



# GIMA

PROFESSIONAL MEDICAL PRODUCTS

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# **GIMA ABPM PULSE RATE MONITOR WITH SpO<sub>2</sub>**

## **User Manual**



**ATTENTION: The operators must carefully read and completely understand the present manual before using the product**



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## **Chapter1**


# **INTRODUCTION**


- For an overall introduction to the monitor, please refer to General Information.
- For basic operating instructions, please refer to Button Function.
- For allocation of interface sockets, please refer to Interfaces.


 **Warning**  
Possible explosion hazard if used in the presence of flammable anesthetics or other flammable substance in combination with air, oxygen-enriched environments, or nitrous oxide.

 **Warning**  
You must verify if the device and accessories can function safely and normally before use.


 **Warning**  
Ensure that the environment in which the device is operated is not subject to any sources of strong electromagnetic interference, such as radio transmitters, mobile telephones, etc. Keep them far away. High level electromagnetic radiation emitted from such devices may greatly affect the monitor performance.

 **Warning**  
The disposal of scrap instrument and its accessories and packings (including battery, plastic bags, foams and paper boxes) should follow the local laws and regulations.

 **Warning**  
Please choose the accessories and probe which are approved or manufactured by the manufacturer, or else it may damage the device.

 **Warning**  
Dispose of the packaging material, observing the applicable waste control regulations and keeping it out of children's reach.

 **Warning**  
The monitor is only for use on one patient at a time.

 **Warning**  
It is recommended that you check if there is any damage on the monitor or the accessories regularly, if you find any damage, stop using it, and contact the biomedical engineer of the hospital or our

Customer Service immediately.

In addition, the overall check of monitor, including the safety check such as the leakage current, should be performed only by qualified personnel once every 12 months.

**Note**

Please choose the computer which should be ensured compliance with the requirements of IEC 60950, or else it may damage the device.

**Note**

The software was developed per IEC60601-1-4. The possibility of hazards arising from errors in the software program is minimized.

**Caution**

At the end of its service life, the product described in this manual, as well as its accessories, must be disposed of in compliance with the guidelines regulation the disposal of such products. If you have questions concerning disposal of the product, please contact us or its representatives.

## 1.1 General Information

### Environment:

Temperature	
Working	5~40 (°C)
Transport and Storage	-20~60 (°C)
Humidity	
Working	≤ 80 %
Transport and Storage	≤ 95 %
Altitude	
Working	-500 to 4,600m (-1,600 to 15,000ft)
Transport and Storage	-500 to 13,100m (-1,600 to 43,000ft)
Power Supply	3 (V) DC Pmax = 2.56VA

### General instruction

The monitor not only measure the ambulatory blood pressure, but also monitor the parameters of NIBP and SpO<sub>2</sub>. But it is applicable for adult only. It integrates parameter measuring modules function and display function in one device, featuring in compactness, lightweight.

The POWER switch is on the front panel. The RUN indicator and the ALARM indicator flash one time when the device is powered on. The ALARM indicator flashes when alarm occurs. The sockets of the sensors are at the top. USB is at the bottom of monitor.

This monitor is a user-friendly device with operations conducted by a few buttons on the front panel. Refer to Button Functions for details.

Measuring the ambulatory blood pressure function:

In this mode, the monitor can work 24 hours continuously. The monitor have the capable of recording up to 4800 measurements, the stored readings in the monitor are downloaded into the computer to proceed the function including editing the data, editing the trend graph, statistic, displaying the information, editing the diagnostic information, setting the parameters and printing and so on. However, this monitor cannot transmit data real-time in the process of measuring.

### Monitoring function:

#### NIBP

- From left to right, there are Systolic pressure, Mean pressure and Diastolic pressure (unit: mmHg or kPa)

#### SpO<sub>2</sub>

- SpO<sub>2</sub> (unit: %)
- Pulse Rate (unit: beats/minute) (When “BOTH” item is selected)



#### Note

In this mode, the length of working time continuously is decided by the interval of measurement set by the user.

It is useful that the software at the state of monitoring as the ambulatory blood pressure.  
Refer to Software Functions for details.

## 1.2 Button Functions

All the operations to the monitor are through the buttons at the bottom of the panel. The names of the buttons are above them. They are:



### POWER

Press the button and the system will start.



### Note

When the battery is low, the alarm occurs.



### MENU

Whatever levels of menu the system is in, press the button and the system immediately executes a certain function.




### UP

Press the button to select the menu item and modify the setup.



### DOWN

Press the button to select the menu item and modify the setup. In the main interface press this button less than 1second to enter alarm pause status. Press “DOWN” for 1 second to enter the silence status and a  symbol appears at main screen. When the system is in silence status, any newly generated alarm will discharge the silence status and make the system give normal alarm status.



### Note

Pulse tone will be heard in Silence status, If new alarm occurs in Alarm Silence status, the system will discharge Silence status automatically, or the silence status will be discharged automatically 1 minute later.



### NIBP

Press to inflate the cuff to start a blood pressure measurement. When measuring, press to cancel the measurement and deflate the cuff.

### Method to use the button to operate in the screen:

The rectangular mark in the screen that moves with the UP button or DOWN button is called “cursor”. Operation can be performed at any position at which the cursor can stay.

When the item is not to select, the cursor is white; when press MENU to select the item, the cursor become red.

### 1.3 Interfaces

For the convenience of operation, the different kinds of interfaces are in different parts of the monitor.

At the top is the Socket for SpO<sub>2</sub> Sensor and socket for NIBP cuff

- 1 the Socket for NIBP cuff
- 2 the Socket for SpO<sub>2</sub> Sensor

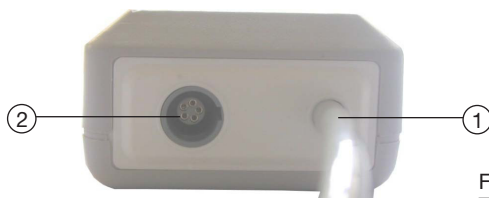


Figure 1.3.1  
Top

At the bottom is the socket for USB, as shown in Figure 1.3.2.  
the Socket for USB



Figure 1.3.2  
Bottom

### 1.4 Accessories

- A a cuff for adult
- B a usb data line
- C a oximeter probe (Model: SpO<sub>2</sub>-01-DR)
- D a disk (PC software)
- E a pouch
- F a user manual



#### **Warning**

Please use the accessories supplied by the manufacturer or replace the accessories according to the requirements of the manufacturer in order to avoid making harms to patients.

## **Chapter 2**

### **GETTING STARTED**

- Open the package and check
- Dry battery installation
- Power on the monitor
- Connect patient sensors

#### **2.1 Open the Package and Check**

Open the package and take out the monitor and accessories carefully.

Keep the package for possible future transportation or storage.

Check the components according to the packing list.

- Check for any mechanical damage.
- Check all the cables, modules and accessories.

If there is any problem, contact the distributor immediately.

#### **2.2 Dry battery installation**

The monitor will be supplied with two 'AA' alkaline batteries or high capacity.

Before using the monitor you shall put the battery in the box of battery.



##### **Note**

When you don't use the monitor, you will take out the dry battery.

#### **2.3 Power on the monitor**

Press POWER to power on the monitor. The indicator will flash, the system will enter monitoring screen of monitoring or ABPM, and you can perform normal monitoring now. Refer to System Menu for details.



##### **Warning**

If any sign of damage is detected, or the monitor displays some error messages, do not use it on any patient. Contact biomedical engineer in the hospital or our Customer Service Center immediately.



##### **Note**

Check all the functions that may be used to monitor and make sure that the monitor is in good status.

## 2.4 Connect Oximeter Probe



### Note

For information on correct connection, refer to Figure 2.4



THE SpO<sub>2</sub> PROBE

Figure 2.4

## 2.5 Connect NIBP Cuff

Connect NIBP extension conduit between the monitor and the patient.



### Note

For information on correct connection, refer to Figure 2.5.



THE CUFF

Figure 2.5

## Chapter3

### FUNCTION INTERFACE

- Main Interface
- System Menu

#### 3.1 Main Interface

Press POWER to power on the monitor, The indicator will flash, the system will enter the main interface successfully.

ABPM : If there is no key-press operation within the time set in the BACKLIGHT TIME item, the monitor will enter standby mode.

RUN indicator light flashes once every other 2 seconds, indicating the monitor is under working mode.

Monitoring Mode: BACKLIGHT TIME item setup is of no effect. The backlight is bright all the time.

The '04' will be displayed in the middle of the speaker and battery when the power is low.

The main interface is shown as the follow:



Figure 3.1.1  
ABPM main menu



Figure 3.1.2  
Monitoring main menu



### Note

When the register is full, will be appearance at the top of screen.  
The note of the last value needs to be cleared.

## 3.2 System Menu

Press the MENU button on the panel to call up the [SYSTEM MENU].  
You can perform option operations by using UP and DOWN buttons.





Figure 3.2  
System menu

[PM BP SETUP], [PM SpO<sub>2</sub> SETUP] and [SpO<sub>2</sub> TABLE] are gray in the mode of ABPM. They cannot be set up.

### 3.2.1 System Setup

Select the SYSTEM SETUP item in the [SYSTEM MENU].  
The following menu will pop up.



Figure 3.2.1  
System setup

Users can set up the system time by selecting the [TIME] item.  
If users select [YES] in the [DEFAULT] item, the monitor will come back to factory default.  
In the [LANGUAGE] item, users can select the words shown in Chinese or English in the screen.

If users select [ON] in the [ALARM] item, the loudspeaker turns on.



will be appeared in the main monitoring interface. On the other hand, when users select [OFF], the loudspeaker turns off,



will turns up.

In the [NEW PATIENT] item, if users select [OFF], the “Clear the last value?” dialog box will appear.

Select [YES] again will delete the measure record of the last patient, then select [NO] back to the [SYSTEM SETUP MENU]. Else, selecting [NO] at first, the monitor will do nothing. Please pay attention to this function. Users can select PM or ABPM in the [FUNCTION SELECT] item and correspond measures will be taken.

In the [BACKLIGHT TIME] item, users can make it from 5 to 120 seconds with 5 seconds per step. Its function is to control the backlight time of the main interface in ABPM.

Under the ABPM, [DEFAULT], [ALARM] and [NEW PATIENT] cannot be set up.

### 3.2.2 BP SETUP

Select [PM BP SETUP] in the[ “SYSTEM MENU”]. The following menu will pop up.



Figure 3.2.2  
BP setup

When users select [ON] in the [AUTO MEASURE] item, the Monitor will measure blood pressure according to the time selected in the [INTERVAL] item. When [OFF] is selected, manual measure is needed, simultaneously [INTERVAL] item turns gray and cannot be set up.

The interval time (Unit: minute) setup in the [INTERVAL] item can be selected from the following options: 5, 10, 15, 20, 30, 45, 60, 90.

The alarm is on or off according to the high and low limits which have been set up. When the pressure higher than the high limit or lower than the low limit, the alarm will occur. [SYS ALM], [MEAN ALM] and [DIA ALM] can be processed separately.

The adjustable ranges of the high and low limits of the alarm are as follows:

DIA ALM: 40~270 mmHg

SYS ALM: 10~215 mmHg

MEAN ALM: 20~235 mmHg

### 3.2.3 SpO<sub>2</sub> SETUP

Select [PM SpO<sub>2</sub> SETUP] in the “SYSTEM MENU”.

The following menu will pop up.



Figure 3.2.3  
SpO<sub>2</sub> setup

For the [PULSE SOUND] item, you can choose its state. When it is “ON”, pulse sound plays while the monitor measure the ambulatory blood pressure. When it is “OFF”, pulse sound doesn’t play while the monitor measure the ambulatory blood pressure.

For the [SpO<sub>2</sub> ALM HI/LO] item, you can set up [SpO<sub>2</sub> ALM H] and [SpO<sub>2</sub> ALM LO]. Alarm occurs, when SpO<sub>2</sub> value overflows.

For the [PR ALM HI/LO] item, you can set up [PRALM HI] and [SpO<sub>2</sub> ALM LO]. Alarm occurs, when PR value overflows.

SpO<sub>2</sub> and PR ALARM analysis alarm limits:

PARAMETERS	Max. HI	Min. LO	Step
SpO <sub>2</sub>	100	0	1
PR	254	0	1

### 3.2.4 Patient Information

Pick the [ABPM INFO] item in the “SYSTEM MENU” to call up the following menu.

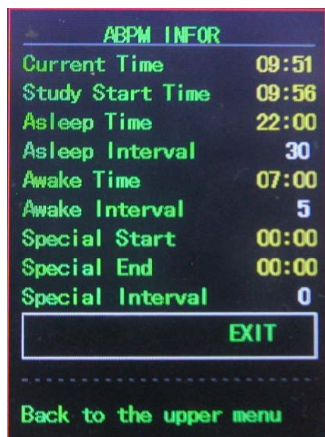


Figure 3.2.4  
ABPM infor

The information in this interface can't be changed, until reinstall the parameter in software.

### 3.2.5 BP TABLE

Pick the [BP TABLE] item in the “SYSTEM MENU” to call up the following menu.

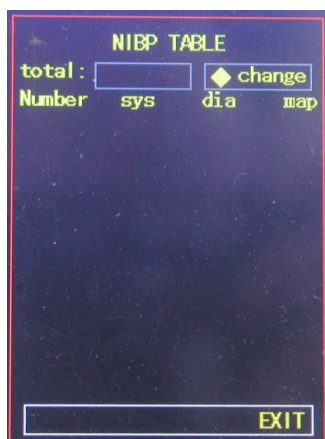


Figure 3.2.5.1  
NIBP table

[total]: the number is the total of all data have been measured from accessing this interface the first time. The sequence number of the current first line will

be displayed when changing the data or turning over pages. Every page can contain 10 data at most.

Select the [change] item to enter the [Change The Number] menu:

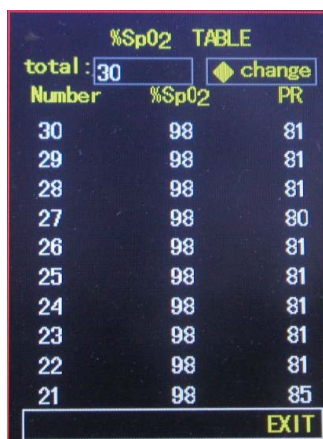


Figure 3.2.5.2  
Change

When the number which you input is more than the total, it will prompt "> total". Blood pressure measure one time per 5 minutes, and the most number of times is 4896.

### 3.2.6 SpO<sub>2</sub> TABLE

Pick the [SpO<sub>2</sub> TABLE] item in the "SYSTEM MENU" to call up the following menu.



Number	%SpO2	PR
30	98	81
29	98	81
28	98	81
27	98	80
26	98	81
25	98	81
24	98	81
23	98	81
22	98	81
21	98	85

Figure 3.2.6.1  
SpO<sub>2</sub> table

[total]: the number is the total of all data have been measured, while accessing this interface for the first time. The sequence number of the first line currently will be displayed, while changing the data or turning over page. Every page can contain 10 data at most.

Select the [change] item to enter the [Change The Number] menu:



Figure 3.2.6.2  
Change

When the number which you input is more than the total, it will prompt ">total". The blood pressure is measured once per 1 s, and the most number of times is 183000.

### 3.2.7 DEMO function

Select the [DEMO] item to enter DEMO status. In the DEMO status, press the "MENU KEY", and system returns to the "MAIN MENU".



Figure 3.2.7  
Demo

**Note**

In clinical application, this function is forbidden because the DEMO will mislead the medical staff to treat the DEMO waveform and parameter as the actual data of the patient, which may result in the delay of treatment or mistreatment.

When it is ambulatory blood pressure state, [PM BP SETUP] [PM SpO<sub>2</sub> SETUP] and [TABLE] can't be changed in the "MAIN MENU".

## **Chapter 4**


### **SpO<sub>2</sub> MONITORING**


#### **4.1 What is the SpO<sub>2</sub> Monitoring**


SpO<sub>2</sub> Plethysmogram measurement is employed to determine the oxygen saturation of hemoglobin in the arterial blood. If, for example, 97% hemoglobin molecules in the red blood cells of the arterial blood combine with oxygen, then the blood has a SpO<sub>2</sub> oxygen saturation of 97%. The SpO<sub>2</sub> numeric on the monitor will read 97%. The SpO<sub>2</sub> numeric shows the percentage of hemoglobin molecules which have combined with oxygen molecules to form oxyhemoglobin. The SpO<sub>2</sub>/PLETH parameter can also provide a pulse rate signal and a plethysmogram wave.

#### **How the SpO<sub>2</sub> / PLETH Parameter Works**


- Arterial oxygen saturation is measured by a method called pulse oximeter. It is a continuous, non-invasive method based on the different absorption spectra of reduced hemoglobin and oxyhemoglobin. It measures how much light, sent from light sources on one side of the sensor, is transmitted through patient tissue (such as a finger or an ear), to a receiver on the other side.  
The sensor measurement wavelengths are nominally 660nm for the Red LED and 940nm for Infrared LED. Maximum optical power output for LED is 4 mW.
- The amount of light transmitted depends on many factors, most of which are constant. However, one of these factors, the blood flow in the arteries, varies with time, because it is pulsating. By measuring the light absorption during a pulsation, it is possible to derive the oxygen saturation of the arterial blood. Detecting the pulsation gives a PLETH waveform and pulse rate signal.
- The SpO<sub>2</sub> value and the PLETH waveform can be displayed in the main screen.

 **Warning**  
ES (Electrosurgery) equipment wire and SpO<sub>2</sub> cable must not be tangled up.


 **Warning**  
Do not put the sensor on extremities with arterial catheter or venous syringe.


 **Note**  
Do not perform SpO<sub>2</sub> measuring and NIBP measuring on same arm at one time, because obstruction of blood flow during NIBP measuring may adversely affect the reading of SpO<sub>2</sub> value.

## **4.2 Precautions during SpO<sub>2</sub>/Pulse Monitoring**

 **Note**  
☒ Make sure the nail covers the light window;  
The wire should be on the backside of the hand.

 **Note**  
SpO<sub>2</sub> waveform is not proportional to the pulse volume.

 **Warning**  
Do not use the SpO<sub>2</sub> sensor once the package or the sensor is found damaged. Instead, you shall return it to the vendor.

 **Warning**  
Prolonged and continuous monitoring may increase jeopardy of unexpected change of dermal condition such as abnormal sensitivity, rubescence, vesicle, repressive putrescence, and so on. It is especially important to check the sensor placement of neonate and patient of poor perfusion or immature dermogram by light collimation and proper attaching strictly according to changes of the skin. Check per 2~3 hours the sensor placement and move it when the skin deteriorates. More frequent examinations may be required for different patients.

## **4.3 Monitoring Procedure**

SpO<sub>2</sub> plethysmogram measurement

1. Switch on the monitor.
2. Attach the sensor to the appropriate site of the patient finger.
3. Plug the connector of the sensor extension cable into the SpO<sub>2</sub> socket, please pay attention to the direction of the sensor.
4. Please pull out the sensor When measure is over.



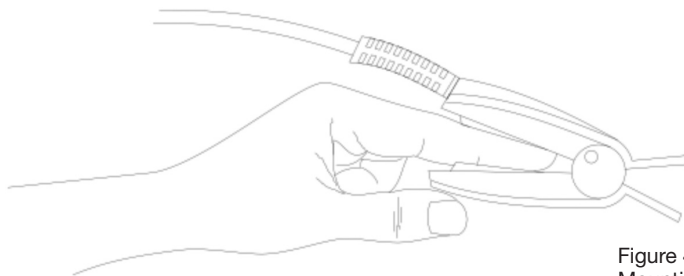


Figure 4.3  
Mounting of the sensor

## **4.4 Maintenance and Cleaning**

### **Care and Cleaning**



#### **Warning**

Turn off the monitor before cleaning the monitor or the sensor



#### **Warning**

Do not subject the sensor to autoclaving.

Do not immerse the sensor into any liquid.

Do not use any sensor or cable that may be damaged or deteriorated.

#### **Cleaning:**

- Use a cotton ball or a soft mull moistened with hospital-grade ethanol to wipe the surface of the sensor, and then dry it with a cloth. This cleaning method can also be applied to the luminotron and receiving unit.
- The cable can be cleaned with 3% hydrogen dioxide, 70% isopropanol, or other active reagent. However, connector of the sensor shall not be subjected to such solution.

## **Chapter 5**

### **NIBP MONITORING**

#### **5.1 Introduction**

- The Non-invasive Blood Pressure (NIBP) module measures the blood pressure using the oscillometric method.
- There are two modes of measurement available: manual and automatic. Each mode displays the diastolic, systolic and mean blood pressure.
- In the MANUAL mode, only one measurement is conducted for each time.
- In the AUTO mode, the measurement is cycled; you can set the interval time to 5/10/15/20/30/45/60/90 minutes.

**Warning**  
Prolonged non-invasive blood pressure measurements in Auto mode may be associated with purport, ischemia and neuropathy in the limb wearing the cuff. When monitoring a patient, examine the extremities of the limb frequently for normal color, warmth and sensitivity. If any abnormality is observed, stop the blood pressure measurements.

**Warning**  
1. You must not perform NIBP measurements on patients with sickle-cell disease or under any condition which the skin is damaged or expected to be damaged.  
2. For a thrombasthenia patient, it is important to determine whether measurement of the blood pressure shall be done automatically. The determination should be based on the clinical evaluation.

## 5.2 NIBP Monitoring

**Warning**  
Do not apply the cuff to a limb that has an intravenous infusion or catheter in place. This could cause tissue damage around the catheter when infusion is slowed or blocked during cuff inflation.

**Warning**  
Make sure that the air conduit connecting the blood pressure cuff and the monitor is neither blocked nor tangled.

1. Plug in the air hose and switch on the system.
  2. Apply the blood pressure cuff to the patient's arm or leg following the instructions below (Figure 5.2).
- Ensure that the cuff is completely deflated.
  - Apply the appropriate size cuff to the patient, and make sure that the symbol "Φ" is over the appropriate artery. Ensure that the cuff is not wrapped too tightly around the limb. Excessive tightness may cause discoloration and eventual ischemia of the extremities.

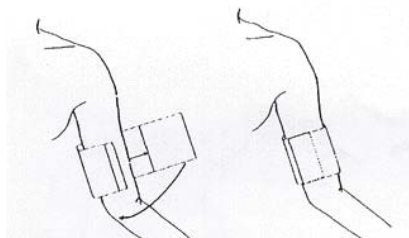


Figure 5.2  
Applying Cuff


**Note**

Don't let the cuff contact with skin directly, but the thickness of clothes shouldn't be more than 3 cm.


**Note**

The width of the cuff should be either 40% of the limb circumference (50% for neonates) or 2/3 of the upper arm length. The inflatable part of the cuff should be long enough to encircle 50-80% of the limb. The wrong size of cuff can cause erroneous readings. If the cuff size is in question, then use a larger cuff.

Size of reusable cuff for neonate/children/adult

Patient type	Limb perimeter	Cuff width	Hose
Adult	25 ~ 35 cm	14 cm	1.5 m o 3 m
Large Adult	33 ~ 47 cm	17 cm	
Thigh	46 ~ 66 cm	21 cm	

- Make sure that the cuff edge falls within the range of mark <->. If it does not, use a larger or smaller cuff that fits better.
- 3. Connect the cuff to the air hose. The limb chosen for taking the measurement should be placed at the same level as the patient's heart. If this is not possible you should apply the following corrections to the measured values:
  - If the cuff is placed higher than the heart level, add 0.75 mmHg (0.10 kPa) for each inch of difference.
  - If it is placed lower than the heart level, deduct 0.75 mmHg (0.10 kPa) for each inch of difference.
- 4. Press the NIBP button on the front panel to start a measurement.

### 5.3 NIBP Message and Explanations

Messaggio	Spiegazione	Causa
02	Self-test failure	Probe or A/D sampling error
06	Loose cuff	Cuff is not connected correctly
07	Air leakage	Air leakage in the valve or airway
08	Atmospheric pressure error	Valve cannot be open
09	Signal is too weak	Il misuratore non riesce a rilevare la pressione o il bracciale non è allacciato bene.
10	It is over the range	Object measuring blood pressure is over the measurement rang
11	Excessive movement	When measuring, signal the presence of excessive movement or pseudo-differential interference
12	Overpressure	Cuff pressure is over the scope, ADU 290 mmHg
13	Saturated signal	Movement or other factors lead to too big signal amplitude
14	Air leakage	There is air leakage in the airway
15	System failure	There is something wrong with NIBP module, A/D sampling or soft of system after turning on the device
19	It spends too much time	Measuring is over certain specified time. When pressure of adult cuff is 200mmHg, it may spend 120s. If not, it may spend 90s

### 5.4 Maintenance and Cleaning



#### Warning

- Do not squeeze the rubber tube on the cuff.
- Do not allow liquid to enter the connector socket at the front of the monitor.
- Do not wipe the inner part of the connector socket when cleaning the monitor.

#### Reusable Blood Pressure Cuff

The cuff can be sterilized by means of conventional autoclaving, gas, or radiation sterilization in hot air ovens or disinfected by immersion in decontamination solutions, but remember to remove the rubber bag if you use this method. The cuff should not be dry-cleaned.

The cuff can also be machine-washed or hand-washed, the latter method may prolong the service life of the cuff. Before washing, remove the latex rubber bag, and for machine-washing, close the Velcro fastening. Allow the cuff to dry thoroughly after washing, then reinsert the rubber bag.

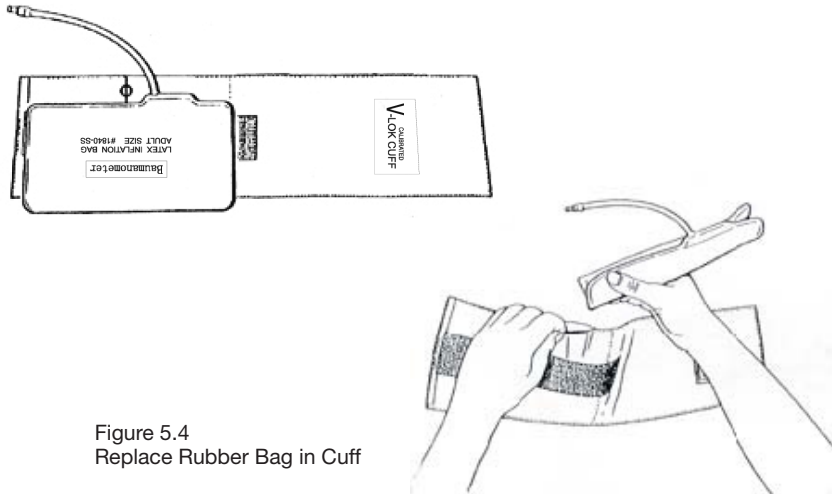


Figure 5.4  
Replace Rubber Bag in Cuff

To replace the rubber bag in the cuff, first place the bag on top of the cuff so that the rubber tubes line up with the large opening on the long side of the cuff. Now roll the bag lengthwise and insert it into the opening on the long side of the cuff. Hold the tubes and the cuff and shake the complete cuff until the bag is in position. Thread the rubber tubes from inside the cuff, and out through the small hole under the internal flap. Disposable Blood Pressure Cuffs

Disposable cuffs are intended for one-patient use only. Do not use the same cuff on any other patient. Do not sterilize or use autoclave on disposable cuffs. Disposable cuffs can be cleaned using soap solution to prevent infection.









#### Note

For protecting environment, the disposable blood pressure cuffs must be recycled or disposed properly.

## 5.5 Transportation and storage

- A. The packed device can be transported by ordinary conveyance or according to transport contract. The device cannot be transported mixed with toxic, harmful, corrosive material.
- B. The packed device should be stored in room with no corrosive gases and good ventilation. Temperature: -20°C~60°C; Humidity: ≤95%

## 5.6 Key of Symbols

Signal	Description
	Warning – See User Manual
SYS	Systolic pressure
MEAN	MEAN pressure
DIA	Diastolic pressure
%SpO2	The pulse oxygen saturation (%)
PR	Pulse rate (bpm)
	Close the sound
	Open the alarm sound indication
	Close the alarm sound indication
	Type BF
SN	Serial number
	1. the finger clip falls off (no finger inserted) 2. probe error 3. signal inadequacy indicator
IPX1	Ingress of liquids rank

## Chapter 6

### INSTALLATION OF THE SOFTWARE

- Demand of editor
- Installation of software

#### 6.1 Demand of Editor

**Processor:** Pentium IV 1.8G or more

**Operation System:** Win2000/XP/VistaXP

**EMS memory:** 256M and up

**Hard Disk:** 40G or more

**Display:** 17 inch or more

**CD-ROM**

**Serial port**

**Resolution of printer:** 600 DPI

## **6.2 Installation of Software**

- 1 Place the CD-ROM in the CD-ROM compartment located on your computer.
- 2 If Auto Play for CDs is enabled, place CD in reader and follow instructions when they appear in the screen; otherwise follow install instructions below:

Open Windows Explorer.

Click on the root CD-ROM directory.

Double click file PM50\_Patient\_Monitor\_V1.2\_Setup.exe.

Follow the instructions in the screen.

## **Chapter 7**

### **INTRODUCTION TO THE SOFTWARE**

#### **7.1 User register**

Each time you open the software will appear the following dialog box for the user's name. Type in user's name. To change user go to "File" then click on "Change User". This feature is available to allow each user to store his or her own configurations, such as thresholds.

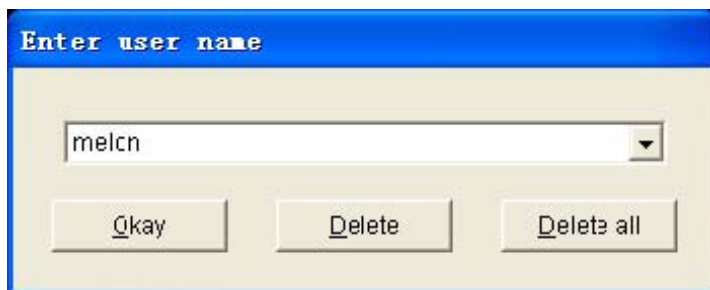


Figure 7.1.1  
User Register

Click “Delete” button will delete the current selected user info and configuration. Click “Delete all” Button will delete all users info and their configurations.

If you are a new user, click “Okay” Button will appear the following dialog box.

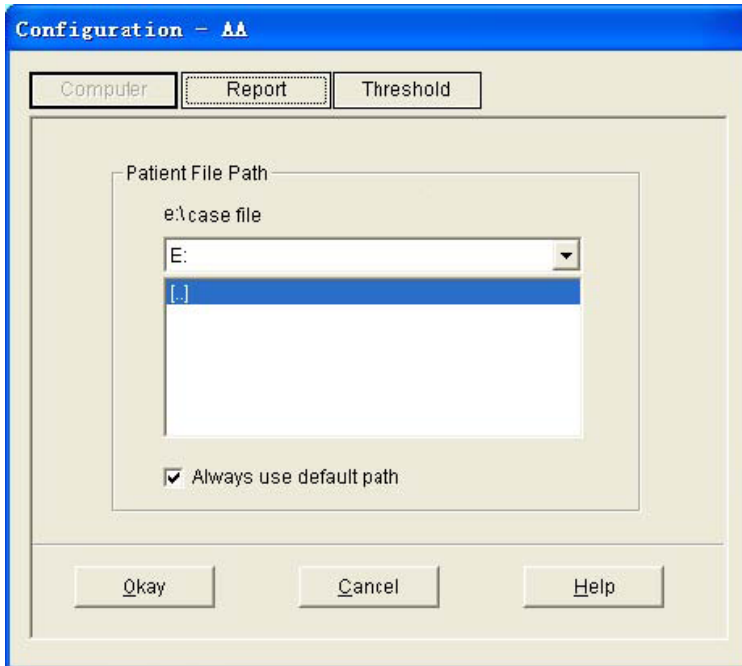


Figure 7.1.2  
Set file path

“Patient File Path”: Choose the downloading route of your case. As soon as the data are downloaded in computer, the case document will save this path. If you check the “Always use default path” checkbox, then data searches will always begin at the default path. If the checkbox is not checked, then data searches will always begin at the last path used.



## 7.2 The main interface

When the settings of the user's configuration information are finished, the main interface is entered, as the following pictured displayed:

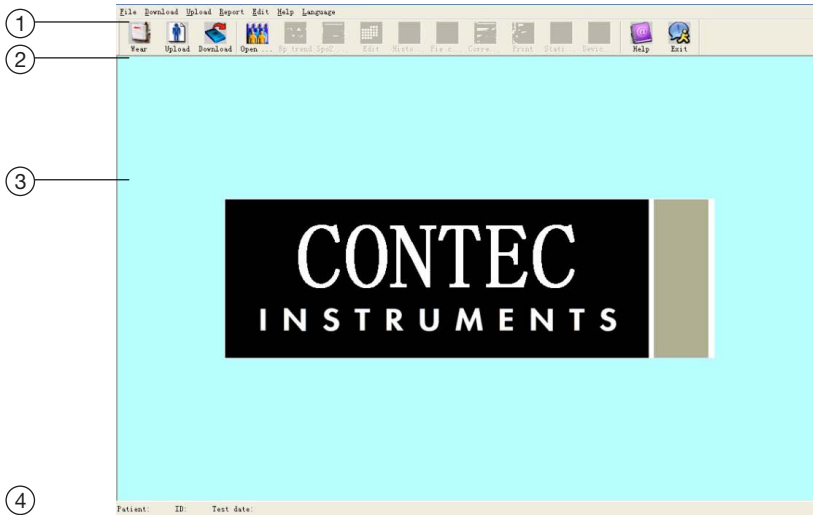



Figure 7.2  
The main  
operating  
interface

1. **Menu bar** - The main operating menu of this software
2. **Toolbar** - Shortcut keys for functions of frequent use
3. **Displaying areas of the trending pictures** - After choosing the case which is edited, it is used for displaying the trending picture.
4. **Status bar** - Display the name, ID, and the data collecting date of the patient.

## 7.3 Wear

Press the shortcut key  will pop up the following dialog box.

You can wear the device according to the picture above.  
Please read the "Note" Carefully before use.

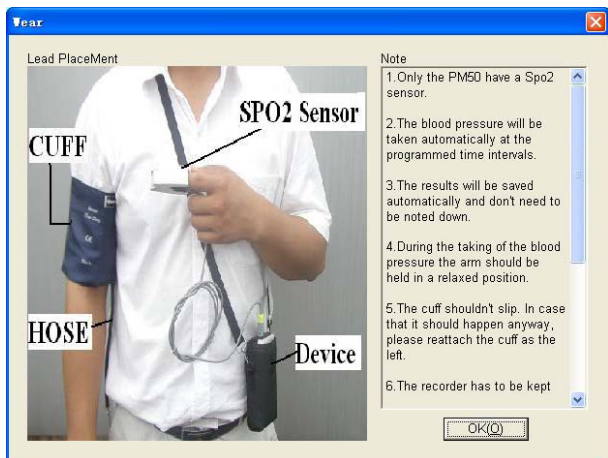


Figure 7.3  
Wear


## 7.4 Design the measurement plan



**Note:** Before you upload the test parameters to the device, make certain:

1. The device is connected to the computer via the serial port.
2. The device is turned on.

### Steps:

1. Press the shortcut key , or from the menu select “Upload”, the following dialoga box will appear.

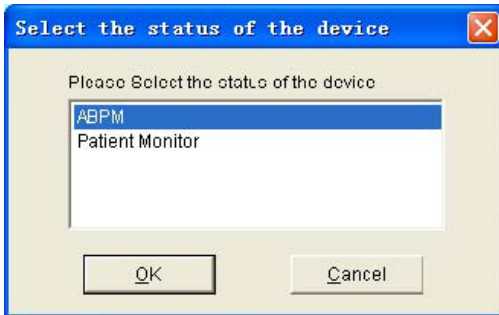


Figure 7.4.1  
Select the status of the device

2. If the item you choosed is “ABPM” the following dialog box will appear.

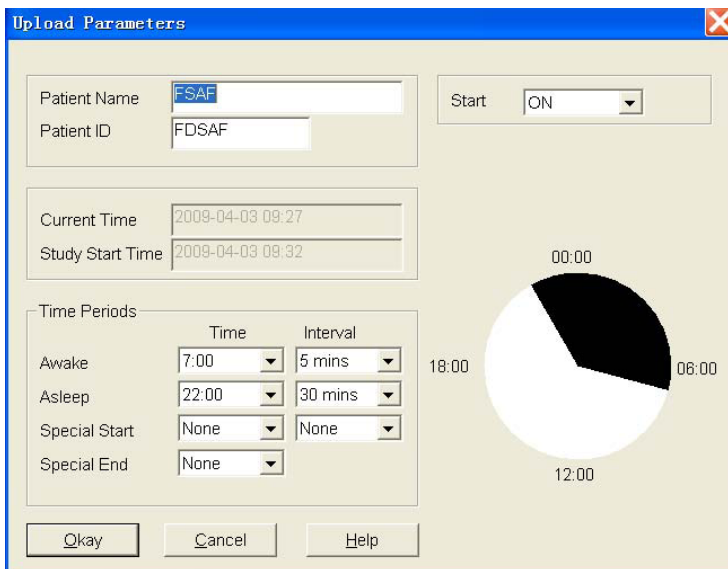


Figure 7.4.2  
Upload test parameters

**Patient Name, Patient ID:** mark the patient.

**Current Time:** That is the time of beginning to collect the parameter.

**Study Start Time:** Collecting start time. It defaulted in the 5 minutes after setting the collecting parameter.

**Start key:** Whether supporting the manual collecting.

**Time Periods:** Among that, Awake refers to the patient in the un-sleeping situation, and Asleep refers to the sleeping situation.

**Special Start** and **Special End** are optional items.

You can set the fixed time to collect the data. Interval setting refers to the intervals of the collecting time. To reduce the impact of the patient's sleep, settings of the general collecting intervals are longer.

Take the above picture as an example: the range of un-sleeping time is 7:00-22:00, the range of sleeping time is 22:00-7:00, the intervals of the un-sleeping time are 5 minutes, and the intervals of the sleeping time are 30 minutes.

The range of sleeping time, the range of un-sleeping time, the range special testing time are displayed by the picture forms in the right corner of the screen. Thus, it is convenient to design the parameter.

If the item you choosed is "Patient Monitor" the following dialog box will appear.

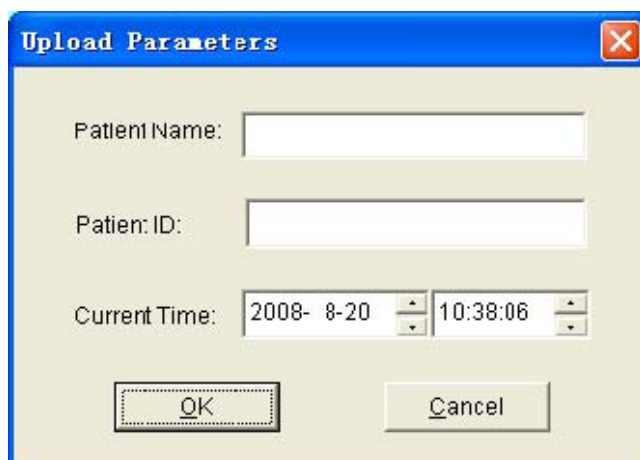


Figure 7.4.3  
Upload test parameters

3. Select the "OK" button will appear the following dialog box show the progress as the data is transferred.



Figure 7.4.4  
Uploading progress bar


## 7.5 Data download

Before you download the measurement data from device, make certain:

1. The device is connected to the computer via the serial port.
2. The device is turned on.
3. Disconnect the device from patient before you connecting it to any piece of hardware such as your personal computer (to avoid electric shock)

The downloaded patient data will be saved in your default computer path.

If you want to change the storage path, from the menu select “Download” and the select “Set file path”, and then the dialogue box(Figure 7.1.2) referred before will be showed up, operators can change the path.

Press the shortcut key , or from the menu select “Download” and then select “Do Download”

will appear the following dialog box. Permitting you select what data you want to download(ABPM data or Patient Monitor data ).

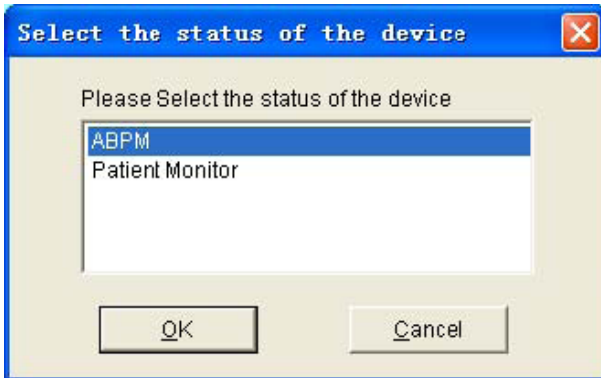


Figure 7.5.1  
Select the status of the device


The following dialog box will appear to show the progress as the data is transferred.



Figure 7.5.2  
Downloading progress bar

After completion, a dialog box will prompt for where the data file was saved.

## 7.6 Choose patient data to edit

Press shortcut key , or from the menu select “File” and select “Open data” the following dialog box will appear:

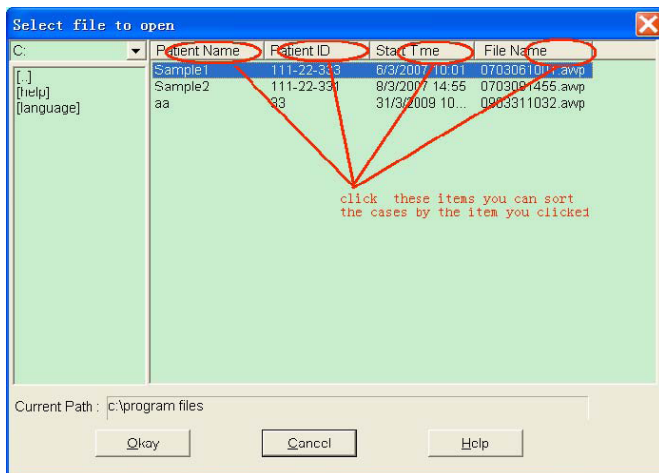


Figure 7.6  
Patient file select

The above dialog box lists the data files found in your current directory. You may use the drive and directory boxes to select a different drive or directory to search for patient files. Select a data file by highlighting the patient's name, and then press the "Okay" button. You may now edit the data.

## 7.7 Delete data file

If you feel some patient data are not necessary, you can delete them. From menu select "File" and then select "Delete Data" to show patient data delete interface which is similar to patient data select interface, showed as below:

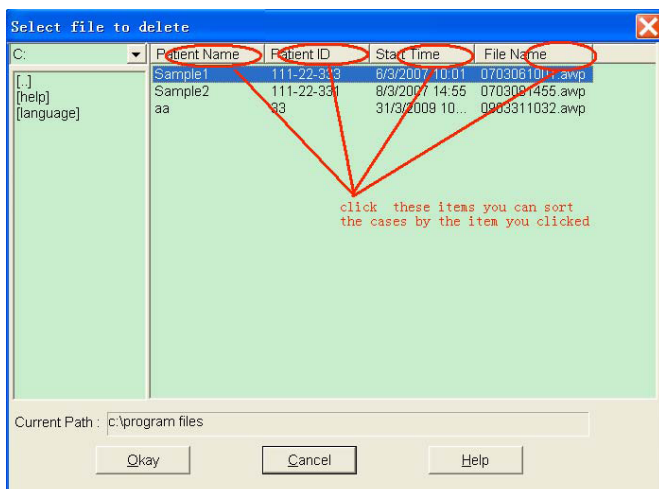


Figure 7.7  
Data file delete

You are able to delete one single file or some files at the same time, to delete some files at the same time; you could push “Ctrl”, and click the file you want to delete at the same time. After selection, click “Okay” button the “sure to delete” Dialog will appear. Click “YES” to complete the delete operation. If you want to cancel, please click “NO”.

## 7.8 Data file backup

Sometimes, you may want to save one original copy before you edit a file, under this situation, you should do patient data backup.

From the menu select “File” and then select “Copy data”, will appear the following dialog box, permitting you to select which data files to copy.

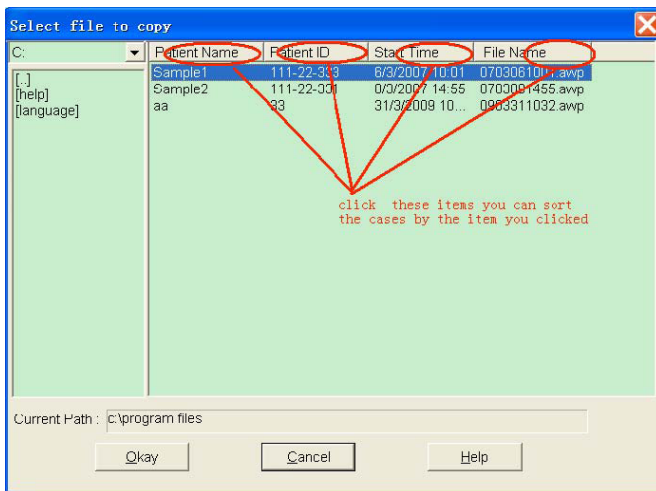


Figure7.8.1  
Data file copy

Select or deselect items by clicking on the rows using the mouse. When all desired selections have been made, select “Okay”.

The following dialog box will appear, permitting you to select the disk drive or directory to copy to.

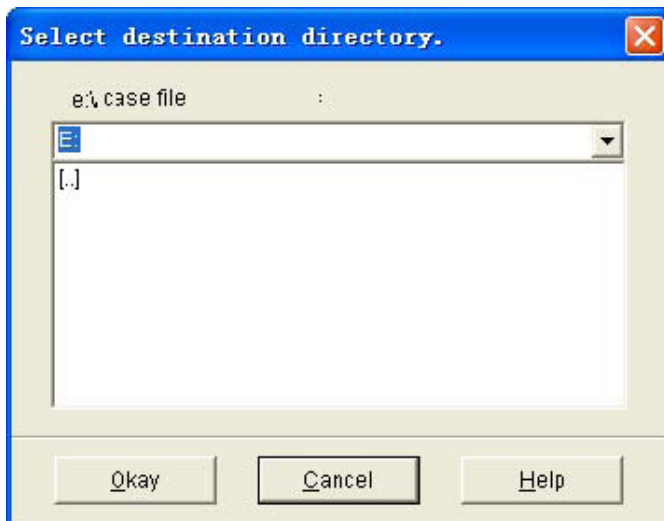



Figure 7.8.2  
Backup path settings

Once you have selected the destination drive or directory, select “Okay”. You may also select “Cancel” to end the dialog without copying patient data.

## 7.9 Edit Blood pressure data

Press the shortcut key , or from the menu select “Edit” and then select “Bp Data” the following dialog box will pop up.

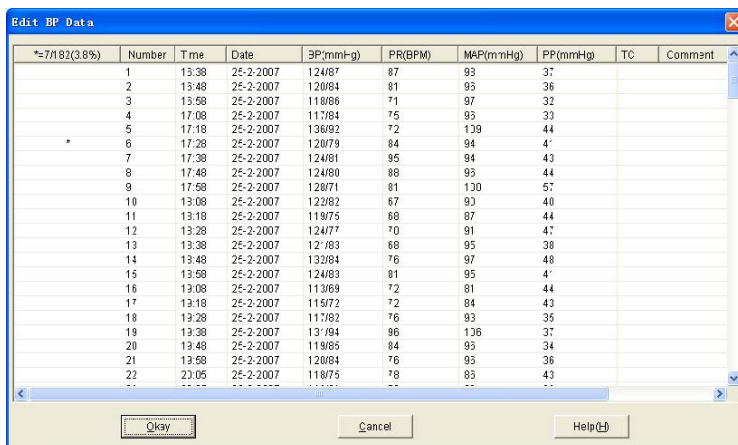


Figure 7.9  
Data edit page

All the BP readings are shown in the above dialog box.

**\*=7/182 (3.8%):** 182 represents the total data sum, 7 represents the data amount deleted, 3.8% stands for data present deleted.

**Number:** stands for data collection serial number.

**Time:** stands for collection time.

**Date:** stands for collection date.

**BP:** number before “/” stands for high blood pressure, number back “/” stands for low blood pressure.

**PR:** Pulse rate.

**MAP:** Mean pressure.

**PP:** Pressure difference between high and low blood pressure.

**TC:** error code (refer to chapter 9)

**Comment:** comment.

## 7.10 Trend Edit

### BP Trend Edit

When you selected the data file, the BP trend will be shown in the screen automatically. In other interfaces you can press shortcut key

enter the “BP trend” interface. The “Bp Trend” has two graph types: color filler type, dotted line type. You can switch from one graph type to another by push the “Graph Type” button.

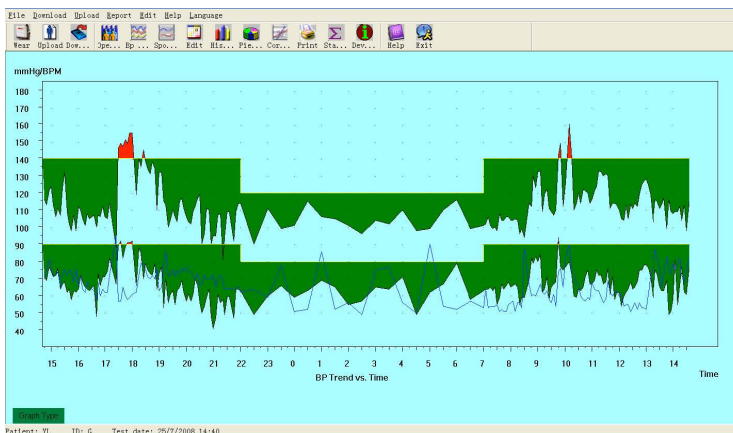


Figure 7.10.1  
Color filler type  
BP trend



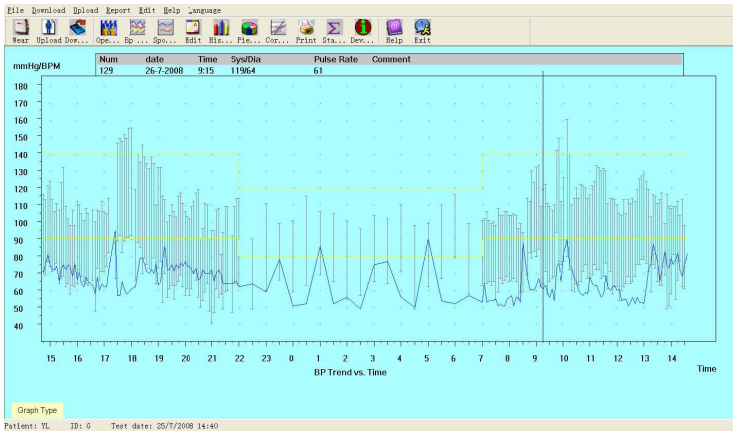


Figure 7.10.2  
Dotted line type  
BP trend

When you move the mouse on the trend area, on the top of the trend area the detail data information about the mouse points will show, including the data serial number, collection time and collection date, high/low blood pressure value, pulse rate, comment, etc. Press mouse' left button to delete or add the data point to be shown.

If the distance between the two data points is too short to move the mouse to one of the points, move the mouse to the time axis area, press the mouse' left button down, dragging the mouse to the right stretch the BP Trend. Of course you can also dragging the mouse to the left shrink the BP Trend. When you stretching the BP Trend, if the trend length beyond the trend show area will appear a horizontal scroll bar, you can see any part of the trend by changing the scroll bar's pos.

Move the mouse to the y-axis area, press the mouse' left button down, dragging the mouse to the top stretch the BP Trend. Of course you can also dragging the mouse to the bottom shrink the BP Trend.

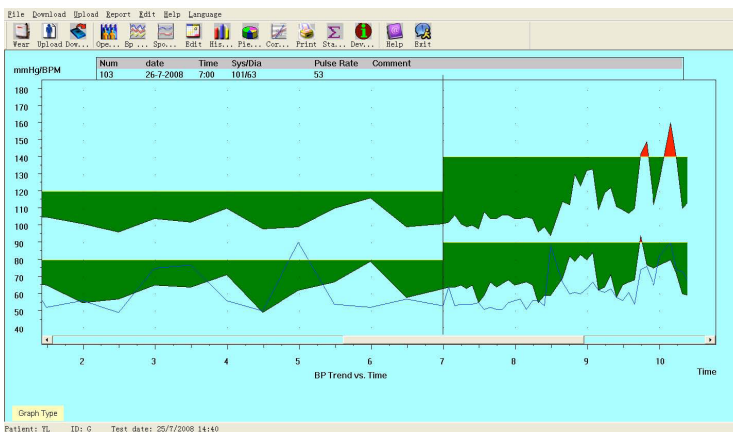


Figure7.10.3  
Stretch BP  
Trend(time axis)

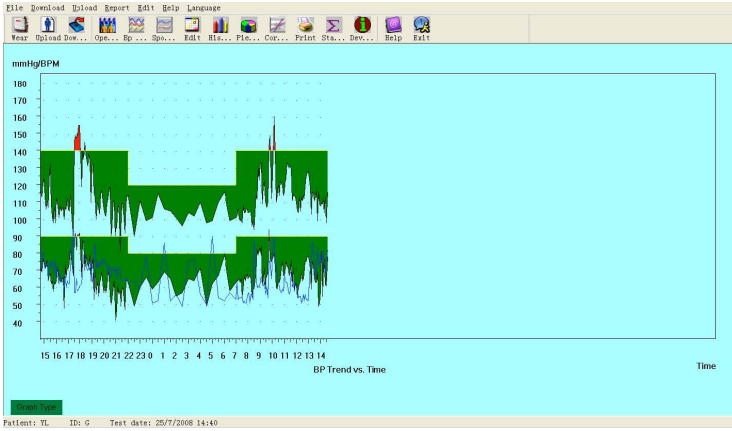


Figure7.10.4  
Shrink BP Trend  
(time axis)

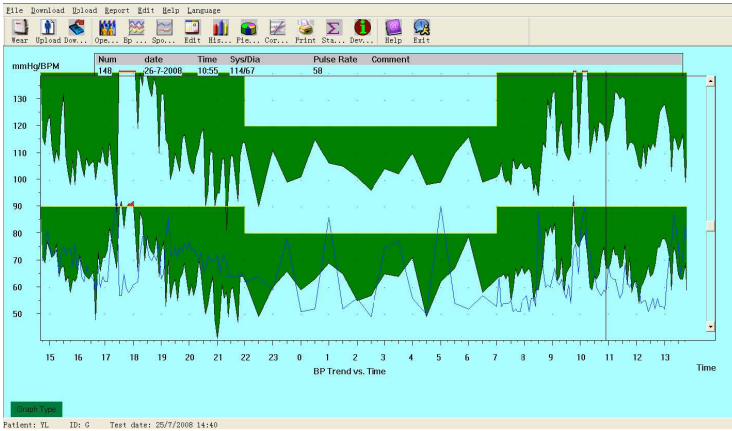


Figure7.10.5  
Stretch BP  
Trend(y-axis)

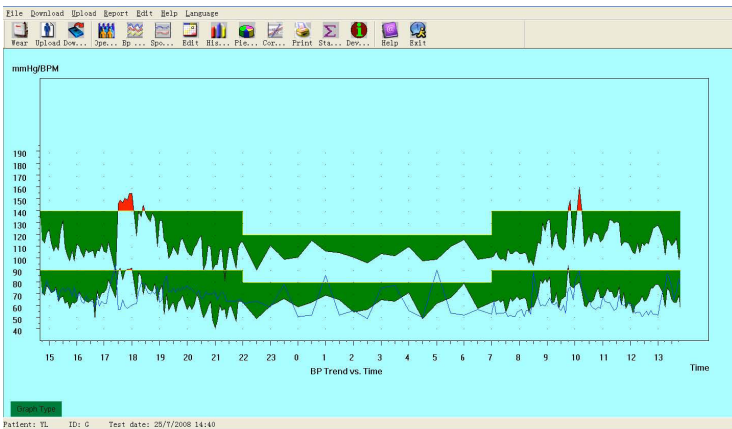


Figure7.10.6  
Shrink BP  
Trend(y-axis)

## SpO<sub>2</sub> Trend Edit

press the short cut key, will appear the SpO<sub>2</sub> trend interface.




Figure 7.10.7  
SpO<sub>2</sub> Trend


The following picture show different parts of the data area.

Move the mouse in the data area, you will see a yellow line, and on top of the data area is the “Selected data info”, where you will see the exact SpO<sub>2</sub> and pulse value according to the time. Along with the mouse move, the value will change accordingly.

The SpO<sub>2</sub> and pulse ruler lines show the exact value of the horizontal lines. You can reset these lines by keeping the mouse right button clicked on the “SpO<sub>2</sub> ruler” area or “Pulse ruler” area, and move the mouse.

This  4 buttons are used to set the page length,

that is how long data will be visible at the same time in the window area from left to right.

“1”: 1 minute. “10”: 10 minute. “60”: one hour.  : manual set, click this button will pop up a dialog box, and you can set the length you want.

This  4 buttons are used to move the data offset,

that is what time is at the left of the window.

“<<” and “>>” buttons move the offset back or forth by page length. If you select “1” as the page length, “>>” will move data time forward by 1 hour.

“<” and “>” buttons move the offset back or forth by step length. Step length is smaller than page size, 1 page often contains several steps, the steps are marked in the time area, and the time mark is marked each step length.

Click the “Parameters set” button will appear the following dialog box.



**Analysis Parameters**

**Spu2 Parameters**

Drop for Event (%)

Minimum Event Duration (sec)

Desaturation Criteria Level (%)

**Pulse Rate Parameters**

Rate Change For Event (bpm)

Minimum Event Duration (sec)

Figure 7.10.8  
Analysis parameters settings

The setup in the dialog box above indicates:

SpO<sub>2</sub> (desaturation) event: the SpO<sub>2</sub> value reduces at least 4% while the time keeps at least 10 seconds.

Pulse Rate event: the pulse rate fluctuates at least 6bpm while the time keeps at least 8 seconds.

## 7.11 Display the statistics information

Press the shortcut key  , or from the menu select

“Report” and the select

Stati...

“View Statistics” will pop-up the following dialog box.



**Statistics**

	Count	BP[mmHg]	PR [BPM]	PP[mmHg]
Awake	7	87.7/45.7	77.3	42.0
Asleep	0	0.0/0.0	0.0	0.0
Total	7	87.7/45.7	77.3	42.0

**BP Load**

	Sys%	Dia %	Threshold
Awake	0.0	0.0	140/90
Asleep	0.0	0.0	120/90
Total	0.0	0.0	

Figure 7.11  
BP statistics information

## 7.12 Edit of diagnose information.

Diagnose information including following items: Patient information, Interpretation, Current Medication and Physician information.  
From the menu select “Edit” and then select “Patient Data” will pop up the following dialog box.

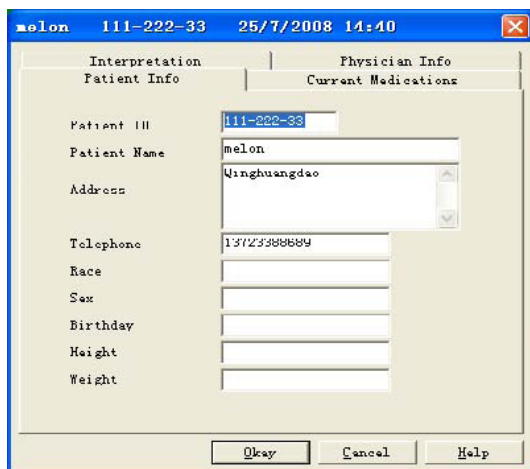


Figure 7.12  
Edit patient's information

click “Current Medications” switch to Current Medications interface,  
then you can modify the medications for the patient.  
click “Interpretation” switch to Interpretation interface.  
click “Physician Info” switch to the page of doctor’s advice.

## 7.13 Sleep period change

Sleep period includes: Awake time and asleep time. Because when collecting patient parameter, patient not always fall asleep and awake according to collection data protocol strictly, you may need change your sleep period. After setup of sleep period, the software will calculate the data automatically, update the BP Trend and recalculate the statistic data.



Figure 7.13  
Sleep period dialog box

## 7.14 BP Thresholds

After BP Thresholds being set up, the trend graph will renew automatically, statistic data will be recalculated.

From the view select “Edit” and then select “Thresholds” will appear the following dialog box.

Figure 7.14  
thresholds dialog box

The default, recommended thresholds for calculating Blood Pressure Load are 140/90 for awake periods and 120/80 for sleep periods. These are the defaults used when you select the Factory Defaults button.

## 7.15 Histogram

Press the shortcut key  , will appear the following interface:

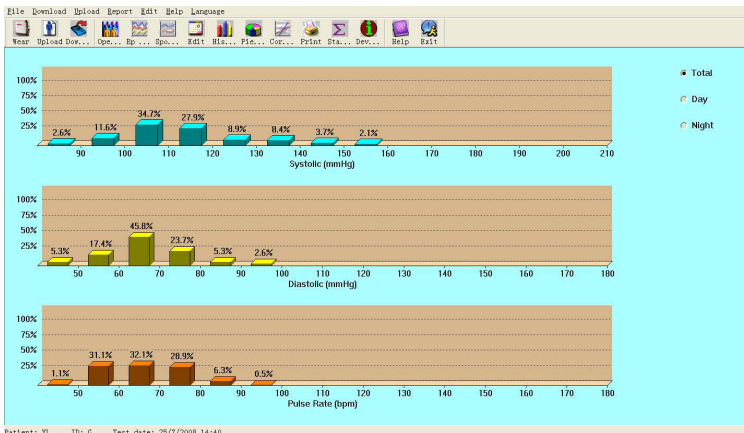


Figure 7.15  
Histogram

**All:** Show all BP data statistics.

**Day:** Show only daytime statistics.

**Night:** Show only nighttime statistics.

## 7.16 Pie chart

Press the shortcut key , will appear the following interface:



Figure 7.16  
Pie chart

You can adjust to show the percentage of above normal value, normal value and below normal value. On the left, some statistics can be displayed, such as BP value, PR maximum, minimum, and average value, etc.

**All:** Show all BP data statistics.

**Day:** Show only daytime statistics.

**Night:** Show only nighttime statistics.

## 7.17 Correlation line

Press the shortcut key , will appear the following interface:

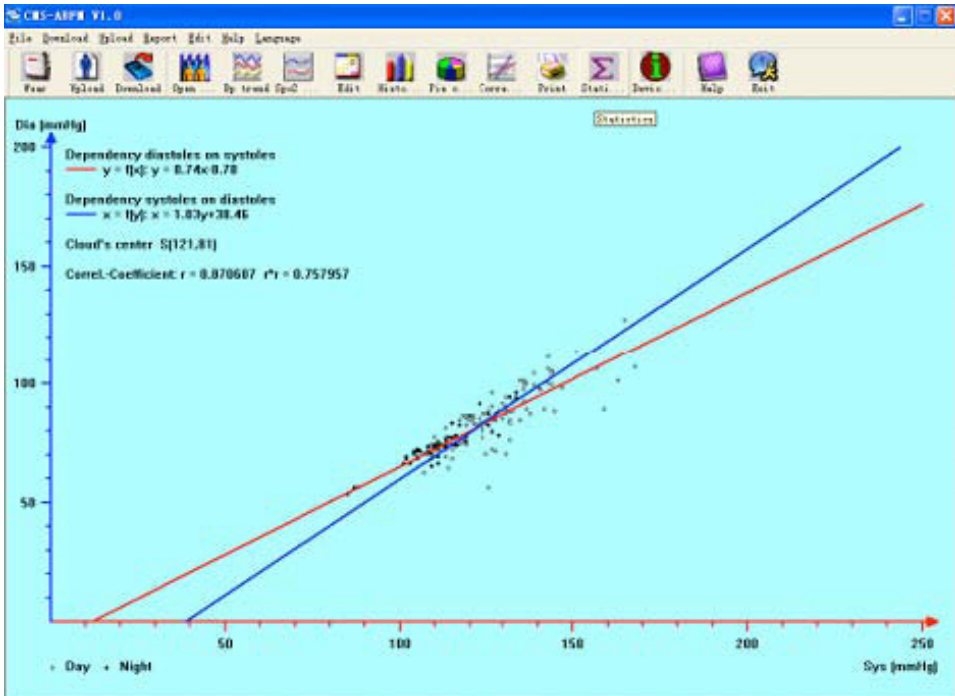


Figure 7.17  
Correlation line

Red line represents systolic; blue line represents diastolic. White small circle represents day time BP value; black small circle represents night time BP value.

Histogram Pie chart and Correlation line are useful for your observation about the data.

### 7.18 Print report

After previous data edit, diagnose information edit, trend edit, and so on, the software will create a series of diagnose reports, you can select these pages or some of them for printing. The information of your selection can be saved as default print page for next time.

From menu select "Report" and then select "Configure Report" Will appear the following dialog box:



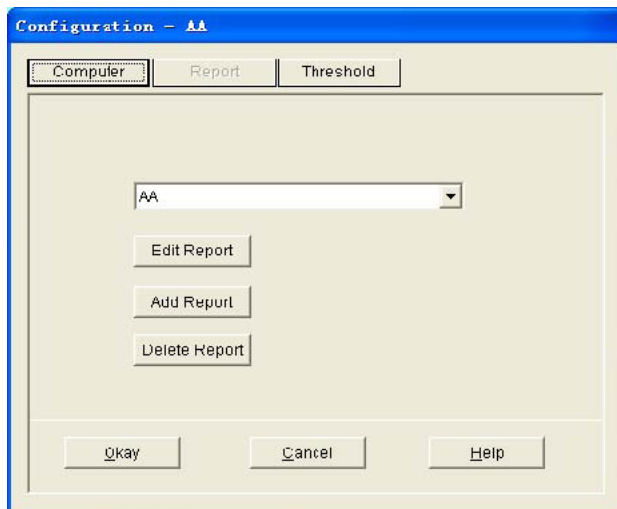


Figure 7.18.1  
Configure Report

You can select an already exist report for print, you may also click “Edit Report” edit the selected report.

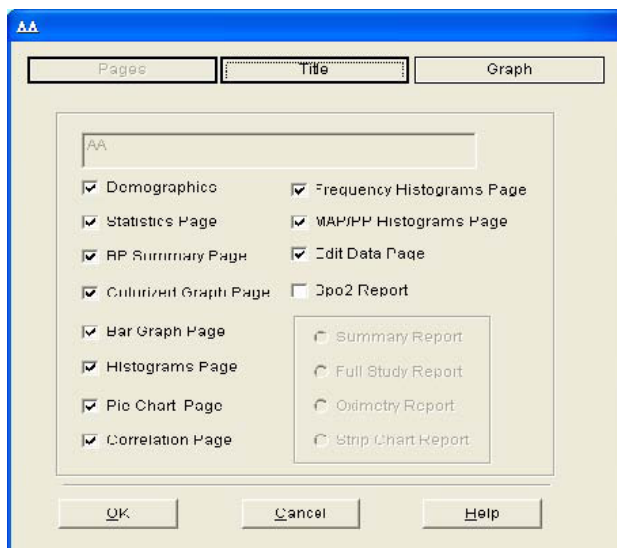


Figure 7.18.2  
Edit Report

You can select all pages or some of them for printing. Only when the data file include  $\text{SpO}_2$  data and you checked the “ $\text{SpO}_2$  Report” could print  $\text{SpO}_2$  report.



Click “Title” button, you may enter the title to print at the top of the printed report.

Of course you can also click “Add Report” add a new report. If you don’t need the current report, you can also click “Delete Report” to delete it. The default paper size is: A4, from the menu select “Report” and then select “Select printer”, you can select a printer. From the menu select “Report” and then select “Print preview”, you can preview the page you selected.

When you sure you want to print the report, press shortcut key , or from menu select “Report” and then select “Print”.



## 7.19 Help

Press shortcut key  will pop up help document. Meanwhile, you will find  in operation interface; click this button can also active the help document.

## Chapter 8 TROUBLESHOOTING GUIDE

Code	Description in Report Editor	Solution
1	No signal	Check position of cuff, tighten cuff
2	Overreach movement	Remain still during BP reading
4	Measurement timeout	Check air hose connections and make certain cuff is tight
85	Airway obstructed	Check air hose connections and make certain air tubing is not crimped
86	Measurement cancelled	Push START/STOP button to start reading
87	Cuff leak	Check air hose and cuff safety time-ou
88	Safety time-out	Retry reading, push START/STOP button. If problem persists return monitor for servicing
89	Cuff overpressure	Check for blocked or kinked air hose
90	Battery low	Replace batteries. If problem persists return for servicing
102	Self-check failed	Return for servicing
110	Out of range	Retry again, if problem persists return for servicing
115	System error	Return for servicing





**Disposal:** *The product must not be disposed of along with other domestic waste. The users must dispose of this equipment by bringing it to a specific recycling point for electric and electronic equipment. For further information on recycling points contact the local authorities, the local recycling center or the shop where the product was purchased. If the equipment is not disposed of correctly, fines or penalties may be applied in accordance with the national legislation and regulations.*

## **GIMA WARRANTY CONDITIONS**

Congratulations for purchasing a GIMA product. This product meets high qualitative standards both as regards the material and the production. The warranty is valid for 12 months from the date of supply of GIMA. During the period of validity of the warranty, GIMA will repair and/or replace free of charge all the defected parts due to production reasons. Labor costs and personnel traveling expenses and packaging not included. All components subject to wear are not included in the warranty. The repair or replacement performed during the warranty period shall not extend the warranty. The warranty is void in the following cases: repairs performed by unauthorized personnel or with non-original spare parts, defects caused by negligence or incorrect use. GIMA cannot be held responsible for malfunctioning on electronic devices or software due to outside agents such as: voltage changes, electro-magnetic fields, radio interferences, etc. The warranty is void if the above regulations are not observed and if the serial code (if available) has been removed, cancelled or changed. The defected products must be returned only to the dealer the product was purchased from. Products sent to GIMA will be rejected.