IMPORTANT!

Read and understand this manual before operating the equipment. After reading, keep this manual in an easily accessible place.
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About This Manual

This operator’s manual describes the operating procedures for this diagnostic ultrasound system. To ensure safe and correct operations, carefully read and understand the manual before operating the system.

Important Information

1. Do not copy part or all content of this manual before you get written permission.
2. Do not make changes or modifications to the software or hardware of this system.
3. The purpose of this system is to provide physicians with data for clinical diagnosis. It is the physician's responsibility for diagnostic procedures. The company shall not be liable for the results of diagnostic procedures.
4. The warranty does not cover the following items, even during the warranty period:
   (1) Damage or loss caused by failure to meet the specified conditions for this system, such as inadequate power supply, improper installation or environmental conditions.
   (2) Damage or loss involving the system purchased from a source other than the company or its authorized agents.
   (3) Damage or loss due to use of the system outside the region where the system was originally sold.
   (4) Damage or loss due to repair performed by personnel other than those designated by the company.
   (5) Damage or loss caused by Acts of God such as fires, earthquakes, floods, lightning, etc.
   (6) Damage or loss due to misuse or abuse.
   (7) Damage or loss is not due to the product itself.

Warranty and maintenance service

Main unit's warranty period is 2 years from shipment, main accessories' warranty period is 1 year from shipment, and it is consist of transducer and kinds of cable.

Exemptions

The company's obligation or liability under this warranty does not include any transportation or other charges or liability for direct, indirect or consequential damages or delay resulting from the improper use or application of the product or the use of parts or accessories not approved by the company or repairs by people other than the company authorized personnel.
This warranty shall not extend to:

- Malfunction or damage caused by improper use or man-made failure.
- Malfunction or damage caused by unstable or out-of-range power input.
- Malfunction or damage caused by force majeure such as fire and earthquake.
- Malfunction or damage caused by improper operation or repair by unqualified or unauthorized service people.
- Malfunction of the instrument or part whose serial number is not legible enough.
- Others not caused by instrument or part itself.

Intellectual Property Statement

The company owns the intellectual property rights to this product and this manual. This manual may refer to information protected by copyright or patents and does not convey any license under the patent rights or copyright of the company, or of others.

Release, amendment, reproduction, distribution, rental, adaptation, translation or any other derivative work of this manual in any manner whatsoever without the written permission of the company is strictly forbidden.
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.

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>![DANGER]</td>
<td>Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.</td>
</tr>
<tr>
<td>![WARNING]</td>
<td>Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td>![CAUTION]</td>
<td>Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.</td>
</tr>
<tr>
<td>NOTE</td>
<td>Indicates a potentially hazardous situation that, if not avoided, may result in property damage.</td>
</tr>
<tr>
<td>Tips</td>
<td>Important information that helps you to operate the system more effectively.</td>
</tr>
</tbody>
</table>
1.3 Meaning of Safety Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Symbol]</td>
<td>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.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>&quot;Attention&quot; indicates the points that you should pay attention to. Be sure to read the Operator’s Manual concerning these points before using the system.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>DANGER: There is explosion risk if the system is used with flammable anesthetics.</td>
</tr>
<tr>
<td>![Symbol]</td>
<td>This product is provided with a CE marking in accordance with the regulations stated in LVD Directive 2006 / 95 / EC and EMC Directive 2004 / 108 / EC.</td>
</tr>
</tbody>
</table>

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 system, because there is danger of explosion.

⚠️ 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.

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

7. 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.

8. Do 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.

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 ⚠️

1. 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.

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. A micrometric 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.
**CAUTION**

1. When using the probe, wear sterile gloves to prevent infection.
   - 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 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

2.3.2 Power supply condition

<table>
<thead>
<tr>
<th>Voltage</th>
<th>100–240V~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>50 / 60Hz</td>
</tr>
<tr>
<td>Rated input power</td>
<td>100VA</td>
</tr>
</tbody>
</table>

2.3.3 Environmental Conditions

<table>
<thead>
<tr>
<th></th>
<th>Operating conditions</th>
<th>Storage and transportation conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0℃～40℃</td>
<td>-20℃～+55℃</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>30%～85% (no condensation)</td>
<td>30%～95% (no condensation)</td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>70KPa～106KPa</td>
<td>70KPa～106KPa</td>
</tr>
</tbody>
</table>

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

External dimensions: 65mm(H)×385mm(L)×366mm(W)
Net weight:3Kg

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

2.3.2.1 Optional probe

<table>
<thead>
<tr>
<th>Probe model</th>
<th>Type</th>
<th>Center Freq</th>
<th>Intended Use</th>
<th>Region Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5-2Ds</td>
<td>Convex</td>
<td>3.5MHz</td>
<td>Small animal’s reproductive system, abdomen, thorax, cardiac and urology</td>
<td>Body surface</td>
</tr>
<tr>
<td>C7-4Cc</td>
<td>MicroConvex</td>
<td>5.0MHz</td>
<td>Small animal’s reproductive system, abdomen, thorax and cardiac</td>
<td>Body surface</td>
</tr>
<tr>
<td>C8-5Cc</td>
<td>MicroConvex</td>
<td>6.5MHz</td>
<td>Small animal’s reproductive system, abdomen, thorax and cardiac</td>
<td>Body surface</td>
</tr>
<tr>
<td>L11-4Fc</td>
<td>Linear</td>
<td>7.5MHz</td>
<td>Animal’s reproductive system</td>
<td>TransRectal</td>
</tr>
<tr>
<td>L7-4Dc</td>
<td>Linear</td>
<td>5.0MHz</td>
<td>Animal’s reproductive system</td>
<td>TransRectal</td>
</tr>
<tr>
<td>L11-4Ds</td>
<td>Linear</td>
<td>7.5MHz</td>
<td>Big animal’s tendon, small animal’s abdomen, small parts and eyeball</td>
<td>Body surface</td>
</tr>
<tr>
<td>E10-4Cs</td>
<td>MicroConvex</td>
<td>6.5MHz</td>
<td>Animal’s reproductive system</td>
<td>Transvaginal</td>
</tr>
</tbody>
</table>

2.4.2.1 Peripherals Supported

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video printer</td>
<td>SONY UP-895MD 、 MITSUBISHI P93W</td>
</tr>
<tr>
<td>2</td>
<td>Graph / text printer</td>
<td>HP DeskJet F2418 、 HP DeskJet D2568</td>
</tr>
</tbody>
</table>
2.5 Explanation of symbols

<table>
<thead>
<tr>
<th>No</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>![Symbol 1]</td>
<td>Trype BF applied part</td>
</tr>
<tr>
<td>2</td>
<td>![Symbol 2]</td>
<td>This symbol represents the contents please refer to the operation manual to avoid safety accident</td>
</tr>
<tr>
<td>3</td>
<td>![Symbol 3]</td>
<td>Network interface</td>
</tr>
<tr>
<td>4</td>
<td>![Symbol 4]</td>
<td>USB port</td>
</tr>
<tr>
<td>5</td>
<td>![Symbol 5]</td>
<td>VIDEO signal connector</td>
</tr>
<tr>
<td>6</td>
<td>![Symbol 6]</td>
<td>Serial port</td>
</tr>
</tbody>
</table>

2.6 Introduction of Each Unit
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Touch screen display</td>
<td>Displays the images and parameters during scanning.</td>
</tr>
<tr>
<td>2</td>
<td>Control Panel</td>
<td>Operator-system interface or control.</td>
</tr>
<tr>
<td>3</td>
<td>Probe Cup</td>
<td>Place the probes</td>
</tr>
<tr>
<td>4</td>
<td>Handle</td>
<td>Used for carrying the system.</td>
</tr>
<tr>
<td>5</td>
<td>Probe port</td>
<td>Connects a probe to the main unit; or connects a probe extend module.</td>
</tr>
<tr>
<td>6</td>
<td>Serial interface</td>
<td>Universal serial port.</td>
</tr>
<tr>
<td>7</td>
<td>S-Video separate video output</td>
<td>Connects video printer.</td>
</tr>
<tr>
<td>8</td>
<td>Network port</td>
<td>Connects the network.</td>
</tr>
<tr>
<td>9</td>
<td>USB port</td>
<td>Connects the USB devices</td>
</tr>
</tbody>
</table>

## 2.7 Control Panel

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1&gt;</td>
<td></td>
<td>New Patient</td>
<td>Press to enter the [Animal info] screen</td>
</tr>
<tr>
<td>Key</td>
<td>Icon</td>
<td>Function</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>&lt;2&gt;</td>
<td>/</td>
<td>Press to optimize the image.</td>
<td></td>
</tr>
<tr>
<td>&lt;3&gt;</td>
<td>Save</td>
<td>Press to enter or exit the arrow comment status.</td>
<td></td>
</tr>
<tr>
<td>&lt;4&gt;</td>
<td>Multifunctional knob</td>
<td>1) in the image scanning, adjust gain; 2) adjust the magnification after entering the ZOOM mode, press the knob to switch between the gain and magnification; 3) In the menu, select the menu item, press the knob to enter the corresponding function; 4) In preset screen, the operation is similar to item 3)</td>
<td></td>
</tr>
<tr>
<td>&lt;5&gt;</td>
<td>Freeze</td>
<td>Press to freeze or unfreeze the image.</td>
<td></td>
</tr>
<tr>
<td>&lt;6&gt;</td>
<td>The power switch</td>
<td>Power switch (reserved)</td>
<td></td>
</tr>
</tbody>
</table>
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.

**CAUTION:** Maintain a generous-free air flowing space around the back and both sides of the system; failure may result due to increased rise in system operating temperature.

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

3.3 Power ON /OFF

3.3.1 Powering ON the System

**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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Check Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1&gt;</td>
<td>The temperature, relative humidity and atmospheric pressure shall meet the requirements of operating conditions. See &quot;2.3.3 Environmental Conditions&quot; for details.</td>
</tr>
<tr>
<td>&lt;2&gt;</td>
<td>There shall be no condensation.</td>
</tr>
<tr>
<td>&lt;3&gt;</td>
<td>There shall be no distortion, damage or dirt on the system and peripheral devices.</td>
</tr>
<tr>
<td>&lt;4&gt;</td>
<td>The probes and probe cables shall be free of damage or stains.</td>
</tr>
<tr>
<td>&lt;5&gt;</td>
<td>There shall be no cable damage (e.g. power cord). Maintaining secure connections to the system at all times.</td>
</tr>
<tr>
<td>&lt;6&gt;</td>
<td>There shall be no loose screws on the monitor or control panel.</td>
</tr>
<tr>
<td>&lt;7&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>&lt;8&gt;</td>
<td>No miscellaneous odds and ends are allowed to be attached or affixed to the control panel.</td>
</tr>
<tr>
<td>&lt;9&gt;</td>
<td>Probe cleaning and disinfection.</td>
</tr>
<tr>
<td>&lt;10&gt;</td>
<td>The overall scanning environment and field must be clean.</td>
</tr>
</tbody>
</table>

Turning on the Power

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

To check the system after it is turned on:

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

⚠️ WARNING ⚠️

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.
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

⚠️ CAUTION ⚠️
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 ⚠️
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.

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.
- Add a print service:
  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 "Setup →<System Preset> →<Hospital Information>"
  - Exam time
Displays the exam time including date and time. Exam time can be set via "Setup→<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 trackball or 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 \( \text{\textregistered} \)), 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 \( \text{\textregistered} \) or \( \text{\textregistered} \) respectively.
  - Delete: select a thumbnail image, and click \( \text{\textregistered} \) to delete it.
  - Send to: select a thumbnail image, and click \( \text{\textregistered} \) 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 <Function>→<Patient> to open the screen.
- To exit the "Animal info" screen
  - You can click 📔 to hidden 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
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.

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), GYN (Gynecology), 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:

<table>
<thead>
<tr>
<th>Exam Type</th>
<th>Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABD (Abdomen)</td>
<td>height</td>
<td></td>
</tr>
<tr>
<td></td>
<td>weight</td>
<td></td>
</tr>
<tr>
<td>OB (Obstetric)</td>
<td>Calculation index</td>
<td>According to the entered index calculation gestational age and expected date of childbirth:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- LMP: (last menstrual period)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- BBT: (basic body temperature)</td>
</tr>
<tr>
<td>GYN (Gynecology)</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>SMP (Small Parts)</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Cardiology</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Nerve</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
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. GYN (Gynecology)
4. SMP (Small Parts)
5. Nerve
6. 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 "11.2 Exam 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 a animal ID.
5 Image Optimization

5.1 Switching Between Imaging Modes

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;B&gt;</td>
<td>Click to enter B Mode</td>
</tr>
<tr>
<td>&lt;2B&gt;</td>
<td>Click to enter Double B Mode</td>
</tr>
<tr>
<td>&lt;4B&gt;</td>
<td>Click to enter Four B Mode</td>
</tr>
<tr>
<td>&lt;B&amp;M&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>&lt;THI&gt;</td>
<td>Click to enter THI Mode</td>
</tr>
</tbody>
</table>

5.2 Image Adjustment

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

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Available Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>To modify the brightness</td>
<td>Adjust gain</td>
</tr>
<tr>
<td></td>
<td>Adjust TGC</td>
</tr>
<tr>
<td>To modify gray scale image effect</td>
<td>Adjust [Dyn Ra.]</td>
</tr>
<tr>
<td></td>
<td>Adjust [Gray Map]</td>
</tr>
<tr>
<td></td>
<td>Adjust [frame correlation]</td>
</tr>
<tr>
<td></td>
<td>Adjust [Q]</td>
</tr>
<tr>
<td>To increase frame rate of gray scale imaging</td>
<td>Decrease depth</td>
</tr>
</tbody>
</table>
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>→<B> 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<B> 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, The Qopt only appear after you opening the <Qopt>.

<table>
<thead>
<tr>
<th>Display</th>
<th>Freq</th>
<th>DR</th>
<th>Gain</th>
<th>Frame Rate</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>Frequency</td>
<td>B Dynamic Range</td>
<td>Gain</td>
<td>Frame Rate</td>
<td>Depth</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Panel</td>
<td>Gain, Qopt</td>
</tr>
<tr>
<td>Soft keys</td>
<td>Dynamic Range, Persistence, Gray Map, Colorize Map, Expand mode, TSI, Depth, TGC, Frequency, L/RFlip, U/DFlip, A.power, Gain, B Steer.</td>
</tr>
<tr>
<td>the image parameter area</td>
<td>Frequency, Dynamic Range, Gain, Depth</td>
</tr>
</tbody>
</table>
### 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.

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**
- To change depth, click on `<Function>→<Depth>` in the soft menu to adjust the gain;
- Click `<Depth>` 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.

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(Penetrate mode) and Res(Resolution mode).

**Operation**
Click <Freq> to switch frequency mode.
Click <THI> to switch frequency mode and harmonic 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 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 Rotate the knob clockwise to increase the gain, 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 turned 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.
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.

B Steer

**Description** This function is to steer the beam transmitted by the probe.

**Operation** Steer the transmitting beam through the [B Steer] item in the soft menu or menu.
The steering angles provided are: -6, 0, and 6.

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 M Mode Image Optimization

5.4.1 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 [M Line] 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 M Mode Parameters

- In single M mode scanning, the image parameter area in the upper left corner of the screen displays the real-time parameter values as follows:

<table>
<thead>
<tr>
<th>Display</th>
<th>Freq</th>
<th>DR</th>
<th>Gain</th>
<th>VF</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>Frequency</td>
<td>M Dynamic Range</td>
<td>M Gain</td>
<td>M speed</td>
<td>Depth</td>
</tr>
</tbody>
</table>

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

**Adjustment**
- 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, the frequency of the probe is 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 M 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.

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.

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.

5.5 BM Mode Image Optimization

5.5.1 BM Mode Exam Protocol

BM mode is the mode that the B and M Image displayed at the same time.
The method to enter BM mode please consult “5.4.1 M Mode Exam Protocol”.

5.5.2 BM Mode Parameters

Parameter’s adjustment in B mode and M mode is independent (part of them are shared, like TGC), and please consult each mode’s image optimization if you want to learn adjust method.

```
<table>
<thead>
<tr>
<th>B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freq</td>
<td>Res 65</td>
</tr>
<tr>
<td>DR</td>
<td>60</td>
</tr>
<tr>
<td>Gain</td>
<td>60</td>
</tr>
<tr>
<td>FrameRate</td>
<td>15</td>
</tr>
<tr>
<td>Depth</td>
<td>18.0</td>
</tr>
<tr>
<td>Zoom</td>
<td>1.2</td>
</tr>
<tr>
<td>Qopt</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DR</td>
<td>60</td>
</tr>
<tr>
<td>Gain</td>
<td>60</td>
</tr>
<tr>
<td>VF</td>
<td>3</td>
</tr>
</tbody>
</table>
```
5.5.3 BM Mode Image Optimization

- You can use to select B or M mode’s soft keys in order to adjust parameters.
- Sampling line adjust
  Under BM mode you can adjust the sampling line. Entering to BM mode request to decide the position of sampling line at first time. Adjust the sampling line, Press down the knob to end sampling line adjust. If you want to adjust the sampling line pressing down the knob and again to end the adjust.

5.6 Image Preset

Please consult “11.3 Image Preset”
6 Display & Cine Review

6.1 Image Display

6.1.1 B, 2B and 4B
The system supports single-split, dual-split and quad-split display format in B mode. However, only one window is active at one time.
The corresponding items are <B><2B><4B> in the soft keys.

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: <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 click \( \text{Manual Play} \), the review sequence is reversed to the image-storing sequence, thus the images are displayed in descending order. Whereas, if you click \( \text{Manual Play} \), 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 click , 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.
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 B General Measurements

The measurements in B mode listed below can be performed:

<table>
<thead>
<tr>
<th>Measurement Tools</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>Measures the distance between two points of interest.</td>
</tr>
<tr>
<td>Angle</td>
<td>The angle between two intersected planes.</td>
</tr>
<tr>
<td>Area</td>
<td>Measures the area and perimeter of a closed region.</td>
</tr>
<tr>
<td>Volume</td>
<td>The volume of a target.</td>
</tr>
<tr>
<td>Trace Length</td>
<td>Measures the length of a curve on the image.</td>
</tr>
<tr>
<td>Distance Ratio</td>
<td>Measures the lengths of any two line segments and the calculated ratio.</td>
</tr>
<tr>
<td>Area Ratio</td>
<td>Measures the area and perimeter of any two closed regions and the calculated ratio.</td>
</tr>
<tr>
<td>Measurement Tools</td>
<td>Function</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Histogram</td>
<td>The grayscale distribution of ultrasonic echo signals in a closed region.</td>
</tr>
</tbody>
</table>

### 7.2.2 M General Measurements

The measurements in M mode listed below can be performed:

<table>
<thead>
<tr>
<th>Measurement Tools</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>The vertical distance between two points.</td>
</tr>
<tr>
<td>Time</td>
<td>The time interval between any two points.</td>
</tr>
<tr>
<td>Slope</td>
<td>Measures the distance and time between two points and calculates the slope.</td>
</tr>
<tr>
<td>HR</td>
<td>Measures the time of two cardiac cycles and calculates the heart rate in M mode image.</td>
</tr>
</tbody>
</table>

### 7.3 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 <Font Size> 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.
  2. Move to a new line:
In the edit status (the characters are in green color), press <Enter> to move the cursor to the new line, and the location of the cursor is aligned with that of the first line.

3. 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, GYN (Gynecology), 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

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 fat16,fat32 or exfat.

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.

NOTE: Please backup, clean up the patient data in time as the patient records in patients database storage system are limited.
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, printer and etc.
- [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.

```plaintext
Export

Target

DICOM

G:

Property

Total: 7433 MB
Free: 6152 MB

Path:

G:

OK Cancel

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 it will result in failure of data storage.
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:
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 patientlist 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

This system supports the following optional DICOM functions:
- DICOM Basic function: DICOM connection verify, DICOM task management, DICOM storage, DICOM print,
- DICOM Worklist
- 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, Worklist, 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:
3. Local Net preset items are described as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP / Static</td>
<td>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.</td>
</tr>
<tr>
<td>IP Address</td>
<td>IP address of the system.</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>Used to set different network segment.</td>
</tr>
<tr>
<td>Gateway</td>
<td>Used to set the gateway IP.</td>
</tr>
<tr>
<td>Apply</td>
<td>Click to confirm parameter setting.</td>
</tr>
</tbody>
</table>

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:

3. DICOM Local Setting items are described as follows:

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

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:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>Name of the device supporting DICOM services</td>
</tr>
<tr>
<td>IP Address</td>
<td>IP address of the server</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Ping</td>
<td>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.</td>
</tr>
<tr>
<td>Add</td>
<td>Click to add servers to the device list</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete the selected server(s) in the device list</td>
</tr>
<tr>
<td>Apply</td>
<td>Click to confirm parameter setting</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>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.</td>
</tr>
<tr>
<td>Service Name</td>
<td>Default is xxx-Storage, and it can be modified.</td>
</tr>
<tr>
<td>AE Title</td>
<td>Application Entity title, here, it should be consistent with that of the storage server.</td>
</tr>
<tr>
<td>Port</td>
<td>DICOM communication port, 104 by default. Here, the port should be consistent with that of the storage server port.</td>
</tr>
<tr>
<td>Add</td>
<td>Add the DICOM service to the service list.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Click to cancel the parameter setting.</td>
</tr>
<tr>
<td>Update</td>
<td>Select an item in the service list, change the parameters in the above area, and click &lt;Update&gt; to update the item in the service list.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete the selected service in the service list.</td>
</tr>
<tr>
<td>Default</td>
<td>Select an item in the service list, click &lt;Default&gt; to set the default server.</td>
</tr>
<tr>
<td>Verify</td>
<td>Click to verify if the two DICOM application entities are normally connected.</td>
</tr>
<tr>
<td>Apply</td>
<td>Click to confirm parameter setting.</td>
</tr>
</tbody>
</table>
10.1.4.2 Print Service Setting

1. 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.

2. Select an item in the service list, and click <Verify> to verify the connection.

3. Click <Apply> to confirm the setting.

DICOM print setting items are described as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>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.</td>
</tr>
<tr>
<td>Service Name</td>
<td>Default is xxx-Print, and it can be modified.</td>
</tr>
<tr>
<td>AE Title</td>
<td>Application Entity title, here, it should be consistent with that of the print server.</td>
</tr>
<tr>
<td>Port</td>
<td>DICOM communication port, 104 by default. Here, the port should be consistent with that of the print server port.</td>
</tr>
<tr>
<td>Copies</td>
<td>Refer to copies of printed files. You can select among 1 through 5, or directly enter the number.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Settings</td>
<td>The system supports RGB (color printing) and MONOCHROME2 (black and white printing). Please select the type the printer supports.</td>
</tr>
<tr>
<td>Film Orientation</td>
<td>Select between LANDSCAPE and PORTRAIT.</td>
</tr>
<tr>
<td>Film Size</td>
<td>Select film size among the selections listed in the drop-down list.</td>
</tr>
<tr>
<td>Display Format</td>
<td>Specify quantity of printed files, e.g. STANDARD\2, 3 indicates 6 images are printed for each page.</td>
</tr>
<tr>
<td>Medium Type</td>
<td>Specify print medium: Paper, Clear Film, and Blue Film.</td>
</tr>
<tr>
<td>Destination</td>
<td>Specify where the file is exposed: MAGAZINE (stored in the magazine), or PROCESSOR (exposed in the processor).</td>
</tr>
<tr>
<td>Add</td>
<td>Add the DICOM service to the service list.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Click to cancel the parameter setting.</td>
</tr>
<tr>
<td>Update</td>
<td>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.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete the selected service in the service list.</td>
</tr>
<tr>
<td>Default</td>
<td>Select an item in the service list, click &lt;Default&gt; to set the default server.</td>
</tr>
<tr>
<td>Verify</td>
<td>Click to verify if the two DICOM application entities are normally connected.</td>
</tr>
<tr>
<td>Apply</td>
<td>Click to confirm parameter setting.</td>
</tr>
</tbody>
</table>

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 Worklist 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.
DICOM service setting for Worklist is described as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>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 Worklist server.</td>
</tr>
<tr>
<td>Service Name</td>
<td>Default is xxx-Worklist, and it can be modified.</td>
</tr>
<tr>
<td>AE Title</td>
<td>Application Entity title, Here, it should be consistent with that of the Worklist server.</td>
</tr>
<tr>
<td>Port</td>
<td>DICOM communication port, 104 by default. Here, the port should be consistent with that of the Worklist server port.</td>
</tr>
<tr>
<td>Scheduled Station AE Title</td>
<td>To set the AE Title of the scheduled station. For example, if the AE Title of the Worklist server is M1, then the scheduled station AE Title here should be M1.</td>
</tr>
<tr>
<td>Add</td>
<td>Click to add the Worklist service to the service list.</td>
</tr>
<tr>
<td>Cancel</td>
<td>Click to cancel the parameter setting.</td>
</tr>
<tr>
<td>Update</td>
<td>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.</td>
</tr>
<tr>
<td>Delete</td>
<td>Click to delete the selected service in the service list.</td>
</tr>
<tr>
<td>Default</td>
<td>Select an item in the service list, click [Default] and you can see “Y” in the Default column.</td>
</tr>
<tr>
<td>Verify</td>
<td>Click to verify if the two DICOM application entities are normally connected.</td>
</tr>
</tbody>
</table>
Name | Description
--- | ---
Apply | Click to confirm parameter setting.

Tips:
In terms of “Scheduled Station AE Title”, if you set this item in the Worklist 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 Worklist 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 Worklist

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

To query animal information via Worklist server:
1. Press <NewPatient> or click <Function>→<Info> to enter Animal info screen.
2. Click <WorkList> to enter the WorkList page.
3. Query animal information:
   1) Set query criteria among Animal ID, Patient Name, Accession #, Search Key, Worklist 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 Worklist server
1. Enter DICOM Service Preset screen, and open the Worklist page: Setup→<DICOM Service>→Worklist.
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 <WorkList> to enter the WorkList page.
6. The system queries intraday patients via Worklist 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Preset</td>
<td>To preset hospital information, General, Measure, OB, Biopsy.</td>
</tr>
<tr>
<td>Exam Preset</td>
<td>To preset the default probe and exam mode.</td>
</tr>
<tr>
<td>Image Preset</td>
<td>To preset the default parameter of various Exam types in B/THI/M mode.</td>
</tr>
<tr>
<td>Local Net</td>
<td>To preset network property.</td>
</tr>
<tr>
<td>DICOM Local</td>
<td>To preset the DICOM server properties.</td>
</tr>
</tbody>
</table>

- 68 -
<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICOM Server</td>
<td>To add or delete DICOM servers, or set IP address and name for the DICOM server.</td>
</tr>
<tr>
<td>DICOM Service</td>
<td>To preset DICOM service attributes.</td>
</tr>
<tr>
<td>System Update</td>
<td>To check system information, Upgrade System and Load Factory.</td>
</tr>
<tr>
<td>Help Manual</td>
<td>The user can browse the machine operation manual here.</td>
</tr>
<tr>
<td>EXIT</td>
<td>To exit Setup.</td>
</tr>
</tbody>
</table>

- 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:

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Information</td>
<td>To set the hospital name, address, telephone, website and department.</td>
</tr>
<tr>
<td>General</td>
<td>To set animal information, comment, key config, status after freeze, language, time zone, date and time.</td>
</tr>
<tr>
<td>Measure</td>
<td>To set maternity measurement, unit system</td>
</tr>
<tr>
<td>Biopsy</td>
<td>To set the bracket model.</td>
</tr>
</tbody>
</table>
### 11.1.1 Hospital Information

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

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Set the name of hospital.</td>
</tr>
<tr>
<td>Address</td>
<td>Set the address of hospital.</td>
</tr>
<tr>
<td>Telephone</td>
<td>Set the telephone.</td>
</tr>
<tr>
<td>Website</td>
<td>Set the website of hospital.</td>
</tr>
<tr>
<td>Department</td>
<td>Set the department.</td>
</tr>
</tbody>
</table>

### 11.1.2 General

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

<table>
<thead>
<tr>
<th>Region and Time Zone</th>
<th>Region</th>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal info</td>
<td>Region</td>
<td>H&amp;W Unit</td>
<td>To select for animal height and weight: Metric、English.</td>
</tr>
<tr>
<td>Comment</td>
<td>Region</td>
<td>Font Size</td>
<td>To set font size of comment: Small、Medium、Large.</td>
</tr>
<tr>
<td>Key Config</td>
<td>Region</td>
<td>Key Volume</td>
<td>To set the volume of key: 0、1、2、3. 0 means no sound</td>
</tr>
<tr>
<td>Screen Saver</td>
<td>Region</td>
<td>Screen Saver</td>
<td>To enable screen saver function, and select the waiting time (1~60minute)</td>
</tr>
<tr>
<td>Language</td>
<td>Region</td>
<td>Language</td>
<td>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.</td>
</tr>
<tr>
<td>Time Zone</td>
<td>Region</td>
<td>Time Zone</td>
<td>To select the time zone. Setting Range: GMT-12:00~GMT+13:00.</td>
</tr>
<tr>
<td>Data Format</td>
<td>Region</td>
<td>Date Format</td>
<td>To set the date format among DD/MM/YYYY, MM/DD/YYYY and YYYY/MM/DD.</td>
</tr>
<tr>
<td>Time Format</td>
<td>Region</td>
<td>Time Format</td>
<td>To select the time format between 12 Hour and 24 Hour.</td>
</tr>
</tbody>
</table>
### 11.1.3 Measure Preset

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

#### 11.1.3.1 Measure Unit

<table>
<thead>
<tr>
<th>Region</th>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>Distance</td>
<td>Set the unite of distance: mm, cm.</td>
</tr>
<tr>
<td></td>
<td>Area</td>
<td>Set the unite of area: mm², cm².</td>
</tr>
<tr>
<td></td>
<td>Slop</td>
<td>Set the unite of slope: mm/s, cm/s, m/s.</td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>Set the unite of time: ms, s.</td>
</tr>
<tr>
<td></td>
<td>Volume</td>
<td>Set the unite of volume: mm³, cm³.</td>
</tr>
</tbody>
</table>

#### 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, 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 C5-2E 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 “C5-2E” from the “Probe” drop-down list.

Image parameter preset

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorize Map</td>
<td>To set the default colorize map in B mode.</td>
</tr>
<tr>
<td>TSI</td>
<td>To set the default TSI mode for B mode.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>To set the default depth in B mode.</td>
</tr>
<tr>
<td>Freq</td>
<td>To set the default frequency of the probe.</td>
</tr>
<tr>
<td>B Gain</td>
<td>To set the default gain value in B mode.</td>
</tr>
<tr>
<td>THI gain</td>
<td>To set the default THI gain value in B mode.</td>
</tr>
<tr>
<td>B effect</td>
<td>To set the default dynamic rang value in B mode.</td>
</tr>
<tr>
<td>THI effect</td>
<td>To set the default dynamic rang value in THI mode.</td>
</tr>
<tr>
<td>Persistence</td>
<td>To set the default level of frame average adjustment in B mode.</td>
</tr>
<tr>
<td>THI Persistence</td>
<td>To set the default level of frame average adjustment in THI mode.</td>
</tr>
<tr>
<td>B frame correlation</td>
<td>To set the default B frame correlation</td>
</tr>
<tr>
<td>THI frame correlation</td>
<td>To set the default THI frame correlation</td>
</tr>
<tr>
<td>L/R Flip</td>
<td>To set the default horizontal flipping mode: Left or Right.</td>
</tr>
<tr>
<td>U/D Flip</td>
<td>To set the default vertical flipping mode: Up or Down.</td>
</tr>
</tbody>
</table>

- 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.

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

12.1.2 Transducer mode

L-Linear probe
C-Convex probe
E-Endocavity probe
A-Animal probe
R-Rectal 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, or it 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, pls 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 pls 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.

3. Secure the sheath with enclosed elastic bands.

4. Inspect the sheath to ensure there are no holes or tears.
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 Serve 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 be belonged 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 may damage 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

Sketch map of high frequency linear array probe prevent immersion

R20 Sketch map of convex 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:**

1. Do not put plug of probe into any liquid like water and antivirus solutions, or it will lead to electric shock or breakdown.

2. If you don’t clear coupling agent after exam, it will freeze and impact probe’s image quality.

   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.

3. **CAUTION:**

   1. When cleaning and disinfection, put on bacteria resistant gloves to prevent infection

   2. 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 informations.

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**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Brand Name</th>
<th>Handing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glutaraldehyde</td>
<td>Cidex (with active glutaraldehyde solution)</td>
<td>Please follow introductions provided by manufacturer to do it.</td>
</tr>
</tbody>
</table>

**Not belong to glutaraldehyde disinfection**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Brand Name</th>
<th>Handing</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-phthalaldehyde</td>
<td>Cidex (With o-phthalaldehyde solution)</td>
<td>Please follow introductions provided by manufacturer to do it.</td>
</tr>
</tbody>
</table>

**WARNING:**

1. Do not plug of probe into any liquid like water and antivirus solutions, or it will lead to electric shock or breakdown.

2. If you don’t clear coupling agent after exam, it will freeze and impact probe’s image quality.

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.

**CAUTION:**

1. When cleaning and disinfection, put on bacteria resistant gloves to prevent infection

2. 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 informations.

---

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

---

- 79 -
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Manufacturer</th>
<th>Brand Name</th>
<th>Handing</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-12 alkyl-1, 3-Trimethylene diamine</td>
<td>Antiseptica</td>
<td>Triacid-N</td>
<td>Please follow introductions provided by manufacturer to do it.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Manufacturer</th>
<th>Product</th>
<th>Handing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaternary ammonium</td>
<td>Ecolab Inc</td>
<td>Ster-Bac</td>
<td>Please follow introductions provided by manufacturer to do it.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Chemical Name</th>
<th>Handing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minncare Cold sterilization</td>
<td>22% of hydrogen peroxide, 4.5% of peracetic acid</td>
<td>Please follow introductions provided by manufacturer to do it.</td>
</tr>
</tbody>
</table>

- 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 its 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 12 minutes.)
- 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.

![Biopsy Guide Diagram]

⚠️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:**

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.

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


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

**NOTE:**

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

2. 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.

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

4. 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.

5. 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.

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

<table>
<thead>
<tr>
<th>EMISSIONS TEST</th>
<th>COMPLIANCE</th>
<th>ELECTROMAGNETIC ENVIRONMENT—GUIDANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions CISPR 11</td>
<td>Group 1</td>
<td>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.</td>
</tr>
<tr>
<td>RF emissions CISPR 11</td>
<td>Class A</td>
<td>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</td>
</tr>
<tr>
<td>Harmonic Emissions IEC 61000-3-2</td>
<td>Class A</td>
<td></td>
</tr>
<tr>
<td>Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3</td>
<td>Compliance</td>
<td></td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>IMMUNITY TEST</th>
<th>IEC 60601 TEST LEVEL</th>
<th>COMPLIANCE LEVEL</th>
<th>ELECTROMAGNETIC ENVIRONMENT-GUIDANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic Discharge (ESD)</td>
<td>±6 kV contact;</td>
<td>±6 kV contact;</td>
<td>Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.</td>
</tr>
<tr>
<td>IEC 61000-4-2</td>
<td>±8 kV air</td>
<td>±8 kV air</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical fast Transient / burst</td>
<td>±2 kV for power</td>
<td>±2 kV for power</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>IEC 61000-4-4</td>
<td>supply voltage;</td>
<td>supply voltage;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>±1 kV for input/output voltage</td>
<td>±1 kV for input/output voltage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>±6 kV contact;</td>
<td>±6 kV contact;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>±8 kV air</td>
<td>±8 kV air</td>
<td></td>
</tr>
<tr>
<td>Surge</td>
<td>±1 kV voltage(s) to voltage(s);</td>
<td>±1 kV voltage(s) to voltage(s);</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>IEC 61000-4-5</td>
<td>±2 kV voltage(s) to earth</td>
<td>±2 kV voltage(s) to earth</td>
<td></td>
</tr>
<tr>
<td>Voltage dips, Short interruptions</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 0.5 cycle</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 0.5 cycle</td>
<td>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.</td>
</tr>
<tr>
<td>and voltage variation on power</td>
<td>40% U&lt;sub&gt;T&lt;/sub&gt; (60% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 cycle</td>
<td>40% U&lt;sub&gt;T&lt;/sub&gt; (60% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 cycle</td>
<td></td>
</tr>
<tr>
<td>supply input voltage</td>
<td>70% U&lt;sub&gt;T&lt;/sub&gt; (30% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 25 cycle</td>
<td>70% U&lt;sub&gt;T&lt;/sub&gt; (30% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 25 cycle</td>
<td></td>
</tr>
<tr>
<td>IEC 61000-4-11</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 sec</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 sec</td>
<td></td>
</tr>
<tr>
<td>Power frequency (50/60 HZ)</td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>magnetic field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEC 61000-4-8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: U<sub>T</sub> 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.

<table>
<thead>
<tr>
<th>IMMUNITY TEST</th>
<th>IEC 60601 TEST LEVEL</th>
<th>COMPLIANCE LEVEL</th>
<th>ELECTROMAGNETIC ENVIRONMENT—GUIDANCE</th>
</tr>
</thead>
</table>
| 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 the system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance:

\[
d = 3.5 \times \sqrt{P} \\
d = 1.2 \times \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz} \\
d = 2.3 \times \sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{GHz}
\]

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:

![Symbol](image)

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 MOBILE RF 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.

<table>
<thead>
<tr>
<th>Rated Maximum Output power of Transmitter (W)</th>
<th>Separation Distance According to Frequency of Transmitter (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150kHz -80MHz</td>
</tr>
<tr>
<td></td>
<td>$d = \left[ \frac{3.5}{1} \right] \sqrt{P}$</td>
</tr>
<tr>
<td>0.01</td>
<td>0.35</td>
</tr>
<tr>
<td>0.1</td>
<td>1.11</td>
</tr>
<tr>
<td>1</td>
<td>3.50</td>
</tr>
<tr>
<td>10</td>
<td>11.07</td>
</tr>
<tr>
<td>100</td>
<td>35.00</td>
</tr>
</tbody>
</table>

For transmitters at a maximum output power not listed above, the recommended separation distance 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.

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.

Note 1  At 80 MHz and 800 MHz, the separation distance for 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.