

**Diagnostic Ultrasound System**  
**DICOM Quick Guide FAQ Manual**

# **Intellectual Property Statement**

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**Note:** Before using DICOM, please read the electronic file DICOM CONFORMANCE STATEMENT along with the device. At the same time, please verify that the SCU services provided by ultrasound machine can be supported by the SCP services provided by the systems such like PACS/RIS/HIS and so on.

The chapter is confined to the preset, connection verification and DICOM services of the DICOM-configured ultrasound machine, not including SCP configurations like PACS/RIS/HIS.

The DICOM package is optional, so the description here is only applicable for the system configured with the DICOM package.

This system supports the following DICOM functions:

- Verify Connectivity
- DICOM Storage
- DICOM Print
- DICOM Worklist
- MPPS Modality Performed Procedure Step
- Storage Commitment
- DICOM Medium Storage DICOMDIR Review
- DICOM Task Management

Workflows of DICOM Applications are briefly described as follows:

1. DICOM preset (Localhost DICOM Service Property, Server Setting, and Set DICOM Service).
2. Verify connectivity.
3. DICOM application (Image Storage, Print, MPPS, Worklist, Storage Commitment, DICOMDIR Review, Q/R and Task Management).

**Abbreviation introduction:**

The followings are the abbreviations in this chapter.

Abbreviation	Description
DICOM	Digital Imaging and Communications in Medicine
AE	Application Entity
MPPS	Modality Performed Procedure Step
PDU	Protocol Data Unit
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
SR	Structured Report
HL7	Health Level 7

# 1 Preset

## 1.1 DICOM Preset

To open the DICOM preset screen:

1. Press <Setup> key to show the Setup menu.
2. Move the cursor onto [DICOM/HL7 Preset] to open the screen, you can set up the Localhost DICOM Service Property, Server Setting and DICOM Services, as shown in Figure 1 DICOM Preset Screen:

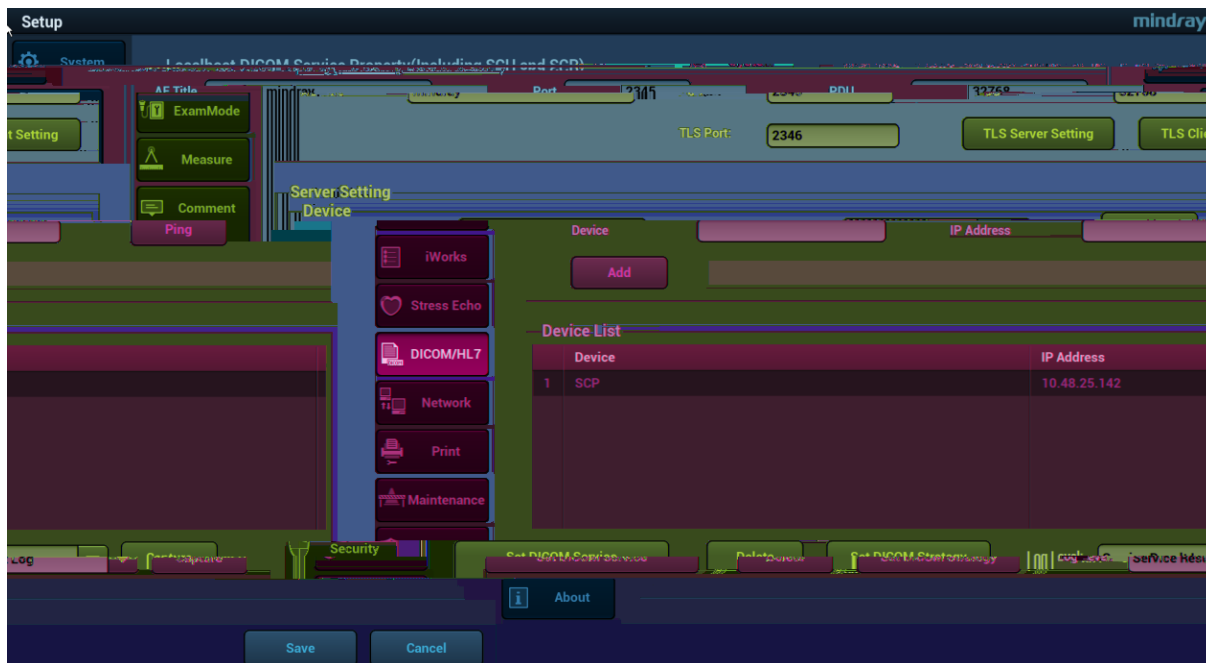


Figure 1 DICOM Preset Screen

The main parameters of localhost DICOM preset are described as follows:

In the above screen, please enter AE Title, Port, and PDU according to the actual situation, and then click [Save] to exit the screen.

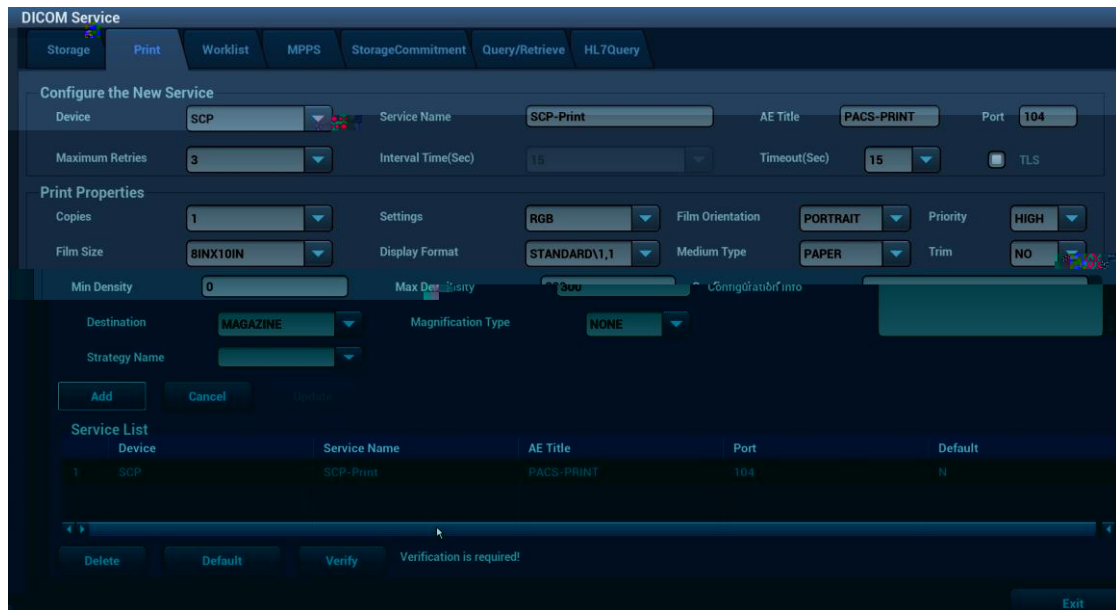
Tip:

- AE Title should be the same with the SCU AE Title preset in the server (PACS/RIS/HIS), for example, if the AE Title of the server preset in the print server is Printer, and the AE Title of the accepted SCU is preset as Machine, then in the figure above, the AE Title of Local should be Machine, and the AE Title of print server should be Printer.
- 1) The device name can be entered to your preference. If the currently entered name has another name.
    - Port must not be set as 4001, 6000, 3001, 6555.
  - 2) IP address must be the actual IP address of the server.



Cine Zoom Mode	Original, 640*480, 800*600, 1024*768 are optional, the default is Original.
Compression Mode	Uncompressed(The image is uncompressed) RLE(The image is lossless compressed) JPEG(Please refer to the information of provider to confirm whether SCP can support JPGE compression. If not, please do not select it) are optional, the default is JPEG.
Compression Ratio	LossLess, High, Middle and Low, three kinds of Compression Ratio are optional. Compression Ratio is in inverse proportion to image quality.
Color Mode	Three options are available, Color means the images sent from system to server will be coded by 24bit, Mixed means the images sent from system to server will be coded by 8bit or 24 bit depends on whether the images themselves are captured in color imaging mode or colorize switch is in on state or not, if they do so, will be coded by 24bit, else 8bit. Gray means the images sent from system to server will be coded by 8bit. The default is Color.
Allow Multiframe	If SCP supports this function, then select it.

## 1.2.2 DICOM Print Preset



**Figure 3** DICOM Print Preset Screen

The main parameters of DICOM Print are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the print server.
Service name	Default is xxx-Print, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the print server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the print server port.
Maximum Retries	0 9 times are optional, the default is 3. If the DICOM storage task that is sent to this server is failed, the task will be retried automatically, the retry times is set here.
Interval Time Sec	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout Sec	Refers to timeout during association establishment. Value: 5-60s, in increments of 5s, and 15 is default.
TLS	User encrypted transmission when checked.
Copies	Refer to copies of printed files. You can select among 1 through 5, or directly enter the numeral.
Settings	The system supports RGB (color printing) and MONOCHROME2 (black and white printing). Please select the type the printer supports.
Film Orientation	Select between LANDSCAPE and PORTRAIT.
Priority	High Middle Low
Film Size	Select film size among the selections listed in the drop down list.
Display Format	Specify quantity of printed files, e.g. STANDARD\2, 3 indicates 6 images are printed for each page.
Media Type	Specify print medium: Paper, Clear Film, Blue Film; select Blue Film or Clear Film for black and white printing; select Paper for color printing.

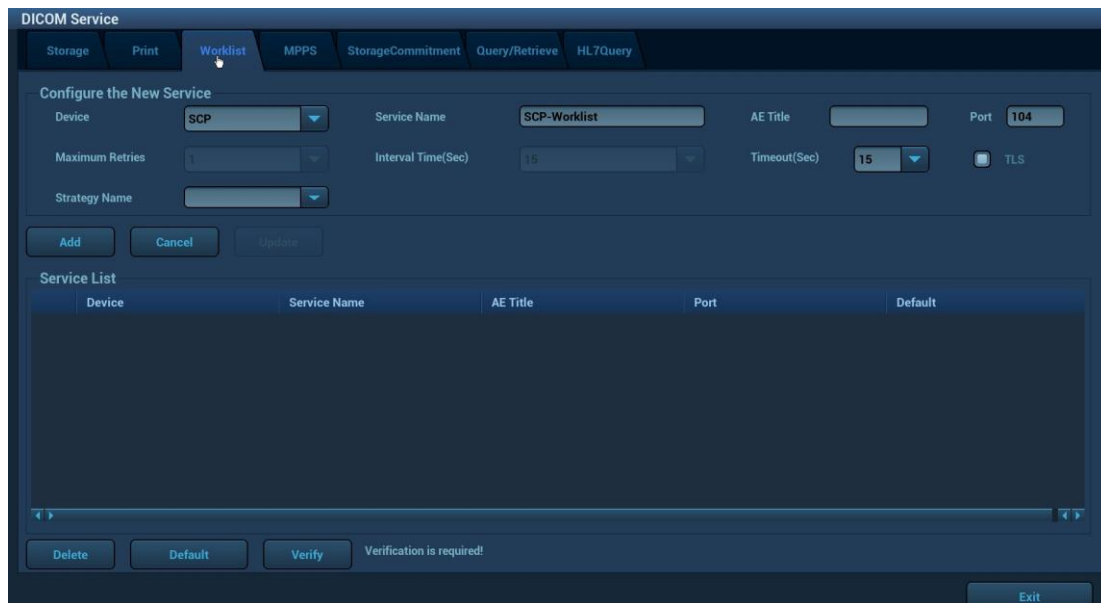
Trim	Specify whether you want a trim box to be printed around each image on the film: Yes or No.
Min Density	Enter the minimum density of the film. The default is 0.
Max Density	Enter the maximum density of the film. The default is 300.
Magnification Type	Select how the printer magnifies an image to fit the film. Replicate: interpolated pixels belong to duplicate of adjacent pixels); Bilinear: interpolated pixels are generated from bilinear interpolations between adjacent pixels; Cubic: interpolated pixels are generated from cubic interpolations between adjacent pixels; None: without interpolation.
Destination	Specify where the file is exposed: MAGAZINE (stored in the magazine), or, PROCESSOR (exposed in the processor).
Configuration Info	Enter configuration information in the field.
Add	Add the DICOM service to the service list.
Delete	Click to delete the selected service in the service list.
Cancel	Click to cancel parameter preset
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	Default column.
Exit	Click to exit the screen.

**Tips:**

The parameters preset should be meet the requirements of printer, for instances:

1. If the printer cannot support the [Film Size] of 8IN\*10IN, please modify it that the printer can support.
2. It will implement color printing when [Settings] is set as RGB, black and white printing when it is set as MONOCHROME2.
3. For [Media Type], select Blue Film or Clear Film for black and white printing; select Paper for color printing.
4. Other parameters can use defaulted values. If there are special requirements for printer, please modify it.

### 1.2.3 Worklist Preset

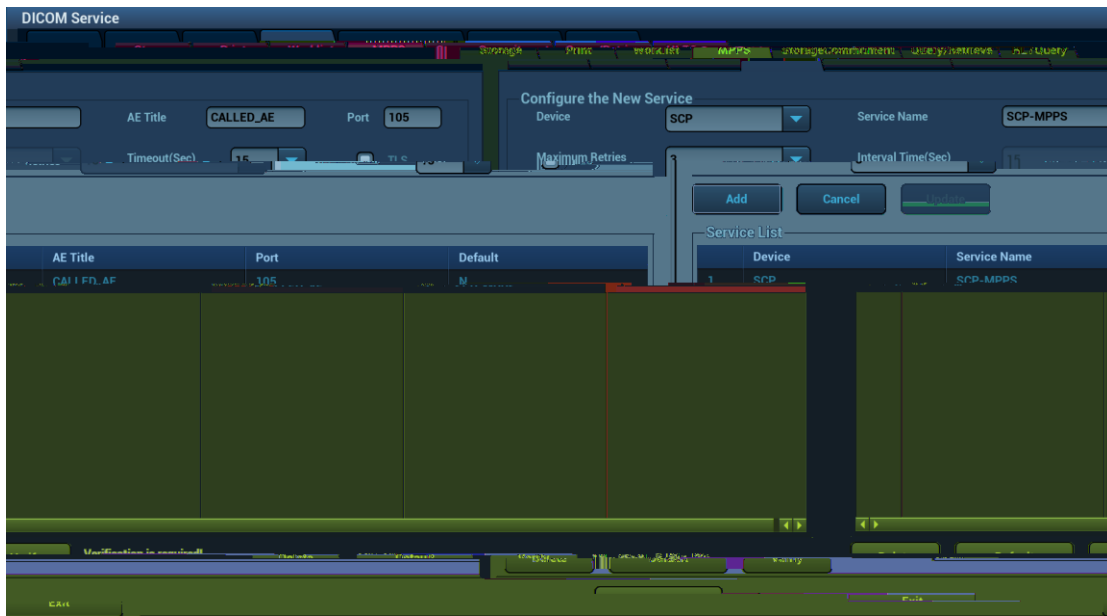


**Figure 4** DICOM Worklist Preset Screen

The main parameters of DICOM Worklist are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server screen, the name (s) will appear in the drop-down list, select the name of the Worklist server.
Service name	Default is xxx-Worklist, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the Worklist server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the Worklist server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time Sec	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout Sec	5-60s, in increments of 5s, and 15 is default. Timeout is the overtime of connecting Association.
TLS	User encrypted transmission when checked.
Add	Click it to add the Worklist service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	Select an item in the service list, click [Default] and you can see he Default column.
Exit	Click to exit the setup screen.

## 1.2.4 MPPS Preset

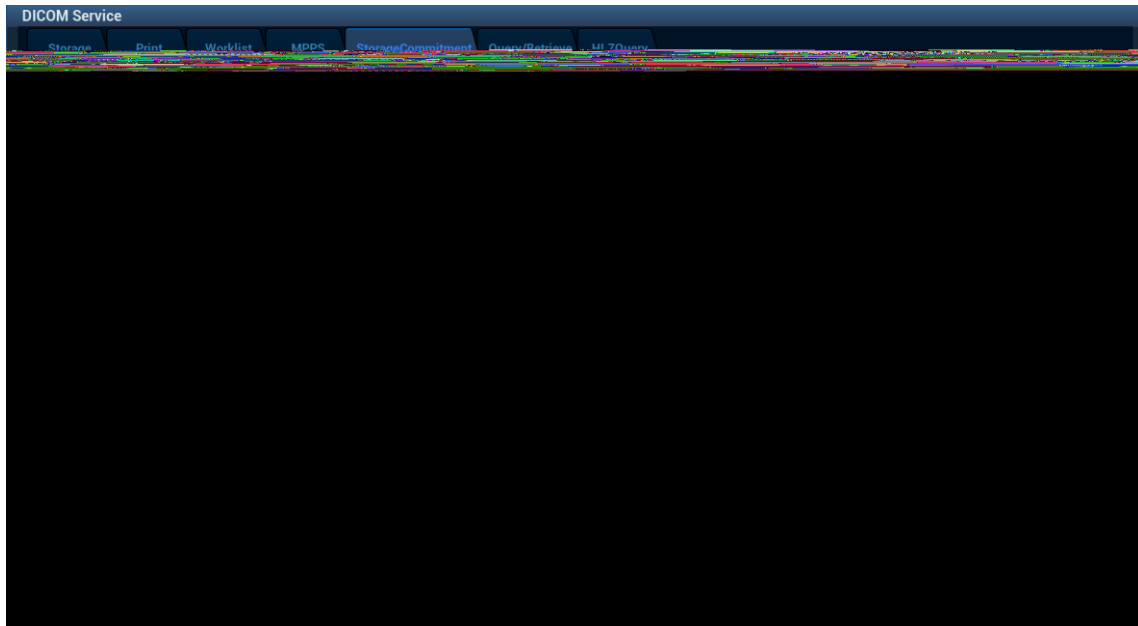


**Figure 5** DICOM MPPS Preset Screen

The main parameters of DICOM MPPS are described as below:

**Name**

## 1.2.5 Storage Commitment Preset



**Figure 6** DICOM Commitment Preset Screen

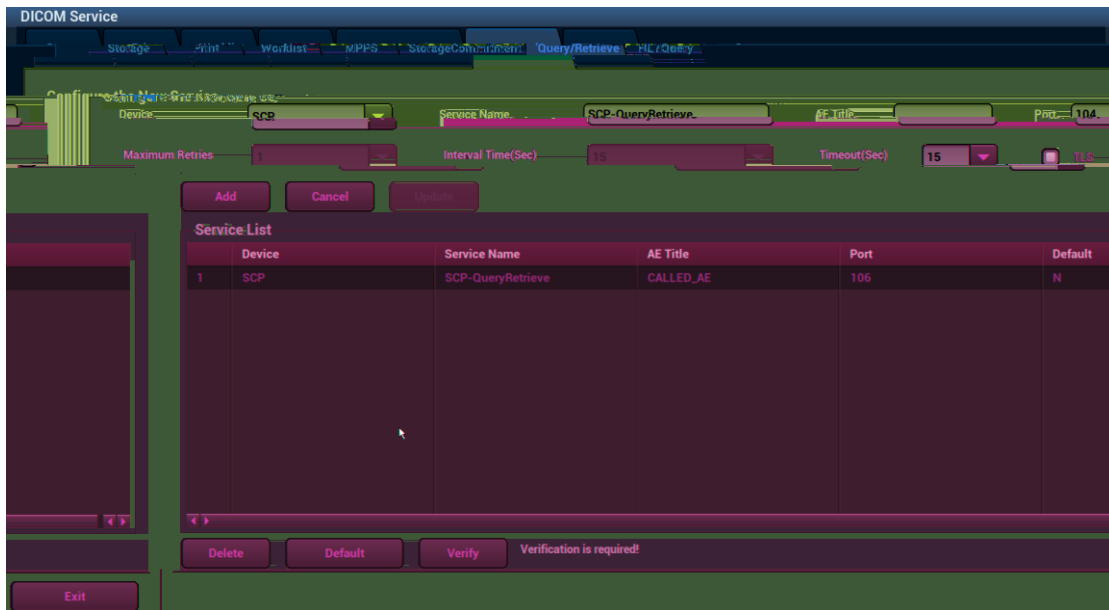
The main parameters of storage commitment are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server Preset screen, the name (s) will appear in the drop-down list, select the name of the server.
Service name	Default is xxx-SC, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the storage commitment server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the storage commitment server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout	Value: 5-60s, in increments of 5s, and 15 is default. After user sending storage commitment for 15 seconds, the connection is closed.
TLS	User encrypted transmission when checked.
Associated Storage Service	The associated storage server is preset before storage commitment, only after the exam is sent out, can storage commitment be created.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are

	normally connected.
Default	Unavailable
Exit	Click to exit the setup screen.

1. Set storage server relating to storage commitment.
2. Set the port for message return and IP at server end, which are respectively corresponding to the port in DICOM Local and IP in TCP/IP preset.

## 1.2.6 Query/Retrieve Preset



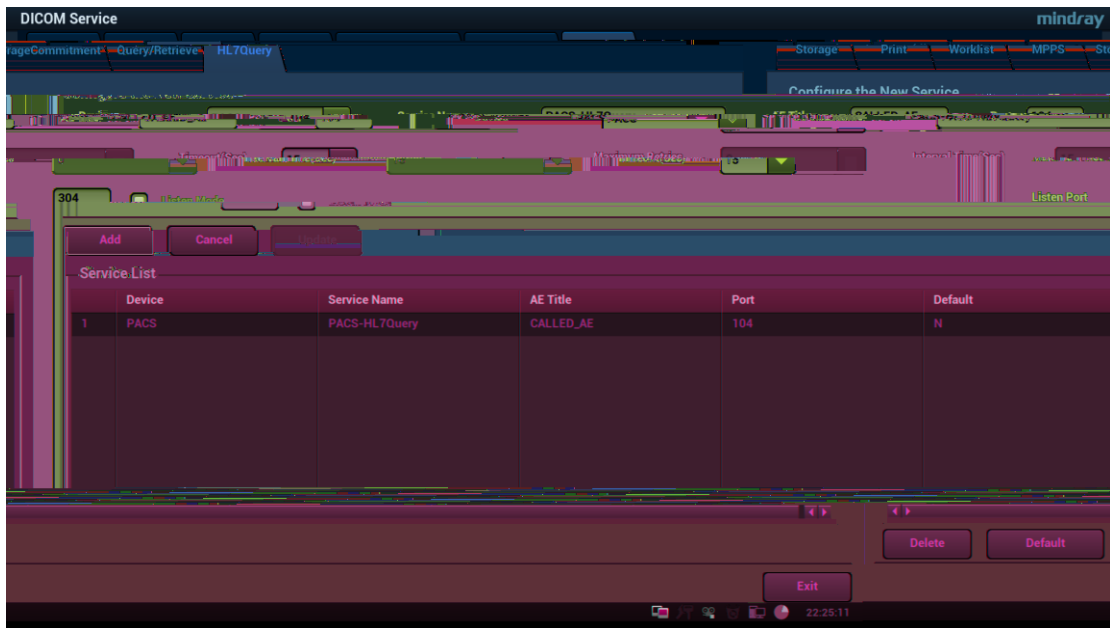
**Figure 7** DICOM Query/Retrieve Preset Screen

The main parameters of Query/Retrieve are described as below:

Name	Description
Devices	After you set the server (s) in DICOM Server Preset screen, the name (s) will appear in the drop-down list, select the name of the storage commitment server.
Service name	Default is xxx-QueryRetrieve, user-changeable.
AE Title	Application Entity title, here, it should be consistent with that of the storage commitment server.
Port	DICOM communication port, 104 is default. Here, the port should be consistent with that of the storage commitment server port.
Maximum Retries	0 9 times are optional, the default is 3. (Reserved)
Interval Time	5 1800 seconds, 15 seconds is default. (Reserved)
Timeout	Value: 5-60s, in increments of 5s, and 15 is default. After user sending storage commitment for 15 seconds, the connection is closed.
TLS	User encrypted transmission when checked.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel parameter preset.
Update	Select an item in the service list, change the parameters in the above area, and

	click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Verify	Click to verify if the two DICOM application entities are normally connected.
Default	Select an item in the service list, click [Default] and you can s column.
Exit	Click to exit the preset screen.

## 1.2.7 HL7Query Preset



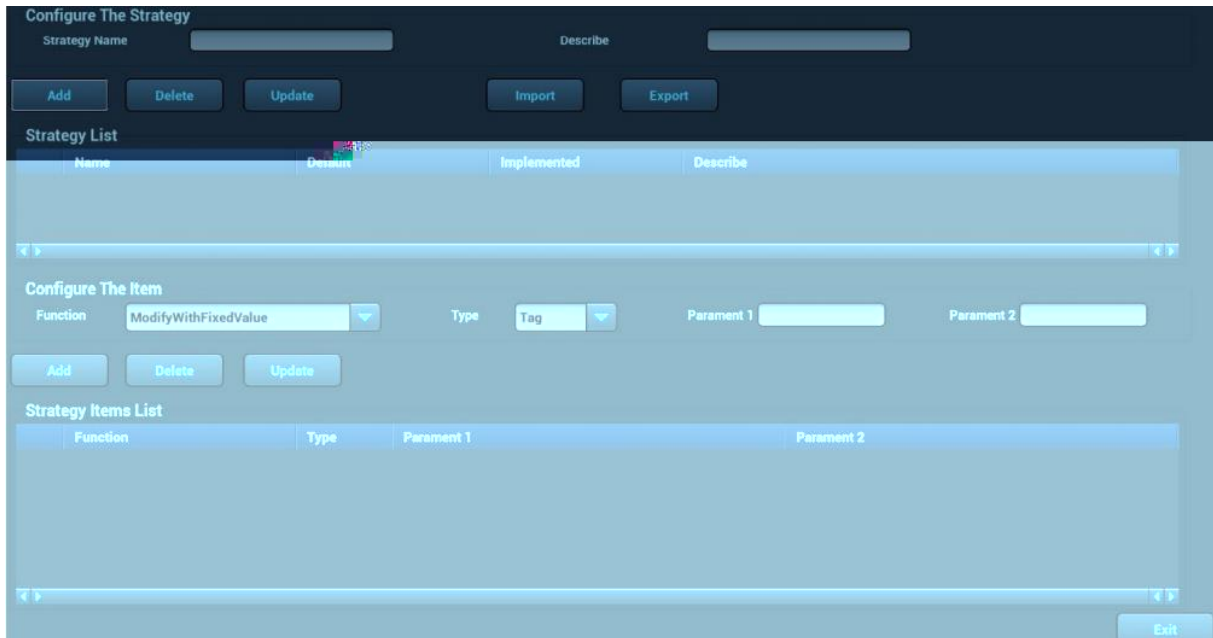
**Figure 8** HL7Query Preset Screen

The main parameters of HL7Query are described as below:

	default is unselected.
Add	Click it to add the HL7 service to the service list.
Cancel	Click to cancel parameter preset changes.
Update	Select an item in the service list, change the parameters in the above area, and click [Update] to update the item in the service list.
Delete	Click to delete the selected service in the service list.
Default	Select an item in the service list, click [Default] and you can see
Exit	Click to exit the setup screen.

## 1.2.8 DICOM Strategy Preset

On the DICOM/HL7 preset screen, click [Set DICOM Strategy] to enter the strategy preset screen as Figure 9.



**Figure 9** Configure the Strategy

Name	Description
Strategy Name	The strategy name is limited to 32-100 characters. Cases including duplication of name, comma and leaving a blank are forbidden.
Describe	Description of the strategy.
Add	Add the DICOM strategy to the strategy list.
Delete	Click to remove the DICOM strategy from the strategy list.
Update	Select an item in the strategy list, change the parameters in the above area, and click [Update] to update the item in the strategy list.
Import	Import DICOM strategy.
Export	Export DICOM strategy.

Function	HL7 Listen Port, the default is 304. This port is used to receive patient query result message.
Type	Under Listen Mode, Ultrasound Diagnostic System sends patient query message as client and receives query result from peer as server; Under non-Listen Mode, Ultrasound Diagnostic System sends and receives HL7 message in one TCP connection. The default is unselected.
Parament 1	Set the parameter according to needs. The maximum character length is 64.
Parament 2	Set the parameter according to needs. The maximum character length is 64.
Add	Add the DICOM strategy item to the strategy item list.
Delete	Click to remove the DICOM strategy item from the strategy item list.
Update	Select an item in the strategy item list, change the parameters in the above area, and click [Update] to update the item in the strategy item list.

NOTE: The DICOM strategy must be configured by qualified personnel with good knowledge of DICOM standards. The qualified personnel must ensure the validity of the DICOM strategy.

# 2 DICOM Service

## 2.1 Verify Connectivity

If you want to verify connectivity (it is not a must), you can click [Verify] button on Storage, Print or Worklist, MPPS, Storage Commitment and Query/Retrieve pages respectively. If the verification , which means the connection is wrong. Please reconfirm it.

Tip:

Not all the SCPs can support verification; please consult SCP belongings to confirm whether SCP

## 2.2 DICOM Storage

DICOM Storage is used to send images (and SR) to DICOM storage server for remote storage. The entrances of storage include:

- ◆ Patient information management (iStation)
- ◆ Review status (Review)
- ◆ Real time/Freeze status (auto workflow)
- ◆ Thumbnail area

DICOM storage supports:

- ◆ Single file transfer
- ◆ Exam transfer
- ◆ Batch transfer
- ◆ Static image and Cine file

Batch transfer means multiple exam records can be selected and sent for storage with one DICOM task for each exam. Multiple files in one exam will be sent in one DICOM connection.

The auto send function can be triggered by:

- ◆ Ending the exam (send to default storage service)
- ◆ Saving an image by pressing the user-defined save key (image is sent to the default DICOM storage server as well as saved).

### 2.1.1 Storage Operation

The system supports automatic and manual storage.

The operations for manual storage service are described below:

storage

1. Configure the storage server according to the above descriptions about service preset.
2. Press <iStation> on the control panel to enter the patient information management page.
3. Select one or more exam records (that contain images. If not, the system will prompt) in exam list, or select one or more images in an exam, as shown in Figure 10 iStation Screen.

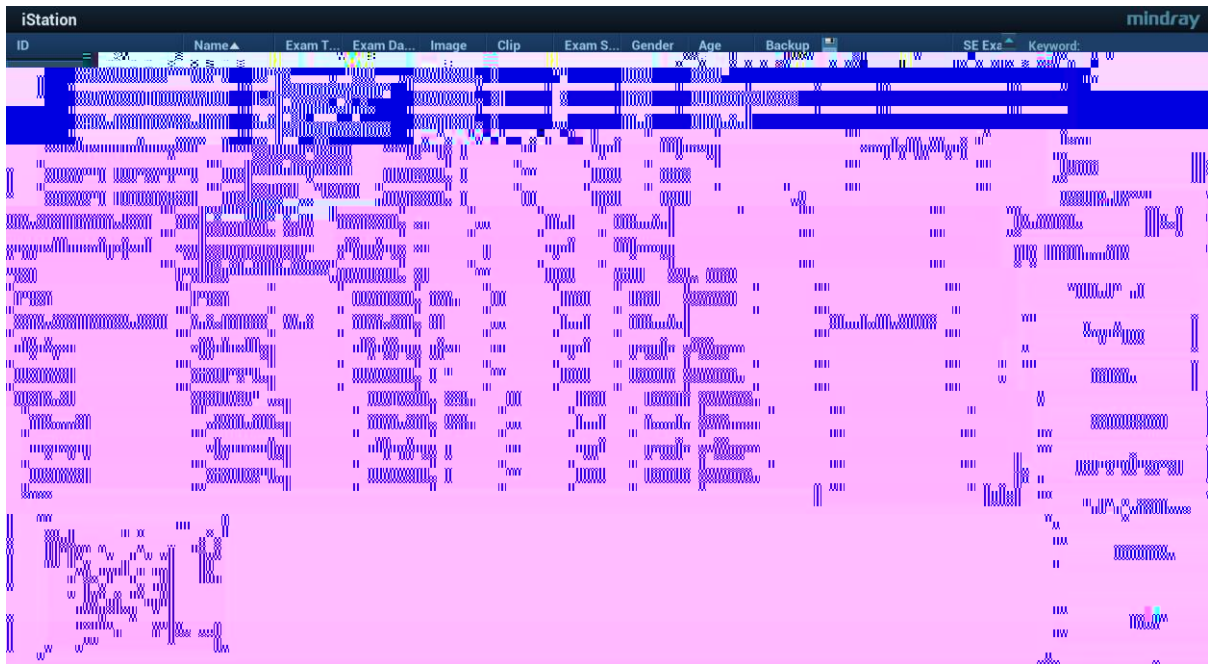


Figure 10 iStation Screen

4. Click [Send Exam] to pop up the [Send To] dialog box.
5. Select the remote DICOM Server; click [OK] to send, as shown in Figure 11 DICOM Send To Screen.

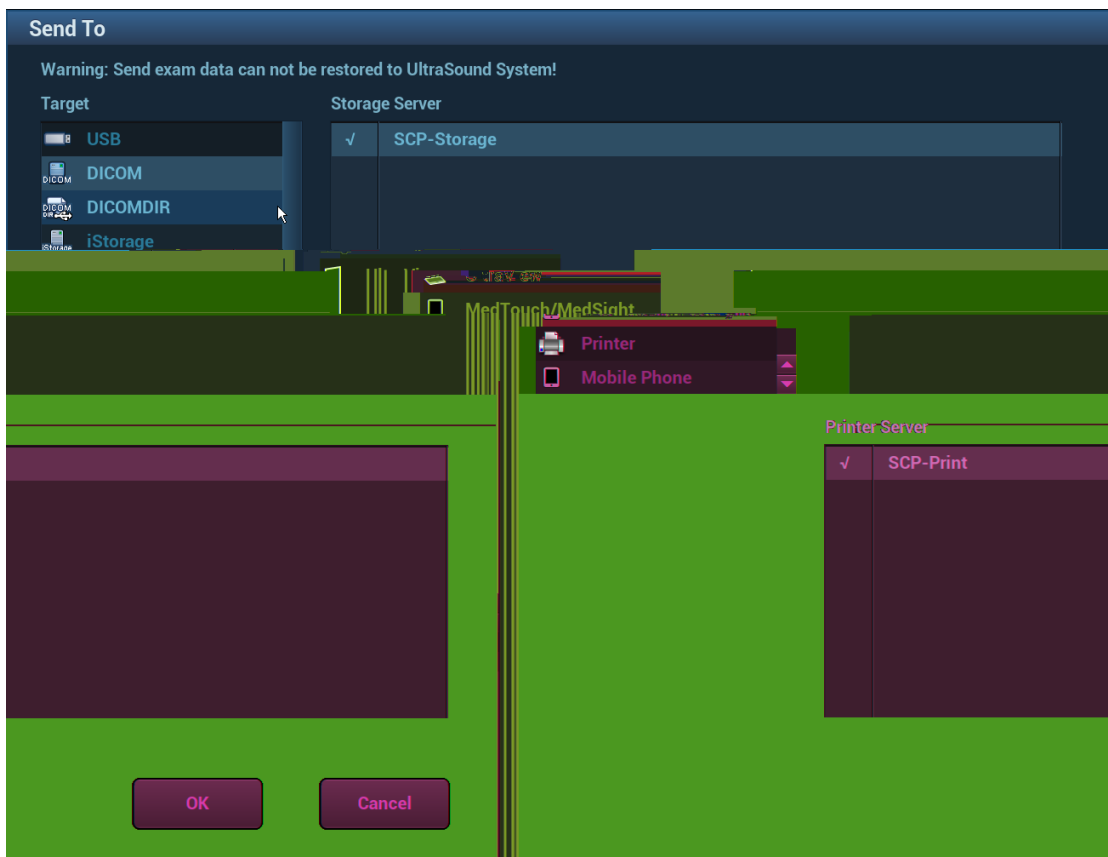

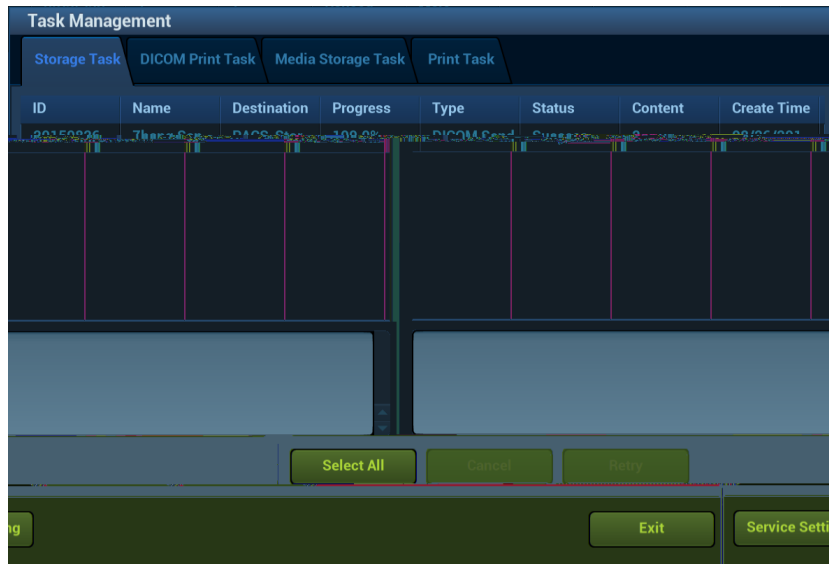


Figure 11 DICOM Send To Screen

6. Click  in the right corner of the screen to open Management, in which, you can review sending status. Select one record, and there is sending result in prompt dialog box, as shown in Figure 12 Task Management.



**Figure 12** Task Management

Function paths of sending image to DICOM storage and sending images by user-defined key after ending exam automatically:

A. Send Image after end exam:



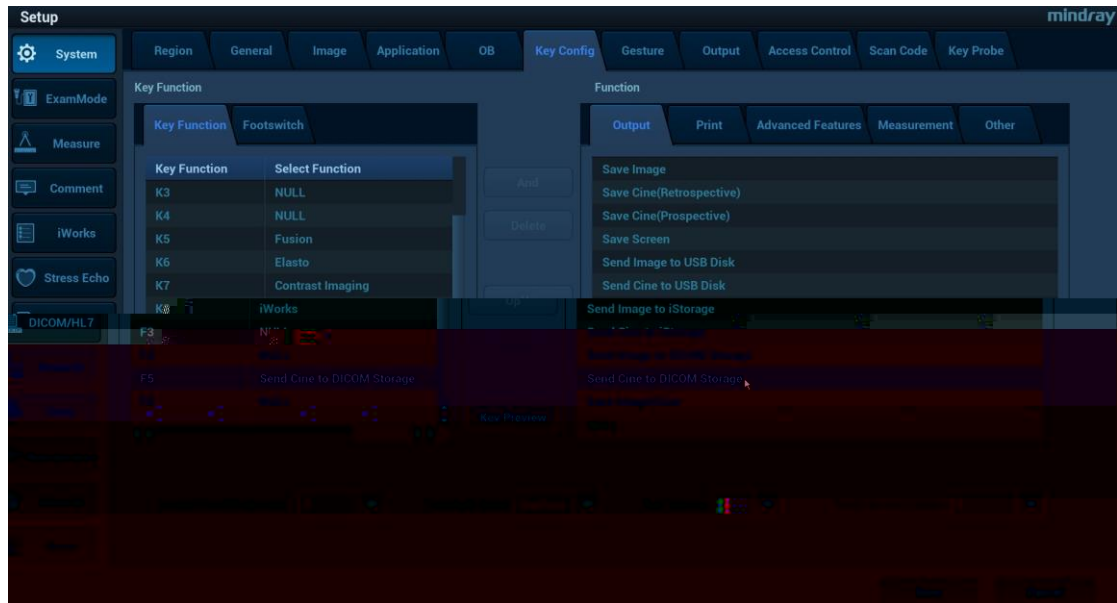
**Figure 13** Send Image after End Exam

Steps:

1. In Setup -> System -> General, select, as shown in Figure 13 Send Image after End Exam.
2. In Setup -> DICOM/HL7 -> DICOM Service -> Storage, set the default storage server (one or more).
3. When pressing <End Exam> with the current exam being active, all images (and SR) of the current exam are sent to the default DICOM storage server.

B. Send to DICOM Storage by user-defined shortcut key

1. In Setup -> System -> Key Config, the NULL key can be set as Send Image to DICOM storage as shown in Figure 14 Send to DICOM Storage by User-defined Key.



**Figure 14** Send to DICOM Storage by User-defined Key

- In Setup -> DICOM/HL7 -> DICOM Service -> Storage, set the default storage server (one or more).
- In current exam, press <F4> (according to the user preset), the system will send a single-frame image to remote DICOM storage automatically. When pressing <F5>, the system will send a multi-frame image to remote DICOM storage

## 2.1.2 Structured Report (SR)

The system provides SRs in gynecology, obstetric, cardiac, vascular, and breast exams that specified in the DICOM standard. The SR can not only be sent alone to a DICOM server but also be sent along with an exam record that has image(s) saved. The type of SR to be sent is determined by the application region of the exam:

- Send obstetric SR: gynecology and obstetrics exam;
- Send cardiac SR: cardiac exam;
- Send Vascular SR: vascular, abdomen and urology exam. (The vascular SR contains the superficial, abdominal and kidney vascular, application region of which corresponds to the vascular, abdomen and urology exam respectively.)
- Send breast SR: breast exam;
- Send Abdomen SR abdomen exam(The abdomen SR contains the abdomen measurements, abdominal and kidney vascular.)
- Send Small Part SR SMP exam and part of URO exam.
- Send SR PED exam.

The SR only could be sent in the circumstance as below:

- The exam type is obstetric, gynecology, cardiac, vascular, breast
- The SR Key for the exam type must be installed in option preset UI.
- Exam is the unit to send.
- The status of the exam is "End", "Paused" or "Cancelled". SR would not be sent when an active exam is selected.
- The DICOM storage service SCPs should be set as "Attach SR When Store Images" or "Only Store SR"

### A. Attach SR When Store Images

Send image and gynecology and obstetric SR (or cardiac, vascular, breast SR abdomen SR) in iStation screen:

1. Attach SR when Store Images    DICOM Service -> Storage-> SR Storage Option(See 1.2.1)
2. Start a new patient:
  - Press <Patient>, enter the Patient ID, Patient Name etc, select [OB] (or GYN, CAR, VAS, BREAST, ABD) application region, click [OK]
  - Or, load a patient from the WorkList, click [Start Exam] (commonly used in hospital)
3. Perform obstetric (gynecology, cardiac, vascular, breast, ABD) measurements:
4. Save image(s)
  - Freeze the image, press <Save> (a user-defined key, maybe preset for other function) on the control panel to save single-frame file.
5. End the exam
6. Enter iStation screen; select the patient, click [Send Exam].A dialog box pops up, as shown in Figure 15 Send To.

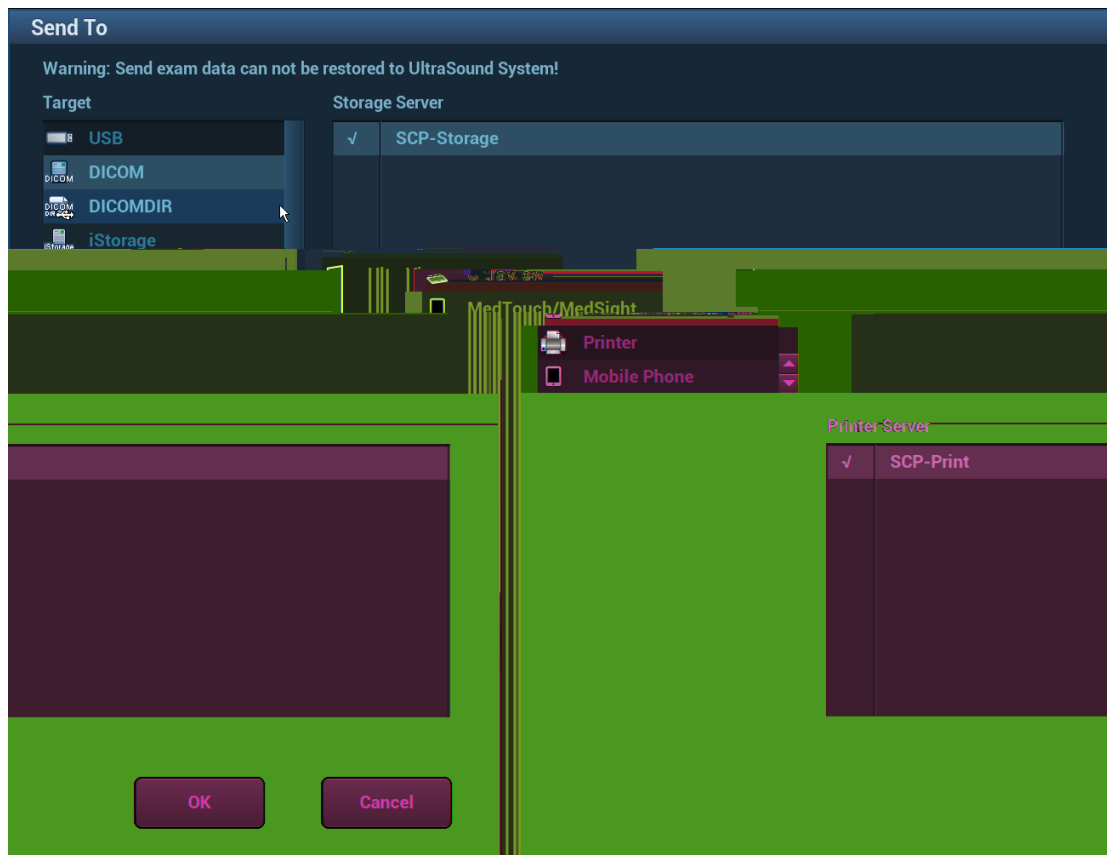


Figure 15 Send To

7. Select DICOM in the [Target] list; select a server in the [Storage Server] list.
8. Click [OK], the status of sending task can be viewed in DICOM task management.

NOTE: For sending SR automatically, the same procedures are followed as in 2.1.1 Storage Operation.

#### B. Only Storage SR

Only Store SR    DICOM Storage Preset -> SR Store Option (See 1.2.1). The procedures are as the same as Attach SR when Store Images .

## 2.1.3 Encapsulated PDF

Encapsulated PDF is a PDF document that has been encapsulated within a DICOM information object, which is used to encapsulate the report document in this system.

The Encapsulated PDF only could be sent in the circumstance as below:

- Exam is the unit to send.
- The status of the exam is "End", "Paused" or "Cancelled". Encapsulated PDF would not be sent when an active exam is selected.
- The "Encapsulated PDF" should be enabled in DICOM storage service preset.
- Measuring result should be existent in default report template, which is to say that measurement in the exam type must be done.

The operation to send Encapsulated PDF: After [Encapsulated PDF] is enabled in preset, select exam to send or send after ending exam automatically as



Note: The DCM files sent to external media or iStorage can be used as teaching files if Hide Patient patient information will not be included in these DCM files.

## 2.3 DICOM Print

DICOM print provides local image printing via the remote DICOM service or printer that supports the DICOM standard. The image displayed on screen can be printed via the selected DICOM print device during exam or image browsing. Print function entrances:

- Patient information management (iStation)
- Review status (Review)
- Real time/ freeze status (auto workflow)
- Thumbnail area

DICOM print supports:

- Single file transfer
- Exam transfer
- Batch transfer
- Static image file
- Succeeding frames printing is available if more than one frame is being sent for printing.

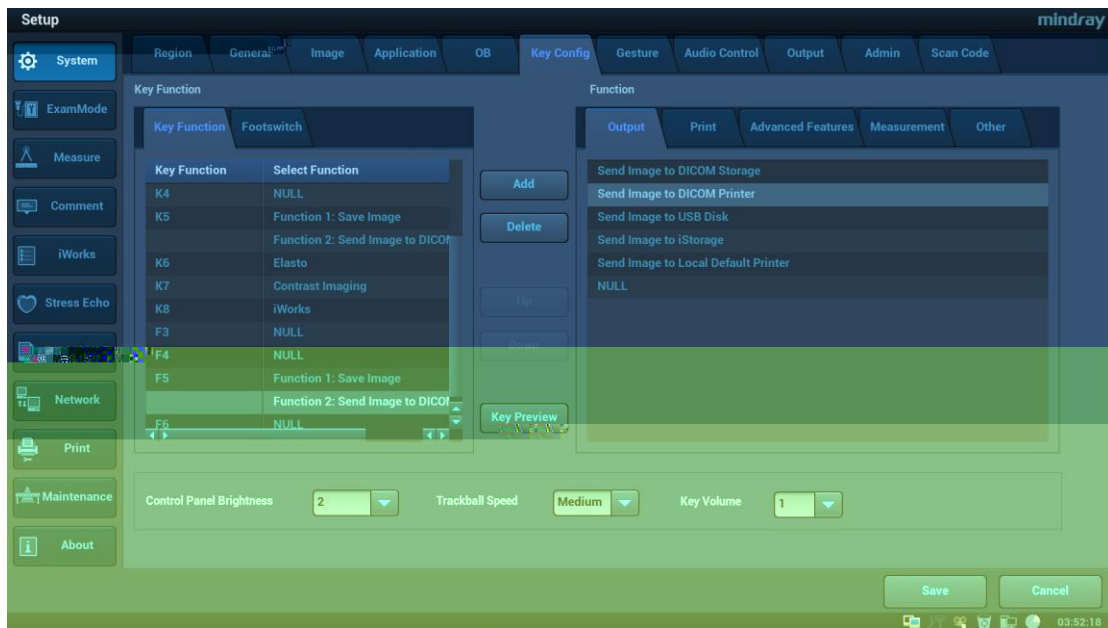
Batch transfer means multiple exam records can be selected and sent for printing with one DICOM task for each exam. Multiple files in one exam will be sent in one DICOM connection.

The auto send function can be triggered by (presettable):

- Ending the exam (send to default print service)
- Saving an image by pressing the user-defined save key (image is sent to the default DICOM service as well as saved)

### 2.3.1 Send to DICOM Print Manually

n iStation screen service use 127.0.0.1 (127.0.0.1) @BAO EMC% - EMTA /paYS(A2i



**Figure 18** Send to DICOM print when pressing user-defined key

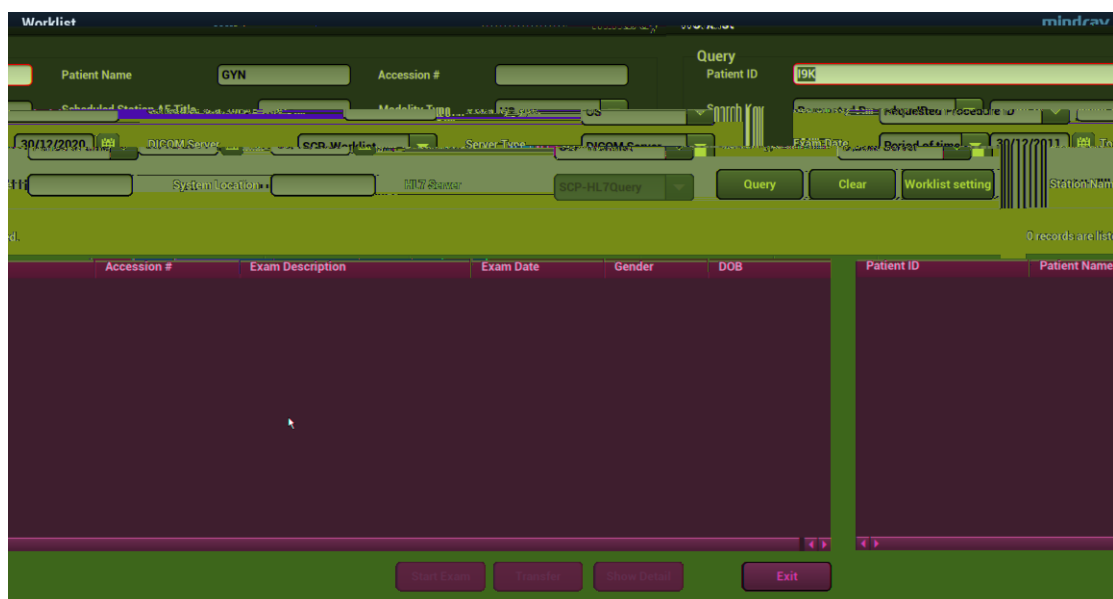
3. In DICOM Preset -> Print Service, set the default print server.
4. In current exam, press <F5> (according to the user preset), the system will save and send a single-frame image to remote DICOM printer automatically.
5. View the print status in the DICOM Task Management, check the DICOM preset and network connection if a print error occurs.

## 2.4 DICOM WorkList

The user can set query conditions when finding exam record(s) from the RIS or other Worklist server, and import the patient information selected in the query result.

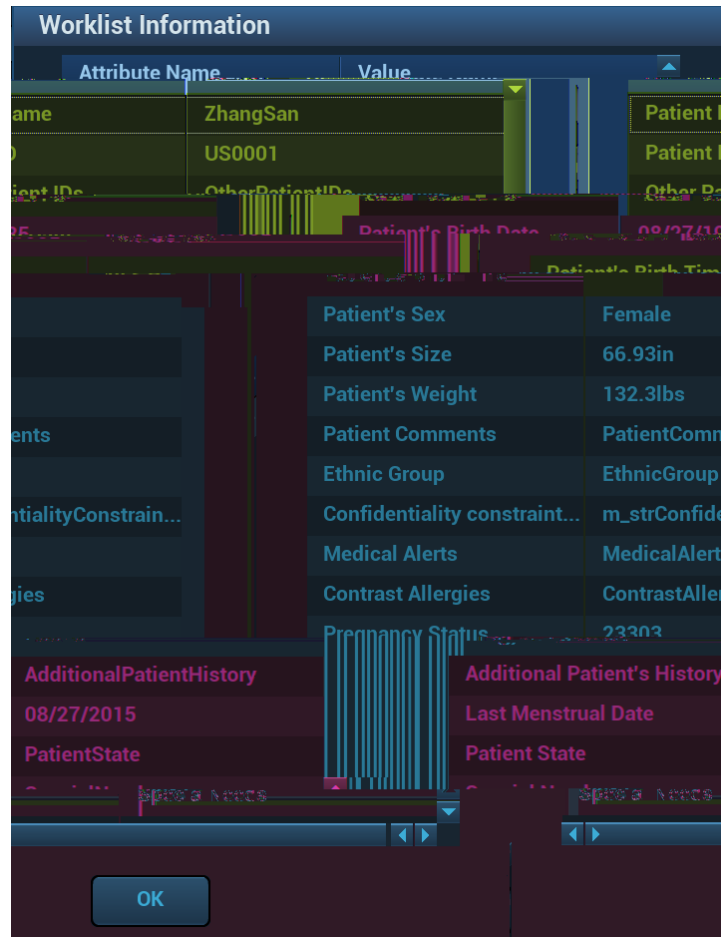
Steps:

1. Press <Info> to open the Patient Info screen.
2. Click [WorkList] to enter the WorkList screen.
3. Query the patient information by setting conditions such as Patient ID, Name, and Key words, Exam Date, Modality, WorkList Server, and Scheduled Station AE Title. The default Exam Date is



**Figure 19** Query in WorkList

4. After the first query is finished, you can perform the second query within the range of the scheduled patients in the first time. The scheduled patients in the list will change in real time.
5. Select a patient record, click [Start Exam], the system import this patient and start the exam; Click [Transfer] will launch the patient record selected into the Patient Info screen to edit and restart the exam; Click [Show Detail] to view the detailed information of the patient. As shown in Figure 20 Detailed Information.

**Figure 20** Detailed Information

6. If necessary, click [Worklist setting] to make following settings for worklist as figure 21.
  - 1 Select the character set from the drop-down menu. The system converts the character set of retrieved patient records to current system character set from the select.
  - 2 Select the field from the drop-down menu. The system displays the corresponding field of retrieved patient data in the column of the selected field.
  - 3 Tick [Query on Display], and next time the system enters the worklist screen, the system starts query automatically according to last searching condition.

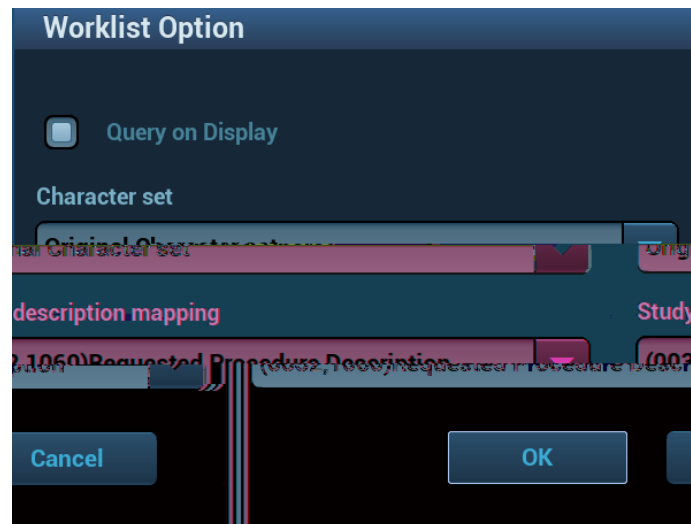


Figure 21 Worklist Setting

**NOTE:**

The modality type can be entered by the user.

If you set the Scheduled Station AE Title in Worklist Query Screen, then this item configured should be consistent with the one set in the server.

Second query and detail information are still available during off-line.

Check the DICOM preset and network connection if a query error occurs.

## 2.5 HL7Query

The user can set query conditions when finding exam record(s) from the Patient Monitors or other HL7 server, and import the patient information selected in the query result.

Steps:

1. Press <Info> to open the Patient Info screen.
2. Click [WorkList] to enter the WorkList screen.
3. Select the Server Type to be HL7 Server. Query the patient information by setting conditions such as Patient ID, Name or combination of them. Patient records will be listed after clicking [Query].

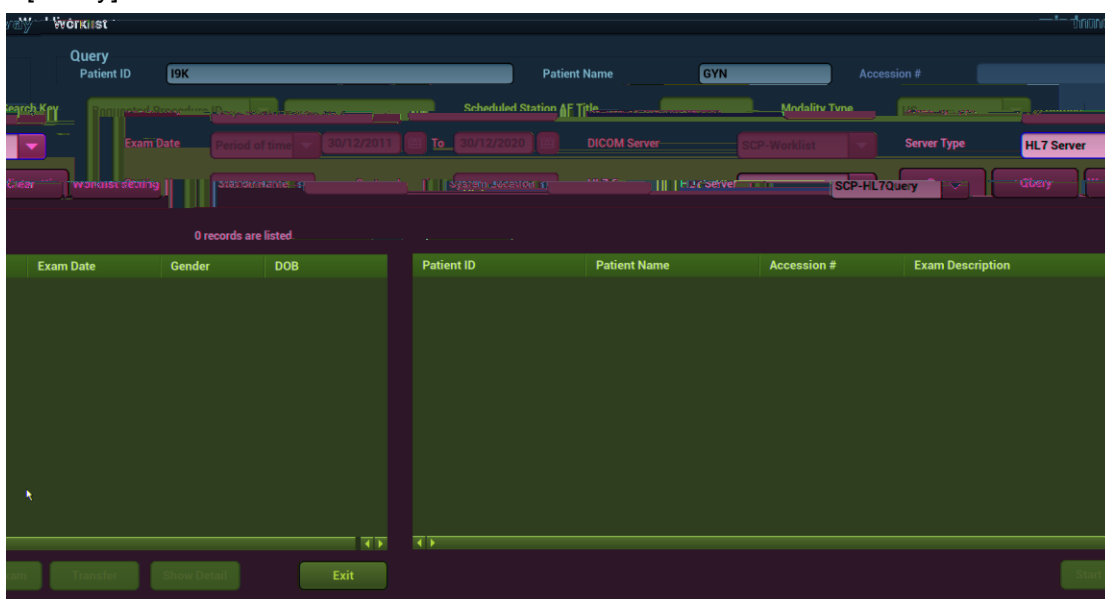


Figure 22 HL7 Query

4. After the first query is finished, you can perform the second query within the range of the scheduled patients in the first time. The scheduled patients in the list will change in real time.
5. Select a patient record, click [Start Exam], the system import this patient and start the exam; Click [Transfer] will launch the patient record selected into the Patient Info screen to edit and restart the exam; Click [Show Detail] to view the detailed information of the patient. As shown in Figure 20 Detailed

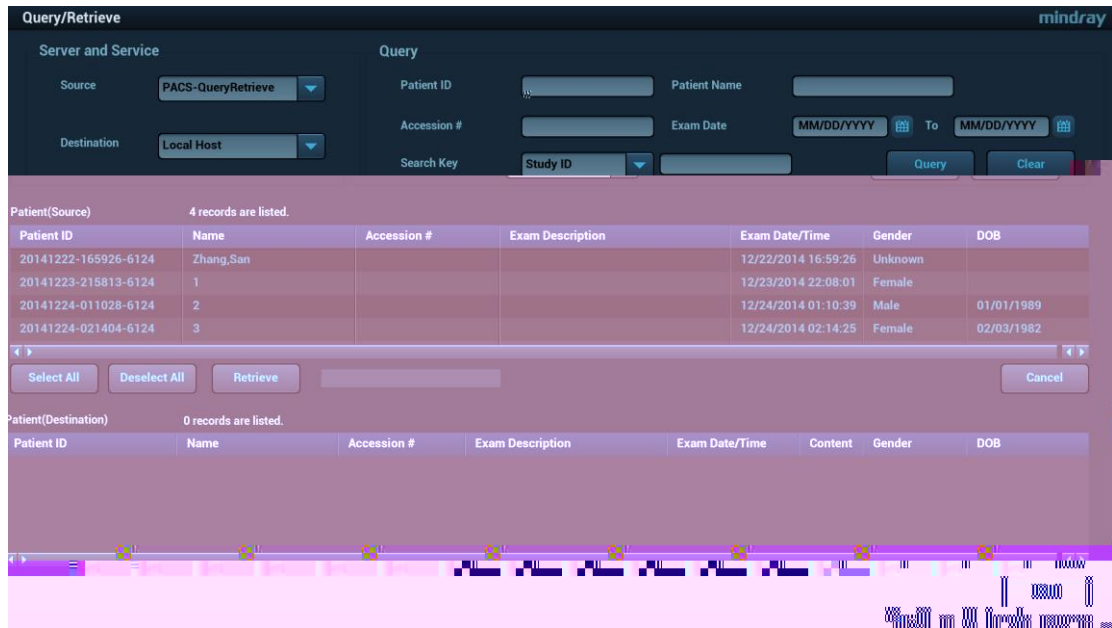


Figure 23 Query

- Select one or more records and click [Retrieve] to get the records down to local system, as shown in Figure 24 Retrieve.

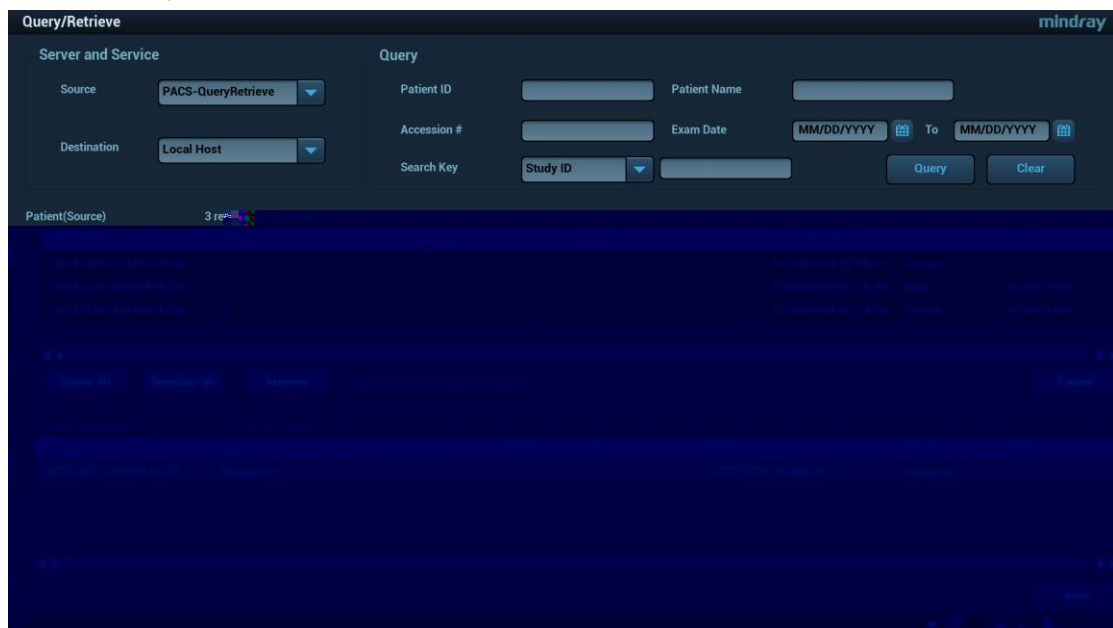


Figure 24 Retrieve

- Click [Exit], the obtained patient records can be viewed in iStation screen.

## 2.9 DICOM Media Storage and Review

DICOM media storage supports storing ultrasonic diagnostic data (patient and image information) into the media (USB flash drive, optical disk or removable hard disk). DICOM media review (DICOMDIR) function supports viewing DCM image(s) stored in external media.

Prerequisites for DICOM media storage and DICOMDIR:

- Configured with DVD recorder that working normally
- Normally read/ write of the USB ports on the ultrasound system
- File system format of CD/ DVD optical file should be ISO9660, and the optical disk should not be damaged

- File system format of DVD optical file should be UDF, and the optical disk should not be damaged
- File system format of removable device (USB flash drive) is FAT32 and the media should not be damaged

## 2.9.1 DICOM Media Storage

Steps:

1. Press <iStation> on the control panel to enter the patient information screen
2. Select one or more exams (with image) that is not active, click [Send Exam] to pop up the [Send To] dialog box.
3. Select the target [DICOMDIR], and select the [Destination] as shown in Figure 25 DICOM Media Storage.

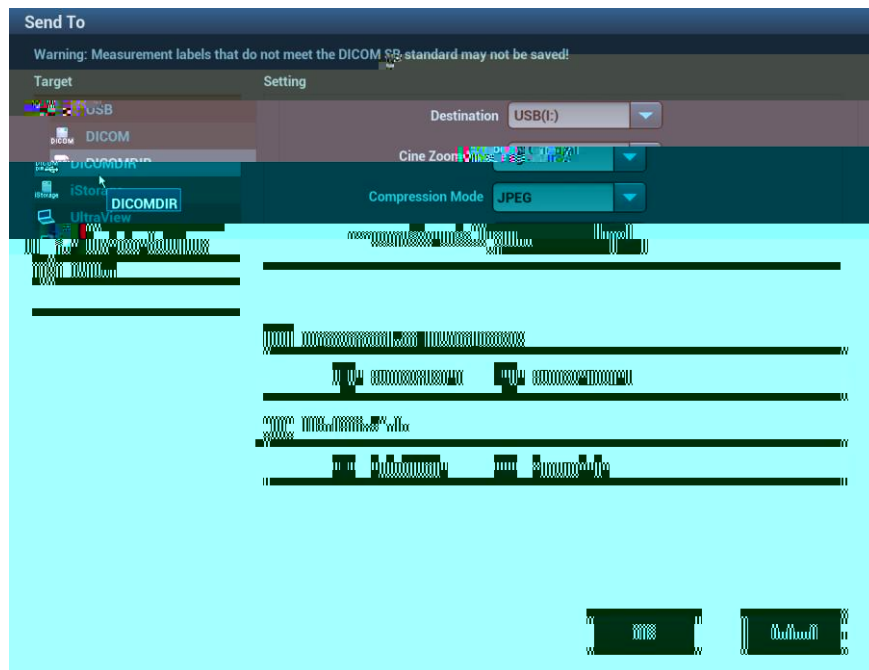




Figure 25 DICOM MediaStorage

4. Click [OK], to export the image in current exam to the external media in DICOM format
5. If the export is succeeded, [Backup] in the iStation screen will be marked with ; otherwise no  is marked

NOTE: make sure enough space on the media; otherwise the media storage process will be failed due to insufficient space.


## 2.9.2 DICOMDIR Review

Steps:




1. Press <iStation> on the control panel to enter the patient information screen
- 2.
3. The exam(s) and image(s) will display in the iStation screen if the media is read successfully.

## 2.10 Task Management

The task management is a platform for the user to manage, view, delete or restart the background task, including DICOM tasks.

Click  icon in the lower right corner of the screen to open the DICOM Task Management dialog box, as shown in Figure 11 DICOM Send To Screen.

Task progress and status of storage task, print task and media storage task can be viewed in this dialog box. The task management icon indicates the status of the task:

1. Task in progress, the icon indicates in green. 
2. No task is in progress with failed task exists, the icon indicates in yellow. 
3. No task is in progress without failed task, the icon is .

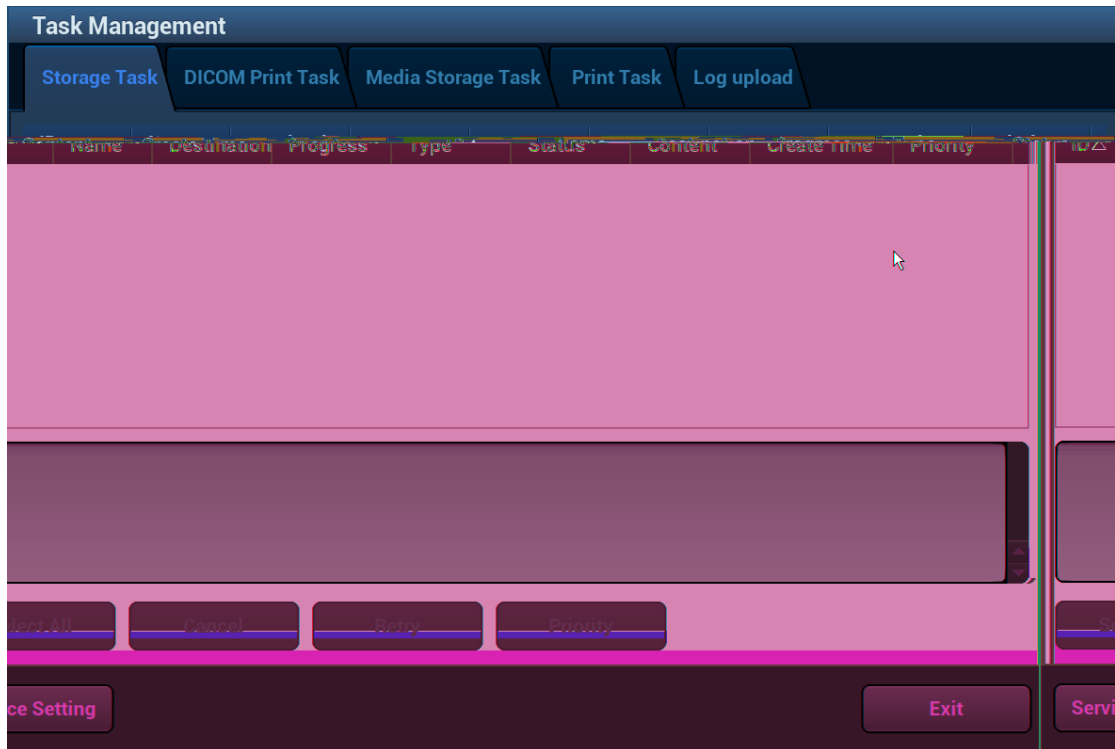


Figure 26 Task Management

# 3 Common Failures and Troubleshooting

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## 3.1 Common Failure: Service Verification Failed

Potential Reasons:

- Failed network connect, please check the network cable and connection;
- Verification service is not supported by the server;
- The verification is supported but not activated on the server; check the server setting if the verification service is activated.

Troubleshooting:

- Check the network cable and connection.
- Check the DICOM Conformance Statement if the SCP is supported;
- Enable the SCP service referring to the Server Manual or DICOM Conformance Statement.
- If the verification is still failed after all above steps and the operating system is Windows 7, Inbound Rules of Windows Firewall. Steps:
  - Control Panel->Windows Firewall->Advanced settings-> Inbound Rules;
  - Click New rules , select Port in the pop-up dialog and then click Next ;
  - Select TCP to which the rule applies and Input the server port in Specific local ports edit box, then click Next ;
  - Select Allow the connection and click Next ;
  - Specify the profiles for which the rule applies and click Next
  - Input the Name of the rule and click Finish .

## 3.2 Common Failure: Server disconnects the ultrasound system during implementing storage

Potential Reasons:

- The JPG compression is enabled on local device but is not supported on the server;
- Wrong AE TITLE setting

### 3.3 Common Failure: Multiframe transmission is failed, but single frame is succeeded.

Potential Reasons:

- "Allow Multiframe" is not selected in the dialog box of Storage preset.

Troubleshooting:

- Select " Allow Multiframe " in the dialog box of Storage preset.

### 3.4 Common Failure: Network disconnected (shown by network icon) during transmission

Potential Reasons:

- The network cable or wireless network is disconnected during transmission;
- The connected switch, router or hub is down or in failure.

Troubleshooting:

- Connect the network;
- Reset the switch, router or hub, or replace a network device with higher performance.

### 3.5 Common failure: Worklist query succeeded, but no patient is shown

Potential Reasons:

- Scheduled Station AE Title in the preset is not consistent with the setting on server;
- Records on the server database are not accordant with the query conditions on local ultrasound system

Troubleshooting:

- Preset the right Scheduled Station AE Title on Worklist screen according to the server settings.
- The ultrasound system is defaulted only to inquire the patient information that the Modality is US, and the patient needs the server to provide US attribute. Change the query conditions (e.g. date or patient name) to make the server find the record accordingly. Based on DICOM standard, Patient ID cannot support fuzzy inquiry, only can support the whole word match. Please confirm the entered Patient ID is right or not.

### 3.6 Common failure: Printing succeeded but the film is blank

Potential Reasons:

- 
- 

Troubleshooting:

- Check the printer conformance statement if the printer can support color printing; if not, modify the Print Preset Screen -> Print to B/W type (MONOCHROME2);
- color printing

### **3.7 Common Failure: Verification of connecting DICOM printer is succeed but printing is failed**

Potential Reasons:


- Wrong AE\_TITLE settings on loc

1. The associated storage commitment server is incorrect;
2. The port and IP address settings on the commitment server are inconsistent with the local preset.

Troubleshooting:

1. Check if the associated storage commitment server is correct;
2. Check if the port and IP address settings on the commitment server are consistent with the local preset.

NOTE:

The storage commitment icon  in [iStation] screen is not refreshed in real time. Exit and enter the [iStation] screen will refresh the commitment icon if a storage commitment is succeeded.

### 3.11 Common Failure: Query is succeeded, but retrieve is failed, with the prompting that the remote server is wrong

Potential Reasons:

1. The client port, AE Title and IP address settings on the Q/R server are inconsistent with the local preset.
2. The setting of the local storage SCP port is wrong.

Troubleshooting:

1. Check if client port, AE Title and IP address settings on the Q/R server are consistent with the local preset.
2. Some servers only support the specified port as the storage SCP port. Please confirm whether the server has this restriction. If it has, please modify the serial number of local port. See the Figure 27 DICOM Local Preset.

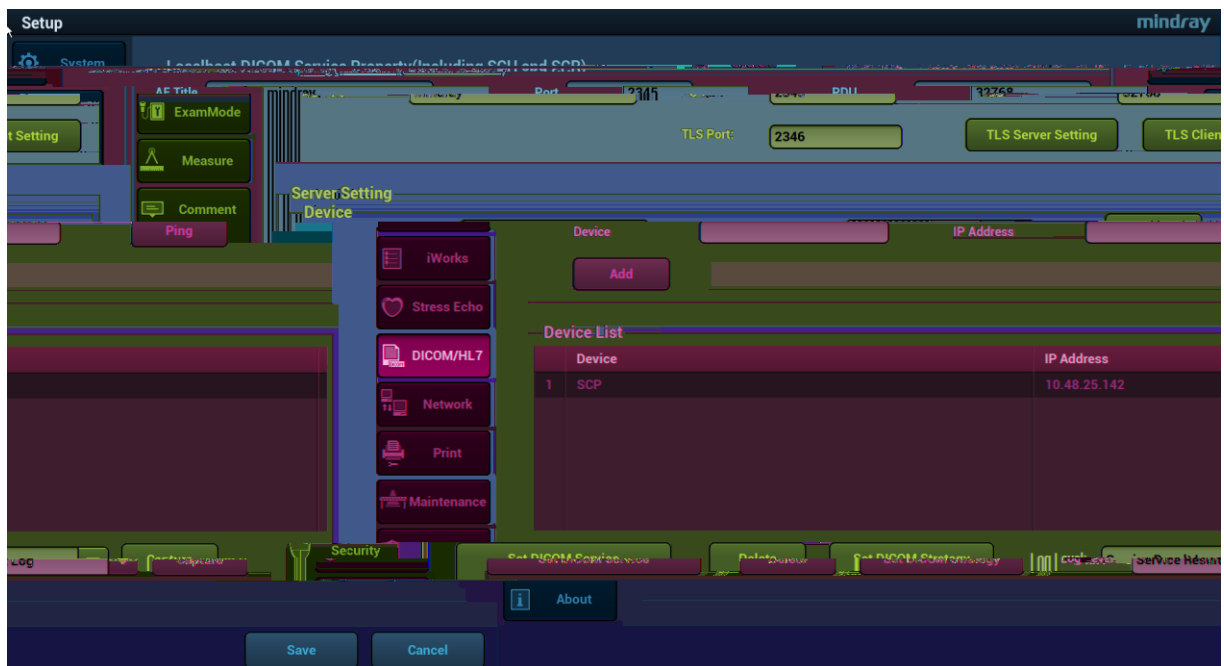
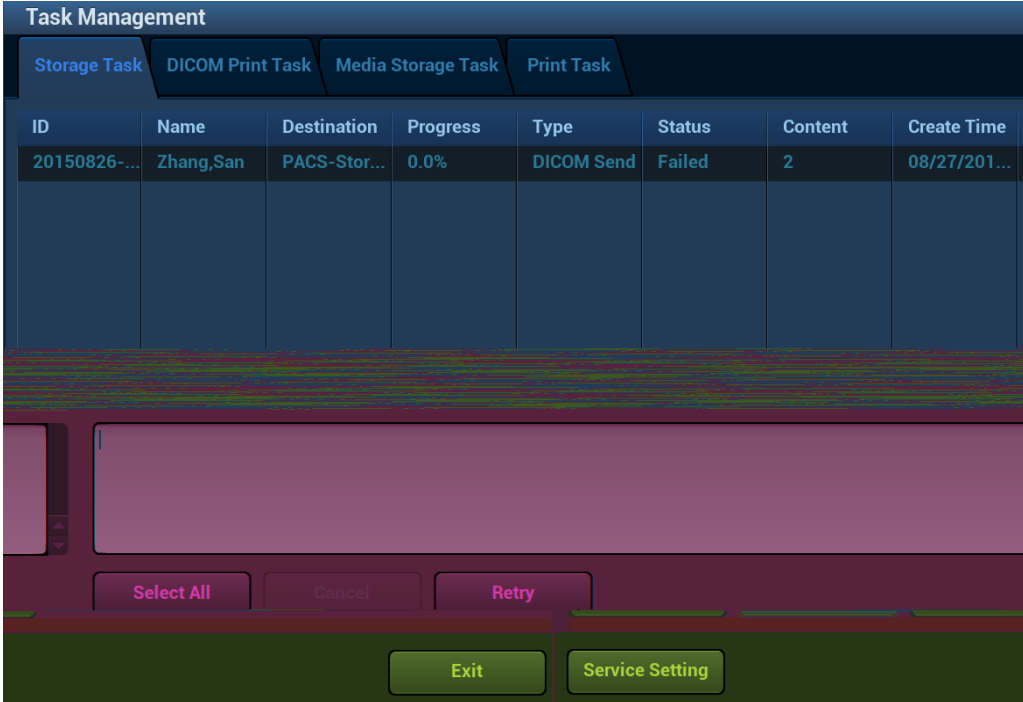


Figure 27 DICOM Local Preset

## 3.12 Common Failure: Error messages in DICOM Task Management

### 3.12.1 Association aborts

Potential Reasons: The association is denied by the SCP due to incorrect setting of AE TITLE on the SCU. See Figure 28 Association aborts.



The screenshot displays the 'Task Management' interface with a table of tasks. The 'DICOM Print Task' tab is selected. The table contains one entry with a status of 'Failed'. Below the table are buttons for 'Select All', 'Cancel', 'Retry', 'Exit', and 'Service Setting'.

ID	Name	Destination	Progress	Type	Status	Content	Create Time
20150826-...	Zhang,San	PACS-Stor...	0.0%	DICOM Send	Failed	2	08/27/201...

Figure 28 Association aborts

### 3.12.2 Network error: Socket sending error

Potential Reasons: Network cable unplugged or network equipment is failed during data transmission. See Figure 29 Network error.



	<i>SHARP1</i> <i>SHARP2</i> <i>SHARP3</i>
--	---

AE TITLE settings that specified in Horizon CI DICOM printer conformance statement are listed in table below:

System Job Settings File	Corresponding Use
Print_SCP	Used for DICOM. Does not contain any print parameter settings. If the media type or size is not included in the DICOM attributes sent to the imager, the imager detects the image type and selects the media type and size as follows: For grayscale images, uses the media set for Grayscale in the Default Media menu at the control panel. For color images, uses the media set for Color in the Default Media menu at the control panel.
Default Grayscale	Imager uses the media set for Grayscale in the Default Media menu at the control panel
Default Color	Imager uses the media set for Color in the Default Media menu at the control panel
8x10-dvf	8x10 DirectVista film (blue)
8x10-dvfb	8x10 DirectVista film (blue)
8x10-dvfc	8x10 DirectVista film (clear)
8x10-dvp	8x10 DirectVista paper
8x10-cvf	8x10 ChromaVista film
8x10-cvt	8x10 ChromaVista film
11x14-dvf	11x14 DirectVista film (blue)
11x14-dvfb	11x14 DirectVista film (blue)
11x14-dvfc	11x14 DirectVista film (clear)
11x14-dvp	11x14 DirectVista paper
11x14-dvp	11x14 DirectVista paper
14x17-dvf	14x17 DirectVista film (blue)
14x17-dvfb	

priority-high	Sets print job priority to high
priority-medium	Sets print job priority to medium
priority-low	Sets print job priority to low
receive-1	Forces sheet output to receive tray 1
receive-2	Forces sheet output to receive tray 2
receive-3	Forces sheet output to receive tray 3
syngofilm	Special OEM-specific job settings

The Horizon CI DICOM printer screen displays:

A4 CV PAPER  
 8X10 DV Blue  
 14X17 DV Blue

● **The following are the correct settings of the ultrasound system DICOM print preset:**

■ Color printing:

- (1) Settings: RGB
- (2) Medium Type: Paper
- (3) Film Size: A4
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print\_Scp (Recommended)

■ B/W printing

1. Method 1

- (1) Settings: MONOCHROME2
- (2) Medium Type: Blue Film
- (3) Film Size: 8X10
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print\_Scp (recommended)

2. Method 2

- (1) Settings: MONOCHROME2
- (2) Medium Type: Blue Film
- (3) Film Size: 14X17
- (4) MAGNIFICATION TYPE: NONE/CUBIC/ REPLICATE/BILINEAR
- (5) AE Title: Print\_Scp (recommended)

● **The following are the incorrect settings of the ultrasound system DICOM print preset:**

■ Color printing:

- 1) Settings: MONOCHROME2 Incorrect.
  
- Medium Type: Blue Film Incorrect.  
Paper and Clear file are supported by color printer according to the printer conformance statement; but only Paper is available as displayed in the printer screen.

Film Size: A3      Incorrect.  
 Only three film size are available according to printer screen display:  
 A4  
 14X17  
 8X10

MAGNIFICATION TYPE      Can be set as: NONE/ CUBIC/ REPLICATE/ BILINEAR

5) AE Title: 14x17-dvfb      Incorrect.  
 Setting AE Title      14x17-      14x17  
 Direct Vista film (blue) printing.

### 3.13.2 Example 2

This example is      FUJI Film drypix4000 printer connected with the ultrasound system.

■ DICOM print settings on ultrasound system:

- 1) Settings: MONOCHROME2
- 2) Medium Type: Blue Film
- 3) Film Size: 14X17
- 4) FORMAT: STANDARD\3, 5
- 5) Film Orientation: Landscape

Result: failed

■ Modify the DICOM print settings:

- 1) Settings: MONOCHROME2
- 2) Medium Type: Blue Film
- 3) Film Size: 14X17
- 4) FORMAT: STANDARD\3, 5
- 5) Film Orientation: Portrait

Result: succeeded.

■ Reasons:

Settings of Film orientation along with the FORMAT that supported by FUJI Film drypix4000 printer are specified in the conformance statement. The print setting of 14X17 Landscape STANDARD\3,5 is unavailable.

According to the printer conformance statement, Film orientation and FORMAT table supported by FUJI Film drypix4000 are listed in table below

Film Size and Orientation	FORMAT
---------------------------	--------



<p>14" 17" Landscape</p>	<p>STANDARD\1,1  STANDARD\2,1  STANDARD\3,1  STANDARD\1,2  STANDARD\2,2  STANDARD\3,2  STANDARD\4,2  STANDARD\3,3  STANDARD\4,3  STANDARD\5,3  STANDARD\6,3  STANDARD\4,4  STANDARD\5,4  STANDARD\6,4  STANDARD\7,4  STANDARD\8,4  STANDARD\5,5  STANDARD\6,5  STANDARD\7,5  STANDARD\8,5  STANDARD\6,6  STANDARD\7,6  STANDARD\8,6  STANDARD\9,6  STANDARD\10,6  STANDARD\7,7  STANDARD\8,7  STANDARD\9,7  STANDARD\10,7  STANDARD\8,8  STANDARD\9,8  STANDARD\10,8</p>
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