

# VV-100 Vein Viewer

## User Manual

Shenzhen Enmind Technology Co.,Ltd.

### **Preface**

#### **1. Application Scope**

Applicable to VV100 Vein Viewer of our company.

This User Manual describes the product's most complete configuration, accessories and functions may not exist in the product of the user, for more detailed information, please contact manufacturer.

#### **2. Applicable Object**

It is applicable to professional trained nurse, doctor, and maintenance technician of this equipment.

### 3. Use Instructions

This User Manual covers the basic information on the safety and effectiveness of the product for guiding the operator to correctly install, test, operate, use and maintain the product. Please read this manual thoroughly before use and use the product in a correct way. Please carefully keep the User Manual for future use.

Our company is responsible for the reliability and performance of the equipment only all following conditions are met:

- Use the equipment according to this Use Manual.
- The equipment can only be disassembled, assembled, replaced, tested, improved and repaired by the professional technicians of our company.
- All components and accessories as well as consumables for repairing are provided by manufacturer.

### 4. Description on Revision of User Manual

The copyright of this User Manual belongs to Shenzhen ENMIND Technology Co., Ltd. Without permission any institute or individual are prohibited to copy, modify or translate the contents speculated in this User Manual.

This User Manual will be revised subject to product improvement, laws updating or instructions improving basing on the preconditions of meeting related laws and regulations, and all revised records will be stated in the new version.

Version	Revising Date	Revised Content
V1.0	2019.1.25	First Edition
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# Chapter 1 Safety Instruction

## 1.1 Warning

- Before using, please check the equipment, connecting wire and accessories to ensure that it can work normally and safely. If there's anything abnormal, immediately stop working and contact our after sale service department. Additionally, the adhesion or intrusion of fluid/drug may possibly cause the equipment fault and malfunction. Therefore, please clean the equipment after use, and store it correctly.
- It is not allowed to put and use the equipment in the environment with anesthetic and other inflammable or explosive articles to avoid fire or explosion.
- It is not allowed to store or use the equipment in the environment with active chemical gas (including gas for disinfecting) and moist environment since it may influence the inside components of the vein viewer and may possibly cause performance drop or damage of the inside components.
- This equipment must be operated by trained professional medical care personnel.
- It is not allowed to disassemble or refit this equipment or use it for other purposes except locate vessel map.
- No one is allowed to repair this equipment except our company or the authorized repair technician of our company.

## 1.2 Equipment safety classification:

- According to electrical safety: Class I BF equipment;
- According to the protection of harmful liquid intake: common equipment;
- According to the use environment: non-AP, APG equipment
- According to operation mode: continuous operation
- According to the way of disinfection and sterilization: equipment provided in a non-sterile way

## 1.3 Electromagnetic interference:

The electromagnetic interference of this product is very low, and it generally does not interfere with nearby electronic equipment and other equipment. In order to further reduce the risk of mutual interference, please keep away from other electronic devices as far as possible.

## 1.4 Environmental protection:

When discarding products, packaging materials or accessories at the end of product life, make sure that the discarded products do not pollute the environment or are disposed of in accordance with relevant laws and regulations.

## 1.5 Symbols

Not all of the below symbols are existed in the equipment you have purchased.

Marks	Description	Marks	Description
	Caution		Type BF Marker
	Protective earth (ground)		Equipment power switch

# Chapter 2 Product Description

## 2.1 Definition

Venipuncture is a commonly used medical method. This blood vessel imaging device can make it easier for doctors and nurses to find veins, improve the success rate of venipuncture in children and obese people, and reduce the pain caused by the failure of venipuncture.

## 2.2 Working Principle

This product is developed on the basis of the specific absorption spectrum of deoxyhemoglobin. When infrared light irradiates human tissues, deoxyhemoglobin in vein has more obvious absorption effect than surrounding tissues, which leads to less reflection of infrared light. CMOS camera is used to collect infrared image of subcutaneous veins. After photoelectric conversion and software filtering, enhancement and segmentation of the image, the vein image which can be distinguished by naked eyes is generated. Shadow-light path will return the processed venogram to the image acquisition point of skin surface in the form of visible light, so that the venous information of skin surface can be more clearly displayed, thus effectively assisting venous localization. Image projection speed 12 frames/s

Based on the above principle, the blood vessel imaging system realizes the display of subcutaneous veins which are difficult to see. It can be used to assist the localization and display of superficial blood vessels in dorsum of hand, dorsum of foot, elbow bend and scalp.

## 2.3 Application Scope

This product is mainly used for the observation and search of superficial subcutaneous vessels in venipuncture departments and varicose operation rooms, and assists medical staff in venipuncture operations such as venipuncture examination, transfusion and blood drawing. 3 different image size are selectable, suitable for adults, pediatric and neonate.

## Chapter 3 Appearance

### 3.1 Front View



① Display

② Menu [UP]

③ Select [FORWARD]

④ Menu [DOWN]

⑤ Select [BACK]

⑥ Power

### 3.2 Back View



①

②

① Camera

② Stand Connector

## 3.3 Display



3.3.1 Size: S(Small)/M(Medium)/L(Large)

3.3.2 Color:

3.3.2.1 Normal Mode

White/Yellow/Pink/Red/Light Blue/Green/Deep Blue

3.3.2.2 Enhancement Mode

Purple/Blue/Yellow

3.3.3 Inverse Mode: Inverse/Non Inverse

3.3.4 Brightness:

L(Low)/M(Medium)/H(High)

## Chapter 4 Use Instruction

- 1) The instrument was placed about 15-25CM above the patient's puncture site. The lens is aligned to the applicable location and blood vessels. Turn on the power supply, press the power button for a long time until the boot-up interface appears on the screen, the machine starts to work, and the projector lights up. When light is projected onto the skin, the projected skin shows an image of the subcutaneous veins and blood vessels.
- 2) If the image is not clear enough and the blood vessel can not be distinguished clearly, the projection image can be clearer by adjusting the distance between the instrument and the patient or the relative angle between the lens and the patient's position.
- 3) The projection size, brightness, color, anti-color and other parameters can be adjusted according to the actual requirements during the use of the equipment. The parameters of the selected options can be adjusted by the upper and lower keys according to the menu on the screen (the upper and lower keys switch

different options, and the left and right keys adjust the parameters of the selected options). The system automatically memorizes the last set of color and anti-color parameters, without having to reset each boot.

- 4) If you need to shut down the device, press the power button for a long time until the system has a shutdown interface. At this time, loosen the power button.
- 5) About charging: insert the micro USB data line into the tail end of the host and connect the 5V 2A adapter. The system will charge automatically.
- 6) Charging time battery is 3 hours .

## Chapter 5 Transportation and Storage

- 1) Shocks, severe vibration and dampness should be prevented during transportation. Transportation requirements are stipulated in the order contract.
- 2) Conditions of transport and storage:

Packed venous imaging equipment should be stored in a non-corrosive gas and well ventilated room.

- A) ambient temperature range: - 40 ~55 C;
- B) Relative humidity range: 10%-95%;
- C) Atmospheric pressure range: 50 kPa-106 kPa

## Chapter 6 After Sale Service

This product offers 18 months free warranty after purchase. The warranty period is from the installation date listed on the “Warranty Card”. The “Warranty Card” is the only voucher for calculating the warranty period, in order to maintain your benefit, please carefully fill into and keep the “Warranty Card”, and hand over the copy for the company to the installation technician.

The damages of the equipment caused by the following shall not enjoy free warranty service.

- 1) Fault caused by incorrect operation, unauthorized refitting or repair.
- 2) The damages caused by incorrect operation during the transportation process after purchase.

3) The fault and damages caused by fire, salt injury, toxic gas, earthquake, windstorm, flood, abnormal voltage and other natural disasters.

For the damages or faults mentioned above, our company provides repair services but charge at repair cost.

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