

Diagnostic Ultrasound System

Operator's Manual

Model: PT50A VET



Preface

Notice

This User Manual is the necessary instruction for the safe use of this product. This Manual introduces the use, properties, method of operation, safety information and intended use of the PT series ultrasound system in details. Before using the product, please carefully read and understand the contents of this Manual, and abide by the method of operation stated in the Manual in order to ensure the safety of patients and operators.

This User Manual is a major component of the product, and should always be placed near the product for easy reference.

Object of Application

This User manual is intended for professional clinical staff or personnel with experience in the use of ultrasound diagnostic equipment. The readers should have knowledge and work experience in medical procedures, practices and terminology of ultrasound diagnosis.

Illustration

All the illustrations in the user Manual are for reference only. The menus, setting and parameters of the Illustrations may be different from your actual currently use system. The content varies depending on the software version, preset setting and optional configuration.

Content

1	Safety Precautions	9
1.1	Safety Classification.....	9
1.2	Meaning of Signal Words.....	9
1.3	Meaning of Safety Symbol	10
1.4	Safety Precautions.....	10
1.5	Warning Labels.....	15
2	Product Overview	16
2.1	Intended Use.....	16
2.2	Contraindication	16
2.3	Product Specifications	16
2.3.1	Imaging Modes	16
2.3.2	Power Supply Condition	16
2.3.3	Environmental Conditions.....	16
2.4	System Configuration.....	17
2.4.1	Standard Configuration	17
2.4.2	Options.....	17
2.5	Explanation of symbols.....	18
2.6	Introduction of Each Unit.....	19
2.7	Control Panel	20
3	System Preparation	21
3.1	Move/Posit the System	21
3.2	Power Supply	21
3.2.1	Connecting the External Power Supply.....	21
3.3	Power ON /OFF	21
3.3.1	Powering ON the Syste	21
3.3.2	Powering OFF the System	23

3.4	Connecting /Disconnecting a Probe	23
3.4.1	Connecting a Probe	24
3.4.2	Disconnecting a Probe	24
3.5	Graph /Text printer	24
3.6	Basic Screen and Operation	25
4	Exam Preparation	29
4.1	To Start an Exam	29
4.2	Animal information	29
4.2.1	New Animal information	29
4.2.2	Retrieve Animal information	32
4.3	Select an Exam Mode and Probe	33
4.3.1	Supported Exam Modes	34
4.3.2	Selecting Exam Modes and Probe	34
4.4	Select the Imaging Mode	34
4.5	End Exam	35
4.6	Cancel an Exam	35
4.7	Anonymous Patient Exam	35
5	Image Optimization	36
5.1	Switching Between Imaging Modes	36
5.2	Image Adjustment	36
5.3	B Mode Image Optimization	37
5.3.1	B Mode Exam Protocol	37
5.3.2	B Mode Parameters	37
5.3.3	B Mode Image Optimization	38
5.4	B&M Mode Image Optimization	42
5.4.1	B&M Mode Exam Protocol	42
5.4.2	BM Mode Parameters	43
5.4.3	BM Mode Image Optimization	44

6	Display & Cine Review	48
6.1	Image Display	48
6.1.1	Splitting Display	48
6.1.2	Image Magnification	48
6.1.3	Freeze/ Unfreeze the Image.....	48
6.2	Cine Review	49
6.2.1	Entering/ Exiting Cine Review	49
6.2.2	Cine Review in B Mode	49
6.2.3	Cine Review in M Mode.....	50
6.2.4	Linked Cine Review.....	50
6.3	Cine Saving.....	50
7	Measurement.....	51
7.1	Basic Operations.....	51
7.2	General Measurements	51
7.2.1	2D General Measurements	51
7.3	Methods of general Measurement.....	52
7.3.1	2D General Measurements	52
7.3.2	M General Measurements	55
7.4	Application Measurement	57
8	Comments and Body Marks	58
8.1	Comments	58
8.1.1	To Add Comments.....	58
8.1.2	Comment Setting	58
8.1.3	Adding Comments	58
8.1.4	Moving Comments.....	59
8.1.5	Modifying Comments.....	59
8.1.6	Deleting Comments	60
8.2	Body Marks	60

8.2.1	Adding Body Marks.....	60
8.2.2	Moving Body Marks	60
9	Patient Data Management.....	61
9.1	Animal information Management.....	61
9.1.1	Enter Animal information.....	61
9.1.2	Animal information setting	61
9.2	Image File Management.....	61
9.2.1	Memory Media	61
9.2.2	Image File Formats.....	61
9.2.3	Save image files to local machine	61
9.2.4	Thumbnails	62
9.2.5	Image Review and Analysis.....	62
9.2.6	Sending Image File.....	63
9.3	Report Management	64
9.4	Patient Data Management (Patient List).....	65
9.4.1	Viewing Animal information.....	66
9.4.2	Patient Data Management.....	66
9.4.3	Examinations	67
9.5	Patient Task Management.....	67
10	DICOM (Optional)	68
10.1	DICOM Preset.....	68
10.1.1	Local Net Setting	68
10.1.2	DICOM Local Setting.....	69
10.1.3	DICOM Server Setting.....	70
10.1.4	DICOM Service Setting	71
10.2	Verify Connectivity	76
10.3	DICOM Application	77
10.3.1	DICOM Storage	77

10.3.2	DICOM Print	78
10.3.3	DICOM Work list	78
10.4	DICOM Task Management	79
11	Setup	80
11.1	System Preset	82
11.1.1	Hospital Information	82
11.1.2	General	82
11.1.3	Measure Preset	83
11.1.4	Biopsy	84
11.2	Exam Preset	84
11.3	Image Preset	84
11.4	Local Net	86
11.5	DICOM Local	86
11.6	DICOM Server	87
11.7	DICOM Service	87
11.8	System Update	87
11.9	Help Manual	87
12	Transducer	88
12.1	Transducer introduction	88
12.1.1	Mark method	88
12.1.2	Transducer mode	88
12.1.3	Product components	88
12.2	Transducer application	88
12.3	Wearing the Probe Sheath	89
12.4	Inspection and maintenance	90
12.4.1	Inspection	90
12.4.2	Serve life	90
12.4.3	Probe maintenance	90

12.4.4	Disinfection soak figure	91
12.5	Cleaning and disinfection.....	93
13	Biopsy Guide.....	96
13.1	Enter/Exit Biopsy Guide Mode	96
13.2	Select Bracket.....	97
13.3	Select the Angle of Biopsy Guide Line	97
13.4	Adjust Biopsy Guide Line	97
14	Guidance and Manufacturer's Declaration.....	99




1 Safety Precautions




1.1 Safety Classification

- According to the type of protection against electric shock:
CLASS I EQUIPMENT
- According to the degree of protection against electric shock:
Type-BF applied part
- According to the degree of protection against harmful ingress of water:
The main unit belongs to IPX0
- According to the degree of safety of application in the presence of a FLAMMABLE ANESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE:





EQUIPMENT not suitable for use in the presence of a FLAMMABLE ANESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE
- According to the mode of operation:
CONTINUOUS OPERATION

1.2 Meaning of Signal Words

In this manual, the signal words "  **DANGER**", " **WARNING**", " **CAUTION**", "**NOTE**" and "**Tips**" are used regarding safety and other important instructions. The signal words and their meanings are defined as follows. Please understand their meanings clearly before reading this manual.

Signal word	Meaning
 DANGER	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.
NOTE	Indicates a potentially hazardous situation that, if not avoided, may result in property damage.
Tips	Important information that helps you to operate the system more effectively.

1.3 Meaning of Safety Symbol

Symbol	Description
	Type-BF applied part. The ultrasound probes connected to this system are type-BF applied parts. The ECG module connected to this system is Type-BF applied part.
	"Attention" indicates the points that you should pay attention to. Be sure to read the Operator's Manual concerning these points before using the system.
	DANGER: There is explosion risk if the system is used with flammable anesthetics.
	This Mark is Only for Veterinary Type. This product is provided with a CE marking in accordance with the regulations stated in the Low Voltage Directive LVD 2006/95/EC, and EMC Directive EMC 2004/108/EC.

1.4 Safety Precautions

Please observe the following precautions to ensure patient and operator's safety when using this system.

 DANGER DO NOT use flammable gasses, such as anesthetic gas or Hydrogen, or flammable liquids such as ethanol, near this

**WARNING:**

1. Do connect the adapter power plug of this system and power plugs of the peripherals to wall receptacles that meet the ratings indicated on the rating nameplate.

Using a multifunctional receptacle may affect the system grounding performance, and cause the leakage current to exceed safety requirements.

2. Use the cable provided with this system to connect the printer. Other cables may result in electric shock.

You must use the power adapter provided with the system; otherwise electric shock may result.

You can only adopt the power supply method provided by the company, other power supply modes (e.g. using a UPS) may result in electric shock.

3. Connect the grounding conductor before turning ON the system. Disconnect the grounding cable after turning OFF the system. Otherwise, electric shock may result.

4. For the connection of power and grounding, follow the appropriate procedures described in this operator's manual. Otherwise, there is risk of electric shock. DO NOT connect the grounding cable to a gas pipe or water pipe; otherwise, improper grounding may result or a gas explosion may occur.

5. Before cleaning the system, disconnect the power cord from the outlet. System failure and electric shock may result.

This system is not water-proof. DO NOT use this system in any place where water leakage may occur. If any water is sprayed on or into the system, electric shock may result. If water is

6. accidentally sprayed on or into the system, power off the system immediately and contact sales representative.

DO NOT allow the patient to contact the live parts of the ultrasound system or other devices, e.g. signal I/O ports. Electric shock may occur.

- 7.

not open the covers and front panel of the system. Short circuit or electric shock may result when the system hardware is exposed and powered on

- 8.

9. **DO NOT** use this system simultaneously with equipment such as an electrosurgical unit, high-frequency therapy equipment, or a defibrillator, etc. Otherwise, there is a risk of electric shock to the patient.
10. When moving the system, you should first disconnect the system from other devices (including probes) and disconnect the system from the power supply.
11. Please dispose the obsolete equipment in accordance with the provisions of local treatment of medical waste.

- ⚠ CAUTION:**
1. Precautions concerning clinical examination techniques:
 - This system must be used only by qualified medical professionals.
 - This operator's manual does not describe clinical examination techniques. The clinician should select the proper examination techniques based on specialized training and clinical experience.
 2. Precautions concerning movement of the system:
 - Confirm that there is no peripheral device connected to the system before moving the system. Otherwise, peripheral device may fall and injure an individual.
 3. **DO NOT** expose the system to excessive vibration through transportation. Mechanical damage may result.
 4. Malfunctions due to radio wave:
 - If a radio wave emitting device is used in the proximity of this system, it may interfere with operations. **DO NOT** use or take any devices transmitting RF signals (such as cellular phones, transceivers and radio controlled products) in the room placing the system.
 - If a person brings a device that generates radio waves near the system, ask him / her to immediately turn **OFF** the device.
 5. Always keep the system dry. Avoid transporting this system quickly from a cold place to a warm place; otherwise condensation or water droplets may form allowing a short circuit and possible electric shock.

6. Do not connect this system to outlets with the same circuit breakers and fuses that control the current of devices such as life-support systems. If this system malfunctions and generates over current, or when there is an instantaneous current at power ON, the circuit breakers and fuses of the building's supply circuit may be tripped.
7. DO NOT connect or disconnect the system's power cord or its accessories (e.g., a printer or a recorder) without turning OFF the power first. This may damage the system and its accessories or cause electric shock.
8. There is no risk of high-temperature burns during normal ultrasound examinations. It is possible for the surface temperature of the probe to exceed the body temperature of a patient due to environmental temperature and exam mode combinations. Apply the probe only for a period of time required for the purpose of diagnosis. Under the condition of satisfying diagnosis, try to shorten the testing time.
9. If the system is powered off improperly during operation, it may result in data damage of the system's hard disk or system failure.
10. Do not use the system to examine a fetus for a long period of time.
11. Do not use gel, disinfectant, probes, probe sheath or needle-guided brackets that are not compatible with the system.

- NOTE:**
1. To avoid damaging the system, DO NOT use it in following environment:
 - (1) Locations exposed to direct sunlight.
 - (2) Locations subject to sudden changes in environmental temperature.
 - (3) Dusty locations.
 - (4) Locations subject to vibration.
 - (5) Locations near heat generators.
 - (6) Locations with high humidity.
 - (7) Locations near strong electromagnetic field (such as a transformer)
 - (8) Locations near high-frequency radiation source,
 2. If the system is used in a small room, the room temperature may rise. Please provide proper ventilation and free air exchange.
 3. When using or placing the system, keep the system horizontal to avoid imbalance.

4. Do not apply external force to the control panel; otherwise, the system may be damaged.
5. DO NOT turn OFF the power supply of the system during printing, file storage or invoking other system operations. An interrupted process may not be completed, and can become lost or corrupted.
6. Turn ON the system only after the power has been turned OFF for a while. If the system is turned ON immediately after being turned OFF, the system may not be rebooted properly and could malfunction.
7. Remove ultrasound gel from the face of a probe when the examination is complete. Water in the gel may enter the acoustic lens and adversely affect the performance and safety of the probe.
8. Ensure that the current exam date and time are the same as the system date and time.

Please read the following precautions carefully to ensure the safety of the patient and the operator when using the probes.



WARNING:

- The ultrasonic probe is only for use with the specified ultrasonic diagnostic system. Please refer to the ultrasonic diagnostic system operator's manual to select the proper probe.
1. ultrasonic diagnostic system operator's manual to select the proper probe.
 2. Do not use an aftermarket probe other than those specified by the company. The probes may damage the system, causing a profound failure, e.g. a fire in the worst case.
 3. Do not disassemble the probe to avoid the possibility of electric shock.
 4. DO NOT use a probe that has a damaged, scratched surface, or exposed wiring of any kind. Immediately stop using the probe and contact sales representative. There is risk of electric shock if a damaged or scratched probe is used.
 5. Do not subject the probe to shock. A defective probe may cause electric shock to the patient.
 6. An amicrobic probe sheath must be installed over the probe before performing intra-cavity or intra-operative examination.
 7. Never immerse the probe connector into liquids such as water or disinfectant because the connector is not waterproof. Immersion may cause electric shock or malfunction.
 8. Confirm that the probe and cable are normal before and after each examination. A defective probe may cause electric shock to the patient.

1. Be sure to use sterile ultrasound gel. Please use the ultrasound gel compliant with the relevant local regulations. And manage the ultrasound gel properly to ensure that it does not become a source of infection.
2. In normal diagnostic ultrasound mode, there is no danger of a normal-temperature burn; however, keeping the probe on the same region of the patient for a long time may cause such a burn.
3. The probe sheath contains natural rubber that can cause allergic reactions in some individuals.

NOTE: 1. Read the following precautions to prevent the probe from malfunction:

- After the examination, wipe off the ultrasound gel thoroughly. Otherwise, the ultrasound gel may solidify and the image quality would be degraded.
- Clean and disinfect the probe before and after each examination.

2. Ambient conditions:

Use the probes under the following ambient conditions:


- ambient temperature: 0°C ~ 40 °C
- relative humidity: 30% ~ 85% (no condensation)
- atmospheric pressure: 70KPa ~ 106Kpa.

To prevent the probe from being damaged, do not use it where it will be exposed to:

- Direct sunlight
- Sudden changes in temperature
- Dust
- Excessive vibration
- Heat generators

3. Repeated disinfection will eventually damage the probe, please check the probe's performance periodically.

1.5 Warning Labels

The warning labels are attached to this system in order to call your attention to potential hazards. The symbol  on the warning labels indicates safety precautions.

The warning labels use the same signal words as those used in the operator's manual. Read operator's manual carefully before using the system.

2 Product Overview

2.1 Intended Use

The ultrasound system is intended for use in veterinary clinical ultrasonic diagnosis.

2.2 Contraindication

The product is not suitable for examining gas containing organs, such as gastrointestinal, lung and other organs; it also cannot be used in the site such as burnt, scald or damaged body surface tissue; other matters needing attention reference to Operator's Manual.

2.3 Product Specifications

2.3.1 Imaging Modes

B Mode

M Mode

2B Mode

4B Mode

B&M Mode

2.3.2 Power Supply Condition

Voltage	AC 100–240V
Frequency	50 / 60Hz
Rated input power	100AV

2.3.3 Environmental Conditions

	Operating conditions	Storage and transportation conditions
Ambient temperature	5°C~40°C	-20°C~+55°C
Relative humidity	30%~85% (no condensation)	30%~95% (no condensation)
Atmospheric pressure	70KPa~106KPa	70KPa~106KPa

WARNING: Do not use, storage and transport this system other than prescribed environmental conditions

2.3.4 External Dimensions and Weight

External dimensions: 402mm (L)×385mm(W)×53mm(H)

Net weight:4.5Kg

2.4 System Configuration

This equipment is mainly made up of main unit and probe.

2.4.1 Standard Configuration

- Main unit
- Accessories
 - Standard probe
 - Power cord
 - Operator manual

2.4.2 Options







2.4.2.1 Optional probe

Probe model	Type	Center Freq	Intended Use	Region Applied
C5-2Ds	Convex	3.5MHz	Small animal's reproductive system, abdomen, thorax, cardiac and urology	Body surface
C8-5Cc	Micro Convex	6.5MHz	Small animal's reproductive system, abdomen, thorax and cardiac	Body surface
L11-4Fc	Rectal Linear	6.0MHz	Animal's reproductive system	Trans Rectal
L11-4Ds	Linear	7.5MHz	Big animal's tendon, small animal's abdomen, small parts and eyeball	Body surface

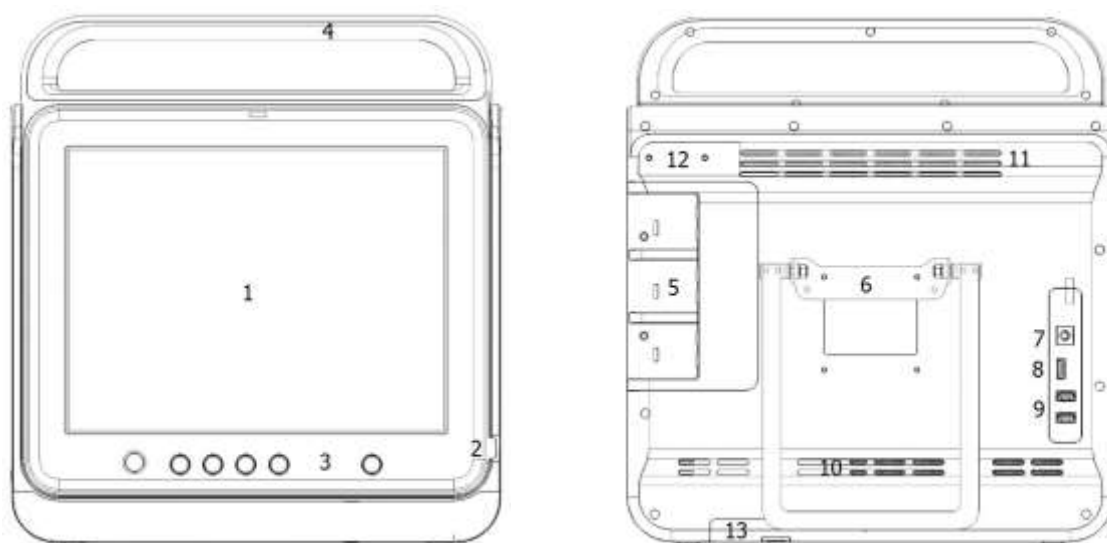
2.4.2.2 Peripherals Supported

No.	Item	Model
1	Video printer	SONY UP-895MD、MITSUBISHI P93W
2	Graph / text printer	HP Deskjet1050 J410、HP Deskjet2520hc、DeskjetF2418 Deskjet 2520hc 、Deskjet 2050 、HPLaserJet Professional p1102 、HP LaserJet Professional p1108 、HPLaserJet Professional p2035 、HP LaserJet m1005 Multifunction Printer、 HP LaserJet 1536DNF MFP

2.5 Explanation of symbols

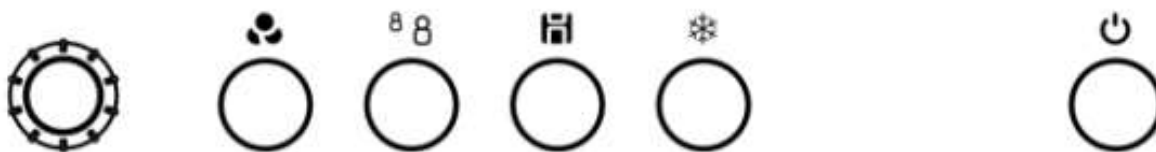
No	Symbol	Description
1		Type BF applied part
2		This symbol represents the contents please refer to the operation manual to avoid safety accident
3		Network interface
4		USB port
5		VIDEO signal connector
6		Serial port







2.6 Introduction of Each Unit



No.	Name	Function
1	Touch screen display	To show working interface, images and parameters, touch-screen operated.
2	Adjustable screen	To adjust the screen at different angles (up to 45 degrees maximum).
3	Control panel	To operate or control the machine.
4	Handle	To carry or support the machine.
5	Connector for probe	The connector for probe on the machine.
6	Bracket	To support the machine in different angles.
7	Video output port	To connect the video printer to output image signal.
8	HDMI	High-definition multimedia connector
9	USB connector	To connect USB devices
10	Air inlet	To let the air go into the machine
11	Vent	To cool down the machine
12	Probe cup slot	To place the probe
13	Battery	Pluggable battery for power supply

2.7 Control Panel



No.	Name	Description	Function
<1>		Multifunctional knob	<ol style="list-style-type: none"> 1. In the image scanning, press it to switch between gain and depth 2. In cine review menu, review the cine image by image 3. In the ZOOM mode, adjust the magnification 4. Press it to enter the corresponding function to select the menu
<2>		One Touch Optimize	Press to optimize the image.
<3>		New Patient	Press to enter the [Animal info] screen
<4>		Save	Press to save images
<5>		Freeze	Press to freeze or unfreeze the image.
<6>		The power switch	Press to turn on/ off the system

3 System Preparation

3.1 Move/Posit the System

Please read and understand the safety precautions before placing the system to ensure safety for both operator and device.

- Turn off the power and disconnect the system from the power cord
- Disconnect the system from all peripherals.
- Place the system in a desired location.
- Leave at least 20cm at the back and both sides of the system.

<p>⚠ CAUTION Maintain a generous-free air flowing space around the back And both sides of the system; failure may result due to</p>

3.2 Power Supply

This system can work normally only when it is connected to the external power supply or the battery capacity is sufficient.

3.2.1 Connecting the External Power Supply

Connected to an AC power cord and internal power.

The external power supply system must meet the following requirements:

- Power supply voltage: AC 100–240V~
- Power supply frequency: 50Hz/60Hz

3.3 Power ON /OFF

3.3.1 Powering ON the Syste



CAUTION

To ensure safe and effective system operation, you must perform daily maintenance and checks.

If the system begins to function improperly – immediately stop scanning. If the system continues to function improperly – fully shut down the system and contact the company Customer Service Department or sales representative.

If you use the system in a persistent improperly functioning state – you may harm the patient or damage the equipment.

■ Checking before Power ON

To check the system before the system is turned on:

No.	Check Item
<1>	The temperature, relative humidity and atmospheric pressure shall meet the requirements of operating conditions. See "2.3.3 Environmental Conditions for details.
<2>	There shall be no condensation.
<3>	There shall be no distortion, damage or dirt on the system and peripheral devices.
<4>	The probes and probe cables shall be free of damage or stains.
<5>	There shall be no cable damage (e.g. power cord). Maintaining secure connections to the system at all times.
<6>	There shall be no loose screws on the monitor or control panel.
<7>	Ensure that all connections are free from damage and remain clear of foreign object blockages. There shall be no obstacles around the system and its air vent.
<8>	No miscellaneous odds and ends are allowed to be attached or affixed to the control panel.
<9>	Probe cleaning and disinfection.
<10>	The overall scanning environment and field must be clean.


■ Turning on the Power

Press the AC power switch, the system enters the work status.

■ To check the system after it is turned on

To check the system after the system is turned on:

No.	Check Item
<1>	There shall be no unusual sounds or smells indicating possible overheating.
<2>	There shall be no persistently displayed system error message.
<3>	There shall be no evident excessive noise, discontinuous, absent or black artifacts in the B mode image.
<4>	Check if there is abnormal heat on the surface of the probe during an ultrasound procedure.
<5>	The exam date and time are the same as the system date and time, and are displayed correctly.
<6>	The touchscreen is sensitive and the control position is accurate.
<7>	The control panel keys and knobs are fully functional.

	<p>WARNING:</p> <ol style="list-style-type: none"> 1. If you use a probe giving off excessive heat, it may burn the patient. 2. If you find anything not functioning properly, this may indicate that the system is defective. In this case, shut down the system immediately and contact the company Customer Service Department or sales representative.
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3.3.2 Powering OFF the System

Press the AC power switch to powering off the system.

You need to power off and reset the system after you upgrade the software. And when the system is defective you need to power off it too.

If you will not use the system for a long period of time, you shall disconnect the power adapter and turn off powers of all peripherals connected to the system.

3.4 Connecting /Disconnecting a Probe

	<p>CAUTION:</p> <ol style="list-style-type: none"> 1. When connecting or disconnecting a probe, place it in a proper position, to prevent the probe from falling off or becoming damaged. 2. Only use the probes provided by the company. Aftermarket probes may result in damage or cause a fire.
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

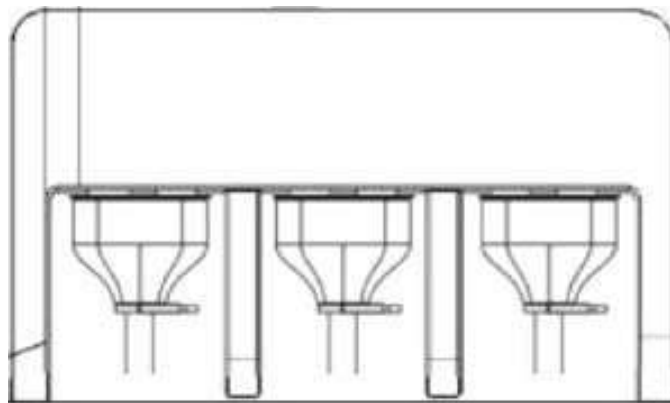
3.4.1 Connecting a Probe

⚠ WARNING	<ol style="list-style-type: none">1 The probes, cables and connectors are in proper operating order and free from surface defects, cracks and peeling. Using a defective probe may cause electric shock.2 Handling the probe, be sure to verify that the host is off or frozen state.
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Keep the cable end of the probe to the right side of the system, and insert the connector into the port of the system, and then press in fully. See the figure below.

Clockwise revolve the locking lever to be tight.

Place the cable properly to avoid being treaded or wrapping with other devices. DO NOT allow the probe head to hang free.



3.4.2 Disconnecting a Probe

Counterclockwise revolve the locking lever to unlock the connector of the probe.
Pull the probe connector straight out.

3.5 Graph /Text printer

- local printer connection

The printer has the power and data cables, power cable plug must be requested directly inserted into a grounded outlet.

Connect the data cable to the USB port of the host. (Video printer needs to be connected to the

video output port of the host)

Turn the instrument and printer power on.

- Report print:

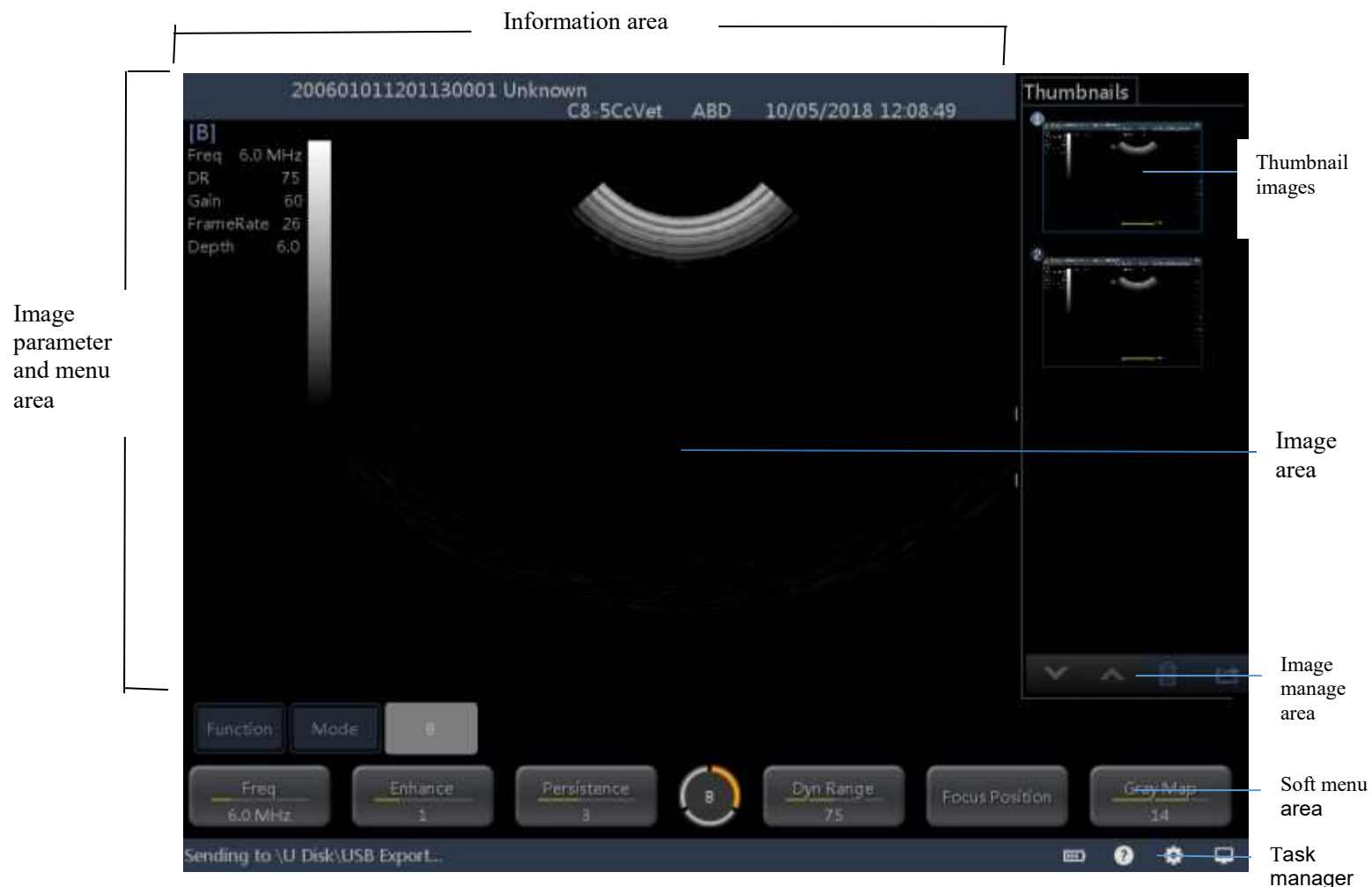
The printer can print the report.

In the reporting interface, click <Print> key to print report.

Please refer to the accompanying manuals of the printers for more details.

3.6 Basic Screen and Operation

The following diagram maps out the different areas in the screen:



- Information Area

The information area displays manufacturer logo, hospital name, exam date & time, freeze icon, animal information, probe model, current exam mode,

- Logo

Manufacture logo, displayed in the upper left corner of the screen.


- Hospital name

Display the hospital name. Hospital name can be set via <Logo> →<System Preset> →<Hospital Information>"

- Exam time

Displays the exam time including date and time. Exam time can be set via "<Logo>→<System Preset>→<General>". Exam time will be frozen with the frozen image.

- Freeze icon

The freeze icon  means the image is frozen.

- Animal information

Displays patient name ID gender and age etc. Enter the animal information through the "Animal info" screen. Or, import the saved patient data from Situation or the DICOM Work list server.

- Probe Model

Display the currently-used probe model, or the default model.

- Exam Mode

Displays the currently used exam type, e.g. A-Abdomen, is displayed.

- Image Parameter and Menu Area

The image parameter and menu are both displayed in this area. When no menu is available; this area displays the image parameters of the current mode.

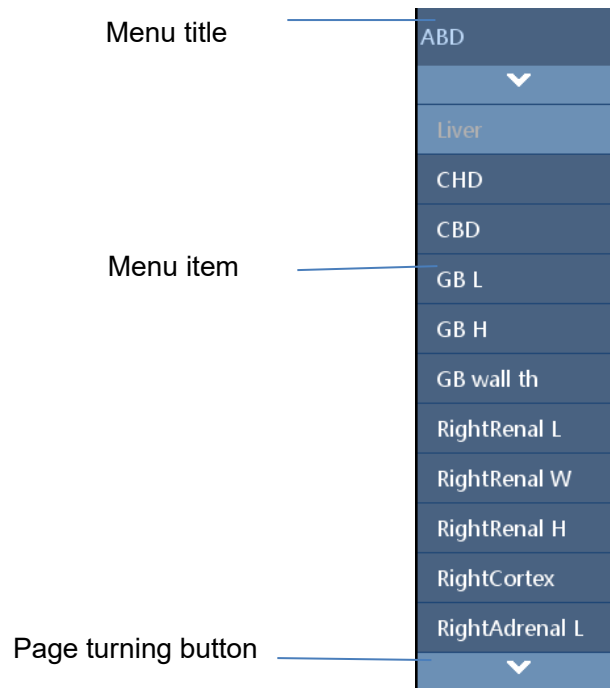
- Menu area

When an image menu is displayed, the imaging parameters will be covered by the menu.

Include image menu, measurement menu, comment menu, body mark menu and so on. Use the touch screen, the cursor and the multifunctional knob to operate on the menu.

Use the <Function>→<Menu> to show or hide the menu.

The menu area consists of menu title, menu items and page-turning button. As shown in figure below.





➤ **Menu title**

Displays the menu name.

➤ **Page-turning button**


When there are too many items in a menu, the items will be divided into more than one page.

You can turn pages by page-turning buttons,  and .

➤ **Items**

Refers to the items on a menu. For item that is applicable for more than one mode, the item appears as universal item in the certain mode. Items of image modes and measurement can be preset.

➤ **Down-drop list button**


If there are several options available for one item, you can choose the options through the  button.

● **Parameter Area**

Display the image parameters for the activated image window. If there are more than one imaging modes, the system displays the parameters of each image mode respectively.

For details, please refer to the corresponding imaging mode(s).

■ **Image area**

The image area displays the ultrasound images, time line (in M mode), coordinate axis (including depth, time), focal position (located at depth axis in the form of ) , besides, the

annotation, body mark, measurement calipers grayscale bar are also displayed here.





■ Image-in-Image Area

In the zoom status, this area displays the thumbnail of a complete image, and a rectangular frame is used to highlight the currently magnified area. This feature is called image-in-image.

■ Thumbnail area of images stored

Displays the thumbnail images stored under the current patient.

■ Image manage area

- Page up/down: when there are more than one page images have been stored, you can turn to the next or preview page by  or  respectively.
- Delete: select a thumbnail image, and click  to delete it.
- Send to: select a thumbnail image, and click  to send it to external devices.

■ Soft Menu Area

Soft key operation:

Click on the current page of the soft key.

■ Task manager

Task manager icon displays the current system job.

4 Exam Preparation

4.1 To Start an Exam

You can start a patient exam in the following situations:

- New animal information: Enter the animal information, if it is a new patient, refer to "4.2.1 New Animal Information" for details;
- New exam: to start a new exam for an already registered patient, the recorded information can be obtained through <Patient List>. Refer to "4.2.2 Retrieve Animal information" for details.
- Anonymous detection: Make an exam directly without inputting the name. The animal ID can be generated automatically by the system, also can be inputted manually. Refer to "4.7 Anonymous Patient Exam" for details.


General procedure for an exam: Enter the animal information → Select an exam mode and probe

→ Choose an imaging mode → Start the exam.


To start a new patient exam, it is better to enter the detailed animal information. The system will set up a unique information database for each patient based on the animal information entered, so that the information of one patient will not be confused with that of another patient.

4.2 Animal information

- To enter the "Animal info" screen

- Press  button to set up the patient information

- To exit the "Animal info" screen

- You can click  to hide the input keyboard after input the information. Click <OK> on the "Animal info" screen to save the settings and exit the screen.
- Click <Cancel> to exit the screen without saving any of the entered patient data.

4.2.1 New Animal information

The "Animal info" screen is shown as follows

Animal Info

First Name Last Name Animal

Animal ID Age

Gender M.I.

DOB Host

ABD | OB | GYN | CARD | Small Parts

Study Description

Primary Indications

Secondary Indications

Height cm

Weight kg

Detailed information is described as follows:

General information

- Animal ID

Once you enter the ID and confirm it, you are not allowed to change it. There are 2 ways to generate the animal ID.

- Auto generate ID

If you start an exam for a patient without inputting ID, the system will automatically generate an ID with a unique time-stamp identification code.

- Enter the ID

Manually input animal ID by yourself.

- Name

Enter the patient name directly through the keyboard. Characters of A through Z and 0 through 9 and "." are allowed.


- Gender

Select Male, Female or unknown for patient gender in the drop down list.

- Animal

Select animal species. It is associated with OB application measurement menu.

- DOB (Date of birth):

You can either enter the birth date of a patient manually according to the format displayed in the field, or click  to select the date. In the table, you can select the desired year (or enter it manually); month and day, then click <OK> to finish it.



- Age:
 - Auto generated age: once the DOB is entered, the system can display an Auto-generated age in the field box, the unit can be “Years”, “Months” or “Days”.
 - Also, you can manually enter the age.
- Select Dog, Cat, Equine, Bovine, Ovine or Other for animal kind in the drop down list.
- Host

Enter the patient name directly through the keyboard. Characters of A through Z and 0 through 9 and “.” are allowed.

NOTE: When you enter the date manually, please enter it in the format as that of the system.

Exam Type

- Exam application type

You can select several types: ABD (Abdomen), OB (Obstetrics), NERVE (nerve) and SMP (Small Part).

Select the exam type tab to enter the exam-specific information. Each exam type requirements of input information is different.

- General information:

There are included in any exam type.

Study description: To enter description for each exam.

Primary indications: To enter the primary indications (reason to perform the exam.)

Secondary indications: To enter the secondary indications.

- Exam specified information:

Exam Type	Information	Description
ABD (Abdomen)	height	
	weight	
OB (Obstetric)	Calculation index	According to the entered index calculation gestational age and expected date of childbirth: <ul style="list-style-type: none"> ● LMP:(last menstrual period) ● BBT:(basic body temperature)
GYN (Gynecology)	None	<ul style="list-style-type: none"> ● LMP:(last menstrual period)
SMP (Small Parts)	None	
Cardiology		Height; Weight; HR; RA Press; BP

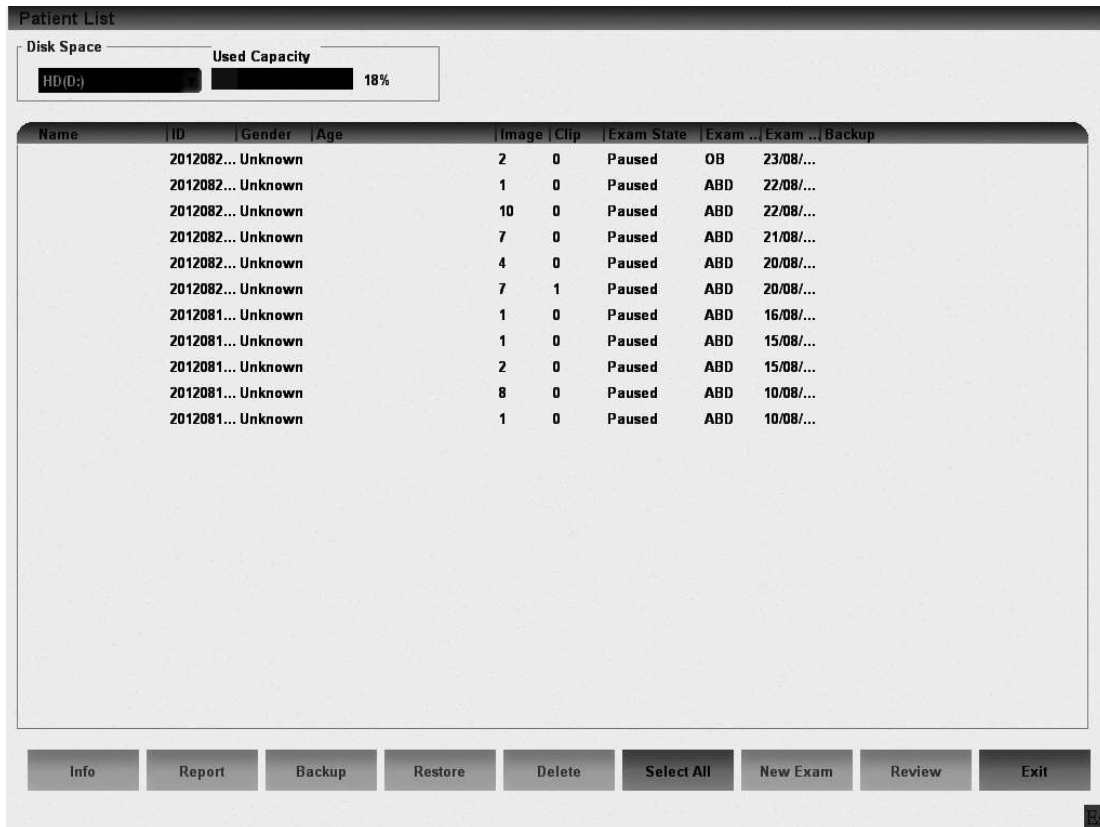
Functional key


- [Cancel Exam]: to cancel the current exam.
- [New Patient]: click to clear the current animal information in the animal information screen in order to input information for a new patient.
- [New Exam]: click to clear the current exam information in order to create a new exam for the current patient.
- [OK]: click to save the patient data entered and exit the screen.
- [Cancel]: click to cancel the patient data entered and exit the screen.
- [Work List]: Click to enter the work list interface, in order to get the animal information directly from DICOM gateway of the hospital information system on the server.

4.2.2 Retrieve Animal information

To enter "patient list" screen (the screen is shown as follows):

- Press <Function>→<patient list> ; or,
- Click <patient list> in the "Animal info" screen; or
- Click <patient list> in the "Review" screen.



- [New Exam]: click to enter “Animal info” screen, meanwhile, the corresponding animal information is also imported to the new exam. After you edit the animal information in the [Animal info] screen, select [OK] to start a new exam.
- [Review]: In the “patient list” screen, select a patient item and click to enter the “Review” screen.
- [Info]: In the “patient list” screen, select a patient item and click to enter “animal info” screen, but you can’t modify any information except note.
- [Report]: If the report of the selected patient has been created, click to enter the report screen, or pop-up a prompt.
- [Backup]: Select the animal information and click <backup>after connecting the storage devices.
- [Restore]: Click the drop-down button  to choose the storage devices. Select the desired animal information and click to restore the animal information.
- [Delete]: Delete the selected patient item.
- [Select all]: Selected all patients in the list.
- [Exit]: click to exit “patient list” dialogue box.

4.3 Select an Exam Mode and Probe.

CAUTION

If the exam mode is changed during a measurement, all measurement calipers on the image will be cleared.

4.3.1 Supported Exam Modes

The system can be configured with the following exam modes:

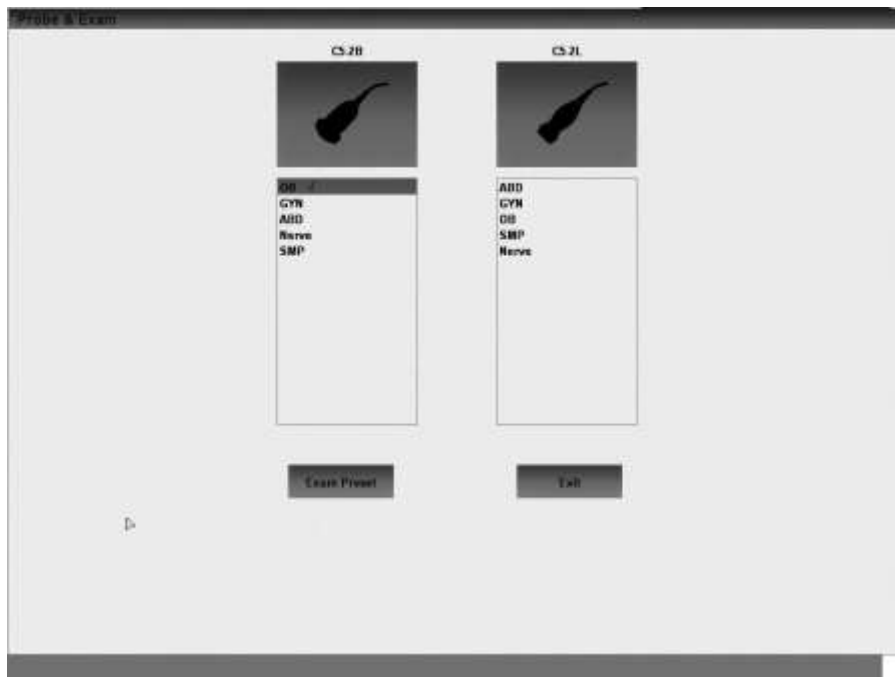
1. ABD (Abdomen)
2. OB (Obstetric)
3. SMP (Small Parts)
4. Nerve
5. Cardiology

The system supports to preset application type. For details, please refer to “11.3 Image preset”.

4.3.2 Selecting Exam Modes and Probe

- Select the probe and exam mode:

(1) Click<Function>→<Probe> to open the following dialog box.



(2) Select the probe and exam mode.

Click <Exam Preset> to enter the exam preset screen. For exam preset, please refer to "11.2Exam Preset

Click <Exit> to exit.

4.4 Select the Imaging Mode

Use the corresponding keys in the “Image Mode” to enter the imaging modes.

For the detailed operations in each imaging mode, please refer to “5 Image Optimization”.

4.5 End Exam

To end an exam, you can do one of the following:

- Click <New Patient> on the Animal info screen to end the last patient exam and clear the animal information.
- Click <New Exam> on the Animal info screen (or Patient List screen, or Review screen) to end the last exam and clear the exam data.

4.6 Cancel an Exam

An undergoing exam can be stopped by clicking <Cancel Exam> in the Animal info screen.

1. Click <Function> → <Patient> to enter "Animal info" screen.
2. Click <Cancel Exam>.
3. The system prompts the confirmation message, then click <OK>.

After the above operations being taken, the exam is canceled, and all the data of the examination are saved with the status of the exam to be "Canceled".

4.7 Anonymous Patient Exam

- In not input the animal information, the system also allows scan image and measurement. The system will automatically generate an ID, and save the images in the ID.
- Fill in the animal information, don't input the name of the patients is allowed, but must be input an animal ID.

5 Image Optimization

5.1 Switching Between Imaging Modes



Key	Description
	Click to enter B Mode
<2B>	Click to enter Double B Mode
<4B>	Click to enter Four B Mode
<B&M>	Click to enter M mode and then used to switch between BM and single M mode. Please consult chapter of M mode image optimization to learn details.

5.2 Image Adjustment

Before optimizing the image by adjusting image parameters, adjust the brightness and contrast of the monitor to the best.

Requirement	Available Operations
To modify the brightness	Adjust gain Adjust TGC
To modify gray scale image effect	Adjust [Dyn Ra.] Adjust [Gray Map] Adjust [frame correlation] Adjust [Q]
To increase frame rate of gray scale imaging	Decrease depth

5.3 B Mode Image Optimization

B mode is the basic imaging mode that displays real-time images of anatomical tissues and organs.

5.3.1 B Mode Exam Protocol

1. Enter the animal information, and select the appropriate probe and exam mode.
2. Click <Function>→ to enter B mode.
3. Adjust parameters to optimize the image.
4. Perform other operations (e.g. measurement and calculation) if necessary.

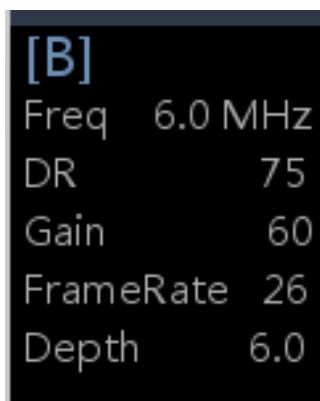
- In real-time scanning of all imaging modes, Click to return to B mode.

5.3.2 B Mode Parameters

- In B Mode scanning, the image parameter area in the upper left corner of the screen will display the real-time parameter values as follows:



The left is Parameter Name, The right is current data, and The Qopt only appear after you opening the <Qopt>.



Display	Freq	DR	Gain	Frame Rate	Depth
Parameter	Frequency	B Dynamic Range	Gain	Frame Rate	Depth

- Parameters that can be adjusted to optimize the B Mode image are indicated in the following.

Adjustment	Items
Control Panel	Gain, Qopt
Soft keys	Dynamic Range, Persistence, Gray Map, Colorize Map, Expand mode, TSI, TGC, Frequency, L/R Flip, U/D Flip, A. power, Gain, Enhance, Focus Position.
the image parameter area	Frequency, Dynamic Range, Gain, Depth

5.3.3 B Mode Image Optimization

- **Gain**

Description To adjust the gain of the whole receiving information in B mode. The real-time gain value is displayed in the image parameter area in the upper left corner of the screen.

Operation Rotate the knob clockwise to increase the gain, and anticlockwise to decrease;

Click <Function>→<Gain>in the soft menu to adjust the gain;

Click<Gain>on the image parameter area in the upper left corner of the screen then Rotate the knob clockwise to increase the gain, and anticlockwise to decrease.

Effects Increasing the gain will brighten the image and you can see more received signals. However, noise may also be increased.

- **Depth**

Description This function is used to adjust the display depth of sampling, the real-time value of which is displayed on the image parameter area in the upper left corner of the screen.

Operation Press the Multi-function knob then Rotate the knob clockwise to increase the depth, and anticlockwise to decrease.

The adjustable depth values vary depending upon the probe types.

Effects Increase the depth to see tissue in deeper locations, while decrease the depth to see tissue in shallower locations.

Impacts Depth's increase will cause a decrease in the frame rate.

● Acoustic Power

Description Refers to the power of ultrasonic wave transmitted by the probe, the real-time value of which is displayed in the image parameter area in the upper left corner of the screen.

Operation Adjust through the <A. Power> item in the soft menu.
The adjusting range is 10%-100% in increments of 6%.

Effects Generally, increasing the acoustic power will increase the brightness and contrast of the image as well as the force of penetration.

Impacts You should perform exams according to actual situation and follow the ALARA Principle.

● TGC

Description The system compensates the signals from deeper tissue by segments to optimize the image.

There are 8-segment TGC sliders of the control panel corresponding to the areas in the image.

Operation Click <Function>→<Gain>in the soft menu and then eight period of control slider appear on the right screen respectively corresponding to different depths of segmented images.

To increase the gain compensation at an area of interest, move the TGC slider to the right.

To decrease the gain compensation at the corresponding area of interest, move the TGC slider to the left.

Effects Adjust the signal gain for the certain image area to get a balanced image.

● Frequency

Description This function is used to select the operating frequency of the current probe, the real-time value of which is displayed in the image parameter area in the upper left corner of the screen. Both B mode frequency and harmonic frequency have three modes : Gen(general mode) ,Pen(Penetrated mode) and Res(Resolution mode)

Operation Click <Freq> to switch frequency mode.

Click <THI> to switch frequency mode and harmonic frequency mode.

Effects According to detection depth and current tissue characteristics to select the
The higher the frequency the better the near field resolution but the worse
the force of penetration.

Harmonic imaging enhances near field resolution and reduces low-frequency
and large amplitude noise, so as to improve small parts imaging.

● Expand mode

Description This function is to expand scanning range.

Operation You can click [expand mode] to open or close the function.

Effects Opening this function will cause a decrease in the frame rate.

● Dynamic Range

Description This function is used to adjust the B image resolution to compress or
expand the gray display range.

The real-time dynamic range value is displayed on the image parameter
area in the upper left corner of the screen.

Operation Adjust through the [Dyn Ra.] item in the soft keys;

Click<DR>on the image parameter are in the upper left corner of the
screen then move the slider to adjust the dynamic range , and
anticlockwise to decrease.

The adjusting range is 30-120dB in increments of 5dB.

Effects The more the dynamic range, the more specific the information, and the
lower the contrast with more noise.

● Persistence

Description This function is used to superimpose and average adjacent B images.

Operation Adjust through the [Persistence] item in the soft menu.

The system provides 8 level of frame average adjustment, 0 indicate the
Persistence function is turn off.

Effects Persistence can remove image noise to make details to be clearer.

Impacts Persistence increase may lead to signal missing.

● Invert /Rotation

Description This function provides a better observation for image display.

Invert(U/D Flip and L/R Flip) To invert the image horizontally or vertically.
Adjust through the <U/D Flip> or <L/R Flip> item in the soft menu.

When you invert, the “Q” mark will change its position correspondingly on the screen; the Q mark is located in the upper left corner of the imaging area by default.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **Gray Map**

Description This function applies the gray correction to obtain the optimum images.

Operation Select among the maps through the [Gray Map] item in the soft menu.
The system provides 6 groups of gray map.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **Colorize Map**

Description Colorize function provides an imaging process based on color difference rather than gray distinction.

Operation Select the colorize map through the [Colorize Map] item in the soft keys.
The system provides 5 gears but 4 colorize maps to be selected among off indicate the colorize is turned off.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **CrossBeam**

Description Improve the image quality by combining multi-frame from different deflection.

Operation Click the soft key [Cross Beam] to turn on or turn off.

Effects If you turn it on, the image would have less dot noise, image will be clearer and enhance the resolution.

- **Enhance**

Description Enhance the shape of the image to get a clear boundary.

Operation Select the [Enhance] item in the soft keys.
The system provides 5 gears but 4 level to be selected among. 'Off' indicate the enhance is off.

Effects If you turn it on, the image would be smooth and sharper.

- **TSI (Tissue Specific Imaging)**

Description The TSI function is used to optimize the image by selecting acoustic speed according to tissue characteristics.

Operation Select among the TSI modes through the [TSI] item in the soft keys.

The system provided 4 ways of optimization for specific tissues: general, muscle, fluid and fat.

- **Focus Position**

Description This function is to adjust the focus position.

Operation Click the Focus Position and slide it to get a clear image.

Optimize (Q)

Description To optimize image parameters as per the current tissue characteristics for a better image effect.

Operation Press<Q>on the control panel to turn on the function,

Click on <Q> item in the soft keys to turn on the function, the symbol of which will be displayed in the image parameter area of the screen.

5.4 B&M Mode Image Optimization

5.4.1 B&M Mode Exam Protocol

- Select a high-quality image during B mode scanning, and adjust to place the area of interest in the center of the B mode image.
- Click on <Image Mode>→<B&M> item in the soft keys, and click on



To adjust the sampling line. You can observe the tissue motion along with anatomical images of B mode.

During the scanning process, you can also adjust the sampling line accordingly when necessary. The details please consult “5.5 BM Mode Image Optimization”.

- Click on <Image Mode>→ <B&M> item again to enter single M mode and then you can switch the mode between BM and single M by the <B&M>key.
- Adjust the image parameters to obtain optimized images.
- Perform other operations (e.g. measurement and calculation) if necessary.

5.4.2 BM Mode Parameters

- BM mode is the mode that the B and M Image displayed at the same time. The image parameter area in the upper left corner of the screen displays the real-time parameter values as follows:

[B]	
Freq	6.0 MHz
DR	75
Gain	60
FrameRate	23
Depth	6.0
[M]	
DR	75
Gain	71
VF	2

Display	Freq	DR	Gain	VF	Depth
Parameter	Frequency	M Dynamic Range	M Gain	M speed	Depth

- Parameters that can be adjusted to optimize the M mode image are indicate in the following.



Adjustment	Items
Control Panel	Gain, Qopt
Soft keys	Dynamic Range , Time Mark, Scanning Speed, Colorize Map, Gray Map, M Soften, Frequency, Acoustic Power

- During M mode scanning, frequency of the probe are synchronous with that of B mode.

- Adjustment of the depth, focus position or TGC to the B mode image will lead to corresponding changes in M mode image.

5.4.3 BM Mode Image Optimization

- **Gain**

Description To adjust the gain of M mode image. The real-time gain value is displayed in the image parameter area in the upper left corner of the screen.

Operation Rotate the knob clockwise to increase the gain, and anticlockwise to decrease.

The adjusting range is 0-100.

Effects Increasing the gain will brighten the image and you can see more received signals. However, noise may also be increased.

- **Depth**

Description This function is used to adjust the display depth of sampling, the real-time value of which is displayed on the image parameter area in the upper left corner of the screen.

Operation Press the Multi-function knob then Rotate the knob clockwise to increase the depth, and anticlockwise to decrease.

The adjustable depth values vary depending upon the probe types.

Effects Increase the depth to see tissue in deeper locations, while decrease the depth to see tissue in shallower locations.

Impacts Depth's increase will cause a decrease in the frame rate.

- **Frequency**

Description This function is used to select the operating frequency of the current probe, the real-time value of which is displayed in the image parameter area in the upper left corner of the screen. Both B mode frequency and harmonic frequency have three modes : Gen(general mode) ,Pen(Penetrated mode) and Res(Resolution mode)

Operation Click <Freq> to switch frequency mode.

According to detection depth and current tissue characteristics to select the different adjust frequency range for different probes.

Effects The higher the frequency the better the near field resolution but the worse penetration.

Harmonic imaging enhances near field resolution and reduces low-frequency and large amplitude noise, so as to improve small parts imaging.

- **Speed**

Description This function is used to set the scanning speed of M mode imaging, and the real-time speed value is displayed in the image parameter area in the upper left corner of the screen.

Operation Change the speed through the <Speed> item in the soft keys.

There are 3 levels of scan speed available, the smaller the value the faster the speed.

Effects Speed changing makes it easier to identify disorders in cardiac cycles.

- **Colorize Map**

Description Colorize function provides an imaging process based on color difference rather than gray distinction.

Operation Select the colorize map through the <Colorize Map> item in the soft menu or menu.

The system provides 5 different maps to be selected among.4 of them are Colorize Map and 0 indicate that the Colorize Map has turned off.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **Gray Map**

Description This function applies the gray correction to obtain the optimum image

Operation Select among the maps through the <Gray Map> item in the soft menu. The system provides 6 groups of gray map.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **Time Mark**

Description Turn on or off the function to show the time mark in B&M mode image, which facilitates to specify the time information of special points.

Operation Turn on or off the function through <Time Mark> item in the soft menu.

Effects This function facilitates to specify the time information of special points, and makes it easier to identify the cardiac cycles and detect more details.

Impacts The function is available in real-time imaging, freeze or cine review status.

- **Dynamic Range**

Description This function is used to adjust the B image resolution to compress or expand the gray display range. The real-time dynamic range value will be displayed in the image parameter area in the upper left corner of the screen.

Operation Adjust through the <Dyn Ra.> item in the soft keys.Or adjust it in the image parameter area.

The adjusting range is 30-120dB in increments of 5

Effects The more the dynamic range, the more specific the information, and the lower the contrast with more noise.

- **Acoustic Power**

Description Refers to the power of ultrasonic wave transmitted by the probe, the real-time value of which is displayed in the image parameter area in the upper left corner of the screen.

Operation Adjust through the <A. Power> item in the soft menu. The adjusting range is 10%-100% in increments of 6%.

Effects Generally, increasing the acoustic power will increase the brightness and contrast of the image as well as the force of penetration.

Impacts You should perform exams according to actual situation and follow the ALARA Principle.

- **M Soften**

Description This feature is used to process the scan lines of M images to reject noise, making the image details to be clearer.

Operation Adjust through the <M Soften> item in the soft keys.

The system provides 5 levels of M Soften adjustment, 0 indicated that M soften has been turned off. the bigger the value the stronger the effect.

- **M Line**

Description Adjust the position of M line.

Operation

Click [M Line>>], the M Line would move to the right. Click [M Line<<], the M Line would move to the left

6 Display & Cine Review

6.1 Image Display

6.1.1 Splitting Display

The system supports dual-split and quad-split display format. However, only one window is active at one time.

- Dual-split: press <Mode> page on the screen, then press <2B > to enter the dual-split mode, and using <2B > to switch between the two images; press to exit.
- Quad-split: press <Mode> page on the screen, then press <4B > to enter the Quad-split mode, and using <4B > key to switch between the four images; press on the control panel to exit.

Imaging modes support splitting display: B mode, M mode, 2B mode, 4B mode, B&M mode.

6.1.2 Image Magnification

■ Enter Zoom

In the real time scanning or freeze status, Click on<Function>→<zoom>, to enter the zoom status.

■ Zoom Adjustment

- To change the magnification factor (the maximum is 10 times).

Rotate the multifunctional knob to the left to decrease the magnification factor; rotate to the right to increase the magnification factor.

Or click on  and  in the thumbnail.

The magnification factor is displayed in the upper left part of the screen. For example, **Zoom** 1.2 indicates the current magnification factor is 1.2.

- Click on the thumbnail to change the zoom position by moving finger.

■ Exit Zoom

Click on<Function>→<zoom> again or<<Exit>>to exit the zoom status.

6.1.3 Freeze/ Unfreeze the Image

Press<Freeze> on the control panel to freeze a scanning image. In freeze mode, the probe stops

transmitting acoustic power, and all images as well as the parameters are kept still.

Tip: after freezing an image, the system may enter cine review, measure, comment adding, or body mark mode, which is dependent upon preset. (Setting path: <Logo>→<System Preset>→<General>→ “Status after Freeze”)

Press<Freeze>in freeze mode to unfreeze the image, the system continues image scanning.

6.2 Cine Review

After you press<Freeze>, the system allows you to review and edit the images prior to the image frozen. You can perform post process operations, measurements, comments adding and body marks on the images being reviewed.

The system supports manual review as well as automatic review. You can switch between Auto Cine and Manual Cine.

6.2.1 Entering/ Exiting Cine Review

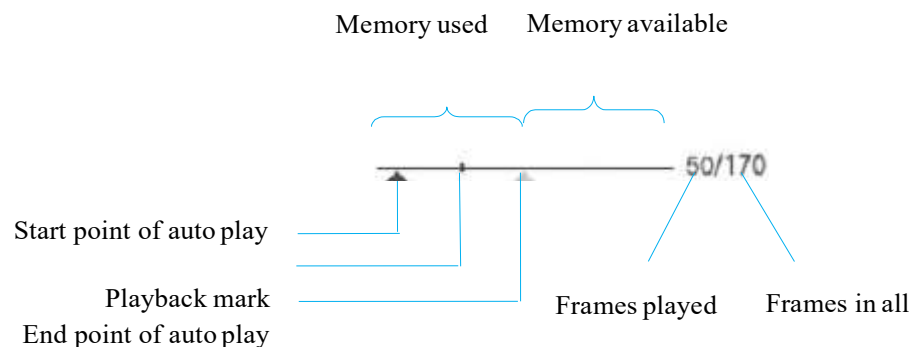
- To enter cine review:
 - Enter "<System Preset> →<General> and set "Status after Freeze" to be "Cine". Press<Freeze>to freeze the image and enter the cine status.
 - Open cine files in thumbnail or Review, the system enters automatic cine review status.
- To exit cine review:
 - Press<Freeze>key again, the system will return to image scanning and exit cine review.

6.2.2 Cine Review in B Mode

- Manual cine review

After entering the cine review of B mode, it will enter manual cine review mode. If you rotate the multi-function knob in a clockwise direction, the review sequence is reversed to the image-storing sequence, thus the images are displayed in descending order. Whereas, if you rotate the multi-function knob in a anticlockwise direction, the review sequence is the same as the image-storing sequence, thus the images are displayed in ascending order. When the reviewing image reaches the first or the last frame, further rolling the trackball will display the last or first frame.

The cine progress bar at the bottom of the screen (as shown in the figure below):



■ Auto Review Reviewing all

Enter: In the manual cine review status, click <Auto Play>in the soft menu to activate auto cine review.

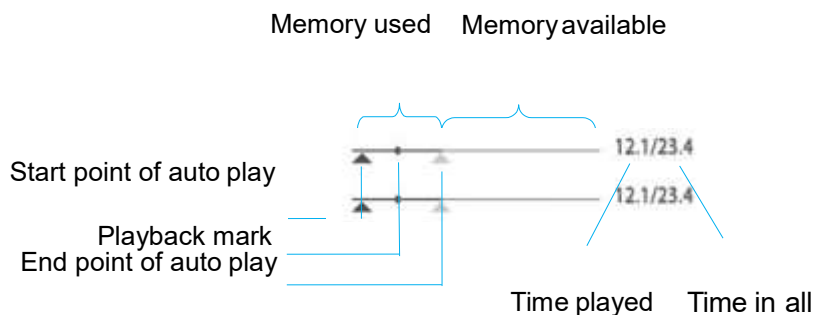
Reviewing speed: In the auto cine review status, click <Auto Play>in the soft menu to adjust the review speed. The available values are $\times 0$, $\times 1/4$, $1/2$, $\times 1$, $\times 2$, and $\times 3$.

Exit: In auto review status, Click [Auto Play] to be 0 to exit cine reviewing.

6.2.3 Cine Review in M Mode

Enter cine review in M mode, and then rotate the multi-function knob, the cine images are displayed on the screen one by one.

The cine progress bar at the bottom of the screen (as shown in the figure below):



Cine review operations are the same as those of B mode.

6.2.4 Linked Cine Review

The linked cine review refers to review of the images captured at the same moment in B+M mode.

6.3 Cine Saving

In freeze mode, click on<Save Cine>in the soft menu or menu to save the cine.

After the cine is successfully saved, there is a thumbnail displayed on the screen.

7 Measurement

Measuring operation can be divided into routine measurement and application of measurement.

⚠ CAUTION	1	If the system is turned off during a measurement, the data not saved will be lost.
	2	Once remove frozen state during a measurement, all measuring information will be deleted and conventional measurement data will be lost.
	3	The change of modes may cause loss of general measurement data.
	4	Meaningless measurement is not performed, such as: the user performs a measurement, which can only be performed on the B image, on an M image.

7.1 Basic Operations

- To enter/ exit measurement
 - Click on <Function>→<Measure> item to enter application measurement.
 - Click on <Exit> key or <Measure> key again to exit.
- Measurement result
 - The system displays and updates measurement results in the result window.

7.2 General Measurements

7.2.1 2D General Measurements

2D general measurements refer to general measurements on images of B, Color or Power modes. The measurements listed below can be performed:

Measurement Tools	Function
Distance	Measures the distance between two points of interest.
Angle	The angle between two intersected planes.
Area	Measures the area and perimeter of a closed region.
Volume	The volume of a target.
Trace Length	Measures the length of a curve on the image.

Trace Area	Measures the area and perimeter of a closed curve.
Distance Ratio	Measures the lengths of any two line segments and the calculated ratio.
Area Ratio	Measures the area and perimeter of any two closed regions and the calculated ratio.
Histogram	The grayscale distribution of ultrasonic echo signals in a closed region

The measurements in M mode listed below can be performed:

Measurement Tools	Function
Distance	The vertical distance between two points.
Time	The time interval between any two points.
Slope	Measures the distance and time between two points and calculates the slope.
HR	Measures the time of tow cardiac cycles and calculates the heart rate in M mode image.

7.3 Methods of general Measurement




The system can be configured with the following application measurement packages corresponding to the application packages:

7.3.1 2D General Measurements



7.3.1.1 Distance

Function: Measures the distance between two points on the image.

1. Click [Distance] in the measurement menu, and the cursor appears on the screen.
2. Move the cursor to the starting point, use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouse button to set the starting point.
You can click  to cancel the last step.
3. Move the cursor and it will show the real distance on the screen.
4. Move the cursor to the end point and set it, the segment will be a fixed yellow segment. The data

is confirmed and we finish this measurement.

5. Repeat the 2-4 steps, you can continue another distance measurement.

7.3.1.2 Angle

Function: Measures the angle of two crossing planes on the image and the range is: 0°- 180°.

1. Click [Angle] in the measurement menu, and the cursor appears on the screen.
2. Use the measure method for distance to set the point of segment a and b.
3. When the two segments are fixed, the length of the segments and the angle will show on the screen.
4. Repeat the 2-3 steps, you can continue another angle measurement.





7.3.1.3 Area

Function: measures the area and circumference of a closed region on the image. Two measurement methods are available:




1. Ellipse: Fix an ellipse region by two equal-cut perpendicular axes.
2. Trace: Fix a closed region by free tracing.

Tips: These two methods are also applicable to other measurement items, and will not be repeated when mentioned below. The operations are as follows.

Ellipse

1. Click [Ellipse Area] in the measurement menu. The cursor appears on the screen.
2. Move the cursor to the starting point of the ellipse's fixed axis, click  or the left mouse button to confirm it.
3. Move the cursor to the ending point of the axis, click  or the left mouse button to confirm it.
You can click  to cancel the last step.
4. Move the cursor will increase or decrease the ellipse from the fixed axis. Move it to trace the area of interest as closely as possible. Click  or the left mouse button to fix the ellipse area. The area and circumference will show on the screen.
5. Press <Set> to set the end point of the first axis of the ellipse. The second axis appears on the screen.


Trace

1. Click [Trace Area] in the measurement menu. The cursor appears on the screen.
2. Move the cursor to the starting point, use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the starting point.
You can click  to cancel the last step.
3. Move the cursor along the target to trace the outline of the target in control panel.

To modify the trace line, please rotate the <Multi-Functional knob>:

Anticlockwise: to cancel a series of points.

Clockwise: to resume a series of points.

4. Click  and the trace line will be closed with a straight line connecting the starting and end points and when the cursor is very near to the starting point, the trace will be closed and the area and circumference will show on the screen.
5. Repeat the 2-4 steps, you can continue another area measurement.

7.3.1.4 3DistVolume

Function: Measures the volume of the target object.




1. Select [3DistVolume] from the soft measurement menu. The cursor appears on the screen.
2. Here, D1, D2, D3 are length of three axes of the target object.

See "7.3.1.1 Distance " for detailed procedures.

Generally, D1, D2, D3 should belong to different scanning plane.

7.3.1.5 Trace Length



Function: Measures the length of a curve on the image.

1. Click [Trace Length] in the measurement menu. The cursor appears on the screen.
2. Move the cursor to the starting point, use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the starting point.
You can click  to cancel the last step.
3. Move the cursor along the target to trace the outline of the target in control panel.

To modify the trace line, please rotate the <Multi-Functional knob>:

Anticlockwise: to cancel a series of points.

Clockwise: to resume a series of points.

4. Click  or just click  beside the cursor or click the left mouth button to set the end point. The trace length will show on the screen.
5. Repeat the 2-4 steps, you can continue another Trace Length measurement.

7.3.1.6 Ratio (D)

Function: Measures the lengths of two line segments and then calculates their ratio.

1. Click [Ratio (D)] in the measurement menu, and the cursor appears on the screen.
2. Measure the length of the two line segments, see "7.3.1.1 Distance" for detailed procedures.

The result displays in the result window after the measurement of the second line is completed.

7.3.1.7 Ratio (A)

Function: Measures the area of two closed regions and then calculates their ratio. The methods are Ellipse, Trace.

1. Select method from the drop-down list on the right of [Ratio (A)] in the menu. The cursor appears on the screen.
2. Measure the area of the two closed regions, see "7.3.1.3 Area" for detailed procedures.





7.3.1.8 Hist (Histogram)

Function: Measures and counts the gray distribution of ultrasonic echo signals within a closed region. The methods to set a closed region are Ellipse and Rect (Rectangle).

Tips Hist must be performed on the frozen image.

7.3.1.8.1 Rect

Rect sets a rectangle with two points on the cross. The operations are:

1. Click [Rect Hist] in the measurement menu. The cursor appears on the screen.
2. Move the cursor to the starting point, use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the first vertex of the rectangle. You can click  to cancel the last step.
3. Move the cursor to the second vertex of the rectangle, press . The result is shown in the following figure:
4. Repeat the 2-3 steps, you can continue another [Rect Hist] measurement.



Where,

Horizontal axis: The gray of the image
 The vertical axis: The gray distribution percentage.
 N: The total pixel number in the area to be measured.
 M: $M = \sum Di / N$;
 MAX: MAX = the pixel number in the maximum gray/ $N \times 100\%$
 SD: Standard deviation. $SD = (\sum Di^2 / N - (\sum Di / N)^2)^{1/2}$

Di : The gray at each pixel point;

$\sum Di$: The total grays of all pixels.

7.3.1.8.2 Ellipse






See "Ellipse" in the "7.3.1.3 Area" for detailed procedures.

7.3.2 M General Measurements








7.3.2.1 Distance

Function: Measures the distance between two points on the M Mode image.

1. Click [Distance] in the measurement menu, and two dotted lines perpendicular to each other appear on the screen.
2. Move the crossing point of the dotted lines to the measurement starting point and use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the starting point. You can click  to cancel the last step.
3. Move the cursor and then the crossing point can only be moved in vertical direction. It will show the real distance on the screen.
4. Move the crossing point to the measurement end point and click  or just click  beside the cursor or click the left mouth button to set the end point, the segment will be a fixed yellow segment. The data is confirmed and we finish this measurement.
5. Repeat the 2-4 steps, you can continue another distance.




7.3.2.2 Time

Function: Measures the time interval between two points on the M Mode image.

1. Click [Time] in the measurement menu, and two dotted lines perpendicular to each other appear on the screen.
2. Move the crossing point of the dotted lines to the measurement starting point and use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the starting point. You can click  to cancel the last step.
3. Move the cursor and then the crossing point can only be moved in horizontal direction. It will show the real distance on the screen.
4. Move the crossing point to the measurement end point and click  or just click  beside the cursor or click the left mouth button to set the end point, the segment will be a fixed yellow segment. The data is confirmed and we finish this measurement.
5. Repeat the 2-4 steps, you can continue another Time.

7.3.2.3 Slope

Function: Measures the distance and time between two points on the M Mode image and calculates the slope between the two points.

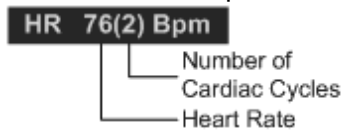
1. Click [Slope] in the measurement menu, and two dotted lines perpendicular to each other appear on the screen.
2. Move the crossing point of the dotted lines to the measurement starting point and use the control panel to adjust the position exactly, click  or just click  beside the cursor or click the left mouth button to set the starting point. You can click  to cancel the last step.
3. Move the cursor and it will show the real distance on the screen.
4. Move the crossing point to the measurement end point. The cross point is connected to the starting point by a dashed yellow line. The data is confirmed and we finish this measurement.
5. Repeat the 2-4 steps, you can continue another Slope measurement.

7.3.2.4 HR

Function: Measures the time of 2 cardiac cycles on the M Mode image and calculates the heart rate.

⚠ CAUTION: During the measurement, the number of cardiac cycles between the measurement starting and end points must be exactly the same as preset. Otherwise, misdiagnosis may occur.

1. Click [HR] in the measurement menu, and two dotted lines perpendicular to each other appear on the screen.
2. The same measurement way as time measurement.
3. The HR result in the result window, as shown in the figure below, displays the measured heart rate value and the preset number of cardiac cycles. As shown in figure below.



HR 76(2) Bpm

Number of Cardiac Cycles

Heart Rate

4. Repeat the 2-3 steps, you can continue another HR measurement.

7.4 Application Measurement

The system can be configured with the following application measurement packages corresponding to the application packages:

- Abdomen measurements - Used for measurements of abdominal organs (liver, gall bladder, pancreas and kidney, etc.).
- OB measurements- Used for measurements of GA and EDD calculations. The fetus can be evaluated through growth graph analysis and fetal biophysical profile.
- Gynecology measurements - Used for the uterus, ovary and follicles, etc.
- Cardiology measurements – Used for heart such as atrium cordis.
- Small Part measurements – Used for small parts such as thyroid.

8 Comments and Body Marks

8.1 Comments

Comments can be added to an ultrasound image to bring attention, notate or communicate information observed during the examination. You can type the character as comments; insert arrow markers.

8.1.1 To Add Comments

- To enter comment status:
 - Click <Function>→<Comment> item, and the cursor becomes “|”.
 - Click <Function>→ <Arrow> item to enter the arrow-adding status.
- To exit comment status:
 - In the comment status, Click on <Exit> key.
 - In the arrow-adding status, Click on <Exit> key.

8.1.2 Comment Setting

You can adjust relevant settings in comment status the soft menu.

- Change Font Size/Arrow Size

Click to change the font size of comment: Small, Mid, Big.
- ABC Display

Click <ABC Display> to display or hide the added comments.

8.1.3 Adding Comments

- Typing comment characters

1. To type the alphanumeric characters:

Click the screen of desired location for comments and keyboard will appear.



Type the alphanumeric characters through the qwerty. The default characters entered are Lowercase letters.

To turn on the uppercase, please click on . You can click on to hide the keyboard.

In the edit status, press <Enter> or the multifunctional knob to confirm the character added, and the color of the character added turns yellow.

■ Adding an Arrow

You can add an arrow to a location where you want to pay attention.

1. Press the <Arrow> item, and an arrow will appear at the default position.
2. Adjust the position of the arrow:

Click the arrow and then click the desired position.

3. Adjust the orientation of the arrow:

Click the arrow and use the multifunctional knob to change the orientation in 15° increments. Press the screen to anchor the arrow, and then the arrow turns yellow.

4. Repeat the above steps to add more arrows if necessary.



8.1.4 Moving Comments

1. Click the comments that needs to be moved. The comments turns green.
2. Press the screen of the new position, and the comment-moving operation is complete.

8.1.5 Modifying Comments

■ Modifying characters

1. In the comment status, move the cursor onto the comment that needs to be modified, and double press the comments to enter the edit status.
2. Or use the , key to move the cursor to a location, where needs to insert characters, and type characters.

3. Press the  key to delete the comment character or text on the right side of the cursor;
Press the  key to delete the comment character or text on the left side of the cursor.
4. Press the multifunctional knob to confirm the modification and to exit the edit status, and the color of the comments turns yellow.

■ **Modifying (Editing) Arrows**

Click the arrow and then click the desired position.

Click the arrow and use the multifunctional knob to change the orientation in 15° increments.
Press the screen to anchor the arrow, and then the arrow turns yellow.

8.1.6 Deleting Comments

Click <Erase All Text> to delete all the comment items on the screen.

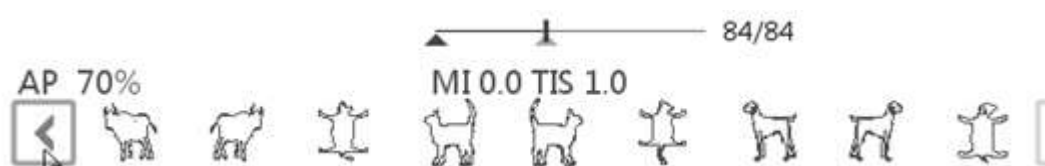
8.2 Body Marks

The Body Mark (Pictogram) feature is used for indicating the exam position of the patient as well as probe position and orientation. The system can be configured with body mark libraries including Abdomen, OB (Obstetrics), SMP (Small Part) ,Cardiology and Nerve.

8.2.1 Adding Body Marks

■ To add the first body mark:

1. Click <Function>→<Body Mark>to enter the body mark status. Select the body mark group through the <Library>. When there is more than one page of the body marks, click <Page Down>to turn pages.



2. Press the desired body mark.
3. To adjust the probe position and orientation marker:
 - Press the body mark and then press the correct position of the screen.
 - Rotate the multifunctional knob to adjust the orientation.
 - Press the multifunctional knob to confirm the position and orientation of the probe marker and exit the body mark mode.

8.2.2 Moving Body Marks

You can move the body mark graphics to any desired position within the image area.

Press the body mark and then press the desired position of the screen. The body mark move to the desired position.

9 Patient Data Management

9.1 Animal information Management

NOT E:	Please backup, clean up the patient data in time as the patient records in patients' database storage system are limited.
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9.1.1 Enter Animal information

The general animal information and exam information are entered through the Animal info screen, for details; please refer to "4.2 Animal information"

After completion of animal information entry, click <OK> to save the animal information to the patient data.

9.1.2 Animal information setting

Open "<Setup>→<System Preset>→ General", and then set the H&W Unit in the Animal info area.

9.2 Image File Management

9.2.1 Memory Media

System supported memory media including:

- USB memory devices: USB flash drive, removable USB hard disk

NOTE:	The format of USB flash drive and removable USB hard disk must be fat 16, fat32 or exfat.
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9.2.2 Image File Formats

The system can save image files as JPG or AVI.

The system can also turn the single frame files to JPG, and cine fine to AVI.

9.2.3 Save image files to local machine

- Save single frame files:

Pressing the <save> key of the control panel, freeze image and the system will save a single frame image file to local machine. The name and location of the file are system-defined.



- Save cine files:

Freezing the image and pressing the <save cine> in the soft keys, the system will save a cine file to local machine. The name and location of the file are system-defined.

The files and cines will display in thumbnail area which is on the right side of screen.

9.2.4 Thumbnails

The stored images or cines are displayed in the form of thumbnails on the screen, there are several solutions as following:

- In the scanning or freeze mode, the thumbnails refer to the images stored in the current exam. You can click  or  to page down or up the thumbnails when there are more than one page.
- In the Review screen, open an image to enter the image analyzing status, all the thumbnails belong to the exam are displayed.

9.2.5 Image Review and Analysis

You can review and analyze the stored images.

9.2.5.1 Review an Image

You can review all images stored in an exam, and send, delete or analyze the stored images.

- To enter Review:

Enter Patient list screen. And press <Review> to enter the Review screen to review the images of the patient. Or double click the selected patient.

- To exit Review:

Click <Exit> on the Review screen.

- Basic operations

Double-click a thumbnail to view and analyze an image.

- Each details of functions in screen is as following:

[Exam history]: Display the contents of exam history and click one image to review it.

[Information]: Click to enter the Animal info screen, you can review or edit the currently-selected animal information.

[Report]: Click to review or edit the currently-selected patient report.

[Select all]: Click to select all images in the thumbnail window.

[Send To]: Click to send the selected image to other location, DICOM server, and printer

[Delete]: Click to delete the selected image.

[New Exam]: click to create a new exam for the selected patient and open the Animal info screen.

[Open]: Click to open the selected image.





[Exit]: Click to exit the Review status, and return to the main screen.

9.2.5.2 Image Analysis


For the image analysis, you can view, zoom, perform post processing and measurements, add comments and perform cine (multi-frame) review for a stored image. The operation steps are the same as those for real-time scanning; please refer to relevant sections for details.

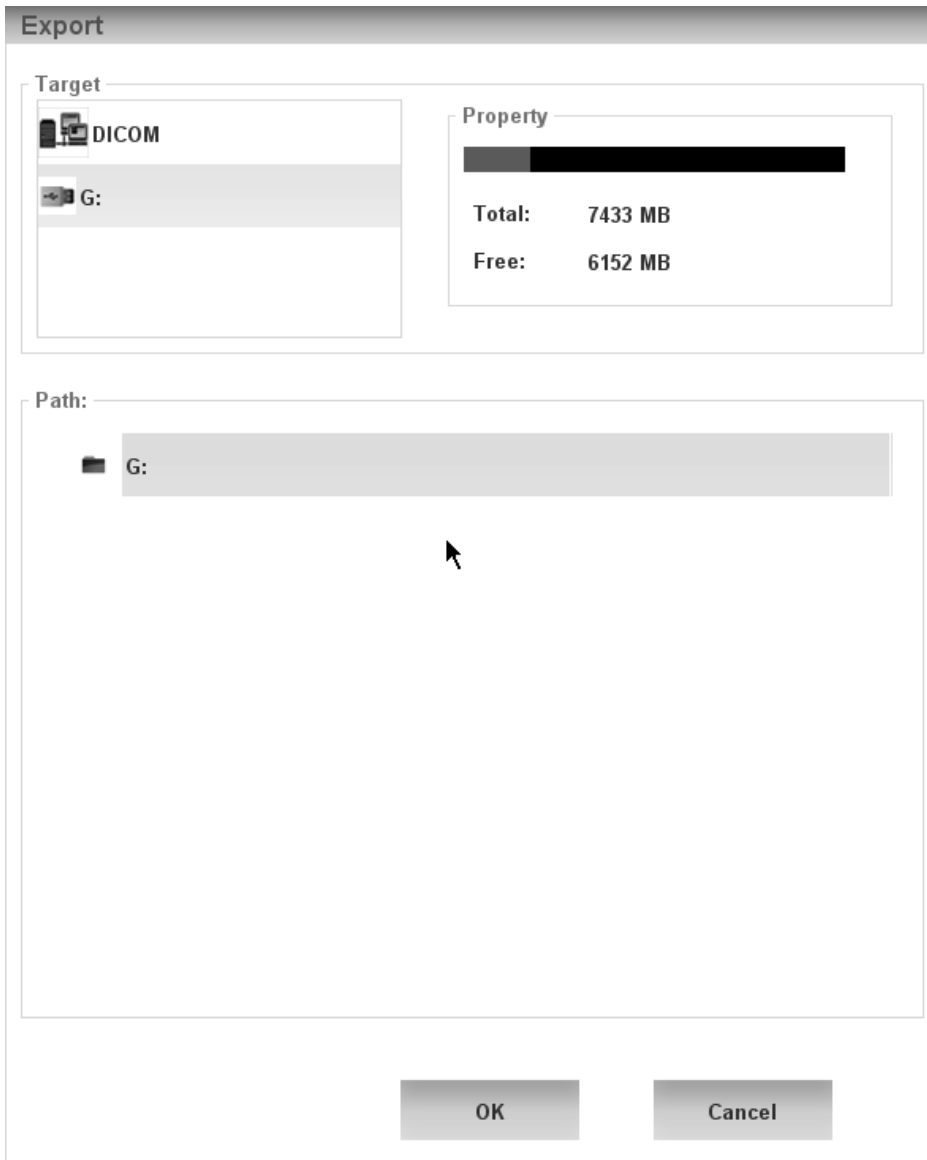
- To enter image analysis:
 - In the image scanning or freeze status, double-click a thumbnail stored in the exam to enter the image analysis status; or
 - In the Review status, select a thumbnail and click <Open> or directly double-click the selected thumbnail to open the image.
- To exit the image analysis:

Press <Freeze> to exit and enter the real-time scanning status.

- In image analysis status, the selected image is open on the screen, and the thumbnails of the same exam are displayed on the Thumbnail area, you can click   to turn pages, click  to delete or click  to send a selected image.

9.2.6 Sending Image File

- On the image screen, select a stored image thumbnail, click  on the lower right corner of the screen.



Selecting the path and pressing <OK>, the image can be sent to the external devices.

- In the Review screen, click <Export> to send the selected image to the external devices.

⚠ CAUTION Do not pull out the U Disk during the export process, otherwise

9.3 Report Management

- Report storage:

The exam reports are stored under the directory of the exam of the patient.

- Printing report

Use a connected graph/text printer to print a report.

- Add image:

The saved images appear after you click <image> in the “report” interface. Select desired images and click <add> the images can be added to the report.

- Delete image:

The image has been added to the report can be deleted. Click <Delete> and click the button in the same location with image.

Click <Delete All> to delete all images have been added.

- Edit Prompt and Findings:

Click <Edit> to add text to the report and then click <OK> to save your text.

You can also click <Edit> to revise original text.

- Add and Delete FG:

The FG button will appear if Measurement formula have FG. Check the desired FG and then the FG will be added to the report. Uncheck the FG that need to delete.

9.4 Patient Data Management (Patient List)

You can search, view, backup, send, restore or delete patient data in Patient list screen.

- To Enter “Patient list”:

Click <Function> → < Patient list > item; or

Click <Patient list> in the Animal info screen; or

Click <Patient list> in the Review screen.

The Patient list screen is shown as follows:

Disk Space

HD(D:) Used Capacity 62%

New Exam Continue Exam Activate Exam

Name	ID	Gen...	Age	Image	Clip	Exam State	Exam Type	Exam Date/Time	Back...
20141231104...	Unk...	1	0	Active	ABD	31/12/2014 10:49:13			
20141231094...	Unk...	3	0	End	ABD	31/12/2014 09:43:39			
20140904092...	Unk...	1	0	End	OB	04/09/2014 09:24:50			
20140904090...	Unk...	2	0	Paused	OB	04/09/2014 09:09:22			
20140904090...	Unk...	1	0	Paused	OB	04/09/2014 09:05:46			
20140903201...	Unk...	1	0	Paused	OB	03/09/2014 20:11:49			
20140903200...	Unk...	1	0	Paused	OB	03/09/2014 20:07:04			
20140903200...	Unk...	1	0	Paused	OB	03/09/2014 20:04:44			
20140903174...	Unk...	1	0	End	OB	03/09/2014 17:48:33			
20140828175...	Unk...	0	0	Paused	OB	01/09/2014 16:29:36			
20140828175...	Unk...	1	0	Paused	ABD	28/08/2014 17:55:28			
20140724085...	Unk...	0	0	End	ABD	24/07/2014 09:18:56			
20140724085...	Unk...	3	0	Paused	ABD	24/07/2014 09:18:16			

Info Report Backup Restore Delete Select All Review Exit

9.4.1 Viewing Animal information

- [Patient list]: Display animal information, exam mode, number of images and cines, exam state, backed up or not.
- [Info]: Select an exam of a patient, click <Info> on the right side to display the animal information of this exam.
- [Report]: After you select an exam of a patient, click <Report> to view the report of this exam for this patient. If no report is generated in the exam, the system prompts that "There is no report belongs to the exam".
- [Review]: Select an exam of a patient, click [Review] to enter Review screen.
- [Select All/Delete All]: Clicking the <Select All>, the button changes into <Deselect All>, you can cancel all the selections by clicking <Deselect All>.

9.4.2 Patient Data Management


- [Delete]: Remove the selected inspection data. The current patient data being checked cannot be deleted.
- [Backup/recovery]: Send the selected data to other location or recovery patient data from an external device support system.

9.4.3 Examinations

[New Exam]:

After you select a patient data or exam in the patient list screen, click the <New Exam> to enter the Animal info screen, where you can select a new exam mode and click <OK> to begin a new exam.

9.5 Patient Task Management

Click  at the lower right corner of the screen to pop up the following dialogue box:



The system supports three types of task management:

- Storage Task: displays the DICOM storage task.
- Print Task: displays the DICOM print task.

In the Task Management dialogue box, animal ID, name, Destination, progress, type, contents and task created time are displayed.

You can do the following operations:

- Click <Cancel> to cancel the selected task.
- Click <Retry> to retry the failed task.
- Click <Select All> to select all the tasks.

10 DICOM (Optional)

This system supports the following optional DICOM functions:

- DICOM Basic function: DICOM connection verify, DICOM task management, DICOM storage, DICOM print,
- DICOM Work list
- Structured Report (SR)

Workflows of DICOM preset and application are briefly described as follows:

1. DICOM preset (Local TCP/IP setting, DICOM local setting, DICOM server setting, and DICOM service setting)
2. Verify connectivity.
3. DICOM Services (image storage, print, Work list, task management).

10.1 DICOM Preset

10.1.1 Local Net Setting

To set the network properties of the ultrasound system.

1. Click the trademark in the upper left corner of the screen to enter the “Setup” menu.
2. Select <Local Net>to open the screen, as shown in the figure below:

Network Property

DHCP
 Static

IP Address: 192.168.1.11 xxx.xxx.xxx.xxx

Subnet Mask: 255.255.255.0 xxx.xxx.xxx.xxx

Gateway: 192.168.1.1 xxx.xxx.xxx.xxx

Apply

3. Local Net preset items are described as follows:

Name	Description
DHCP / Static	If "DHCP" is selected, IP address will be automatically obtained from DNS server; if "Static" is selected (using static IP address), you need to enter the IP address.
IP Address	IP address of the system.
Subnet Mask	Used to set different network segment.
Gateway	Used to set the gateway IP.
Apply	Click to confirm parameter setting.

Tips: The IP address of the system should not be occupied by other devices in the network, or the DICOM function will fail.

10.1.2 DICOM Local Setting

To set the DICOM server properties.

1. Click the trademark in the upper left corner of the screen to enter the "Setup" menu.
2. Click <DICOM Local> to open the screen, as shown in the figure below:

Localhost DICOM Service Property

AE Title	
Port	104
PDU	16384

3. DICOM Local Setting items are described as follows:

Name	Description
AE Title	Application entity title of the ultrasound system. The AE title here should be the same with the one of the acceptable SCU set in the server.
Port	DICOM communication port, which should be the same with the one in the server.
PDU	Maximum PDU data package size ranging from 16384 to 65536. The default value is 32768.
Apply	Click to confirm parameter setting

Tips:

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 storage server is AAA, and the AE Title of the accepted SCU is preset as MMM, then in the figure above, the AE Title of Local should be MMM, and the AE Title of storage server should be AAA.

10.1.3 DICOM Server Setting

To add or delete DICOM servers, or set IP address and name for the DICOM server.

1. Click the trademark in the upper left corner of the screen to enter the "Setup" menu.
2. Click <DICOM Server> to open the screen, as shown in the figure below:



3. DICOM server setting items are described as follows:

Name	Description
Device	Name of the device supporting DICOM services
IP Address	IP address of the server
Ping	You can ping other machines to verify connection after entering the correct IP address. Also you can check the connection of the already added server in the list.
Add	Click to add servers to the device list
Delete	Click to delete the selected server(s) in the device list
Apply	Click to confirm parameter setting

Tips:

- If the currently entered name has already existed, the system will pop up: "The server name exists!" Click <OK> to enter another name.

10.1.4 DICOM Service Setting

Open <Setup>→<DICOM Service> to set properties of DICOM services.

10.1.4.1 Storage Setting

1. Enter the "Storage" page: "<Setup>→<DICOM Service>→Storage."
 - Select device, enter the information. For device setting, please refer to "10.1.3 DICOM Server Setting".
 - Click <Add> to add the service to the Service list.
 - 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.
 - Select an item in the service list, and click <Delete> to delete the service.
 - Select an item in the service list, and click <Default> to set the server to be the default service.
2. Select an item in the service list, and click <Verify> to verify the connection.
3. Click <Apply> to confirm the setting.

DICOM storage setting items are described as follows:

Name	Description
Device	After you set the server(s) in DICOM Server Setting, the name(s) will appear in the drop-down list, select the name of the storage server.
Service Name	Default is xxx-Storage, and it can be modified.
AE Title	Application Entity title, here, it should be consistent with that of the storage server.
Port	DICOM communication port, 104 by default. Here, the port should be consistent with that of the storage server port.
Add	Add the DICOM service to the service list.
Cancel	Click to cancel the parameter setting.
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> to set the default server.

Verify	Click to verify if the two DICOM application entities are normally connected.
Apply	Click to confirm parameter setting.

10.1.4.2 Print Service Setting

- Enter the "Print" page: "Setup→<DICOM Service>→Print".
 - Select device, enter the information. For device setting, please refer to "10.1.3 DICOM Server Setting".
 - Click <Add> to add the service to the Service list.
 - 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.
 - Select an item in the service list, and click <Delete> to delete the service.
 - Select an item in the service list, and click <Default> to set the server to be the default service.
- Select an item in the service list, and click <Verify> to verify the connection.
- Click <Apply> to confirm the setting.

DICOM print setting items are described as follows:

Name	Description
Device	After you set the server (s) in DICOM Server Setting, the name(s) will appear in the drop-down list, select the name of the print server.
Service Name	Default is xxx-Print, and it can be modified.
AE Title	Application Entity title, here, it should be consistent with that of the print server.
Port	DICOM communication port, 104 by default. Here, the port should be consistent with that of the print server port.
Copies	Refer to copies of printed files. You can select among 1 through 5, or directly enter the number.
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.
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.
Medium Type	Specify print medium: Paper, Clear Film, and Blue Film.
Destination	Specify where the file is exposed: MAGAZINE (stored in the magazine), or PROCESSOR (exposed in the processor).
Add	Add the DICOM service to the service list.
Cancel	Click to cancel the parameter setting.
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> to set the default server.
Verify	Click to verify if the two DICOM application entities are normally connected.
Apply	Click to confirm parameter setting.

Parameters setting should meet the requirements of printer:

- If the printer does not support the type of 8INX10IN, please select the type the printer supports.
- Medium Type: Select Blue Film or Clear Film for black and white printing, select Paper for color printing may provide better effects.
- The other parameters you can use the default. Please revise according to the requirement of printer if the printer have special requirements.

10.1.4.3 DICOM Work list Setting

1. Enter the "Work list" page: "Setup→<DICOM Service>→Work list".
 - Select device, enter the information. For device setting, please refer to "10.1.3 DICOM Server Setting".
 - Click <Add> to add the service to the Service list.
 - 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.
 - Select an item in the service list, and click <Delete> to delete the service.
 - Select an item in the service list, and click <Default> to set the server to be the default service.
2. Select an item in the service list, and click <Verify> to verify the connection.
3. Click <apply> to confirm the setting.

Storage
Print
Worklist

Configure the New Service

Device

AE Title

Scheduled Station AE Title

Service name

Port

Add
Cancel
Update

Service list

Device	Service name	AE Title	Port	Default

Delete
Default
Verify
Verify Undo!

Apply

DICOM service setting for Work list is described as follows:

Name	Description
Device	After you set the server(s) in DICOM Server Setting screen, the name(s) will appear in the drop-down list, select the name of the Work list server.
Service Name	Default is xxx-Work list, and it can be modified.
AE Title	Application Entity title, Here, it should be consistent with that of the Work list server.
Port	DICOM communication port, 104 by default. Here, the port should be consistent with that of the Work list server port.
Scheduled Station AE Title	To set the AE Title of the scheduled station. For example, if the AE Title of the Work list server is M1, then the scheduled station AE Title here should be M1.
Add	Click to add the Work list service to the service list.
Cancel	Click to cancel the parameter setting.
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 "Y" in the Default column.
Verify	Click to verify if the two DICOM application entities are normally connected.
Apply	Click to confirm parameter setting.

Tips:

In terms of "Scheduled Station AE Title", if you set this item in the Work list server, then "Scheduled Station AE Title" configured here should be consistent with the one set in the server.

For example, when you set "Scheduled Station AE Title" in the Work list server as M1 (this means you assigned the scheduled exam to M1), then both "Scheduled Station AE Title" and "AE Title" in the ultrasound system configuration should be M1.

10.2 Verify Connectivity

If you want to verify connectivity (it is not a must), you can click <Verify> button on the pages of DICOM Service screen respectively.

- If the verification succeeds, it will prompt "xxx Verify Succeed".
- Otherwise, it prompts "xxx Verify Failed".

If verification failed, the possible causes may be:

- The ultrasound machine can't communicate normally with the server. Please check if the cable is properly connected; or,

Check if the IP of the server is configured in the same segment with that of the ultrasound machine; or,

Check if the network adapter, the router, the exchanger and the HUB are normally working.

- The server does not support the verification. If the connection is normal, it can be concluded that the server does not support the verification.
- The server supports the verification, but this function is not activated. Please check if the verification function is activated.

Tips:

Not all the SCPs can support verification; please consult SCP belongings to confirm whether SCP can support this service. If not, the verification won't pass.

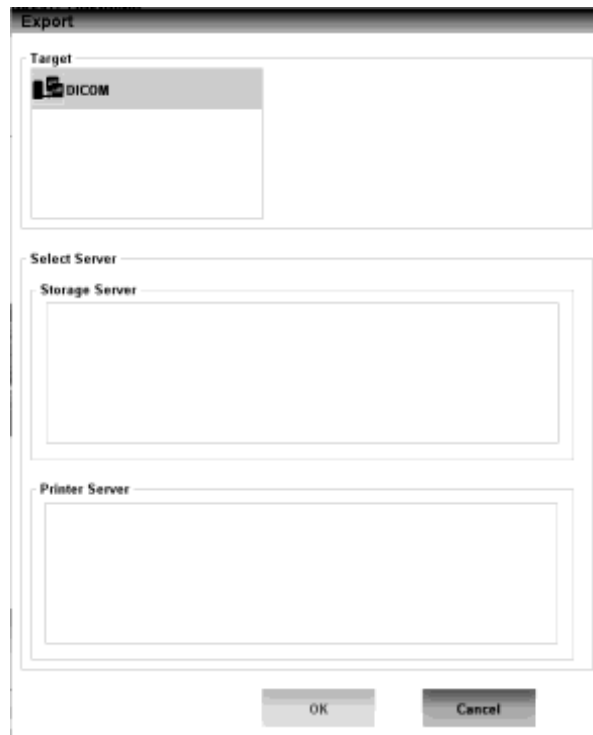
10.3 DICOM Application

10.3.1 DICOM Storage

DICOM Storage is used to send image(s) to DICOM storage server for storage.

Send image in Review/main screens:

1. Select image(s)
 - Press <Patient list> to enter the Patient list screen, click to select an exam record in the list, press <Review> to enter the Review screen, click to select an image or several images. Or,
 - On the main screen, select a thumbnail or several thumbnails.
2. On the Review screen, click the corresponding <Export> button. The following dialogue box pops up:



3. Select DICOM in the “Target” list; select a server in the “Storage Server” list.
4. Click <OK> to start the sending.

10.3.2 DICOM Print

DICOM Print is used to send image(s) to DICOM print server to print images.

Print image in Review/main screens:

1. Select image(s), operations are the same with DICOM storage.
2. In the Send To dialogue box, select a DICOM print server. (Procedures are the same with those in DICOM Storage).
3. Click <OK> to send print task.

10.3.3 DICOM Work list

After successfully connected DICOM Work list server with ultrasound system, you can query patient records from Work list server, and then import the desired information to your system.

- To query animal information via Work list server:

1. Press <New Patient> or click <Function>→<Info> to enter Animal info screen.
2. Click <Work List> to enter the Work List page.

The screenshot displays the 'WorkList' application window. At the top, there is a 'Query' section with several input fields: 'Patient Name', 'Patient ID', 'Exam Date' (with a calendar icon), 'To' (with a calendar icon), and 'WorkList Server' (with a dropdown arrow). Below these fields are 'Query' and 'Clear' buttons. A status line indicates '0 records are listed.' Below this is a table header with columns: 'Name', 'Patient ID', 'Exam Description', 'Exam Date', 'Gender', and 'DOB'. At the bottom of the window, there are four buttons: 'Start Exam', 'Transfer', 'Show Detail', and 'Exit'.

3. Query animal information:
 - 1) Set query criteria among Animal ID, Patient Name, Accession #, Search Key, Work list Server or Exam Date. The default exam date is the current date.
 - 2) Click <Query>.
 - 3) The scheduled patients, which meet the criteria, are displayed in the lower part of the screen.
 - 4) After the first query, you can perform the second query based on the previous results. The scheduled patients in the list will update in real time.
 4. Select the desired patient record in the displayed patient list, and
 - Select the desired patient and click <Start Exam>, the animal information is imported into the system and then an exam is started.
 - Click <Transfer>, the animal information is imported into the Animal info screen. Edit the animal information in the Animal info screen, and select <OK> to start a new exam.
 5. To show animal information in details:
 - 1) Click to select a patient record.
 - 2) Click <Show Detail> to view the detailed animal information and properties.
- Use the automatic query function via Work list server
1. Enter DICOM Service Preset screen, and open the Work list page:
Setup→<DICOM Service>→Work list.
 2. Select an item in the service list, and click [Default] to set the server to be the default service.
 3. Click <Apply> to confirm parameter setting.
 4. Click <Function>→<Info> to enter Animal info screen.
 5. Click <Work List> to enter the Work List page.
 6. The system queries intraday patients via Work list server automatically and the patient records will appear in the list.

10.4 DICOM Task Management

DICOM Task Management is used to view task progress or manage tasks after sending images for storage, print, or media storage.

11 Setup

The Setup function is designed to set the configuration parameters of operating the system and maintain user workflow preferences. The setup data of the user and system are stored to the hard drive.

⚠ CAUTION When the setup data is changed, be sure to save the preferences according to the methods described in this chapter.

- To enter Setup:

Click the trademark in the upper left corner of the screen to enter the “Setup” menu.

The screenshot shows the 'Setup' menu on the left and the 'Hospital Information' form on the right. The 'Setup' menu includes options: System Preset, Exam Preset, Image Preset, Local Net, DICOM Local, DICOM Server, DICOM Service, System Update, and Exit. The 'Hospital Information' form has tabs for 'Hospital Information', 'General', 'Measure', and 'Biopsy'. The form contains input fields for Name, Address, Telephone, Website, and Department. An 'Apply' button and a system tray with icons are visible at the bottom right.

Page	Description
System Preset	To preset hospital information、 General、 Measure、 OB、 Biopsy.
Exam Preset	To preset the default probe and exam mode.
Image Preset	To preset the default parameter of various Exam types in B/THI/M mode.
Local Net	To preset network property.
DICOM Local	To preset the DICOM server properties.
DICOM Server	To add or delete DICOM servers, or set IP address and name for the DICOM server.
DICOM Service	To preset DICOM service attributes.
System Update	To check system information, Upgrade System and Load Factory.
Help Manual	The user can browse the machine operation manual here.
EXIT	To exit Setup.

■ To exit Setup:

Select <Exit> on the Setup menu to close the Setup menu with parameter settings saved.

If you change the system language and click<Exit> on the Setup menu, please restart the system to make the changing effective.

■ Basic operations

The commonly-used setting types are:

- Text box: posit the cursor into the corresponding box; enter the desired value through keyboard.
- Radio button: click the button to select an item.
- Check box: click the check box to select one or several options.
- Drop-down list: click the arrow beside the list to select an item.

■ General buttons

- <Apply>: click to confirm the setting.
- <Cancel>: click to give up the setting, exit the current page and then return to the previous page.
- <Default>: click to the current parameter as the default value.
- <Upgrade System>: click to upgrade the system.
- <Load Factory>: click <Load Factory>, and all parameter settings will be restored to the original factory default.

11.1 System Preset

Click <System Preset> on the Setup menu to open the following page:

Page	Description
Hospital Informati	To set the hospital name, address, telephone, website and
General	To set animal information, comment, key config, status after freeze, language, time zone, date and time.
Measure	To set maternity measurement、 unit system
Biopsy	To set the bracket model.

11.1.1 Hospital Information


Open the Hospital Information page via “[Setup] → [General] → Hospital Information”.

Items	Description
Name	Set the name of hospital.
Address	Set the address of hospital.
Telephone	Set the telephone.
Website	Set the website of hospital.
Department	Set the department.

11.1.2 General

Open the General page via “Setup → <System Preset> → General”, items are introduced as follows:

Region	Items	Description
Animal info	H&W Unit	To select for animal height and weight: Metric、 English.
Comment	Font Size	To set font size of comment: Small、 Middle、 Large.
Key Config	Key Volume	To set the volume of key:0、 1、 2、 3. 0 means no sound
Screen Saver	Screen Saver	enable screen saver function, and select the waiting time (1~60minute) until screen saver.

Language and Time Zone	Language	To select a language for the system, the available languages are Chinese, English. Change system language, please restart your system, or it may cause some serious problems.
	Time Zone	To select the time zone. Setting Range: GMT-12:00~GMT+13:00.
	Data Format	To set the date format among DD/MM/YYYY, MM/DD/YYYY and
	Time Format	To select the time format between 12 Hour and 24 Hour.
Date and Time	System Date	To set the system date. Posit the cursor into the corresponding field, and enter the data through the keyboard; or, click the calendar icon  , and then select the date.
	System Time	Move the cursor onto the corresponding field, enter the time manually through the keyboard; or, move the cursor onto the time segment and press <Set>, then increase or decrease the certain value by rotating the multifunctional knob or clicking the icons at the right side.

11.1.3 Measure Preset

Open the Image Preset page via “Setup→ <System Preset>→ Measure”.

11.1.3.1 Measure Unit

Region	Items	Description
Unit	Distance	Set the unite of distance: mm、 cm.
	Area	Set the unite of area: mm ² 、 cm ² .
	Slop	Set the unite of slop: mm/s、 cm/s、 m/s.
	Time	Set the unite of time: ms、 s.
	Volume	Set the unite of volume:mm ³ 、 cm ³ .

11.1.3.2 Fetal Gestational Age

OB Items: Set obstetrics item

Author: Set the gestational age formula

11.1.3.3 Fetal Weight

OB Items: Set obstetrics item.

Fetal Weight Unit: Set the unit of the fetal weight.

11.1.4 Biopsy

Open the Biopsy page via “Setup→ <System Preset>→ Biopsy”.

■ Bracket model


To select the default needle-guided bracket for the probe

■ Parameter setting

Guide Line Dot Type: Think, Middle, Thick.

11.2 Exam Preset

Click <System Preset> on the Setup menu to open Exam Preset page:

To select a probe: move the cursor onto the column **Probe** , and select the probe model through the drop-down menu.

To select exam modes: Move the cursor onto the column and select the exam mode click [Default] to set a selected exam mode as the default exam mode and Click <OK> to confirm the modified setup.

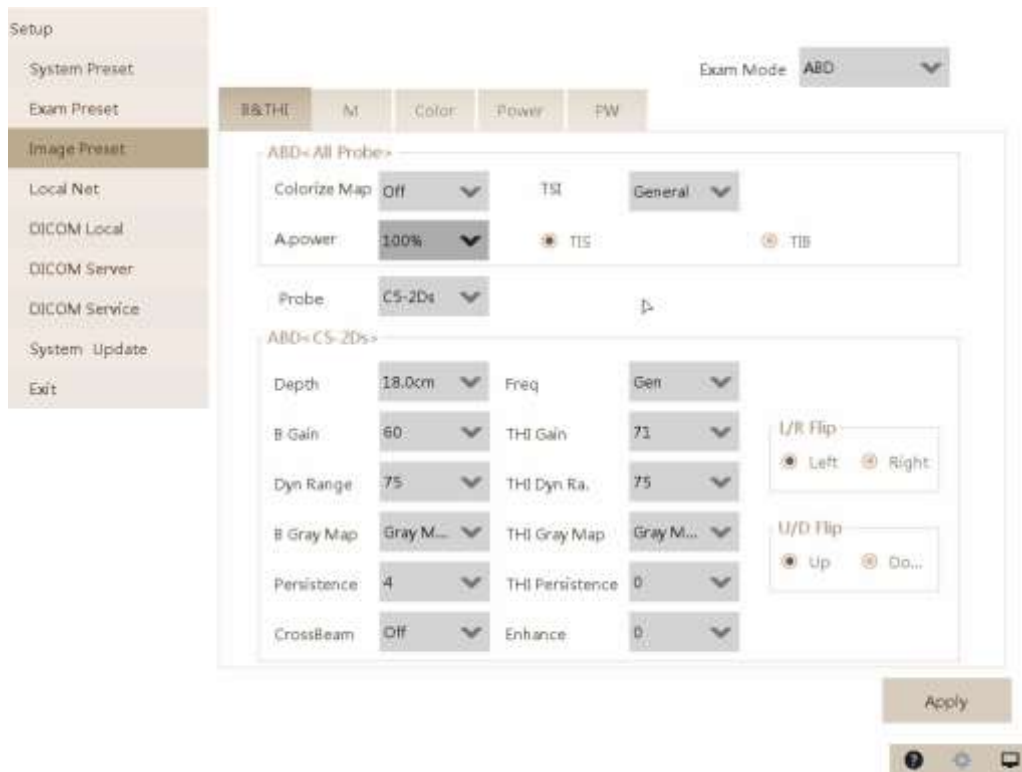
11.3 Image Preset

Click <Image Preset> on the Setup menu to open the following page:

The image preset is used to set image parameters for all the probes and a specific probe in a specific exam mode. The setting methods are similar although parameter items are different in each image mode.

An example is provided below to demonstrate the steps of preset as in ABD exam, B/THI mode for the C5-2Ds probe.

Select “<Image Preset> → <B/THI>” to enter the B mode parameters preset, as shown in the following figure.



Select the exam mode and probe.

- Select “ABD” from the “Exam Mode” drop-down list.
-
- Select “C5-2Ds” from the “Probe” drop-down list.

Image parameter preset

- The [ABD<All Probe>] field displays the parameter preset for the all probe

Parameter	Description
Colorize Map	To set the default colorize map in B mode.
TSI	To set the default TSI mode for B mode.

- The [ABD-C5-2Ds] field displays the parameter preset for the C5-2Ds probe in ABD exam mode.

Parameter	Description
Depth	To set the default depth in B mode.
Freq	To set the default frequency of the probe.
B Gain	To set the default gain value in B mode.
THI gain	To set the default THI gain value in B mode.
B effect	To set the default dynamic rang value in B mode.
THI effect	To set the default dynamic rang value in THI mode.

Persistence	To set the default level of frame average adjustment in B mode.
THI Persistence	To set the default level of frame average adjustment in THI mode.
B frame correlation	To set the default B frame correlation
THI frame correlation	To set the default THI frame correlation
L/R Flip	To set the default horizontal flipping mode: Left or Right.
U/D Flip	To set the default vertical flipping mode: Up or Down.

- Click <Apply> to record all the currently-used setting and values for each preset image parameter. If exit without save ,it will appears the following tip :



Click <OK>to save the settings and exit Click <Cancel> to abandon the settings and exit.

Exit: click<EXIT>.

11.4 Local Net

Click <Local Net> Setup menu to open the following page. You can set the net parameter in this page.

Network Property
Set Local IP.

11.5 DICOM Local

Please refer to “10.1.3 DICOM Server Setting”.

11.6 DICOM Server

Please refer to “10.1.3 DICOM Server Setting”.

11.7 DICOM Service

Please refer to “10.1.3 DICOM Server Setting”.

11.8 System Update

Click System <Update System> on the Setup menu to open the following page:

- Upgrade System: click <Upgrade System>, system will be updated to the latest version.
- Load Factory: click <Load Factory>, system will be restored the factory settings.

NOTE: Upgrade System and Load Factory will cover the current data.

WARNING :	The power-off may cause failure of upgrading and the system cannot be restarted.
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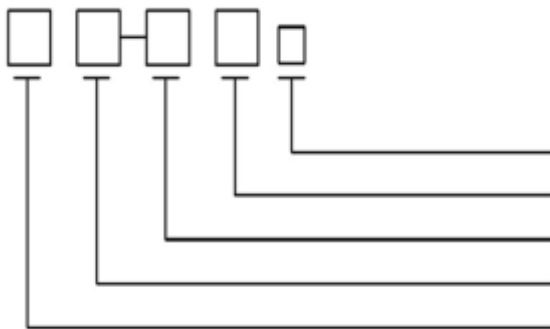
11.9 Help Manual

Operation manual is divided into different sections here. The user can click the chapters of the operation manual to browse quickly. Click <before>and<back> to browse page by page.

12 Transducer

12.1 Transducer introduction

12.1.1 Mark method



the version of the probe Other
combination factor The
minimum frequency The
maximum frequency Probe
classification

12.1.2 Transducer mode

L-Linear probe C-
Convex probe

E-Endocavity probe P-
Phased probe

K-Ke Visual flow probe

12.1.3 Product components

The transducer is consist of Piezoelectric ceramic chips, acoustic focusing lens, multi-core coaxial cables, multi core plugs, protective wire sets, shell and so on.

12.2 Transducer application

- 1) Remove the product from the package; then insert it to the slot in B mode machine under correct direction, finally you should lock handle knob tightly.
- 2) Once the probe and the hosts are connected, do not supposed to dismantle it at random, orit may cause bad contact between probe plug and socket.

Operation and storage environment.

3) Correct use method

For the sake of extend probe's service life and obtain the optimal quality, please do as follows:

- Please power off when connect or unsnatch probe.
- When not in use, please keep it in the probe package,
- Strictly prohibit from heating the probe
- Forbid curving or pulling the cable, or it may cause fragmentation of the inner cable.
- Couplant should be only used in the probe head, after use, please clean it
- Probe is belong to fragile please handle with care. it should not be collided, depreciated and stricked.

12.3 Wearing the Probe Sheath

A legally marketed probe sheath must be installed over the probe before performing intra-cavitary examination. Protective barriers may be required to minimize disease transmission. Probe sheaths are available for use with all clinical situations where infection is a concern.

CAUTION:

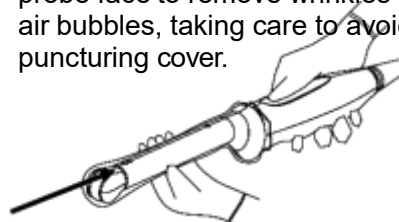
1. **Be sure to cover the probe with a new (unused) probe sheath to prevent infection during examination. If the package of a probe sheath is open or broken, the sterilization of the probe sheath may not be sufficient. DO NOT use such a probe sheath.**
2. **The cover contains natural rubber latex and talc that can cause allergic reactions in some individuals**
3. **DO NOT use an expired probe sheath. Before using probe sheaths, verify whether the term of validity has expired.**

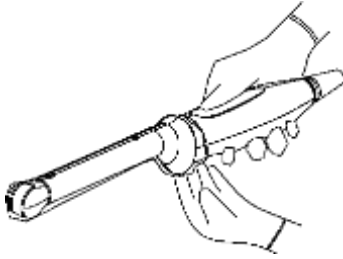
Method (for reference only):

1. Place an appropriate amount of gel inside the sheath or on probe face. Poor imaging may result if no gel is used.



2. Insert the probe into the sheath; make sure to use proper sterile technique. Pull cover tightly over probe face to remove wrinkles and air bubbles, taking care to avoid puncturing cover.





12.4 Inspection and maintenance

12.4.1 Inspection

Constantly check the cable of probe, if any breakage and damage found, it should be banned using and be replaced or repaired at once.

Regularly check the sockets of probe and acoustic window position, if any damage and foaming phenomenon found, it should be banned using and be replaced or repaired at once.

12.4.2 Service life

According to the documents of design and produce from the manufactory, the service life of this products regularly known as 3years. The material of the products may appear signs of aging over time, which may cause the increase of performance decrease and failure rate.

⚠WARNING:

Any risk caused by over service span using should not bebelonged to the responsibilities of the manufacturer.

12.4.3 Probe maintenance

After using the probe, please clean it with a soft cloth which contains 3.4 percent of Saturation acetaldehyde solution.

Probe is valuable and breakable products, it should not be collided, depreciated and stricken. When diagnosis paused, you should put it into the probe box, and make the instrument in frozen state, besides.

Diagnosis should choose medical ultrasonic coupling agent.

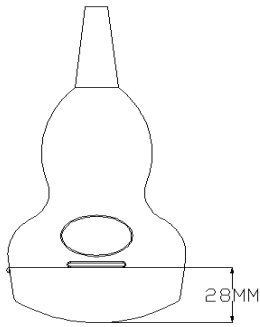
⚠CAUTION:

Long time and repetition with ultrasonic coupling agent maydamage the probe.

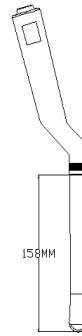
12.4.4 Disinfection soak figure

As shown in the following figure:

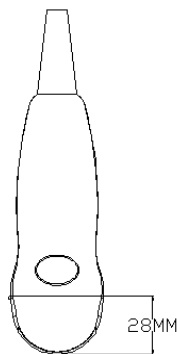
The grade of waterproof is IPX4 of probe and water line should not over the sound head of probe when immerse in water. And you should check whether the casing have flaw or not to avoid immersing in water and damaging the internal element,



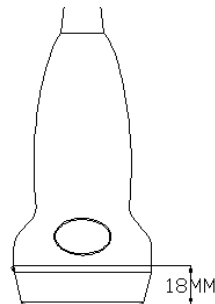
Sketch map of R60 convex array probe prevent immersion



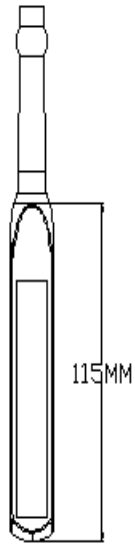
Sketch map of R13 cavity array probe prevent immersion



R20 Sketch map of convex array probe prevent immersion



Sketch map of high frequency linear array probe prevent immersion



Sketch map of rectal array probe prevent immersion



Sketch map of animal array probe prevent immersion

12.5 Cleaning and disinfection

1. Probe is an unit which is direct to contact with patient, so in order to avoid infection please close ultrasound exam system after finish each exam, then clean and disinfect (sterilize) probes as required.

WARNING:	<ol style="list-style-type: none">1. Do not put plug of probe into any liquid like water and antivirus solutions, or it will lead to electric shock or breakdown2. If you don't clear coupling agent after exam, it will freeze and impact probe's image quality. <p>When cleaning and disinfection, do not put probe in high temperature condition(over 55°C),the high temperature may lead to probe incomplete and damage.</p>
-----------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

CAUTION:	<ol style="list-style-type: none">1. When cleaning and disinfection, put on bacteria resistant gloves to prevent infection2. After disinfection, use Sterilization water to Clear residual thoroughly, the chemical residual is harm for health.3. If you can't ensure disinfection and Bactericidal solution's efficacy, please contact with manufacturer to gain product information.
-----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2. Cleaning

Please follow the cleaning introductions on the manual to do it.

- a) Put on bacteria resistant gloves to prevent infection.
- b) Use water to clean the probe, get rid of stains. You can also use suds and clear with Polyurethane Sponge. Avoid using a brush so as not to damage the probe.
- c) After cleaning, use sterilization cloth or gauze wipe dry the probe. Do not oven dry it.

3. High disinfection

Please follow the disinfection introductions on the manual to do it

- a) Put on bacteria resistant gloves to prevent infection.
- b) Please clear the probe before disinfection, the following disinfection solutions is recommended.

Based on glutaraldehyde's disinfection

Chemical Name	Brand Name	Handing
Glutaraldehyde	Cidex (with active glutaraldehyde solution)	Please follow introductions provided by manufacturer to do it.

Not belong to glutaraldehyde disinfection

Chemical Name	Brand Name	Handing
O-phthalaldehyde	Cidex (With o-phthalaldehyde solution)	Please follow introductions provided by manufacturer to do it.

N- 12 alkyl-1,3- Trimethylene diamine disinfection (Not applicable to the USA and Canada)

Chemical Name	Manufacturer	Brand Name	Handing
N-12 alkyl-1, 3-Trimethylene diamine	Antiseptica	Triacid-N	Please follow introductions provided by manufacturer to do it.

Quaternary ammonium disinfection (Not applicable to the USA and Canada)

Chemical Name	Manufacturer	Product	Handing
Quaternary ammonium	Ecolab Inc	Ster-Bac	Please follow introductions provided by manufacturer to do it.

hydrogen peroxide and peracetic acid disinfection (Not applicable to the USA and Canada)

Brand Name	Chemical Name	Handing
Minnicare Cold sterilization	22% of hydrogen peroxide , 4.5% of peracetic acid	Please follow introductions provided by manufacturer to do it.

- Disinfection solutions' do's and don'ts, dilution and enrichment disinfection methods and use process please follow the instructions from Manufacturers provide.
 - Do not put plug of probe or it's tail end into any liquid like water and antivirus solutions,
 - The shortest time of the probe immerse in disinfectant reference provided by the manufacturer (for example, the shortest time of the probe immerse in Cidex provided by the manufacturer is 12minutes.)
 - Please follow the local rule to choose and use disinfectant,
4. Use vast sterilization water to clear Chemical residues on probe (about 7.75 liter) at least one minute. Or use the method provided by disinfectant manufacturers to clear the probe.

5. After cleaning, use sterilization cloth or gauze wipe dry the probe. Do not oven dry it.

Attention: 1. after each use, please clear the probe.

2. Do not use surgery brush to clean the probe, even though you use the soft brush, it may damage the probe too.

⚠ WARNING

:

1. Be for away from strong current and magnetic field devices.
2. Do not use paint thinner, ethylene oxide and other organic solvents. These organic solvents may damage the surface protective film of probe.
3. Do not put plug of probe into any kind of liquid or antivirus solutions.
4. Do not let any kind of liquid immerse in probe.
- 5 Do not use gas or heating method to disinfect probe.
- 6 Do not put probe cable or probe socket into solutions, though the surface of probe is waterproof, but is only available for the top of probe. Please be careful to use coupling agent and clean the surface of probe.
- 7 If the probe break down, do not repair it by yourself, you have to send to the company to repair it.

13 Biopsy Guide

13.1 Enter/Exit Biopsy Guide Mode

Enter Biopsy Guide mode:

When B-mode image is in real-time status, press<Biopsy>to enter Biopsy guide mode.

If the probe has no Biopsy guide bracket, “Current probe does not support biopsy!” will be displayed on the screen, which expresses the transducer couldn’t be used to Biopsy guide. Otherwise the information “Please verify guidelines before biopsy!” will display on the screen. After this dialog box is closed, the Biopsy guide line displays in the Image area and the Biopsy dialog is displayed on the upper right side of the screen. See the figure below.




⚠ WARNING Do not freeze image during needle guide.

Exit Biopsy Guide mode:

Press<exit>on keyboard when the system is in biopsy guide mode. Biopsy guide dialog closes at the same time. The biopsy guide line in the Image area will also disappear.

13.2 Select Bracket

Select different bracket to biopsy by <Bracket> on dialog when there are more bracket of the probe.

 WARNING: Disinfect the probe and sterilize the needle-guided bracket before and after an ultrasound-guided biopsy procedure is performed. Failure to do so may cause the probe and the needle-guided bracket become source of infection.

13.3 Select the Angle of Biopsy Guide Line


If the biopsy guide bracket of the probe has various needle guide line, you can let the system display different biopsy guide line by using the <Guides Line> item of the Biopsy.

Click the <Guides Line> item, biopsy guide lines of different angles will be displayed circularly. The value of the current guide line will also be displayed on the dialog item. The "All" option means to display all biopsy guide lines.

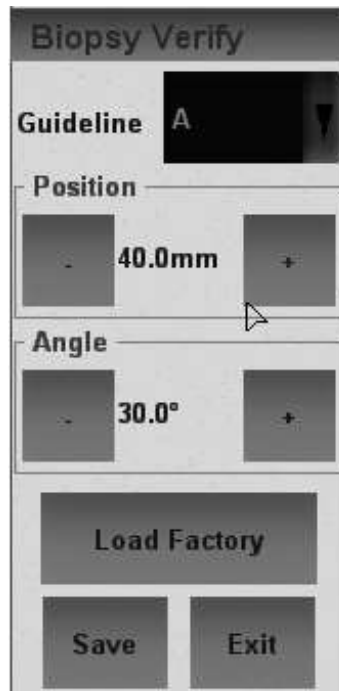
13.4 Adjust Biopsy Guide Line

Before leaving the factory, biopsy guide line has been correctly calibrated.

After being used for a period, the needle may bend lightly therefore requiring calibrating. Press <Verify> to open the Biopsy Verify Dialog.

 WARNING	<ol style="list-style-type: none">1 Prior to each puncture, calibrate the biopsy guide line.2 If the positions of the needle and biopsy guide line are not consistent, do not execute biopsy guide operation.
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Calibrating method:



Move biopsy guide line horizontally:

Use the <Position> item on the Biopsy Verify Dialog to move the biopsy guide line horizontally. Press<+>to increase the position value and press <->to decrease it. The value of the current position is also displayed between two buttons.

Trim needle guide line angle:

Use the <Angle> item on the Biopsy Verify Dialog to adjust biopsy guide line angle. The operating procedures are the same as <Position>.

Save calibrating value

After calibrating the position and angle of the biopsy guide line, click<Save>item, then the system will save the data of the current biopsy guide line. When starting up the system next time, displayed position of the biopsy guide line will consequently be the position after calibrating.

Restore factory value of the biopsy guide line

Click the<Load Factory>item, the position and angle of the biopsy guide line will return to the factory setup value.

14 Guidance and Manufacturer's Declaration

The system complies with the EMC standard IEC60601-1-2: 2007+AC: 2010.

⚠ WARNING The use of unapproved accessories may diminish system performance.

- NOTE**
- Use of accessories, probes, and cables other than those specified may result in increased emission or decreased immunity of system.

 - ! The system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, system should be observed to verify normal operation in the configuration in which it will be used.

 - ! The system needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided below.

 - ! Preventing conducted RF immunity. Due to technological limitations, the conducted RF immunity level are limited to 1Vrms level, conducted RF interference above 1Vrms may cause wrong diagnosis and measurements. We suggest that you position system further from sources of conducted RF noise.

 - ! Operation of system, in the case that the patient physiological signal is lower than the minimum amplitude or value specified in the product specifications, may cause inaccurate results.

 - ! Portable and mobile RF communications equipment can affects system. See tables 1, 2, 3, and 4 below.


TABLE 1

GUIDANCE AND THE COMPANY DECLARATION—ELECTROMAGNETIC EMISSIONS		
The system is intended for use in the electromagnetic environment specified below. The customer or the user of system should assure that it is used in such an environment.		
EMISSIONS TEST	COMPLIANCE	ELECTROMAGNETIC ENVIROMENT — GUIDANCE
RF emissions CISPR 11	Group 1	The system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The system is suitable for use in all establishments including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Compliance	

TABLE 2

GUIDANCE AND THE COMPANY DECLARATION—ELECTROMAGNETIC IMMUNITY			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of system should assure that it is used in such an environment.			
IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT-GUIDANCE
Electrostatic Discharge(ES D) IEC 61000-4-2	±6 kV contact; ±8 kV air	±6 kV contact; ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast Transient / burst IEC 61000-4-4	±2 kV for power supply voltage; ±1 kV for input/output voltage	±2 kV for power supply voltage; ±1 kV for input/output voltage	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV voltage(s) to voltage(s); ±2 kV voltage(s) to earth	±1 kV voltage(s) to voltage(s); ±2 kV voltage(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, Short interruptions and voltage variation on power supply input voltage IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycle 70% U_T (30% dip in U_T) for 25 cycle <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycle 70% U_T (30% dip in U_T) for 25 cycle <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If you require continued operation during power mains interruptions, it is recommended that our product be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 HZ) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the A.C. mains voltage prior to application of the test level.			

TABLE 3

GUIDANCE AND THE COMPANY DECLARATION—ELECTROMAGNETIC IMMUNITY			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of system should assure that it is used in such an environment.			
IMMUNITY TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ELECTROMAGNETIC ENVIRONMENT-GUIDANCE
Conduced RF IEC 61000-4-6	3 Vrms 150 kHz - 80 MHz	1 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 3.5 \times \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80MHz - 2.5GHz	3 V/m	$d = 1.2 \times \sqrt{P}$ 80 MHz to 800 MHz $d = 2.3 \times \sqrt{P}$ 800 MHz to 2.5GHz Where, P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 

Note 1 At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

- Field strengths from fixed transmitters, such as base stations for radio (cellular

/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy.

To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which system is used exceeds the applicable RF compliance level above, system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating system.

- Over the frequency ranges 150kHz to 80MHz, field strengths should be less than 1V/m.

TABLE 4

RECOMMENDED SEPARATION DISTANCES BETWEEN PORTABLE AND MOBILERF COMMUNICATION DEVICE AND SYSTEM			
The system is intended for use in an electromagnetic environment in which radiated RF disturbance are controlled. The customer or the user of system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and system as recommended below, according to the maximum output power of the communication equipment.			
Rated Maximum Output power of Transmitter (W)	Separation Distance According to Frequency of Transmitter (m)		
	150kHz -80MHz	80MHz-800MHz	800MHz-2.5GHz
	$d = \left[\frac{3.5}{f} \right] \sqrt{P}$	$d = \left[\frac{3.5}{f} \right] \sqrt{P}$	$d = \left[\frac{7}{f} \right] \sqrt{P}$
	[1]	[3]	[3]
0.01	0.35	0.12	0.23
0.1	1.11	0.37	0.74
1	3.50	1.17	2.34
10	11.07	3.69	7.38
100	35.00	11.67	23.34
<p>For transmitters at a maximum output power not listed above, the recommended separation distanced in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.</p> <p>If system image distortion occurs, it may be necessary to position system further from sources of conducted RF noise or to install external power source filter to minimize RF noise to an acceptable level.</p> <p>Note 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.</p> <p>Note 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			