

1. VSM

The vital signal module (VSM) can acquire and monitor the physiological signals of the patient in real time. It sends the physiological signals to the system for gated scans and reconstruction through the receiver on the gantry.

WARNING

Using the VSM as a patient monitoring system may cause misdiagnosis.

- ◆ Do not use the vital signals acquired by the VSM as patient monitoring data.

WARNING

- ◆ If the VSM is not working properly, stop the gated scan and contact UIH Customer Service Center.

- ◆ Using disposable electrodes can reduce the risk of infection.

1.1 Wireless VSM

The wireless VSM consists of a handheld terminal and a receiver.

The receiver is installed on the gantry. It receives physiological signals and sends them to the console.

The handheld terminal is composed of the main body, lead wires, and electrodes. It collects and transmits physiological signals. To use the wireless VSM, place the handheld terminal on the patient table. After the VSM lead wires have been placed properly, the VSM can move up and down along with the patient table.

CAUTION

- ◆ Before you start scans using VSM signals, make sure that the wireless VSM module matches the system.

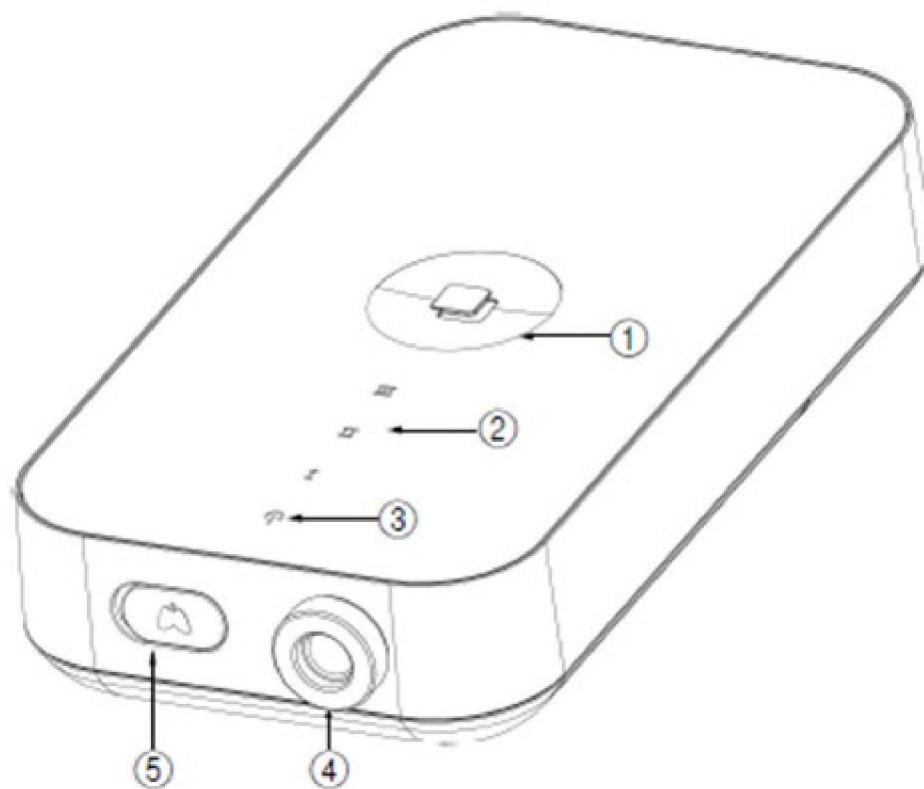


Figure 1 Main body of the wireless VSM handheld terminal

No.	Name	Description
1	Lead mode button	◆ Hold down the lead mode button to switch the handheld terminal on or off. ◆ When VSM is operating normally, press the lead mode button to switch among three lead modes.
2	Lead mode indicators	Displaying the lead mode. ECG acquisition has three lead modes. Lead II is used by default.

3	Indicator	Indicating the current status of signal transmission and battery power. ◆ The indicator lights up when the VSM is switched on. ◆ When the physiological signals are acquired and transmitted normally, the indicator flashes in a constant frequency. ◆ The indicator turns red when the battery power is low.
4	Port for the ECG lead cable	Connecting the ECG lead cable.
5	Port for the respiratory pillow	Connecting the respiratory tube and respiratory pillow.

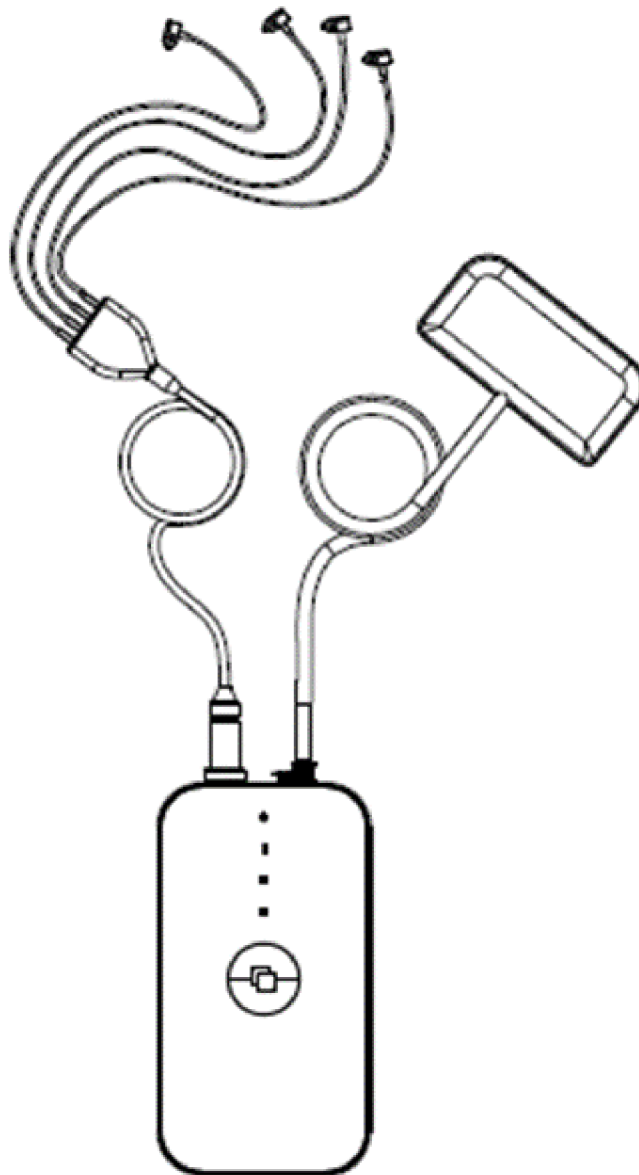


Figure2 VSM handheld terminal with ECG lead cable and respiratory pillow

1.1.1 Accessories for the wireless VSM

Name	Function
ECG lead cable	Connecting disposable electrodes to acquire ECG signals of the human body.

Integrated respiratory pillow	Acquiring the amplitude changes of organs caused by human respiration.
Rechargeable battery	Supplying power to the handheld terminal.
Charger	Charging spare batteries.

1.1.2 VSM charging

The VSM uses a rechargeable battery as the power supply. NK-PCS-B is recommended.

Users should note the following points:

- Charge the battery of the VSM handheld terminal in time. In order to avoid low-power failure, check the power of the VSM battery every morning before you use the system.
- Use the batteries recommended by UIH.
- When the VSM shows the low-power alert, open the battery compartment of the VSM handheld terminal, take out the lithium battery, and charge the battery with a charger.

Install the lithium battery back into the VSM handheld terminal after it is fully charged.

Use the NK-PCS-C intelligent charger to charge the battery.

- If there is any problem in battery charging, or if the service life of the battery has expired, contact UIH customer service engineers.

CAUTION

Chemical!

If you are not going to use the VSM for a long time, take out the battery of the VSM to prevent battery leakage.

CAUTION

Chemical!

Charge the battery properly. Overcharge and over discharge may shorten the service life of the battery.

1.1.3 Three-lead electrodes

See the table below for the electrode numbers, colors, and positions

AHA standard		IEC standard		Electrode position
Lead number	Electrode color	Lead number	Electrode color	
RA	White	R	Red	Right chest, right under the middle part of the clavicle
LA	Black	L	Yellow	Left chest, right under the middle part of the clavicle
LL	Red	F	Green	Below the rib cage on the left upper quadrant of the abdomen

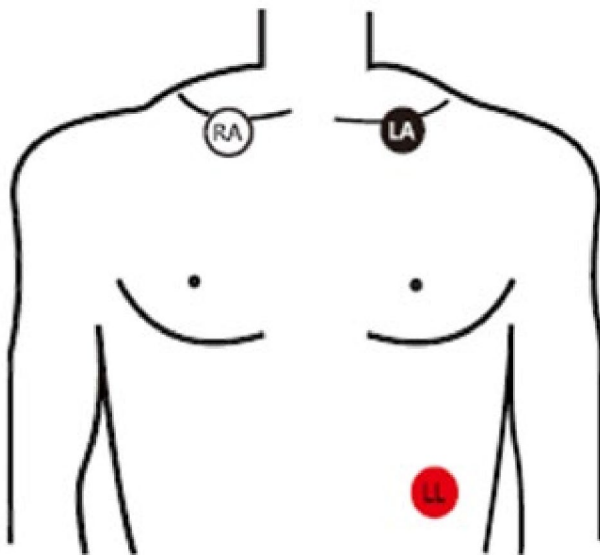


Figure 3 Three-lead electrode placement (AHA standard)

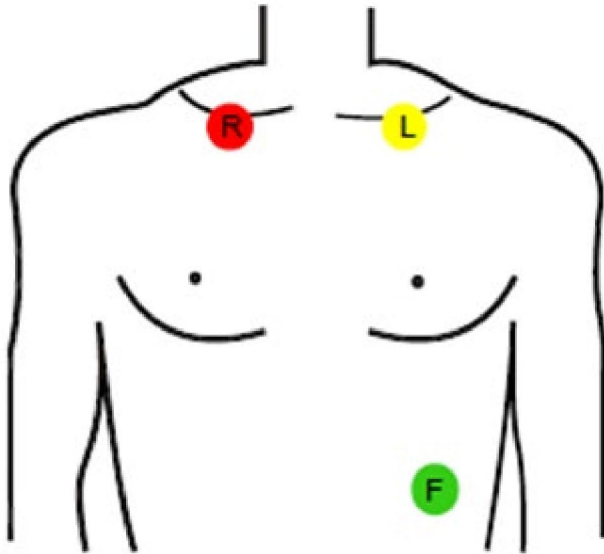


Figure 4 Three-lead electrode placement (IEC standard)

1.1.4 Four-lead electrodes

Table 1 Electrode numbers, colors, and positions

AHA standard		IEC standard		Electrode position
Lead number	Electrode color	Lead number	Electrode color	
RA	White	R	Red	Right chest, right under the middle part of the clavicle
LA	Black	L	Yellow	Left chest, right under the middle part of the clavicle
LL	Red	F	Green	Below the level of the lowest rib on the left

				abdominal area
RL	Green	N	Black	Below the level of the lowest rib on the right abdominal area

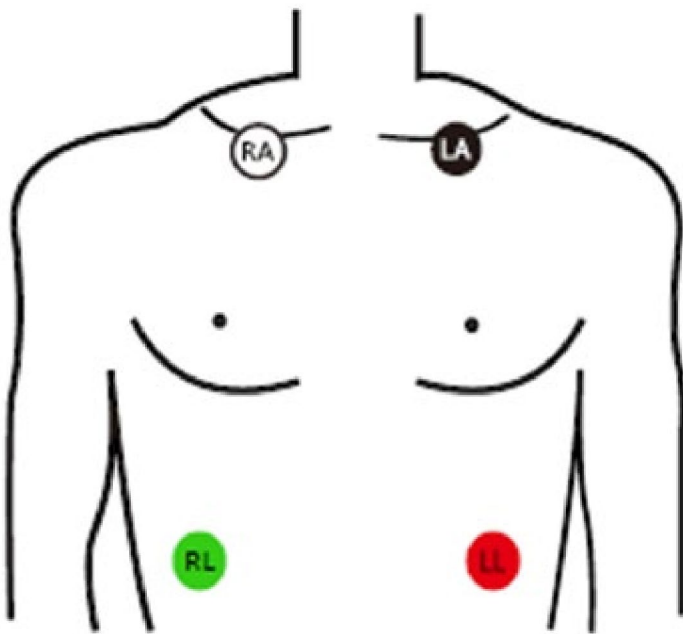


Figure 5 Four-lead electrode placement (AHA standard)

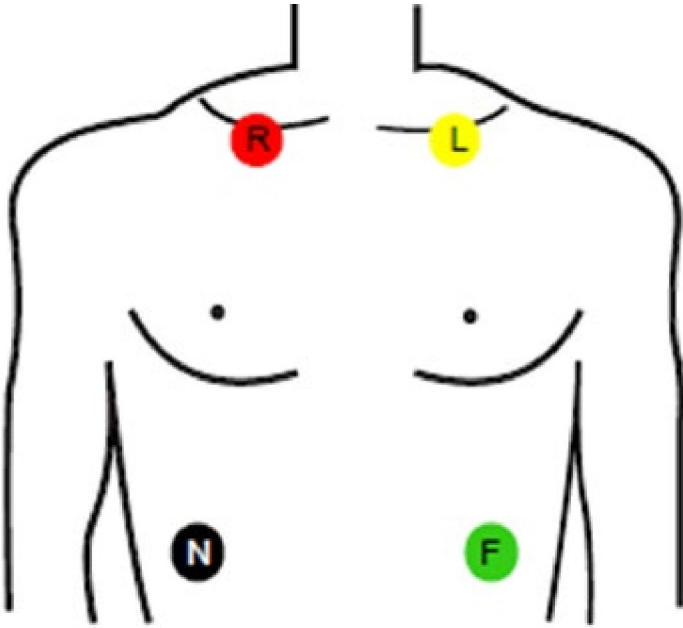


Figure 6 Three-lead electrode placement (IEC standard)

1.1.5 Parameters of wireless communication

Parameter	Value
VSM Model	80503065
Operating frequency range(s)	2410MHZ~2475MHZ
Transmit power	≤10 mW (e.i.r.p)
Type of modulation	GFSK
RF channel spacing	5MHz
Operation Voltage	DC 3.7V
Number of channels	14

Operating Temperature Range	10℃~40℃
Data Rate	1Mbps
Antenna Type	Antenna PCB
Antenna Gain	2.83dBi
Receiver Model	uCRPG0302-IS
Operating frequency range(s)	2410MHZ~2475MHz
Transmit power	≤10 mW (e.i.r.p)

FCC Compliance Statements

§ 15.19 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.

§ 15.21 Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

§ 15.105 This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct

the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ISED Compliance Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC&IC RF Exposure Compliance of Wireless VSM Handheld, Model: 80503065

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy. The exposure standard for wireless devices employs a unit of measurement known as Specific Absorption Rate, or SAR.

The SAR limit set by the FCC/IC is 1.6 W/Kg. For body-worn operation, this device has been tested and meets the FCC/IC RF exposure guidelines for use with an accessory that contains no metal and positions the device a minimum of 0 mm cm from the Body&Limbs. RF exposure compliance with any body-worn accessory that contains metal was not tested and certified, and use of such body-worn accessory should be avoided. Any accessory used with this device for body-worn operation must keep the device a minimum of 0 mm away from the Body&Limbs.

Cet appareil respecte les exigences du gouvernement en matière d'exposition aux ondes radio. Cet appareil est conçu et fabriqué de manière à ne pas dépasser les limites d'émission d'énergie radiofréquence (RF). La norme d'exposition pour les appareils sans fil utilise une unité de mesure appelée taux d'absorption spécifique, ou SAR.

La limite SAR établie par la FCC/IC est de 1,6 W/kg. Pour une utilisation portée sur le corps, cet appareil a été testé et respecte les directives d'exposition aux RF de la FCC/IC lorsqu'il est utilisé avec un accessoire ne contenant pas de métal et positionnant l'appareil à un minimum de 0 mm du corps et des membres. La conformité de l'exposition aux RF avec tout accessoire porté sur le corps contenant du métal n'a pas été testée ni certifiée, et l'utilisation de tels accessoires portés sur le corps doit être évitée. Tout accessoire utilisé avec cet appareil pour une utilisation portée sur le corps doit maintenir l'appareil à un minimum de 0 mm du corps et des membres.

FCC&IC RF Exposure Compliance of COU64-VSMR, Model: uCRPG0302-IS

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

L'appareil est conforme aux limites d'exposition au rayonnement FCC/IC spécifiées pour les environnements non contrôlés. Lors de l'installation et de l'utilisation de cet appareil, la distance entre le radiateur et le corps doit être d'au moins 20 cm.