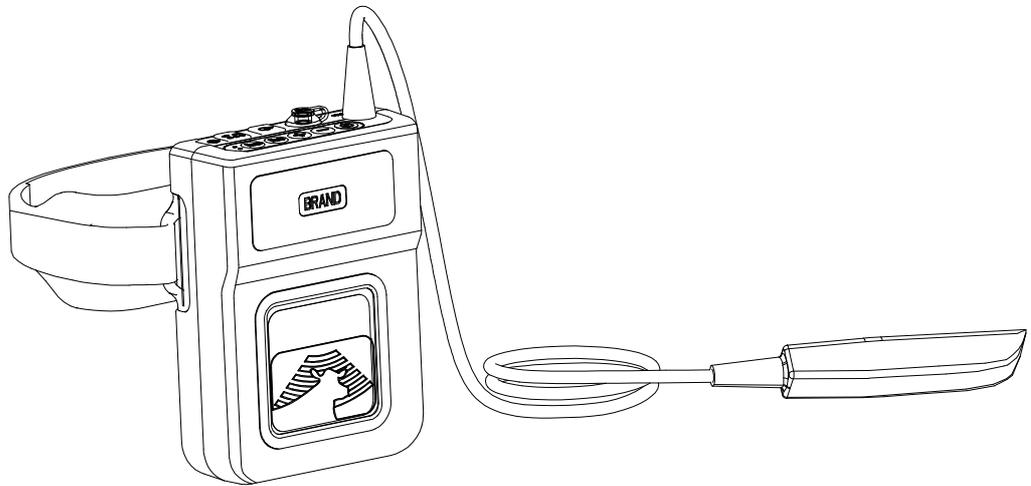


KAIXIN

DVU82

**Full Digital Ultrasonic Diagnostic
Instruments (Vet)**

User's Manual



Introduction

Thank you for purchasing DVU82 full digital ultrasonic diagnostic instruments (Vet).

Users shall carefully read through this manual and fully understand the text before operating the equipment.

Please keep this manual after reading so that you can access at any time when needed.

The user's manual issue date: April 14, 2016, Version: V1.01

For the changes of appearance, this manual is subject to change without further notice!

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3. Related electrical equipment complies with national standards and the requirements of the user's manual;
4. Operate the product in accordance with the user's manual.

Warranty and repair service

Purchased the product warranty, sees the company's service policies.

Manufacturer's Information



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Important Statement

1. User shall be fully responsible for the maintenance and management of this product after purchasing this product.
2. Even in the warranty period, warranty does not include the following:
 - a) Damage or loss caused by error or rough using.
 - b) Damage or loss caused by force majeure (such as fires, earthquakes, floods, or lightning etc.).
 - c) Damage or loss caused by not meeting the conditions of use specified by the system, such as inadequate power supply, incorrect installation or environmental conditions do not meeting the requirements.
 - d) Damage or loss caused by not used the system in the initial buy region.
 - e) Damage or loss caused by the system purchased not by Kaixin or its authorized dealer or agents.
3. Medical personnel qualified with professional qualifications only to use this system.
4. Do not modify the software or hardware of the equipment without authorization of the manufacturer.
5. In any case, Kaixin shall not be liable for the problems, damages or losses due to re-installation, alteration or repair the system by non-Kaixin designated personnel.
6. This product is intended to provide clinical diagnostic data for the doctor.

The doctor shall be responsible for the diagnostic process. Kaixin shall not be liable for any problems arising out of the process.
7. Be sure to back up important data to external storage media, such as notebooks.
8. Due to operator's error or abnormal condition causing the data stored in the internal system is lost, Kaixin is not responsible.
9. This user's manual contains warnings for predictable dangers. Users shall also exercise care at any time to be aware of the dangers unforeseen in this manual. Kaixin shall not be liable for the damages and losses arising out of neglecting to follow the operation instructions herein described.
10. This user's manual shall be furnished with the machine so that managerial and operating personnel can refer to it any time as necessary. Once the managerial personnel of the system changes, it shall hand over this user's manual.
11. Deal with the exhausted product according to the local statute.
12. The maintenance and servicing of product shall be performed by the trained engineer or by Kaixin Electronic Instrument Company Ltd.
13. Qualified service personnel should be trained and authorized by Kaixin Electronic Instrument Company Ltd.

Safety Cautions

1. Warning Symbols and Definitions

The following warning symbols are used in this manual to indicate safety level and other important items. Please remember these symbols and understand the meaning as you read this user's manual. These symbols convey specific meanings as detailed in the table below:

Symbols & Words	Connotation
 Danger	Indicates an imminent danger that may result in personal death or serious injury if not avoided.
 Warning	Indicates a potential danger that may result in personal injury if not avoided.
 Attention	Indicates a potential danger or unexpected use condition that may result in light injury or property loss or affecting the use if not avoided.

2. Safety Symbols

Symbols	Meaning	Symbols	Meaning
	Type B applied part		Keep dry
	Direct current		Fragile
	Power supply indication		Stacking limit by number
	Battery charge indicator		Temperature limits (Storage and transport)
	Up		Humidity limitation (Storage and transport)
	Marking for the separate collection of electrical and electronic equipment		Atmospheric pressure limitation (Storage and transport)

	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/EC. The device, accessories and the packaging have to be disposed of waste correctly at the end of the usage. Please follow Local Ordinances or Regulations for disposal.
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Chapter One Technical Specifications

1.1 Technical Data

1. Adapter ratings: 100-240V~, 1.2-0.6A, 50-60Hz
2. Output of adapter: DC12.8V 3.0A
3. Main device rating: DC12V 3.0A
4. Main Unit Size: approx. 190 * 150 * 53 mm³ (L * W * H)
5. Weight of main unit: approx. 2kg (including probe and battery)

1.2 Primary Functions

1. Magnification conversion function.
2. Frequency conversion function.
3. Frame correlation function.
4. Image post-process function.
5. Edge enhancement function.
6. Compression curve selection function.
7. Adjust near field, far field, total gain and dynamic range.
8. Image left/right reverse.
9. Image storage function.
10. PAL-NTSC conversion.
11. Language conversion function.

Chapter Two System Outline and Structure

2.1 Structure composition of the instrument

DVU82 full digital ultrasonic diagnostic instruments (Vet) are composed of main unit, probe etc.

2.2 Components name

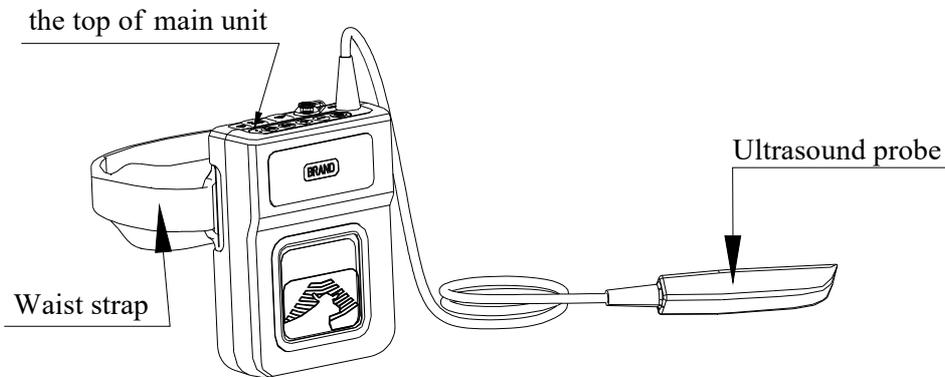


Fig. DVU82 main unit sketch map

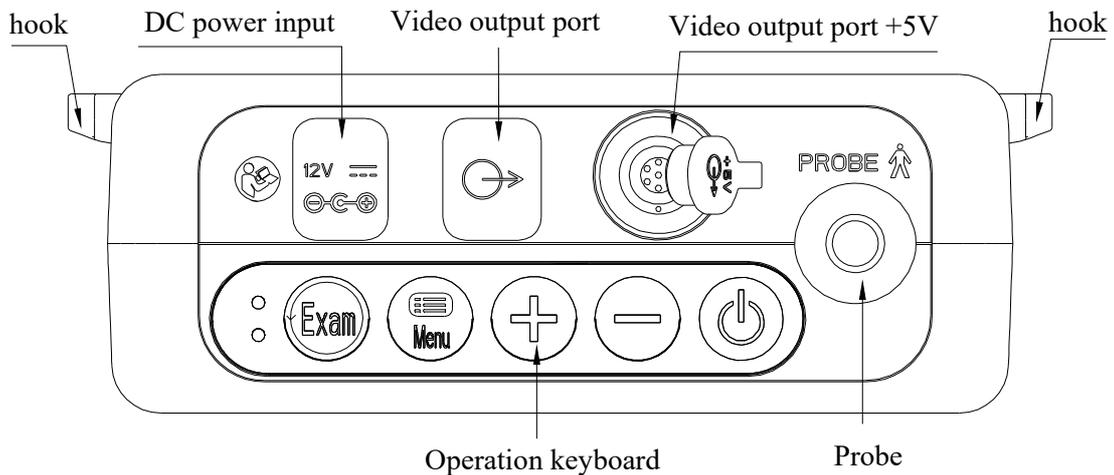


Fig. the top of DVU82 main unit sketch map

⚠ Warning: The cooling of this equipment uses the enclosure of main unit to cool. When main unit is working, the temperature of heat sink may be higher than 40 °C. If used, be careful to avoid burns!

2.3 Function keys description

SN.	Function keys	Function
1		(1) Diagnostic mode selection, diagnostic mode preset; (2) Image adjustment menu-item selection, main unit setting menu-item selection; (3) Freeze image after insert U disk.
2		Enter to confirm, image adjustment menu, main unit setting menu
3		Parameter adjustment, selection
4		Parameter adjustment, selection
5		Power switch

Chapter Five System Installation and Check

⚠Warning: To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

⚠Warning:

1. All plugs of instruments of this system shall be connected into the power socket with protectively earth on the wall and the socket must meet the requirement of power rating of instrument. Use of multiple portable socket-outlets may affect protective earth to make leakage currents exceed the safety requirements.
2. Please follow the correct electrical connections method to connect the power supply and earth, otherwise there will be danger of electric shock. Do not connect the grounding wire to any gas pipe or water pipe, or it may cause bad grounding and danger of explosion.
3. This equipment is not waterproof, not use this equipment in place where liquid may into the interior of the equipment. Never pour any liquid on the equipment; otherwise there will be danger of electric shock or cause equipment damage. If accidentally spill liquid on the equipment, turn off the power immediately and contact your local representative.
4. Additional equipment connected to the medical electrical equipment must comply with the respective IEC or ISO standards (e.g. IEC60950 for data processing equipment). Furthermore all configurations shall comply with the requirements for medical electrical systems (see IEC 60601-1-1 or clause 16 of IEC60601-1 3rd, respectively). Anybody connecting additional equipment to medical electrical equipment configures a medical system and is therefore responsible that the system complies with the requirements for medical electrical systems. Attention is drawn to the fact that local laws take priority over the above mentioned requirements. If in doubt, consult your local representative or the technical service department.
5. Prohibit the live parts of the equipment or other devices (such as various signal input and output ports, etc.) contact with the patient, if this equipment or other equipment has failure, the patient will have danger of electric shock.
6. If the integrity of the external protective conductor in the installation or its arrangement is in doubt, equipment shall be operated from its internal electrical power source.

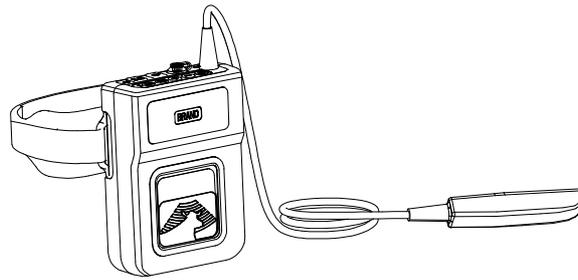
⚠Warning:

1. When instrument works abnormally, do stop working, turn off the power and check the reason, then contacts Kaixin Company about it.
2. Turn off power and pull out of the plug from socket after each ultrasonic diagnostic operation.
3. It is forbidden to drag and press the power and probe cables emphatically; regularly inspect whether there is pull-apart and bareness, if there is the phenomena like this, turn off power supply immediately, stop using it and change it for new one.
4. It is forbidden to load and unload the probe or move the instrument in galvanic to avoid danger of safety.
5. Pull out of the plug from socket after operation in thunderstorm weather to avoid the instrument being damaged by lightning.
6. If the temperature changes greatly in short time will cause vapor recovery inside of instrument, the case may damage the instrument.
7. The instrument is turned off completely only by disconnecting the power supply from the wall socket.

5.1 System installation

Please carefully read through and fully understand the use-method before installing the system, and check the goods for its completeness according to the packing list furnished.

Remove the main unit and waist strap; install the waist strap on the hook of machine as fig shown.



5.2 Install video glasses (Goggle03)

Turn off the system; connect the video signal line of Goggle03 to the “Video output port + 5V” on the top of main unit.

5.3 Install wireless transmitter

1. Turn off the system; according to the following figures, the supplied RCA connector of video connection line is connected to the “Video output port” at the top of DVU82 main unit, and the other end BNC connector is connected to the “Video input port” of the wireless transmitter;
2. Turn on “Wireless transmitter switch”, its power indicator lights and the wireless transmitter enters work status.



Fig. Video connection line (BNC to RCA) sketch map

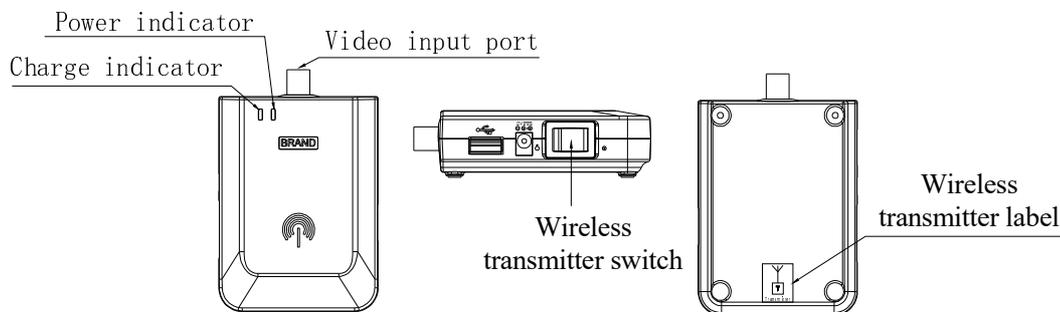


Fig. Wireless transmitter sketch map

5.4 Wireless receiver connects to video glasses for TV signal output

1. Turn off the system; connect the video connection line to the “Video output port” at the top of wireless receiver, and the other end to the video output interface of the video glasses for TV signal output;
2. Turn on “Wireless receiver switch”, its power indicator lights and the wireless receiver enters work status.

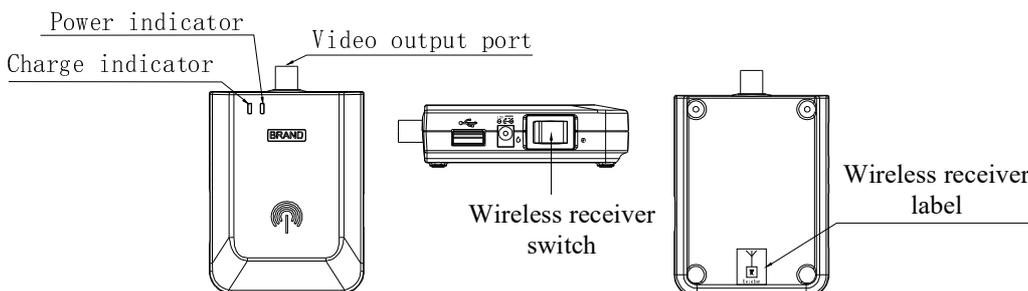
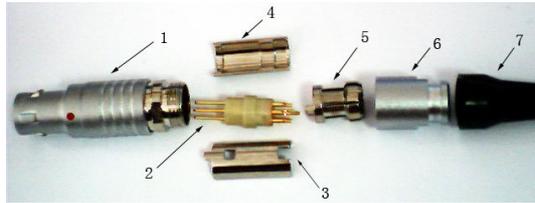


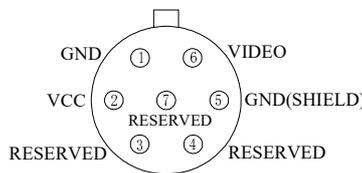
Fig. Wireless receiver sketch map

5.5 LEMO connector welding method

1. First take out the LEMO connector from the accessories, and then place the disassembled parts in order of following picture:

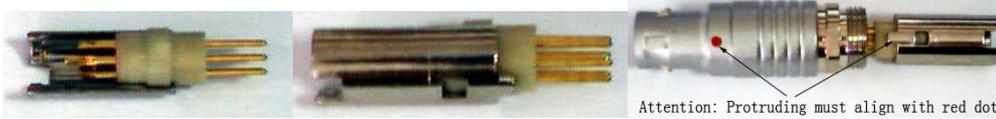


1. First take out the LEMO connector from the accessories, and then place the disassembled parts in order of following picture:
2. Remove part 2, in accordance with the pins definition welding method provided by the following picture, the wire will be welded on the pins of LEMO connector, pay attention to the welding direction. (If the other end of conductor has other equipment, you need to penetrate the part 7-bushing, part 6-nut and part 5- line deduction in order before welding. Pay attention to direction and then welding.)

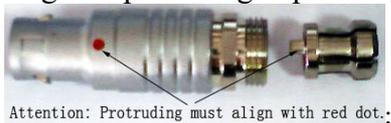


Welding method: 1. GND, 2. VCC, 3. Reserved, 4. Reserved, 5. GND (Shield), 6. Video signal, 7. Reserved.

3. Place part 3 and part 4 in accordance with the shown picture, buckle the welded wire and part 3/4 together, align the protruding of part 3 with a red dot of part 1, and then be put into the part 1;



4. Align the protruding of part 5 with a red dot of part 1, and then be put into the part 1



5. Put the part 6-nut into the part 1 and tighten;
6. Has completed the LEMO connector welding; connect LEMO connector to “Video output port + 5V” interface, this connector can be used.

5.6 Install video recorder

1. Turn off the system, connect the equipotential terminal (⏏) of the video recorder to the earthing;
2. Connect one end of the video connection line to the video recorder and the other end to the “Video output port” on the top of main unit;
3. Insert one end of power plug (jack) of the video recorder to the power input socket of the video recorder, the other end to the power supply socket.

5.7 Connect to power

1. Connect to the power adapter

Insert the output plug of adapter into DC power input interface, which is on the top of main unit.

2. Connect to the main power supply

Insert the power plug (jack) furnished with the machine into power input socket of the power adapter, the other end to the mains socket-outlet. The instrument uses three-core power supply. It connects with the protective earth line when power plug inserts into its socket.

⚠Warning:

1. **Adapter has no switch. APPLIANCE COUPLER or MAINS PLUG is used as the intended disconnection device from the supply mains. Do not position the EQUIPMENT the place where it is difficult to operate the disconnection device.**
2. **AC/DC adapter is as a part of the equipment, please only use the AC/DC adapter provided by Kaixin Company.**
3. **To avoid damaging power adapter or harming people by unexpected fallen, make sure the power adapter is placed on the leveled desk.**
4. **The operator must not touch signal input/ signal output and patient simultaneously.**

5.8 Ultrasonic probe check before and after operation

Before and after ultrasonic diagnosis to check if there are any exceptionally on the surface of the probe or cable jacket, such as peeling, cracks, bulge, or if the acoustic lens is reliable, disinfected or cleaned.

5.9 Main unit check before and after operation**5.9.1 Inspection before start-up**

Check the following items before starting the machine:

1. The temperature, humidity and atmospheric pressure shall meet the requirements of operation condition.
2. No condensation occurs.
3. No distortion, damage or contamination on system and peripheral. Clean the parts as specified in relevant sections, if the contaminant is present.
4. Check the control panel and enclosure to ensure they are in good working condition and free of abnormality (such as cracks and loosened screws).
5. No damage on power cable, and hard up on its connection.
6. Check probe and its connections to ensure they are free of abnormality (such as scuffing, drop-off or contamination). If the contaminant is present, clean, disinfect the contaminated objects as specified in relevant sections.
7. No barriers around the intake of equipment.
8. See to it that probe has been cleaned, disinfected; else dispose it as specified in relevant sections.
9. Check all the ports of the machine for possible damage or blockage.
10. Clean the field and environment.

5.9.2 Inspection after start-up

Check the following items after starting the machine:

1. No abnormal voice, strange smell and overheating appear.
2. Check the machine to ensure a normal start-up: The power indication light is on, the machine will be automatically display B mode.
3. Check the acoustic lens for abnormal heat when the probe is in use. This can be done by hand touching the probe to feel the temperature of the lens.
4. Check the image to ensure trouble-free display (no excessive noise or flicker).
5. Check the control panel to ensure normal operation condition.
6. Check the instrument to ensure that the phenomenon of local high temperature will not appear.

⚠Attention: If the overheat acoustic lens is placed on the patient's skin, heat injury may occur.

⚠Attention: Thoroughly clean the coupling gel on the probe surface each time after ultrasonic operation, or the coupling gel may become hardened on the acoustic lens of the probe, deteriorating quality of image.

5.10 System reset

In case of abnormal screen display or no-working for system operation, try to restart the system by turning on/off the main unit power.

Chapter Six Functional Operation

6.1 Startup and Shutdown

In shutdown status, hold down  key, machine starts up, power indicator  lights.

In startup status, hold down  key, machine shuts down, power indicator  goes out. Please note that when shut down the machine, the time of pressing key is a rather long than normal pressing key.

6.2 Main unit setting

6.2.1 Language setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “Language”;
2. Press keys   to select language;
3. Press  key to confirm this setting and exit main unit setting interface.

6.2.2 TV mode setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “TV Mode”;
2. Press keys   to select “PAL” or “NTSC”;
3. Press  key to confirm this setting and exit main unit setting interface.

6.2.3 Main interface status setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “Status”;
2. Press keys   to select “ON” or “OFF”;
3. Press  key to confirm this setting and exit main unit setting interface.

6.2.4 Characters brightness setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “Char Bright”;
2. Press keys   to select characters brightness among 128, 144, 160 and 176;
3. Press  key to confirm this setting and exit main unit setting interface.

6.2.5 Grid setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “Grid Setup”;
2. Press keys   to select “0” or “1” or “2”; “0” is “No grid”, “1” is “Line grid”, “2” is “Dot grid”;
3. Press  key to confirm this setting and exit main unit setting interface.

6.2.6 Spacing setting

1. Press  key twice to enter main unit setting menu, press  key to move cursor to “Spacing”;
2. Press keys   to select “10” or “20” to change the space of grid;
3. Press  key to confirm this setting and exit main unit setting interface.

Note: The above setting items can be finished setting once after entering main unit setting menu, and then exit.

6.3 Image adjustment

6.3.1 Total gain adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Gain”;
2. Press keys   to adjust parameter among 0~120 dB;

3. Press  key to confirm and exit image adjustment menu interface.

6.3.2 Dynamic range adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Dynamic”;
2. Press keys   to adjust parameter among 30~90 dB;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.3 Near field gain adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Near”;
2. Press keys   to adjust parameter among -31~0 dB;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.4 Far field gain adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Far”;
2. Press keys   to adjust parameter among 0~ 31 dB;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.5 Frequency conversion adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Frequency”;
2. Press keys   to select the frequency grade;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.6 Frame correlation adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Frame”;
2. Press keys   to select the frame correlation grade;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.7 Image post-process adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “IP”;
2. Press keys   to select IP grade;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.8 Edge enhancement adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “IE”;
2. Press keys   to select IE grade;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.9 Compression curve adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Comp”;
2. Press keys   to select compression curve grade;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.10 Focus position adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Focus”;

2. Press keys   to select the focus position;
3. Press  key to confirm and exit image adjustment menu interface.

6.3.11 Left/right reversal (Image) adjustment

1. Press  key to enter image adjustment menu, press  key to move cursor to “Image”;
2. Press keys   to select “L” or “R”;
3. Press  key to confirm and exit image adjustment menu interface.

Note: The above setting items can be finished setting once after entering image adjustment menu, and then exit.

6.4 Diagnostic mode preset

Diagnostic modes have 4 kinds, which respectively are A, B, C and D. These modes can be defined by user and be stored. The details as follow:

1. After completed the diagnostic mode, long time press  key, diagnostic mode number A, B, C and D is shown on the screen;
2. Press keys   to select diagnostic mode number;
3. Select the number, press  key to store, “YES” or “NO” prompt will be displayed on the screen;
4. Press keys   to select “YES” or “NO”; select “YES” then press  key, store the diagnostic mode for this setting and exit. Select “NO” then press  key to give up storage and exit.

Note: A mode is default after starting up. So it is recommended user to store the diagnostic mode in A number.

6.5 Restore factory settings

1. In the menu exit state, long hold the key  until the machine automatically shut down;
2. After boot, four diagnostic modes A, B, C and D are restored to factory data.

6.6 Magnification

In real-time status, press   keys to select eight kinds of magnification.

6.7 Save images to U disk

1. Plug U disk;
2. Press  key to freeze the image;
3. Press  or  key to save the image, percentage prompt appears on lower right corner of the screen, after the prompt disappear, the current image is stored in the “USER” folder of U disk.

Explanation:

(1) Image are stored in the “USER” folder of U disk, you need to browse on the computer.

(2) If U disk has been inserted to the machine,  key is used to freeze the image; if not been inserted U disk,  key is used to select/preset the diagnostic mode or select the menu-item.

6.10 The usage of wireless transmitter and wireless receiver

1. Connect the wireless transmitter to DVU82 main unit; and then connect the wireless receiver connects to video glasses for TV signal output;
2. Respectively open the switches of wireless transmitter and wireless receiver;
3. The DIP switches  of wireless transmitter and wireless receiver are set to the same statue; you can use the wireless transmitter and wireless receiver.

Explanation:

1. The DIP switch  is switched to the top as “OFF” and to the bottom as “ON”. After completed the same settings, the video glasses or TV monitor will display the normal ultrasound image.

Such as:

The DIP switch  (1, 2, 3, 4) of wireless transmitter is set to ON, OFF, OFF, ON, then the DIP switch  (1, 2, 3, 4) of wireless receiver must also be set to ON, OFF, OFF, ON.

2. Wireless reception range is within 10 meters, no obstacles.
3. The DIP switch  of wireless receiver must be keep consistent with the “DIP switch” of wireless transmitter, otherwise can not be used.

Chapter Seven System Maintenance

The system maintenance should be performed by the user and service engineer. Users shall be in full charge of maintenance and operation of the system after purchasing the product.

7.1 Maintenance by users

7.1.1 System cleaning and disinfection

⚠ Warning: Turn off the instrument and pull out the power supply wire before cleaning every instrument of the system. It may cause electric shock if clean the system under power is on.

⚠ Warning: There is no any waterproof device in the system. Do not splash any water or liquor into the system when cleaning or maintaining; otherwise it will cause malfunction or electric shock.

⚠ Attention:

1. To prevent possible infection, it is advisable to wear sterilized gloves when cleaning, disinfecting the ultrasonic probe.
2. Clean the probe with sterile water to remove the residual chemicals after disinfection, because the residual chemicals may be harmful for humans.
3. Kaixin Company will not make any guarantee for the efficacy of disinfectant. Please contact the appropriate manufacturer for details.

⚠ Attention:

1. In the process of cleaning and disinfection, avoid probe overheat (exceeding 60°C) as it may be deformed or damaged under excessive heat.
2. In the operation of disinfection, please refer to medical institutions disinfection technical specifications.

1. Clean the probe

- (1) Must wear sterilized gloves to prevent possible infection.
- (2) Rinse the probe with water or soapy water to remove all contaminants, or use a soft urethane sponge to wipe the probe. Do not use brushes as it may damage the probe.
- (3) After finishing the rinsing, use a sterilized cloth or gauze to wipe the water on the surface of probe. Do not dry the probe by heating it.

2. High-level disinfection

Please follow the disinfection method provided in this user’s manual for disinfection.

- (1) Before disinfection, wear sterilized gloves to prevent possible infection;
- (2) You must clean the probe before disinfection. Recommend the solution to disinfect in the following table.

Glutaraldehyde-based disinfectant:

Chemical Name	Reagent Name	Step
Glutaraldehyde (2.4%)	Cidex Glutaraldehyde disinfectant	Please refer to the instructions of the solution for details.

Non-glutaraldehyde-based disinfectant:

Chemical Name	Reagent Name	Step
Phthalaldehyde solution (0.55%)	Cidex OPA	Please refer to the instructions of the solution for details.

- Please follow the instructions about disinfectant concentration and disinfection method, as well as the precautions about disinfectants provided by disinfectant provider. But do not rinse or soak the probe connector or close to connector cable.
 - The soaking time of probe in the disinfectant is limited to the minimum time recommended by disinfectant manufacturer (e.g., Cidex OPA manufacturer recommended minimum 12 minutes).
 - Please follow local laws and regulations to choice the disinfectants.
- (3) After disinfection, rinse the probe with a large number of sterile water (about 2 gallons) for at least one minute to remove the residual chemicals. You may follow the recommended method by the disinfectant manufacturer to rinse.
 - (4) After finishing the rinsing, use a sterilized cloth or gauze to wipe the water on the surface of probe. Do not dry the probe by heating it.

⚠Attention: The waterproof grade of intra-cavity probe is IPX7, immersion depth is from probe's acoustic head to the sheath of probe handle; others are IPX4.

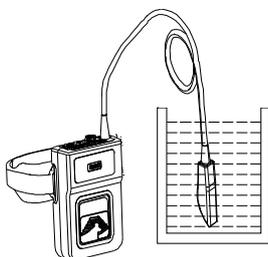


Fig. Immersion disinfection of probe (sketch map)

⚠Attention:

1. It is a normal phenomenon that color of the acoustic lens may change and color of the probe label may fade away.
2. The regular disinfection times should be minimized as it may lead to degrade of the probe safety and performance.

3. Check probe after cleaning and disinfection

- (1) Check the probe enclosure and its cable to ensure they are free of abnormality (such as scuffing, cracks or drop-off);
- (2) The sound window of probe is thin; ensure that there are no any abnormality on the sound window, such as scuffing, cracks, peeling, and bulge.

4. Clean the LED screen

Use a soft cloth dipped in glass cleaner to clean the LED screen, and then air-dried.

⚠Attention: Do not clean the screen with hydrocarbon detergent for example alcohol etc or OA equipment cleaning media.

⚠Attention: Prohibit using sharp objects to touch the LED screen, and prohibit pressing or squeezing against the LED screen.

5. Clean the control panel, shell

Clean the instrument surface with soft, dry cloth or with soft cloth dipped in moderate water cleaning media to remove the blots, and then dry the instrument with soft, dry cloth or with air.

6. Clean the video recorder

- (1) Use the soft dry cloth to wipe the video recorder.
- (2) If it is difficult to wipe away the blemish, clean with soft cloth dipped in moderate detergent and then air-dry it.

7.1.2 Use and maintenance for the rechargeable battery pack

● The battery use for main unit

1. The output plug of adapter plugs into DC power input interface at the top of main unit to charge. The charge indicator is green and blinking state when charging; the charge indicator is green and no blinking when fully charged.
2. The charging time is about 6 hours, over-charging or discharging will shorten the battery life; the full charged battery can be used about 7.5 hours.
3. Battery is consumable; the battery cycle-life is based on the times of charge and discharge as unit. When the use time reduced significantly compared with normal conditions, the battery should be promptly replaced.
4. The excess high or low temperature will affect the charging and discharging performance, and short the battery life and capacity.

⚠ Attention: Power indicator in the bottom of image area will appear “” and glitter continually when the electric quantity is too low. Connect the main unit to external power supply and recharge the battery, or turn off the machine to recharge.

● The battery use for wireless receiver

1. Only use battery pack of wireless receiver (model HYLB-1627) provided by KaiXin Company.
2. There are two ways to charge for wireless receiver (see the charge sketch map for wireless receiver battery):
 - Use USB port to charge: connect the USB line to “USB port” of wireless receiver on the left of it, the other end to the computer. The charge indicator is orange and blinking state when charging, the charging time is about 8 to 10 hours; the charge indicator is green and no blinking when fully charged.
 - Use power adapter to charge: Insert the output plug of adapter into DC power input port, which is on the left of wireless receiver. The charge indicator is orange and blinking state when charging, the charging time is about 8 to 10 hours; the charge indicator is green and no blinking when fully charged.
3. Over-charging or discharging will shorten the battery life; the full charged battery can be used about 4 to 5 hours.

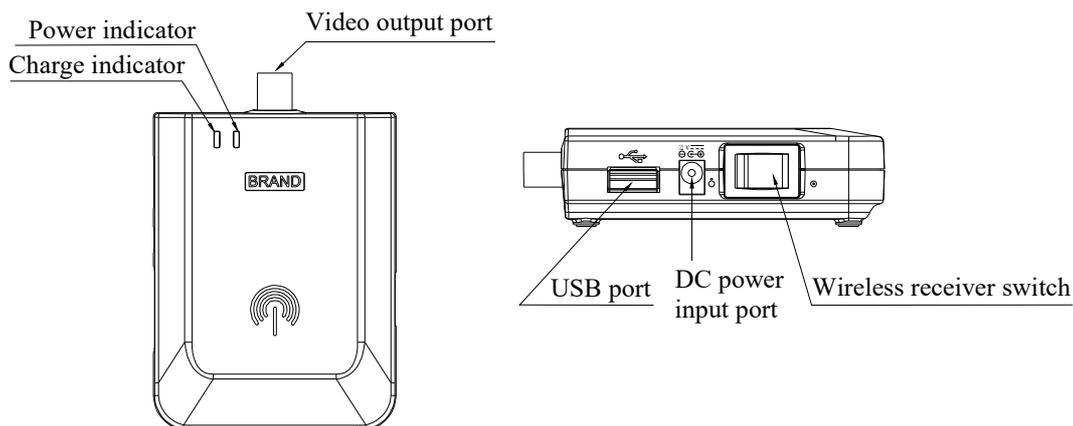


Fig. the charge sketch map for wireless receiver battery

● The battery use for wireless transmitter

1. Only use battery pack of wireless transmitter (model HYLB-1627) provided by KaiXin Company.
2. The battery charging for the wireless transmitter is the same as the wireless receiver. When using the USB port or power adapter charging, the charging time of the wireless transmitter battery is about 8-10 hours.
3. Over-charging or discharging will shorten the battery life; the full charged battery can be used about 4 to 5 hours.

⚠ Attention: Battery is consumable; the battery cycle-life is based on the times of charge and discharge as unit. When the use time reduced significantly compared with normal conditions, the battery should be promptly replaced.

⚠ Attention: Don't throw away the exhausted battery anywhere; especially throw it in the fire. Please deal with it according to local statutes. Use pollution degree II to deal with.

⚠ Attention:

1. Do not throw the battery into water or be wet, which will lead to the battery leakage, explosion or fire;
2. Do not use or store the battery near the heat source, such as fire or heater, which will lead to the battery leakage, explosion or fire;
3. Do not connect the anode and cathode reversely, which will lead to the battery leakage, explosion or fire;
4. Do not heat up or throw the battery into fire, which will lead to the leakage, explosion or fire;
5. Do not connect the anode and cathode with any metal or conductor; do not transport or store the battery together with necklaces, hairpins or other metal objects, which will lead to the leakage, explosion or fire;
6. Do not hammerblow, throw or mechanically shake the battery, which will lead to the leakage, explosion or fire;
7. Do not insert the battery with nail or other spiculate objects; do not hammerblow or trample the battery, which will lead to the leakage, explosion or fire;
8. Do not weld the battery terminal directly, which will lead to the leakage, explosion or fire;
9. Do not disassemble the battery in any way, which will lead to the leakage, explosion or fire;
10. Do not charge the battery near the heat source or extra-hot environment, which will lead to the leakage, explosion or fire;
11. Do not put the battery into the microwave oven or pressure vessel, which will lead to the leakage, explosion or fire;
12. Do not mixed use the battery together with one-off battery (such as dry battery), or different capability or different model or different brand battery, which will lead to the leakage, explosion or fire;
13. Do not use the abnormal battery with particular smell or abnormal heat or distortion or turn colors or abnormal phenomena, which will lead to the leakage, explosion or fire;
14. Do stop the charge and pull out the battery from the charger at once if any abnormal phenomenon happens to the battery, such as particular smell or abnormal heat or distortion or turn colors. Otherwise, each of above will lead to the leakage, explosion or fire;
15. Do remove the battery from the near fire if any leakage or particular smell happens, which will lead to the leakage, explosion or fire;
16. If any leakage splash into eye, do not wipe the eye, instead of washing it and get help from the doctor as soon as possible. Otherwise, the eye will be injured;
17. Do not use the battery in the extremely hot environment, such as hot sunshine or in the car when it is too hot, because these will catch fire, even worsen its performance and shorten its life;
18. If use the battery beyond the listed environment on the manual, it will worsen its performance or shorten its life, even lead to extreme heat or explosion or fire.

7.2 Troubleshooting

To ensure normal operation, users are recommended to prepare a proper maintenance and regular examination plan to regularly check on product safety performance. If any abnormality occur, timely contact International Trade Dept of Kaixin for support.

If the following problems occur on starting up the machine, try to make corrections following the method in the table. If the problem remains unsolved, contact International Trade Dept of Kaixin for support.

Trouble	Correction
Power light is off and no screen display is present when starting the machine.	1. Check power supply. 2. Check power cable and connector. 3. Check power adapter.
Intermittent stripe, snow, or far-field interference appears on screen.	1. Check power supply.(spark interference present) 2. Check environment.(source of interference around the machine, such as electric motor, ultrasonic atomizer, automobile, computer or other interference) 3. Check power plug/socket of the instrument or probe connectors. They shall be properly contacted.
Image display is not clear.	1. Adjust the total gain, near field, far field. 2. Adjust the brightness and contrast level of the display.
Control panel malfunction	Restart the system by turning off the main unit power.

7.3 Periodic Safety Checks

To ensure the system performance and safety, it must be checked after using 1 year. When check the instrument, please consult the International Trade Dept of Kaixin or its dealers, as they need to have professional technology engineers.

1. The following safety checks should be performed at least every 12 months by a qualified person who has adequate training, knowledge, and practical experience to perform these tests.
 - Inspect the equipment and accessories for mechanical and functional damage.
 - Inspect the safety relevant labels for legibility.
 - Inspect the fuse to verify compliance with rated current and breaking characteristics.
 - Verify that the device functions properly as described in the instructions for use.
 - Test the protection earth resistance according to IEC 60601-1: Limit: 0.1Ω .
 - Test the earth leakage current according to IEC 60601-1: Limit: NC300 μ A, 300 μ A (for UL) SFC: 1000 μ A.
 - Test the touch current according to IEC 60601-1: Limit: NC 100 μ A, SFC: 500 μ A.
 - Test the patient leakage current according to IEC 60601-1: Limit: for a.c.: 100 μ A (B), for d.c.: 10 μ A (B).
 - Test the patient leakage current under single fault condition with mains voltage on the applied part according to IEC 60601-1: Limit: for a.c.: 500 μ A (B), for d.c.: 50 μ A (B).

The leakage current should never exceed the limit. The data should be recorded in an equipment log. If the device is not functioning properly or fails any of the above tests, the device has to be repaired.

2. Please clean the plug of power cord at least once a year. Too much dust on plug may cause the fire.

Chapter Eight Storage and Transportation

Storage and Transportation

1. If the instrument is stored over 3 months, take out the instrument from the packing case, connect it to power supply for 4 hours, and then disconnect the power and place it in the case again following the direction indicated by arrows on the package. Store the case in the warehouse. Do not pile the case. The instrument case should have adequate space from ground, walls and ceiling of the warehouse.
2. Environment requirement
Ambient temperature: $-20^{\circ}\text{C} - 55^{\circ}\text{C}$; Relative humidity: 30%—93% (without condensation);
Atmospheric pressure: 700hPa-1060hPa. The warehouse should be well ventilated and free of direct sunlight and corrosive gas.
3. Shockproof measures have been taken inside the packing case to allow for transport by air, railway, land and sea. The goods shall not be exposed to poor weather conditions like rain and snow, nor shall the goods be placed upside down, bumped, knocked or over-stacked.

Chapter Nine Safety Classification

1. Classified according to electric shock protection type:
Class I, internally powered equipment
2. Classified according to electric shock protection degree:
Type B applied part
3. Classified according to the degree of protection against ingress of liquid:
Main unit belong to IPX0 equipment
4. Classified according to operation safety in condition of existence of flammable anesthetic mixture with air or oxygen or nitrous oxide:
It is neither of category AP equipment nor of category APG equipment
5. Classified according to mode of operation:
Continuous operation equipment
6. Classified according to the protection of radio services:
Group I Class A equipment

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Information contained in this manual is subject to change without further notice.