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# 1 Components

Remote & Mobile Ambulatory Blood Pressure Monitoring System monitors the blood pressure and uploads data to the server through an e+Health mobile phone in real time. It provides doctors and nurses with real-time data, and uploads emergency events (including events generated by pressing the emergency button and events generated when the blood pressure exceeds preset alarm value) to the server for alarming.

It consists of blood pressure collector, e+Health mobile phone and doctor workstation, as shown in Figure 1-1.

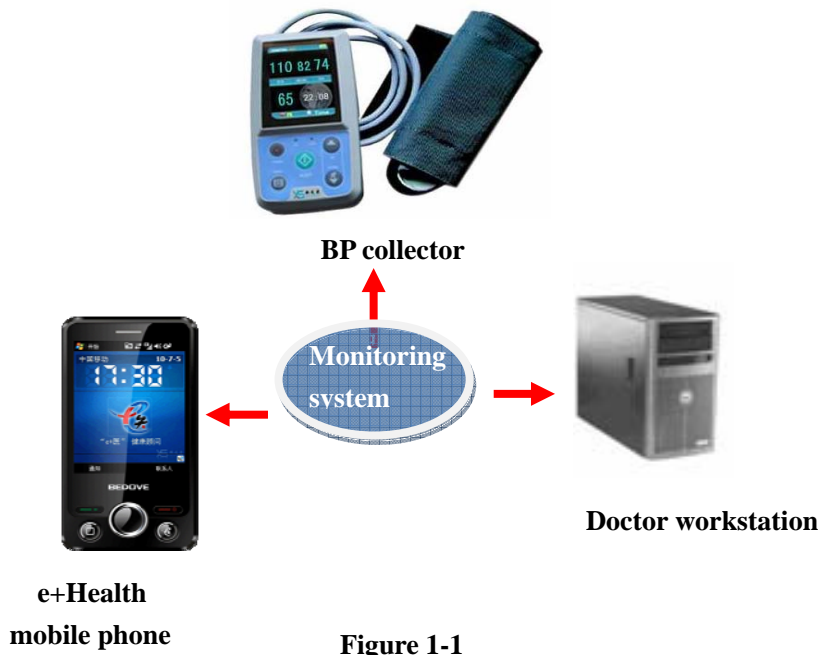


Figure 1-1

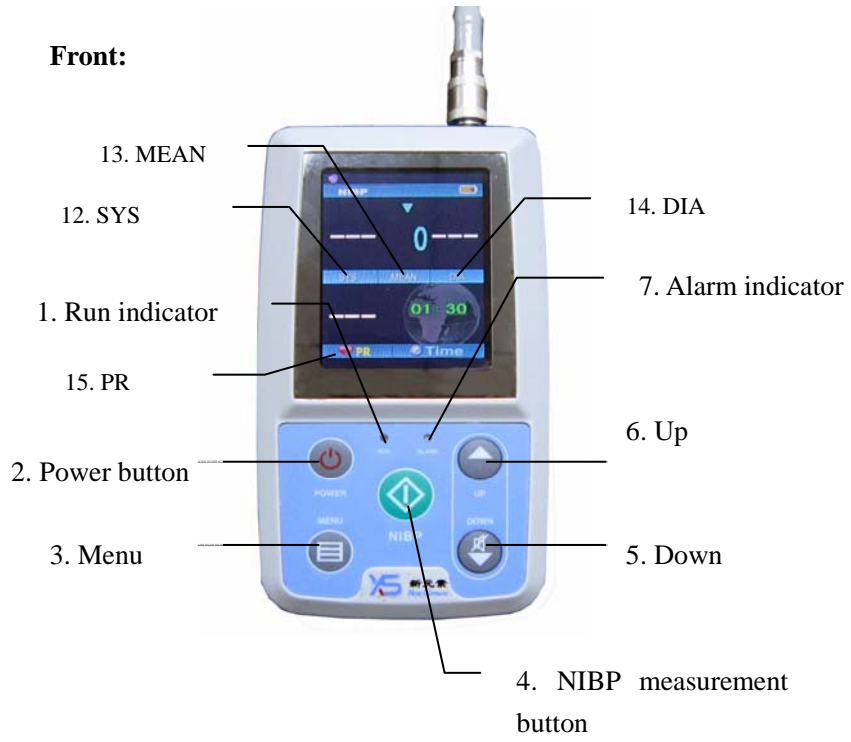
## 2 Introduction

### 2.1 Blood Pressure Collector

Blood pressure collector is the terminal of collecting blood pressure data. It connects the mobile phone via Bluetooth. Data transmitted includes blood pressure data, control information and parameters.

The appearance of the blood pressure collector is shown in Figure 2-1:

**Front:**



**Side:**



**Rear:**



**Figure 2-1**

Function and usage of each label and button are shown in Table 2-1:

**Table 2-1**

No.	Type	Name	Function
1	Indicator	RUN indicator	The Run indicator flashes once every three seconds, indicating the collector is working.

<b>No.</b>	<b>Type</b>	<b>Name</b>	<b>Function</b>
2	Button	Power button	Power switch of the blood pressure collector. Pressing and holding it for three seconds to power on.
3	Button	Menu	Pressing this button to execute the selected function.
4	Button	Measuring button	Pressing this button to inflate the cuff and measure blood pressure. Pressing the button to stop measuring and deflate the cuff during the measuring.
5	Button	Down	Button for selection. Pressing this button on main interface to pause alarming. Pressing it again to restore alarming.
6	Button	Up	Button for selection.
7	Indicator	Alarm indicator	The indicator flashes when alarm is generated during the measuring.
8	Other	Air tube	Connecting the cuff of the collector.

<b>No.</b>	<b>Type</b>	<b>Name</b>	<b>Function</b>
9	Other	USB port	Used to connect USB cable.
10	Other	Battery cover	One of the collector shelves. It is used to load and unload the batteries.
11	Other	Label	Product information.

Remark: the No.9 USB port just for renew the programme in the factory, will not function to the users.

## 2.2 Cuff

Cuff connects the upper arm of the user and blood pressure collector, as shown in Figure 2-2:



Figure 2-2



## **2.3 Health Mobile Phone**

The health mobile phone obtains blood pressure data collected by the collector and upload data to the doctor workstation in real time. It can analyze and display data in user-defined period, and offer simple statistics and search.

The phone can also receive interactive messages sent by the doctors, and transmit the parameters of blood pressure collector to the doctor workstation.

The appearance of the health mobile phone is shown in Figure 2-3.



**Figure 2-3**

③ Navigation button

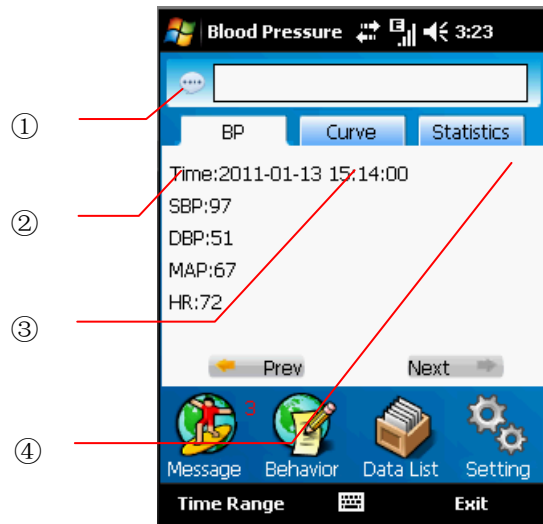
Function and usage of the health mobile phone keys are shown in Table 2-2.

**Table 2-2**

No.	Name	Function
1	Dialing button	To dial numbers.
2	Emergency	Pressing this button when the

No.	Name	Function
	button	user feels uncomfortable to generate an emergency alarm, so the doctor can receive emergency information in time and give advice.
3	Navigation button	OK or move upwards and downwards
4	e+Health	Pressing this button to start the system and display the interface when the interface is hidden.
5	Hang-up	Pressing this button to end the call or hide the interface.
6	e+Health shortcut icon	Refer to the function of the e+Health button.

Monitoring interface and functions of the health mobile phone are shown in Figure 2-4.



**Figure 2-4**

1. Message bar
2. Blood pressure: displaying all data (SBP, DBP, HR, MAP) measured at certain time
3. Curve chart: displaying data (SBP, DBP, HR, MAP) measured in certain period with curve chart.
4. Statistics: displaying statistics data in certain period (max. blood pressure, blood pressure load, DBP load, SBP load, HR).

## 3. Operations

### 3.1 Monitoring Blood Pressure

#### 3.1.1 Installing Batteries

The collector is powered by two AA alkaline batteries. Load two batteries to collector before using. (Note the positive and negative marks in the battery box.)

1. Press the rear cover lock to remove the rear cover.
2. Load the batteries correctly.
3. Put the rear cover back.



Figure 3-1 Loading batteries



**Unload the batteries when the collector is idle.**

### **3.1.2 Powering On**

Press and hold the **Power** button for three seconds to power on the collector. Run indicator and alarm indicator cyclically flash once. Then the main interface is displayed. The system will switch to standby mode to save power if no button is pressed during the preset power saver time-out. You can press any button to display the interface again.

**Note:**

Because the LCD is not self-luminous, a luminous source should be placed on the LCD to display the interface. Backlight time is the time of luminescence of the LCD luminous source.

### 3.1.3 Wearing the Cuff

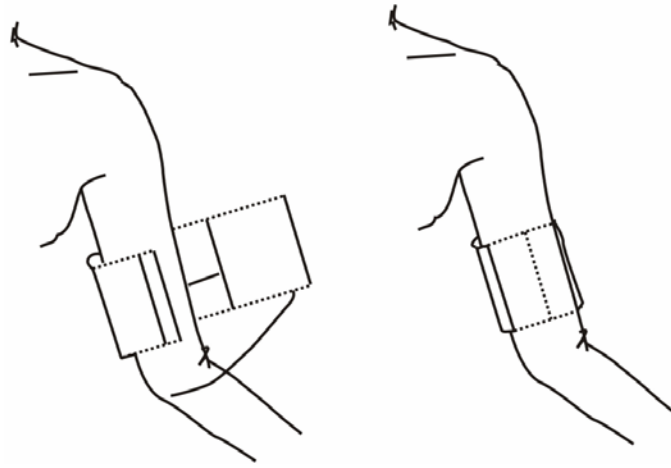
 Caution:

Connect the cuff of the collector correctly, as shown in Figure 3-2:



**Figure 3-2 Connection**

Wrap the cuff to the upper arm as shown in Figure 3-3.



**Figure 3-3 Wrapping the cuff**

### **3.1.4 Measuring Blood Pressure**

After being distributed, the blood pressure collector automatically measures blood pressure at the schedule set by the doctor. If manual measurement is needed, you can press the **NIBP** button on the front panel of the collector.

### **3.2 Collecting Blood Pressure Data**

1. Power on the mobile phone. Press e+Health button or click the shortcut icon to access the main interface. (If the phone is on power-saving mode, press the power switch on

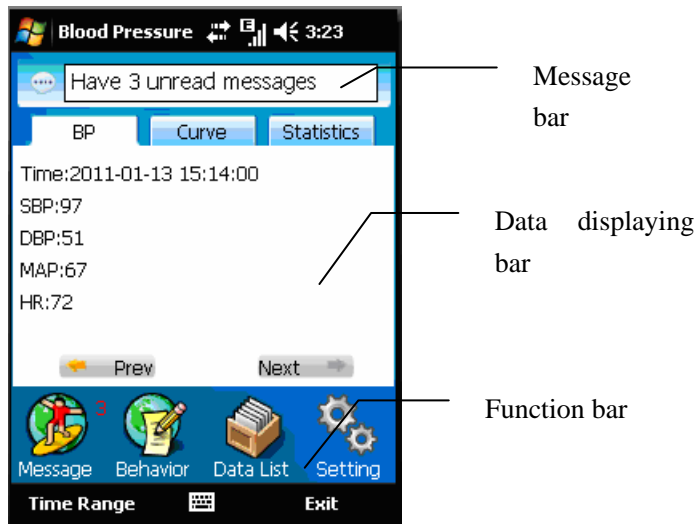


the top to activate the phone.) See Figure 3-4.



**Figure 3-4 Monitoring platform for personalized healthcare**

Click **Blood Pressure** to access the monitoring interface (as shown in Figure 3-5), which is divided into three sections: message bar, data section and function bar.



**Figure 3-5 Blood pressure monitoring**

### **3.2.1 Message Bar**

Displaying collector low battery alarm, interactive message reminding and alarm of insufficient mobile phone memory.

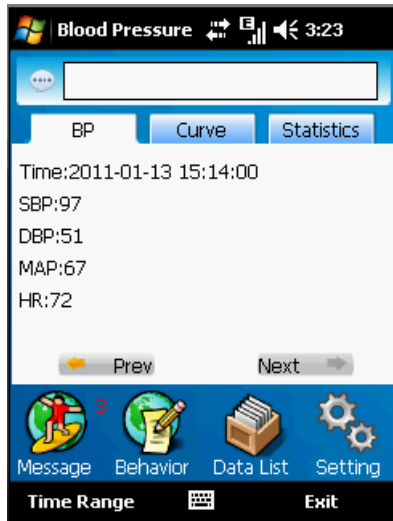
### **3.2.2 Data Section**

Click blood pressure, curve chart and statistics in the chart bar to view monitoring status (as shown in Figure 3-6, 3-7 and 3-8).

Blood pressure: displaying real-time blood pressure data collected by the collector (as shown in Figure 3-6).

Curve chart: displaying real-time blood pressure data curve chart collected by the collector. (SBP: dark blue curve; DBP: green curve; MAP: yellow curve; HR: red curve)

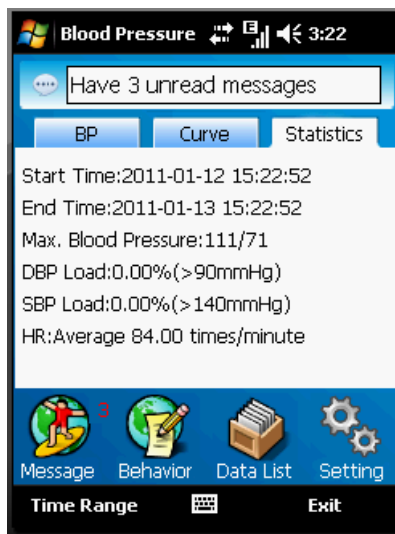
Statistics: displaying blood pressure statistics measured in certain time period (max. blood pressure, DBP load, SBP load, and HR).



**Figure 3-6 Blood pressure**



**Figure 3-7 Curve chart**



**Figure 3-8 Statistics**

### **3.2.3 Function Bar**

The functional bar lies on the bottom of the main interface, including interactive message, behavior record, data list and system setting.

#### **3.2.3.1 Interactive Message**

Click **Interactive Message** on the interface (as shown in Figure 3-5) to access the interface shown in Figure3-9. You can search for messages sent by the doctor by date. Received messages are stored as common interactive messages by default. If a message is regarded as important, you can click **Options** to move it to important interactive messages.



**Figure 3-9 Interactive message**

**Receiving interactive messages sent by doctors:**

Interactive messages are downloaded when uploading blood pressure data or refreshing interactive messages, and saved as common messages. Patients are also notified of that.

Operation: choose **Operation** > **Download** on the lower right of the interface shown in Figure 3-9 to download.

**Searching interactive messages by date:**

Display all interactive messages by sorting them in reverse order of date. Page turning button is displayed when the number of interactive messages exceeds 100.

**Deleting interactive message:**

Delete interactive messages which are not needed any more based on types. You can delete a message or all messages of the same type.

Operation: select a message, choose **Options** > **Delete** on the lower right of the interface shown in Figure 3-9 to delete the message. Click **Delete All** to delete all interactive messages.

**Managing important interactive messages:**

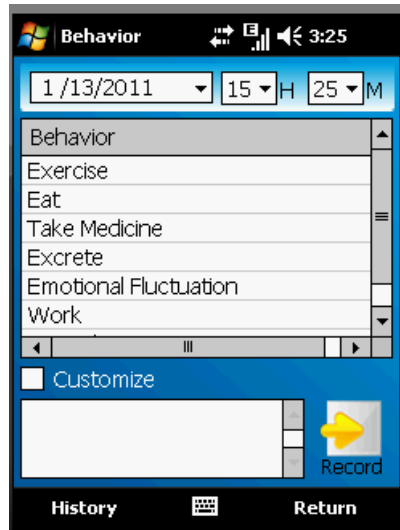
Received messages are stored as common interactive message by default. If a message is regarded as important, you can click **Options** to move it to important interactive messages.

Operation: select a message, choose **Options** > **Move to Important** on the lower right of the interface shown in Figure 3-9 to move the message.


**3.2.3.2 Behavior Record**

Click **Behavior Record** shown in Figure 3-5 to access the interface. You can select a certain date to view behaviors on that day, including exercises, eating, taking medicines, excretion, emotional fluctuation, work and poor sleep etc.

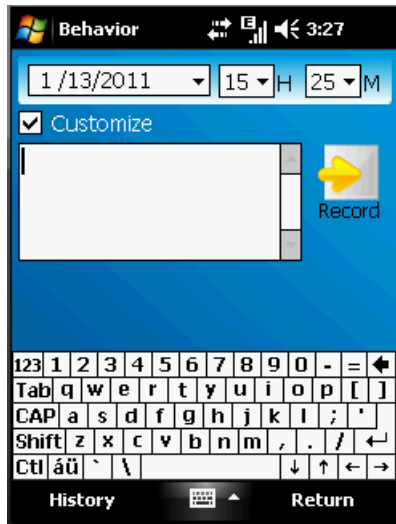
See Figure 3-10.



**Figure 3-10 Behavior record**

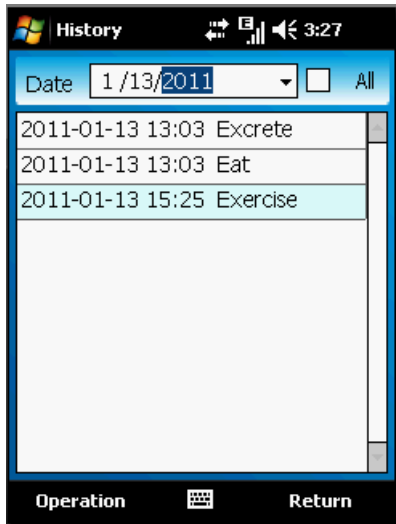
Select **User-Defined Behavior** in Figure 3-10 to access the editing interface as shown in Figure 3-11. Enter the content and click  to finish editing. This record will be saved in historical records.





**Figure 3-11 Behavior record editing**

Click **History** to view behavior records of other days (as shown in Figure 3-12). You can select a certain date, record the behavior of that day, or select all buttons to view all the historical records.



**Figure 3-12 Historical records**

Select a record, choose **Options** > **Delete** on the lower right of the interface shown in Figure 3-12 to delete the message. Click **Delete All** to delete all uploaded historical records.

### **3.2.3.3 Data List**

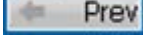

Click **Data List** shown in Figure 3-5 to access the interface. You can select a certain date to view detailed data, or select **All** to view all data (as shown in Figure 3-13).

SBP	DBP	MAP	HR
97	51	67	72
93	71	74	83
105	60	72	88
99	53	60	105
111	69	82	85
104	58	72	88
106	35	68	72

**Figure 3-13 Data list**

Select an item in the data list shown in Figure 3-13, the SBP, DBP, MAP and HR during certain measuring period are displayed. Note: the period can be measured in second.)

The data list in Figure 3-13 displays 10 items on each page.

You can turn the pages by clicking  and .

Choose **Options** > **Delete** on the lower right of the interface shown in Figure 3-13 to delete the record. Click **Delete All** to delete all uploaded blood pressure data.

### 3.2.3.4 System Setting

Click **System Setting** on the interface (as shown in Figure 3-5) to access the interface shown in Figure 3-14.



**Figure 3-14 System setting**

#### 1. **Font Size**

You can adjust the font size to **Large**, **Medium** and **Small**.  
Medium is the default font size.

#### 2. **Audible Alarm**

You can enable or disable the function.

#### 3. **Curve Chart**

You can set whether to display SBP, DBP, MAP and HR on

the interface with curve chart.

SBP: displayed with dark blue curve

DBP: displayed with green curve

MAP: displayed with yellow curve

HR: displayed with red curve

### **3.3 Emergency Button**

A user can press the emergency button when feeling uncomfortable. Meanwhile, the message "Sending..." is displayed on the phone interface, and later on "Sending succeeded", meaning the event has been sent to the doctor workstation. The doctor can give advice in time.

## 4 Cautions

1. Make sure the distance between the collector and mobile phone is between 5 cm and 10 m when collecting data.
2. If the user presses dialing key on the left or hang-up key unintentionally, the blood pressure monitoring interface may switch to backstage running. Then the user needs to press the **e+Health** key on the phone, or click e+Health health consultant shortcut icon on the standby interface to access the operation interface.
3. The air tube connecting the collector is fixed. Do not pull it out. Unload the batteries when the collector is idle.
4. Keep the mobile phone on during the monitoring; replace with new batteries when the phone generates a prompt indicating that the battery level of the blood pressure collector is low.
5. Keep the arm still and relaxed when measuring the blood pressure.

### **Additional Information:**

1. Figures and description in this user manual are only for demonstration. All information is subject to actual products in case of any discrepancy.

2. Please contact relevant hospital personnel in case of any questions during the operation.

**FCC NOTE:**

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.