DYNASCOPE 8000 Series
Patient Monitor

DS-8007 System

Ver. 03

Maintenance Manual

* Before using the product, please read this manual thoroughly.
* Store this manual where it can be always referred to.

FUKUDA

This manual is for the DS-8007 System Version 03.

MEDICAL-PATIENT-
MONITORING EQUIPMENT

AS TO ELECTRICAL SHOCK, FIRE AND MECHANICAL HAZARDS ONLY
ANSI/AAMI ES 60601-1 (2005)+AMD1 (2012),
IEC 60601-2-25 (2011), IEC 60601-2-27 (2011),
IEC 80601-2-30 (2009)+AMD1 (2013), IEC 60601-2-34 (2011),
IEC 60601-2-49 (2011), ISO 80601-2-55 (2011),
ISO 80601-2-56 (2009) AND ISO 80601-2-61 (2011).

⚠ CAUTION	Federal Law restricts this device to sale by or on the order of a physician.

CAUTION

- Only physician or persons instructed by physicians are allowed to use the equipment.
- The information contained in this document is subject to change without notice due to improvement in the equipment.

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Preface

Preface

Introduction

Thank you for purchasing this product. Read the "Safety Precautions" thoroughly before use to ensure correct and safe use of the product.

Before using or installing this product, read this manual thoroughly.

Important Notice

For Safe Operation of the Equipment

(1) Before using this equipment, read this operation manual.

(2) Fukuda Denshi cannot predict all the dangers which may be caused by misusage of this product or environmental condition.

(3) For using this equipment, there are many items that "should be performed", "should not be performed", and "cannot be performed". It is not possible to cover all these items in this manual or warning labels. Therefore, it is necessary to also follow the general safety precaution other than the items described in this manual.

(4) To prevent accidents, usage other than intended, or usage, cleaning, and maintenance not described in this manual should not be performed.

(5) When using this equipment, follow the respective regulation to minimize the probability of accidents.

Intended Use of this Equipment

This equipment is designed for the following <Intended Use>.

<Intended Use>

This equipment is intended for patient monitoring in surgery room, ICU, ward, emergency room or during transportation in the medical facility by measuring parameters such as ECG, respiration, NIBP, pulse rate, SpO_2, SpCO, SpMet, SpHb, pulse wave, temperature, BP, CO, respiration gas (CO_2 concentration), BIS, SQI, SR, EMG, EEG, and monitors patient condition by displaying/recording the measurement data on this equipment or central monitor and generates alarm as required.

This equipment is intended for monitoring one patient. It is not intended for monitoring multiple patients.

The 12-lead ECG analysis function is intended for adult and pediatric patients.

For specification of this equipment, refer to "Chapter 14 Specification" of this manual.

This equipment is intended to be used by healthcare professionals. Users should have a thorough knowledge of the function and operation before using this equipment. The maintenance of this equipment should be performed by skilled personnel who received a training of possible hazards and measures to avoid those hazards. Also, your local regulation must be followed. If this equipment is used for the purpose other than intended, or if the user does not follow the safety instructions, the following hazard may result.

- Hazard to the Life and Health of the Patient or the User

- A Problem Related to Medical Practice
- Damage to the Equipment

Copyright

(1) The copyright of this manual is owned by Fukuda Denshi. No part of this document may be copied or transmitted in any form without the prior written permission of Fukuda Denshi Co., Ltd.

(2) This manual includes the description for the optional equipments that can be connected.

(3) The illustration in this manual may differ with the actual equipment.

(4) If you lose or damage this manual, contact your nearest sales representative. Using the equipment without this manual may cause accidents.

(5) When handing over this equipment, make sure to also pass this manual to the next owner.

Maintenance, Repair, Replacement

Fukuda Denshi is liable for the safety, reliability, and performance of its equipment only if;

- Maintenance, modifications, and repairs are carried out by authorized personnel or organization.
- Components are used in accordance with Fukuda Denshi operating instructions.

A full technical description of the DS-8007 System is available from your local Fukuda Denshi sales representative.

Contact

If you need more detailed information, please contact following.

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About This Manual

Expression Used in This Manual

❑Meaning of the Symbols

Type of Precaution	Description
⚠ DANGER	Failure to follow this message may cause immediate threat of death or serious injury.
⚠ WARNING	Failure to follow this message may result in death or serious injury.
⚠ CAUTION	Failure to follow this message may cause injury or failure to the equipment.
NOTE	"Note" is used to emphasize important information.
REFERENCE	"Reference" is used to provide useful information.
☞	Indicates the reference page for the procedure and precaution.
*	Used in a table which indicates that there is detailed explanation outside the table.

❑Indications for the Screens and Keys

The keys displayed on the monitor screen are indicated by [ ].
(Ex.: [Display Config.], [Manual Printing], etc.)

The expressions displayed on the monitor screen are indicated by " " .
(Ex.: "Volume", "Admit/Discharge", etc.)

The messages displayed on the screen are indicated by < >.
(Ex: <Searching>, <Alarm Suspend>, etc.)

REFERENCE

- There are 2 types of menu display for this equipment, menu list and simple menu.
  (☞"Menu Configurations" P1-3)
- In this manual, the operation procedure is explained for the case when menu list is displayed (when simple menu setup is OFF).
  If simple menu is displayed, press [Menu] > [Menu List] to follow the procedure explained in this manual.

Composition of This Manual

The operation manual is composed of the following chapters.

Chapter Title	Description
Preface	Outline and purpose of this manual (Important Notice, About This Manual)
Safety	Warning, Precautions for Safety
1.General Description	Composition, features, menu configuration of this equipment
2.Name of Parts and Their Functions	Name and function of each part, external appearance
3.Operation Procedure and Screen Examples	Operation procedure, home display, window, procedure to return the display, user key setup
4.Preparation	Installing the recording paper, power ON/OFF, time/date, daily checks
5.Admit/Discharge	Entering patient information (name, age, etc.) at admittance, discharging the patient, user mode selection, suspend monitoring
6.Alarm Function	General description of alarm function, alarm-related setups
7.Monitoring	Measurement condition setup of the monitoring parameters, size/scale setup, etc. Setup of the stopwatch, connector
8.Review Function	Arrhythmia analysis, trend, recall, NIBP list, Tabular Trend, ST measurement, hemodynamics, lung function, alarm history, other bed display, full disclosure waveform, MPDR
9. Printing	Recorder output function
10. System Configuration	Setup of the display configuration, tone/volume, color, brightness, night mode
11. Troubleshooting	Message list, maintenance and troubleshooting of this equipment
12. Setup Item/Default Value	Setup item and default value
13. Accessories	List of accessories and optional accessories of this equipment
14. Specification	Specification and performance of this equipment

The maintenance manual is composed of the following chapters.

Chapter Title	Description
Preface	Outline and purpose of this manual (Important Notice, About This Manual)
Safety	Warning, Precautions for Safety
1.Installation of the Unit	Precautions about the operating environment, system construction, power source and ground connection, trolley usage
2.Network System Construction	Network connection and setup
3.Using the External Media	Procedure to use the USB memory and SD card.
4.Connection to the External Devices	External equipment connection and setup
5.Initial Settings	Initial setup, administrator setup, alarm/measurement setup, user I/F, user mode registration
6.Setup Item/Default Value	Default and backup of setup items
7.Replacement Parts	Precautions about the periodic replacement parts, consumable parts
8.Cleaning/Disinfecting/Storing	Procedure to handle, clean, store this equipment
9. Maintenance Check	Daily and periodic checks, self-diagnosis function, software version software install

Safety

Safety

About the Safety Precautions

The Meaning of Each Safety Precaution

Read this manual thoroughly before use to ensure correct and safe use of the product.

Be sure to follow the precautions indicated below, as these are important messages related to safety.

Type of Precaution	Description
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

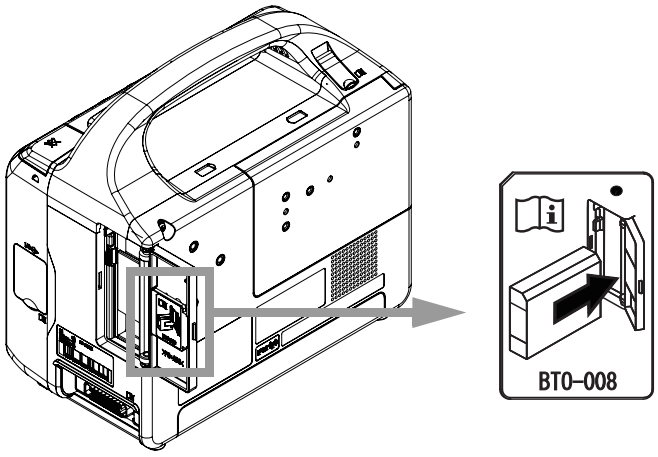
Warning Labels Attached to the Unit

Make sure to read the warning label attached to the equipment and comply with the requirements while operating the equipment.

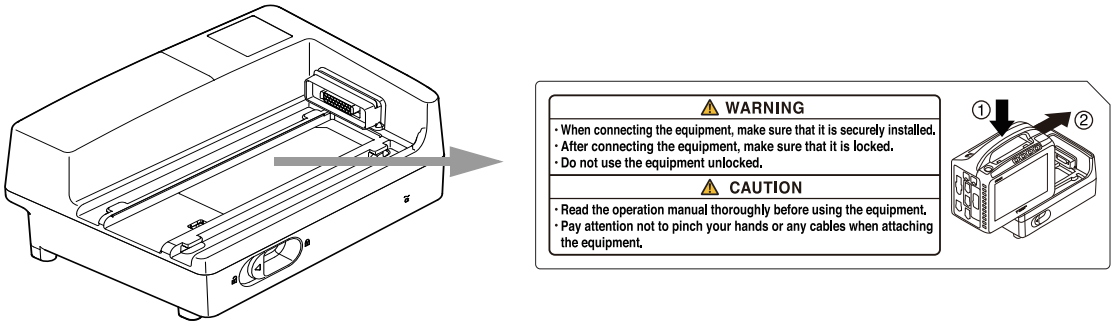
⚠ CAUTION

- Do not damage or erase the warning label attached to the equipment.
  These warning labels contain important descriptions for handling and operating the equipment properly and safely. A damaged label may compromise safe operation.

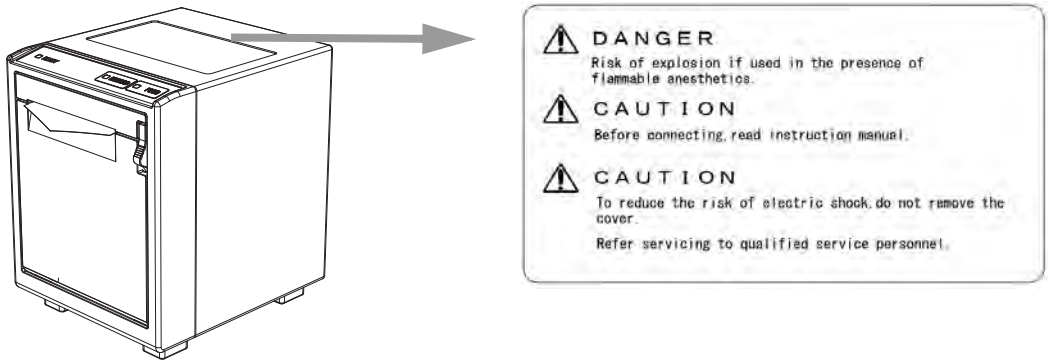
❑DS-8007 System Main Unit



❑DSA-81 AC Unit



❑HR-800 Recorder Unit



Graphic Symbols

Refer to the following for the meaning of the symbol indicated on the equipment.

Symbol	Description
	Follow operating instructions (Warning); indicated in blue. Failure to follow operating instructions could place the patient or operator at risk.
	Follow operating instructions (Information); Indicates the need to refer to the related accompanying documents before operation.
	General precaution
	Caution, refer to accompanying documents Indicates the need to refer to the related accompanying documents before operation.
	Potential Equalization Terminal Indicates the terminal to equalize the potential difference when interconnecting the devices.
	Protective Earth Indicates the protective earth inside the equipment.
	Alternating Current (Main Power Input Indicator)
	Indicates that the equipment is in normal operation.
	Indicates that the equipment is in standby mode.
	Electrostatic Sensitive Part Directly touching this connector part with hands should be avoided.
	Type CF Applied Part with Defibrillation-Proof Indicates the degree of protection against electric shock is Type CF Applied Part with defibrillation-proof.
	Type BF Applied Part with Defibrillation-Proof Indicates the degree of protection against electric shock is Type BF Applied Part with defibrillation-proof.
	Signal Output
	Signal Input/Output
	GAS Input Part
	GAS Output Part
	Battery
	Alarm Silence
	Name and Address of Manufacturer Indicates the name and address of manufacturer.
	Date of Manufacture Indicates the date of manufacture.
	WEEE (Waste Electrical and Electronics Equipment) Indicates a separate collection for electrical and electronic equipment.
IP32	Dustproof (IP3X): Protection against tips of tools. (Φ2.5 mm or more) Waterproof (IPX2): Protection against water drops falling vertically over 15 degrees range. Only when temperature connector cover, USB memory slot cover, CO_2 I/F connector cover, button cover, or battery connector is attached.
IPX1	Waterproof (IPX1): Protection against water drops.

Precautions for Safe Operation of Medical Electrical Equipment

⚠ WARNING

- Do not disassemble or remodel the equipment.

⚠ CAUTION

- Users should have a thorough knowledge of the operation before using this equipment.
- Do not use the equipment in an environment where protective earth and wiring is questionable.

❑Precautions about the Location of Installation and Storage of the Equipment

- Set the monitor to the user's intended position where the user can easily recognize the visual and audible monitoring conditions. Normally it is recommended to set at a distance of 1m from the user.
- Install or store in a place where the equipment will not be exposed to splashing water.
- Install or store in an area where environmental conditions such as atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, sodium, and sulfur will not adversely affect the system.
- Place the equipment on a stable surface where there is no inclination, vibration, or shock (including during transportation).
- Do not install or store in an area where chemicals are stored or gases are evolved.
- Verify the power frequency, voltage and allowable current (or power consumption).
- Ensure the grounding is proper by connecting the accompanying power cable to the hospital grade outlet.
- Make sure to secure the equipment using a trolley or stand.
- Do not place the equipment or accessories in any position that might cause it to fall on the patient.

❑Precautions Before Using the Equipment

- Verify the power voltage. Charge the battery pack fully before operating the system with the battery pack.
- Check the cable connection and polarity to ensure proper operation of the equipment.
- Make sure the power system has adequate earth ground.
- Ensure that all cables are firmly and safely connected.
- Pay special attention when the equipment is used in conjunction with other equipment as it may cause erroneous diagnosis and danger.

❑Precautions During Using the Equipment

- Always observe the equipment and patient to ensure safe operation of the equipment.
- If any abnormality is found on the equipment or with the patient, take appropriate measures under the safe conditions, such as ceasing operation of the equipment.
- Do not allow the patient to come in contact with the equipment.
- On start-up of the system, verify that the start-up tone generates and alarm indicator lights.
- For the connectors which are not Type BF, CF applied part, do not touch them and the patient at the same time.

❑Precautions After Using the Equipment

- Unplug all the cables from the patient before turning off the power.
- When unplugging the cables, do not apply excessive force by pulling on the cord. Pull by the connector part of the cable.
- Clean the accessories and cables, and keep them together in one place.
- Keep the equipment clean to ensure proper operation for the next use.

❑Precaution when Equipment Failure Occurs

- If the equipment is damaged and in need of repair, the user should not attempt service. Label the unit "OUT OF ORDER" and contact our service representative.

❑Precaution about Disassembling/Remodeling the Equipment

- Do not disassemble or remodel the equipment.
- If water or other liquids enter the equipment, cease using the equipment and contact your nearest service representative.

❑Precautions about Maintenance Check

- Make sure to periodically check the equipment, accessories, and cables.
- Before reusing the equipment that has been left unused for a while, make sure that the equipment operates normally and safely.

❑Precautions when Using with Other Equipment

- To prevent patient from burn injury, verify proper attachment of patient ground plate, ECG electrode type when using the electrosurgical knife, and verify paste volume, output energy when using the defibrillator. Also, verify that each equipment is properly grounded.

Precautions about the Maintenance

⚠ WARNING

- Never open the housing while the equipment is in operation or connected to hospital grade outlet as it may result in electric shock.

⚠ CAUTION Precautions about Safety Check

- For safe operation of the equipment, regular inspection and maintenance are required. Once a year, check all cables, devices, and accessories for damage, earth impedance, earth and leakage currents, and all alarm functions. Also, ensure that all safety labels are legible. Maintain a record of these safety inspections.
- Immediate maintenance has to be carried out for the following case.
  - When the equipment was subjected to extreme mechanical stress, e.g. after a heavy fall.
  - When the equipment was subjected to liquid spill.
  - When the monitoring function is interrupted or disturbed.
  - When parts of the equipment enclosure are cracked, removed, or lost.
  - When any connector or cable shows signs of deterioration.

Precautions about the Network System

Medical Telemetry

⚠ CAUTION Precautions about the Installation

- The medical institution (hereinafter referred as "Institution") must decide the telemetry installation plan for the medical institution in order to prevent interference between transmitters (telemetry based on destination country's radio law). When telemetry has already been installed and been used, radio format, frequency, and antenna power are required to be examined to prevent interference.
- When using telemetry which requires zone location, the institution is to set up the zones as an operation unit for each transmitter to prevent electronic interference between telemetry throughout the Institution.
- When using telemetry which requires zone location, display and identify each prepared zone in the equipment.
- When laying receiver antenna for each transmitter, the Institution has to examine the installation so that electronic interference does not occur.
- Based on the above examination result, the Institution should place each receiver antenna as required.

⚠ CAUTION Precautions about the Management

- The institution appoints a person to manage the wireless channels for the whole medical institution. And when using telemetry which requires zone location, the Institution should nominate a person to manage the wireless channels in each zone (a "Coordinator"). However, when using such telemetry in a local medical institution, one person can perform both functions.
- Select a telemetry coordinator who understands the characteristics and functionality of telemetry systems, and is skilled in operating telemetry.
- When installing telemetry, the Coordinators have to understand the precautions for use of the telemetry in advance.
- The Coordinator takes responsibility of wireless channel management and transmitter storage for the whole Institution by giving proper instruction.
- The Coordinator should create a management log (hereinafter referred to as the "log"), which contains a list of the management status of the wireless channels for the whole Institution. When changing a wireless channel, register it in the log and give proper instructions to the user.
- The Coordinator assumes responsibility for managing the wireless channels, storing, and managing telemetry.
- The Coordinator assigns the transmitter to the user, and provides enough education for use inside the zone.
- The telemetry user verifies operation of the transmitter/receiver before use.
- The telemetry user, if using the telemetry in a zone location, follows the instructions of the Coordinator for the zone and gives instructions to the patient if required.
- When interference or breakdown occurs in telemetry communication, the user is required to inform the Coordinators of the problems. The Coordinators are to deal with the problem properly and/or contact their nearest Fukuda Denshi representative for service.

Bidirectional Wireless Communications Module (TCON)

⚠ CAUTION Precautions about the Installation

- The medical institution (hereinafter referred to as "Institution" must execute investigation required to prevent interference including types of radio waves, frequencies, and antenna power if wireless equipment is already installed and being used in the facility.
- Even if this equipment is installed within the range of radio communication, the communication may not be possible due to noise or multi-path phasing etc. This should be fully considered when using the TCON network.
- If the TCON is installed in a line-of-sight distance where there are no obstacles or on the upper floors, unexpected long distance transmission may occur which may cause interference with nearby medical institution. Before using the TCON system, test the reception to make sure that it does not interfere with other channels. If the channel is used by other medical institution, change the channel ID.
- Do not install the TCON system in an area where it will be subject to splashing water. Water entering the equipment may cause the equipment to malfunction or be damaged.

⚠ CAUTION Precautions about the Management

- The Institution should appoint a person (hereinafter referred as the "Overall Manager" to manage the wireless devices for the whole facility. The ME engineer is appropriate for the Overall Manager.
- When installing TCON, the Overall Manager has to receive an explanation of the precautions for use of the TCON from the manufacturer or sales representative.
- The Overall Manager is responsible for the maintenance and storage of the equipment.
- The Overall Manager should create a management log (hereinafter referred to as the "log"), which contains a list of the management status of the wireless channels for the whole Institution. When changing a wireless channel, register it in the log and give proper instructions to the Zone Manager or to the user.
- The user needs to verify the transmitting/receiving operation before use.
- If interference or breakdown occurs in the communication, the TCON user is required to stop using the TCON and to inform the Overall Manager of the problem. The Overall Manager is to deal with the problem properly and/or contact the nearest Fukuda Denshi representative for service.

⚠ CAUTION Precautions for Operation

The Bidirectional Wireless Communications Module (TCON) uses radio waves to transmit data. Therefore, necessary precautions need to be taken for the characteristics and difficulties of using the device that emits radio waves. The TCON user should fully understand these precautions beforehand, and use the TCON device safely.The TCON communication status can be verified by the messages and symbols ( ) displayed on the screen. If TCON communication is interrupted by other wireless devices, a mark indicating the communication status and technical messages, <TCON Interference>, <Chk TCON Reception> will be displayed. For details, refer to the HTC-702 (FA) Operation Manual.

Furthermore, situations in which interference may occur are outlined below. In such cases, pay special attention to the condition of the patient connected to the bedside monitor, and eliminate the cause of interference.

- When the patient’s data become mixed with a different patient's data due to interference.
- When there are multiple TCON devices set to the same TCON ID and channel (group).
- When communication failure, unstable communication, or poor reception occur.
- When the radio communication is poor as there are metal, concrete, or other such obstacles between the Bidirectional Wireless Communications Modules (TCON).
- When a different wireless device is using the same frequency (channel).
- When there are other TCON devices nearby using different channels (groups).
- When a cell telephone or other wireless device is being used nearby.
- When citizens broadcast bands such as amateur radio or truck radios are used in the vicinity of the TCON operating area.

- When a computer or word processor, or electrical device that has an internal computer, is used near the TCON device antenna.
- When the TCON device is installed or moved to a location that is outside the radio communication range.
- When the channel settings for the two TCON groups are close to each other.

⚠ CAUTION Precautions about the Setting

- Follow the instructions from the Overall Manager for the wireless channel when setting the TCON and channel IDs to prevent interference within the same institution.
- If the TCON is set to [OFF], all TCON messages such as <Check TCON Comm.> will not be displayed.
- Even if [ON] is set for "Start NIBP Auto Mode with Start/Stop key" ([Initial Settings]>[User I/F]>[Power ON/Discharge]), "Backup at Discharge (NIBP Auto Mode)" setting will be [ON] since the central monitor will not be in standby mode during TCON communication.
- Make sure that three antenna bar marks ( ) are displayed.
- Make sure that the TCON channels of the bedside monitor and central monitor are the same.
- When using the TCON network, do not move the equipment. The radio waves may not be transmitted.
- There are following restrictions when connecting the DS-8007 System to the TCON network.
  - When the measurement unit of BP is [kPa], the central monitor will not receive the numeric data of NIBP, BP1, and BP2. Also, the alarm setting of NIBP, BP1, and BP2 cannot be changed from the central monitor.
  - The NIBP measurement cannot be started from the central monitor via TCON system if the NIBP measurement interval is set to [5 min] or less, or during the 1-minute or continuous measurement. However, it can be stopped.
  - When the measurement unit of CO_2 concentration is [mmHg], the CO_2 value of 100 mmHg or above will be transmitted as 99 mmHg.

- On the DS-8007 system, the TCON settings are saved on the AC Unit (DSA-81).

Precautions when Using with Other Equipment

Pacemaker

⚠ WARNING

- Minute ventilation rate-adaptive implantable pacemakers can occasionally interact with certain cardiac monitoring and diagnostic equipment, causing the pacemakers to pace at their maximum programmed rate. The cardiac monitoring and diagnostic equipment may possibly send wrong information. If such event occurs, please disconnect the cardiac monitoring and diagnostic equipment, or follow the procedures described in the operation manual of the pacemaker. For more details, contact FUKUDA DENSHI personnel, your institution's professionals, or your pacemaker distributors.
- Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance.

Reference

"Minute Ventilation Rate-Adaptive Pacemakers"
FDA alerts health professionals that minute ventilation rate-adaptive implantable pacemakers can occasionally interact with certain cardiac monitoring and diagnostic equipment, causing pacemakers to pace at their maximum programmed rate.
[Based on a safety bulletin issued by FDA Center for Devices and Radiological Health on October 14, 1998]

Non-Explosion Proof

⚠ DANGER

- Never operate the equipment in the presence of flammable anesthetics, high concentration of oxygen, or inside hyperbaric chamber. Also, do not operate the equipment in an environment in which there is a risk of explosion. Explosion or fire may result.

Defibrillator

⚠ WARNING

- When defibrillating, keep away from the electrodes or medicament applied to the patient chest. If this is not possible, remove the electrodes or medicament before defibrillating.
  If the defibrillator paddles are directly in contact with the electrodes or medicament, an electrical shock may result by the discharged energy.
- When defibrillating, make sure that the electrodes, sensor cables, or relay cables are firmly connected to the device.
  Contacting the metal part of the disconnected cable may result in electrical shock from the discharged energy.
- When defibrillating, do not touch the patient and the metal part of the device or cables.
  Electric shock may result from the discharged energy.
- This equipment will return to standard operating mode within 10 seconds after defibrillating. However, when in diagnosis mode, it may require 10 seconds or more after defibrillation to display the normal ECG waveform as the time constant setting is large.
  The stored data will not be affected. The measurement accuracy will temporarily decrease during defibrillation, but it will not compromise the safety of patient and the equipment.
- The QRS synchronized signal is not intended to be used as synchronized signal for defibrillator.

Electrosurgical Instrument

⚠ WARNING

- The monitoring system contains protection against interference generated by electrosurgical instruments. However, depending on the operating conditions, surgery site with respect to the location of ECG electrodes, ground plate attachment condition, or the type of instrument used, it may cause burn injury at the electrode site or noise on the ECG. The noise is generated at the tip of the electrosurgical knife and is difficult to completely eliminate because of the frequency components of the ECG. To reduce electrosurgical interference, take the following precautions:

  Location:

  Locate the electrosurgical unit as far as possible from this equipment and the patient cable. This will help reduce interference on the ECG through the monitor or cables.

  Power Supply:

  Connect the electrosurgical unit to a power supply that is different from that of this equipment. This will help prevent interference through the power cable.

  Electrode Placement

  The amount of noise interference is considerably different depending on the electrode position and surgery site. Place the ECG electrodes as far away as possible from the surgery site and the ground plate. Do not place electrodes in the path between the surgery site and the ground plate. If the electrodes are placed in this path, the amount of interference will be quite large. Position (+) and (–) electrodes as close as possible to each other.

  Ground Plate

When using electrosurgical instruments, make sure the contact between the patient and the ground plate is secure. If the connection is incomplete, the patient may suffer from burn at the electrode site.

- The stored data will not be affected. The measurement accuracy will temporarily decrease during electrosurgery, but it will not compromise the safety of patient and the equipment.
- When using the electrosurgery-proof type ECG relay cable, the impedance respiration cannot be measured, and its numeric data and waveform will not be displayed. When measuring in an environment where electrosurgery is not performed, make sure to use the standard ECG relay cable.
- As this equipment utilizes capacitive touch panel, the energy from the electrosurgical knife may pass through the cable to the touch panel causing unintentional touch panel control. Locate the cables as far away as possible from the touch panel.

MRI (Magnetic Resonance Imaging)

⚠ WARNING

MR Unsafe-Keep away from magnetic resonance imaging (MRI) equipment.

- Do not use this equipment in magnetic resonance imaging (MRI) environments.
- When conducting MRI test, remove the electrodes and sensors connected to the patient (test subject). This equipment may be pulled towards the MRI device. Also, the local heating caused by the induced electromotive force may cause burn injury to the patient or performance degradation, failure, damage of this equipment.
  For details, refer to the operation manual for the MRI testing device.

Precautions about Connections to Peripheral Devices

To use the equipment safely and to ensure maximum performance of the equipment, connection of other manufacturer's equipment to this equipment is not authorized, unless the connection is explicitly approved by Fukuda Denshi. It is the user's responsibility to contact Fukuda Denshi to determine the compatibility and warranty status of any connection made to another manufacturer's equipment.

⚠ WARNING

- When multiple equipments are connected to the patient, it may be necessary to take measures for connection (use of separation device), power supply (use of isolation power), grounding (additional protective earth). If these measures are not properly taken, a leakage current may flow between the equipments, or the total amount of leakage current may exceed the limit specified on IEC 60601-1-1.
- Only the peripheral devices specified by Fukuda Denshi should be connected with the given procedure. Use of an unspecified device may cause electric shock to the patient and/or operator due to excessive leakage current.

⚠ CAUTION

- Although the peripheral device connectors on the DS-8007 System are, with some exceptions, isolated from the power supply, the connecting peripheral devices should comply with IEC 60601-1. It is the user's responsibility to verify that the overall system complies with IEC 60601-1-1.
- To prevent danger of electric shock, always position the peripheral devices away from the patient.
- Network equipment including printer and hub should be located outside the "Patient Environment". If located inside the "Patient Environment", it may result in electric shock to the patient or the operator.
- Combinations of medical equipment with non-medical equipment must comply with IEC 60601-1-1 or IEC

60601-1. Never use a multiple portable socket-outlet or extension cable when connecting the equipments unless it is supplied specifically for use with that equipment.

Precautions for Using the Equipment

This System

⚠ DANGER

- When connecting to other equipments, contact your nearest representative.
  Danger such as electric shock may result to the patient and operator.

⚠ WARNING Warnings about the System

- Do not connect any damaged/unspecified equipment or cable to any I/O connector. Otherwise, the equipment cannot deliver its maximum performance and the connected equipments may be damaged, resulting in a safety hazard.
- If this equipment is used under an environment not fulfilling the specified condition, not only that the equipment cannot deliver its maximum performance, the equipment may be damaged and safety cannot be ensured. If using the equipment under condition other than specified, contact your nearest representative.
- Use only the supplied 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.
- The power cable must be connected to a hospital grade outlet.
- When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipments. Even a small potential difference may result in electric shock to the patient and the operator.
- Carefully route cables to reduce the possibility of patient entanglement and strangulation.
- When lifting this equipment, hold it by the handle or the bottom part of the main unit.
- When using this equipment, the operator should stay in a distance close enough to recognize an alarm sound. Do not move too far away from the equipment where an alarm sound cannot be recognized.

⚠ WARNING Warnings about the monitoring

- The patient classification selection influences the precision of the QRS detection and NIBP measurement. Make sure the proper selection is made.
- The pacemaker usage setting influences the precision of the QRS detection and arrhythmia analysis. Make sure the correct selection is made.
- If the QRS pace mask function is set to [OFF], [10ms]/[20ms], the pace pulse may be erroneously detected as a QRS complex and HR alarm or asystole alarm may not generate due to incorrect HR (counting pace pulse as QRS complex). Select [OFF], [10ms]/[20ms] only if you are sure that pacing failure will not occur, or when the patient can be constantly monitored.
- When measuring the SpO_2 of patient with high fever or peripheral circulatory insufficiency, check the sensor attachment periodically and change the attachment site. The temperature of the attachment site will rise due to the sensor heat which may result in burn injury.
- For the following case, accurate measurement of SpO_2 may not be possible.
  - Patient with excessive abnormal hemoglobin (COHb, MetHb)
  - Patient with the pigment injected to the blood
  - Patient receiving CPR treatment
  - When a sensor is applied to a limb with NIBP cuff, arterial catheter, or intracatheter
  - When measuring at site with venous pulse

- Patient with body motion
- Patient with small pulse

- When a patient is receiving a photodynamic therapy, measuring SpO_2 on a same site for a long duration may cause blisters from the irradiation light of the SpO_2 sensor. Make sure to periodically change the sensor attachment site.
- Before the measurement, make sure the patient classification (Adult/Child/Neonate) is properly selected. Otherwise, correct measurement cannot be performed, and congestion or other injury may result.
- When the system alarm is suspended, all the alarm will be suspended even if the parameter alarm is set to [ON]. Also, the alarms will not be stored as recall events.
- If the upper/lower alarm limit of the parameter is set to [OFF], or arrhythmia alarm is set to [OFF], alarm will not function even if the individual alarm is set to [ON]. Pay attention when setting them [OFF].
- Objective and constant arrhythmia detection is possible through the fixed algorithm incorporated in this monitor. However, excessive waveform morphology change, motion artifact, or the inability to determine the waveform pattern may cause an error, or fail to make adequate detection. Therefore, physicians should make final decisions using manual printing, alarm printing and recall waveform for evaluation.
- The RR/APNEA alarm will not be generated unless the numeric data box corresponded to the selected RR/APNEA alarm source is displayed.Make sure to display the numeric data box for the RR/APNEA alarm source.
- The SpO_2 respiration measurement function is not intended for use as an APNEA monitor.
- When selecting [0] for "Volume" or [Timer] for "Display" for the Night Mode, pay attention not to miss any important alarm by simultaneously monitoring the patient on central monitor or other monitors.
- When the alarm sound is suspended, the alarm sound will not generate for the fixed amount of time. Pay attention not to miss any important alarm by simultaneously monitoring the patient on central monitor or other monitors.
- If the safety of the patient cannot be ensured, do not suspend the alarm or decrease the alarm volume.

⚠ WARNING Warnings about the CO_2 Monitoring (HCP-810/HCP-820, HPD-810/HPD-820)

- Only one of either HCP-810/HCP-820/HPD-810/HPD-820 can be connected.
- When using a sampling line for intubated patients with a closed suction system, do not place the airway adapter between the suction catheter and endotracheal tube. This is to ensure that the airway adapter does not interfere with the functioning of the suction catheter.
- To prevent cross-infection, do not allow the sampling gas to return to the breathing system.
- To protect the hospital staffs from unnecessary anesthetic agent when using the HCP-810/HCP-820, it is strongly recommended to connect the exhaust hole to the gas exhaust system in the hospital.
- Loose or damaged connections of the sampling line may compromise ventilation or cause an inaccurate measurement of respiratory gases. Securely connect all components and check connections for leaks according to standard clinical procedures.
- Do not cut or remove any part of the sampling line. It could lead to erroneous readings.
- If too much moisture enters the sampling line (i.e., from ambient humidity or breathing of unusually humid air) when using the HCP-810/HCP-820, <Check Sample Line> will be displayed in the message area. Replace the sampling line once this message is displayed.
- Carefully route the sampling line to reduce the possibility of patient entanglement or strangulation.
- Do not lift the HCP-810/HCP-820 by the sampling line, as the sampling line could disconnect from the equipment, causing the equipment to fall on the patient.
- CO_2 readings and respiratory rate can be affected by sensor application errors, certain ambient environmental conditions, and certain patient conditions.

⚠ CAUTION Precautions for Installing the Monitor

- Make sure to secure the equipment using a specified trolley or stand. Otherwise, the equipment may fall down, resulting in injury to the operator or damage to the equipment.

⚠ CAUTION Precautions about the Trolley

- When attaching the monitor to the specified trolley, make sure that it is securely fixed on. Otherwise, the equipment may fall off from the trolley, resulting in injury to the operator or damage to the equipment.
- Make sure to use only the specified trolley. Otherwise, the trolley may fall down, resulting in injury to the operator or damage to the equipment.
- When using or storing the trolley, make sure that the casters are locked. Otherwise, the trolley may fall down, resulting in injury to the operator or damage to the equipment.
- Do not use or store the trolley where it will be subject to inclination of 10 degrees or more. The trolley or equipment may fall resulting in injury to the operator or damage to the equipment.

⚠ CAUTION Precautions about the System

- Use only the spare parts specified for this equipment. Otherwise, proper function cannot be executed.
- Do not use the touch panel with the film attached. It may cause malfunction or damage the touch panel.
- For quality improvement, specifications are subject to change without prior notice.
- This equipment utilizes LED for the backlight. Since this LED deteriorates by the life cycle, the display may become dark, scintillate, or may not light by the long term use. In such case, contact your nearest service representative.
- This equipment is intended to be used for only one patient.
- The installation of this equipment should be performed by our service representative or a person who is well acquainted with this equipment.
- If not using the equipment for a long period, disconnect the power cable, module connection cable and lithium-ion battery.
- The lithium-ion battery can only be charged in the specified operational temperatures of the equipment. Refer to the operation manual of the lithium-ion battery (BTO-008) for details.

⚠ CAUTION Precautions about the ECG Monitoring

- If any electrodes get detached from the patient after being connected to the lead cable and patient monitor, pay attention that the metal part of the electrode does not get in touch with any metal parts of the bed or any conductive parts. Also, the operator should not touch any conductive parts with bare hands. Otherwise, it may cause electric shock to the patient and/or operator due to excessive leakage current.
- The indication for continuous use of the electrode is about one day.
- Replace the electrode if the skin contact gets loosen due to perspiration, etc.
- When an electrode is attached to the same location for a long period, some patients may develop skin irritation. Check the patient's skin condition periodically and change the electrode site as required.
- For stable arrhythmia detection and ECG monitoring, verify proper electrode placement, lead, waveform size, and filter mode selection. If not properly selected, it may cause erroneous detection.
- The threshold level for arrhythmia detection changes with ECG waveform size. Set a proper waveform size for monitoring.
  - When the ECG waveform size is x1/4, x1/2, or x1, the arrhythmia detection level is 250 μV.
  - When the ECG waveform size is x2 or x4, the arrhythmia detection level is 150 μV.
- The leads for arrhythmia detection, central monitor display, printing are fixed as ECG1 and ECG2. Set the most appropriate leads with high QRS for ECG1 and ECG2, especially for arrhythmia detection. If the QRS amplitude for the set lead is low, it may cause erroneous arrhythmia detection.
- In ESIS Mode, artifacts such as electrosurgical noise or EMG can be largely reduced, but QRS amplitude attenuation, waveform distortion, or ST segment change may occur compared with other filter modes.

- The ESIS mode cannot completely reduce the electrical noise, and may erroneously detect the pacemaker spike. This mode should be selected only when a high frequency noise largely affects the HR measurement.
- There are some cases when the pacemaker pulse cannot be detected depending on the pacemaker type, pulse voltage, pulse width, electrode lead type (unipolar, bipolar), or electrode placement which causes the pacemaker pulse amplitude to decrease, and disables the pacemaker pulse detection.
- If signals similar to a pacemaker pulse are present, such as electric blanket noise or excessive AC frequency noise, these may be erroneously detected and displayed as a pacemaker pulse.
- When a spontaneous QRS and pacemaker pulse overlap (ex. fusion beat, etc.), QRS detection cannot be performed properly. In this case, the heart rate is degraded.
- If a pacemaker pulse is continuously detected due to AC frequency interference, QRS detection will be suspended and the heart rate will be reduced. Arrhythmia will not be detected either.

⚠ CAUTION Precautions about the ST Measurement

- The ST algorithm has been tested for accuracy of the ST segment data. The significance of the ST segment changes need to be determined by a clinician.
- For the lead which the electrode is detached, the reference waveform setup cannot be performed. Check if the electrode is appropriately attached, and perform the setup again.

⚠ CAUTION Precautions about the SpO_2 Monitoring

- Use only the sensor/relay cable specified by Fukuda Denshi. Otherwise, it may cause measurement error.If the sensor is damaged, stop using it.
- If the nail is rough, dirty, or manicured, accurate measurement will not be possible. Change the finger or clean the nail before attaching the sensor.
- If irritation such as skin reddening appears with the sensor use, change the attachment site or stop using the sensor.
- Do not apply the sensor too tight. At the same time, check the blood flow constantly so that congestion is not generated at the peripheral site.
- Do not use tape to attach the sensor.
- Even attachment for a short duration may inhibit the blood flow and generate compression necrosis or burn injury. Also, blood flow inhibition may prevent correct measurements.
- Check the sensor attachment site constantly in every 4 hours when probes or reusable sensor are used, and at least every 8 hours when single patient use sensors are used. Be especially careful of a patient with bad perfusion. If the sensor attachment position is not changed constantly, skin irritation or skin necrosis due to compression may be developed. For the patient with bad perfusion, check the sensor attachment position at least every 2 hours.
- As skin for neonate, premature infant is immature, change the sensor attachment site more frequently depending on the condition.
- Direct sunlight to the sensor area can cause a measurement error.Place a black or dark cloth over the sensor if using in direct sunlight.
- When not measuring, unplug the relay cable and sensor from the SpO_2 connector. Otherwise, the outside light may affect to falsely display measurements.
- The pulse wave is normalized for SpO_2 measurement, and does not indicate perfused blood volume. Check proper probe attachment by observing the pulse wave.
- Precautions for Reusable Sensors
  The light-emitting part of the sensor should be over the root of the fingernail or as instructed per the related sensor instruction manual. Do not insert the finger too far into the sensor as it may hurt the patient. For details, refer to the SpO_2 sensor instruction manual.
- Precautions for Single-Patient-Use Type Sensors
  The sensor can be reused on the same patient as long as the adhesive tape attaches without slippage. But do not reuse on other patients to avoid cross contamination. It is intended for single patient use only. For details, refer

to the SpO_2 sensor instruction manual.

- If "---" is displayed for the SpO_2 numeric data, make sure that the sensor is properly attached.
- Measuring on a limb with NIBP cuff, arterial catheter, or intracatheter may result in incorrect measurement.
- Venous congestion may cause under reading of actual oxygen saturation. Therefore, assure proper venous outflow from monitored site. Sensor should not be below heart level (e.g. sensor on hand of a patient in a bed with arm dangling to the floor).

⚠ CAUTION Precautions about the NIBP Monitoring

- Do not apply the NIBP cuff to site of injury. An injury may be worsened by the measurement.
- Do not apply the NIBP cuff to the arm on side treated axillary lymph nodes dissection. It may lead to lymphatic edema by the cuff pressure.
- Measuring on a limb with SpO_2 sensor, arterial catheter, or intracatheter may result in incorrect measurement.
- An operator must not get away from a patient during the NIBP measurement. However, when getting away from the patient is necessary, do not activate the Alarm Suspend and Silence functions in order not to miss any sudden changes in the patient's condition.
- Pay attention when measuring the NIBP of patient with bleeding disorders or hyper coagulation. The cuff inflation may cause petechia or circulatory failure by the blood clot.
- For the following situation, measurements will be terminated.
  - When the measurement time has exceeded 160 seconds for adult and child, 80 seconds for neonate.
  - When the inflation value has exceeded 300mmHg for adult, 210mmHg for child, and 150mmHg for neonate.
- If used with the incorrect patient classification, it will not only cause erroneous measurement, but the inflating level for the adult may be applied to child or neonate causing dangerous situation to the patient.
- The continuous measurement and 1-minute interval measurement will automatically stop after 12 minutes (maximum 15 minutes).
- If the mean MAP display is set to OFF, the MAP alarm will not be generated. Also the MAP data will not be displayed for the tabular trend or the NIBP list.

⚠ CAUTION Precautions about the BP Monitoring

- Do not reuse / re-sterilize the disposable type transducers.
- If using a reusable blood pressure transducer, disinfect it according to the manufacturer's guidelines.
- The long-term use of the blood pressure transducer, tube and catheter may increase the risk of infection. Perform periodic replacement with new one. The guidelines of the CDC (Disease Control and Prevention) recommend replacing within 96 hours.
- If the ambient temperature of the blood pressure transducer has changed greatly, the zero balance may cause the drift. Perform the zero balance again.
- An operator must not get away from a patient during the BP measurement. However, when getting away from the patient is necessary, do not activate the Alarm Suspend and Silence functions in order not to miss any sudden changes in the patient's condition.
- Be sure to perform Daily Check. Use of faulty equipment might harm the patient or operator.
- If the Equipment Status Alarm occurs or if you feel the unusual operation of the equipment, perform the inspections to confirm the safety or contact our service representative.
- If the transducer get disconnected, pay attention that the metal part of the transducer does not get in touch with any metal parts of the bed or any conductive parts. Also, the operator should not touch the conductive parts with bare hands. Otherwise, it may result in electric shock to the patient and/or operator.
- When the power is turned ON, the BP value will not be displayed until zero balance is performed. Make sure to perform the zero balance. Once the zero balance is performed, the zero balance information will be maintained, and the BP value will be displayed.
- Each time the blood pressure transducer or tubing is replaced, the zero balance procedure is required to ensure

accurate measurements.

- The zero balance procedure is required for the following case.
  - When starting the measurement.
  - When the position of the heart has changed due to body movement.
  - When the position of the transducer has changed.
  - When measuring for a long period of time and there is a possibility of measurement error due to change in ambient temperature, etc.
  - When a connector is connected/disconnected, or a transducer is replaced.
- Note that Systolic Pressure (SYS) = Peak Systolic Pressure (PSP) for the graphic trend, data base, and alarm setup.
- When ECG is not measured, Peak Diastolic Pressure (PDP) cannot be calculated.
- The undisplayed BP data (SYS/DIA/Mean) will not generate a BP alarm or be displayed in the tabular trend. Select the appropriate display type according to the monitoring purpose.

⚠ CAUTION Precautions about the CO_2 Monitoring (HCP-810/HCP-820)

- Conduct CO_2 calibration for the following case.
  If the CO_2 gas calibration is not performed at a specified interval, CO_2 measurement accuracy may be affected and also subsequent gas calibration may not be possible.
  - When the accumulated measurement time exceeds 1,200 hours from the first use.
    However, if the first calibration was performed before the accumulated measurement time reaches 720 hours, another calibration is required when the accumulated measurement time exceeds 1,200 hours from the first calibration.
  - When 12 months has elapsed or the accumulated measurement time has exceeded 4,000 hours from the previous calibration.
  - When $EtCO_2$ measurement is not stable or accuracy is degraded compared with other measuring device.
  - When the patient monitor was not used for a while, or when $EtCO_2$ was not measured for a while.
- Perform the calibration 5 minutes after turning ON the power on the HCP-810/HCP-820.
- Do not disconnect the sampling tube during calibration. If disconnected, calibration will cease.
- Dispose of calibration gas according to the regulation of each medical institution.
- Microstream® $EtCO_2$ sampling tubes are designed for single patient use, and are not to be reused. Do not attempt to clean, disinfect, sterilize or flush any part of the sampling tube as this can cause damage to the monitor or lead to cross-infection.
- Dispose of sampling tubes according to standard operating procedures or local regulations for the disposal of contaminated medical waste.
- Before use, carefully read the Directions for Use for the Microstream® $EtCO_2$ sampling tube.
- Only use Microstream® $EtCO_2$ sampling lines to ensure the monitor functions properly.

⚠ CAUTION Precautions about the CO_2 Monitoring (HPD-810/HPD-820)

- The airway adapter should be attached with the thicker side facing to the patient. If attached oppositely, it may damage the CO_2 sensor or airway adapter.
- Dispose of calibration gas according to the regulation of each medical institution.

⚠ CAUTION Precautions about the Alarm

- Alarm messages will be displayed according to the priority. (Level S > Level H > Level M > Level L> Level N)
- For the same alarm level, the alarm message for the newer alarm will be displayed.
- The arrhythmia alarm message other than Tachy, Brady, Ext Tachy, Ext Brady will continue to be displayed for 30 seconds after the alarm is resolved.
- When "LEAD OFF", "Check Electrodes" is displayed, HR alarm or arrhythmia alarm will not function. If this

condition is left unresolved, a sudden change of the patient may not be noticed. Take prompt action when the lead-off condition is detected.

- For the HPD-810/HPD-820 and HCP-810/HCP-820, the CO_2 measurement range is 0 to 99 mmHg/0 to 13.3 kPa, and the upper $EtCO_2$ alarm will not generate if the upper alarm limit is set to 100 mmHg/13.4 kPa and above.
- Whether to use the SpO_2 second alarm function and its threshold selection should be based on the patient's clinical indication/portent and medical evaluation.
- If the SpO_2 alarm and second alarm setup is set to [OFF], the second alarm integral value will be set to 0.
- Pay attention not to set the alarm volume too low to avoid missing any important alarms.
- On a wired network, the alarm generated on the bedside monitor will be output to the network with a maximum delay of 1 second, and to the central monitor with a total delay of 2.5 seconds.
- On a wireless network, the alarm generated on the bedside monitor will be output to the network with a maximum delay of 2 seconds, and to the central monitor with a total delay of 3 seconds to 12 seconds.
- If the same or similar equipments with different alarm settings are used in the same facility or same department, pay attention not to misjudge the alarms.

⚠ CAUTION Precautions about the System Setup

- When the waveform and numeric data display for each parameter is set to OFF, the alarm and trend input will be also suspended.
- If the HR/PR source is set to [BP], and if BP waveform/numeric data is set to [Disp. OFF], the PR value will not be displayed.
- If the HR/PR source or RR source is set to [SpO2], and if SpO2 parameter is set to [Disp. OFF], the HR and RR parameter will not be displayed.
- If the RR source is set to [CO_2/GAS], and if CO_2 waveform/numeric data is set to [Disp. OFF], the RR value will not be displayed.
- If the time/date is not correctly set, or changed during monitoring, malfunction may occur with NIBP measurement, periodic printing, trend, NIBP list data, and age calculation from the birth date.

⚠ CAUTION Precautions about the Patient Admit/Discharge

- If monitoring of a new patient is started without discharging the previous patient, data of the new patient will be added to the data of the previous patient which will result in inaccuracy.
- The user mode setting (alarm/display configuration) will remain effective even when the power is turned OFF or when the patient is discharged. Before monitoring, make sure the current user mode is suitable for the patient's condition.
- Resuming monitoring will also resume the alarm in suspension.

⚠ CAUTION Precautions about the SD Card

- Use only the specified SD card.
- Use only the SD card formatted on this equipment.
- Make sure to power cycle the system after the setup data is read from the SD card.
  By power cycling the system, the read data will become effective.
- Do not leave the SD card in reach of patients or infants.

⚠ CAUTION Precautions about the Maintenance

- When cleaning the touch panel, never use strong-acidic cleaning solution.
- To clean the touch panel, use an optional cleaning cloth, eyeglass cleaning cloth, soft cotton cloth, or non-woven cloth (pulp, rayon, polyethylene, etc.).
- Clean the equipment frequently so stains can be removed easily.
- To prevent injury, it is recommended to wear gloves when cleaning the equipment.
- Pay attention not to allow chemical solution to enter the equipment or connectors.

- Do not use organic solvents, thinner, toluene or benzene to avoid damaging the resin case.
- Do not polish the equipment with abrasive or chemical cleaner.
- When disinfecting the entire room using a spray solution, pay close attention not to get any solution into the equipment or connectors.
- Use only neutral detergent to clean the equipment. The surface resin coating may damage, resulting in discoloration, scratches, and malfunction.
  Example:
  chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent and chemicals (cleanser, thinner, benzine, benzol, and synthetic detergent for house and furniture), or sharp-edged tools
- Do not open the housing.
- Do not allow alcohol or other liquids to enter the equipment.
- Replace the periodic replacement parts periodically as specified.

Wired Network (DS-LANII/ DS-LANIII)

⚠ WARNING

- Do not connect unspecified device to the wired network.
- Do not mix devices with DS-LANII and DS-LANIII setting in the same wired network. The network may cease and proper monitoring may not be possible.

⚠ CAUTION

- If performing wired network transmission, configure the display so that the numeric data corresponded to the waveform is displayed. If not, the displayed waveform or numeric data may not be transmitted.
- On the DS-8007 system, the following settings are saved on the AC Unit (DSA-81).
  Room ID, Bed ID, DS-LAN II/III Setup, Pat. ID Transmission Start Position, Hemodynamic Data Synchronization, CO_2(mmHg) Upper Limit of Transmission
- On the AC Unit (DSA-81), the default setting of Bed ID is "000". If connected to a wired network with the bed ID unchanged, monitoring on the central monitor will not be possible.
- When connecting to a wired network, make sure that there are no other bedside monitors with the same ID. If there is more than one bedside monitor with the same bed ID, the duplicated bedside monitors cannot be monitored on the central monitor.
- When connected to the DS-LAN II network, set the Bed ID in the range from "001" to "048" .
- When connected to the DS-LAN III network, set the Bed ID in the range from "001" to "100" .
- There are following restrictions when connecting the DS-8007 System to the wired network.
  - The BP measurement unit setting should be the same for all central monitors and bedside monitors. If the setting is different among the monitors, data such as BP waveform, BP numeric data, NIBP numeric data, NIBP list will not be transmitted.It will be treated as not measured data, and will not be displayed on the central monitor.The alarm limit setup from the central monitor cannot be performed either.
  - On the DS-LAN II network, the arrhythmia alarm of Tachy, Brady, Couplet, Pause, Trigeminy, ExtTachy, ExtBrady, RR IREG, Prolong RR, Triplet, Multiform, VENT Rhythm, Not Capt, Not Pacing, S Couplet, SVT, SVPC, S Frequent will not be transmitted.
  - On the DS-LAN II network, arrhythmia alarm of "SLOW VT" will be transmitted as "VT" .
  - On the wired network, measurement data and alarm of TEMP3 to 6 will not be transmitted. Also, the displayable waveform, numeric data, alarm differs depending on the connected central monitor.Refer also to the operation manual for the respective central monitor.
  - The PR_IBP alarm will not be transmitted to the central monitor.
  - If the "RR/APNEA alarm source" is other than [Impedance] (or, if [Auto] selects a setting other than [Impedance]), the RESP waveform will not be transmitted on a wired network.

- If the "RR/APNEA Alarm Source" setting is other than [CO_2] (Or, if [Auto] selects a setting other than [CO_2]), the CO_2 waveform will not be transmitted on a wired network.
- For the numeric data displayed as "xxx", maximum or minimum value of measurable range will be transmitted.
- The numeric data displayed as "--- " will be treated as not measured data.
- If the measurement unit of CO_2 concentration is mmHg and [99mmHg] is selected for "CO_2 (mmHg) Upper Limit of Transmission" ([Initial Settings]>[System]>[DS-LAN]), the CO_2 value of 100mmHg or above will be transmitted as 99mmHg.

- As the DS-8007 System do not have the arrhythmia template display and 12-lead ST display function, waveforms and other data will not be displayed for these displays on the central monitor connected to the DS-LAN network.
- When connected to the wired network, the time/date will synchronize with the central monitor.Even if the time/date is changed on the DS-8007 System, it will be corrected to the time/date of the central monitor.
- Depending on the central monitor model type, the ST display will be distorted if the ECG lead (ECG1 or ECG 2) is changed on the DS-8007 System system. Redrawing the ST display will return the display to normal.
- On the central monitor, the respiration waveform and RR value based on the "RR/APNEA Alarm Source" selected on this monitor will be displayed. The same parameter for the RR and apnea will be monitored on this monitor and the central monitor. However, the DS-7000 series central monitors do not support RR_SpO_2 measurement, and if RR/APNEA source is set to [SpO_2], RR value and APNEA condition will not be displayed. For details of the central monitor type and software version, refer to your nearest service representative.

Wireless Network System

⚠ DANGER

- When monitoring a patient using wireless telemetry, make sure the patient data is properly received at the central monitor. Pay special attention when the channel ID at the bedside monitor is changed.

⚠ WARNING

- A password can be set to access the channel ID setup menu to allow only the telemetry channel administrator to change the channel ID.
- Some type of wireless combinations may generate interference with other telemetry.
- Before selecting a channel, verify it will not interfere with other channels.
- Inform the supervisor of the use of telemetry channels to avoid interference with other telemetry.
- If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference.

⚠ CAUTION Precautions about the Telemetry

- When performing telemetry transmission, configure the display so that the numeric data corresponded to the waveform is displayed. If not, the displayed waveform or numeric data may not be transmitted.
- The setup of channel ID and group ID should be performed only by the telemetry channel administrator or our service representative. Users should not perform this procedure as malfunction may occur.
- When the measurement unit of BP is "kPa", corresponding waveform and numeric data will not be transmitted. When using a wireless network, use "mmHg" for the BP measurement unit.
- BP waveform with a scale above the set scale can not be properly transmitted. When transmitting the BP waveform, pay attention to the displayed BP scale.
- If the measurement unit of CO_2 concentration is mmHg and [99mmHg] is selected for "CO_2 (mmHg) Upper Limit of Transmission" ([Initial Settings]>[System]>[Telemeter]), the CO_2 value of 100mmHg or above will be transmitted as 99mmHg.

RTC and Data Backup

⚠ CAUTION

- This equipment is equipped with a built-in clock.When the power of this equipment is turned OFF, this clock is backed up by a lithium primary battery.If incorrect time is displayed when turning ON the power, a low battery may be the cause. In such case, contact Fukuda Denshi service representative for replacing the battery.

Precautions about the Ventilator Monitoring

⚠ WARNING

- The ventilator alarm sound is set to OFF at factory default setting.
  The alarm sound can be turned ON on the Tone/Volume setup screen.
- If the DS-8007 System does not generate an alarm even though the ventilator is generating an alarm, or if any other malfunction occurs, immediately check the ventilator, this equipment, cable, and replace the cable if necessary. If the malfunction persists, stop using the equipment.
- The alarm generation on the DS-8007 System is not guaranteed if the alarm other than the specified one generates at the ventilator.
  (☞Maintenance Manual "Ventilator Alarm Input" P4-1)

⚠ CAUTION

- The ventilator operation should be performed by well-trained and authorized personnel.
- When connecting this equipment and a ventilator, use only the specified connection cable.
- Verify that this equipment and the ventilator are properly connected.
- When connecting the cable, verify that the main power of this equipment and the ventilator are OFF.
- During ventilator monitoring, if the DSA-81 is disconnected from the DS-8007, the ventilator alarm will not generate.

Precautions about the SpO_2 Sensor

⚠ DANGER Danger of Burn Injury Caused by the SpO_2 Sensor

- When monitoring SpO_2, make sure to use only the specified sensor/relay cable. If any other sensor/relay cable is used, a high temperature rise of the sensor may place the patient in danger of burns.
  If there are any questions regarding the sensor/relay cable use for SpO_2 measurements of this equipment, please contact Fukuda Denshi service representative.

Precautions about the NIBP Cuff

⚠ CAUTION

- Some of the NIBP cuffs used for this equipment contain natural rubber latex which may cause allergic reactions.
  (FDA: Medical Alert on Latex Products, "Allergic Reactions to Latex-Containing Medical Devices", Food & Drug Administration, 10903 New Hampshire Avenue, Silver Spring, MD 20993, 1991.)

Precautions about Disposing of the Equipment, Accessories, or Components

⚠ CAUTION

- When disposing of this equipment, accessories, or components, use an industrial waste distributor. Do not dispose of as ordinary waste.
- When disposing of the battery, separate it from other wastes and contact your nearest service representative.

Precautions about Transportation

⚠ CAUTION

- When transporting this equipment, pack it with specified packing materials.
  Also, transport it under appropriate environment condition.
  (☞Operation Manual "Specification" P14-1)

Monitoring after Power Failure

When the power failure is less than 30 seconds, monitoring will resume with the display mode and patient information unchanged. When the power failure is 30 seconds or more, monitoring will resume with the default display mode set by the user, or the display mode which was last set.

HCP-810/HCP-820, HPD-810/HPD-820 will start up from the warm-up mode. The warm-up time differs for each unit.

To Prepare for Emergency Use

Accessories/Optional Accessories

- The ECG electrodes are consumable products. Always prepare extra supplies of electrodes.
- Verify that there is no wire break on the patient cable once a week.

Battery Pack

- Even if the battery pack is not in use, the remaining capacity decreases due to self-discharge.Make sure to verify once a week that the battery pack is fully charged.
- To fully charge the empty battery pack, it takes 8 hours during operation, and 4 hours when the power is OFF and AC cable is connected.
- The performance of the battery deteriorates with repeated use. To ensure performance of the battery, it is recommended to replace it once a year.

Electromagnetic Compatibility

The performance of this equipment under electromagnetic environment complies with IEC 60601-1-2:2007.

⚠ CAUTION

Do not use any unauthorized equipment or cables as they may not comply with the EMC standard.

Precautions for Safe Operation under Electromagnetic Influence

If any sorts of electromagnetic wave, magnetic field, or static electricity exist around the device, noise interference or malfunction of the device may occur.If any unintended malfunction or noise occurs during monitoring, check the electromagnetic influence and take appropriate countermeasures.

The following are examples of the common cause and countermeasures.

⚠ DANGER Static Electricity

In a dry environment (room), static electricity is likely to occur.Take the following countermeasures.

- Both operator and patient should remove any static electricity before entering the room.
- Humidify the room.

⚠ WARNING Cellular Phone

- The radio wave may cause malfunction to the device.
  Cellular phones and radio sets should be turned off in the room (building) where medical device is located.

⚠ CAUTION Lightning

A lightning nearby may induce excessive voltage to the equipment.If any danger is suspected;

- Use the uninterruptible power supply system.
- Use the battery.

⚠ CAUTION High frequency noise interference from other device through the power outlet

- Check where the noise is originated and remove it using filtering device, etc.
- Stop using the device that is originating the noise.
- Use other power outlet.

EMC Guidance

This device complies with the Safety Standard IEC 60601-1-2:2007. However, if portable transmitter or wireless LAN equipment is used extremely nearby, the electromagnetic influence may largely exceed the compliance level and may cause unexpected phenomenon such as noise interference on the waveform, etc.

Also, if this equipment is installed close to, or stacked with other equipment, malfunction may occur. Make sure to verify that the equipment operates properly in a used location.

This equipment should be used in a location specified by each medical institution.

If any unexpected noise interference on the waveform or failure to the peripheral device occurs, stop using the equipment and follow the instruction of the technical engineer.

The following is the information relating to EMC (Electromagnetic Compatibility).

(When using this equipment, verify that it is used within the environment specified below.)

This equipment complies with IEC 60601-1-2:2007 for the following system configuration.

- Main Unit: DS-8007
- AC Unit: DSA-81
- CO_2 Gas Unit: HCP-820 or Gas Unit I/F: HPD-820
- Recorder Unit: HR-800
- BISx I/F Unit: HBX-800
- BISx Module: BISx
- Lithium-Ion Battery Pack: BTO-008

❑Compliance to the Electromagnetic Emissions

The DS-8007 System is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-8007 System should assure that it is used in such an environment.

Guidance and Manufacturer's Declaration - Electromagnetic Emissions		
Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The DS-8007 System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The DS-8007 System is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network which supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Complies	

❑Compliance to the Electromagnetic Immunity (1)

The DS-8007 System is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-8007 System should assure that it is used in such an environment.

Guidance and Manufacturer's Declaration - Electromagnetic Immunity			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6kV: contact ±8kV: air	±6kV: contact ±8kV: air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2kV: power supply lines ±1kV: input/output lines	±2kV: power supply lines ±1kV: input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV: differential mode ±2kV:common mode	±1kV: differential mode ±2kV:common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines. IEC 61000-4-11	<5% U_T* (>95% dip in U_T) for 0.5 cycles 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec.	<5% U_T (>95% dip in U_T) for 0.5 cycles 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If it is required to continuously operate the DS-8007 System during power failure, it is recommended to operate on an uninterrupted power supply.
Power Frequency (50/60Hz) Magnetic Field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

*: U_T is the AC mains voltage prior to application of the test level.

❑Compliance to the Electromagnetic Immunity (2)

The DS-8007 System is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-8007 System should assure that it is used in such an environment.

Guidance and Manufacturer's Declaration - Electromagnetic Immunity			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - Guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the DS-8007 System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	$d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m	$d = 1.2\sqrt{P}$ 80MHz to 800MHz $d = 2.3\sqrt{P}$ 800MHz to 2.5GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey*1, should be less than the compliance level in each frequency range*2. Interference may occur in the vicinity of equipment marked with the following symbol: 

Note 1: At 80MHz and 800MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations.
Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

*1: Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast can not be predicted theoretically with accuracy.
To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered.If the measured field strength in the location in which the DS-8007 System is used exceeds the applicable RF compliance level above, the DS-8007 System should be observed to verify normal operation.If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the DS-8007 System.

*2: Over the frequency range 150kHz to 80MHz, field strength should be less than 3V/m.

❑Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the DS-8007 System

The customer or the user of the DS-8007 System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DS-8007 System as recommended below, according to the maximum output power of the communications equipment.

Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the DS-8007 System			
Rated Maximum Output Power of Transmitter (W)	Separation Distance according to Frequency of Transmitter (m)		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	80MHz to 800MHz $d = 1.2\sqrt{P}$	800MHz to 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. Note 1: At 80MHz and 800MHz, the separation distance for the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Chapter 1 Installation of the Unit

Chapter 1 Installation of the Unit

Precautions for Installing the Equipment

This section describes the environmental condition to use this equipment.

⚠ CAUTION

- The installation of this equipment should be performed by our service representative or a person who is well acquainted with this equipment.
- Avoid stacking multiple equipments or placing anything on the equipment during operation.
- Install this equipment in a place where power supply cable can be easily disconnected.
- If any abnormality is found on the equipment, immediately turn OFF the power, and disconnect the power supply cable from the outlet.
- Do not soak or immerse the equipment in liquids.

Operating Environment

- The following environmental conditions should be observed when operating the equipment.
  - Surrounding Temperature: 10°C to 40°C/50°F to 104°F
  - Relative Humidity: 30% to 85% (non-condensing)
  - Atmospheric Pressure : 70 kPa to 106 kPa

- This equipment is intended for patient monitoring in NICU, ICU, CCU, surgery, emergency room and ward. Do not use in MRI environment or in a home-care setting.

- The power source should fulfill the following condition.
  - Use a hospital grade outlet (3-pin grounded outlet).
  - Verify power voltage and frequency before connecting to an AC power source.
  - Use the power source that can provide adequate power to the device.
    Refer ☞Operation Manual "Main Unit: DS-8007" P14-1 for power voltage, frequency, and power consumption.

- Pay attention to install or store the equipment in proper location. Do not install or store in the following locations.
  - where chemicals are stored or gas may generate
  - where the equipment will be subject to splashing water or humidity from a nebulizer or vaporizer
  - where the equipment will be subject to direct sunlight
  - where the equipment will be subject to inclination, vibration, or shock.

- Ensure proper ventilation to cool the device.
  - A minimum space of 5 cm is required between the rear side of the monitor and the wall.If the monitor is embedded in a wall or surrounded by a wall, a minimum space of 10 cm is required.

WARNING

- If the equipment is used under an environment not fulfilling the specified condition, not only that the equipment cannot deliver its maximum performance, the equipment may be damaged and safety cannot be ensured.
  If using in an environment other than specified above, contact your nearest service representative.

CAUTION

- Equipotential Grounding
  - When connecting multiple equipments, electrical potential difference may be generated between the equipments. This may result in electric shock to the patient connected to these devices. Pay special attention for use in Operating Room, ICU, CCU, Cardiac Catheter Laboratory, and Cardiovascular X-ray room. To avoid such electrical potential difference, use the ground cable to connect each equipment's potential equalization terminal to the same ground terminal. This is called equipotential grounding.

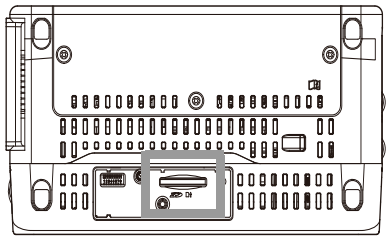
System Construction

This section describes the connection procedure of this equipment.
The following units can be connected to the DS-8007.

- AC Unit (DSA-81)
- DS-8007 Adapter (DSA-82)
- SD Card
- CO_2 Gas Unit (HCP-810/HCP-820)
- Gas Unit I/F (HPD-810/HPD-820)
- BISx I/F Unit (HBX-800)
- Recorder Unit (HR-800)

Inserting the SD Card

1 Remove the maintenance cover on the bottom of the DS-8007, and insert the SD card.



REFERENCE

- Refer to ☞"Formatting the Full Disclosure Waveform Card" P3-5 for instructions on formatting the SD card.

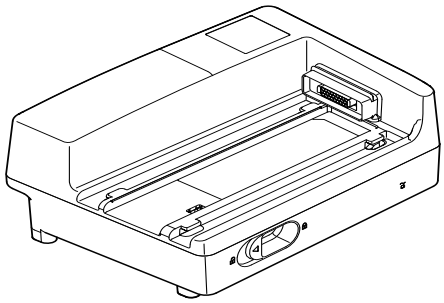
Connecting the AC Unit and CO_2 Gas Unit

⚠ WARNING

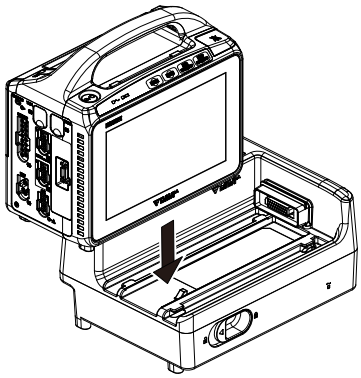
- When lifting this equipment, hold it by the handle or the bottom part of the main unit.
- Turn OFF the power when connecting the option unit.

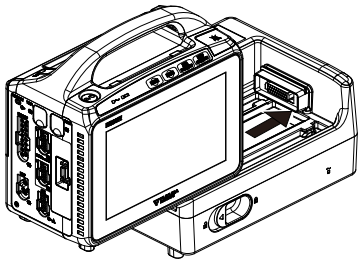
❑AC Unit (DSA-81)

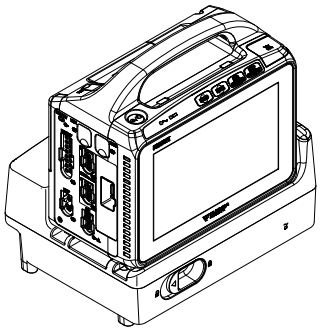
DSA-81



1 Place the AC Unit (DSA-81) on the table, place the DS-8007 on the center of the rail, and slide it along the rail in the arrow direction until it is securely connected



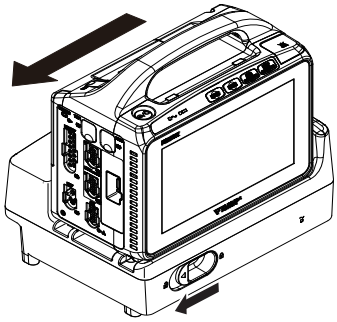




⚠ WARNING

- After connecting the DS-8007, make sure that it is securely installed.
- After connecting the DS-8007, make sure that it is locked. Do not use the equipment unlocked.

2 To remove the DS-8007 from the AC Unit (DSA-81), unlock the lever on the front side of the DSA-81, and slide the DS-8007 to the arrow direction.



❑DS-8007 Adapter (DSA-82)

The preparation to connect the DS-8007 series to the host monitor via DSA-82 is explained below.

⚠ WARNING

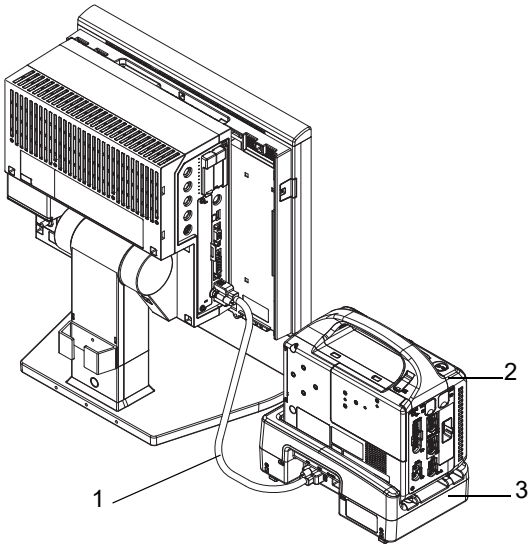
- The power is supplied from the host monitor.
- When the DS-8007 is connected to the host monitor using the DSA-82, a voltage drop may occur depending on the cable connection condition which causes the charging process to temporarily cease or cease before completion.

1 Connect the host monitor and the DSA-82 with module connection cable (CJO-08SSxx).

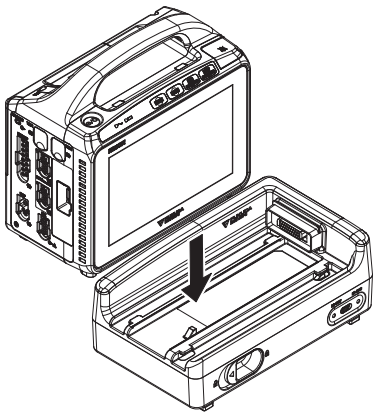
1 CJO-08SSxx

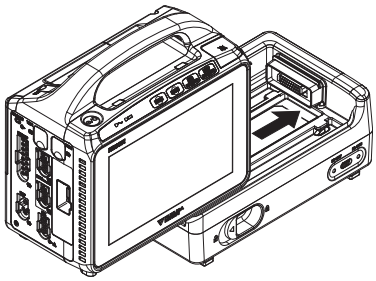
2 DS-8007

3 DSA-82



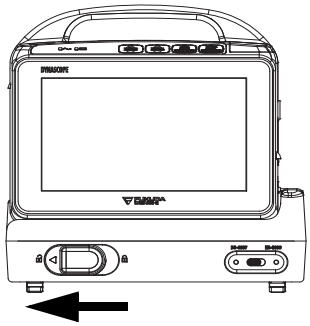
2 Place the DS-8007 on the center of the DSA-82, and slide it along the rail in the arrow direction until it is securely connected.

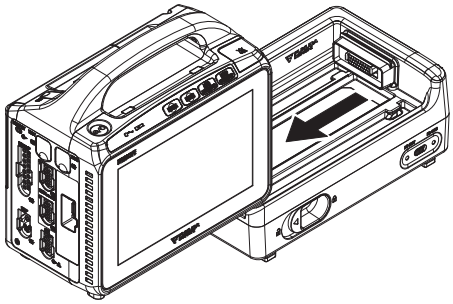




▸ When disconnecting the DS-8007, unlock the release lever, and slide the DS-8007 along the rail in the arrow

direction.



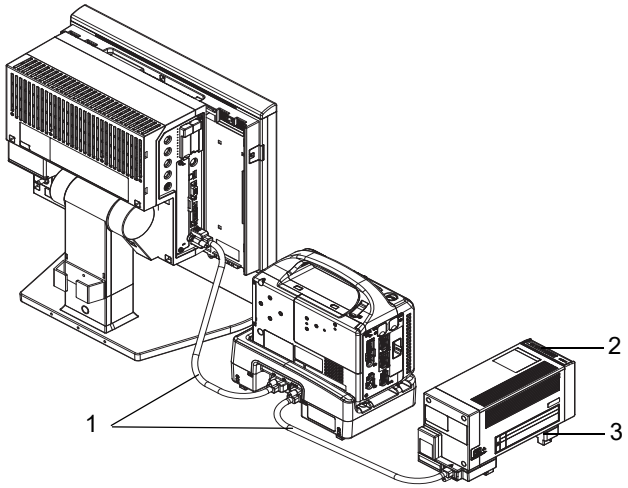


3 By connecting the HS-8000 (HSA-80) to the DS-8007 (DSA-82) using the module connection cable (CJO-08SSxx) , the using unit can be switched.The selection of which unit to use on the host monitor can be made by DS-8007/HS-8000 Switch.

1 CJO-08SSxx

2 HS-8000

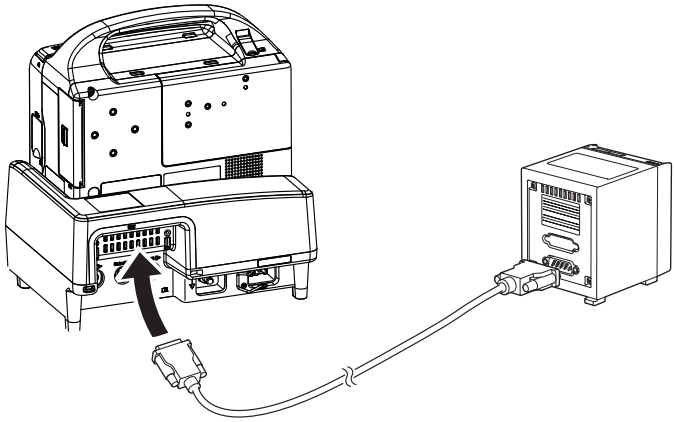
3 HSA-80



Connecting the Recorder Unit (HR-800)

1 Connect the unit connection cable (CJO-09SSxx) on the rear side of the HR-800.

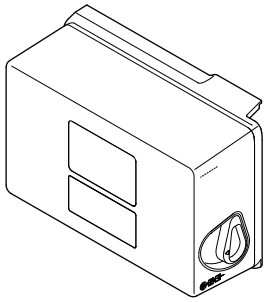
2 Connect the other side of the cable to the U-LINK connector on the AC Unit (DSA-81).



Connecting the HCP-820, HPD-820

Follow the procedure below to attach the CO_2 Gas Unit (HCP-820), Gas Unit I/F (HPD-820).

HCP-820/HPD-820

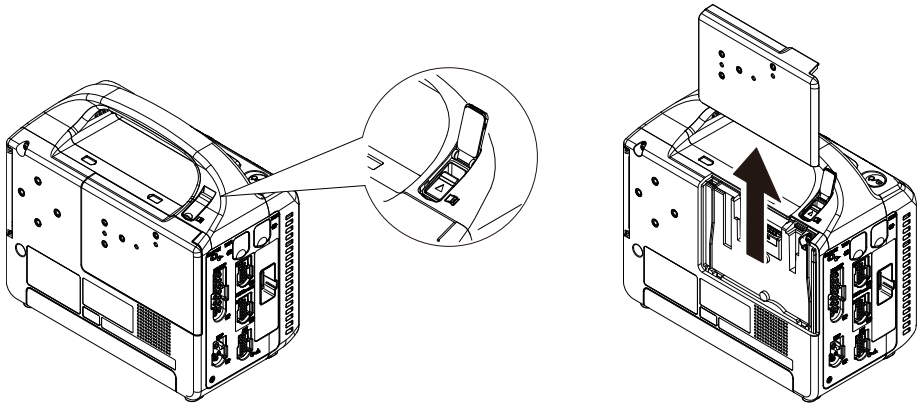


1 Place the DS-8007 main unit upright on a table.

NOTE

- Secure sufficient workspace for installation.

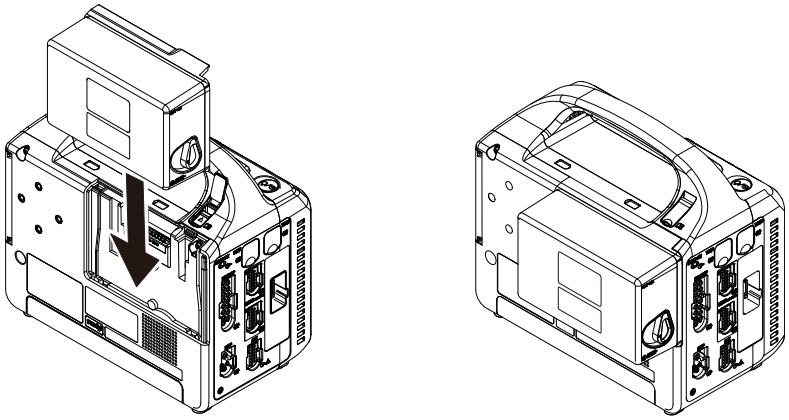
2 Open the button cover located behind the handle on the DS-8007. While sliding the button to the open side, slide the maintenance cover upwards and remove it.



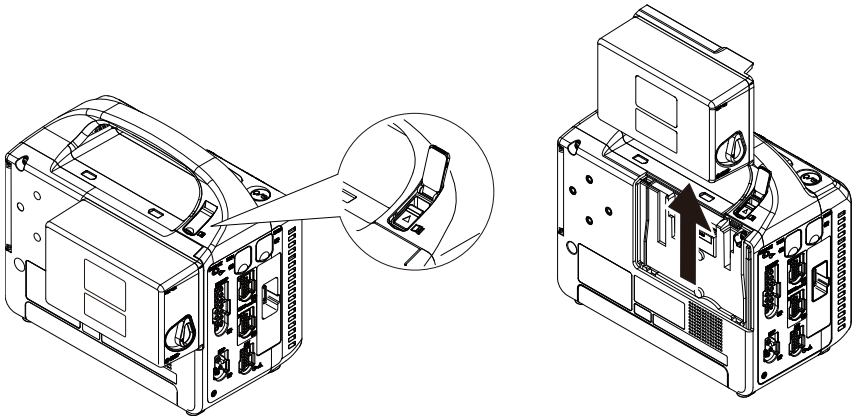
NOTE

- Do not apply excessive force when sliding.

3 Slide the HCP-820/HPD-820 along the rail on the rear side of the main unit until it is firmly connected.



4 To remove the HCP-820/HPD-820, open the button cover located behind the handle on the DS-8007, and while sliding the button to the open side, slide the HCP-820/HPD-820 upwards, and remove it.
Then, attach the maintenance cover which was removed at step 2 by sliding along the rails on the rear side of the main unit.



Connecting the HPD-810, HCP-810, HBX-800

Follow the procedure below to attach the CO_2 Gas Unit (HCP-810), Gas Unit I/F (HPD-810), BISx I/F Unit (HBX-800).
For the attachment procedure, optional AUX Unit Mounting Bracket (OAO-103A) is required.

⚠ WARNING

- When lifting this equipment, hold it by the handle or the bottom part of the main unit.
- When attaching each unit to the main unit, make sure to secure them with screws.

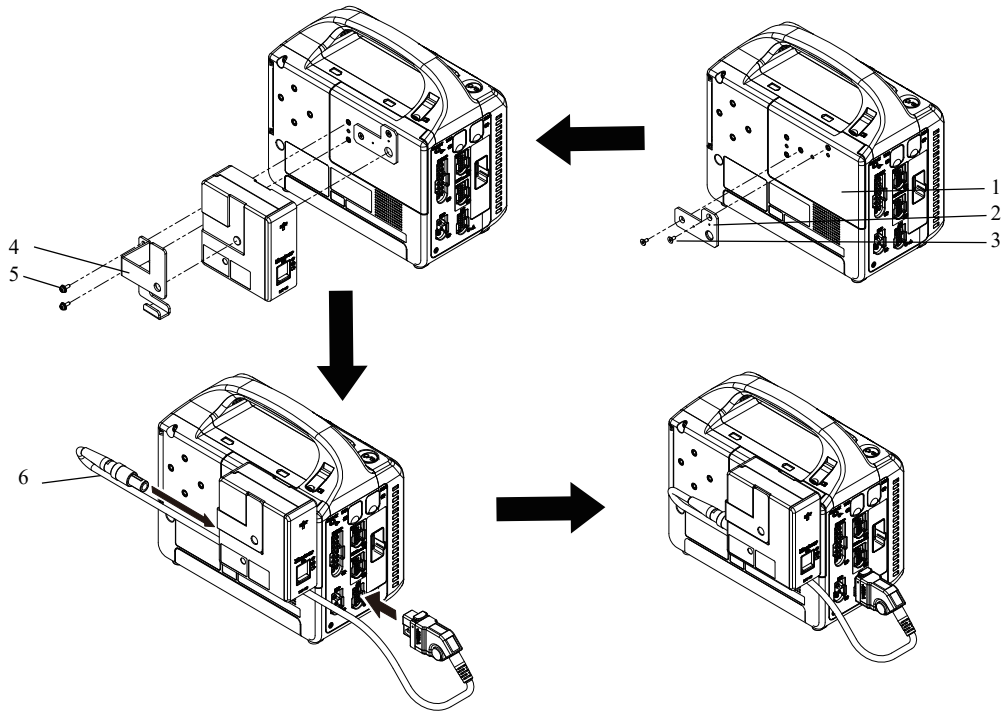
1 Place the DS-8007 main unit upright on a table.

NOTE

- Secure sufficient workspace for installation.

2 Connect the HPD-810, HCP-810, HBX-800 to the DS-8007.

1. Attach the AUX Unit Mounting Plate (B) to the maintenance cover on the rear side of the DS-8007.
2. Attach the HPD-810/HCP-810/HBX-800 to the AUX Unit Mounting Plate (B) using the AUX Unit Mounting Plate (A).
3. Connect the AUX connection cable to the rear side of the HPD-810/HCP-810/HBX-800, and the other side to the AUX connector on the monitor.



1 Maintenance Cover

2 OAO-103A: AUX Unit Mounting Plate (B)

3 Flat-head Screw (M3x6)

4 OAO-103A: AUX Unit Mounting Plate (A)

5 Pan-head Screw (M3x8)

6 AUX Connection Cable (CJO-25TR)

Power Source and Ground Connection

This section explains about the power connection.

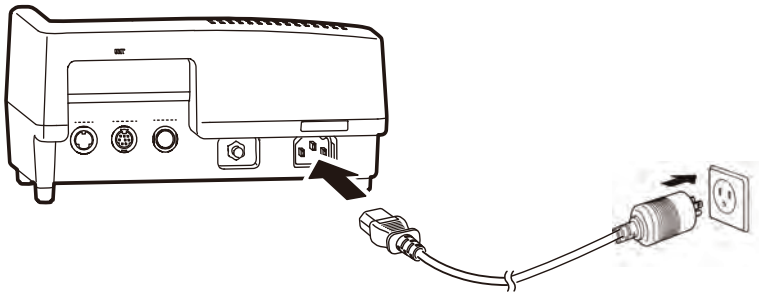
Power Connection of the Main Unit

1 Connect the power cable to the main unit (DS-8007).

1 Connect the power cable (CS-24) to the rear side of the AC Unit (DSA-81).

2 Use the lever to lock the cable retainer clip.

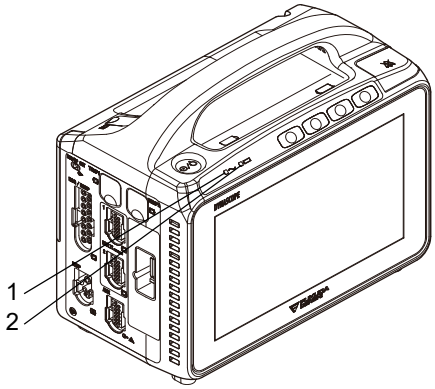
3 Connect the power cable to a hospital grade outlet (3-pin grounded outlet).



To disconnect the power cable, unplug one end from the outlet, and the other end from the rear side of the main unit after releasing the lock lever.

2 Turn ON the standby switch on the main unit.

- AC power will be supplied and the power supply LED on the front side of the main unit will light.



1 Power Supply LED
Green: In normal operation
Orange: Standby Mode
Light Off: During battery operation
(The AC power cable is not connected.)

2 Battery Charging LED
Green: Charging is complete
Orange: Charging is in process
Light Off: During battery operation, or when battery is not installed, or when battery charging is ceased (due to temperature, etc.)
Flash: Battery charging error

NOTE

- If the battery charging LED flashes, battery charging error is occurring. Remove the battery and install it again. If the error persists, contact your nearest service representative.

Equipotential Grounding

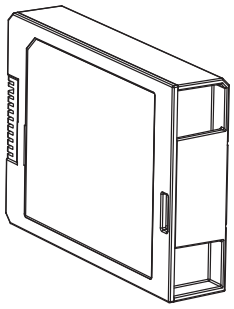
When connecting multiple devices, electrical potential difference may be generated between the devices. This may result in electric shock to the patient connected to these devices.Pay special attention for use in operating room, ICU, CCU, cardiac catheter laboratory, and cardiovascular X-ray room. To avoid such electrical potential difference, use the ground cable to connect each device's potential equalization terminal to the same ground terminal. This is called equipotential grounding.
The ground cable is a connector which can be connected/disconnected manually without using tools.

Installing the Lithium-Ion Battery Pack (BTO-008)

⚠ WARNING

- When lifting this equipment, hold it by the handle or the bottom part of the main unit.
- When replacing the battery while monitoring, make sure to connect the AC Unit to supply

power by the power cable.



1 Place the DS-8007 main unit upright on a table or other stable surface.When replacing the battery while monitoring, connect the AC Unit (DSA-81).

NOTE

- Secure sufficient workspace for installation.

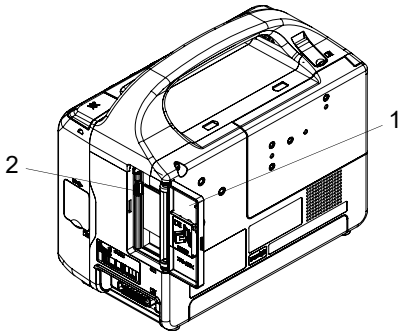
2 Open the battery cover on the DS-8007 main unit. If the battery is already installed, release the battery lock lever and remove the battery.

NOTE

- Hold the battery lock lever when removing the battery.
- Do not apply excessive force when sliding.

1 Battery Cover

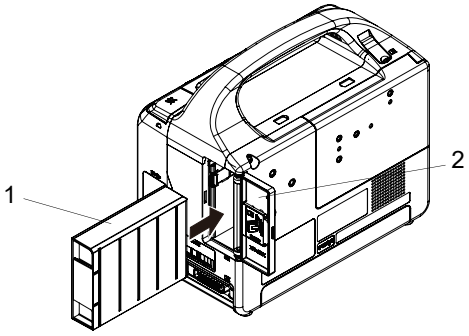
2 Battery Lock Lever



3 Insert the battery to the main unit and close the battery cover. If the battery does not fit properly, make sure that the positive and negative ends are facing correctly.

1 Battery

2 Battery Cover



NOTE

- Make sure to close the battery cover until it is securely locked.

Chapter 2 Network System Construction

Chapter 2 Network System Construction

Wired Network System

In this section, connection and setup procedure for wired network is explained.
A wired network system can be constructed by using the LAN cable. Maximum of 48 beds for the DS-LAN II network, maximum of 100 beds for the DS-LAN III network can be connected. The central monitor corresponded to each wired network is required and the central monitor with the central ID "1" will function as the network administrator.

DS-LAN Connection

⚠ WARNING

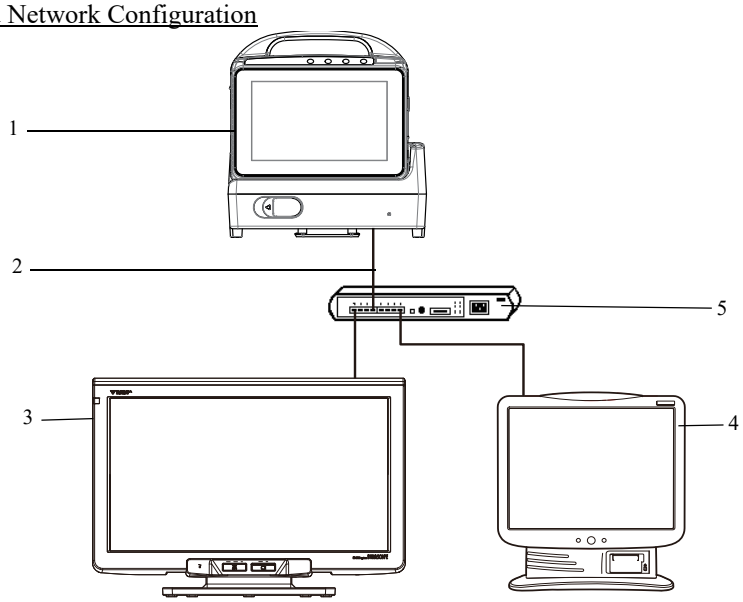
- Do not connect unspecified equipment to the wired network.
- Do not mix devices with DS-LAN II and DS-LAN III setting in the same wired network.The network may cease and proper monitoring may not be possible.

⚠ CAUTION

- On a wired network, the alarm generated on the bedside monitor will be output to the network with a maximum delay of 1 second, and to the central monitor with a total delay of 2.5 seconds.
- When connecting to the DS-LAN network, perform "DS-LAN Setup" under [Initial Settings>System>DS-LAN] and restart the system before connecting the LAN cable.
- Use a repeater HUB for DS-LAN II network and a switching HUB for DS-LAN III network.
- On the DS-8007 system, the Room ID/Bed ID are saved on the AC Unit (DSA-81).
- On the AC Unit (DSA-81), the default setting of Bed ID is "000". If connected to a wired network with the bed ID unchanged, monitoring on the central monitor will not be possible.
- When connecting to a wired network, make sure that there are no other bedside monitors with the same ID. If there is more than one bedside monitor with the same bed ID, the duplicated bedside monitors cannot be monitored on the central monitor.
- When connecting to the DS-LAN II network, set the ID in the range from 001 to 048. When connecting to the DS-LAN III network, set the ID in the range from 001 to 100.
- If the measurement unit of CO_2 concentration is mmHg and [99 mmHg] is selected for "Upper Limit of CO_2 (mmHg) Transmission" under [Initial Settings>System>DS-LAN or Telemeter], the CO_2 value of 100 mmHg or above will be transmitted as 99 mmHg.
- Configure the network as specified by Fukuda Denshi. If the equipment of different network type is connected, malfunction may occur to the whole network system.

By connecting a Ethernet branch cable to the DS-LAN connector on the AC Unit (DSA-81), a wired network system can be constructed.

Example of Wired Network Configuration



1 Bedside Monitor: DS-8007 System

2 Ethernet Branch Cable (CJ-522)

3 DS-8900 System Central Monitor

4 DS-7700 System Central Monitor

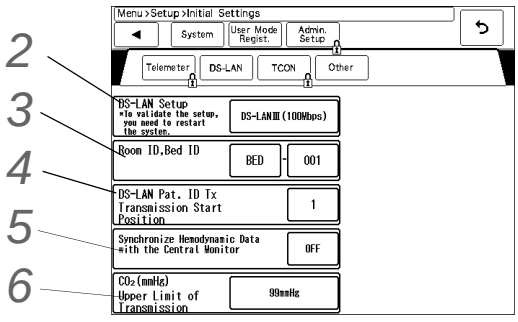
5 HUB

DS-LAN Setup

To connect to the central monitor using a wired network, connect the AC Unit (DSA-81), and perform settings for the DS-LAN and Room/Bed ID.

1 Press the [Menu], [Initial Settings], [System] keys.

▸ The DS-LAN setup screen will be displayed.



2 Set the DS-LAN.

Select the DS-LAN network type.

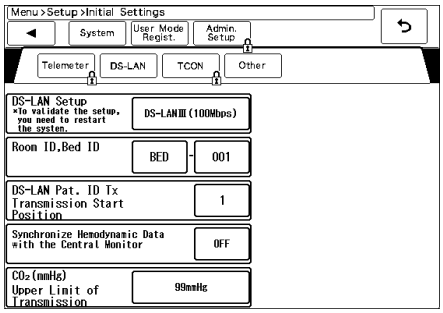
⚠ CAUTION

- When the DS-LAN setup is changed, make sure that the same setting is made on the central monitor. If the setting is different, proper communication cannot be performed. The following central monitors can connect to DS-LAN II network only. When connecting these central monitors, make sure all monitors in the same wired network is set to DS-LAN II. DS-5700, DS-5800N/NX/NX^{MB}, DS-7600/7600W (software version up to V05)

- To validate the DS-LAN setting, it is necessary to restart the system. Make sure to power cycle the system when the setting is changed.

▸ Select from [DS-LANII (10Mbps)]/ [DS-LANIII (100Mbps)].

3 Set the Room ID/Bed ID.



⚠ CAUTION

- When connected to the wired network, make sure that there are no other bedside monitors with the same Bed ID. If the Bed ID is duplicated, monitoring on the central monitor is not possible.
- When connecting to the DS-LAN II network, set the ID in the range from 001 to 048. When connecting to the DS-LAN III network, set the ID in the range from 001 to 100.

NOTE

- When connecting to a wired network, set the Room ID/Bed ID.
- The set Room ID/Bed ID will be saved on the AC Unit (DSA-81) even after the main power is turned OFF.The settings may change if the AC Unit is replaced.

▸ Enter the Room ID using the alphanumeric keys, and press the [Regist] key.
The entered ID will be displayed on the upper left of the screen.

▸ Press the entering area for "Bed ID", and enter the ID using the numeric keys.
To display the keys for Room ID again, press the entering area for "Room ID".

▸ Press the [Regist] key. The entered ID will be displayed on the upper left of the screen.

4 Set the "DS-LAN Pat. ID Transmission Start Position".

On the DS-8007 System, patient ID of up to 20 digits can be set, but only 10 digits can be transmitted on a DS-LAN II network. This setup will set the starting digit from the 20 digits to be transmitted on the DS-LAN II network.

On the DS-LAN III network, if [Central] is selected for the printer and printing is started on the bedside monitor, the central monitor printer can print only up to 10 digits.This setup allows to set the starting digit of the 10 digits to be transmitted.The 10 digits restriction is only for printing, and all 20 digits can be transmitted on the DS-LAN III network.

▸ Enter the starting position in the range from 1 to 20.

5 Set the "Synchronize Hemodynamic Data with the Central Monitor".(Enabled when the DS-5700 is connected.)

▸ [ON]: 5 latest hemodynamic data will be synchronized between this monitor and the central monitor. Other hemodynamic data will be deleted.
When the hemodynamic data is edited on this monitor, the result will be also reflected on the central monitor, and vice versa.

- [OFF]: 5 latest data will be transmitted to the central monitor, but the data will not be synchronized between this monitor and the central monitor. The hemodynamic data edited on the central monitor will be deleted. The hemodynamic data edited on this monitor will be transmitted to the central monitor.

6 Set the "CO_2(mmHg) Upper Limit of Transmission".

If the CO_2 measurement unit is "mmHg", and the CO_2 value is 100 mmHg or above, whether or not to limit the value for transmission to the central monitor can be set.

- [No limit]: Actual CO_2 value will be transmitted to the central monitor even if the value is 100 mmHg or above.
- [99mmHg]: 99 mmHg will be transmitted as the CO_2 value if the value is 100 mmHg or above.

7 Press the [Menu], [Initial Settings], [System], [Other] keys, and set the "Search Patient ID". (☞"System Setup" P5-22)

- [Enable]: Patient data can be searched on the patient data server using the patient ID. (☞Operation Manual "Entering Patient Information from the Patient Data Server (When DS-LANIII, TCON is used)" P5-4)
- [Disable]: Patient data will not be searched on the patient data server.

Precautions about the DS-LAN

⚠ CAUTION

- Precautions Common for the DS-LAN II/DS-LAN III Network
  - If the "RR/APNEA Alarm Source" setting is other than [Impedance] (or, if [Auto] selects a setting other than [Impedance]), the RESP waveform will not be transmitted on a wired network.
  - If the "RR Alarm/APNEA Source" setting is other than [CO_2] (Or, if [Auto] selects a setting other than [CO_2]), the CO_2 waveform will not be transmitted on a wired network.
  - For the numeric data displayed as "xxx", maximum or minimum value of measurable range will be transmitted.
  - The numeric data displayed as "--- " will be treated as not measured data.
  - If the measurement unit of CO_2 concentration is mmHg and [99 mmHg] is selected for "Upper Limit of CO_2 (mmHg) Transmission" under [Initial Settings>System>DS-LAN or Telemeter), the CO_2 value of 100 mmHg or above will be transmitted as 99 mmHg.
  - As this monitor do not have the arrhythmia template display and 12-lead ST display function, these display on the central monitor will not be corresponded.
  - When connected to a wired network, the time/date will synchronize with the central monitor. In this case, the time/date cannot be changed on this monitor.
  - On the central monitor, the respiration waveform and RR value based on the "RR/APNEA Alarm Source" selected on this monitor will be displayed. The same parameter for the RR and apnea will be monitored on this monitor and the central monitor. However, the DS-7000 series central monitors do not support RR_SpO_2 measurement, and if RR/APNEA source is set to [SpO_2], RR value and APNEA condition will not be displayed.
  - The alarms that can be notified to the central monitor depend on the model type and software version of the central monitor. For details, refer to the operation manual of the central monitor.

⚠ CAUTION

- Precautions about the DS-LAN II Network
  - The BP measurement unit should be set to "mmHg".
  - The data cannot be output to the AU-5500N.
  - When the BP measurement unit is "kPa", BP waveform, BP numeric data, NIBP numeric data, NIBP list will not be transmitted. It will be treated as not measured data, and will not be displayed on the central monitor. Also, the alarm limit setup from the central monitor cannot be performed.
  - The following arrhythmia alarms cannot be transmitted.
    TACHY, BRADY, COUPLET, PAUSE, TRIGEMINY, TRIPLET, EXT TACHY, EXT BRADY, R on T, MULTIFORM, VENT RHYTHM, SVT, IRREGULAR RR, PROLONGED RR, S FREQUENT, S COUPLET, VPC, SVPC, PACER NOT CAPTURE, PACE NOT PACING
  - Arrhythmia alarm of "Slow_VT" will be transmitted as "VT" .
  - On a wired network, waveform, numeric data, and alarm of TEMP3 to 6 will not be transmitted. Also, the displayable waveform, numeric data, alarm differs depending on the connected central monitor. Refer also to the operation manual for the respective central monitor.
  - The numeric data and alarm of PR_IBP will not be transmitted to the central monitor. Even if the PR_IBP alarm is generated on the DS-8007, this alarm will not be generated on the central monitor.
  - When the DS-5800N/NX/NX^{MB} is used as a central monitor, recall, graphic trend, and tabular trend will not be displayed, and Σ recording cannot be performed. For the ST display, overlap waveform will not be displayed on the DS-5800N/NX/NX^{MB} until 15 minutes have passed since the reference waveform is set on this monitor.
  - When connected to the DS-LAN II network, data uploading for the MPDR function is not possible.
  - The ST display on the central monitor will be distorted when the ECG lead (ECG1 or ECG 2) is changed on this monitor. Redrawing the ST display will return the display to normal.

NOTE

- If the numeric data is displayed as "xxx" (out of measurement range) on this monitor, maximum or minimum value of measurable range will be transmitted to the central monitor.

	Value Outside the Measurement Range	Central Monitor Display
HR	301 bpm and above	300 bpm
Respiration Rate	151 Bpm and above	150 Bpm
Respiration Rate (RR_SpO_2)	41 Bpm and above	40 Bpm
Blood Pressure	–51 mmHg and below 301 mmHg and above	-50 mmHg 300 mmHg
Temperature	-0.1°C/31.8°F and below 45.1°C/113.2°F and above	0°C/32.0°F 45.0°C/113.0°F
Pulse Rate (Masimo Unit)	240 bpm and above 25 bpm and below	239 bpm 26bpm
Pulse Rate (Nellcor Unit)	251 bpm and above	300 bpm

Wireless Network

In this section, connection and setup procedure for wireless network is explained.
By constructing a wireless network using the optional telemetry unit, the data on this monitor can be transmitted to the central monitor.

WARNING

- On a wireless network, the alarm generated on the bedside monitor will be output to the network with a maximum delay of 2 seconds, and to the central monitor with a total delay of 3 seconds to 12 seconds.
- Some type of wireless combinations may generate interference with other telemetry.
- Before selecting a channel, verify it will not interfere with other channels.
- Make sure the telemetry manager of your system is aware of any changes to the telemetry channels.
- If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference.

Example of Wireless Network Construction

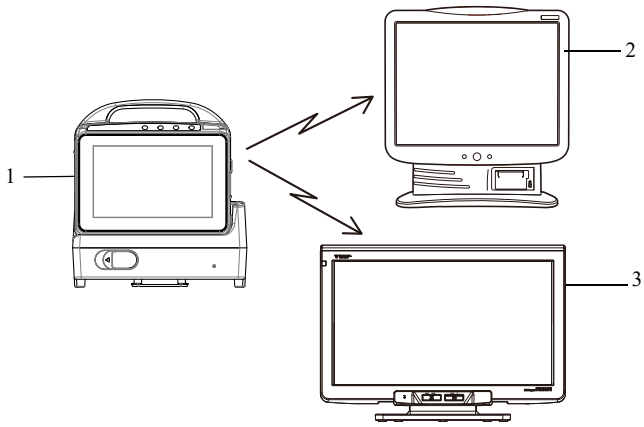
CAUTION

- The setup of channel ID and group ID should be performed only by our service representative. Users should not perform this procedure as malfunction may occur.

1 Bedside Monitor
DS-8007 System with HLX-801

2 Central Monitor
DS-7700 system

3 Central Monitor
DS-8900 system with LW Receiver



Channel ID and Telemetry Wave Setup

In this section, channel ID and telemetry wave setup when using the telemeter is explained.
Once the transmitting channel ID and group ID are set, these will be retained even after the main power is turned OFF.

WARNING

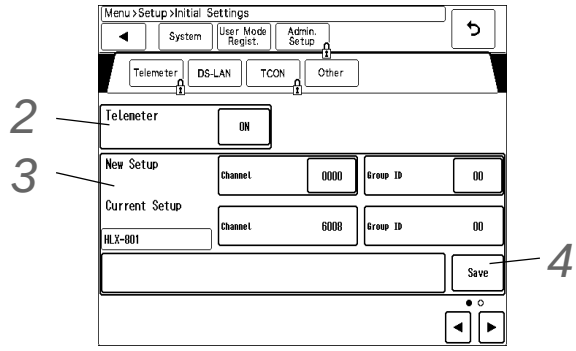
- A password can be set to restrict access to the channel ID setup menu so that only the telemetry channel administrator can change the channel ID.
- Some type of wireless combinations may generate interference with other telemetry.
- Before selecting the wireless channel, verify it does not cause interference.

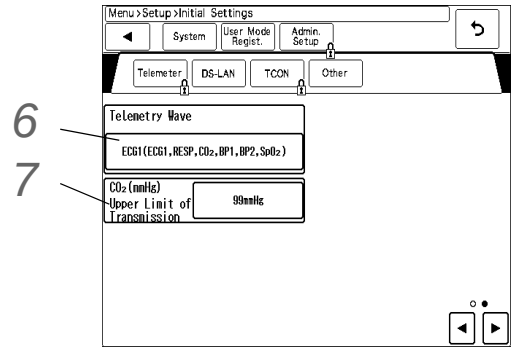
- Inform the supervisor of the use of telemetry channels to avoid interference with other telemetry.
- If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference.

NOTE

- To change the setting, enter the password.
  (☞"Administrator Setup" P5-2)

1 Press the [Menu], [Initial Settings], [System], [Telemeter] keys to display the telemeter setup menu.

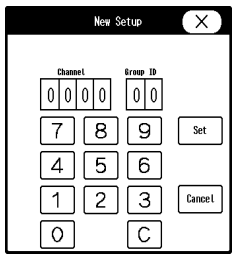




2 Perform setup for the telemetry transmission.

- [ON]: Telemetry transmission will be performed.
- [OFF]: Telemetry transmission will not be performed. In this case, channel ID will not be displayed on the home display.

3 Set the channel ID and group ID.

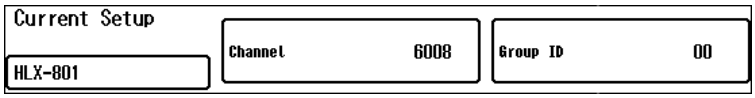


1. Press the key for "Channel" or "Group ID", and display the numeric keypad.
2. Enter the 4-digit medical telemetry channel ID, and the group ID in the range of 00 to 63.
3. Press the [Set] key.

4 Press the [Save] key to save the channel ID and group ID.

- The channel ID and group ID will be saved.
- <Complete> will be displayed.
- The set channel ID will be displayed on the upper left of the home display.
- If an error is found on the password, channel ID, or group ID, <Invalid Data> message will be displayed. (Ex. The entered channel ID or group ID is outside the allowable range.)
  Enter the ID within the range and press the [Save] key.

5 Check the stored channel ID and group ID.



NOTE

- If the numeric data is displayed as "xxx" (out of measurement range) on this monitor, maximum or minimum value of measurable range will be transmitted to the central monitor.

	Value Outside the Measurement Range	Central Monitor Display
HR	301 bpm and above	Calculated on the central monitor based on ECG waveform.
Respiration Rate	151 Bpm and above	150 Bpm In case of impedance respiration, it is calculated on the central monitor.
Respiration Rate (RR_SpO_2)	41 Bpm	40 Bpm
Blood Pressure	–51 mmHg and below	-50 mmHg
	301 mmHg and above	300 mmHg
TEMP	-0.1°C/31.8°F and below	0°C/32.0°F
	45.1°C/113.2°F and above	45.0°C/113.0°F
PR (Masimo Unit)	240 bpm and above 25 bpm and below	239 bpm 26 bpm
PR (Nellcor Unit)	251 bpm and above	254 bpm

- If RR alarm/APNEA source is set to [SpO_2], RR value and APNEA condition will not be displayed on the central monitors which do not support RR_SpO_2 measurement.

6 Select the telemetry wave.

- [ECG1]: ECG1, RESP, CO_2, BP1, BP2, SpO_2 will be transmitted.
- [ECG2]: ECG1, ECG2, RESP/CO_2, BP1, SpO_2 will be transmitted.Either one of CO_2 or RESP waveform will be transmitted depending on the APNEA source setting.

7 Set the "CO_2(mmHg) Upper Limit of Transmission".
(☞"DS-LAN Setup" P2-2)

⚠ CAUTION

- When the BP measurement unit is kPa, the corresponding waveform and numeric data will not be transmitted. When using the wireless network, the BP measurement unit should be set to "mmHg".
- The BP waveform with a scale above the set scale cannot be properly transmitted. When transmitting the BP waveform, pay attention to the displayed BP scale.
- If the measurement unit of CO_2 concentration is mmHg and [99 mmHg] is selected for "Upper Limit of CO_2 (mmHg) Transmission" under [Initial Settings>System>DS-LAN or Telemeter), the CO_2 value of 100 mmHg or above will be transmitted as 99 mmHg.

- When using the Nellcor Unit, the PR value of 251 bpm or above will be transmitted to the central monitor as 254 bpm.

REFERENCE

- The waveform not displayed on the home display cannot be transmitted.

TCON Network

This section explains the connection and setup procedure of the TCON function using the Bidirectional Wireless Communication Module (HTC-702 (FA)).
There are following features for the TCON network.

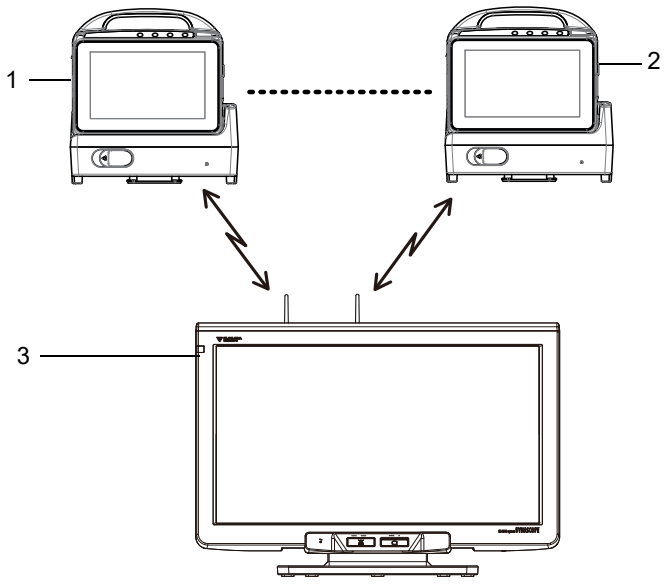
- The measured data on this equipment can be sent to the central monitor.
- Alarm settings can be synchronized.
- The NIBP measurement can be started from the central monitor.
- The patient information and time/date can be synchronized with the central monitor.

Example of TCON Network Configuration

This section describes the configuration example of the bedside monitor and the central monitor using the TCON network.
Unlike medical telemetry, the TCON network does not require floor antenna.

❑Configuration Example of Medical Telemetry and TCON

The group of central monitors and bedside monitors communicating with the same channel is referred to as "TCON group". The same channel must be set for the monitors within the same TCON group.



1 Bedside Monitor: DS-8007 System
TCON ID : 1
Channel: 9

09-01

2 Bedside Monitor: DS-8007 System
TCON ID : 16
Channel: 9

09-16

3 Central Monitor: DS-8900 System with LW Receiver, etc.
TCON ID : C1
Channel: 9

TCON1:09

CAUTION

- Make sure that three antenna bar marks ( ) are displayed.
- Make sure that the TCON channels of the bedside monitor and the central monitor within the same TCON group are the same.
- When using the TCON network, do not move the equipment. The radio waves may not be transmitted.
- On the DS-8007 system, the TCON ID/Channel settings are saved on the AC Unit (DSA-81).
- There are following restrictions when connecting this system to the TCON network.
  - The NIBP interval measurement less than 5 minutes, 1-minute or continuous measurement cannot be started from the central monitor. However, the measurement can be stopped from the central monitor.
  - If the measurement unit of CO_2 concentration is mmHg, the CO_2 value of 100 mmHg or above will be transmitted as 99 mmHg.
  - The setting items which are not supported on the TCON Base Station (C1) cannot be synchronized even if they are supported on the TCON Remote Station (C2).
  - Depending on the model type and software version of the TCON bed, the upper limit of the apnea alarm that can be set on central monitor is either 20 seconds or 60 seconds. For details of the software version, refer to your nearest service representative.

Serial Communication Setup

To use the TCON function, the serial communication setup needs to be performed.

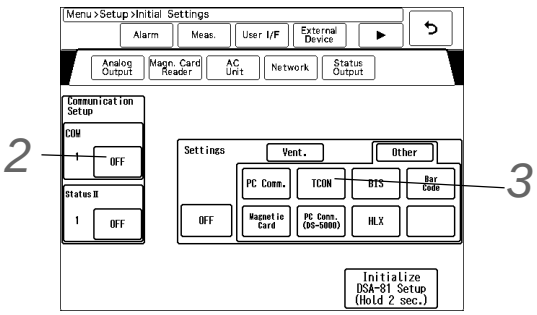
1 Press the [Menu], [Initial Settings], [External Device], [AC Unit] keys.

▸ The AC Unit setup menu will be displayed.

2 Press the key for "COM".

▸ The setup mode will change to COM.

3 Select [Other], and press the [TCON] key.



TCON ID/Channel Number Setup

To connect to the TCON network, it is necessary to set the TCON ID and TCON channel. The set TCON ID and TCON channel will be saved on the AC Unit (DSA-81) even after the main power is turned OFF.

CAUTION

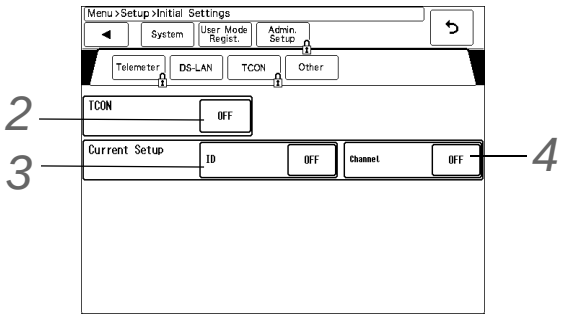
- The TCON setting will be performed by our service representative. Users should not perform this procedure as malfunction may occur.

NOTE

- To change the setting, enter the password.
  (☞"Administrator Setup" P5-2)

1 Press the [Menu], [Initial Settings], [System], [TCON] keys.

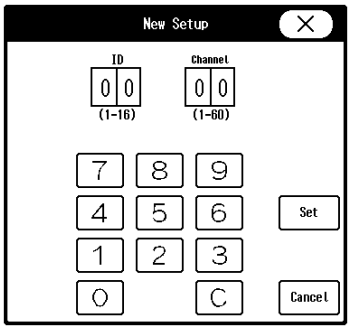
- The TCON setup menu will be displayed.



2 Select ON/OFF of TCON communication.

- [ON]: The bidirectional wireless communication will start and the TCON mark will be displayed.
- [OFF]: The bidirectional wireless communication will cease.

3 Set the TCON group ID and channel.



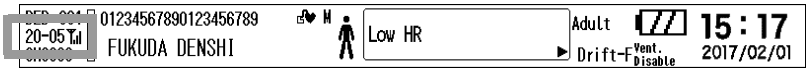
NOTE

- TCON ID is set to distinguish the bedside monitors in the same TCON group. Make sure not to set the same TCON ID to the bedside monitors in the same TCON group. (☞"Example of TCON Network Configuration" P2-9)
- Make sure to set the same TCON channel number in the same TCON group. Otherwise, communication failure or interference with other TCON group may occur. The same TCON channel number should be set in the same TCON group. (☞"Example of TCON Network Configuration" P2-9)

- Select the ID from [1] to [16].
- Select the channel number from [1] to [60].

REFERENCE

- If the reception is proper, three antenna bar marks will be displayed as shown below and TCON channel number and TCON ID will be also displayed next to the bar marks.



1 TCON Channel Number
The same channel number (group number) with the central monitor will be displayed. If the numbers are different, check the setting. The TCON channel number (group number) will not be displayed unless communication with the corresponding central monitor is established. In such case, check the TCON settings of the bedside monitor and the central monitor.

2 TCON ID
The set TCON ID will be displayed.

3 Antenna Mark
The TCON antenna marks show the strength of the signal reception (electric field strength) in the same way as on a cell phone.

	(Green):	The electrical field strength is sufficient and communication errors rarely occur.
	(Green):	The electrical field strength is sufficient, but exogenous noise may cause communication errors.
	(Yellow):	The reception is available, but communication errors may occur frequently.
	(Red):	The communication is not possible.

4 Press the [Home] key.

NOTE

- When the <TCON Check Reception> is displayed, the communication with the central monitor is not established. In such case, check if proper TCON setting is made on the bedside monitor and the central monitor, and repeat the setup procedure from step 1 to 4.
- When the <TCON Interference> is displayed, other equipments transmitting the same radio wave may exist nearby, or other bedside monitor with the same TCON ID may exist. Check the setting.
- If a patient data server is connected to the system, patient information (name, age, etc.) can be searched from the patient ID and can be automatically entered. To use the patient ID search function, select [Enable] for "Search ID" under [Menu>Initial Settings>System>Other].
- The TCON setting is saved on the AC Unit. If the AC Unit is changed, the TCON settings will changed to the settings saved on the connected AC Unit. (☞"Example of TCON Network Configuration" P2-9)

Chapter 3 Using the External Media

Chapter 3 Using the External Media

By using the USB memory or SD card, setup data can be transferred between the patient monitors. The screen shot of the home display can be saved on the USB memory by pressing the [Print] key. The saved data on the USB memory can be viewed/printed on the PC.

By using the optional SD card (FSD-8GA: 8GB, SD-16G: 16GB), full disclosure waveform data can be saved. Also, by using the "Transfer Full Disclosure Waveform Card" function, the patient data and setup data can be transferred to other DS-8007 using the SD card.

Inserting the USB Memory/SD Card

1 Insert the USB memory to the USB slot.
Or, insert the specified SD card into the SD card slot.

NOTE

- Make sure to use the USB memory formatted on the PC. (FAT32)

❑SD Card Message

When the SD card is inserted, a message may be displayed.

Message	Operation
This card is not for review data transfer. Format the card.	If the full disclosure waveform card used on other DS-8007 is inserted to this unit, this message will be displayed. To erase the full disclosure waveform data of other unit, and to use as full disclosure waveform card on this unit, press the [Yes] key. If [No] is selected, the card can be used only for data transfer on this unit.
This card is for review data transfer. Do you want to use this card?	If "Transfer Full Disclosure Waveform Card" process for the SD card has been performed on other unit, and inserted to this unit, this message will be displayed. If [Yes] is selected, the patient data and setup data of other unit will be overwritten to that of this unit, and the SD card will function as full disclosure waveform card on this unit. If [No] is selected, the card can be used only for data transfer on this unit.
SD card is inserted. Format the card.	If the card not formatted on the DS-8007 is inserted, this message will be displayed. If [Yes] is selected, the card will be formatted to be used as full disclosure waveform card. If [No] is selected, the card can be used only for data transfer on this unit.

Data Backup/Copy Using the USB Memory/SD Card

This section explains about the backup and copy procedure of the setup data using the USB memory/SD card.

Setting all the monitors in the same ward to the same alarm settings and display configuration may take large amount of time. This process can be simplified by performing the setup on one monitor, and copying the data to other monitors using the USB memory/SD card.

⚠ CAUTION

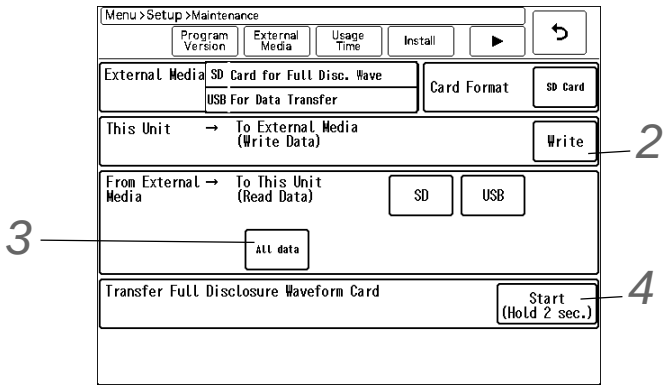
- Make sure to use the specified SD card.
- If unspecified SD card is inserted, the full disclosure waveform data cannot be saved.
- To backup/copy the data, use the media with capacity of 512 MB or more.

REFERENCE

- For details of the data which can be backed up, refer to "Data that can be Backed Up/ Copied".

1 Press the [Menu], [Detail Setup], [Maintenance], [External Media] keys.

▸ For details of the displayed messages, refer to "Displayed Messages on the External Media Menu".



2 Write the data to the card.

(Backup)

1 Make sure that the USB memory/SD card is inserted.

2 Press the [Write] key. On the displayed window, select the media and press the [Start] key.
However, full disclosure waveform data cannot be saved.

3 Read the data from the USB memory/SD card. (Copy)

1 Make sure that the USB memory/SD card is inserted.

2 Select the media from [SD] or [USB].

3 Press the [All Data] key.

▸ The setup data will be read.

4 Press the [Yes] key if OK to read the data from the USB memory/SD card.
However, full disclosure waveform data cannot be read.

⚠ CAUTION

- During access to the USB memory/SD card, all keys will become inoperative until the process is complete.
- The trend data and recall data during access to the SD card will not be saved on the SD card as updating of the data base is suspended during the access.
- Make sure to power cycle the system after the setup data is read from the USB memory/ SD card. By power cycling the system, the read data will become effective.

NOTE

- If read/write is incorrectly selected, the data on the USB memory/SD card may be unintentionally overwritten with the data on the patient monitor. Make sure to check that the selection is correct before pressing the [Yes] key.
- When the data reading procedure is complete, the display will return to the home display.

- When the backup/copy process is complete, and the data is no longer necessary, format the card to erase the data.

4 Prepare the full disclosure waveform card for data transfer.

This function can be used to transfer the patient data, setup data, full disclosure waveform data to other DS-8007.

1 Make sure that the SD card is inserted in the slot.

2 Press and hold the [Start] key.

3 When the process completes, remove the SD card.

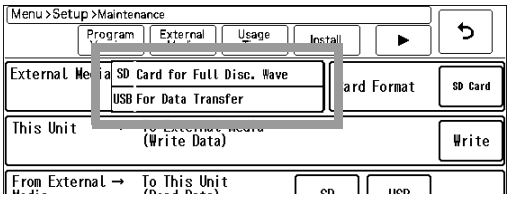
4 Press the [Yes] key if OK to read the data from the USB memory/SD card.
With this process, the patient data, setup data, full disclosure waveform data can be transferred.

⚠ CAUTION

- While copying the data, do not disconnect the DSA-81. It may damage the setup data.
- To copy the setup data saved on the AC Unit (DSA-81), connect the AC Unit (DSA-81) to the DS-8007 before copying the data.
- If not copying the setup data saved on the AC Unit (DSA-81), disconnect the AC Unit (DSA-81) from the DS-8007 before copying the data.
- Make sure to power cycle the system after the data is read from the SD card. By power cycling the system, the read data will become effective.

❑Displayed Messages on the External Media Menu

For "External Media", the following messages will be displayed depending on the external media status.



Message	Description
Full Disclosure Waveform Card	The card is formatted on the used DS-8007.
Full Disc. Wave Card (Other Unit)	The card is formatted on other DS-8007.
Format the card.	The card is not formatted on the DS-8007.
There is no media.	The media is not inserted.
For data transfer	USB memory or unspecified SD card

❑Data that can be Backed Up/Copied

The setup data such as monitoring condition, alarm setting, and patient data such as graphic trend and tabular trend can be backed up/copied.
*Backup: By selecting [Write], setup data and patient data will be both backed up.
*Copy: By selecting [All Data], only the setup data saved on the SD card or USB memory will be copied to the patient monitor.

NOTE

- Selecting [All Data] will not copy the patient data.To transfer the patient data, use the "Transfer Full Disclosure Waveform Card" function.
- While the data is being backed up or copied, full disclosure waveform data will not be saved.

- On the USB memory, full disclosure waveform data cannot be saved.

Setup Data

Data		Description
Parameter Setup		Stores the monitoring condition (size, lead, etc.) for all the monitoring parameters.
Alarm		Stores the alarm threshold level.
Setup Data	Basic Setup	Stores the current setup.
	Alarm	Stores the alarm ON/OFF and alarm limit settings.
	Parameter Setup	Stores the monitoring condition (size, lead, etc.) for the parameter.
	Data Review/Waveform Review/ Calculation	Stores the settings for each review data.
	Initial Settings	Stores the current setup.

Patient Data

Data	Description
Patient Information	Stores the patient information such as name, ID, age, sex, pacemaker usage, patient classification.
Graphic Trend Data	Stores 24 hours of graphic trend data.
Tabular Trend Data	Stores 24 hours of tabular trend data.
Recall	Stores 300 recall data.(10 data if SD card is not used.)
Hemodynamic Data	Stores 10 measurement data.(5 data if SD card is not used.)
Lung Function Data	Stores 256 measurement data.(5 data if SD card is not used.)

The following items will not be backed up/copied.

- Setup Data
  - Time/Date
  - Telemeter Setup
    (The settings are saved in the connected telemetry transmitter module.)
- Patient Data
  - OCRG Data
  - CO Measurement Result

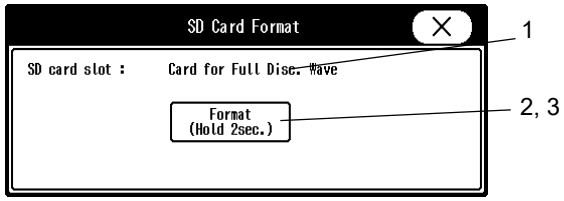
Formatting the Full Disclosure Waveform Card

In this section, formatting of SD card to be used for storing the full disclosure waveform is explained.
By formatting the specified card for full disclosure waveform, the card can be used for storing the full disclosure waveform data. By inserting the formatted card to the card slot, storing of the full disclosure waveform data will automatically start, and reviewing of the full disclosure waveform will become possible.

⚠ CAUTION

- The full disclosure waveform card formatted on other bedside monitors and central monitors cannot be used on this equipment.
- The full disclosure waveform card formatted on this equipment cannot be used on other bedside monitors and central monitors.
- While saving the full disclosure waveform to the card, avoid removing/inserting the card beyond necessity.
- It will take about 3 minutes to format the full disclosure waveform card. Do not format the card during monitoring as all operation will not be possible during the format process.
- During the format process, do not turn OFF the power, or enter into standby condition, or remove the card. It may damage the card.
- After formatting the full disclosure waveform card, the graphic/tabular trend data before 25 hours will be deleted.

1 On the [Menu>Setup>Maintenance>External Media] display, press the [SD Card] key for "Card Format".



NOTE

- The card for data transfer cannot be formatted.

2 Format the full disclosure waveform card.

1. Make sure that the card is inserted, and that the card is unformatted, or is for the full disclosure waveform data.
2. Press the [Format (Hold 2 sec.)] key for 2 seconds.
3. Wait until the format completes.
   The format process will take about 3 minutes. During the process, do not remove the SD card or turn OFF the power.
4. When the format process is completed, the "SD Card Format" window will close and storing of the full disclosure waveform will automatically start.

The storage duration of full disclosure waveform data depends on the SD card capacity.

SD Card Capacity	Storage Duration
8 GByte	120 hours
16 GByte	240 hours

Chapter 4 Connection to the External Devices

Chapter 4 Connection to the External Devices

Ventilator Alarm Input

Ventilator can be connected to the DS-8007 System using the Status II connector.
By connecting a ventilator, ventilator alarm monitoring can be centralized on the patient monitor.
Also, ventilator alarm can be notified to the central monitor via wireless, wired, and TCON network.
This section describes the procedure to connect the DS-8007 System and ventilator for monitoring the ventilator alarm.

Ventilator	Connection Cable
	For Status II Connector
Servo Ventilator 300/300A	CJ-401RI-70SV3 (x1)
Servo Ventilator SERVO-i/SERVO-s/SERVO-U/SERVO-n/SERVO-air	CJ-402RI-70SVi (x1)
PURITAN-BENNETT Ventilator 740/760	CJ-403RI-70PB (x1)
PURITAN-BENNETT Ventilator 840	CJ-403RI-70PB (x1)
Drager Medical Ventilator Evita 2dura/Evita 4/Evita XL	CJ-402RI-70SVi (x1)
VELIA/ASTRAL	CJO-23DR2
VS ULTRA	CJO-24DR2

When connecting a ventilator, check the corresponding software version of the ventilator.

Ventilator	Corresponding Software Version
Servo Ventilator 300/300A	Not specified
Servo Ventilator SERVO-i	v1.5 / v2.0 / v3.0
Servo Ventilator SERVO-s	v2.0 / v3.0
Servo Ventilator SERVO-U/SERVO-n/SERVO-air	v1.0
PB740	M
PB760	H
PB840	K
Evita 2 dura	04.14
Evita 4	04.14
Evita XL	05.10
VELIA/ASTRAL	Not specified
VS ULTRA	Not specified

⚠ WARNING

- If the DS-8007 System does not generate an alarm even though the ventilator is generating an alarm, or if any other malfunction occurs, immediately check the ventilator, this equipment, cable, and replace the cable if necessary.
- The alarm generation on this system is not guaranteed if the alarm other than the following generates at the ventilator.

♦SV-300:
airway pressure upper limit alarm, high continuous pressure alarm, O_2 concentration lower limit alarm, expiratory minute volume upper/lower limit alarm, apnea alarm, gas supply alarm, air supply alarm, O_2 supply alarm, battery alarm, limited battery alarm, no battery alarm, overrange alarm

♦SERVO-i:
airway pressure upper limit alarm, high continuous pressure alarm, O_2 concentration lower limit alarm, expiratory minute volume upper/lower limit alarm, apnea alarm, gas supply alarm, O_2 supply alarm, battery alarm, no battery alarm, limited battery alarm, overrange alarm, expiratory cassette disconnected alarm, backup ventilation alarm, regulation pressure limited alarm, respiratory rate alarm, PEEP low alarm, $EtCO_2$ upper limit alarm, $EtCO_2$ lower limit alarm

♦SERVO-s:
airway pressure upper limit alarm, high continuous pressure alarm, O_2 concentration lower limit alarm, expiratory minute volume upper/lower limit alarm, apnea alarm, gas supply alarm, air supply alarm, O_2 supply alarm, backup ventilation alarm, respiratory rate alarm, PEEP low alarm

♦PB 740/PB 760/PB 840:
The PB740/PB760/PB840 acquires alarm information from the nurse call port. The ventilator alarm that cannot be acquired from the nurse call port is not guaranteed. For corresponding alarm, refer to the service representative of the ventilator manufacturer.

- This equipment is not compatible to the following alarms generated on the Evita 4 / Evita XL / Evita 2 dura.
  - O_2 monitoring disabled alarm, CO_2 alarm disabled alarm, Oximeter alarm disabled alarm, Neo. volume measurement inoperable alarm, Minute volume alarm disabled alarm, Minute volume alarm low off alarm, Tidal volume alarm high off alarm, Apnea alarm off alarm, Nebulizer active alarm
- When the Evita 2 dura/Evita 4/Evita XL is connected, there is a communication delay of 3 seconds between the DS-8007 System and the Evita ventilator.Therefore, if the alarm generated at the ventilator is resolved within 3 seconds, the ventilator alarm may not be generated at the DS-8007 System.
- When connecting the VELIA, ASTRAL, VS ULTRA, refer to the respective operation manual, and check which ventilator alarm will be output.
- When the VELIA, ASTRAL, VS ULTRA ventilator is connected, and the ventilator power is turned OFF, alarm will not generate on the DS-8007 System. If the connection cable is disconnected from the ventilator, <Vent. Alarm> will generate, but <VENT_COMM> alarm will not generate on the DS-8007 System.

⚠ CAUTION

- The ventilator operation should be performed by well-trained and authorized personnel.
- Only one ventilator can be connected to each DS-8007 system. Do not connect more than one ventilators.
- When connecting DS-8007 System and a ventilator, use only the specified connection cable.
- Make sure that the ventilator is connected to the specified connector on the DS-8007 System.
- When connecting the cable, make sure that the main power of this system and the ventilator is OFF.
- On the DS-8007 system, the Status II connector and serial connector (COM) settings are saved on the AC Unit (DSA-81).

- If the DSA-81 is disconnected from the DS-8007 during ventilator monitoring, the ventilator alarm will not generate.

Connecting the Ventilator

❑In Case of SV-300, SERVO-i/s

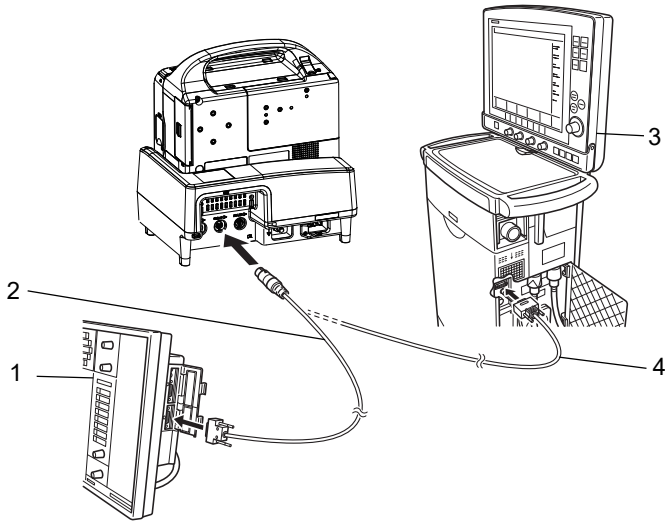
1 Connect the SV-300 or SERVO-i/s to the Status II connector on the AC Unit (DSA-81).

1 SV-300

2 CJ-401RI-70SV3

3 SERVO-i/s

4 CJ-402RI-70SVi



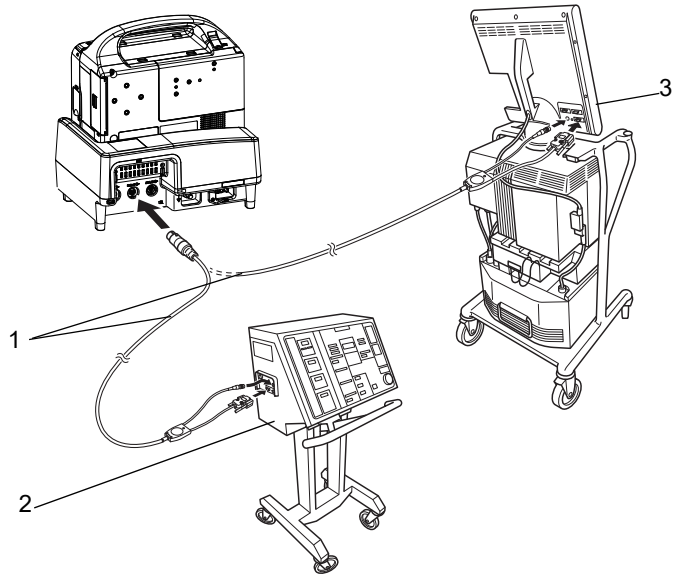
❑In Case of PB740/760/840

1 Connect the PB740/760/840 to the Status II connector on the AC Unit (DSA-81).

1 CJ-403RI-70PB

2 PB740/760

3 PB840

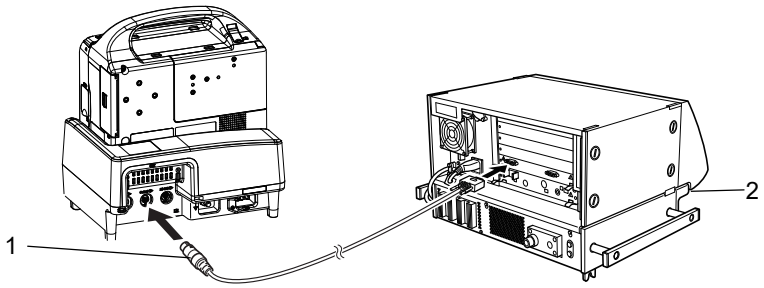


❑In Case of Evita

1 Connect the Evita 2 dura/Evita 4/Evita XL to the Status II connector on the AC Unit (DSA-81).

1 CJ-402RI-70SVi

2 Evita 2 dura



❑In Case of SERVO-U/SERVO-n/SERVO-air

1 Connect the SERVO-U, SERVO-n, SERVO-air to the Status II connector on the AC Unit (DSA-81).

❑In Case of VELIA, ASTRAL, VS ULTRA

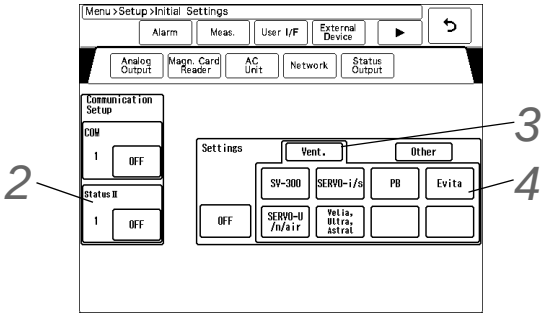
1 Connect the VELIA, ASTRAL, VS ULTRA to the Status II connector on the AC Unit (DSA-81).

External Device Setup

To monitor the ventilator alarm, it is necessary to perform setups for the connecting ventilator in advance.

1 Press the [Menu], [Initial Settings], [External Device], [AC Unit] keys.

▸ The "AC Unit" setup menu will be displayed.



2 Select the port to connect the ventilator.

3 Press the [Ventilator] key.

4 Select from [SV-300]/[SERVO-i/s]/[SERVO-U/n/air]/[Velia, Ultra, Astral]/[PB]/[Evita].

NOTE

- If communication with ventilator is already established through the corresponding port, it is necessary to disconnect the communication in order to change the selection on this menu.
- The "AC Unit" setup menu will be displayed only if AC Unit (DSA-81) is connected to the DS-8007. When performing the "AC Unit" setup, make sure to connect the AC Unit (DSA-81) to the DS-8007.

BIS Data Input

By connecting the A-2000/A-3000 BIS monitor (Covidien), the patient's recovery from anesthesia can be verified by BIS (Bispectral Index) value.

BIS Monitor	Connection Cable	
	For Status II Connector	For Serial Connector
A-2000	CJ-407RI-70BIS	CJO-03RS4
A-3000		

⚠ CAUTION

- Refer to the BIS monitor operation manual and set the SQI value above 15.
- ASCII should be set to communicate with this system. Make sure that ASCII is set on the BIS monitor communication setting. Refer to the BIS monitor operation manual for procedures.
- Securely connect the cable to the serial or status connector of the AC Unit (DSA-81) and the connector of the BIS monitor.

Connecting the A-2000/A-3000 (Covidien)

⚠ CAUTION

- When connecting this equipment and the BIS monitor, use only the specified connection cable.
- Make sure that the BIS monitor is connected to the specified connector on this equipment.When connecting the cable, make sure that the power of this equipment and the BIS monitor is turned OFF.

1 Connect the serial connector or Status II connector on the AC Unit (DSA-81) to the serial connector on the BIS monitor using the BIS connection cable (CJ0-03RS4).

External Device Setup

To display the BIS monitor data, external device setup is required.

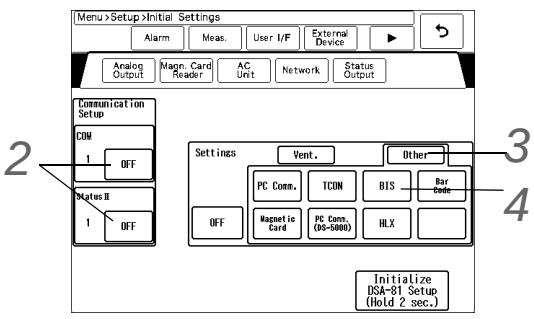
1 Press the [Menu], [Initial Settings], [External Device], [AC Unit] keys.

▸ The "AC Unit" setup menu will be displayed.

2 Select the port to connect the BIS monitor.

3 Press the [Other] key.

4 Press the [BIS] key.



NOTE

- The BIS monitor cannot be set to multiple ports. If the setting is duplicated, the other port will be automatically set to [OFF].
- The "AC Unit" setup menu will be displayed only if AC Unit (DSA-81) is connected to the DS-8007. When performing the "AC Unit" setup, make sure to connect the AC Unit (DSA-81) to the DS-8007.
- When using the BISx, BIS Monitor data cannot be input.

Setup for the External Device Connection

This section explains about the external device connection setup.

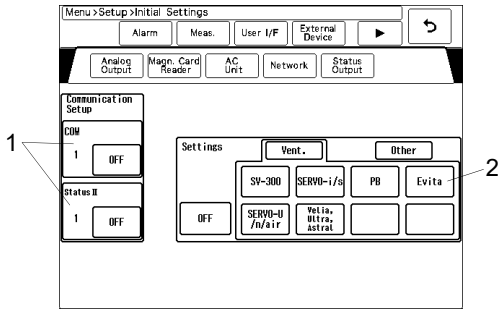
External Device Setup

1 Press the [Menu], [Setup], [Initial Settings], [External Device] keys.

▸ The "External Device" setup menu will be displayed.

1 Select the connecting port from the left side of the screen.

2 Select the connecting equipment from the displayed selection.
By selecting a category ([Vent.] or [Other]) from the upper area, the corresponding selection for each category will be displayed at the lower area.



Selectable External Device for Each Port

Port	Selectable External Device
COM	PC Comm., Barcode Reader, Magnetic Card Reader, BIS, PC (DS-5000) , TCON, HLX
Status II	SV-300, SERVO i/s, PB, Evita, BIS, SERVO-U/n/air, Velia, Ultra, Astral

NOTE

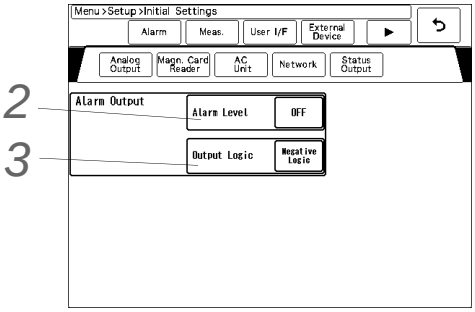
- The same function cannot be set to multiple ports.
- When [TCON] is selected, perform TCON setup (TCON ID, etc.) on the TCON setup screen. (☞"TCON Network" P2-9)
- When [Magnetic Card Reader] is selected, perform further settings on the "Magnetic Card Reader" setup menu.
- The "AC Unit" setup menu will be displayed only if AC Unit (DSA-81) is connected to the DS-8007. When performing the "AC Unit" setup, make sure to connect the AC Unit (DSA-81) to the DS-8007.
- On the DS-8007 system, the Status II connector and serial connector (COM) settings are saved on the AC Unit (DSA-81).

Alarm Output Setup

The alarm can be output from the Status II connector on the AC Unit (DSA-81).

1 Press the [Menu], [Setup], [Initial Settings], [External Device], [AC Unit], [Status Output] keys.

- The "Status Output" setup menu will be displayed.



2 Set the "Alarm Level".

- [OFF]: Alarm will not be output.
- [APNEA]: Apnea alarm will be output.
- [Level H]: Level H alarm will be output.
- [Level H,M]: Level H, M alarm will be output.
- [Level H,M,L]: Level H, M, L alarm will be output.

3 Set the "Output Logic".

- [Positive Logic]: The positive logic alarm will be output.
- [Negative Logic]: The negative logic alarm will be output.
- [Pulse]: A square wave of 440 ms cycle will be output.

NOTE

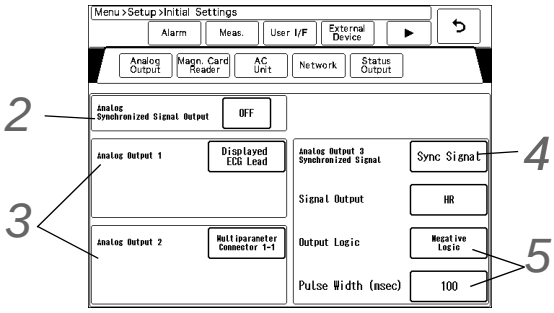
- Refer to ☞"Status I/O Signal (Status II Connector)" P6-14 for connector pin assignments of the alarm output.
- The equipment status alarm will be output as level L.To output the equipment status alarm, select [Level H,M,L].
- On the DS-8007 system, the status output settings are saved on the AC Unit (DSA-81).

Analog Output Setup

On the DS-8007 system, analog output of ECG waveform and BP waveform is possible. For "Analog Output 3", synchronized signal (HR or RR) can be also output.
The BP waveform for analog output can be selected from the measured waveforms on the DS-8007 multiamplifier connector.
On the "Analog Output" setup menu, initial settings for display/printing can be performed.

1 Press the [Menu], [Setup], [Initial Settings], [External Device], [Analog Output] keys.

- The "Analog Output" setup menu will be displayed.



2 Set the "Analog Synchronized Signal Output".

- Select from [ON]/[OFF].

3 Set the "Analog Output 1", "Analog Output 2".

- Select from [Selected ECG Lead]/[Displayed ECG Lead]/[Multiparameter Connector 1-1]/ [Multiparameter Connector 1-2]/[Multiparameter Connector 2-1]/[Multiparameter Connector 2-2].

- When [Selected ECG Lead] is selected, press the key for "Output Lead Sel.".
  Select from [I]/[II]/[III]/[aVR]/[aVL]/[aVF]/[V1] to [V6].
- However, if 3-lead cable is used, the waveform of [Displayed ECG Lead] will be always output even if [Selected ECG Lead] is selected.

4 For the "Analog Output 3", analog output or synchronized signal output can be selected.

- To output analog waveform, select from [Selected ECG Lead]/[Displayed ECG Lead]/[Multiparameter Connector 1-1]/[Multiparameter Connector 1-2]/[Multiparameter Connector 2-1]/[Multiparameter Connector 2-2].
  When [Selected ECG Lead] is selected, select also the output lead.
- To output the synchronized signal, select [Sync. Signal]

5 When [Sync. Signal] is selected, select also the output signal.

1 Press the key for "Signal Output", and select from [HR]/[RR].

- [HR]: HR synchronized signal will be output.
- [RR]: RR synchronized signal will be output.

2 Set the "Output Logic".

- [Positive Logic]: Positive synchronized signal will be output.
- [Negative Logic]: Negative synchronized signal will be output.

3 Select the "Pulse Width" from [100]/[60]/[20] msec.

- The synchronized signal will be output with the selected pulse width.

⚠ CAUTION

- When connecting the cable, make sure that the power of this equipment and the connected device is turned OFF.
- Perform the "Analog Output" setup before starting the monitoring.
- Even when the "RR/APNEA Alarm Source" is set to CO_2 or RR_SpO_2, the impedance RR synchronized signal will be output.
- When using this equipment as a module, and a host monitor with a software version not supporting the pulse width selecting function is connected, the pulse width of 100 msec will be output.For details, contact your nearest service representative.
- If the host monitor is connected to the external device, and changed to the one with a software version not supporting the pulse width selecting function, communication failure with the external device may occur.

NOTE

- The QRS synchronized signal is a delay output (35 msec or less during Monitor/Diagnosis Mode).
  The delay time varies depending on the filter mode setting and input waveform type.
- When the QRS synchronized signal is input to the external device, make sure that the delay time is within the acceptable range of the connected device.

Using the Magnetic Card Reader

This section explains the connection and setup procedure for the magnetic card reader.
By using the magnetic card reader, patient information can be automatically entered from the magnetic card at patient admittance.
(☞Operation Manual "Entering Patient Information from the Magnetic Card" P5-4)

Connecting the Magnetic Card Reader

1 Connect the magnetic card reader cable to the conversion cable (CJ-756).

2 Connect the other side of the conversion cable to the serial connector (COM) on the AC Unit (DSA-81).

Magnetic Card Reader Setup

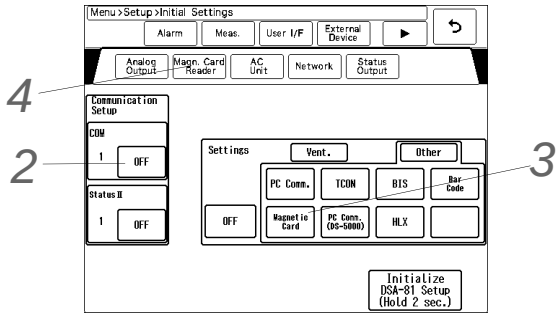
On the "Magnetic Card Reader" setup menu, the initial settings for the magnetic card reader can be performed.

1 Press the [Menu], [Setup], [Initial Settings], [External Device], [AC Unit] keys.

▸ The "AC Unit" setup menu will be displayed.

2 Select the serial connector (COM) which the magnetic card reader was connected.

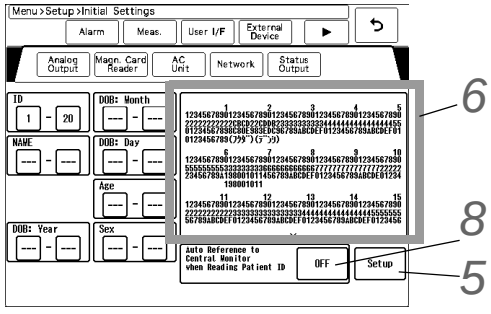
3 Select [Magnetic Card Reader] in the [Other] category.



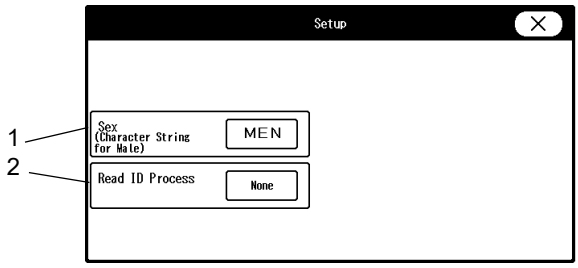
Since the data formats of magnetic card vary for each institution, it is necessary to set the digit location of each information.
For the items that needs to be loaded, perform the setup following the procedure 4 to 7. This setup is not necessary for the items not required to be loaded.

4 Press the [Magnetic Card Reader] key.

▸ The "Magnetic Card Reader" setup menu will be displayed.



5 Press the [Setup] key to preconfigure the magnetic card reader.
The character strings to indicate birth date, sex, etc., can be set.



1 Press the key for "Sex" to display "Character String for Male" window. Enter the character string for male (max. 3 characters) used on the magnetic card.

2 Set the "Read ID Process".

- [None]: The whole patient ID will be read as the patient ID.
- [Numeric]: Only the numerics will be read as the patient ID.
- [Alphanumeric]: The numerics and alphabets will be read as the patient ID.

6 The starting and ending digit of the data read from a magnetic card can be analyzed.

NOTE

- The procedure to analyze the data read from the magnetic card is explained below.
- If analyzing is not necessary, proceed to step 7.
- To use the magnetic card reader, make sure to connect the AC Unit (DSA-81) to the DS-8007.

REFERENCE

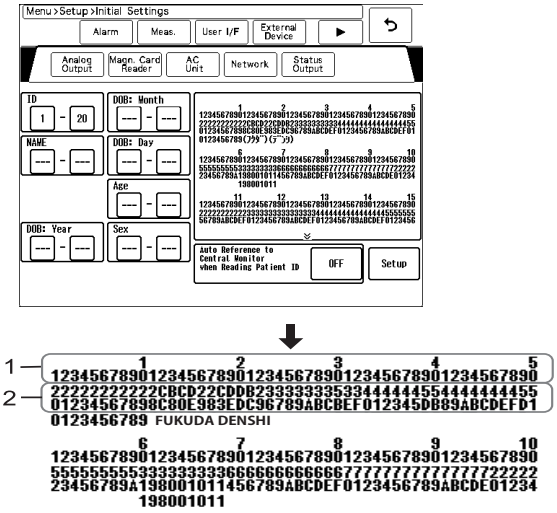
- On the "Magnetic Card Reader" setup menu, starting and ending digit of each data such as [ID], [DOB: Year] can be set.
  - From: Starting digit number of the data to be read from the magnetic card
  - To: Ending digit number of the data to be read from the magnetic card.

REFERENCE

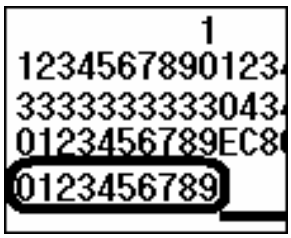
- The analyzing procedure is explained using the example of patient data below.
  Patient ID:0123456789
  Patient Name: FUKUDA DENSHI
  Date of Birth: Jan. 1, 1980
  Sex: Male

1 While the first page of the "Magnetic Card Reader" setup menu is displayed, scan the magnetic card.

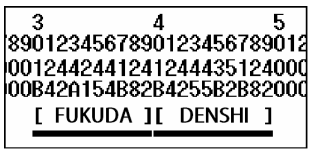
- At the first and second row, the data read from the card will be displayed in hexadecimal. At the third row, the characters converted from the data will be displayed.



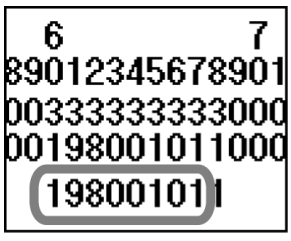
2 From the displayed result, specify the data position.



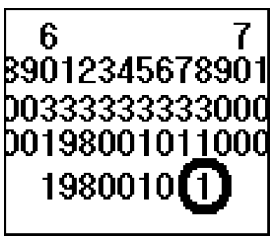
The patient ID, "0123456789" is displayed at 1st to 10th digit.



The patient name, "(FUKUDA) (DENSHI)" is displayed at 30th to 49th digit. Depending on the length of patient name, up to 59th digit may be used.
"( )" should be also included in the digit range.



The date of birth, "19800101" is displayed at 27th to 34th digit.



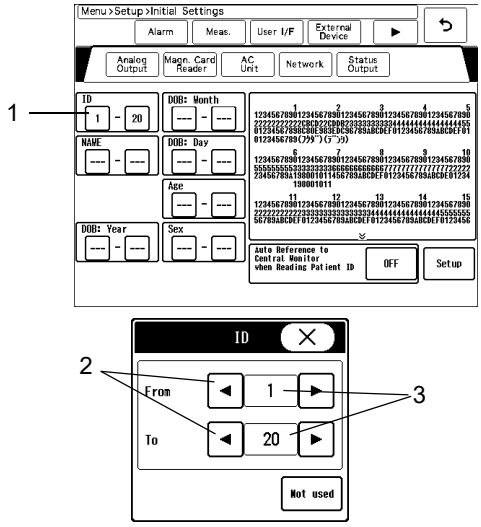
"1" which is displayed at the 68th digit can be estimated as the character string for male.
It will be more definite if compared with the data of female.

3 The setup will be performed with the analyzed result.

NOTE

- After the setup, check if the data of other patient's card can be correctly read.

7 Enter the starting digit and ending digit for each data.



1 Select the item to enter from the list displayed at left.

2 Enter the starting digit or ending digit in the range of 1 to 255 using the left or right button.

3 Press the [1] key for "From" or the [20] key for "To".

REFERENCE

- If the data is not present on the magnetic card, enter [Not Used] for both starting and ending digit.

4 Repeat step 1 to 3.

8 Set the "Auto Reference to Central Monitor when Reading Patient ID".

- [ON]: Patient information can be automatically acquired from the central monitor using the magnetic card. This function is available only when the DS-LAN III network is constructed.
- [OFF]: Patient information cannot be received.

REFERENCE

- To use this function, select [Enable] for "Search ID" under [Initial Settings>System>Other].

PC Communication

This section explains about the PC communication setup procedure.
By using the PC communication function, vital data measured on the bedside monitor can be transmitted to PC.

Connection with the System

1 Connect the accessory cable to the serial connector (COM) on the AC Unit (DSA-81).

External Device Setup

To transmit the data to PC, "External Device" setup is required.

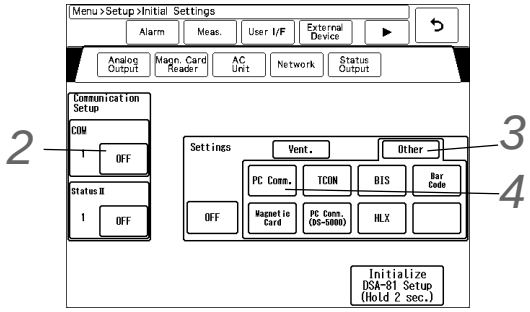
1 Press the [Menu], [Setup], [Initial Settings], [External Device], [AC Unit] keys.

▸ The screen to set the connecting device type for each port will be displayed.

2 Select the serial connector (COM) which the PC was connected.

3 Press the [Other] key.

4 Press the [PC Comm.] key.



NOTE

- If the PC communication is disconnected, <Check System Conn.> will be displayed.

Connection with the Laser Printer

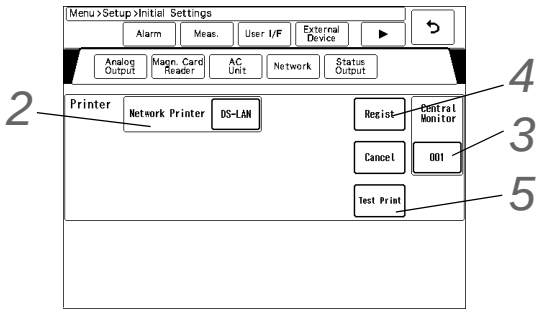
This section explains the setup procedure for the laser printer connected to the central monitor.
(Only when connected to DS-LAN III network)

Laser Printer Setup

Set the central ID of the central monitor which is connected to the laser printer.

1 Press the [Menu], [Setup], [Initial Settings], [External Device], [Network] keys.

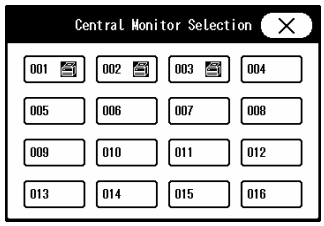
- The "Network" setup menu will be displayed.



2 Select [DS-LAN] for "Network Printer".

3 Specify the central ID of the central monitor to perform the printing. (shown on right)

- The "Central Monitor Selection" window will be displayed.
- The central ID with the printer icon displayed can be selected.



4 Press the [Regist] key, then [OK] key.
It is necessary to press the [OK] key to validate the setting.

5 Perform test printing. Verify that the printing is properly performed.

⚠ CAUTION

- If the output characters are garbled, printer specification may be incorrectly set on the central monitor. Refer to the operation manual of the printer and check the printer specification.
- On the central monitor, central monitor printer output will be prioritized over the laser printer output. If the central monitor printer output is started during the laser printer output, the laser printer output will resume after the central monitor printer output.
- [DS-LAN] can be selected only when [DS-LAN III] is set for "DS-LAN Setup". If the "DS-LAN Setup" setting is changed to [DS-LAN II], the "Network Printer" setting will change from [DS-LAN] to [OFF].
- On the DS-8007 system, the network printer settings are saved on the AC Unit (DSA-81).

Chapter 5 Initial Settings

Chapter 5 Initial Settings

Initial Settings

This section explains about the "Initial Settings" menu.
Under "Initial Settings" menu, there are 7 setup categories which are Alarm, Measurement, User I/F, External Device, System, User Mode Registration, and Administrator Setup.

Description for Each Category

Category	Subcategory	Description
Alarm	-	Alarm-related settings, alarm indicator settings, etc.
Measurement	User Label	User label settings for BP and TEMP
	Unit	Measurement unit settings for CO_2, BP, ST, etc.
	Other	Other settings such as arrhythmia analysis filter, etc.
User I/F	Display/Print	Display and print settings such as date format, BP alarm limit increment, etc.
	Power ON/ Discharge	Settings such as backup status at "Power ON" and "Discharge", etc.
	Shortcut Menu	Key display settings for shortcut menu
	Key Mask	Key mask settings for unnecessary keys
	Operation	Settings for hiding the window or user key
	Quick Menu	Key display settings for quick menu
External Device	Analog Output	Settings for analog waveform output, synchronized signal output
	Magnetic Card Reader	Settings for magnetic card reader
	AC Unit	Settings for external device connectors such as serial connector and Status II connector
	Network	Network settings for laser printer
	Status Output	Alarm Output Setup
System	DS-LAN	Wired network settings such as Room ID, Bed ID.
	Telemeter	Telemetry settings such as telemetry channel, transmitting waveform, etc.
	TCON	TCON settings such as TCON ID, TCON channel.
	Other	Settings for AC filter, search patient ID, etc.
User Mode Registration	-	Settings for monitor mode, display mode according to the monitoring purpose
Administrator Setup	Key Lock	Settings of key lock level for display and setting
	Password Setup	Settings for password and administrator

Administrator Setup

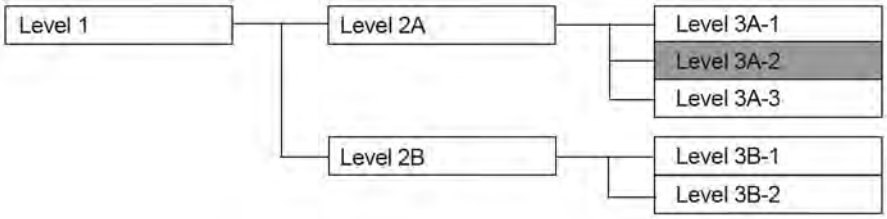
This section explains about the "Administrator Setup" menu.
The "Administrator Setup" is composed of [Key Lock] and [Password Setup].

NOTE

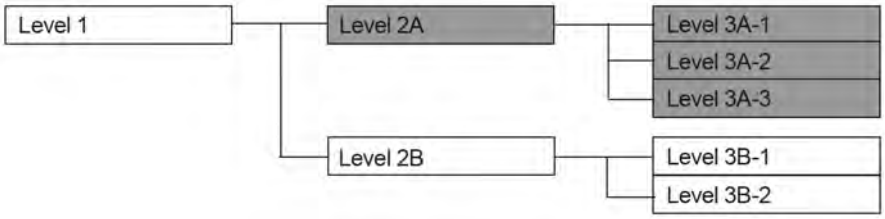
- To display the administrator setup menu, a password is required. There are 3 levels of password with different operation authorization. With higher level password, the lower level settings can be changed.
- For details of the password, refer to your nearest service representative.

Key Lock

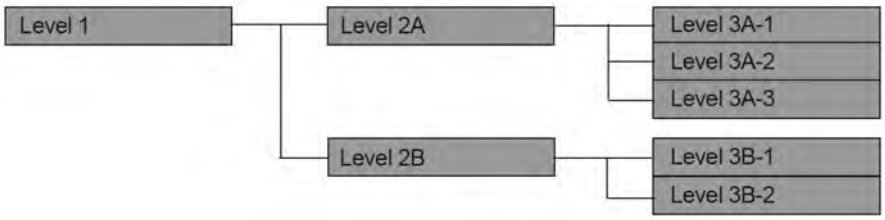
On the "Key Lock" menu, setup items can be locked so that settings cannot be changed unless a password is entered.
The setup items are in tree structure.
If the upper level item is locked, the lower level item will be also locked.
For the following tree structure, if "Level 3A-2" is locked, only this item will be masked.



If "Level 2A" is locked, the locked items will be as follows.



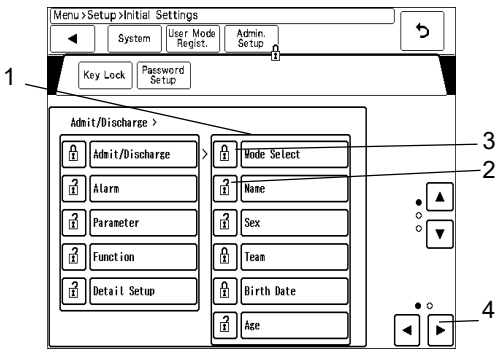
If "Level 1" is locked, the locked items will be as follows.



1 Press the [Menu], [Setup], [Initial Settings], [Admin. Setup] keys.

2 Enter the password.

▸ The "Key Lock" menu will be displayed.
The items that can be protected by password will be displayed in a tree format.



1 The lower level items will be displayed.

2 This indicates unlocked item. It is displayed in white.

3 This indicates locked item. To change the setting, an authorized password is required.
There are 3 levels of password which are distinguished by the color of the icon.
The level is in the order of red>yellow>green. For example, the following operation is possible.
Red: Manager > Yellow: Administrator > Green: User

4 The page will switch.

REFERENCE

- Maximum of 3 types of password can be set for the administrator which can individually lock the setting with each password.

Password Setup

This section explains how to change the password and how to enter the administrator name.

CAUTION

- Do not forget the password.
- The password should be strictly controlled.

NOTE

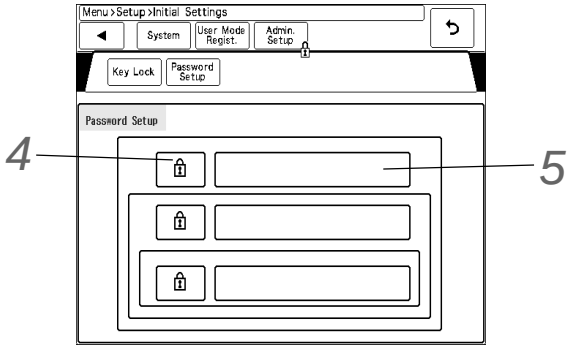
- The default passwords are set as follows.
  Red Key: 11111111
  Yellow Key: 22222222
  Green Key: 33333333
- Before using the equipment, make sure to change the password.
- For details of the password, refer to your nearest service representative.

1 Press the [Menu], [Setup], [Initial Settings], [Admin. Setup] keys.

2 Enter the password.

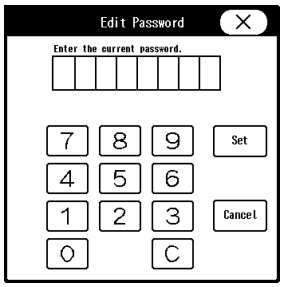
3 Press the [Password Setup] key.

▸ The password setup window will be displayed.



4 Enter the password.

Depending on the password, the operation authorization will differ. With higher level password, the lower level settings can be changed.



1 Press the key for the level to change the password.

2 Enter the current password using the numeric keys.

3 Press the [Set] key.

4 Enter the new password using the numeric keys.4 to 8 digits can be set for the password.

NOTE

- As the authorization level is distinguished by the password, the password cannot be duplicated.

5 For confirmation, enter the new password again.

REFERENCE

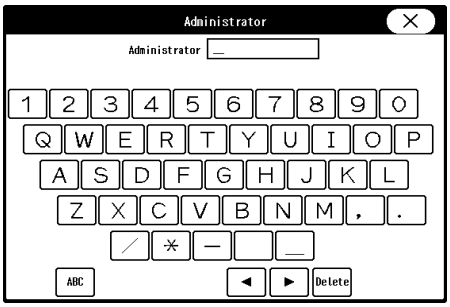
- There are 3 levels of password which are distinguished by the color of the icon. The level is in the order of red>yellow>green and are distinguished by the entered password to display the administrator setup menu.

5 Set the administrator name.

Depending on the password, the operation authorization will differ. With higher level password, the lower level settings can be changed.

1 Press the key for the level to change the administrator name.

▸ The "Administrator" window will be displayed.



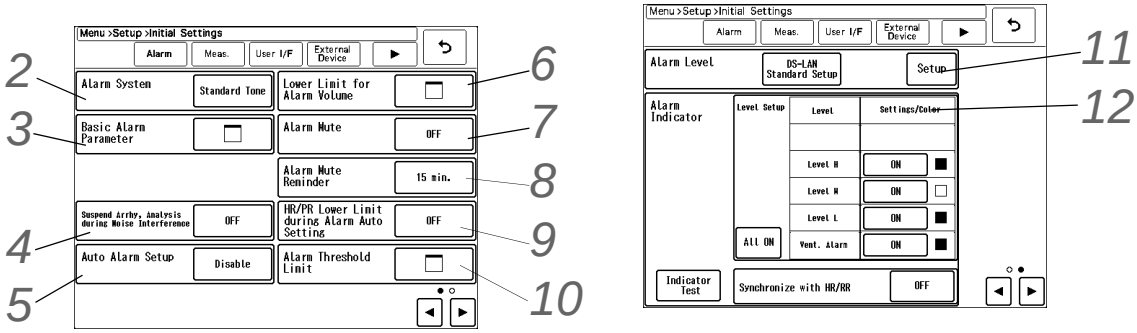
2 Enter the administrator name using the alphanumeric keys.Maximum of 8 characters can be set for the administrator name.

Alarm Related Setup

On the alarm setup menu, alarm related setup can be performed.

1 Press the [Menu], [Setup], [Initial Settings], [Alarm] keys.

▸ The alarm setup menu will be displayed.



2 Set the "Alarm System".

⚠ WARNING

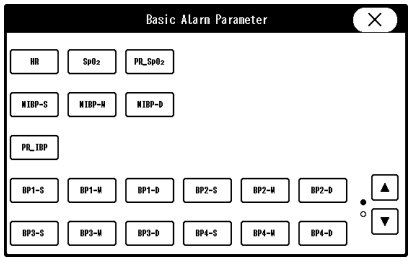
- Changing the setting for "Alarm System" (Initial Settings > Alarm) will also change the alarm volume and tone setting. Make sure to check the volume and tone when the setting is changed.

▸ [Fukuda Tone]: The alarm tone common to DS-7000 series bedside monitor will be set.

▸ [Melodic Tone]: The alarm tone which the rhythm is the same with [Standard Tone] with different melody will be set.

▸ [Standard Tone]: The alarm tone complied to the IEC standard will be set.

3 Set the "Basic Alarm Parameter".



1 Select the item to perform the setting.

▸ The selected key will be displayed in blue.

▸ By pressing the selected key again, the selection will be canceled.

2 Press (X).

▸ The "Basic Alarm Parameter" window will close.

4 Set the "Suspend Arrhy. Analysis during Noise Interference" .

▸ [ON]: Arrhythmia analysis will be suspended for fixed duration (5 sec.) when a noise is continuously interfering.

▸ [OFF]: Arrhythmia analysis will not be suspended even when a noise is continuously interfering.

⚠ CAUTION

- When "Suspend Arrhy. Analysis during Noise Interference" is set to [ON], and the suspended duration continues for more than 30 seconds, "Cannot analyze" message will generate.

5 Set the "Auto Alarm Setup".

- [Enable]: [Auto] key will be displayed on the alarm setup menu.
- [Disable]: [Auto] key will not be displayed on the alarm setup menu.

6 Set the "Lower Limit for Alarm Volume".

Set the lower limit of alarm volume for "Vital Alarm", "Ventilator Alarm", "Status Alarm".

WARNING

- Changing the setting for "Alarm System" will also change the alarm volume and tone setting. As the "Lower Limit for Alarm Volume" may also change, make sure to check the volume and tone on the "Tone/Volume" setup menu.

- The lower limit of adjustable alarm volume range on the "Tone/Volume" setup menu will be set. The lower limit level can be set according to the alarm level priority, Urgent>Caution>Status.
- [Test]: The test sound will be generated with the set volume.

7 Alarm Mute

- [ON]: The alarm mute function will turn ON.
- [OFF]: The alarm mute function will turn OFF.

8 Alarm Mute Reminder

- A reminder message/sound can be displayed/generated after preprogrammed duration to remind the alarm mute condition.
- Select from [15 min.] / [30 min.] / [60 min.] / [120 min.].
- [OFF]: A reminder message/sound will not be displayed/generated.

9 Set the "HR/PR Lower Limit during Alarm Auto Setting".

- [OFF]: No limit will be set.
- [30 bpm]: When the auto alarm is set and the lower limit is below 30 bpm, the lower limit will be fixed to 30 bpm.
- [40 bpm]: When the auto alarm is set and the lower limit is below 40 bpm, the lower limit will be fixed to 40 bpm.

10 Set the "Alarm Threshold Limit".

- The alarm threshold range for each parameter can be set.
- For the parameter set to [Enable], the alarm threshold level outside the set range cannot be set.

NOTE

- If the alarm threshold set on the central monitor exceeds the threshold limit set on the bedside monitor, the alarm threshold set on the central monitor will be applied. In such case, the threshold limit is deactivated.
- When the data transfer function for alarm settings is enabled on the host monitor, and the alarm threshold set on the host monitor exceeds the threshold limit set on the DS-8007, the exceeded alarm threshold will be applied. In such case, the threshold limit is deactivated on the DS-8007. For details of the data transfer function for alarm settings, refer to the operation manual of the host monitor.
- If the alarm threshold of "Setup at Discharge" exceeds the alarm threshold limit, the exceeded alarm threshold will be applied. Make sure to check the alarm setting at

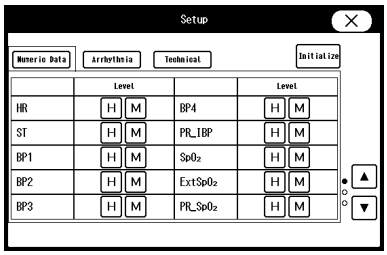
admittance as the threshold limit is deactivated in such case.

- If the alarm threshold of the selected monitor mode exceeds the alarm threshold limit, the exceeded alarm threshold will be applied. In such case, the threshold limit is deactivated.

11 Set the "Alarm Level".The alarm level for numeric data alarm, arrhythmia alarm, technical alarm can be set. The alarm level can be selected from S, H, M, L according to the priority. ("S" is the highest priority alarm.)

1 Select the alarm level from [DS-LAN Standard Setup] or [User Setup].
(☞Operation Manual "Vital Alarm Message" P11-1)
(☞Operation Manual "Vital Alarm Message (DS-LAN Standard Setup)" P11-4)

2 Press the [Setup] key to display the alarm level setup window. (shown on right)



3 Press one of the [Numeric Data], [Arrhythmia], [Technical] key.

▸ The window will change according to the selected alarm group.

4 Press the ▲/▼ keys.

▸ The page will switch.

5 Select the alarm level from [S]/ [H]/ [M]/ [L]/ [N] for each parameter.

NOTE

- Only the displayed alarm level can be selected.
- Press the [Initialize] key to initialize the alarm level setting.

12 Set the operation for the alarm indicator located at the upper part of the main unit.

NOTE

- The flashing colors of the alarm indicator are fixed for each alarm level and cannot be changed.
  Ventilator Alarm, Level H: Red
  Level M: Yellow
  Level L: Blue

1 Select [ON]/ [OFF] for each level.
When not using the alarm indicator function, select [OFF].

2 Press the [Indicator Test] key to test the flash pattern.

3 Select from [All ON] or [All OFF].

▸ [All OFF]: Alarm indicator function will be turned OFF for all levels.

▸ [All ON]: Alarm indicator function will be turned ON for all levels.

4 Set the "Synchronize with HR/RR".

▸ [Sync. to HR]: The alarm indicator will flash in green synchronizing to HR.

▸ [Sync. to RR]: The alarm indicator will flash in green synchronizing to RR.

▸ [OFF]: The alarm indicator will not synchronize with HR/RR.

NOTE

- If asystole alarm generates while [Sync. to HR] is selected, and [OFF] is selected for alarm indicator function, the green LED of alarm indicator will remain lit. When PR synchronized mark is displayed, the LED on the alarm indicator will not flash.
- When [Sync. to RR] is selected and RR synchronized mark other than impedance is displayed, the alarm indicator will not flash.
- To turn OFF the alarm indicator operation all at once, press the [All OFF] key.
- When the alarm is generated, and the alarm indicator is lit, the indicator will not flash synchronizing to the HR/RR even if "Synchronize to HR/RR" is set.

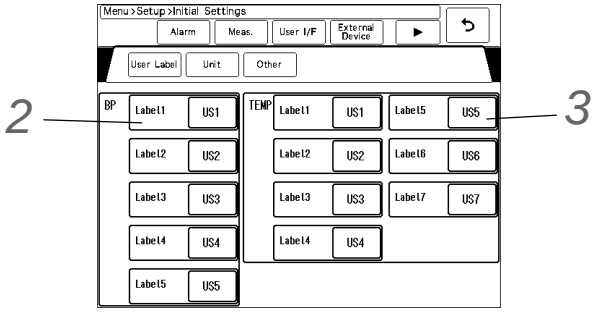
Measurement Related Setup

User Label Setup

On the "User Label" setup menu, BP and TEMP user labels can be set.

1 Press the [Menu], [Setup], [Initial Settings], [Meas.] keys.

▸ The "User Label" setup menu will be displayed.



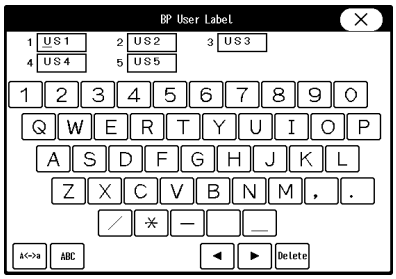
2 Set the BP user label.

1 For "BP", select from [US1] to [US5].

▸ The "BP User Label" window will be displayed.

2 Use the alphanumeric keys to enter the user label up to 3 characters.

▸ The cursor position will be indicated by a red underline.



REFERENCE

- Press the display area for the user label to perform the setting.

CAUTION

- When the system is connected to DS-LAN, BP label of US3 to US5, TEMP label of US3 to US7 cannot be selected.

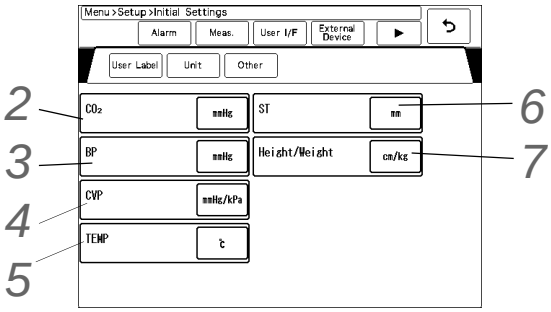
3 Set the TEMP label using the same procedure with step 2.

Measurement Unit

Set the measurement unit on the "Unit Setup" menu.

1 Press the [Menu], [Setup], [Initial Settings], [Meas.], [Unit] keys.

▸ The "Unit" setup menu will be displayed.



2 Select the CO_2 measurement unit from [mmHg]/[kPa]/[%].

3 Select the BP and NIBP measurement unit from [mmHg]/[kPa].

4 When the BP label is CVP (Central Venous Pressure), select the measurement unit from [mmHg/kPa]/[cmH_2O].

5 Select the TEMP measurement unit from [°C] / [°F].

6 Select the ST measurement unit from [mV]/[mm].

7 Select the measurement unit for height and weight from [cm/kg]/[in/lb].

NOTE

- When the BP, CVP unit is changed, the tabular/graphic trend data with the previous measurement unit will be deleted. Also, when the unit is changed, it is necessary to perform the alarm setup for the new measurement unit.

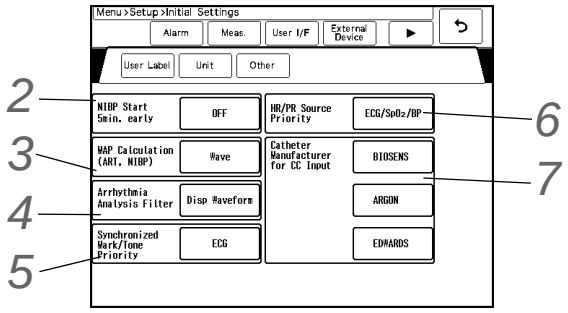
Other Setup

Set the other measurement related settings.

1 Press the [Menu], [Setup], [Initial Settings], [Meas.], [Other] keys.

- The "Other" menu will be displayed.

2 Set the "NIBP Start 5min. early".

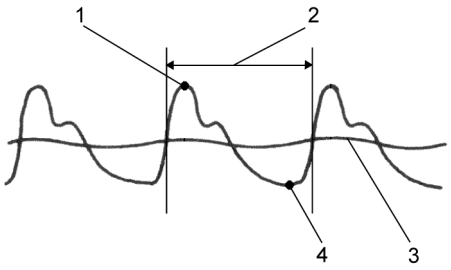


- If outputting the data to PC or other external device using the PC communication function of this system, an error may be generated to the NIBP measurement time depending on the input interval of the external device.
  This system outputs the data at completion of NIBP measurement, and if the external device inputs the data at 60 minutes interval, 60 minutes time lag will occur. By starting the measurement 5 minutes early, this time lag between the external device can be minimized.
- [ON]: When [60min]/[120min] is selected for the measurement interval, the measurement will start 5 minutes before the set time.
- [OFF]: The measurement will not be started 5 minutes early.

3 The measurement source of BP/NIBP mean value can be selected from waveform or calculation.

- [Calc.]: Calculates the mean BP from the following calculation. Mean BP = (Systolic BP + Diastolic BP x 2) /3
- [Wave]: In case of NIBP, maximum amplitude of oscillograph will be the mean value (MAP). In case of BP, the following measurement will be performed.

Example of BP Measurement



1: Systolic BP

2: HR interval

3: Mean BP (MEAN)

4: Diastolic BP

NOTE

- The NIBP specification stated on "Chapter 14 Specification" is based on the validation when [Wave] is selected.

4 Set the "Arrhythmia Analysis Filter".

- [Disp. Waveform]: The filter selected on "Admit/Discharge" menu or "ECG" setup menu will be set.
- [Fixed]: The filter will be fixed to 0.5 Hz to 40 Hz.

NOTE

- When [Disp. Waveform] is selected, the filter will be set according to the selection on [Menu > Parameter > ECG]. If [Diag.] is selected, the filter will be 0.5 Hz to 40 Hz which is the same with [Fixed].

5 Set the "Synchronized Mark/Tone".When [Auto] is selected for "Synchronized Mark/Tone", the priority of the synchronizing parameter can be set.

- [ECG]: The synchronizing priority will be set in the order of ECG>SpO_2>BP. The synchronized tone will set to [ON].
- [SpO_2]: The synchronizing priority will be set in the order of SpO_2>ECG>BP. The synchronized tone will be set to [ON].

6 Set the display priority of the parameter to be displayed inside the HR/PR numeric data box.
This priority setting will be applied when [Auto] is selected for "HR/PR", or when [HR/PR] user key is used to switch the HR/PR source.

Select the priority order from the dropdown list.
For example, if [ECG/SpO_2/BP] is selected, HR/PR source will be set in the priority of ECG>SpO_2>BP.

7 Set the "Catheter Manufacturer for CC Input".Press one of the keys, and enter the manufacturer name on the displayed window. (Max. 8 characters)

User I/F

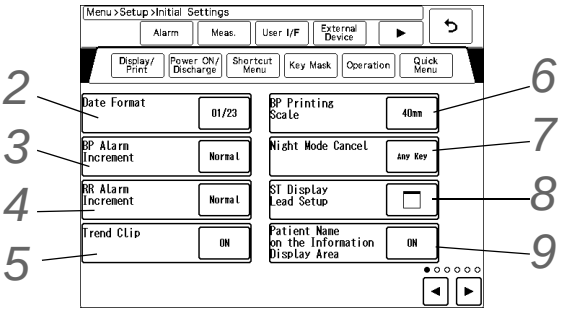
Display/Print Setup

On the "Display/Print" menu, initial settings for displaying/printing can be performed.

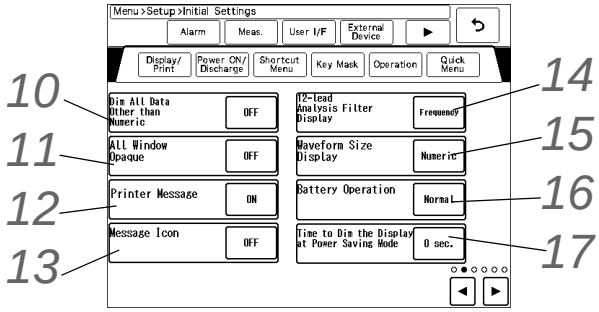
1 Press the [Menu], [Setup], [Initial Settings], [User I/F] keys.

▸ The "Display/Print" setup menu will be displayed.

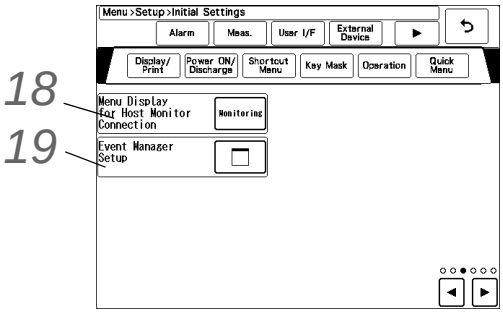
Page 1



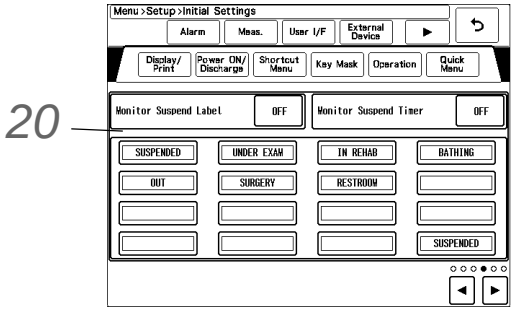
Page 2



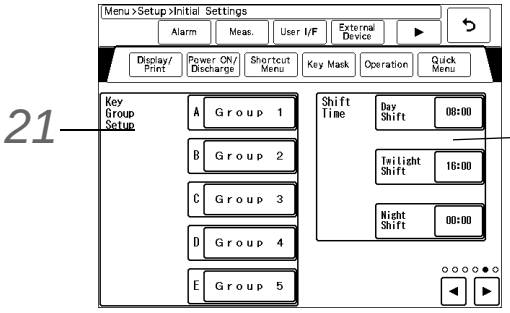
Page 3



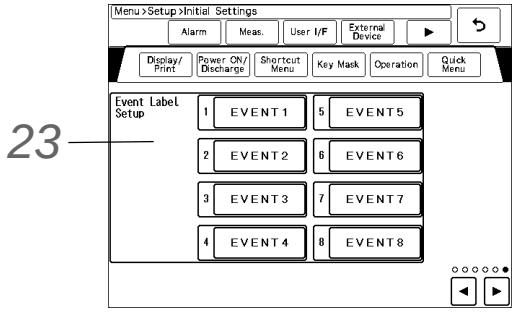
Page 4



Page 5



Page 6



2 The selected format will be applied to display and printing.

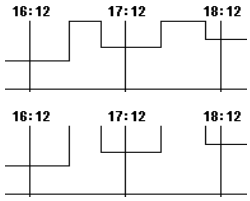
3 Select [Normal] or [Small] for "BP Alarm Increment".

	[Normal]	[Small]
0 mmHg to 50 mmHg	2 mmHg increment	1 mmHg increment
55 mmHg to 300 mmHg	5 mmHg increment	
0 kPa to 7 kPa	0.2 kPa increment	0.1 kPa increment
7.5 kPa to 40.0 kPa	0.5 kPa increment	

4 Select [Normal] or [Small] for "RR Alarm Increment".
[Normal]: 5 Bpm (Adult), 2 Bpm (Child, Neonate)
[Small]: 1 Bpm

5 If the measurement on the graphic trend display exceeds the vertical axis scale, whether or not to display the exceeded portion can be selected.

[ON]: The exceeded portion will be displayed in straight line at the upper or lower limit.

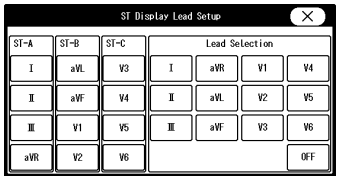


[OFF]: The exceeded portion of the vertical axis scale will not be displayed.

6 Select the printing scale height for the BP1 to 2 waveform.

7 Select the procedure to cancel the night mode when [No Change]/[Darker]/[Dark] is set.
[Any Key]: The night mode can be canceled by pressing any key on the screen.
[Night Mode Key]: The night mode can be canceled by pressing the [Night Mode] key on the user key area or on the menu.

8 The ST lead to be displayed for ST-A to ST-B can be set.
Set the lead to the key displayed in blue.



9 Set the "Patient Name on the Information Display Area".
[ON]: Patient name will be displayed on the information display area.
[OFF]: Patient name will not be displayed on the information display area.

10 Set the brightness of the numeric data box.
[ON]: The display brightness of measurement unit, alarm limit, etc. displayed inside the numeric data box will be dimmed.
[OFF]: The display brightness will not be dimmed.

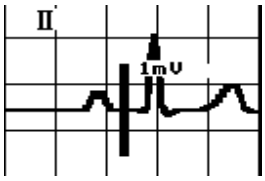
11 Set whether or not to make the window translucent.
[OFF]: The window will become translucent allowing to view the waveform displayed behind the window. However, the key display will not become translucent.
[ON]: The window will not become translucent.

12 Set whether or not to display the bedside monitor printer message.
[ON]: The bedside monitor printer status will be displayed on the home display.
[OFF]: The bedside monitor printer status will not be displayed.

13 Select [ON]/[OFF] for "Message Icon".
When there are many numeric data display, the numeric data box size will be reduced which may disable the message to be displayed inside the numeric data box.
A message icon will be displayed instead to notify that a message is present. (☞Operation Manual "Numeric Data Box Display (for all parameters)" P3-7)

14 Select the display type for the 12-lead analysis filter.
The filter display type on the 12-lead analysis display/printing will change with this selection.
[Frequency]: The set frequency (ex. [25Hz]) will be displayed.
[Filter Type]: The filter type (ex. [MF_ST], [DF_WK]) will be displayed.

15 Select the display type of the waveform size.



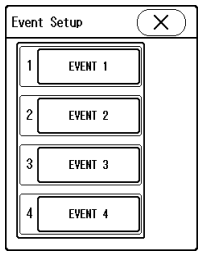
[Numeric]: The waveform size for the ECG, RESP, SpO_2 will be displayed in numerics.
[Bar]: The waveform size will be indicated by a bar.
[Bar (10mm)]: The waveform size will be indicated by a 10 mm bar. The amplitude voltage value of the corresponding waveform size will be displayed beside the bar. (shown on right)

16 Set the display brightness during battery operation.
[Normal]: The set brightness will be applied during battery operation.
[Low Power]: The power saving mode brightness will be applied during battery operation.

17 Set the duration to operate with the set brightness during power saving mode.
[0 sec.]: The power saving mode brightness will be applied during operation.
[5 sec.] to [60 sec.]: The set brightness will be applied for the selected duration.

18 Select the screen to be displayed when a host monitor is connected via DSA-82.
[Monitoring]: Monitoring screen (Home Display) will be displayed. Screen operation is not possible.
[Timer]: Stopwatch/Timer will be displayed.
[Event Manager]: Event manager will be displayed.
[Patient Name]: Patient name and ID will be displayed.

19 Set the event label. (shown on right)
On the displayed window, enter the event label.



20 Monitor Suspend Label Setup (☞"Monitor Suspend Setup" P5-14)

21 Key Group Setup
Eight (8) user keys can be registered for each group. The label for the key group can be also set.

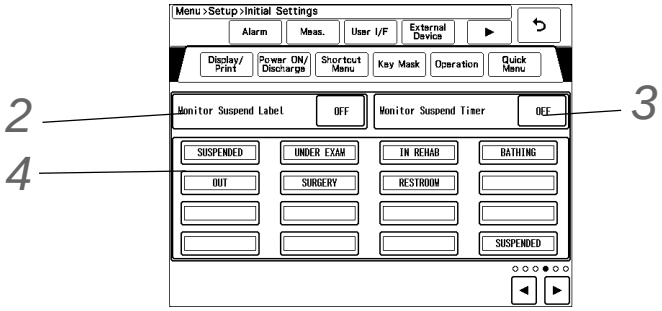
22 By setting the time for "Day Shift", "Twilight Shift", "Night Shift", the time bar displayed at the upper part on the data/waveform review screen will be displayed in different colors by each shift time.
Day Shift: Yellow
Twilight Shift: Green
Night Shift: Blue

23 Event Label Setup
Eight (8) event labels (Surgery, etc.) can be registered. By setting [Event] on the user key, the registered event label can be printed at any time.

❑Monitor Suspend Setup

During monitoring suspended status, different messages in different colors according to the patient's destination can be displayed. Suspend timer function can be also used.
When using the monitoring suspend timer function, alarm sound will generate after the preprogrammed duration to remind the user to resume monitoring.
The labels and colors to be displayed when monitoring is suspended, and monitor suspend time can be set.
Maximum of 15 labels can be set.

1 Display the "Monitor Suspend Label" screen. [Menu>Initial Settings>User I/F>Display/Print]



2 Select ON/OFF for "Monitor Suspend Label".

- [ON]: [Mon. Suspend Setup] key will be displayed when the monitoring is suspended to allow monitor suspend label setup.
- [OFF]: Monitor suspend label function will be ineffective.

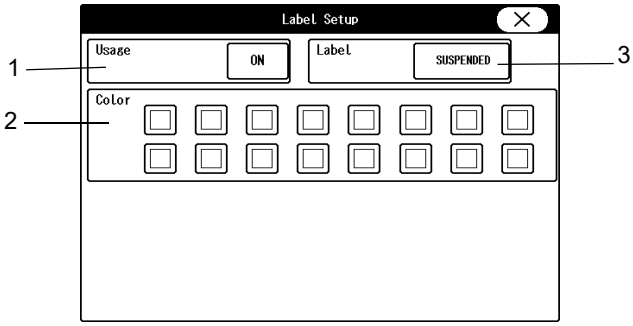
3 Set the "Monitor Suspend Timer".

- [ON] will turn ON the monitor suspend timer function, and timer will start when monitoring is suspended. (☞Operation Manual "Suspend Monitoring" P5-9)
- By setting "Monitor Suspend Label" and "Monitor Suspend Timer" to [ON], an alarm sound can be generated after the set duration (15 min./30 min./1 hr./1.5 hr./2 hr.).

NOTE

- If "Monitor Suspend Label" is set to [OFF], "Monitor Suspend Timer" function cannot be used.
- If "Monitor Suspend Label" is set to [OFF], "Monitor Suspend Timer" function will also automatically set to [OFF].

4 Select the key to edit the monitor suspend label.



1 Usage
"Usage": Select whether or not to use this monitor suspend label.

2 Color Setup
Select the color for the label. The background of the monitor suspend label will be displayed with the selected color.

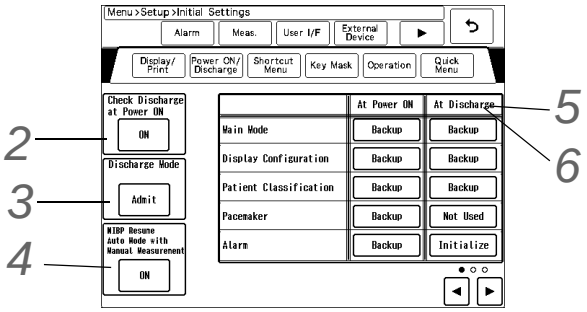
3 Label
Set the label. Maximum of 14 alphanumeric characters can be entered.

Power ON/Discharge

On this menu, monitoring operation when the power is turned ON or when a patient is discharged can be performed.

1 Press the [Menu], [Setup], [Initial Settings], [User I/F], [Power ON/Discharge] keys.

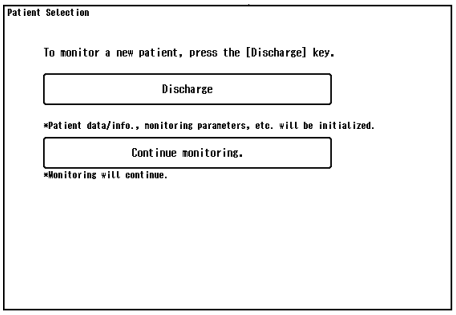
▸ The "Power ON/Discharge" setup menu will be displayed.



2 The trend data will be stored even after the monitoring is ceased by pressing the standby switch. To start monitoring a new patient, it is necessary to perform discharge procedure on the "Admit/Discharge" menu, and clear the data of previous patient. If the power has been turned OFF for 30 seconds or more, whether or not to display the discharge confirmation window at power ON can be selected.

[OFF]: The discharge confirmation window will not be displayed and monitoring will be immediately started.

[ON]: The discharge confirmation window will be displayed at power ON if the power has been turned OFF for 30 seconds or more.



3 Set the monitoring condition after the patient has been discharged.[Admit]: Monitoring will continue even after the discharge operation has been performed.

[Monitor Suspend]: Monitoring will be suspended after the discharge operation. The numeric data display will be cleared, and alarm generation, NIBP periodic measurement, periodic printing will not be performed.

4 Set how to resume NIBP auto mode after the patient has been discharged.[OFF]: At power ON and at discharge, NIBP auto mode will continue even after the patient is discharged regardless of whether the next patient is admitted or not.

[ON]: At power ON and at discharge, NIBP auto mode will resume by starting a manual measurement for the newly admitted patient.

Until the NIBP auto mode is resumed or the interval is changed, "Standby" will be displayed inside the NIBP numeric data box.

5 The backup status when the power is turned ON and when the patient is discharged can be set for each item.

[Backup]: The setting will be backed up.

[Initialize]: Initializes the settings. The initialized settings are as follows.

Selection other than Backup

Item	Setup	Power ON/Discharge
Monitor Mode	Current Mode Monitor Mode 1 to 6	The setting will be initialized to the selected mode.
Display Configuration	Display Mode 1 to 6	The setting will be initialized to the selected mode.
Patient Classification	Adult, Child, Neonate	The setting will be initialized to the selected patient classification.
Pacemaker	Not Used	"Not Used" will be set for "Pacemaker".
Alarm Settings	Initialize	The setting will be initialized with the currently selected mode.
ECG1, ECG2 Lead	Initialize	The setting will be initialized with the currently selected mode.
ECG1, ECG2 Size	Initialize	The setting will be initialized with the currently selected mode.
Impedance Mode ON/OFF	Initialize	The setting will be initialized with the currently selected mode.
CVA Detect	OFF	CVA detection will be set to OFF.
NIBP Auto Mode	OFF	NIBP auto mode will be turned OFF.
	OFF, 2.5 min	If NIBP Auto Mode is OFF, 2.5 min. interval will be set.
	OFF, 5 min	If NIBP Auto Mode is OFF, 5 min. interval will be set.
	2.5 min.	NIBP auto mode will be set to 2.5 min. interval.
	5 min.	NIBP auto mode will be set to 5 min. interval.
BP Scale	Initialize	The setting will be initialized with the currently selected mode.
SpO_2 Averaging	Initialize	The setting will be initialized with the currently selected mode.
CO_2 Scale	Initialize	The setting will be initialized with the currently selected mode.
$EtCO_2$ Peak Duration	10 sec.	$EtCO_2$ peak picking duration will be set to 10 sec.

⚠ CAUTION

- When the discharge process is performed, patient data such as recall and trend will be initialized. The parameter and alarm settings will be reset according to the settings made under [Menu>Setup>Initial Settings>User I/F>Power ON/Discharge).
  When the discharge process is performed on the central monitor, alarm will be reset according to the settings made under "Admit Setup" of the central monitor.

NOTE

- The operation after the power is turned ON will be according to the setting made on [Initial Settings] > [User I/F] > [Power ON/Discharge]. However, if the power was turned OFF for less than 30 seconds, the setting before the power was turned OFF will remain.
- If the "Monitor Mode" setting is other than [Backup], only the display configuration and pacemaker settings can be performed.
- If the alarm threshold of "Setup at Discharge" exceeds the alarm threshold limit, the exceeded alarm threshold will be applied. Make sure to check the alarm setting at admittance as the threshold limit is deactivated in such case.

6 When "Link with Patient Class." is set to [ON], the operation will differ depending on the "Monitor Mode" setting under "Power ON/Discharge". (☞"To Program the User Mode" P5-24)

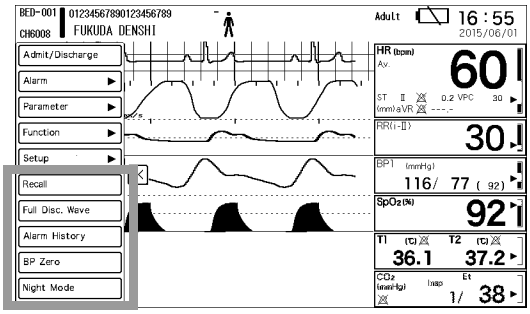
- If [Backup] is set for "Monitor Mode" under "Power ON/Discharge", the settings will be as follows. When "Link with Patient Class." is set to [ON], it is recommended to set [Initialize] for "Alarm" under "Power ON/Discharge".

Power ON/Discharge		Operation	
Patient Classification	Alarm Settings		
Backup	Backup	Patient Classification:	Current patient classification will be maintained.
		Alarm Settings:	Current alarm settings will be maintained.
	Initialize	Patient Classification:	Current patient classification will be maintained.
		Alarm Settings:	Alarm settings of the monitor mode selected for "Link with Patient Class."
Adult	Backup	Patient Classification:	Patient classification will be set to "Adult".
		Alarm Settings:	Current alarm settings will be maintained.
	Initialize	Patient Classification:	Patient classification will be set to "Adult".
		Alarm Settings:	Alarm settings of the monitor mode selected for "Link with Patient Class."
Child	Backup	Patient Classification:	Patient classification will be set to "Child".
		Alarm Settings:	Current alarm settings will be maintained.
	Initialize	Patient Classification:	Patient classification will be set to "Child".
		Alarm Settings:	Alarm settings of the monitor mode selected for "Link with Patient Class."
Neonate	Backup	Patient Classification:	Patient classification will be set to "Neonate".
		Alarm Settings:	Current alarm settings will be maintained.
	Initialize	Patient Classification:	Patient classification will be set to "Neonate".
		Alarm Settings:	Alarm settings of the monitor mode selected for "Link with Patient Class."

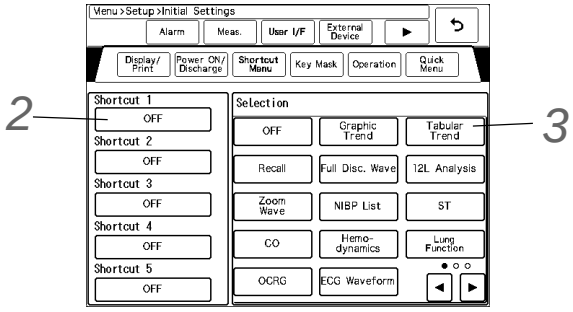
- If settings other than [Backup] is set for "Monitor Mode" under "Power ON/Discharge", the selected monitor mode settings will be applied regardless of the ON/OFF setting of "Link with Patient Class.".

Shortcut Menu

The keys to be displayed on the menu display can be customized.
By registering the frequently used menu, quick access to the menu will become possible.
5 shortcut menus can be set.



1 Press the [Menu], [Setup], [Initial Settings], [User I/F], [Shortcut Menu] keys.



2 Select the area to set the shortcut menu.

3 Select the shortcut menu from the "Selection" list.

▸ The selected menu will be displayed in blue.

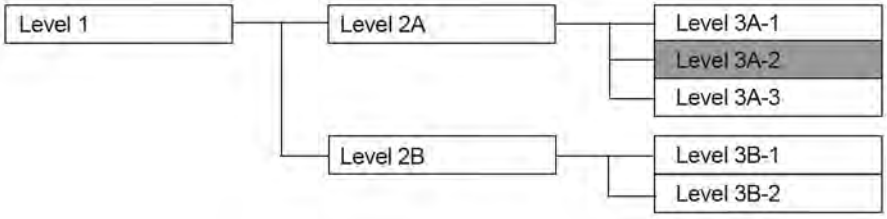
Key Mask

On the "Key Mask" setup menu, unnecessary keys and tabs can be masked.

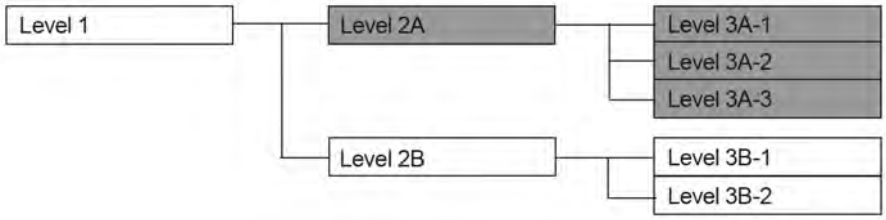
NOTE

- The masked key operation will be disabled on this system, but it will not affect the key operation from the central monitor. The setting can be changed from the central monitor even when the corresponding key is masked on this system.

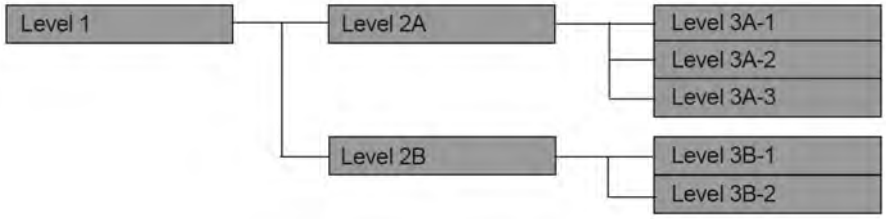
The setup items are in tree structure.
If a upper level key is masked, the lower level key will be also masked.
For the following tree structure, if "Level 3A-2" is masked, only this item will be masked.



If "Level 2A" is masked, the masked items will be as follows.



If "Level 1" is masked, the masked items will be as follows.



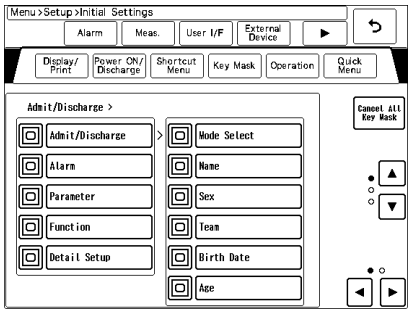
1 Press the [Menu], [Setup], [Initial Settings], [User I/F], [Key Mask] keys to display the "Key Mask" setup menu.

2 Select the item to perform the setting.

NOTE

- If there are no lower level items for the selected item, the display will not change.

▸ The lower level items will be displayed.



3 Press ▣ for the item to mask.

NOTE

- Only the items with ▣ displayed with blue frame can be masked. For the items with white frame, display the lower items to perform the mask setting.
- Even if the key mask setting is performed for the "Initial Setting", the [Key Mask] key cannot be masked.

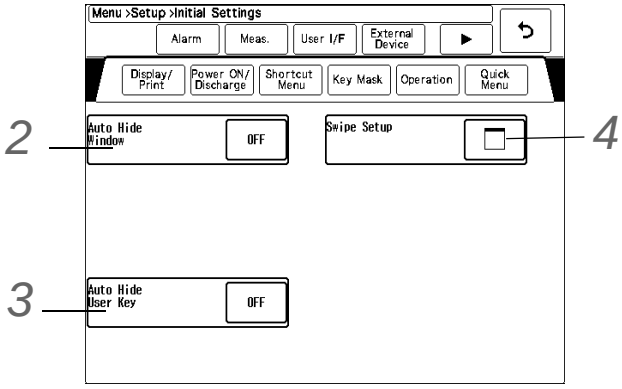
4 To cancel the key mask, press ☐ for the item to display.

Operation Related Setup

The initial settings for the operation can be performed.

1 Press the [Menu], [Setup], [Initial Settings], [User I/F], [Operation] keys.

▸ The "Operation" setup menu will be displayed.



2 Auto Hide Window

The window can be automatically closed after fixed duration.

[OFF]: The window will not automatically close.

[5] to [60]: If no operation was performed for the set duration, the window will automatically close. However, the windows for "Data Review", "Waveform Review", "Calculation", "Initial Settings" will not automatically close.

3 Auto Hide User Key

Whether or not to display the user key area can be selected.

[OFF]: The user key area will always be displayed.

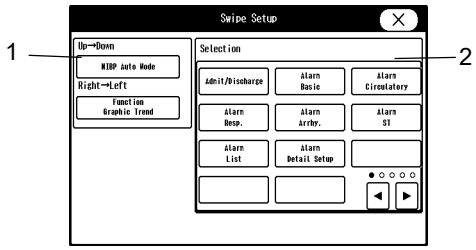
[5] to [60]: The user key area will be hidden by pressing the [Home] key or after being idle for the set duration. To restore the hidden user key area, swipe it upwards.

NOTE

- Depending on the layout, the hidden user key area will differ.
  - Numeric Data Box/Left or Right: All user keys will be hidden.
  - Numeric Data Box/Bottom: The user key area up to the height of the numeric data box will be hidden.

4 Swipe Setup

The function menu to be displayed by swipe operation (up to down, right to left) on the home display can be set.



1 Press the key to perform the setup.

2 Select the function menu from the "Selection" list.

REFERENCE

- The swipe operation from left to right on the home display will display the menu.
- The swipe operation from down to up on the home display will display the user keys if hidden.
- The displayed function can be hidden by the swipe operation.The operation procedure is as follows.
  - For the menu display, swipe from right to left.

- For the user keys, swipe from up to down.
- When the numeric data box is located at right or bottom, and when a window or tool is displayed, swipe operation from right to left will return the display to the home display.In the same way, when the numeric data box is located at left, swipe operation from left to right will return the display to the home display.

Quick Menu Setup

The function menu to be displayed and its displayed color on the quick menu can be set.
(☞Operation Manual "Quick Menu" P3-20)

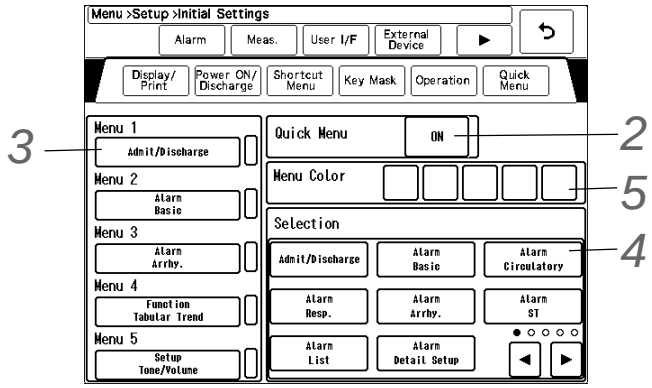
1 Press the [Menu], [Setup], [Initial Settings], [User I/F], [Quick Menu] keys to set the quick menu display.

2 Select whether or not to display the quick menu.

3 Press the key for "Menu 1" to "Menu 5" to perform the setup.

4 Select the function menu from the "Selection" list.

5 Set the color of the function menu.



Setup for the External Device Connection

For the setup procedure of external device connection, refer to the corresponding pages on "Chapter 4 Connection to the External Devices".

System Setup

On the "System" setup menu, system related setup can be performed.

REFERENCE

- For the setup procedures of DS-LAN, telemeter, TCON, refer to the corresponding chapters in this manual.
  (☞"Network System Construction" P2-1)

1 Press the [Menu], [Setup], [Initial Settings], [System], [Other] keys.

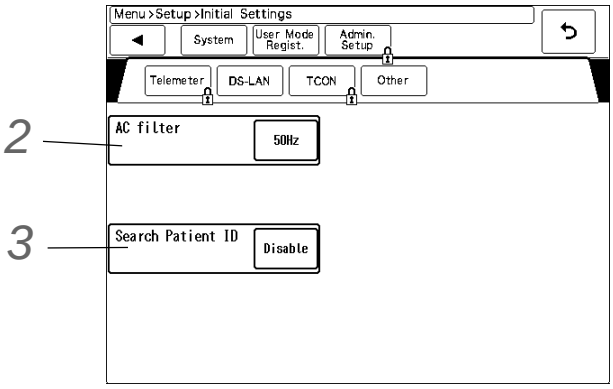
▸ The "System" setup menu will be displayed.

2 Select the AC filter frequency from [50Hz]/ [60Hz].

3 Set the "Search Patient ID".

▸ [Enable]: Patient data can be searched on the patient data server using the patient ID. (☞Operation Manual "Entering Patient Information from the Patient Data Server (When DS-LANIII, TCON is used)" P5-4)

▸ [Disable]: Patient data will not be searched on the patient data server.



User Mode Registration

This section explains about the user mode registration.

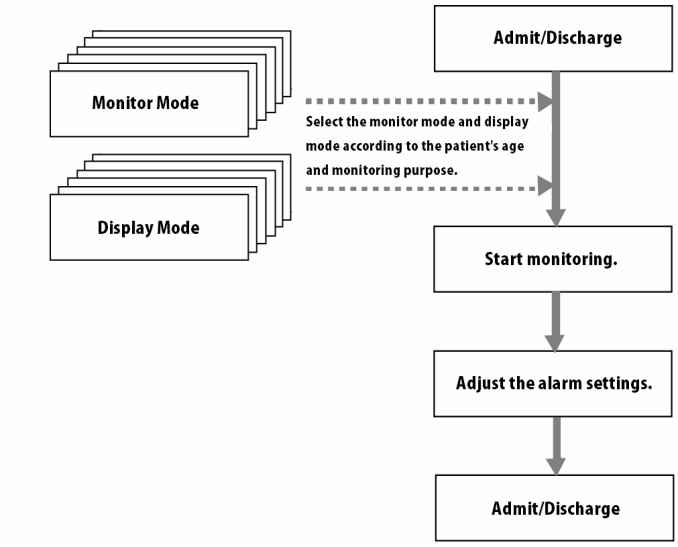
About the User Mode

For the user mode, up to 6 monitor modes of alarm settings and parameter settings can be registered according to the patient's age and monitoring purpose.
By registering the monitor mode and display mode, the alarm and display configuration at patient admittance can be set by just selecting one of the modes. The mode can be registered in rough classification such as patient's age, monitoring purpose (ICU or surgery) to speed up the patient admittance process. The settings can be changed for each patient if necessary.

❑Items that can be registered for the Monitor Mode

The following items can be registered for the monitor mode.

- Mode Name
- Patient Classification
- Alarm
- Manual Printing
- Auto Printing
- Tone/Volume
- Night Mode Setup
- Parameter Setup
- Graphic/Tabular Trend Display
- Synchronized Mark/Tone
- RR/APNEA Alarm Source



❑Items that can be registered for the Display Mode

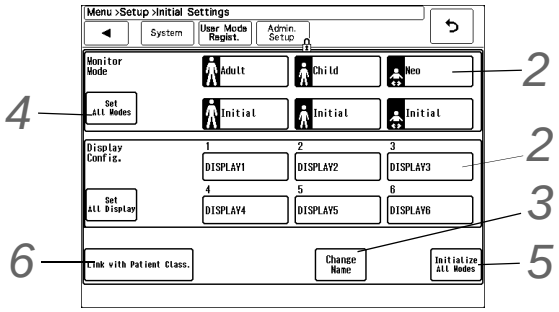
The following items can be registered for the display mode.

- Mode Name
- Display Configuration
- Color
- Brightness

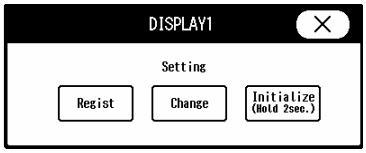
To Program the User Mode

This section explains how to register/change the user mode.

1 Press the [Menu], [Setup], [Initial Settings], [User Mode Regist.] keys to display the user mode registration menu.



2 By pressing the key for each mode, the selection window will be displayed.



- [Regist]: The current monitoring settings will be registered to the selected key.
- [Change]: User mode settings can be changed. The user mode setting window background will be displayed in pink.
- [Initialize]: The settings for the selected key will be initialized.

NOTE

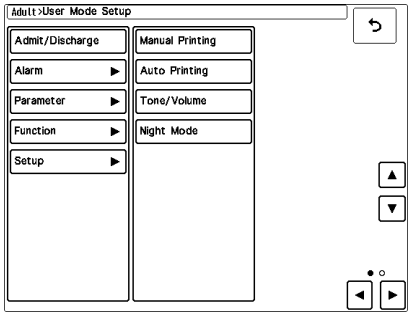
- When a user mode is registered, changed, or initialized, the monitoring mode will change to the selected user mode. The setting made for "Alarm System" under [Menu>Setup>Initial Settings>Alarm] will be applied.

3 To change the user mode name, press the [Change Mode Name] key, and then select the key for the corresponding user mode.

4 The item to set the same settings for all modes can be selected.

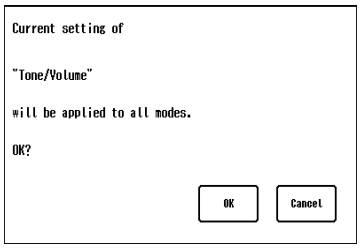
1 Press the [Set All Modes] or [Set All Display] key.

▸ The screen to select the setting item will be displayed.



2 Press the key for the setting item.

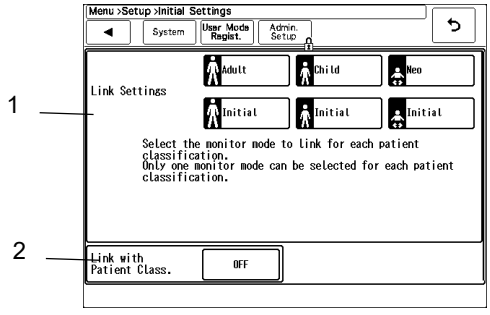
▸ The confirmation window to apply the current setting to all monitor modes or all display modes will be displayed.



3 Press [OK] to apply the current setting to all modes.

5 Press the [Initialize All Modes] key for 2 seconds to initialize all user modes.

6 By pressing the [Link with Patient Class.], the monitor mode to link with the patient classification can be set.



▸ The patient icon indicates the patient classification registered for each monitor mode.
When the monitor mode is linked with the patient classification, the patient icon will change to blue.

1 Link Settings

▸ Select the monitor mode to link with each patient classification. One monitor mode per each patient classification can be set.

NOTE

- When [Regist] or [Initialize] key is pressed on the monitor mode setup window, the link setting for that monitor mode will be canceled.
- When patient classification is changed by pressing the [Set All Modes] key, link settings for all monitor modes will be canceled.

- When [Initialize All Modes] key is pressed, link settings for all monitor modes will be canceled, and "Link with Patient Class." will be set to OFF.

2 ON/OFF of "Link with Patient Class."

- [ON]: The monitor mode will change when the patient classification is changed.
- [OFF]: The monitor mode will not change when the patient classification is changed.

NOTE

- When selecting [ON] for "Link with Patient Class.", set the following in advance.
  *On the "Link Settings", select the monitor mode to link with each patient classification.
  *Set the appropriate alarm limits for the linked monitor mode.
  *Check the settings for "Power ON/Discharge". (☞"Power ON/Discharge" P5-16)

Chapter 6 Setup Item/Default Value

Chapter 6 Setup Item/Default Value

Setup Item

Initial Settings

❑Initial Settings (Alarm)

Item		Description	Default	Backup
Alarm System		Fukuda Tone, Melodic Tone, Standard Tone	Standard Tone	Yes
Basic Alarm Parameter		Each Parameter (S, D, M can be specified for BP)	HR, SpO_2, NIBP-S, CO_2Et	Yes
Suspend Arrhy. Analysis during Noise Interference		ON, OFF	OFF	Yes
Lower Limit for Alarm Volume	Vital Alarm: Urgent	11 levels	0	Yes
	Vital Alarm: Caution		0	
	Vital Alarm: Status		0	
	Ventilator Alarm		0	
	Status Alarm: Urgent		0	
	Status Alarm: Caution		0	
	Status Alarm: Status		0	
	Other Bed Alarm		0	
Alarm Mute		ON, OFF	OFF	Yes
Alarm Mute Reminder		OFF, 15 min., 30 min., 60 min., 120 min.	15 min.	Yes
HR/PR Lower Limit during Alarm Auto Setting		OFF, 30 bpm, 40 bpm	OFF	Yes
Alarm Auto		Enable, Disable	Disable	Yes
Alarm Threshold Limit	Parameter	HR, Ext Tachy, Ext Brady, SpO_2, Ext SpO_2, PR-SpO_2, PR-SpO_2-2, PR_IBP, NIBP-S, BP1-S, RR, APNEA, $EtCO_2$	Disable	Yes
	Setting Range	(Standard alarm setting range will be applied.)		
Alarm Indicator Setup	Level S[*1]	ON, OFF	ON	Yes
	Level H		ON	Yes
	Level M		ON	Yes
	Level L		ON	Yes
	Ventilator Alarm		ON	Yes
	Synchronize with HR/RR	Sync. to HR, Sync. to RR, OFF	OFF	Yes
Alarm Level [*2]		DS-LAN Standard Setup, User Setup	DS-LAN Standard Setup	Yes
Numeric Data	HR:	S, H, M	M	Yes
	ST	H, M	M	Yes
	BP1 to 4	H, M	M	Yes

Item		Description	Default	Backup
	PR_IBP	H, M	M	Yes
	SpO_2	H, M	M	Yes
	Ext SpO_2	H, M	H	Yes
	PR_SpO_2	H, M	M	Yes
	NIBP	H, M	M	Yes
	TEMP1 to 6	H, M, L	L	Yes
	Tb	H, M, L	L	Yes
	RR	H, M, L	M	Yes
	Apnea	H, M, L	H	Yes
	CO_2 In	H, M	M	Yes
	CO_2 Et	H, M	M	Yes
	SpCO	H, M, L	L	Yes
	SpMet	H, M, L	L	Yes
	SpHb	H, M, L	L	Yes
Arrhythmia	Asystole	S, H	H	Yes
	VF	S, H	H	Yes
	VT	S, H	H	Yes
	Ext Tachy	S, H	H	Yes
	Ext Brady	S, H	H	Yes
	Slow VT	H, M	H	Yes
	Tachy	S, H	H	Yes
	Brady	S, H	H	Yes
	Run	H, M	M	Yes
	Pause	H, M	M	Yes
	Triplet	H, M, L	L	Yes
	Couplet	H, M, L	L	Yes
	R on T	H, M, L	L	Yes
	Multiform	H, M, L	L	Yes
	Vent Rhythm	H, M, L	L	Yes
	Bigeminy	H, M, L	L	Yes
	Trigeminy	H, M, L	L	Yes
	Frequent	H, M, L	L	Yes
	SVT	H, M, L	L	Yes
	Irregular RR	H, M, L	L	Yes
	Prolonged RR	H, M, L	L	Yes
	S Frequent	H, M, L	L	Yes
	S Couplet	H, M, L	L	Yes
	VPC	L	L	Yes
	SVPC	L	L	Yes
	Pacer Not Capture	H, M, L	L	Yes
	Pacer Not Pacing	H, M, L	L	Yes
Technical	SpO_2 Low Perfusion	L, N	L	Yes
	Check NIBP cuff, hose	M, L, N	L	Yes

Item	Description	Default	Backup
NIBP meas. failed. (***-**)	M, L, N	M	Yes
Check System Conn.	L, N	N	Yes
Chk DS-LAN Comm	L, N	L	Yes
Some parameters are not displayed due to the display layout setting.	L, N, OFF	N	Yes
Check Electrodes	H, M, L	L	Yes
SpO_2 Check Sensor Attach.	H, M, L	L	Yes
Chk TCON Reception	L, N	L	Yes
BP Transducer OFF	M, L	L	Yes

*1: This setting is selectable only when [Fukuda Tone] is set for "Alarm System".

*2: Set the Alarm Level to [User Setting] before setting the alarm level for each parameter.

❑Initial Settings (Measurement)

Item		Description	Default	Backup
NIBP Start 5 min. early		ON, OFF	OFF	Yes
MAP Calculation (ART, NIBP)		Wave, Calc.	Wave	Yes
Arrhythmia Analysis Filter		Disp Waveform, Fixed	Disp Waveform	Yes
Synchronized Mark/Tone Priority		ECG, SpO_2	ECG	Yes
HR/PR Source Priority		ECG/SpO_2/BP, ECG/BP/SpO_2, SpO_2/ECG/BP, SpO_2/BP/ECG, BP/ECG/SpO_2, BP/SpO_2/ECG	ECG/SpO_2/BP	Yes
BP User Label	Label 1	3 alphanumeric characters	US1	Yes
	Label 2		US2	
	Label 3		US3	
	Label 4		US4	
	Label 5		US5	
TEMP User Label	Label 1	3 alphanumeric characters	US1	Yes
	Label 2		US2	
	Label 3		US3	
	Label 4		US4	
	Label 5		US5	
	Label 6		US6	
	Label 7		US7	
Measurement Unit	CO_2	mmHg, kPa, %	mmHg	Yes
	BP	mmHg, kPa	mmHg	Yes
	CVP	mmHg/kPa, cmH_2O	mmHg/kPa	Yes
	TEMP	°C, °F	°F	Yes
	ST	mm, mV	mm	Yes
	Height/Weight	cm/kg, in/lb	in/lb	Yes
Catheter Manufacturer for CC Input	Manufacturer 1	8 alphanumeric characters	BIOSENS	Yes
	Manufacturer 2		ARGON	
	Manufacturer 3		EDWARDS	

❑Initial Settings (User I/F)

Display/Print

Item		Description	Default	Backup
Date		07/19, Jul.19, 19 Jul	Jul. 19	Yes
BP Alarm Increment		Normal, Small	Normal	Yes
RR Alarm Increment		Normal, Small	Normal	Yes
Trend Clip		ON, OFF	ON	Yes
BP Printing Scale		20 mm, 40 mm	40 mm	Yes
Night Mode Cancel		Any Key, Night Mode Key	Any Key	Yes
ST Display Lead Setup (A to C)		4 leads for each pattern of A to C I to V6, OFF	ST-A: I, II, III, aVR ST-B: aVL, aVF, V1, V2 ST-C: V3, V4, V5, V6	Yes
Patient Name on the Information Display Area		ON, OFF	ON	Yes
Dim All Data Other than Numeric		ON, OFF	OFF	Yes
All Window Opaque		ON, OFF	OFF	Yes
Printer Message		ON, OFF	ON	Yes
Message Icon		ON, OFF	OFF	Yes
12-Lead Analysis Filter Display		Frequency, Filter Type	Frequency	Yes
Waveform Size Display		Numeric, Bar, Bar (10 mm)	Numeric	Yes
Battery Operation		Normal, Low Power	Normal	Yes
Time to Dim the Display at Power Saving Mode		0 sec., 5 sec., 10 sec., 20 sec., 30 sec., 60 sec.	0 sec.	Yes
Menu Display for Host Monitor Connection		Monitoring, Timer, Event Manager, Patient Name	Monitoring	Yes
Event Manager Setup	Event 1	8 alphanumeric characters	Event 1	Yes
	Event 2		Event 2	Yes
	Event 3		Event 3	Yes
	Event 4		Event 4	Yes
Monitor Suspend Setup	Monitor Suspend Label	ON, OFF	OFF	Yes
	Monitor Suspend Timer	ON, OFF	OFF	Yes
	Label 1	ON, OFF Label: 7 characters Color: 16 colors	ON (SUSPENDED/Red)	Yes
	Label 2		ON (UNDER EXAM/Pink)	Yes
	Label 3		ON (IN REHAB/Green)	Yes
	Label 4		ON (BATHING/Orange)	Yes
	Label 5		ON (OUT/Light Orange)	Yes
	Label 6		ON (SURGERY/Violet)	Yes
	Label 7		ON (RESTROOM/Light Blue)	Yes
	Label 8 to Label 15		OFF	Yes

Display/Print

Item		Description	Default	Backup
Time Shift	Day Shift	Selectable Time	08:00	Yes
	Twilight Shift		16:00	Yes
	Night Shift		00:00	Yes
Key Group Setup	Label A to E	8 alphanumeric characters	Blank*	Yes
	A to E	Up to 8 user keys can be registered to each group (Home, Key Lock, Menu, Mode Select, Alarm Silence, Admit/Disch., Alarm Suspend, Rapid Discharge, NIBP Start/Stop, HR/PR Source, NIBP Cont., HR/PR, ECG Size (All Leads), Alarm History, BP Zero, Print Start/Stop, Scale, Monitor Suspend, SpO_2 Display ON/OFF, CO_2 Display ON/OFF, Suspend CO_2, Freeze, ST, Cardiac Output, Short Trend ON/OFF, PCWP, Transparent Window ON/OFF, Hemodynamics, Change Palette, Lung Function, Graphic Trend, Full Disc. Wave, 12-Lead Analysis, ECG Waveform, Tabular Trend, Tone/Volume, NIBP List, NIBP Auto Mode, Recall, Alarm Setup (List), Alarm Setup (Basic), Other Bed, Print (LBP) Cancel, OCRG, Manual Printing, Display Config., Time/Date, MPDR, Stopwatch, Adult Mode, Child Mode, Neonate Mode, Default_Adult, Default_Child, Default_Neonate, Display)	None	Yes
Event Label Setup	Event 1 to Event 8	8 alphanumeric characters	Event 1 to Event 8	Yes

*: When blank, "Group n" will be displayed.

Power ON/ Discharge

Item	Description	Default	Backup
Check Discharge at Power ON	ON, OFF	ON	Yes
Discharge Mode	Admit, Monitor Suspend, Standby	Admit	Yes
NIBP Resume Auto Mode with Manual Measurement	ON, OFF	ON	Yes

Power ON/ Discharge

Item		Description	Default	Backup
At Power ON Backup/Initialize	Monitor Mode	Backup, Current Mode, Adult, Child, Neonate, Initial_Adult, Initial_Child, Initial_Neonate	Backup	Yes
	Display Configuration	Backup, Display1, Display 2, Display 3, Display 4, Display 5, Display 6	Backup	Yes
	Patient Classification	Backup, Adult, Child, Neonate	Backup	Yes
	Pacemaker	Backup, Not Used	Backup	Yes
	Alarm Settings	Backup, Initialize	Backup	Yes
	ECG1, ECG2 Lead	Backup, Initialize	Backup	Yes
	ECG1, ECG2 Size	Backup, Initialize	Backup	Yes
	Impedance Mode ON/OFF	Backup, Initialize	Backup	Yes
	CVA Detect	Backup, OFF	Backup	Yes
	NIBP Auto Mode	Backup, OFF OFF->2.5 min., OFF->5 min., 2.5 min., 5 min.	Backup	Yes
	BP Scale	Backup, Initialize	Backup	Yes
	SpO_2 Averaging	Backup, Initialize	Backup	Yes
	CO_2 Scale	Backup, Initialize	Backup	Yes
	$EtCO_2$ Peak Duration	Backup, 10 sec.	Backup	Yes
At Discharge Backup/Initialize	Monitor Mode	Backup, Current Mode, Adult, Child, Neonate, Initial_Adult, Initial_Child, Initial_Neonate	Backup	Yes
	Display Configuration	Backup, Display1, Display 2, Display 3, Display 4, Display 5, Display 6	Backup	Yes
	Patient Classification	Backup, Adult, Child, Neonate	Backup	Yes
	Pacemaker	Backup, Not Used	Not Used	Yes
	Alarm Settings	Backup, Initialize	Initialize	Yes
	ECG1, ECG2 Lead	Backup, Initialize	Initialize	Yes
	ECG1, ECG2 Size	Backup, Initialize	Initialize	Yes
	Impedance Mode ON/OFF	Backup, Initialize	Initialize	Yes
	CVA Detect	Backup, OFF	OFF	Yes
	NIBP Auto Mode	Backup, OFF OFF->2.5 min., OFF->5 min., 2.5 min., 5 min.	OFF	Yes
	BP Scale	Backup, Initialize	Initialize	Yes
	SpO_2 Averaging	Backup, Initialize	Initialize	Yes
	CO_2 Scale	Backup, Initialize	Initialize	Yes
	$EtCO_2$ Peak Duration	Backup, 10 sec.	10 sec.	Yes

Shortcut Menu

Item	Description	Default	Backup
Shortcut 1	OFF, Graphic Trend, Tabular Trend, Recall, Full Disc. Wave, 12-Lead Analysis, Zoom Wave, NIBP List, ST, CO, Hemodynamics, Lung Function, OCRG, ECG Waveform, Alarm History, Other Bed, NIBP Auto Mode, PCWP, Suspend CO_2, BP Zero, Monitor Suspend, Alarm Silence, Alarm Suspend, Night Mode, Alarm Setup (List), Alarm Setup (Basic), Mode Selection, Display Config., Tone/Volume, Manual Printing, Auto Printing, Time/Date, Color, Brightness, Initial Settings, Maintenance, MPDR	OFF	Yes
Shortcut 2		OFF	Yes
Shortcut 3		OFF	Yes
Shortcut 4		OFF	Yes
Shortcut 5		OFF	Yes

Key Mask

Item		Description	Default	Backup
Key Mask	Admit/Discharge Items	ON/OFF	All ON	Yes
	Alarm	ON/OFF	All ON	Yes
	Parameter	ON/OFF	All ON	Yes
	Function	ON/OFF	All ON	Yes
	Setup	ON/OFF	All ON	Yes

Operation (Touch Panel, etc.)

Item		Description	Default	Backup
Window	Auto Hide Window	OFF, 5, 10, 20, 30, 60 sec.	OFF	Yes
	Auto Hide User Key	OFF, 5, 10, 20, 30, 60 sec.	OFF	Yes
Swipe Setup	Up->Down	Admit/Discharge, Basic Alarm, Circulatory Alarm, Respiratory Alarm, Arrhythmia Alarm, ST Alarm, Alarm List, Alarm Detail Setup, ECG, RESP, NIBP, SpO_2, NIBP Auto Mode, Graphic Trend, Tabular Trend, Recall, ECG Waveform, OCRG, Full Disc. Wave, ST, Alarm History, NIBP List, Zoom Wave, Display Config., Manual Printing, Auto Printing, Tone/Volume, Time/Date, Color, Brightness, Night Mode, Mode Selection	NIBP Auto Mode	Yes
	Right->Left		Graphic Trend	Yes

Quick Menu

Item		Description	Default	Backup
Quick Menu		ON, OFF	ON	Yes
Menu Setup	Menu 1	Admit/Discharge, Basic Alarm, Circulatory Alarm, Respiratory Alarm, Arrhythmia Alarm, ST Alarm, Alarm List, Alarm Detail Setup, ECG, RESP, NIBP, BP, SpO_2, TEMP, CO_2, Sp*, Graphic Trend, Tabular Trend, Recall, 12-Lead Analysis, ECG Waveform, OCRG, Full Disc. Wave, ST, CO, Alarm History, Zoom Window, Hemodynamics, Lung Function, Other Bed, MPDR, Display Config., Manual Printing, Auto Printing, Tone/Volume, Time/Date, Color, Brightness, Night Mode	Admit/Discharge	Yes
	Menu 2		Basic Alarm	Yes
	Menu 3		Arrhythmia Alarm	Yes
	Menu 4		Tabular Trend	Yes
	Menu 5		Tone/Volume	Yes

Quick Menu

Item		Description	Default	Backup
Menu Color	Menu 1	Gray, Yellow, Blue, Red, Green	Gray	Yes
	Menu 2		Red	Yes
	Menu 3		Yellow	Yes
	Menu 4		Blue	Yes
	Menu 5		Gray	Yes

❑Initial Settings (External Device)

Analog Output

Item		Description	Default	Backup
Analog Synchronized Signal Output		ON, OFF	ON	Yes
Analog Output 1	Analog Output 1	Selected ECG Lead, Displayed ECG Lead, Multiparameter Connector 1-1, Multiparameter Connector 1-2, Multiparameter Connector 2-1, Multiparameter Connector 2-2	Displayed ECG Lead	Yes
	Output Lead Sel.*	I, II, III, aVF, aVL, aVR, V1, V2, V3, V4, V5, V6	I	
Analog Output 2	Analog Output 2		Multiparameter Connector 1-1	Yes
	Output Lead Sel.*	I, II, III, aVF, aVL, aVR, V1, V2, V3, V4, V5, V6	I	
Analog Output 3	Analog Output 3	Selected ECG Lead, Displayed ECG Lead, Multiparameter Connector 1-1, Multiparameter Connector 1-2, Multiparameter Connector 2-1, Multiparameter Connector 2-2, Sync. Signal	Sync. Signal	Yes
	Output Lead Sel.*	I, II, III, aVF, aVL, aVR, V1, V2, V3, V4, V5, V6	I	
	Signal Output	HR, RR	OFF	Yes
	Output Logic	Positive Logic, Negative Logic	Negative Logic	Yes
	Pulse Width (msec)	100, 60, 20	100	Yes

*: "Output Lead Sel." will be displayed when [Selected ECG Lead] is set for "Analog Output".

Magnetic Card Reader

Item		Description	Default	Backup
Starting Digit / Ending Digit	Patient ID	Entering using numeric keys	1-20	Yes
	Patient Name		OFF–OFF	Yes
	Birth Year		OFF–OFF	Yes
	Birth Month		OFF–OFF	Yes
	Birth Day		OFF–OFF	Yes
	Age		OFF–OFF	Yes
	Sex		OFF–OFF	Yes
Auto Reference to Central Monitor when Reading Patient ID		ON, OFF	OFF	Yes

AC Unit

Item		Description	Default	Backup
Communication Setup*	COM	OFF, PC Comm., HLX, TCON, BIS, Barcode Reader, Magnetic Card Reader, PC Comm. (DS-5000)	OFF	Yes

AC Unit

Item		Description	Default	Backup
	Status II	OFF, SV-300, SERVO-i/s, SERVO-U/n/air, Velia, Ultra, Astral, PB, Evita, BIS	OFF	Yes

Network

Item		Description	Default	Backup
Printer*	Network Printer	OFF, DS-LAN	OFF	Yes
	Central Monitor	001 to 016	001	Yes

Status Output

Item		Description	Default	Backup
Alarm Output Setup*	Alarm to Output	OFF, APNEA, Level H, Level H,M, Level H,M,L	OFF	Yes
	Status II	Positive Logic, Negative Logic, Pulse	Negative Logic	Yes

NOTE

- For the item with *mark, the setting is backed up on the AC Unit (DSA-81). Therefore, the settings may change if the AC Unit (DSA-81) is replaced.

❑Initial Settings (System)

Item		Description	Default	Backup
DS-LAN*	DS-LAN Setup	DS-LANII (10Mbps) , DA-LANIII (100Mbps)	DA-LANIII (100Mbps)	Yes
	Room ID	3 alphanumeric characters	BED	Yes
	Bed ID	3 numerics	000	Yes
	DS-LAN Pat. ID Transmission Start Position	1st to 20th character	1st character	Yes
	Synchronize Hemodynamic Data with the Central Monitor	ON, OFF	OFF	Yes
	CO_2 (mmHg) Upper Limit of Transmission	No limit, 99mmHg	99mmHg	Yes

Item		Description	Default	Backup
Telemeter	Usage	ON, OFF	ON	Yes
	Channel	HLX-801 (FA) 0801 to 0879, 0900 to 0979 1000 to 1079, 1100 to 1179 1200 to 1279, 1300 to 1379 HLX-801 (G) 9501 to 9539, 9600 to 9639 9700 to 9739, 9800 to 9839 9900 to 9938, 2701 to 2739 2800 to 2839, 2900 to 2918 2921 to 2939, 3000 to 3039 3100 to 3118	Telemetry Transmission Depends on the telemetry transmitter module	Yes
	Group	00 to 63	00	Yes
	Transmitting Waveform	ECG1(ECG1, RESP, CO_2, BP1, BP2, SpO_2), ECG2 (ECG1. ECG2. RESP/ CO_2, BP1, SpO_2)	ECG1(ECG1, RESP, CO_2, BP1, BP2, SpO_2)	Yes
	CO_2 (mmHg) Upper Limit of Transmission	No limit, 99mmHg	99mmHg	Yes
TCON Setup*	TCON	ON, OFF	OFF	Yes
	TCON ID	1 to 16	OFF	Yes
	TCON Channel	1 to 60	OFF	Yes
Other	AC Filter	50Hz, 60Hz	60 Hz	Yes
	Search Patient ID*	Enable, Disable	Disable	Yes

NOTE

- For the item with *mark, the setting is backed up on the AC Unit (DSA-81). Therefore, if the AC Unit (DSA-81) is replaced, the setting may change.

❑Initial Settings (User Mode Registration: Monitor Mode)

Item		Description	Default	Backup
Monitor Mode	Mode Name	8 characters	Adult	Yes
			Child	
			Neo	
			Initial_Adult	
			Initial_Child	
			Initial_Neo	

The following settings can be registered for the monitor mode. Other than display configuration setting, the default settings will be applied to all modes.

Patient Classification
Manual Printing Settings
Auto Printing Settings
Tone/Volume Settings
Night Mode Settings
Alarm Settings
Settings for Each Parameter
Settings for Review Data (GraphicTrend, Tabular Trend, Recall, OCRG, ST, Zoom Wave, Full Disc. Wave)

❑Initial Settings (User Mode Registration: Display Configuration)

Item		Description	Default	Backup
Display Mode	Mode Name	8 characters	Display 1	Yes
			Display 2	
			Display 3	
			Display 3	
			Display 4	
			Display 5	

The following settings can be registered for the display mode. Other than display configuration setting, the default settings will be applied to all modes.

Display Configuration Color Settings Brightness Settings

Display Mode 1

Item		Default	Backup
Label		Display 1	Yes
Layout		Standard/1 Column	
Numeric Data		HR, SpO_2, NIBP, RR_IMP	
Waveform		ECG1, SpO_2, RESP	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)	Grid	ON	
	Scale	ON	
	Thickness	Regular	
	Clip	ON	
	Fill CO_2 Waveform	ON	
	ST/VPC/Arrhy. Alarm Display	ON	
	Block Cascade	Waveform Quantity: 2 Waveform: ECG1, ECG2	

Display Mode 2

Item		Default	Backup
Label		Display 2	Yes
Layout		Standard/2 Columns	
Numeric Data		HR, SpO_2, NIBP, RR_IMP	
Waveform		ECG1, SpO_2, RESP	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)		(Same as Display Mode 1)	

Display Mode 3

Item		Default	Backup
Label		Display 3	Yes
Layout		Enlarged Numeric	
Numeric Data		HR, SpO_2, NIBP, RR_IMP	
Waveform		ECG1, SpO_2, RESP	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)		(Same as Display Mode 1)	

Display Mode 4

Item		Default	Backup
Label		Display 4	Yes
Layout		Standard/1 Column	
Numeric Data		HR, SpO_2, NIBP, RR_CO_2, RR_IMP, CO_2	
Waveform		ECG1, SpO_2, RESP, CO_2	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)		(Same as Display Mode 1)	

Display Mode 5

Item		Default	Backup
Label		Display 5	Yes
Layout		Standard/2 Columns	
Numeric Data		HR, SpO_2, NIBP, RR_IMP, CO_2, RR_CO_2	
Waveform		ECG1, SpO_2, RESP, CO_2	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)		(Same as Display Mode 1)	

Display Mode 6

Item		Default	Backup
Label		Display 6	Yes
Layout		Enlarged CO_2	
Numeric Data		HR, SpO_2, NIBP, RR_IMP, CO_2, RR_CO_2	
Waveform		ECG1, SpO_2, RESP, CO_2	
User Key		Alarm Silence, Display, Alarm (Basic), NIBP Auto Mode, Monitor Suspend, Full Disc. Wave	
Short Trend		OFF	
		15 min.	
Detail Setup (Numeric Data)	Alarm Limit Display	Graph	
	At Alarm Occurrence	Reversed	
Detail Setup (Waveform)		(Same as Display Mode 1)	

❑Initial Settings (Link with Patient Classification)

Item		Description	Default	Backup
Link Settings	Adult	Monitor Mode1 to 6	OFF	Yes
	Child		OFF	
	Neonate		OFF	
Link with Patient Class.		ON, OFF	OFF	

External Connection (Pin Assignments)

This section lists the connector pin assignments.

Serial Connector Output Signal

No.	Signal Name	Remarks	Signal Level
1	RESET	Reset	Open Collector Output (Internal Pull-Up Resistor)
2	NC	Not connected	
3	TxD	Serial Transmission Data Output	RS232C
4	GND_ISO	Isolation Ground	
5	RxD	Serial Reception Data Input	RS232C
6	+5V	+5V Power Supply Output	+5V Power Supply (150mA)
7	NC	Not connected	
8	NC	Not connected	

Status I/O Signal (Status II Connector)

No.	Signal Name	Remarks	Signal Level
1	ALARM_OUT1	Alarm Output1	Logic TTL
2	ALARM_OUT2+	Alarm Output2+ (Isolation)	Photo MOS Relay Contact
3	TxD	Serial Transmission Data Output	RS232C
4	RxD	Serial Reception Data Input	RS232C
5	ALARM2_IN+	Alarm Input 2 (Isolation)	Logic Input
6	ALARM2_IN-	Alarm Input 2 Return (Isolation)	
7	+5V	+5V Power Supply Input	+5V Power Supply (150mA)
8	ALARM_OUT2-	Alarm Output 2- (Isolation)	Photo MOS Relay Contact
9	GND_ISO	Isolation Ground	

If isolation is necessary, use the alarm input 2 and output 2.

Analog Output Signal

No.	Signal Name	Remarks	Signal Level
1	QRS/AOUT3	QRS Synchronized Signal/Analog Output 3 Waveform	Synchronized Signal: High Level: +4.3 V to +5.0 V Low Level: 0.3 V and below
2	GND_AOUT	Alarm Output Ground (Isolation)	
3	AOUT2	Analog Output 2 Waveform	
4	AOUT1	Analog Output 1 Waveform	

Chapter 7 Replacement Parts

Chapter 7 Replacement Parts

Periodic Replacement

To ensure reliability of safety, function, and performance of this equipment, the following parts must be replaced periodically.
When replacing, contact your nearest service representative.

⚠ CAUTION

- Replace the periodic replacement parts periodically as specified.
- This equipment utilizes LED for the backlight.Since this LED deteriorates by the life cycle, the display may become dark or may not light by the long term use. In such case, contact your nearest service representative.

Periodic Replacement Parts	Periodic Replacement Period
DS-8007 (Main Unit)	
NIBP Unit	100,000 times of measurement or 6 years, whichever earlier
Lithium-Ion Battery Pack BTO-008	300 times of charge/discharge or 1 year of usage whichever earlier
HCP-810/HCP-820	
CO_2 Unit	30,000 hours

To Check the Periodic Replacement Period

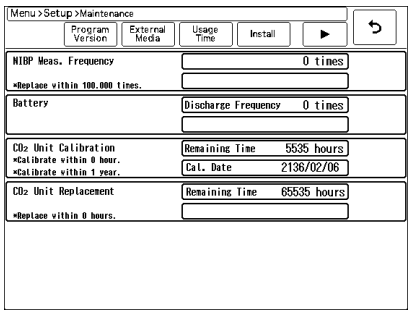
The usage hours for the part which requires periodic replacement can be displayed.
It can be used as an indication of replacement period for each part.

⚠ CAUTION

- When replacing the parts, contact your nearest service representative.

1 Press the [Menu], [Detail Setup], [Maintenance], [Usage Time] keys.

▸ The "Usage Time" window will be displayed.
The usage time for each part will be displayed.



Disposing the Equipment

⚠ CAUTION

- When disposing of the equipment, accessories, follow the regulations of local authority or each institution. Do not dispose of as ordinary waste.
- When disposing of the battery, separate it from other wastes and contact your nearest service representative.
- If there is risk of infection, dispose of as infectious waste according to the regulations of local authority or each institution.

Chapter 8 Cleaning/Disinfecting/Storing

Chapter 8 Cleaning/Disinfecting/Storing

After Usage/Handling the Equipment

This section explains about how to handle the equipment.

After Using the Equipment

- When unplugging the cables, make sure to pull from the connector part of the cable and avoid applying excessive force.
- Clean the equipment, accessories, and cables, and keep them together in one place for next use.
- Always check for adequate supply of ECG electrodes, and other disposable accessories. If any shortage is found, contact your nearest service representative.

Display

- As the touch panel is made of glass, a strong impact may cause damage. Pay attention not to hit or drop the touch panel.
- As the display panel is vulnerable, do not scratch or rub it with a hard item.
- If the display panel cracks, or the internal part of the equipment gets exposed due to any accident, do not touch the display panel or the exposed part. It may cause electric shock or injury to the operator. Contact your nearest service representative.

Storing the Equipment and Recording Paper

This section explains how to store the equipment and recording paper.

Equipment

- Store in a place where the equipment will not be exposed to splashing water.
- Store in an area where the environmental conditions, such as atmospheric pressure, temperature, sunlight, dust, sodium, sulfur, will not adversely affect the system.
- Store in a level area where the equipment is not exposed to vibration and shock (including during transportation).
- Store in an area which meets the following environmental conditions.
  - Storage Temperature: -10°C to 60°C/14°F to 140°F
  - Storage Humidity: 10% to 95% (at 40°C/104°F, non-condensing)
  - Atmospheric Pressure: 70 kPa to 106 kPa

Recording Paper

The recording paper is thermal type. Storage over an extended period of time at a high temperature may change the quality of the printed content, and make it illegible. When storing, follow the precautions below.

- Store in a place where light is shut off and avoid direct sunlight.
- Do not leave the paper in a high temperature (50 °C/122 °F and above).
- Do not store the paper in a polyvinyl chloride bag.
- Do not expose the paper to alcohol, hydrochloric acid, or ester ketone.
- Avoid using adhesive agents other than water based glue.

Cleaning the Equipment and Sensors

This section explains how to clean/disinfect the equipment and sensors.

⚠ CAUTION

- Do not sterilize the equipment.
- Do not disinfect the equipment while monitoring patient.

Touch Panel

Since the display panel of the DS-8007 System incorporates a touch panel, finger prints and other stains are likely to appear on the touch panel.Follow the procedure below to clean the touch panel while monitoring.For disinfecting procedure, refer to the next section, "Housing"..

⚠ CAUTION

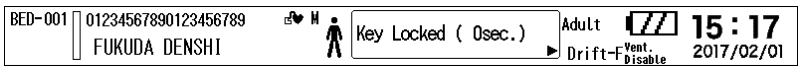
- Never use strong-acidic cleaning solution.
- To clean the touch panel, use an optional cleaning cloth, eyeglass cleaning cloth, soft cotton cloth, or non-woven cloth (pulp, rayon, polyethylene, etc.).

1 Press the [Key Lock] key on the Home Display for more than 2 seconds.

NOTE

- Assign the [Key Lock] key to the user key area in advance.
  (☞Operation Manual "To Configure the Display" P10-4)
- If the touch panel is not touched for 30 seconds, the key lock condition will be automatically canceled.When the key lock condition is canceled, press the [Key Lock] key again.
- In case of emergency, the MENU key (fixed key) can be also used to cancel the key lock condition.

▸ <Key Locked> will be displayed.



▸ While this message is displayed, the touch panel key will be deactivated.

▸ If <LEAD OFF> or other message is displayed, the key lock message will not be displayed.

2 Wipe the touch panel using a cleaning cloth.

3 Press again the [Key Lock] key for more than 2 seconds.

▸ The message will disappear, and the key locked condition will be canceled.

Housing

❑Cleaning

Wipe using a tightly squeezed cloth saturated with diluted neutral detergent. Then wipe with a dry cloth.

Usable Cloth:

*Soft cloth (cotton)

*Soft non-woven cloth (pulp, rayon, polyethylene, etc.)

❑Disinfection

Wipe with a cloth dampened with one of the following chemicals. Then, wipe off with dry cloth.

Chemicals:

*Glutaral 2%

*Alcohol (ethanol, isopropyl alcohol for disinfection)

*Benzalkonium Chloride 0.2%

*Benzethonium Chloride 0.2%

*Alkyldiaminoethylglycine Hydrochloride 0.5%

Usable Cloth:

*Soft cloth (cotton)

*Soft non-woven cloth (pulp, rayon, polyethylene, etc.)

⚠ CAUTION

- Clean the equipment frequently so stains can be removed easily.
- To prevent injury, it is recommended to wear gloves when cleaning the equipment.
- When cleaning or disinfecting, do not allow chemical solution to enter the equipment or connectors.
- Do not use organic solvents, thinner, toluene or benzene to avoid damaging the resin case.
- Do not polish the equipment with abrasive, chemical cleaner, alkaline or acidic detergent. Otherwise, the surface resin or paint coating may be damaged, resulting in discoloration, scratches, and other problems.
- For the precautions for storing and handling the chemicals, refer to the instruction manual for the respective chemical.

NIBP Cuff and Air Hose

To clean the cuff shell, remove the bladder and wash it using neutral detergent. Make sure that the cuff is dry before placing back the bladder inside.

For procedure to clean/disinfect the reusable cuff, refer to the instruction manual for the respective cuff.

Do not reuse/resterilize the disposable cuff.

⚠ CAUTION

- After washing, ensure the size indication on the bladder and cuff shell match. Make sure that the cuff hose is threaded through one of the hose openings in the cuff.

BP Transducer

Disinfect the blood pressure transducers according to the manufacturer's guidelines.
Do not reuse / re-sterilize the disposable type transducers.

SpO_2 Sensor

Disinfect the SpO_2 sensor according to the manufacturer's guidelines. Do not reuse/resterilize the disposable SpO_2 sensor.

❑Nellcor Sensor

- Do not soak the sensor in water or antiseptic solution.
- Wipe the DURASENSOR with disinfectant such as 70% alcohol. Do not sterilize by irradiation, steam, or ethylene oxide.
- OxiMax is a single-patient use type sensor. Do not reuse or resterilize.

❑Masimo Sensor

- Do not soak the sensor or patient cable in water or antiseptic solution.
  (Sensors and connectors are not water-proof.)
- Do not sterilize the sensors and cables by irradiation, steam, or ethylene oxide.
- The Masimo disposable sensor can be reused on the same patient if the light emitting and receiving part is clean, and if it is still adhesive to the skin.
  For most of the sensors, the adhesiveness will return by cleaning the sensor with alcohol and completely drying it before applying it to the patient. For details of the cleaning procedure, refer to the instruction manual of the sensor.
- Disinfect the Masimo reusable sensor and patient cable according to the manufacturer's guidelines.
- When cleaning the Masimo reusable sensor and patient cable, disconnect them from the main unit, and follow the procedure below.

1 Wipe the sensor and cable using 70% isopropyl alcohol cotton.

2 Dry it completely with air before reusing.

Temperature Probe

- Disinfect the temperature probe according to the manufacturer's guidelines.
- When cleaning the relay cable, follow the procedure below.

1 Wipe the cable using 70% isopropyl alcohol cotton.

2 Dry it completely with air before reusing.

Cardiac Output Relay Cable

- Do not reuse / resterilize the cardiac output catheter.
- When cleaning, follow the procedure below.

1 Wipe the cable using 70% isopropyl alcohol cotton.

2 Dry it completely with air before reusing.

Airway Adapter for Capnostat 5

- Sterilize the airway adapter according to the manufacturer’s guidelines.
- Do not reuse / re-sterilize the disposable airway adapter.

BISx

- Clean any spillage of blood or solutions on BISx as soon as possible.
- Use lint-free absorbent towels for spill cleanups.
- Dampen the towel with detergent and lukewarm water to aid in cleaning.
- After cleaning, wipe the PIC connector ends with alcohol and allow to dry completely.
- Residual moisture inside the connector may affect BISx performance.
- Use lint-free absorbent towels dampened with a 10% bleach solution, or a commercial disinfectant.

⚠ CAUTION

- BIS sensor is disposable. Do not reuse it.
- Do not reuse the BIS sensor to other patients. It may cause cross-infection.
- The duration for one usage should be within 24 hours.

Chapter 9 Maintenance Check

Chapter 9 Maintenance Check

Daily and Periodic Check

Maintenance Check

Periodic check must be performed. When reusing the equipment which was left unused for a while, always check that the equipment operates properly and safely before use.

In this section, the maintenance check items that must be performed for this equipment are explained. Make sure to perform "Daily Check" and "Periodic Check" described in this section to maintain functionality, performance and reliability. Fukuda Denshi is not liable for any accidents arising from lack of maintenance.

Contact your nearest service representative for information on basic performance.

For additional information required by the service and technical engineers to service the equipment, refer to your nearest service representative.

⚠ CAUTION

- Do not open the housing.
- Do not allow alcohol or other liquids to enter the equipment.

❑Daily Check

Perform the daily check according to the procedure described in this section.

❑Periodic Check

Periodic check of medical electronic equipment is mandatory to prevent failures and accidents and to ensure safety and reliability.

Periodic check may be performed by the medical institution or by a third party by concluding a "Maintenance Contract".

For more details, contact your nearest service representative.

Daily Check Items and Procedures

Perform the daily check using the following list.

- If the equipment fails any check item on the daily check list, the general judgment will be "Fail". Repair the equipment so that it passes all the check items.
- Use the equipment only if the judgments for all the items are "OK".

No.	Check Items	Check Procedure	Criteria
1. Cleanness, Cleaning (Note: Turn OFF the power, and disconnect the power cable and battery before cleaning.)			
01	Cleanness	If contamination is found, perform proper disinfection before the daily check.	No contamination should be found.
02	Cleaning	Visually check the exterior, and perform proper cleaning. For details, refer to "Chapter 8 Cleaning/ Disinfecting/Storing" of Maintenance Manual.	It should be clean.

No.	Check Items	Check Procedure	Criteria
2. External Appearance			
01	External Appearance	Visually check the exterior for scratches, cracks, and rust.	No abnormality should be found.
02	Cables	Check that the cables are intact and firmly connected.	The cables should be intact and firmly connected.
03	Installation	Check whether the equipment is installed on a level surface.	The installation area must be level and free from vibration and shock.
04	Installation	Check whether the equipment is installed in a place susceptible to adverse environment.	The temperature and humidity of the installation area must be as specified. The equipment should not be subjected to splashing water or chemicals.

No.	Check Items	Check Procedure	Criteria
3. Operation			
01	Function	Turn ON the power, and check that the equipment operates normally.	The home display should appear, and the power supply LED should light.
			The date and time should be correct.
02	Function	Turn ON the power, and check that the equipment operates normally.	With the BP relay cable and BP transducer connected, pressing the BP zero balance switch should start the zero balance.
			Pressing the NIBP Start/Stop key should inflate the NIBP cuff.
			Connecting the SpO_2 sensor should light the sensor LED.
03	Function	(When HPD-810/820, HCP-810/820 are used)	The home display should appear, and the power supply LED should light in green.
			When the sampling tube is connected, "0" should be displayed in the numeric data box.
04	CO_2 Calibration (When HCP-810/ 820 is used)	Check the date of the previous calibration. (Refer to the following caution.)	Should be within one year.
		Check the remaining time until the next calibration. [Menu] > [Parameter] > [CO_2]> [CO_2 Cal.]	Should not be 0 hrs.
05	Alarm Indicator	Check the alarm indicator operation by pressing the [Indicator Test] key.	It should light with the color of each level.

No.	Check Items	Check Procedure	Criteria
06	Alarm Sound	Check the alarm sound by pressing the [Test] key. ([Menu] > [Tone/Volume])	The alarm sound should be properly generated from the speaker.
07	Recorder Unit (When HR-800 is used)	Visually check the installed condition of the paper.	The paper should be correctly installed.
			Neither damage nor discoloration should be found.
		Check if the printing operation is smooth, and no abnormal sound is occurring.	The operation should be smooth and no abnormal sound should occur.
08	When the DSA-82 is used	Turn ON the power of the host monitor, and check whether the power supply LED lights.	The power supply LED on the front side of the adapter should light.
09	SD Card for Full Disclosure Waveform (Optional)	Visually check the full disclosure waveform display.	Connect the ECG cable. ECG waveforms should be displayed with the full disclosure waveform function.

No.	Check Items	Check Procedure	Criteria
4. Other Items			
01	Periodic Replacement Parts	Check the number of measurements of the NIBP unit.	It should not exceed 100,000 times.
		Check the number of charging/discharging times or the first usage date of the BTO-008 Lithium-Ion Battery Pack.	The number of charging/discharging times should not exceed 300 times, or usage duration should not exceed one year.
		Check the operation hours of the CO_2 unit (HCP-810/HCP-820).	It should not exceed 30,000 hours.
02	Periodic Inspection	Check the date of the previous periodic inspection.	Should be within one year.
03	Operation Manual	Check that accompanying documents (operational manual, etc.) are stored in specified location.	Should be stored in specified location.

⚠ CAUTION

- If the CO_2 gas calibration is not performed at a specified interval, CO_2 measurement accuracy may be affected and also subsequent gas calibration may not be possible.

Periodic Check Items and Procedures

Perform the periodic check according to the following list.

- The periodic check should be performed once a year.
- If the equipment fails any check item on the periodic check list, the general judgment will be "Fail". Repair the equipment so that it passes all the check items.
- Use the equipment only if the judgments for all the items are "OK".
- Check all cables, equipments, accessories, earth impedance, leakage current, and accuracy.

⚠ CAUTION

- Before the check procedure, back up the setup data and patient data on the external media.
- Some models of commercially available bench top functional testers and patient simulators can be used to verify the proper functionality of SpO_2 monitoring system, sensors, cables, but they are incapable of properly evaluating the SpO_2 measurement accuracy. SpO_2 measurement accuracy can only be evaluated by comparing measurement data with SaO_2 measurements obtained from simultaneously sampled arterial blood using a laboratory Co-

oximeter.

No.	Check Items	Check Procedure	Criteria
1. Preparation, Cleaning			
01	Data Backup, etc.	Before the check procedure, back up the setup data and patient data on the external media. If backup is not possible, write down the setting information, etc. before the check procedure, and restore the settings to original state after the check procedure.	The data should be properly backed up. Or, the setting information, etc. should be written down.
02	Cleanness	If contamination is found, perform proper disinfection before the daily check.	No contamination should be found.
03	Cleaning	Visually check the exterior, and perform proper cleaning. For details, refer to "Chapter 8 Cleaning/Disinfecting/Storing" of Maintenance Manual.	It should be clean.

No.	Check Items	Check Procedure	Criteria
2. External Appearance/Accessories			
01	External Appearance	Visually check the exterior for scratches, cracks, deformation, and rust.	No scratches, cracks, deformation, and rust should be found on the exterior.
02	Label	Visually check the rating label and caution label of the equipment.	Should be neither peeled nor stained nor unclear.
03	Cables	Check that neither damage nor broken wire is found in all cables. Check that the connection is smooth and secure.	Neither damaged nor broken wire should be found. Should be securely connected.
04	Printing Paper (When HR-800 is used)	Visually check the installed condition. Check that extra printing paper is stored.	The paper should be correctly installed. No discoloration should be found. Extra printing paper should be stored.
05	Operation Manual	Check that accompanying documents (operational manual, etc.) are stored in specified location.	Should be stored in specified location.

No	Check Items	Check Procedure	Criteria
3. Power Supply			
01	Standby Switch	Check by connecting the power cable to AC and turning the power ON/OFF using a standby switch.	Check that the power supply LED lights. ON: Green, OFF: Orange
02	Battery-Charging Operation (When a battery is installed)	Install the battery, and check the charging operation.	Check that the battery charging LED lights. Charging is in process: Orange, Fully charged: Green No battery: Light Off
03	Battery Operation (When a battery is installed)	After charging the battery, unplug the power cable, and change to battery operation.	Check that the battery-operating condition is as specified on the operation manual.
04	Replacing the Battery (When a battery is installed)	Check the battery replacement date.	Should be within one year from start of usage.

No	Check Items	Check Procedure	Criteria
4. Display/Operation/Print			
01	Operation, Switch	Check by operating the control switches and keys on the touch panel.	Should operate correctly.
02	LCD	Check that the home display is displayed on the LCD.	Characters and waveform should be clear. The display should be clearly displayed with sufficient brightness.

No	Check Items	Check Procedure	Criteria
03	Alarm Indicator	Check if the alarm indicator lights when the power is turned ON.	Should light when the power is turned ON.
04	Alarm Sound/ Operating Sound	On the "Tone/Volume" menu, check the alarm sound.	Alarm sound should generate with proper volume. There should be no beat noise.
05	Date/Time	Check the year, month, day, and time on the display.	The year, month, day, and time should be correctly displayed.
06	Printing Status (When HR-800 is used)	Perform test printing on the maintenance menu. Visually check the printing condition and also if there are thin or missing points.	The printed characters should be clear and legible.
07	Paper Speed (When HR-800 is used)	Perform test printing on the maintenance menu. Check by measuring the length of printed grid.	Error should be within ±3% for 25 mm/sec and 50 mm/sec waveform traces.
08	Telemetry Transmission	Perform telemetry transmission, and check the reception condition and waveform on the receiver side.	Correct waveforms and numeric data should be displayed and receiving condition should be stable.

No	Check Items	Check Procedure	Criteria
5. ECG			
01	ECG Display Size	Input square wave of 1 mV amplitude from the simulator, and check the displayed waveform on the monitor with a waveform size of x1.	The amplitude of the displayed waveform should be within 10 mm ± 1 mm.
02	Heart Rate Display Accuracy	Set the heart rate to 60 bpm on the simulator, and check the displayed heart rate on the monitor.	The displayed heart rate should be within 60 bpm ± 3 bpm.
03	Lead OFF	Remove each electrode from the simulator and check that "Lead OFF" message is displayed.	The "Lead OFF" message for the removed electrode should be displayed.

No	Check Items	Check Procedure	Criteria
6. Respiration (Impedance Measurement)			
01	Respiration Rate display accuracy	Input the respiration signal of 20 Bpm with the following setting from the simulator, and check the displayed RR value on the monitor. Baseline Impedance : 1500Ω, Detection Lead: II (LL), Respiration Waveform: Normal, Amplitude: 1 Ω	The displayed RR should be within 20 Bpm ± 3 Bpm.

No	Check Items	Check Procedure	Criteria
7. Invasive Blood Pressure			
01	BP Zero	Input the blood pressure of 0 mmHg from the simulator, perform zero balance, and check the BP value on the monitor.	Zero balance should be properly performed, and the displayed BP value should be within 0 mmHg ± 1 mmHg.
02	BP value display accuracy	Set the BP value to 250 mmHg on the simulator, and check the displayed BP value on the monitor.	The displayed BP value should be within 250 mmHg ± 5 mmHg.

No	Check Items	Check Procedure	Criteria
8. SpO_2			
01	Oxygen Saturation Display Accuracy	Input the oxygen saturation signal of 90%SpO_2 from the simulator, and check the displayed oxygen saturation value on the monitor.	The displayed oxygen saturation value should be within 90%SpO_2 ± 2%.
02	Pulse Rate Display Accuracy	Input the pulse rate signal of 60 bpm from the simulator, and check the displayed HR value on the monitor.	The displayed heart rate should be within 60 bpm ± 3 bpm.

No	Check Items	Check Procedure	Criteria

9. NIBP			
01	NIBP Test	Connect the 500 ml tank, and perform the NIBP test under the test menu.	All the test results should be "OK".
02	BP Measurement Error	Set the simulator to 120 mmHg for SYS, 80 mmHg for DIA, 90 mmHg for MAP, and perform the NIBP measurement.	The displayed BP value should be within 120 mmHg ± 10 mmHg for SYS, 80 mmHg ±10 mmHg for DIA, 90 mmHg ±10 mmHg for MAP.
03	Pulse Rate Measurement Error	Set the pulse rate to 60 bpm on the simulator, and perform the NIBP measurement.	The displayed pulse rate should be within 60 bpm ± 3 bpm.

No	Check Items	Check Procedure	Criteria
10. Temperature			
01	Temperature display error	Input the temperature signal of 37°C/98.6°F from the simulator, and check the displayed temperature value on the monitor.	The displayed temperature value should be within 37°C±0.2°C/98.6°F±0.4°F.

No	Check Items	Check Procedure	Criteria
11. Cardiac Output (Blood Temperature, Injectate Temperature)			
01	Blood Temperature Measurement	Input the blood temperature signal of 37°C/ 98.6°F from the simulator, and check the displayed blood temperature value on the monitor.	The displayed blood temperature value should be within 37°C±0.3°C/98.6°F±0.5°F.
02	Injectate Temperature Measurement	Input the injectate temperature signal of 15°C/ 59.0°F from the simulator, and check the displayed injectate temperature value on the monitor.	The displayed injectate temperature value should be within 15°C±0.5°C/59.0°F±0.9°F.

No	Check Items	Check Procedure	Criteria
12. CO_2 Concentration (Optional)			
01	CO_2 Concentration Calibration (HCP-810/820)	Perform calibration according to the procedure explained in "Chapter 9 Maintenance Check [CO_2 Calibration]" (Maintenance Manual).	The calibration should complete without error.
02	CO_2 Concentration Measurement	Perform measurement with 5% calibration gas, and check the displayed CO_2 concentration value on the monitor.	The displayed CO_2 concentration value should be within 38 mmHg ± 2 mmHg.

No	Check Items	Check Procedure	Criteria
13. BIS (Optional)			
01	Sensor Detection	Connect the signal generator and BIS sensor simulator, and check that EEG is displayed.	EEG should be displayed on the monitor.

No	Check Items	Check Procedure	Criteria
14. Analog Output			
01	ECG Output Accuracy	Input 10 Hz sine-wave signal of 1mV (2mVp-p) amplitude from the simulator, connect the oscilloscope to the output, and check the displayed waveform.	The displayed waveform amplitude should be within 1 V ± 0.1 V (2 Vp-p ± 0.2 Vp-p).
02	BP output accuracy	Input BP signal of 0 mmHg, 100 mmHg, 250 mmHg from the simulator, connect the oscilloscope to the output, and check the displayed waveform.	The displayed output voltage should be within 0 V ± 0.1 V at 0 mmHg, The displayed output voltage should be within 1 V ± 0.1 V at 100 mmHg,

No	Check Items	Check Procedure	Criteria
15. Periodic Replacement Parts, Aftertreatment			
01	NIBP Unit	Check the number of measurements or date of first usage.	It should not exceed 100,000 times, or six (6) years from the first usage.

02	Lithium-Ion Battery Pack BTO-008	Check the number of charging/discharging times or the first usage date.	The number of charging/discharging times should not exceed 300 times, or usage duration should not exceed one year.
03	CO_2 Unit (When HCP-810/ HCP-820 is used)	Check the usage hours.	It should not exceed 30,000 hours.
04	Restore Backup Data	After the check procedure, restore the setup data from the external media. If the setting information before the check procedure have been written down, restore the settings to original state as written.	The settings should be properly restored to original state.

No	Check Items	Check Procedure	Criteria
16. Electrical safety			
01	Earth Leakage Current (NC)	Measure the earth leakage current under normal condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Earth Leakage Current (NC) Should be 5mA or less
02	Earth Leakage Current (SFC)	Measure the earth leakage current under single failure condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Earth Leakage Current (SFC) Should be 10mA or less
03	Touch Current (NC)	Measure the touch current under normal condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Touch Current (NC) Should be 100μA or less
04	Touch Current (SFC)	Measure the touch current under single failure condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Touch Current (NC) Should be 500μA or less
05	Patient Leakage Current (NC)	Measure the patient leakage current under normal condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	[AC/DC] Type CF Applied Part Patient Leakage Current (NC) Should be10μA or less
06	Patient Leakage Current (SFC)	Measure the patient leakage current under single failure condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	[AC/DC] Type CF Applied Part Patient Leakage Current (SFC) Should be50μA or less
07	Total Patient Leakage Current (NC)	Measure the total patient leakage current under normal condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	[AC/DC] Type CF Applied Part Patient Leakage Current (NC) Should be 50μA or less
08	Total Patient Leakage Current (SFC)	Measure the total patient leakage current under single failure condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	[AC/DC] Type CF Applied Part Patient Leakage Current (SFC) Should be 100μA or less
09	Patient Auxiliary Current (NC)	Measure the patient auxiliary current (NC) under normal condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Patient Auxiliary Current (NC) Should be10μA or less
10	Patient Auxiliary Current (SFC)	Measure the patient auxiliary current (SFC) under single failure condition using a leak measurement safety tester. Test according to the test method of IEC 60601-1.	Patient Auxiliary Current (SFC) Should be 50μA or less

Handling and Storage of Lithium-Ion Battery Pack (BTO-008)

This section describes the handling and storage of the BTO-008 battery pack. Refer also to the BTO-008 Operation Manual.

❑Handling the Battery

- For uninterrupted monitoring, charge the battery when the battery level is low.
- When the battery operation time becomes short even after it is fully charged, the battery needs to be replaced.
- The battery should be charged at room temperature (10°C to 30°C/50°F to 86°F).
- The lithium-ion battery can only be charged in the specified operating temperatures of the equipment. Refer to the operation manual of the lithium-ion battery (BTO-008) for details.
- When using the battery for the first time, or using after leaving it for a while, make sure to charge the battery before use.

❑Storing

To take advantage of the characteristic of the battery pack, pay attention to the following when storing.

Storage Temperature and Humidity for the Battery

- Store in an environment specified below without corrosive gas.

Storage Period	Storage Temperature	Storage Humidity
Within 30 days	-20°C to 60°C/-4°F to 140°F	20% to 85% (non-condensing)
Within 90 days	-20°C to 45°C/-4°F to 113°F	
Within 1 year	-20°C to 20°C/-4°F to 68°F	

- Do not store in an environment outside the specified temperature range or excessive high humidity. This may result in leakage caused by expansion/contraction inside the battery or rusting of the metal part.

❑Long-Term Storage

- If the battery is left installed in the monitor without use for a long period of time, the capacity recovery after storage may be degraded.
  When storing the monitor for a long period, remove the battery from the monitor.

CO_2 Calibration (HCP-810/HCP-820)

This section describes about the procedure of CO_2 gas calibration.
Perform calibration for the following case.

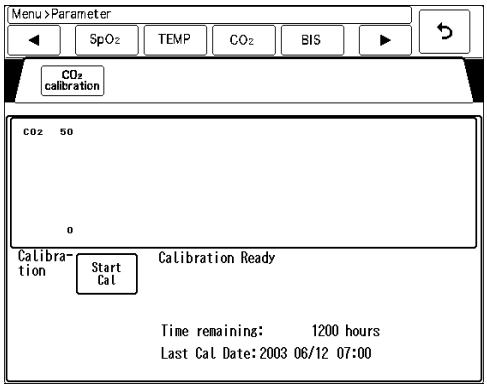
- When the measurement time exceeds 1,200 hours from the first use.
- When 1 year has elapsed from the last calibration; or the accumulated $EtCO_2$ measurement time exceeds 4,000 hours, whichever comes earlier.
- When error occurs to the measurement reading.

1 Press the [Menu], [CO_2] ("Parameter"), [CO_2 Calibration] to display the CO_2 calibration screen.

2 Press the [Start Cal] key and conduct calibration according to the displayed messages.

3 The message, <Feed CAL. GAS> will be displayed. Press the injection button and inject the calibration gas.

4 The message, <Cal. Gas can be removed> will be displayed. Stop pressing the injection button to cease the injection.



5 The message, "CAL. OK" will be displayed. "Last Cal. Date" will be updated to the current date.

▸ If any of the following messages is displayed, start the procedure again from step 2. <CAL. error>, <CAL GAS error>, <Auto Zero fail>, <No stable gas flow>, <CAL. failure>

6 Press the [Cal Complete] key to end the calibration.

⚠ CAUTION

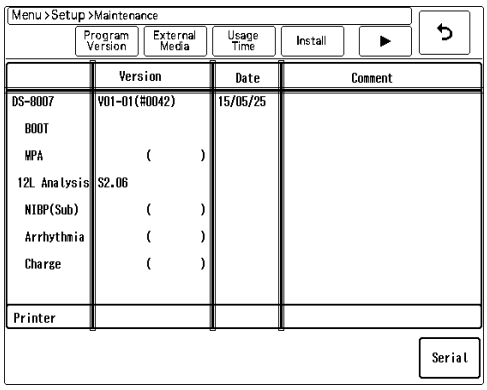
- Perform the calibration 5 minutes after turning ON the power on the HCP-810/HCP-820.
- Do not disconnect the sampling tube during calibration.If the sampling tube is disconnected, calibration will cease.
- Conduct CO_2 calibration for the following case.
  - When the accumulated measurement time exceeds 1,200 hours from the first use. However, if the first calibration was performed before the accumulated measurement time reaches 720 hours, another calibration is required when the accumulated measurement time exceeds 1,200 hours from the first calibration.
  - When 12 months has elapsed or the accumulated measurement time has exceeded 4,000 hours from the previous calibration.
  - When $EtCO_2$ measurement is not stable or accuracy is degraded compared with other measuring device.
  - When the patient monitor was not used for a while, or when $EtCO_2$ was not measured for a while.
  - When a message, "Calibrate the CO_2 unit (HCP-810/HCP-820)" or "The periodic calibration of the CO_2 unit (HCP-810/HCP-820) is approaching" is displayed at power ON.
- Dispose of calibration gas according to the regulation of each medical institution.

Program Version

On the program version screen, software version of the main unit and modules can be verified.

1 Press the [Menu], [Detail Setup], [Maintenance] keys.

- The software version screen will be displayed.
- The software version, boot version, date, comment required for the DS-8007 System will be displayed.
  - Main Unit Software
  - Recorder Unit Software
- [Serial]: The information of the equipment connected to the serial connector of the main unit will be displayed.

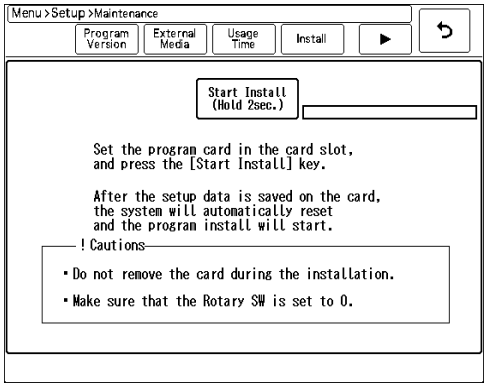


Software Install

The software can be updated on the install screen.

1 Press the [Menu], [Setup], [Maintenance], [Install] keys.

- The software install screen will be displayed.



NOTE

- Users cannot perform the software update process. Refer to your nearest service representative.

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