mobiCARE +Pulse

Pulse Oximeter

User Manual

Model: MP100W

Document No.: ST-UM-MP100W-EN

Version No.: draft-0

Date Written: 2022-08-31

Index

1. General Information

1.1. Name & Permission/Certification Information

Product Name : mobiCARE +Pulse

Model Name : MP100W, MP100WF, MP100WA/N, MP100WP

* The content included in this user manual can be applied to all MP100W products. Depending on the model you have purchased, the sensor may not be included)

1.2. Intended Use

For proper Use of the product, an interoperable pulse oximeter (Meter) and probe (sensor) must be used, and the purpose of each gadget/equipment are as follows.

- Pulse Oximeter (A17190.01 [2])
  The pulse oximeter is a device that is used for measuring the oxygen saturation, pulse rate, respiratory rate, and perfusion index of the patient/user without collecting blood samples by utilizing the optical properties of two different types of hemoglobin: 1) hemoglobin that is bound to oxygen, 2) hemoglobin that is not bound to oxygen. The calculated oxygen saturation, pulse rate, respiratory rate, and perfusion index can be checked in real-time through the display included in the measurement device. The information can be sent to an external destination (i.e., gateway, etc.) to monitor the patient's conditions to prevent complications associated with oxygen therapy, hypoxia (below 80%), etc.

- Probe, general-purpose, external (A58020.01 [1])
  It is an probe used for the non-invasive measurement of oxygen saturation within the blood by utilizing the different absorption properties of red light and infrared light.

1.3. Intended medical indications

This product can be used, but is not limited to, the following cases:

- Real-time monitoring of patients in the ICU, ER, operating room, etc. (if real-time monitoring is required)

- Cases in which the patient's vital signs may change due to treatments such as surgery, invasive inspection/testing, etc.
- Cases in which patients' vital signs may change due to non-invasive inspection/tests such as transesophageal echocardiography, endoscopy, medication, etc.
- Monitoring of preterm birth
- Monitoring patients with heart and lung disease
- Breathing abnormalities, abnormal heart rhythms, dizziness, chest pain, excessive sweating, fainting, fatigue, anxiety, etc.

1.4. Operating Principle

- Pulse Oximeter (Meter)

  This product is used with compatible sensors (in-vitro universal probe) that utilize the different absorption properties of red light and infrared light for the non-invasive measurement of oxygen saturation (SpO_2), pulse rate, respiratory rate, and perfusion index. The light emitting sensor included in the compatible sensor irradiates two types of light with different wavelengths to the user's skin. Then, the amount of reflected/penetrated light is calculated by the light-receiving sensor and transmitted to the main device via the connection cable and connector. The transferred value is analyzed through a PPG (photo-plethysmography) method to calculate the pulse rate and oxygen saturation. The calculated oxygen saturation, pulse rate, respiratory rate, and perfusion index can be checked in real-time through the display. The information can also be sent to an external destination (i.e., gateway, etc.) depending on the settings to monitor the patient's condition.

- Probe, general-purpose, external (Sensor)

  This product is a sensor (in-vitro universal probe) that utilizes the different absorption properties of red light and infrared light for the non-invasive measurement of oxygen saturation (SpO_2), pulse rate, respiratory rate, and perfusion index. It consists of a light-emitting sensor, a light-receiving sensor, a connection cable, and a connector. The light emitting sensor irradiates two types of light with different wavelengths to the user's skin. Then, the amount of reflected/penetrated light is calculated by the light-receiving sensor and transmitted to the compatible device via the connection cable and connector. The transferred value is analyzed through a PPG (photo-plethysmography) method to calculate the pulse rate and

oxygen saturation.

1.5. Intended patient population

This product can be used by anyone, regardless of his/her race, age, gender, etc.

1.6. Intended part of the body or type of tissue interacted with

Wrap the strap around the wrist to fix the product and wear the sensor on the fingertips to use the product.

* The strap can be wrapped around the ankles of newborn babies and infants, and the sensor can be worn at the tip of the toes.

1.7. Intended user profile

This product can be used by experts and non-experts who meet the following requirements. However, if you use this product for the first time, you must consult an expert.

- Level of Education
  Users with more than 10 years of education (basic/public education such as elementary school, etc.) can use this product independently. Users who have not received more than 10 years of education (i.e., children, etc.) can use this product under the guidance of their parent or a legal guardian who has received more than 10 years of education.
- Knowledge
  The user must be able to understand the content written in this manual.
- Language
  The user must understand the information in this manual, which is written in Korean.

Before using the product, the user MUST be familiar with the content included in this user manual and use the product for its intended purpose.

1.8. Intended condition of use

- This product can be used in hospitals (general ward, ER, operating room), homes, and ambulances.
- Operating Temperature: 5~40℃
- Storage Temperature: -25~70℃

- Operating/Storage Humidity (Relative): 10-95%
- Operating/Storage Atmospheric Pressure: 700 ~ 1060 hPa

1.9. RF Testing Environment

-20~50℃

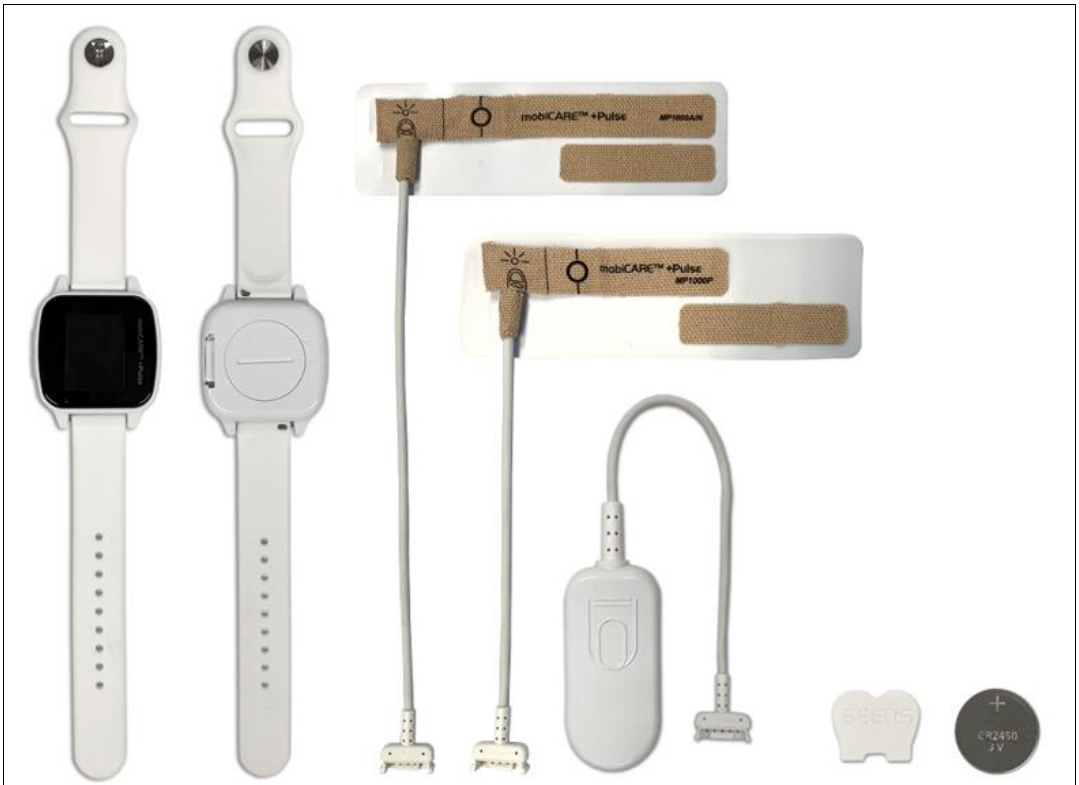
1.10. Symbols

Symbol	Description
	Manufacturer
	Manufacture Date
	Batch Code/Lot Number
	Catalogue/Reference Number
	Device Number (Serial Number)
	Keep Dry
	Temperature Limit
	Humidity Limit
	Consult Instructions for use
	Follow instructions for use
	Restrictions
	Warning (Danger)
	Caution
	Type BF applied Parts
IP33	Protection against external dust (greater than 2.5mm in diameter) Protection against water spray
	Requires proper disposal of waste

CE XXXX	CE Marking of Conformity
FC	FCC Rule of Conformity

2. Product Overview/Summary

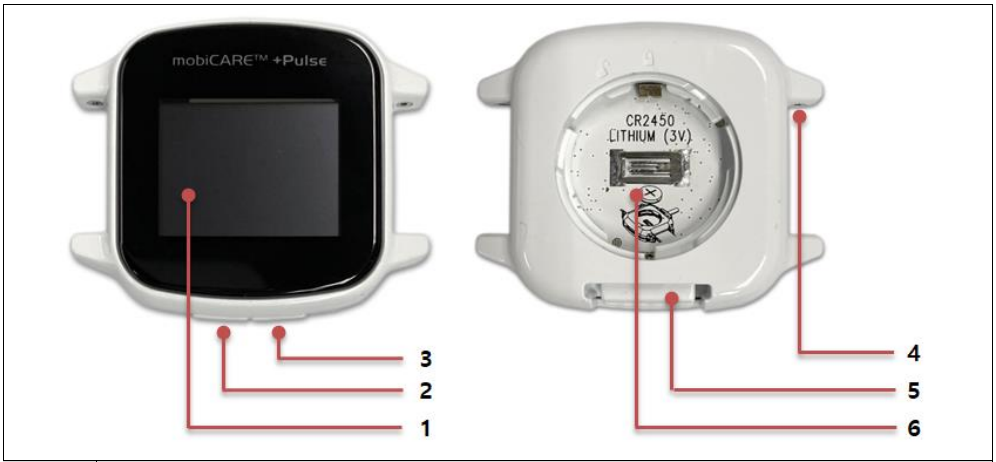
2.1. Product Composition/Configuration



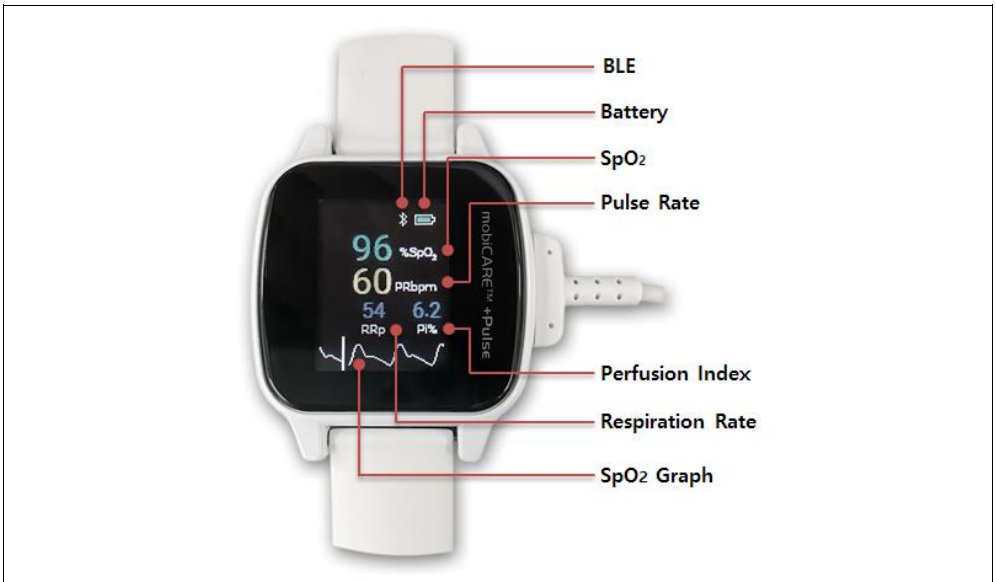
No.	Model Name	Meter	Items				
			Battery Cover	Strap	Battery	Cover Opening Tool	Sensor
1	MP100W	O	O	O	O	O	-
2	MP100WF	O	O	O	O	O	O(MP1000F)
3	MP100WA/N	O	O	O	O	O	O(MP1000A/N)
4	MP100WP	O	O	O	O	O	O(MP1000P)

2.2. Product Features

2.2.1. Meter (Main unit)



No.	Name	Description
1	Screen	Shows the measured oxygen saturation (SpO_2) and pulse rate
2	Power Button	The button used to turn the power on/off, rotate the screen and adjust the settings
3	Settings Button	Button used to enter setup/settings mode
4	Strap Connection	The area where the strap is connected
5	Sensor Connection	The area where the reusable/disposable sensor is connected
6	Battery Insert	The area where the battery is inserted



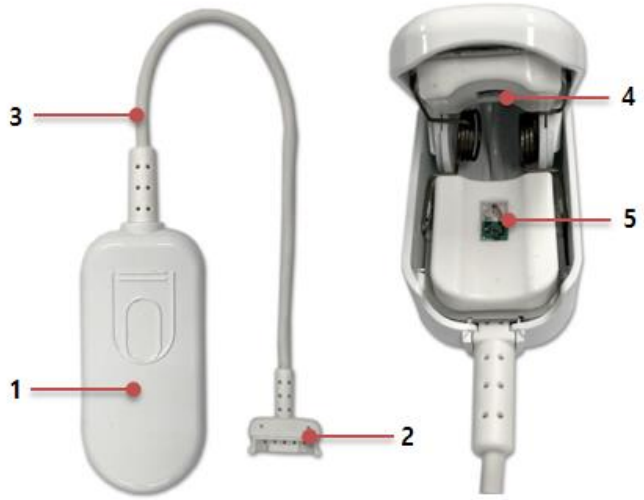
No.	Name	Description
1	SpO_2	Displays the measured oxygen saturation level (SpO2) through

		the optical sensor
2	Pulse Rate	Displays the measured pulse rate (PRbpm)
3	Perfusion Index	Displays the measured perfusion index (Pi%)
4	Respiration Rate	Displays the measured respiratory rate (RRp)
5	SpO_2 Graph	Displays the oxygen saturation (SpO_2) waveform that is currently being measured
6	BLE	Displays the Bluetooth (BLE) interlink status with external devices
7	Battery	Displays the remaining amount of battery

2.2.2. Components

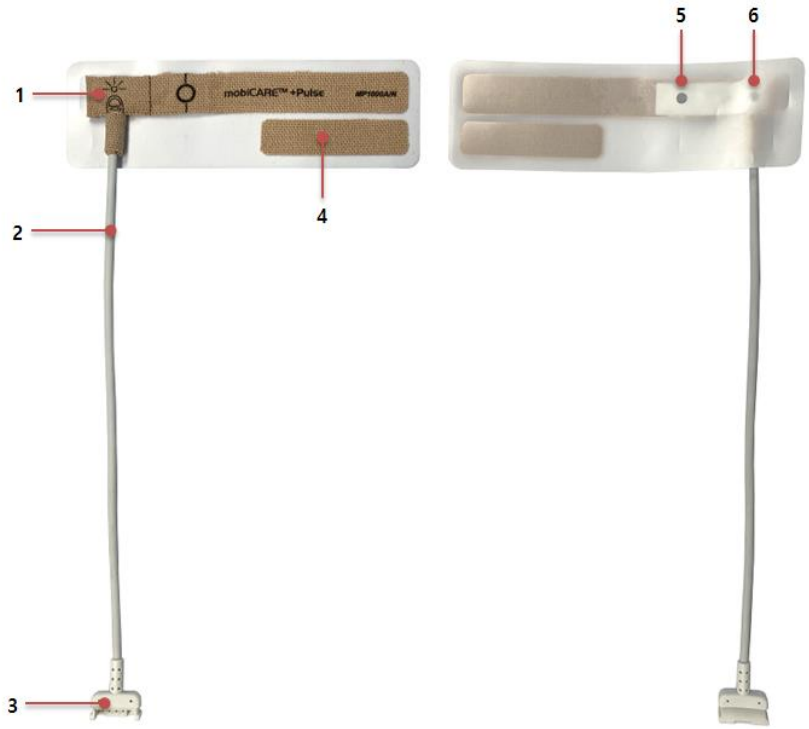
No.	Name	Appearance	Description
1	Battery Cover		Used to secure the battery, so it does not fall out from the main body.
2	Strap		Used to fix the product to the body while wearing it.
3	Battery (CR2450)		Supplies power to the product.
4	Open tool		A tool that can be used for opening and closing the battery cover

2.2.3. Reusable Sensor (MP1000F)



No.	Name	Description
1	Measurement Unit	The part is mounted to measure the patient's oxygen saturation. It consists of a light receiver sensor and a luminescence sensor
2	Connector	The part that connects the main body of the measurement device and the reuse sensor
3	Cable	A cable that is used for transmitting the input signal through the measurement unit
4	Light-Receiving Sensor	A sensor that receives the transmitted or reflected light
5	Light-emitting Sensor	A sensor that irradiates the user's skin with two different types of lights (red light & infrared light)

2.2.4. Disposable Sensor (MP1000A/N, MP1000P)



* 'MP1000A/N' and 'MP1000' are basically the same products, only with different dimensions depending on the target of Use.

No.	Name	Description
1	Measurement Unit	The part is mounted to measure the patient's oxygen saturation. It consists of a light receiver sensor and a luminescence sensor
2	Cable	A cable that is used for transmitting the input signal through the measurement unit
3	Connector	The part that connects the main body of the measurement device and the disposable sensor
4	Cable-Fixing Tape	A tape that is attached to the skin of the user to fix the cable when putting on the disposable sensor
5	Light Receiver Sensor	A sensor that receives the transmitted or reflected light
6	Luminescence Sensor	A sensor that irradiates the user's skin with two different types of lights (red light & infrared light)

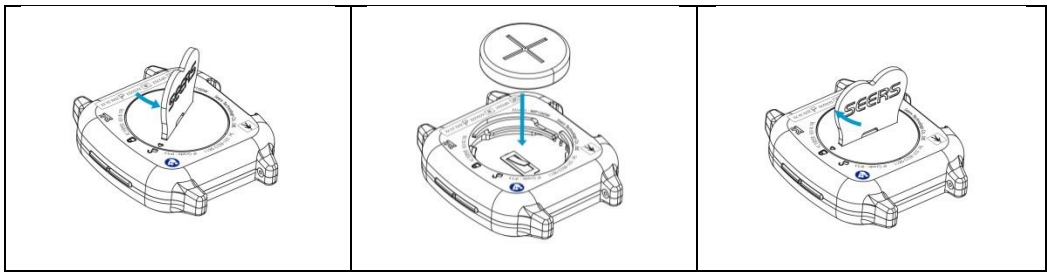
3. Method of Use

3.1. Pre-use preparation

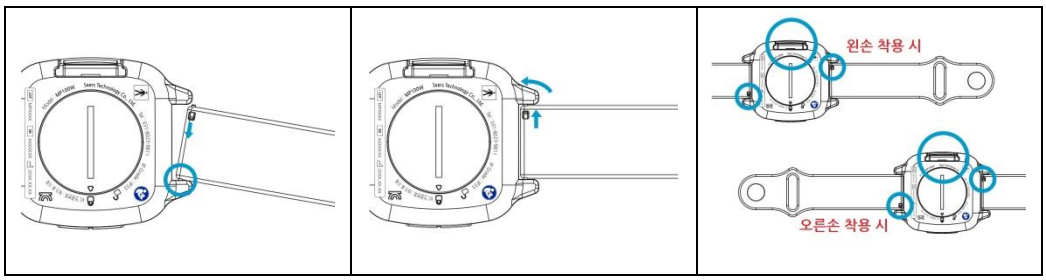
1) Make sure to read the instructions written in the user manual of this product and the compatible in-vitro universal probe (from now on, referred to as "sensor") before using the product.
2) Refer to this user manual to check whether there are any broken or missing components. The main measurement body (from now on referred to as "body"), battery cover, strap, battery, and at least one sensor compatible with the main device are all required for normal Use of the product.
   * The battery cover is attached to the rear side of the main body.
3) Follow the instructions of the medical staff when setting up and using the device for the first time.
4) Before attaching the sensor to avoid such areas, check whether there are any edemas nearby.
5) If your nails are colored or artificial, the light transmittance rate may decrease, leading to inaccurate measurements.
6) Excessive brightness (too much light) may lead to inaccurate measurements. Excessively bright light may cause errors in the measurement device. Make sure that the area where the measurement device is used is not exposed to an excessive amount of light. If so, cover the area where the sensor is attached with an opaque handkerchief, etc.
7) When used in an environment with low temperatures, you can obtain more accurate measurements by rubbing or warming your fingers before wearing the sensors.

3.2. Operation method

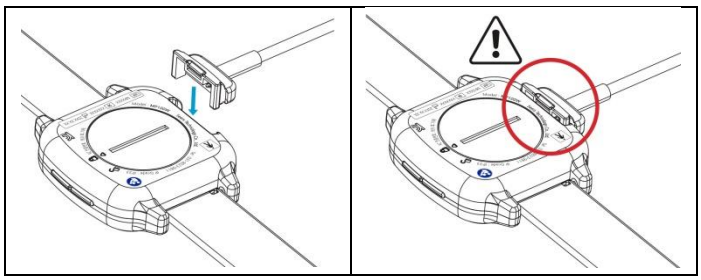
1) Place the main body/device so the screen can face the floor. Use the cover opener to open the battery cover located on the rear side of the body and insert the battery in the correct direction. Then, close the battery cover using the cover opener.



2) Attach the strap to the main body/device, considering that the pulse oximeter will be worn. While doing this, make sure that the strap handle is located at the rear side of the main body/device.



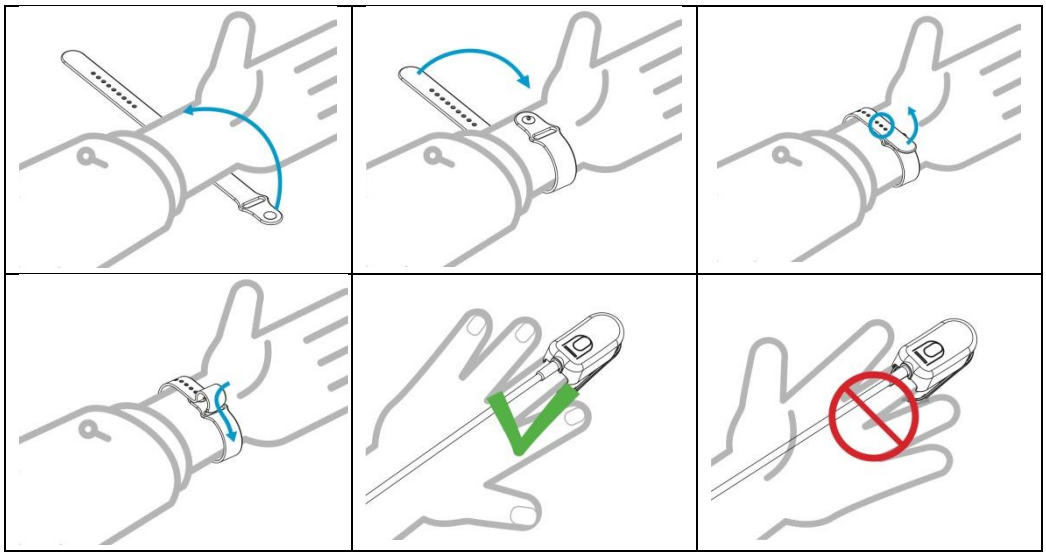
3) Equip a sensor that fits the purpose of Use. Pay close attention to ensure the sensor does not stick outside the body/device.



4) Wear the device on the wrist using the strap. The sensor must be equipped on the finger where you want to measure. At this time, the user shall refer to the user manual and stick the sensor to his/her finger as close as possible for accurate measurement. However, suppose the patient/user is currently in the ICU, ER, or operating room or cannot wear the strap/sensor themselves. Medical personnel familiar with the product can help them wear the device/sensor in that case.

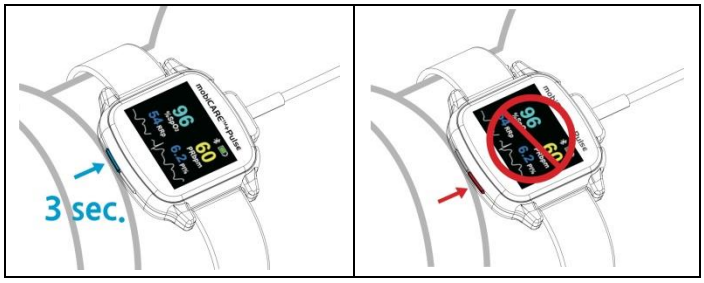
* When wearing the strap, the connecting part of the sensor shall be positioned in the direction of the fingertip.

* The sensor will operate without any problem regardless of the finger worn, but it is recommended that you equip the sensor on your index or middle finger for better accuracy. You should also pay attention to the direction/orientation of the finger when wearing the sensor.

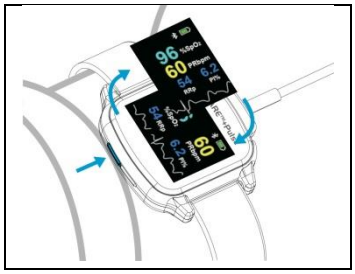


* Check the image above to equip the sensor properly

5) After fitting the sensor, press the power button for more than 3 seconds to turn the power on.



6) The device will automatically start taking measurements when the power is turned on. The results of the measurements will be shown on the screen after 5 seconds. At this point, you can rotate the screen by pressing the power button. Set the direction of the screen, then make sure that the results of the measurement appear on the screen correctly.



7) Check the measured values.

* If the user/patient has no respiratory diseases, he/she shall maintain an oxygen saturation level of 95% or higher. If the value goes below 95%, you should consult a doctor.

Oxygen Saturation (SpO_2)	Status
95~100%	Normal

91~94%	Warning (Risk of hypoxia)
81~90%	Danger (Hypoxia may result in shortness of breath)
Below 80%	Severe Case of Hypoxia

* Unnecessary movements of the body during measurement may lead to inaccurate results. For better measurement accuracy, we recommend that you do not move your body as much as possible.

* Measurements that exceed the normal range may be displayed on the screen in red letters. In this case, you must notify your current condition medical staff for professional help.

8) Change the product's settings to suit your purpose using the Settings button.

* **Description (by Feature)**

Function	Activated	Deactivated
Bluetooth		
	Wireless connection using Bluetooth is enabled.	Wireless connection using Bluetooth is disabled.
AUTO-OFF		
	If the input signal is maintained via the sensor, the screen will not be turned off, and the measurements will continue to be displayed on the screen. If the signal is not maintained, the device's power will automatically go off after 15 seconds.	The screen will be turned off, and enter 'Low-Power Mode' when you don't press any buttons for more than 40 seconds. The power will NOT be automatically turned off at this point, even when no signal is sent via the sensor. However, data transmission via Bluetooth shall still be maintained.

* **When checking the measurements in real-time using the main screen**

AUTO OFF: Activate (Mandatory)
Bluetooth: Deactivate (Recommended)

(If you wish to directly check the measurements on the main screen of the device, it is recommended to activate (enable) the Auto OFF feature and deactivate (disable) the Bluetooth feature. When the Auto OFF feature is enabled, the screen will stay on with an input signal, and the measurements will be displayed constantly. If there is no input signal, the device's power will automatically be turned off after 15 seconds. You can still enable the Bluetooth feature, which may reduce the battery life.

① Activate the Auto OFF function in the Settings menu.

* **For real-time monitoring via wireless connection**

Bluetooth: Activate (Necessary)
AUTO OFF: Deactivate (Recommended)

If you are using a wireless connection, check the compatibility and use the product after checking the manual of the compatible product. When used with incompatible products, the accuracy of the measurements cannot be ensured, leading to inappropriate prescriptions and delays in treatment. The product's compatibility can be verified by contacting the manufacturer's Customer Support Center (Tel. 031-8023-9811).

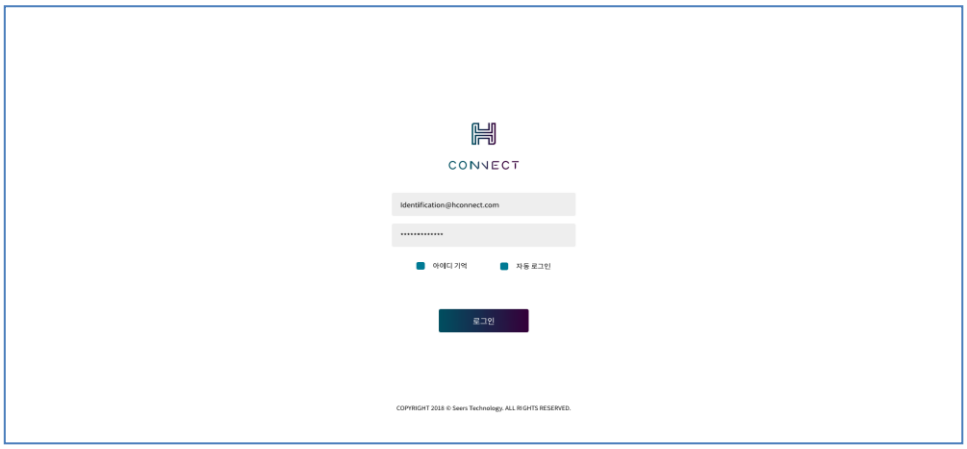
(If you wish to use the product for real-time monitoring purposes via wireless communication, you must activate the Bluetooth feature, and it is recommended to disable the Auto OFF feature. If the Auto OFF feature is disabled, the screen will be turned off, and enter 'Low-Power Mode' when you don't press any buttons for more than 40 seconds. Even when the device enters 'Low-Power Mode, ' data transmission via Bluetooth will still be maintained. You may enable the Auto OFF

feature, but this may harm the battery's life since the screen won't turn off even when you don't use it.

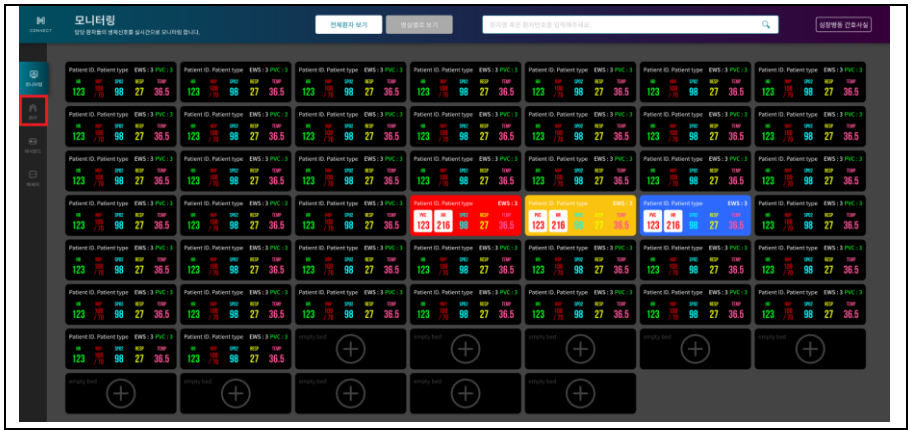
The description below is only an example, and the screen configuration may vary depending on the compatible product. Make sure to follow the instructions written in the user manual of the compatible product for proper Use.

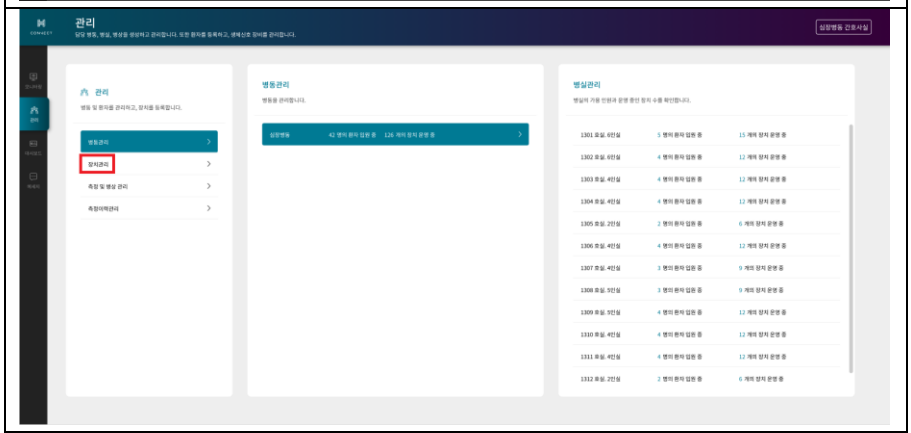
① Check the web software (referred to as "Web") linked to the product, then access the corresponding link.

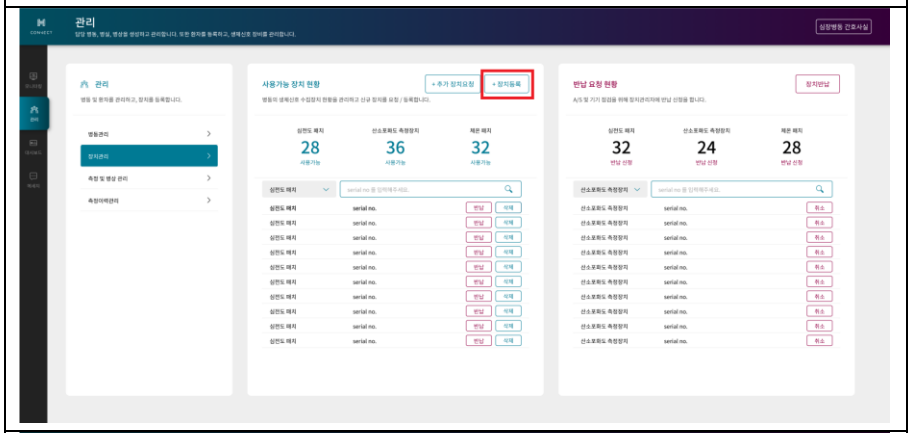
② Log in to the Web using the ID and password provided by the manufacturer.

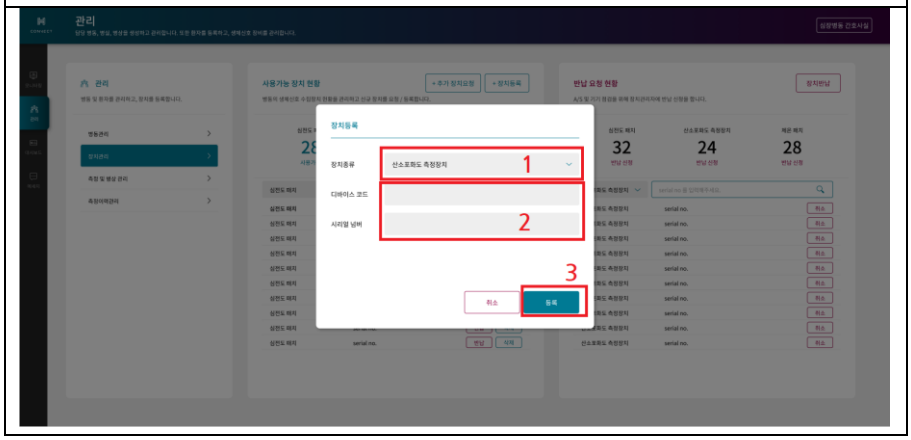


③ Register the device on the Web. (Click the red box in the order shown below)









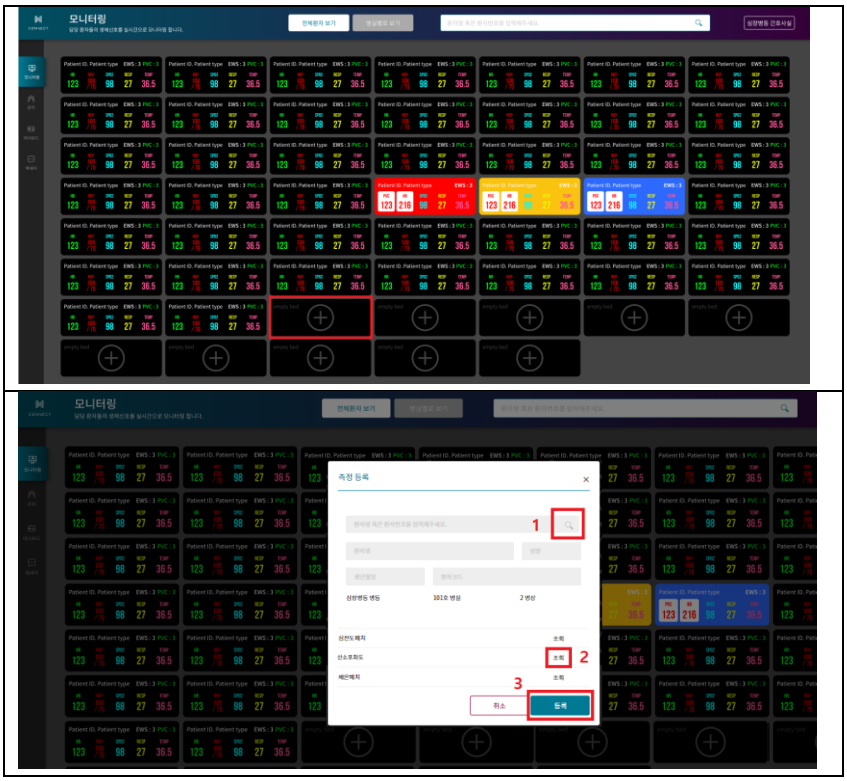
* The hospital enters the device code, and the serial number is included on the back of the

measuring device.

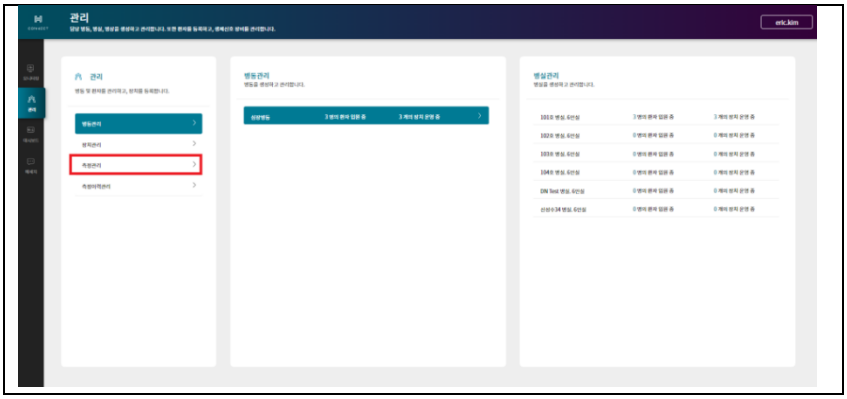
④ Register the measurements by interlinking them with the patient information registered in the hospital system.

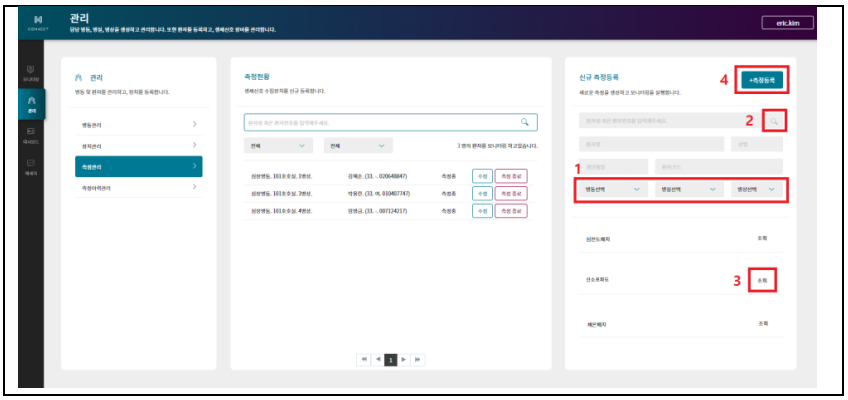
(Register the measurement by pressing the red box in the suggested order (use one of the two methods presented below.)

i. Register directly from the dashboard



ii. Register from the Admin/Manage Registration screen



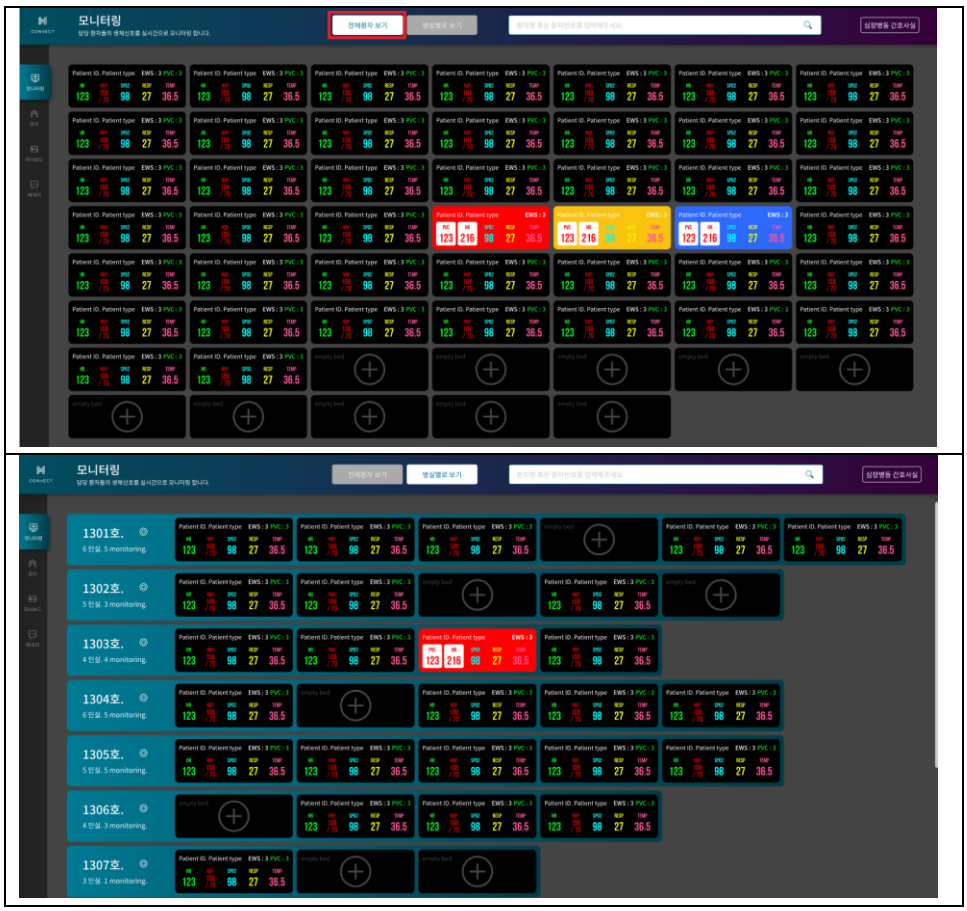


⑤ The pulse oximeter will automatically connect when you go to the location where the gateway is installed after activating the Bluetooth setting at 'Settings.' Real-time monitoring of the status of the oximeter is also available via the Web.

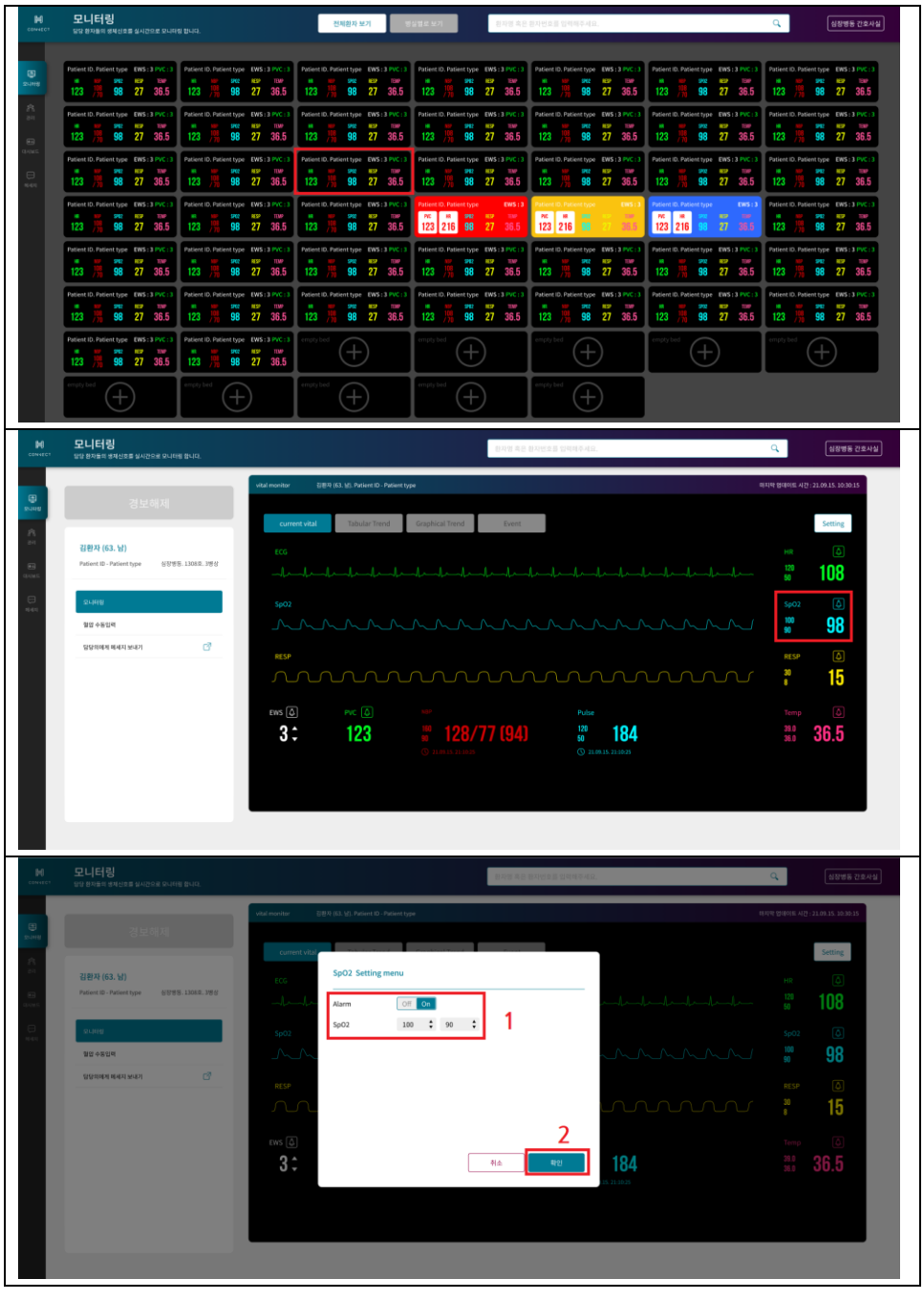
* It will be disconnected when the power is turned off or the device goes out of the connection range of the gateway (10m, but will automatically reconnect when the power is turned back on or moves back within the connection range.

* Real-time monitoring can be maintained even if the patient moves into another room within the hospital because the device can automatically reconnect to the gateway located in another room (installed by Seers Technology.)

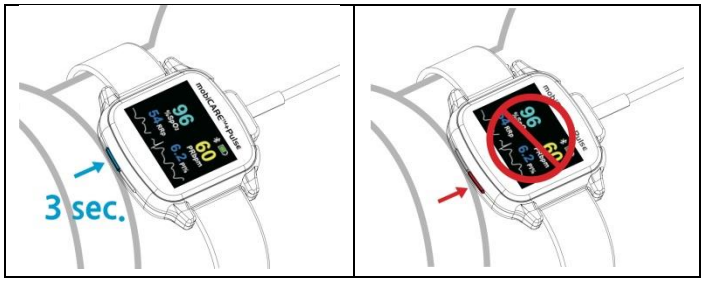
⑥ Information about the monitored patients can be viewed at once (“View All Patients”) or in each room (“View by rooms”).



⑦ On the main monitoring screen, you can click on a patient's name to view the detailed measurement information. You can also use the 'Alarm' function by setting a minimum/maximum limit for the currently measured item.



9) If you have finished using the device, press the power button for more than 3 seconds to turn the power off. When the Auto OFF feature is enabled, the device's power will automatically be turned off if there is no input signal for more than 15 seconds.



10) After the power is turned off, remove the sensor from your finger and take off the strap.

11) Separate the used sensor from the main body. Separating the cable from the body while holding the cable may cause severe damage. Make sure to pull the cable off while holding the connector area of the body. While doing this, be careful not to hurt your hands.

3.3. Post-use Storage & Management

1) After using the device, store it after sterilizing all surfaces of the main body and sensor cable using a 70% alcohol spray, sanitizing/disinfecting wet wipes, or a clean gauze soaked in a cleaning solution.
2) Remove the battery from the product if you don't plan to use it for a long time.
3) When a disposable sensor is used, DO NOT reuse the sensor.
4) When disposing of the product, it shall be destroyed, dismantled, incinerated, etc., according to the relevant laws and regulations (i.e., Wastes Control Act) so that it cannot be used for its original purpose.

4. Precautions

(1) Make sure to read this manual before using the product and compatible in-vitro universal probe (from now on referred to as "sensor") and use it according to its intended purpose.

(2) When using this product for the first time, ensure to receive guidance from a qualified medical staff/expert. Incorrect Use of the product, such as wearing the sensors incorrectly, may result in inaccurate measurements.

(3) Using sensors that are incompatible with this product may result in a malfunction of the device, inaccurate measurements, and even result in patient injury. Please check the user manual to ensure the sensor is compatible with the product.

(4) Incorrect measurements can be obtained due to the following reasons.

- The sensor is attached/equipped to inappropriate areas (wounds, edema, etc.)
- Improper sensor mounting due to manicures, artificial nails, contamination of the measurement area, etc.
- Excessive movement
- The sensor is worn too tight or loose
- Hemoglobin disorder or intravascular staining agents
- Excessive lighting towards the area where the sensor is worn/equipped

(5) This product is not sterilized. If the product is exposed to contamination, there is a severe risk of infection, so the surface shall be cleaned thoroughly before/after Use.

(6) If this product is broken or damaged, it may be difficult to obtain accurate measurements. Always be aware of the situations below.

- The device shall not be in contact with water or any type of liquid
- Do not drop the device from a high place
- Do not bend or apply excessive force to the cables.

(7) This product shall not be used during MRI scanning since the accuracy of measurements will decrease significantly. Patients may even suffer a severe burn.

(8) Misuse of the in-vitro universal probe (applying excessive pressure for a prolonged time) may result in compression injuries.

(9) Do not swallow the batteries since it may lead to severe chemical burns.

(10) Keep the battery out of reach of children. If the battery casing is not closed correctly, stop using the device and prevent children from accessing it. If you or a child swallowed

the battery or think the battery is physically located inside the body, you shall immediately seek medical advice.

5. Safety Warnings & Cautions

Before using the Pulse Oximeter (MP100W), be aware of the various safety warnings listed in this [Safety Warnings & Cautions] section. Safety warnings use different symbols and letters to inform the patient or the handler of the risk of various potential hazards that can cause damage to the MP100W or injuries to the user. This manual categorizes the possible risks into the following three categories.

	**Restrictions** Ignoring this symbol and mishandling the MP100W may lead to a high chance of serious outcomes such as death, serious injuries, etc.
	**Warning (Danger)** Ignoring this symbol and mishandling the MP100W may lead to a chance of serious outcomes such as death, serious injuries, etc.
	**Caution** Ignoring this symbol and mishandling the MP100W may lead to minor injuries and material damage.

Restrictions

- Keep out of reach of children under the age of 12.
- Use this product only for the purposes specified in this user manual. Make sure to comply with the safety precautions when using it on children.

Warning (Danger)

- Do not immerse this product in water or any type of liquid.
- Avoid storing this product in an environment with excessively low or high temperature (below -25℃ or above 70℃) or humidity (above 95% non-condensing relative humidity). If the product is stored in a cooler or hotter place than where it is used, put it in the same room/space with the patient, who will be measured for about 10 minutes before taking the measurement.
- This product's measurement of oxygen saturation SHALL NOT be used as an excuse to skip or avoid receiving professional help/care from a qualified specialist or pediatrician. Make sure to consult a specialist or a pediatrician if there is something wrong with the measured oxygen saturation value.
- Do not use the product if any signs of damage are inflicted on the main body and

sensor. Do not attempt to repair the product if it is damaged.

- Only qualified technicians/experts are allowed to repair this product.
- This product consists of ultra-fine mechanical precision parts. Be careful not to drop or expose the product to severe impact.
- Swallowing the small parts can cause children to choke on it, so always be careful.
- Keep the product/device out of reach of infants and children.
- When replacing the battery, pay close attention to the polarity of the battery.
- Incorrect replacement of the battery may result in fire or explosion.
- Only use 'official' batteries supplied/specified by the manufacturer. Using unauthorized batteries may lead to malfunction of the product and inaccurate measurements.
- When replacing the battery, do not allow children or pets to touch or swallow the battery.
- Swallowing the battery may lead to severe chemical burns.
- Use the ON/OFF switch to turn off the product when the device is not in Use. Also, remove the battery from the device if the device is not in use for an extended time.
- Do not attach/equip this product outside of the areas specified in this manual.
- Learn how to use this product through sufficient training before using it.
- Be careful to avoid hurting when separating the sensor from the main device.
- When separating a cable, you must hold the connector of the device, not the cable. Pulling a cable may cause harm to the cable.
- Avoid using the product in areas where there might be difficulties in maintaining connection via wireless communication (areas full of metallic hardware and electronic devices)
- Do not modify the pulse oximeter without the approval of the manufacturer.

Any use of the product that is not included or described in this manual

⚠	**Caution**

- If the oxygen saturation and pulse rate go above or below the normal range, it can signify a weakened immune system or severe diseases. Consult a medical specialist when measuring the oxygen saturation of the following people.
- If the person who has to get his/her oxygen saturation level measured have entered the room from outside or moved to a different place with a different temperature environment, wait for at least 30 minutes before taking the measurement.
- When measuring oxygen saturation, excessive movement may lead to inaccurate results, so please calm down before measuring.
- Do not allow infants or children to touch the main body of the device or the sensor with

wet hands or put it into their mouth.

・Always keep the main body and probe clean and undamaged.

・ Do not measure oxygen saturation while replacing the batteries or when the battery cover is left open.

・Connecting the device to unverified devices may pose a severe risk to the safety of the patient and the operator.

・The person who manages the device must make sure that the Bluetooth function is not used for illegal purposes (illegal copying for commercial use/profit, illegal transmission of data, etc.)

・ Disassembling or modifying the measurement device and other connectable devices without permission may lead to malfunction and connection errors.

・ Obstacles between the devices that transmit and receive data may shorten the connection distance.

・Only Bluetooth v.5.1 is applicable. Further verification and validation are required in case of updates and changes in the network's structure.

6. Troubleshooting & Problem Solving

When a problem/issue occurs while using the product, you should read the manual below and take necessary actions: If you experience the same problem even after taking the measures required following this manual, please contact the supplier or the manufacturer (Seers Technology) of the product.

6.1. Troubleshooting

Issue	Reason	Solution
The device won't turn on even when you press the power button for more than 3 seconds.	Battery issue	Replace the internal battery and try again.
The battery cover does not close	Ill-fitted	Check whether the battery cover is correctly fitted to the marked area.
Oxygen saturation is significantly outside the normal range	Measurement or ill-fitted	The measurement results may be inaccurate when the probe's location attached to your finger is incorrect or due to foreign substances on your body. Check the location of the probe and measurement area, then try again.
Cannot measure the oxygen saturation (and it is not displayed on screen)	Ill-fitted (probe)	Check the connection of the cable. Suppose the oxygen saturation is not being measured (or displayed correctly) even when the power is turned on and the probe is properly attached to your finger. In that case, there might be something wrong with the connection between the main device and the probe.
The screen goes off during the measurement	Normal operation	The unit is designed to operate with the screen turned off 40 seconds after the display HUD is turned on to maintain low power usage and measure for an extended time. This is the normal operating condition, and once you turn the power button on, the screen of the pulse oximeter will be turned on, and check the measured value.
Press the power button for more than 3 seconds to turn on the device, but the power is automatically turned off after about 15 seconds.	Normal operation, Check settings	To allow non-continuous oxygen saturation measurement, when the AUTO OFF function is turned on in the product settings, the device will recognize the probe mounted on the patient's finger and perform a continuous measurement.
The icon for 'Change	Battery issue	This icon will be displayed on the screen when the

Battery' keeps on blinking on a screen		battery voltage exceeds the required minimum operation limit. In this case, you must replace the battery with a new CR2450 battery.
Oxygen saturation cannot be measured properly	H/W or S/W error	Contact your supplier or Seers Technology to inspect the device.

7. Specifications

7.1. Product Specifications

Category	Details
Model Name	MP100W, MP100WF, MP100WA/N, MP100WP
Product Group Name	Pulse Oximeter
License No.	Enter After Acquisition
Supply Voltage	Rated Voltage: DC 3V Coin Battery (Lithium, Type CR2450)
Product Dimensions	Main unit: 46 x 13.6 x 44(WxHxD) mm
Product Weight	34.85g
Display	1.29 inch
	OLED 262K color and 65K colors
	128 x 96 pixels
	2,000:1
	Wide viewing angle 160°
Battery Life	36 Hours
Expected Service Period	2 Years
Protection Against Electric Shock	Internal Power, Type-BF
Communication Method (with peripheral devices)	Bluetooth Wireless Communication (Communication Distance – Within 10m of LOS(Line of Sight))
Measurement Range (Accuracy)	Oxygen Saturation (SpO_2): 70 ~ 100% (±2 %)
	Pulse Rate (PRbpm): 30 ~ 250 bpm (±3 bpm)
	Perfusion Index (Pi%): 0.5% ~ 20% (±0.5 %)

	Respiratory Rate (RRp): 7 ~ 70 rpm (±3 rpm)
Continuous or Non-continuous Operation	Continuous / Non-continuous Operation
Waterproof/Dustproof Grade	IP33
Sterilization	Sterilization is not intended.
Software	Device Firmware : MP100W Firmware(v1.0.0)
Operating Environment	Temperature: 5℃ ~ 40℃ Relative Humidity: 10% ~ 95% Atmospheric Pressure: 700hPa ~ 1060hPa
Storage & Transportation Environment	Temperature: -25℃ ~ 70℃ Relative Humidity: 10% ~ 95% Atmospheric Pressure: 700hPa ~ 1060hPa

7.2. Wireless Specifications

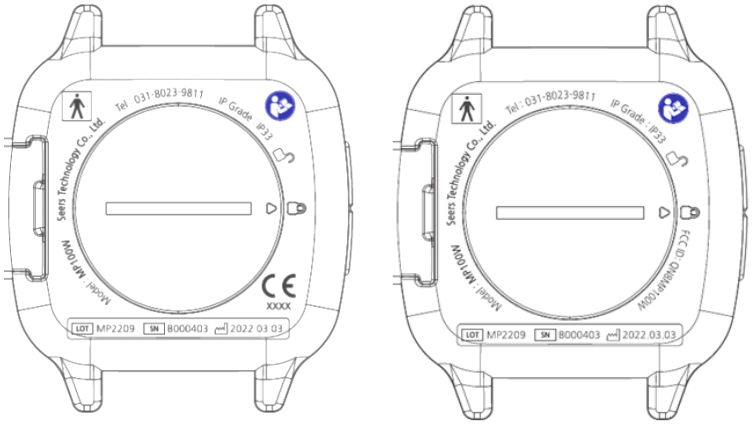
Category	Details
Wireless Specifications	BLE 5.1 (1M, LE Coded S8, S2) (Communication Distance – Within 10m of LOS(Line of Sight))
Frequency	2.4GHz (2402-2480 MHz)

7.3. KC Certification (Details)

Category	Details
Model	MP100W
Trade Name (Certified)	Seers Technology Co., Ltd.
Device Name	Short-Range Low Power Wireless Device (Wireless Device for Wireless Data Communication System)
Certification No.	R-R-stt-MP100W
Date of Manufacture	Refer to External Label
Manufacturer / Country	Seers Technology Co., Ltd. / Republic of Korea

7.4. Label

7.4.1. Device Label



7.4.2. Printing Format

M	P	A	A	B	B	-	Bxxxxxx
Type Name Identification Symbol		Production Year (2 digits)		Production Month (2 digits)		-	Device Number (Serial Number)

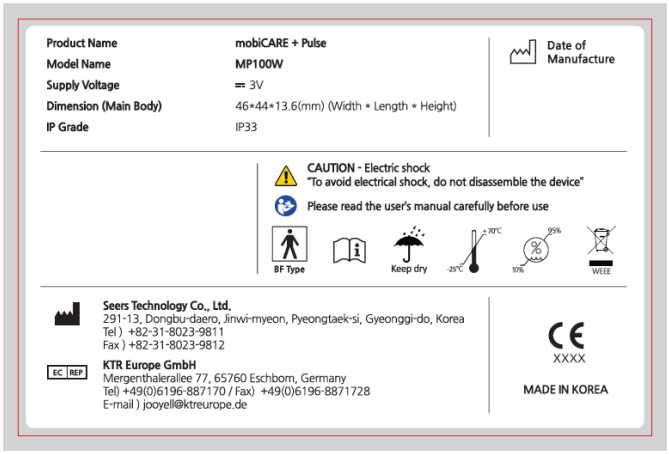
- MP : Type/Model Name Identification Symbol (2 Digits) (MP100W→ MP)
- AA: Indicates the year that the device has been produced. (Year: 2022 → 22)
- BB : Indicates the month that the device has been produced. (January → 01)
- Bxxxxxx : ID Symbol + Convert the last 5 digits of the Mac Address to decimal and use the last 6 digits as the device number.

Ex) MP100W, produced in September 2022 + Mac Address (08:D5:C0:40:01:AB)

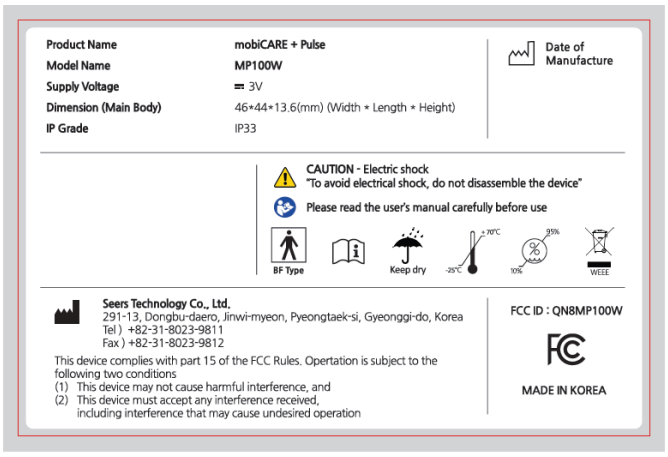
→ MP2209-B000427

7.4.3. Box Label

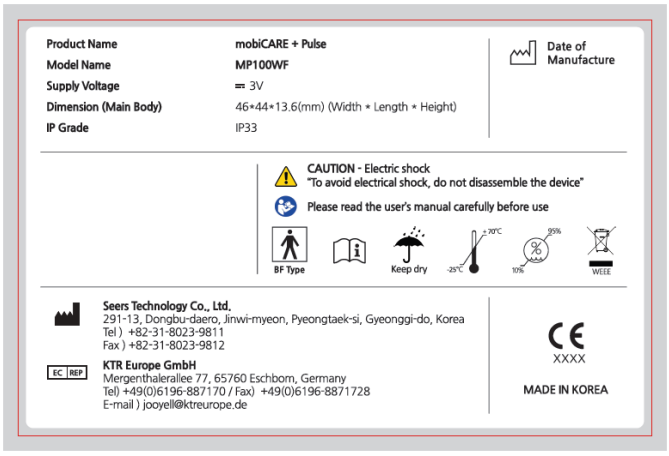
Gift Box Label (MP100W / CE)



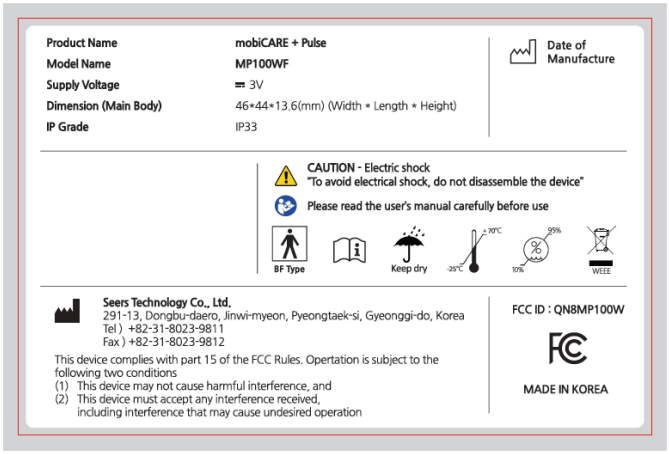
Gift Box Label (MP100W / FCC)



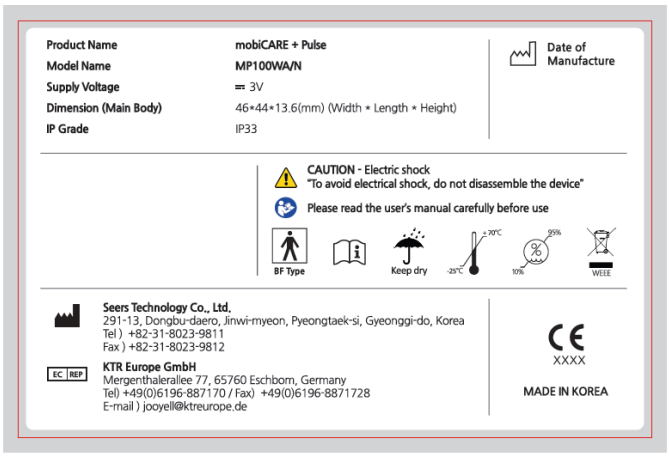
Gift Box Label (MP100WF / CE)



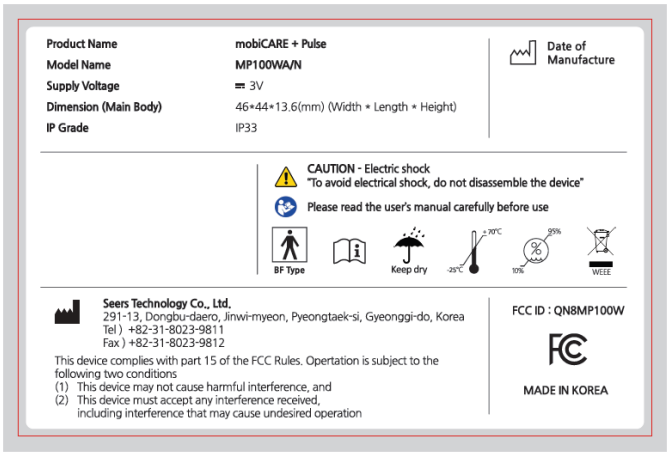
Gift Box Label (MP100WF / FCC)



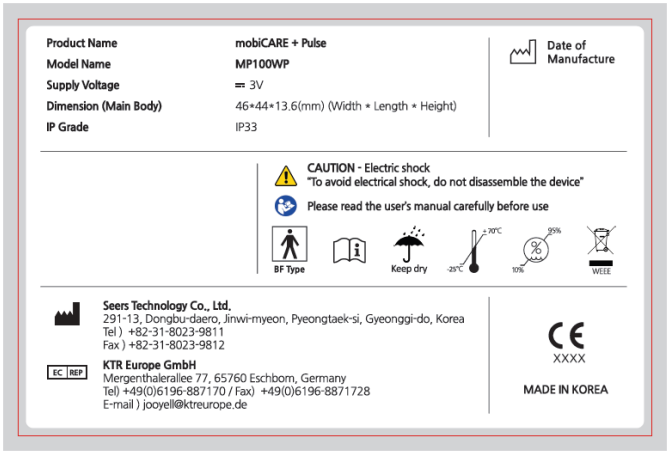
Gift Box Label (MP100WA/N / CE)



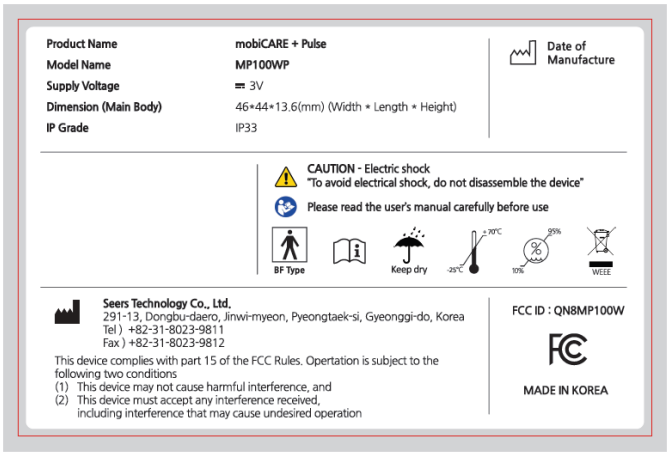
Gift Box Label (MP100WA/N / FCC)



Gift Box Label (MP100WP / CE)



Gift Box Label (MP100WP / FCC)



8. Manufacturer's Responsibilities & After-Sales Service

The manufacturer and vendor of this device shall ensure normal and safe operation of the product/device and shall be held responsible only for the following cases:

(1) When the user/customer has received maintenance/repair services from a person who the manufacturer has qualified

(2) When the user/customer has used the device following the instruction manual

(3) In a case where the damage, loss, or failure of equipment is NOT due to the user's negligence

Please contact the supplier or manufacturer below if you need to repair or exchange the product.

Manufacturer	Seers Technology 291-13, Dongbu-daero, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do ※ Customer Service Center: 031-8023-9811

9. Precautions (Electromagnetic Waves)

Electromagnetic Interference		
MP100W is intended for use in the electromagnetic environment specified below. The user of this equipment shall ensure that MP100W is used in such an environment.		
Interference Test	Result	Electromagnetic Environment (Guidelines)
Radioactive Disturbance/Interference KN11	Type 1	The MP100W uses RF energy only for its internal functions. Therefore, the RF radiation level of MP100W is very low and is unlikely to cause any kind of interference/disturbance to nearby electronic devices.
Radioactive Interference KN11	Grade B	MP100W is suitable for all installations and facilities, including household facilities and facilities directly connected to the low-voltage public power grids, which are supplied to buildings used for residential purposes.
Harmonic Interference IEC 61000-3-2	Not Applied	
Voltage Disturbance/Flicker Radiation IEC61000-3-3	Not Applied	

Resistance to Electromagnetic Waves			
MP100W is intended for Use in the electromagnetic environment specified below. The client and user shall ensure that the MP100W is used in such an environment.			
Resistance Test	IEC60601 Testing Condition	Conformity Level	Electromagnetic Environment (Guidelines)
Electrostatic Discharge	Contact 8 kV Air 15 kV	Contact 8 kV Air 15 kV	The floor shall be made of wood, concrete, or ceramic tiles. If the floor is covered with

<table>
<tr><td>(KN 61000-4-2)</td><td></td><td></td><td>composite material, the relative humidity must be above 30%</td></tr>
<tr><td colspan="4">Resistance to Electromagnetic Waves of Medical Devices that are not for Life Support Purposes</td></tr>
<tr><td colspan="4">MP100W is intended for Use in the electromagnetic environment specified below. The client and user shall ensure that the MP100W is used in such an environment.</td></tr>
<tr><td>Resistance Test</td><td>IEC60601 Testing Condition</td><td>Conformity Level</td><td>Electromagnetic Environment (Guidelines)</td></tr>
<tr><td>Conductive RF
KN61000-4-6</td><td>3 Vrms
150 kHz
80 MHz ~</td><td>3 Vrms</td><td rowspan="2">For portable or mobile communication equipment, all components, including the body and cables of the MP100W, shall not be closer than the separation distance calculated by the equation applied to the transmitter frequency

Recommended Separation Distance
d = 1.2 √P
d = 1.2 √P 80 MHz~800 MHz
d = 2.3 √P 800 MHz~2.5 GHz
'P' is the transmitter's maximum output power rating (W), which the manufacturer of the transmitter discloses, and 'd' is the recommended separation distance (m)
The strength of the electric field of the fixed RF transmitter, which has been determined through a site inspection [a], shall be below the conformity level in each frequency range [b].
Failure/Interference may occur near a medical device marked with the symbol below.
  </td></tr>
<tr><td>Radioactive RF
KN 61000-4-3</td><td>3 V/m
80 MHz ~
2.5 GHz</td><td>3Vrms</td></tr>
<tr><td colspan="4">Note #1. Apply a higher frequency range at 80 MHz and 800 MHz
Note #2. This guideline shall not be applied to all situations. This is because electromagnetic waves are affected by absorption and reflection caused by nearby structures, objects, and people.</td></tr>
<tr><td colspan="4">a. It is theoretically difficult to accurately predict the exact intensity of the electric field caused by various sources (i.e., amateur wireless communication, AM/FM radio, TV broadcasting, land mobile communication, etc.)
To evaluate the electromagnetic environment caused by a fixed RF transmitter, a field/site inspection is required.</td></tr>
</table>

It is necessary to observe and verify that the device is operating correctly. Suppose the strength of the electric field measured at the location where the device is used exceeds the applicable RF level. In that case, check if the device operates appropriately necessary. If an abnormal operation is observed, additional measures, such as adjusting the direction of the device or moving the location, may be required.

b. The strength of the electric field shall be less than 3 V/m within the frequency range of 50KHz ~ 80MHz

Recommended Separation Distance Between Portable and Mobile RF Communication Equipment and MP100W

The MP100W is intended to be used in an electromagnetic environment where radioactive RF disturbances/interferences are under control. Based on the maximum power output of the communication equipment, the buyer (or the user) of the product can avoid electromagnetic disturbance/interference by maintaining the minimum distance between the portable/mobile RF communication device (transmitter) and MP100W as recommended below.

Rated/Maximum Output Power of Transmitter [W]	Recommended Separation Distance (based on transmitter frequency) [m]		
	150kHz~80MHz d = 1,2 √P	80MHz~800MHz d = 1,2 √P	800MHz~2.5GHz d = 2,3 √P
0.01	0.12m	0..12m	0.23m
0.1	0.38m	0.38m	0.73m
1	1.2m	1.2m	2.3m
10	3.8m	3.8m	7.3m
100	12m	12m	23m

The recommended separation distance ('d' (m)) for a transmitter with a rated maximum power output not listed above may still be determined using a formula that applies to the frequency of the said transmitter. Even there, 'P' refers to the maximum power output rating of the transmitter (W), which the transmitter manufacturer discloses.

Note #1. Apply a higher frequency range at 80 MHz and 800 MHz

Note #2. This guideline shall not be applied to all situations. This is because electromagnetic waves are affected by absorption and reflection caused by nearby structures, objects, and people.

FCC Part 15.105	The MP100W series 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.

	The MP100W series 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 MP100W series does cause harmful interference 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.
FCC Part 15.19(a)	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.
FCC Part 15.21	The MP100W series may generate or use radio frequency energy. Changes or modifications to MP100W series may cause harmful interference unless the modifications are expressly approved in the instruction manual. This user could lose the authority to operate MP100W series if an unauthorized change or modifications is made.
CE	The MP100W series can be operated in at least one Member State without infringing applicable requirements on the use of radio spectrum.

Seers Technology

Manufacturer

Seers Technology Co., Ltd

291-13, Dongbu-daero, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do

※ Customer Service Center: 031-8023-9811