PARAMOUNT BED

INSTRUCTION MANUAL

NEMURI SCAN

NN-1520U/NN-1520UP

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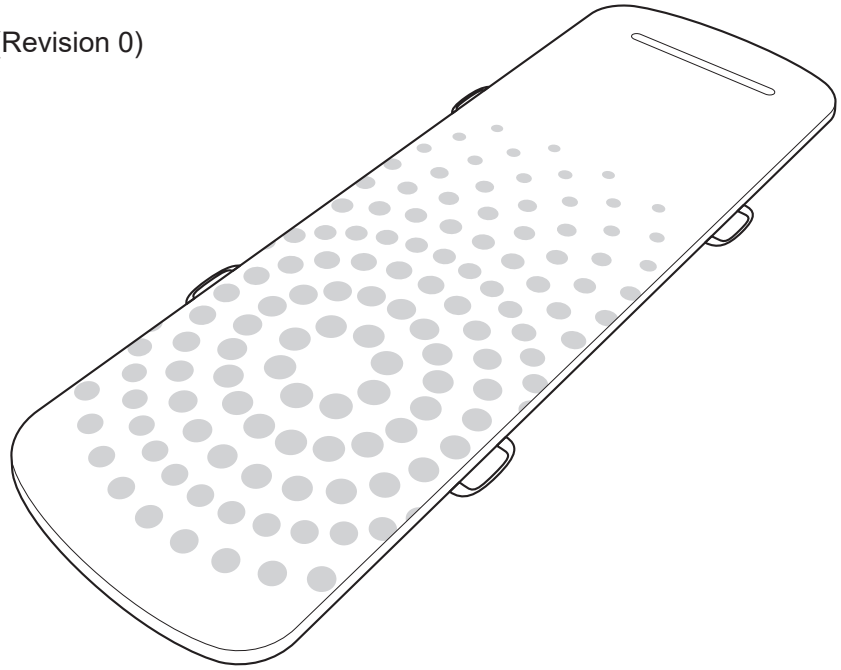

Preface

Thank you for purchasing **Nemuri SCAN**.

This instruction manual describes precautions and how to properly use and operate **Nemuri SCAN**.

- **To ensure safe and proper use of Nemuri SCAN, be sure to read this instruction manual before use.**
- **In addition to the person who uses Nemuri SCAN, caregivers should also read this instruction manual.**
- **After reading this instruction manual, store it in a place that can be easily accessed for later reference.**
- Some of the descriptions in this instruction manual may differ from the product you have purchased due to model improvements.
- Values described for the operation range, dimensions, angles, and weights are subject to normal manufacturing tolerances. Except for special cases, words such as approximately and about are omitted in this instruction manual to improve readability.
- If you have any questions, please contact Paramount Bed.

PARAMOUNT BED CO., LTD.

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1 INTRODUCTION

⚠ CAUTION	**Federal U.S. law restricts this device to sale by or on the order of a physician.**

- The Nemuri SCAN bed sensing unit is a medical device that continuously measures the respiratory rate, heart rate, and movement of an individual who is using a bed (“bed user”), automatically and without coming into contact with the bed user. Nemuri SCAN performs these measurements using a sensor located inside the main unit, saving and transmitting the measurement data for medical professionals to view and analyze. The main unit is placed under the mattress during use.
- There is a sensor plate inside the main unit of Nemuri SCAN that uses piezoelectric technology to detect mechanical vibrations produced by the bed user’s heart, respiration, and body movements. Algorithms in the Nemuri SCAN firmware process these received piezoelectric signals to provide measurements of bed user respiratory rate, heart rate, and movement.
- Nemuri SCAN saves the measurement data internally, and also on an external memory card if one is inserted into the main unit. In addition, Nemuri SCAN simultaneously communicates the measurement data to the Viewer software. This allows medical professionals to understand the real-time or accumulated respiratory rate, heart rate, and movement data of the bed user. A Viewer software user can view or be made aware of bed user status in real time, and view analysis of the data for specified time intervals, according to parameters or thresholds that the software user designates.
- Please note that Nemuri SCAN has not been tested, studied, or evaluated with specific patient demographic groups, or in relation to any specific illness or medical condition. Nemuri SCAN is intended for continuous measurement of respiration rate, heart rate, and movement in a real-time, contact-less manner. It is for use in a suitable environment as defined in this manual: In a hospital, or clinical setting. The device is indicated for use with adults, adolescents, and children weighing 30 kg to 180 kg in a sleeping or resting condition.

■ FCC Regulatory information

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.

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.

⚠ CAUTION	**Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2 INTENDED USE AND CONTRAINDICATIONS

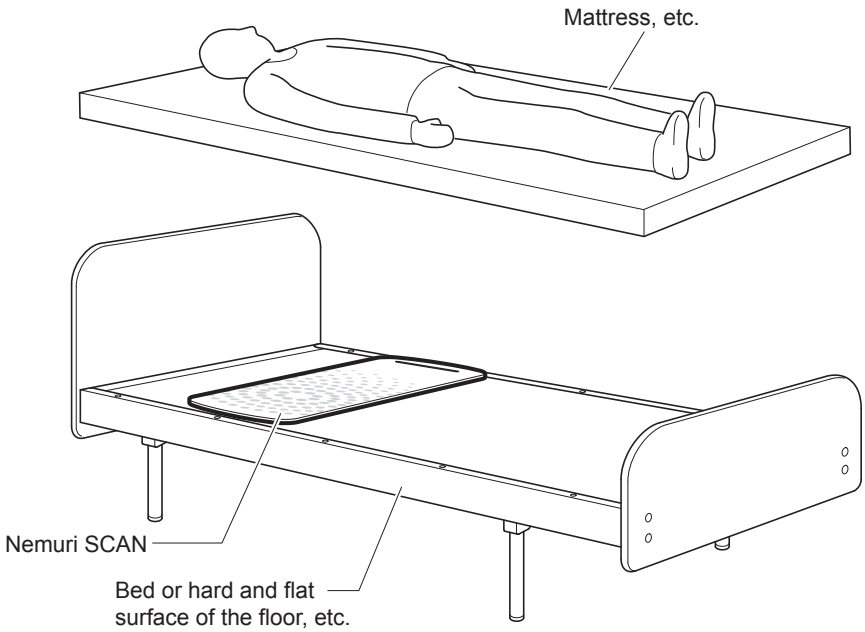
■ Intended use

- Nemuri SCAN is a bed sensing unit that is intended for continuous measurement of respiration rate, heart rate, and movement in an automatic, contact-less manner. It is for use in a suitable environment as defined in “Installation Conditions” on page 13 of this manual, in a hospital or clinical setting. The device is indicated for use with adults, adolescents, and children weighing 30 kg to 180 kg in a sleeping or resting condition.
- Continuous measurement of user respiration rate, heart rate, and the activity associated with movement during sleep; in a real-time, contact-less manner.

■ Contraindications for use

Nemuri SCAN is contraindicated for use as follows:

- To monitor a life-threatening condition in the bed user, such as sleep apnea.
- In an environment where combustible anesthetic gases or high-concentration oxygen may be present.
- In a wet or potentially wet environment.
- In an MR environment.
- With bed users weighing less than 30 kg or more than 180 kg.



Note!

- **Dedicated software (NN-C110E) and a PC are required to view the measurement data. For details, see “7 PROCEDURE UNTIL SLEEP DATA MEASUREMENT” on p. 12.**
- **The installation conditions vary depending on the product you purchased. For details on installation conditions, see “8 BEFORE USE” on p. 13.**

⚠ CAUTION	**When viewing measurement results and providing care, always follow the instructions of a physician. Failure to observe this may result in improper care or injury.**

3 SAFETY PRECAUTIONS

■ Be sure to read these safety precautions before use to ensure proper use.

● The safety precautions described here are intended to ensure safe use of the product and prevent personal injury and property damage. Precautions are classified into ⚠ WARNING, ⃠ PROHIBITED, and ⚠ CAUTION, which indicate the degree of hazard or injury that could result from improper use. **They are all important safety precautions that must be strictly observed.**

⚠ **WARNING**	**Indicates that improper handling by ignoring this indication may cause death or serious injury (broken bones, pressure being applied, or paralysis).**
⚠ **CAUTION**	**Indicates that improper handling by ignoring this indication may cause minor injuries (such as bruises, scratches, or cuts) or property damage.**
	**Indicates that improper handling by ignoring this indication may cause a malfunction or poor performance.**

* After reading this instruction manual, store it in a place that can be easily accessed for later reference.

⚠ WARNING

■ Use the supplied or suitable optional dedicated AC adapter and cables to connect devices to Nemuri SCAN.

● If you use an AC adapter and cables other than the supplied or suitable optional ones, the voltage or terminal polarity may differ, resulting in smoke or fire.

■ Do not damage the dedicated AC adapter and cables.

● Electric shock or fire may occur. Please request repair (or replacement) of a damaged dedicated AC adapter or cable.

■ Do not apply excessive force to the power plug.

● Electric shock or fire may occur.

■ Connect cables correctly (see p. 17 to 19).

● Damaged cables may cause an electric shock or fire, or a person's foot may get tangled in a cable, resulting in fall and injury.

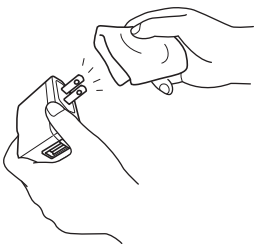
● Measurement may not be performed correctly.

- Be careful to prevent cables from getting caught in the moving parts of the bed, side-rails, etc.
- Route cables where a person's foot may not get entangled in the cables.
- Do not pull the cables or apply excessive force to them.
- Regularly check that the cables are connected correctly.
- Do not move Nemuri SCAN with cables connected to it.
- When moving the bed, disconnect the dedicated AC adapter from the outlet.

■ Do not allow dust to accumulate on the power plug.

● Dust on the power plug may absorb moisture and conduct electricity, resulting in poor insulation and fire.

● Wipe away any dust accumulating on the surface of the power plug using a dry cloth.



3 SAFETY PRECAUTIONS

⚠ WARNING

■ Disconnect the power plug while holding the dedicated AC adapter.

● If you disconnect the power plug while holding the dedicated USB cable, the dedicated AC adapter or dedicated USB cable may be damaged, resulting in electric shock or fire.

■ Turn off the power supply before starting maintenance.

● A short circuit or electric shock may occur.

■ Keep away from fire.

● Do not use heaters or other heating devices near Nemuri SCAN. Doing so may cause deterioration, deformation, or fire.

■ Do not spill water or other liquids onto Nemuri SCAN.

● A short circuit, electric shock, or failure may occur. If liquid is accidentally spilled, turn off the power supply and contact your distributor or directly contact Paramount Bed (see p. 50).

■ Please request an inspection or repair of a damaged Nemuri SCAN.

● If your Nemuri SCAN is damaged in an earthquake, fire, flood, or other incident, contact your distributor or directly contact Paramount Bed (see p. 50) for inspection or repair. A short circuit, electric leakage, electric shock or fire may occur.

■ Do not connect or disconnect the power plug with wet hands.

● A short circuit, electric shock, or failure may occur.

■ Do not connect multiple cables to a single outlet.

● If you connect other electrical appliances to the same outlet as Nemuri SCAN, the capacity of the outlet or extension cable may be exceeded and the dedicated AC adapter or cables may overheat, resulting in fire.

■ Do not use Nemuri SCAN in a life-threatening environment for the user.

● Nemuri SCAN is intended to measure respiratory rate, heart rate, and the movement associated with sleep, and is not intended to monitor life-threatening events, such as apnea.

■ Do not use Nemuri SCAN in an environment where combustible anesthetic gases and high-concentration oxygen may be present.

● Explosion or fire may occur.

⚠ CAUTION

■ When carrying Nemuri SCAN, be careful not to bump against surrounding objects.

- It may be damaged or deformed.

■ Take care that Nemuri SCAN does not fall.

- It may be damaged.

■ Do not bring sharp objects near Nemuri SCAN.

- It may be damaged.

■ Turn off the power supply when using electronic medical devices.

- If you use Nemuri SCAN together with electronic medical devices (e.g. microwave or ultrashortwave medical devices), Nemuri SCAN may fail or measurement may not be performed correctly.
- Check for safety before using Nemuri SCAN in conjunction with other medical devices.

■ Do not apply strong impacts to Nemuri SCAN by sitting down on it with great force, or by jumping up and down on it, etc.

- A failure may occur because it includes precision sensors.

■ Be careful with regard to the user's weight.

- The maximum user weight allowed on Nemuri SCAN is 180 kg. If 180 kg is exceeded, Nemuri SCAN may fail or measurement may not be performed correctly.

■ Observe the following when storing Nemuri SCAN.

- Do not store Nemuri SCAN with heavy objects placed on it or large forces applied to it. Nemuri SCAN may be damaged or fail.
- When folding Nemuri SCAN, follow the specified procedure. Otherwise, Nemuri SCAN may be damaged or fail. (For the folding procedure, see p. 26.)

■ Inspect Nemuri SCAN regularly.

- Nemuri SCAN will deteriorate differently depending on the operating frequency and environment. Regularly inspect for damage, etc. (For the inspection items, see p. 25.)

■ When viewing measurement results and providing care, always follow the instructions of a physician.

- Failure to do so may result in improper care or injury.

3 SAFETY PRECAUTIONS

⚠ CAUTION

■ Only use Nemuri SCAN with the correct installation conditions and installation procedure.

● Failure to do so may result in measurement being performed incorrectly. Furthermore, products may come into contact with each other or cables may get caught, causing damage or deformation.

■ Do not allow Nemuri SCAN to be installed by children aged 12 or under or any person deemed incapable of understanding its operation.

● Measurement may not be performed correctly or a failure may occur.

■ Do not use Nemuri SCAN in an environment with a temperature of 40˚C or higher.

● The temperature of Nemuri SCAN will rise, resulting in a failure. Be careful about the temperature when using an electric carpet, floor heating, electric heating blanket, etc.

■ Nemuri SCAN should not be used by two or more persons (or together with a pet).

● Measurement will not be performed correctly.

■ Do not use Nemuri SCAN in an environment with vibration.

● If vibration from a mobile phone or other device is transmitted to Nemuri SCAN, measurement may not be performed correctly.

■ Do not install Nemuri SCAN on an uneven surface or a soft surface such as the top of the mattress, etc.

● Measurement may not be performed correctly.

■ Do not spray a spray-type insecticide directly on Nemuri SCAN.

● Solvents contained in the insecticide may damage, discolor, or dissolve Nemuri SCAN. Furthermore, damaged or dissolved parts may cause accidental injury.

■ Do not repair or modify Nemuri SCAN yourself.

● It may operate abnormally, resulting in injury.

■ Notes on using Nemuri SCAN with a wireless LAN (notes on radio waves).

● When Nemuri SCAN will be used in conjunction with a cardiac pacemaker or other medical devices, follow the guidelines and instructions of the corresponding medical institution or facility and confirm safety before use. Malfunction may occur.

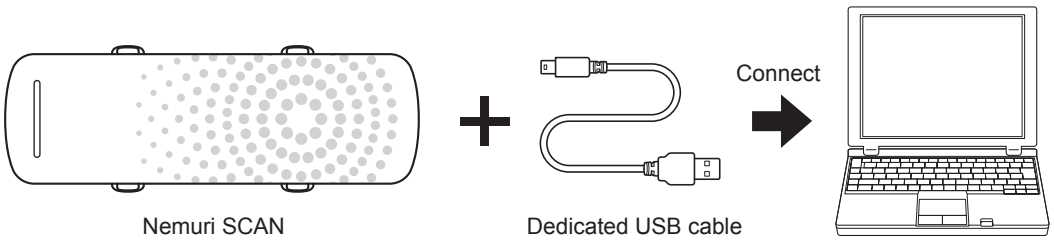
4 FEATURES

[Reading measurement data]

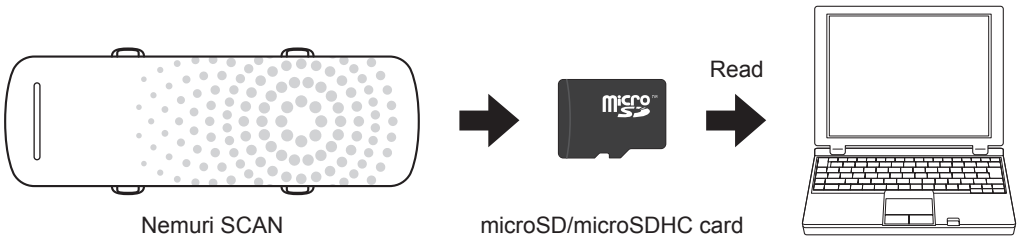
- There are three procedures to view the measurement data as described below. Select the one that matches your usage.
- Dedicated software (NN-C110E) is required to view the data on a PC. For details, see "7 PROCEDURE UNTIL SLEEP DATA MEASUREMENT" on p. 12.
- Commercial devices, such as a PC, wireless LAN access point, or hub, should be installed at least 1.5 m from the bed or mattress on which the user is lying.

1. Connecting Nemuri SCAN to a PC with a dedicated USB cable.

A dedicated AC adapter is not required since power is supplied from the PC.
Dedicated AC adapter (NN-LA10: optional accessory) is required for NN-1520UP.

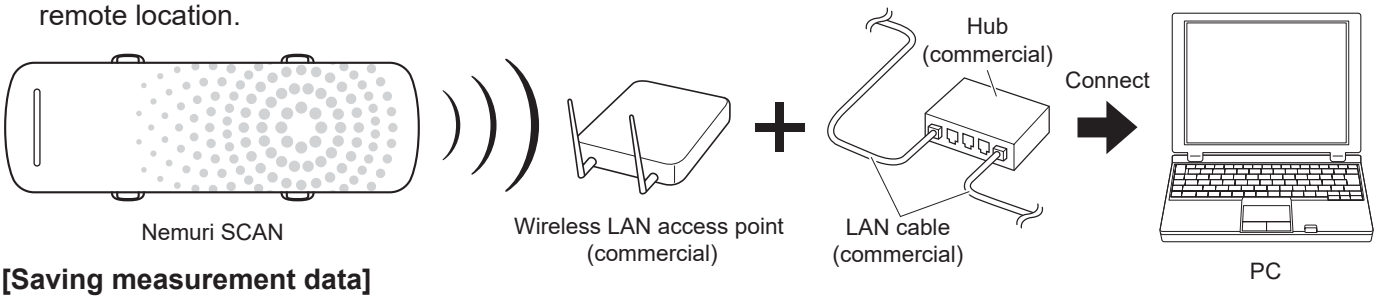


2. Reading a microSD/microSDHC card (commercially available product) with a PC.



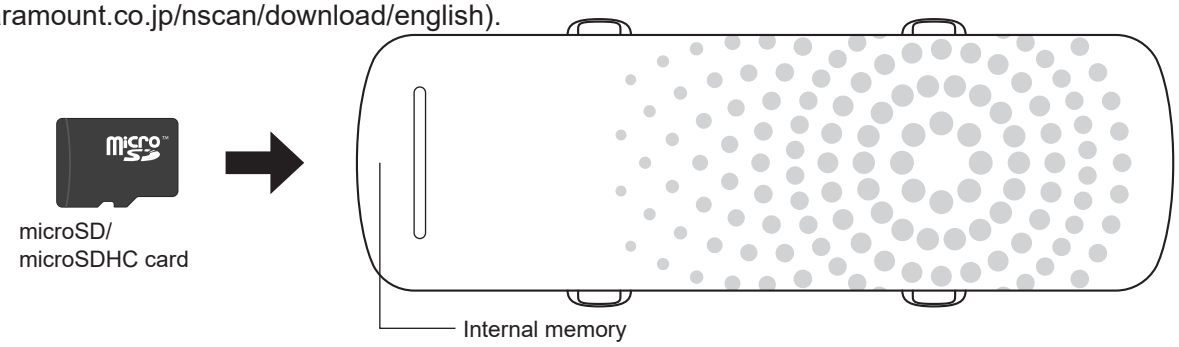
3. Using a wireless LAN

The asleep, awake, and out-of-bed states of the Nemuri SCAN user can be checked in real time from a remote location.



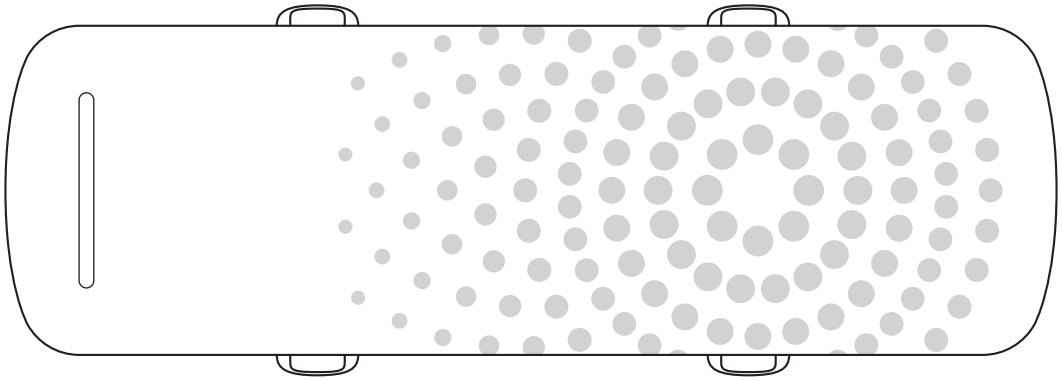
[Saving measurement data]

- The measurement data is saved to the internal memory.
  Also, if you use a commercially available microSD or microSDHC card, the measurement data will be saved to both the internal memory and microSD/microSDHC card. For details, see "11 SAVING MEASUREMENT DATA" on p. 21.
  * For microSD/microSDHC cards for which operation has been verified, check our website (https://www.paramount.co.jp/nscan/download/english).

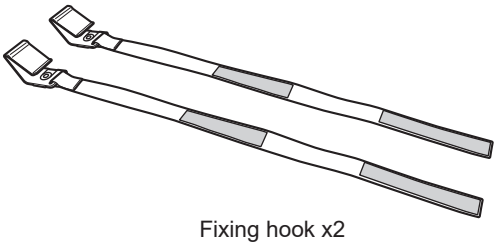


5 CHECKING PARTS

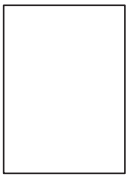
■**After unpacking, check that there are no missing or damaged parts. If any parts are missing or damaged, contact your distributor or directly contact Paramount Bed (see p. 50).**



Nemuri SCAN (main unit) x1

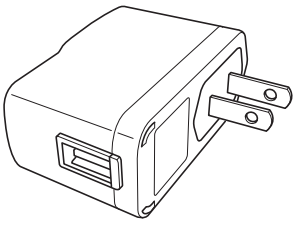


Fixing hook x2

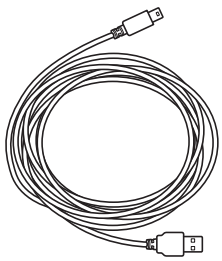


Instruction manual
(this document) x1

NN-1520U only

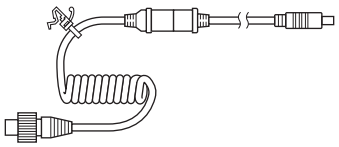


Dedicated AC adapter x1



Dedicated USB cable x1
(length: 2.5 m)

NN-1520UP only

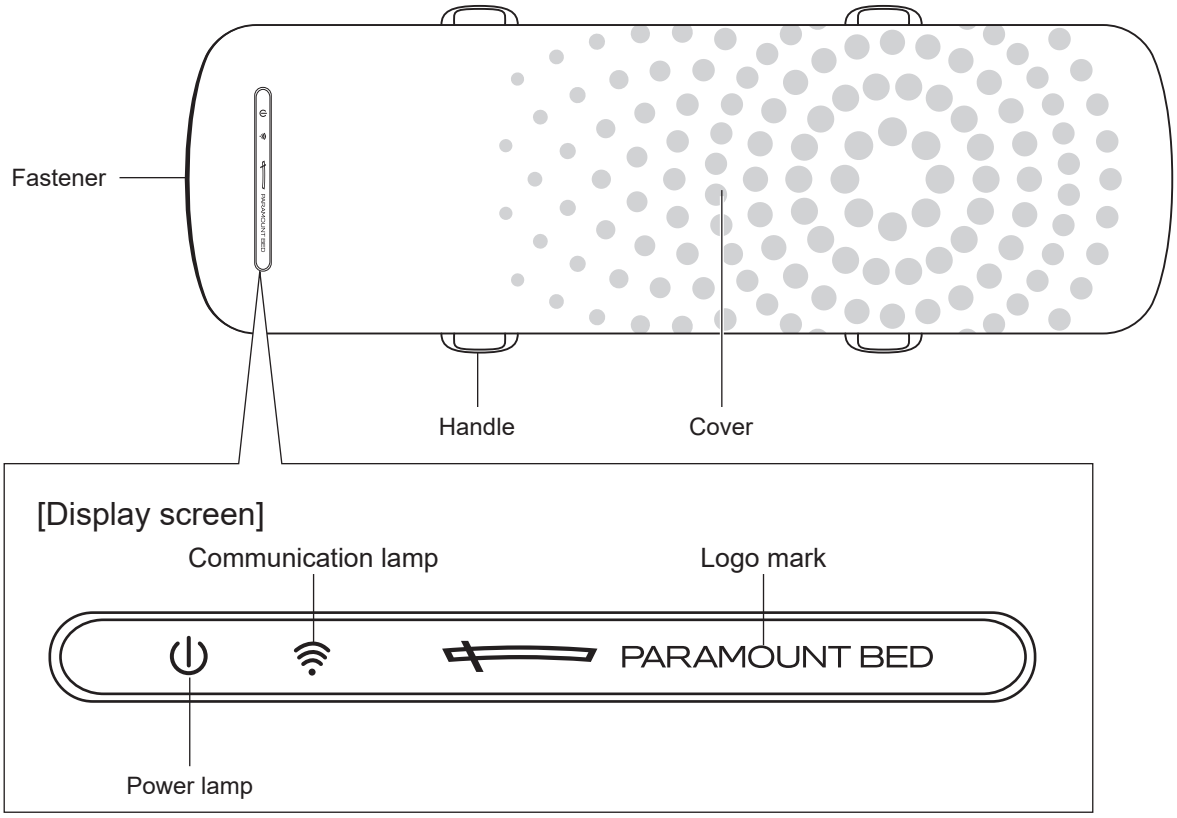


Bed connection cable x1

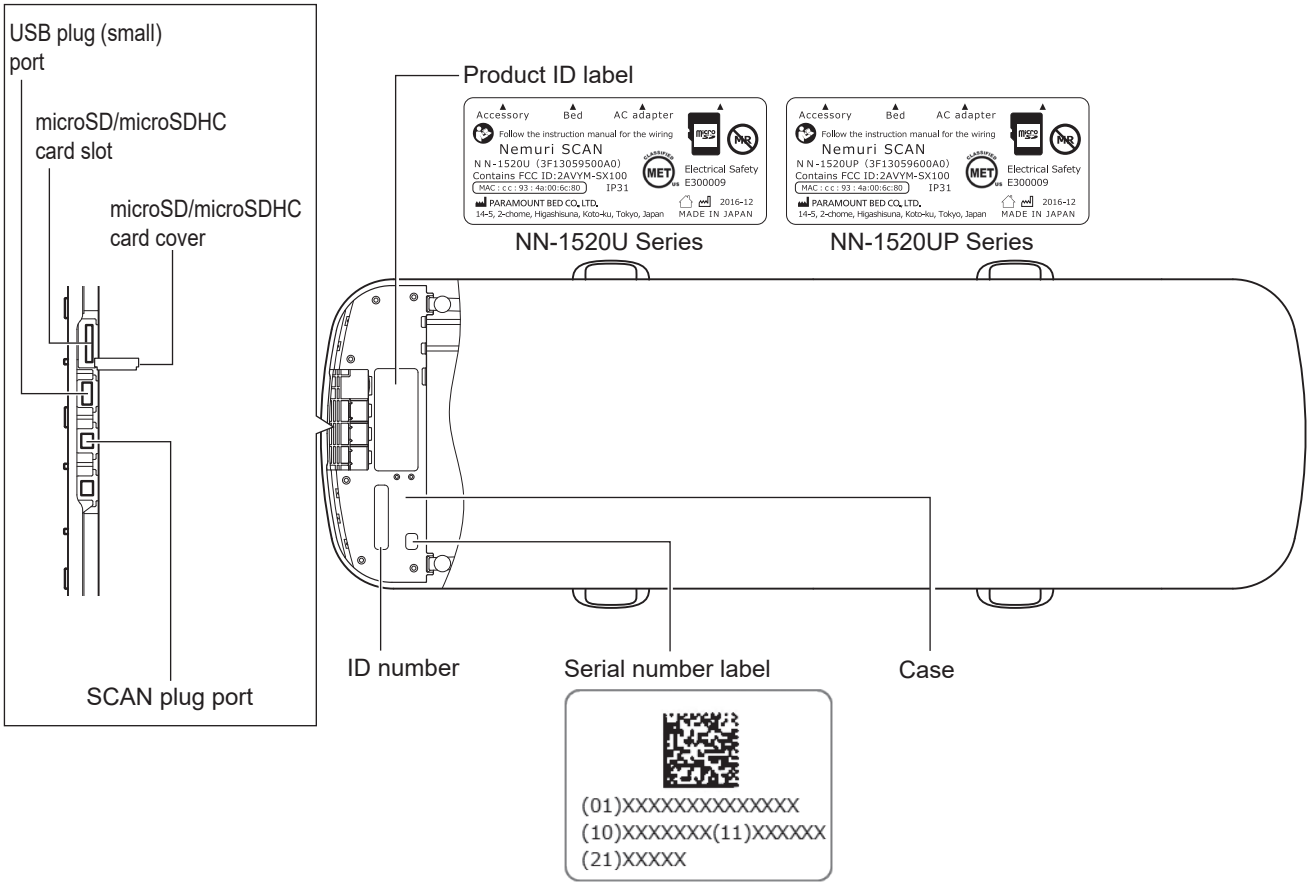
6 PART NAMES

Nemuri SCAN (main unit)

[Front]



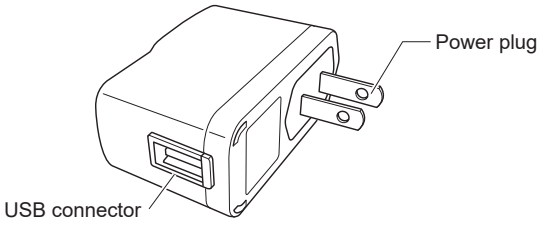
[Back]



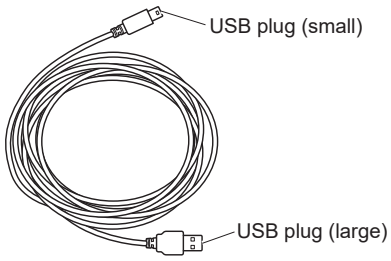
6 PART NAMES

NN-1520U only

Dedicated AC adapter

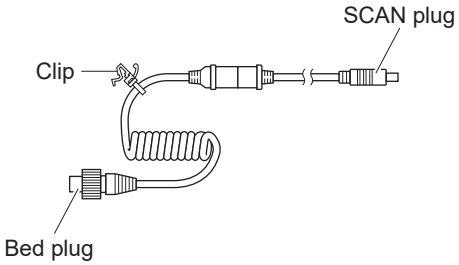


Dedicated USB cable

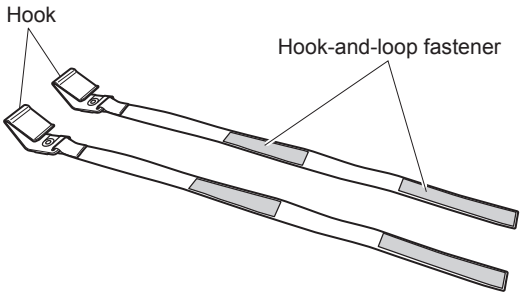


NN-1520UP only

Bed connection cable



Fixing hook



7 PROCEDURE UNTIL SLEEP DATA MEASUREMENT

■**To measure sleep data with Nemuri SCAN, follow the steps below to perform setup, installation, and connection.**

*: Operate dedicated software (NN-C110E) on a PC.

⚠ CAUTION	**When determining measurement results and providing care based on the measurement results, follow the instructions of the physician. Failure to observe this may lead to a worsening of symptoms.**

Before use

☞ **p. 13 to 14, p. 35 to 41**

1. Installation conditions
2. Setting wireless LAN for Nemuri SCAN (main unit)*
3. Registering Nemuri SCAN*
4. Registering measured persons and rooms*

Installing Nemuri SCAN

☞ **p. 15 to 19**

1. Installing Nemuri SCAN (main unit)
2. Installing Nemuri SCAN on a suitable bed (back-raising function)
3. Connecting cables

Turning on the power supply and starting measurement

☞ **p. 22**

Viewing measurement data

☞ **p. 42 to 49**

1. Seeing measurement data on a PC*
2. Printing measurement data*
3. Changing settings*

About dedicated software (NN-C110E)

Dedicated software (NN-C110E) is required to view the measurement data on a PC. Download the dedicated software (NN-C110E) from the following URL.

https://www.paramount.co.jp/nemuriscan/download/english

* An ID and password are required for downloading. For ID and password issuance, contact Paramount Bed (see p. 50).
* For details on using the dedicated software, also see the manual for the dedicated software.

8 BEFORE USE

⚠ CAUTION	● **Measurement may not be performed correctly depending on the lying posture or position (e.g., with the body positioned near the edge of the mattress or with the head positioned at the foot end).** ● **Do not use Nemuri SCAN in the following environment since Nemuri SCAN may be damaged or measurement may not be performed correctly.** **• Used by two or more people (including a pet)** **• Used in an environment with vibration (e.g., vibration from a cell phone)** **• Used on an uneven surface or a soft surface on the mattress, etc.** **• When the back-raising function is used on a bed other than a suitable bed (back-raising function)** **• Not installed in the specified position**

1. Installation conditions

● Nemuri SCAN should be installed in an environment as described below with the surface with the logo mark (PARAMOUNT BED) facing upward (surface with a dot design).

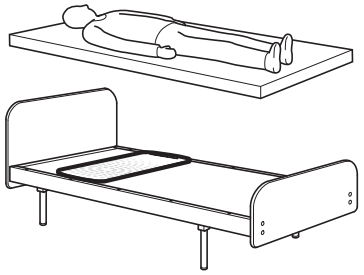
[Installation surface]

• Hard and flat surface on the bed, floor, etc.

[Suitable mattress, etc.]

• When the width is 100 cm or less, the thickness of the mattress, etc. is 20 cm or less.

• When the width is 120 cm or less, the thickness of the mattress, etc. is 16 cm or less.



● When using the back-raising function of a bed, use any of the suitable beds below.

Suitable bed (back-raising function)	ALiUS Series

● When using the bed connection cable, use the suitable bed below.

Suitable bed (Bed connection)	ALiUS Series

■ For suitable beds other than the above or the latest information, visit the Paramount Bed website (https://www.paramount.co.jp/english/) or contact Paramount Bed.

2. Setting wireless LAN for Nemuri SCAN (main unit)

●You can set up Nemuri SCAN to work with a wireless LAN using a PC. Be sure to set before using Nemuri SCAN with a wireless LAN. For how to set a wireless LAN for Nemuri SCAN, see p. 38.

3. Registering Nemuri SCAN

●You can register Nemuri SCAN to communicate via a LAN. For how to register, see p. 39.

4. Registering measured persons and rooms

●You can register the persons (residents) to be measured and room information. For how to register, see p. 40 and 41.

<Dedicated Software (NN-C110E) Operating Environment>

OS	**Windows 10, Windows 8.1**
CPU	**Intel Pentium compatible processor running at 1 GHz or higher is recommended**
Memory	**1 GB or higher is recommended**
Hard disk	**Approx. 40 MB (Space used by installation. Excludes space used by recording measurement data.)**
Display size	**XGA (1024x768 pixels) or more**
Communication interfaces	**• USB port • Wired LAN (Ethernet)**
Other	**Acrobat Reader 5.0 or higher**

9 INSTALLING NEMURI SCAN

⚠ CAUTION	● Do not bring sharp objects near Nemuri SCAN. Nemuri SCAN may be damaged. ● Nemuri SCAN should be installed with the surface with the logo mark (PARAMOUNT BED) facing upward (surface with a dot design).

Note!

- **Install Nemuri SCAN in a position where you can connect and disconnect the power plug of the dedicated AC adapter as well as cables.**
- **Be careful that Nemuri SCAN is not moved off from the installation position or does not fall off the bed when placing or moving the mattress, etc. to make the bed.**

1. Installing Nemuri Scan (main unit)

When using Nemuri SCAN on the bed

Note!

If a mattress, etc. is on the bed, remove it from the bed before installation.

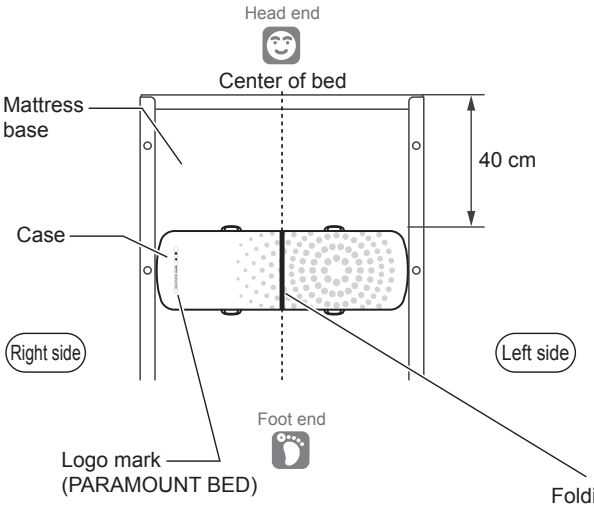
❶ Confirm the side on which the user gets in and out of the bed and determine the position of the case (right or left side). (See the figure below.)
❷ Place Nemuri SCAN (main unit) on the bed with the surface with the logo mark (PARAMOUNT BED) facing upward.
❸ Install Nemuri SCAN (main unit) in the correct position as follows.
○ For the lateral direction, check the mattress base width of the bed and install Nemuri SCAN as follows.
- When the mattress base width is 91 cm or more
  Install Nemuri SCAN (main unit) so that its folding part comes to near the center of the mattress base.
- When the mattress base width is 83 cm or less
  Install Nemuri SCAN (main unit) so that it does not protrude over the edge of the mattress base.

○ Make sure that the distance from the mattress base edge at the head end of the bed to the edge of Nemuri SCAN (main unit) is 40 cm. For the suitable beds (back-raising function), see “1. Installation conditions” on p. 13.

* The following figure shows a bed with a mattress base width of 83 cm.
* The right and left sides in the figure below are viewed from the perspective of a user lying face up.

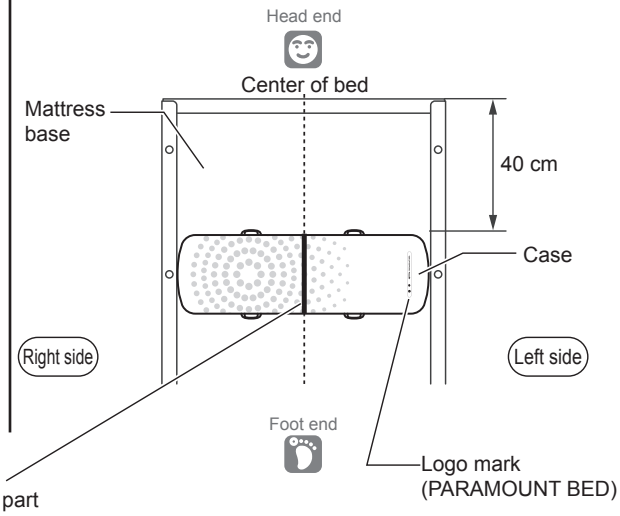
When getting in and out of the bed from the left side

Install the case on the right side



When getting in and out of the bed from the right side

Install the case on the left side



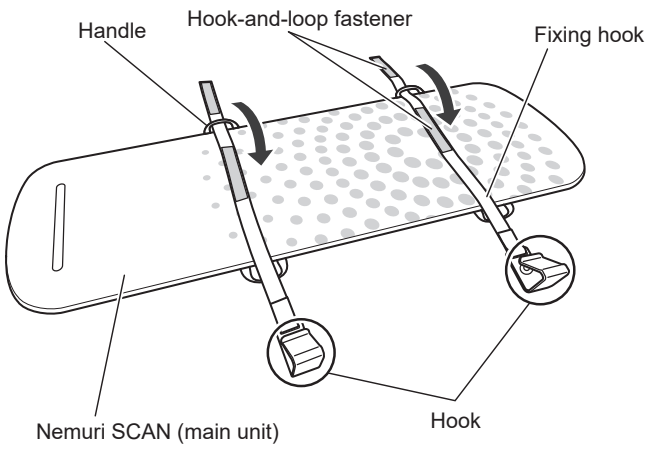
Folding part

When using Nemuri SCAN on a hard and flat surface of the floor, etc. other than the bed

❶ Determine the position to place the mattress, etc.
❷ Install Nemuri SCAN (main unit) by following steps ❶ to ❸ of “When using Nemuri SCAN on the bed” on p. 15.
* Read “bed” and “mattress base” in ❶ and ❸ as “mattress, etc.” and “on the bed” in ❷ as “on the floor, etc.”

2. Installing Nemuri SCAN on a suitable bed (back-raising function)

● For details on the suitable beds (back-raising function), see p. 13.



❶Pass the fixing hooks through the handles on the side of Nemuri SCAN (main unit) and fix the hook-loop-fasteners so that they cover the entire surface.
* Note that the fixing hook attachment handles differ depending on the orientation to place Nemuri SCAN (main unit).

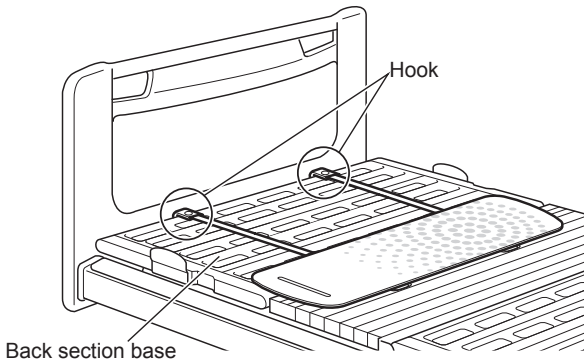
Note!

● **Attach the fixing hooks so that the logo mark (PARAMOUNT BED) faces upward when Nemuri SCAN is installed on the bed.**

❷Set the hooks of the fixing hooks on the back section base of the bed.
* If the back section base is raised, return it to a flat position and then set the hooks.
* Set the hooks so that the belts of the fixing hooks are not twisted.

Note!

● **If it is difficult to set the hooks on the back section base, detach the headboard of the bed.**
● **For how to detach the headboard, see the instruction manual for the bed.**



❸Make sure that the folding part of Nemuri SCAN (main unit) is placed near the center of the mattress base of the bed.
(See p. 15.)

❹After performing steps ❶ to ❸, raise and lower the back and knee section bases and the height of the bed to make sure that Nemuri SCAN (main unit) and the fixing hooks are not caught in the moving parts of the bed.

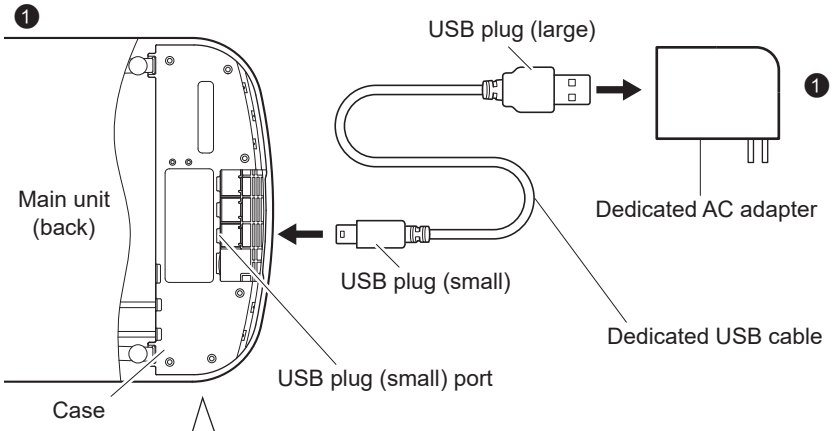
9 INSTALLING NEMURI SCAN

3. Connecting cables

⚠ **WARNING**	**Connect the cables correctly. Damaged cables may cause an electric shock or fire, or a person's foot may get tangled in a cable, resulting in falling down and injury. Furthermore, measurement may not be performed correctly.** **• Be careful to prevent cables from getting caught in the moving parts of the bed, side-rails, etc.** **• Route cables where a person's foot may not get entangled in the cables.** **• Do not pull the cables or apply excessive force to them.** **• Regularly check that the cables are connected correctly.** **• Do not move Nemuri SCAN with cables connected to it.** **• When moving the bed, disconnect the dedicated AC adapter from the outlet.**
⚠ **CAUTION**	**When disconnecting a cable, hold the plug and pull it out straight. Measurement may not be performed correctly due to disconnection or damage.**

There are two different connection methods depending on the devices you use. Do not connect cables with two or more connection methods at the same time. Do not connect any cables other than those described in each connection method to Nemuri SCAN (main unit).

■Connection method of dedicated AC adapter and dedicated USB cable

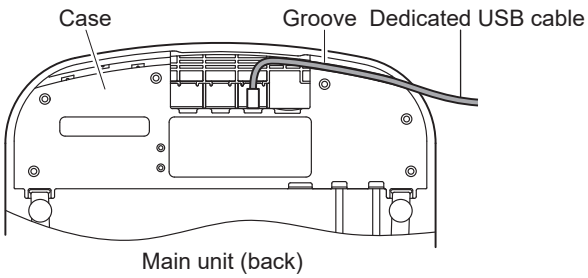


❶ Insert the USB plug (large) into the USB connector for the dedicated AC adapter. Open the fastener on the side of Nemuri SCAN (main unit) and draw out the case. Connect the USB plug (small) to the USB plug (small) port.

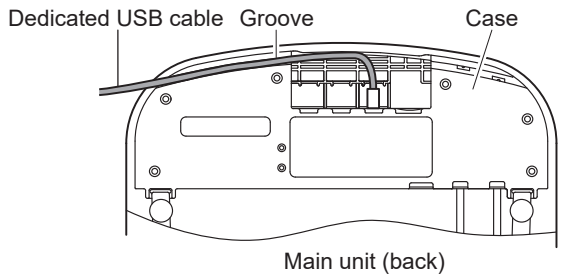
❷ Determine the direction to draw out the dedicated USB cable according to the position of the outlet, insert the dedicated USB cable into the groove on the case, and close the fastener.

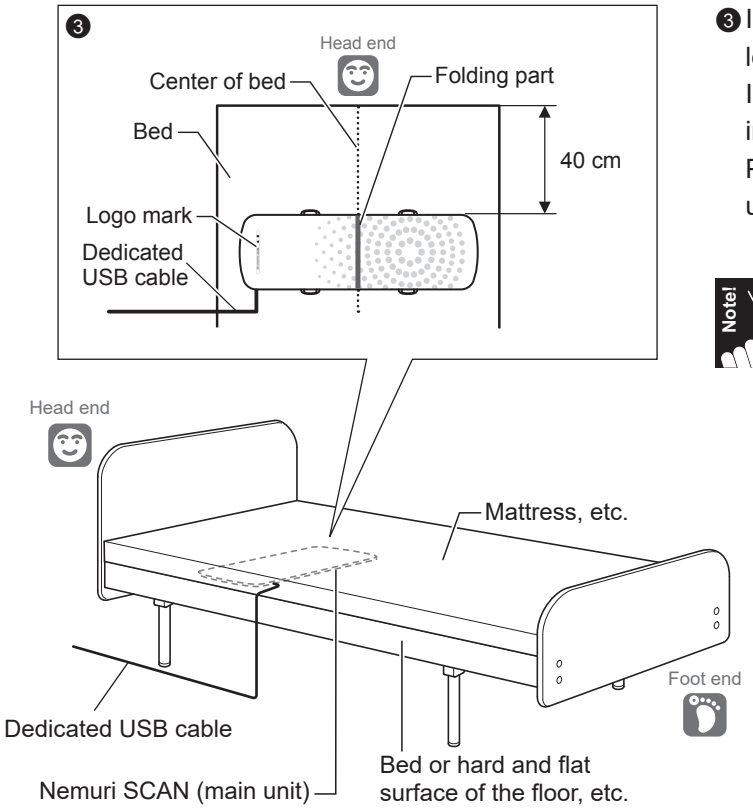
Be careful not to damage the dedicated USB cable when closing the fastener.

When drawing out the dedicated USB cable from the left side of Nemuri SCAN (main unit)



When drawing out the dedicated USB cable from the right side of Nemuri SCAN





❸ Install Nemuri SCAN on the floor or bed with the logo mark (PARAMOUNT BED) facing upward.
Insert the power plug of the dedicated AC adapter into the outlet.
Place the mattress, etc. on Nemuri SCAN (main unit).

Note!

- **Install Nemuri SCAN (main unit) so that its folding part comes to near the center of the mattress (the dotted line in the figure on the left).**
- **Install Nemuri SCAN so that the distance from the mattress edge at the head end of the bed to the edge of Nemuri SCAN (main unit) is 40 cm.**
- **Make sure that the dedicated USB cable is not caught in a gap in the furniture.**

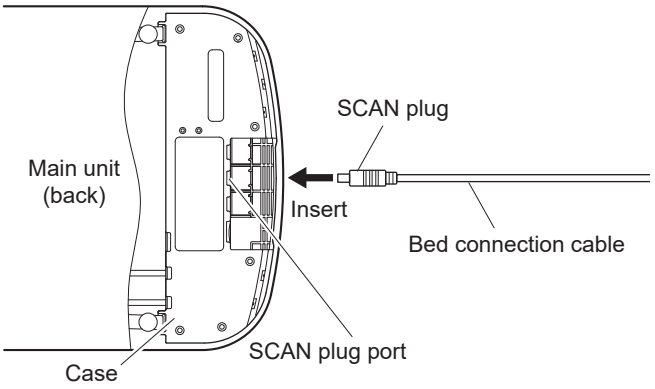
* The figure shows the dedicated USB cable drawn out from the left side of Nemuri SCAN (main unit) when using the bed.

9 INSTALLING NEMURI SCAN

■Connection method of bed connection cable

ALiUS Series

❶

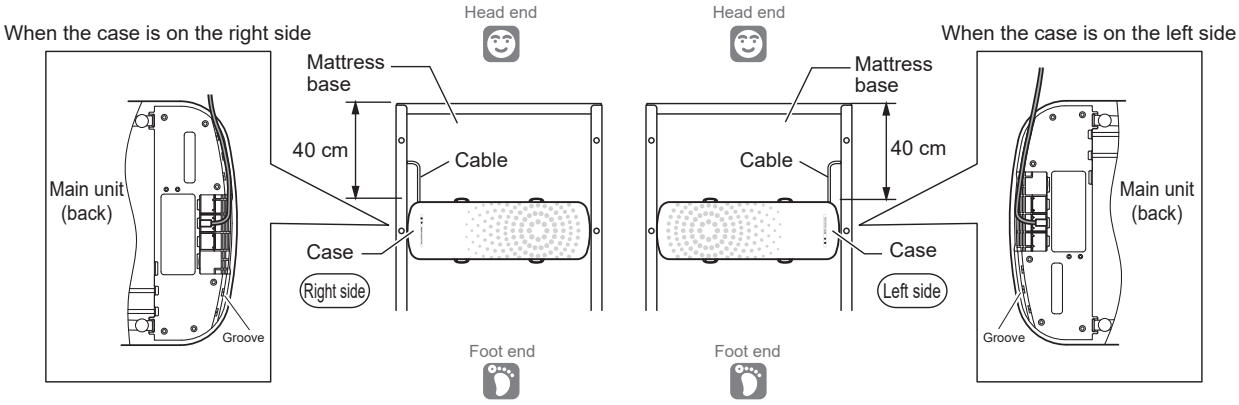


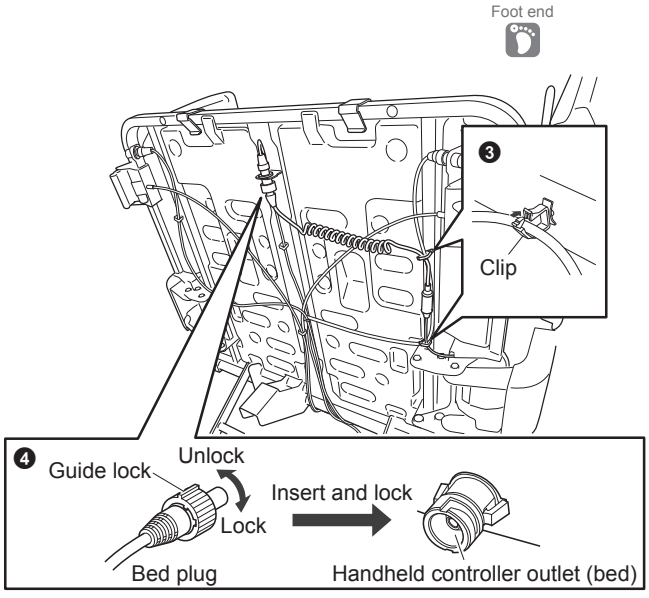
❶Open the fastener on the side of Nemuri SCAN (main unit) and draw out the case. Insert the SCAN plug into the SCAN plug port of the case.

❷Insert the cable on the back of the back section base into the groove on the back of the case as shown in the figure below so that it does not sag. If the inserted cable is excessive, pull the excess part of the cable outside. (See figure ❷.)

* The right and left sides in the figure below are viewed from the perspective of a user lying face up.

❷





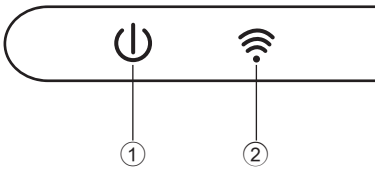
❸Raise the back section base angle of the bed to the maximum position and route the bed connection cable along the back of the back section base.

Fasten the bed connection cable with two clips on the back of the back section base of the bed. (See figure ❷.)

❹Insert the bed plug of the bed connection cable into the bed plug port on the back section base of the bed. To prevent the bed plug from being disconnected, turn the guide lock clockwise to lock it. (See figure ❺.) For the position of the bed plug port, see the instruction manual for the bed.

❺After performing steps ❶ to ❹, raise and lower the back and knee section bases and the height of the bed to make sure that Nemuri SCAN (main unit) and the cables are not caught in moving parts or side-rails of the bed.

10 INDICATOR LAMPS



① Power lamp

Off	: Power is off.
Flashing (green)	: Power is on (during measurement).
Flashing (orange)	: Error (caution) occurred.

② Communication lamp

Flashing (green)	: Wi-Fi connection being established.
On (green)	: Wi-Fi is connected.
Off	: Wi-Fi is disconnected or turned off.

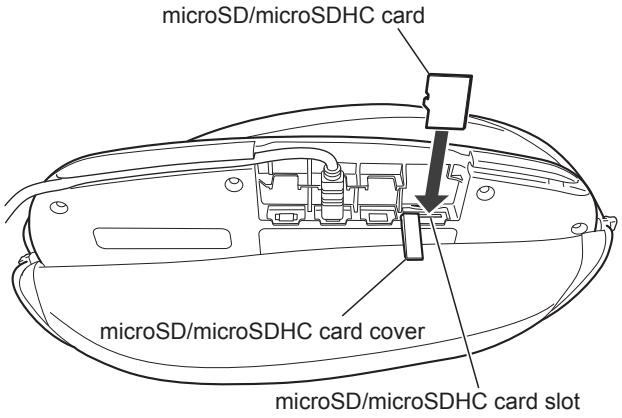
* If an error occurred, see “17 TROUBLESHOOTING” on p. 27.

11 SAVING MEASUREMENT DATA

● Measurement data is automatically saved to the internal memory of Nemuri SCAN during measurement.

■ When using a microSD/microSDHC card
When a commercially available microSD/microSDHC card (hereinafter referred to as the “card”) is used, the measurement data will be saved to both the internal memory and the card.

■ Dedicated software (NN-C110E) is required to transfer and view the measurement data recorded in the card with a PC. For how to use the dedicated software, see the manual for the dedicated software.



Inserting a card

❶ Make sure that data other than the measurement data of Nemuri SCAN is not stored in the card you use.
❷ Turn off the power supply if Nemuri SCAN is measuring. (See p. 22.)
❸ Open the microSD/microSDHC card cover and push in the card in the correct direction until it clicks. (See the figure on the left.)
❹ Close the microSD/microSDHC card cover firmly so that the cover does not become detached.

Note!

● **Use a card with a capacity of at least 8 GB.**
● **For the cards that can be used and number of records that can be recorded, see “18 SPECIFICATIONS” on p. 29.**

Removing a card

❶ Turn off the power supply if Nemuri SCAN is measuring. (See p. 22.)
❷ Open the microSD/microSDHC card cover, push in the card until it clicks, and then return the card slowly to its original position and pull it out.
❸ Close the microSD/microSDHC card cover firmly so that it does not become detached.

⚠ CAUTION	● **Push in the card until it clicks. Measurement data may not be saved correctly.** ● **Close the microSD/microSDHC card cover firmly. If dust is accumulated inside of the case of Nemuri SCAN, measurement may not be performed correctly or failure may occur.** ● **Insert or remove the card while the power supply of Nemuri SCAN is turned off. Measurement data may be damaged.** ● **Do not use the card for any other purposes than recording the measurement data of Nemuri SCAN. The measurement data may be damaged or measurement may not be performed correctly.**

12 MEASUREMENT

Turning on the power supply (starting measurement)

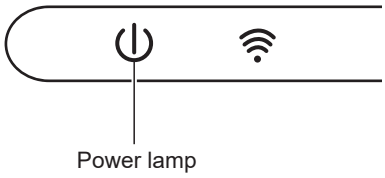
Measurement starts automatically when you turn on the power supply.
Place a mattress, etc. on Nemuri SCAN and then get into the bed.

■When using the dedicated adapter (NN-1520U)

❶Insert the power plug of the dedicated AC adapter into the outlet.

■When using the bed connection cable (NN-1520UP)

❶Insert the power plug of the bed into the outlet.
❷Make sure that the power lamp of Nemuri SCAN is flashing green.



Turning off the power supply (stopping measurement)

■When using the dedicated adapter (NN-1520U)

Disconnect the power plug of the dedicated AC adapter from the outlet.

■When using the bed connection cable (NN-1520UP)

Disconnect the power plug of the bed from the outlet.

⚠ CAUTION	● **When disconnecting a cable, hold the connector and pull it out straight. Measurement may not be performed correctly due to disconnection or damage.**

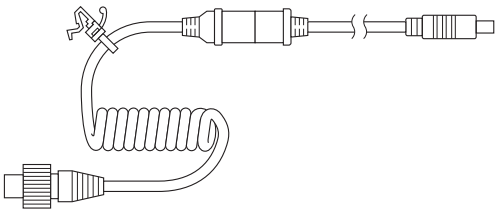
Note!

- **Make sure that Nemuri SCAN is correctly installed and connected before turning on the power supply.**
- **Be careful that Nemuri SCAN is not moved off from the installation position or does not fall off the bed when placing or moving a mattress, etc. to make a bed.**

13 SUITABLE OPTIONAL ACCESSORIES

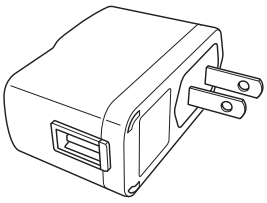
● Some of the descriptions in this instruction manual may differ from the actual product due to specification changes. For any questions, please contact your distributor or directly contact Paramount Bed (see p. 50).

1. Bed connection cable (NN-LP10)

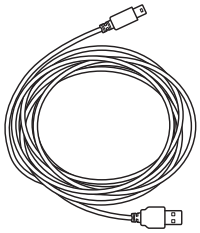


■When using NN-1520U, you can connect Nemuri SCAN to a bed by using a bed communication cable (NN-LP10). For the suitable beds (bed connection) to which you can connect Nemuri SCAN, see p. 13. For how to connect the bed connection cable, see p. 19.

2. AC adapter cable (NN-LA10)



Dedicated AC adapter x1

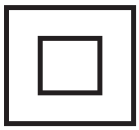


Dedicated USB cable x1

■When using NN-1520UP, power can be supplied from the AC adapter to Nemuri SCAN by using an AC adapter cable (NN-LA10).
For the AC adapter cable connection methods, see p. 17.

● You cannot use the bed connection cable (NN-LP10) and AC adapter cable (NN-LA10) at the same time.

14 SYMBOLS USED FOR THIS PRODUCT

Symbol	Description
	PSE mark
	Class II equipment
	Follow the instruction manual
	Alternating current
	Direct current
	Warning: Dangerous voltage
	Disassembling prohibited
	WEEE mark

Symbol	Description
	UL mark
	CE mark
	FCC mark
	Indoor use
	Date of manufacture
	Manufucturer
	MR Unsafe: Keep away from magnetic resonance imaging (MRI) equipment

15 INSPECTION AND DAILY MAINTENANCE

● Do not perform inspection and daily maintenance while Nemuri SCAN is in use.

Inspection

<Maintenance and inspection items to be performed by user>

■Before using Nemuri SCAN, check the inspection items below to make sure that there is no abnormality. If you notice an abnormality or if you want a detailed inspection, contact your distributor or directly contact Paramount Bed (see p. 50).

Inspection items
Make sure that Nemuri SCAN is installed in the correct position and surface orientation according to the installation conditions and installation procedures. * See p. 12 to 19.
When using Nemuri SCAN with a suitable bed (back-raising function), make sure that Nemuri SCAN is fixed to the bed with the fixing hooks. * See p. 16.
Make sure that the cables are connected correctly. * See p. 17 to 19.
Make sure that the power lamp flashes green when turning on the power supply. *See p. 20.
Make sure that Nemuri SCAN (main unit and labels) and its standard and optional accessories are not damaged or deformed.

Daily maintenance

⚠ WARNING **Turn off the power supply before starting the maintenance. Short circuit and electric shock may occur.**

<Removing stains>

❶Wipe off stains with a cloth soaked in a neutral detergent diluted with water and wrung out well.

❷Wipe off any residual detergent with a cloth soaked in water and wrung out well.

❸Wipe off any residual moisture with a dry cloth.

At the conclusion of cleaning, visually inspect all surfaces of the device. If not visually clean, repeat the cleaning procedure. If the device cannot be visually cleaned, the device should be discarded.

<Sterilizing>

Use one of the disinfectants listed below at the specified concentration according to the instruction manual for the disinfectant used.

Disinfectant	Specified concentration
Ethanol for disinfection	**76.9 to 81.4%**
Benzalkonium chloride (e.g. Osvan)	**0.05 to 0.2%**
Benzethonium chloride (e.g. Hiamine)	**0.05 to 0.2%**
Chlorhexidine gluconate (e.g. Hibitane)	**0.05%**
Sodium hypochlorite (e.g. Milton)	**0.02 to 0.05%**

The following disinfectants can also be used

● Super Sani-Cloth® Germicidal Disposable Wipe

● Clorox HealthCare® Bleach Wipe

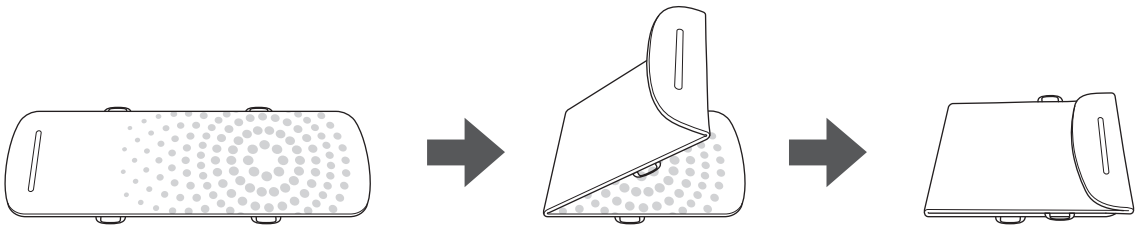
⚠ CAUTION

- **Do not use volatile cleaning solution (such as paint thinner, benzene, or gasoline) and cresol. There is a risk of discoloration or deterioration.**
- **Do not use cleaning solutions other than those listed above with the product. There is a risk of damage or deterioration.**
- **Thoroughly wipe off parts with a damp cloth after using a neutral cleaning solution. Not doing so may cause cracking of the resin.**
- **Do not sterilize. This product is not intended for sterilization and has not been tested for compatibility with healthcare sterilization systems including ozone, moist heat/ steam, dry heat, ethylene oxide vaporized Hydrogen peroxide and other chemical sterilizers. Exposure of the subject device to these processes may damage the device and render it non-functional.**

16 LONG-TERM STORAGE AND DISPOSAL

Long-term storage

- Do not store Nemuri SCAN in a location subject to direct sunlight or excessive dust.
- Store Nemuri SCAN at a temperature between -10 to 50˚C, humidity between 0 and 90% RH, and atmospheric pressure between 700 and 1060 hPa.
- Keep the instruction manual and accessories in a safe place so that they do not become lost.
- Do not store Nemuri SCAN with heavy objects placed on it or a force applied to it.
- You can store Nemuri SCAN folded. When folding Nemuri SCAN, be sure to fold it as shown in the figure below.



⚠ CAUTION	**Observe the following when storing Nemuri SCAN. Nemuri SCAN may be damaged or fail.** **• Do not store Nemuri SCAN with heavy objects placed on it or a force applied to it.** **• When folding Nemuri SCAN, fold it in the specified direction.**

Disposal

- When disposing of Nemuri SCAN, follow the rules and regulations of the local government.

17 TROUBLESHOOTING

■Problems may not always indicate failures. Check the following once again before requesting repair.

■If the problem persists after taking corrective action, turn off the power immediately and stop using Nemuri SCAN and then contact your distributor or directly contact Paramount Bed (see p. 50) for inspection.

Problem	Check	Corrective action	Reference page
Power lamp does not flash green.	Are the dedicated AC adapter and cables connected correctly?	Check the following. • Are the cables connected correctly? • Are the cable connectors connected? • Is the power plug of the bed connected to the outlet? (NN-1520UP only) • Is the dedicated AC adapter connected to the outlet? (NN-1520U only)	17 to 19
Power lamp flashes orange (on for 0.2 second and off for 0.2 second).	—	Turn off the power supply, check that the power lamp is turned off, and then turn on the power supply again.	22
Sleep data cannot be measured.	Is Nemuri SCAN installed in the correct position?	Check the following. • Is Nemuri SCAN installed under a mattress, etc.? • Is the lying posture or position proper? (E.g., make sure that the body is not positioned along the edge of the mattress or the head is not positioned at the foot end.) • Is Nemuri SCAN installed at a distance of 40 cm from the edge of the mattress at the head end of the bed to the edge of Nemuri SCAN? • Is Nemuri SCAN installed in the specified position when using a suitable bed?	15 to 19
	Is an electric carpet, floor heating, electric blanket, etc. being used near Nemuri SCAN?	Nemuri SCAN may fail if the temperature of the electric carpet, floor heating, electric blanket, etc. is too high. Change the temperature setting or refrain from using it during measurement.	7
	Was the power supply interrupted by turning off the power supply or due to a power failure during measurement?	The data may not have been saved correctly during measurement. Make sure that the power supply is turned off, connect the dedicated USB cable to the PC, and check the measurement data using the dedicated software (NN-C110E). Then, perform the operation following the instructions of the dedicated software (NN-C110E).	12

Problem	Check	Corrective action	Reference page
Power lamp flashes orange (on for 1 second and off for 1 second).	Was the card removed or power interrupted (turning off the power supply, power failure, etc.) during measurement?	The data may not have been saved correctly during measurement. Turn off the power supply, check that the power lamp is turned off, and then turn on the power supply again. If the lamp still continues to flash, remove the card and format the card using a PC. Note that formatting will delete all of the data stored in the card so save necessary data to the PC before performing formatting.	22
	Is the inserted card a microSD/microSDHC card?	• Make sure that the inserted card is a microSD/microSDHC card. • The inserted card may have failed. Make sure that the card operates normally by saving and reading data with a PC or other device.	21
	Are you using a card with a capacity of less than 8 GB?	Replace the card with one that has a capacity of at least 8 GB.	29
	Is data other than the measurement data of Nemuri SCAN stored in the card?	Delete data other than measurement data of Nemuri SCAN.	21

If you request repair or if you have any questions, please provide us with the number displayed on the serial number label. (For the label affixed location, see “6 PART NAMES” on p. 10.)

18 SPECIFICATIONS

- You cannot use a microSDXC card or MMC micro card.
- For the microSD/microSDHC cards for which operation has been verified, check our website (https://www.paramount.co.jp/nscan/download/english).
- Use a microSD card with a capacity of at least 8 GB.
- Reading may take a while depending on the type of microSD/microSDHC card.
- Make sure that the microSD/microSDHC card is not write protected.

Product name			Nemuri SCAN (NN-1520U Series)	
Part No.			NN-1520U	NN-1520UP
Type of protection against electrical shock			Class II equipment (AC adapter)	—
Protection class			IP31 (IEC 60920) * Main unit only	
Operation mode			Continuous operation	
Dimensions (cm)	Total length		78.0	
	Total width		24.5	
	Total height		1.5 * Excluding display screen: 1.0	
Product weight (main unit only)			1.0 kg	
Materials	Case		ABS resin	
	Cover		Polyester	
Service life			5 years (based on Paramount Bed data) * On condition that you perform the specified maintenance and inspection and replace the consumable parts.	
User weight			30 to 180 kg	
Environmental conditions	Transport and storage	Temperature	-10 to 50˚C	
		Humidity	0 to 90% RH	
		Atmospheric pressure	700 to 1060 hPa	
	Operation	Temperature	0 to 40˚C	
		Humidity	30 to 90% RH	
		Atmospheric pressure	700 to 1060 hPa	
External communication	Wireless LAN (Wi-Fi)		○ (IEEE802.11a/b/g/n, 2.4 GHz/5 GHz)	
	Security		WPA-PSK/WPA2-PSK/WPA-Enterprise/WPA2-Enterprise	
	Encryption		TKIP/AES	
	Bed connection		○ * Bed connection cable (NN-LP10) is required.	○
Storage media			Internal memory, microSD/microSDHC card (commercially available product)	
Recording duration / number of recordings	Internal memory		Maximum: 512 hours (3 weeks)	
	SD/SDHC card		Maximum: 100 recordings*1 (no limit to recording duration per recording)	
Power supply	Connected device		Dedicated AC adapter (FRM06-S05-UU) Input: 100 to 240 VAC 0.3 to 0.15 A 50/60 Hz Output: 5 VDC, 1.2 A	For the suitable connection devices, see suitable beds (bed connection) on p. 13.
	Rated voltage		5 VDC	
Power consumption			2.0 W or less	
EMD compliance			IEC60601-1-2:2014	
Basic performance			None	
Frequently used function			Measuring sleep and other states	

*1 • When the number of recordings exceeds 100, data is deleted automatically from the oldest one.
• The maximum number of recordings does not vary depending on the capacity of the microSD/microSDHC card.

■Performance

	Respiration Rate (RR)	Heart Rate (HR)
Range	5-40 Br./min	30-150 BPM
Averaging Period	1 Min.	1 Min.
Accuracy	1.8 ± 3.2% on a static mattress 4.3 ± 9.8% on an alternating pressure air mattress	2.4 ± 4.4% on a static mattress 2.5 ± 4.9% on an alternating pressure air mattress
	We derived the same HR from electrocardiography and the same RR from the nasal airflow pressure in PSG. Consequently, the absolute relative error of HR was 2.5 ± 4.9% on an alternating pressure air mattress (Air) and 2.4 ± 4.4% on a static mattress (non-Air). For RR, the absolute relative error on Air was 4.3 ± 9.8%, which is high relative to that on non-Air (1.8 ± 3.2%). * We excluded the HR data of 17.7% of the Air group and 13.9% of the non-Air group from comparison because Nemuri SCAN detected body movements in the time window or considered the time window as having a low signal-to-noise ratio.	
Notification Thresholds	Default: No notification Low=8 Br./min or less High=30 Br./min or more	Default: No notification Low=40 BPM or less High=120 BPM or more
Min- Max settable Notification Thresholds	Low: 5 Br./min or less High: 40 Br./min or more	Low: 30 BPM or less High: 150 BPM or more

■Wireless LAN specification

Wireless LAN	IEE802.11a/b/g/n
Operating frequency	2412-2462 MHz, 5180-5320 MHz, 5500-5720 MHz, 5745-5825 MHz
Type of modulation	DSSS/OFDM
Channel spacing	11b/g/n: 5 MHz, 11a/n: 20 MHz / 40 MHz
RF output power (EIRP)	2.4 GHz: 87.5 mW (Average), 5 GHz: 22.4 mW (Average)
Bandwidth	11b/g/n: 20 MHz/40 MHz, 11a/n: 20 MHz / 40 MHz
Antenna gain	2.4 GHz: +1.72 dBi, 5 GHz: +1.91 dBi
Polarization	Linear V+H

* 5.15-5.25 GHz band is restricted to indoor operations only.

19 TECHNICAL EXPLANATION REGARDING EMD

Nemuri SCAN needs special safety precautions regarding EMD. It needs to be used according to the EMD information provided below.

Cable	Maximum length [m]	Remark
Dedicated USB cable	2.5	Shielded
Dedicated communication cable	1.5	Shielded

⚠ CAUTION	● You cannot use Nemuri SCAN adjacent to other devices. If you must use Nemuri SCAN adjacent to other devices, monitor Nemuri SCAN to confirm that it operates properly at the location where it is used. This may cause a decline in the performance of Nemuri SCAN or other devices adjacent to it. ● Use of accessories and cables other than those designated and supplied by the manufacturer of Nemuri SCAN as replacement parts for internal components may increase emissions and decrease immunity of Nemuri SCAN. ● Use portable RF communication devices (including antenna cables and peripheral devices such as external antennas) at a distance of at least 30 cm from all parts of Nemuri SCAN. Using RF communication devices within a distance of 30 cm may cause a decline in the performance of Nemuri SCAN. ● Do not use Nemuri SCAN in an environment where radio waves are generated by equipment such as a diathermy machine, electrosurgical knife, RFID equipment, or security system (e.g, electromagnetic wave anti-theft system or metal detector). Nemuri SCAN may not operate correctly. If Nemuri SCAN does not operate correctly, check if RF equipment is being used near Nemuri SCAN, and if so, stop using the RF equipment.

Nemuri SCAN is intended for use in a specialized healthcare facility environment, such as in rehabilitation rooms in healthcare facilities, or in facilities for the aged (e.g., healthcare facilities for the elderly, day services, or paid nursing homes). Be sure to use Nemuri SCAN in an environment specified here.

Guidance and manufacturer's declaration — electromagnetic emission		
Nemuri SCAN is intended for use in the electromagnetic environments specified below. Be sure to use Nemuri SCAN in an environment specified here.		
Emissions test	**Compliance**	**Electromagnetic environment — guidance**
RF emissions CISPR11	Group 1	Nemuri SCAN uses RF energy only for its internal functions. Therefore, its RF emission level is low and causes almost no interference with nearby electronic equipment.
RF emissions CISPR11	Class B	Nemuri SCAN can be used with all equipment, including domestic-use equipment, or equipment directly connected to a low-voltage power supply network for general households.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Compliant	

Guidance and manufacturer's declaration — electromagnetic immunity		
Nemuri SCAN is intended for use in the electromagnetic environments specified below. Be sure to use Nemuri SCAN in the environment specified here.		
Immunity test	**IEC 60601-1-2 Test level**	**Compliance level**
Electrostatic discharge (ESD) IEC 61000-4-2	**±8 kV contact discharge ±2 kV, ±4 kV, ±8 kV, ±15 kV air discharge**	**±8 kV contact discharge ±2 kV, ±4 kV, ±8 kV, ±15 kV air discharge**
Electrical fast transient / burst IEC 61000-4-4	**±2 kV for power supply lines**	**±2 kV for power supply lines**
Surge IEC 61000-4-5	**± 0.5kV and ± 1kV between lines**	**± 0.5kV and ± 1kV between lines**
Voltage dip IEC 61000-4-11	**0% UT for 0.5 cycle 0˚, 45˚, 90˚, 135˚, 180˚, 225˚, 270˚, 315˚**	**0% UT for 0.5 cycle 0˚, 45˚, 90˚, 135˚, 180˚, 225˚, 270˚, 315˚**
	0% UT for 1 cycle and 70% UT for 25/30 cycles Single phase: 0˚	**0% UT for 1 cycle and 70% UT for 25/30 cycles Single phase: 0˚**
Voltage interruption IEC 61000-4-11	**0% UT for 250/300 cycles**	**0% UT for 250/300 cycles**
Rated power frequency magnetic field IEC 61000-4-8	**30 A/m**	**30 A/m**

***: UT is the AC power supply voltage prior to application of the test level.**

19 TECHNICAL EXPLANATION REGARDING EMD

Guidance and manufacturer's declaration — electromagnetic immunity			
Nemuri SCAN is intended for use in the electromagnetic environments specified below. Be sure to use Nemuri SCAN in the environment specified here.			
Immunity test	**IEC 60601-1-2 Test level**	**Compliance level**	**Electromagnetic environment — guidance**
Conducted RF IEC 61000-4-6	**• 3 V 0.15 to 80 MHz • 6 V ISM band between 0.15 and 80 MHz 80% amplitude modulation (1 kHz)**	**• 3 V 0.15 to 80 MHz • 6 V ISM band between 0.15 and 80 MHz 80% amplitude modulation (1 kHz)**	**Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, must be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol.** 
Radiated RF electromagnetic field IEC 61000-4-3	**10 V/m 80 MHz to 2.7 GHz 80% amplitude modulation (1 kHz)**	**10 V/m 80 MHz to 2.7 GHz 80% amplitude modulation (1 kHz)**	

a. Field strengths from fixed transmitters, such as those of base stations for radio (cellular/cordless) telephones, land mobile radios, amateur radios, AM and FM radio broadcasts, and TV broadcasts cannot be predicted theoretically with accuracy. To determine the electromagnetic environment due to fixed RF transmitters, an electromagnetic survey of the site should be considered. If the measured field strength in the location in which Nemuri SCAN is used exceeds the applicable RF compliance level above, Nemuri SCAN should be monitored to ensure that it is operating properly. If an abnormal operation is seen, take additional measures as needed, such as changing the location where Nemuri SCAN is used.

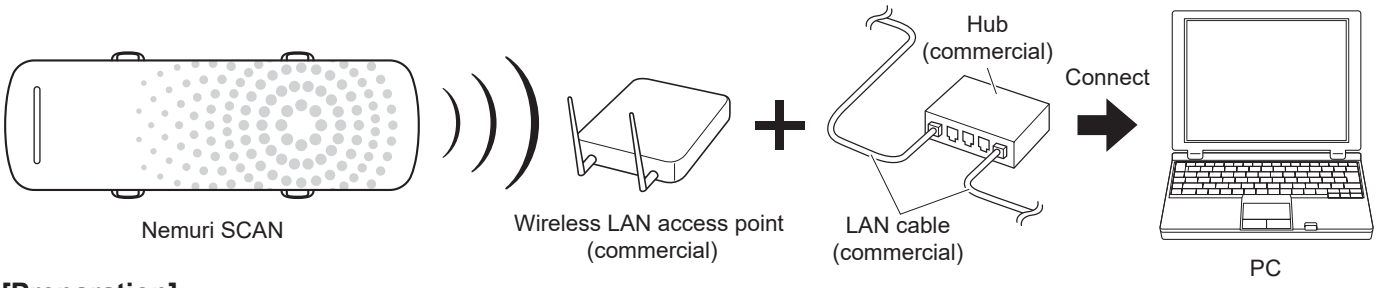
b. If the frequency range of 150 kHz to 80 MHz is exceeded, the field strength must be less than 3 V/m.

Guidance and manufacturer's declaration- electromagnetic immunity							
Nemuri SCAN is intended for use in the electromagnetic environments specified below. Be sure to use Nemuri SCAN in the environment specified here.							
Immunity test	IEC 60601-1-2 Test level	Compli-ance Level	Bandwidth (MHz)	Service	Modulation	Maximum power (W)	Dis-tance (m)
Near magnetic field IEC 61000-4-3	27 V/m 385 MHz	27 V/m	380 to 390	TETRA 400	Pulse modulation 18 Hz	1.8	0.3
	28 V/m 450 MHz	28 V/m	430 - 470	GMRS 460 FRS 460	Pulse modulation 18 Hz	2	0.3
	9 V/m 710 MHz	9 V/m	704 - 787	LTE bandwidth 13, 17	Pulse modulation 217 Hz	0.2	0.3
	9 V/m 745 MHz						
	9 V/m 780 MHz						
	28 V/m 810 MHz	28 V/m	800 - 960	GSM800/900 TETRA800 iDen820 CDMA850 LTE bandwidth 5	Pulse modulation 18 Hz	2	0.3
	28 V/m 870 MHz						
	28 V/m 930 MHz						
	28 V/m 1720 MHz	28 V/m	1700 - 1990	GSM1800 CDMA1900 GSM1900 DECT LTE bandwidth 1, 3, 4 25; UMTS	Pulse modulation 217 Hz	2	0.3
	28 V/m 1845 MHz						
	28 V/m 1970 MHz						
	28 V/m 2450 MHz	28 V/m	2400 - 2570	Bluetooth WLAN 802.11b/g/n FRID2450 LTE bandwidth 7	Pulse modulation 217 Hz	2	0.3
	9 V/m 5240 MHz	9 V/m	5100 - 5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	0.2	0.3
	9 V/m 5500 MHz						
	9 V/ms 5785 MHz						

20 OPERATING DEDICATED SOFTWARE (NN-C110E)

1. Introduction

● This manual explains major operation content (preparation, display, and operation) when a Nemuri SCAN and PC are connected via LAN and used.



[Preparation]

■ Before using Nemuri SCAN, perform the following four types of settings.

Setting wireless LAN for Nemuri SCAN

☞ **p. 38**

Setting wireless LAN for Nemuri SCAN (main unit).

Register Nemuri SCAN

☞ **p. 39**

Register information required for communication. (Nemuri SCAN ID number and IP address)

Register the person to be measured

☞ **p. 40**

Set the name of the person to be measured and set notification settings.

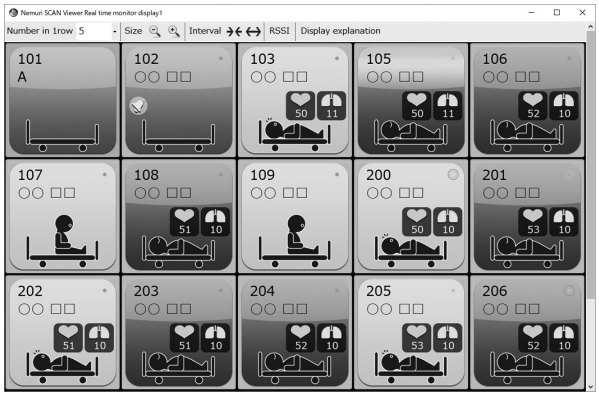
Register the room

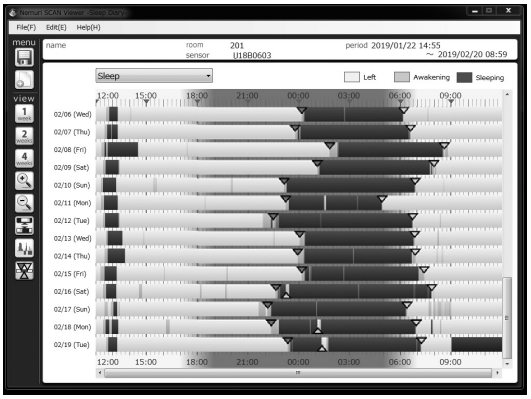
☞ **p. 41**

Enter the room name, Nemuri SCAN installed in the room, and the name of the person to be measured in the room.

[Display] ☞ **p. 42 to 45**

■ This section explains a screen that displays the current status in a list, how to open a Sleep Diary, and how to view screens.





[Operation] ☞ **p. 46 to 49**

■ This section explain major operations to be performed in ordinary operation.

- Change the notification setting
- Add a person to be measured
- Associate a room and person to be measured

[Network Requirements]

- The PC with the dedicated software (NN-C110E) installed and Nemuri SCAN do not need an Internet connection to the outside.
- Set the PC with the dedicated software (NN-C110E) installed and Nemuri SCAN to the same network address.
- The dedicated software on the PC communicates with Nemuri SCAN once every 2 seconds via the network.
- The dedicated software on the PC displays a communication error if it does not receive a response from Nemuri SCAN within 20 seconds.
- Up to 120 Nemuri SCAN can be registered to the dedicated software (NN-C110E) on the PC.
- A signal strength of at least -60 dB is recommended for the wireless LAN of Nemuri SCAN.

■Wireless LAN (Wi-Fi)

- IEEE802.11a/b/g/n, 2.4 GHz / 5 GHz
- Data rate: Up to 54 Mbps
- Security: WPA-PSK/WPA2-PSK/WPA-Enterprise/WPA2-Enterprise (* WPA2 is recommended.)
- Encryption: TKIP/AES

■Ethernet LAN * Connection between the PC with the dedicated software (NN-C110E) installed and the access point

- 10 / 100 Mbps

■Network Characteristics

- Communication over TCP/IP protocols
- All components have a static IP
- Volume of communication between the PC with the dedicated software (NN-C110E) installed and one Nemuri SCAN: 2 kBit/sec
- Volume of communication between the PC with the dedicated software (NN-C110E) installed and 120 Nemuri SCAN: 0.3 MBit/sec

⚠ CAUTION	● **When connecting the PC with the dedicated software (NN-C110E) installed to the Internet, take appropriate security measures for the PC and network.** ● **Set WPA2 or stronger encryption for the wireless LAN between the access point and Nemuri SCAN. Inadequate security measures and wireless communication encryption may result in not only the measurement data of Nemuri SCAN not being displayed correctly in the dedicated software (NN-C110E) but also malicious activity such as unauthorized access by a third party.** ● **Install the PC with the dedicated software (NN-C110E) installed in an environment where it is only accessible by nurses at the nurse station and other medical professionals. Installing the PC with the dedicated software (NN-C110E) installed in an environment accessible by regular users may result in not only the measurement data not being displayed correctly in NN-C110E but also malicious activity such as unauthorized access by a third party, data theft, and data deletion.** ● **Before beginning use after installation or changing the network environment or PC environment (including applications), check that communication between the dedicated software (NN-C110E) and Nemuri SCAN is stable. The measurement data of Nemuri SCAN may not be displayed correctly in the dedicated software (NN-C110E) depending on the network environment or PC environment.**

[Actions to take if wireless issues occur]

■Stop using Nemuri SCAN immediately. Investigate the cause of the wireless issue, take the appropriate measure, and then check that communication between the PC with the dedicated software (NN-C110E) installed and Nemuri SCAN is stable before beginning use.

[Backup and recovery procedures]

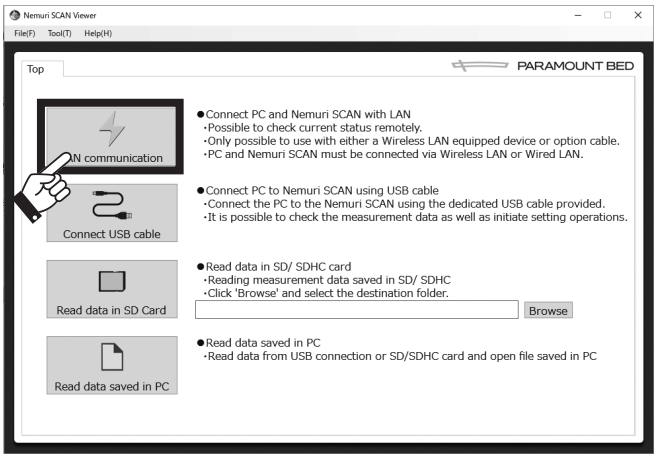
■The data measured by Nemuri SCAN is saved to the folder specified below on the PC with the dedicated software (NN-C110E) installed.

C:\ProgramData\PARAMOUNT BED\NN-C110E
NemuriScanData.db: Measurement data
NemuriScanSettings.db: Setting data

To back up the data, regularly copy these files to a location other than the folder specified above. To recover from trouble such as damaged data, return the backed up files to the specified locations.

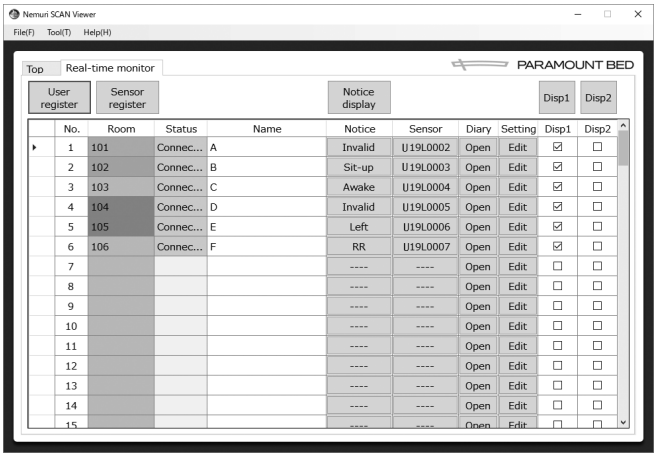
2. Display of Real-time monitor screen

1.Double-click the [Nemuri SCAN_Viewer] icon on the PC desktop.



2. Start the software and click the [LAN Communication] button. The Real-time monitor screen appears.

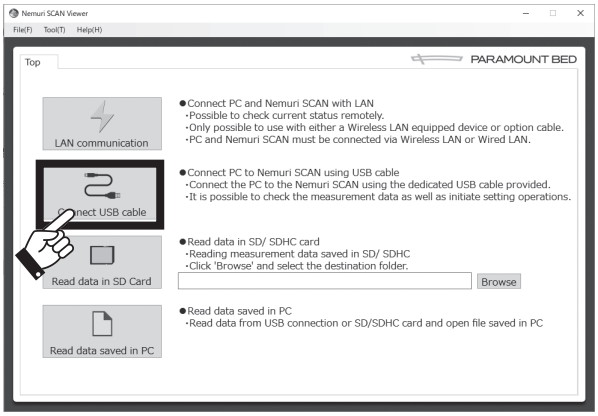
● Real-time monitor screen



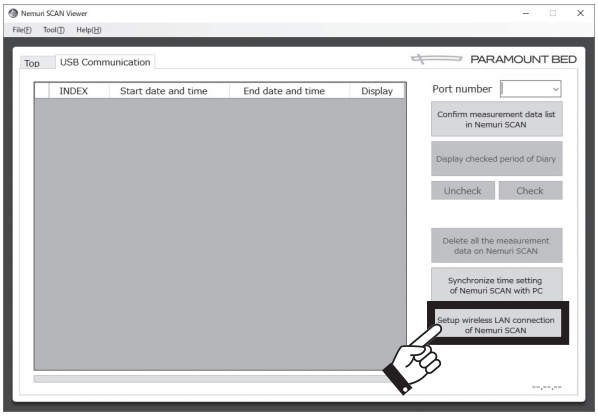
3. On this screen, you can configure various settings for communication or display a list screen for the current status.When this screen appears, processing for communication with the registered Nemuri SCAN is automatically started.

3. Setting wireless LAN for Nemuri SCAN (main unit)

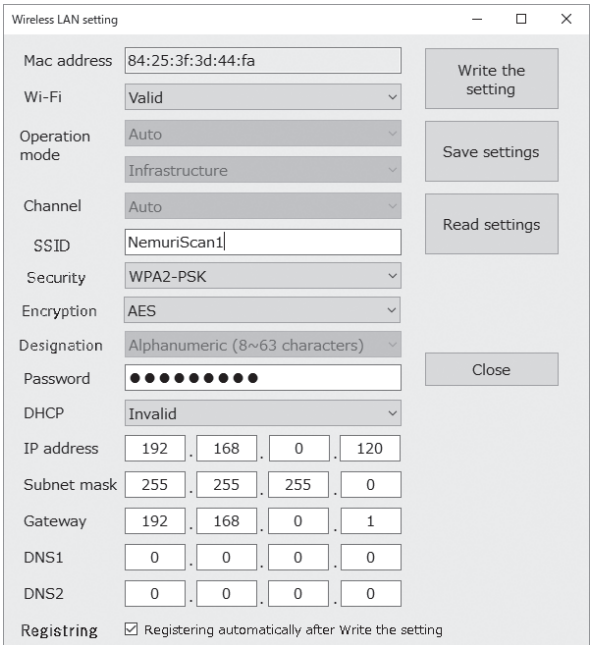
■You can set up Nemuri SCAN to work with a wireless LAN. When setting Nemuri SCAN, connect Nemuri SCAN to a PC using the USB cable.



1. Click the [Connect USB cable] button.



2. Click the [Setup wireless LAN connection of Nemuri SCAN] button.



3. A confirmation screen is displayed asking whether to read the content set in the Nemuri SCAN. Select [Yes] or [No]. After that, the wireless LAN configuration screen appears.

■When using a wireless LAN, enable the Wi-Fi function, set each item, and then click the [Write the setting] button.

[Write the setting] button: Writes the setting content to the Nemuri SCAN.
[Save Settings] button: Saves the setting content to a PC.
[Read Settings] button: Reads the setting content saved on a PC.
[Close] button: Closes the wireless LAN setting window.

4. Registering Nemuri SCAN

■You can register Nemuri SCAN to communicate via a LAN.
*Normally, this registration procedure is performed once when the product is purchased.

For registration, the ID number and IP address are required.

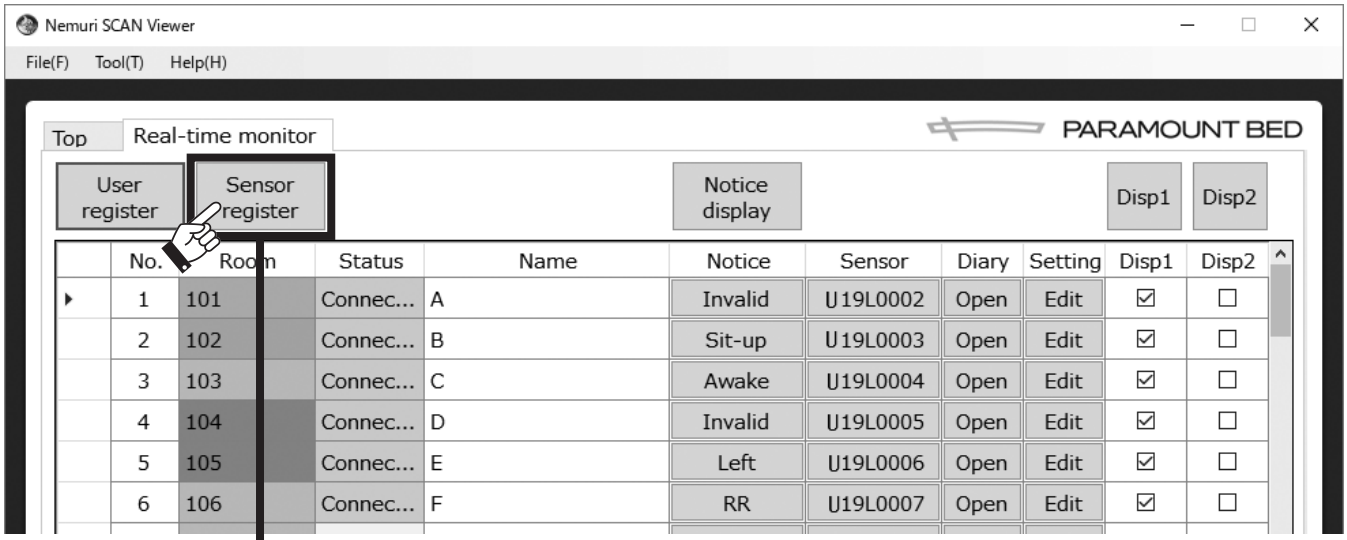
ID number

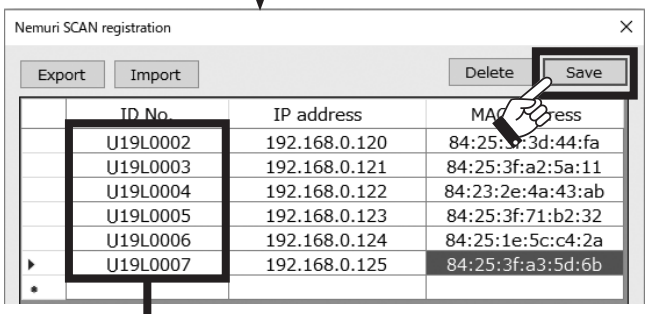
This is an 8-digit number starting with “U” printed on the label on the back side of the Nemuri SCAN main unit case. For the label affixed location, see “6 PART NAMES” on p. 10.

IP address

The number that must be set for communicating using a LAN.

* Set a fixed value IP address, not the one automatically assigned by DHCP.





Direct input by double-click

For registration, click the [Sensor register] button, double-click inside the table and directly enter the numbers.

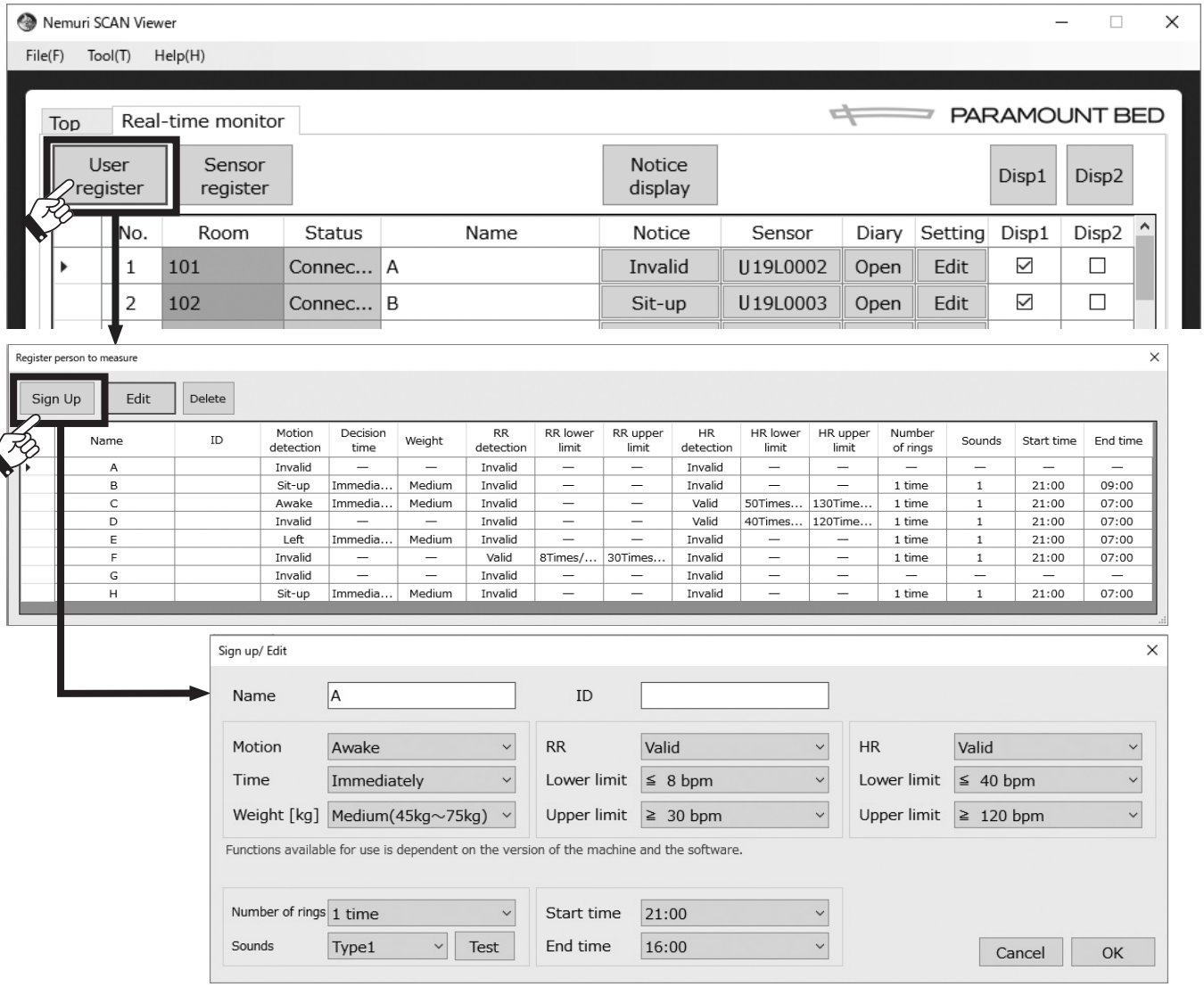
When the registration procedure is completed, click the [Save] button

5. Registering persons to be measured

■You can register the persons (residents) to be measured.
For registration, click the [User register] button and on the opened screen, click the [Sign Up] button.
The input form opens. Enter the name of the person and select notification settings as needed.
Clicking [OK] button completes the procedure.

For a facility where acceptance of residents will start in future

- **It is possible to register persons to be measured later but by registering persons for the number of rooms beforehand, it facilitates the registration procedure when accepting residents. For example, temporarily enter a room name for "Name" and register the room information, which is explained on the next page, beforehand. In this way, when an actual resident is accepted, registration is finished by only changing the name.**



- **The notifications of the dedicated software (NN-C110E) are not intended to be used for monitoring in, for example, high risk situations where electrocardiogram monitoring is required.**
- **The notifications of the dedicated software (NN-C110E) may not be noticed if there is no staff near the dedicated software (NN-C110E) or trouble occurs with the power supply, network environment, or Nemuri SCAN.**
- **False notification may occur depending on the conditions. Set the appropriate notification settings for each person to be measured. Also regularly check that the notification settings are appropriate. If notification is not set appropriately, false notification or no notification may occur.**
- **Nemuri SCAN is intended to be used as a support tool for measuring the respiration rate, heart rate, and motion.**

6. Registering rooms

■You can register room information.

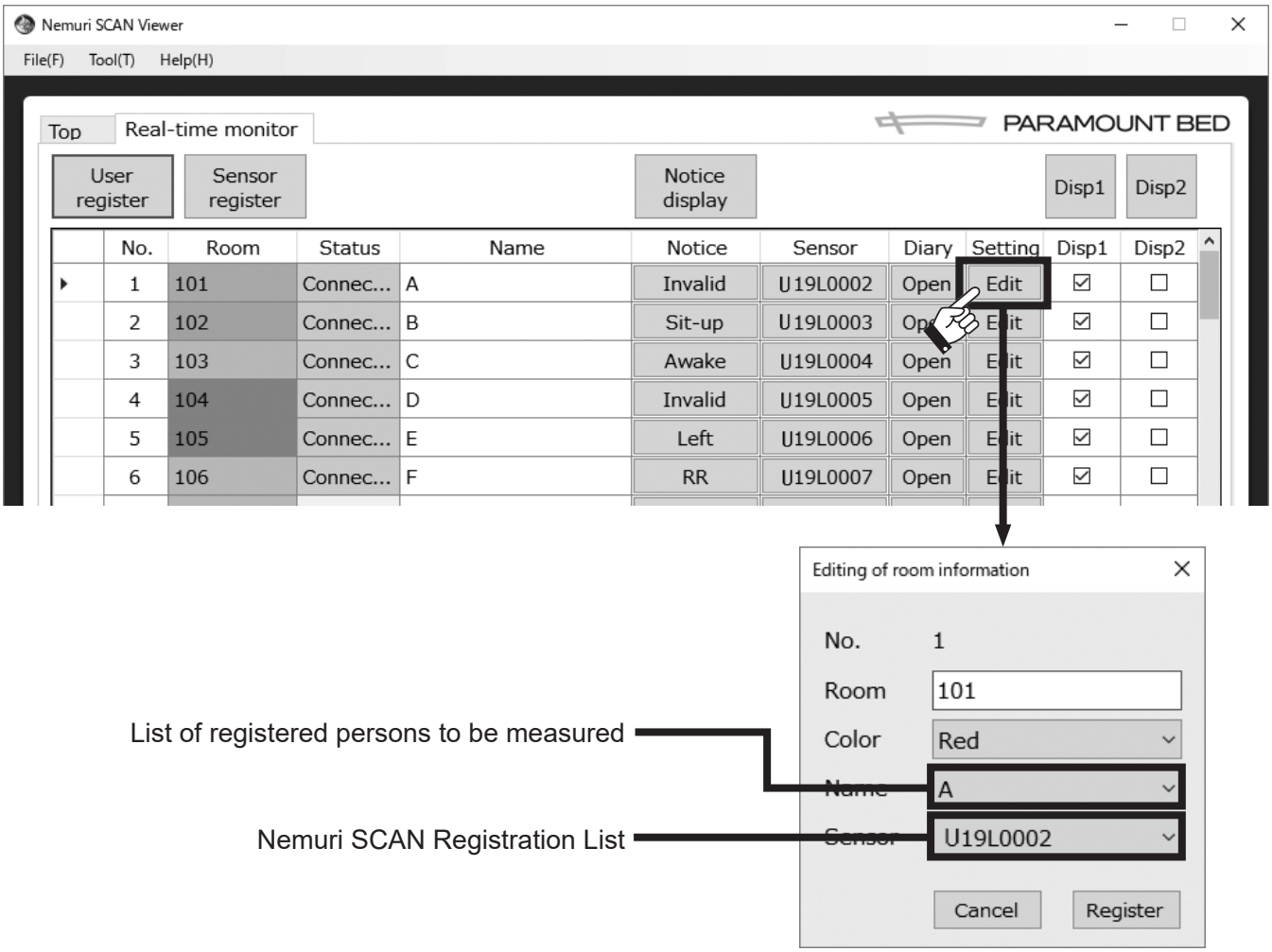
Nemuri SCAN Viewer can manage up to 120 rooms (120 units). In the No. row, numbers 1 to 120 are assigned. Aside from this, room names can be registered. Normally, register rooms in order of the lowest room number first.

To perform registration, click the [Edit] button in the [Setting] row, enter or select the following information and then press the [Register] button to complete the procedure.

- Room: Enter the name of each room, such as Room No. 101.
- Color: Select the background color for the list display. If different colors are used for different floors, it is easy to view the list display.
- Name: Select the person to be measured who will become a resident of the room. The list displayed here is the content in “5. Registering persons to be measured”.
- Sensor: Select Nemuri SCAN installed in the room. The list displayed here is the content in “4. Registering Nemuri SCAN”.

When the room and the Nemuri SCAN are associated, communication starts automatically.

Check that the room name, the name of the person to be measured, and Nemuri SCAN ID are correct before starting monitoring of a new patient. Also regularly check that the room name, the name of the person to be measured, and Nemuri SCAN ID are correct.

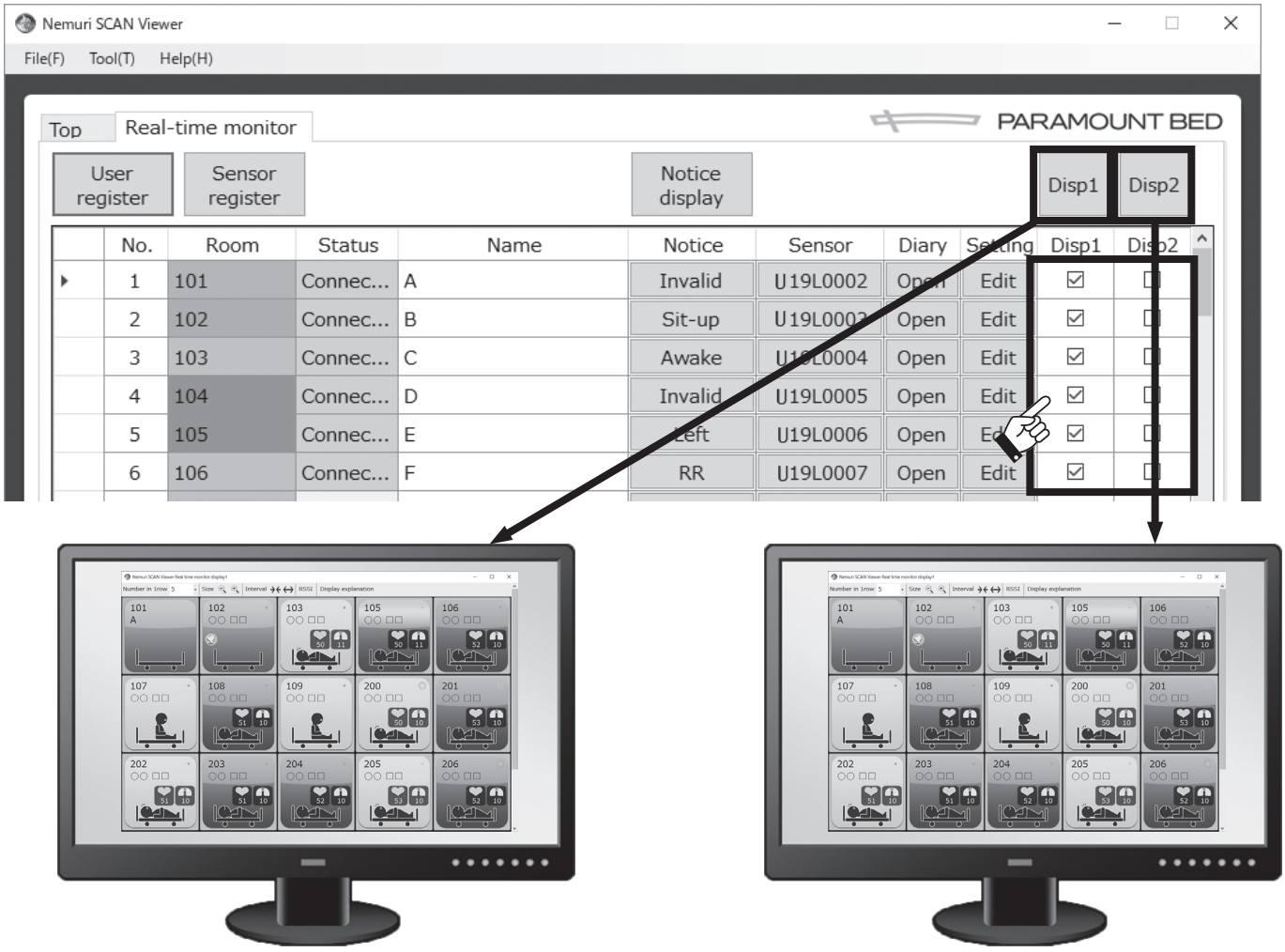


7. Displaying the list screen

■The current status can be displayed on Screen 1 and Screen 2.

Tick the room you wish to display, then click the [Display Screen 1] or [Display Screen 2] button.
Only the selected room is displayed in the list.

On the list display, you can use the [+], [-] [←→], and [→←] buttons to adjust the size and margins.
If there are too many rooms to display on one monitor screen, it is possible to connect two monitors to the PC to show Screen 1 and Screen 2 on the display, respectively.
* In that case, the PC must be able to support multiple displays.

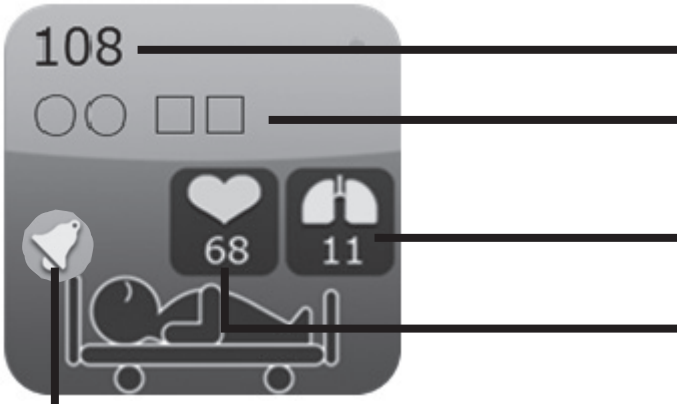


When there are two displays

- **If the PC supports multiple displays, it is possible, for example, to display the 1st floor and 2nd floor on Monitor 1 and the 3rd floor and 4th floor on Monitor 2.**

20 OPERATING DEDICATED SOFTWARE (NN-C110E)

■This section explains the content displayed on the list screen.
On the list screen, the current status, notification setting status, respiration rate and heart rate per minute are displayed for each person measured.



Room name

Name of measured person

Respiration rate (per minute)

Heart rate (per minute)

Status of the notification settings

■There are the following current status types.

	**It is determined that the person is asleep on the bed.**		**It is determined that the person has left the bed.**
	**This is the transition state from “awake” to “asleep”.**		**Nemuri SCAN (main unit) is in a connected state.**
	**It is determined that the person is not asleep while on the bed.**		**A communication error has occurred. The PC and Nemuri SCAN are not connected via the LAN.**
	**It is determined that the person is sitting up in bed.** * Sitting up status is displayed for only 15 seconds after the judgment is made.		

About the judgment cycle of the current status

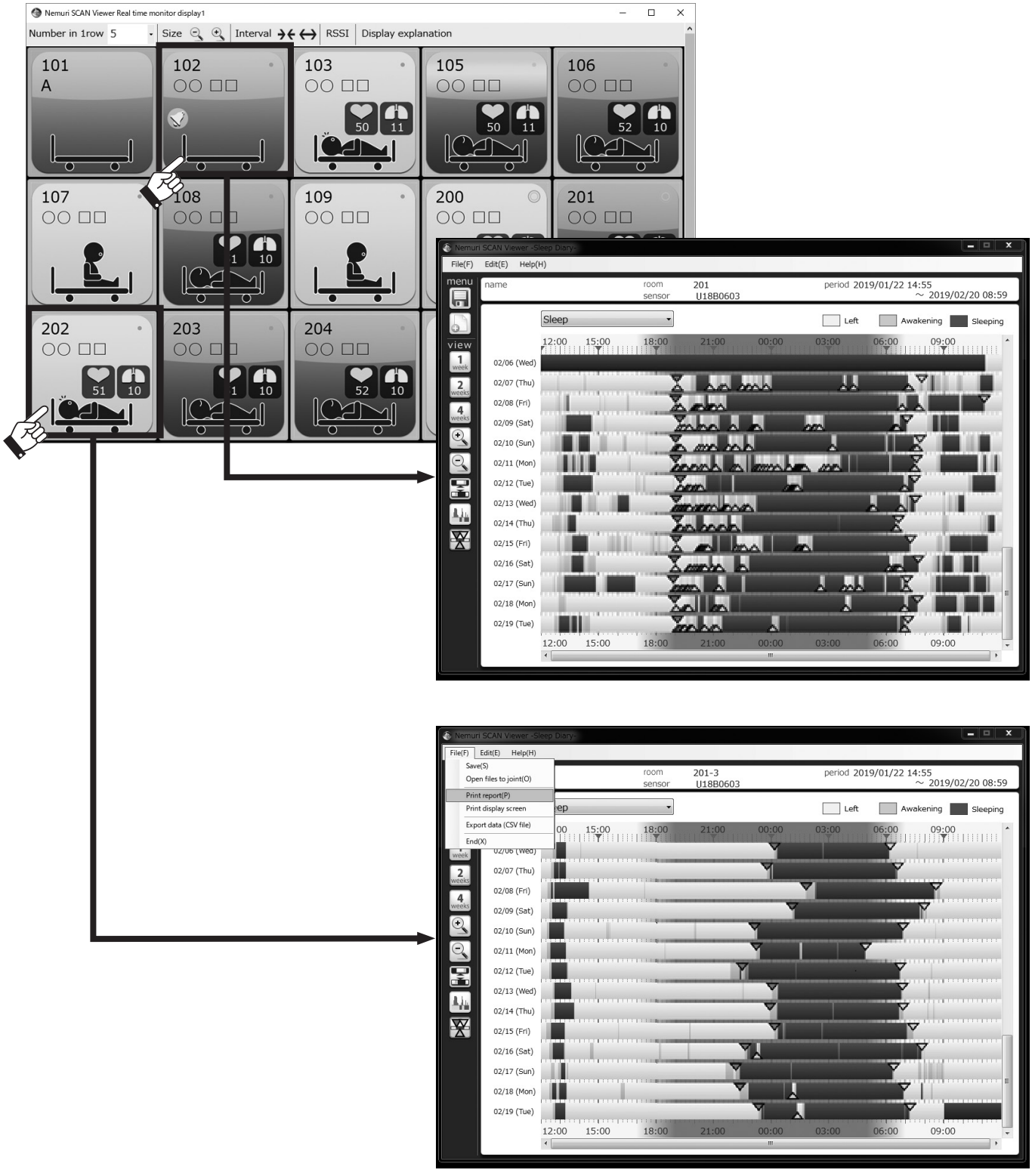
- **Judgment of sleep and awake is performed every 5 seconds based on the amount of activity in the most recent 5 minutes. For that reason, it is possible that the judgment is changed later than the actual situation.**
- **When there is no body movement for a specified duration, the person is determined to have left the bed. For that reason, determination happens 10 to 15 seconds later than the actual movement.**

8. Measurement Data Display 1 (Data of Last 4 Weeks)

■By clicking the icon on the list display screen, it is possible to open the Sleep Diary for the latest 4 weeks.

* Immediately after starting Nemuri SCAN Viewer, about several seconds to 10 minutes is required for data synchronization.

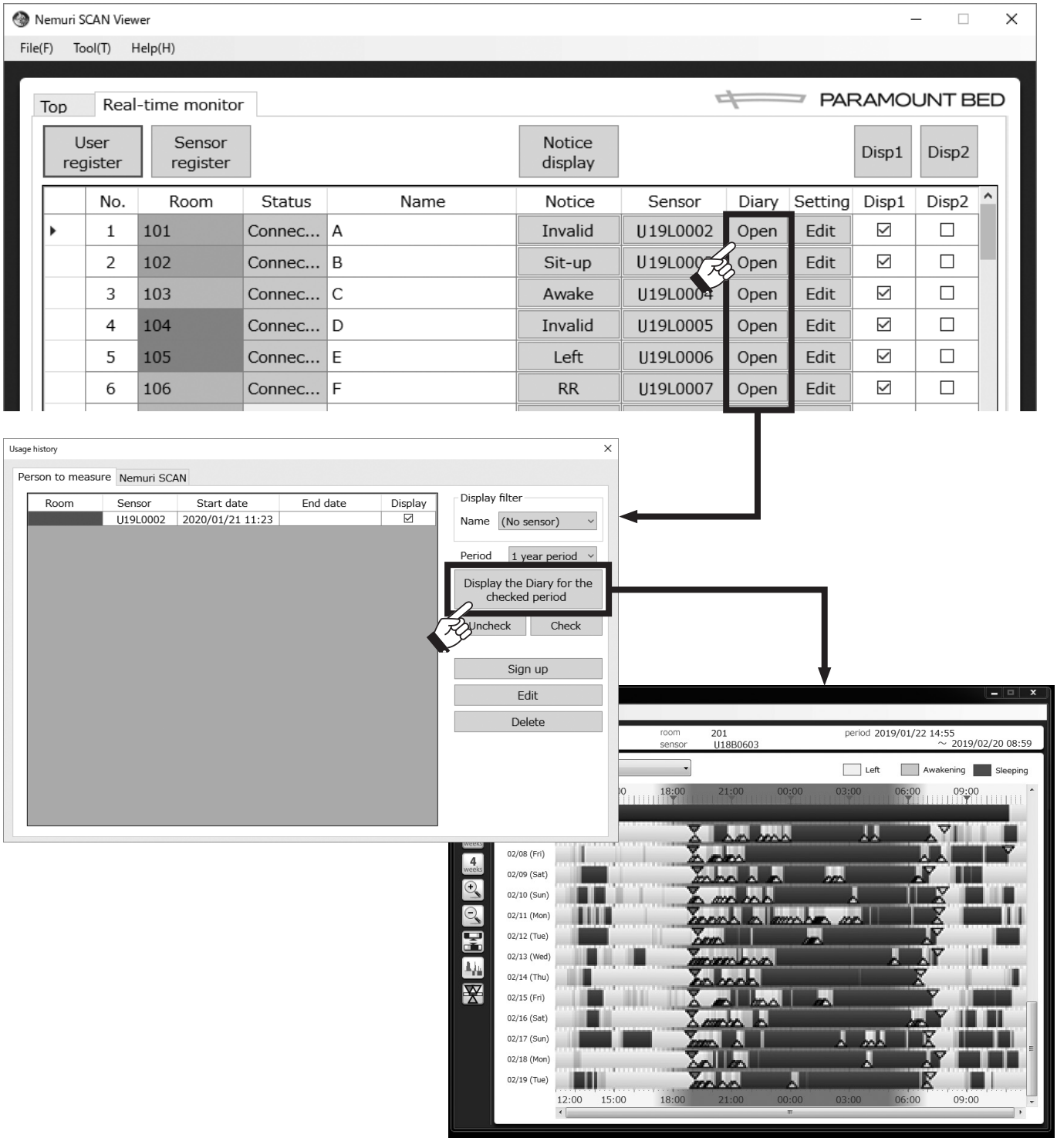
This is the simplest operation to check the latest daily rhythm. As necessary use the function of Printing Measurement Data.



9. Measurement Data Display 2 (Past Data)

■This operation is used to check the measurement data before the most recent 4 weeks.

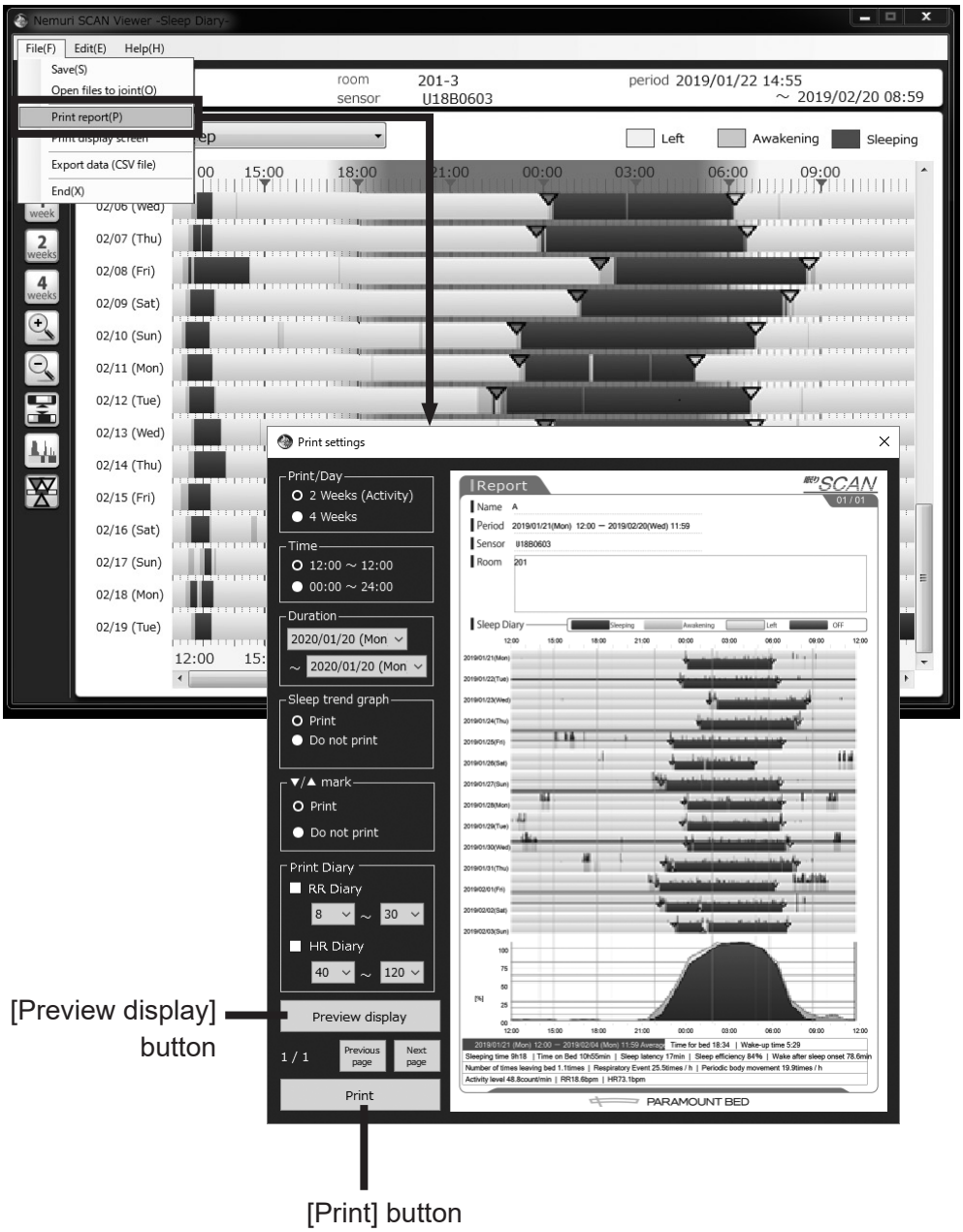
When the [Open] button in the [Diary] column is clicked on the Real-time monitor, the usage history of the person measured on the clicked row is displayed.
Select the period you wish to display and click the [Display the Diary for the checked period] button. The Sleep Diary for the specified period appears.



10. Printing Measurement Data

■To print measurement data, on the Sleep Diary screen, click [File>Print report] from the tool bar.

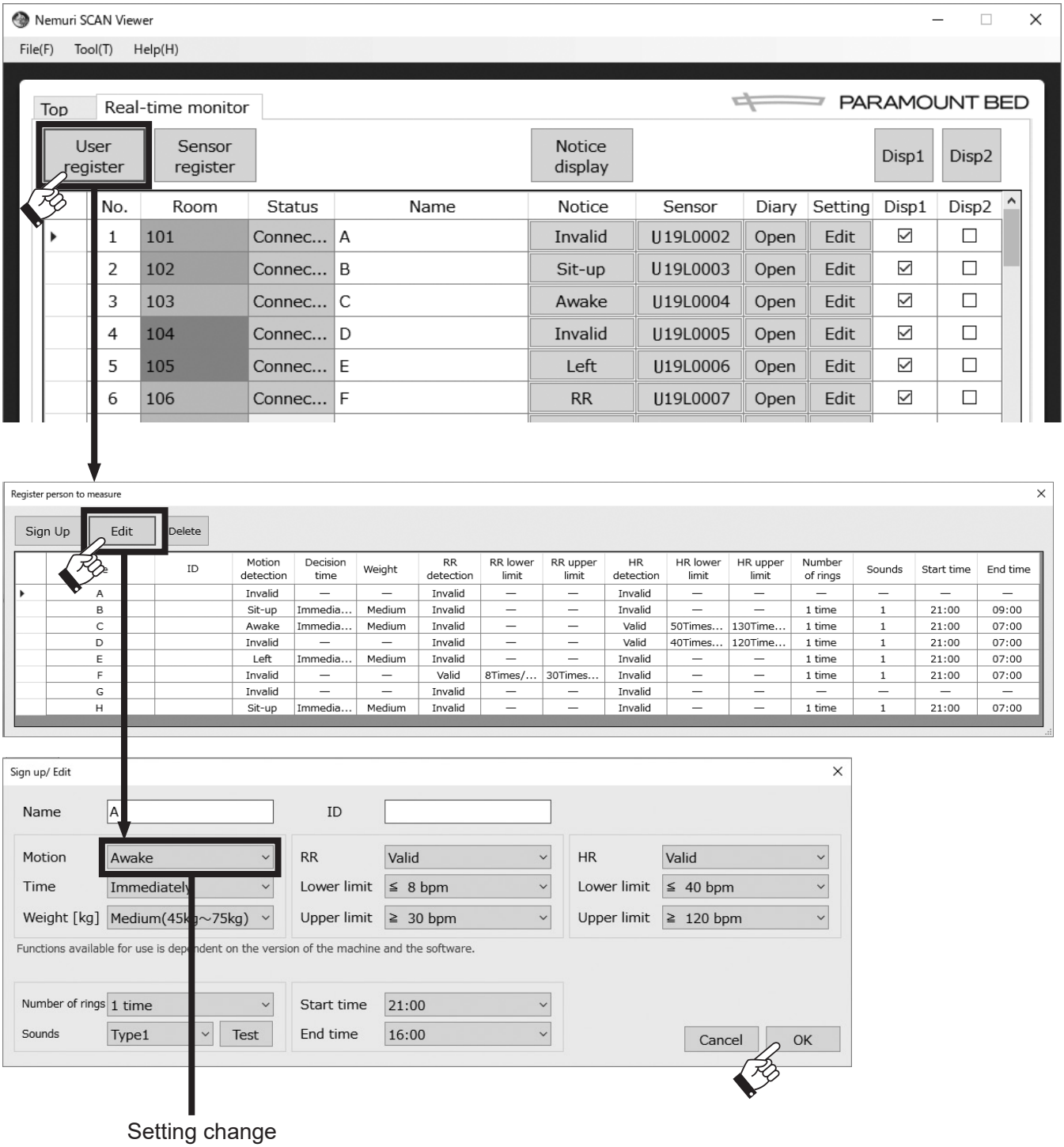
The [Print settings] dialog box appears. Select the period and content to be printed.
When clicking the [Preview display] button, the print content is displayed on the right side of the screen.
When clicking the [Print] button, the print dialog box appears. Set the printer and perform printing.



11. Changing the Notification Setting

■This operation is used to change the notification setting.

1. Click the [User register] button on the Real-time monitor screen.
2. Click the cell for the person to be measured who you wish to change and click the [Edit] button.
3. An editing screen appears. Change the setting and click [OK].

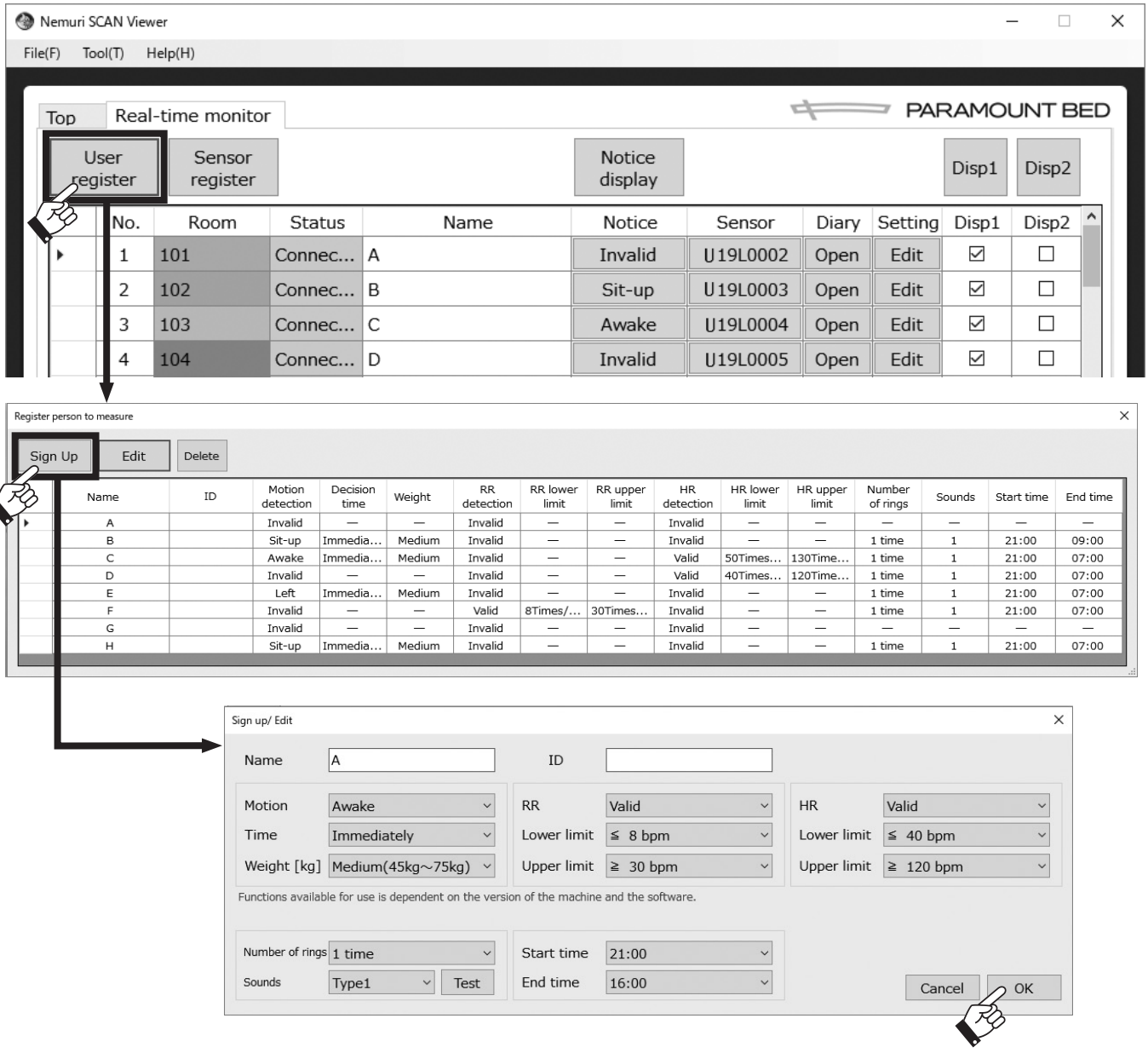


12. Adding Persons to be Measured

■This operation is used to register a new person (resident) to be measured.
* The content is basically the same as “5. Registering persons to be measured”.

For registration, click the [User register] button and on the opened screen, click the [Sign Up] button. The input form opens. Enter the name of the person and select the notification setting as needed. Clicking [OK] button completes the procedure.

Continuously after completing registration, go on to perform “13. Associating a Room and Person to be Measured” on the next page.



About motion detection, breathing detection and heartbeat detection

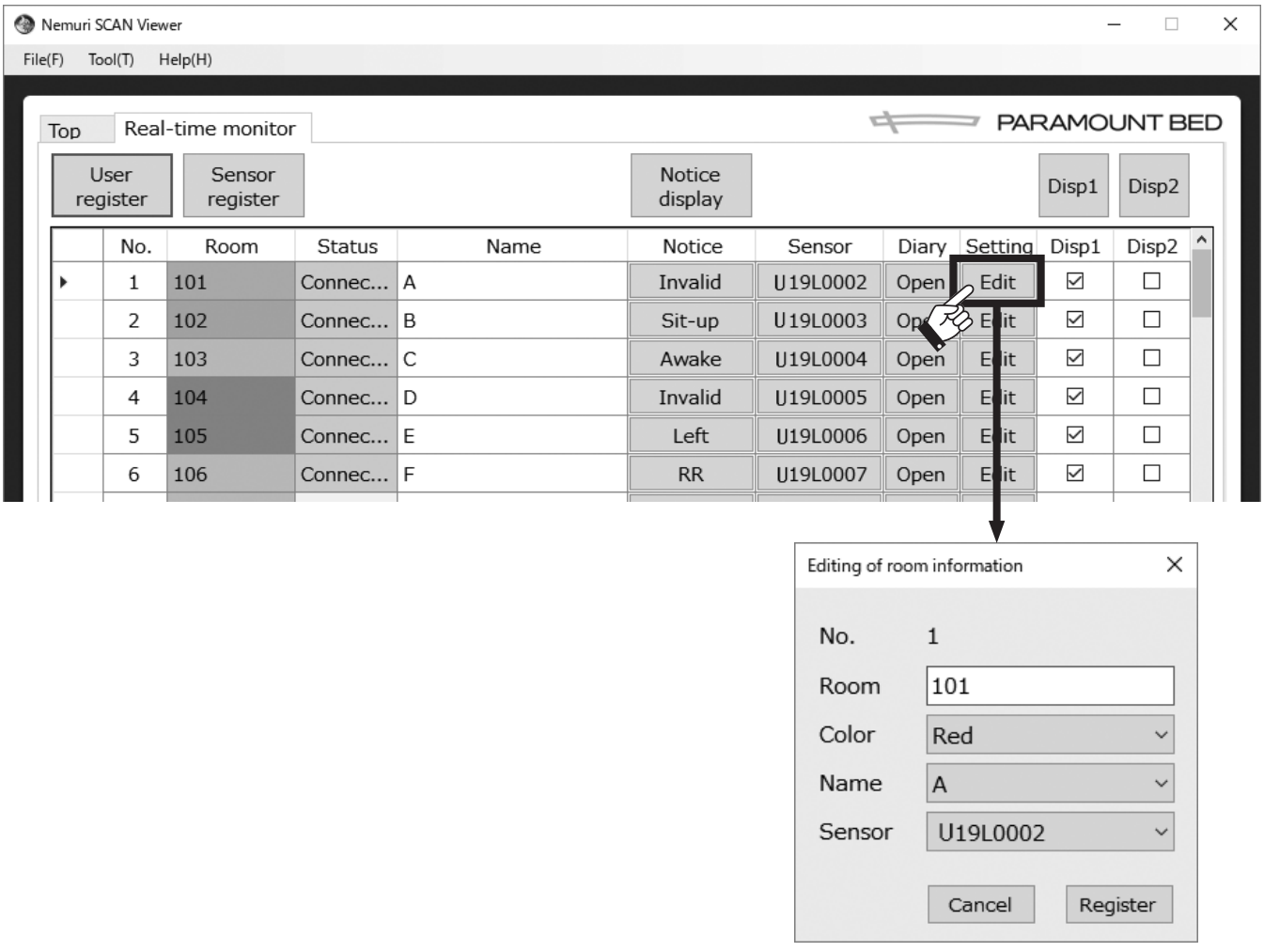
- **Nemuri SCAN is an assisting device to measure the movement associated with sleep, respiratory rate, and heart rate, and does not guarantee safety. Depending on the movement or position of the measured person on the bed, or the communication environment, misreporting or incorrect detection could occur. Please be advised that Paramount Bed assumes no responsibility whatsoever for damage resulting from accidents, etc.**

13. Associating a Room and Person to be Measured

■You can associate a room and person to be measured.
* The content is basically the same as “6. Registering rooms”.

To perform registration, click the [Edit] button in the [Setting] row, enter or select the following information and then press the [Register] button to complete the procedure.

Room: Enter the name of the room, such as Room No. 101.
Color: Select the background color for the list display. If different colors are used for different floors, it is easy to see the list display.
Name: Select the person to be measured who will become a resident of the room. The list displayed here is the content in “5. Registering persons to be measured”.
Sensor: Select Nemuri SCAN installed in the room. The list displayed here is the content in “4. Registering Nemuri SCAN”.



21 AFTER-SALES SERVICE

1. When requesting repairs

First check the items described in "17 TROUBLESHOOTING" on p. 27 and 28 in the instruction manual. If the problem persists, contact your distributor or directly contact Paramount Bed (see below).

■ Details necessary when requesting repair

- ● Product name, product number, product ID label number (see "6 PART NAMES" on p. 10)
- ● Date of purchase
- ● Details of the fault or problem (please provide as much detail as possible)
- ● Your name, organization, address, and phone number

2. Minimum stock availability period

Paramount Bed keeps replacement parts (necessary to maintain performance of the product) in stock for at least 5 years after the discontinuation of production.

3. Questions regarding after-sales service

Contact your distributor or directly contact Paramount Bed (see below).

Disposal

When the product has reached the end of its usable life, discard it according to local standards.

Contact Information

For any queries, contact to the address or telephone number listed below.

PARAMOUNT BED USA Corporation
95 Argonaut, Suite 120, Aliso Viejo, CA 92656

Tel : (949)328-9766
Fax : (949)328-9752
E-mail : contact@paramountbed-us.com

PARAMOUNT BED CO., LTD
Global Sales Div.

14-5, 2-chome, Higashisuna, Koto-ku, Tokyo,
136-8670, JAPAN

Tel : +81-(0)3-3648-2961
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PARAMOUNT BED

[Instruction Manual]
Made by: Torindo Co., Ltd.