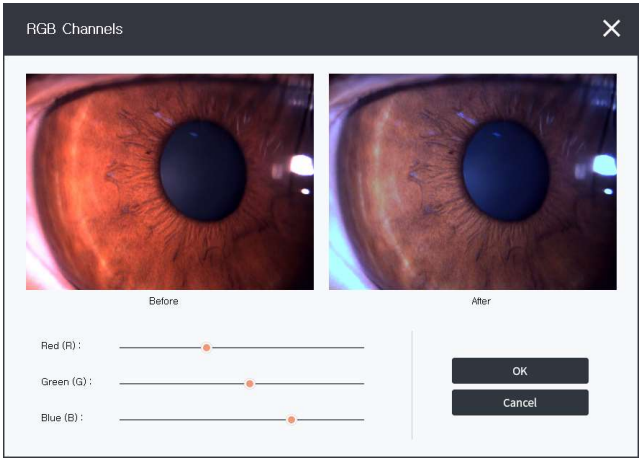
⑫ **Save Image**
save all changes of image into file.

⑬ **Reload Image**
reload as original image from its image file, all changes before reloading are recovered.

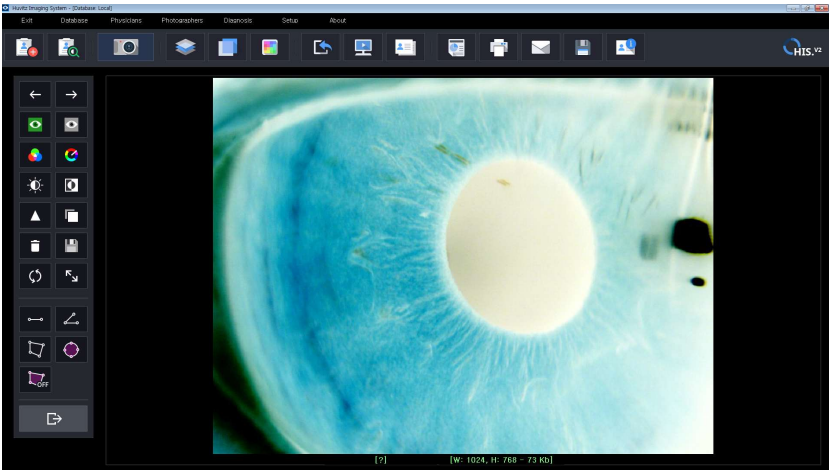
⑭ **Full Screen**
show the Full Screen image in the exam.



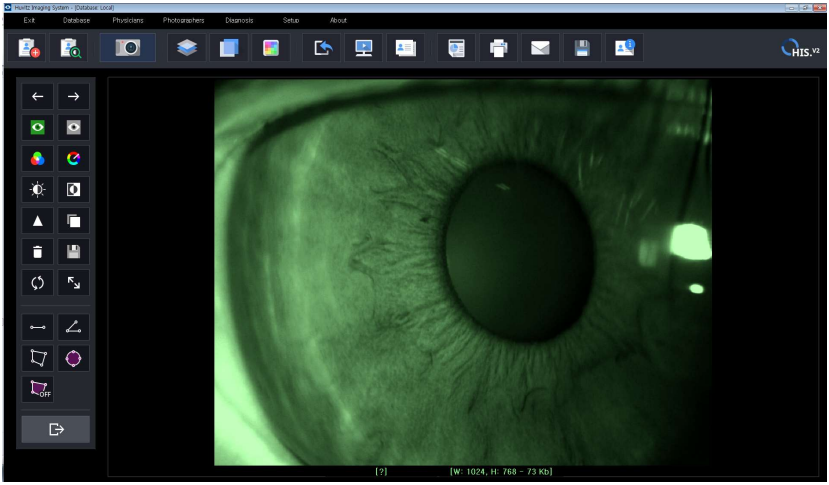
[Bright & Contrast]



[RGB Components]

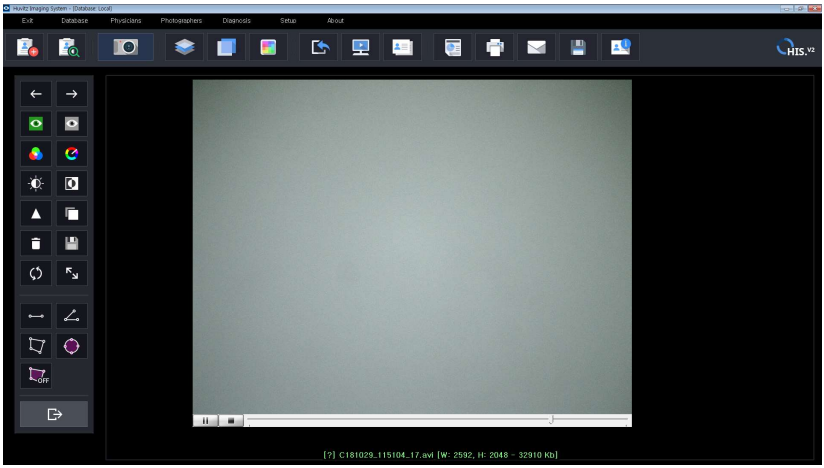


[Invert Color]



[RED Free]

Note that if the current image is a preview of movie in the exam, automatically starts playing instead of the image, and the above functions of Toolbar don't work.

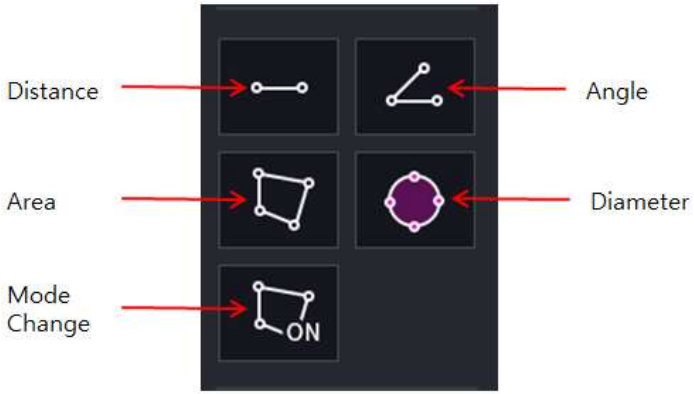


[Movie Play]

8.2 Measurements

Calibration by entering the information captured image can be measured.

Measure the desired button, then click the left mouse to draw an object, distance, angle, width, and diameter can be measured, and the measurement mode of the image enlargement / reduction is not possible.



[Measurement Toolbar]

① **Distance**
Measure the distance between two points

② **Angle**
Measure the angle between three points

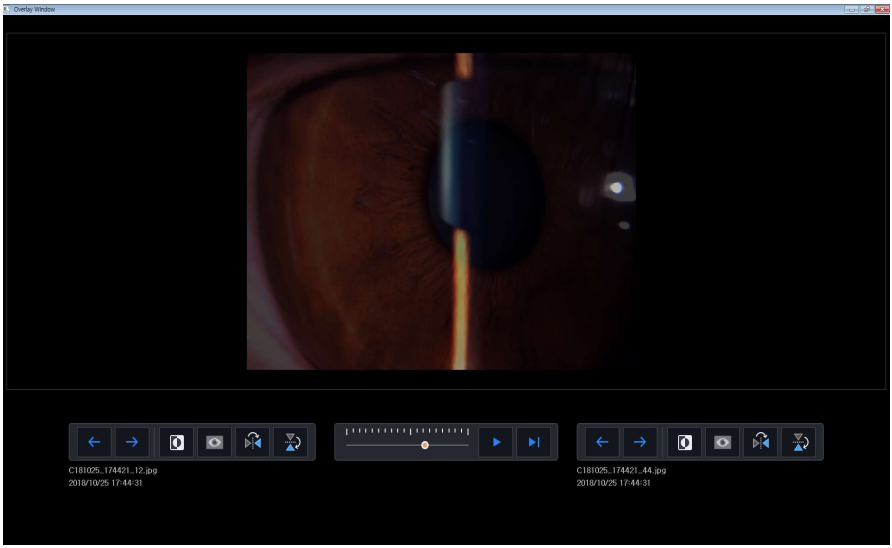
③ **Area**
Draw a polygon inside the polygon measure the extent of

④ **Diameter**
The diameter of the circle passing through three points measured

⑤ **Mode Change**
Measurement mode and the reduction / enlargement mode conversion

8.3 Overlay Image

Overlay Image shows two images lied one upon another using animation as continuous change of transparency level. It helps to analyze existence of trauma from before and after images, or transition of it in time sequence.



[Overlay Image Window]

To start Overlay Image, select more than two images in Thumbnail List, then press Overlay Image button of Main Menu. At the first, the lastly selected two images appears, press Previous or Next image button to change it.

In Overlay Image window, the buttons on the left side controls the overlaying image, the buttons on the right side control the overlaid image.

① **Previous Image**
show the previous image in the selected images.

② **Next Image**
show the next image in the selected images.

③ **Invert Color**
invert image color.

④ **Gray Color**
change to grayed color.

⑤ **Flip**
flip image vertically.

⑥ **Reverse**
reverse image horizontally.

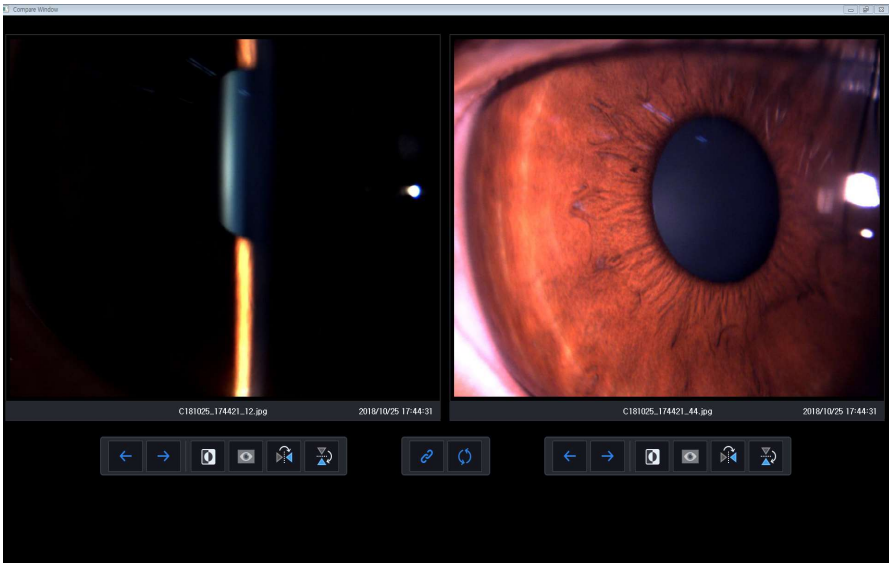
- To change transparency level between images, move the position of slider bar, and to see continuous change of it as animation, press Play or Repeat button.

- To move the position of the overlaying image, move mouse cursor clicking on it.

- To see zoomed image, use mouse wheeling.

8.4 Image Comparison

Compare Image shows two images lied side by side. It helps to examine two different images at the same time using zooming or positioning.



[Compare Image Window]

To start Compare Image, select more than two images in Thumbnail List, then press Compare Image button of Main Menu. At the first, the lastly selected two images appears, press Previous or Next image button to change it.

In Compare Image window, the buttons on each side of left and right controls its own image.

① **Previous Image**
show the previous image in the selected images.

② **Next Image**
show the next image in the selected images.

③ **Invert Color**
invert image color.

④ **Gray Color**
change to grayed color.

⑤ **Flip**
flip image vertically.

⑥ **Reverse**
reverse image horizontally.

⑦ **Synchronize**
apply all changes including zooming or color to both images.

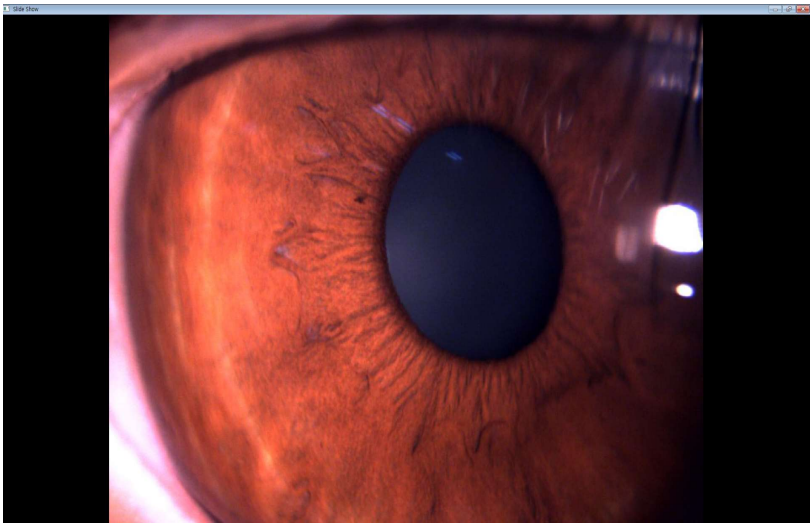
⑧ **Reload**
reload original image from image file, all changes of it are recovered.

8.5 Import Image

Import Image adds any image file from directory on disk into the exam. In Open File dialog box, select the files, then press Ok button to import. Note that if it has not appropriate image format, will appears as an empty image.

8.6 Slide Show

Slide Show shows the selected images in Thumbnail List as full screen size, It is useful for presentation.

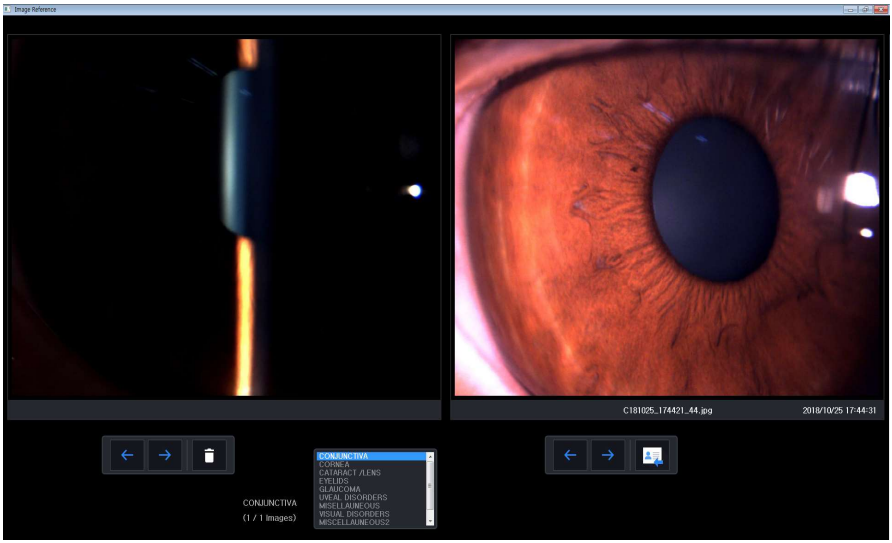


[Slide Show]

- To move to the next among the selected images, press SPACE key of keyboard.
- To see zoomed image, click mouse button or use wheeling.
- To exit Slide Show, press ESC key of keyboard.

8.7 Reference Image

Reference Image makes categorized reference image set from the images of exam.



[Reference Image Window]

① **Previous Image**
show the previous image of reference or the selected images.

② **Next Image**
show the next image of reference or the selected images.

③ **Delete Image**
remove the current reference image.

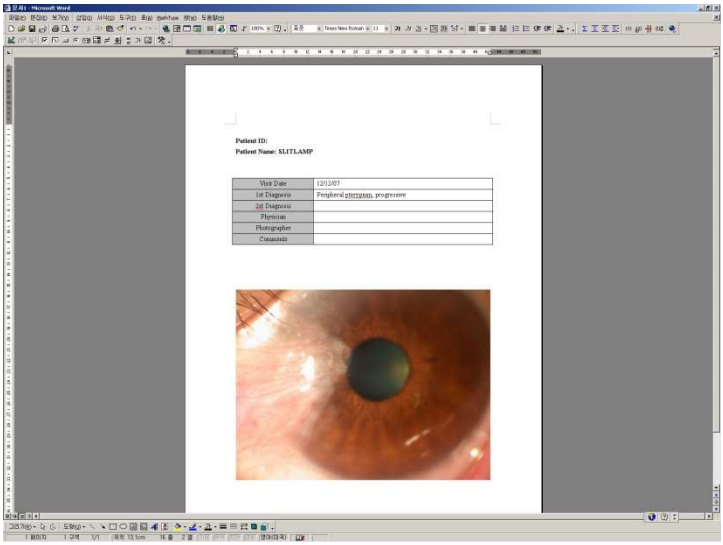
④ **Insert as Reference**
add the image to the current category of reference.

- To make a reference image, select a category in list, then press Insert as Reference button.

- To search reference images, select a category in list, then press Previous or Next Image button. If the category is empty, none of image appears.

8.8 Make Report

Make Report generates a Word document containing patient and exam information, the selected images in Thumbnail List. Note that if Microsoft Word Application is not installed on PC, this doesn't work.



[Make Report]

8.9 Print Image

Print Image starts printing with the selected images in Thumbnail List without showing Printer Setup dialog box. The size, alignment of the printed image or margin on the paper can be assigned in Setup Window of Main Menu.

8.10 Send Email

Send Email starts running default Mail client like Microsoft Outlook Express or Outlook, and make a new mail to transport image files. It needs to select images in Thumbnail List before, then the selected image files are attached to the mail including simple patient & exam information.

Note that Windows default mail profile has to be registered before.

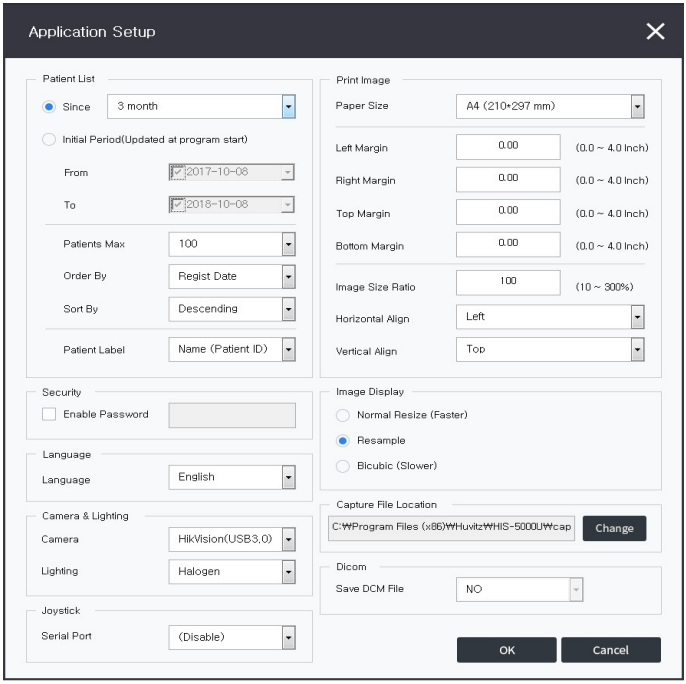
8.11 Save Image

Export Image save the selected images in Thumbnail List into the specific directory as general PC image files. In Save as File dialog box, input directory name, and image file format, then press Okay button to export.

9 Application Setup

9.1 Setup Window

To show Setup Window, press Setup button of Main Menu. After changes of settings, press OK button to apply, or Cancel button.



[Application Setup]

- **Patient List**
  - ① Time Period
    : The period of time to load patient information from database to Patient List by registered date.

② Patient Max
: Maximum number of patients in Patient List.

③ Order By
: Display order of patients in Patients List.

④ Sort By
: Sorting order of patients in Patient List.

⑤ Patient Label
: Patient Label format in Patient List.

- **Security**
  ① Enable Password
  : If it is checked, when starting HIS-5000U program, password Inputted in the field is required to continue.

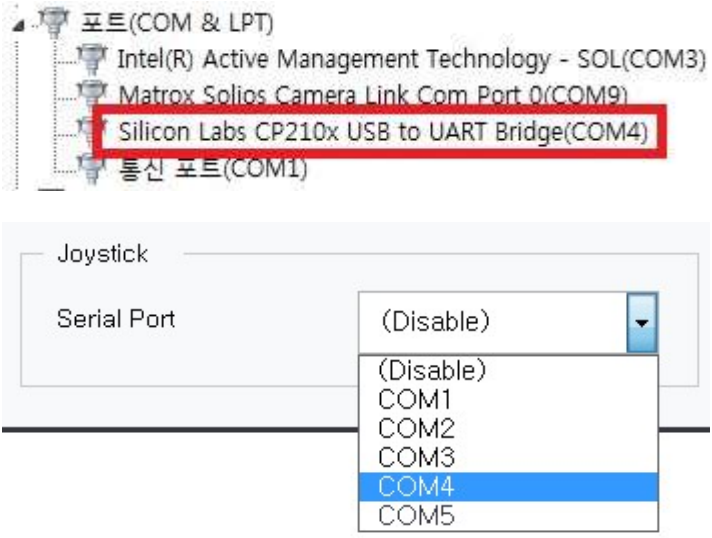
- **Language**
  ① Language
  English / Chinese to select Changed settings are applied when you restart the program. Chinese in a Chinese window will be activated.

- **Camera**
  ① Camera
  Select your camera.

- **Joystick**
  ① Serial Port
  Select the COM port that is connected to the Joystick.

※ If you are connected to the Serial Port Joystick only one COM port if it is not

displayed, but several COM ports are displayed.
In this case, open Device Manager, Ports(COM & LPT) to see.
As follows: Silicon Labs CP210x USB to UART Bridge marked with a check to set the COM number.



- **Image Display**
  - ① Normal Resize(Faster)
    : Use the Normal Resize algorithm to show image in Main Window. This is the fastest method to display, but the detail of image can be spoiled when resizing.
  - ② Resample
    : Use the Resample algorithm to show image.
  - ③ Bicubic(Slower)
    : Use the Bicubic algorithm to show image. This is the slowest method to display, but the detail of image is remained properly when resizing.

- **Print Image**
  - ① Paper Size
    : Paper size to print image whether A4 or letter.
  - ② Left Margin
    : The margin in inches of the left side on paper.
  - ③ Right Margin
    : The margin in inches of the right side on paper.
  - ④ Top Margin
    : The margin in inches of the top side on paper.
  - ⑤ Bottom Margin
    : The margin in inches of the bottom side on paper.
  - ⑥ Image Size Ratio
    : The percentage of image size to print.
  - ⑦ Horizontal Align
    : The horizontal alignment of printed image on paper.
  - ⑧ Vertical Align
    : The vertical alignment of printed image on paper.

10 Specifications

10.1 Camera Technical Characteristics

HIS-5000U (10M) Camera - IDS uEye UI-1490SE-C-HQ	
Image Sensor	1/2" Aptina CMOS (color)
Max Resolution	3840 x 2748
Color depth (sensor)	12 bit
Color depth (camera)	8 bit
Pixel Class	10 MP
Shutter	Rolling shutter
max fps in Freerun Mode	3.2
Binning Modes	Color
Subsampling Modes	Color
Sensor Model	MT9J003STC
Pixel size	1.67 µm
Optical Size	6.413 mm x 4.589 mm
Interface	USB 2.0
Lens Mount	C-Mount
Protection Class	IP30
Dimensions H/W/L	34.0 mm x 32.0 mm x 34.0 mm
Power supply	USB Cable

HIS-5000U (5M) Camera - MV-CA050-20UC	
Image Sensor	5.0 MP 1” CMOS
Max Resolution	2592x2048
Shutter	Global shutter
Frame Rate	30fps
Binning Modes	Color
Subsampling Modes	Color
Dynamic Range	>60 dB
SNR	>40 dB
Pixel size	4.8 µm x 4.8 µm
Gain Range	0 to 10 dB
Interface	USB 3.0
Lens Mount	C-Mount
Exposure Time	16 µs to 10 sec
Power supply	USB 3.0 Cable
Dimension	29 mm x 29 mm x 30 mm

HIS-5000U (1.4M) Camera - Crevis MV-CS20U	
Image Sensor	1/2" SONY CCD (color)
Max Resolution	1280 X 1024
Chip Size	7.60mm(H) X 6.20mm(V)
Cell Size	4.65 X 4.65(μm)
Scanning Method	Full, 1/2 Partial(30 fps), AOI
Maximum Frame Rate	Full Scan : 15 fps
Trigger mode	Fixed shutter, Pulse width (Exposure time = 62.6 μsec ~ 4.1 sec)
Data Format	8bit, 10bit
Minimum Illumination	1 lx at F1.4
Gamma	Pixel Center ±0.1mm
Gain	Manual 0dB ~ +22dB
Electronic Shutter	OFF ~ 1/10,000sec
Interface	USB 2.0 (high speed)
Lens Mount	C Mount
Power Supply /	+5V via USB cable / 2.5W
Dimensions	29mm x 29mm x 29mm (excluding projection)

⚠ WARNING

You can use USB 2.0 DSLR Camera, 1394A 1.4M Camera and 1394B 1.4M Camera.
However, In use, you should use only cameras certified by medical devices.

10.2 System Requirements

Hardware and Software suggested requirements		
	Minimum Requirements	**Recommended**
Processor	Intel® Core™ i3(2.4GHz over)	Intel® Core™ i5(3G4Hz over)
RAM	Over 2GB recommended	Over 4GB recommended
Video Card	On board graphics chip(PCI/PCIe graphics card with DirectDraw support DirectX 9.0	On board graphics chip(PCI/PCIe graphics card with DirectDraw support DirectX 9.0 0 or Higher Recommended
O/S	Windows 7 SP1, 8, 10, 11	Windows 7 SP1, 8, 10, 11
Interface	USB2.0, USB3.0 (depending on camera model)	USB2.0, USB3.0 (depending on camera model)
Monitor Resolution	min. 1920x1080	1920x1080

⚠ WARNING

- To ensure that the system works correctly, HIS-5000U recommends not using laptops and All-In-One-PC, using a high-quality desktop computer instead.
- Only use medically approved PCs or operate via a medically approved isolating transformer.
- Auxiliary units on the PC(e.g. printer, monitor) must be operated through an isolating transformer.

- We have completed the test in the PC specification below.

Test Desktop Specification	
Processor	Intel® Core™ i3, 3.9GHz
RAM	4GB
Video Card	On board graphics Intel® HD Graphics Family
O/S	Windows 10 64bit
Interface	USB2.0, USB3.0 (depending on camera model)
Monitor Resolution	1920x1080 (32bit)(59Hz)

11 Service Information

How to contact service: If there are any problems with the equipment, please follow the steps below:

- First of all, refer to the 10. Appendix sections according to the problem that you are encountered. And then follow the suggested sequences.
- If the problem persists, please contact the local distributor in your province or country at first.
- Before calling to the local distributor, you'd better check these information such as Model and Serial Numbers. To do so, fill up the following table as soon as you purchase our product. You can look up these information at any time. The serial number is found on the back of this unit. The serial number is unique to this unit. You should retain this manual as a permanent record of your purchase. Please retain your purchase receipt as your proof of purchase.

Date of Purchase: _____

Dealer's Name: _____

Dealer Address: _____

Dealer Phone No. : _____

Model No.: _____

Serial No.: _____

- If you can't contact with your local distributor, you can directly get in touch with the service department of the HUVITZ using the phone number and the address written in the below table.

Manufacturer

HUVITZ Co., Ltd

38, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055, Republic of Korea

Tel: 031-428-9100 (Primary)

Fax: 031-477-9022(F/A)

http://www.huvitz.com, e-mail: svc@huvitz.com

EU Representative – EU ONLY

Medical Device Safety Service GmbH (MDSS)

Schiffgraben 41, 30175 Hannover, Germany

Tel: +49-511-62628630
Fax: +49-511-62628633

CANADA Representative – CANADA ONLY

AXIS Medical Canada Inc.,

30 Hanna Court, Unit #1 Belleville, Ontario K8P 5J2, CANADA

Tel: +1-604-540-1755(Ext 303)
Fax: +1-604-540-1733

U.S. Representative

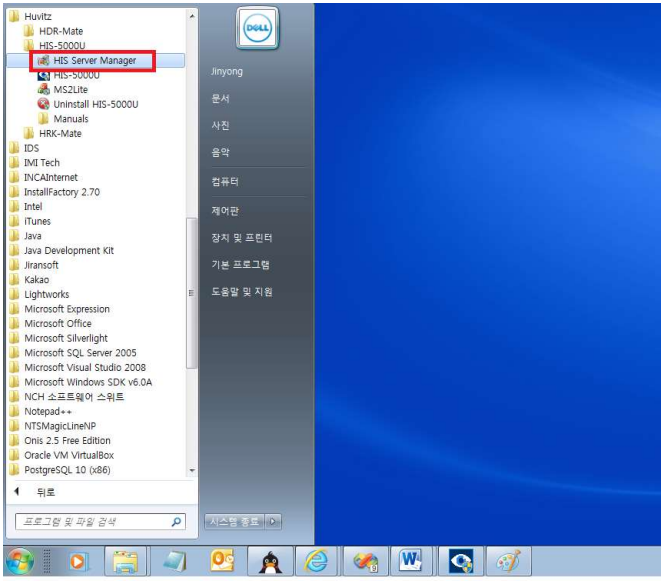
COBURN TECHNOLOGIES

83 Gerber Road West, South Windsor, CT 06074, United states
Tel: +1-860-648-4906

■ Appendix A. HIS Server Management

1. Starting up HIS Server Manager

As HIS-5000U software package is installed, HIS Server Manager for controlling HIS Storage Service and supporting data backup on HIS Database, is additionally installed. HIS Server Manager can be run by double clicking its program icon on Windows desktop, or installed directory. (Default is “C:\Program Files(x86)\Huvitz\ HIS-5000U\HIS Manager”)



2. Main Window

Main Window of HIS Server Manager is composed of the following functional items.

- ‘Service Manager’
- ‘Image Storage’
- ‘Database Backup Wizard’
- ‘Database Restore Wizard’
- ‘Database Configuration’
- ‘Exit’

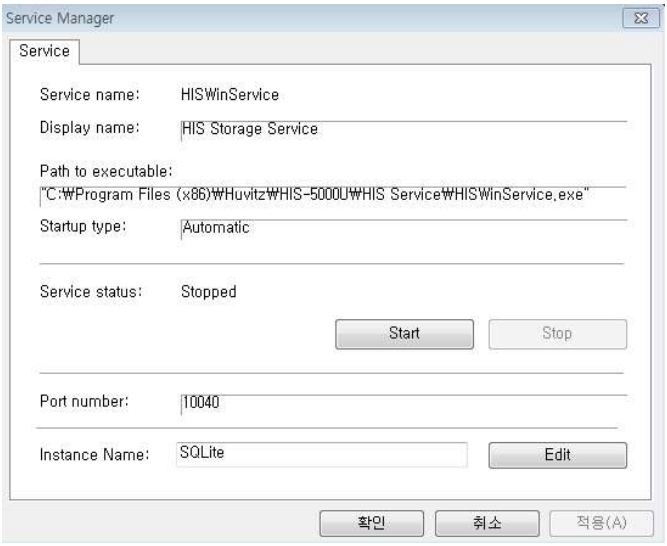


[Main Window]

A. Service Manager

When HIS-5000U software is installed, HIS Storage Service is also registered as a Windows Service. It enables the connected HIS-5000U.exe programs to access patient information from HIS Database and image files from the Image Storage directory existing on the PC which HIS Storage Service is running.

For example, HIS-5000U program is going to connect to HIS database on the PC as IP Address: 192.168.114.112, it needs to confirm that HIS Storage Service is running on it, if not, the connection will be failed.



[Service Manager]

- To start HIS Storage Service as a Windows Service, press ‘Start’ button. If successful, Service status will be changed as ‘Started’. If not, as ‘Stopped’. Started Service will be automatically restarted by Windows OS whenever system reboots.

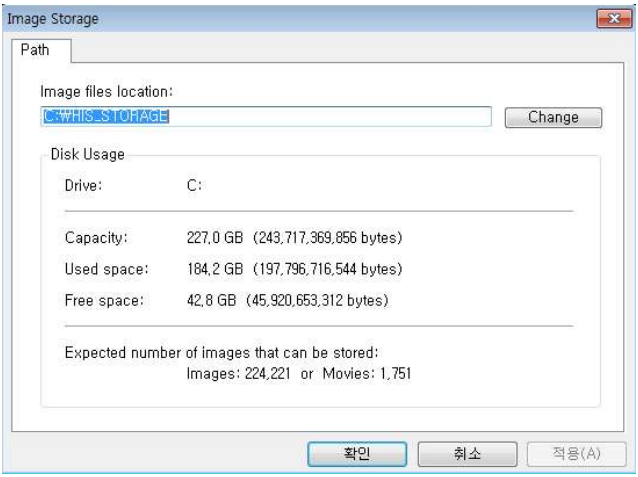
- To stop HIS Storage Service, press ‘Stop’ button. Confirm that Service status is changed as ‘Stopped’. Note that Stopped Service will not be automatically restarted after system reboots.

HIS Storage Service allows HIS-5000U programs to access via TCP/IP Protocol with a port number 10040 as default. After starting HIS Storage Service on the target PC, if HIS-5000U program still fails to connect to it with IP Address of it, then checks Windows Firewall configuration or the current security configurations, the port number must be allowed to make a network connection.

Each HIS Storage Service allows to make maximum 16 connections with HIS-5000U programs as default.

B. Image Storage

HIS Storage Service saves all image files including thumbnails and movies from the connected HIS-5000U programs into Image Storage directory. The file path of each image is determined as its examination date and the patient identifier under Image Storage path. Note that if the path is modified or deleted, HIS-5000U program will fail to load images.



- To change Image Storage path, press ‘Change’ button, and choose a folder in dialog box. Note that the capacity of hard disk including the path must have enough free space to save further image files.

After the change of Image Storage path, there are any image files under the previous folder, it needs to copy all of them, files and sub folders into the new folder manually.

C. Database Backup Wizard

Database Backup Wizard makes a backup file including all information of HIS database like patient, examination, diagnosis, etc, and image files from Image Storage directory for the specific time period.

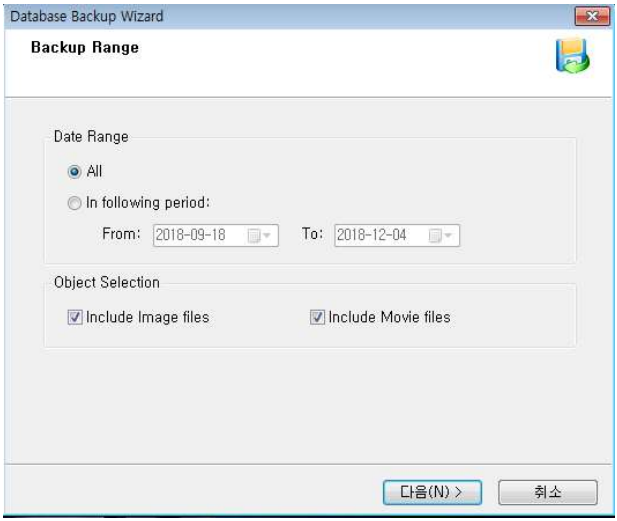
1. Starting Database Backup Wizard

Click ‘Database Backup Wizard’ on Main Window of HIS Server Manager. Note that if HIS Storage Service is running, it must be stopped before.

2. Choosing Backup Range

Select date range to backup database records, and target objects to be included into backup file. All patients who registered in the time period, and their information like examination with images are backed up.

For example, if you assigned the date range as from April 4, 2009 to May 15, 2009, and checked only image files in target objects, then for all patients registered during the time period, their examination records and image files except the movie files will be exported into backup file.



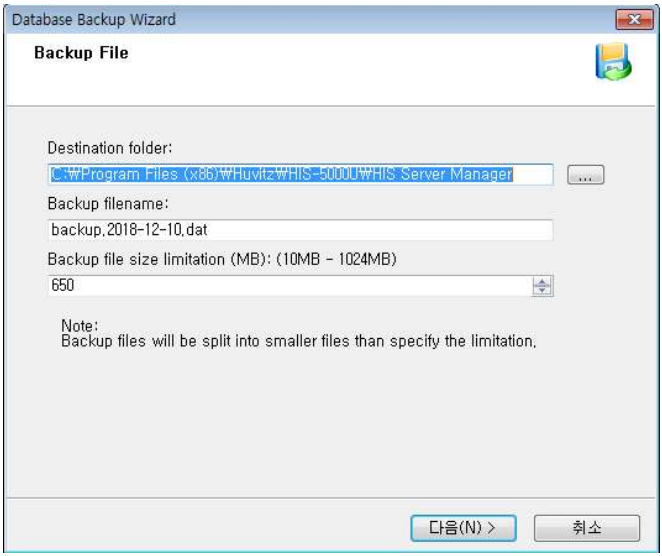
- To backup all patients in database, select ‘All’ in date range.

- To backup the relevant imaging files with the selected patients, check object selection. Note that if all items are not checked, backup file will include just patient and examination records.

Click ‘Next’ button to continue.

3. Configure Backup File

Configure destination folder, backup filename and backup file size, and then press ‘Next’ button.

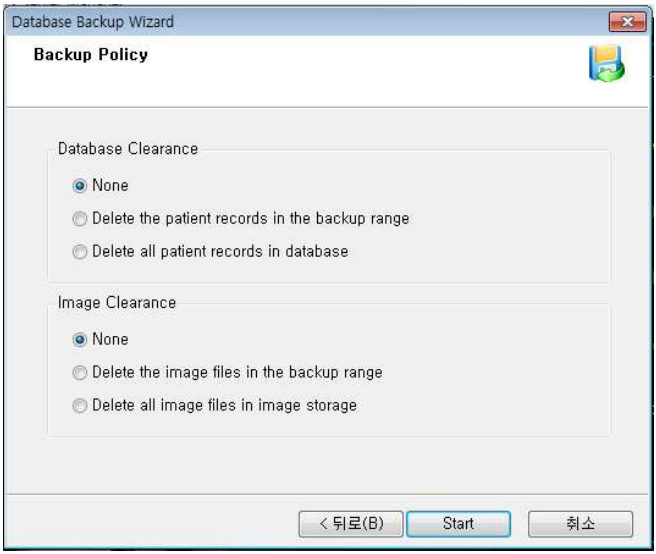


- The size limitation of backup file is from 10MB to 1024MB (1GB).

- If backup file exceed the maximum size, in order of precedence creates file add 001, 002, 003 file expansion.

4. Configure Backup Policy

Before starting backup, configure that how to clear patient records in database and image files in Image Storage directory.



- To don't delete records in the database, select 'None' in the Database Clearance.
- To delete only records of the backup file in the database, select 'Delete the patient records in the backup range' in the Database Clearance.
- To delete all records in the database, select 'Delete all patient records in database' in the Database Clearance.
- To don't delete image or movie files, select 'None' in the Image Clearance.

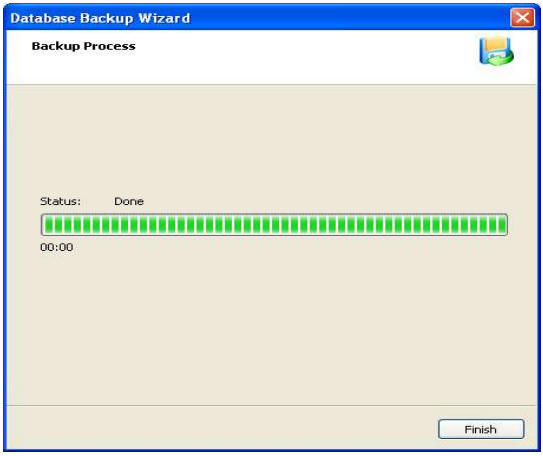
- To delete only image or movie files of the backup file, select ‘Delete the image files in the backup range’ in the Image Clearance.

- To delete all image or movie files, select ‘Delete all image files in image storage’ in the Image Clearance.

Press Start button to continue.

5. Complete Backup Process

Display status of backup and progress backup process. After finished backup process, display processing time and ‘Finish’ button.



- If it is happened error during backup process, display error information in the status area.

D. Database Restore Wizard

Database Restore Wizard supports function that can restore HIS-5000 database from the backup file including patient, exam information, image, move files.

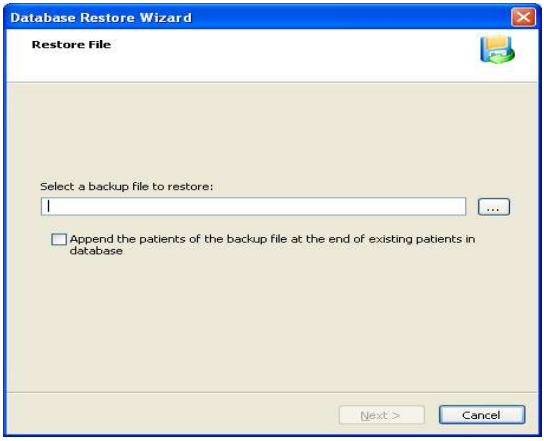
The process of database restore is as follows.

1. Execute Database Restore Wizard

At first execute HIS Server Management (HSM), and then press 'Database Restore Wizard' button.

2. Configure Restore File

Select a backup file to restore, and then press 'Next' button.

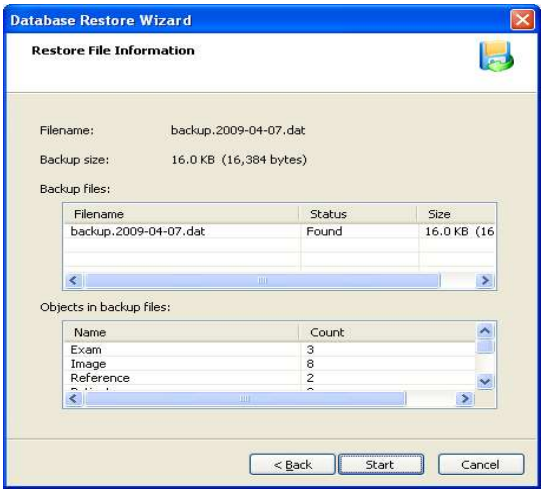


- If you want to append the database, image and movie file of the backup file at the end of existing records, check ‘Append ~ ’.

- All the backup files(~001, ~002, …) must be located same directory with selected backup file.

3. Confirm Restore File Information

Confirm the information of backup file(Filename, File size, File list…), and then press ‘Start’ button.

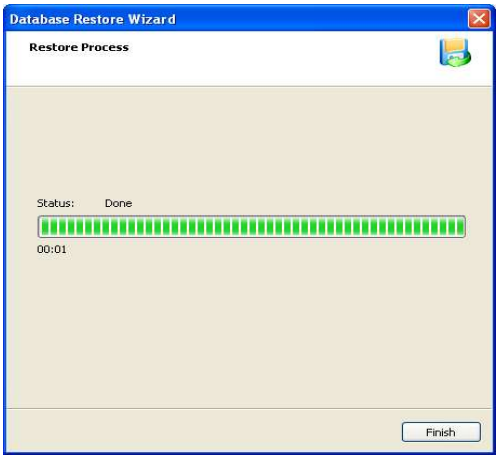


- All the backup files(~001, ~002, …) must be located same directory with selected backup file.

- If all the backup file isn‘t located same directory, can‘t start to restore.

4. Complete Restore Process

Display status of restore and progress restore process. After finished restore process, display processing time and ‘Finish’ button.



- If it is happened error during backup process, display error information in the status area.

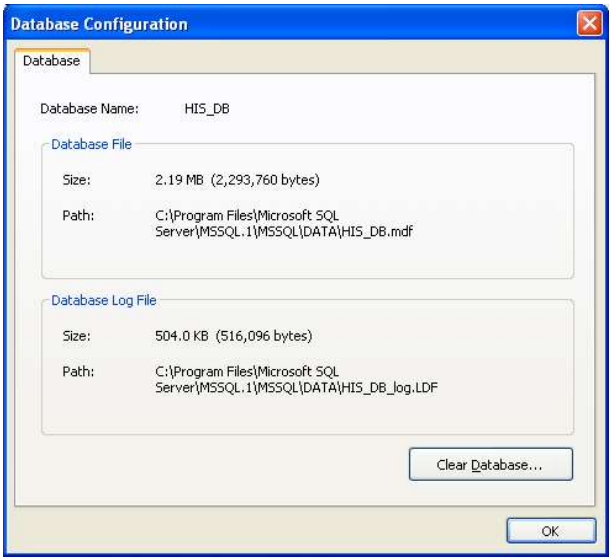
E. Database Configuration

Database Configuration window shows the physical file information of the current HIS Database instance. All patient data is stored in Database File, and its database transaction history is stored in Database Log File.

Note that Database File doesn't include image file binaries.

1. Execute Database Configuration

At first execute HIS Server Management (HSM), and then press 'Database Configuration' button.



2. Execute Clear Database

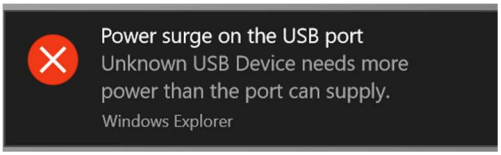
Press ‘Clear Database’ button, and then appear dialog box. After confirm message, press ‘Yes’ button to delete HIS-5000 database.



- If it is deleted database, All HIS-5000 data (Patient Info, Exam Info, Image File, Movie File…) is deleted,
- If it should be delete data except for image, movie file, uncheck ‘Delete ~’ .

■ Appendix B. How to Disable Power Management for USB connected Devices

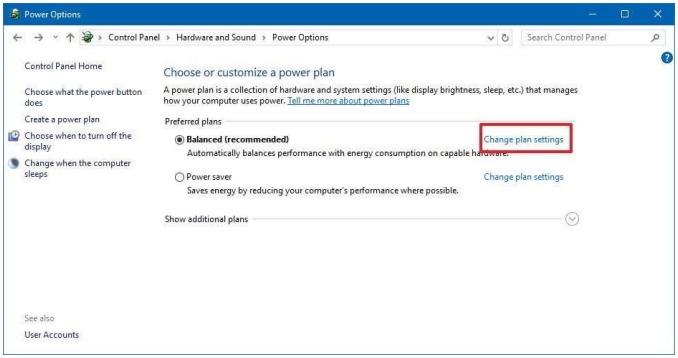
You can see the warning message - 'Power surge on the USB port', when you use a lot of usb ports on your PC.



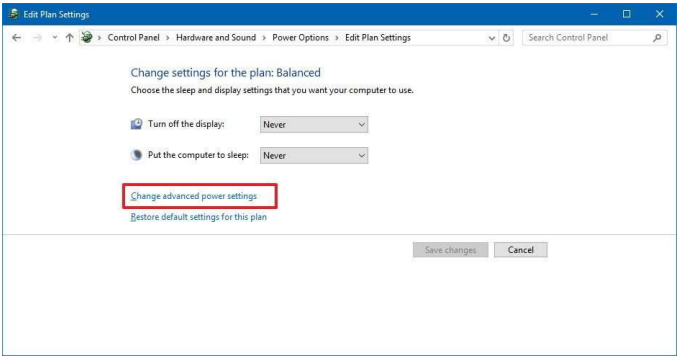
You can turn off the above warning message in windows panel.

How to disable USB selective suspend

1. Open **Control Panel**.
2. Click on **Hardware and Sound**.
3. Click on **Power Options**.
4. Under "Preferred plan," click the **Change plan settings** link for the plan you're currently using. (If you change the settings on the power plan that isn't active, this won't work.)



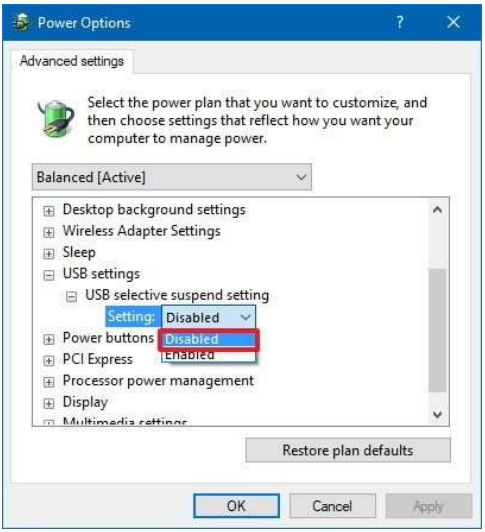
5. Click the Change advanced power settings link.



6. Expand USB settings.

7. Expand USB selective suspend setting.

8. Select Disabled from the drop-down menu.

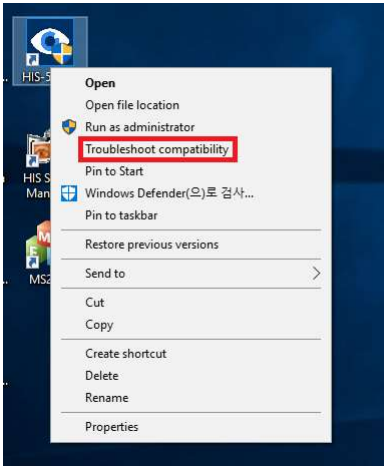


9. Click Apply.

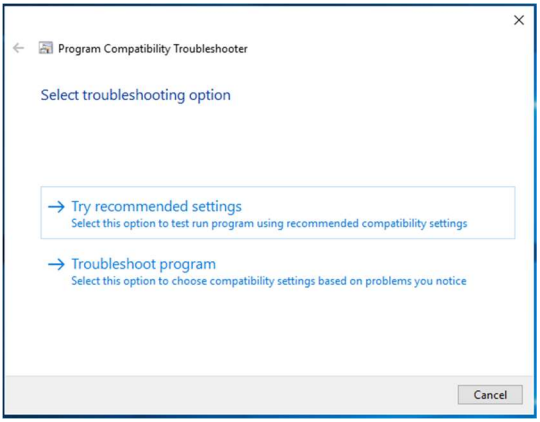
10. Click OK.

■ Appendix C. Troubleshoot not running on Windows 10

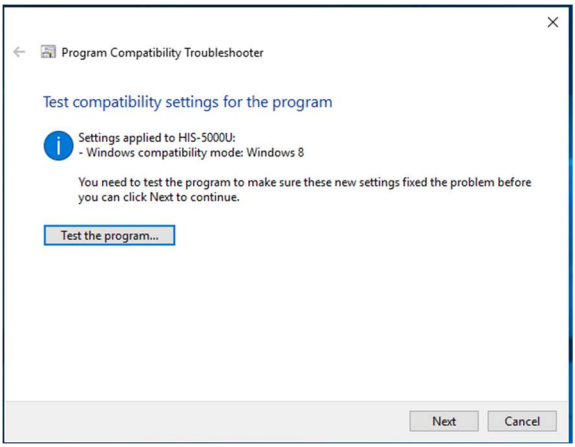
1. Select the HIS-5000U app and right click, click the troubleshoot compatibility in menu.



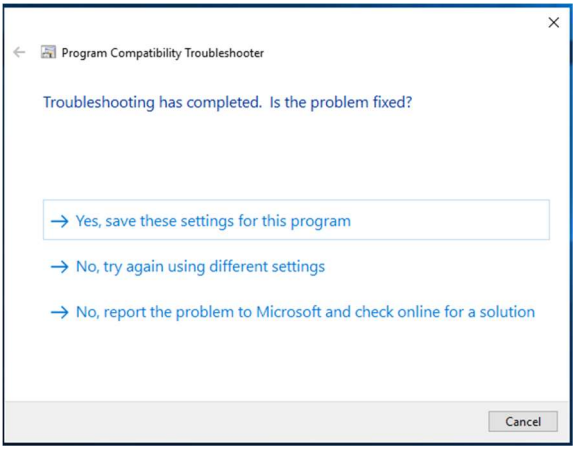
2. Select a troubleshooting option: use the recommended compatibility setting



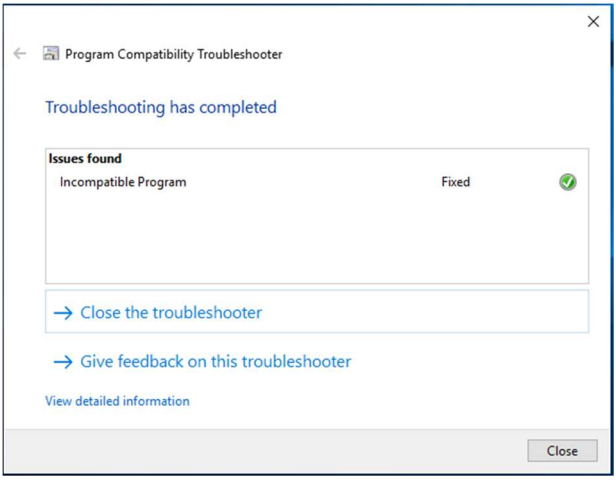
3. If you choose to use the recommended settings, the troubleshooter will test the app using a previous version of Windows so you can see if that resolves the issue. Click the Test the program button and then click next.



4. Click the 'Yes, save these setting for this program'



5. Click the ' Close troubleshooter'



You'll have to run the troubleshooter for HIS-5000U app you're having compatibility problems with.