

DynaScope 7000 Series
Central Monitor

DS-7600 System

Ver.08

Operation Manual



- Before using this device, read this operation manual thoroughly.
- Keep this manual near the device for future reference.

This operation manual is for the DS-7600 System Ver. 08.

⚠ CAUTION

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

CAUTION:

- The company and product names used in this manual are trademarks or registered trademarks.
- If this manual has pages missing or out of order, contact Fukuda Denshi for replacement.
- 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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Printed in Japan

Preface

Thank you for purchasing this product.

Before using this product, read the following precautions to make sure the product is used correctly and safely.

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System Construction

WARNING

- The installation of this equipment will be performed by our service representative. The users should not attempt the installation.
- The system construction and network setup of this equipment should be performed by our service representative or system administrator of your institution.
- Refer to "9. Installation" for procedure of system construction, network setups, and setups to be performed before monitoring. Make sure to follow these procedures and perform correct setups before monitoring.

Safety Precautions

- Read the “Safety Precautions” 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.



Failure to follow this message may cause immediate threat of death or serious injury, or complete failure of the equipment.



Failure to follow this message may result in death or serious injury, or complete failure of the equipment.



Failure to follow this message may cause injury or failure to the equipment.



A note is not related to product safety, but provides information about the correct use and operating procedures to prevent incorrect operation and malfunction of the equipment.

Expression Used in This Manual

●Classification by Display Unit Size

There are following model types for the DS-7600 system.

In this operation manual, DS-7680, DS-7600L are referred to as "DS-7600 series", and DS-7640W, DS-7680W, DS-7600WL are referred to as "DS-7600W series".

	Display Unit Size	Wireless Beds	Max. Monitoring Beds
DS-7600 Series			
DS-7680	15 inch	8 Beds	16 Beds
DS-7600L		—	
DS-7600W Series			
DS-7640W	19 inch	4 Beds	16 Beds
DS-7680W		8 Beds	
DS-7600WL		—	

●Display Example in this Operation Manual

Although the display layout (key size, arrangement, etc.) for the DS-7600 series and DS-7600W series slightly differs, the display example for DS-7600 series will be mainly used in this operation manual.

If the display layout of DS-7600 series and DS-7600W series largely differs, both display examples will be used for explanation.

●Key Display

The keys displayed on the monitor screen will be indicated by .
(Ex.: Menu, Home etc.)

The keys on the keyboard will be indicated by "[]". (Ex: [Delete] key, [Enter] key)

●Classification by System Construction

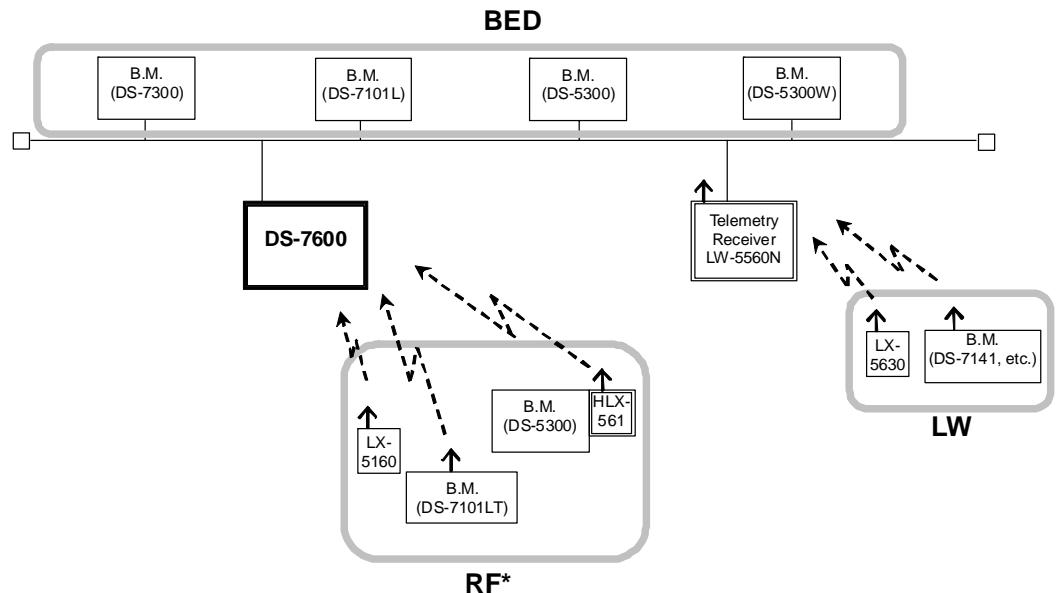
The DS-7600 system is capable of various network construction using wired and wireless network.

Some display and setups on the DS-7600 are restricted depending on the system construction. To explain these restrictions in a way easy to understand, the following expressions are used in this operation manual.

General Term	Expression	Description
Wireless Network Bed*	RF	<p>The monitoring data is transmitted to the built-in telemetry module of the DS-7600 via wireless network.</p> <ul style="list-style-type: none">• Waveforms and numeric data can be displayed on the DS-7600.• Monitoring control is not possible on the DS-7600.
Wired Network Bed	BED	<p>The monitoring data is transmitted to the DS-7600 via wired network.</p> <ul style="list-style-type: none">• Waveforms and numeric data can be displayed on the DS-7600.• Monitoring control is possible on the DS-7600.
	LW	<p>Telemetry bed</p> <ul style="list-style-type: none">• The monitoring data is transmitted to the telemetry receiver (LW-5560N) which is then transmitted to the DS-7600 via wired network (DS-LANII only).• Monitoring control is not possible on the DS-7600.

【Outline of System Construction】

-----> : telemetry transmission



*The DS-7600L/DS-7600WL cannot be installed for a wireless network system (RF).

Labels Attached to the Unit

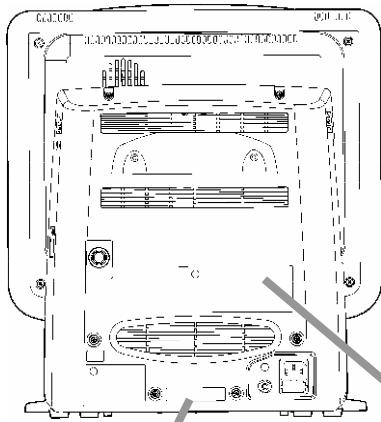
Make sure to read the warning labels attached to the unit and comply with these requirements while operating the unit.



CAUTION

Do not damage or erase the warning labels attached to the unit.

These warning labels contain important descriptions for handling and operating the unit properly and safely. A damaged label may compromise safe operation.



DANGER

Risk of explosion if used in the presence of flammable anesthetics.



CAUTION

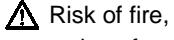
Before connecting, read instruction manual.



CAUTION

To reduce the risk of electric shock, do not remove the cover.

Refer servicing to qualified service personnel.



Risk of fire,
replace fuse as marked.

Measurement Unit for Each Parameter

The measurement units for this equipment are as follows.
 (____ : Default Setting)

Parameter (Default Color)	Detail	Display	Unit
ECG (Green)	Heart Rate	HR	bpm (beats per minute)
	ST level	ST1/ST2	mm / mV
	12-Lead ST Level	STI, STII, STIII, STaVR, STaVL, STaVF, STV ₁ , STV ₂ , STV ₃ , STV ₄ , STV ₅ , STV ₆ ,	mm / mV
Respiration (White)	Respiration Rate	RR (RESP)	Bpm (breaths per minute)
	Apnea Time	APNEA	s (second)
BP	Blood Pressure 1 to 6	BP1 to 6	mmHg / kPa
	Central Venous Pressure	CVP	mmHg / cmH ₂ O [*] *according to the setup on the transmitting bed
NIBP (White)	Non-invasive Blood Pressure	NIBP	mmHg / kPa
SpO ₂ (Yellow)	Arterial Oxygen Saturation	SpO ₂	%
	Pulse Rate	PR	bpm (beats per minute)
Temperature (White)	Temperature 1	T1	°C / °F
	Temperature 2	T2	°C / °F
CO ₂ (White)	End-Tidal CO ₂ Concentration	EtCO ₂	mmHg / kPa / %
	Inspiratory CO ₂ Concentration	InspCO ₂	mmHg / kPa / %
Gas Data CO ₂ : White O ₂ : Green N ₂ O: Blue AGT: White ISO: Purple HAL: Red ENF: Orange SEV: Yellow DES: Light Blue MAC: White	End Tidal Carbon Dioxide	CO ₂ -E	mmHg / kPa / %
	Inspired Carbon Dioxide	CO ₂ -I	mmHg / kPa / %
	End Tidal Oxygen	O ₂ -E	%
	Inspired Oxygen	O ₂ -I	%
	Expired Nitrous Oxide	N ₂ O-E	%
	Inspired Nitrous Oxide	N ₂ O-I	%
	End Tidal Anesthetic Gas	AGT-E	%
	Inspired Anesthetic Gas	AGT-I	%
	Expired Isoflurane	ISO-E	%
	Inspired Isoflurane	ISO-I	%
	Expired Halothane	HAL-E	%
	Inspired Halothane	HAL-I	%
	Expired Enflurane	ENF-E	%
	Inspired Enflurane	ENF-I	%
	Expired Sevoflurane	SEV-E	%
	Inspired Sevoflurane	SEV-I	%
	Expired Desflurane	DES-E	%
	Inspired Desflurane	DES-I	%
	Minimum Alveolar Concentration	MAC	No unit
Vigilance Data • Vigilance • Vigilance CEDV • VigilanceII • Vigileo	Mixed Venous Oxygen Saturation	SvO ₂	%
	Continuous Cardiac Output	CCO	L/minute
	Continuous Cardiac Index	CCI	L/minute/m ²
	Blood Temperature	BT	°C

 CAUTION	In case of DS-LANIII network, if the measurement unit for BP (mmHg/kPa) and temperature (°C/°F) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
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Graphic Symbols

Refer following for the meaning of the symbols indicated on the equipment.

Symbols indicated on the power supply part

Symbol	Description
	Equipotential Terminal Indicates the terminal to equalize the potential difference when interconnecting the devices.

Symbols indicated on the equipment

Symbol	Description
	Inhibition The operation is inhibited. Refer to the instruction.
	Caution; refer to accompanying documents Indicates the need to refer to related accompanying documents before operation.
	Antenna Terminal Indicates the terminal to connect the antenna.
	Electrostatic Sensitive Part Do not touch near this connector directly with hands.
	TCP/IP Network Connector Indicates the TCP/IP network connection.
	Eject Indicates the switch to remove the recorder paper cassette.
	Manufactured Date

Symbols displayed on the screen

Symbol	Description
	Alarm OFF Indicates the alarm is OFF.
	Heart Rate Synchronization Mark This mark flashes synchronizing to the heartbeat.
	Lead OFF Indicates the lead-off condition.
	Check Battery Indicates the low battery condition of the telemetry transmitter.
	Record/Stop Starts/stops the recording.
	Alarm Silence / Event List Display / Too Far Alarm Indicates the alarm generation or too far alarm generation.

<i>Symbol</i>	<i>Description</i>
	Laser Printer Symbol Indicates the laser printer connected to the TCP/IP network is used.
	Laser Printer Operation Progress Symbol The printing progress is indicated by these symbols.
	<u>EMR Notice Icon</u> Indicates that the patient on the electronic medical record is admitted. (When EMR link function is used.)

Precautions for Safe Operation of Medical Electrical Equipment

CAUTION

- Read the following precautions thoroughly to correctly operate the device.
- Users should have a thorough knowledge of the operation before using this system.
 - Pay attention to the following when installing and storing the equipment.
 - Do not install or store in an area where the equipment will be subject to splashing water.
 - Do not install or store in an area where the environmental conditions, such as atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, sodium, sulfur, will 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 there are chemical or gasses stored.
 - 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.
 - Before operating the system, verify the following items.
 - Verify the power voltage.
 - 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 device is used in conjunction with other equipment as it may cause erroneous judgment and danger.
 - Ensure all patient connections are proper and secure.
 - During operation of the system, verify the following items.
 - Always observe the system and patient to ensure safe operation of the equipment.
 - If any abnormality is found on the equipment or patient, take appropriate measures such as ceasing operation of the equipment in the safest way for the patient.
 - Do not allow the patient to come in contact with the device.
 - After using the system, verify the following items.
 - 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 unit clean to ensure proper operation of the next use.
 - If the equipment is damaged and in need of repair, user should not attempt service. Label the unit "OUT OF ORDER" and contact Fukuda Denshi.
 - Do not disassemble or remodel the equipment.
 - Maintenance Check
 - Make sure to periodically check the equipment, accessories and cables.
 - Before reusing the device that has been left unused for a while, make sure that the device works normally and safely.
 - When using the electrosurgical knives or defibrillator with this equipment, verify proper attachment of patient ground plate, ECG electrode type for the electrosurgical knives, and paste volume, output energy for the defibrillator. Also, verify that proper ground is selected.

Precautions for Safe Operation of Medical Telemetry

⚠ CAUTION	<p>Precautions for Safe Operation of Medical Telemetry</p> <p>To operate the device correctly, read the following precautions carefully.</p> <ul style="list-style-type: none">● The medical institution (hereinafter referred to as the “Institution”) must decide the telemetry installation plan in order to prevent interference and 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 install each receiver antenna as required. <p>In managing, be sure to follow the precautions below.</p> <ul style="list-style-type: none">● The Institution should appoint a person (hereinafter referred to as the “Overall Manager”) to manage the wireless channels for the whole Institution. And when using telemetry which requires zone location, the Institution should nominate a person (hereinafter referred to as the “Zone Manager”) to manage the wireless channels in each zone. However, when using such telemetry in a local Institution, one person can perform both functions.● Select a telemetry manager who understands the characteristics and functionality of telemetry systems, and is skilled in operating telemetry.● When installing telemetry, the Overall Manager and the Zone Manager have to understand the precautions for use of the telemetry in advance.● The Overall Manager takes responsibility of wireless channel management and transmitter storage for the whole Institution by giving proper instruction.● 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 Zone Manager assumes responsibility for managing the wireless channels, storing, and managing telemetry.● The Zone Manager 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 Zone Manager 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 Zone Manager and the Overall Manager of the problems. The Zone Manager and Overall Manager are to deal with the problem properly and/or contact their nearest Fukuda Denshi representative for service.
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Precautions about the Maintenance

Safety Inspection and Maintenance

For safe operation of the equipment, regular inspection and maintenance is 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 if :

- the equipment was subjected to extreme mechanical stress, e.g. after a heavy fall.
- the equipment was subjected to liquid spill.
- the monitoring function is interrupted or disturbed.
- parts of the equipment enclosure are cracked, removed, or lost.
- any connector or cable shows signs of deterioration.



Refer to "10. Maintenance" for details.



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

Maintenance, Modifications, and Repairs

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.
- Components are used in accordance with Fukuda Denshi operating instructions.

A full technical description of the DS-7600 system is available from your local Fukuda Denshi representative.

Precautions about the Pacemaker



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 a 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.)

Reference

"Minute Ventilation Rate-Adaptive Pacemakers"

In the US, 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.

[October 14, 1998 (Letter: www.fda.gov/cdrh/safety.html) – FDA]

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.

Defibrillation Safety



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 directly contact the electrodes or medicament, 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 by the discharged energy.
- When defibrillating, do not touch the patient and the metal part of the device or cables. Electric shock may result by the discharged energy.

Electrosurgery Safety



WARNING

The monitoring system contains protection against interference generated by electrosurgical instruments. However, operating conditions, surgery site with respect to the location of ECG electrodes, or the type of instrument used, may cause noise on the ECG. The noise is generated at the tip of an electrical 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 unit 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 the monitor. This will help prevent interference through the power cable.

Electrode Placement

The amount of 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 a burn at the electrode site.

Precautions about Magnetic Resonance Imaging



- Do not operate this equipment in magnetic resonance imaging (MRI) environments.
- When conducting MRI test, remove the electrodes and sensors connected to the patient (test subject).
The local heating caused by the induced electromotive force may cause burn injury to the patient (subject). For details, refer to the operation manual for the MRI testing device.

Precautions about Connections to Peripheral Devices

In the interest of safe and sufficient performance of this equipment, the connection of other manufacturers' equipment to the monitor 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.



For the connector with mark, 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.



All the peripheral device connectors on the DS-7600 system are isolated from the power supply, but the peripheral devices are not isolated. To prevent danger of electric shock, always position the peripheral devices away from the patient.

When connecting peripheral devices to DS-7600 system, it is the user's responsibility to verify that the overall system complies with IEC 60601-1-1, "Collateral Standard: Safety Requirements for Medical Electrical Systems".

Precautions about Fuse



If the fuse blows, contact Fukuda Denshi Service Representative. Do not continue using it as internal damage to the equipment may be considered.

Accessories and Optional Accessories



Use only the cables specified by Fukuda Denshi.

Use of other cables may result in increase in emission or decrease in immunity.

Precautions about the DS-7600 System

 DANGER	<ul style="list-style-type: none">When connecting to other device, contact Fukuda Denshi service representative. Danger such as electric shock may result to the patient and operator.When monitoring a telemetry bed, make sure the patient data is properly received at the central monitor. Pay special attention when channel ID at the bedside monitor is changed.
 WARNING	<ul style="list-style-type: none">If the DS-7600 system 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.Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipment. Even a small potential difference may result in electric shock to the patient and the operator.The pacemaker use selection influences the precision of the QRS detection and arrhythmia analysis. Make sure the correct selection is made.The patient type selection influences the precision of the QRS detection and NIBP measurement. Make sure the correct selection is made.When Suspend is selected for "Setup at Discharge", the suspend condition on the DS-7600 will continue until the Resume key is pressed, even if the monitoring is performed on the bedside monitor.Depending on the software version of the bedside monitor, NIBP periodic measurement interval will not synchronize between the central monitor and bedside monitor. (For details of the software version, refer to our service representative.) If performing NIBP periodic measurement from the central monitor, do not set the interval on the bedside monitor.The ventilator alarm on this monitor should be used as supplementary function. Check the patient's condition, ventilator alarm sound and message occasionally.If the upper/lower alarm limit of the individual parameter is set to OFF, or if arrhythmia alarm is set to OFF, alarm will not generate even if the individual parameter alarm is set to ON. Pay attention when setting them OFF.When the alarm is suspended, all alarm will not generate even if the individual parameter alarm is set to ON. Also, the alarm event will not be stored as recall data.When a parameter monitored on a bedside monitor or telemetry transmitter is in a connector-off condition, the alarm will not be generated on the central monitor. Make sure that the connector is securely connected. If a waveform/numeric data is not displayed for the monitored parameter, check the patient's condition and pay attention not to miss the connector-off condition.The alarm for the parameter not selected for the "HR/PR Alarm Source" (ECG/SpO₂/BP) will be set to OFF on the DS-7600.<ul style="list-style-type: none">The "HR/PR Alarm Source" setting will synchronize between the bedside monitor and the central monitor.For example, if SpO₂ is set as the HR/PR alarm source on the bedside monitor, HR alarm will be set to OFF on the central monitor.When "Chk TLM Receive" is displayed, alarm will not function. Arrhythmia analysis will not be performed either.If the "Alarm Judgment" is set OFF, HR alarm and arrhythmia alarm will not be generated at lead-off condition. 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.

 WARNING	<ul style="list-style-type: none"> ● 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 recording, alarm recording and recall waveform for evaluation. ● If the QRS pace mask function is turned OFF, a decrease in heart rate may not generate HR or ASYSTOLE alarms due to erroneously detected QRS. Turn this function OFF only if you are sure that pacing failure will not occur, or when the patient can be constantly monitored. ● Fukuda Denshi is not liable of the operation caused by improper TCP/IP network connection. When changing the network setup, refer to our service representative. When connecting to an existing network, follow the instruction of the network administrator. ● Make sure not to duplicate the IP address for the DS-7600 system, laser printer, and server. ● As DS-7600 does not correspond to DHCP (Dynamic Host Configuration Protocol) IP address, set the IP address excluded for DHCP if DHCP server is in the network configuration. ● Be careful not to confuse the HUB for the DS-LAN network and the TCP/IP network. Fukuda Denshi will not guarantee the operation for the improper connection. ● On the network configuration menu, pressing the Enter key after changing the setup will display a warning message. All operation controls will not be possible until the system is restarted.
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 CAUTION	<p>System</p> <ul style="list-style-type: none"> ● Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. ● Use only the accessories specified for this device. Otherwise, proper function cannot be executed. ● For quality improvement, specifications are subject to change without prior notice. ● The mouse and keyboard function is supported by the DS-7600W series only. ● Do not use the touch panel with film or adhesive tape attached. Malfunction of the touch panel or damage may result. ● Always operate the touch panel with fingers or a touch panel pen. Do not touch with a pen-point or other hard-edged instruments. It may cause malfunction or damage the touch panel. ● Do not use the touch panel with the film or adhesive tape attached. Malfunction of the touch panel or damage may result. ● As the touch panel is made of glass, a strong impact may cause damage. Pay attention not to hit or drop the touch panel. ● Do not press the touch panel with strength or twist your finger on the panel. It may cause malfunction or damage the touch panel. ● Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will be reduced in few hours or half a day after the power is turned ON. ● The maintenance and internal switch setting will be performed by our service representative. Users should not attempt the procedure as malfunction may occur. ● Verify that the correct date/time is set before monitoring. If the date/time is changed during monitoring, error may be caused to the trend data or other patient data. The date/time must be set before monitoring. ● The HR, SpO₂, PR value of the NIBP list may differ between the DS-7600 and the bedside monitor.
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 CAUTION	<p>System (Continued)</p> <ul style="list-style-type: none"> The time will be synchronized with the following priority. <ol style="list-style-type: none"> 1) Administrating monitor, if wired network is constructed. 2) SNTP server, if used. 3) Patient server, if used, and if "Time Synchronization" on Patient Data Server setup is set to ON. If constructing a network with more than one central monitors, the same preset setup should be applied to all central monitors. The drift filter setup should be the same for all central monitors. Proper function cannot be achieved if the setup is different among the central monitors. Canceling the bed registration will clear all data for that bed. Many of the preset menu setup items can be set only on the network-administrating monitor (central ID: 001). Such preset menu keys will not be displayed on other monitors. Unless the correct power frequency is set, the AC filter will not properly function. Do not use any slave monitors which does not satisfy the required display resolution even if it is capable of displaying higher resolution than the actual resolution. If such monitor is used, the display screen image will not be properly shown. <p>PC/CF Card</p> <ul style="list-style-type: none"> Do not use unspecified CF card. Not only the data but also the equipment may be damaged. Turn OFF the power when inserting / removing the CF card. Check that the CF card indicator is not lighted in red when turning OFF the power of the DS-7600. The CF card can be used only on the DS-7600 where the card was formatted. The data transfer is possible only between the DS-7600 system central monitors. The data cannot be transferred to a bedside monitor. If the software version of the two DS-7600 central monitors are different, the data transfer may not be possible, or part of the data may not be transferred. (The data transfer from the newer version monitor to the older version monitor is not possible.) For details, refer to our service representative. For the data transfer from DS-7600 series to DS-7600W series, or from DS-7600W series to DS-7600 series, the user keys settings will not be transferred. <p>Patient Admit / Discharge</p> <ul style="list-style-type: none"> If you start monitoring a new patient without performing a discharge procedure for the previous patient, new data will be added to the previous data which will result in inaccuracy. If monitoring is suspended on the bedside monitor, the data for that patient will not be transmitted to the DS-7600. When monitoring is resumed on the bedside monitor, the data transmission to the DS-7600 will resume. There are following restrictions when using the DS-LANII network. <ul style="list-style-type: none"> - Up to 20 characters of patient ID can be set on the DS-7600 but some bedside monitors are capable to set only up to 10 characters depending on the software version. (Refer to our service representative for software version of the bedside monitor.) To synchronize the central monitor and the bedside monitor, set the transmitting starting digit of the ID on the "Patient ID Starting Column" of the soft switch menu. The 10 characters from the set starting digit will be transmitted as patient ID. - Up to 16 characters of patient name can be set on the DS-7600 but some bedside monitors are capable to set only up to 8 characters depending on the software version. Refer to our service representative for software version of the bedside monitor. The pacemaker pulse will not be displayed unless Used is selected for pacemaker on the admit menu, and ON or Distinct Color is selected for pace pulse on the ECG setup menu. Also, the DS-7600 will not display the artificial pacemaker pulse unless Used is selected for pacemaker on the bedside monitor. When searching patient ID using the patient data server, admit process should be performed using the patient data acquired using the search function. Do not change the Bed ID of the bedside monitor during monitoring. When the monitoring is suspended, the trend data and full disclosure waveform (optional function) data will not be acquired. Resuming monitoring will resume from alarm suspend condition.
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CAUTION	<p>Patient Admit / Discharge (Continued)</p> <ul style="list-style-type: none"> • The monitor suspend function will not be linked between the central monitor and the bedside monitor. • When a bed transfer procedure is performed, all setup data for the new bed will be updated. The data for the wired bed (BED) and the same data monitored on other central monitor will be initialized. • If bed transfer/exchange is performed for the monitors connected to the DS-LANII/III network, the GAS alarm settings will be backed up or initialized depending on the settings for "Backup at Discharge" on the bedside monitor. • When the discharge process is performed on the bedside monitor or other central monitors, the monitoring on the DS-7600 will not be suspended even if Suspend is selected for "Setup at Discharge". • When EMR link function is used, the patient admitted on EMR will be also admitted on the DS-7600 system. But it is also necessary to perform admit process for this patient on the DS-7600 system. Setting the pacemaker usage and patient type is especially important as these will affect the monitoring accuracy. • The discharge process on EMR will only initialize the patient information on the DS-7600 system. To initialize the monitored data and settings for this patient, it is necessary to perform discharge process on the DS-7600 system. <p>Parameter Monitoring</p> <ul style="list-style-type: none"> • For the following case, CO₂ concentration monitoring cannot be performed on the DS-7600. <ul style="list-style-type: none"> • If the bedside monitor is DS-5300. • If the software version of the HLX-561 is V01-07 or prior. <p>ECG Monitoring</p> <ul style="list-style-type: none"> • There are some cases when pacemaker pulse can not 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 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. • Depending on the electric signal condition under transmission, noise may interfere and incorrectly display the pacemaker pulse. • When spontaneous QRS and pacemaker pulse overlap (ex. fusion beat, etc.), QRS detection cannot be performed properly. In this case, the heart rate is degraded. • When continuously detecting AC noise artifact as pacemaker pulses, QRS detection stops and heart rate is extremely degraded. Also arrhythmia cannot be detected. • The threshold level for arrhythmia detection changes with the ECG waveform size. Set the proper waveform size for monitoring. • "QRS Detect" on the ECG setup menu: The "QRS Detect" can be set only for the telemetry bed. (RF, LW) QRS detection may not be possible for ECG waveform with amplitude 0.3mV or below. When only one ECG waveform is measured, QRS automatic detection is executed with ECG1, regardless of the setting. The "QRS Detect" setup for the wired bed (BED) will be according to the setup on the bedside monitor.
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CAUTION

Alarm Setup

- The adjustable alarm limit increment is different between the DS-5000 series and DS-7000 series monitors. Therefore, the set alarm limit may change depending on the monitor type and the network construction.
- Depending on the system construction, the arrhythmia alarm of Slow VT, Couplet, Pause, Trigeminy cannot be analyzed.
- The alarm messages will be displayed according to the priority. (Level 1 > Level 2 > Level 3 > Level 4)
- For the same alarm level, the alarm message for the newer alarm will be displayed.
- Depending on the bedside monitor type and software version, the ventilator alarm factor may not be transmitted. For details, refer to our service representative.
- If "Suspend Arrhy. Analysis during Noise Interference" under Alarm Related Setup (Preset) is set to ON, the "Cannot analyze" alarm will generate when analysis suspended duration exceeds 30 seconds.
- Even during "LEARN" status, alarm for HR, ASYSTOLE, VF, TACHY, BRADY, PAUSE will be generated.
- Even during "Cannot analyze" alarm generation, alarm for HR, ASYSTOLE, VF, TACHY, BRADY will be generated.
- The alarm message for the arrhythmia alarm (except Tachy, Brady) will continue to be displayed for 30 seconds even after the alarm condition dissolves.
- The settings for the "HR Low Limit for VT" and "HR Low Limit for RUN" will be compared with the average HR of continuous VPC. Therefore, the displayed HR value at alarm generation may be lower than the settings if it is just after the VT detection, or if RUN with few continuous VPC is detected.
- Do not set the alarm volume too low to prevent missing any alarm generation.
- The same setup for "Asystole, VF, VT Alarm Setup" of alarm-related setup should be performed for all central monitors in the same network. Otherwise, proper function cannot be achieved.

For the DS-LANIII network, the setup will automatically synchronize with the monitor functioning as the network administrator.

TCP/IP Network Connection

- Always reset the power of the printer after the printer setup.

Maintenance

- The maintenance procedure will be performed by our service representative. Users should not attempt this procedure as malfunction may result to the device.
- If stains cannot be removed from the touch panel surface, wipe softly with a dry or ethanol dampened cleaning cloth. Never use strong-acidic solution. Neither is it recommended that mild acidic or alkaline cleaning solution to be used.
- A special coating is applied to the surface of the touch panel. Do not wipe the surface with a cloth or gauze with coarse texture. Wipe the surface with the soft cleaning cloth provided as optional accessory or with an eyeglass cleaning cloth.
- If stains cannot be removed from the touch panel surface, wipe softly with dry or ethanol dampened cleaning cloth. Do not clean using strong acid.
- Clean the equipment frequently so stains can be removed easily.
- To prevent injury, it is recommended to wear gloves when cleaning the equipment.
- Do not allow liquids such as alcohol or cleaning solution enter the equipment or connectors.
- Do not use organic solvents, thinner, toluene and benzene to avoid damaging the resin case.
- Do not polish the housing with abrasive or chemical cleaner.
- When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the monitor or connectors.
- Use only neutral detergent to clean the housing. Do not use chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent and chemicals (cleanser, thinner, toluene, benzine, benzol, and synthetic detergent for house and furniture), or sharp-edged tools. The surface resin coating may be damaged, resulting in discoloration, scratches, and other problems.
- Do not open the housing.
- Avoid alcohol or other liquids from getting into the equipment.
- Replace the components periodically as specified.

Precautions about the Wired Network System (DS-LANII/DS-LANIII)

⚠ WARNING

- Do not connect unspecified device to a 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.
- Be careful not to confuse the HUB for the DS-LAN network and the TCP/IP network. Fukuda Denshi is not liable of the operation caused by improper network connection.
- For the DS-LANII network, use the specified repeater HUB (10M), and for the DS-LANIII network, use the specified switching HUB (100M). If unspecified HUB is used, communication failure will occur.

⚠ CAUTION

- The two different network systems (DS-LANII and DS-LANIII) cannot exist in the same network.
- Make sure that DS-LAN setup (DS-LANII/DS-LANIII selection) is the same for all monitors connected to the same network.
- The DS-5000 series bedside monitors, LW-5560N Telemetry Receiver, and AU-5500N 8ch Recorder are not compatible with the DS-LANIII network.
- If the DS-LAN setup is changed from DS-LANIII to DS-LANII, the registered beds from 49th to 100th will be cancelled and patient data for these beds will be erased.
- The central monitor with central ID 001 functions as the network administrator and controls the LAN system. Make sure to set the central ID 001 for only one of the central monitors. Take care not to duplicate the ID numbers with other monitors.
- For the alarm generation on the bedside monitor, maximum of 2.5 seconds delay will occur for the alarm generation on the central monitor.
- The 12-lead waveform display and 12-lead ST level measurement can be performed only for the wired network bed (BED) which is monitoring the 12-lead ECG waveform. The 12-lead ST waveform can be displayed only for the DynaScope 5000 series bedside monitors. It cannot be displayed for the DynaScope 7000 series bedside monitors.
- When connected to the DS-LANII/III network, and if the "RR source" is other than impedance respiration (Or, if Auto selects the RR source other than impedance respiration) on the bedside monitor, respiration waveform will not be displayed on the central monitor.
Similarly, if the "RR source" is other than CO₂ (Or, if Auto selects the RR source other than CO₂) on the bedside monitor, the CO₂ waveform will not be displayed on the central monitor.
- When connected to the DS-LANII/III network, and if BP1 is selected for "HR/PR source" (Or, if Auto selects BP1 for HR/PR source) on the bedside monitor, ECG waveform will not be displayed on the central monitor.
- DS-LANII Network System
 - For the network-administrating monitor (Central ID: 001), the DS-7600 or DS-5700 must be set. The network will not function if the DS-5800N/NX/NXMB is set as the network-administrating monitor. Also, make sure not to duplicate the Central ID with other central monitors.
 - If more than three DS-5800N/NX/NXMB are connected, the DS-5800N/NX/NXMB cannot display the same patient data on all 3 monitors at the same time. Maximum of 2 monitors are able to display the same patient data.
 - For the DS-5800N/NX/NXMB or other bed display for the bedside monitor, maximum of 2 monitors can simultaneously display the same patient data.

 **CAUTION**

- DS-LANII Network System (Continued)
 - Maximum of 32 beds can be monitored on the DS-5800N/NX/NXMB which is connected to the same wired network with the DS-7600.
 - When the temperature unit is °F, the temperature data can not be monitored on the central monitor.
 - When the DS-7300 is connected to the wired network, BP7, 8, TEMP3-8 alarm will not generate on the central monitor.
- DS-LANIII Network System
 - If the measurement unit for BP (mmHg/kPa) and temperature (°C/°F) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
 - For numeric data displayed as “xxx” on the bedside monitor, maximum or minimum value of measurable range will be transmitted to the central monitor.

Precautions about the Wireless Network System

 **DANGER**

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

 **WARNING**

- Make sure to set the correct channel ID.
- Some wireless combinations of telemetry transmitters may generate interference with other devices. Before selecting the 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 neighboring facility must make agreements on the setting of telemetry channels to prevent telemetry interference.
- If channel ID is changed for the transmitter, make sure to replace the channel label attached to the transmitter with a new one.
- If the channel ID is changed without notifying, it will result in monitoring an incorrect patient. To avoid incorrect diagnosis, make sure that the channel ID corresponds to the patient.

 **CAUTION**

For the alarm generation on the bedside monitor connected by wireless network, maximum of 15 seconds delay will occur for the alarm generation on the DS-7600 Central Monitor.

Disposing of Equipment, Accessories, or Components



When disposing of the equipment, accessories, or components, use an industrial waste distributor. Do not dispose of as ordinary waste.

Precautions about Transportation

For transporting the DS-7600, pack with specified packing materials.



Refer to "11. Technical Information Specification" for environmental condition during transportation.

Precautions about RTC or Data Backup



- The DS-7600 system is equipped with a built-in clock. When the power of the DS-7600 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.
- To protect the data during voltage dip, short interruptions and voltage variations on power supply input lines or during short duration of power turned OFF, this monitor performs 10-minute (approx.) data backup using the secondary battery. The data such as trend data, NIBP list data, ST data, recall data may not be protected if the power is turned off within 30 minutes from power on.

Precautions about Handling the Cables



When disconnecting the cables, pull on the connector and not on the cable itself. For cable with a lock tab, push the tab when disconnecting. Pull the connector straight so the connector pins do not bend. When attaching the cables to each other, both connectors should be directly facing each other.

Precautions about the Recording Paper



Recording paper

- Use only "OP-124TE" recording paper specified by Fukuda Denshi. The surface treatment and thickness of the recording paper affects the recording quality.

Storing the recording paper

The recording paper is thermal coated. Storage over an extended period of time at a high temperature may change the quality of the recorded content, and make it illegible. When storing the paper, take care to observe the following:

- Do not store the paper in direct sunlight.
- Do not store the paper in a high temperature (50°C / 122°F or higher)
- Do not store the paper in a container made of polyvinyl chloride
- Do not superpose the papers until the diazo copy is completely dried.
- Do not expose the paper to alcohol, hydrochloric acid, or ester ketone.
- Avoid using adhesive agents other than water-based glue.

Electromagnetic Compatibility

The performance of this device under electromagnetic environment complies with IEC60601-1-2 (2001).

Precautions for Safe Operation under Electromagnetic Influence

 CAUTION	<p>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 magnetic influence and take appropriate countermeasures. The following are examples of the common cause and countermeasures.</p> <ul style="list-style-type: none">● <u>Cellular Phone</u> 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.● <u>Static Electricity</u> In a dry environment (room), static electricity is likely to occur. Take the following countermeasures.<ul style="list-style-type: none">• Both operator and patient should remove any static electricity before entering the room.• Humidify the room.● <u>Lightning</u> A lightning nearby may induce excessive voltage to the equipment. If any danger is suspected, use the uninterruptible power supply system.● <u>High frequency noise interference from other device through the power outlet</u> Check where the noise is originated and remove it using filtering device, etc.<ul style="list-style-type: none">• Stop using the device that is originating the noise.• Use other power outlet.
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EMC Guidance

This equipment complies with IEC60601-1-2 (2001). 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.

Therefore, 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 technician.

The following is the information relating to EMC (Electromagnetic Compatibility).
(When using this equipment, verify that it is used within the environment specified below.)

●Compliance to the Electromagnetic Emissions

The DS-7600 is intended for use in the electromagnetic environment specified below.
The customer or the user of the DS-7600 should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The DS-7600 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	
Harmonic Emissions IEC 61000-3-2	Not applicable	The DS-7600 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.
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Not applicable	

●Compliance to the Electromagnetic Immunity (1)

The DS-7600 is intended for use in the electromagnetic environment specified below.
The customer or the user of the DS-7600 should assure that it is used in such an environment.

Immunity Test	IEC60601-1-2 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 for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for 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 cycle 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 5sec.	<5% U _T (>95% dip in U _T) for 0.5 cycle 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 5sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the DS-7600 requires continued operation during power mains interruptions, it is recommended that the DS-7600 is powered from an uninterruptible 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.

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

●Compliance to the Electromagnetic Immunity (2)

The DS-7600 is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7600 should assure that it is used in such an environment.

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the DS-7600, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance $d = 1.2 \sqrt{P}$
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, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 

Note 1 : At 80MHz and 800MHz, 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.

^a 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-7600 is used exceeds the applicable RF compliance level above, the DS-7600 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the DS-7600.

^b 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-7600 System

The DS-7600 system is intended for use in an environment in which radiated RF disturbances are controlled. The electromagnetic interference can be prevented by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DS-7600 system as recommended below, according to the maximum output power of the communications equipment.

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.

Telemetry Precautions

For proper management of the telemetry installation, consult your Fukuda Denshi representative concerning the following:

- Plan the installation of your telemetry system, taking into account your entire medical facility needs and plant requirements.
- Be sure the antenna system installed meets the facility and plant requirements.



This Radio Frequency device is susceptible to interference from other outside sources. Interference may prevent the monitoring of patients connected to this device. If problems exist, contact your local service representative.

• Note: This device operates in the 600MHz UHF band. The exact frequency of operation depends on the destination, and has been preset for your facility, and may be identified by cross-referencing the channel designator on the device with the Telemetry Channel-Frequency Table in the transmitter operating manual.



- The manufacturers, installers and users of WMTS equipment are cautioned that operation of this equipment could result in harmful interference to other nearby medical devices.
- Users are advised to periodically contact the FCC or specified frequency coordinator and determine if your transmitter frequencies may cause interference.
- To assure safe and reliable operation, observe the following precautions:
 - Be sure that no other devices are using the frequency assigned to this transmitter.
 - This device is susceptible to interference from electrosurgical knives and other computerized equipment. If problems occur, contact your local Fukuda Denshi service representative.
 - Any obstruction such as reinforced concrete or large metallic surfaces between the receiver and the transmitter can affect reception. If problems occur, contact your local Fukuda Denshi service representative.
 - When a low battery alarm occurs, replace the battery in the transmitter.

Declaration of Conformity

Device : Central Monitor
Model Name: DS-7680/DS-7640W/DS-7680W

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

The responsible party for this device is:

Fukuda Denshi USA, Inc.
17725-C NE 65th Street
Redmond, WA 98052
Phone: (425) 881-7737, US Agent



Changes or modification not approved by the responsible party for compliance of this device could void the user's authority to operate the equipment.

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1. General Description	Explains the general description of this equipment.
2. Basic Operation	Describes the basic operation for monitoring.
3. Admit/Discharge of a Patient	Describes the procedure to admit/discharge a patient to/from the monitor.
4. Parameter Setup	Explains the procedure to set the monitoring condition, scale, alarm, etc. for each parameter.
5. Alarm Function	Describes the alarm function of this equipment.
6. Recording	Describes the function of the built-in recorder and the laser printer.
7. Review Function	Describes the review function such as trend, recall, etc.
8. System Configuration	Explains the procedure to set the monitoring condition such as display configuration, tone/volume, color, etc.
9. Installation	Explains about the network system, preset menu, and external equipment connection.
10. Maintenance	Describes about the maintenance and troubleshooting of this equipment.
11. Technical Information	Lists the specification, default setting, and connector pin assignments.
12. Accessories	Lists the accessories and optional accessories for this equipment.

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Chapter 1

General Description

This chapter explains the general description of this equipment.

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General Description

The DS-7600 System Central Monitor (hereinafter referred to as DS-7600) is a central monitor which supports various system construction combining wired and wireless network in general ward, ICU, etc.

The large color LCD (15-inch for DS-7600 series, 19-inch for DS-7600W series) allows to easily view the patient data.

The lineup for the DS-7600 series are DS-7680 and DS-7600L, and the lineup for the DS-7600W series are DS-7640W, DS-7680W, and DS-7600WL.

Type DS-7640W and DS-7680/DS-7680W is capable of monitoring maximum of 4 beds and 8 beds respectively via wireless network system using a built-in telemetry module, and maximum of 48 beds via DS-LANII and maximum of 100 beds via DS-LANIII wired network system.

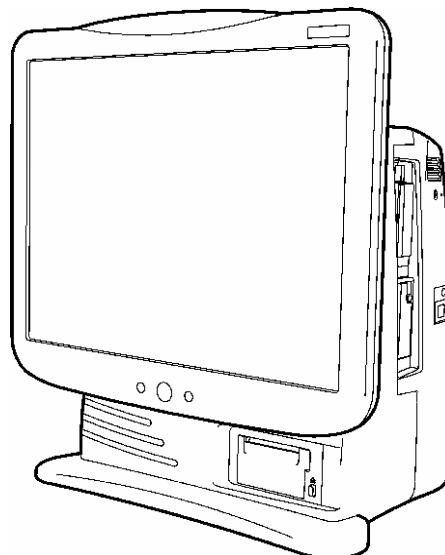
Type DS-7600L/DS-7600WL is capable of monitoring maximum of 48 beds via DS-LANII and maximum of 100 beds via DS-LANIII wired network system.

The DS-7600L/DS-7600WL is not equipped with a built-in telemetry module.

On the DS-LANII wired network system, a telemetry receiver (LW-5560N) can be also connected allowing monitoring of data received from a telemetry transmitter.

On the DS-LANII wired network system, the LW-5560N Telemetry Receiver can be also connected allowing monitoring of data received from telemetry transmitter. (Maximum connection of 48 beds include the beds received by the LW-5560N.)

Maximum of 16 beds from any combination of wireless and wired (DS-LANII / DS-LANIII) connection can be monitored on the DS-7600 system.



<The illustration is DS-7600 series>

Model Type	Display Unit Size	Maximum Connection			Maximum Monitoring Beds
		Wireless	DS-LANII*	DS-LANIII	
DS-7600 Series					
DS-7680	15 inch	8 beds	48 beds	100 beds	16 beds (any combination from the left)
DS-7600L		—	48 beds	100 beds	
DS-7600W Series					
DS-7640W	19 inch	4 beds	48 beds	100 beds	16 beds (any combination from the left)
DS-7680W		8 beds	48 beds	100 beds	
DS-7600WL		—	48 beds	100 beds	

* including the telemetry beds received by the LW-5560N.

Features

- The large 15-inch (DS-7600 series), or 19-inch (DS-7600W series) color LCD allows to easily view the patient data.
- Maximum of 16 beds connected to the wireless network (LX-5160, HLX-561, etc.) or to the wired network (DS-LANII/DS-LANIII) can be monitored.
- The user keys arranged at the lower part of the display are used to access the respective menu. The keys are composed of 2 "fixed" keys (menu, home display) and preprogrammed "user" keys. (7 or 9 user keys can be selected for the DS-7600 series, and 10 keys can be selected for the DS-7600W series.)

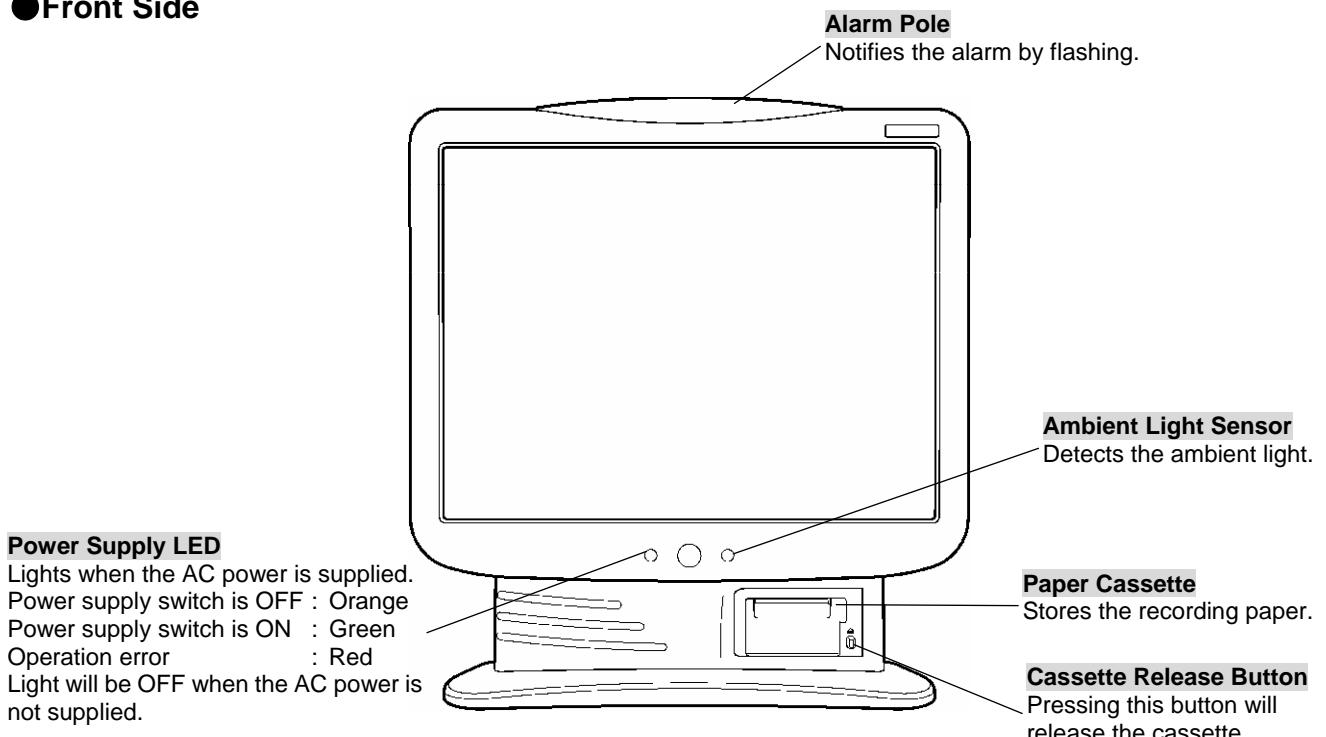


Do not use the touch panel with film or adhesive tape attached to it. Malfunction of the touch panel or damage may result.

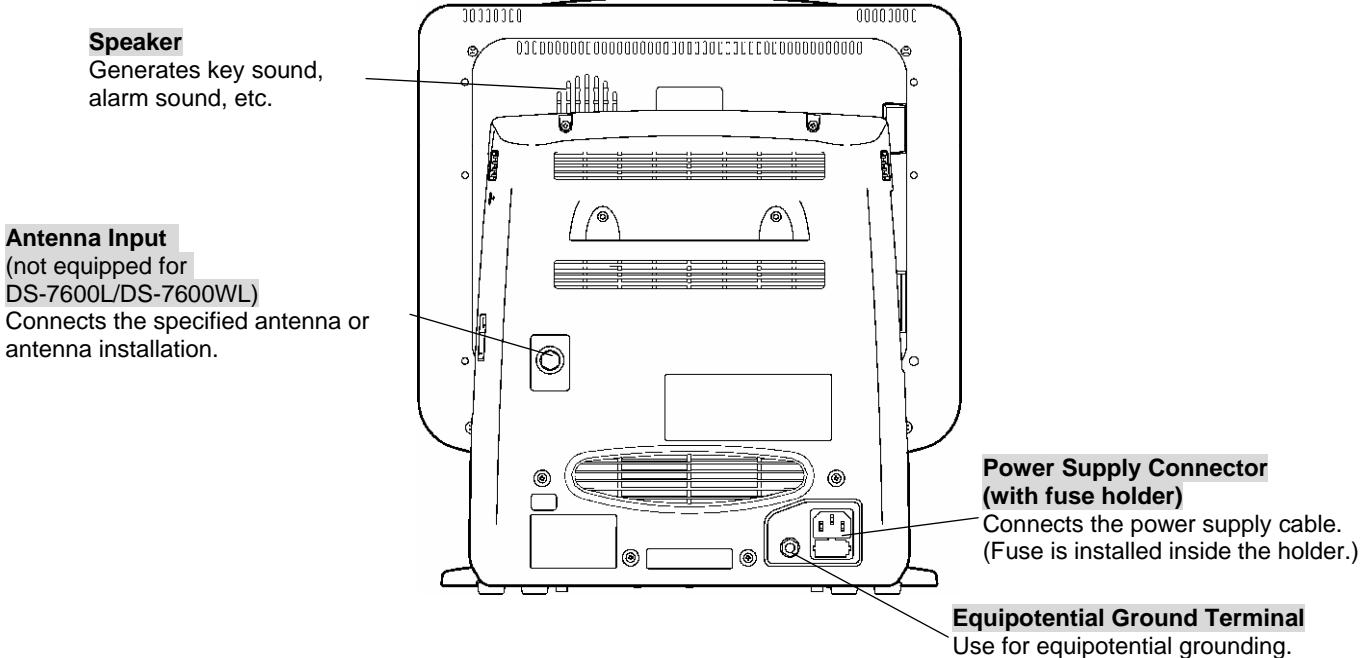
- For the DS-7600W series, connecting the optional mouse and keyboard allows mouse control of the touch panel keys and keyboard input.
- Various display configurations can be selected to monitor patient data.
- Initial settings at admittance can be set on the preset menu.
- A recorder is incorporated which allows maximum of 3 channels of waveform recording, graphic trend recording, etc.
- An alarm pole is equipped, which notifies the alarm in 3 flash patterns according to the alarm level.
- By using the optional CF card (FCF-1000, FCF-16GA), full disclosure waveform recording can be performed. (24-hour data of 32 waveforms, 96-hour data of 8 waveforms, etc.) Also, using the PC/CF card allows to easily transfer patient data and setup data.
- By connecting to the TCP/IP network, the data can be output to a laser printer. Also, by connecting to the network server, storing patient data, time synchronization, and admit/discharge process linked to the electronic medical record (EMR) is possible.

Names of Parts and Their Functions

●Front Side



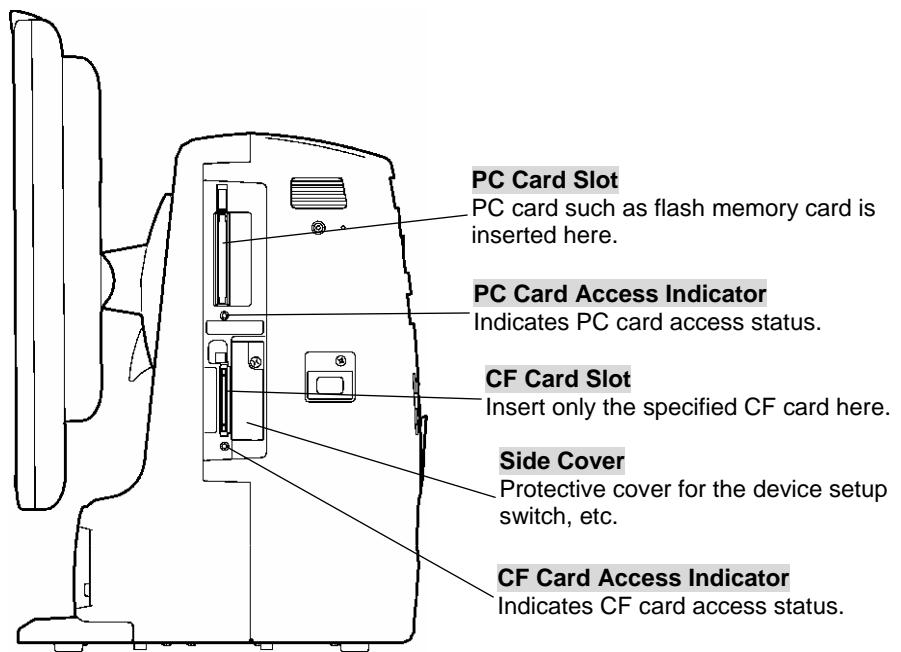
●Rear Side



CAUTION

Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. If done so by mistake, the device cannot deliver its maximum performance and the connected units may be damaged, resulting in a safety hazard.

●Right Side



CAUTION

- Do not use unspecified CF card. Not only the data but also the equipment may be damaged.
- The internal switch setup will be performed by our service representative. The users should not open the side cover.

●Left Side

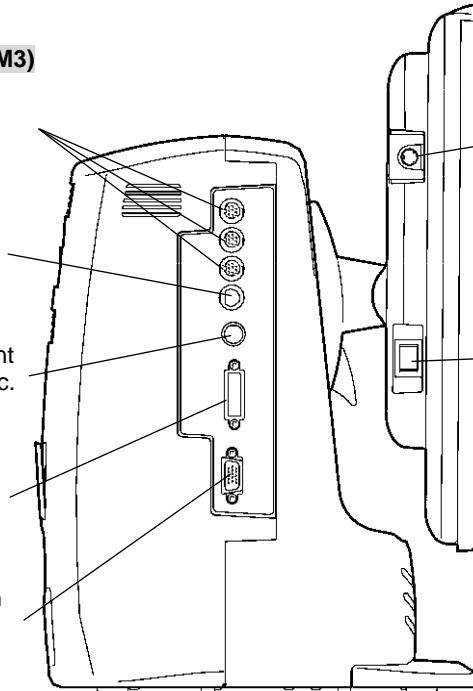
Serial Connector (COM1, COM2, COM3)
Connects associated equipment via RS-232C Cable.

External Equipment Connector
Connect the optional mouse and keyboard. (DS-7600W series only)
(To use the keyboard, optional PS/2 Splitter Cable is required.)

Status Input/Output Connector
Connects the specified equipment.

Power Supply Switch
Turns the monitor power ON or OFF.

DS-LAN Connector
Connects the specified LAN equipment via CJ-522 Ethernet Branch Cable, etc.



CAUTION

The mouse and keyboard function is supported by the DS-7600W series only.

CAUTION	<ul style="list-style-type: none">● Do not use the touch panel with film or adhesive tape attached. Malfunction of the touch panel or damage may result.● Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will be reduced in few hours or half a day after the power is turned ON.
NOTE	<ul style="list-style-type: none">● The touch panel utilizes exclusive fluorescent light for the backlight. Since this fluorescent light deteriorates by the life cycle, the display may become dark, flicker, or may not light by the long-term use. In such case, contact your nearest service representative.● Although the LCD utilizes highly accurate picture elements, occasionally, there may be few pixels which does not light or constantly lights. Please note that this is not an equipment failure, and will not affect monitoring operation.

Chapter 2

Basic Operation

This chapter describes the basic operation for monitoring.

2

Basic Operation

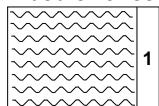
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Home Display and Individual Display

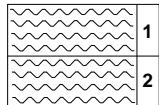
About the Home Display

The home display is the basic display to monitor the patient.
It can be selected from the following 11 patterns.

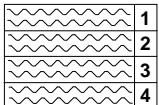
1bed 8waves



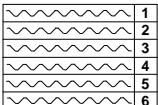
2beds 4waves



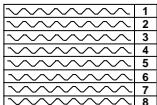
4beds 2waves



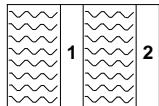
6beds 1wave



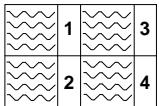
8beds 1wave



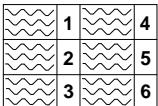
2beds 8waves



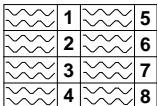
4beds 4waves



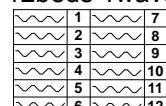
6beds 3waves



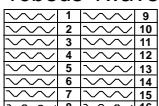
8beds 2waves



12beds 1wave

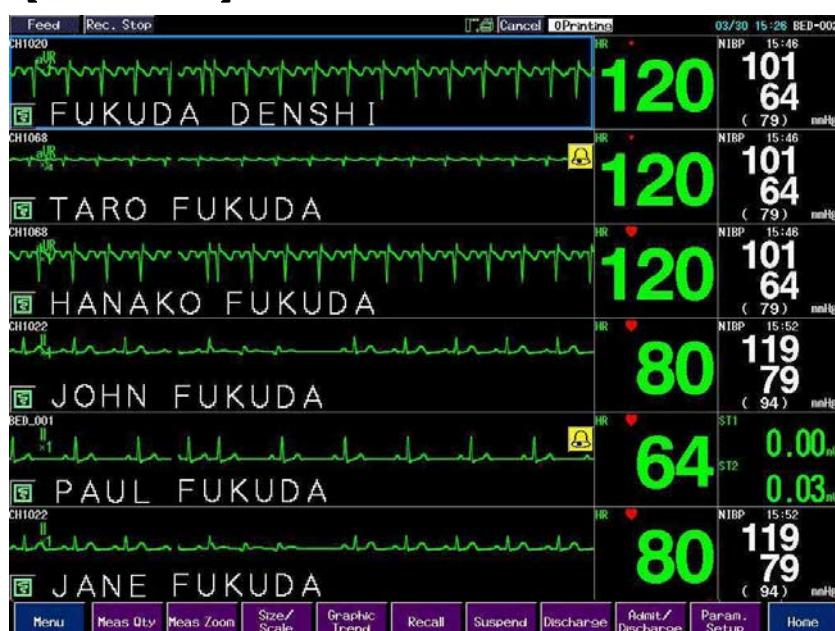


16beds 1wave



- The size, number, and types of numeric data can be changed to configure various types of display according to the monitoring purpose.
- On the waveform display area, the patient name can be displayed enlarged, or short trend graph can be displayed.

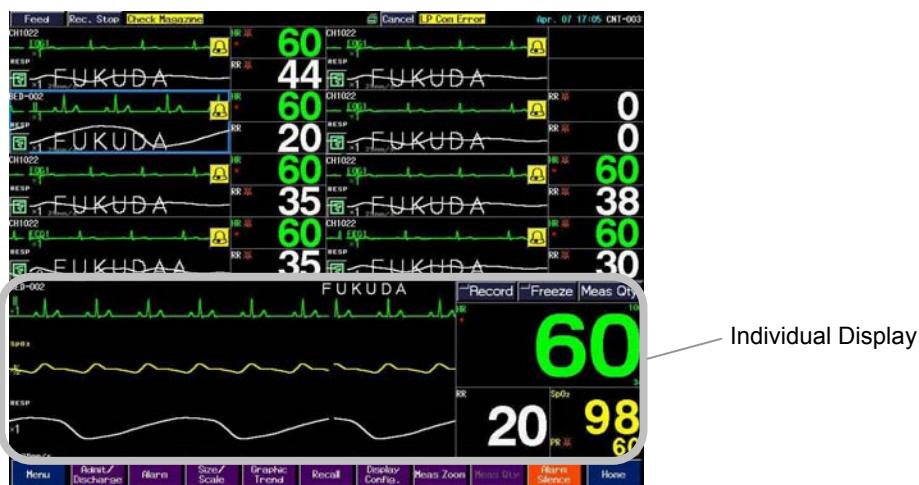
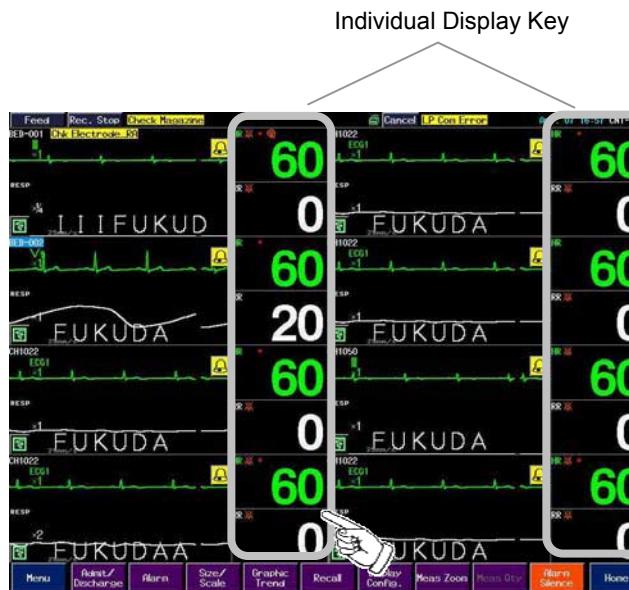
[6beds 1wave]



The number of beds, waveforms, numeric data to be displayed can be selected on the display configuration setup menu.
→ "8. System Configuration Display Configuration"

Individual Display

By pressing the individual display key (numeric data box), the detailed data of the selected bed will be displayed at the lower half of the display.
This display is called the "Individual Display".



The number and types of numeric data to be displayed on the individual display can be changed according to the monitoring purpose.

Short Trend Display

For the display configuration of 2beds 4waves, 4beds 2waves, 6beds 1wave, and 8beds 1wave, graphic trend can be displayed on the home display.

The waveform and short trend can be displayed overlapped.



To display the short trend, ON/OFF/Overlap selection for "Short Trend" should be made on the display configuration setup menu.
→ "8. System Configuration Display Configuration"



Short Trend Display

The short trend will be displayed beside the numeric data.

The displayed order of the parameter will be according to the setup of the "Measurement Selection" for the "Home Display Config."

Pressing the trend display area will sequentially change the display duration in the order of 10 min→20 min→30 min→10 min.

Trend Scale

The short trend scale will be displayed between the short trend and numeric data.

The scale will be according to the value set for the graphic trend display.

NOTE	<ul style="list-style-type: none">● The short trend can be displayed only for the following display configuration. 1bed 8waves, 2beds 4waves, 4beds 2waves, 6beds 1wave, and 8beds 1wave.● The display duration of the short trend will differ depending on the numeric data display width on the home display.
-------------	--

To Return to the Main Display

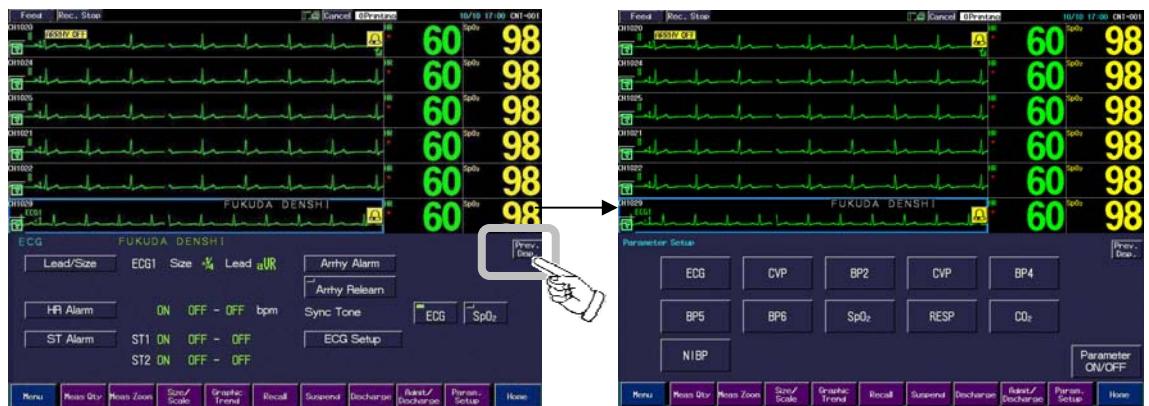
● To Return to Home Display

Press the **Home** key to return to the home display.



● To Return to One Previous Display

Press the **Prev. Disp.** key to return to one previous display.



Control Key

All operations on this equipment are performed through the touch panel keys.

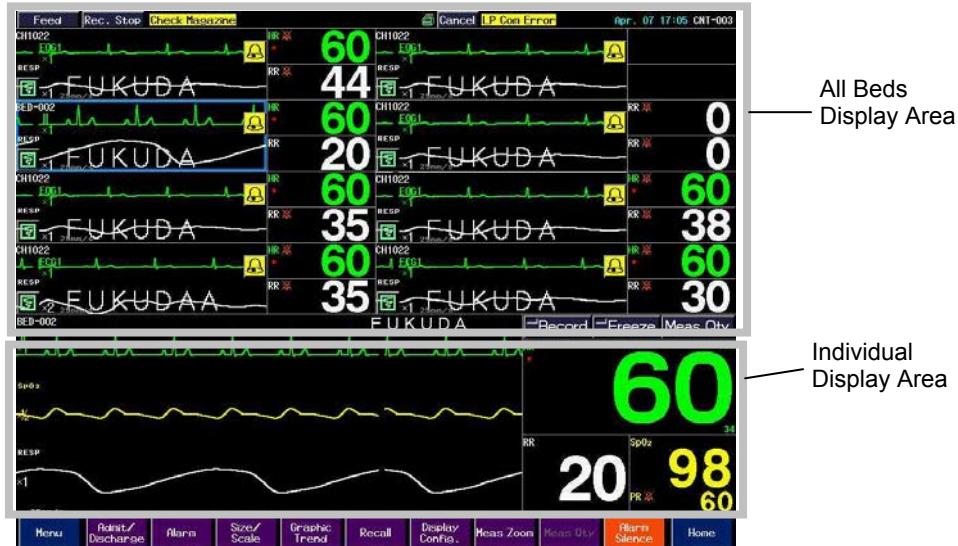
For the DS-7600W series, connecting the optional mouse and keyboard allow mouse control of the touch panel keys and keyboard input.

Here, control keys on each area are explained.

Upper, lower area : "Feed" key, "Rec. Stop" key, "Menu" key, "Home" key, user keys

All bed display area : Bed selection key / Individual display key, Record key, Alarm event key

Individual display area: Parameter key, Record key, "Freeze" key, "Meas Qty" key



CAUTION

- Always operate the touch panel with fingers or a touch panel pen. Do not touch with a pen-point or other hard-edged instruments. It may cause malfunction or damage the touch panel.
- Do not use the touch panel with the film or adhesive tape attached. Malfunction of the touch panel or damage may result.
- As the touch panel is made of glass, a strong impact may cause damage. Pay attention not to hit or drop the touch panel.
- Do not press the touch panel with strength or twist your finger on the panel. It may cause malfunction or damage the touch panel.
- Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will be reduced in few hours or half a day after the power is turned ON.

Tips

Various displays and keys are available on the DS-7600 system which allows various key steps to access one particular menu.

For example, following procedures can be used to access the HR alarm setup menu.

An easiest procedure can be selected according to the user's preference.

【Menu】

Press the [Menu] → [Param. Setup] → [ECG] → [HR Alarm] keys.

or

[Menu] → [HR] (Alarm) keys.

【User Key】 (* Presetting is required.)

• Press the [HR Alarm] key (user key).

• Press the [Alarm] (user key) → [HR] keys.

• Press the [Arrhy. Alarm] (user key) → [HR] keys.

【Parameter Key】

Press the HR parameter key on the individual display → [HR Alarm] key.

Keys on the Upper/Lower Display Area

The following keys are displayed on the upper and lower display area.

These keys can be used at any time, as these will be always displayed regardless of which menu are displayed.

【Keys Displayed on the Upper Display Area】



Feed key will feed the recording paper to the page top.

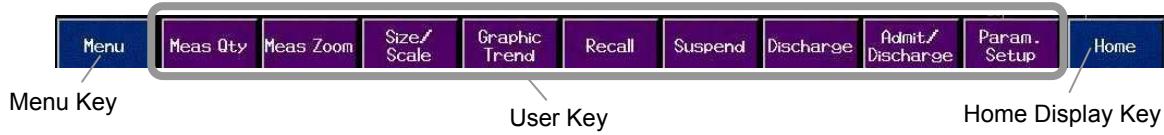
Rec. Stop key will stop the recording.

【Keys Displayed on the Upper Display Area (when laser printer is used)】



When laser printer is selected as output recorder, laser printer status message will be displayed.
Pressing the **Cancel** key during recording will delete all stacked data.

【Keys Displayed on the Lower Display Area】



Pressing the **Home** key will return the display to the home display.

Menu key will display the menu display. This menu display will be the entrance to all operation.

These two keys are fixed and cannot be changed.

The frequently used keys can be assigned as user keys (7 or 9 for the DS-7600 series, 10 for the DS-7600W series) at the lower display area.
By setting a user key, quick access to the menu can be attained.

When optional keyboard is connected for the DS-7600W series, the function keys (F1 to F12) on the keyboard will also function as "Menu" key, "Home" key, and user keys.



CAUTION The keyboard function is supported by the DS-7600W series only.

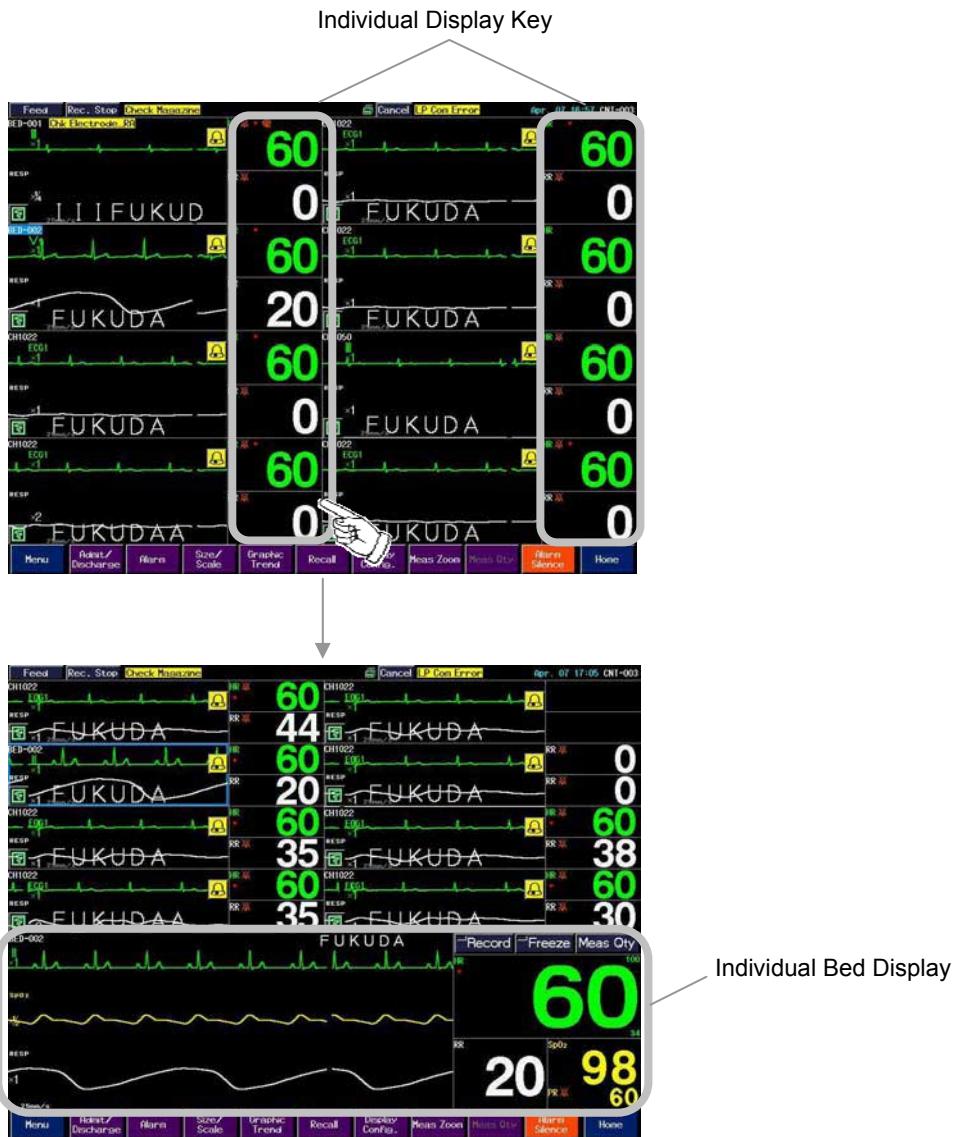


The user keys can be set on the preset menu.
→ "9. Installation Procedure to Start Monitoring 5-5 Set the user key"

Control Keys on the All Bed Display Area

● Individual Display Key

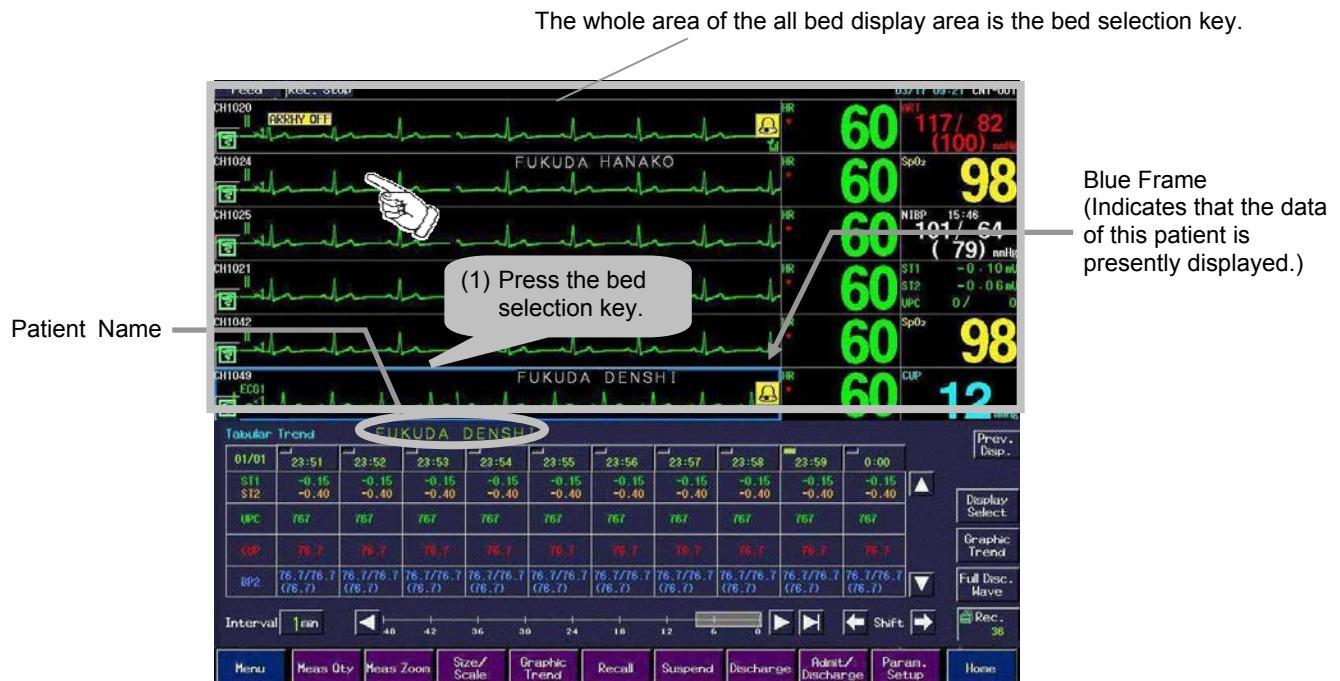
The numeric data box on the all bed display area will function as an individual display key. By pressing the individual display key, the detailed data of the selected bed will be displayed at the lower half of the display.



●Bed Selection Key

The whole area of the all bed display area will function as a bed selection key.

A blue frame will be displayed on the waveform area for the selected patient and indicates that the menu display and individual display for this patient is presently displayed.
By pressing the bed selection key for another patient, the display will change to the newly selected patient.

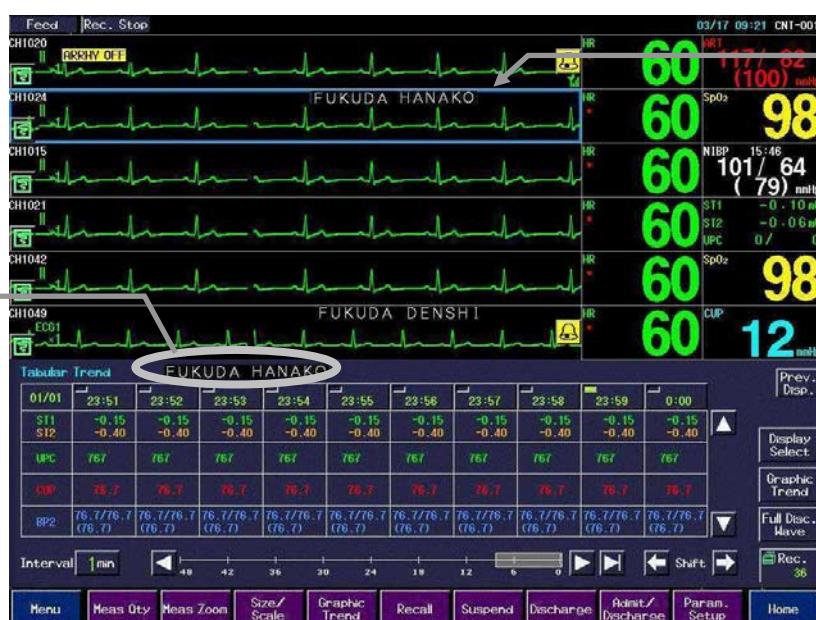


(1) To change the display to other patient, press the bed selection key.

(2) The blue frame will shift to the waveform display area for the newly selected patient, and the menu display and individual display will also change to the display for that patient.

(2) The display will change to the newly selected patient.

(2) The blue frame will shift to the newly selected patient.



●Manual Record Key

This key is used to start the manual recording. When pressed, the key will turn to red and starts recording. Pressing the key again will stop the recording.

By pressing the manual record keys for more than one bed, the manual recording will be performed one at a time for the pressed beds. The manual record key for the recording standby beds will be displayed in orange. However, it is necessary to set the recording duration to **12 sec.**, or **24 sec.** for the manual recording setup.

●Event Key

By selecting **ON** for “Event Key” of the Alarm Related Setup (preset menu), this key will be displayed when alarm event generates.

Even if **OFF** is set for “Event Key”, the event key will be displayed for the following cases;

- When the too far alarm generates.
- When the monitor suspend duration is set, and the set duration has elapsed.
- At alarm occurrence, pressing this event key will silence the alarm sound and displays the event list. Pressing the event list will display the recall display.
- When the too far alarm generates, pressing this key will silence the alarm sound and displays the **Too Far Alarm Silence** key.
- Whether to light (ON) the alarm pole or not (OFF) when the event key is displayed can be selected. (Default: OFF)
- When monitor suspend duration is set, pressing this key after completion of the set duration will extend the suspend duration.



For ON/OFF setup of Event Key display, refer to “9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup”.

For details of silencing the alarm, refer to “5. Alarm Function Alarm Setup Silencing the Alarm Sound”.

For details of too far alarm, refer to “5. Alarm Function Alarm Setup Too-Far Alarm”.

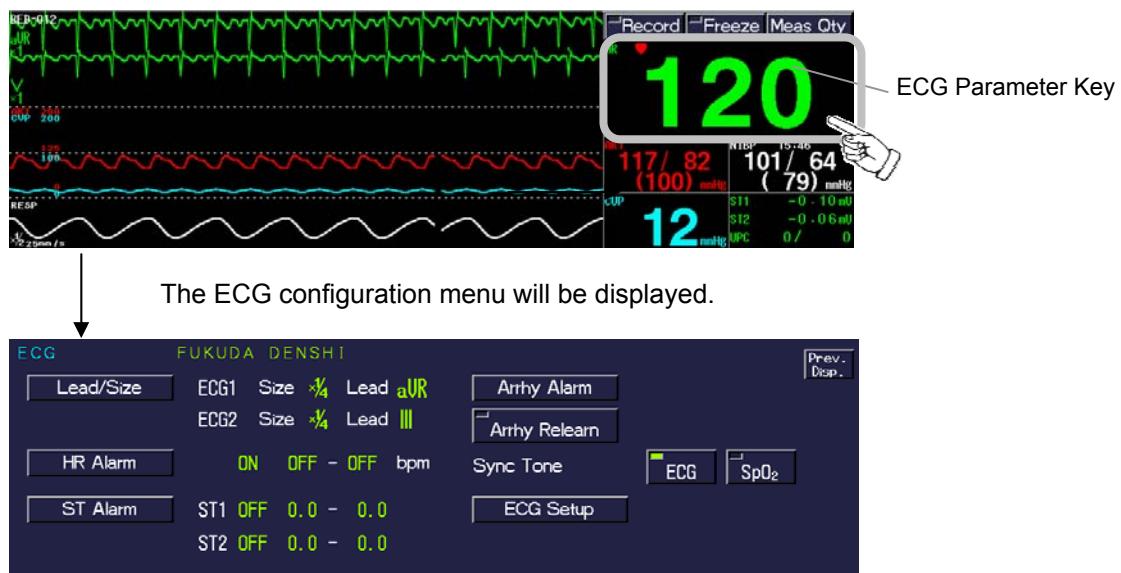
For details of recall function, refer to “7. Review Function Recall”.

For details of monitor suspend duration setup, refer to “3. Admit/Discharge of a Patient Suspend Monitoring” and “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”..

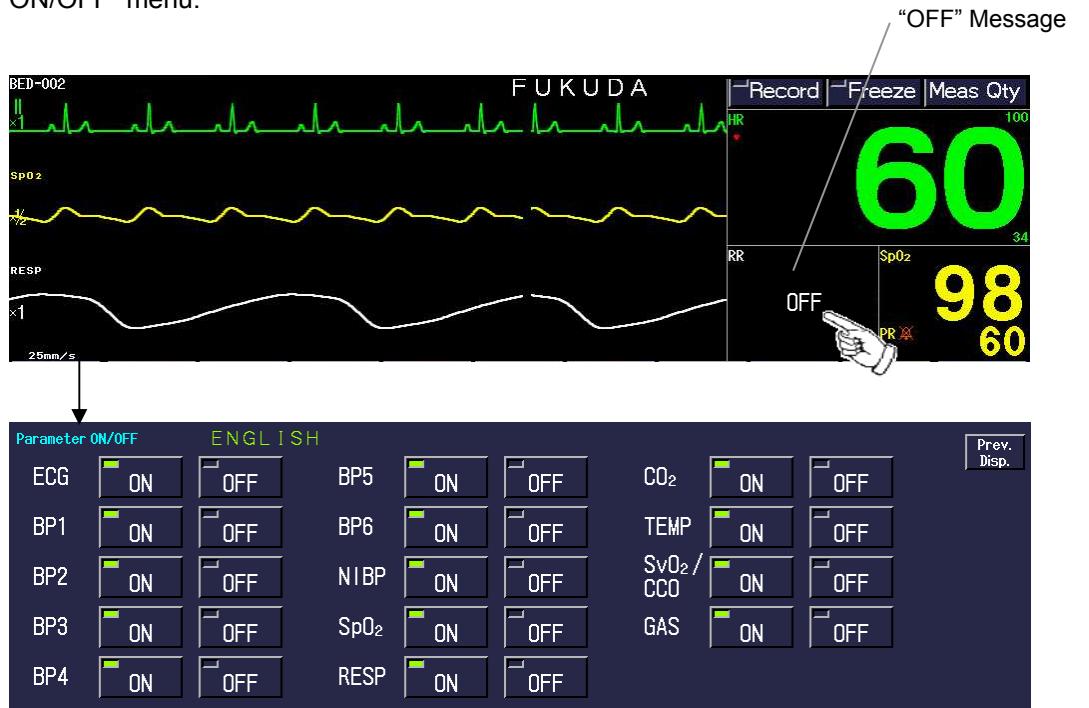
Control Key on the Individual Display

●Parameter Key

The numeric data box of the individual display will function as a parameter key.
Pressing the parameter key will display the configuration menu for the corresponded parameter.



For the parameter which OFF is selected for the “Parameter ON/OFF” setup, “OFF” will be displayed inside the parameter key. Pressing this parameter key will display the “Parameter ON/OFF” menu.



On the Parameter ON/OFF menu, whether to monitor the corresponded parameter or not can be selected.

●Other Keys

Record key

Pressing this key will start recording with the preprogrammed condition. Pressing the key will start the recording, and pressing the key again will stop the recording.

Freeze key

Pressing this key will freeze the waveform trace on the individual display. This will not affect the numeric data display. Pressing the key once will stop the waveform trace, and pressing the key again will resume the waveform trace.

NOTE

The freeze recording function (waveform recording during freeze condition) is not supported for this equipment.

Meas Qty key

Pressing this key will sequentially change the number of displayed numeric data.



"4. Parameter Setup Numeric Data on the Individual Display"

NIBP Measurement Key



This key will be displayed in the individual display area for the bed connected to the DS-LANIII network. The NIBP measurement can be started/stopped by pressing this key. To start the measurement, press the key for more than 1 second.

Keyboard / Mouse Operation (DS-7600W Series Only)



The mouse and keyboard function is supported by the DS-7600W series only.

By connecting the optional keyboard and mouse for the DS-7600W series, the following operation can be performed.



For details of the keyboard and mouse setup (pointer shape, color, etc.), refer to "9. Installation Keyboard / Mouse Setup"

2

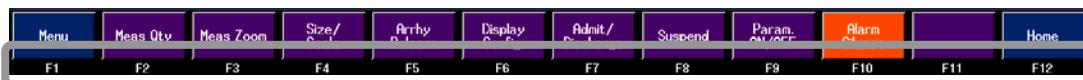
Control Key

【Mouse Operation】

- The touch panel keys can be controlled using the mouse.

【Keyboard Operation】

- By pressing the F1 to F12 keys on the keyboard, the same operation with the keys displayed at the bottom of the screen ([Menu] / User keys / [Home]) can be performed.



[F1] : [Menu] key
[F2] to [F11] : User keys
[F12] : [Home] key

- The character input such as patient ID and patient name can be performed using the keyboard.



For details of the character input procedure, refer to "3. Admit/Discharge of a Patient / Admitting a Patient".

NOTE

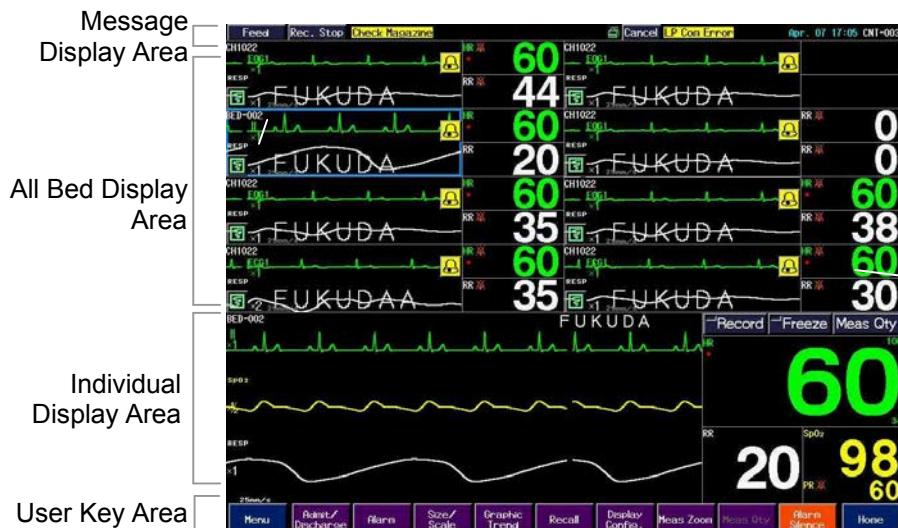
The keyboard input is possible only when the touch panel keyboard is displayed (patient name, monitor suspend setup, etc.)
The keyboard input is not possible for the display other than above (password input, etc.).

Description of the Display

The following display is an example of the “8-bed 2-wave display + individual display”.
The display consists of 4 main areas.

- Message Display Area
- All Bed Display Area
- Individual Display Area
- User Key Area

Each display area is explained below.



●Message Display Area



Paper Feed Key

Feeds the paper of the built-in recorder.

Rec. Stop Key

Stops the recording operation of the built-in recorder.

Recorder Information

The messages related to the built-in recorder such as “Check Magazine”, “Paper Out” will be displayed.

System Status Message

When malfunction occurs to the equipment, message such as “Check Backup Battery”, “Check PC Card” will be displayed.



For details of displayed message, refer to “5. Alarm Function General Description of the Alarm Function Displayed Message”.

Laser Printer Status Message (When laser printer is used)

The messages related to laser printer will be displayed.

Cancel LP Com Error : The specified printer does not exist or cannot be seen on the TCP/IP network.

Cancel LP Waiting : The laser printer is not ready for recording.

Cancel x Printing : In process of recording on the laser printer.

(x: number of stacked data)

indicates the recording progress. ()

Date/Time

Displays the current date/time.

If the SNTP server is set ON, and the time synchronization fails, the date/time will be displayed in yellow.

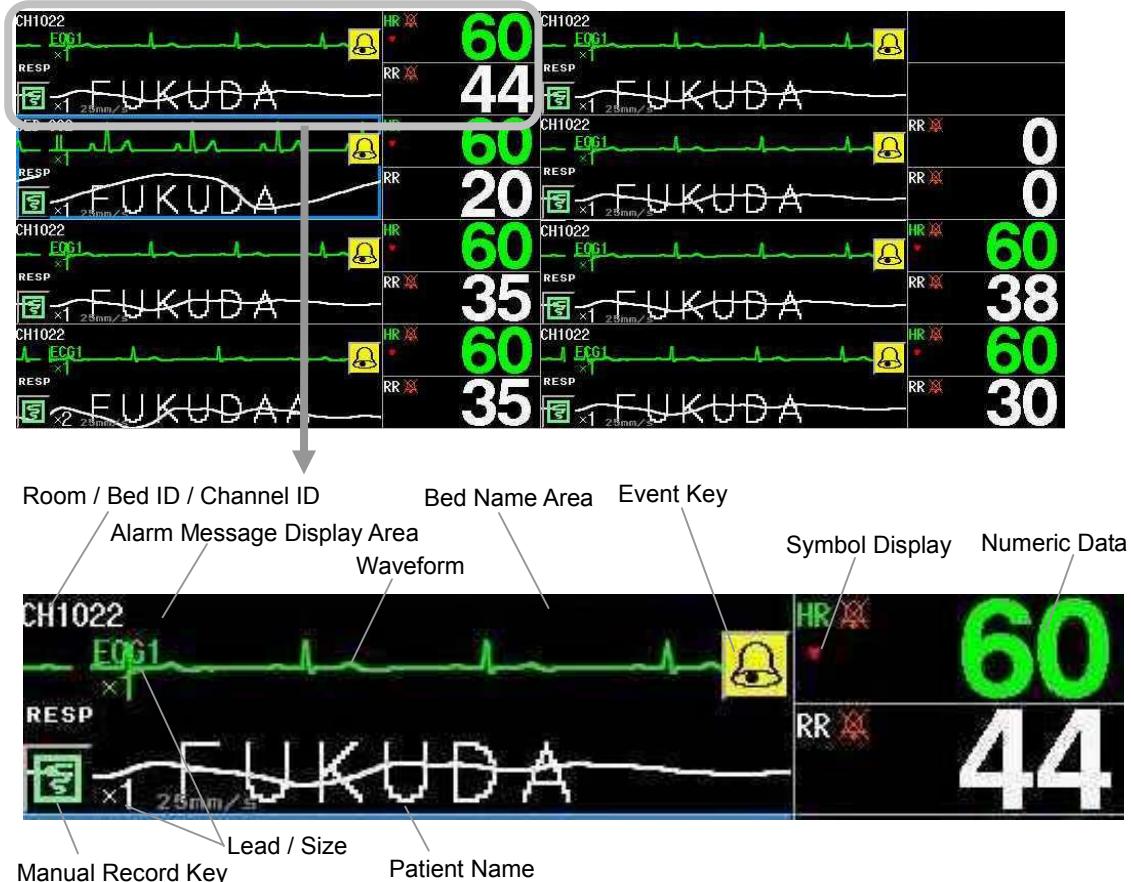


Verify that the correct date/time is set on the preset menu before monitoring. If the date/time is changed during monitoring, error may be caused to the trend data or other patient data. The date/time must be set before monitoring.

Central ID

Displays the central monitor ID for this device.

●All Beds Display Area



Waveform

A stationary method is used for the waveform trace and is drawn from left to right. The waveform thickness can be selected from 3 selections.



For procedure to set the waveform thickness, refer to "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch".

Lead / Size

Displays ECG lead and size/scale of each waveform.

Numeric Data (Individual Display Key)

The numeric data for each patient will be displayed. Maximum of 8 parameters per bed can be displayed. The numeric data box will also function as individual display key. Pressing the numeric data box will display the individual display of the corresponded patient.

NOTE	The waveform and numeric data (HR, RR) may slightly differ with the bedside monitor due to difference of processing among the different monitor model types and wireless network condition.
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Room • Bed ID / Channel ID

The room/bed ID of the bedside monitor and channel ID will be displayed.

Manual Record Key

This key is used to start the manual recording. When pressed, the key will turn to red and starts recording. Pressing the key again will stop the recording.

By pressing the manual record keys for more than one bed, the manual recording will be performed one at a time for the pressed beds. The manual record key for the recording standby beds will be displayed in orange. However, it is necessary to set the recording duration to **12 sec.** or **24 sec.** for the manual recording setup.

Alarm Message

The alarm message for each patient will be displayed. If more than one alarm are generated at the same time, the alarm message of the higher priority alarm will be displayed.



For details of displayed messages, refer to "5. Alarm Function General Description of the Alarm Function Displayed Message".

Event Key

By selecting **ON** for "Event Key" of the Alarm Related Setup (preset menu), this key will be displayed when alarm event generates.

Even if **OFF** is set for "Event Key", the event key will be displayed for the following cases;

- When the too far alarm generates.
- When the monitor suspend duration is set, and the set duration has elapsed.
- At alarm occurrence, pressing this event key will silence the alarm sound and displays the event list. Pressing the event list display will display the recall display.
- When the too far alarm generates, pressing this key will silence the alarm sound and displays the **Too Far Alarm Silence** key.
- Whether to light (ON) the alarm pole or not (OFF) when the event key is displayed can be selected. (Default: OFF)
- When monitor suspend duration is set, pressing this key after completion of the set duration will extend the suspend duration.



For ON/OFF setup of Event Key display, refer to "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup".

For details of alarm silence function, refer to "5. Alarm Function Alarm Setup Silencing the Alarm Sound".

For details of too far alarm, refer to "5. Alarm Function Alarm Setup Too-Far Alarm".

For details of recall function, refer to "7. Review Function Recall".

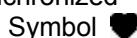
For procedure to set the alarm pole, refer to "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup".

For details of monitor suspend duration setup, refer to "3. Admit/Discharge of a Patient Suspend Monitoring" and "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch".

Symbol Display

The following symbols will be displayed.

Heart Beat Synchronized



: This symbol is synchronized to the heart beat.

The symbol for the specified bed can be emphasized in red color with the soft switch setup.

Low Battery Symbol 	: This symbol indicates low battery condition of the telemetry transmitter or bedside monitor.
Lead-Off Symbol 	: This symbol indicates lead-off condition.
Alarm OFF Symbol 	: This symbol indicates alarm off condition for the respective parameter.



For details of synchronized symbol / tone, refer to “●Synchronized Symbol/Tone” below.

NOTE	When a telemetry transmitter (ex. LX-5160) is used, the low battery symbol will be enlarged after 2 hours of display to warn the low battery condition. For the bedside monitor (ex. DS-7101LT), the low battery symbol will be displayed enlarged from the start.
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The alarm pole can be set to light synchronizing to the heartbeat (ON). (Default: OFF)
For procedure to set the alarm pole, refer to “9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup”.

Patient Name

The patient name input on the patient admit menu will be displayed.

The patient name can be displayed enlarged, by setting the “Name Zoom” to ON on the display configuration setup menu.



NOTE	The numbers of letters that can be displayed for the patient name depends on the display layout.
-------------	--

Bed Name

The bed name set on the patient admit menu will be displayed. It can be displayed in standard or enlarged size, or not displayed depending on the selection on the display configuration setup menu.



→ “8. System Configuration Display Configuration”

The bed name can be registered on the preset menu.

→ “9. Installation Procedure to Start Monitoring 5-8 Register the bed name”

EMR Notice Icon

When using the EMR link function, this icon will be displayed to indicate that the patient on the electronic medical record is admitted. Pressing this icon will display the patient admit/discharge menu.



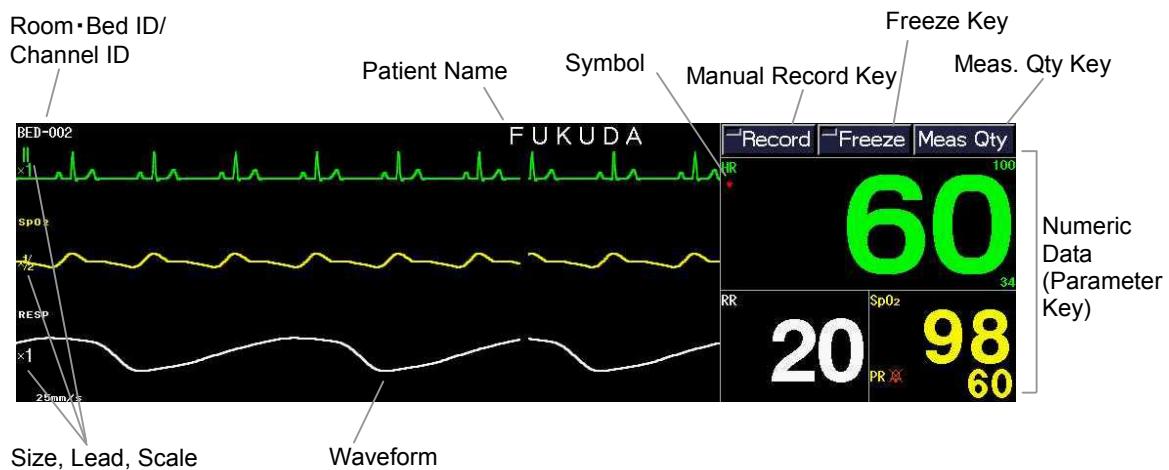
CAUTION	<ul style="list-style-type: none"> When EMR link function is used, the patient admitted on EMR will be also admitted on the DS-7600 system. But it is also necessary to perform admit process for this patient on the DS-7600 system. Setting the pacemaker usage and patient type is especially important as these will affect the monitoring accuracy. The discharge process on EMR will only initialize the patient information on the DS-7600 system. To initialize the monitored data and settings for this patient, it is necessary to perform discharge process on the DS-7600 system.
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To use the EMR link function, it is necessary to perform patient server setup on the preset menu.

→ “9. Installation TCP/IP Network Connection Patient Server Setup ●EMR Link Function”

●Individual Bed Display Area



Waveform

Up to 5 waveforms can be displayed. A stationary method is used for the waveform trace and is drawn from left to right.

The waveform thickness can be selected from 3 selections.



For procedure to set the waveform thickness, refer to "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch".

Size, Lead, Scale

Displays the waveform size, scale, and ECG lead. This information will be printed at time of recording.

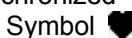
Numeric Data

Numeric data of up to 10 parameters can be displayed. The numeric data box of the individual display functions as parameter key, and pressing this key allows to perform setup of corresponded parameter.

Symbol Display

The following symbols will be displayed.

Heart Beat Synchronized



: This symbol is synchronized to the heart beat.
The symbol for the specified bed can be emphasized in red color with the soft switch setup.

Low Battery Symbol



: This symbol indicates low battery condition of the telemetry transmitter or bedside monitor.

Lead-Off Symbol



: This symbol indicates lead-off condition.

Alarm OFF Symbol



: This symbol indicates alarm off condition for the respective parameter.



For details of synchronized symbol / tone, refer to "●Synchronized Symbol/Tone" below.

The alarm pole can be set to light synchronizing to the heartbeat (ON). (Default: OFF)

For procedure to set the alarm pole, refer to "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup".

NOTE	<p>When a telemetry transmitter (ex. LX-5160) is used, the low battery symbol will be enlarged after 2 hours of display to warn the low battery condition. For the bedside monitor (ex. DS-7101LT), the low battery symbol will be displayed enlarged from the start.</p>
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Alarm Message

Alarm message will be displayed. If more than one alarm generate at the same time, the alarm message of the higher priority alarm will be displayed.

NIBP Measurement Key

This key will be displayed in the individual display area for the bed connected to the DS-LANIII network. The NIBP measurement can be started/stopped by pressing this key. To start the measurement, press the key for more than 1 second.

Room, Bed ID / Channel ID

The room/bed ID of the bedside monitor and channel ID will be displayed.

Record key

Pressing this key will start recording with the preprogrammed condition. Pressing the key will start the recording, and pressing the key again will stop the recording.

Freeze key

Pressing this key will freeze the waveform trace on the individual display. This will not affect the numeric data display. Pressing the key once will stop the waveform trace, and pressing the key again will resume the waveform trace.

NOTE

The freeze recording function (waveform recording during freeze condition) is not supported for this equipment.

Meas Qty key

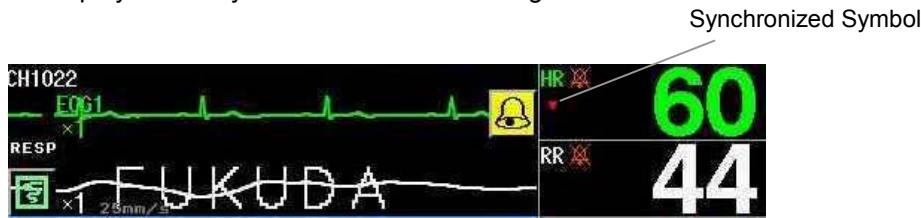
Pressing this key will sequentially change the number of displayed numeric data.



“4. Parameter Setup Numeric Data on the Individual Display”

●Synchronized Symbol / Tone

On the home display or individual display, the symbol synchronized to the heartbeat or pulse can be displayed and synchronized tone can be generated.

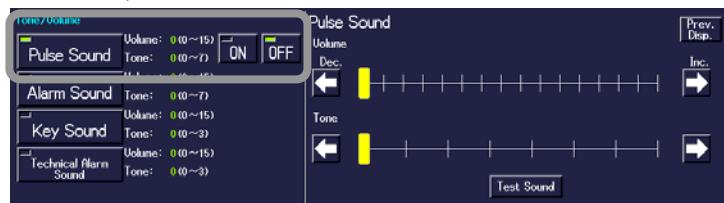


The following setup can be performed for the synchronized symbol / tone.

Tone / Volume (System Configuration menu)

- Pulse Sound: ON/OFF

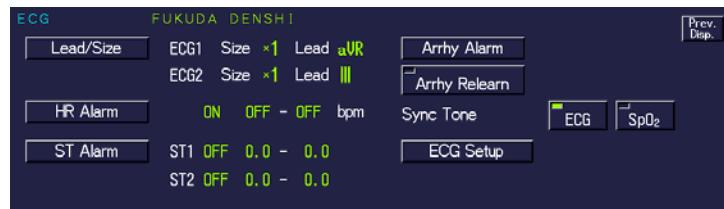
Whether to generate the pulse sound or not (ON/OFF) can be selected, and volume and tone can be adjusted.



ECG menu, SpO₂ menu

- Sync Tone: OFF/ECG/SpO₂

The tone can be selected to synchronize to ECG or SpO₂.



Soft Switch menu (Preset menu)

- Sync Tone Bed Selection:
Selected Bed / ECG/SpO₂ Menu
- Sync Mark:
Standard/Emphasize



[If **Selected Bed is selected for “Sync Tone Bed Selection” on the soft switch menu]**

- Sync Tone : The synchronized tone for the currently selected bed on the home display will be generated. (The displayed individual bed, or bed with the waveform area outlined in light blue on the home display.) The bed to generate the synchronized tone can be changed arbitrarily.
- Sync Mark : **Standard** will display the synchronized symbols for all beds in red. **Emphasize** will emphasize the symbol for the bed generating the synchronized tone in red. The symbols for other beds will be displayed in respective parameter colors.

[If **ECG/SpO₂ Menu is selected for “Sync Tone Bed Selection” on the soft switch menu]**

- Sync Tone : The synchronized tone for the bed which ECG or SpO₂ is selected for “Sync Tone” on the ECG or SpO₂ menu will be generated. The bed to generate the synchronized tone will be fixed to one bed.
- Sync Mark : **Emphasize** will be automatically set.



The preset menu should be set by our service representative or system administrator before starting monitoring.

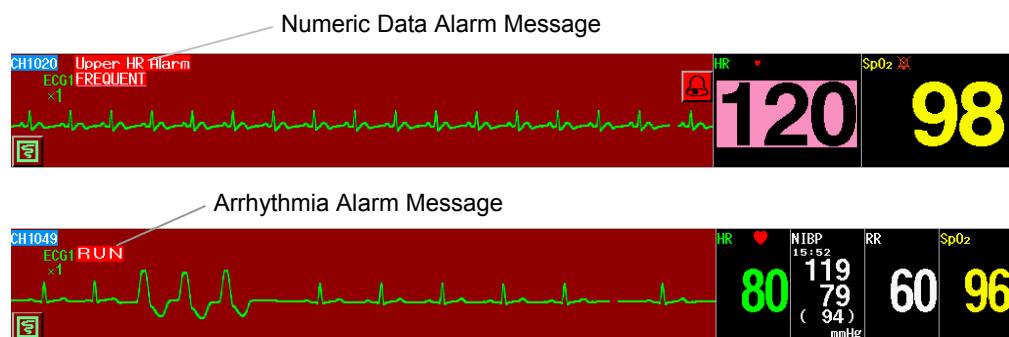
For setup procedure of Sync Tone Bed Selection (Selected Bed / ECG/SpO₂ Menu), refer to “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”.

Message Display Area

Patient name, alarm message, and status message will be displayed on each individual bed display area.

● Alarm Message

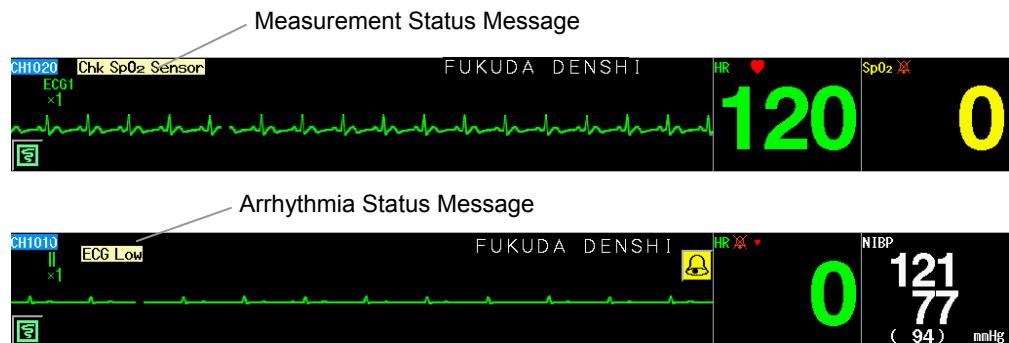
There are 2 types of alarm messages; numeric data alarm and arrhythmia alarm.



The alarm message for the arrhythmia alarm (except Tachy, Brady) will continue to be displayed for 30 seconds even after the alarm condition dissolves.

● Status Message

The status messages for measurement condition and arrhythmia analysis condition will be displayed.



Operation Menu

Pressing the **Menu** key will display the menu window. From this menu window, all operation can be performed.

【Menu Display】



Displays the parameter setup menu.

Displays the system configuration menu.

●Patient Setup Menu



For details of patient setup, refer to "3. Admit/Discharge of a Patient".

- Admit : Allows to enter the patient information before monitoring.
Discharge : Deletes patient information, monitoring data, setup condition of discharging patient.
Suspend : When a patient leaves the bed for a long period of time, temporarily suspends the measurement, alarm generation, automatic measurement and recording with the data and setup condition unchanged.

●Alarm Setup Menu



For details of alarm function, refer to "5. Alarm Function".

- Alarm Suspend : Temporarily suspends or sets ON the alarm for that patient.
Each Parameter : Sets ON/OFF, and upper / lower limit of alarm for each parameter.

●Function Selection Menu



For details of function selection menu, refer to "7. Review Function".

- Graphic Trend : Displays 48 hours of data in graphic format.
Tabular Trend : Displays 48 hours of data in tabular format.
Recall : Allows verification of the waveform and numeric data at alarm occurrence.
NIBP List : Displays NIBP data with HR, SpO₂, PR data in list format.
ST : Measures ST level for the monitoring ECG.
Full Disc. Wave : By using the optional CF card (FCF-1000, FCF-16GA), maximum of 96 hours of waveform can be stored and monitored on the display.
Night Mode : Sets the Night Mode for the DS-LANIII BED.
12-lead : Displays 12-lead ECG waveform.

●Parameter Setup Menu

The setup for the monitoring parameters can be performed.



For details of parameter setup, refer to "4. Parameter Setup".

ECG	
Size / Lead	Waveform size and lead
HR Alarm	ON/OFF of HR alarm, alarm limit
ST Alarm	ON/OFF of ST level alarm, alarm limit
Arrhythmia Alarm	ON/OFF of each arrhythmia alarm
Arrhythmia Learn	When arrhythmia analysis error or QRS judgment error occurs, performing "Arrhythmia Learn" will recover the original accuracy.
Synchronized Tone	Select whether to synchronize the pulse tone to ECG or SpO ₂ .
ECG Setup	AC Filter (ON/OFF) QRS Pace Mask (ON/OFF) Pace Pulse (ON/OFF/Distinct Color)
BP	
Scale	BP waveform scale
BP Alarm	ON/OFF of BP alarm, alarm limit of systolic (SYS) / diastolic (DIA) / mean (MEAN) pressure
SpO ₂	
Size	Pulse waveform size
SpO ₂ Alarm	ON/OFF of SpO ₂ alarm, ON/OFF of PR alarm, alarm limit
Synchronized Tone	Select whether to synchronize the pulse tone to ECG or SpO ₂ .
RESP	
Size	Respiration waveform size
RESP Alarm	ON/OFF of RR alarm, ON/OFF of APNEA alarm, alarm limit
CVA Detection	ON/OFF of CVA detection
CO ₂	
Scale	CO ₂ waveform scale
CO ₂ Alarm	ON/OFF of EtCO ₂ alarm, ON/OFF of InspCO ₂ alarm, alarm limit
Unit	CO ₂ measurement unit (mmHg/kPa/%)
NIBP	
Periodic Interval	Periodic measurement unit
NIBP Alarm	ON/OFF of NIBP alarm, alarm limit of systolic (SYS) / diastolic (DIA) / (MEAN) pressure
NIBP List	Displays NIBP list
GAS	
O ₂ Scale	O ₂ waveform scale
AGT Scale	AGT waveform scale
GAS Alarm	ON/OFF of GAS alarm
Parameter ON/OFF	
Sets whether to monitor (ON) or not monitor (OFF) each parameter.	

●System Configuration Menu



Record	Set the recording condition for manual, periodic, and alarm recording. Output recorder can be also selected from built-in recorder or laser printer.	"6. Recording"
Display Config.	Set the display configuration for home display and individual display.	"8. System Configuration"
Bed Transfer	Bed transfer / exchange allow to transfer / exchange the patient information and monitoring data all at once.	"3. Admit/Discharge of a Patient"
Color	Set the displaying color of the waveform and numeric data.	
Brightness	Set the brightness of the display.	
Tone/Volume	Set the volume / tone of alarm sound, pulse sound, key sound.	
Sweep Speed	Set the sweep speed for the displaying waveform. It can be set differently for circulatory (ECG, BP) and respiratory system.	"8. System Configuration"
Monitor Suspend Setup	Set different monitor suspend message and color according to the monitor suspend reason of each patient. This can be set only when ON is set for "Monitor Suspend's Message Selection" on the soft switch menu.	



For details of preset menu, refer to "9. Installation".

Chapter 3

Admit/Discharge of a Patient

This chapter describes the procedure to admit or discharge a patient to/from the monitor.

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What You Can Do on the Admit/Discharge Menu

With this menu, patient name and other patient information can be entered before starting monitoring.

When the monitoring is finished, the patient's monitoring data can be deleted by performing the discharging procedure.

When the patient leaves the bed for a long period of time, monitoring can be suspended to temporarily cease the measurement and alarm generation.

Press the **Menu** key to display the menu window.

On this window, press **Admit**, **Discharge**, **Suspend** to display the admit, discharge confirmation, monitor suspend confirmation window respectively.



Admit/Discharge	BED-002	Bed Name	ROOM-102	Admit Date	2006/08/02	Prev. Disp.
ID	ID-00000001			Sex: Male Age: 32 yrs Birth Date: 1975/04/08 Height: 164.0cm Weight: 60.0kg BSA: 1.65 m ²		Wave Select
Name	FUKUDA DENSHI					Suspend
Pacemaker	<input type="checkbox"/> Used	<input checked="" type="checkbox"/> Not Used				Comment
Type	<input checked="" type="checkbox"/> Adult	<input type="checkbox"/> Child	<input type="checkbox"/> Neonate			Discharge

⚠ CAUTION	<ul style="list-style-type: none">If you start monitoring a new patient without performing the discharge procedure for the previous patient, new data will be added to the previous data which will result in inaccuracy.If monitoring is suspended on the bedside monitor, the data for that patient will not be transmitted to the DS-7600. When monitoring is resumed on the bedside monitor, the data transmission to the DS-7600 will resume.
------------------	---

Admitting a Patient

Patient Name, Sex, Age

When admitting a patient, enter the following information.

- Patient ID
- Patient Name
- Bed Name
- Comment
- Pacemaker (Used / Not Used)
- Patient Type (Adult / Child / Neonate)
- Patient Information (sex, birth date, age, height, weight, BSA)

There are following ways to set the patient information.

- 1) Manually input using the displayed touch keys or keyboard (optional).
- 2) Automatically set by searching on the patient data server using the patient ID.
- 3) Automatically set using the EMR link function through the patient data server.



To use the patient data server, it is necessary to perform network setup in advance.
→ “9. Installation TCP/IP Network Connection”
→ “9. Installation EMR Link Function”

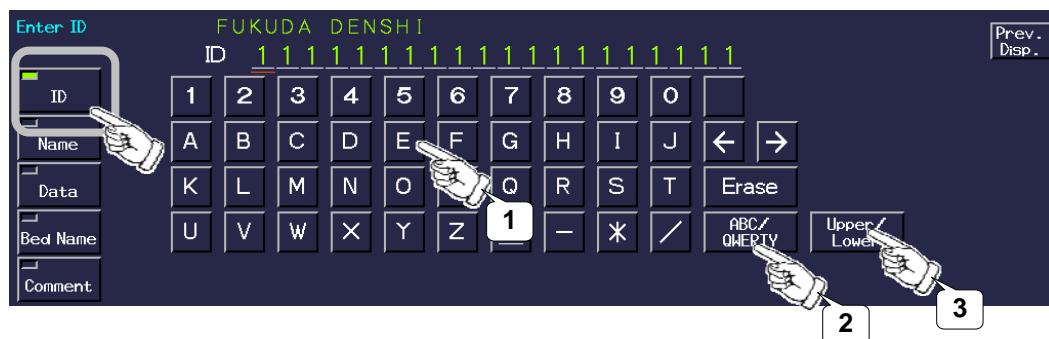
If the DS-7600 system is connected to the TCP/IP network and data server is used, the admit date of the patient can be changed.



For procedure to change the admit date, refer to P3-8 “Changing the Admit Date”.

To Input the Patient Information

- 1 Select a bed on the home display.
- 2 Press the **Menu** → **Admit** (“Patient”) keys.
The patient admit menu will be displayed.
- 3 Press the **ID** key, and enter the patient ID.



(1) Use the touch panel keys or keyboard (DS-7600W) to enter the ID of maximum 20 characters.

The characters not displayed (ex: "#", "&") cannot be input from the keyboard.

Use **[←]**, **[→]** (or **[←] [→]**) keys on the keyboard to move the cursor (red underline) position.

[Delete] key will delete the character at cursor position.

[Back Space] key will delete the character at left of cursor position.

(2) The key arrangement can be changed using the **ABC / QWERTY** key.

(3) The upper case and lower case can be selected using the **Upper / Lower** key.

([Shift]+[Caps Lock] key, or input character while pressing [Shift] key)

⚠ CAUTION

On the DS-LANII network, up to 20 characters of patient ID can be set on the DS-7600 but some bedside monitors are capable to set only up to 10 characters depending on the software version. (Refer to our service representative for software version of the bedside monitor.) To synchronize the central monitor and the bedside monitor, set the transmitting starting digit of the ID on the “Patient ID Starting Column” of the soft switch menu. The 10 characters from the set starting digit will be transmitted as patient ID.

→ “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”

4 Press the **Name** key, and enter the patient name.

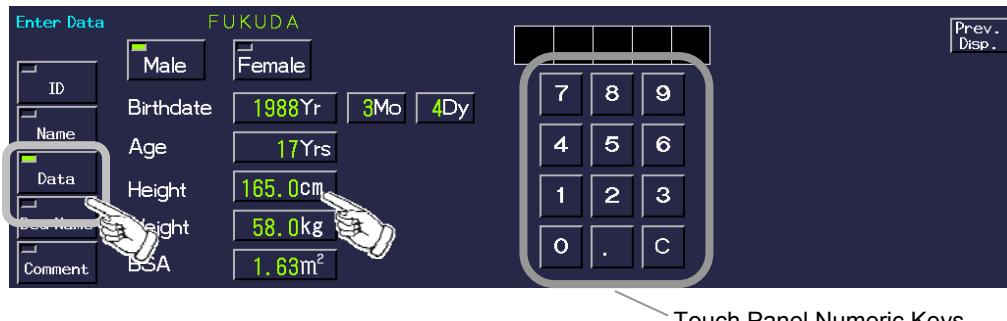
Use the touch panel keys or keyboard (DS-7600W) to enter the patient name in maximum of 20 characters. The key arrangement and upper/lower case selection can be performed using the **ABC / QWERTY** and **Upper / Lower** keys respectively.



⚠ CAUTION

On the DS-LANII network, up to 16 characters of patient name can be set on the DS-7600 but some bedside monitors are capable to set only up to 8 characters depending on the software version. Refer to our service representative for software version of the bedside monitor.

5 Press the **Data** key, and enter the patient's sex, age, height, weight.



Sex : Select **Male** or **Female**. (At default, neither is selected.)

This selection will not affect monitoring such as measurement accuracy.

Birth Date/Age : Age will be automatically calculated when the birth date is entered.

Or, it can be directly input using the touch panel keys (or keyboard).

If **Neonate** is selected for patient type, age will be displayed in days.

To directly input the age, enter the age using the numeric keys and press the **Yrs.** key.

Entering the year, month, day of birth using the numeric keys will automatically calculate the age.

Enter the year, month, day using the numeric keys, and press the **Yr**, **Mo**, **Dy** keys respectively.

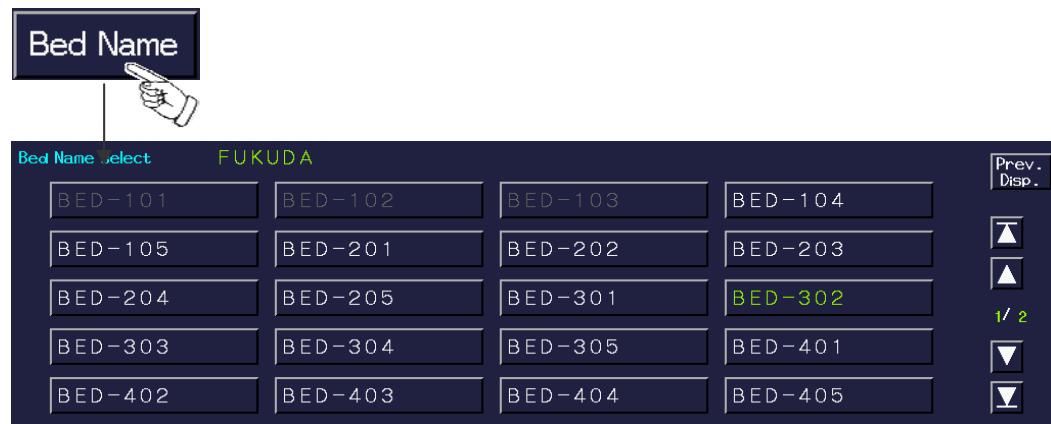
Height/Weight/BSA: Enter the height using the touch panel keys (or keyboard) and press the **cm** key.

Enter the weight using the numeric keys and press the **kg** key.

The BSA will be automatically calculated from the height and weight.

The BSA can be also entered using the numeric keys and pressing the **m²** key.

- 6 Select the bed name for the patient. Press the **Bed Name** key to display the bed name selection menu.**

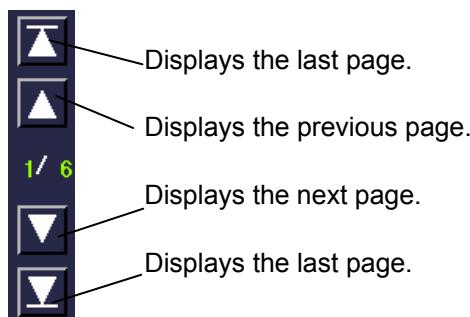


The Bed Name Selection menu displays a grid of 16 bed names. The names are arranged in four rows and four columns. The names are: BED-101, BED-102, BED-103, BED-104; BED-105, BED-201, BED-202, BED-203; BED-204, BED-205, BED-301, BED-302; BED-303, BED-304, BED-305, BED-401; and BED-402, BED-403, BED-404, BED-405. The name 'BED-302' is highlighted in green, indicating it is the selected bed name. To the right of the grid are scroll navigation keys: Prev. Disp., Up Arrow, Page Number (1/2), Down Arrow, and Last Page.

Select the bed name from the selections.

The bed name displayed in gray indicates that it is not selectable. It is already used by another bed.

To scroll the screen, use the arrow keys displayed at right.



- 7 Press the **Comment** key, and enter the comment.**

A comment for the patient can be entered using the touch panel keys (or keyboard) up to 30 characters.



The Enter Comment screen shows a text input field containing 'FUKUDA'. To the left of the input field is a tree menu with nodes: ID, Name, Data, and Bed Name. Below the input field is a 'Comment' button with a hand cursor icon. To the right of the input field is a numeric keypad and a QWERTY keyboard. Navigation keys for Prev. Disp., Up Arrow, Page Number (1/6), Down Arrow, and Last Page are also present.

- 8 Press the **Prev. Disp.** key to display the patient admit menu.**



The Patient Admit Menu displays patient information: ID (BED-002), Name (FUKUDA DENSJI), Room (ROOM-102), Admit Date (2006/08/02), and a Prev. Disp. key. Below this, there are sections for Pacemaker (Used/Not Used), Type (Adult/Child/Neonate), and a Comment field. On the right side, there are buttons for Wave Select, Suspend, and Discharge.

9 Select “Used” or “Not Used” for “Pacemaker”.

If “Used” is selected for “Pacemaker”, pacing stimulus (pace pulse) will be detected and artificial pacemaker pulse will be displayed. Pace pulse detection will prevent erroneous detection of pace pulse as QRS when pacing waveform does not appear (pacing failure).

Also, during the arrhythmia analysis, pacing beat will be analyzed as P (pace beat), F (fusion beat) to prevent misjudgment of VPC.



Select from Used / Not Used.

Appropriate selection should be made for the patient.



WARNING The pacemaker influences the precision of the QRS detection and arrhythmia analysis. Make sure the correct selection is made.



CAUTION The pacemaker pulse will not be displayed unless Used is selected for pacemaker on the admit menu, and ON or Distinct Color is selected for pace pulse on the ECG setup menu. Also, the DS-7600 will not display the artificial pacemaker pulse unless Used is selected for pacemaker on the bedside monitor.

10 Select the patient type.

The patient type selection affects NIBP measurement range, HR measurement range, and respiration filter.

It also affects the delay time to generate the parameter alarm.

	Adult	Child	Neonate
HR Meas. Range	0bpm, 12 to 300bpm		0bpm, 30 to 300bpm
Resp. Filter	1.5Hz		2.5Hz
Alarm Delay	5 sec.		0 sec.

The alarm delay time prevents frequent occurrence of parameter alarm by not generating the alarm until the alarm limit is exceeded for the delay time.

The alarm delay time functions for HR/PR, BP, RR, SpO₂, TEMP, EtCO₂/InspCO₂, TACHY, BRADY.



Select from Adult / Child / Neonate.

Make sure to select the correct patient type.



WARNING The monitor determines the detection algorithms for QRS and NIBP according to the selected patient type. Make sure the proper selection is made.

11 The admit procedure for one patient is complete with the above procedure.

To continue with the admit procedure for another patient, repeat the following steps.

- (1) Select the patient using the bed selection key.
- (2) Procedure 3 to 10

To Search the Patient

The patient information can be searched from the patient server.

Reference

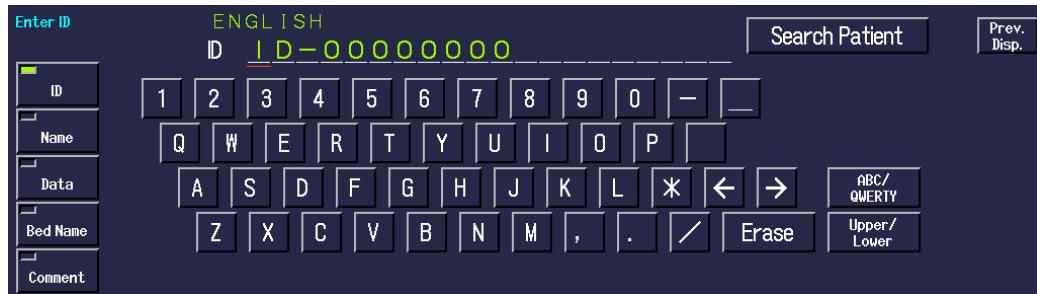
To use the patient data server, it is necessary to perform network setup in advance.

→ "9. Installation TCP/IP Network Connection Patient Server Setup"

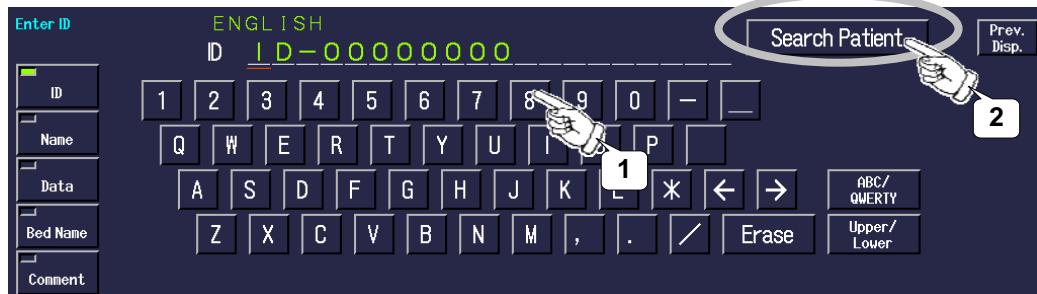
For patient admit/discharge procedure using the EMR link function, refer to "EMR Link Function".

1 Select a bed on the home display.

2 Press the **Menu** → **Admit** ("Patient") → **ID** keys.



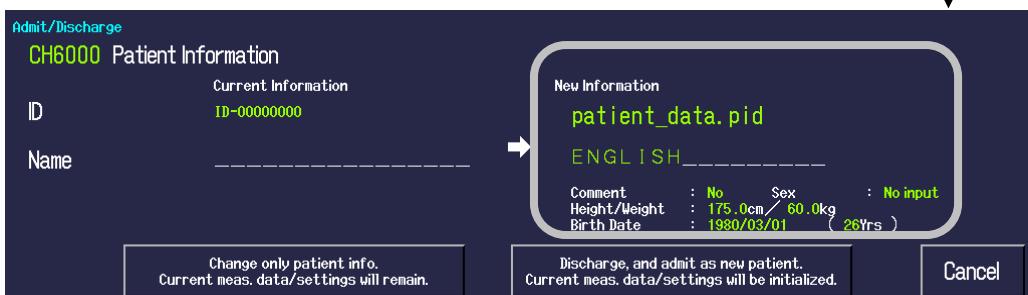
3 Enter the patient ID and search on the patient data server.



1) Use the touch panel keys or keyboard (DS-7600W only) to enter the ID.

2) Search the entered patient ID on the patient data server.

The searched patient information will be displayed under "New Information".



Memo

Messages displayed for "New Information"

"Searching" : In process of searching the patient server.

"No relevant patient found" : No relevant patient has been found on the patient server.

4 Select whether or not to set the searched patient information.

Select from **Change only patient info.** / **Discharge and admit as new patient.** / **Cancel.**

Change only patient info. will replace the current patient information to the newly acquired information.

Discharge and admit as new patient. will initialize the current patient data/monitoring condition and admit the searched patient as new patient.

Cancel will invalidate the acquired data.

Not all the information will be acquired from the patient data server. Make sure that all required patient information are input on the patient admit/discharge menu.



P3-3 "Input the Patient Information Using the Touch Keys"

To Change the Admit Date

The admit date of the patient can be changed using the Data Server through the TCP/IP network.



It is necessary to perform network setup in advance.
→ "9. Installation TCP/IP Network Connection Data Server Setup"

- When the data server is used, **Admit Date** key will be displayed on the patient admit menu.

Pressing this **Admit Date** key will display the "Date of Admission" editing screen.

The screenshot shows the patient admit menu. The 'Admit Date' key is highlighted with a red box. Other visible keys include 'Admit/Discharge', 'CH6000', 'Bed Name', 'ROOM-101', 'Prev. Disp.', 'ID', 'Name', 'Sex: Male', 'Age: 58Yrs', 'Birth Date: 1950/11/20', 'Height: 170.0cm', 'Weight: 65.0kg', 'BSA: m²', 'Pacemaker: Used', 'Type: Adult', 'Comment', 'Wave Select', 'Suspend', 'Discharge', and 'Setup'.

- Enter the year, month, day, hour, and minute.

The screenshot shows the "Date of Admission" touch screen input interface. A numeric keypad is displayed with a grid of numbers (1-9, 0, Clear). Four hands are shown interacting with the screen: hand 1 points to the '2' in '2007Yr'; hand 2 points to the '2' in '11Mo'; hand 3 points to the '2' in '7Dy'; hand 4 points to the '2' in '11hh'. The 'Date of Admission' field shows '2007Yr 11Mo 7Dy 11hh 28mm'. A 'Setup' button is at the bottom left, and a 'Prev. Disp.' button is at the top right.

- Enter the year of admission using the numeric keypad.
- Press the **Yr** key.
- Using the same procedure above, enter the month, day, hour, and minute using the numeric keypad and press the **Mo**, **Dy**, **hh**, **mm** keys respectively.
Ex.) 11:28 Nov. 7, 2007
2 0 0 7 Yr 1 1 Mo 7 Dy 1 1 hh 2 8 mm
- Press the **Setup** key and validate the input data.



CAUTION You cannot set a future date/time.

Suspend Monitoring

Suspend/Resume

In this section, monitoring suspend/resume function when the patient leaves the bed for a long period of time will be explained.

Suspend monitoring will suspend the measurement, alarm occurrence, automatic measurement and automatic recording with data and setup unchanged.

By selecting ON for “Monitor Suspend’s Message Selection” on the soft switch menu, different messages in different colors according to the patient’s destination can be displayed during monitoring suspend condition.

In addition, by setting the monitor suspend duration (15Min./30Min./1Hr./1.5Hr./2Hr), alarm will generate after the set duration to remind the user to resume monitoring.



To display the detailed message during monitoring suspend condition, select ON for “Monitor Suspend’s Message Selection” on the soft switch menu, and set the details on the “Monitor Suspend Setup” menu of the system configuration menu.

→ “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”

→ “8. System Configuration Monitor Suspend Setup”



- When the monitoring is suspended, the trend data and full disclosure waveform (optional function) data will not be acquired.
- Resuming monitoring will resume from alarm suspend condition.
- The monitor suspend function will not be synchronized between the central monitor and the bedside monitor.
 - Suspending monitoring on the central monitor will not suspend monitoring on the bedside monitor. Conversely, suspending monitoring on the bedside monitor will not suspend monitoring on the central monitor.
 - Resuming monitoring on the bedside monitor will not resume monitoring on the central monitor. Conversely, resuming monitoring on the central monitor will not resume monitoring on the bedside monitor.

To Suspend Monitoring

1 Select the bed to suspend monitoring.

2 Press the **Menu** → **Suspend** (“Patient”) keys.

[If “Monitor Suspend’s Message Selection” (soft switch) is set to OFF]

A confirmation message to suspend monitoring will be displayed.

If you do not want to suspend monitoring, press the **Cancel** key.

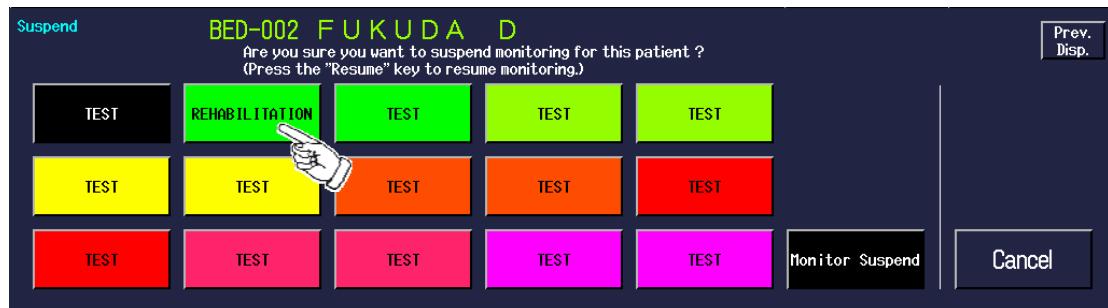


Press the **Suspend** key. The display will automatically return to the home display with the **Resume** key displayed for the monitoring suspended patient.



【If Both “Monitor Suspend’s Message” and “Monitor Suspend Time” are set】

When the “Monitor Suspend’s Message Selection” is set ON, the following screen will be displayed.

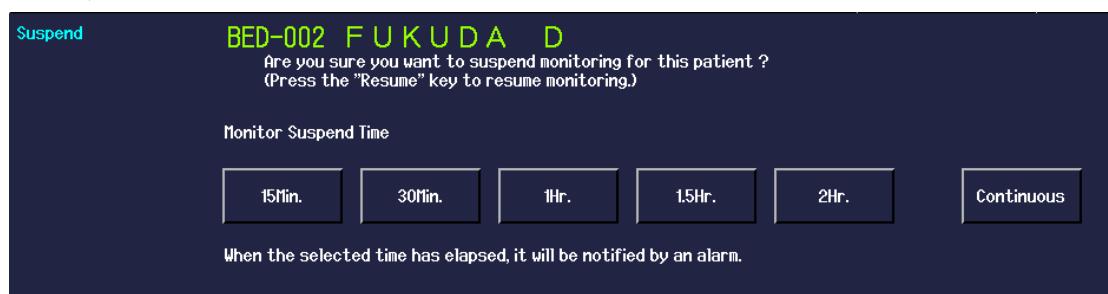


By clicking one of the selections, “Monitor Suspend Time” selection screen will be displayed.

Pressing the [Monitor Suspend] key on this screen will immediately suspend monitoring without displaying the “Monitor Suspend Time” selection screen.

Selecting the monitor suspend duration from [15Min.] / [30Min.] / [1Hr.] / [1.5Hr.] / [2Hr.] will start to suspend monitoring for the selected duration. The timer will start counting down for the set duration.

[Continuous] will start to suspend monitoring without setting the duration.



The selected monitor suspend message with the set color will be displayed on the home display. A countdown timer will be also displayed under the monitor suspend message.



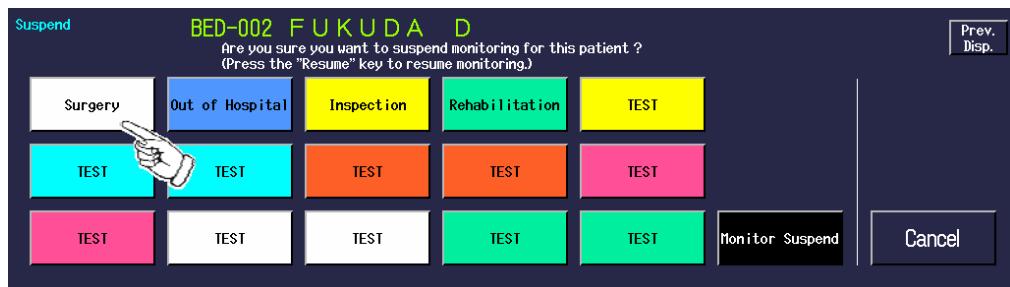
When the preprogrammed duration completes, alarm will generate. The Event key will be displayed, alarm sound will generate (5 sec. interval), and alarm indicator will light.

Pressing the Event key will display the “Monitor Suspend Time” selection screen. To extend the monitor suspend duration, select the duration.

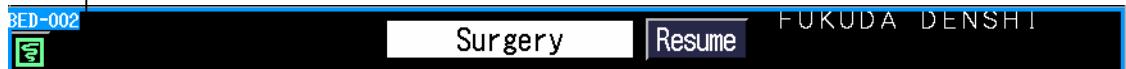
To resume monitoring, press the [Resume] key.



[If “Monitor Suspend’s Message” is set, but “Monitor Suspend Time” is not set]
When “Monitor Suspend’s Message” is set ON, the following screen will be displayed.

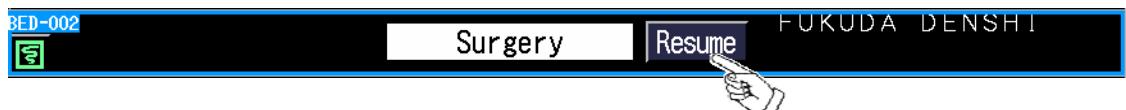


By clicking one of the selections, the screen will automatically return to the home display, and the selected monitor suspend message with the set color will be displayed.



To Resume Monitoring

- 1 Press the **Resume** key on the home display.



Bed Transfer and Bed Exchange

By performing bed transfer or bed exchange procedure, patient information or monitoring data can be transferred or exchanged all at once.

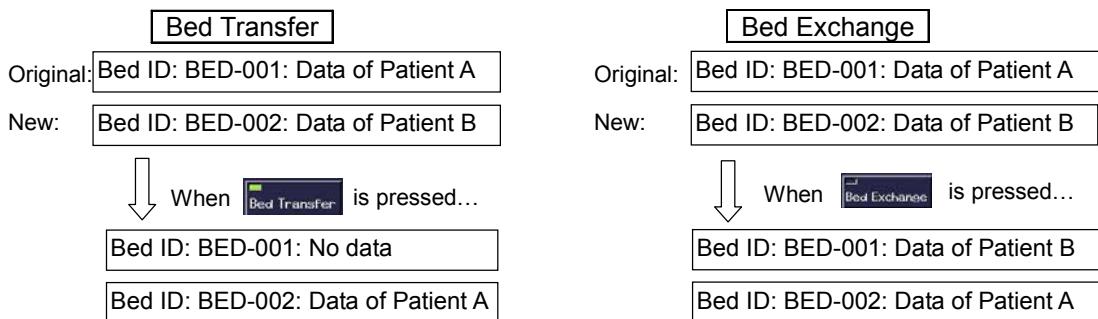
Bed Transfer : The setup data of the original bed will be overwritten to the setup data of the new bed.

The setup data of the original data will be cleared.

Bed Exchange : The setup data of the original bed and new bed will be exchanged.

The setup data of both beds will not be cleared.

The setup data of both beds before the exchange will not be changed.



	Detail	Bed Transfer		Bed Exchange	
		Original	→ New	Original	↔ New
Patient Data	Admit setup data	No	Yes	Yes	Yes
Alarm	Alarm setup data	■	Yes	Yes	Yes
Record	Record setup data	No	Yes	Yes	Yes
Review	Graphic Trend	No	Yes	Yes	Yes
	Tabular Trend		Yes	Yes	Yes
	NIBP List		Yes	Yes	Yes
	Full Disclosure Waveform		Yes	Yes	Yes
	Recall		Yes	Yes	Yes
	ST Display		Yes	Yes	Yes

Yes: Data will be transferred. No: Data will be cleared. ■: Data will be initialized.



- When a bed transfer procedure is performed, all setup data for the new bed will be updated. The data for the wired network bed and the same data monitored on other central monitor will be initialized.
- If bed transfer/exchange is performed for the monitors connected to the DS-LANIII network, the GAS alarm settings will be backed up or initialized depending on the settings for "Backup at Discharge" on the bedside monitor.
- The bed transfer/bed exchange function cannot be used when EMR link function is used. This function will become available when the EMR link is offline.

- 1 Press the **Menu** → **System Config.** → **Bed Transfer** keys to display the bed transfer menu.



- (1) Press **Bed Transfer** or **Bed Exchange**.
The LED will light for the pressed key.
(2) Select the original bed.
(3) Select the new bed to transfer/exchange the data. A confirmation message will be displayed.



- (4) Press the **OK** key to transfer/exchange the data.

Discharging a Patient

Clearing the Data

When a discharge procedure is performed, patient information, monitoring data, setup data will be cleared to prepare for monitoring a next patient.

The following data will be cleared after the discharge procedure.

- Patient information input during the admit procedure (patient name, pacemaker used/not used, etc.)
- Patient monitoring data (trend data, recall waveform)
- Setup data changed during monitoring

Reference

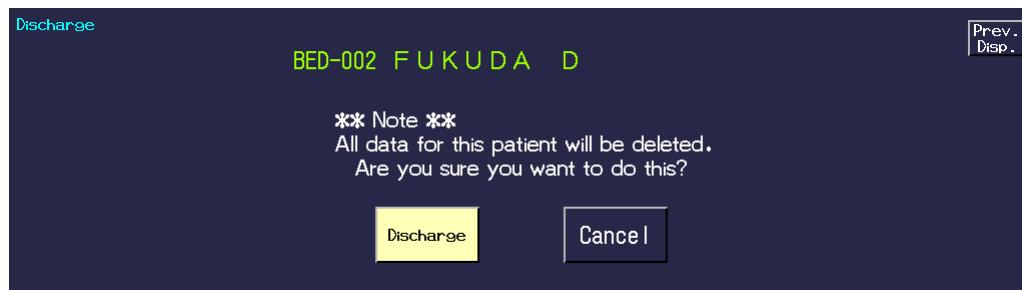
- The alarm limit will be initialized to the value set for the “Admit Setup” of the preset menu.
→“9. Installation Procedure to Start Monitoring 5-7 Set the initial settings at admittance”
- The monitoring condition after discharge can be selected from **Admit** or **Suspend** for “Setup at Discharge” on the soft switch menu.
→“9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”

Discharging Procedure

1 Select a bed to perform the discharge procedure.

2 Press the **Menu → **Discharge**.**

The discharging confirmation message will be displayed.



3 To discharge the patient, press the **Discharge key.**

The patient data, monitoring condition, etc. will be initialized.

To cease the discharge procedure, press the **Cancel** key.

4 After the discharging procedure, the display will return to the home display.

Depending on the setup of the “Setup at Discharge” on the soft switch menu, the home display will appear differently.



EMR Link Function

Using the EMR link function through the patient data server allows to perform following operation on the DS-7600 system.

- When a patient is admitted on EMR, the same patient will be admitted on the DS-7600 system.
- When a patient is discharged on EMR, this patient's information on the DS-7600 system will be initialized. The monitored data and settings will remain until the discharge process on the DS-7600 system is performed.
- When a patient information is changed on the EMR, the patient information on the DS-7600 system will also change.



To use the EMR link function, it is necessary to select **[Link with EMR]** on the Network Configuration Setup (Patient Data Server) → "9. Installation EMR Link Function"

⚠ CAUTION

- When EMR link function is used, the patient admitted on EMR will be also admitted on the DS-7600 system. But it is also necessary to perform admit process for this patient on the DS-7600 system. Setting the pacemaker usage and patient type is especially important as these will affect the monitoring accuracy.
- The discharge process on EMR will only initialize the patient information on the DS-7600 system. To initialize the monitored data and settings for this patient, it is necessary to perform discharge process on the DS-7600 system.

Restrictions of EMR Link Function

There are following restrictions when using the EMR link function.

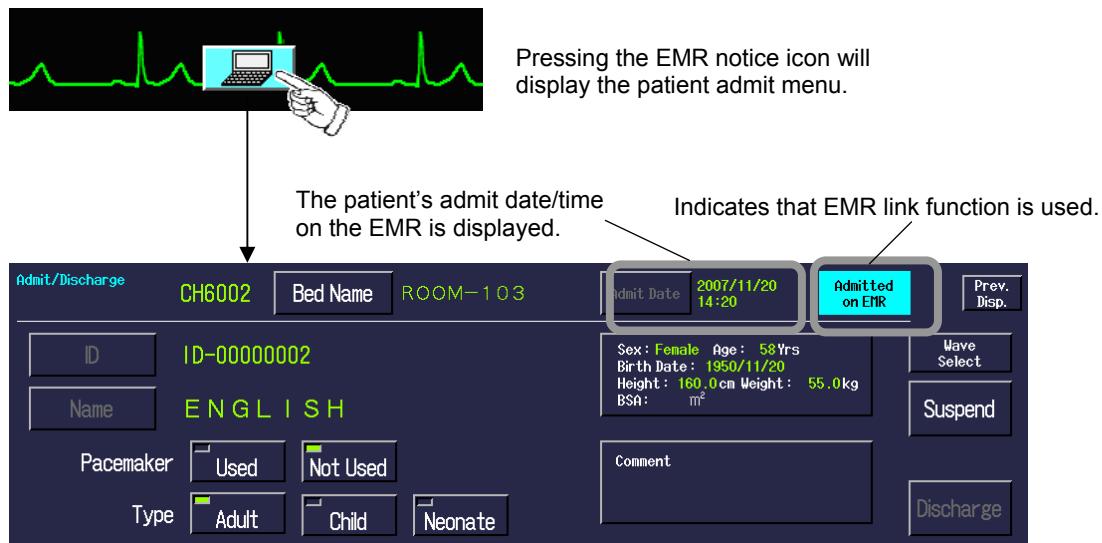
Function	Item	EMR Link Function		
		EMR Admitted	EMR Discharged	EMR Offline
Patient Admit Menu	EMR Link Message	Admitted on EMR	Discharged from EMR	EMR Offline
	ID	No	No	Yes
	Search Patient	No	No	No
	Name	No	No	Yes
	Discharge	No	Yes	Yes
	Suspend	Yes	Yes	Yes
	Admit Date	No	No	Yes
	Bed Name	Yes	Yes	Yes
	Other patient information	Yes	Yes	Yes
Menu	Discharge	No	Yes	Yes
System Configuration	Bed Transfer	No	No	Yes
DS-LAN Network (Operation on the bedside monitor)	Change of patient ID	No	No	Yes
	Change of patient name	No	No	Yes
	Change of admit date	No	No	Yes
	Change of patient information	Yes	Yes	Yes
	Discharge process	No	Yes	Yes

"Yes": Can display, edit, and change settings. "No": Cannot display, edit, and change settings.

Admit/Discharge on the EMR

●When a Patient is Admitted on the EMR

When a patient is admitted on the EMR, EMR notice icon will be displayed on the DS-7600 system.



The patient ID, patient name, and admit date from the EMR cannot be changed on the DS-7600 system, but other patient information can be input on the admit menu.

After inputting the patient information on the admit menu, monitoring on the home display can be started.

●When a Patient is Discharged from the EMR

When a patient is discharged from the EMR, "Discharged on EMR" will be displayed on the home display.



Pressing the [Discharge] key on the admit menu will allow to discharge the patient from the DS-7600 system.



●To Display the Review Data after EMR Discharge

Setting ON for "Display Data Before Discharging" on the Network Configuration Setup (Patient Data Server) menu will allow to display the patient's review data even after the patient is discharged from the EMR. The review data can be displayed until the discharge process is performed on the DS-7600 system. If OFF is set for "Display Data Before Discharging", the review data will not be displayed.



For details of the review data display after EMR discharge, refer to "7. Review Function Review Data Display after EMR Discharge"

Setup at Admittance

On the “Admit Setup” of the preset menu, ON/OFF of monitoring each parameter, default value of alarm setup can be set.

When a discharge procedure is performed, the alarm setup will be initialized to the value set on this “Admit Setup” menu. If the discharge procedure is performed on the bedside monitor, alarm setup will be initialized to the value for the bedside monitor.



The setup at admittance should be performed by our service representative or your system administrator.

For procedures, refer to “9. Installation Procedure to Start Monitoring 5-7 Set the initial settings at admittance”.

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Chapter 4

Parameter Setup

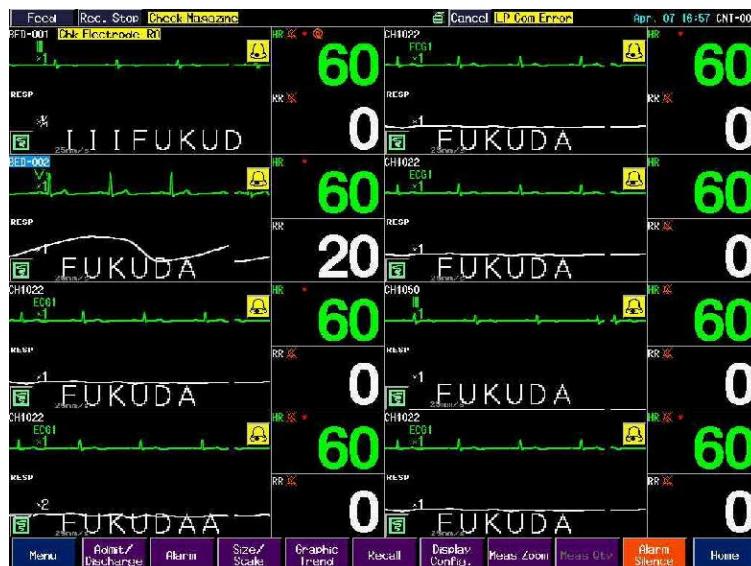
This chapter explains the procedure to set the monitoring condition, scale, alarm, etc. for each parameter.

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Monitoring on the Home Display

Parameter signals are received from the telemetry transmitter or bedside monitor to display waveform and numeric data measurements.

- The waveform and numeric data to be displayed on the home display can be set on the display configuration menu.
- Set the waveform size and sweep speed as required.



⚠️ WARNING

When a parameter monitored on a bedside monitor or telemetry transmitter is in a connector-off condition, the alarm will not be generated on the central monitor. Make sure that the connector is securely connected. If a waveform/numeric data is not displayed for the monitored parameter, check the patient's condition and pay attention not to miss the connector-off condition.

⚠️ CAUTION

For the following case, monitoring will not be performed on the central monitor. Waveforms and numeric data will not be displayed.

- In case of DS-LANII network, when the temperature unit is °F on the bedside monitor.
- In case of DS-LANIII network, when the measurement unit for BP (mmHg/kPa) and temperature (°C/°F) is different between the bedside monitor and the central monitor.

ECG Monitoring

- HR measurement, arrhythmia analysis, ST measurement can be performed.
- Waveform size and position can be adjusted.
- ECG lead can be selected.
- Alarm for HR and arrhythmia can be set.
- AC filter can be set.
- Drift filter can be set.
- ON/OFF of QRS pace mask can be set.
- Pacemaker artificial pulse can be displayed overlapped to ECG waveform.
- Number of ECG channel (ECG1/ECG1+2) for QRS detection can be selected.

CAUTION

Precautions for ECG Monitoring

- There are some cases when pacemaker pulse can not 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 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.
- Depending on the electric signal condition under transmission, noise may interfere and incorrectly display the pacemaker pulse.
- When spontaneous QRS and pacemaker pulse overlap (ex. fusion beat, etc.), QRS detection cannot be performed properly. In this case, the heart rate is degraded.
- When continuously detecting AC noise artifact as pacemaker pulses, QRS detection stops and heart rate is extremely degraded. Also arrhythmia cannot be detected.

Respiration (RESP) Monitoring

- Waveform size can be adjusted.
- RR and apnea time measurement can be performed.
- Alarm for RR and apnea can be set.
- Respiration detection is performed automatically.
- ON/OFF of CVA detection can be selected.

WARNING

The purpose of this respiration alarm is to alert the user to evaluate for the possible occurrence of apnea events by identifying the absence of respiration. It is not intended to be classified as an "Apnea Monitor" and will not identify the condition creating the possible event. (Central, Obstructive or Mixed.)

Blood Pressure (BP1 to 6) Monitoring

- Systolic, diastolic, and mean BP can be displayed.
- Alarms for systolic, diastolic, mean BP can be set.
- BP waveform scale can be adjusted.
- The BP label will correspond to the label set on each bedside monitor.

Arterial Oxygen Saturation (SpO_2) Monitoring

- Pulse waveform size can be set.
- Alarm for SpO_2 value can be set.
- Alarm for pulse rate can be set.
- SpO_2 sensor check alarm generation can be set.

Non-invasive Blood Pressure (NIBP) Monitoring

- Systolic, diastolic, mean NIBP, measurement time can be displayed.
- Alarms for systolic, diastolic, mean NIBP can be set.
- The latest 120 data can be displayed on the NIBP list.

NOTE

The NIBP measurement time is the time measured on the bedside monitor. Make sure the same time is set for the central monitor and the bedside monitor.

Temperature (TEMP) Monitoring

- The temperature measurement can be displayed.
- Alarm for temperature measurement can be displayed.

CO_2 Concentration Monitoring

- End-tidal CO_2 concentration (EtCO_2), Inspiratory CO_2 concentration (InspCO_2) measurement can be performed.
- The measurement unit can be selected from mmHg / kPa / %.
- CO_2 waveform scale can be set.
- EtCO_2 , InspCO_2 alarm can be set.
- "Check CO_2 " message will be displayed during warmup, airway adapter zeroing, zero error, measurement error, sensor error, etc.

 CAUTION	<p>For the following case, CO₂ concentration monitoring cannot be performed on the DS-7600.</p> <ul style="list-style-type: none">• If the bedside monitor is DS-5300.• If the bedside monitor is DS-5400 with the software version V03-02 or prior.• If the software version of the HLX-561 is V01-07 or prior.
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Gas Concentration Monitoring

Gas concentration can be monitored only when connected to the DS-LANIII network.

- Carbon dioxide (CO₂_E, CO₂_I), oxygen (O₂_E, O₂_I), nitrous oxide (N₂O_E, N₂O_I), anesthetic gas (AGT_E, AGT_I) measurements can be monitored.
- Scales for O₂ waveform and anesthetic gas waveform can be set.
- ON/OFF of anesthetic gas alarm can be set.
- MAC value can be monitored if set to ON on the bedside monitor.

Display according to the Network Construction

The display on the DS-7600 System Central Monitor differs depending on the system construction.

● Numeric Data/Waveform Display

		Wired Network (BED)		Wireless Network	
		DS-LANII	DS-LANIII	(LW)	(RF)
Numeric Data	HR	Displays data of bedside monitor.		Measured on central monitor from ECG waveform. (Averaged value over 6 sec. calculated from R-R interval. Averaged value over 3 sec. for neonate.)	
	ST			Measured on central monitor from ST reference waveform.	
	VPC			Displays data measured on central monitor.	
	RR			<ul style="list-style-type: none"> • Impedance respiration Displays data measured on central monitor. 	
	APNEA			<ul style="list-style-type: none"> • Other than impedance respiration Displays data of bedside monitor. 	
	BP1–BP6				
	SpO ₂				
	PR				
	NIBP				
	TEMP				
	EtCO ₂				
	InspCO ₂				
	SvO ₂ /CCO			No display	
	12-lead ST			No display	
	GAS	No display	Displays data of bedside monitor.	No display	
Each Waveform		Displayed			

● Arrhythmia Display/Setup

		Wired Network (BED)		Wireless Network	
		DS-LANII	DS-LANIII	(LW)	(RF)
Arrhythmia	Asystole	Yes	Yes	Yes	Yes
	VF	Yes	Yes	Yes	Yes
	VT	Yes	Yes	Yes	Yes
	Slow VT	No	Yes	No	Yes
	Run	Yes	Yes	Yes	Yes
	Tachy	Yes	Yes	Yes	Yes
	Brady	Yes	Yes	Yes	Yes
	Couplet	No	Yes	No	Yes
	Pause	No	Yes	Yes	Yes
	Bigeminy	Yes	Yes	Yes	Yes
	Trigeminy	No	Yes	No	Yes
	Frequent	Yes	Yes	Yes	Yes

Yes: Display/Setup is possible. Alarm will generate.

No: Display/Setup is not possible. Alarm will not generate.

Lead-Off Condition

When ECG lead is detached, some waveform may become immeasurable depending on the detached lead. In such case, ECG waveform or respiration waveform will be displayed in baseline, and ECG related alarm will generate.

ECG related alarms are as follows.

- HR Alarm
- Arrhythmia Alarm
- ST Alarm
- RR Alarm of Impedance Respiration
- Apnea Alarm of Impedance Respiration

If the alarm generated during lead-off condition is considered not reliable, turning the "Alarm Judgment" OFF will not generate the ECG related alarm during lead-off condition.

For the alarm function during lead-off condition, the following setup can be performed on the "Alarm-related Setup" menu.

- ON/OFF of Alarm Judgement
- ON/OFF of Alarm Recording
- ON/OFF of Lead-Off Message
- Lead-Off Alarm Interval (5/30/60 sec.)

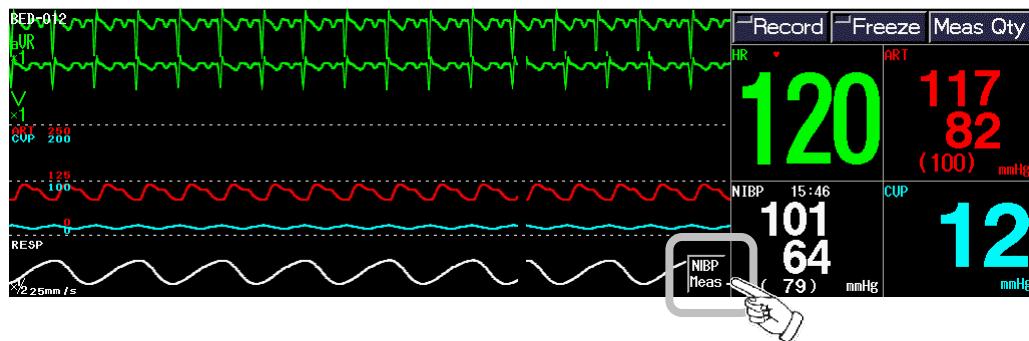


For details of lead-off condition, refer to "5. Alarm Function Lead-Off Condition".

NIBP Manual Measurement

[NIBP Meas] key will be displayed in the individual display area when connected to the DS-LANIII network bed.

By pressing this key for more than 1 second, NIBP measurement can be started.



NIBP Automatic Measurement

NIBP measurement can be performed automatically at selected time interval or at selected time. This function is available only when connected to the DS-LANIII network.

⚠ WARNING

Depending on the software version of the bedside monitor, NIBP periodic measurement interval will not synchronize between the central monitor and bedside monitor. (For details of the software version, refer to our service representative.) If performing NIBP periodic measurement from the central monitor, do not set the interval on the bedside monitor.

1 Select a bed to perform the setup.

2 Press the NIBP parameter key.

Or, press the **Menu** → **Param. Setup** → **NIBP** keys.

The NIBP parameter setup menu will be displayed.

3 Set the periodic measurement interval or time to start the measurement.

Select **Interval** or **Timer**. Select **OFF** if not performing the periodic measurement.

If **Interval** is selected, select the measurement interval from **2min** / **2.5min** / **3min** / **5min** / **10min** / **15min** / **20min** / **30min** / **60min** / **120min**.



The measurement time will be the integral multiple of the selected interval time beginning with 0 minute.

Ex.) If the present time is 13:14, the measurement time will be as follows for each interval time.

2min : 13:16, 13:18, 13:20, . . .

2.5min : 13:15, 13:17:30, 13:20, . . .

3min : 13:15, 13:18, 13:21, . . .

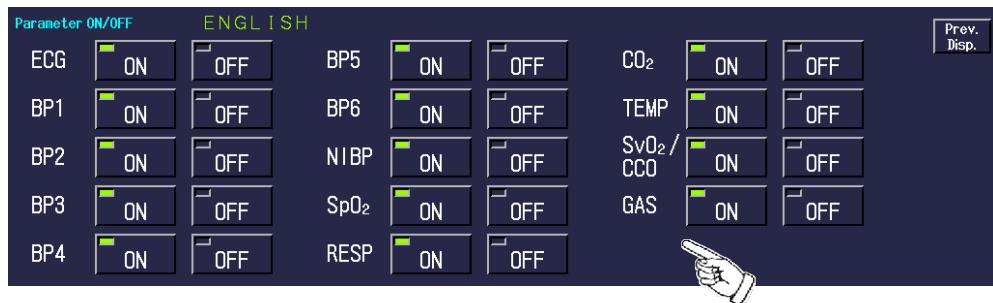
If **Timer** is selected, select the measurement starting time from **0:00** to **23:00**. (More than one selection is possible.) The measurement will automatically start at selected time.



Parameter ON/OFF Setup

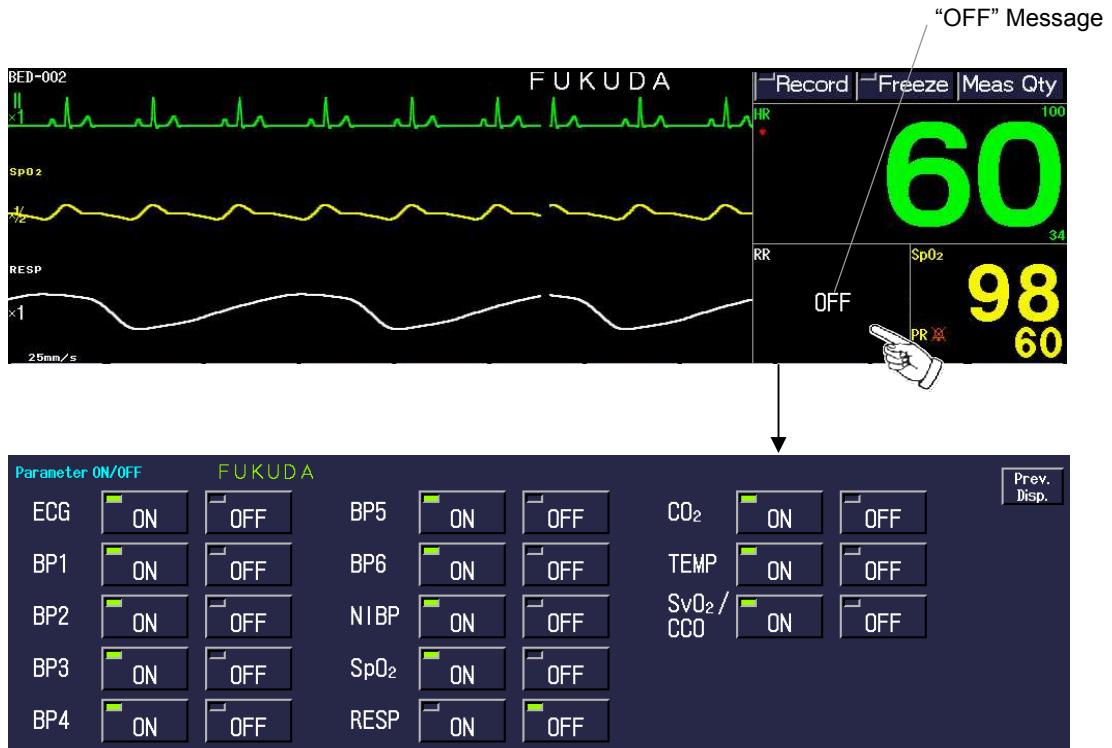
Whether or not to monitor each parameter can be set.

- 1 Select the patient to perform the Parameter ON/OFF setup.
- 2 Press the **Menu** → **Param. Setup** → **Parameter ON/OFF** keys. (Or, press the **Parameter ON/OFF** key set as user key.)
The Parameter ON/OFF menu will be displayed.
- 3 Select **ON** (monitor) or **OFF** (not monitor) for each parameter.



- 4 When **OFF** is selected, “OFF” will be displayed inside the corresponded parameter key (numeric data box).

Pressing the parameter key where “OFF” is displayed will display the Parameter ON/OFF menu.



Parameter Setup Menu

Setup Item for Each Parameter

ECG	
Lead / Size	Size and lead of ECG waveform
HR Alarm	ON/OFF of HR alarm, alarm limit
ST Alarm	ON/OFF of ST level alarm, alarm limit
Arrhy. Alarm	ON/OFF of each arrhythmia alarm, alarm limit
Arrhy. Relearn	When arrhythmia or QRS is misjudged, performing arrhythmia relearn will recover the original accuracy.
Sync. Tone	Heartbeat synchronized tone: ECG/SpO ₂
ECG Setup	AC Filter (ON/OFF) Drift Filter (ON/OFF) QRS Pace Mask (ON/OFF) QRS Detect (ECG/ECG1+2) Pace Pulse (ON/OFF/Distinct Color)
BP	
Scale	BP waveform scale
BP Alarm	ON/OFF of BP alarm, each alarm limit for systolic (SYS), diastolic (DIA), mean (MEAN) blood pressure
SpO₂	
Size	SpO ₂ waveform size
SpO ₂ Alarm	ON/OFF of SpO ₂ alarm, PR alarm, alarm limit
Sync. Tone	Heartbeat synchronized tone: ECG/SpO ₂
RESP	
Size	Respiration waveform size
RESP Alarm	ON/OFF of RR alarm, APNEA alarm, alarm limit
CVA Detect	ON / OFF of CVA detection
CO₂	
Scale	CO ₂ waveform scale
CO ₂ Alarm	ON/OFF of EtCO ₂ alarm, InspCO ₂ alarm, alarm limit
Unit	CO ₂ measurement unit
NIBP	
NIBP Alarm	ON/OFF of NIBP alarm, each alarm limit for systolic (SYS), diastolic (DIA), mean (MEAN) blood pressure
GAS	
O ₂ Scale	O ₂ waveform scale
AGT Scale	Anesthetic gas waveform scale
GAS Alarm	ON/OFF of GAS alarm
Parameter ON/OFF	
ON/OFF of each parameter monitoring	

To Display the Parameter Setup Menu

There are 2 procedures to display the parameter setup menu as described below.

●To Display from the Parameter Key

On the individual display, numeric data for each parameter are displayed. This numeric data display area functions as a parameter key.

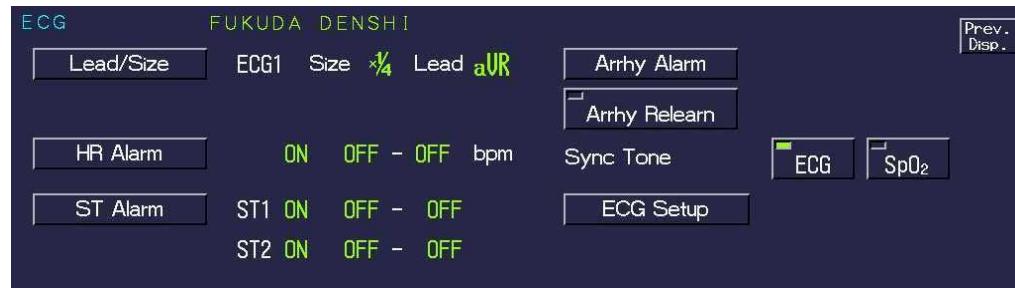
Pressing this parameter key will display the setup menu for that parameter.

For example, pressing the ECG parameter key (area where HR is displayed) will display the ECG setup menu

The parameter setup menu can be also accessed from the **Menu** key, but using the parameter key allows quick access to the desired setup menu.

- 1 Select a bed to perform the setup.**
- 2 For example, press the ECG parameter key (area where HR data is displayed).**

The ECG setup menu will be displayed.



●To Display from the Menu Display

- 1 Select a bed to perform the parameter setup.**
- 2 Press the **Menu** → **Param. Setup** keys.**

The parameter setup menu will be displayed.



- 3 Select a parameter for setup.**

The parameter setup menu for the selected parameter will be displayed.

Numeric Data on the Home Display



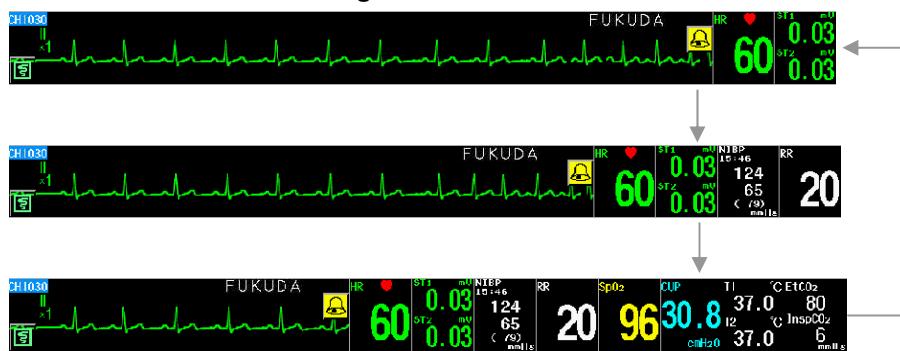
For procedure to set the user key, refer to “9. Installation Procedure to Start Monitoring 5-5 Set the user key”.

To Change the Quantity of Displayed Numeric Data (Home Display)

When the display configuration is 1bed8waves, 2beds4waves, 4beds2waves, 6beds1wave, or 8beds1wave, pressing the [Meas Qty] key preprogrammed as user key will sequentially change the area size of the parameter key.

The quantity of numeric data can be also changed on the “Home Display Configuration” menu.

[For “8Beds 1Wave” configuration]



To Change the Size of Numeric Data Display Area (Home Display)

The [Meas Zoom] key preprogrammed as user key will enlarge or reduce the size of each parameter key without changing the size of the whole numeric data display area.

Pressing the [Meas Zoom] key will sequentially enlarge ↔ reduce the size.

The size of each parameter key can be also enlarged or reduced on the “Home Display Configuration” menu.



Enlarging the size of each parameter key will decrease the quantity of displayed parameter key, and reducing the size of parameter key will increase the quantity of displayed parameter key.



For the patterns of displayable numeric data quantity, refer to the next section, “Numeric Data on the Individual Display”.

Depending on the setting, enlarging/reducing the size of parameter key can be either applied to all beds or to individual bed.

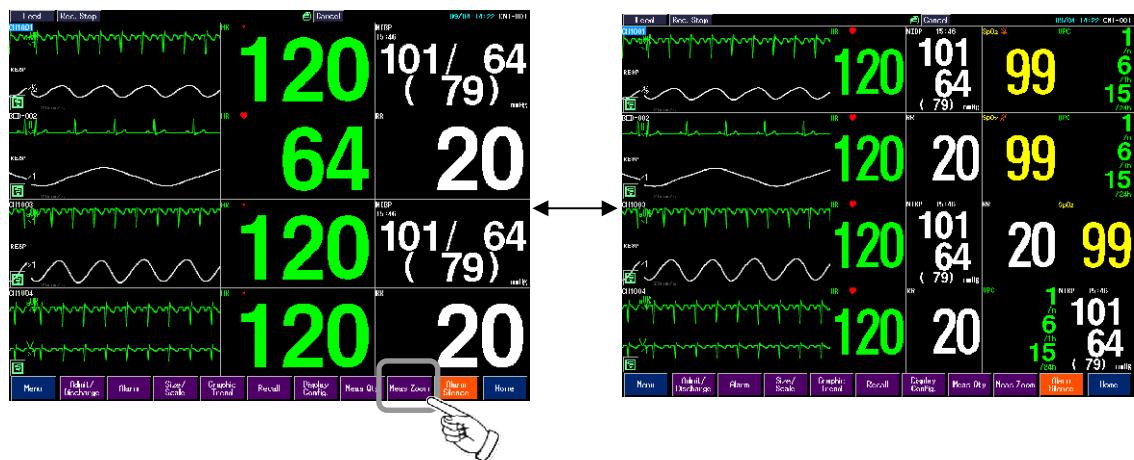
This setting can be performed on the display configuration setup menu by selecting either **All Beds** or **Each Bed** for "Meas Zoom".



For procedure to set the "Meas Zoom", refer to "8. System Configuration Display Configuration Home Display Layout".

[When **All Beds** is selected for "Meas Zoom"]

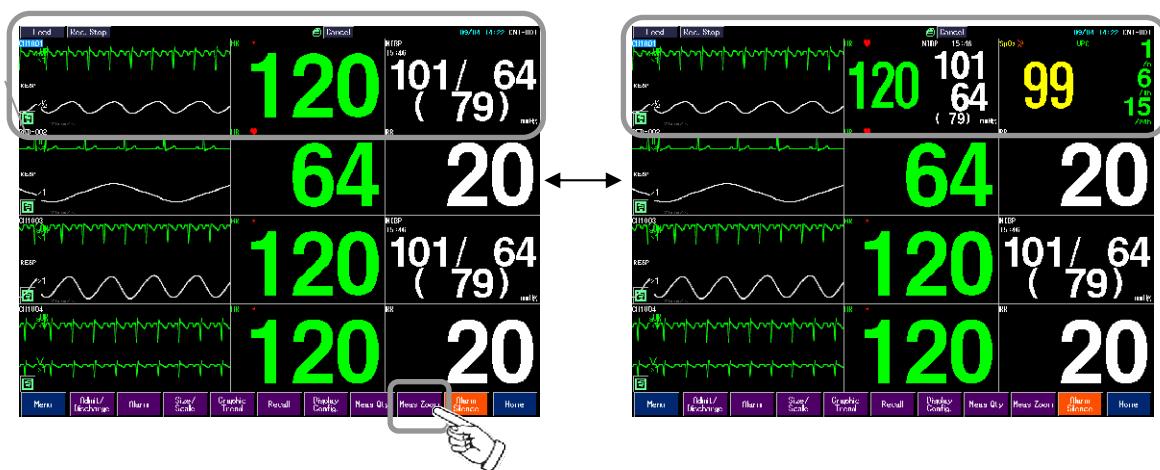
Each parameter key will be enlarged/reduced for all beds.



[When **Each Bed** is selected for "Meas Zoom"]

Each parameter key will be enlarged/reduced for the selected bed.

Selected Bed
(Bed with channel no., bed ID, etc
displayed in cyan color.)



Numeric Data on the Individual Display

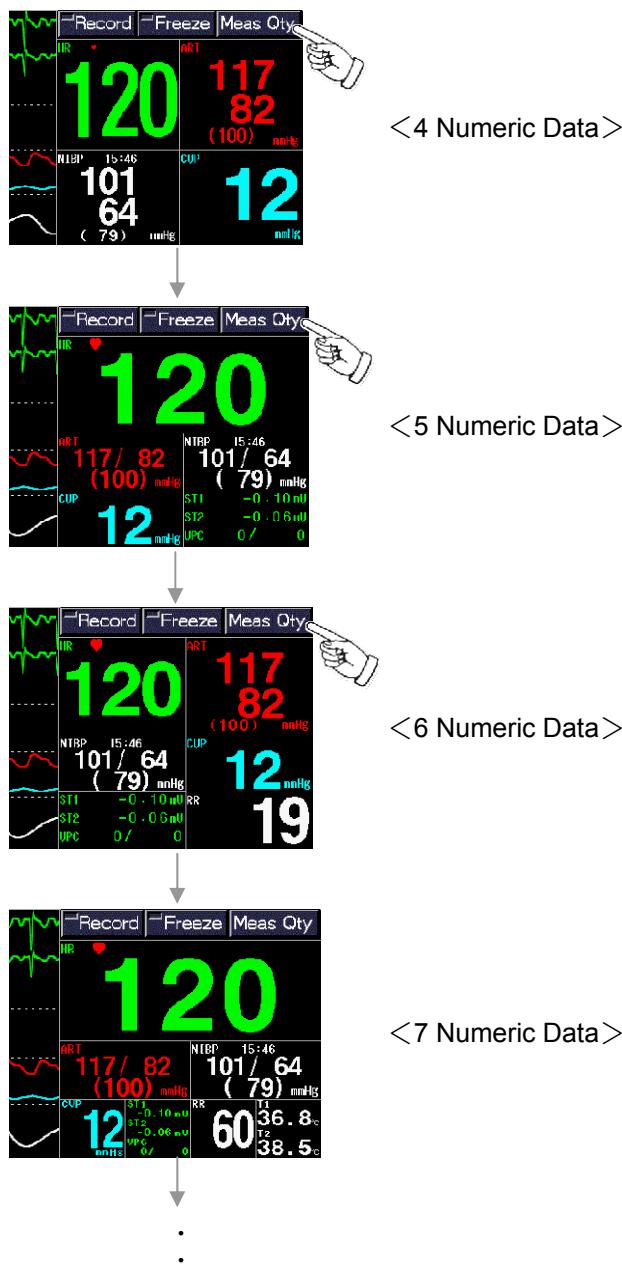
To Change the Quantity of Displayed Numeric Data (Individual Display)

Pressing the **Meas Qty** key preprogrammed will change the quantity of displayed numeric data on the individual display.

The selections will depend upon the programmed numeric data layout pattern set for the individual display configuration.



Refer to “8. System Configuration Display Configuration Selecting the Waveforms and Numeric Data (Individual Display)” for programming the layout pattern.



Adjusting the Size / Scale / Baseline Position

There are two ways to set the waveform size / scale.

- Display from the parameter setup menu.
- Display from the user key.

The baseline position can be adjusted only for ECG.



The threshold level for arrhythmia detection changes with the ECG waveform size. Set the proper waveform size for monitoring.
If the waveform size is $\times 1/4$, $\times 1/2$, or $\times 1$, the detection threshold is 250 μ V.
If the ECG waveform size is $\times 2$, or $\times 4$, the detection threshold is 150 μ V.

To Adjust from the Parameter Setup Menu

This procedure allows to adjust the waveform size/scale from the parameter setup menu.

1 Select a bed to perform parameter setup procedure.

The individual bed information will be displayed.

2 For example, press the ECG parameter key (area where HR data is displayed).

The ECG setup menu will be displayed.

3 Press the **Lead/Size** key.

The size / lead / baseline setup menu will be displayed.



(1) Size

Select from $\times 1/4$ / $\times 1/2$ / $\times 1$ / $\times 2$ / $\times 4$.

For the BP waveform and CO₂ waveform, scale can be adjusted.

For the BP waveform, select the scale from 20 / 50 / 75 / 100 / 150 / 200 / 250 / 300 (mmHg) or 4 / 8 / 12 / 16 / 20 / 24 / 32 / 40 (kPa). If the BP label is CVP, 20 / 40 (cmH₂O) can be also selected.

For the CO₂ waveform, 50 / 100 (mmHg), 4 / 8 / 10 (kPa), or 4 / 8 / 10 (%) can be selected.

(2) Baseline

Press the \downarrow / \uparrow keys to adjust the ECG baseline position up or down.

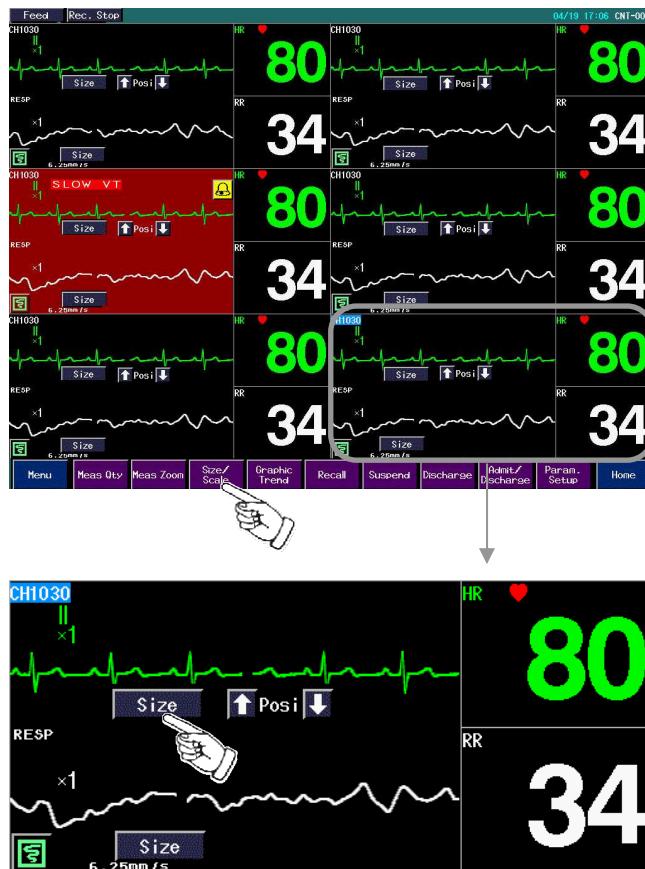
To Adjust from the User Key



The user keys need to be preassigned.
→ "9. Installation Procedure to Start Monitoring 5-5 Set the user key"

1 Press the **Size/Scale** key assigned as user key.

The keys to adjust the waveform size will be displayed.



2 Pressing the **Size** key will sequentially change the waveform size to $\times\frac{1}{4}$ / $\times\frac{1}{2}$ / $\times 1$ / $\times 2$ / $\times 4$.

For the BP, CO₂ waveform and GAS waveform (CO₂, O₂, AGT), the scale will be sequentially changed.

3 To adjust the baseline position of the ECG waveform, press the **↓** / **↑** keys to move the waveform up or down.

Parameter Setup

[ECG] Lead Selection

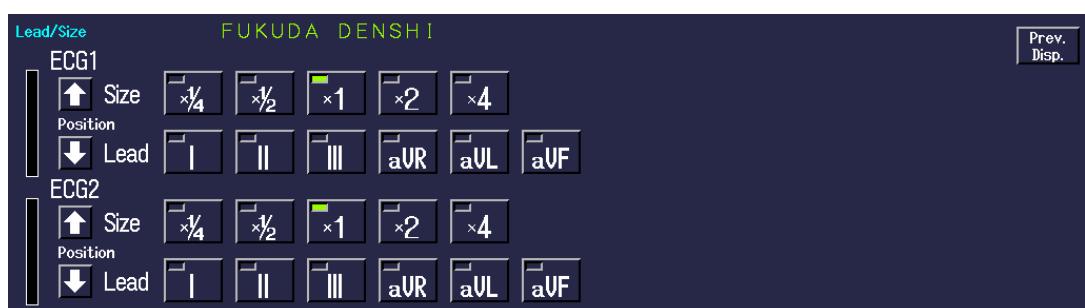
The displayed ECG leads can be changed. The selectable leads will depend on the lead cable type.

		Wired Network (BED)	Wired Network (LW) / Wireless Network (RF)	
Selectable Lead	3-electrode	I, II, III	Transmitter	
			HLX	LX
			(not selectable) <u>Display</u> One of I, II, III	(not selectable) <u>Display</u> Only ECG1
	4-electrode	I, II, III, aVR, aVL, aVF, V, MCL*	(not selectable) <u>Display</u> One of I, II, III, aVR, aVL, aVF	<u>Display</u> One of I, II, III, aVR, aVL, aVF
	5-electrode	I, II, III, aVR, aVL, aVF, V, MCL*, V, ECG1, ECG2	(not selectable) <u>Display</u> One of I, II, III, aVR, aVL, aVF, MCL*, V, ECG1, ECG2	(not selectable) <u>Display</u> One of ECG1, ECG2
	10-electrode	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6		(not supported)

* MCL lead can be selected for only the DS-5000 series bedside monitors.

- 1 Select a bed to perform the setup.
- 2 Press the ECG parameter key → **Lead/Size** key.

The ECG lead selection menu will be displayed.



- 3 Select a lead.
- The display will differ according to the used lead cable.
Select the lead type from the displayed selection.

[ECG / SpO₂] Synchronized Tone Setup

The synchronized tone can be selected from ECG or SpO₂. (Default: ECG)
The display will differ depending on the “Sync Tone Bed Selection” setting (Selected Bed / ECG/SpO₂ Menu) of the soft switch menu.



ON/OFF of synchronized tone can be set on the tone/volume setup menu.
→ “8. System Configuration Tone/Volume”

The preset menu should be set by our service representative or system administrator before starting monitoring.

For setup procedure of “Sync Tone Bed Selection” (Selected Bed / ECG/SpO₂ Menu), refer to “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”.

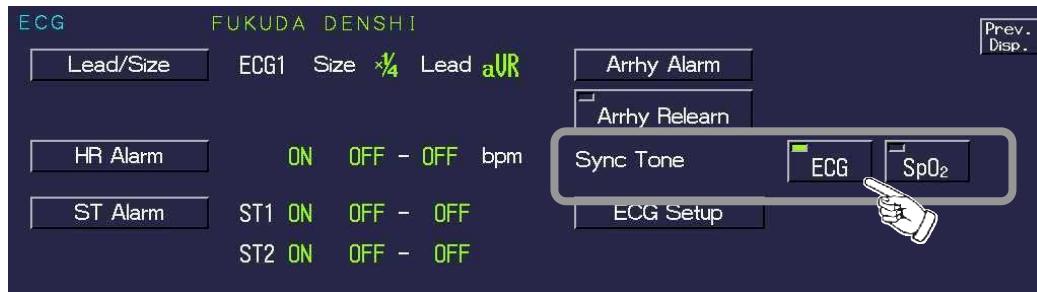
1 Press the ECG parameter key.

Or, press the **Menu** → **Param. Setup** → **ECG** (or **SpO₂**) keys.

The ECG setup menu will be displayed.

2 If **Selected Bed** is set for “Sync Tone Bed Selection” on the soft switch menu

The selected synchronized tone (ECG or SpO₂) will be generated for the currently selected bed on the home display.



ECG will generate a tone synchronized to ECG heartbeat.

SpO₂ will generate a tone synchronized to pulse wave. The tone will change according to the SpO₂ value.

3 If **ECG/SpO₂ Menu** is set for “Sync Tone Bed Selection” on the soft switch menu

The synchronized tone for the bed which synchronized tone selection (ECG or SpO₂) is made will be generated. If ECG or SpO₂ is selected for one of the beds, OFF will be automatically set for all other beds.



ECG or **SpO₂** will generate synchronized tone for this bed.

OFF will not generate synchronized tone for this bed.

NOTE

When **ECG/SpO₂ Menu** is selected, ECG or SpO₂ can be selected for only one bed. OFF will be automatically set for all other beds.

[ECG] AC Filter

Turning ON the AC filter when noise from the AC power is interfering with the ECG will remove the 50Hz or 60Hz frequency factor from ECG. (Default: ON)

However, as the QRS complex of the ECG contains frequency components around 50 to 60Hz, turning ON the AC filter may reduce and distort the QRS amplitude.

When AC interference occurs, first check the following:

- Ground of the monitor and any connected device are firmly connected.
- Power cable is away from the patient.
- Electrodes are firmly attached.
- Electrodes are not dry from long term use.
- Electrode, lead cable is firmly connected.
- Lead cable is not defective.
- Noise source, such as an electric blanket is not placed near the patient.

NOTE

- The AC filter can be set only for the telemetry beds. (RF, LW)
- For the RF beds (with HLX-561), setting the AC filter may double the filter depending on the bedside monitor setup.

Before setting ON/OFF of AC filter, it is necessary to set the correct AC filter frequency (50Hz/60Hz).



→ "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch"

1 Select a bed to perform the setup, and press the ECG parameter key →

ECG Setup keys to display the ECG setup menu. Set the “AC Filter”.



ON will eliminate the AC frequency component (50Hz or 60Hz) by setting the AC filter.

OFF will not set the AC filter.

[ECG] Drift Filter

By setting the ECG drift filter ON, only the amplitude with frequency component under 1Hz will be attenuated to prevent the ECG baseline drift. (Default: ON)



To set ON/OFF of drift filer, **Each Bed** should be selected for "Drift Filter" on the soft switch menu.

If **All Beds ON** or **All Beds OFF** is selected, drift filer cannot be set on the ECG setup menu.

→ "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch"

NOTE	<ul style="list-style-type: none"> ● The drift filter can be set only for the telemetry beds. (RF, LW) ● For the RF beds (with HLX-561), setting the drift filter may double the filter depending on the bedside monitor setup.
------	---

1 Set the "Drift Filter" on the ECG setup menu.

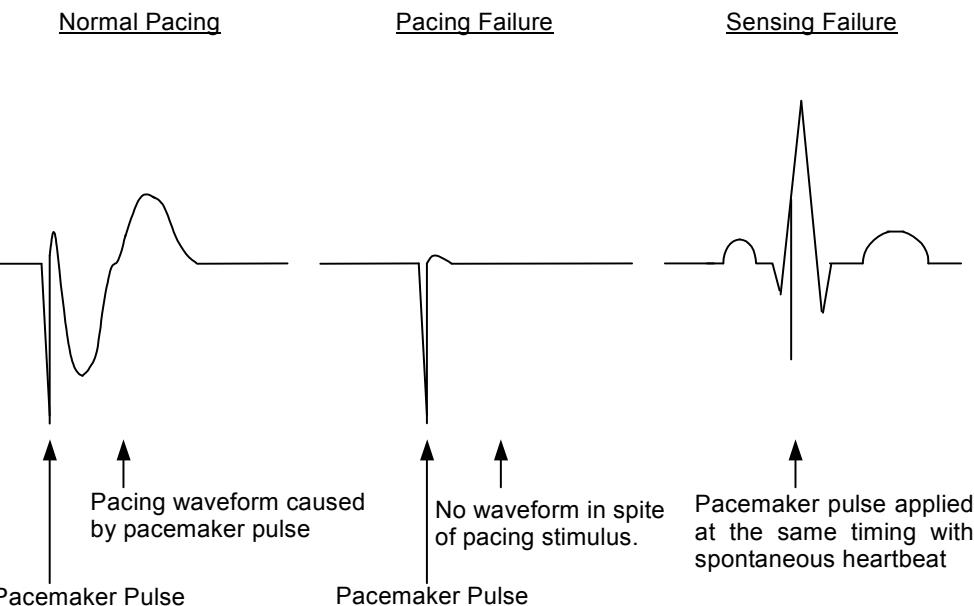


ON will set the drift filter

OFF will not set the drift filter.

[ECG] QRS Pace Mask

For patients using pacemakers, there are cases when the pacing waveform may not occur in spite of the pacing stimulus. This condition is called “pacing failure”, or “failure to capture”. To avoid detecting pacemaker pulses as a QRS complex, the monitor has a function to suspend QRS detection for a fixed amount of time starting from the detection of the pacing stimulus. This function is called “pace mask”. But if the pacemaker does not detect the patient’s spontaneous heartbeat (sensing failure), and the pacing stimulus is applied at the same timing as QRS, this “pace mask” function may erroneously mask the QRS and cause the heart rate measurement to decrease. To avoid this, QRS pace mask function can be turned off for correct measurement of the heart rate. (default setting : ON)



If the QRS pace mask function is turned OFF, a decrease in heart rate may not generate HR or asystole alarms due to erroneously detected QRS. Turn this function OFF only if you are sure that pacing failure will not occur, or when the patient can be constantly monitored.

NOTE

The QRS pace mask setup can be performed only for the telemetry bed. (RF, LW)

1 Set the “QRS Pace Mask” on the ECG setup menu.



ON will mask QRS detection for fixed amount of time after pace pulse is detected.

OFF will not perform masking process.

[ECG] Artificial Pace Pulse

The artificial pacemaker pulse can be displayed superimposed on the ECG waveform. (Default: Distinct Color)

1 Set the “Pace Pulse” on the ECG setup menu.



ON will display the artificial pace pulse with the same color as ECG waveform.

OFF will not display the artificial pace pulse.

Distinct Color will display the artificial pace pulse in different color (yellow) with the ECG waveform. When **Used** is set for “Pacemaker” on the patient admit menu, **Distinct Color** will be automatically set.

[ECG] ECG Channels for QRS Detection

The ECG channels to use for QRS detection can be selected. (Default: ECG1+2)



- The “QRS Detect” setup can be performed only for the telemetry bed. (RF, LW)
- QRS detection may not be possible for ECG waveform with amplitude 0.3mV or below.
- When only one ECG waveform is measured, QRS automatic detection is executed with ECG1, regardless of the setting.
- The “QRS Detect” setup for the wired network bed (BED) will be according to the setup on the bedside monitor.



If **ECG1+2** is selected and an artifact is detected on one of the waveforms, whether to detect QRS by merging ECG1 and ECG2 or to detect QRS from the waveform without artifact can be selected.

→ “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”

1 Set the “QRS Detect” on the ECG setup menu.



ECG1 will detect QRS only from ECG1.

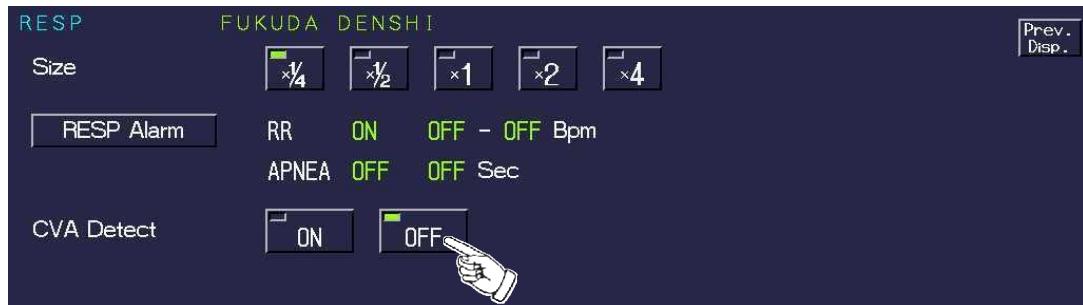
ECG1+2 will detect QRS from either ECG1 or ECG2 with the larger amplitude.

[RESP] CVA Detection

When the amplitude of the respiration waveform decreases due to causes such as respiratory pause, the ECG waveform may be superimposed on to the respiration waveform, making the RR equal to the HR. This condition is called CVA (Cardio-Vascular Artifact), and is detected using the CVA detection function.

If the ECG waveform is superimposed on to the respiration waveform, with HR (RR) 30bpm or over, for 20 seconds or over (10 seconds or over for neonates) and the CVA detection function is set to ON, the "CVA Detect" message will be displayed, and an alarm sound will be generated.

- 1 Select a bed to perform the setup.**
- 2 Press the respiration parameter key and display the RESP setup menu.**

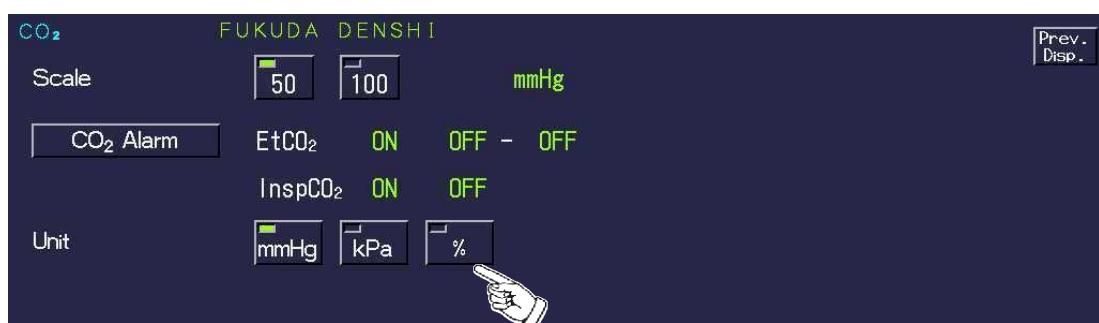


- 3 Select [ON] or [OFF] for CVA detection.**

[CO₂] Measurement Unit

The CO₂ measurement unit can be selected from mmHg / kPa / %. (Default: mmHg)

- 1 Select a bed to perform the setup.**
- 2 Press the CO₂ parameter key.**
Or, press the **Menu** → **Param. Setup** → **CO₂** keys.
The CO₂ setup menu will be displayed.
- 3 Select a measurement unit from [mmHg] / [kPa] / [%].**



Chapter 5

Alarm Function

This chapter describes the alarm function of this equipment.

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General Description of the Alarm Function

⚠ CAUTION

- For the alarm generation on the bedside monitor connected by wired network, maximum of 2.5 seconds delay will occur for the alarm generation on the DS-7600 system.
- For the alarm generation on the bedside monitor connected by wireless network, maximum of 15 seconds delay will occur for the alarm generation on the DS-7600 system.

Alarm Level and Alarm Tone

The alarms are classified in 4 levels according to the exigency.

The alarm tone and the display priority of alarm message differ depending on the alarm level.

<i>Alarm Level</i>	<i>Description</i>	<i>Tone</i>	<i>Color (Letters/ Background)</i>
Level 1	Technical Alarm (Ventilator Alarm)	Continuous rapid beep tone, or Continuous beep tone*	White/Red
	Life Threatening Alarm (Numeric data, arrhythmia alarm)		
Level 2	Cautionary Alarm	Beep tone every 5 seconds	White/Red
Level 3	Treatment Needed Alarm	Single beep tone	Black/Yellow
Level 4	Notification Alarm	Display Only	Black/Yellow

*The tone will differ depending on the "Tone" setup on the Volume/Tone setup menu.

⚠ CAUTION

- The alarm messages will be displayed according to the priority.
(Level 1>Level 2>Level 3>Level 4)
- For the same alarm level, the alarm message for the newer alarm will be displayed.

Displayed Message

In this section, the displayed messages are described.

By selecting [Lighting] for “Alarm Wave Background” of the alarm-related setup, the background of the alarm-generated waveform can be displayed in red (“Lighting”).
(Default: Lighting)



For procedure to set the background of the alarm-generated waveform to be displayed in red, refer to “9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup”.

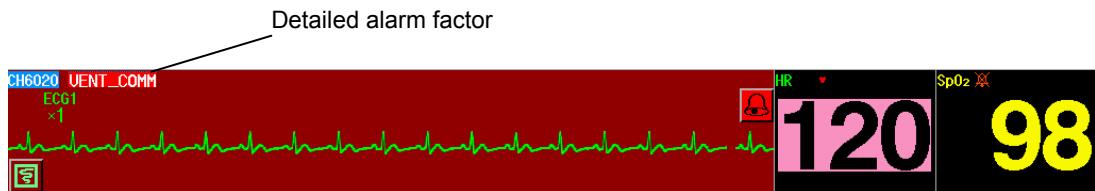
●Technical Alarm

The technical alarm message will be displayed with the highest priority.
The alarm will generate with the volume and tone set for the “Technical Alarm Tone” on the Volume/Tone setup menu.

If the detailed alarm factor can be specified, a detailed message will be displayed.

⚠ WARNING	The ventilator alarm on this monitor should be used as supplementary function. Check the patient's condition, ventilator alarm sound and message occasionally.
------------------	--

<i>Displayed Message</i>	<i>Alarm Level</i>	<i>Description</i>
Ventilator	1	Alarm is generated on the ventilator. Or, ventilator connection error.
Alarm Factor		
AWP		Airway Pressure
MV		Minute Ventilation
APNEA		Apnea
CONT. HP		Continuous High Pressure
Upper FiO ₂		FiO ₂ Upper Limit Alarm
Lower FiO ₂		FiO ₂ Lower Limit Alarm
Upper EtCO ₂		EtCO ₂ Upper Limit Alarm
Lower EtCO ₂		EtCO ₂ Lower Limit Alarm
Upper RR		RR Upper Limit Alarm
Lower RR		RR Lower Limit Alarm
PEEP		PEEP
COMM		Power OFF, cable disconnected, standby condition, etc.
URGENT		Other high level alarm



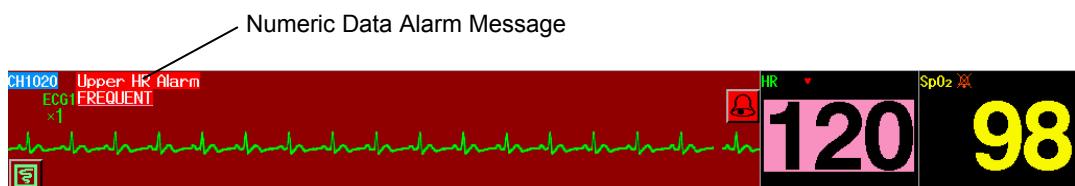
⚠ CAUTION	Depending on the bedside monitor type and software version, the ventilator alarm factor may not be transmitted. For details, refer to our service representative.
------------------	--

●Numeric Data Alarm and Arrhythmia Alarm

When the measurement data exceeds the preprogrammed alarm limit or when arrhythmia alarm is detected, the alarm generation is notified by message and sound.

- When more than one alarm are generated, the alarm message of the higher priority according to the alarm level will be generated.
- When the alarms of the same level are generated, the alarm message of the newer alarm will be displayed.

⚠ CAUTION	The alarm message for the arrhythmia alarm (except Tachy, Brady) will continue to be displayed for 30 seconds even after the alarm condition dissolves.
------------------	---



【Numeric Data Alarm】 The priority is higher from the top.

Parameter	Message	Alarm Level	Description
Alarm	Alarm Susp.	—	Alarm is suspended.
HR	Lower HR Alarm	1	
	Upper HR Alarm	1	
BP (BP1, ART)	Lower xxx Alarm	1	
	Upper xxx Alarm	1	xxx: BP label
Respiration	Lower RR Alarm	1	
	Upper RR Alarm	1	
	APNEA Alarm	1	
NIBP	Lower NIBP Alarm	1	
	Upper NIBP Alarm	1	
SpO ₂	Lower SpO ₂ Alarm	1	
	Upper SpO ₂ Alarm	1	
	Lower PR Alarm	1	
	Upper PR Alarm	1	
CO ₂ Concentration	Lower EtCO ₂ Alarm	1	
	Upper EtCO ₂ Alarm	1	
Gas Concentration	Upper CO ₂ -I Alarm	2	
	Lower CO ₂ -E Alarm	2	
	Upper CO ₂ -E Alarm	2	
	Lower O ₂ -I Alarm	2	
	Upper O ₂ -I Alarm	2	
	Lower O ₂ -E Alarm	2	
	Upper O ₂ -E Alarm	2	
	Upper N ₂ O-I Alarm	2	
	Lower AGT-I Alarm	2	
	Upper AGT-I Alarm	2	
	Lower AGT-E Alarm	2	
	Upper AGT-E Alarm	2	
BP (other than BP1, ART)	Upper MAC Alarm	2	
	Lower xxx Alarm	2	
	Upper xxx Alarm	2	xxx: BP label
Temperature	Lower Tx Alarm	2	
	Upper Tx Alarm	2	x: 1 or 2
ST Level	Lower STx Alarm	2	
	Upper STx Alarm	2	x: 1 or 2
ST Level (12-lead)	Lower STx Alarm	2	x: I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
	Upper STx Alarm	2	

【Arrhythmia Alarm】

Message	Alarm Level	Description
Arrhythmia Alarm OFF	—	All arrhythmia alarm is set OFF.
LEARN	—	Learning arrhythmia
Cannot analyze	2	Cannot analyze arrhythmia due to noise interference.
ASYSTOLE	1	Cardiac Arrest
VF	1	Ventricular Fibrillation
VT	1	Ventricular Tachycardia
SLOW VT	1	Accelerated Idioventricular Rhythm
RUN	1	Consecutive VPC
TACHY	1	Tachycardia
BRADY	1	Bradycardia
COUPLET	2	Couplet Ventricular Extrasystole
PAUSE	2	Cardiac Pause
BIGEMINY	2	Ventricular Bigeminy
TRIGEMINY	2	Ventricular Trigeminy
FREQUENT	2	Frequent VPC

⚠ CAUTION

- If "Suspend Arrhy. Analysis during Noise Interference" under Alarm Related Setup (Preset) is set to ON, the "Cannot analyze" alarm will generate when analysis suspended duration exceeds 30 seconds.
- Even during "LEARN" status, alarm for HR, ASYSTOLE, VF, TACHY, BRADY, PAUSE will be generated.
- Even during "Cannot analyze" alarm generation, alarm for HR, ASYSTOLE, VF, TACHY, BRADY will be generated.

● Measurement Status and Arrhythmia Status

The following messages indicate measurement status and arrhythmia status.
The messages are listed in the order of priority.

Measurement Status Message



【Measurement Status Message】

Item	Message	Alarm Level	Description
NIBP	NIBP meas. failed.	2	NIBP measurement has failed. (Displayed only when connected to DS-LANIII network.)
ECG	Chk Electrode	3	More than one leads are detached, or reference electrode is detached.
	Chk Electrode_xx	3	The electrode is detached. (xx: lead type)
SpO ₂	Chk SpO ₂ sensor	2 or 3 * ¹	SpO ₂ pulse wave is low, Probe sensor attachment is not appropriate, etc
Respiration	CVA Detect	3	ECG waveform is superimposed on to the respiration waveform.
CO ₂	Check CO ₂	3	CO ₂ unit of filter line error.
Telemeter	Chk TLM Receive	2 * ²	Cannot receive telemetry signal. If "Too Far Alarm" is set to ON, telemetry signal cannot be received for set duration (5 to 60 sec.).
	Chk TLM Battery	2 or 4 * ³	Remaining telemetry battery level is 10% or less.
	RCV Interference	4	Noise from other equipment is present.
DS-LANII/III	Chk DS-LAN Comm	4	<ul style="list-style-type: none"> • Communication error with DS-LANII/III. • DS-LANII/III connection is cut off. • Cannot receive data via DS-LANII/III.

- *¹ The alarm level (2 or 3) will depend on the setting of "During 'Check SpO₂ Sensor'" under "Alarm Related Setup 2/3".
- *² The alarm sound will differ with standard level 2 alarm sound.
- *³ For "Chk TLM Battery Alarm" on the Alarm Related Setup 1/3 (Preset), if OFF is selected, the alarm level will be 4, and if ON is selected, the alarm level will be 2. The alarm sound will be different from the standard sound for alarm level 2.

WARNING

When "Chk TLM Receive" is displayed, alarm will not function.
Arrhythmia analysis will not be performed either.

NOTE

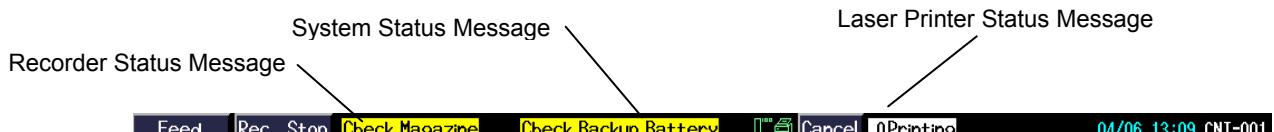
If the "Chk TLM Battery" alarm is silenced, the alarm sound will not resume even after the preprogrammed duration.

[Arrhythmia Status Message]

Message	Alarm Level	Description
ECG Artifact	2 or 4 ^{*4}	Noise is interfering to ECG.
ECG Low	2 or 4 ^{*4}	Cannot acquire ECG.
ECG1 Low	4	Cannot acquire ECG1.
ECG2 Low	4	Cannot acquire ECG2.
ECG1 Artifact	4	Noise is interfering to ECG1.
ECG2 Artifact	4	Noise is interfering to ECG2.

- *⁴ For "Suspend Arrhy. Analysis during Noise Interference" on the Alarm Related Setup 1/3 (Preset), if OFF is selected, the alarm level will be 4, and if ON is selected, the alarm level will be 2. The alarm sound will be different from the standard sound for alarm level 2.

●Recorder Status, System Status, Laser Printer Status



[Recorder Status Message]

The following messages indicate the built-in recorder status.

Message	Alarm Level	Description
Check Recorder	4	Thermal head error.
Check Magazine	4	Recorder cassette is not properly set.
Paper Out	4	No recording paper is present.
Paper Jam	4	Recording paper is jammed.
Recorder Busy	4	In process of recording.

[System Status Message]

The following messages indicate the system status message.

Message	Alarm Level	Description
Central ID is duplicated.	2	When connected to the wired network, central ID is duplicated with other central monitor.
Check SNTP Comm	4	Communication error with SNTP server.
Check PC/CF Card	4	PC/CF card error, or the card cannot be identified.
Check Backup Battery	4	Backup battery is depleted.
Check EMR comm.	4	Communication error with the patient data server.
EMR Offline	4	"Offline" is selected for EMR link function.

【Laser Printer Status Message】(when laser printer is used)

The following messages indicate the laser printer status.

Message	Alarm Level	Description
LP Com Error	4	The specified printer does not exist on the TCP/IP network. Or, cannot print due to paper out, etc.
LP Waiting	4	The laser printer is not ready for recording.
x Printing	4	In process of printing. (x: total number of stacked data, max. 64 data)

Alarm Setup

The alarm can be set ON/OFF for each parameter, or suspended for all alarm. When the alarm is suspended, the alarm setup for all parameters will be ineffective.



- When the alarm is suspended, all alarm will not generate even if the individual parameter alarm is set to ON. Also, the alarm event will not be stored as recall data.
Check the patient's condition frequently.
- If the upper/lower alarm limit of the individual parameter is set to OFF, or if arrhythmia alarm is set to OFF, alarm will not generate even if the individual parameter alarm is set to ON. Pay attention when setting them OFF.
- The alarm for the parameter not selected for the "HR/PR Alarm Source" (ECG/SpO₂/BP) will be set to OFF on the DS-7600 Central Monitor.
 - The "HR/PR Alarm Source" setting will synchronize between the bedside monitor and the central monitor.
 - For example, if SpO₂ is set as the HR/PR alarm source on the bedside monitor, HR alarm will be set to OFF on the central monitor.

Suspending All Alarm

The alarm can be temporarily suspended. During the alarm suspension, "Alarm Susp:xxx" message will be displayed. During the alarm suspended time, alarm will not generate even if the individual parameter alarm is set to ON. All alarm will automatically turn ON when the suspended time completes. Use this function when replacing the ECG lead or sensor to avoid false alarm generation.

1 Press the **Menu** key.

The menu selection will be displayed.

2 Press the **Alarm Suspend** ("Alarm") key.

Pressing the **Alarm Suspend** key will alternately switch the key between **Alarm ON** and **Alarm Suspend**. The alarm is suspended when the key LED is lit.



3 Check the message.

For the bed in alarm suspension, "Alarm Susp:xxx" message will be displayed. "xxx" indicates the remaining suspended time.



The alarm suspend time can be selected from 1 to 5 min. (Default: 3min.)
→ "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup"

NOTE

If different alarm suspend time is set for the DS-7600 and the bedside monitor on a wired network, the shorter time will be applied for the alarm suspend time.

Alarm Setup for Each Parameter

ON/OFF of alarm and upper and lower alarm limit can be set for each parameter.

CAUTION	For the alarm generation on the bedside monitor connected by wired network (DS-LANII/DS-LANIII), maximum of 2 seconds delay will occur for the alarm generation on the DS-7600 Central Monitor.
NOTE	<ul style="list-style-type: none">The alarm limit of HR and PR are linked with each other. Changing the HR alarm limit will also change the PR alarm limit to the same value. However, ON/OFF of alarm function will not link each other. It is possible to set the HR alarm ON when PR alarm is OFF.The adjustable alarm limit range for the DS-7600 and the bedside monitor may differ. For example, upper limit of 300bpm can be set for PR on the DS-7600, but there are some bedside monitors which can set the limit only up to 250bpm. Check the alarm limit range of the bedside monitor before setting the alarm limit on the DS-7600.

● Alarm Limit Range for Each Parameter

Parameter	Alarm Limit Range		Automatic Setup*	
	Lower Limit	Upper Limit		
	Adjustable Increments			
HR	20 to 295bpm	22 to 300bpm	Upper: current value +40bpm Lower: current value -40bpm	
	60bpm or lower: increments of 1bpm 60bpm or above: increments of 5bpm			
ST 12-lead ST	-2.0 to +1.8mV	-1.8 to +2.0mV	Upper: current value +0.2mV (+2mm) Lower: current value -0.2mV (-2mm)	
	0.1mV step			
	-20 to +18mm	-18 to +20mm		
	1mm step			
RR	5 to 145Bpm	10 to 150Bpm	Upper: current value +20Bpm Lower: current value -20Bpm	
	5Bpm step			
APNEA	—	5 to 20sec.	15 sec.	
	1 sec. step			
BP1 to 6 NIBP	0 to 295mmHg	2 to 300mmHg	[BP1/ART, NIBP] Upper: current value +40mmHg, Lower: current value -20mmHg	
	0 to 50mmHg: increments of 1mmHg 50mmHg or above: increments of 5mmHg			
CVP	0 to 38cmH ₂ O	2 to 40cmH ₂ O	[BP other than BP1/ART] Upper: current value +20% Lower: current value -20%	
	1cmH ₂ O step			

Parameter	Alarm Limit Range		Automatic Setup*
	Lower Limit	Upper Limit	
	Adjustable Increments		
SpO ₂	50 to 99%	51 to 100%	Upper: OFF Lower: 90%
PR	20 to 295bpm 60bpm or lower: increments of 1bpm 60bpm or above: increments of 5bpm	22 to 300bpm	Upper: current value +40bpm Lower: current value -40bpm
EtCO ₂	1 to 98mmHg 1mmHg step 0.1 to 14.8kPa 0.1kPa step 0.1 to 14.8% In increments of 0.1%	3 to 100mmHg 0.3 to 15.0kPa 0.3 to 15.0% In increments of 0.1%	Upper: current value +10mmHg (+1.3kPa / +1.3%) Lower: current value -10mmHg (-1.3kPa / -1.3%)
InspCO ₂	— In increments of 1mmHg — In increments of 0.1kPa — In increments of 0.1%	1 to 4mmHg 0.1 to 0.4kPa 0.1 to 0.4% In increments of 0.1%	3mmHg (0.3kPa / 0.3%)
TEMP	30.0 to 49.0°C In increments of 0.5°C	31.0 to 50.0°C	Upper: current value +2°C Lower: current value -2°C
GAS CO ₂ _E, CO ₂ _I, O ₂ _E, O ₂ _I, N ₂ O_I, AGT_E, AGT_I, MAC	ON/OFF setting only. Alarm limit cannot be set manually or automatically. (The alarm limit set on the bedside monitor will be applied.)		

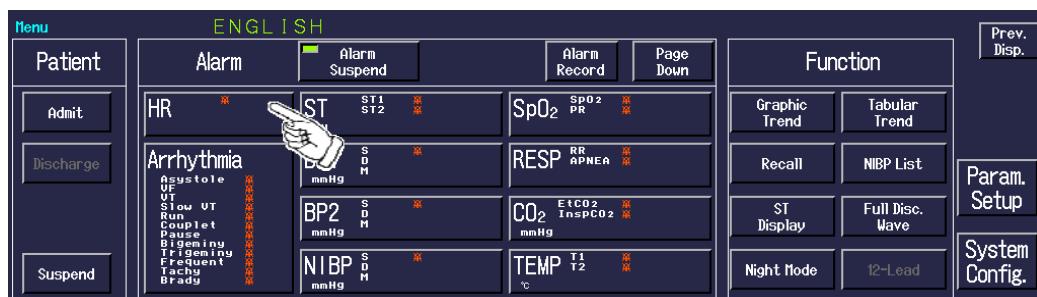
- * • If the value exceeds the adjustable range, the upper/lower adjustable limit will be set.
 • The automatic setup will not be performed for the turned OFF limit.

●Parameter Alarm Setup Procedure

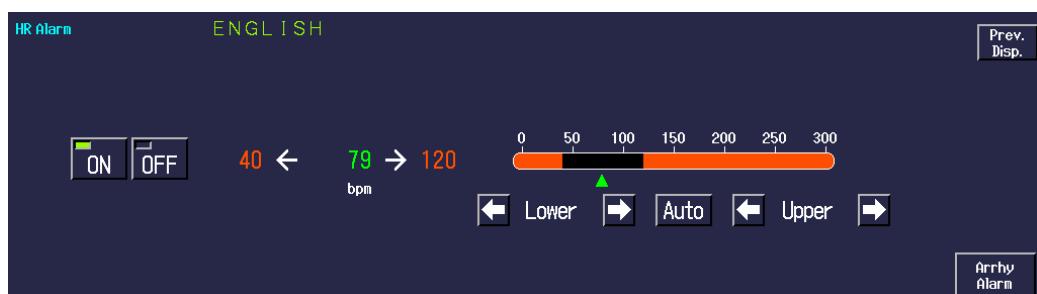
1 Press the **Menu** key.

The menu selection will be displayed.

2 Select a parameter from the “Alarm” section to perform the alarm setup procedure.



3 Set ON/OFF of alarm and upper and lower alarm limit for each parameter.



Display	Description
	Display upper/lower limit and current value (▲). The alarm limits can be also adjusted by directly pressing the bar display area.
55 ← 70 → 130	Lower Limit ← Current Value → Upper Limit

Key	Item	Description
	Individual Alarm	ON will generate the alarm. OFF will not generate the alarm.
	Lower Limit Alarm	Set the lower limit. The lower limit will turn OFF when it exceeds the adjustable range.
	Upper Limit Alarm	Set the upper limit. The upper limit will turn OFF when it exceeds the adjustable range.
	Automatic Setup	Automatically set the upper/lower limit according to the current value. The turned OFF limit will remain OFF.

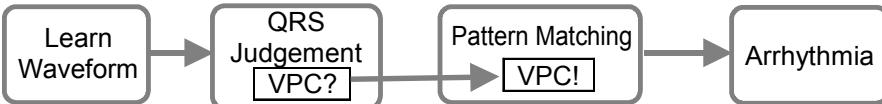
	The adjustable alarm limit increment is different between the DS-5000 series and DS-7000 series monitors. Therefore, the set alarm limit may change depending on the monitor type and the network construction.
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Arrhythmia Alarm Setup

ON/OFF of arrhythmia alarm and arrhythmia detection level can be set.
When all arrhythmia alarm is set OFF, "ARRHY OFF" message will be displayed.

● About the Arrhythmia Analysis

Arrhythmia Analysis Flow



The arrhythmia detection algorithm learns the normal waveform of the patient and compares the waveform (QRS pattern) and RR interval for each heartbeat to determine the VPC. It compares the parameters such as QRS amplitude, QRS width, QRS polarity, RR interval, and selects abnormal QRS. Then the QRS with suspected VPC is matched to distinguish the noise and VPC. This will finally determine the VPC and generate the arrhythmia alarm.

⚠ WARNING

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 recording, alarm recording and recall waveform for evaluation.

⚠ CAUTION

The threshold level for arrhythmia detection changes with the ECG waveform size. Set the proper waveform size for monitoring. If the waveform size is $\times 1/4$, $\times 1/2$, or $\times 1$, the detection threshold is $250\mu\text{V}$. If the ECG waveform size is $\times 2$, or $\times 4$, the detection threshold is $150\mu\text{V}$.

● QRS Classification

Each QRS is classified to the following pattern.

N (Normal)	Normal QRS Beat
V (VPC)	Ventricular Extrasystole
P (Pacing Beat)	Pacing beat
F (Fusion Beat)	Fusion beat of pacing and spontaneous beat
? (Undetermined Beat)	Learning arrhythmia, or unmatched beat

●Arrhythmia Type

With the above QRS judgment, the following 12 types of arrhythmia alarm can be generated.



Depending on the system construction, Slow VT, Couplet, Pause, Trigeminy cannot be analyzed.



For details of the difference of display/setup depending on the system construction, refer to "4. Parameter Setup/Monitoring on the Home Display / Display according to the Network Construction ●Arrhythmia Display Setup".

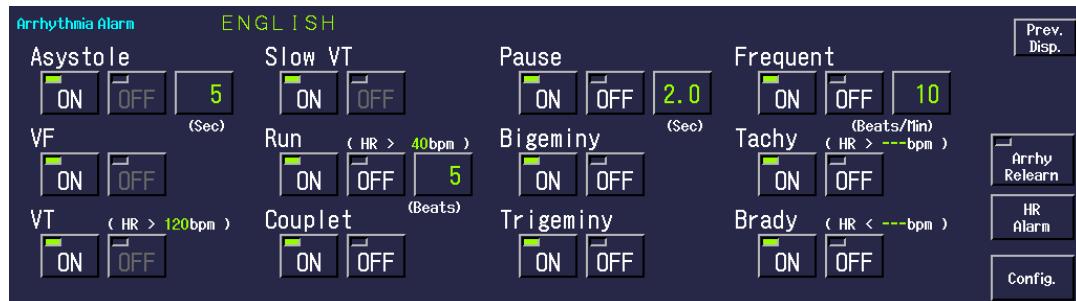
Arrhythmia	Setup	Detection Criteria
Asystole (Cardiac Arrest)	ON, OFF 3 to 10 sec*	Cardiac arrest is detected for more than preprogrammed time. * 3 to 8 sec. for DS-LANII network beds (BED, LW).
VF (Ventricular Fibrillation)	ON, OFF	A random, rapid electrical activity of the heart is detected.
VT (Ventricular Tachycardia)	ON, OFF	9 or more continuous ventricular beats are detected and HR is same or above the preprogrammed value (140bpm or 120bpm). For LW beds and DS-5000 series beds: HR: 120bpm or over.
Slow VT (Accelerated Idioventricular Rhythm)	ON, OFF	9 or more continuous ventricular beats are detected. (HR: 100 to 140bpm or 100 to 120bpm)
Run (Consecutive VPC)	ON, OFF 2 to 8 beats	Continuous VPC exceeding the preprogrammed value (2 to 8 beats) is detected and HR is same or above the preprogrammed value (0 to 100bpm).
Couplet (Couplet Ventricular Extrasystole)	ON, OFF	2 continuous VPC beats are detected.
Pause (Cardiac Arrest)	ON, OFF 1.5 to 5.0 sec.	Cardiac arrest exceeding the preprogrammed duration is detected.
Bigeminy (Ventricular Bigeminy)	ON, OFF	QRS pattern of V-N-V-N-V-N is detected.
Trigeminy (Ventricular Trigeminy)	ON, OFF	QRS pattern of V-N-N-V-N-N is detected.
Frequent (Frequent VPC)	ON, OFF 1 to 50 beats/min,	VPC exceeding the preprogrammed value is detected within 1 minute.
Tachy (Tachycardia)	ON, OFF	The upper HR alarm limit is exceeded.
Brady (Bradycardia)	ON, OFF	The lower HR alarm limit is exceeded.

●Arrhythmia Alarm Setup Procedure

1 Press the **Menu** → **Arrhythmia** (“Alarm”) keys.

The arrhythmia alarm setup menu will be displayed.

The screen shown below is for the DS-LANIII network bed.



2 Set ON/OFF of each arrhythmia.

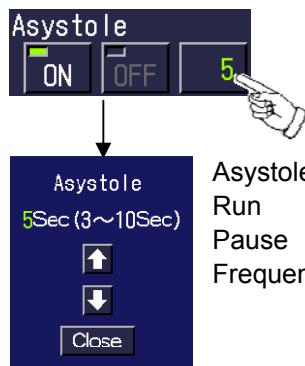


ON will generate the arrhythmia alarm.

OFF will not generate the arrhythmia alarm.

If all arrhythmia alarms are set OFF, “ARRHY OFF” message will be displayed.

3 Set the detection level for Asystole, Run, Pause, Frequent alarm.



Asystole : Set the Asystole time to 3 to 10 sec. (Default: 5 sec.)
Run : Set the Run continuous beat to 2 to 8 beats. (Default: 3 beats)
Pause : Set the Pause time to 1.5 to 5 sec. (Default: 2 sec.)
Frequent : Set the Frequent beats to 1 to 50 beats/min.
(Default: 10 beats/min.)



If **ON** is set for “Asystole/ VF/ VT Alarm Setup” of Alarm-related setup, Asystole, VF, VT, Slow VT alarm cannot be turned OFF.
→ “9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup”

●HR Low Limit for VT and RUN

On the Arrhythmia Alarm Setup menu, HR low limit for VT and RUN can be set.

CAUTION	The settings for the “HR Low Limit for VT” and “HR Low Limit for RUN” will be compared with the average HR of continuous VPC. Therefore, the displayed HR value at alarm generation may be lower than the settings if it is just after the VT detection, or if RUN with few continuous VPC is detected.
NOTE	For the DS-5000 series beds and the beds using telemetry receiver (LW-5560N), this setting is not possible. The Arrhythmia Alarm Setup menu cannot be displayed.

1 Press the **Config.** key on the Arrhythmia Alarm Setup menu.

The Arrhythmia Alarm Setup menu will be displayed.



2 Set “HR Low Limit for VT”.

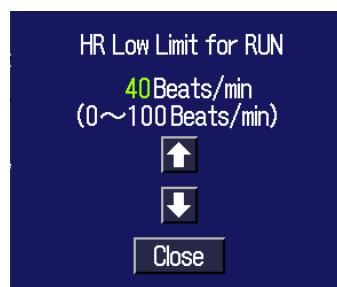


Select the HR low limit to detect VT from 120 or 140bpm. If HR is 100bpm or over, and below the set value, it will be detected as Slow_VT.

3 Set “HR Low Limit for RUN”.



Pressing the detection level key (ex. **40** for the screen on left) will display the window to adjust the detection level.



Use the arrow keys to set the detection threshold. 0 to 100bpm can be set.

After the setup, press the **Close** key.

●Arrhythmia Learn

Learning of normal ECG largely affects the accuracy of arrhythmia analysis. If any error occurs in arrhythmia detection and QRS judgment, performing arrhythmia learning will recover the original analyzing accuracy. Arrhythmia learning will be performed for about 20 beats for the normal ECG, but it may take longer if the heartbeat is unstable. During the arrhythmia learn procedure, arrhythmia alarm other than asystole, tachycardia, bradycardia will not generate.

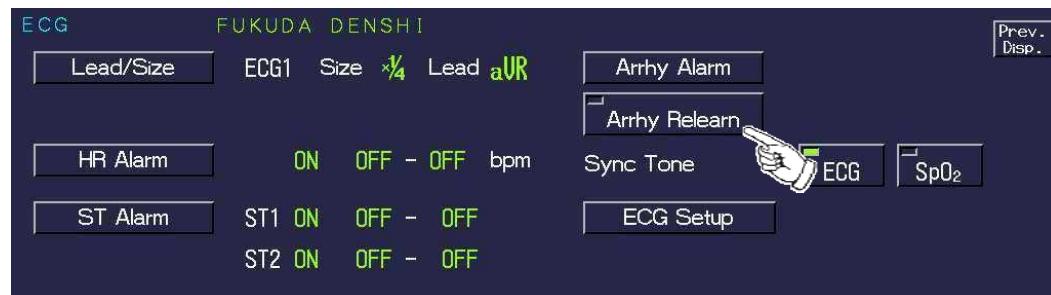
The arrhythmia learn can be performed from the ECG configuration menu or from the **Arrhy. Relearn** key preprogrammed as user key.



For procedure to set the user key, refer to "9. Installation Procedure to Start Monitoring 5-5 Set the user key."

[Procedure from the ECG configuration menu]

- 1 Select the patient by pressing the bed selection key.**
- 2 Press the ECG parameter key and display the ECG configuration menu.**



- 3 Press the **Arrhy. Relearn** key to start the arrhythmia learn procedure.**

If the LED is lighted, it indicates that arrhythmia learn is arrhythmia learn procedure will not cease the process.



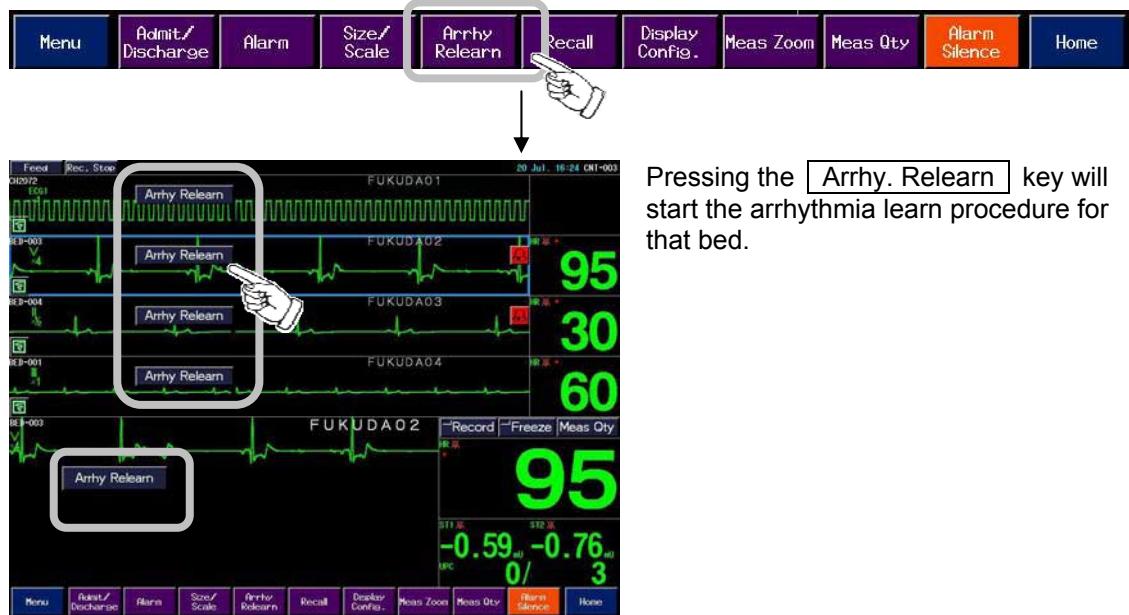
- 4 During the procedure, a message will be displayed.**



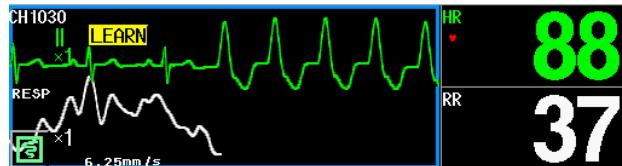
When the procedure is completed, the message will disappear.

[Procedure from the user key]

- 1 Pressing the **Arrhy. Relearn** key preprogrammed as user key will display the **Arrhy. Relearn** key on the all bed display area and individual display area.



- 2 During the learn procedure, a message will be displayed.



When the learn procedure is completed, the message will disappear.

- 3 To clear the **Arrhy. Relearn** key for the bed which arrhythmia learn procedure was not performed, press again the **Arrhy. Relearn** key of the user key.



●Asystole, VF, VT, Slow VT Alarm

To not miss any life-threatening alarm, asystole, VF, VT, and slow VT alarm can be set so that they cannot be turned OFF.

This setup should be performed by our service representative or system administrator of your institution.



→ “9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup”

Silencing the Alarm Sound

The alarm sound can be temporarily silenced without affecting the alarm message display. If the alarm persists at completion of alarm silence time, the alarm sound will generate again. If another alarm of the same or higher level generates during the alarm silence time, the alarm sound for the new alarm will generate.

NOTE	<ul style="list-style-type: none">● Alarm silence function is effective for each parameter. If an alarm condition for the selected parameter is resolved for a moment but is generated again during the alarm silence time, the alarm will remain silenced. The recall and alarm recording will not function at this time.● If another alarm with lower priority occurs during the alarm silence time, alarm sound will not generate. The alarm recording will not function at this time.● If the event key  or Alarm Silence key (user key) is pressed for the alarm of another parameter which occurred during the alarm silence time, the alarm silence time for the first alarm will not be extended.
------	---



The alarm silence time can be selected from 1 to 5 minutes.

Whether to display the event key or not at alarm generation can be also selected.

→ "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup"

The alarm silence condition for all parameter will be ceased in the event of any of the following.

- When the power is turned ON.
- When the system alarm status is changed. (ON / Alarm Suspend)
- When the monitoring is suspended.
- When the patient is discharged.

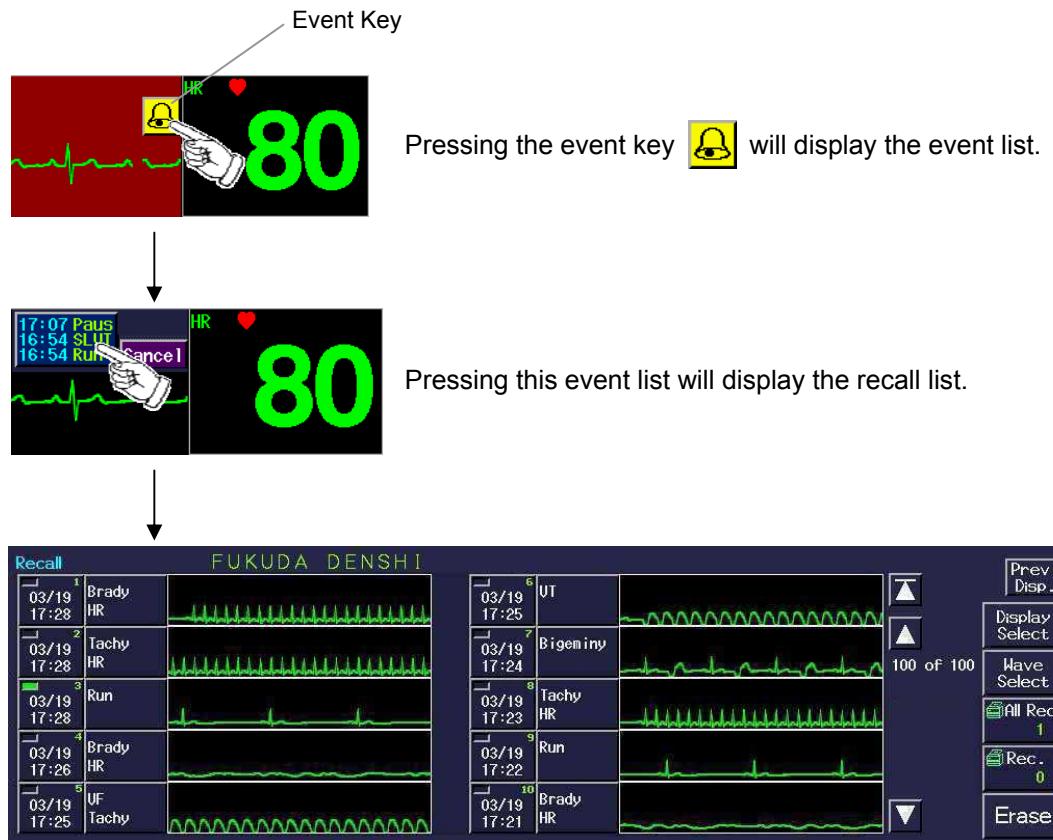
The alarm silence condition for individual parameter will be ceased in the event of any of the following.

- When automatic alarm is selected for the parameter.
- When the alarm is turned OFF for the parameter.

1 When the alarm generates, press the **Alarm Silence** key (user key).

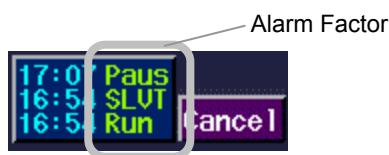


- 2 When an alarm is generated, the event key  will be displayed on the home display. (Only if **ON** is selected for “Event Key” on the Alarm Related Setup.) Pressing this key will silence the alarm sound for the corresponded bed.**



[Alarm Factor Display on the Event List]

On the event list display, the following abbreviation will be used for each alarm factor.



Alarm Factor	Abbreviation
Asystole	Asys
VF	VF
VT	VT
Slow VT	SLVT
Run	Run
Couplet	Cplt
Pause	Paus
Bigeminy	Bigm
Trigeminy	Trgm
Frequent	Freq
Tachy	Tach
Brady	Brad
HR	HR
ST1	ST
ST2	ST
SpO ₂	SpO ₂
PR	PR
RESP	RR

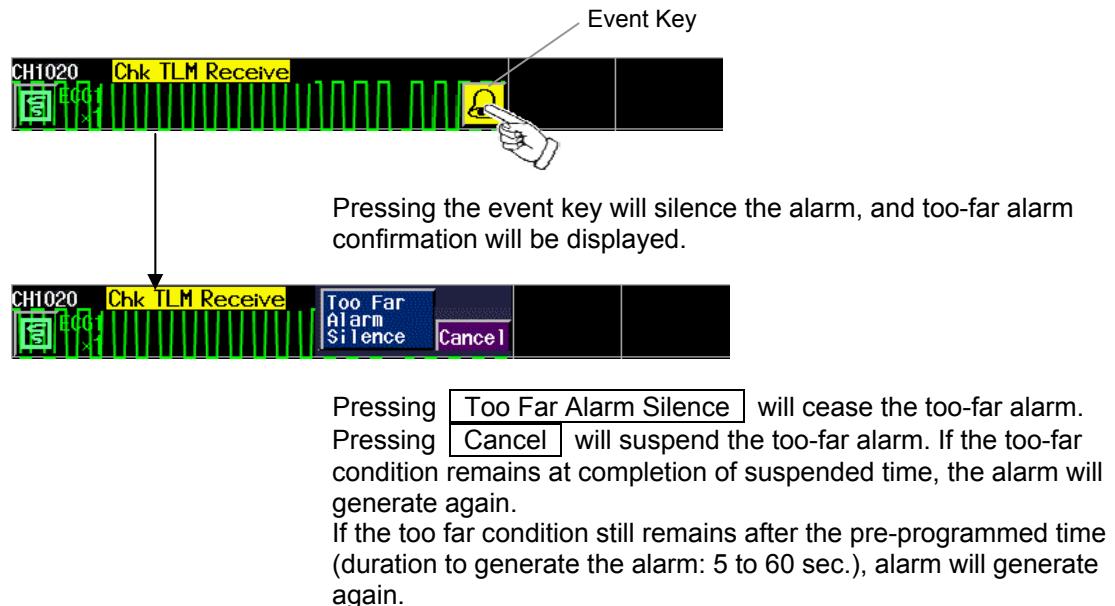
Alarm Factor	Abbreviation
APNEA	APN
CVA	CVA
EtCO ₂	CO ₂
InspCO ₂	CO ₂
xxx (xxx = TEMP label)	xxx
Ventilator	VENT
NIBP_SYS	NIBP
NIBP_DIA	NIBP
NIBP_MEAN	NIBP
xxx_SYS (xxx = BP label)	xxx
xxx_DIA (xxx = BP label))	xxx
xxx_MEAN (xxx = BP label))	xxx
Telemeter	TELE
Periodic Recording*	AUTO

* Periodic recording is not an alarm factor, but will be displayed on the event list.

Too-Far Alarm

When **ON** is selected for “Too Far Alarm” on the alarm-related setup of the preset menu, and telemetry transmitter is outside the transmission range for preprogrammed duration (5 to 60 sec.), “Chk TLM Receive” message will be displayed and alarm sound will generate in 5 seconds interval.

The event key will be also displayed on the home display regardless of the ON/OFF setting of the “Event Key” on the alarm related setup.



Alarm Related Setup

Alarm Silence Time, etc.

On the preset menu, the alarm function setup can be performed.

This setup should be performed by our service representative or system administrator of each institution.

Reference

→ "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup"

Alarm Related Setup 1/3

Alarm Silence Time	↑ 3Min ↓	Asystole/VF/VT Alarm Setup	[ON/OFF] [ON] (Only Asystole for neonate)	Prev. Disp.
Alarm Suspend Time	↑ 3Min ↓	Suspend Arrhy, Analysis during Noise Interference	[ON] [OFF] (Only for Telemetry Bed)	
Too Far Alarm	[ON] [OFF] ↑ 20Sec ↓			
Chk TLM Battery Alarm	[ON] [OFF]			Page Down

Alarm Related Setup 2/3

During Lead OFF		During "Check SpO ₂ Sensor"		Prev. Disp.
Alarm Judgement	[ON] [OFF]	Alarm Judgement	[ON] [OFF]	
Alarm Record	[ON] [OFF]	Message	[ON] [OFF]	
Lead OFF Message	[ON] [OFF]	Alarm Sound	[ON] [OFF]	
Lead OFF Alm Interval	↑ 5Sec ↓	During "NIBP measurement failed."		
		Alarm	[ON] [OFF]	Page Up
				Page Down

Alarm Related Setup 3/3

*The following settings are common for all beds.							Prev. Disp.
Alarm Pole Output Setup	[Ventilator]	[Level1]	[Level2]	[Level3]	[Pulse Sound]	[Alarm Pole Pattern Setup]	
Alarm wave background	[Lighting]	[Normal]					
Event key	[ON]	[OFF]					Page Up

ECG Alarm at Lead-Off Condition

When ECG lead is detached, some waveforms may become immeasurable depending on the detached lead. In such case, ECG waveform or respiration waveform will be displayed in baseline, and ECG related alarm will generate.

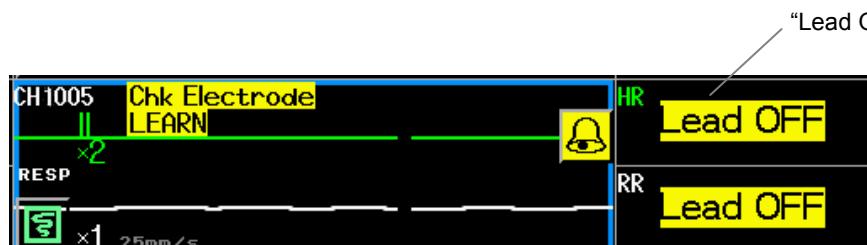
ECG related alarms are as follows.

- HR Alarm
- Arrhythmia Alarm
- ST Alarm
- RR Alarm of Impedance Respiration
- APNEA Alarm of Impedance Respiration

If the alarm generated during lead-off condition is considered not reliable, turning the "Alarm Judgment" OFF will not generate the ECG related alarm during lead-off condition

For the alarm function during lead-off condition, the following setup can be performed on the alarm-related setup menu.

- ON/OFF of Alarm Judgment
- ON/OFF of Alarm Recording
- ON/OFF of Lead-Off Message
- Lead-Off Alarm Interval (5/30/60 sec.)



If the "Alarm Judgment" is set OFF, HR alarm and arrhythmia alarm will not be generated at lead-off condition. 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.



These setups should be performed by our service representative or system administrator of your institution.
→ "9. Installation Procedure to Start Monitoring 5-6 Set the alarm related setup"

Other Alarm Function

Alarm Recording

At alarm generation, the waveform or numeric data of the alarm factor can be recorded automatically.

When the recorder is in “Paper Out” or “Check Magazine” condition, alarm recording will be cancelled and will be stored as recall data.

If more than one alarm generate at the same time, the alarm factor which could not be recorded will be stored as recall data.



The alarm recording setup can be performed on the recording setup menu.
→ “6. Recording Setting the Recording Condition and Output Recorder Alarm Recording Setup”

Storing the Alarm Factor as Recall Data

At alarm generation, the waveform or numeric data of the alarm factor can be stored as recall data and can be used for later review.



For recall data display, refer to “7. Review Function Recall”.

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Chapter 6

Recording

This chapter describes the function of the built-in recorder and the laser printer.

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Types of Recording and Output Recorder

In this section, the procedure to record the monitoring data to the built-in recorder or to the laser printer connected to the TCP/IP network will be explained.

These are the following types of recording.

Other than those, patient data such as graphic trend and recall waveform can be recorded.

NOTE	On the wired network system, if remote recording operation is performed on the bedside monitor to be output on the central monitor recorder, it will be output on the central monitor with the smallest central ID. For example, if the bedside monitor is monitored by several central monitors (central ID: CNT-002, CNT-004, CNT-006), performing remote recording operation on this bedside monitor will record on the central monitor with the central ID, CNT-002.	
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Recording Types	Output Recorder	
	Built-in Recorder	Laser Printer
Waveform Recording		
Manual Recording	Yes	No
Alarm Recording	Yes	No
Periodic Recording	Yes	No
Remote Recording	Yes	No
Review Data Recording		
Graphic Trend	Yes	Yes
Enlarged Graphic Trend	Yes	Yes
Tabular Trend	Yes	Yes
Recall List (All)	No	Yes
Recall List	No	Yes
Recall Enlarged Wave	Yes	Yes
NIBP List (All)	Yes	Yes
NIBP List	Yes	No
ST Record	Yes	Yes
12-lead Waveform	Yes	Yes
12-lead ST Waveform	Yes	Yes
Full Disc. Compressed	Yes	Yes
Full Disc. Enlarged	Yes	Yes
Full Disc. Report	No	Yes

Yes: can be recorded

No: cannot be recorded



The laser printer setup should be performed by our service representative or system administrator of your institution.

Refer to "9. Installation TCP/IP Network Connection" for setup procedure.

Setting the Recording Condition and Output Recorder

The recording procedure can be set for each bed.

- Manual Record : Pressing the  (Record Key) for the monitoring patient will start recording the waveform and numeric data, and pressing the key again will stop the recording. There are direct/delay recording, 12 sec./24 sec./continuous recording, and maximum of 3 waveforms can be selected for recording.
- Alarm Record : When an alarm occurs for the monitoring parameter, automatically records the waveform and numeric data with the pre-programmed recording condition.
- Periodic Record : Automatically records at pre-programmed time or at fixed interval.

Manual Recording Setup

- 1 Select a bed to perform the manual recording setup.**
- 2 Press the  →  →  →  keys.**

The manual recording setup menu will be displayed.



- 3 Select a waveform to record.**

Up to 3 waveforms can be selected.

The parameter with the lighted key LED is the selected parameter. Pressing the key again will turn off the key LED. The recording position will be automatically located.

- 4 Set the recording duration.**

Select ,  or .

,  will automatically stop recording after 12 seconds or 24 seconds.

 will continuously record until the  (Record) key is pressed.

- 5 Set the delay time.**

Select  or .

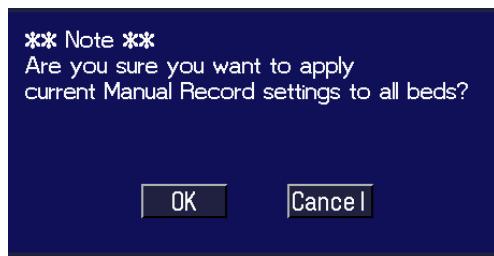
 will record from the point the  (Record) key is pressed.

 will record 8 seconds prior from the point the  (Record) key is pressed.

NOTE

When performing manual recording on the bedside monitor of the wired network system (DS-LANII/III), the recording will be performed according to the condition set on the bedside monitor.

- 6 To set the same setup for all beds, press the **All Beds** key.
Press the **OK** key when the confirmation display appears.**



Alarm Recording Setup

- 1 Select a bed to perform alarm recording setup.
2 Press the **Menu** → **System Config.** → **Record** → **Alarm Record** keys.**

The alarm recording setup menu will be displayed.



- 3 Set ON/OFF of alarm recording.**

ON will automatically start recording at alarm occurrence.
OFF will set the alarm recording function OFF.

- 4 Select a waveform for recording.**

Maximum of 3 waveforms can be selected.

Alarm will record the waveform which generated the alarm.

The parameter with the lighted key LED is the selected parameter. Pressing the key again will turn off the key LED.

The recording position will be automatically located.

- 5 Set the recording factor.**

Press the **Factor Setup** key to set the alarm recording factor.

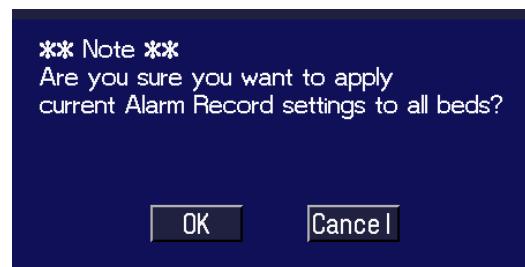
More than one parameter can be selected.

ALL ON will select all parameters.

ALL OFF will cancel all selection.



- 6 To set the same setup for all beds, press the **All Beds** key.
Press the **OK** key when the confirmation display appears.**



NOTE	<ul style="list-style-type: none"> ● The alarm recording duration is fixed as 12 seconds. ● The alarm recording prints the data at alarm occurrence. ● Alarm recording will be cancelled at condition such as recorder busy or paper out. The data will be stored as recall data instead. Also, if alarm generates simultaneously at more than one bed, the data that could not be recorded will be stored as recall data. ● If the same alarm generates during the alarm generation for the following parameter, alarm recording for the later generated alarm will not be performed. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 2px;">Parameter</th><th style="text-align: center; padding: 2px;">Priority of Recording</th></tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;">BP</td><td style="text-align: center; padding: 2px;">SYS>DIA>MEAN</td></tr> <tr> <td style="text-align: center; padding: 2px;">ST Level</td><td style="text-align: center; padding: 2px;">ST1>ST2</td></tr> <tr> <td style="text-align: center; padding: 2px;">12-lead ST Level</td><td style="text-align: center; padding: 2px;">ST(I)>ST(II)>ST(III)>ST(aVR) >ST(aVL)>ST(aVF)>ST(V₁) >ST(V₂)>ST(V₃)>ST(V₄) >ST(V₅)>ST(V₆)</td></tr> </tbody> </table> <ul style="list-style-type: none"> ● If OFF is selected for "Alarm Record during Lead OFF" of the alarm-related setup, alarm recording for the following alarm factor will not be performed at lead-off condition. <ul style="list-style-type: none"> • HR alarm, arrhythmia alarm, ST alarm • RR alarm and apnea alarm of impedance respiration • The alarm recording will not be performed for the ventilator alarm. 	Parameter	Priority of Recording	BP	SYS>DIA>MEAN	ST Level	ST1>ST2	12-lead ST Level	ST(I)>ST(II)>ST(III)>ST(aVR) >ST(aVL)>ST(aVF)>ST(V ₁) >ST(V ₂)>ST(V ₃)>ST(V ₄) >ST(V ₅)>ST(V ₆)
Parameter	Priority of Recording								
BP	SYS>DIA>MEAN								
ST Level	ST1>ST2								
12-lead ST Level	ST(I)>ST(II)>ST(III)>ST(aVR) >ST(aVL)>ST(aVF)>ST(V ₁) >ST(V ₂)>ST(V ₃)>ST(V ₄) >ST(V ₅)>ST(V ₆)								



For the alarm recording, measurement status such as vital signal condition will be also recorded after the recording type (ALARM).
For details, refer to "Printing the Measurement Status".

Periodic Recording Setup

- 1 Select a bed to perform the periodic recording setup.
- 2 Press the **Menu** → **System Config.** → **Record** → **Periodic Record** keys.

The periodic recording setup menu will be displayed.



- 3 Select the destination to output the periodic recording.

Recorder will record the selected parameter on the built-in recorder.

Recall will store the selected parameter as recall waveform.

OFF will not perform the periodic recording.

NOTE

When the recorder is busy or in paper out condition, the data will be stored as recall even if **Recorder** is selected.

- 4 Select a waveform for periodic recording.

3 waveforms can be selected if recording on the recorder.

The parameter with the lighted key LED is the selected parameter. Pressing the key again will turn off the key LED.

2 waveforms can be selected if storing as recall waveform.

If storing as recall waveform, 2 waveforms from the selected 3 waveforms will be stored according to the following priority.

[Priority of Recall Waveform]

ECG1 > ECG2 > BP1 > BP2 > ... > BP6 > SpO₂ > RESP > CO₂

For example, if **ECG1**, **RESP**, **BP1** are selected for "Wave Sel.", **ECG1** and **BP1** will be stored as recall waveform according to the priority.

Reference

For procedure to set the recall waveform, refer to "7. Review Function Recall".

5 Set the recording time or recording interval.

Select **Interval** or **Timer**.

If **Interval** is selected, select the recording interval from **1 min** / **2 min** / **3 min** / **5 min** / **10 min** / **15 min** / **20 min** / **30 min** / **60 min** / **120 min**.



The recording will be performed in the selected interval starting from 0 minutes.

For example, if the current time is 10:05, the recording time will be as follows for the following intervals.

2 min	: 10:06, 10:08, 10:10, ...
3 min	: 10:06, 10:09, 10:12, ...
10 min	: 10:10, 10:20, 10:30, ...
15 min	: 10:15, 10:30, 10:45, ...

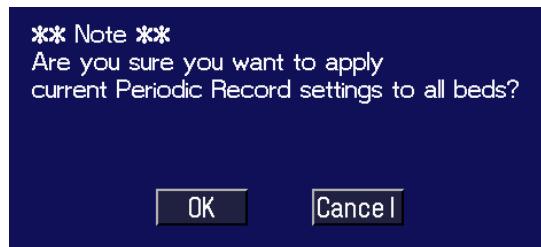
If **Timer** is selected, select the time to start the recording from **0:00** to **23:00**.

(More than one selections are possible.) The recording will automatically start at selected time.



6 To set the same setup for all beds, press the **All Beds** key.

Press the **OK** key when the confirmation display appears.



Output Recorder Setup for Review Data Recording

If a laser printer is connected to TCP/IP network, output recorder of graphic data can be selected from built-in recorder or laser printer.



The laser printer setup should be performed by our service representative or system administrator of your institution.

Refer to "9. Installation TCP/IP Network Connection" for setup procedure.

To monitor/record the 12-lead waveform, "12-Lead" on the soft switch menu should be set to ON.

→ "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch"

1 Select the patient to perform the output recorder setup.

2 Press the **Menu** → **System Config.** → **Record** → **Output Rec. Sel.** keys.

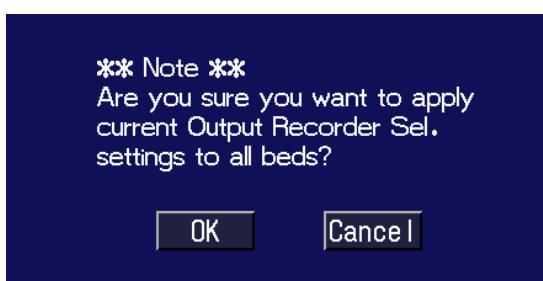
The output recorder selection menu will be displayed.

Output Recorder Sel.	ENGLISH	Output Recorder	Output Recorder	Prev. Disp.
Graphic Trend	Built-in	Laser	ST Display	Built-in
Tabular Trend	Built-in	Laser	Full Disc. Compressed Wave	Built-in
NIBP List	Built-in	Laser	Full Disc. Zoom Wave	Built-in
Recall Zoom Wave	Built-in	Laser	12-Lead Record	Built-in
				All Beds

3 Select the output recorder from **Built-in** (built-in recorder) or **Laser**.

4 To set the same output recorder for all beds, press the **All Beds** key.

On the confirmation display, press the **OK** key.



12-Lead Recording Setup

The 12-lead waveform recording setup for the built-in recorder and laser printer can be performed.

Reference

To monitor/record the 12-lead waveform, "12-Lead" on the soft switch menu should be set to ON.

→ "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch"

1 Select the patient to perform the recording.

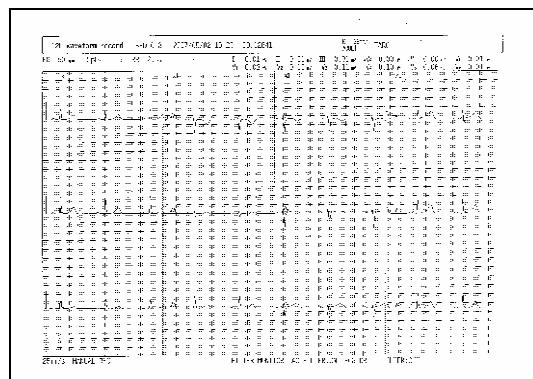
2 Press the **Menu** → **System Config.** → **Record** → **12-Lead Record** keys.

The 12-lead recording setup menu will be displayed.



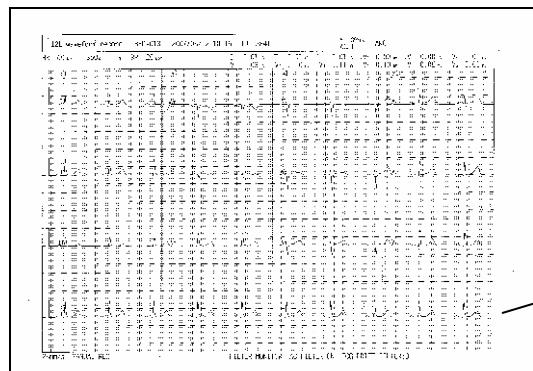
3 Set the recording format for the laser printer.

3 Waves×4 will record 3 waveforms × 4 columns. The length of each waveform is 2.5 seconds.



Recording example on the left;
1st column: I, II, III
2nd column: aVR, aVL, aVF
3rd column: V1, V2, V3
4th column: V4, V5, V6

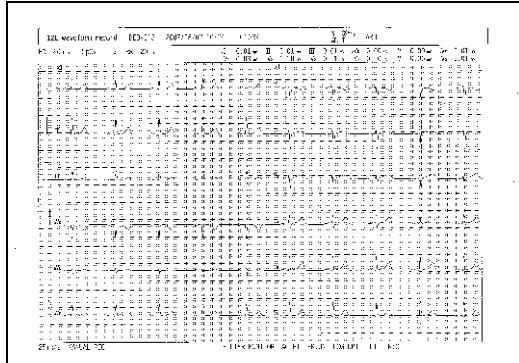
3 Waves×4+Rhy. will record 3 waveforms × 4 columns along with 10 seconds of rhythm waveform (ECG1 lead on the home display).



Recording example on the left;
1st column: I, II, III
2nd column: aVR, aVL, aVF
3rd column: V1, V2, V3
4th column: V4, V5, V6

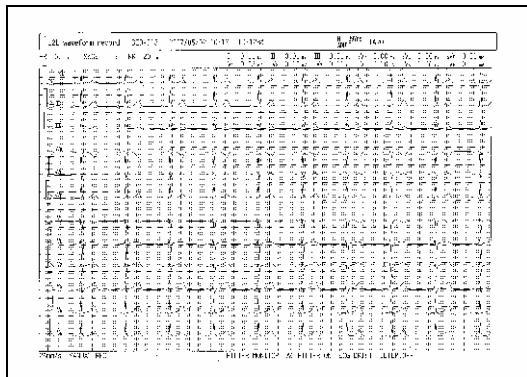
Rhythm Waveform

6 Waves×2 will record 6 waveforms × 2 column. The length of each waveform is 5 seconds.



Recording example on the left;
1st column: I, II, III, aVR, aVL, aVF
2nd column: V1, V2, V3, V4, V5, V6

12 Waves will record 12 waveforms. The length of each waveform is 10 seconds.



Recording example on the left;
The waveforms from the top are as follows.
I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6

4 Set the waveform position.

Center will equalize the recording width of each lead so that the waveform baseline will be at the center. The recording scale of the waveform will be also automatically adjusted.

Proportional will equalize the blank space between each lead to avoid overlapping of the waveforms. The recording scale of the waveform will be also automatically adjusted.

OFF will not adjust the waveform position when recording.

5 Set the recording order of the waveforms.

Regular will start recording from the limb leads.

(In the order of I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6)

Reverse will start recording from the chest leads.

(In the order of V1, V2, V3, V4, V5, V6, I, II, III, aVR, aVL, aVF)

6 Select whether or not to automatically adjust the recording scale.

Select whether or not to automatically adjust the recording scale when waveform position adjustment is set to **OFF**.

ON will automatically adjust the recording scale.

OFF will not automatically adjust the recording scale and record with the displayed scale.

NOTE

The recording scale will be adjusted in the range of $\times 1$, $\times 1/2$, $\times 1/4$.
It will not be adjusted to $\times 2$ or $\times 4$ even if the amplitude is small.

7 Select whether or not to print the calibration waveform when recording on the laser printer.

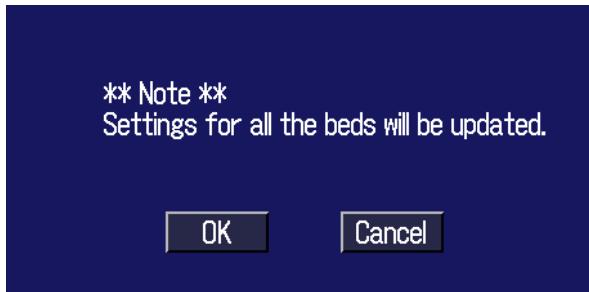
- ON** will print the calibration waveform.
- OFF** will not print the calibration waveform.

8 Select whether or not the print the lead boundary when recording on the laser printer.

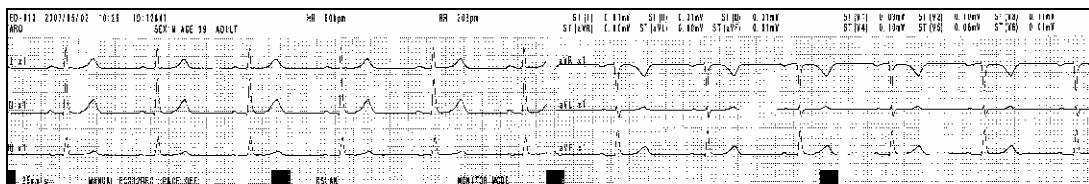
ON will print the lead boundary between the leads.
OFF will not print the lead boundary.

9 To assign the same setup for all beds, press the **All Beds** key.

On the confirmation display, press the **OK** key.



【Recording Example of Built-in Recorder】



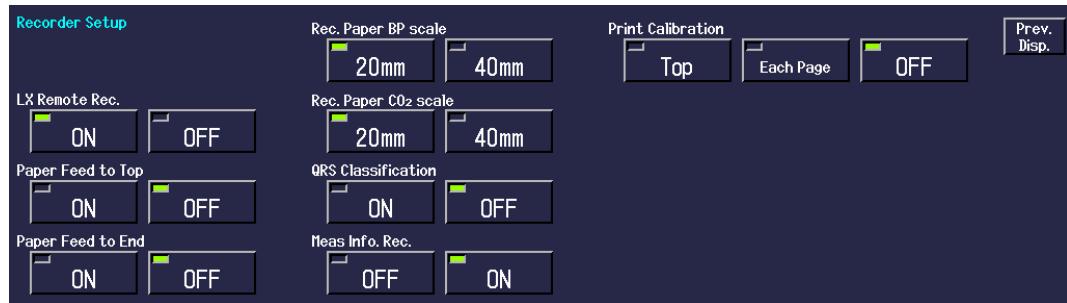
Recorder Setup

Recorder Setup

The following setup can be performed for the recorder setup on the preset menu.
This setup should be performed by our service representative or system administrator of each institution.

Reference

→ “9. Installation Procedure to Start Monitoring 5-2 Set the recorder operation”



Recording Paper Size Selection

On the soft switch menu, the recording paper size for laser printer can be selected from A4 size or letter size.

Reference

→ “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”



Recording Procedure

To Perform Manual Recording

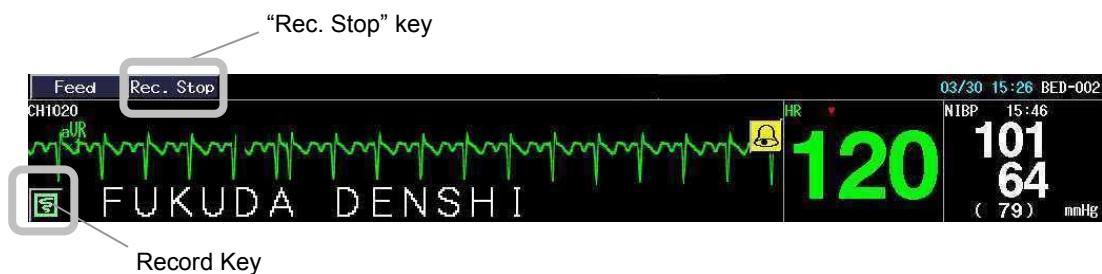
1 Press the (Record) key.

The recording will start.

If the  (Record) key is pressed during recording of other bed, the recording will start after completion of the ongoing recording.

To stop the recording, press the  (Record) key again for the same bed.

Pressing the **Rec. Stop** key on the home display will also stop the recording.



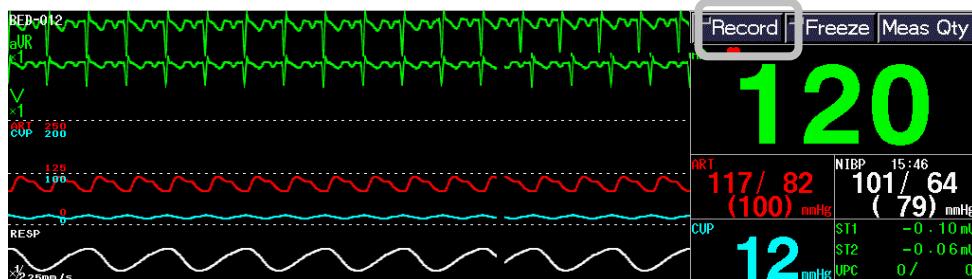
Tips

Pressing the  keys for more than one bed will sequentially start the manual recording for the pressed beds. However, **12sec.** or **24sec** should be selected for recording duration on the manual recording setup.

2 The manual recording can be also started by pressing the **Record** key on the individual bed display.

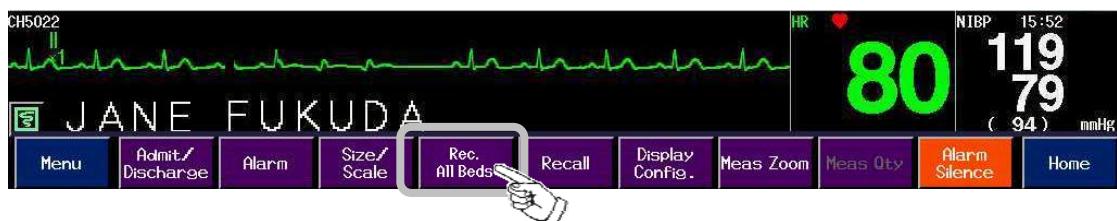
The key LED will light during recording.

To stop the recording, press the **Record** key again.



3 By setting the **Rec. All Beds** key to user key, manual recording of all patients displayed on the home display will be started.

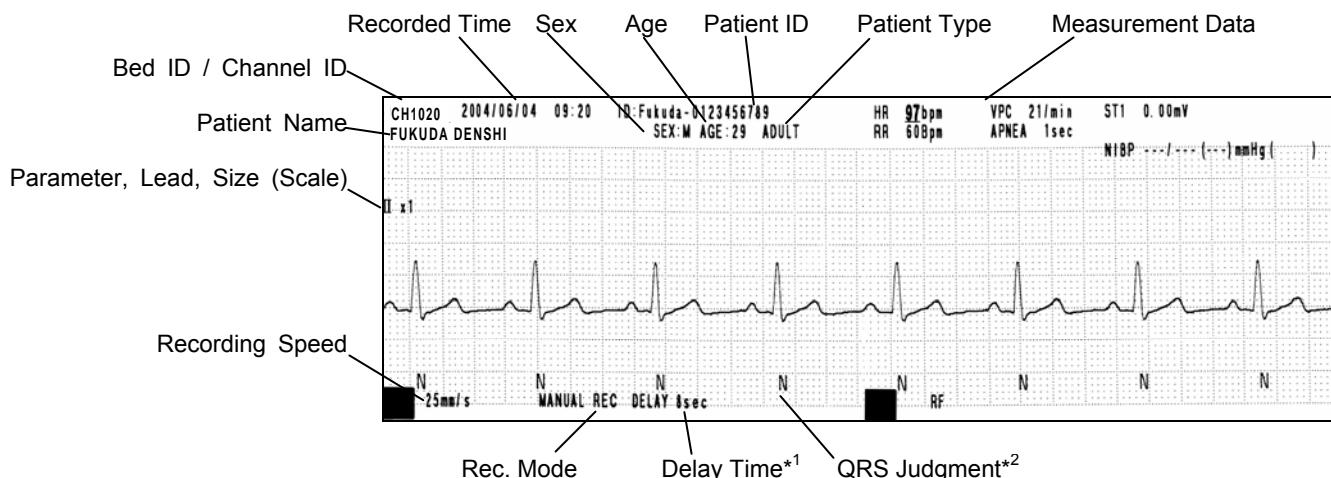
The recording duration and delay time is fixed as 12 seconds and 8 seconds respectively.



Reference

For procedure to set the user key, refer to “9. Installation Procedure to Start Monitoring 5-5 Set the user key”.

【Example of Manual Recording】



*¹ 【Delay Time】

If **None** is selected for “Delay Time” on manual recording setup, it will be printed as “MANUAL REC. DIRECT”.

*² 【QRS Classification】

Selecting **ON** for “QRS Classification” on the recorder setup of the preset menu will print the following symbols.

Symbol	Description
N (Normal)	Normal QRS beat
V (VPC)	Ventricular Extrasystole
P (Pacing Beat)	Pacing beat
F (Fusion Beat)	Fusion beat of pacing and spontaneous beat.
? (Undetermined beat)	Learning arrhythmia, or beat not matching the pattern

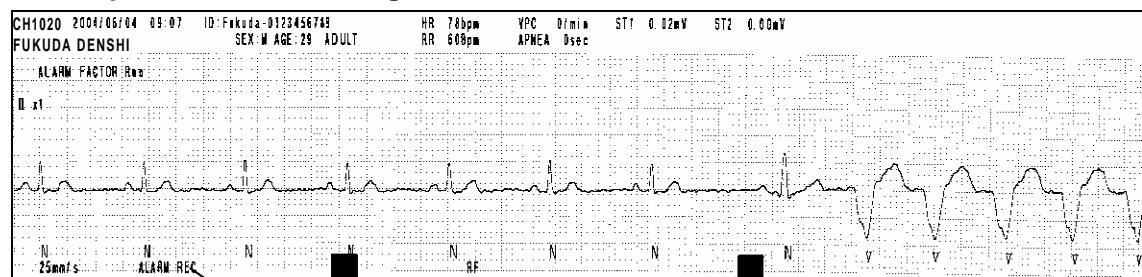
Reference

→ “9. Installation Procedure to Start Monitoring 5-2 Set the recorder operation”

To Perform Alarm/Periodic Recording

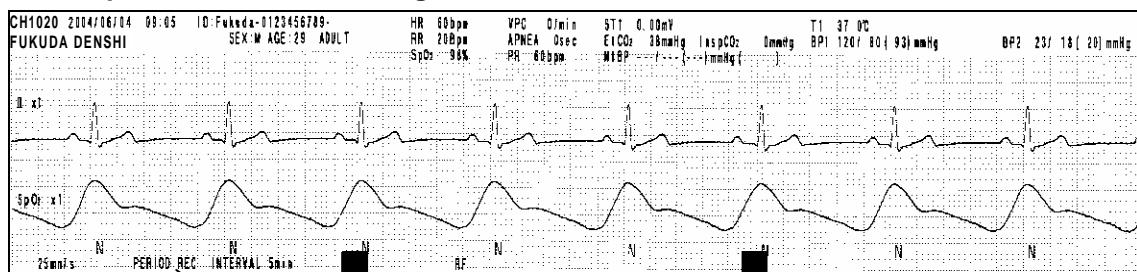
If the set condition is met, alarm/periodic recording will automatically start/stop.

【Example of Alarm Recording】



Indicates alarm recording.

[Example of Periodic Recording]



Indicates periodic recording.

Remote Recording

When the record key on the bedside monitor or “EVENT” key on the telemetry transmitter is pressed, remote recording can be performed on the built-in recorder of the DS-7600.

●Waveform Remote Recording from the Wired Bedside Monitor.

By pressing the record key on the bedside monitor, remote recording can be performed on the built-in recorder of the DS-7600.

If more than one central monitors are connected to the network, recording will be performed on the central monitor with the smallest central ID.

1. “Central Recorder” should be selected as output recorder for waveform recording on the bedside monitor.
2. The recording will be performed according to the recording condition set on the bedside monitor.
3. For the patient ID, maximum of 10 digits will be printed on the central recorder.

●Graphic Remote Recording from the Wired Bedside Monitor.

By pressing the [Record] key on the extended function display (ex. graphic trend display) on the bedside monitor, graphic recording can be performed on the built-in recorder of the DS-7600.

1. “Central Recorder” should be selected as output recorder for graphic recording on the bedside monitor.
2. The recording will be performed according to the recording condition set on the bedside monitor.

●Remote Recording from the Telemetry Bedside Monitor (with HLX-561)

From the bedside monitor without the recorder module (DS-5300, DS-5100, etc.), remote recording can be performed through the telemetry transmitter (ex. HLX-561) to the built-in recorder of the DS-7600.

NOTE

The telemetry remote recording is effective only for manual recording. If a recorder is connected to the bedside monitor, telemetry remote recording will not function.

There are following restrictions when performing telemetry remote recording from the telemetry transmitter (ex. HLX-561).

1. The recording duration is 24 seconds, and the delay time is 12 seconds.
2. “Module Recorder” should be selected as output recorder on the bedside monitor.
3. The waveform selection will be according to the manual recording setup on the central monitor.

●Remote Recording from the Telemetry Transmitter (LX-5160, LX-5630)

By pressing the event key on the LX-5160 or LX-5630, remote recording on the built-in recorder of the DS-7600 can be performed.

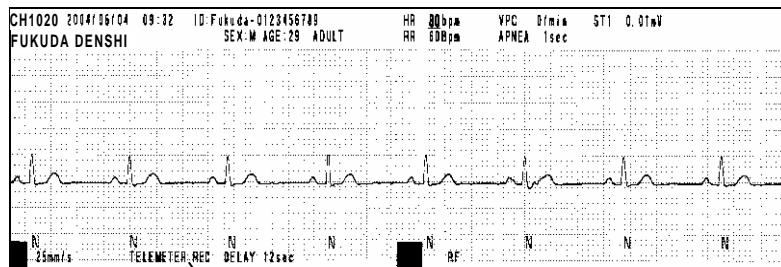
There are following restrictions when performing telemetry remote recording from the telemetry transmitter (ex. LX-5160, LX-5630).

1. This recording can be performed only if **ON** is selected for "LX Remote Rec." on the recorder setup menu of the preset menu.
2. Press the event key on the LX-5160, LX-5630 for more than 3 seconds.
3. The recording duration is 24 seconds, and the delay time is 12 seconds.
4. The waveform selection will be according to the manual recording setup on the central monitor.



"9. Installation Procedure to Start Monitoring 5-2 Set the recorder operation"

【Example of Telemetry Remote Recording】



Indicates telemetry remote recording.

Review Data Recording (Graphic Trend, Tabular Trend, etc.)

The review data such as graphic trend, tabular trend, NIBP list, recall waveform, ST waveform can be recorded.

The review data recording can be started by pressing the **Rec.** key displayed on the data review display of each patient.

The following shows the example of graphic trend.

- 1 Select a patient to display the graphic trend.
- 2 Press the **Menu** → **Graphic Trend** ("Function") keys and display the graphic trend.
- 3 Record the displayed graphic trend.

【When the output recorder is built-in recorder】

Press the **Rec.** key.

The currently displayed 3 graphic trend data will be recorded on the built-in recorder.

Pressing again the **Rec.** key during recording will stop the recording.



【When the output recorder is laser printer】

Press the **Rec.** key.

The currently displayed 3 graphic trend data will be recorded on the laser printer.

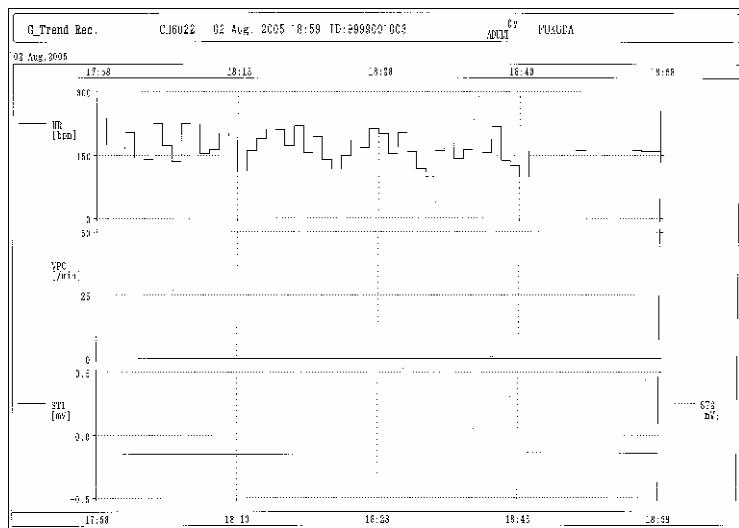


- The number of stacked recording data for the bed will be displayed inside the **Rec.** key.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.

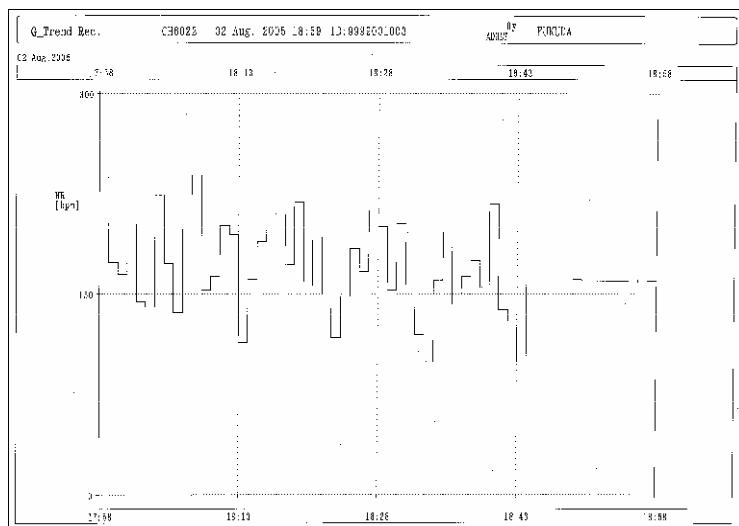
NOTE	When the output recorder is laser printer, pressing again the Rec. key during recording will not stop the recording. A new data will be added as stacked data instead.
------	---

●Laser Printer Output Example

[Graphic Trend Recording]



[Graphic Trend Enlarged Recording]



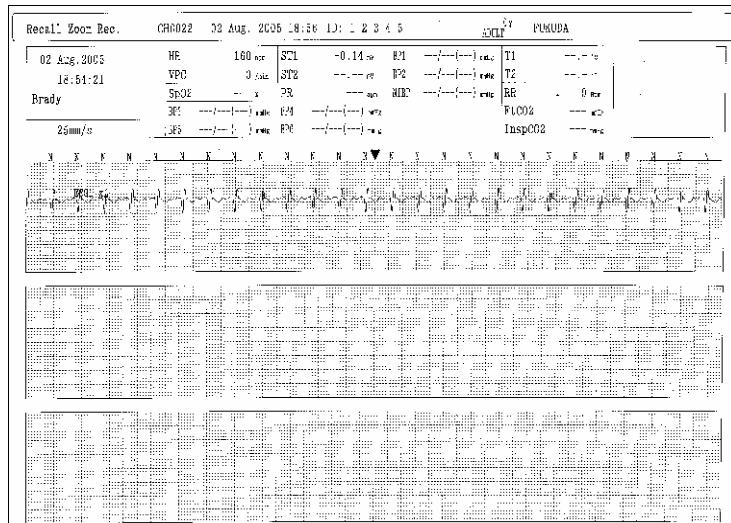
[Tabular Trend Recording]

T_Trend Rec.		CJ6022 02 Aug. 2005 18:48 ID:9999001003										ADM		FIR0A	
		02 Aug. 2005													
IR	Max	160	160	160	160	160	228	286	263	276	274				
IR	Avg	160	160	160	160	160	164	180	162	184	182				
IR	Min	160	160	160	160	160	112	125	90	106	120				
ST1	Sz1	0	0.14	-0.14	-0.14	0.14	0.14	-0.14	-0.14	-0.15	-0.15				
ST1	Sz2	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.15	-0.15				
ST1	St1	-0.14	-0.14	-0.14	-0.15	-0.15	0.15	0.15	0.15	0.15	0.15				
ST2	Sz1	0	0	0	0	0	0	0	0	0	0				
ST2	Sz2	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.15	-0.15				
ST2	St1	-0.14	-0.14	-0.14	-0.15	-0.15	0.15	0.15	0.15	0.15	0.15				
VPC	0	0	0	0	0	0	0	0	0	0	0				
ak	25	27	27	27	25	14	0	0	0	0	0				
ak	Max	24	13	12	10	10	30	30	30	30	30				
SP1															
SP2															
SP3															
SP4															
T1	1°C														
T2	1°C														
FIR0															

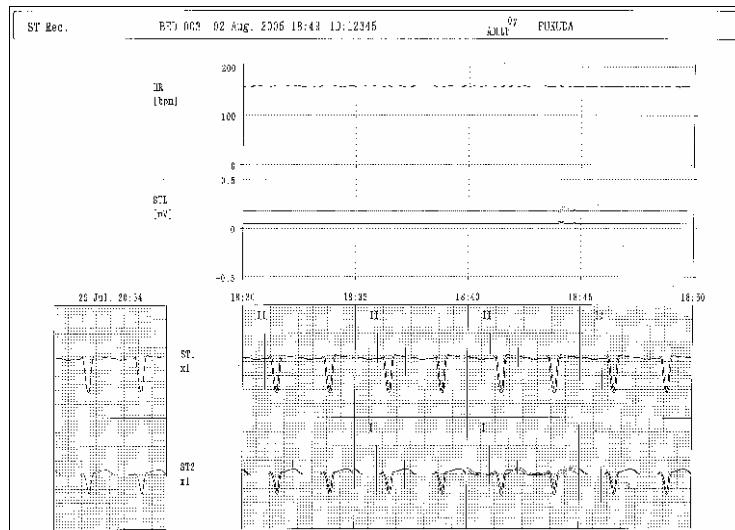
[Recall List Recording]

Recall List Rec.		CH6022 C2 Aug. 2006 18:58 ID: 1 2 3 4 5					ADULT		PUMA		1/1	
No. 1	Periodic Record						No. 3	Periodic Record				
02 Aug. 18:58							02 Aug. 18:58					
Xe.1							Xe.3					
32 Aug. 18:58							32 Aug. 18:58					
No. 5	Periodic Record						No. 7	Periodic Record				
02 Aug. 18:58							02 Aug. 18:58					
Xe.5							Xe.7					
No. 8	Periodic Record						No. 9	Periodic Record				
02 Aug. 18:58							02 Aug. 18:58					
Xe.8							Xe.9					
No. 4	Periodic Record						No. 6	Periodic Record				
02 Aug. 18:58							02 Aug. 18:58					
Xe.4							Xe.6					
No. 10	Brady, HR(160bpm)						No. 10	Periodic Record				
02 Aug. 18:58							02 Aug. 18:58					
Xe.10							Xe.10					
32 Aug. 18:58							32 Aug. 18:58					

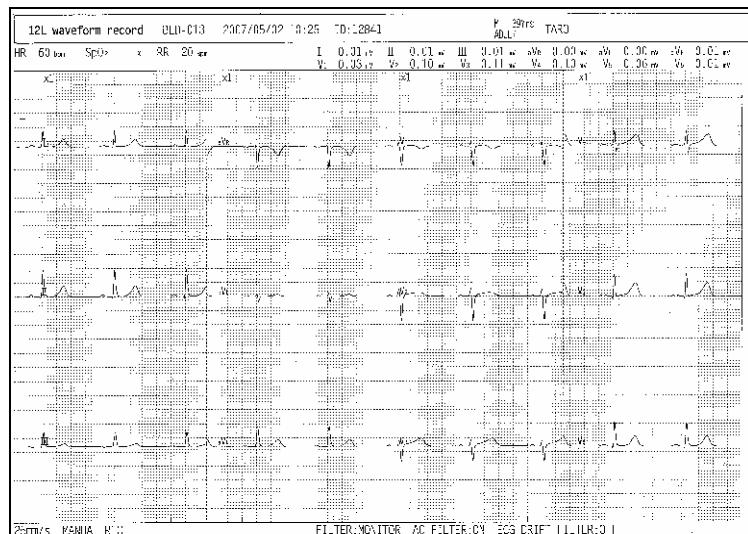
[Recall Enlarged Waveform Recording]



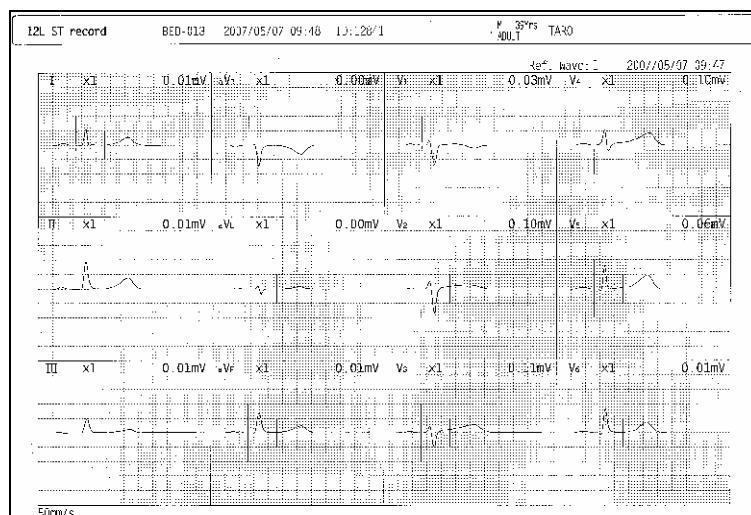
【ST Recording】



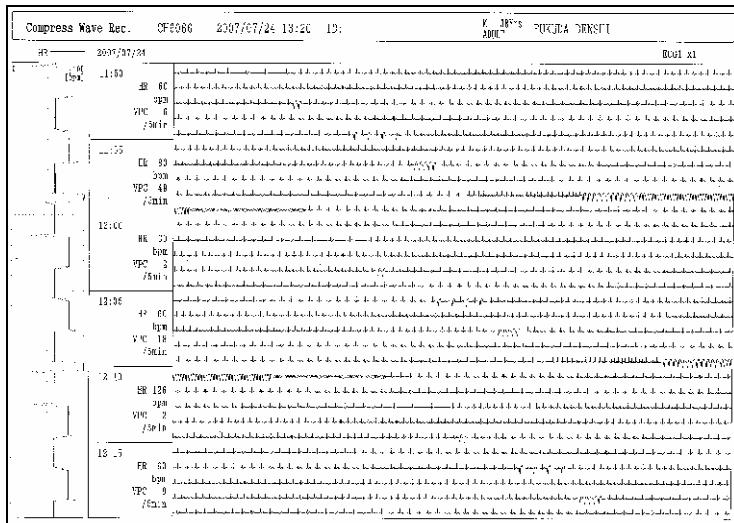
【12-Lead Waveform Recording (3 Waves×4)】



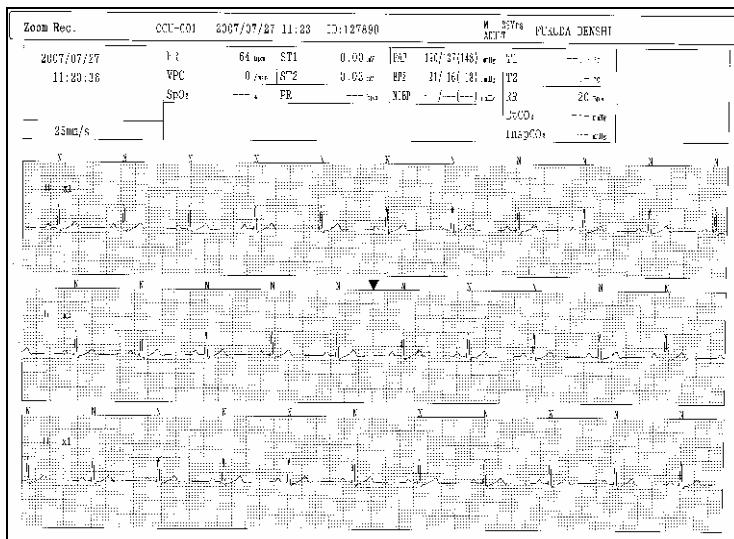
【12-Lead ST Recording】



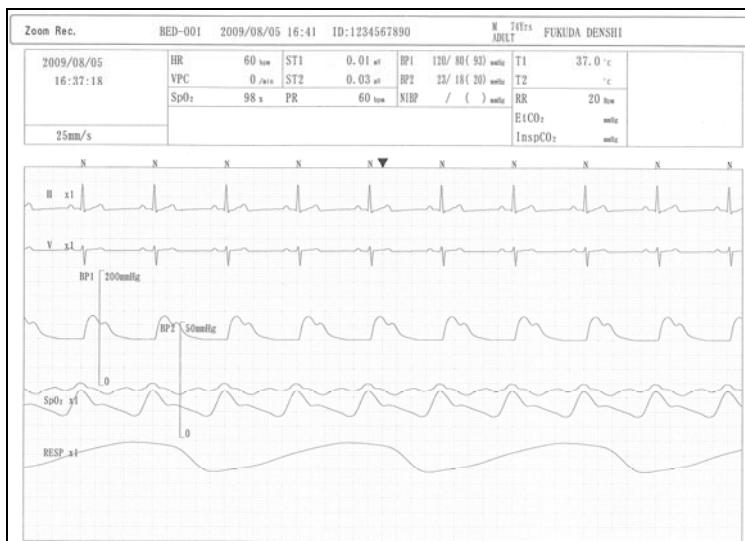
[Full Disclosure Compressed Waveform Recording]



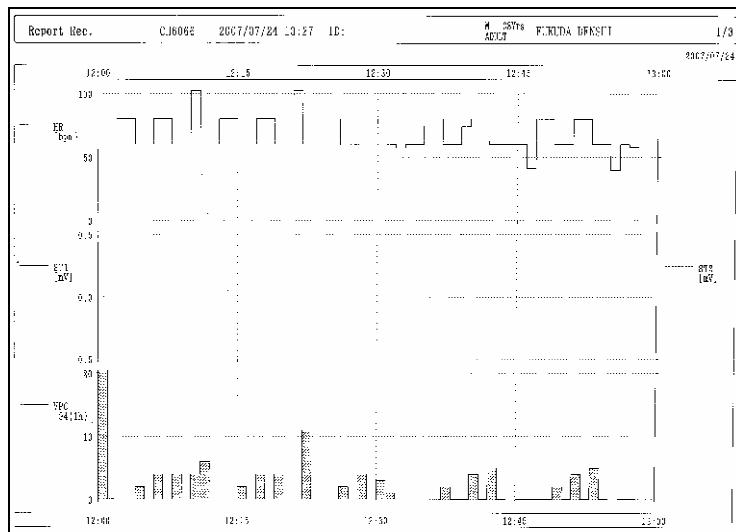
[Full Disclosure Enlarged Waveform Recording] (3 Waves × 30sec.)



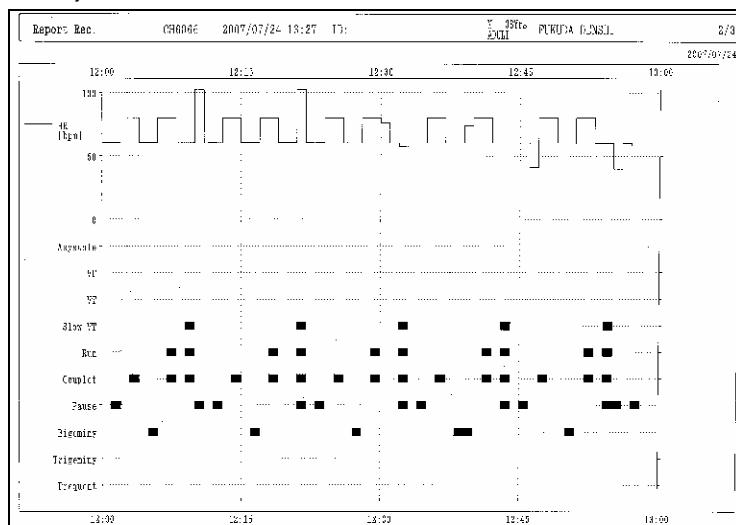
[Full Disclosure Enlarged Waveform Recording] (6 Waves × 10sec.)



[Full Disclosure Waveform/Report Recording] (1st page: HR, ST1, VPC trend)

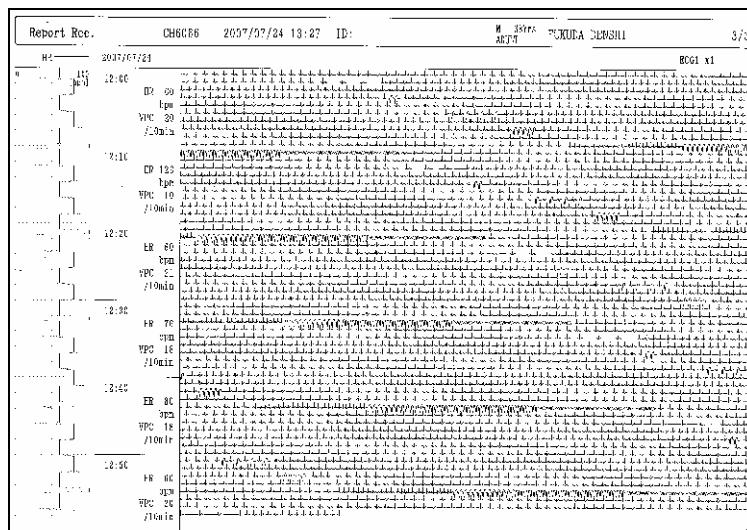


[Full Disclosure Waveform/Report Recording] (2nd page: HR trend and arrhythmia event trend)



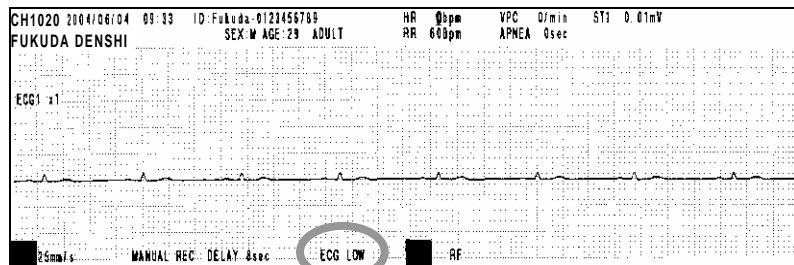
[Full Disclosure Waveform/Report Recording] (3rd page and onward: compressed waveform and trend)

The compressed waveform and trend will be recorded for preprogrammed duration.



Printing the Measurement Status

On the waveform recording output, measurement status such as vital signal condition and equipment status will be printed after the recording type.



Vital signal condition or equipment status will be printed.

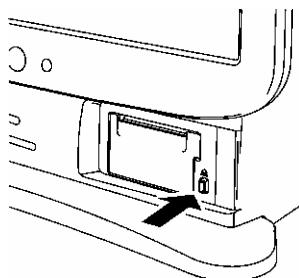
There are following messages which may be printed on the recording paper.

Message	Description
LEAD OFF	The electrode is detached. Check electrodes.
CVA	CVA is detected.
P SEARCH	SpO ₂ pulse wave is small. SpO ₂ probe sensor attachment is not appropriate, etc.
ECG LOW	The amplitude of ECG waveform is low.
ECG CAN'T	Cannot perform arrhythmia analysis.
ECG1 LOW	The amplitude of ECG1 waveform is low.
ECG2 LOW	The amplitude of ECG2 waveform is low.
ECG1 CAN'T	Cannot perform arrhythmia analysis of ECG1.
ECG2 CAN'T	Cannot perform arrhythmia analysis of ECG2.
CO ₂ CHECK	CO ₂ sensor error.
TLM OFF	Too far, noise interference.
TLM LOWBAT	Telemetry battery or bedside monitor battery is depleted.
LAN OFF	<ul style="list-style-type: none"> • Communication error with DS-LANII/DS-LANIII. • DS-LANII/DS-LANIII connection is cut off. • Cannot receive data via DS-LANII/DS-LANIII.

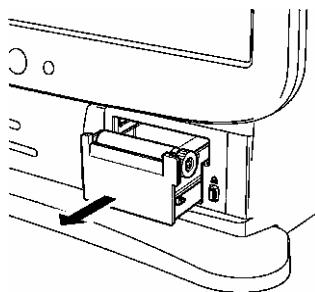
Built-in Recorder Operation

To Install the Paper

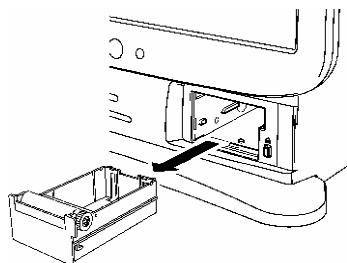
- 1 Press the button located at the right side of the recorder paper cassette.



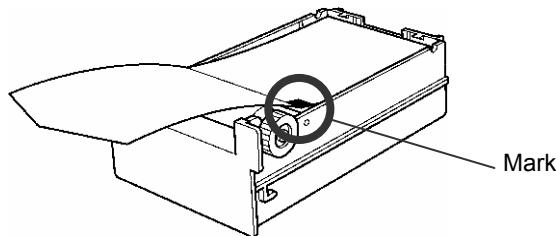
- 2 The paper cassette will come out.



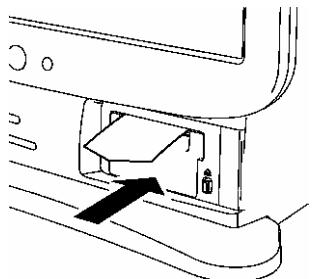
- 3 Pull out the paper cassette from the main unit.



- 4 Set the paper so that the printed mark is on the right side.



- 5 Put the paper cassette back into the main unit. Push in until it locks into place with a click sound.



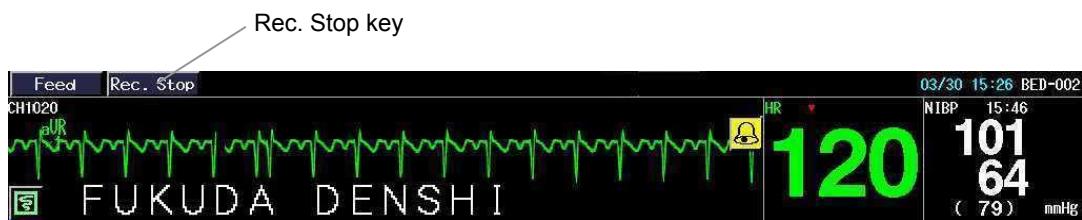
Paper Feed

The **Feed** key on the home display allows to feed the recording paper to the top of the paper.



Stop Recording

Pressing the **Rec. Stop** key on the home display allows to stop the recording.



Built-in Recorder Status Message

The built-in recorder status will be indicated with the following message.



<i>Message</i>	<i>Description</i>
Check Recorder	Thermal head error
Check Magazine	Recorder paper cassette is open. Set the cassette properly.
Paper Out	No recording paper is present. The recording will automatically stop when the recording paper is out. Set a new pad of recording paper. The message will continue to be displayed until the recording paper is set.
Paper Jam	Recording paper is jammed. Remove the jammed paper, and set the recording paper properly.
Recorder Busy	Recording is in operation.



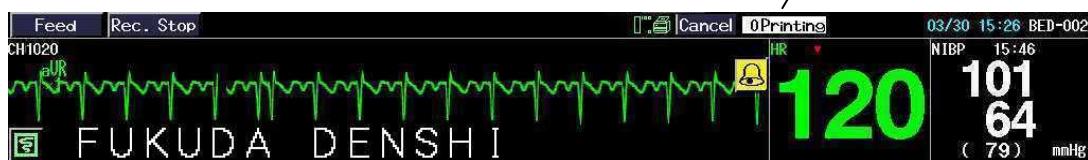
For procedure to install the recording paper, refer to "Built-in Recorder Operation To Install the Paper".

Laser Printer Operation

Laser Printer Status Message

The laser printer status will be indicated by the following messages and icons.

Laser Printer Status Message Display Area



Message	Description
LP Com Error	The specified printer does not exist on the TCP/IP network.
LP Waiting	The laser printer is not ready for recording.
0 Printing	In process of recording on the laser printer. (x: number of stacked data) <ul style="list-style-type: none">• indicates the recording progress. ()• Pressing Cancel during recording will delete all stacked data.

Number of Stacked Data

Maximum of 64 data can be stacked as recording data.



On the laser printer status message display area, total number of stacked data for all beds will be displayed.

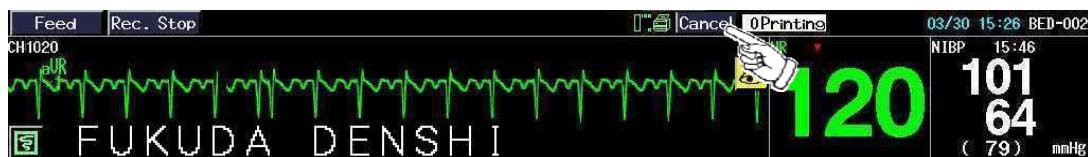


Inside the **Rec.** key on the review display (graphic trend, tabular trend, etc.), the number of stacked data for the bed will be displayed.

When the total stacked data for all beds reaches 64 data, the key will become ineffective by turning gray.

Deleting the Stacked Data

By pressing the **Cancel** key on the upper display area during recording, all stacked recording data will be deleted.



NOTE

Pressing again the **Rec.** key on each review display during recording will not stop the recording. A new data will be added as stacked data instead.

Chapter 7

Review Function

This chapter explains the review function such as trend, recall, etc.

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This section describes about the graphic trend function and printing procedure.
The monitoring data stored every minute for 48 hours can be graphically displayed in time span of maximum 24 hours.

To Display the Graphic Trend

The graphic trend display can be accessed from the menu or from the pre-programmed user key.

- 1 Select a bed and press the **Menu** → **Graphic Trend** (“Function”) keys.**
The graphic trend will be displayed.
- 2 It can be also accessed by pressing the **Graphic Trend** key assigned as user key.**

Description of the Display

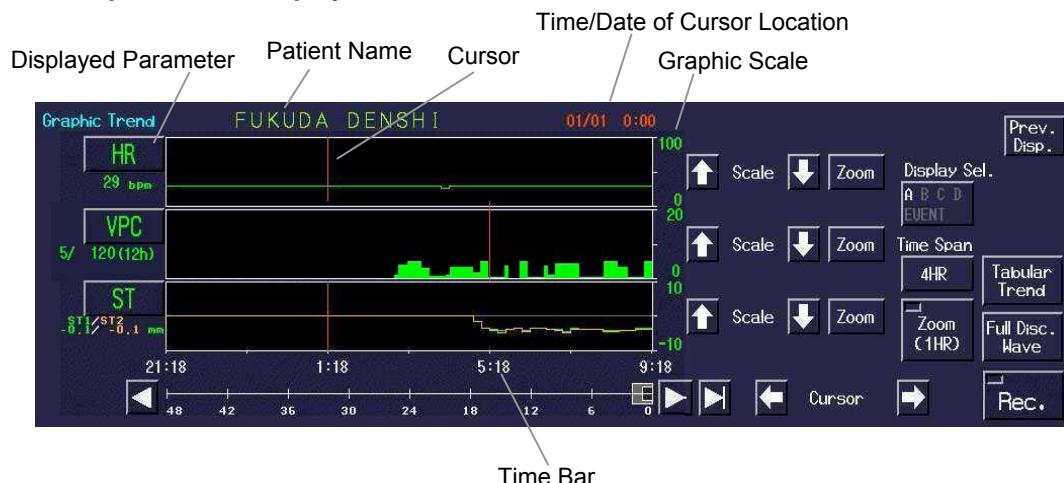
The graphic trend of 3 parameters can be displayed simultaneously. It is necessary to preprogram the combination of these parameters.

The time and measurement value at cursor position will be always displayed. As the cursor moves, the time and measurement value will also change.

The graph at cursor position can be displayed enlarged to 1-hour time scale.

The display can be switched to graphic trend of the alarm event.

[Graphic Trend Display]



A time bar will be displayed at the lower part of the display. The placing of displayed trend data among the whole stored trend data is indicated on the time bar.



[Graphic Trend Enlarged Display]



[Alarm Event Trend Display]



●The Displayed Value for Each Time Span

The displaying time span can be selected from 1 hr / 2 hrs / 4 hrs / 8 hrs / 12 hrs / 24 hrs.
The displayed value and cursor interval of each parameter differs depending on the time span.

Parameter

Time Span	1 hr	2 hrs	4 hrs	8 hrs	12 hrs	24 hrs
HR, ST, RR, SpO ₂ , PR, IBP, TEMP, CO ₂ , SvO ₂ , CCO, CCI, BT, GAS_CO ₂ , GAS_O ₂ , ΔO ₂ , GAS_N ₂ O, GAS_AGT, MAC						
APNEA						
VPC						
NIBP	Latest Value					

*“Total displayed VPC” indicates the total value within the displayed time span.
(For example, the value will be total VPC of 12 hrs if the time span is “12 hrs”.)

Cursor Interval

The cursor interval differs according to the time span.

Time Span	1 hr	2 hrs	4 hrs	8 hrs	12 hrs	24 hrs
Cursor Interval		1 min.			3 min.	

To View the Graphic Trend Data

1 Display the graphic trend.



2 Select the displaying parameter.

[Select by group]



Press the “Display Selection” key to select the parameter group from (A), (B), (C), (D), (EVENT).



The programmed parameters will be displayed beside each parameter group key.

Select a group to display from A / B / C / D / EVENT.

[Select each parameter]



Pressing the key at the left of the graphic area will display the parameter selection.



Select the parameter from the selection.

Changing the parameter will also change the programmed parameter for the group (A/B/C/D).

3 Select the displaying scale.



Use the or key to select the vertical axis scale.
The scale will differ according to the parameter.

Parameter	Scale	Unit
HR	100, 200, 300	bpm
ST	±0.2, ±0.5, ±1.0, ±2.0 ±2, ±5, ±10, ±20	mV mm
VPC	20, 50, 100	beat
BP	20, 50, 100, 150, 200, 300 4, 8, 16, 20, 24, 40 (When CVP) 20, 40	mmHg kPa cmH ₂ O
NIBP	20, 50, 100, 150, 200, 300	mmHg
SpO ₂	0–100, 50–100, 80–100	%
PR	100, 200, 300	bpm
TEMP	0–40, 20–45, 30–40	°C
RR	50, 100, 150	Bpm
APNEA	15, 30	Sec
CO ₂	4.0, 8.0, 10.0 50, 100	%, kPa mmHg
SvO ₂	0–100, 50–100, 80–100	%
CCO	0.0–6.0, 0.0–12.0, 0.0–20.0	L/min
CCI	0.0–6.0, 0.0–12.0, 0.0–20.0	L/min/m ²
BT	0–40, 20–45, 30–40	°C
GAS_CO ₂	4.0, 8.0, 10.0 50, 100	%, kPa mmHg
GAS_O ₂	0–50, 0–100	%
ΔO ₂	3, 6, 9	%
GAS_N ₂ O	0–50, 0–100	%
GAS_AGT	4, 8, 10	%
MAC	5, 10	No unit

4 Select the displaying time span.

[Enlarged Display of One-hour Span]



Zoom (1HR) will display enlarged one-hour data with cursor time at center. This key is ineffective when the time span is set to 1HR. Directly pressing the graphic display area will also display the enlarged one-hour data with the pressed time at center.

[Time Span Selection]



Press the "Time Span" key to display the time span selection.



Select the time span from 1HR / 2HR / 4HR / 8HR / 12HR / 24HR.

5 Switch the page.



The page can be shifted to newer or older data with the currently displayed time span.

will shift half page to older data.

will shift half page to newer data.

will display the latest data.

Pressing the time bar will also shift the display to the pressed time.

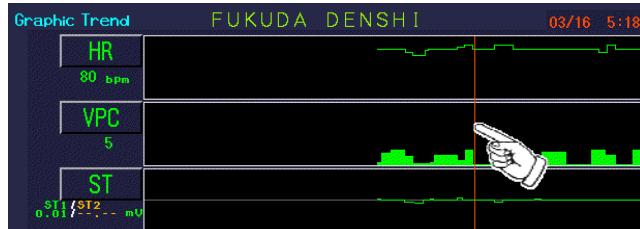
6 Move the cursor.



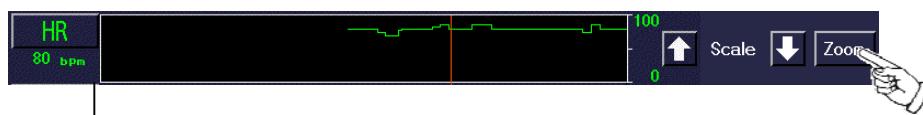
Move the cursor using the **←** or **→** keys to read the measurement value of the specific time.

The date and time indicates the date and time at cursor position.

Directly pressing the graphic area will also move the cursor to the pressed position.



7 Enlarge the graphic trend of selected parameter.



Pressing **Zoom** will enlarge the graphic trend of selected parameter with currently displayed time scale.



To return the display to graphic trend of 3 parameters, press the key displayed at right.



8 The tabular trend data and full disclosure waveform data of the cursor position can be displayed.



Tabular Trend will display the tabular trend data of the cursor position.



Full Disc. Wave will display the full disclosure waveform data of the cursor position. This is effective when optional CF card is used for full disclosure waveform recording.

9 Record the graphic trend.

[When the output recorder is built-in recorder]



The currently displayed graphic trend (3 trends if graphic trend, 1 trend if graphic trend enlarged display) will be recorded on the built-in recorder.

[When the output recorder is laser printer]



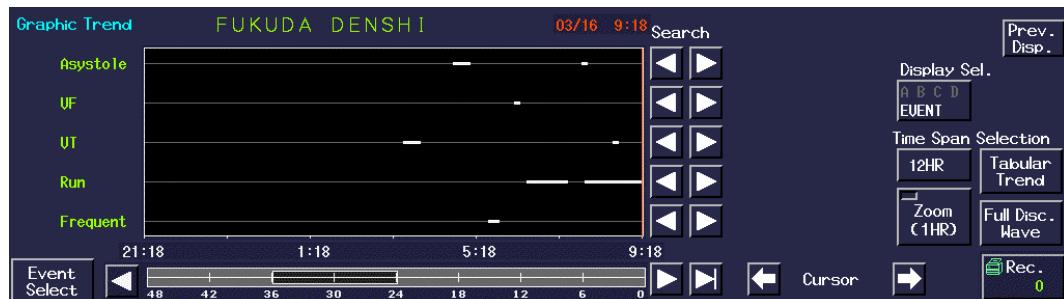
The currently displayed graphic trend (3 trends if graphic trend, 1 trend if graphic trend enlarged display) will be recorded on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.

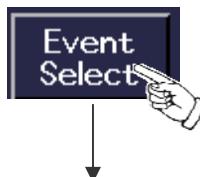
To Display the Alarm Event Trend

1 Display the graphic trend and select [EVENT] for "Display Selection".

The time where the numeric data alarm or arrhythmia alarm has generated will be indicated by point.



2 Select the event to display.



5 events can be selected to be displayed.
Press the [Event Sel.] key to display the selection.



(1) Select the position at the left to register the selecting event.

(2) Select the event from the list displayed at right.

(3) After completion of event selection, press the [Prev. Disp.] key.

Changing the displaying event will also change the programmed EVENT group for "Display Selection".

3 Search the event point.



will search the event point to past direction.

will search the event point to present direction.

4 The following keys have the same function as the numeric data graphic trend explained in the previous section.



Select the time span from **1HR** / **2HR** / **4HR** / **8HR** / **12HR** / **24HR**.



will shift half page to older data.

will shift half page to newer data.

will display the latest data.

Pressing the time bar will also shift the display to the pressed time.



Zoom (1HR) will display enlarged one-hour data with cursor time at center.
This key is ineffective when the time span is set to **1HR**.



Use or to move the cursor position on the graph.



[When the output recorder is built-in recorder]

The currently displayed event trend will be output on the built-in recorder.



[When the output recorder is laser printer]

The currently displayed event trend will be output on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.



Tabular Trend will display the tabular trend data of the cursor position.



When optional CF card is used, pressing **Full Disc. Wave** will display the full disclosure waveform data of the cursor position.

Tabular Trend

Display/Print

This section describes about the tabular trend function and printing procedure.

Maximum of 48 hours of monitoring data can be displayed in list format with a time interval of 1 minute to 1 hour.

To Display Tabular Trend

The tabular trend display can be accessed from the menu or from the pre-programmed user key.

- 1 Select a bed and press the **Menu** → **Tabular Trend** (“Function”) keys.

The tabular trend will be displayed.

- 2 It can be also accessed by pressing the **Tabular Trend** key assigned as user key.

Description of the Display

4 parameters can be displayed on one display.

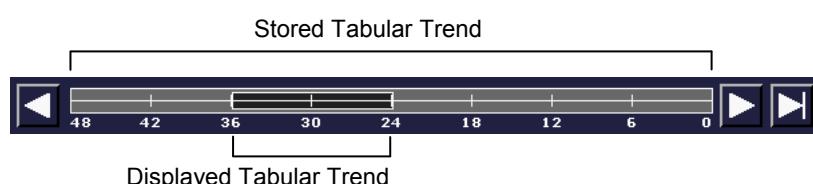
keys can be used to scroll the display up or down.

The parameter not monitored will be displayed as “- - -”.

[Tabular Trend Display]



A time bar will be displayed at the lower part of the display. The placing of displayed trend data among the whole stored trend data is indicated on the time bar.

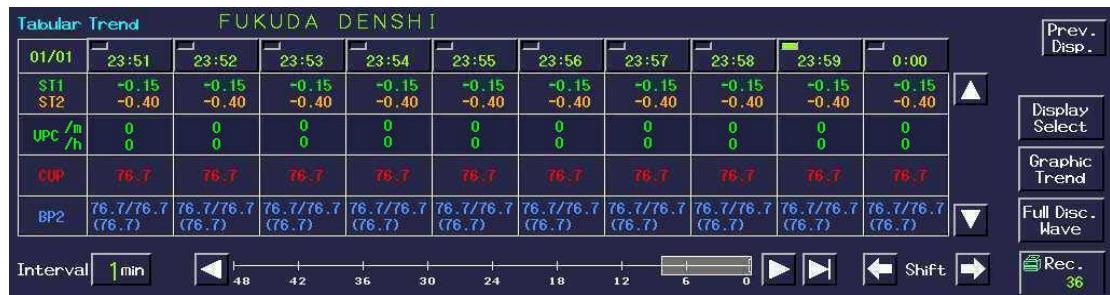


The displayed value for each parameter is as follows.

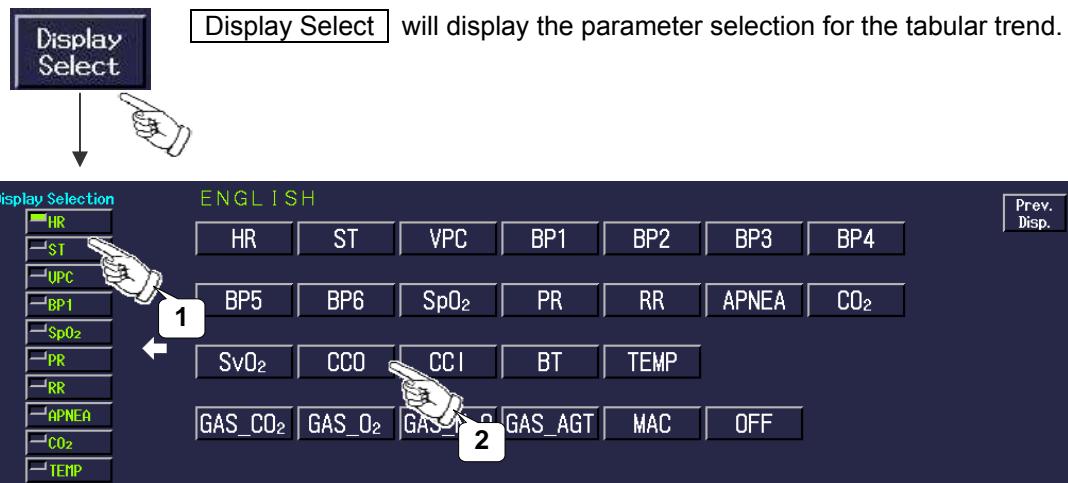
HR, ST, RR, SpO ₂ , PR, IBP, TEMP, CO ₂ , SvO ₂ , CCO, CCI, BT, GAS_CO ₂ , GAS_O ₂ , GAS_N ₂ O, GAS_AGT, MAC	The value at that time.
APNEA	Maximum value of the past 1 minute.
VPC	VPC of the past 1 minute and the past 1 hour.

To View the Tabular Trend Data

1 Display the tabular trend.

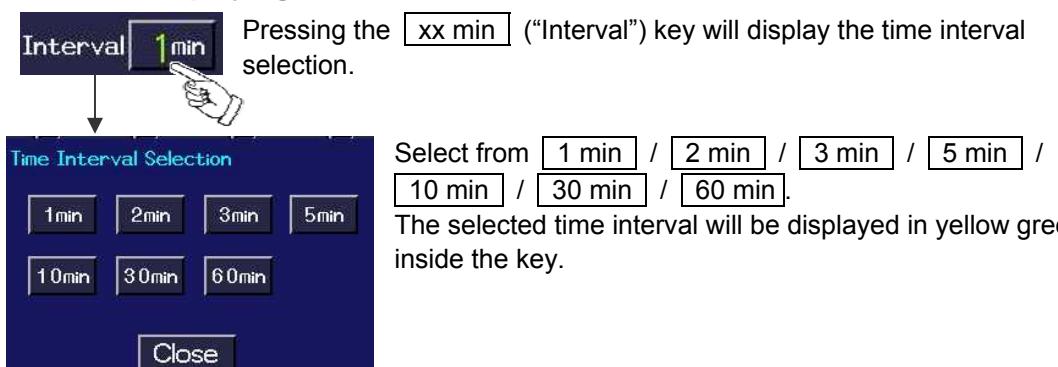


2 Select the parameters to display.



- (1) Select the position at the left to register the selected parameter.
- (2) Select the parameter from the list displayed at right.

3 Select the displaying interval.



5 min will display the time in real time such as 10:00, 10:05, ...10:25.

60 min will display the time such as 10:00, 11:00, 12:00. If the tabular trend is displayed on 10:35, the data from 10:00 will be displayed.

4 Shift the display by one page.



The display can be shifted by one page with the displayed time interval.

◀ will shift one page to older data.

▶ will shift one page to newer data.

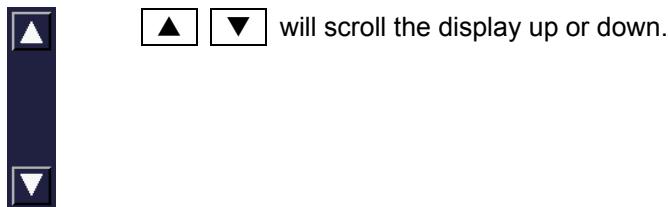
▶▶ will display the latest data.

Pressing the time bar will also shift the page to the pressed time.

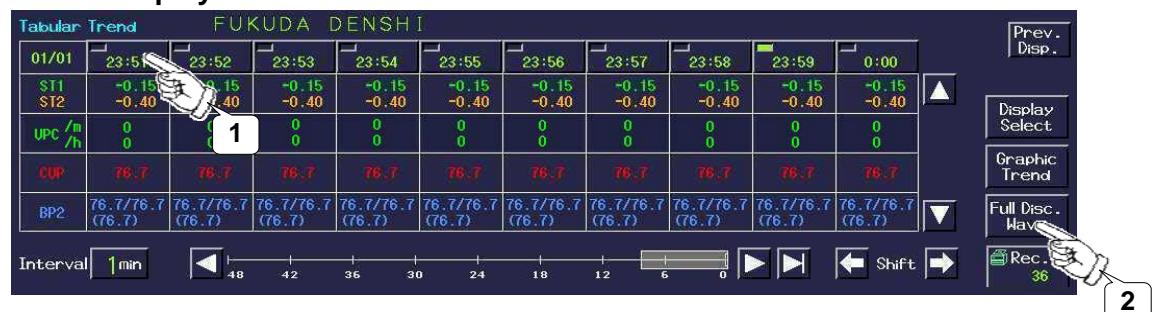
5 Scroll the display left and right.

Shift will shift to one older data.
 will shift to one newer data.

6 Scroll the display up or down.



7 The graphic trend data and full disclosure waveform data of the cursor position can be displayed.



- (1) Select the time/date to display the graphic trend or full disclosure waveform.
- (2) Then, press the **Graphic Trend** key to display the graphic trend for the selected time/date.
Pressing the **Full Disc. Wave** key will display the full disclosure waveform for the selected time/date. This key is effective only when the optional CF card is used to perform full disclosure waveform recording.

8 Record the tabular trend data.

[When the output recorder is built-in recorder]



The currently set tabular trend will be output on the built-in recorder.

[When the output recorder is laser printer]



The currently set tabular trend will be output on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.

The waveform (12-seconds) and numeric data at alarm occurrence can be stored in recall memory. Total of 200 waveforms can be stored as recall data. If storing one waveform per bed, maximum of 200 data, if storing 2 waveforms per bed, maximum of 100 data can be stored. From the stored recall data, only the recall data of the specified recall factor can be selected for display.

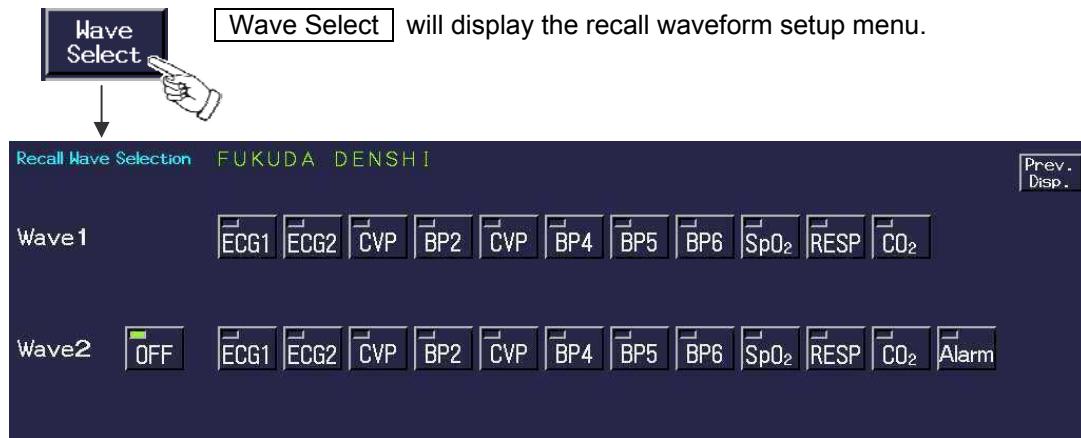
Set the Recall Condition

Set the recall condition before displaying the recall waveform.

- 1 Select a bed to perform the setup procedure.**
- 2 Press the **Menu** → **Recall** ("Function") keys.**



- 3 Set the storing condition.**



Maximum of 2 waveforms can be selected for recall waveform. The key LED will light when selected.

To Display the Recall Waveform

The recall display can be accessed from the menu or from the pre-programmed user key. It can be also accessed by pressing the event key  which will be displayed at alarm occurrence. (The event key  will be displayed only if **ON** is selected for "Event Key" on the Alarm Related Setup.)

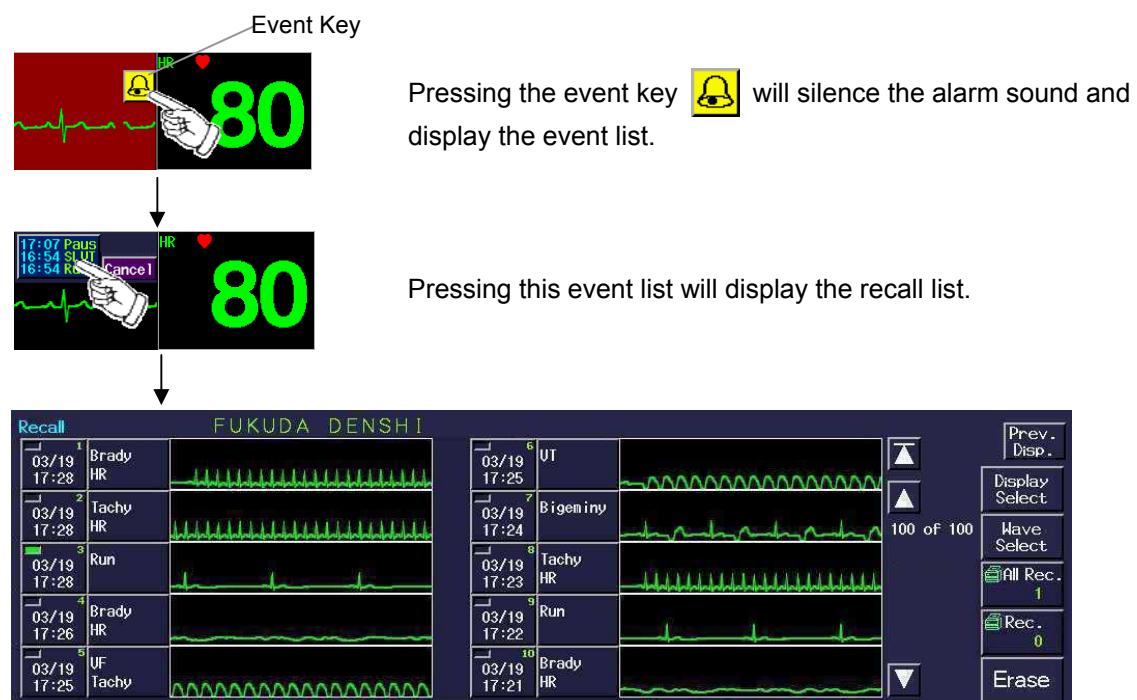
- 1 Select a bed and display the **Menu** → **Recall** ("Function") keys.**

The recall list will be displayed.

- 2 Pressing the **Recall** key (user key) will also display the recall list.**

- 3 Pressing the event key will also display the recall list.**

The event key  will be displayed on the home display at alarm occurrence.

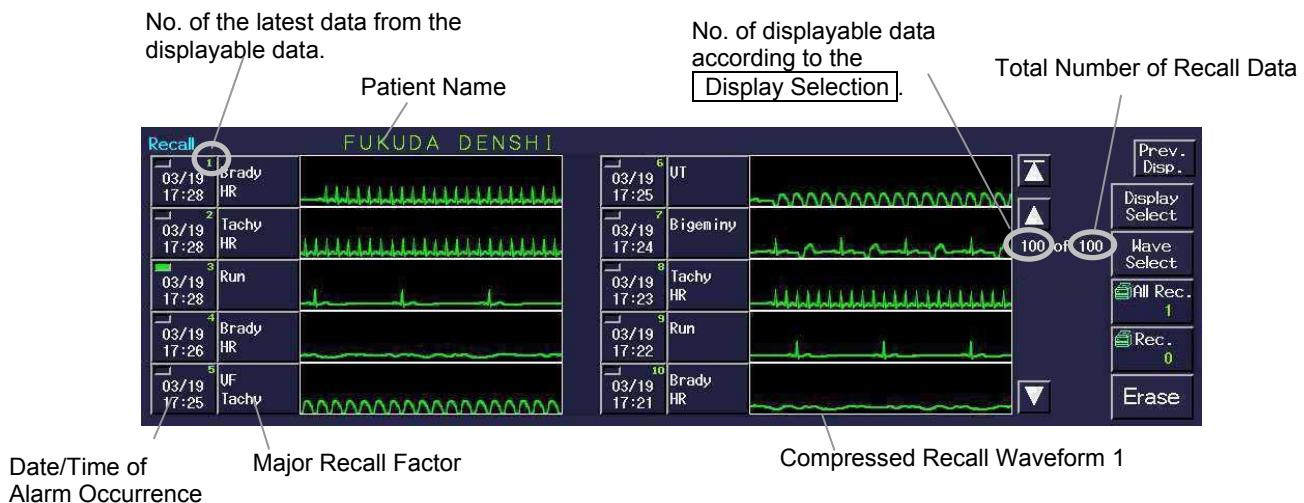


Description of the Display

On the recall list display, 10 compressed recall waveforms will be displayed. By pressing one of the data on the display, the enlarged recall waveform for that data can be displayed.

The recall waveform will be acquired from the point prior to alarm occurrence so that alarm-generated point will be displayed at 7 to 8 seconds point on the 12-seconds recall waveform.

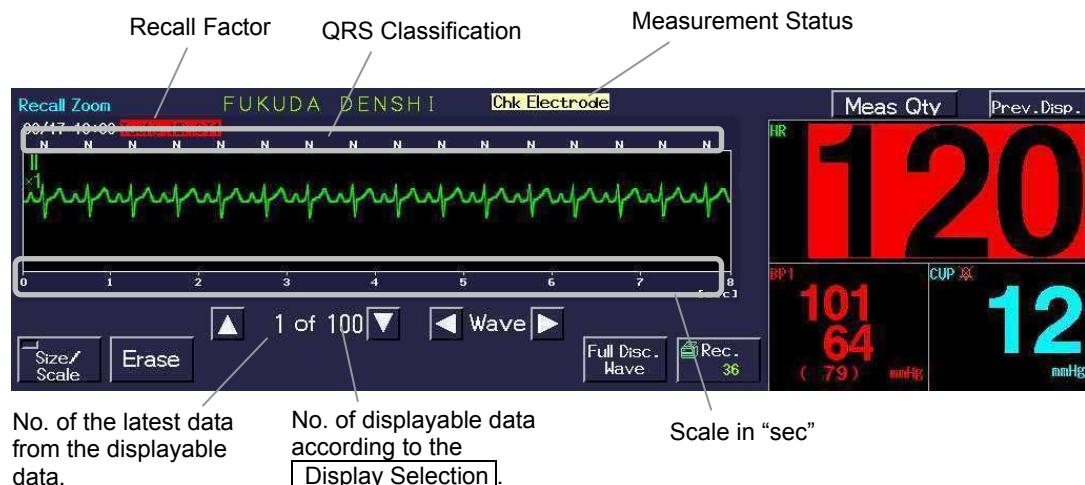
【Recall List Display】 (The following display is from DS-7600 series.)



10 recall data can be displayed simultaneously on the recall list display.
Pressing the recall factor or waveform area will display the recall enlarged display.

【Recall Enlarged Display】 (The following display example is from DS-7600 series.)

The waveform display duration is 8 seconds for the DS-7600 series, and 10 seconds for the DS-7600W series.

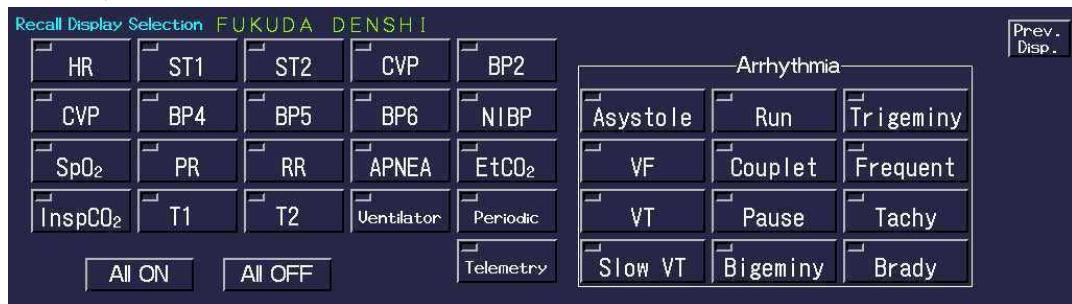
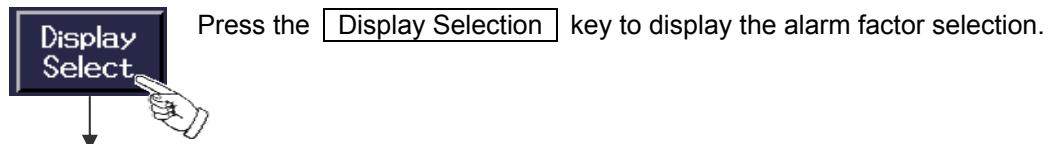


To View the Recall List

1 Display the recall list.



2 Select the alarm factor to display on the recall list.



Select the alarm factor. The key with the lighted LED is the selected alarm factor.

All ON will select all parameters.

All OFF will cancel all selections.

- **Telemetry** will display the recall data at the point the event key is pressed on the telemetry transmitter (LX-5160, LX-5630, etc.). If telemetry remote recording could not be performed due to paper out or other reasons, the data will be stored as recall waveform instead and can be displayed on the recall list.
- Or, if **Recorder** is selected for periodic recording output, but recording could not be performed due to paper out or other reasons, the data can be stored as recall waveform instead and can be displayed on the recall list.

NOTE

If the parameter not selected generates an alarm, the display selection will automatically turn ON for that parameter.

3 Shift the page.

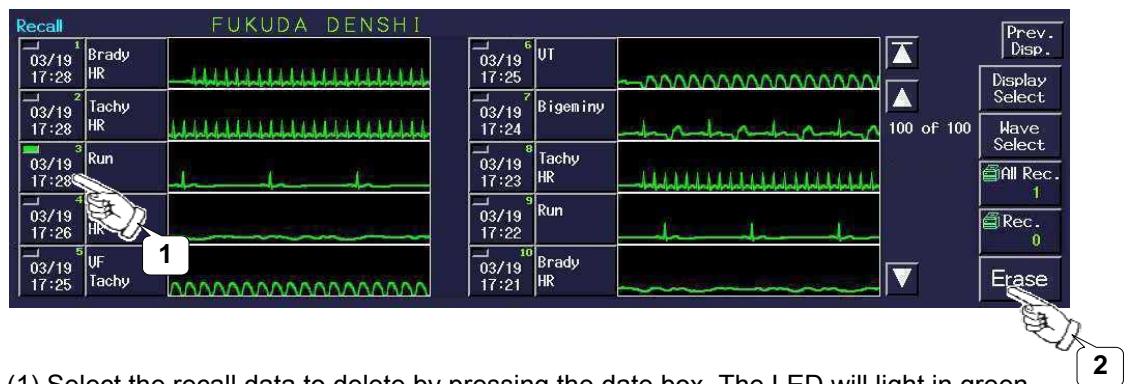


▲ will display 10 latest data.

▲ will shift the recall list 1 page (10 data) upward to newer data.

▼ will shift the recall list 1 page (10 data) downward to older data.

4 Delete the unnecessary recall data.



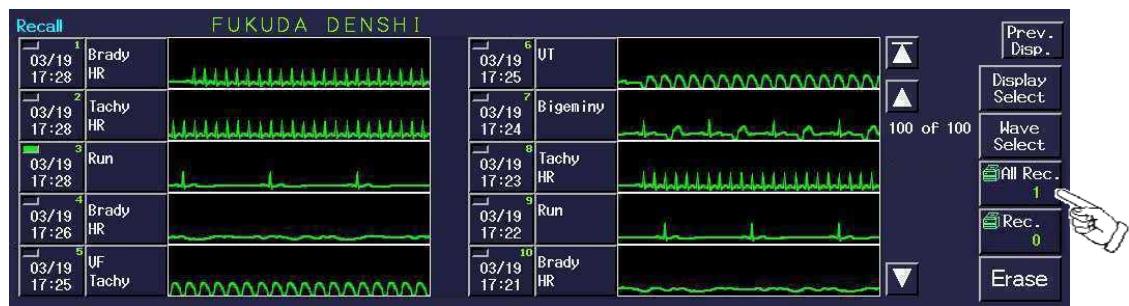
- (1) Select the recall data to delete by pressing the date box. The LED will light in green.
More than one data can be selected.

(2) Pressing the **Erase** key will delete the selected recall data.

NOTE

If selecting more than one data, be cautious when deleting as the selected data will be deleted all at once.

5 If laser printer is selected as the output recorder for the recall waveform, the recall list can be printed.



All the stored recall list will be printed on the laser printer.

- The number of stacked data for all recall recording for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the printing cannot be performed.



Currently displayed recall list will be printed on the laser printer.

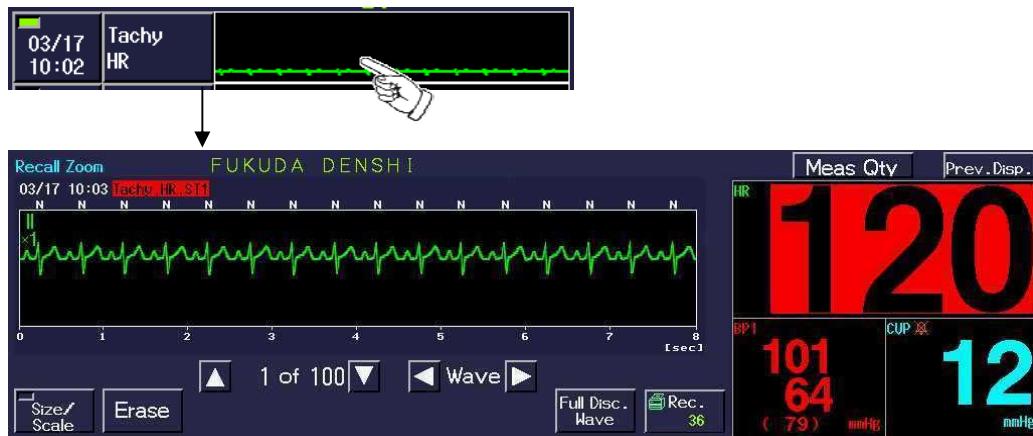
- The number of stacked data for recall recording for the bed is displayed.

To Enlarge the Recall Waveform

On the enlarged recall waveform display, the recall waveform will be displayed in a sweep speed of 25mm/s, and the waveform before and after the alarm occurrence can be verified using the cursor.

- 1 Pressing one of the recall factor or waveform area on the recall list will display the enlarged recall waveform.

The recall waveform of the selected date/time will be displayed enlarged.



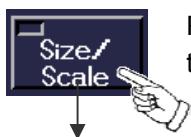
- 2 Switch the recall data to be displayed.

1 of 100 The display can be switched to previous or next data.
The displayed number is the number of stored recall data for the selected alarm factor.
 key will display newer data, key will display older data.

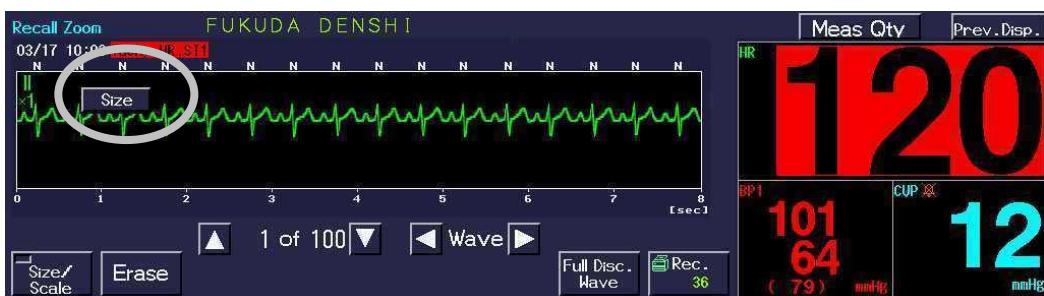
- 3 Shift the waveform left and right.

Wave The recall waveform display can be shifted to left and right.
 key will display older data, key will display newer data.

- 4 Adjust the waveform size/scale.



Pressing the key will display the key on the waveform to adjust the waveform size.



Pressing the key will sequentially change the waveform size in the order of $\times\frac{1}{4} \rightarrow \times\frac{1}{2} \rightarrow \times 1 \rightarrow \times 2 \rightarrow \times 4$.

For BP and CO₂ waveform, waveform scale can be adjusted.

- 5 The number of displaying parameter can be selected.

Pressing the key will sequentially change the number of displayed numeric data to 3→5→7→10→3.

6 The parameters to be displayed can be selected.



Pressing the numeric data area will display the parameter selection list.
Select the parameter from the list.



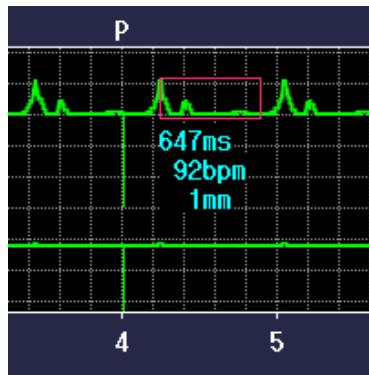
Select the parameter to be displayed.

7 By using the caliper function, PR, RR, PP interval and R-wave height can be measured.

NOTE

The caliper function can be used only when a mouse is connected. (DS-7600W series only.)

- (1) On the recall zoom waveform, left-click on the starting point of measurement. The caliper mode will become active.



During the caliper mode, a cross shape cursor and a red box will be displayed.

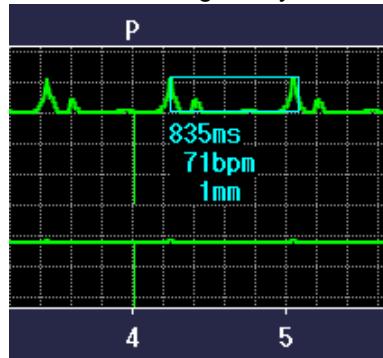
The box will be created by dragging the cursor. The following values will be displayed inside the waveform area.

- x-axis value (waveform interval) in "ms"
- conversion value in "bpm"
- y-axis value (wave height) in "mm"

When the cursor is outside the waveform area, the red box and measurement value will not be displayed.

Also, when size/scale key is displayed, caliper function cannot be used.

- (2) By left-clicking on the measured interval, caliper display will be finalized and the color of the box will change to cyan.

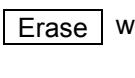


By left-clicking again after finalizing the caliper display, previous caliper display will disappear and a new caliper display will appear.

- (3) During the caliper mode, clicking outside the waveform area will cease the caliper mode and clear the caliper display.

8 Delete the displayed recall data.

 Erase

 will delete the displayed recall data.

9 Output the displayed recall waveform on the recorder.

[When the output recorder is built-in recorder]



Pressing this key will output the enlarged recall waveform on the built-in recorder.

[When the output recorder is laser printer]

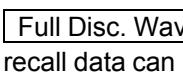


Pressing this key will output the enlarged recall waveform on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.

10 The full disclosure waveform data of the enlarged recall data can be displayed.

 Full Disc. Wave

 will display the full disclosure waveform data of the enlarged recall data can be displayed. This is effective when the optional CF card is used for full disclosure waveform recording.

The latest 120 data can be displayed in list format. The displayed parameters are systolic/diastolic/mean NIBP data, HR, SpO₂, and PR.

To Display the NIBP List

The NIBP list display can be accessed from the menu, from the pre-programmed user key, or from the pre-programmed NIBP list key on the numeric data area.

- 1 Select a bed and display the **Menu** → **NIBP List** (“Function”) keys.**
- 2 It can be also accessed by pressing the **NIBP List** assigned as user key.**
- 3 Pressing the **NIBP List** key programmed to be displayed on the numeric data area will also display the NIBP list.**



[DS-7600 Series]

10 data will be displayed for each display.

No.	Date Time	NIBP mmHg	HR	SpO ₂	PR
1	01/12 16:00	50/ 50 (50)	50	50	50
2	01/12 15:59	49/ 49 (49)	49	49	49
3	01/12 15:58	48/ 48 (48)	48	48	48
4	01/12 15:57	47/ 47 (47)	47	47	47
5	01/12 15:56	46/ 46 (46)	46	46	46
6	01/12 15:55	45/ 45 (45)	45	45	45
7	01/12 15:54	44/ 44 (44)	44	44	44
8	01/12 15:53	43/ 43 (43)	43	43	43
9	01/12 15:52	42/ 42 (42)	42	42	42
10	01/12 15:51	41/ 41 (41)	41	41	41

[DS-7600W Series]

20 data will be displayed for each display.

No.	Date Time	NIBP mmHg	HR	SpO ₂	PR
1	01/12 16:00	50/ 50 (50)	50	50	50
2	01/12 15:59	49/ 49 (49)	49	49	49
3	01/12 15:58	48/ 48 (48)	48	48	48
4	01/12 15:57	47/ 47 (47)	47	47	47
5	01/12 15:56	46/ 46 (46)	46	46	46
6	01/12 15:55	45/ 45 (45)	45	45	45
7	01/12 15:54	44/ 44 (44)	44	44	44
8	01/12 15:53	43/ 43 (43)	43	43	43
9	01/12 15:52	42/ 42 (42)	42	42	42
10	01/12 15:51	41/ 41 (41)	41	41	41
11	01/12 15:50	40/ 40 (40)	40	40	40
12	01/12 15:49	39/ 39 (39)	39	39	39
13	01/12 15:48	38/ 38 (38)	38	38	38
14	01/12 15:47	37/ 37 (37)	37	37	37
15	01/12 15:46	36/ 36 (36)	36	36	36
16	01/12 15:45	35/ 35 (35)	35	35	35
17	01/12 15:44	34/ 34 (34)	34	34	34
18	01/12 15:43	33/ 33 (33)	33	33	33
19	01/12 15:42	32/ 32 (32)	32	32	32
20	01/12 15:41	31/ 31 (31)	31	31	31

Programming the NIBP list key on the numeric data area can be performed on the display configuration setup menu.

Select **NIBP List** for the “Measurement Selection” on the Home Display Configuration Setup or Individual Display Configuration Setup menu.

→ “8. System Configuration Display Configuration”



Description of the Display

On the NIBP list, 120 NIBP data, and HR, SpO₂, PR value at the time of NIBP measurement will be displayed.

- The Quick SYS data on the bedside monitor will not be displayed on the NIBP list.
- The erroneous NIBP data can be set to not display on the NIBP list with the soft switch setup (“Display measurement error on NIBP list”). The default setting is “ON” which will include the erroneous data in the NIBP list.



→ “9. Installation Procedure to Start Monitoring 5-3 Set the soft switch”

NIBP List		FUKUDA DENSHI						Prev.	Disp.
No.	Date Time	NIBP	kPa	HR	SpO ₂	PR	▲	▼	Graphic Trend
1	01/12 16:00	5.0 /	5.0 (5.0)	50	50	50	▲	▼	Full Disc. Wave
2	01/12 15:59	4.9 /	4.9 (4.9)	49	49	49	▲	▼	
3	01/12 15:58	4.8 /	4.8 (4.8)	48	48	48	▲	▼	
4	01/12 15:57	4.7 /	4.7 (4.7)	47	47	47	▲	▼	
5	01/12 15:56	4.6 /	4.6 (4.6)	46	46	46	▲	▼	
6	01/12 15:55	4.5 /	4.5 (4.5)	45	45	45	▲	▼	
7	01/12 15:54	4.4 /	4.4 (4.4)	44	44	44	▲	▼	
8	01/12 15:53	4.3 /	4.3 (4.3)	43	43	43	▲	▼	
9	01/12 15:52	4.2 /	4.2 (4.2)	42	42	42	▲	▼	
10	01/12 15:51	4.1 /	4.1 (4.1)	41	41	41	▲	▼	Rec. 36



- Do not change the date/time setup during monitoring, as it will cause inaccurate time display for the NIBP measurement. Always set the time/date before monitoring.
- The HR, SpO₂, PR value of the NIBP list may differ between the DS-7600 and the bedside monitor.

To View the NIBP List Data

- 1 Display the NIBP list.
- 2 Shift the display by one data.



will shift the display upward to one newer data.
 will shift the display downward to one older data.



- 3 Shift the display by one page.



will display the latest data.
 will shift the display one page upward. (newer data)
 will shift the display one page downward. (older data)



4 Record the NIBP list.

[When the output recorder is built-in recorder]



All Rec. will record all NIBP list data on the built-in recorder.

Rec. will record currently displayed NIBP list on the built-in recorder.

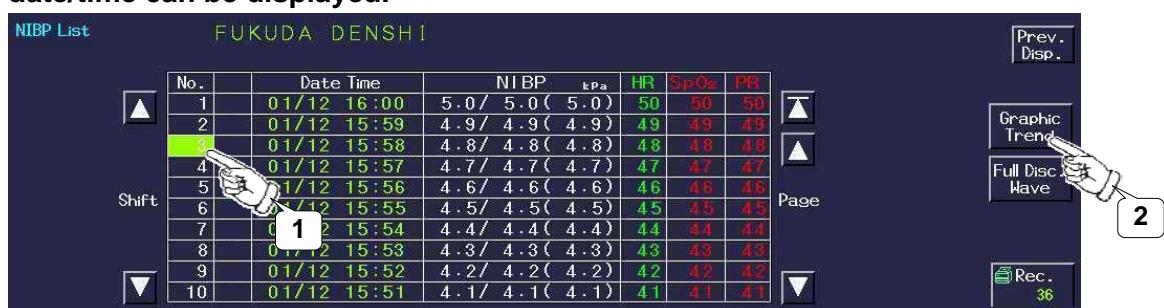
[When the output recorder is laser printer]



Pressing this key will record all NIBP list data on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the recording cannot be performed.

5 The graphic trend data and full disclosure waveform data of the specified date/time can be displayed.



(1) Select the data number to display the graphic trend or full disclosure waveform.

(2) Then, press the Graphic Trend key to display the graphic trend display.

Pressing the Full Disc. Wave key will display the full disclosure waveform display. This is effective only when the optional CF card is used for full disclosure waveform recording.

NOTE

- For the following case, pressing the Graphic Trend key or Full Disc. Wave key will not display the data.
 - If the Graphic Trend key is pressed for the time which is more than 48 hours prior to the current time.
(The trend data can be stored for maximum 48 hours.)
 - If the Full Disc. Wave key is pressed for the time/date which full disclosure waveform recording was not performed.
- The date/time of searched data may slightly differ from the specified date/time depending on the graphic trend display interval or discrepancy of time.

ST Measurement

ST Display, ST Alarm, etc.

The ST level measurement can be performed for the monitoring ECG.

To Display the ST Measurement Display

The ST measurement display can be accessed from the menu, or from the preprogrammed user key

- 1 Select a bed and press the **Menu** → **ST Display** ("Function") keys.
- 2 It can be also accessed by pressing the **ST Display** key assigned as user key.

The ST measurement display will appear.

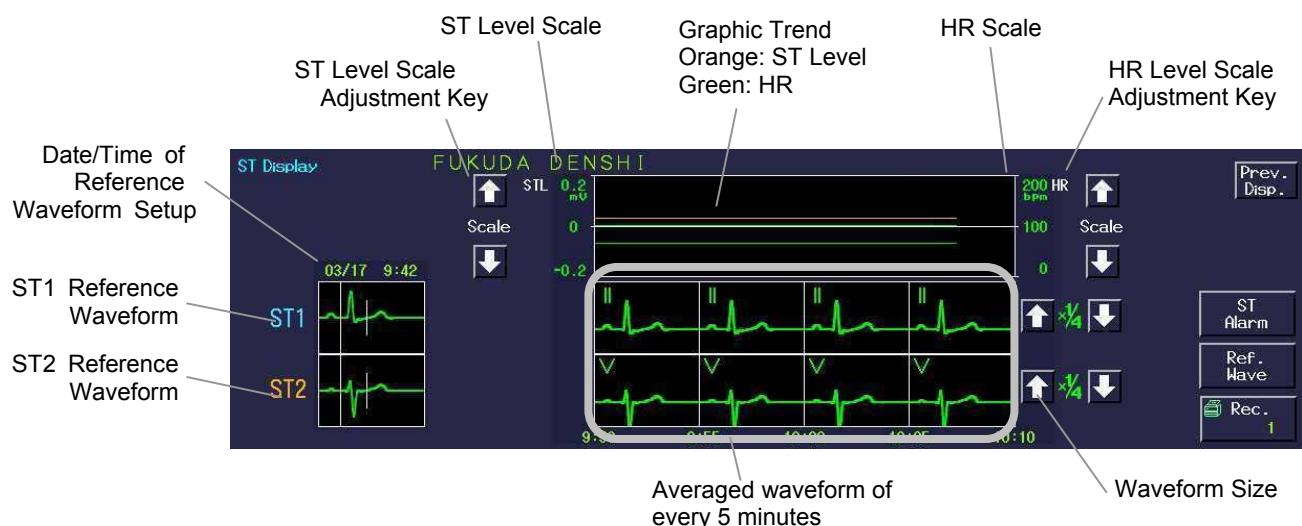
First, set the reference waveform for the ST measurement on the reference waveform setup menu.

Description of the Display

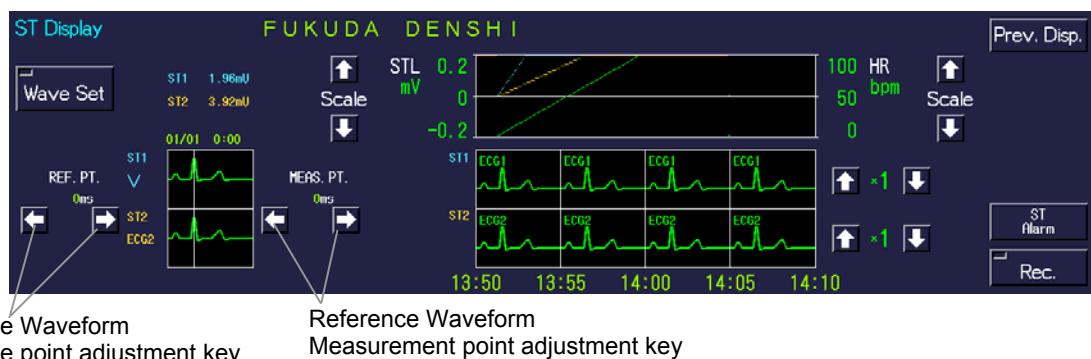
On the ST display, the averaged ECG waveform will be superimposed for 5 minutes. HR and ST level data will be simultaneously displayed in graphic trend. This graphic trend is an instant trend of every 5 seconds.

The ST reference point and measurement point are set based on reference ECG waveform.

[DS-7600 Series]



[DS-7600W Series]

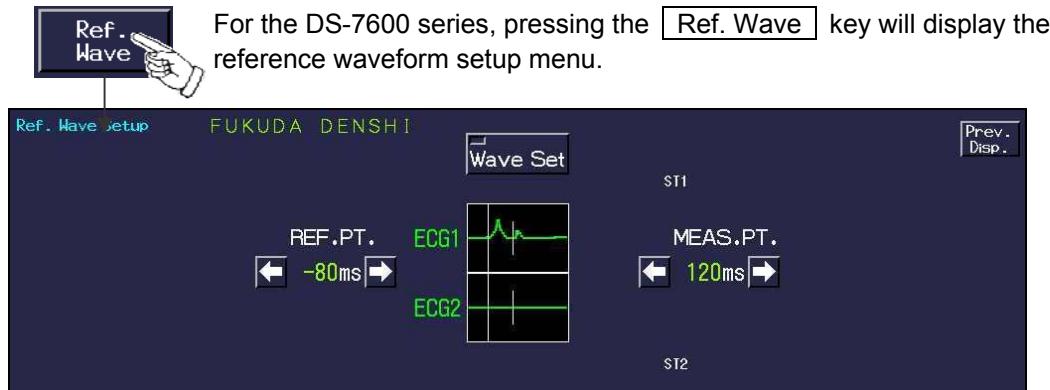


To Set the Reference Waveform

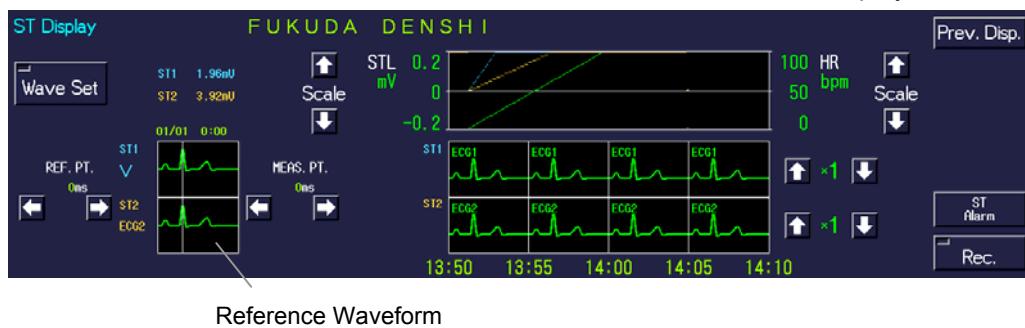
Set the reference point and measurement point to measure the ST level.
The reference point and measurement point are common for ECG1 and ECG2.

1 Display the ST Measurement Display.

2 Display the Reference Waveform Setup Display.



For the DS-7600W series, reference waveform can be set on the ST Display.



3 Set the reference waveform.



Pressing the **Wave Set** key will average the waveform for 16 beats to set as reference waveform. During the reference waveform setup, the key LED will light.

NOTE	<ul style="list-style-type: none"> As the average ECG is calculated only with normal QRS beat, the reference waveform setup may take time for patient with ventricular extrasystole or frequent pacing beat. The ST reference waveform cannot be set unless the arrhythmia learn process is performed. Make sure to perform the arrhythmia learn process first. → "4. Parameter Setup Alarm Setup Arrhythmia Learn Procedure"
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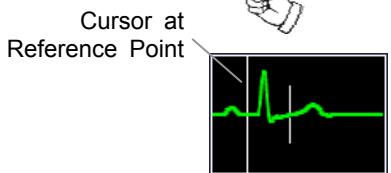
4 Set the reference point for ST measurement.



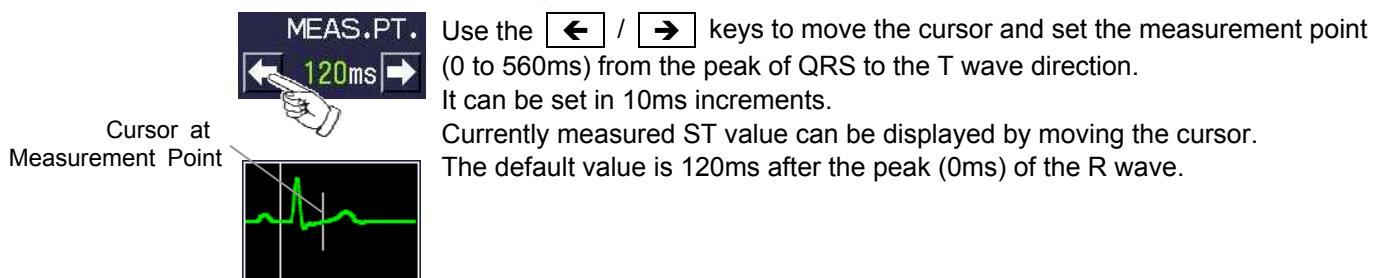
Use the **REF.PT.** / **MEAS.PT.** keys to move the cursor and set the reference point (-240 to 0ms) from the peak of QRS to the P wave direction.

It can be set in 10ms increments.

The default value is 80ms prior to the peak (0ms) of the R wave.



5 Set the measurement point for ST measurement.



To View the ST Display

1 Open the ST display window.



2 Adjust the trend scale.



Use the **↓** **↑** key to adjust the trend scale.
Changing the trend scale will simultaneously change the HR scale and ST scale on the graphic trend display.

Parameter	Scale	Unit
HR	100, 200, 300	bpm
ST	$\pm 0.2, \pm 0.5, \pm 1.0, \pm 2.0$	mV
	$\pm 2, \pm 5, \pm 10, \pm 20$	mm

3 Adjust the ST waveform size.



Use the **↓** **↑** keys to change the displayed ST waveform size to $\times 1/4$ / $\times 1/2$ / $\times 1$ / $\times 2$ / $\times 4$.

NOTE	Changing the ST waveform size will simultaneously change the ECG waveform size displayed on the home display.
-------------	---

4 Output the ST data.

[When the output recorder is built-in recorder]



ST level and HR graphic trend (20 minutes), ST reference waveform, 5-minute ECG waveform (20 minutes) will be output on the built-in recorder.

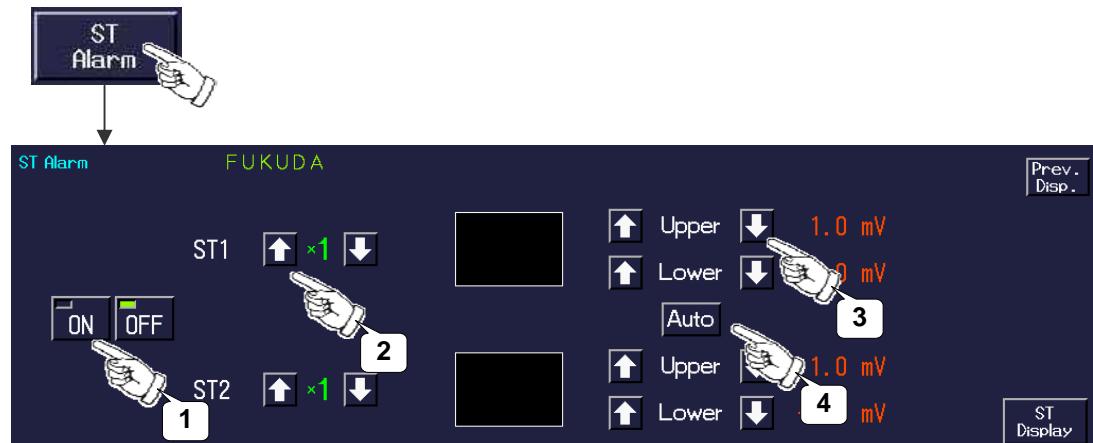
[When the output recorder is laser printer]



ST level and HR graphic trend (20 minutes), ST reference waveform, 5-minute ECG waveform (20 minutes) will be output on the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the printing cannot be performed.

5 Press the **ST Alarm key to set the ST alarm condition.**



(1) ST Alarm ON/OFF

ON generate the ST alarm.

OFF not generate the ST alarm.

(2) Set the waveform size for reference waveform.

(3) \uparrow Upper \downarrow / \uparrow Lower \downarrow

Press the \uparrow / \downarrow keys to adjust the upper and lower limit.

If it exceeds the adjustable range, the threshold will be set to OFF.

(4) Auto

The upper and lower limit will be automatically adjusted with reference to the current measurement data.

Upper Limit: Current ST data+0.2mV (+2mm)

Lower Limit: Current ST data-0.2mV (-2mm)

When automatically adjusted, ST alarm will be automatically set to ON. If upper limit or lower limit is set to OFF, it will remain OFF.

12-Lead Waveform

Display/ST Measurement

For bed monitoring with 12-lead ECG waveform, 12-lead waveform can be displayed and ST measurement can be performed.

Reference

To monitor/record the 12-lead waveform, it is necessary to select ON for "12-Lead" on the soft switch menu.

→ "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch"

CAUTION

- 12-lead waveform display and 12-lead ST level measurement can be performed only for wired bedside monitor which is monitoring 12-lead ECG waveform.
- The 12-lead ST waveform of only the DynaScope 5000 series bedside monitors can be displayed. It cannot be displayed for the DynaScope 7000 series bedside monitors.

To Display the 12-Lead Waveform

The 12-lead display can be accessed from the menu or from the preprogrammed user key.

1 Select a bed and press the **Menu** → **12-Lead** ("Function") keys.

The 12-lead waveform or 12-lead ST measurement screen will be displayed depending on which screen was previously displayed.

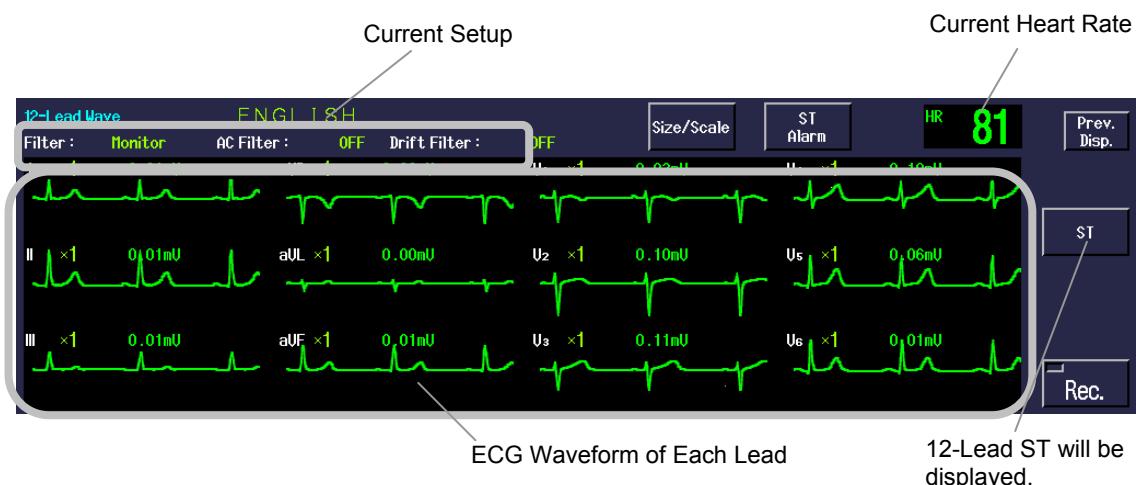
To perform the 12-lead ST measurement, first set the reference waveform.

2 The 12-lead waveform display can be also accessed by pressing the **12-Lead Wave** assigned as a user key.

The 12-lead ST display can be also accessed by pressing the **12-Lead ST** assigned as a user key.

Description of the Display

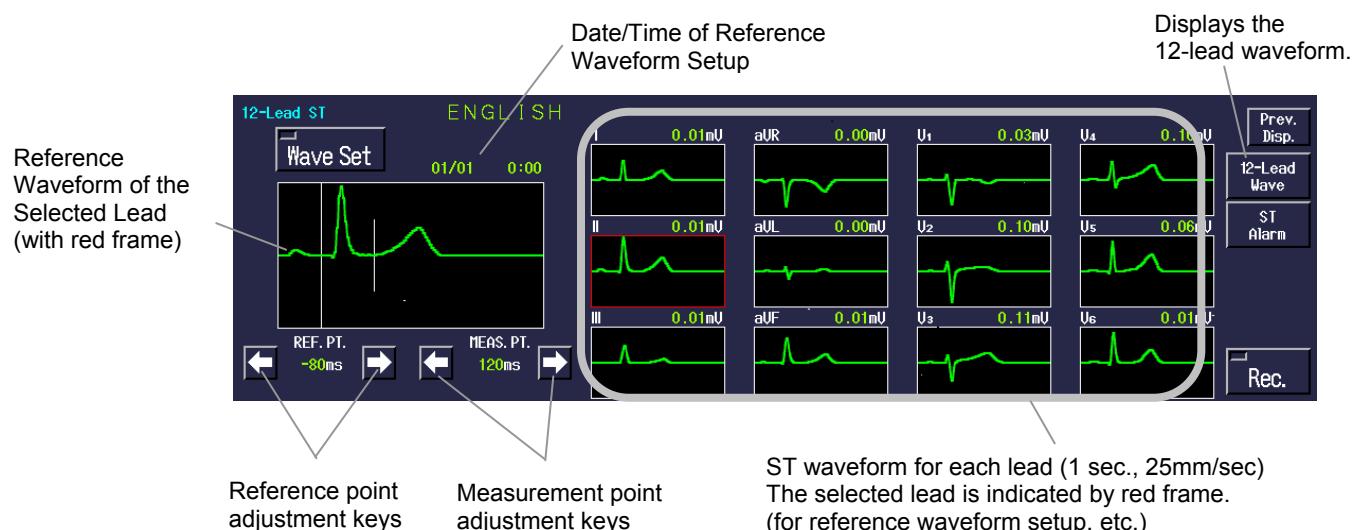
●12-Lead Waveform Display



●12-Lead ST Measurement

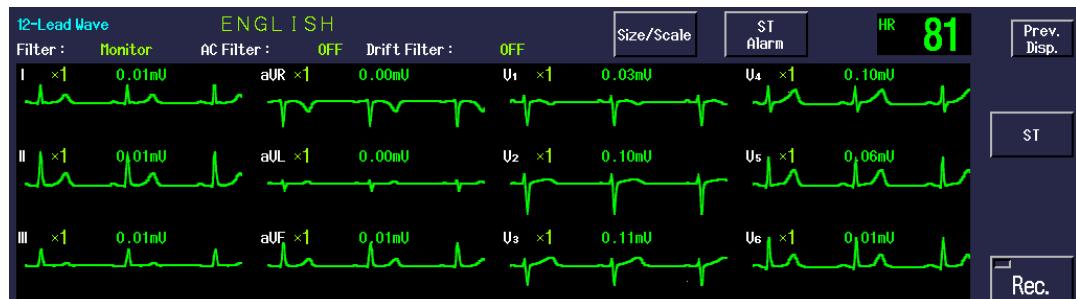
The 12-lead ST measurement screen can be displayed by pressing the **[ST]** key on the 12-lead display.

On the 12-lead ST measurement screen, ST waveform for each lead will be displayed. The reference point and measurement point for ST measurement are common for all leads.



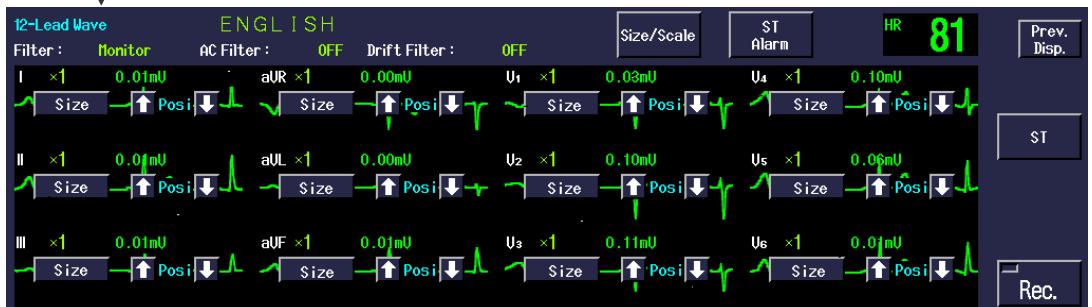
To Monitor the 12-Lead Waveform

1 Press the **[Menu] → [12-Lead]** (“Function”) keys.



2 Adjust the waveform size and baseline position.

Pressing the **[Size/Scale]** key will display the keys to adjust the size and baseline position on the waveforms.



Pressing the **[Size]** key will sequentially adjust the waveform size in the order of $\times\frac{1}{4}$, $\times\frac{1}{2}$, $\times 1$, $\times 2$, $\times 4$.

To adjust the baseline position of the waveforms, use the **[↓]/[↑]** keys.

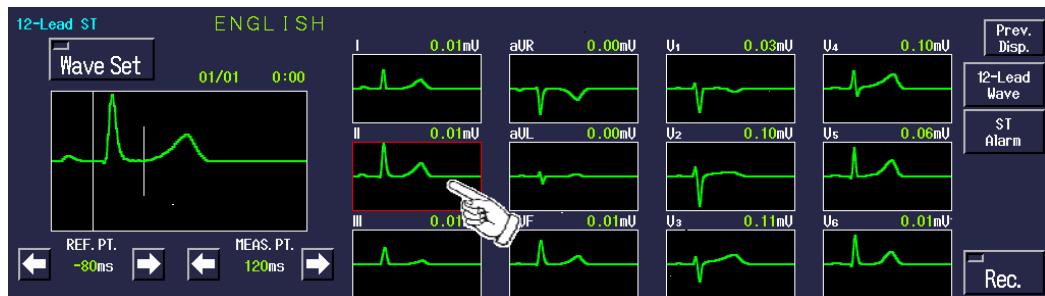
To Set the Reference Waveform

To perform 12-lead ST level measurement, first set the reference point and measurement point.

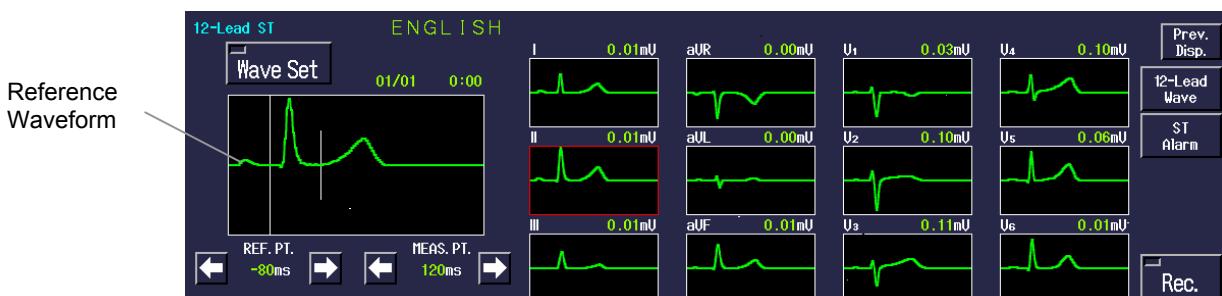
1 Display the 12-lead waveform, and press the **ST key to display the 12-lead ST measurement screen.**

2 Select the lead to set the reference waveform.

Pressing the waveform display area on the right side of the screen will allow to select the lead. The selected lead will be indicated by a red frame.



3 Set the reference waveform.



Pressing the **Wave Set** key will average the normal QRS waveform for 16 beats to set as reference waveform. During the reference waveform setup, the key LED will light.

NOTE

- As the average ECG is calculated only with normal QRS beat, the reference waveform setup may take time for patient with ventricular extrasystole or frequent pacing beat.
- The ST reference waveform cannot be set unless the arrhythmia learn process is performed. Make sure to perform the arrhythmia learn process first. → "4. Parameter Setup Alarm Setup Arrhythmia Learn Procedure"

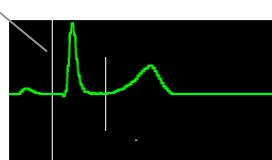
4 Set the reference point for 12-Lead ST measurement.



Use the **← / →** keys to move the cursor and set the reference point (-240 to 0ms) from the peak of QRS to the P wave direction. It can be set in 10ms increments.

The default value is 80ms prior to the peak (0ms) of the R wave.

Cursor at Reference Point

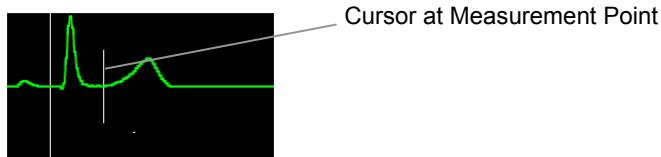


5 Set the measurement point for 12-Lead ST measurement.



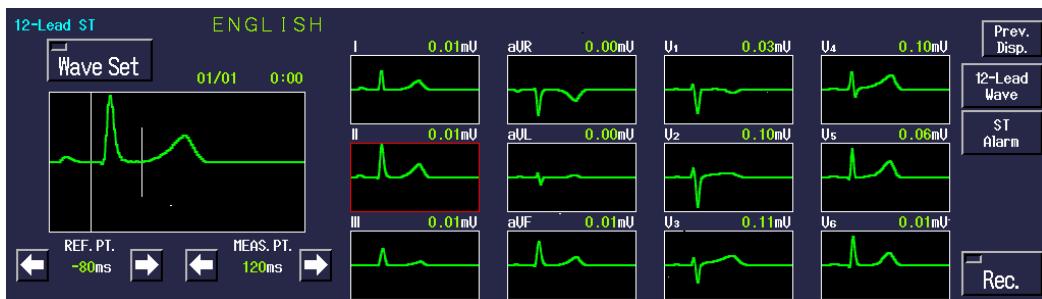
Use the **◀ / ▶** keys to move the cursor and set the measurement point (0 to 560ms) from the peak of QRS to the T wave direction. It can be set in 10ms increments.

Currently measured ST value can be displayed by moving the cursor. The default value is 120ms after the peak (0ms) of the R wave.



To Monitor the 12-Lead ST Measurement Data

1 Display the 12-lead ST measurement screen.



2 Record the 12-lead ST measurement data.

[When the output recorder is built-in recorder]



The displayed 12-lead ST waveform will be output to the built-in recorder.

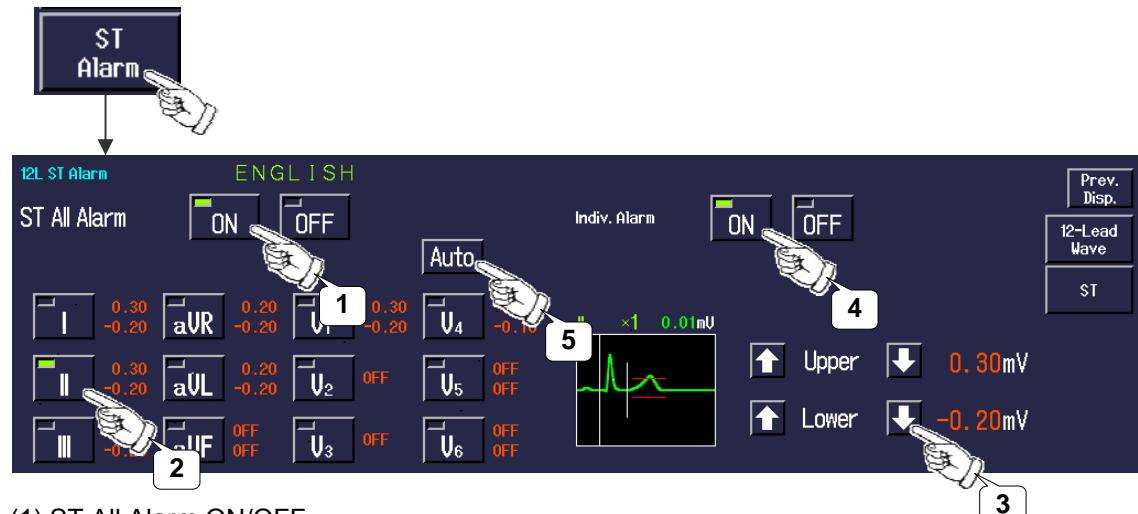
[When the output recorder is laser printer]



The 12-lead ST waveform will be output to the laser printer.

- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the printing cannot be performed.

3 Press the **ST Alarm key to set the ST alarm condition.**



(1) ST All Alarm ON/OFF

ON will generate the 12-lead ST alarm. However, alarm will not be generated for the lead which individual alarm is set to OFF.

OFF will not generate the 12-lead ST alarm.

(2) Select the lead to set the alarm.

(3) **↑** Upper **↓** / **↑** Lower **↓**

Press the **↑** / **↓** keys to adjust the upper and lower limit. If it exceeds the adjustable range, the threshold will be set to OFF.

(4) Individual Alarm ON/OFF

ON will generate the ST alarm for the selected lead.

OFF will not generate the ST alarm for the selected lead.

(5) **Auto**

The upper and lower limit will be automatically adjusted with reference to the current measurement data.

Upper Limit: Current ST data+0.2mV (+2mm)

Lower Limit: Current ST data–0.2mV (-2mm)

When automatically adjusted, ST alarm will be automatically set to ON. If upper limit or lower limit is set to OFF, it will remain OFF.

Full Disclosure Waveform Recording (Optional Function)

By using the optional CF card (FCF-1000:1GB, FCF-16GA:16GB), maximum of 3 waveforms per bed can be recorded in one of the following 3 types of full disclosure waveform.

When using the FCF-1000

- 32 waveforms 24-hours
- 16 waveforms 48-hours
- 8 waveforms 96-hours

When using the FCF-16GA

- 32 waveforms 96-hours

The parameters that can be recorded as full disclosure waveform are ECG1, ECG2, BP1, BP2, SpO₂, RESP, CO₂ (except GAS CO₂ waveform).

The alarm event and time will be also recorded which allows to search the waveform by each factor.

If an optional slave monitor is used, the full disclosure waveform can be displayed on the slave monitor. (DS-7600W series only)

Reference

For details of the slave monitor, refer to "9. Installation Using the Slave Monitor".

CAUTION

- Use only the specified CF card (FCF-1000, FCF-16GA).
- Turn OFF the power when inserting / removing the CF card.
- Check that the CF card indicator is not lighted in red when turning OFF the power of the DS-7600.
- The CF card can be used only on the DS-7600 where the card was formatted.
 - The CF card used for full disclosure waveform recording cannot be used for data transfer to other DS-7600 Central Monitor.
 - The CF card used for full disclosure waveform recording on the DS-7600 Central Monitor cannot be used for full disclosure waveform recording on other DS-7600 Central Monitor.

NOTE

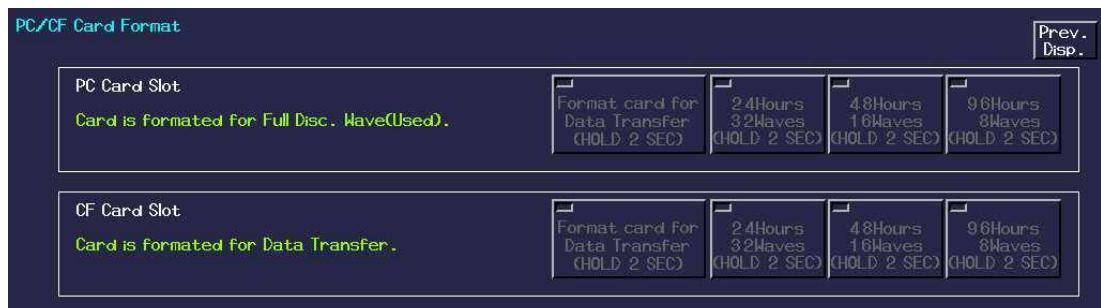
When the recordable data of the CF card is exceeded, the data will be deleted from the old data.
To delete the full disclosure waveform data, perform the discharge procedure.
(→ "3. Admit/Discharge of a Patient Discharging a Patient")

To Format the Card

- 1 Insert the CF card (FCF-1000, FCF-16GA) into the card slot.
- 2 Press the **Menu** → **Setup** → **Pre-set** → enter password → **PC/CF Card** → **Format** keys.

The PC/CF card format menu will be displayed.
This menu will be displayed even when the unformatted card is inserted into the slot.

[When using the FCF-1000]



[When using the FCF-16GA]



- 3 When using the FCF-1000, select from **24Hours 32Waves** / **48Hours 16Waves** / **96Hours 8Waves**, when using the FCF-16GA, select from **96Hours 32Waves** and press the key for more than 2 seconds.

When a beep tone generates and the display returns to the previous display (or home display), the format procedure is complete.

NOTE

The recordable number of waveforms (32 waveforms / 16 waveforms / 8 waveforms) indicate the total number for each monitor and not for each bed.

To Select the Waveform for Recording

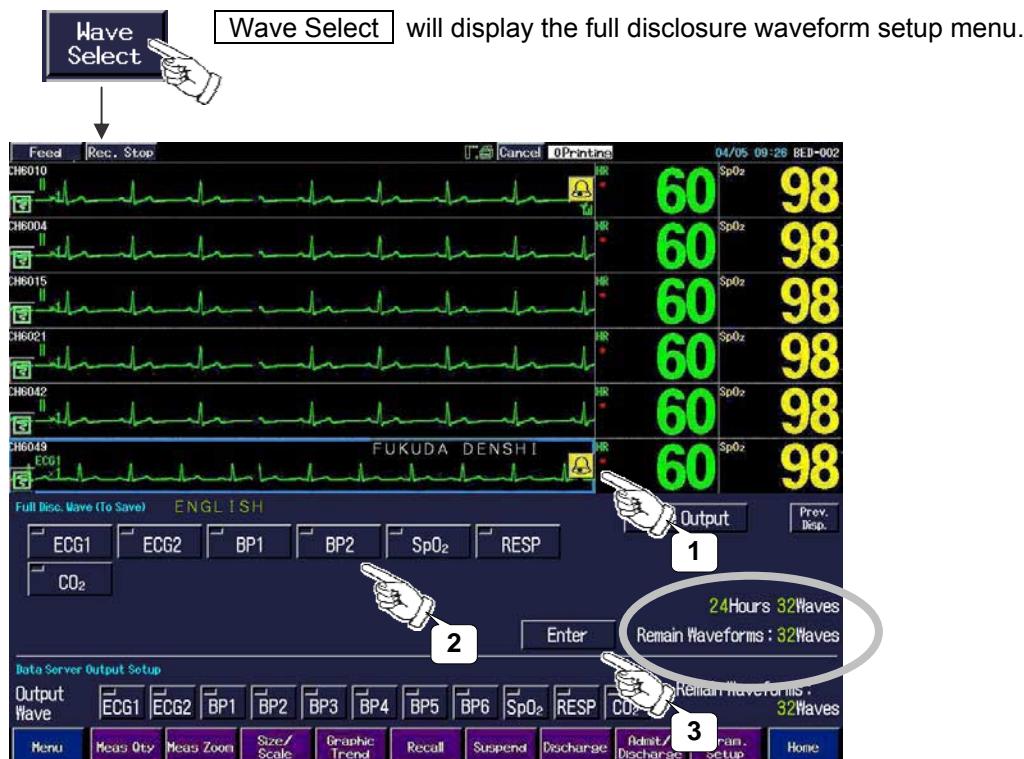
The bed and waveform selection for recording can be performed on the waveform setup display. Maximum of 3 waveforms can be recorded for each bed.

Waveform 1 for each bed is fixed as ECG1. In case of **[96Hours 8Waves]**, all 8 waveforms will be fixed as ECG1 as there are 8 beds with one waveform per bed.

- 1 Press the **Menu** → **Admit** (“Patient”) keys.

The patient admit menu will be displayed.

- 2 Set the waveform to store.



(1) Select the bed for recording.

(2) Select the parameters for Waveform 1, Waveform 2, and Waveform 3.

(3) Press the **Enter** key to validate the setting.

At the lower right of the display, the remaining number of recordable waveforms will be displayed. Based on this remaining number of waveforms, repeat (1) bed selection → (2) waveform selection → (3) **Enter**, and set the recording waveform for other beds.

To Display the Compressed Full Disclosure Waveform

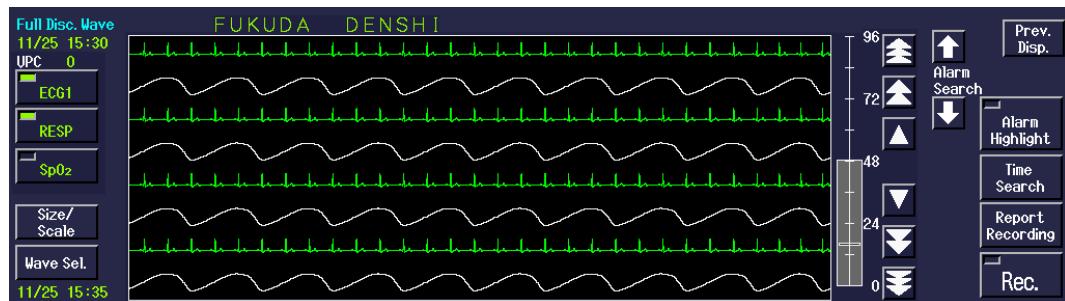
The full disclosure compressed waveform can be accessed from the menu, or from the preprogrammed user key.

- 1 Select a bed and press the **Menu** → **Full Disc. Wave** (“Function”) keys.
- 2 It can be also accessed by pressing the **Full Disc. Wave** key assigned as user key.

The compressed full disclosure waveform will be displayed.

【Full Disclosure Compressed Waveform Display on the Main Monitor】

(The display is from DS-7600 series: 2 waveforms display)



【Full Disclosure Compressed Waveform Display on the Slave Monitor】

(2 waveforms display)



NOTE

The full disclosure waveform can be displayed on the slave monitor for the DS-7600W series only.



For details of the slave monitor, refer to “9. Installation Using the Slave Monitor”.

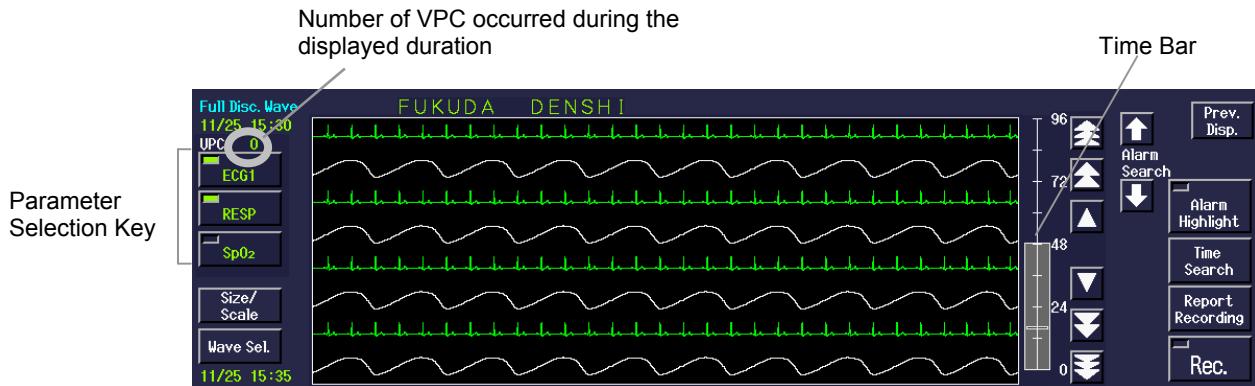
Description of the Display

There are 2 types of full disclosure waveform display. One is a compressed full disclosure waveform display, and the other is an enlarged full disclosure waveform display which can display the precise data of the specified date/time.

Main Monitor

【Compressed Full Disclosure Waveform Display】

(The display is from DS-7600 series : 2 waveforms display)



Maximum of 3 waveforms can be recorded per bed, and maximum of 2 waveforms can be displayed on the full disclosure waveform display.

The waveform display duration is as follows.

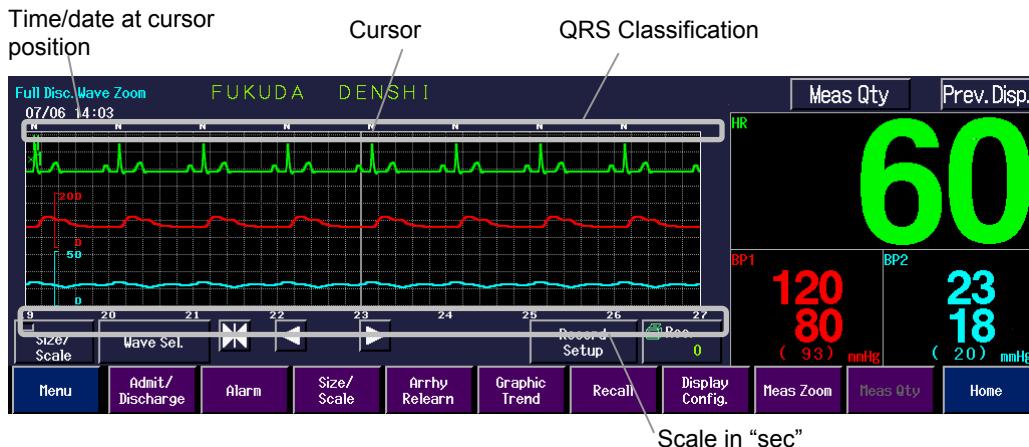
	DS-7600 Series	DS-7600W Series
1 Waveform Display	5 minutes (30sec/line × 10 lines)	15 minutes (1min/line × 15 lines)
2 Waveforms Display	2 minutes (30sec/line × 2 waves × 4 lines/wave)	5 minutes (1min/line × 2 waves × 5 lines/wave)

A time bar is displayed at the right side of the display. The displayed full disclosure waveform can be indicated on the time bar to see the time position among the whole full disclosure waveform data.

Pressing the waveform area will display the enlarged full disclosure waveform display.

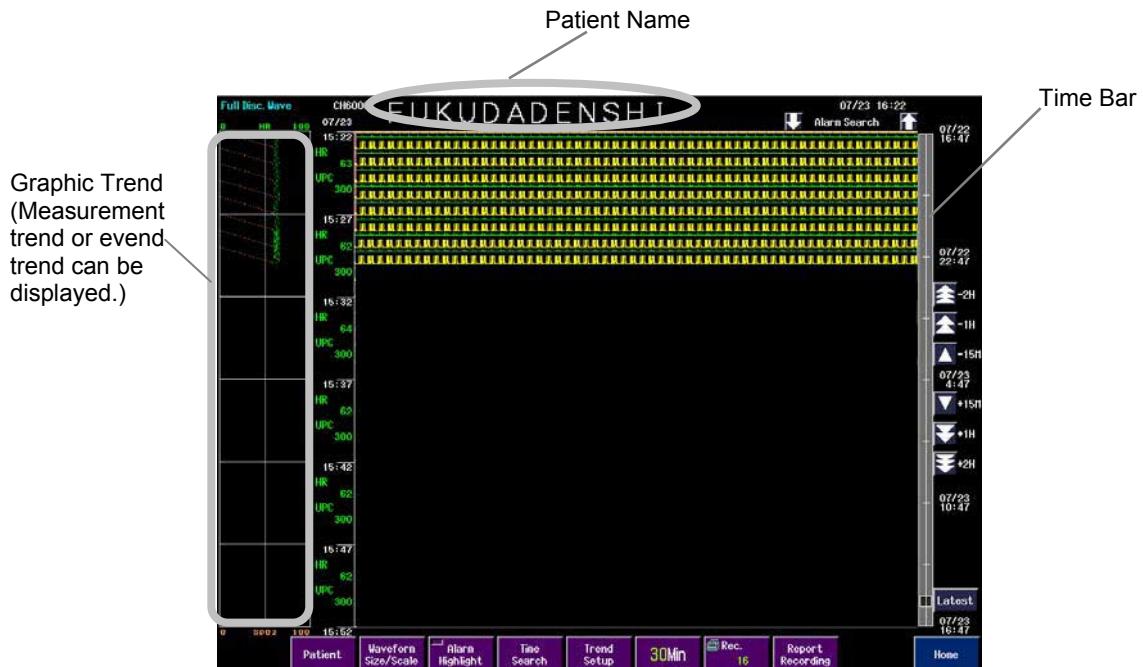
【Enlarged Full Disclosure Waveform Display】 (The display is from DS-7600 series.)

The waveform display duration is 8 seconds for the DS-7600 series, and 10 seconds for the DS-7600 series.)



●Slave Monitor (DS-7600W Series Only)

[Full Disclosure Compressed Waveform + Trend]

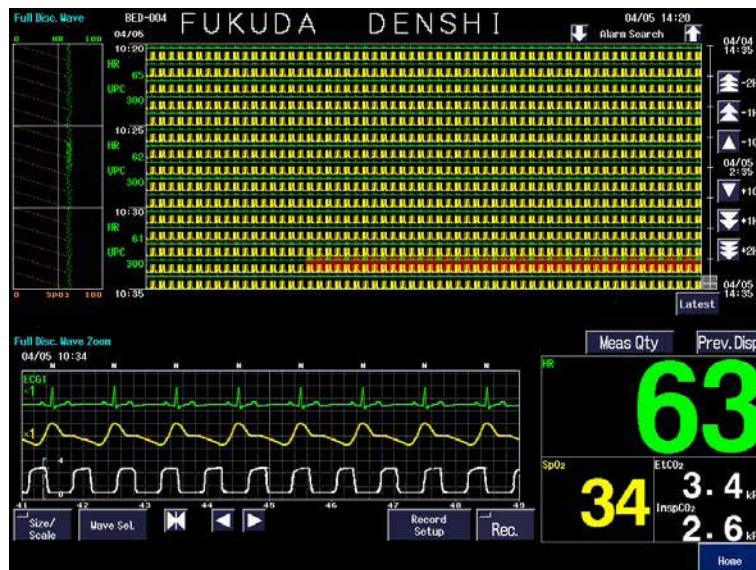


The waveform display duration is as follows.

	Compressed Waveform	Compressed Waveform+Enlarged Waveform Display
1 Waveform Display	60 minutes (1min/line × 60 lines)	30 minutes (1min/line × 30 lines)
	30minutes (1min/line × 30 lines)	15 minutes (1min/line × 15 lines)
2 Waveforms Display	30 minutes (1min/line×2 waves×30 lines/wave)	15 minutes (1min/line × 2 waves × 15 lines/wave)
	15 minutes (1min/line×2 waves×15 lines/wave)	7 minutes (1min/line × 2 waves × 7 lines/wave)

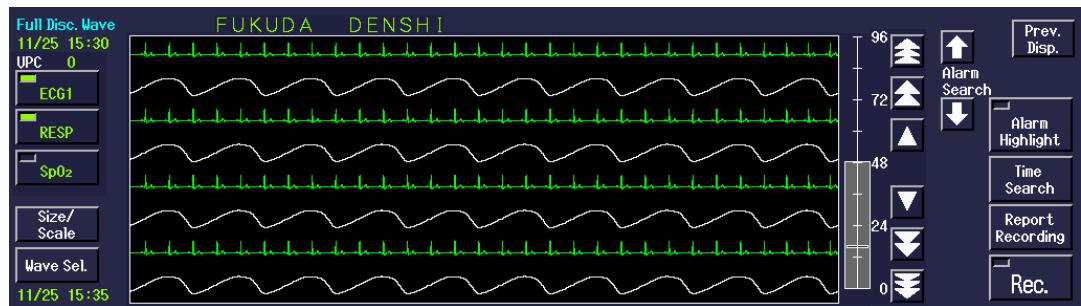
Pressing the waveform display area will display the full disclosure enlarged waveform.

[Full Disclosure Compressed Waveform + Trend + Full Disclosure Enlarged Waveform]

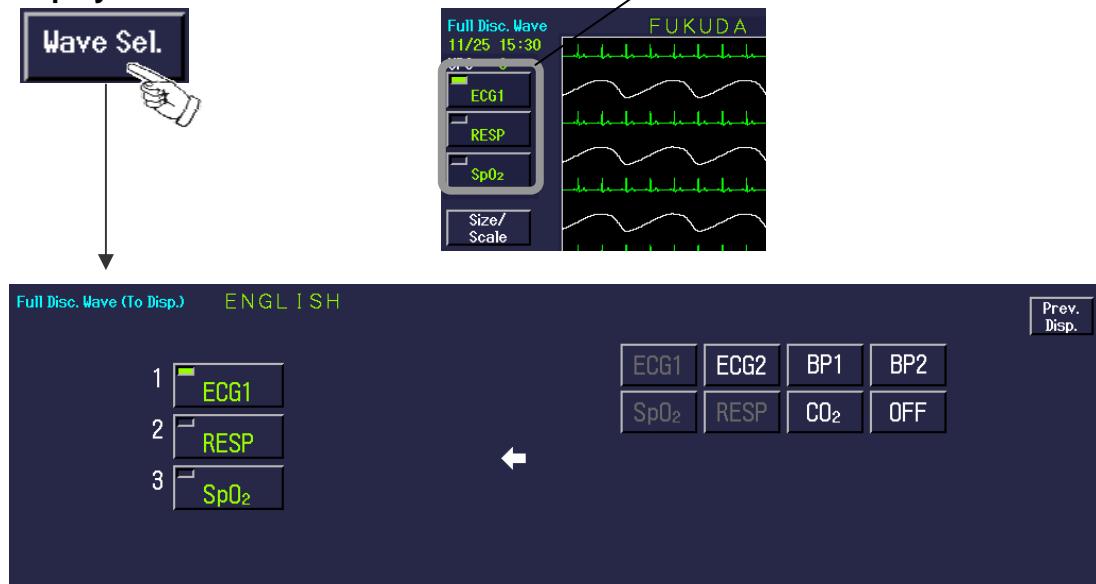


To Monitor Full Disclosure Waveform on Main Monitor

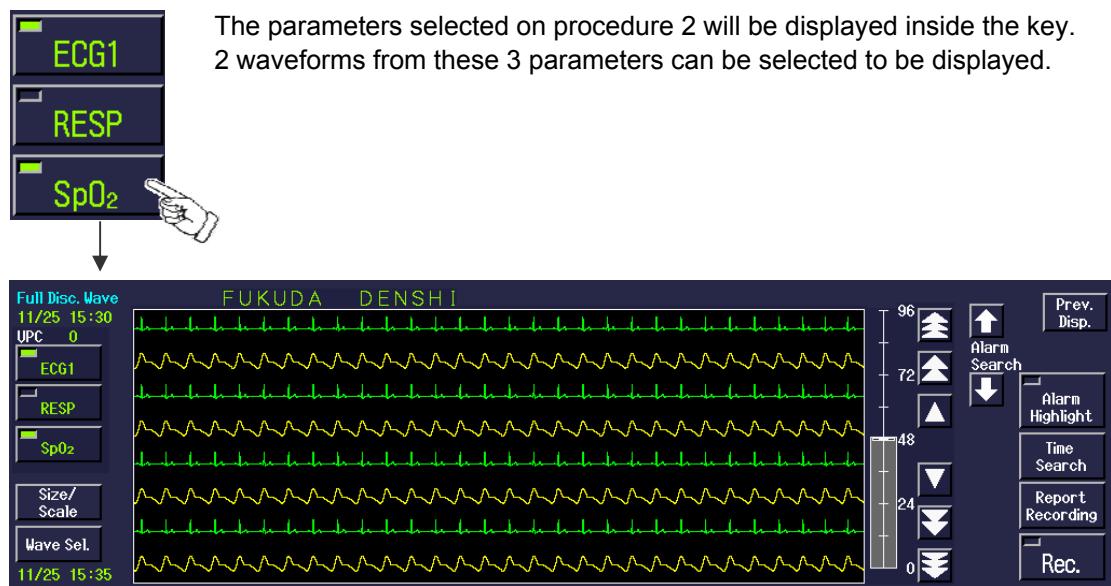
1 Display the compressed full disclosure waveform.



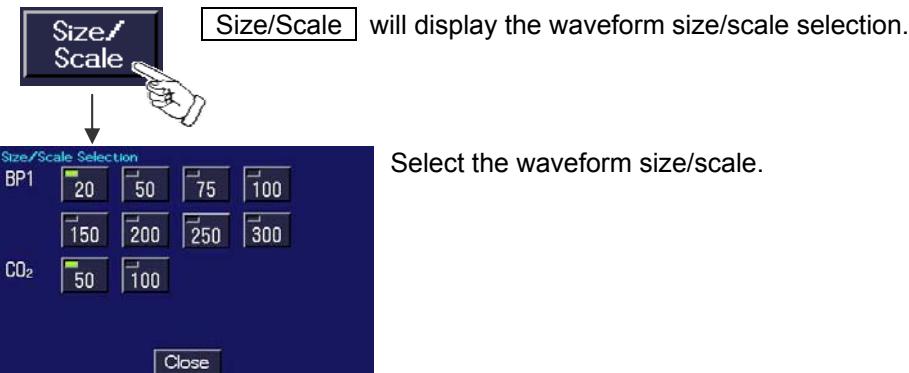
2 Press the **Wave Sel.** key and set the 3 waveform selection keys to be displayed.



3 Select the waveform to be displayed.



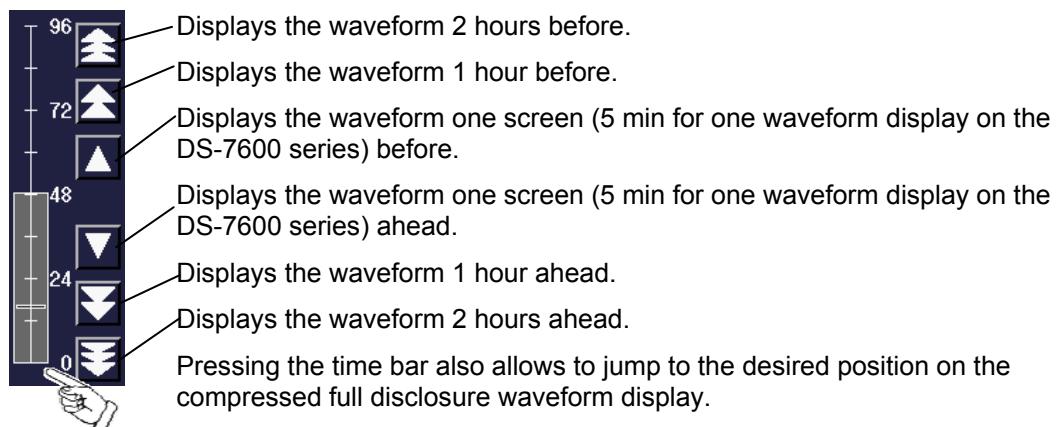
4 Adjust the waveform size.



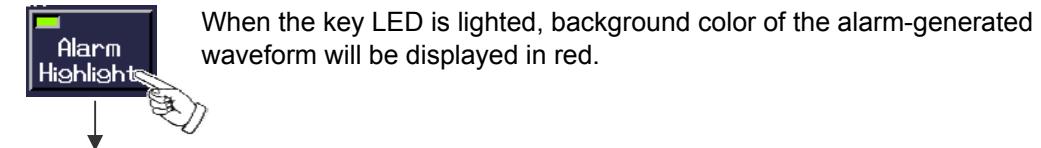
Size/Scale will display the waveform size/scale selection.

Select the waveform size/scale.

5 Scroll the display.



6 The background color of the alarm-generated waveform can be changed.

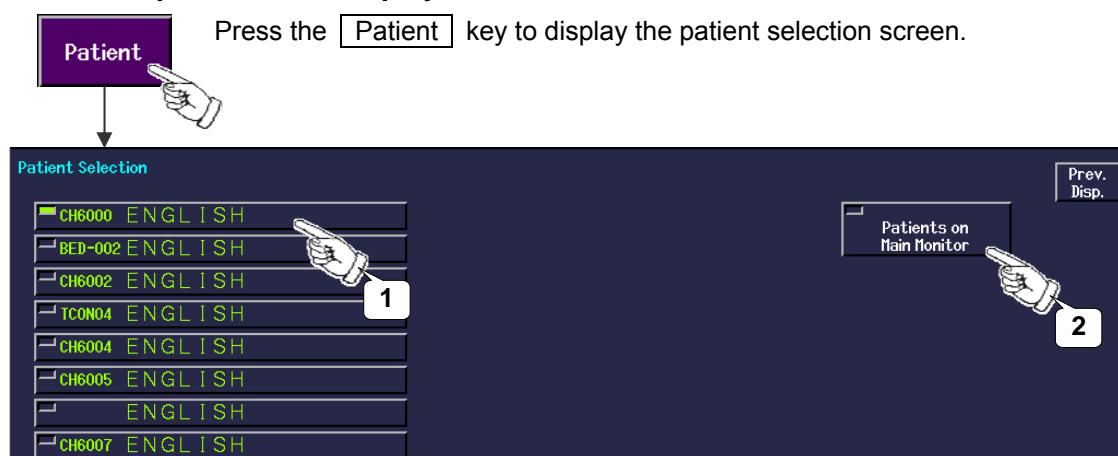


To Monitor Full Disclosure Waveform on Slave Monitor (DS-7600W Series Only)

1 Display the compressed full disclosure waveform.



2 Select the patient to be displayed.

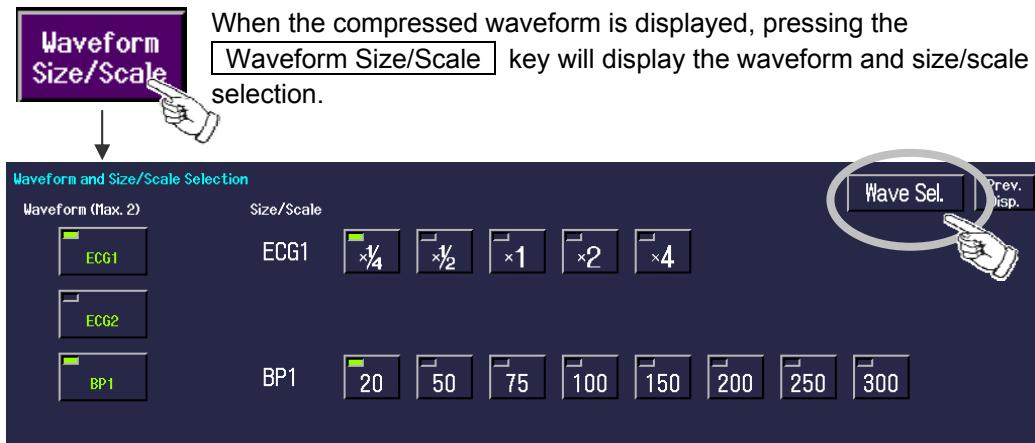


- (1) Select the patient to display the full disclosure waveform.
- (2) **Patients on Main Monitor** will display the full disclosure waveform for the patients displayed on the DS-7600. If the displayed patient is changed on the DS-7600, the slave monitor display will also change.

Reference

For details of the slave monitor, refer to "9. Installation Using the Slave Monitor".

3 Select the waveform to be displayed and size/scale of each waveform.



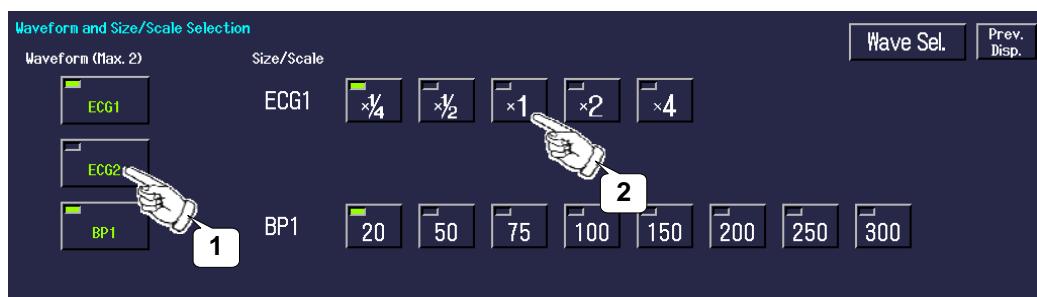
Press the **Wave Sel.** key, and select the 3 waveforms to be displayed. On the full disclosure compressed waveform screen, 2 from these 3 waveforms can be displayed.



- (1) Select the position at the left.
- (2) Select the parameter from the right to be assigned to the selected position.

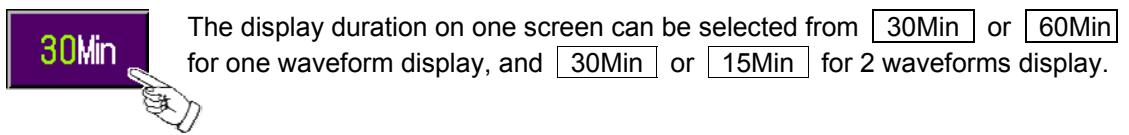
4 Select the displaying waveform and waveform size/scale.

Press the **Prev. Disp.** key on the "Full Disc. Wave (To Disp.)" key and select the size/scale for each waveform.

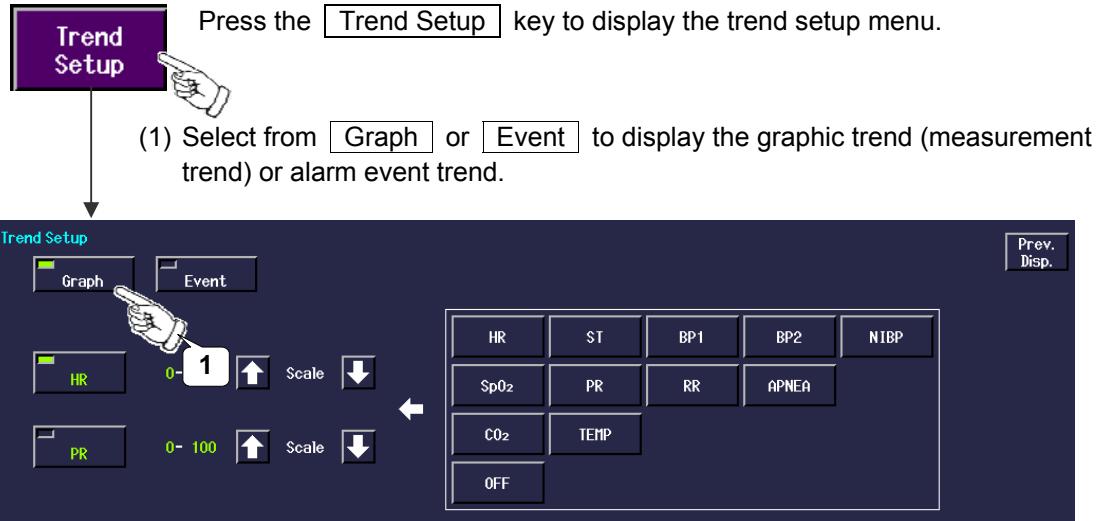


- (1) The waveform parameters recorded for each bed will be displayed.
On the full disclosure compressed waveform display, 2 from these 3 waveforms can be displayed. The parameter with the LED lighted is the currently displayed parameter.
- (2) Select the size/scale for each waveform.

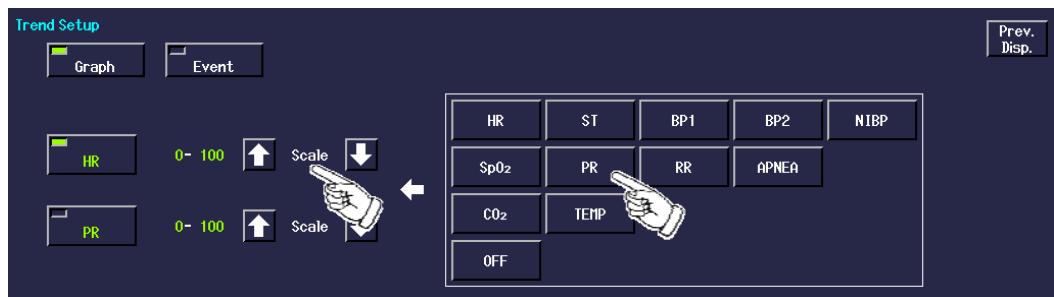
5 Select the waveform display duration.



6 Select the trend to be displayed.



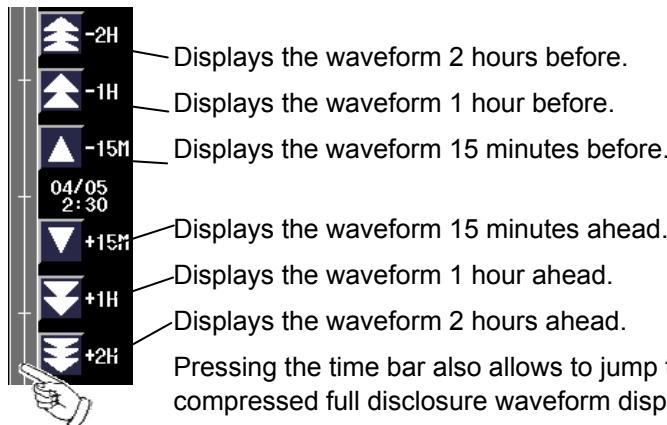
- (2) For graphic trend, 2 parameters can be displayed. Select the parameters to be displayed from the right. Use the **↓**/**↑** keys to set the scale for each graph.



- (3) For event trend, 5 alarm events can be selected to be displayed.



7 Scroll the display.



Displays the waveform 2 hours before.

Displays the waveform 1 hour before.

Displays the waveform 15 minutes before.

Displays the waveform 15 minutes ahead.

Displays the waveform 1 hour ahead.

Displays the waveform 2 hours ahead.

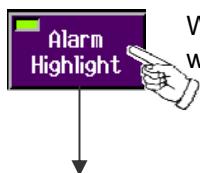
Pressing the time bar also allows to jump to the desired position on the compressed full disclosure waveform display.



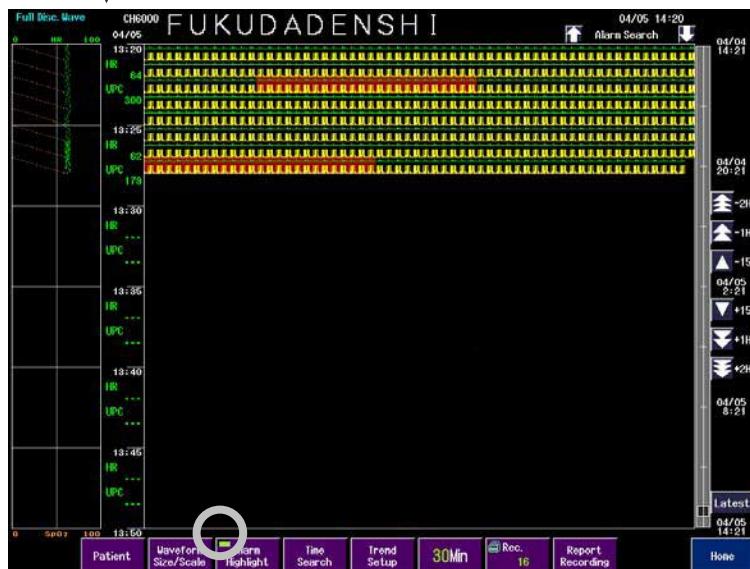
Pressing the **[Latest]** key will turn the key to green and displays the latest information of the waveform.

When the **[Latest]** key is green, the display will automatically scroll so that the latest information will be always be displayed. The automatic scrolling can be cancelled by pressing the scroll key such as key.

7 The background color of the alarm-generated waveform can be changed.



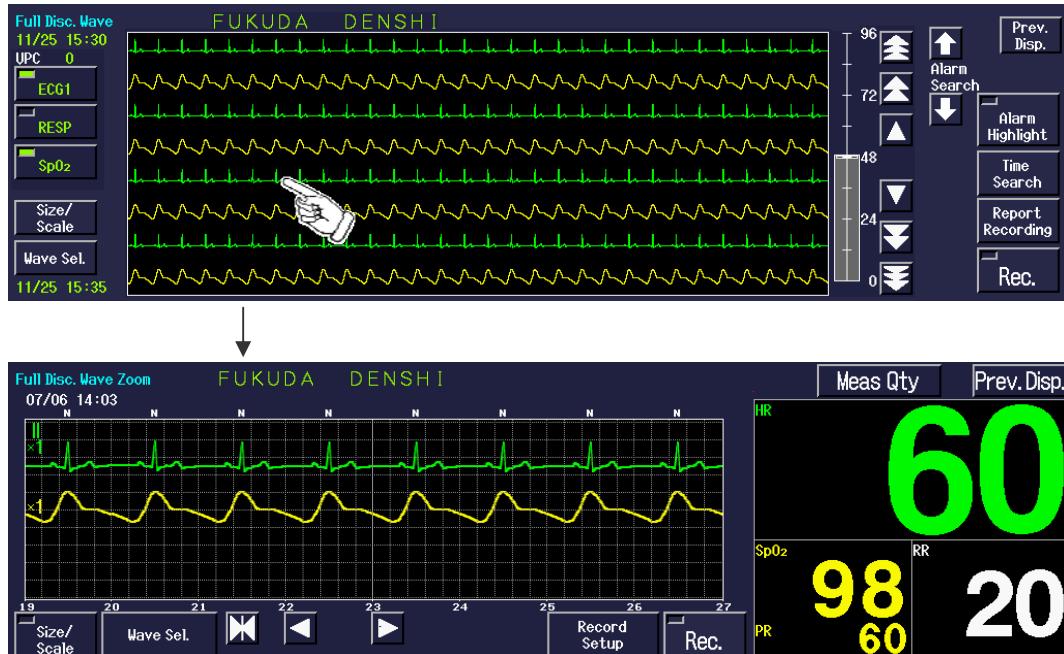
When the key LED is lighted, background color of the alarm-generated waveform will be displayed in red.



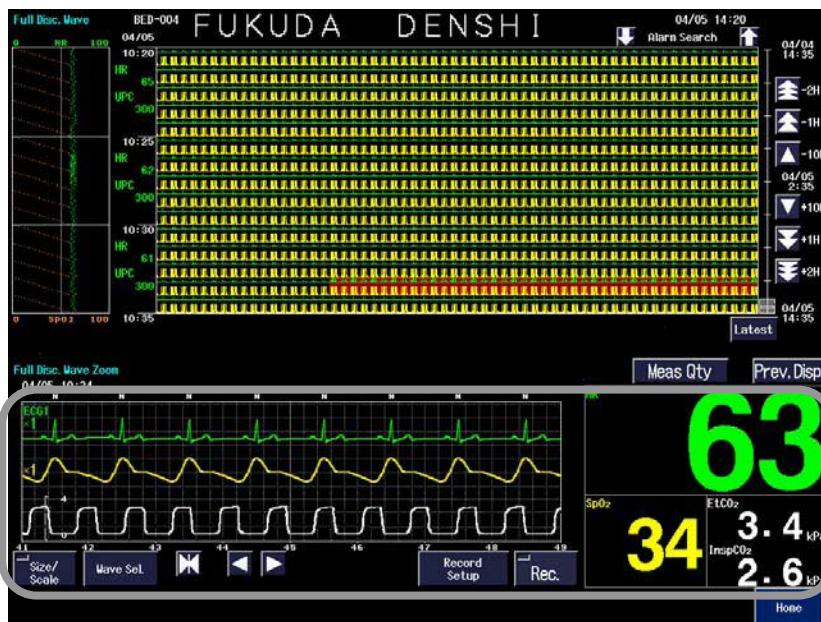
To Display the Enlarged Full Disclosure Waveform

- 1 Pressing the waveform area will display the enlarged full disclosure waveform display.**

[The Display on the Main Monitor]



[The Display on the Slave Monitor] (DS-7600W Series Only)



- 2 Scroll the display to view the left and right of the waveform.**



will scroll the display to older waveform.

will scroll the display to newer waveform.

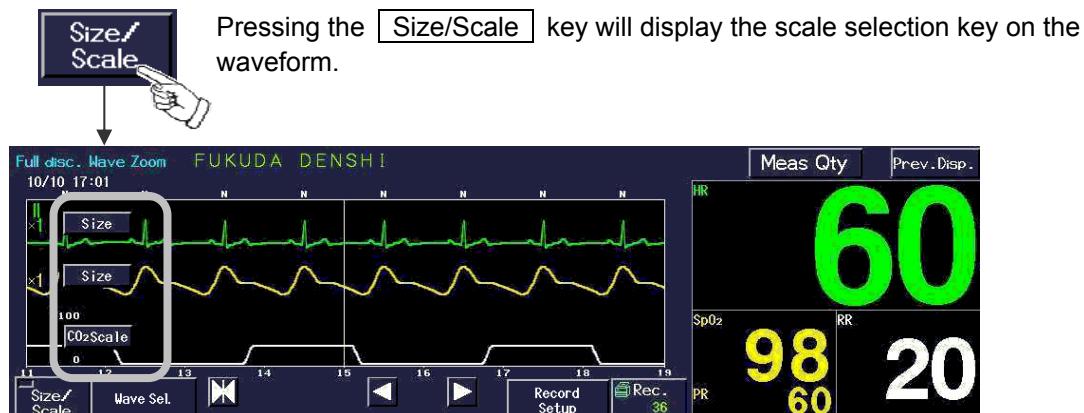


The waveform display will return to the original time point when the enlarged full disclosure waveform was first displayed.



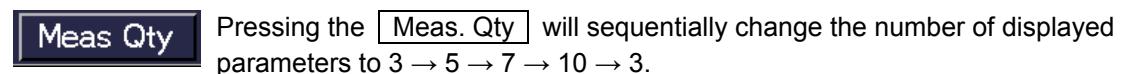
For details of the slave monitor, refer to "9. Installation Using the Slave Monitor".

3 The waveform size/scale can be adjusted.

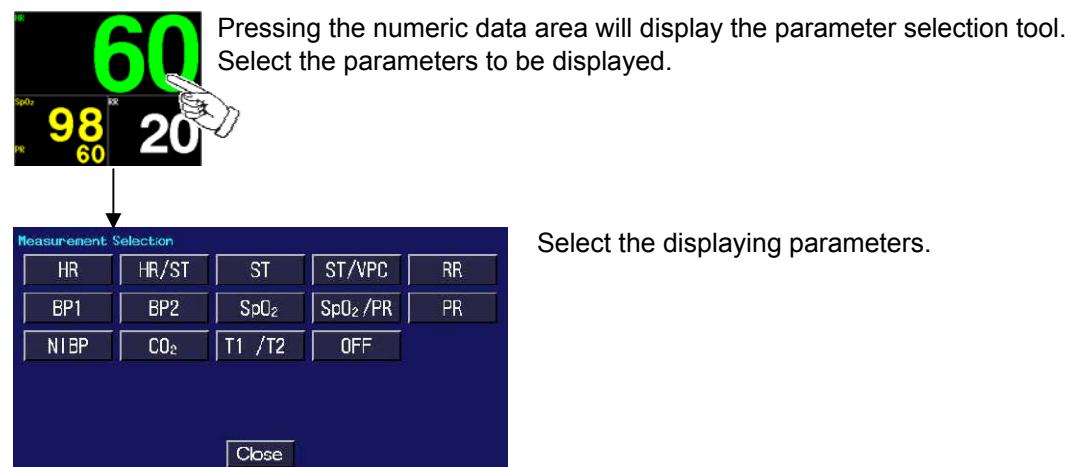


Press the **Size** and **Scale** keys to change the waveform size/scale.

4 The numbers of displaying parameters can be changed.



5 The displaying parameters can be changed.

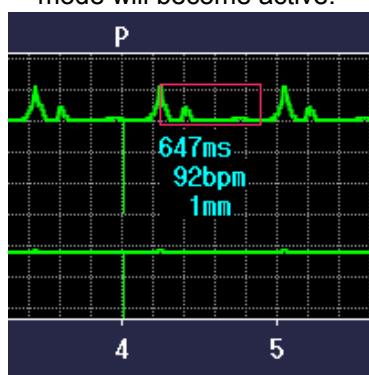


Select the displaying parameters.

6 By using the caliper function, PR, RR, PP interval and R-wave height can be measured.

NOTE	The caliper function can be used only when a mouse is connected. (DS-7600W series only.)
-------------	--

- (1) On the recall zoom waveform, left-click on the starting point of measurement. The caliper mode will become active.



During the caliper mode, a cross shape cursor and a red box will be displayed.

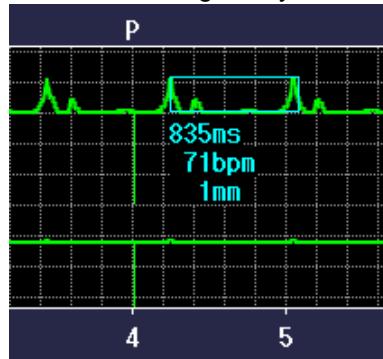
The box will be created by dragging the cursor. The following values will be displayed inside the waveform area.

- x-axis value (waveform interval) in "ms"
- conversion value in "bpm"
- y-axis value (wave height) in "mm"

When the cursor is outside the waveform area, the red box and measurement value will not be displayed.

Also, when size/scale key is displayed, caliper function cannot be used.

- (2) By left-clicking on the measured interval, caliper display will be finalized and the color of the box will change to cyan.



By left-clicking again after finalizing the caliper display, previous caliper display will disappear and a new caliper display will appear.

- (3) During the caliper mode, clicking outside the waveform area will cease the caliper mode and clear the caliper display.

To Print the Full Disclosure Waveform

The full disclosure waveform can be output to the built-in recorder or laser printer.

● To Print on the Built-in Recorder

If **Built-in** is selected for output recorder of "Full Disc. Compressed Wave" or "Full Disc. Zoom Wave", the waveform can be printed on the built-in recorder.

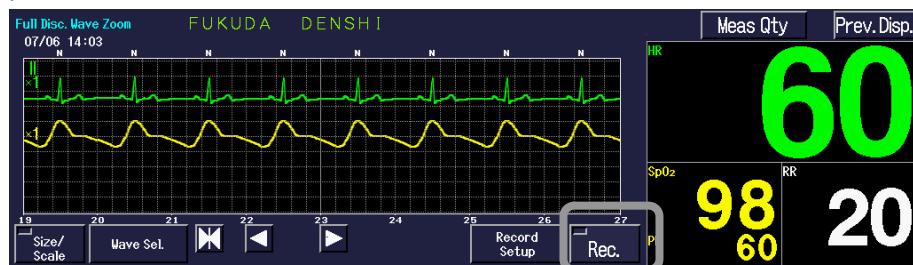
[Main Monitor: Compressed Full Disclosure Waveform]

The currently displayed compressed full disclosure waveform will be printed on the built-in recorder.



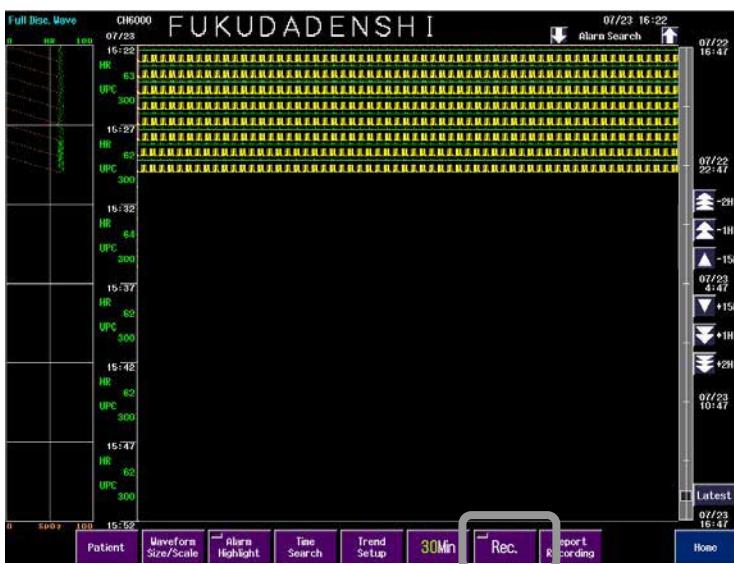
[Main Monitor: Enlarged Full Disclosure Waveform]

8 seconds (10 seconds for DS-7600W series) of enlarged waveform and numeric data will be printed on the built-in recorder.



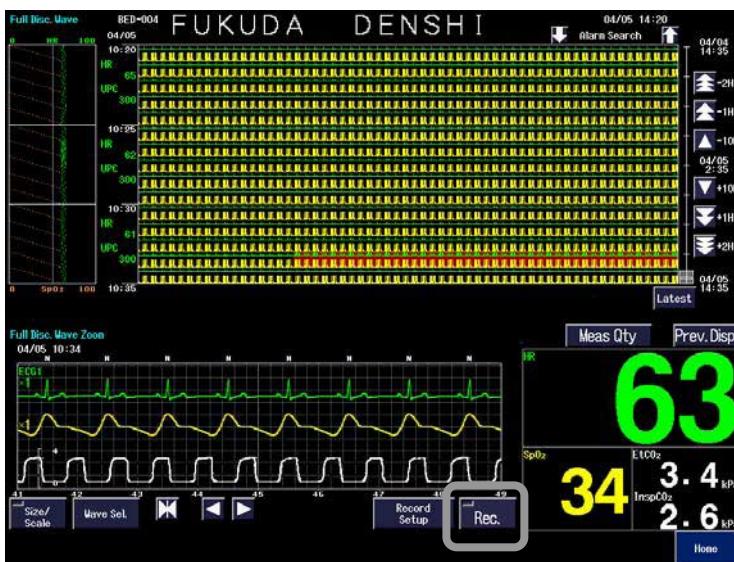
[Slave Monitor: Compressed Full Disclosure Waveform] (DS-7600W Series Only)

The currently displayed compressed full disclosure waveform will be printed on the built-in recorder.



[Slave Monitor: Enlarged Full Disclosure Waveform] (DS-7600W Series Only)

8 seconds of enlarged waveform and numeric data displayed at the lower part of the display will be printed on the built-in recorder.



For details of the slave monitor, refer to "9. Installation Using the Slave Monitor".

● To Print on the Laser Printer



- The number of stacked recording data for the bed is displayed.
- If the stacked data reaches maximum, the key will turn to gray which indicates the printing cannot be performed.

【Main Monitor: Compressed Full Disclosure Waveform】

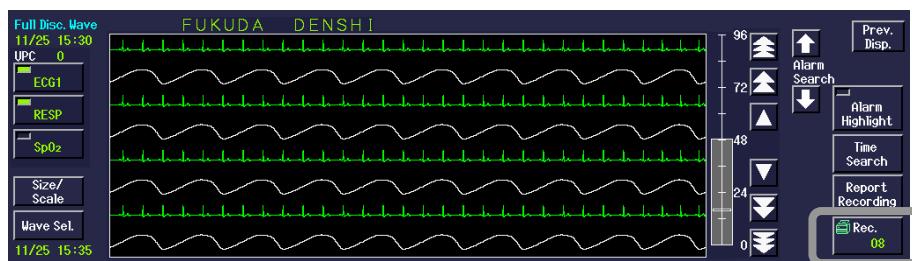
For 1 waveform display, 30 minutes of waveform will be printed.

(15 minutes before and after the time displayed at the center.)

For 2 waveforms display, 15 minutes of waveform will be printed.

(5 minutes before and 10 minutes after the time displayed at the center.)

The trend for waveform 1 will be printed. (For example, if waveform 1 is ECG1, HR trend will be printed and if waveform 1 is SpO₂, PR and SpO₂ trend will be printed.)



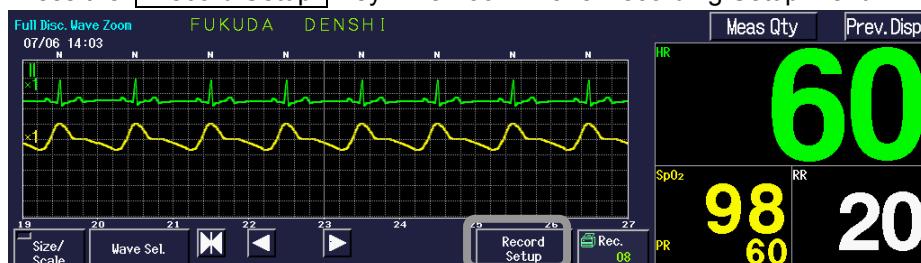
【Main Monitor: Enlarged Full Disclosure Waveform】

30 seconds (15 seconds before and after the time displayed at the center) of waveform and numeric data will be printed on the laser printer.



When using the FCF-16GA, the quantity of recording waveforms can be selected from 3 waveforms (30 seconds) or 6 waveforms (10 seconds).

(1) Press the [Record Setup] key. The Zoom Wave Recording Setup menu will be displayed.



(2) Select the quantity of waveforms to be recorded from **3W×30s** or **6W×10s**.

[When **3W×30s** is selected]



[When **6W×10s** is selected]

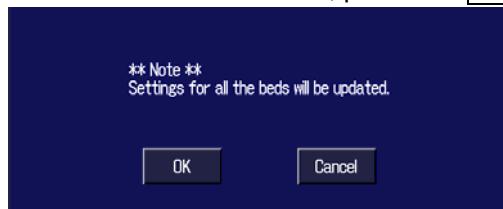


(3) When **6W×10s** is selected, select the recording waveform.

First, select the parameter from the right, then assign it to the recording position on the left.

(4) To assign the same setting to all beds, press the **All Beds** key.

On the confirmation screen, press the **OK** key.



【Slave Monitor: Compressed Full Disclosure Waveform】(DS-7600W Series Only)

For 1 waveform display: 60 minutes of waveform will be printed.

(30 minutes before and after the time displayed at the center.)

For 2 waveforms display: 30 minutes of waveform

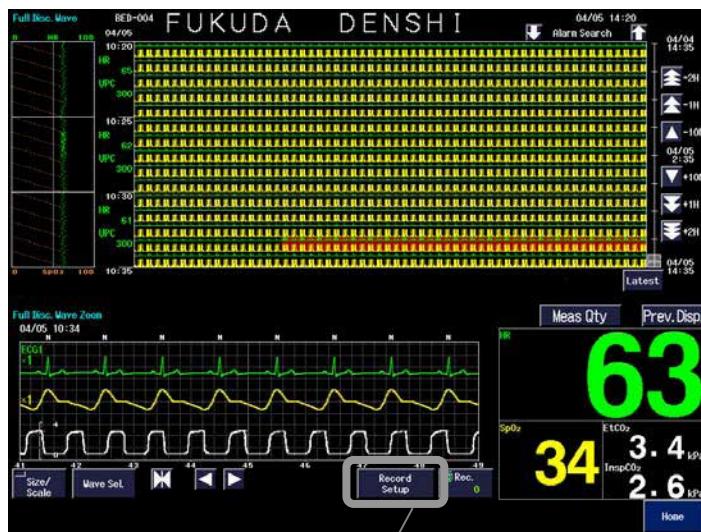
(15 minutes before and after the time displayed at the center.)

Currently displayed graphic trend will be printed.



【Slave Monitor: Enlarged Full Disclosure Waveform】(DS-7600W Series Only)

The waveform and numeric data of 15 seconds before and after the time displayed at the center (total 30 seconds) will be printed on the laser printer.



When using the FCF-16G, the quantity of recording waveforms can be selected from 3 waveforms (30 sec.) or 6 waveforms (10 sec.).

●Report Recording

The report recording can be performed only on the laser printer.



**Report
Recording**

Press the **Report Recording** key on the full disclosure compressed waveform display (main monitor / slave monitor) to display the full disclosure report recording screen.

The set “Display Duration” will be shown in time bar.
Gray: full disclosure waveform range
Light Green: report recording range



Number of reports

(1) Select the display duration.



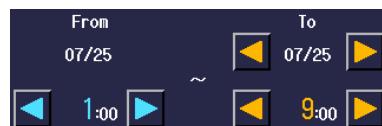
Set the duration to display with the time bar. The selection will differ depending on the CF card format type. (24Hours32Waves / 48Hours16Waves / 96Hours8Waves / 96Hours 32Waves).

(2) Select the report duration.



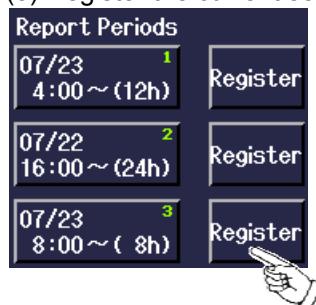
Select the report recording duration from [8HR] / [12HR] / [24HR] / [Set Time].

For example, if [8HR] is selected, the report recording will start from 8 hours before the current time.



If [Set Time] is selected, set the starting time and completing date/time using the [◀] and [▶] keys.

(3) Register the current setup.



Maximum of 3 report periods can be registered.

To register the report duration set on procedure (2), press the [Register] key.

NOTE

Pressing the [Register] key will overwrite the previously registered report period.

(4) Start the report recording.



Press the [Report] key to start the report recording with the registered report period.

[Printed Information on the Report Recording]

The following information will be printed on the report recording.

1st page: Graphic Trend of HR, ST, VPC

2nd page: Graphic Trend of HR, Arrhythmia Event

3rd page and onward:

60 minutes of compressed waveform per page if 1 waveform display, and 30 minutes of compressed waveform per page if 2 waveforms display will be printed for the set report duration.

For example, if the set report duration is 1 hour, 1 page will be output for the 1 waveform display and 2 pages will be output for the 2 waveforms display.

If the set report duration is 8 hours, 8 pages will be output for the 1 waveform display and 16 pages will be output for the 2 waveforms display.

For the main monitor, graphic trend for waveform 1 will be printed.

For the slave monitor, the currently displayed graphic trend will be printed.

To Search by Alarm Event

The alarm-generated full disclosure waveform can be searched.
The data is searched from the stored alarm event on the recall function.

1 Display the full disclosure compressed waveform.

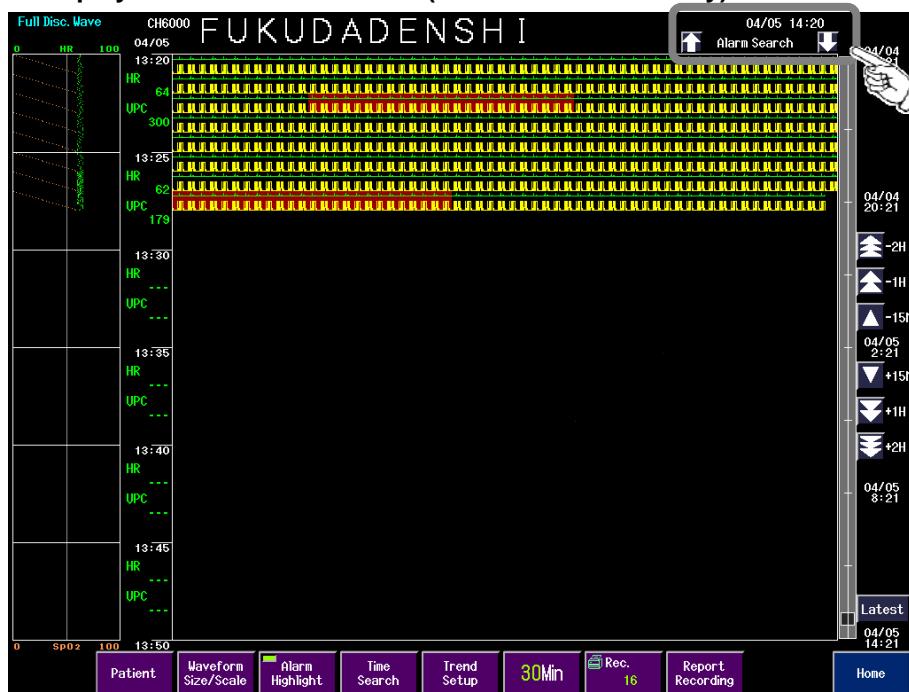
Press the (newer data) or (older data) keys for "Alarm Search" to display the full disclosure waveform at alarm occurrence.

One alarm per page will be searched. Other alarms displayed on the same page will be neglected. Performing the alarm search will automatically turn ON the alarm highlight.

[Display on the Main Monitor]



[Display on the Slave Monitor] (DS-7600W Series Only)



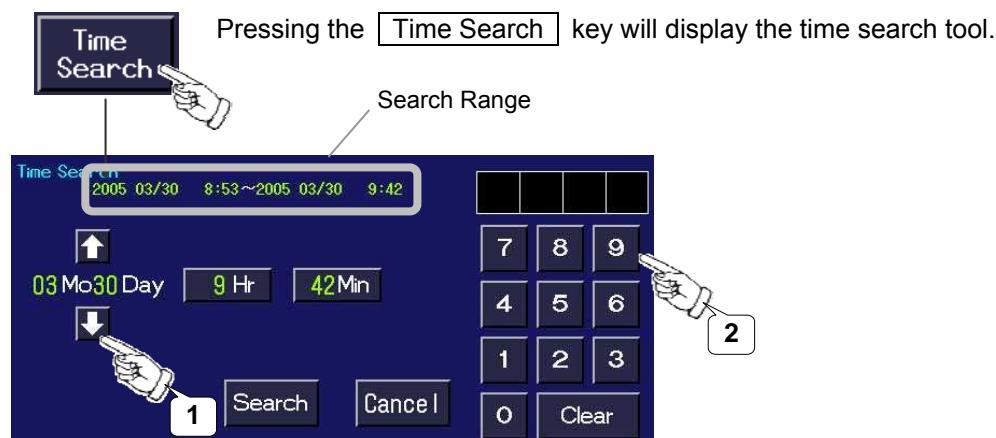
To Search by Time

Specifying the time will display the full disclosure waveform of that time.

●On Main Monitor

1 Display the compressed full disclosure waveform.

2 Specify the search date.



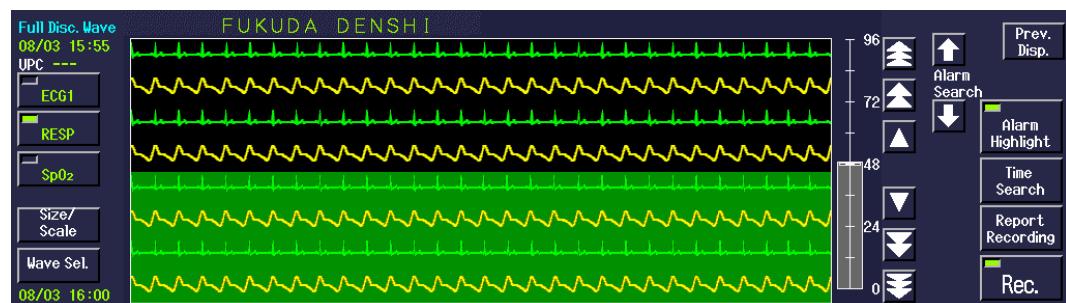
(1) Use the \downarrow or \uparrow keys to specify the date.

(2) Use the numeric keys to enter the hour and minute, and press the $\boxed{\text{Hr}}$, $\boxed{\text{Min}}$ keys respectively.

Ex.) 13:25 \rightarrow $\boxed{1}$ $\boxed{3}$ $\boxed{\text{Hr}}$ $\boxed{2}$ $\boxed{5}$ $\boxed{\text{Min}}$

3 Press the **Search key to start searching.**

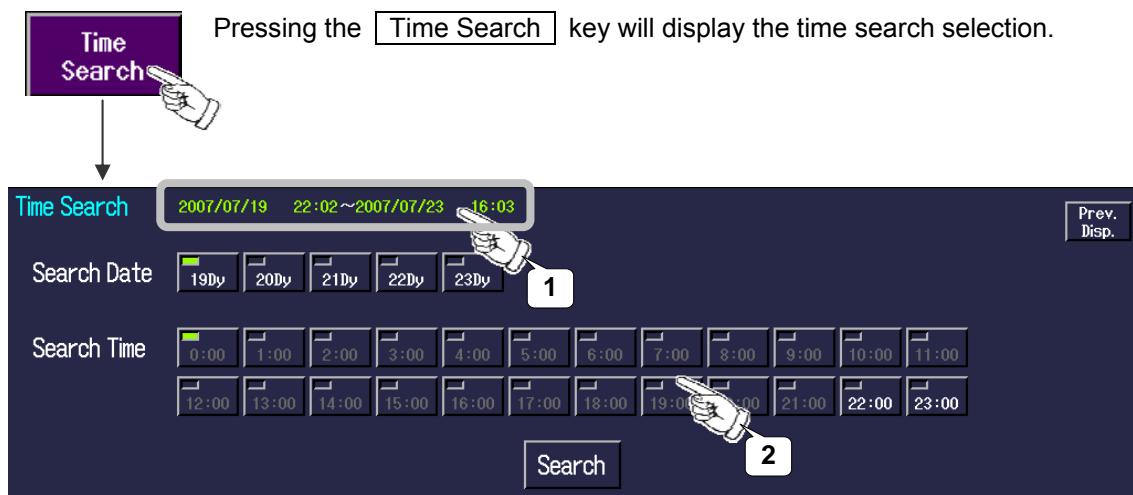
The full disclosure waveform for the specified time will be displayed. The waveform searched by time will be displayed in light green background.



●On Slave Monitor (DS-7600W Series Only)

1 Display the compressed full disclosure waveform.

2 Specify the search date.

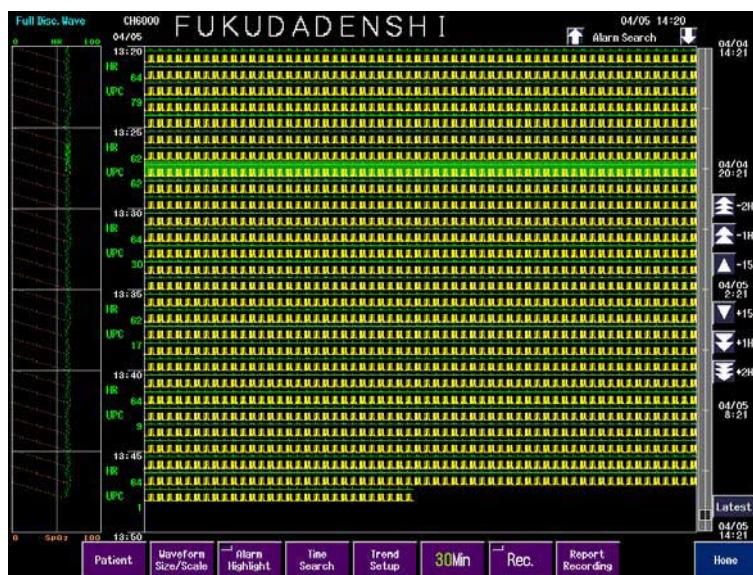


(1) Select the “Search Date”.

(2) Select the “Search Time”.

3 Press the **Search key to start searching.**

The full disclosure waveform for the specified time will be displayed. The waveform searched by time will be displayed in light green background.



Night Mode

The Night Mode for the beds connected to the DS-LANIII network can be turned ON or OFF on the DS-7600 Central Monitor.

The Night Mode is a function to decrease the screen brightness and alarm volume when turning OFF the light of the ward or when the patient is asleep, etc.

The brightness and alarm volume settings during Night Mode can be preprogrammed on the bedside monitor.

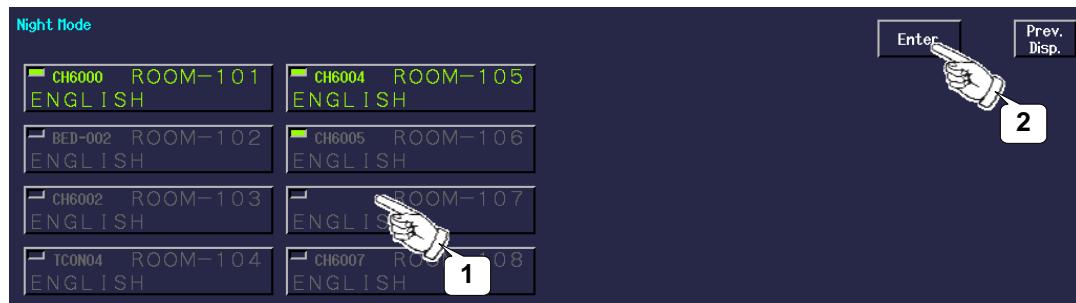
NOTE

The Night Mode can be set only for the bed connected to the DS-LANIII network.

1 Press the **Menu → **Night Mode** (“Function”) keys.**

The Night Mode menu will be displayed.

The Night Mode is ON for the bed with LED lighted, and the Night Mode is OFF for the bed with LED turned OFF.



(1) Select a bed to turn ON the Night Mode.

(2) Press the **Enter** key.

On the confirmation screen, press the **OK** key.



If the Night Mode is set, the alarm sound and alarm indicator may not function on the bedside monitor.

(Depends on the bedside monitor setting.)

OK **Cancel**

NOTE

The confirmation screen will not be displayed when turning OFF the Night Mode for all beds.

Review Data after EMR Discharge

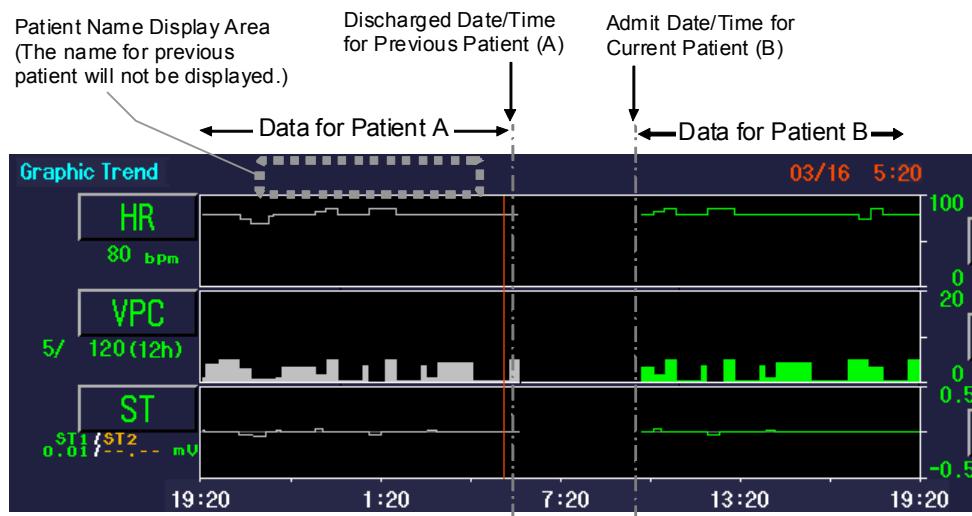
By selecting ON for “Display Data Before Discharging” on the Network Configuration Setup (Patient Data Server), the review data for the patient discharged from the EMR can be displayed. The review data that can be displayed are as follows.

- Graphic Trend
- Tabular Trend
- Recall (List, Enlarged Display)
- NIBP List
- ST Waveform
- 12-Lead ST
- Full Disclosure Waveform (Compressed, Enlarged Display)
- Full Disclosure Waveform (Slave/Compressed, Slave/Enlarged)



For details on EMR admit/discharge process, refer to P3-15 “3. Admit/Discharge of a Patient Admit/Discharge on the EMR”.

The example of graphic trend display is explained below.



- The graphic trend for currently admitted patient B will be normally displayed.
 - The data for the previous patient A will be displayed with lower brightness.
 - The patient name display area for the previous patient will be left blank.
- By moving the cursor to data on patient B, the name for patient B will be displayed in the patient name display area
- Pressing the **Rec.** key will only print the data for the current patient. The review data for the previous patient cannot be printed.

Blank Page

Chapter 8

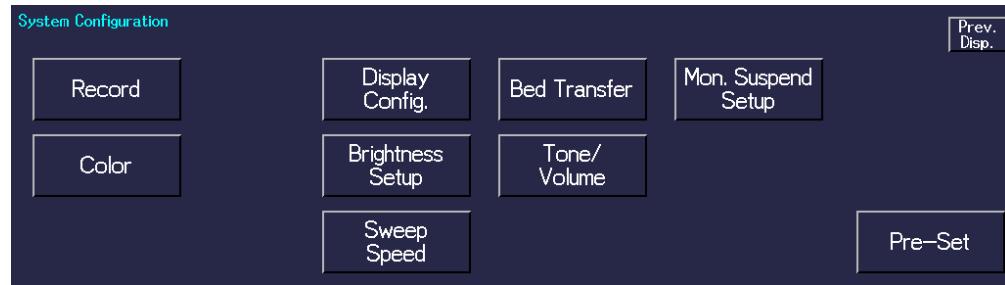
System Configuration

This chapter explains the procedure to set the monitoring condition such as display configuration, tone/volume, color, etc.

System Configuration Menu	8-2
Display Configuration Display Layout Setup.....	8-3
Home Display Layout.....	8-3
To Select the Beds (Home Display)	8-5
To Select the Waveforms/Numeric Data (Home Display)	8-5
To Select the Waveforms/Numeric Data (Individual Display)	8-10
To Select the 12-Lead ST	8-14
Color	8-15
Brightness	8-16
Tone / Volume	8-17
Sweep Speed	8-18
Monitor Suspend Setup	8-19

System Configuration Menu

This section describes the setup procedure of each item on the system configuration menu.



- | | | |
|--------------------|---|--|
| Record | : | Recording procedure can be set.
↳ "6. Recording" |
| Display Config. | : | Display layout of the home display and individual display can be set. |
| Bed Transfer | : | When transferring / exchanging beds, patient information and monitoring data can be transferred / exchanged.
↳ "3. Admit/Discharge of a Patient" |
| Color | : | The colors of displaying waveform and numeric data can be set. |
| Brightness Setup | : | The brightness of the display can be set. |
| Tone / Volume | : | The volume and tone of the alarm sound, heartbeat sound, key sound can be set. |
| Sweep Speed | : | The sweep speed of the displaying waveform can be set. A different sweep speed can be set for circulatory system (BP, ECG) and respiratory system. |
| Mon. Suspend Setup | : | Different monitor suspend message and color can be set according to the monitor suspend reason of each patient. This can be set only when "Monitor Suspend's Message Selection"(soft switch) is set to ON. |



The preset item must be set before monitoring either by our service representative or system administrator of your institution.
For setup procedure, refer to "9. Installation".

Display Configuration

Display Layout Setup

The display configuration of the home display and individual display can be set on this menu.

- 1 Press the **Menu** → **System Config.** → **Display Config.** keys.



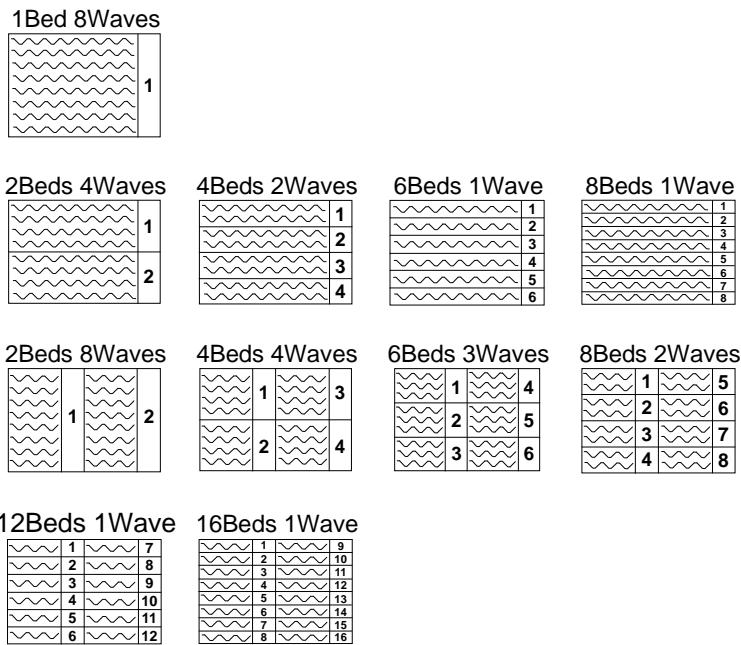
On the display configuration menu, the following setup can be performed.

- Home display layout
- Patient name display (Zoom / Normal)
- Bed name display (Zoom / Normal / OFF)
- Enlarge/reduce of parameter key (All Beds / Each Bed)
- Short trend display (ON / OFF / Overlap)
- Selection of displaying beds on the home display
- Selection of displaying waveform / numeric data on the home display
- Selection of displaying waveform / numeric data and displaying pattern on the individual display

Home Display Layout

- 1 Select the display layout from **1Bed 8Waves** / **2Beds 4Waves** / **2Beds 8Waves** / **4Beds 2Waves** / **4Beds 4Waves** / **6Beds 1Wave** / **6Beds 3Waves** / **8Beds 1Wave** / **8Beds 2Waves** / **12Beds 1Waves** / **16Beds 1Wave**.





2 Select whether or not to enlarge the patient name display.



Zoom will enlarge the patient name display and overlaps with the waveform.

Normal will not enlarge the patient name display.

3 Select whether or not to enlarge the bed name display, or not display.



Zoom will enlarge the bed name display and overlaps with the waveform.

Normal will not enlarge the bed name display.

OFF will not display the bed name.

NOTE The patient name and bed name cannot be enlarged at the same time.

4 Set whether to apply the “Meas Zoom” function to all beds or to selected bed.

The **Meas Zoom** key (user key) function can be applied to all beds or only to the selected bed.



All Beds will enlarge/reduce the parameter key for all beds.

Each Bed will enlarge/reduce the parameter key for the selected bed.

5 Set the short trend display.



ON will display the graphic trend on the home display.

OFF will not display the graphic trend on the home display.

Overlap will display the graphic trend overlapped with the waveform.

NOTE

- The short trend can be displayed only when the display layout is 1Bed 8Waves, 2Beds 4Waves, 4Beds 2Waves, 6Beds 1Wave, 8Beds 1Wave.
- The short trend cannot be displayed when maximum area is used for the numeric data display.

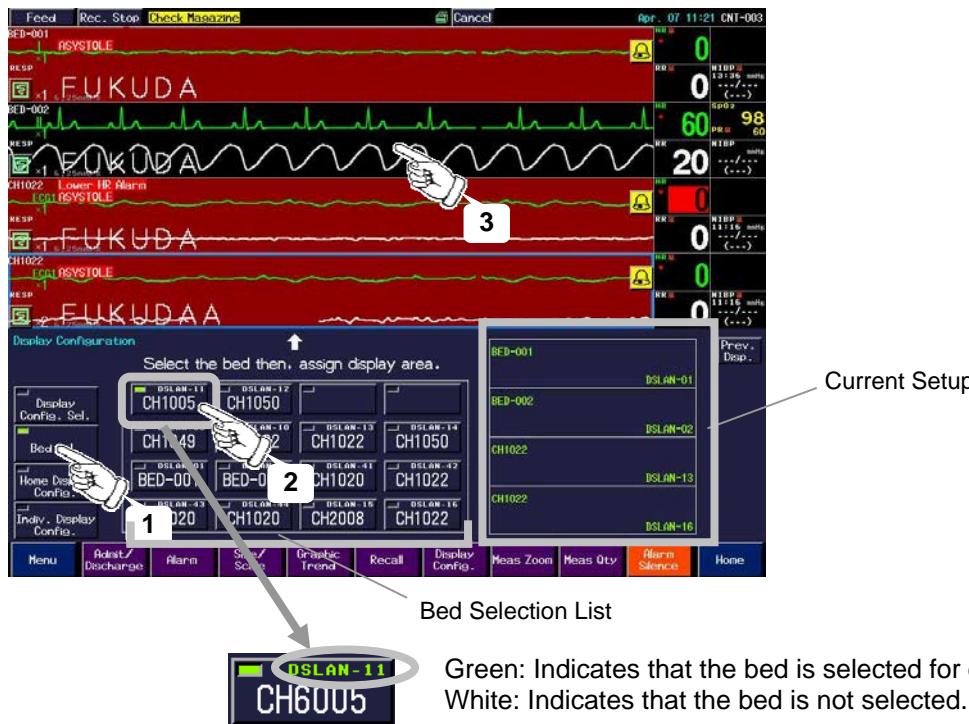
Maximum area for the numeric data display



To Select the Beds (Home Display)

- 1** Press the **Bed Sel.** key on the display configuration menu.

The selectable beds will be listed at the center. The current setup will be displayed at the right.



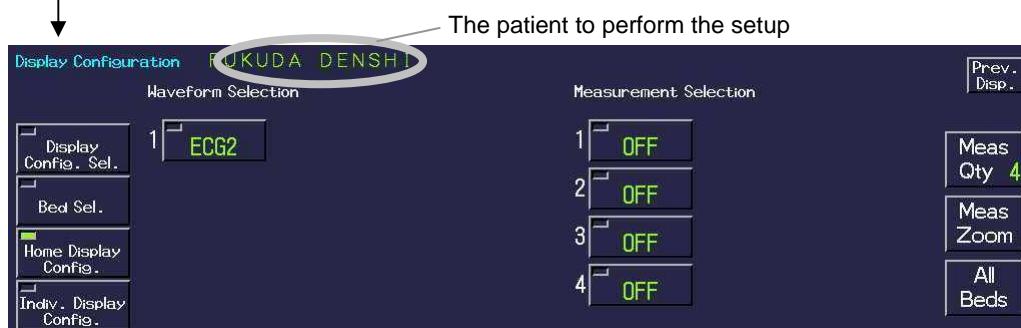
- 2** Select the bed from the list.
 - 3** On the home display, press the area where you desire to display the selected bed.

To Select the Waveforms/Numeric Data (Home Display)

- 1** Press the **Home Display Config.** key on the display configuration menu.



The “Home Display Configuration” menu will be displayed.



- The patient to perform the setup

At the upper part of the display, the patient name to perform the setup will be displayed. To perform the setup for another patient, select the patient from the bed selection list.

2 To change the number of numeric data to be displayed, press the **Meas Qty key.**

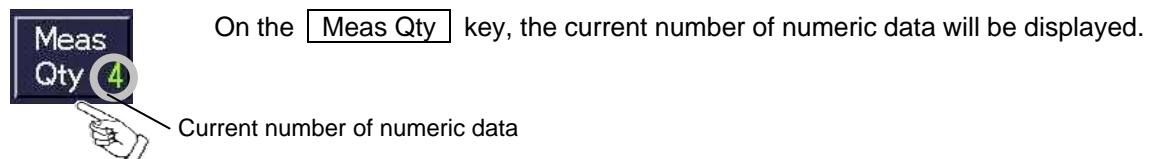
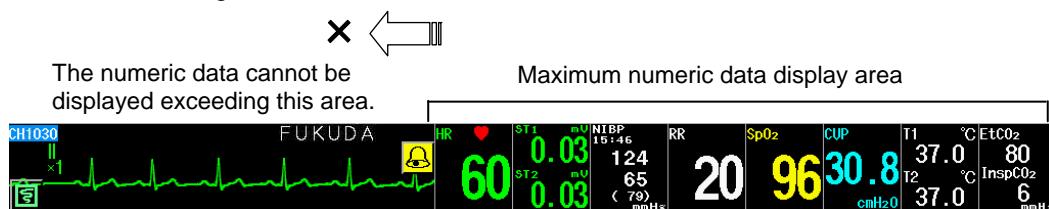
To change the size of the parameter key, press the **Meas Zoom** key.



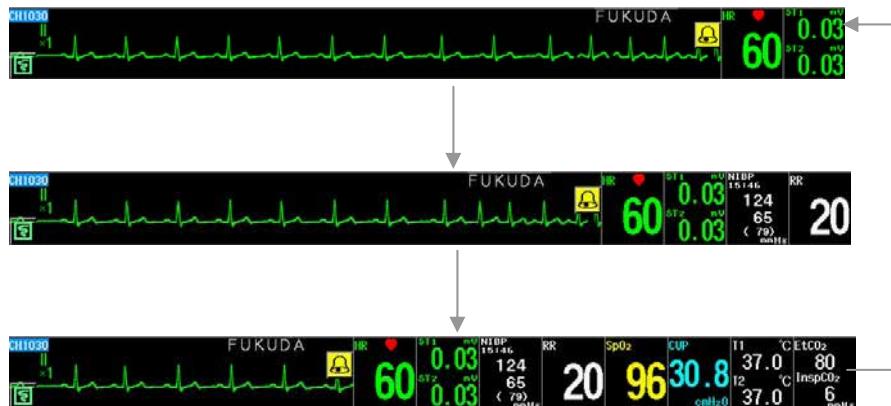
NOTE	<ul style="list-style-type: none"> The number of displaying numeric data can be changed only for the display layout of 1Bed 8Waves, 2Beds 4Waves, 4Beds 2Waves, 6Beds 1Wave, 8Beds 1Wave. If All Beds is selected for "Meas Zoom" on the Display Configuration menu, the Meas Zoom key function will be applied to all beds. If Each Bed is selected, the Meas Zoom key function will be applied only to the selected bed.
------	--

[To change the number of displaying numeric data]

The maximum area size for displaying the numeric data is as follows. The number of numeric data can be changed within this area.



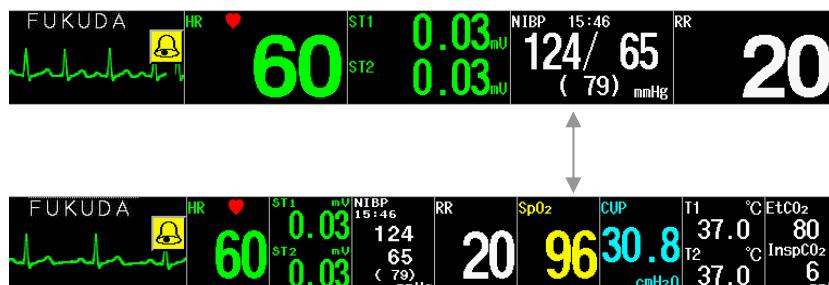
Pressing the **Meas Qty** key will sequentially change the number of displaying numeric data.



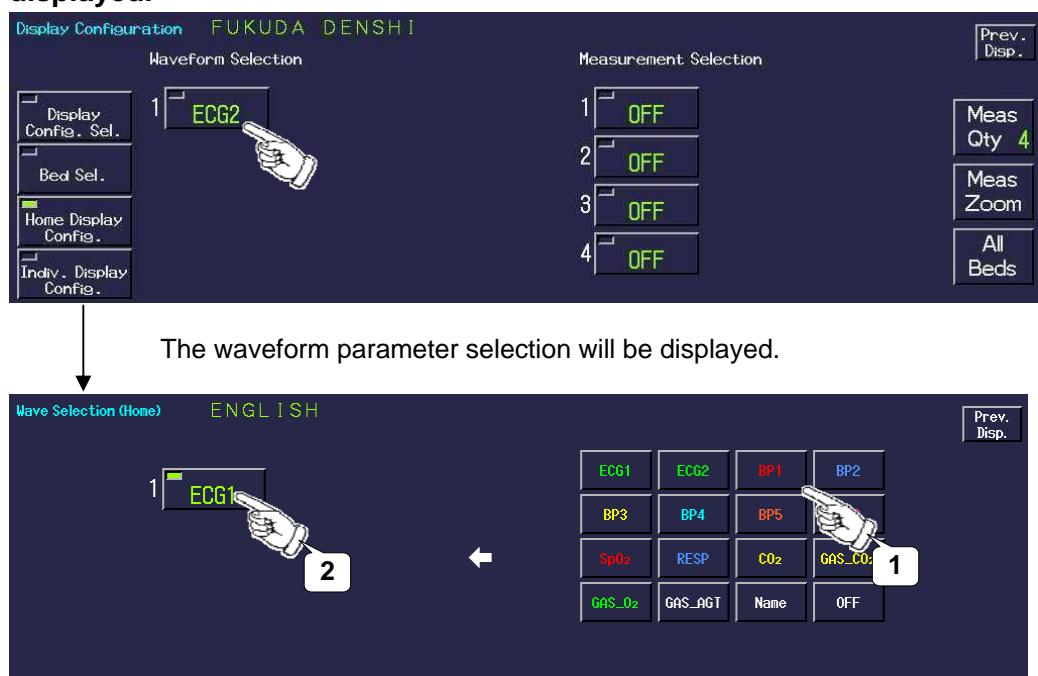
[To change the numeric data frame size]

The frame size of the numeric data can be enlarged or reduced.

Pressing the **Meas Zoom** key will alternately enlarge and reduce the numeric data frame size.



- 3 Press the key for the “Waveform Selection” to select the waveform to be displayed.**



- (1) First, select the parameter.

Selecting **Name** will display the patient name instead of waveform.
(2) Next, select the position to display the waveform for that parameter.

- 4** Press the **Prev. Disp.** key to return to the Home Display Configuration menu.
Press the key for the “Measurement Selection” to select the numeric data to be displayed.



The numeric data parameter selection will be displayed.

<Measurement Selection 1st Page>



NOTE

The **NIBP Meas** key function is available only for the beds connected to the DS-LANIII network.

- (1) First, select the parameter.

The page can be switched by using the **Page Down** / **Page Up** keys.

<Measurement Selection 2nd Page>



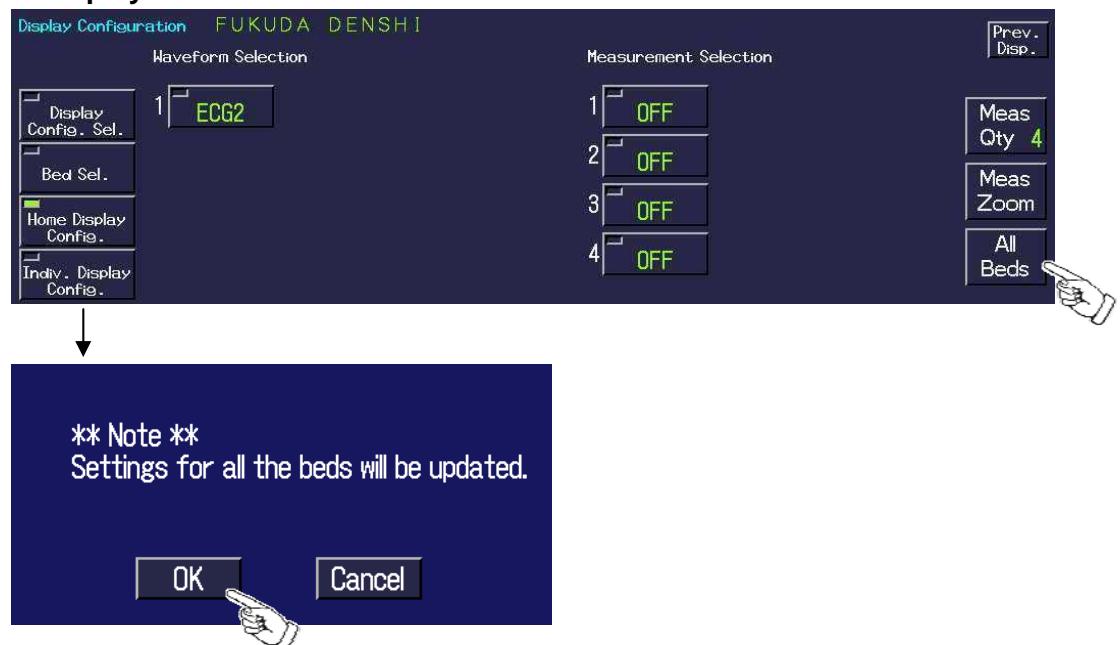
<Measurement Selection 3rd Page>



- (2) Next, select the position to display the numeric data for that parameter.

- 5** To set the display for another bed, select the patient from the bed selection list and repeat the procedure 3, 4.

- 6** To set the same display layout for all beds, press the **All Beds** key on the Home Display Configuration menu. Press **OK** when the confirmation message is displayed.



To Select the Waveforms/Numeric Data (Individual Display)

- 1 Press the **Indiv. Display Config.** key on the display configuration menu.



The Individual Display Configuration menu will be displayed.



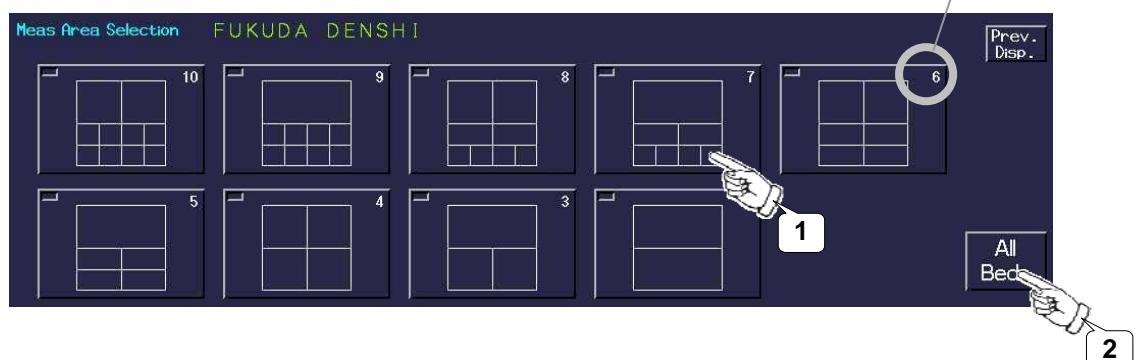
The patient to perform the setup will be displayed.

At the upper part of the display, the patient name to perform the setup will be displayed.
To perform the setup for another patient, select the patient from the bed selection list.

- 2 Press the **Meas Area Sel.** key and select the numeric data display pattern.

The number displayed at upper right of each pattern is the number of displayable numeric data.

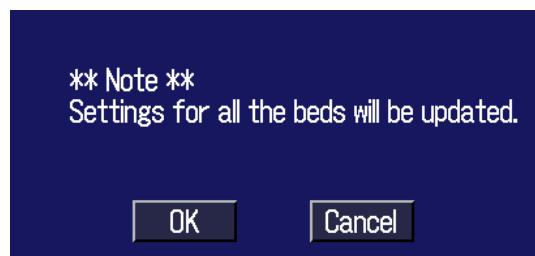
Displayable number of numeric data



(1) Select the display pattern. The LED will light to indicate that the pattern is programmed.

(2) Pressing the **All Beds** key will set the same pattern for all beds.

Press **OK** when the confirmation message is displayed.



3 Press [Prev. Disp.] and return to Individual Display Configuration menu.

Press the [Meas Qty] key to set the number of numeric data to be displayed.

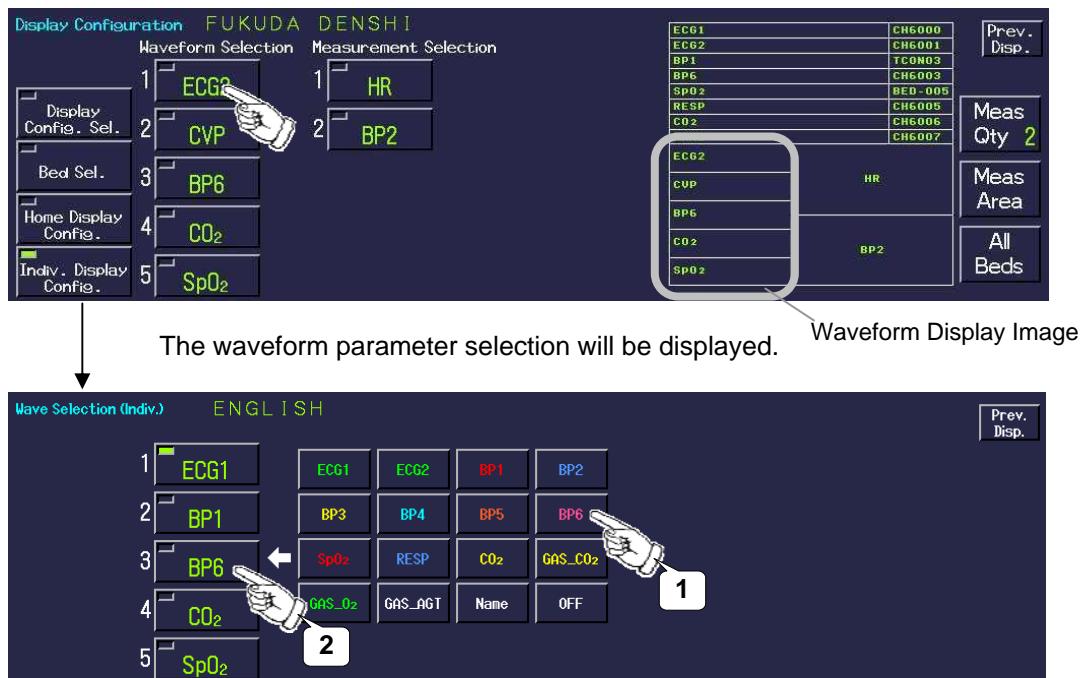
Pressing the [Meas Qty] key will sequentially change the number of numeric data displayed on the individual display configuration.

The display pattern will change to the one selected at procedure 2.



4 Press the “Waveform Selection” key to select the waveform parameter to be displayed.

Maximum of 5 waveforms can be displayed on the individual display.



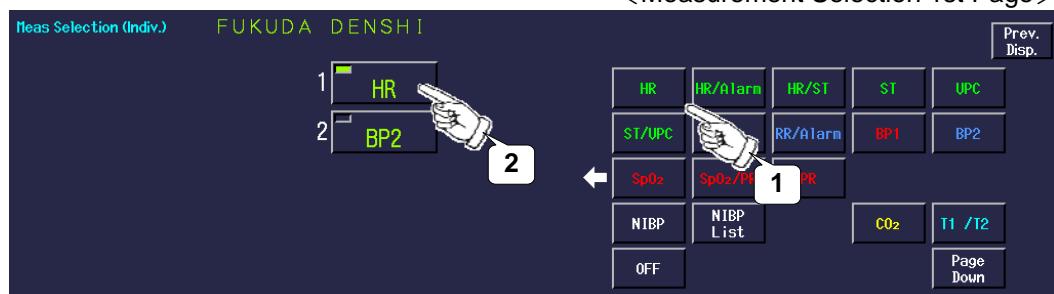
(1) First, select the parameter.

(2) Next, select the position to display the waveform for that parameter.

- 5 Press the [Prev. Disp.] key to return to the Individual Display Configuration Menu. Then, press the key for the “Measurement Selection” to select the numeric data to be displayed.**



<Measurement Selection 1st Page>



(1) First, select the parameter.

The page can be switched by using the [Page Down] / [Page Up] keys.

<Measurement Selection 2nd Page>



<Measurement Selection 3rd Page>



(2) Next, select the position to display the numeric data for that parameter.

- 6 To set the display for another bed, select the patient from the bed selection list and repeat the procedure 3 to 5.**

- 7 To set the same display layout for all beds, press the **All Beds** key on the Individual Display Configuration menu. Press **OK** when the confirmation message is displayed.**

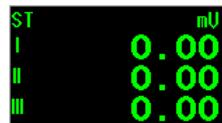
This will be also effective for numeric data display pattern setup.



To Select the 12-Lead ST

When monitoring 12-lead waveform, ST value of 3 leads can be displayed inside the ST numeric data box. 4 types of lead combination (A, B, C, D) can be registered.

The registered combination is common for home display measurement selection and individual measurement selection.

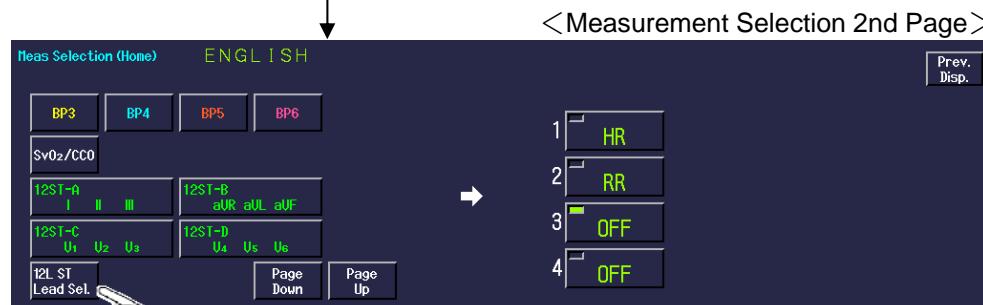


1 The 12-lead ST lead selection can be displayed with the following process.

- (1) Press the [Home Display Config.] (or [Indiv. Display Config.]) key on the display configuration menu.



- (2) Press any key on "Measurement Selection" to display the measurement selection. Press the [Page Down] key to display the 2nd page.



- (3) Press the [12L ST Lead Sel.] key.



2 Register the leads for 4 groups.



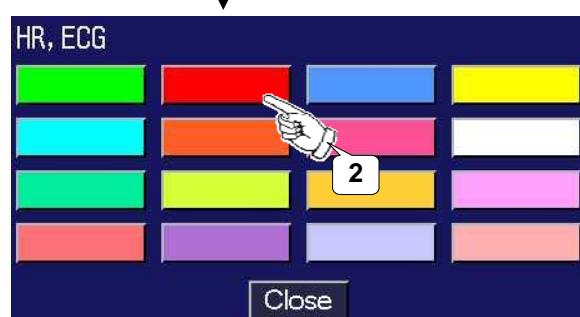
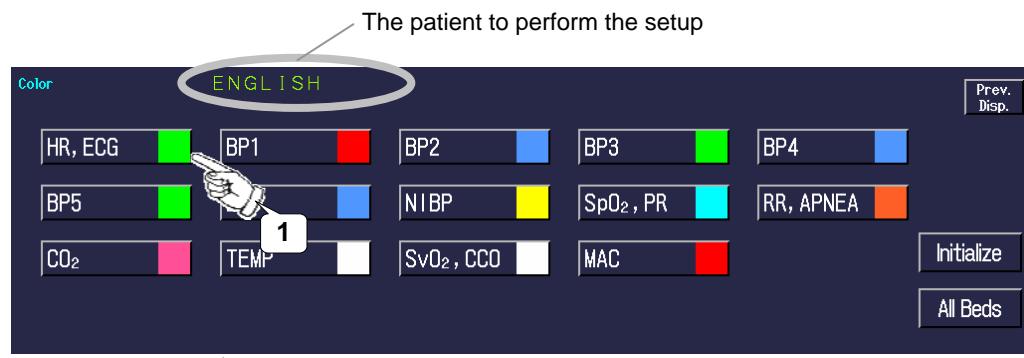
- (1) Select the group (A to D) to register.
- (2) Select the lead display position (upper, middle, lower).
- (3) Select the lead to display for that position.

Color

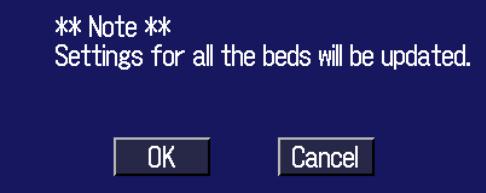
The color of the displayed waveform and numeric data can be selected.

- 1 Select a bed to perform the color setup.**
- 2 Press the **Menu** → **System Config.** → **Color** keys to display the setup menu.**
- 3 Select a color.**

Select a parameter and display the color selection. Select the color from 16 selections.



- 4 To set the same color for all beds, press the **All Beds** key.
Press the **OK** key on the confirmation display.**

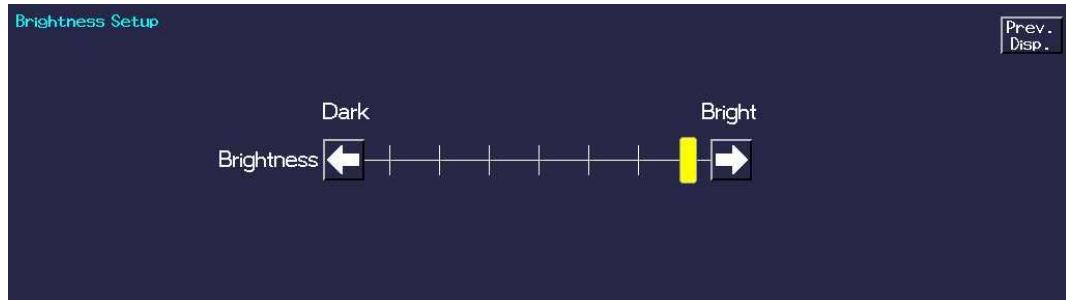


- 5 To initialize the color to factory setting, press the **Initialize** key.**

Brightness

The brightness of the display can be adjusted.

- 1 Press the **Menu** → **System Config.** → **Brightness Setup** keys to display the brightness setup menu.



- 2 Adjust the display brightness using the “Dark **←** or **→** Bright” keys.
It can be also adjusted by directly pressing on the bar.

Tone / Volume

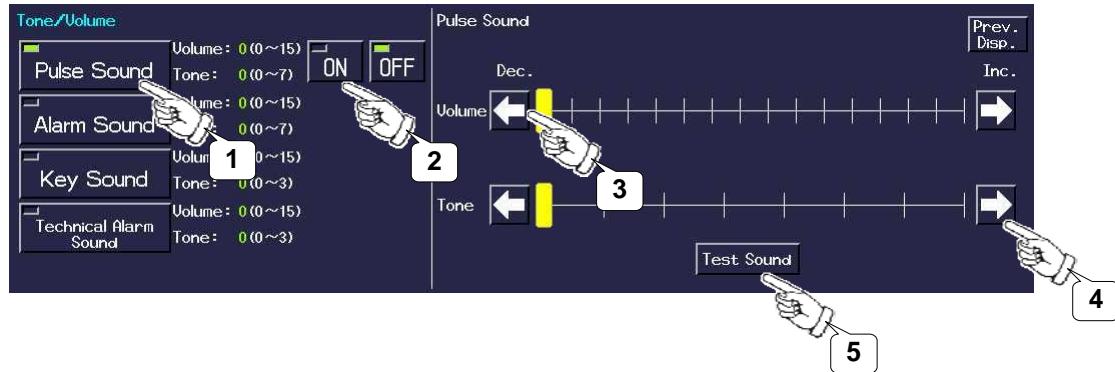
The tone and volume of heartbeat sound, key sound, and technical sound can be set.
The same setup will be applied to all beds.

⚠ CAUTION

Do not set the alarm volume too low to prevent missing any alarm generation.

- 1** Press the **Menu** → **System Config.** → **Tone/Volume** keys to display the tone/volume setup menu.

- 2** Set the pulse sound.

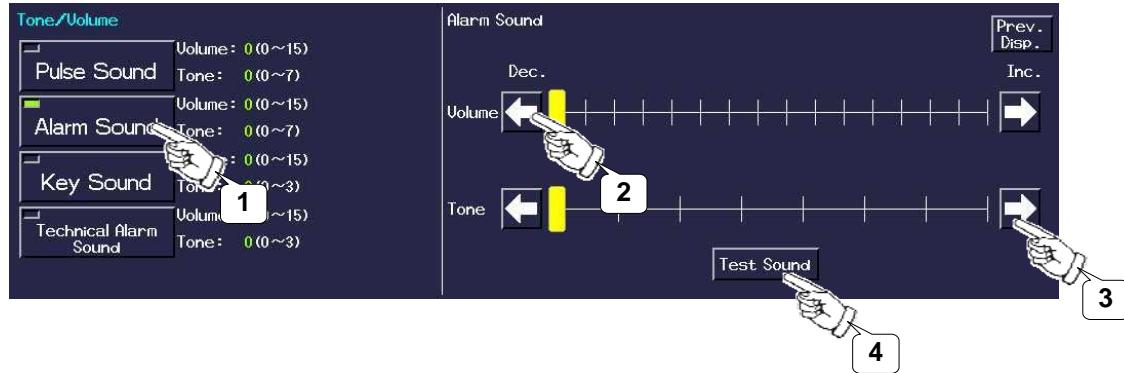


- (1) Press the **Pulse Sound** key.
- (2) Select **ON** / **OFF** of pulse sound.
- (3) Adjust the volume using the "Dec. **←** / **→** Inc." keys or by directly pressing on the bar.
- (4) Adjust the tone using the **←** / **→** keys or by directly pressing on the bar.
- (5) Press the **Test Sound** key to check the adjusted sound.

8

Tone / Volume

- 3** Use the same procedure to adjust the Alarm Sound, Key Sound, and Technical Alarm Sound.

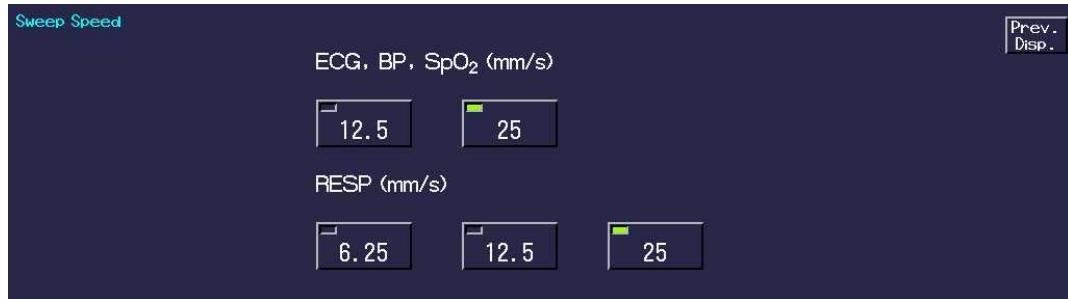


- (1) Select the sound from **Alarm Sound** / **Key Sound** / **Technical Alarm Sound**.
- (2) Adjust the volume using the "Dec. **←** / **→** Inc." keys or by directly pressing on the bar.
- (3) Adjust the tone using the **←** / **→** keys or by directly pressing on the bar.
- (4) Press the **Test Sound** key to check the adjusted sound.

Sweep Speed

The sweep speed of the displayed waveform can be set. The sweep speed can be set differently for the circulatory system waveform (ECG, BP) and respiratory system waveform.

- 1 Press the **Menu** → **System Config.** → **Sweep Speed** keys and display the sweep speed setup menu.



- 2 Select the ECG/BP/SpO₂ sweep speed from **12.5** / **25** (mm/s).
- 3 Select the RESP, CO₂, O₂, AGENT waveform sweep speed from **6.25** / **12.5** / **25** (mm/s).

Monitor Suspend Setup

Different suspend message and color can be set according to reason of each patient.
This can be set only when "Monitor Suspend's Message Selection"(soft switch) is set to ON.

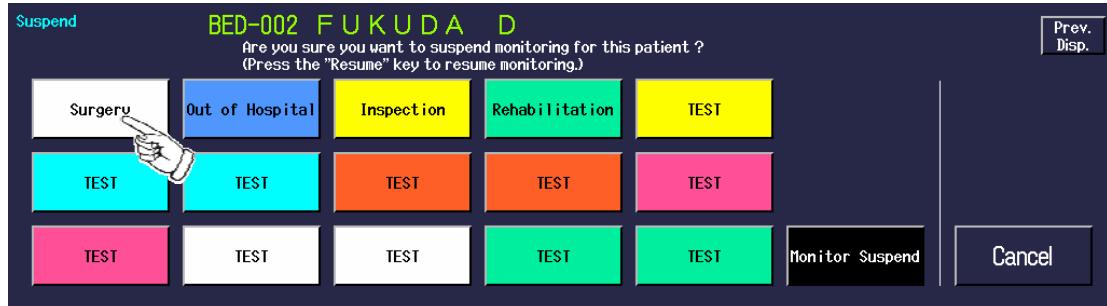
Reference

The preset menu should be set by our service representative or system administrator before starting monitoring.

For setup procedure, refer to "9. Installation Procedure to Start Monitoring 5-3 Set the soft switch".

Monitor suspend duration can be selected on the soft switch menu.

For example, pressing the [Menu] → [Suspend] will display the following screen.



By selecting the reason of monitor suspend (ex. Rehabilitation, Out of Hospital, etc.) on this screen, the screen automatically returns to the home display, and the selected patient will be in a monitor suspend condition with the selected message displayed.



1 Press the [Menu] → [System Config.] → [Mon. Suspend Setup] keys to display the Monitor Suspend Setup menu.

2 Set the monitor suspend message (reason of monitor suspend).

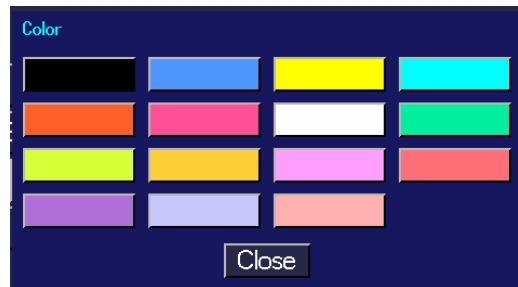
Maximum of 15 monitor suspend messages can be set.



3 Pressing one of the items will display the “Edit message” screen.



- (1) Press **Use** or **Not Use** key, to select whether to use this item or not.
- (2) Use the touch panel key or keyboard, and enter the display message of up to 15 characters.
- (3) By pressing the **Color** key, background color of the message can be set.



Chapter 9

Installation

This chapter explains about the network system, preset menu, and external equipment connection.

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Precautions for Installing the Equipment



- The installation of this equipment will be performed by our service representative. The users should not attempt the installation.
- The system construction and network setup of this equipment should be performed by our service representative or system administrator of your institution.

Precautions about the Operating Environment

- The following environmental conditions should be observed when operating the DS-7600.
 - Surrounding Temperature : 10 to 40°C
 - Relative Humidity : 30 to 85% (non-condensing)
- The DS-7600 is intended for patient monitoring in ICU, CCU, surgery, and ward. Direct use in MRI environment or home-care should be avoided.
- The power source should fulfill the following condition.
 - Use a hospital grade 3-way outlet. If a hospital grade outlet is not available, make sure to connect the equipotential ground terminal with the accessory ground cable.
 - Verify power voltage and frequency before connecting to an AC power source.
 - Use the power source that can provide adequate power to the device.
- Pay attention when installing or storing the device. Do not install or store in the following locations.
 - Place where chemicals are stored or gas may generate
 - Place where the equipment will be subject to splashing water or humidity from a nebulizer or vapolizer
 - Place where the equipment will be subject to direct sunlight
 - Unstable place with inclination, vibration, or shock.
- Ensure proper ventilation to cool the device.
 - A minimum space of 5 cm is required between vents on 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.



If the monitor is used in an environment not fulfilling the above conditions, not only the monitor will not deliver its maximum performance, but damage to the equipment may occur and safety cannot be ensured. If using in an environment other than specified above, contact our service representative.

System Construction

For the DS-7600 System Central Monitor, the following network system can be constructed.

(1) Wired Network System (DS-LANII/DS-LANIII)

This network system is connected via LAN cable.

By connecting a telemetry receiver, telemetry beds (LW bed) can be also included in this system.

Maximum of 48 beds for DS-LANII and maximum of 100 beds for DS-LANIII can be connected for 1 network segment.

A network administrating monitor (Central ID: 001) is required.

(2) Wireless Network System

This network system is connected via telemetry from the bedside monitor with HLX-561, LX-5160 Telemetry Transmitter, etc.

Maximum of 8 beds can be connected for 1 network segment.

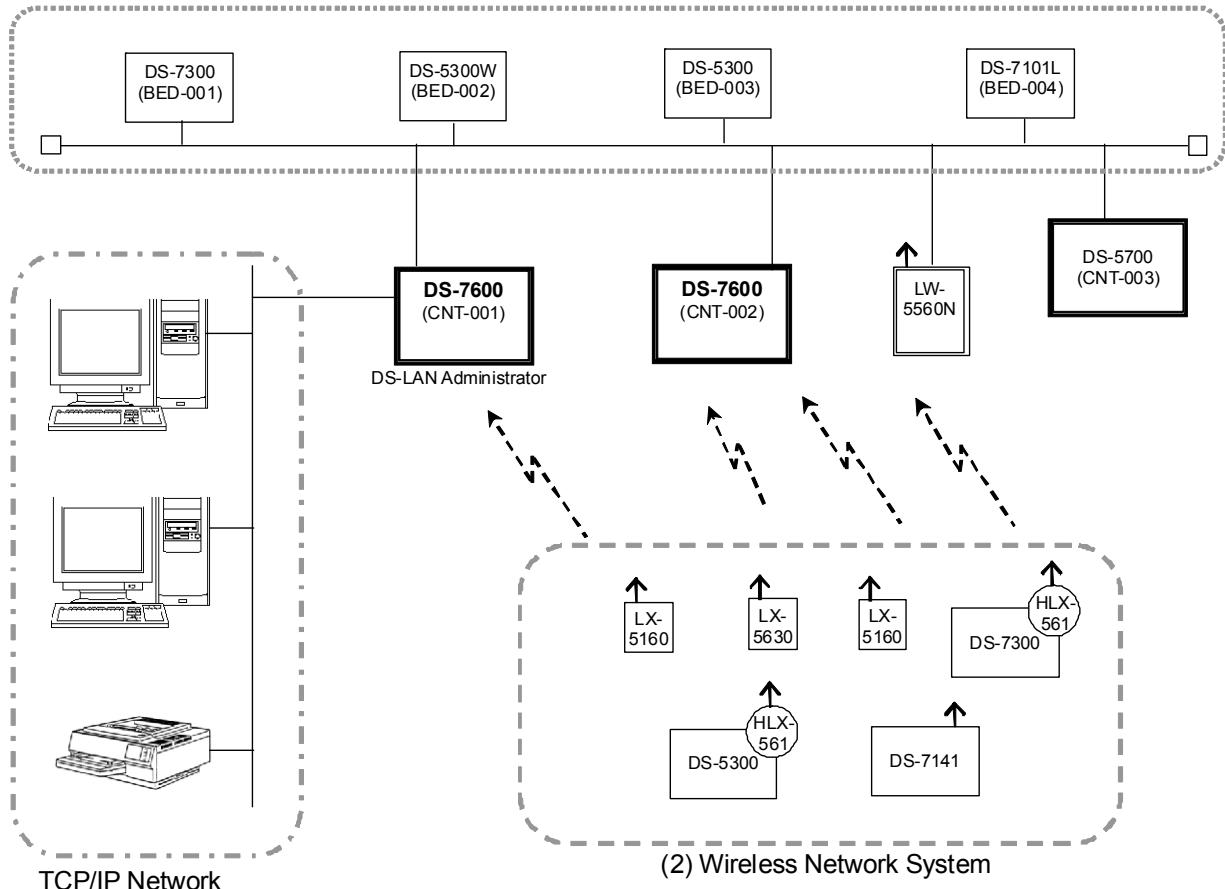
Other than above, TCP/IP network connection is also possible for recording the review data such as graphic trend on the laser printer.



For procedure to set the TCP/IP network, refer to "TCP/IP Network Connection".

(1) Wired Network System (DS-LANII/DS-LANIII)

* For the devices that can be connected to the DS-LANIII network, refer to P9-4 "Devices that can be connected to the Wired Network".



This setup should be performed by our service representative or your network administrator.

Wired Network System

A wired network system can be constructed by using the LAN cable.
Maximum of 48 beds for the DS-LANII network, maximum of 100 beds for the DS-LANIII network can be connected.

⚠ CAUTION

- For the network-administrating monitor (Central ID: 001), the DS-7600 or DS-5700 (in case of DS-LANII) must be set. The network will not function if the DS-5800N/NX/NX^{MB} is set as the network-administrating monitor. Also, make sure not to duplicate the Central ID with other central monitors.
- If more than three DS-5800N/NX/NX^{MB} are connected, the DS-5800N/NX/NX^{MB} cannot display the same patient data on all 3 monitors at the same time. Maximum of 2 monitors are able to display the same patient data.
This restriction does not apply to the DS-5700 and DS-7600.
- For the DS-5800N/NX/NX^{MB} or other bed display for the bedside monitor, maximum of 2 monitors can simultaneously display the same patient data.
- Maximum of 32 beds can be monitored on the DS-5800N/NX/NX^{MB} which is connected to the same wired network with the DS-7600. For example, if more than three (3) DS-5800N/NX/NX^{MB} are connected, and if 16 beds are monitored on each DS-5800N/NX/NX^{MB}, maximum of 32 beds from the smallest central ID and from the prior display location can be displayed. The exceeded beds will not be displayed on the DS-5800N/NX/NX^{MB}.
- For the alarm generation on the bedside monitor connected by wired network, maximum of 2.5 seconds delay will occur for the alarm generation on the DS-7600 system.

● Devices that can be connected to the Wired Network

	DS-LANII	DS-LANIII
DS-5000 Series Bedside Monitor DS-5100, DS-5300/5300W	Yes	No
DS-5000 Series Central Monitor DS-5700, DS-5800N/NX/NX ^{MB}	Yes	No
Central Telemetry Receiver LW-5560N	Yes	No
8ch Recorder AU-5500N	Yes	No
DS-7000 Series Bedside Monitor DS-7100, DS-7300	Yes	Yes
DS-7000, DS-7200	Yes	No
DS-7000 Series Central Monitor DS-7600/7600W	Yes	Yes

Network Restrictions

There are some restrictions on monitoring and setups depending on the constructed network and model type/software version of the monitor connected to the network.

Restrictions for Monitor Setup

There are some setups that can be performed only on the network administrator of the wired network system.

Also, when more than one monitor are used in a same network, there are some setups that should be the same for all monitors (both central monitors and bedside monitors).

The following lists show these restrictions for setup.

If only one DS-7600 is used in a wireless network system, there are no restrictions for setup.

Tips

The data transfer function using the PC/CF card is useful when applying the same setups for more than one DS-7600 Central Monitors.
→ “To Read/Write the Card Data”

This setup should be performed by our service representative or your network administrator.

●Setup Item Synchronizing to the Network Administrator

Setup Item	Synchronize to Wired Network Administrator
System Configuration	
Display Configuration	
Display Layout (ex. 4Beds 2Waves)	No
Short Trend	No
Name Zoom	No
Brightness Setup	
Brightness	No
Tone/Volume	
All Setup	No
Sweep Speed	
All Setup	No
Preset	
Recorder Setup	
LX Remote Rec.	Yes
Rec. Paper BP Scale	Yes
Rec. Paper CO ₂ Scale	No
Meas. Info. Rec.	Yes
Paper Feed to Top	No
Paper Feed to End	No
QRS Classification	No
Print Calibration	No
Bed Register	
Registered Bed	No
Channel Setup	
Channel for Each Bed	No
Group ID	No
Stored Channels	No
Soft Switch	
Display measurement error on NIBP list	No
Date	Yes
Disregard Artifact Ch. at QRS Detect	Yes
Drift Filter	No
AC Filter	Yes
Setup at Discharge	No
Home Display	No
Patient ID Starting Column	No
Rec. Paper	No
Wave Thickness	No
12-Lead	No
Sync Tone Bed Selection	No
Sync Mark	No
Monitor Suspend's Message Selection	No
Monitor Suspend Time	No
Unit	
All	No
Serial Comm Setup	
Function assigned to each COM port	No

Setup Item	Synchronize to Wired Network Administrator
Bed Name Registration	
Bed Name	No
User Key	
All	No
Clock	
Clock	Yes
Central ID	
All	No
Network Configuration	
All	No
Alarm-related Setup	
Alarm Silence Time	No
Alarm Suspend Time	No
Too Far Alarm	No
Chk TLM Battery Alarm	No
Asystole/VF/VT Alarm Setup	Yes (Only for DS-LANIII)
Suspend Arrhy. Analysis during Noise Interference	Yes ^{*1}
During "Check SpO ₂ Sensor"	
Alarm Judgement	No
Message	No
Alarm Sound	No
During Lead OFF	
Alarm Judgement	Yes
Alarm Record	Yes
Lead OFF Message	No
Lead OFF Alarm Interval	No
During "NIBP measurement failed"	
Alarm	No
Alarm Pole Output Setup	No
Alarm Wave Background	No
Event Key	No
Admit Setup	
All	No
Keyboard/Mouse Setup	
All	No
Slave Setup	
All	No

^{*1} It will not be synchronized if the network administrator is DS-5700.

This setup should be performed by our service representative or your network administrator.

●Setup Item Synchronizing within the Same Network System

Setup Item	Synchronize within the same Network	
	DS-LANII	DS-LANIII
Patient Information		
Patient ID	Yes ^{*1}	Yes
Patient Name	No	Yes
Pacemaker Use	Yes	Yes
Patient Type	Yes	Yes
Comment	No	No
Height/Weight/BSA	Yes	Yes
Birth Date/Age	Yes	Yes
Sex	Yes	Yes
Alarm		
Alarm Suspend	Yes	Yes
Alarm Silence	Yes	Yes
HR Alarm Setup	Yes	Yes
Asystole Alarm Setup	Yes	Yes
VF Alarm Setup	Yes	Yes
VT Alarm Setup	Yes	Yes
Slow VT Alarm Setup	No	Yes
RUN Alarm Setup	Yes	Yes
Couplet Alarm Setup	No	Yes
Pause Alarm Setup	No	Yes
Bigeminy Alarm Setup	Yes	Yes
Trigeminy Alarm Setup	No	Yes
Frequent Alarm Setup	Yes	Yes
Tachy Alarm Setup	Yes	Yes
Brady Alarm Setup	Yes	Yes
HR Low Limit for VT ^{*4}	Yes	Yes
HR Low Limit for RUN ^{*4}	Yes	Yes
ST1 Alarm Setup	Yes	Yes
ST2 Alarm Setup	Yes	Yes
BP1 Alarm Setup	Yes	Yes
BP2 Alarm Setup	Yes	Yes
BP3 Alarm Setup	Yes	Yes
BP4 Alarm Setup	Yes	Yes
BP5 Alarm Setup	Yes	Yes
BP6 Alarm Setup	Yes	Yes
NIBP Alarm Setup	Yes	Yes
RR Alarm Setup	Yes	Yes
APNEA Alarm Setup	Yes	Yes
SpO ₂ Alarm Setup	Yes	Yes
PR Alarm Setup	Yes	Yes
EtCO ₂ Alarm Setup	Yes	Yes
InspCO ₂ Alarm Setup	Yes	Yes
GAS Alarm	No	No
TEMP1 Alarm Setup	Yes	Yes
TEMP2 Alarm Setup	Yes	Yes
Parameter Setup		
ECG		
Arrhy Relearn	Yes	Yes
ECG1 Lead	Yes ^{*2}	Yes ^{*2}
ECG1 Waveform Size	Yes	Yes
ECG1 Baseline Position	No	No
ECG2 Lead	Yes ^{*2}	Yes ^{*2}
ECG2 Waveform Size	Yes	Yes
ECG2 Baseline Position	No	No

*1 For DS-7100 system of V05-01 and after, all 20 digits will be synchronized. For prior version, only 10 digits will be synchronized.

*2 Some leads cannot be synchronized depending on the used transmitter and lead cable type.

*3 The NIBP measurement interval synchronizes for the following case. (The measurement time for "Timer" function will not be synchronized.)
 • DS-7100 system of V08-01 and after
 • DS-7300 system of V06-01 and after

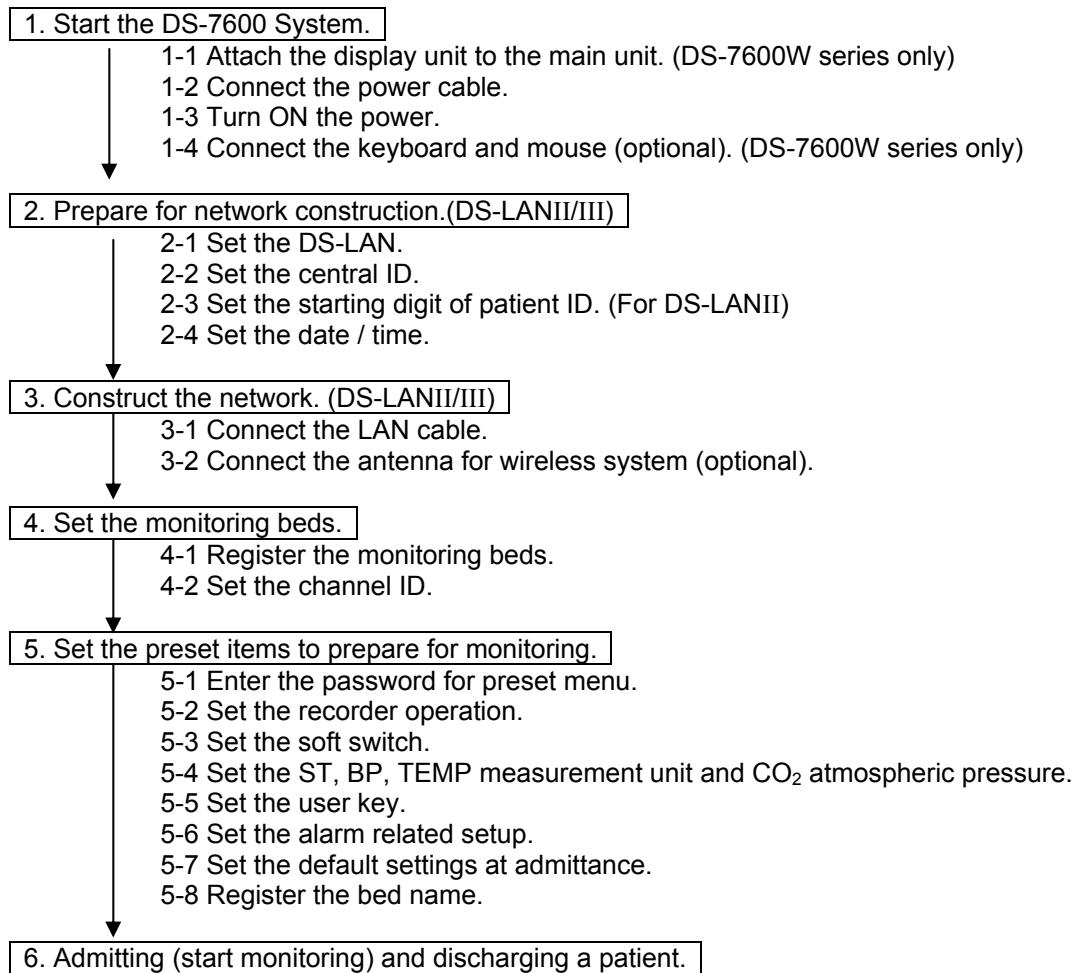
*4 This setting is not possible for the DS-5000 series beds and the beds using telemetry receiver (LW-5560N).

Setup Item	Synchronize within the same Network	
	DS-LANII	DS-LANIII
Sync Tone	No	No
AC Filter	No ("Yes" for LW bed)	No ("Yes" for LW bed)
Drift Filter	No ("Yes" for LW bed)	No ("Yes" for LW bed)
QRS Pace Mask	Yes	Yes
Pace Pulse	Yes	Yes
QRS Detect	Yes	Yes
BP1 to BP6		
BP Waveform Scale	No	No
NIBP		
NIBP Auto Mode Interval	No	Yes ^{*3}
SpO ₂		
SpO ₂ Waveform Size	Yes	No
Sync Tone (Refer to ECG Config.)	No	No
RESP		
RESP Waveform Size	Yes	Yes
CVA Detect	Yes	Yes
CO ₂		
CO ₂ Waveform Scale	No	No
CO ₂ Unit	No	No
GAS		
O ₂ Waveform Scale	No	No
AGT Waveform Scale	No	No
Parameter ON/OFF	All	No
Function		
Graphic Trend / Tabular Trend	All	No
Recall		
Wave Select	No	No
Display Select	No	No
Full Disc. Wave	All	No
ST Display/12-Lead ST	Ref. Point / Meas. Point	Yes
System Configuration		
Record	All	No
Color	All	No
Display Configuration		
Home Display Config.	No	No
Indiv. Display Config.	No	No

This setup should be performed by our service representative or your network administrator.

Procedure to Start Monitoring

In this section, installation / preparation of the device, setup procedure, admit/discharge procedure will be explained.



NOTE

The short-term backup battery used for this device needs to be replaced periodically. (Every 3 years depending on the used frequency) Write the replacement date on the Parts Replacement Label supplied as accessory and use it for indication of replacement period.

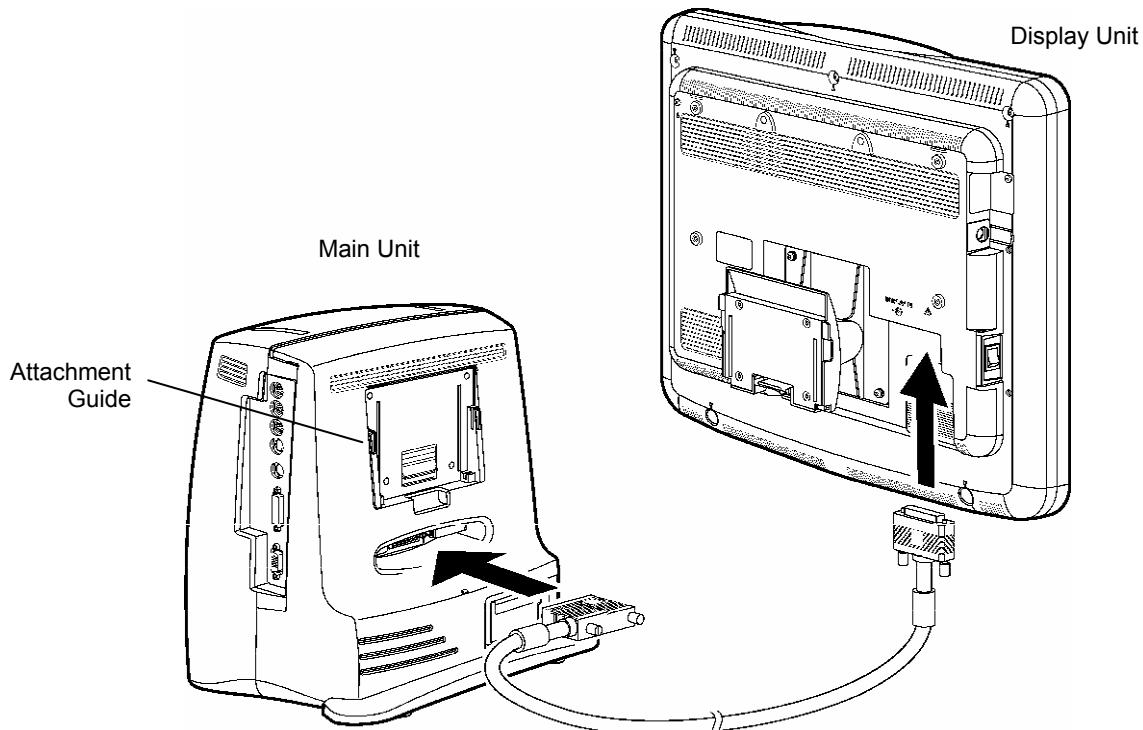
1 Start the DS-7600 System

1-1 Attach the display unit to the main unit. (DS-7600W series only)

To use the 19-inch display unit, it is necessary to first attach the display unit to the main unit. For the DS-7600 series, this procedure is not necessary as the display unit is already connected to the main unit with a cable.

1 Connect the main unit and display unit using the display unit connection cable (CJ-731S).

The power will be supplied to the display unit from the main unit via cable.



2 Attach the display unit to the main unit.

Insert from the top along the attachment guide, and push in until it clicks into position. Make sure it is securely locked.

WARNING

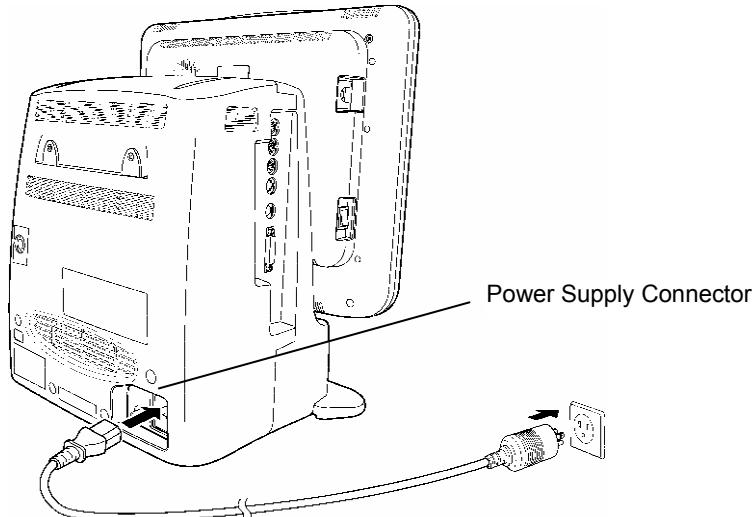
- When lifting up the device, hold the lower part of the main unit.
- Make sure that the display unit is securely locked into position on the main unit.

This setup should be performed by our service representative or your network administrator.

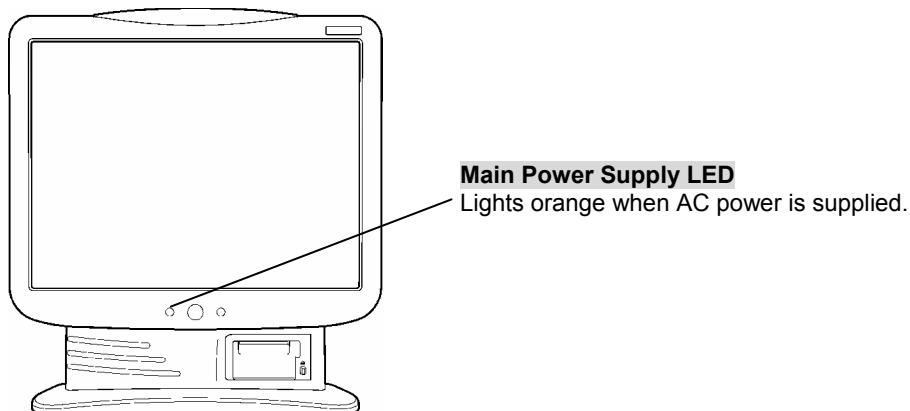
1-2 Connect the power cable.

Connect the accessory power cable (CS-24) to the power supply connector on the rear side of the main unit.

Connect the other end of the power cable to the hospital grade outlet with ground terminal.



When the power cable is connected, the main power supply LED will light in orange to notify that the AC power is supplied.



WARNING

- Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.
- When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipment. Even a small potential difference may result in electric shock to the patient and the operator.

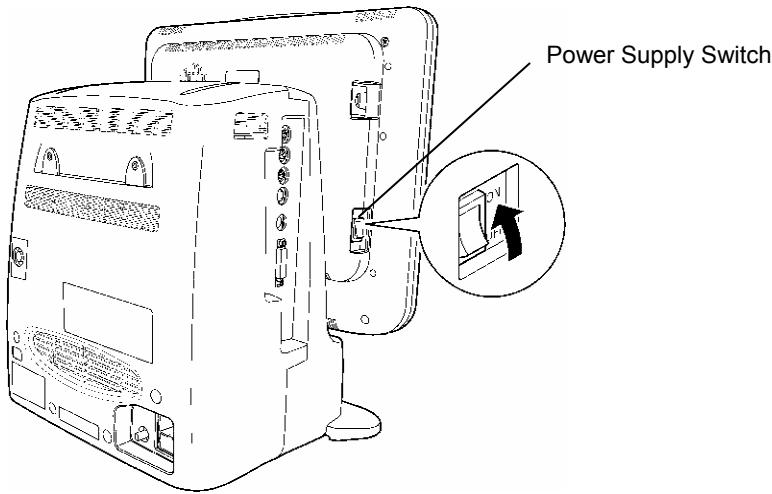
NOTE

Equipotential Grounding

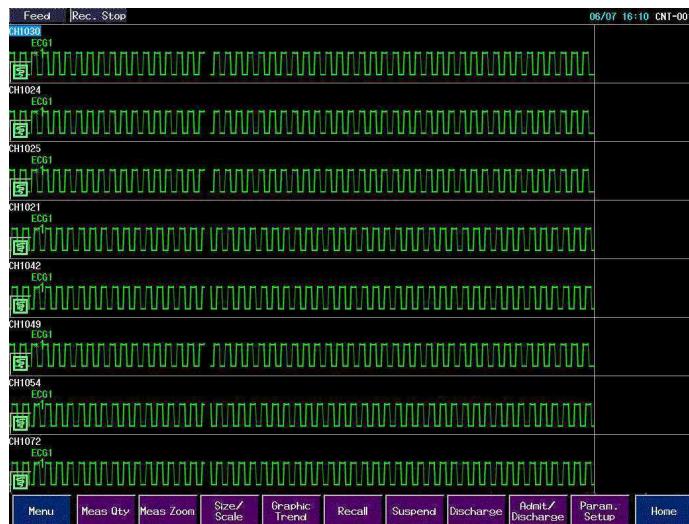
When connecting multiple devices, electrical potential difference may be generated between the devices. This may result in electric shock to the patient connected to these devices. Pay special attention for use in the operating room, ICU, CCU, Cardiac Catheter Laboratory, and Cardiovascular X-ray room.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

1-3 Turn ON the power.

- 1 Turn ON the power switch located at the left side of the display unit.
The main power supply LED will light in green.**



The display will turn ON.



[Example of Startup Display]

The display will differ according to the setup.



The display brightness can be adjusted for optimum view.
→ "8. System Configuration Brightness"

This setup should be performed by our service representative or your network administrator.

1-4 Connect the keyboard and mouse (optional). (DS-7600W series only)

CAUTION

The mouse and keyboard function is supported for the DS-7600W series only.

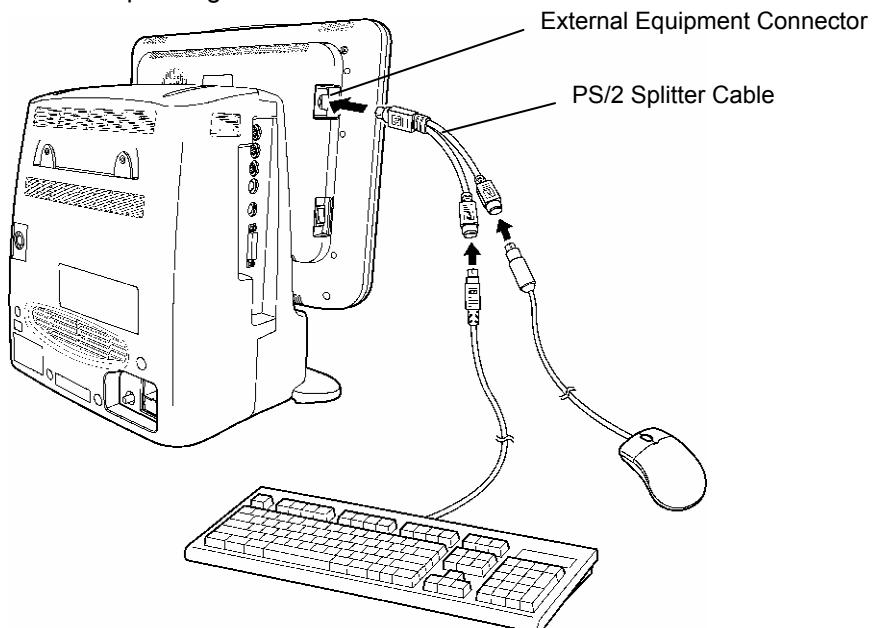
By connecting a keyboard, character input can be performed using the keyboard. Also, by connecting a commercially available mouse, the touch panel keys can be controlled by clicking the mouse. Use the PS/2 keyboard and PS/2 mouse.



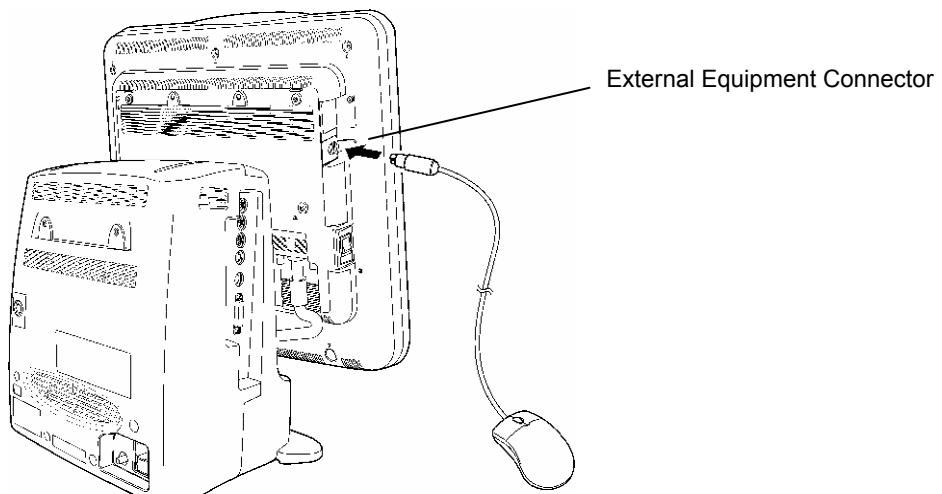
When using the keyboard and mouse, keyboard and mouse setup will be necessary.
→ "Keyboard / Mouse Setup"

- 1 When using both the keyboard and mouse, or using the keyboard only, first connect the PS/2 Splitter Cable to the external equipment connector located at the left side of the display unit. Then, connect the keyboard and mouse to the PS/2 Splitter Cable.**

On the PS/2 Splitter Cable, a keyboard mark and a mouse mark is indicated. Properly connect to the corresponding connectors.



- 2 When using only the mouse, connect the mouse directly to the external equipment connector located at the left side of the display unit.**



2 Prepare for network construction. (DS-LANII/III)

2-1 Select the DS-LAN System (DS-LANII/III)

When using the wired network, it is necessary to select the DS-LAN system (DS-LANII or DS-LANIII) for all the monitors within the same network.

⚠ CAUTION

- The two different network systems (DS-LANII and DS-LANIII) cannot exist in the same network.
- Make sure that DS-LAN setup (DS-LANII/DS-LANIII selection) is the same for all monitors connected to the same network.
- If the DS-LAN setup is changed from DS-LANIII to DS-LANII, the registered beds from 49th to 100th will be cancelled and patient data for these beds will be erased.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → → **DS-LAN Setup** keys.
Select **DS-LANII** or **DS-LANIII** for the wired network.



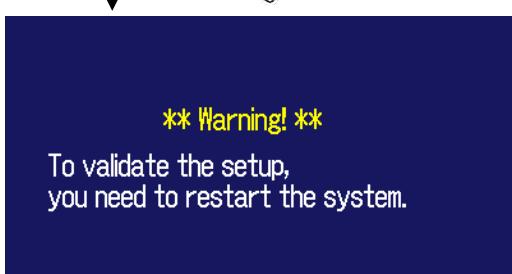
- 2 Press the **Enter** key to validate the setup. It is necessary to restart the system.



- (1) When the DS-LAN setup is changed from DS-LANIII to DS-LANII, a confirmation screen will be displayed if there are beds that will be removed from the registration.



- (2) When the **OK** is pressed, a warning message will be displayed.



- (3) Turn OFF the power, and then turn it ON again.

⚠ WARNING

Once the warning message is displayed, all operations will not be possible until the system is restarted.

This setup should be performed by our service representative or your network administrator.

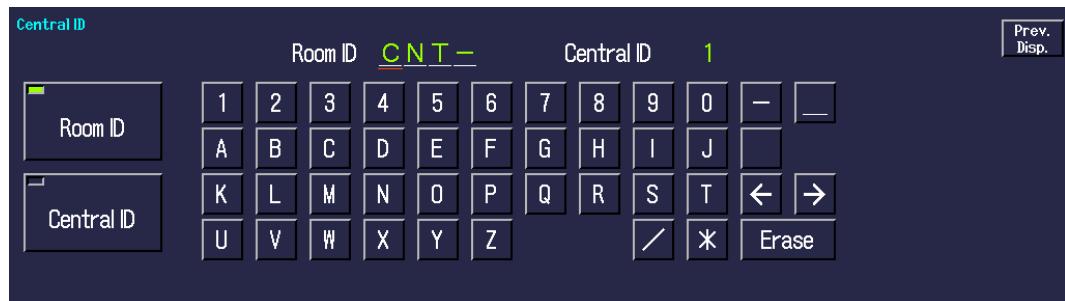
2-2 Set the Central ID (DS-LANII/III).

A Central ID must be set to connect to the DS-LANII/III network system.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Central ID** keys to display the central ID setup menu.

Use the **Room ID** / **Central ID** keys shown on the left to switch the screen.

[Room ID]



A letter will be input to the red underlined position.

Maximum of 4 letters can be input for the Room ID using the numeric keys and alphabet keys.

[Central ID]



The Central ID can be set from 1 to 8 for the DS-LANII network, and from 1 to 16 for the DS-LANIII network.

⚠ CAUTION

The central monitor with the Central ID: 001 will function as a network-administrating monitor. One of the central monitors must have the Central ID: 001 in a network system.
Also, make sure not to duplicate the Central ID with other monitors.

2-3 Set the starting digit of patient ID. (For DS-LANII/III)

The DS-7600 is capable to enter 20 digits for the patient ID on the patient admit menu. However, there are some bedside monitors connected to the DS-LANII network that can enter only up to 10 digits.

The "Patient ID Starting Column" sets the starting digit of 10 letters to transmit to the bedside monitor.

In case of DS-LANIII network, all 20 digits can be transmitted between the central monitor and bedside monitor. However, if **Center** is selected for the recorder on the bedside monitor, the central monitor recorder can print only up to 10 digits. The starting digit to be printed will be according to the bedside monitor setting.

Ex.) Patient ID : ABCDEFGHIJ0123456789 (20digits)

If the patient ID starting digit is set as **5**,

→ The patient ID will be EFGHIJ0123.

1 Press the **Menu → **System Config.** → **Pre-set** → enter password →**

Soft Switch keys to set the soft switch menu.

Set the starting digit using the **◀** or **▶** keys.



This setup should be performed by our service representative or your network administrator.

2-4 Set the date / time (DS-LANII/III).

Set the current year, month, day, hour, and minute.

⚠ CAUTION

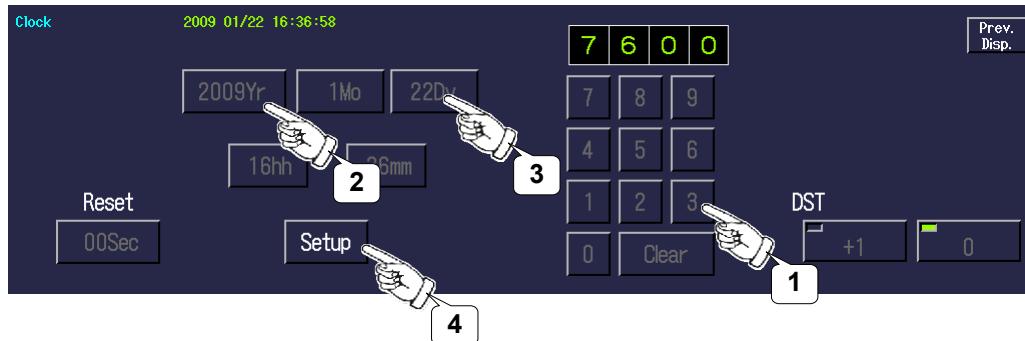
- The time will be synchronized with the following priority.
 - 1) Administrating monitor, if wired network is constructed. (Time can be set only on the administrating monitor.)
 - 2) SNTP server, if used.
 - 3) Patient data server, if used, and if “Time Synchronization” on Patient Data Server setup is set to **ON**, or if **Time Synchronization** is selected.
- If the time is changed during monitoring, error may be caused to the NIBP list data. The date / time must be set before monitoring.

1 Set the **Menu** → **System Config.** → **Pre-set** → enter password → **Clock** keys to set the date/time setup menu.

⚠ CAUTION

The preset menu includes important setup items for the whole system. Therefore, a password is required to allow only the system administrator to change the setup items on the preset menu.

2 Enter the year, month, day, hour, and minutes.



(1) Enter the year using the numeric keys.

(2) Press the **Yr** key.

(3) Enter the month, day, hour, minute using the numeric keys and press the **Mo**, **Day**, **hh**, **mm** keys respectively.

Ex.) May 17, 2004 19:19

2 0 0 4 Yr 5 Mo 1 7 Day 1 9 hh 1 9 mm

(4) Press the **Setup** key to validate the setup.

3 Press the “Reset” **00 sec** key to reset to “00” second.



NOTE

- Pressing the **Setup** key will not reset to “00” second.
- The reset key can be pressed only once per minute.

4 Set the daylight saving time (DST).

+1 will set the daylight saving time.

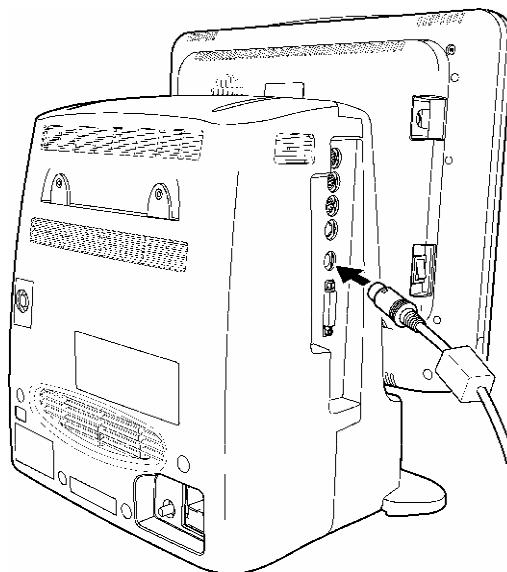
0 will not set the daylight saving time.

3 Construct the network (DS-LANII/III).

3-1 Connect the LAN cable.

By connecting the DS-5000 system bedside monitors or DS-7100 system bedside monitors to the DS-7600 with LAN cable, DS-LANII/III network system can be constructed. Maximum of 48 beds for the DS-LANII and maximum of 100 beds for the DS-LANIII network can be connected.

- 1 **Connect the CJ-522 Ethernet Branch Cable to the DS-7600 and the other side to the HUB.Or, connect the CJ-530 LAN Interface Cable to the DS-7600 and the other side to the LW-5560N.**



WARNING

- Be careful not to confuse the HUB for the DS-LAN network and the TCP/IP network. Fukuda Denshi is not liable of the operation caused by improper network connection.
- For the DS-LANII network, use the specified repeater HUB (10M), and for the DS-LANIII network, use the specified switching HUB (100M). If unspecified HUB is used, communication failure will occur.

CAUTION

- Make sure that DS-LAN setup (DS-LANII / DS-LANIII selection) is the same for all monitors connected to the same network.
- To construct a DS-LANIII network, it is necessary that all monitors are compatible with the DS-LANIII.

This setup should be performed by our service representative or your network administrator.

3-2 Connect the Antenna for Wireless System (Optional)

The DS-7600 system incorporates a telemetry module, which receives biological information and waveforms from a telemetry transmitter.

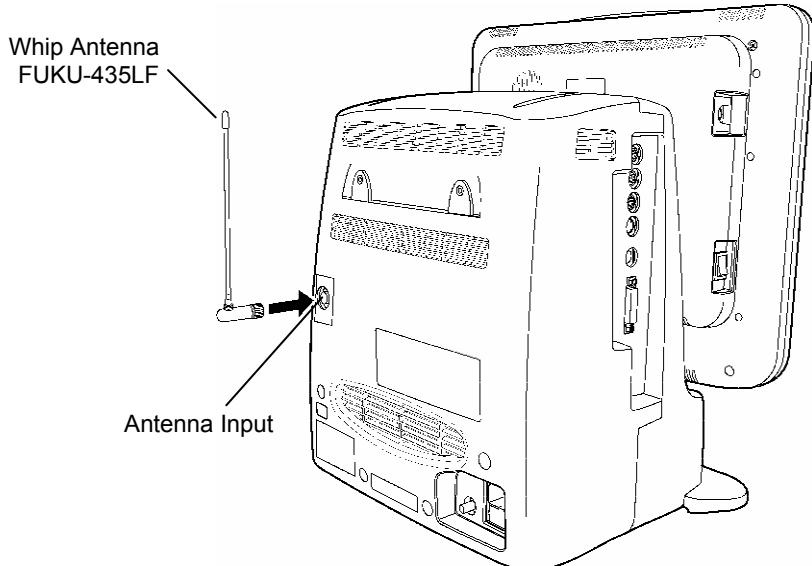
The number of wireless beds that can be monitored on the DS-7600/7600W series depends on the model type.

Model Type	Wireless Beds
DS-7680	8 beds
DS-7640W	4 beds
DS-7680W	8 beds

When constructing a wireless network system, you will need the optional 435MHz Whip Antenna (FUKU-435LF).

NOTE	For the DS-7600L and DS-7600WL, telemetry reception is not possible, as they do not incorporate a telemetry receiver module.
-------------	--

- 1 Connect the optional 435MHz Whip Antenna (FUKU-435LF) to the antenna input connector located at the rear of the DS-7600.**



4 Set the monitoring beds.

4-1 Register the monitoring beds.

Maximum of 16 beds can be registered for monitoring.

The programmed beds can be selected on the bed selection menu for the display configuration.
(**Menu** → **System Config.** → **Display Config.** → **Bed Sel.**)

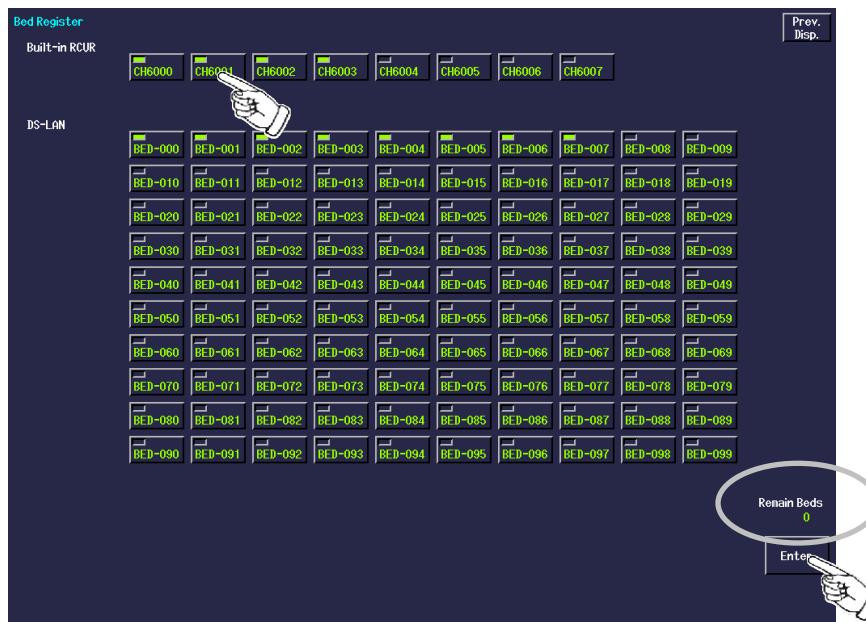
CAUTION Canceling the bed registration will clear all data for that bed.

NOTE

For the beds connected to the wired network system (BED, LW), some functions (ex. arrhythmia alarm such as Slow VT, Couplet) are restricted.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Bed Register** keys to display the Bed Registration display.

The beds which can be monitored on the DS-7600 will be displayed in green.



[Built-in RCVR (RF)]

CHxxxx indicates telemetry beds which construct the wireless network system. (RF)

NOTE

This selection is not possible for the DS-7600L/DS-7600WL.

[DS-LAN]

CHxxxx indicates telemetry beds which construct the wired network system. (LW).

BED-xxx indicates wired beds which construct the wired network system. (BED)

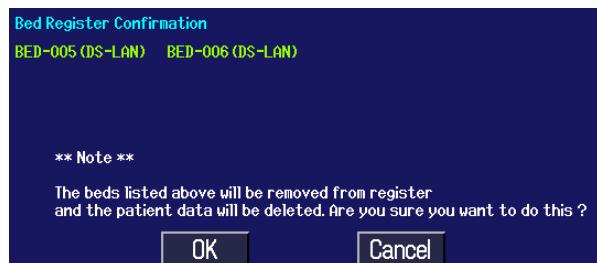
- 2 Select the monitoring beds.

"Remain Beds" will be displayed at the right side to indicate the remaining number of beds that can be selected.

- 3 Press the **Enter** key after selecting the beds.

If there are beds that will be removed from the registration, a confirmation screen will be displayed. If OK, press the **OK** key.

This setup should be performed by our service representative or your network administrator.



NOTE	The setup will not be validated unless the Enter key is pressed. Make sure to press the Enter key.
-------------	---

4-2 Set the channel ID.

When using a wireless system, it is necessary to set the channel ID, zone, and band of the receiving telemeter.



- Make sure to set the correct channel ID.
- Some wireless combinations of telemetry transmitters may generate interference with other devices.
- Before selecting the 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 neighboring facility must make agreements on the setting of telemetry channels to prevent telemetry interference.
- If channel ID is changed for the transmitter, make sure to replace the channel label attached to the transmitter with a new one.
- If the channel ID is changed without notifying, it will result in monitoring an incorrect patient. To avoid incorrect diagnosis, make sure that the channel ID corresponds to the patient.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Channel Setup** keys.

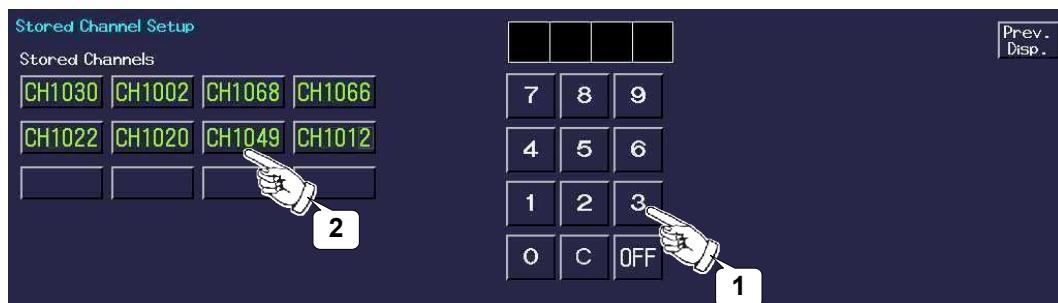
The channel setup menu will be displayed.

Currently programmed channel ID							
Channel Setup	Bed1	---	Bed5	CH5042			
	Bed2	CH1004	Bed6	CH5017	7	8	9
	Bed3	CH5041	Bed7	CH6015	4	5	6
	Bed4	CH5042	Bed8	CH6021	1	2	3
GROUP ID					0	Clear	
					Store Setup		
					Prev. Disp.		
Stored Channels							
CH6022 CH1004 CH4012							

2 Maximum of 12 frequently used channel ID can be programmed.

Press the **Store Setup** key.

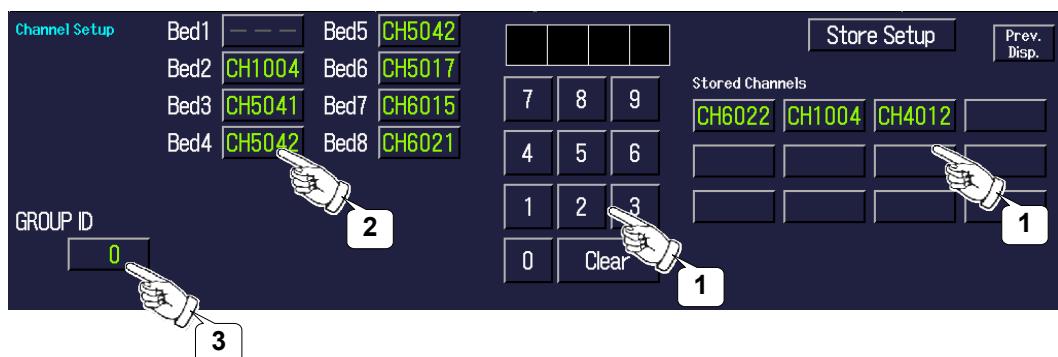
The channel registration menu will be displayed.



- (1) Enter a 4-digit number (medical telemetry channel ID) using the numeric keys.
- (2) Press the key at the left side of the display. The entered ID will be programmed for "Stored Channels". Only the medical telemetry channel ID can be set.

After programming the channel ID, press the **Prev. Disp.** key to return to the channel ID setup menu.

3 Set the channel ID and group ID.



- (1) Select a channel from the programmed channel on the right side of the display.
Or, use the numeric keys and enter the 4-digit number (medical telemetry channel ID).
- (2) Select a bed to assign that channel ID.
Select a bed by pressing the key at the left side of the display. The channel ID will be assigned to that bed.
- (3) Enter the group ID in the range from 0 to 63.

NOTE

- If wired network (DS-LANII/III) and wireless system are used simultaneously, the group ID must be set to "0".
- The channel ID can be set only for the beds displayed on the current display configuration
To perform setup for all telemetry beds programmed at system construction, it is recommended to set the display configuration to 16-beds 1-waveform.
→ "8. System Configuration Display Configuration Display Layout for the Home Display"

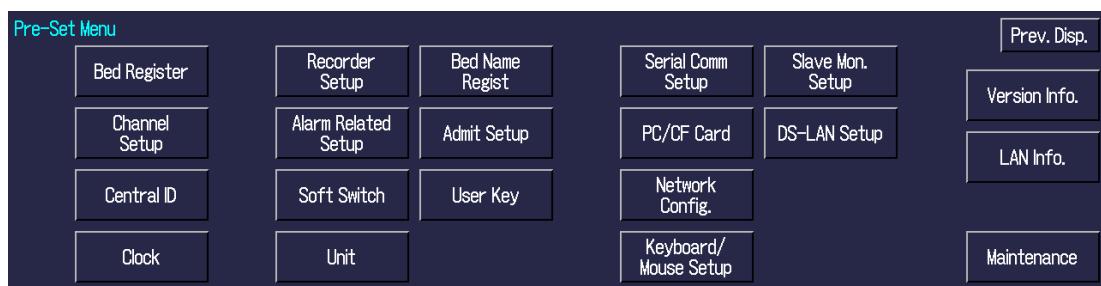
5 Set the preset items to prepare for monitoring.



- The preset menu includes important setup items for the whole system. Only the system administrator should perform this setup.
- Some preset setups are restricted to network-administrating monitor (central ID: 001) when connected to wired network system. For details, refer to "Network Restrictions".

The setup procedure for each preset item is explained below.

If using more than one DS-7600 system central monitor, using the PC/CF card will enable same setups for all monitors.



(Display Example for DS-7600W series)

- | | | |
|---------------------|---|---|
| Recorder Setup | : | Set ON/OFF of paper feed, QRS classification, etc. |
| Soft Switch | : | Set AC frequency, setup at discharge, etc. |
| Unit Setup | : | Set the unit for ST level, BP, TEMP and CO ₂ atmospheric pressure. |
| Bed Name Register | : | Register bed name. |
| User Key | : | Set the frequently used key at the bottom of the display. |
| Alarm-related Setup | : | Set alarm suspend time, alarm silence time, etc. |
| Admit Setup | : | Set the alarm initial settings at patient admittance. |

For the following items, refer to the corresponded section.

- | | | |
|--------------------------|---|---|
| • Bed Register | : | "4-1 Register the monitoring beds." |
| • Channel Setup | : | "4-2 Set the channel ID." |
| • Clock | : | "2-4 Set the date/time" |
| • Central ID | : | "2-2 Set the central ID" |
| • Network Configuration | : | "TCP/IP Network Connection" |
| • Keyboard / Mouse Setup | : | "Keyboard / Mouse Setup (DS-7600W Series Only)" |
| • Slave Monitor Setup | : | "Using the Slave Monitor" |
| • PC/CF Card | : | "Using the PC/CF Card" |
| • DS-LAN Setup | : | "2-2 Set the DS-LAN" |
| • LAN Info. | : | "10. Maintenance" |
| • Version Info. | : | "10. Maintenance" |
| • Maintenance | : | "10. Maintenance" |



- Many of the preset menu setup items can be set only on the network-administrating monitor (Central ID: 001). Such preset menu keys will not be displayed on other monitors.
- If constructing a network with more than one central monitors, the same preset setup should be applied to all central monitors.

This setup should be performed by our service representative or your network administrator.

5-1 Enter the password for preset menu.

The preset menu includes important setup items for the whole system. Therefore, a password is required to allow only the system administrator to change the setup items on the preset menu.

- 1 Press the **Menu** → **System Config.** → **Pre-set** keys.

A password will be required.



- 2 By entering the correct password, the preset menu will be displayed.

5-2 Set the recorder operation.

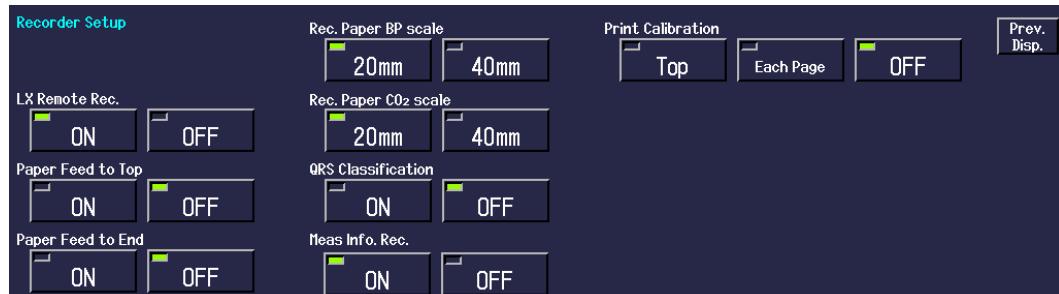
NOTE

The following items will be set according to the network-administrating monitor (central ID: 001) when more than one central monitors are connected to the wired network (DS-LANII/III).

- LX remote recording
- BP Scale on the recording paper
- Measurement Information Recording

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Recorder Setup** keys.

The recorder setup menu will be displayed.



- 2 Select ON/OFF of LX remote recording.



When a telemetry transmitter (LX-5160, LX-5630) is used, whether to perform telemetry remote recording can be selected.

ON will perform the remote recording from the transmitter.

OFF will not perform the remote recording from the transmitter.

This setup should be performed by our service representative or your network administrator.

3 Select whether to feed the paper to the top of the page.



- ON** will start the recording from the next perforation on the recording paper.
 OFF will start recording from the end position of the last recording.

4 Select whether to feed the paper to end page after recording.



- ON** will feed the recording paper to perforation after recording is completed.
 OFF will not feed the paper after recording.

5 Select the recording scale for BP and CO₂ waveform.



- 40mm** will record the waveform in 40mm scale.
 20mm will record the waveform in 20 mm scale.
The recording accuracy is lower but overlapping onto other waveforms can be avoided.

6 Select whether to print the QRS classification.



- Whether or not to print the QRS symbol listed below can be selected.
 ON will print the QRS symbol.
 OFF will not print the QRS symbol.

NOTE

The QRS symbol cannot be printed for manual recording if "None" is selected for delay time and for periodic recording. To print the QRS symbol, set the delay time to 8 seconds on the manual recording setup menu.

Symbol	Description
N (Normal)	Normal QRS Beat
V (VPC)	Ventricular Extrasystole
P (Pacing Beat)	Pacing beat
F (Fusion Beat)	Fusion beat of pacing and spontaneous beat
? (Undetermined Beat)	Learning arrhythmia, or unmatched beat

7 Select whether to print the status information.



- ON** will print the status information.
 OFF will not print the status information.

NOTE

This function is for maintenance only. For details, please refer to our service representative.

8 Select whether to print the calibration on the waveform.



- Top** will print the calibration only at the beginning of the waveform.
 Each Page will print the calibration on each page of the recording paper.
 OFF will not print the calibration.

5-3 Set the soft switch.

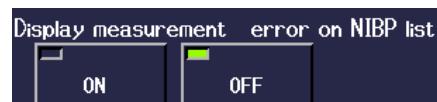
NOTE	For the wired network system, the setup of “Disregard Artifact Ch. at QRS Detect” and “AC Filter” can be performed only on the network-administrating monitor (central ID: 001). The same setup will be applied to other central monitors.
-------------	--

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Soft Switch** keys to display the soft switch menu.



[Display measurement error on NIBP list]

Whether or not to display the error data on the NIBP list can be selected.



ON will display the error data.

OFF will not display the error data.

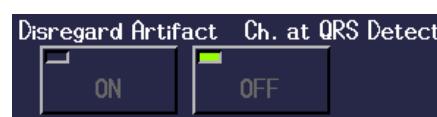
[Date]

The display format for the date can be selected. This setup will be applied to display and recording.



[Disregard Artifact Ch. at QRS Detect]

This selection can be made when monitoring 2 channels of ECG waveform (ECG1 and ECG2). Merging the ECG1 and ECG2 waveform will allow QRS detection if one of the ECG waveform has stable QRS amplitude. However, if either of the ECG waveforms is in lead-off condition or contains artifact, QRS may be erroneously detected causing inaccurate heart rate measurement. “Disregard Artifact Ch. at QRS Detect” allows selection of QRS detection procedure in such case.



ON will detect QRS by merging ECG1 and ECG2. However, if artifact is present on one of the waveforms, detection is made using the stable ECG waveform only.

OFF will always detect QRS by merging ECG1 and ECG2.

NOTE	When ON is selected, and both ECG1 and ECG2 contain artifact, the QRS detection will be performed by merging ECG1 and ECG2. If the QRS amplitude is low for the ECG waveform without artifact, QRS may not be detected and may generate HR alarm or asystole alarm. Make sure both ECG1 and ECG2 are displayed in appropriate size.
-------------	--

This setup should be performed by our service representative or your network administrator.

【Drift Filter】



All Beds ON will set the drift filter ON for all beds.
ON/OFF selection on the ECG setup menu will not be possible.

All Beds OFF will set the drift filter OFF for all beds.
ON/OFF selection on the ECG setup menu will not be possible.

Each Bed will allow ON/OFF selection for each bed on the ECG setup menu.

⚠ CAUTION	The drift filter setup should be the same for all central monitors. Proper function cannot be achieved if the setup is different among the central monitors.
------------------	---

NOTE	The drift filter setup can be performed only for the telemetry beds (RF, LW).
-------------	---

【AC Filter】

If AC noise is present on the ECG, the AC frequency factor (50 or 60Hz) can be removed.
Select 50Hz or 60Hz according to the used AC power source.



Select **50Hz** or **60Hz**.

⚠ CAUTION	Unless the correct power frequency is set, the AC filter will not properly function.
------------------	--

NOTE	The AC filter can be set only for the telemetry beds (RF, LW).
-------------	--

【Setup at Discharge】

Monitoring condition after discharge process can be set.



Admit will continue monitoring even after the discharge process has been performed.

Suspend will suspend monitoring after the discharge process has been performed. The numeric data display will be cleared, and alarm generation, periodic recording will be suspended.

⚠ WARNING	When Suspend is selected for "Setup at Discharge", the suspend condition on the DS-7600 will continue until the Resume key is pressed, even if the monitoring is performed on the bedside monitor.
------------------	--

⚠ CAUTION	When the discharge process is performed on the bedside monitor or other central monitors, the monitoring on the DS-7600 will not be suspended even if Suspend is selected for "Setup at Discharge".
------------------	--

【Home Display】

Whether to display the all beds display or individual display when the **Home Display** key is pressed can be selected.



All Beds Display will display the home display with all beds display.

Indiv. Display will display the home display with individual display. Pressing the **Home Display** key on the individual display will display the all beds display.

This setup should be performed by our service representative or your network administrator.

[Patient ID Starting Column]



This setup should be performed before network connection.
→ "2-2 Set the starting digit of patient ID"

[Wave Thickness]

The thickness of the waveform displayed on the home display and review display of each patient can be selected from 3 levels.



[12-Lead]



ON will monitor 12-lead ECG waveform.

OFF will not monitor 12-lead ECG waveform. The screen and key for 12-lead will not be displayed either.

[Recording Paper Size]



The recording paper size can be selected from A4 size or letter size. (for laser printer.)

2 Press the **Page Down** key, to display the second page of the soft switch menu.



[Sync Tone Bed Selection]

The bed to generate the synchronized tone can be changed arbitrarily or can be fixed to one bed with this soft switch setting.



Selected Bed will generate the synchronized tone for the currently selected bed on the home display. (The displayed individual bed, or bed with the waveform area outlined in light blue on the home display.)

ECG/SpO₂ Menu will generate the synchronized tone for the bed which ECG or SpO₂ is selected for "Sync Tone" on the ECG or SpO₂ menu. The bed generating the synchronized tone will be fixed to one bed.

[Sync Mark]



Standard will display the synchronized mark for all beds in red.

Emphasize will highlight the synchronized mark for the bed generating the synchronized tone in red.

The synchronized mark for the bed not generating the synchronized tone will be displayed in color set for the corresponding parameter.

If **ECG/SpO₂ Menu** is selected for "Sync Tone Bed Selection", **Emphasize** will be automatically selected.

This setup should be performed by our service representative or your network administrator.

【Monitor Suspend's Message Selection】

Select whether to display the detailed monitor suspend message during the monitor suspend condition.



ON will allow to display the selected detailed monitor suspend message during monitor suspend condition.

Also, **Mon. Suspend Setup** key will be displayed on the system configuration menu to allow setting the user-defined message.

OFF will not allow selection of the detailed monitor suspend message. A message, "Monitor Suspend" will be displayed during monitor suspend condition.

【Monitor Suspend Time】

When the "Monitor Suspend's Message Selection" is set to **ON**, setting this "Monitor Suspend Time" function to **ON** will allow to preprogram the monitor suspend duration (15Min. / 30Min. / 1Hr. /1.5Hr. /2Hr.). When the preprogrammed duration completes, it will be notified by an alarm.



ON will allow to set the monitor suspend duration.

OFF will not allow to set the monitor suspend duration.

If "Monitor Suspend's Message Selection" is set to **OFF**, "Monitor Suspend Time" function cannot be set.

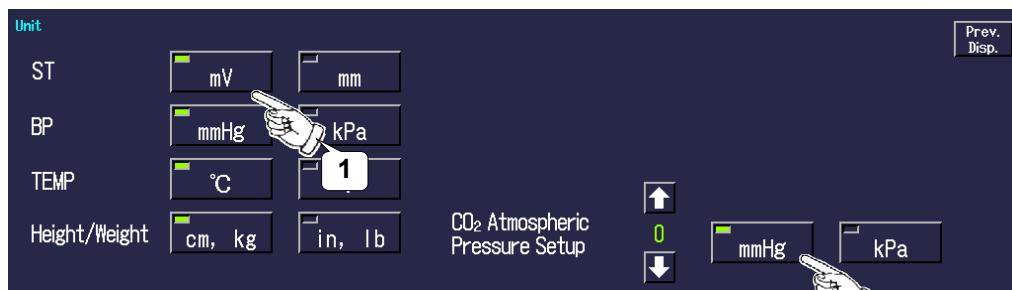
If "Monitor Suspend's Message Selection" setting is changed from ON to OFF, "Monitor Suspend Time" function will be also automatically set to OFF.



For details of Monitor Suspend function, refer to "3 Admit/Discharge of a Patient Suspend Monitoring".

5-4 Set the ST, BP, TEMP, Height/Weight unit and CO₂ atmospheric pressure.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Unit** keys to display the measurement unit setup menu.



(1) Set the ST, BP, TEMP, Height/Weight measurement unit.

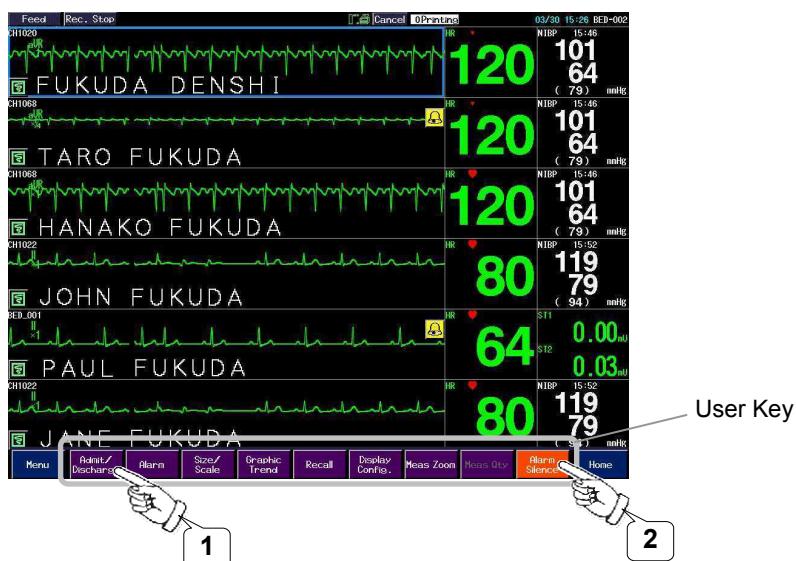
(2) Set the CO₂ atmospheric pressure and measurement unit. Entering the atmospheric pressure will adjust the measurement data to a correct value.



- In case of DS-LANIII network, the measurement unit setting for BP and temperature on the central monitor will synchronize to the network-administrating monitor. If the measurement unit for BP (mmHg/kPa) and temperature (°C/F) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
- In case of DS-LANII network, temperature unit cannot be selected.

5-5 Set the user key.

The frequently used keys can be assigned as user key on the display. Setting the user key allows to directly access the frequently used menu. 7 or 9 user keys can be set for the DS-7600 series, and 10 user keys can be set for the DS-7600W series.



The list below shows the items that can be set as user keys.

There are user keys which function for all beds, and user keys which function only for the selected bed.

(1) Example of [key functioning for individual bed]

Admit/Discharge will display the admit menu for the selected bed.

(For the above display, "FUKUDA DENSHI").

(2) Example of [key functioning for all beds]

Alarm Silence will silence the alarm for all beds.

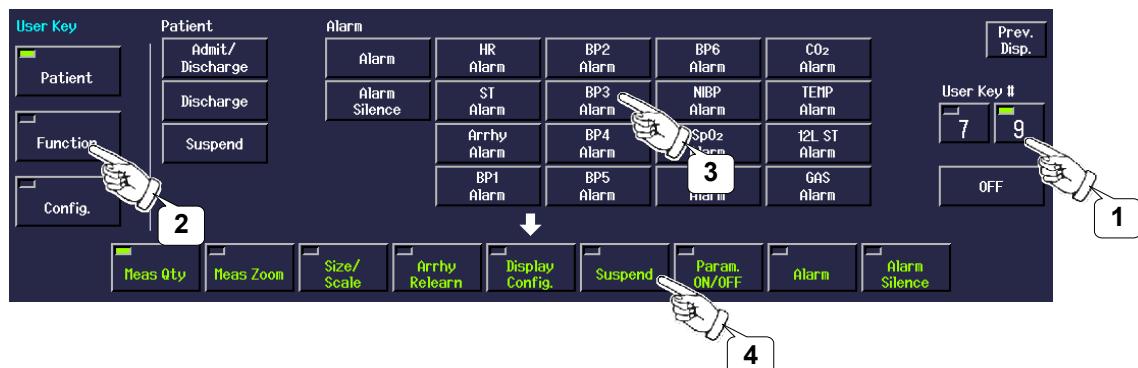
User Keys	Description	Key Control	
		All Beds	Individual Bed
Admit/Discharge			
Admit/Discharge	Displays patient admit menu.		Yes
Discharge	Displays patient discharge menu.		Yes
Suspend	Suspends patient monitoring.		Yes
Alarm			
Each Parameter	Displays alarm setup menu for each parameter.		Yes
Alarm	Displays the alarm setup menu.		Yes
Alarm Silence	Silences the alarm for preprogrammed time (1 to 5min.).	Yes	
Function			
Graphic Trend	Displays graphic trend.		Yes
Tabular Trend	Displays tabular trend.		Yes
Recall	Displays recall list.		Yes
NIBP List	Displays NIBP list.		Yes
ST	Displays ST measurement display.		Yes
Full Disc. Waveform	Displays full disclosure waveform.		Yes
Night Mode	Allows to set the Night Mode ON/OFF for DS-LANIII BED.	Yes	
Rec. All Beds	Manually records the data of all beds displayed on the home display.	Yes	
12-Lead	Displays 12-lead waveform.		Yes
12-Lead ST	Displays 12-lead ST waveform.		Yes

This setup should be performed by our service representative or your network administrator.

Display Setup			
Size/Scale	Displays keys to set the waveform scale/position.	Yes	
Meas. Qty	Sequentially changes the number of numeric data.	Yes	
Meas. Zoom	Sequentially changes the size of numeric data.	Yes	
Parameter			
Param. Setup	Displays parameter setup menu.		Yes
Each Parameter	Displays parameter setup menu for each parameter.		Yes
Arrhy. Relearn	Displays "Arrhy. Relearn" key.	Yes	
Parameter ON/OFF	Displays parameter ON/OFF setup menu.		Yes
System Configuration			
System Config.	Displays system configuration menu.	Yes	
Record	Displays record setup menu.		Yes
Color	Displays color setup menu.		Yes
Display Config.	Displays display configuration menu.	Yes	Yes
Bright. Setup	Displays brightness setup menu.	Yes	
Sweep Speed	Displays sweep speed setup menu.	Yes	
Tone/Volume	Displays tone/volume setup menu.	Yes	
Bed Transfer	Displays bed transfer menu.	Yes	

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
 → **User Key** keys to display the user key setup menu.

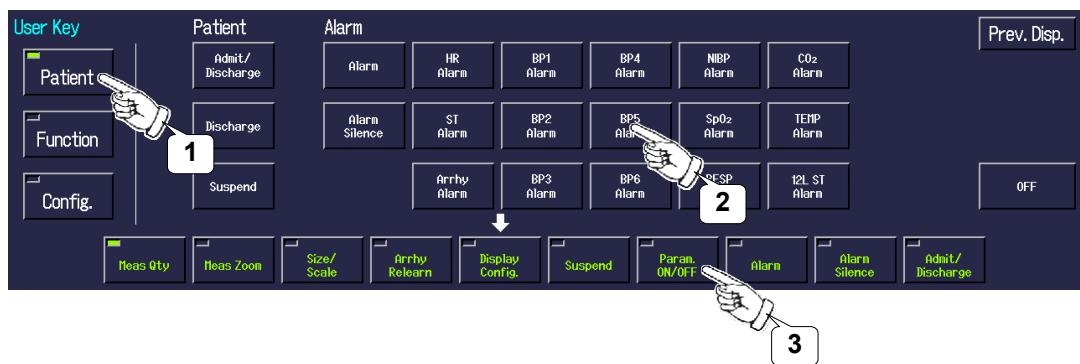
[DS-7600 Series]



- (1) Select the number of user keys from **7** or **9**.
- (2) Select the function from **Patient**, **Function**, or **Config.**.
 The list of selectable user keys corresponded to the selected function will be displayed.
- (3) Select the user key.
 If not assigning a user key, select **OFF**.
- (4) Select the assigning position.

This setup should be performed by our service representative or your network administrator.

[DS-7600W Series]



- (1) Select the function from **Patient Setup**, **Function**, or **Config.**.

The list of selectable user keys corresponded to the selected function will be displayed.

- (2) Select the user key.

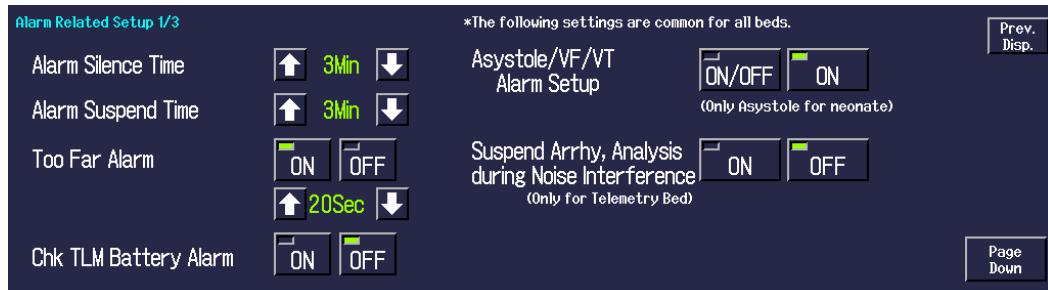
If not assigning a user key, select **OFF**.

- (3) Select the assigning position.

5-6 Set the alarm related setup.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Alarm Related Setup** keys.

The alarm related setup menu will be displayed.



* The selection of "HR Low Limit for VT" is not supported for the DS-7600L.

- 2 Set the "Alarm Silence Time".

Alarm Silence Time 1min

When an alarm generates, pressing the **Alarm Silence** key assigned as user key will silence the alarm for the preprogrammed time. The alarm silence time can be selected from **1** to **5** min.

- 3 Set the "Alarm Suspend Time".

Alarm Suspend Time 1min

The alarm suspend time when the **Alarm Suspend** key is pressed can be selected from **1** to **5** min.

- 4 Set ON/OFF of "Too Far Alarm" and time.

Too Far Alarm 20Sec

Whether or not to generate an alarm when a telemetry transmitter is out of receiving range can be selected. **ON** will generate the too far alarm, and **OFF** will not generate the alarm.

When **ON** is selected, the time until the alarm generates can be selected from 5 to 60 sec.

This setup should be performed by our service representative or your network administrator.

5 Set the “Chk TLM Battery Alarm”.



ON will generate alarm sound and display message for telemetry battery alarm when remaining battery level is 10% or less.

OFF will only display message for telemetry battery alarm when remaining battery level is 10% or less.

6 Set the “Asystole, VF, VT Alarm Setup”.



To not miss any life threatening alarms, these alarms can be always set to ON.

ON will not allow to set the Asystole, VF, VT, Slow VT alarm OFF.

ON/OFF will allow ON/OFF selection of asystole, VF, VT, Slow VT alarm.



The same setup should be performed for all central monitors in the same network (DS-LANII). Otherwise, proper function cannot be achieved. For the DS-LANIII network, this setting will synchronize with the network-administrator.



If the patient type is neonate, this selection will only apply for asystole alarm. The ON/OFF selection of VF, VT, Slow VT alarm can be made on the arrhythmia alarm menu.

7 Set the “Suspend Arrhy. Analysis during Noise Interference”.



When a noise is interfering on the ECG signal, arrhythmia analysis can be suspended.

ON will suspend arrhythmia analysis for fixed duration (5sec.) when a noise is continuously interfering.

Alarm sound will generate for “ECG Artifact” and “ECG Low”.

OFF will not suspend arrhythmia analysis even when a noise is continuously interfering.

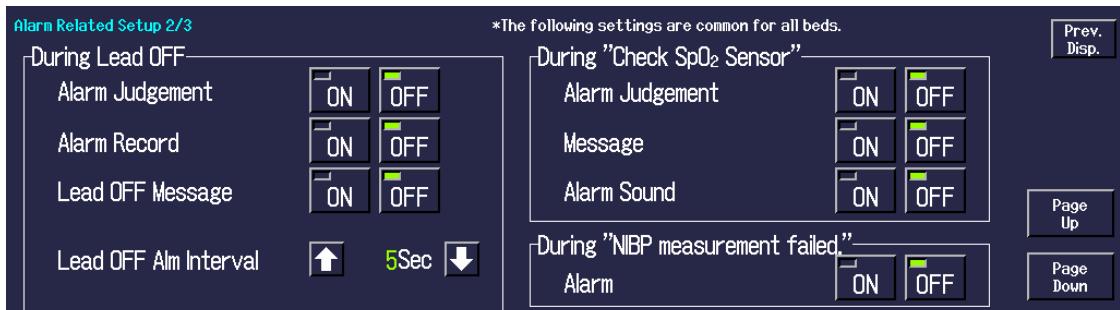


When “Suspend Arrhy. Analysis during Noise Interference” is set to ON, and the suspended duration continues for more than 30 seconds, “Cannot analyze” message will generate.



This setup can be performed only for the wireless network bed (RF bed).

8 Press the **Page Down** key to display the second page.



9 Set the “During Lead OFF”.

When ECG lead is detached, some waveform may become immeasurable depending on the

This setup should be performed by our service representative or your network administrator.

detached lead.

In such case, ECG waveform or respiration waveform will be displayed in baseline, and ECG related alarm will generate.

ECG related alarms are as follows.

- HR Alarm
- Arrhythmia Alarm
- ST Alarm
- RR Alarm for Impedance Respiration
- APNEA Alarm for Impedance Respiration

If the alarm generated during lead-off condition is considered not reliable, turning the “Alarm Judgment” OFF will not generate the ECG related alarm during lead-off condition.

For the alarm function during lead-off condition, the following setup can be performed on the alarm-related setup menu.



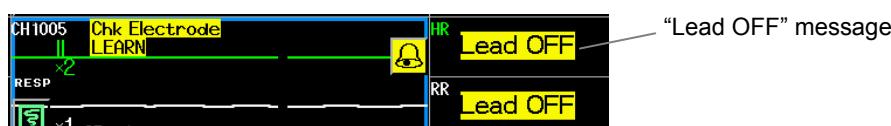
【Alarm Judgment】

Whether or not to perform ECG related alarm judgment during lead-off condition can be selected.

ON will perform ECG related alarm judgment during lead-off condition.

OFF will not perform ECG related alarm judgment. In this case, if an alarm above level 2 is not generating, a continuous tone different from lead-off alarm tone (level 3) will be generated.

OFF will automatically set the “Alarm Recording” to OFF, and “Lead-Off Message” to ON. “Lead OFF” message will be displayed inside the numeric data box.



⚠ WARNING

If the “Alarm Judgement” is set OFF, HR alarm and arrhythmia alarm will not be generated at lead-off condition. 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.

【Alarm Recording】

Whether or not to perform ECG related alarm recording during lead-off condition can be selected.

However, alarm recording will be performed if parameter other than ECG (BP, SpO₂, etc.) generates alarm during lead-off condition.

ON will perform alarm recording for ECG related alarm during lead-off condition.

OFF will not perform alarm recording for ECG related alarm during lead-off condition.

【Lead OFF Message】

Whether or not to display the “Lead OFF” message on the waveform display area at lead-off condition can be selected.

ON will display the “Lead OFF” message.

OFF will not display the message.

【Lead OFF Alm Interval】

The lead-off alarm interval can be selected from 5 sec / 30 sec. / 60 sec.

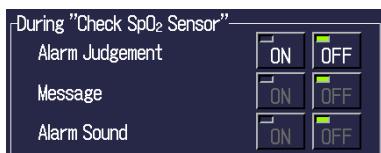
For example, if “5 sec” is selected, a beep sound will generate in interval of 5 seconds.



Refer to “5. Alarm Function ECG Alarm at Lead-Off Condition” for system operation during lead-off condition.

This setup should be performed by our service representative or your network administrator.

10 Set the items for “During Check SpO₂ Sensor”.



When the pulse wave cannot be detected due to low amplitude or inappropriate probe attachment, whether to generate the alarm message/sound or not can be selected.

Selecting **ON** for “Alarm Judgement” will generate level 1 alarm when SpO₂ value exceeds the alarm limit during “Check SpO₂ Sensor” condition. **OFF** will generate level 2 alarm (“Check SpO₂ Sensor”) when SpO₂ value becomes 0% during “Check SpO₂ Sensor”.

Selecting **ON** for “Message” will display the “SpO₂ Sensor Check” message to notify the sensor check condition.

OFF will not display the message.

Selecting **ON** for “Alarm Sound” will notify the sensor check condition by generating an alarm sound.

OFF will not generate the alarm sound.

11 Set the items for “During NIBP measurement failed.”.



Select whether to generate an alarm when NIBP measurement fails.

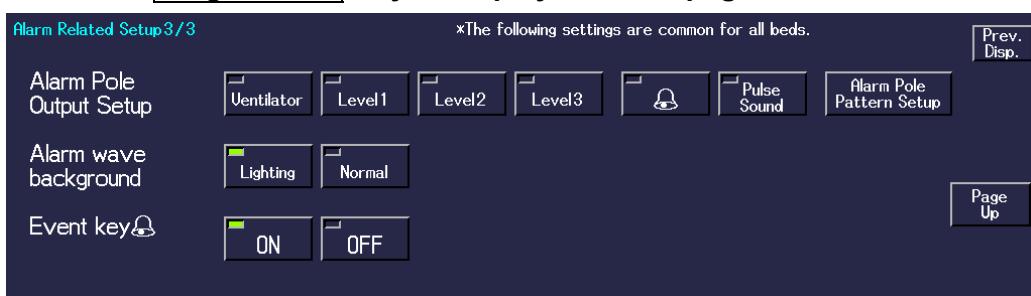
ON will generate level 2 alarm (“NIBP measurement failed.”) at NIBP measurement failure.

OFF will not generate an alarm at NIBP measurement failure.



This setup is effective only when connected to the DS-LANIII network.

12 Press the **Page Down** key to display the third page.



13 Set the “Alarm Pole Output Setup”.



Select the alarm level to light the alarm pole from **Ventilator**, **Level 1**, **Level 2**, **Level 3**.

When is selected, alarm pole will light to notify when event key is displayed.

When **Pulse Sound** is selected, green LED at the center of alarm pole will light synchronizing to the heartbeat.

14 Set the “Alarm wave background”.



Lighting will display the background color of the alarm-generated waveform in red.

Normal will not change the background color of the alarm-generated waveform.

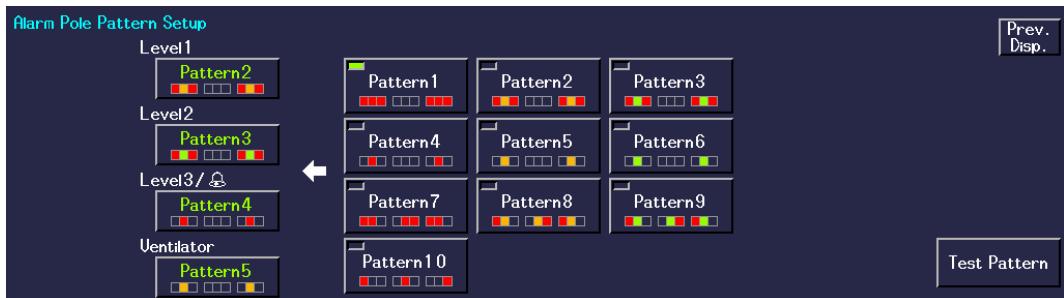
This setup should be performed by our service representative or your network administrator.

15 Set the “Event key”.



ON will display the event key when an alarm generates.
OFF will not display the event key when an alarm generates.

16 Press the **Alarm Pole Pattern Setup** key to set the alarm pole flash pattern.



Select the flash pattern for “Level 1”, “Level 2”, “Level 3”, and “Ventilator Alarm”.
Press the **Pattern Test** key to test the flash pattern.

[Alarm Pole Flash Pattern]

Pattern	Flash
Pattern 1	(Red, Red, Red)→(· · ·)→(Red, Red, Red)→(· · ·)→(Red, Red, Red)
Pattern 2	(Red, Orange, Red)→(· · ·)→(Red, Orange, Red)→(· · ·)→(Red, Orange, Red)
Pattern 3	(Red, Green, Red)→(· · ·)→(Red, Green, Red)→(· · ·)→(Red, Green, Red)
Pattern 4	(· Red ·)→(· · ·)→(· Red ·)→(· · ·)→(· Red ·)
Pattern 5	(· Orange ·)→(· · ·)→(· Orange ·)→(· · ·)→(· Orange ·)
Pattern 6	(· Green ·)→(· · ·)→(· Green ·)→(· · ·)→(· Green ·)
Pattern 7	(Red, Red ·)→(· · ·)→(· Red, Red)→(· · ·)→(Red, Red ·)
Pattern 8	(Red, Orange ·)→(· · ·)→(· Orange, Red)→(· · ·)→(Red, Orange ·)
Pattern 9	(Red, Green ·)→(· · ·)→(· Green, Red)→(· · ·)→(Red, Green ·)
Pattern 10	(Red · ·)→(· · ·)→(· Red ·)→(· · ·)→(· · Red)

This setup should be performed by our service representative or your network administrator.

5-7 Set the initial settings at admittance.

The admit setup menu allows to set the initial settings at patient admittance. ON/OFF of parameter monitoring, alarm limit, etc. can be set. When a new patient is admitted, the settings of previous patient will be cleared and will be reset to these initial settings.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Admit Setup** keys to display the first page of admit setup menu.

Select **ON** / **OFF** of monitoring for each parameter.

Admit Setup 1/2 Parameter ON/OFF								Page Down	Prev. Disp.
ECG	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	BP5	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	CO ₂	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	
BP1	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	BP6	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	TEMP	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	
BP2	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	NIBP	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	SvO ₂ / CCO	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	
BP3	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	SpO ₂	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	GAS	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	
BP4	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF	RESP	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF				

- 2 Press the **Page Down** key to display the second page and set the alarm.

Admit Setup 2/2 Alarm Setup								Page Up	Prev. Disp.
HR	<input checked="" type="checkbox"/> ST _{mV}	<input type="checkbox"/> ST ₁	<input checked="" type="checkbox"/> ST ₂	<input checked="" type="checkbox"/> BP4	<input type="checkbox"/> SD	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> SpO ₂	<input type="checkbox"/> PR	<input checked="" type="checkbox"/> GAS
Arrhythmia	<input type="checkbox"/> BP1	<input type="checkbox"/> SD	<input checked="" type="checkbox"/> M	<input type="checkbox"/> BP5	<input type="checkbox"/> SD	<input checked="" type="checkbox"/> M	<input type="checkbox"/> RESP	<input type="checkbox"/> RR	<input checked="" type="checkbox"/> APNEA
Asystole	<input type="checkbox"/> mmHg			<input type="checkbox"/> BP6	<input type="checkbox"/> SD	<input checked="" type="checkbox"/> M	<input type="checkbox"/> CO ₂	<input type="checkbox"/> ETCO ₂	<input checked="" type="checkbox"/> INSPO ₂
VF				<input type="checkbox"/> mmHg			<input type="checkbox"/> mmHg	<input type="checkbox"/> INSPO ₂	
Slow VT									
Run									
Doublet									
Pause									
Bigeminy									
Fibrillating									
Frequent									
Tachy									
Brady									

To set ON/OFF of alarm, or to adjust the alarm limit, select a parameter (ex. press **HR** key) to perform these setup.

The alarm setup menu will be displayed.

Use the **ON** / **OFF** keys, “**←** lower limit **→**”, “**←** upper limit **→**” keys to set the alarm condition.

5-8 Register the bed name.

By registering a bed name, the bed name for the patient can be displayed on the home display.
Maximum of 480 bed names can be registered.



The registered bed name can be assigned to the patient on the admit menu.
Refer to "3. Admit/Discharge of a Patient Admitting a Patient".

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Bed Name Regist** keys to display the bed name registration menu.**

The currently registered bed name will be displayed in list format.

Bed Name Regist			
No	Bed Name	No	Bed Name
1	BED-101	11	BED-301
2	BED-102	12	BED-302
3	BED-103	13	BED-303
4	BED-104	14	BED-304
5	BED-105	15	BED-305
6	BED-201	16	BED-401
7	BED-202	17	BED-402
8	BED-203	18	BED-403
9	BED-204	19	BED-404
10	BED-205	20	BED-405

Bed Name select

Page 1/ 2

Prev Disp.

Regist

Add
Change

Delete

PC/CF Card

Read Bed Name
Write Bed Name

- 2 Select the bed name.**

Bed Name Regist			
No	Bed Name	No	Bed Name
1	BED-101	11	BED-301
2	BED-102	12	BED-302
3	BED-103	13	BED-303
4	BED-104	14	BED-304
5	BED-105	15	BED-305
6	BED-201	16	BED-401
7	BED-202	17	BED-402
8	BED-203	18	BED-403
9	BED-204	19	BED-404
10	BED-205	20	BED-405

Bed Name select

Page 1/ 2

Prev Disp.

Regist

Add
Change

Delete

PC/CF Card

Read Bed Name
Write Bed Name

The bed name with yellow green background indicates that it is currently selected.

To select other bed name, use the keys or directly press the bed name area.

To scroll the screen, use the arrow keys displayed at right.



Displays the first page.

Displays the previous page.

Displays the next page.

Displays the last page.

- 3 The bed name registration data can be edited.**

Bed Name Regist			
No	Bed Name	No	Bed Name
1	BED-101	11	BED-301
2	BED-102	12	BED-302
3	BED-103	13	BED-303
4	BED-104	14	BED-304
5	BED-105	15	BED-305
6	BED-201	16	BED-401
7	BED-202	17	BED-402
8	BED-203	18	BED-403
9	BED-204	19	BED-404
10	BED-205	20	BED-405

Bed Name select

Page 1/ 2

Prev Disp.

Regist

Add
Change

Delete

PC/CF Card

Read Bed Name
Write Bed Name

This setup should be performed by our service representative or your network administrator.

[To add/change the bed name]



To register a new bed name, or to change the currently selected bed name, press the **Add** or **Change** key.

The bed name input screen will be displayed.

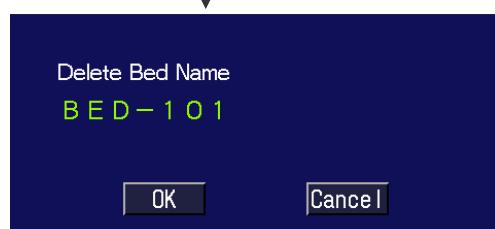


Input the bed name. Maximum of 16 alphanumeric letters can be input, and the first 12 letters will be displayed.

[To delete the bed name]



To delete the currently selected bed name, press the **Delete** key.

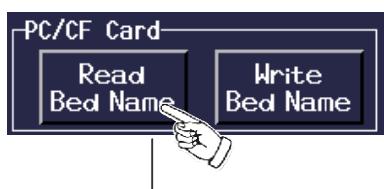


A confirmation message will be displayed.
To delete the bed name, press the **OK** key.

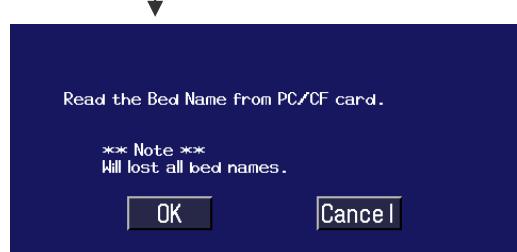
4 The bed name data can be read from or written on to the PC/CF card.

[To read the bed name data from the card]

- 1) Insert the CF card with the bed name data to the CF card slot.
Or, insert to the PC card slot using the adapter.



- 2) Pressing the **Read Bed Name** key will display a confirmation message screen.



- 3) Press the **OK** key to read the bed name data.
All bed name data will be replaced with the data read from the PC/CF card.

- 4) When a beep sound generates, the reading process is complete.

NOTE

Reading the bed name data from the card will erase all bed name data on the DS-7600.

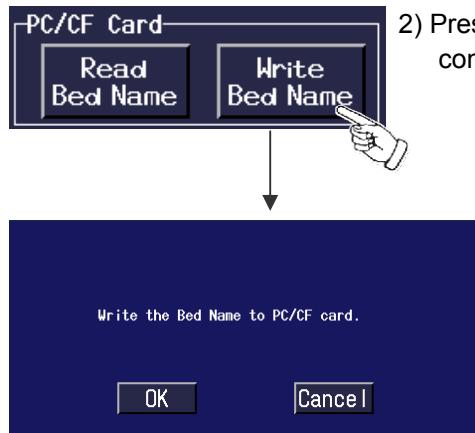
This setup should be performed by our service representative or your network administrator.

[To write the bed name data to the card]

- 1) Insert the CF card formatted for data transfer to the CF card slot. Or, insert to the PC card slot using the adapter.



For details of PC/CF card format, refer to "Using the PC/CF Card Formatting the PC/CF Card" in this chapter.



- 2) Pressing the **Write Bed Name** key will display a confirmation message screen.

- 3) To write the bed name data, press the **OK** key.
- 4) When a beep sound generates, the writing process is complete.

6 Admitting (start monitoring) and discharging a patient.

Before starting monitoring, enter the patient name, patient ID, age, sex, etc. as patient information (admitting a patient).

By performing the admit procedure, patient name will be displayed on the home display, and patient information will be printed on the report recording.

At admittance, enter the following patient information.

- Patient ID
- Patient Name
- Bed name
- Comment
- Pacemaker (Used / Not Used)
- Patient Type (Adult / Child / Neonate)
- Sex, birth date, age, height, weight, BSA

When the monitoring has completed, perform discharge procedure and clear all patient information, monitoring data, and monitoring setup to allow monitoring a new patient.

When EMR link function is used via patient data server, patient information from the EMR can be input to the monitor.



For details of admit procedure, refer to "3. Admit/Discharge of a Patient".
For EMR admit/discharge procedure, refer to "EMR Link Function" in this manual.

Using the PC/CF Card

The patient data and setup data can be stored on the PC/CF card.
And, the stored PC/CF card data can be read on the DS-7600.
The PC/CF card of 1GB can store the data of 2 patients.

By using the optional CF card (FCF-1000: 1GB, FCF-16GA: 16GB), the following 4 types of full disclosure waveform data can be stored.

- 32Waves 24Hours (Only when FCF-1000 is used)
- 16Waves 48Hours (Only when FCF-1000 is used)
- 8Waves 96Hours (Only when FCF-1000 is used)
- 32Waves 96Hours (Only when FCF-16GA is used)

Inserting the PC/CF Card

- 1 Insert the specified CF card into the CF card slot.
Or, use the adapter and insert to the PC card slot.

Formatting the PC/CF Card



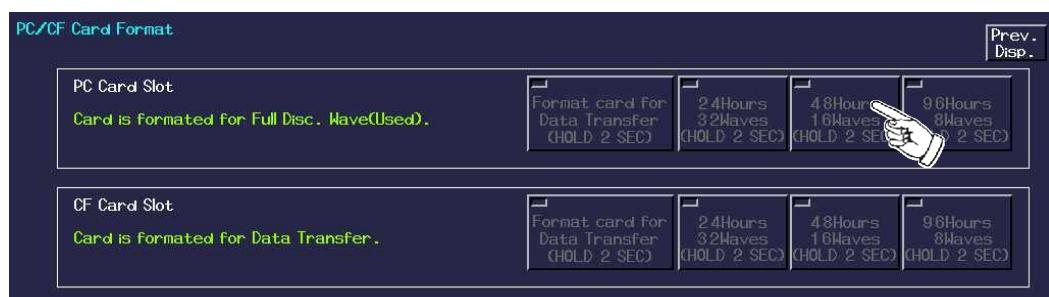
The CF card can be used only on the DS-7600 where the card was formatted.

- The CF card used for full disclosure waveform recording cannot be used for data transfer to other DS-7600 Central Monitor.
- The CF card used for full disclosure waveform recording on the DS-7600 Central Monitor cannot be used for full disclosure waveform recording on other DS-7600 Central Monitor.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **PC/CF Card** → **Format** keys to display the PC/CF card format menu.

This display will also appear when unformatted card is inserted.

<When Using the FCF-1000>



<When Using the FCF-16GA>



This setup should be performed by our service representative or your network administrator.

- 2 To format the card for data transfer, press the **Format card for data transfer** key for more than 2 seconds.**
- 3 To format the card for full disclosure waveform recording, press one of the **24Hours 32Waves** / **48Hours 16Waves** / **96Hours 8Waves** keys (for FCF-1000), or press the **96Hours 32Waves** (for FCF-16GA) for more than 2 seconds.**

When the beep tone generates and the display returns to the previous display (or home display), the format process is complete.

To Transfer the Patient Data

When a patient is transferred to another bed, the PC/CF card can be used to easily transfer the patient data to new monitor and allows monitoring with the same setup.

【Stored Data (patient data)】

Item		Description
Patient Information		Stores the patient admittance data. (patient name, comment, sex, height, weight, patient ID, birth date, age, patient type, pacemaker use)
Database	Trend Data	Up to 48 hours of data for the currently monitored parameter will be stored.
	Recall Data	Maximum of 200 recall waveforms will be stored.
	NIBP data	Maximum of 120 data will be stored.
Parameter Setup		Stores the measurement condition (scale, lead, alarm limit, etc.) of the currently monitored parameters.
Setup	Recording	Stores the current setup.
	Color	
	Display Config.	Stores the displayed numeric data / waveform on the home display and individual display.
	Alarm Setup	



For details of the data which can be transferred using the PC/CF card, refer to "11. Technical Information Data Transfer by the PC/CF Card".

△ CAUTION

- The data transfer is possible only between the DS-7600 system central monitors. The data cannot be transferred to a bedside monitor.
- If the software version of the two DS-7600 central monitors are different, the data transfer may not be possible, or part of the data may not be transferred.
(The data transfer from the newer version monitor to the older version monitor is not possible.) For details, refer to our service representative.

This setup should be performed by our service representative or your network administrator.

To Store the Setup Data

By storing the setup data to the PC/CF card, it can be used to set the same setup for more than one DS-7600 system central monitors.

The same setup can be used by simply reading the setup data from the PC/CF card to the monitor.

[Stored Data (Setup Data)]

Data Item		Description
Setup	Tone / Volume	Stores the current setup.
	Sweep Speed	
	Display Config.	Stores the current setup. (except bed selection)
	Brightness Setup	Stores the current setup.
Preset	Recorder	Stores the current setup.
	Channel Setup	Stores only stored channel setup
	Soft Switch	
	Measurement Unit	
	User Key	Stores the current setup. (Refer to the following caution.)
	Alarm Related Setup	
	Admit	
	Bed Name Registration	



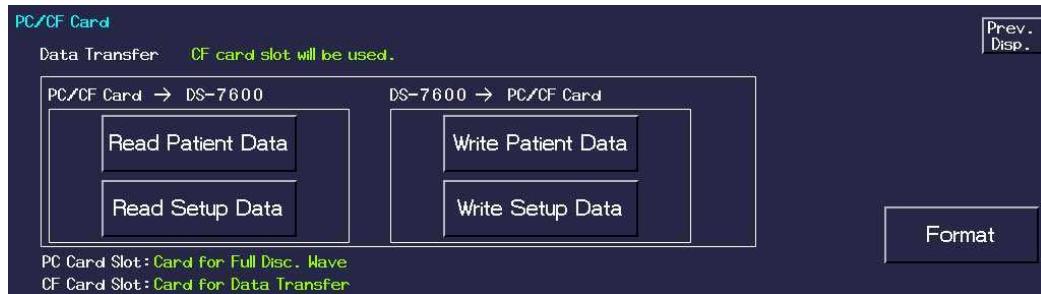
For details of the data which can be transferred using the PC/CF card, refer to
“11. Technical Information Data Transfer by the PC/CF Card”.

⚠ CAUTION

- The data transfer is possible only between the DS-7600 system central monitors. The data cannot be transferred to a bedside monitor.
- If the software version of the two DS-7600 central monitors are different, the data transfer may not be possible, or part of the data may not be transferred.
- For the data transfer from DS-7600 series to DS-7600W series, or from DS-7600W series to DS-7600 series, the user keys settings will not be transferred.

To Read/Write the Card Data

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **PC/CF Card** keys to display the PC/CF card menu.**



- 2 PC/CF Card → DS-7600**

Read patient data / Read setup data

Press these keys to read the PC/CF card data to DS-7600 system.

Read patient data : Reads patient attribute, trend data, and other patient data.

Read setup data : Reads alarm setup, parameter setup, and other setup data.

- 3 DS-7600 → PC/CF Card**

Write patient data / Write setup data

Press these keys to write the DS-7600 system data to PC/CF card.

Write patient data : Writes patient attribute, trend data, and other patient data.

Write setup data : Writes alarm setup, parameter setup, and other setup data.

- 4 Pressing one of the keys will display the card data transfer display.**

The following is a display when the **Read patient data** key is pressed.



(1) First, select a patient data (or setup data) to transfer.

(2) Select the Room/Bed ID (or Channel ID) to write the selected data.

NOTE	Monitoring cannot be performed during the reading/writing process.
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TCP/IP Network Connection

By connecting the DS-7600 system to the TCP/IP network, the following function using the laser printer or server can be performed.

- Review data such as graphic trend can be recorded on the laser printer.
- By using the patient data server, patient data can be referred via server. In addition, EMR link function can be used to admit/discharge the patient.
- By using the data server, the waveform data for the patient can be stored in the server.
- By setting the SNTP server ON, the time can be synchronized to the SNTP server.
- If the HL7 server is used in the hospital, patient information and current measurement data monitored on the DS-7600 can be transmitted to the HL7 server when requested.

Before using the laser printer and server, network setup for the DS-7600 system, laser printer, and server should be performed.

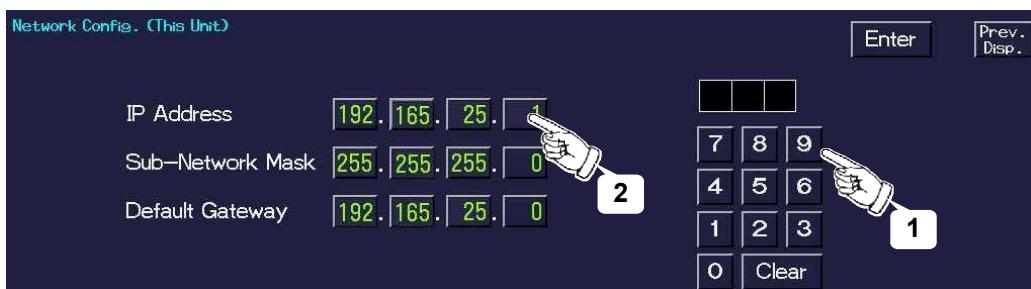
⚠ WARNING

- Fukuda Denshi is not liable of the operation caused by improper TCP/IP network connection. When changing the network setup, refer to our service representative.
- When connecting to an existing network, follow the instruction of the network administrator.
- Make sure not to duplicate the IP address for the DS-7600 system, laser printer, and server.
- As DS-7600 does not correspond to DHCP (Dynamic Host Configuration Protocol) IP address, set the IP address excluded for DHCP if DHCP server is in the network configuration.

Network Setup for the DS-7600

Set the IP address, sub-network mask, default gateway for this unit.

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Network Config.** → **This Unit** keys to display the network configuration menu.
- 2 Set the IP address for the DS-7600 system.



- (1) Use the alphanumeric keys (0 to 9, A to F) to input the address.
- (2) Press the corresponded key. The input value will be displayed inside the key.

- 3 Set the sub-network mask.

Sub-Network Mask **255.255.255.0**

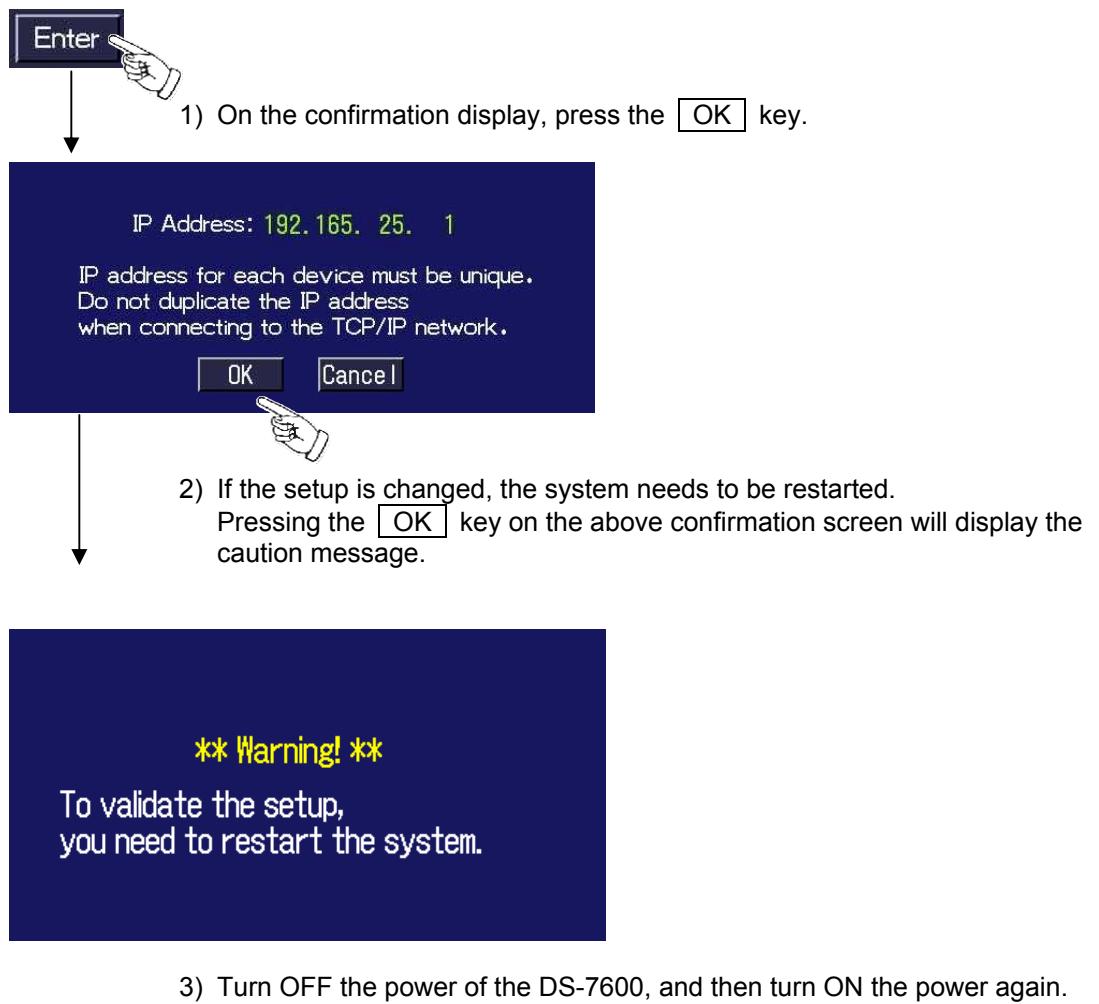
Use the alphanumeric keys (0 to 9, A to F) to input the address.

- 4 Set the default gateway.

Default Gateway **192.165.25.0**

Use the alphanumeric keys (0 to 9, A to F) to input the address.

5 Press the **Enter key to finalize the setup.**



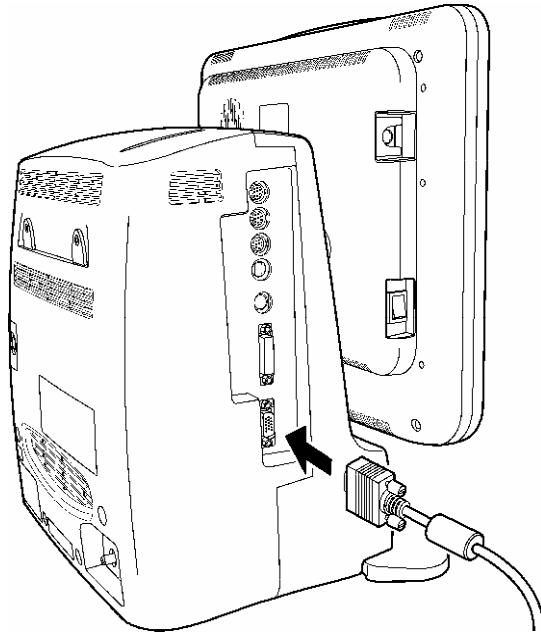
When the warning message is displayed, all operation controls will not be possible until the system is restarted.

**6 Connect the CJ-761 LAN Interface Cable (Cross) to the DS-7600 system.
Refer to the next section for procedures.**

This setup should be performed by our service representative or your network administrator.

Connecting the Unit to TCP/IP Network

- 1 Connect the CJ-761 LAN Interface Cable (cross) to the DS-7600 system and the other side to the network equipment such as laser printer or HUB.



⚠ WARNING

Be careful not to confuse the HUB for the DS-LAN network and the TCP/IP network. Fukuda Denshi will not guarantee the operation for the improper connection.

- 2 Turn ON the power of the DS-7600 system.
Turn ON the power switch located at the left side of the display.

Network Setup for the Laser Printer

Set the IP address, MAC address, and printer specification for the laser printer.

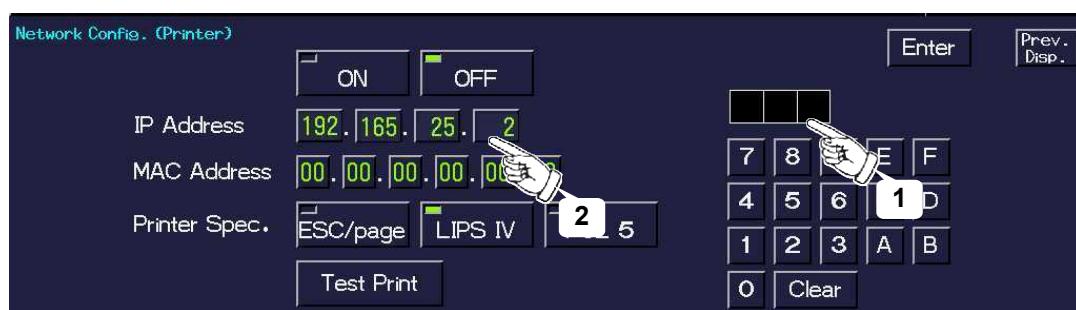
- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Network Config.** → **Printer** key to display the printer setup menu.



- 2 Set **ON** / **OFF** of printer operation.



- 3 Set the IP address of the printer.



- (1) Use the alphanumeric keys (0 to 9, A to F) to input the address.
- (2) Press the corresponded key. The input value will be displayed inside the key.

- 4 Set the MAC address of the printer.

MAC Address **00.00.00.00.00.00**

MAC (Media Access Control) address is an address assigned for the network equipment.
Refer to the operation manual of the printer network board.
Use the alphanumeric keys (0 to 9, A to F) to input the address.

This setup should be performed by our service representative or your network administrator.

5 Select the printer specification.

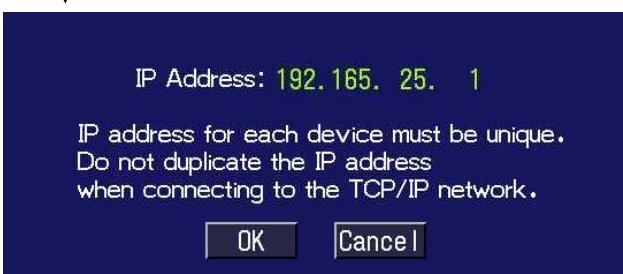


Refer to the operation manual of the printer.

6 Press the **Enter** key to finalize the setup.



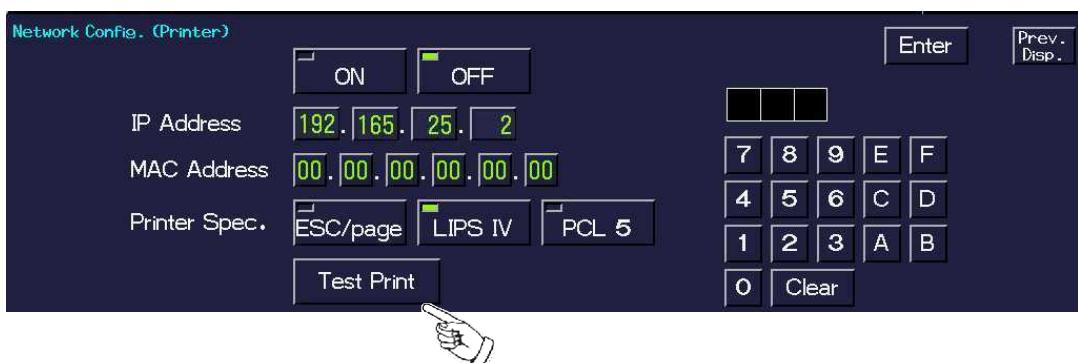
On the confirmation display, press the **OK** key.



CAUTION Always reset the power of the printer after the printer setup.

7 Perform test printing.

Press the **Test Print** key and check if the printing is correctly performed.



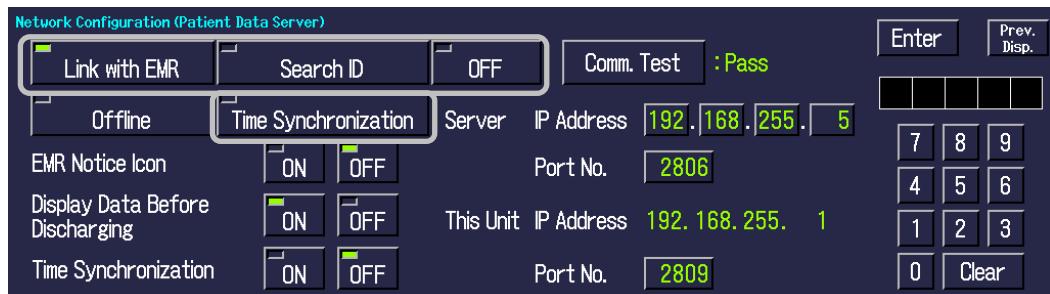
For output recorder setup for the review data recording, refer to "6. Recording Setting the Recording Condition and Output Recorder Output Recorder Setup for Review Data Recording".

Patient Data Server Setup

By using the patient data server, patient information (ID, name, etc.) can be searched on the server and input to the monitor.

In addition, EMR link function can be used to input patient information from the EMR.

To display the patient data server setup menu, press the **Menu** → **System Config.** → **Pre-set** → enter password → **Network Config.** → **Patient Server** keys.



Link with EMR will allow to admit/discharge the patient linked to the EMR.

Search ID will display the **Search Patient** key on the patient admit menu. By pressing the **Search Patient** key, the patient information will be searched on the patient data server based on the input patient ID. Then, the searched patient information can be input to the monitor.

When not using the patient data server, select **OFF**.

Time Synchronization will perform only time synchronization with the patient data server.

The time will be synchronized with the patient data server every 1 minute. However, note that the time will be synchronized according to the priority listed below.

NOTE	<p>[Priority of the Time Synchronization] The time will be synchronized with the following priority.</p> <ul style="list-style-type: none"> 1) Administrating monitor, if wired network is constructed. 2) SNTP server, if used. 3) Patient data server, if used, and if "Time Synchronization" on Patient Data Server setup is set to ON, or if Time Synchronization is selected.
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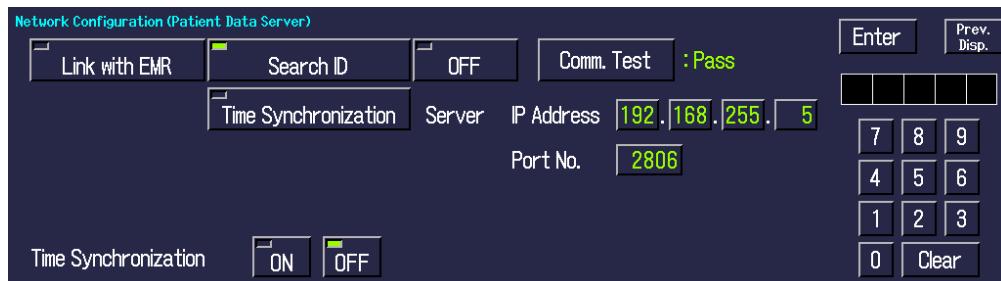
●EMR Link Function



For details of the EMR link function, refer to "EMR Link Function" explained later in this chapter.

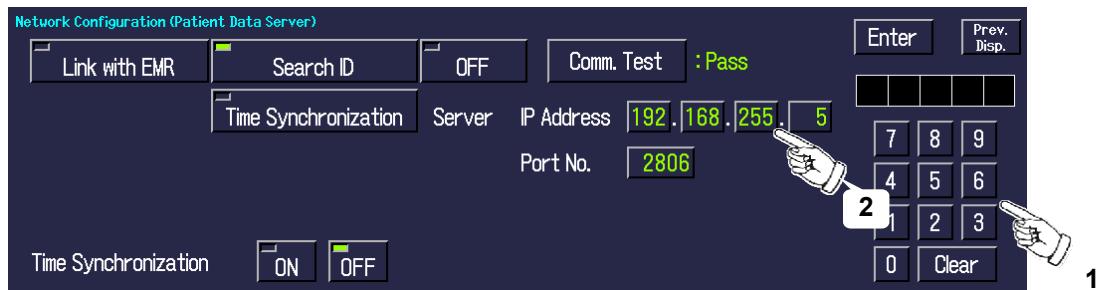
●Search ID Function

1 Select **Search ID** on the patient data server setup screen.



This setup should be performed by our service representative or your network administrator.

2 Input the IP address and port number for the patient data server.



- 1) Input the IP address number using the numeric keypad.
- 2) Press the corresponding key. The input number will be displayed inside the key.
- 3) Input the port number using the same procedure above.

Port No. **2301**

Input the port number using the numeric keypad.

NOTE Input the port number recommended for the used patient data server.

3 Select ON/OFF for “Time Synchronization”.



ON will synchronize the time with patient data server by communicating with the server every 1 minute.

However, if higher priority time synchronization is present,, this setting will be invalid.

OFF will not synchronize the time with patient data server.

NOTE

[Priority of the Time Synchronization]

The time will be synchronized with the following priority.

- 1) Administrating monitor, if wired network is constructed.
- 2) SNTP server, if used.
- 3) Patient data server, if used, and if “Time Synchronization” on Patient Data Server setup is set to **ON**.

4 Press the **Enter** key to validate the setup.



When a confirmation message is displayed, press the **OK** key.

IP Address :**192.168.255.5**

IP address for each device must be unique.
Do not duplicate the IP address
when connecting to the TCP/IP network.

OK

Cancel

5 Press the **Comm. Test** key to verify it is properly communicating.

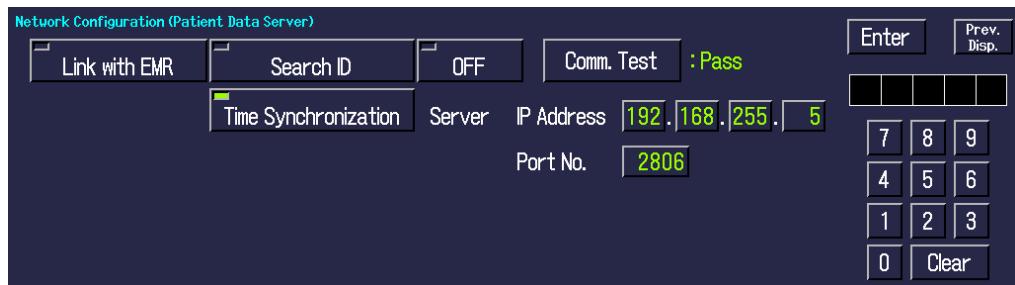
Comm. Test :**Pass**

If properly communicating, “Pass” will be displayed.

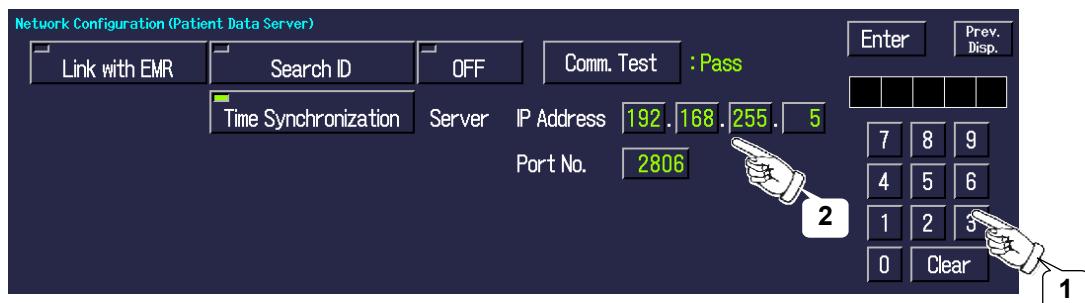
If any failure, “Fail” will be displayed. In such case, check the network setting, and perform the setup again.

● Time Synchronization Function

1 Select **Time Synchronization** on the patient data server setup screen.



2 Input the IP address and port number for the patient data server.



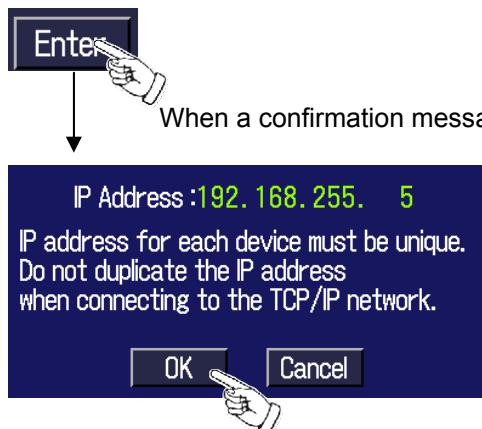
- 1) Input the IP address number using the numeric keypad.
- 2) Press the corresponding key. The input number will be displayed inside the key.
- 3) Input the port number using the same procedure above.

Port No. **2301**

Input the port number using the numeric keypad.

NOTE	Input the port number recommended for the used patient data server.
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3 Press the **Enter** key to validate the setup.



4 Press the **Comm. Test** key to verify it is properly communicating.

Comm. Test : **Pass**

If properly communicating, "Pass" will be displayed. If any failure, "Fail" will be displayed. In such case, check the network setting, and perform the setup again.

Data Server Setup

By using the data server, the waveform data for the monitored patient can be stored on the server. Maximum of 32 waveforms can be stored.

●Specify the Data Server

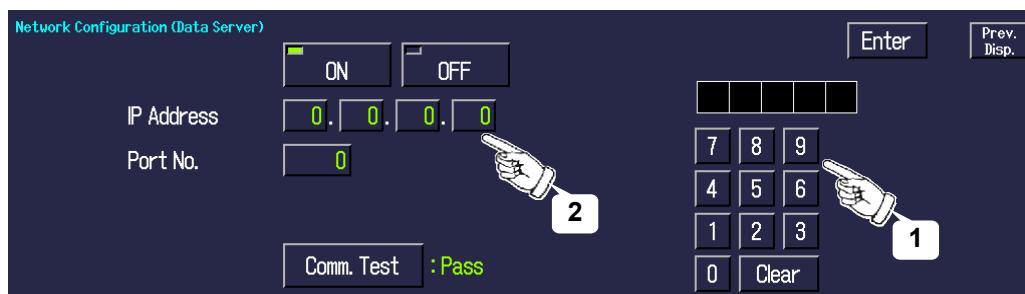
1 Press the **Menu** → **System Config.** → **Pre-set** → enter password

→ **Network Config.** → **Data Server** keys.

2 Select **ON** / **OFF** for usage of Data Server.



3 Input the IP address of the data server.



1) Input the IP address number using the numeric keypad.

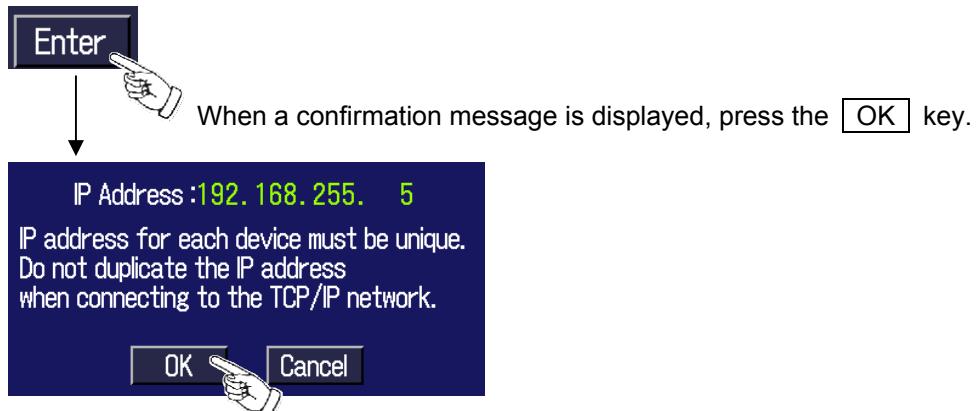
2) Press the corresponding key. The input number will be displayed inside the key.

4 Set the port number.

Port No. **2301** Input the port number using the numeric keypad.

NOTE Input the port number recommended for the used data server.

5 Press the **Enter** key to validate the setup.



6 Press the **Comm. Test** key to verify it is properly communicating.

Comm. Test : **Pass**

If properly communicating, "Pass" will be displayed.

If any failure, "Fail" will be displayed. In such case, check the network setting, and perform the setup again.

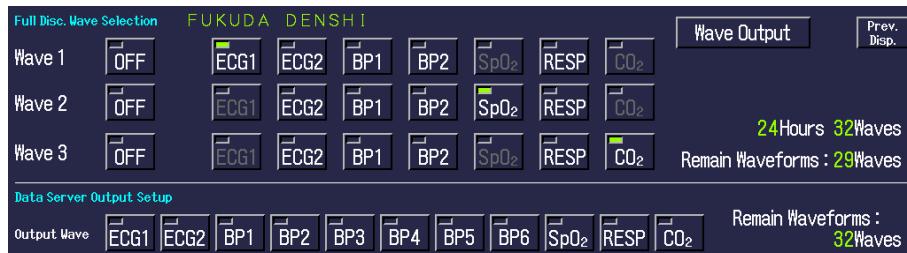
●Select the Waveform to Store

Select the waveform to store on the data server. Maximum of 32 waveforms for each DS-7600 can be stored.

- 1 Select a patient, and press the → **Menu** → **Admit** (“Patient”) → **Wave Select** keys.

The waveform selection for the selected patient will be displayed.

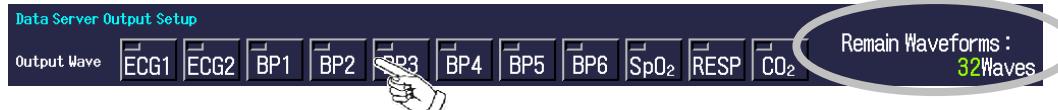
The upper section is for the full disclosure waveform recording, and the lower section is for the data server output.



NOTE

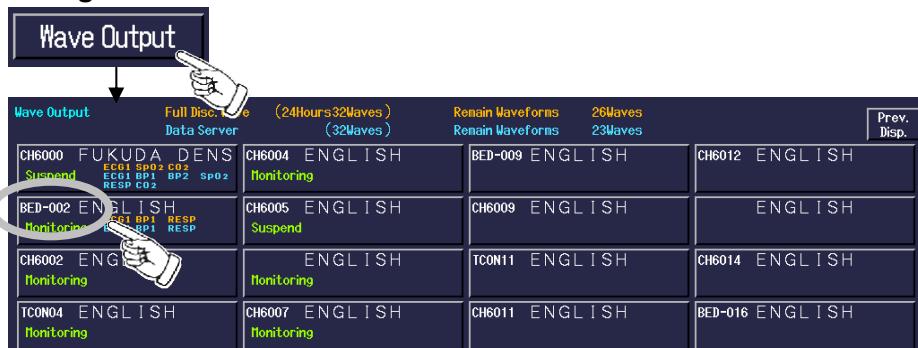
The **Wave Select** key on the admit menu will be only displayed for the following case.
 1) If CF card for full disclosure waveform recording is inserted
 2) “Data Server” is set to ON on the network configuration menu.

- 2 Select the waveform to store.

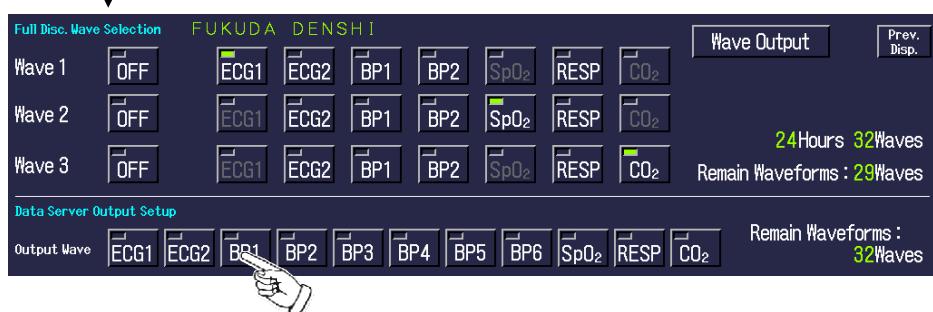


At the lower right of the display, the remaining number of waveforms that can be stored will be displayed.

- 3 Pressing the **Wave Output** key will display the waveform selection settings for all registered beds.

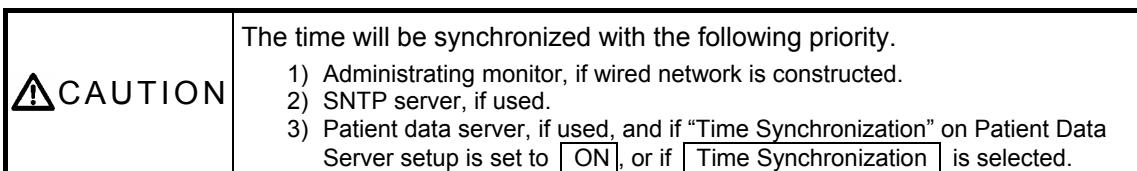


The parameter for full disclosure waveform recording will be displayed in orange, and the parameter for data server output waveform will be displayed in cyan. “Monitoring” will be displayed for the currently monitored bed. Selecting a bed will display the waveform selection menu for that patient.



SNTP Server Setup

By setting ON the SNTP (Simple Network Time Protocol) server, the time can be synchronized to SNTP server every 10 minutes.

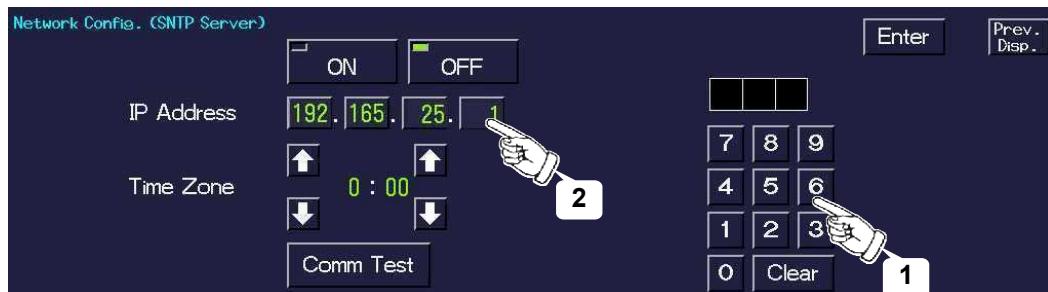


- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Network Config.** → **SNTP Server** key to display the SNTP server setup menu.

- 2 Select **ON** / **OFF** for SNTP server.



- 3 Set the IP address for SNTP server.



- (1) Use the alphanumeric keys (0 to 9, A to F) to input the address.
(2) Press the corresponded key. The input value will be displayed inside the key.

- 4 Set the time zone for your country. (Refer to the next page for the time zone list.)

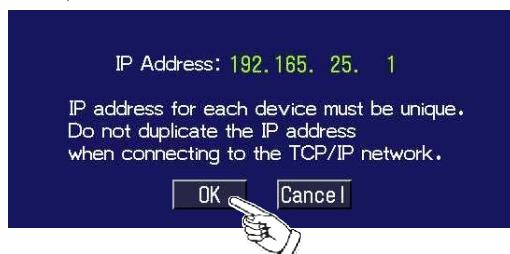
Use the arrow keys to set the time zone. (Ex. Tokyo → +09:00)



- 5 Press the **Enter** key and finalize the setup.



On the confirmation display, press the **OK** key.



- 6 Press the **Comm Test** key and check if the communication is properly performed.



If properly communicating, "Pass" will be displayed.
If any failure, "Fail" will be displayed. In such case, check the network setting, and perform the setup again.

Time Zone List

Time Zone Offset (in Hours)	Time Zone	System Time Zone (as displayed in Date/Time Settings)
-12:00	Dateline Standard Time	Eniwetok, Kwajalein
-11:00	Samoa Standard Time	Midway Is, Samoa
-10:00	Hawaiian Standard Time	Hawaii
-10:00	Alaskan Standard Time	Alaska
-08:00	Pacific Standard Time	Pacific Time (US & Canada); Tijuana
-07:00	Mexican Standard Time [La Paz] (*)	Chihuahua, La Paz, Mazatlan
-07:00	Mountain Standard Time	Mountain Time (US & Canada)
-07:00	Mountain Standard Time [Arizona]	Arizona
-06:00	Central Standard Time	Central Time (US & Canada)
-06:00	Mexico Standard Time	Mexico City, Tegucigalpa
-06:00	Canada Central Standard Time	Saskatchewan
-06:00	Central America Standard Time	Central America
-05:00	Eastern Standard Time	Eastern Time (US & Canada)
-05:00	Eastern Standard Time [Indiana (East)]	Indiana (East)
-05:00	SA Pacific Standard Time	Bogota, Lima, Quito
-04:00	Atlantic Standard Time	Atlantic Time (Canada)
-04:00	SA Western Standard Time	Caracas, La Paz
-04:00	Pacific SA Standard Time	Santiago
-03:30	Newfoundland Standard Time	Newfoundland
-03:00	SA Eastern Standard Time	Buenos Aires, Georgetown
-03:00	E. South America Standard Time	Brasilia
-03:00	Greenland Standard Time	Greenland
-02:00	Mid-Atlantic Standard Time	Mid-Atlantic
-01:00	Azores Standard Time	Azores
-01:00	Cape Verde Standard Time	Cape Verde Is
00:00	Universal Coordinated Time	Casablanca, Monrovia
00:00	Greenwich Mean Time	Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
+01:00	Romance Standard Time	Amsterdam, CopenHagen, Madrid, Paris, Vilnius
+01:00	W. Central Africa Standard Time	West Central Africa
+01:00	Central European Standard Time	Belgrade, Sarajevo, Skopje, Sofija, Zagreb
+01:00	Central Europe Standard Time	Bratislava, Budapest, Ljubljana, Prague, Warsaw
+01:00	W. Europe Standard Time	Brussels, Berlin, Bern, Rome, Stockholm, Vienna
+02:00	Egypt Standard Time	Cairo
+02:00	South Africa Standard Time	Harare, Pretoria
+02:00	Israel Standard Time	Israel
+02:00	E. Europe Standard Time	Bucharest
+02:00	FLE Standard Time	Helsinki, Riga, Tallinn
+02:00	GTB Standard Time	Athens, Istanbul, Minsk
+03:00	Arab Standard Time	Kuwait, Riyadh
+03:00	E. Africa Standard Time	Nairobi
+03:00	Arabic Standard Time	Baghdad
+03:00	Russian Standard Time	Moscow, St. Petersburg, Volgograd
+03:30	Iran Standard Time	Tehran

This setup should be performed by our service representative or your network administrator.

Time Zone Offset (in Hours)	Time Zone	System Time Zone (as displayed in Date/Time Settings)
+04:00	Arabian Standard Time	Abu Dhabi, Muscat
+04:00	Caucasus Standard Time	Baku, Tbilisi
+04:00	Afghanistan Standard Time	Kabul
+05:00	West Asia Standard Time	Islamabad, Karachi, Tashkent
+05:00	Ekaterinburg Standard Time	Ekaterinburg
+05:30	India Standard Time	Bombay, Calcutta, Madras, New Delhi
+05:45	Nepal Standard Time	Kathmandu
+06:00	Central Asia Standard Time	Almaty, Dhaka
+06:00	Sri Lanka Standard Time	Columbo
+06:00	N. Central Asia Standard Time	Almaty, Novosibirsk
+06:30	Myanmar Standard Time	Rangoon
+07:00	SE Asia Standard Time	Bangkok, Hanoi, Jakarta
+07:00	North Asia Standard Time	Krasnoyarsk
+08:00	China Standard Time	Beijing, Chongqing, Hong Kong, Urumqi
+08:00	W. Australia Standard Time	Perth
+08:00	Singapore Standard Time	Singapore
+08:00	Taipei Standard Time	Taipei
+08:00	North Asia East Standard Time	Irkutsk, Ulaan Bataar
+09:00	Tokyo Standard Time	Osaka, Sapporo, Tokyo
+09:00	Korea Standard Time	Seoul
+09:00	Yakutsk Standard Time	Yakutsk
+09:30	AUS Central Standard Time	Darwin
+09:30	Cen. Australia Standard Time	Adelaide
+10:00	AUS Eastern Standard Time	Canberra, Melbourne, Sydney
+10:00	E. Australia Standard Time	Brisbane
+10:00	West Pacific Standard Time	Guam, Port Moresby
+10:00	Tasmania Standard Time	Hobart
+10:00	Vladivostok Standard Time	Vladivostok
+11:00	Central Pacific Standard Time	Magadan, Solomon Is, New Caledonia
+12:00	Fiji Standard Time	Fiji, Kamchatka, Marshall Is
+12:00	New Zealand Standard Time	Auckland, Wellington
+13:00	Tonga Standard Time	Nuku'alofa

HL7 Server Setup

If the HL7 (Health Level Seven) server is used in the hospital, patient information and current measurement data monitored on the DS-7600 can be transmitted to the HL7 server when requested.

NOTE

- Only one HL7 server can access to one central monitor.
- There may be some parameters without measurement data if “Display OFF” is selected on the bedside monitor, or monitoring is suspended, or telemetry condition is not good. In such case, those measurement data will not be transmitted to the HL7 server from the central monitor.
- When using the HL7 server, the time needs to be synchronized with the DS-7600 system. Perform SNTP server setup or select **ON** for “Time Synchronization” on the Patient Data Server setup menu.

[Measurements that can be transmitted to the HL7 Server]

For the DS-LANII: HR, ST1, ST2, RR (Impedance/CO₂/Ventilator), BP1 to 6, EtCO₂, InspCO₂, SpO₂, PR(SpO₂), T1, T2, VPC, NIBP, SvO₂, CCO, CCI, BT

For the DS-LANIII: HR, ST1, ST2, RR (Impedance /CO₂/ Ventilator), BP1 to 6, EtCO₂, InspCO₂, SpO₂, PR(SpO₂), T1, T2, VPC, NIBP, E-O₂, I-O₂, E-N₂O, I-N₂O, E-CO₂, I-CO₂, E-Agent1, I-Agent1, E-Agent2, I-Agent2, SvO₂, CCO, CCI, BT, MAC

- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Network Config.** → **HL7 Server** keys.**

For the “This Unit IP Address”, IP address for the DS-7600 system will be displayed.
For the “Central ID”, an unique ID for this device will be displayed.



On the right side of the screen, the registered beds (max. 16) will be displayed.



For details of bed registration, refer to “4-1 Register the monitoring beds”.

- 2 Select **ON** / **OFF** for usage of HL7 Server.**



- 3 Set the port number.**

Port No. **2900**

Input the port number using the numeric keypad.

NOTE Input the port number recommended for the used HL7 server.

- 4 Press the **Enter** key to validate the setup.**



This setup should be performed by our service representative or your network administrator.

EMR Link Function

Using the EMR link function through the patient data server allows to perform following operation on the DS-7600 system.

- When a patient is admitted on EMR, the same patient will be admitted on the DS-7600 system.
- When a patient is discharged on EMR, this patient's information on the DS-7600 system will be initialized. The monitored data and settings will remain until the discharge process on the DS-7600 system is performed.
- When a patient information is changed on the EMR, the patient information on the DS-7600 system will also change.

Restrictions of EMR Link Function

There are following restrictions when using the EMR link function.

Function	Item	Network Configuration (Patient Data Server)		
		EMR Link Function		
		EMR Admitted	EMR Discharged	EMR Offline
Menu	Discharge	No	Yes	Yes
System Configuration	Bed Transfer	No	No	Yes
User Key	Bed Transfer	No	No	Yes
	Discharge	No	Yes	Yes
PC/CF Card	Read Patient Data	No	No	Yes
	Write Patient Data	Yes	Yes	Yes
Patient Admit Menu	ID	No	No	Yes
	Search Patient	No	No	No
	Name	No	No	Yes
	Discharge	No	Yes	Yes
	Suspend	Yes	Yes	Yes
	Admit Date	No	No	Yes
	Bed Name	Yes	Yes	Yes
	Other patient information	Yes	Yes	Yes
	EMR Link Message	Admitted on EMR	Discharged from EMR	EMR Offline
Patient Information, Comment Input	ID	No	No	Yes
	Name	No	No	Yes
DS-LAN Network (Operation on the bedside monitor)	Change of patient ID	No	No	Yes
	Change of patient name	No	No	Yes
	Change of admit date	No	No	Yes
	Change of patient information	Yes	Yes	Yes
	Discharge process	No	Yes	Yes

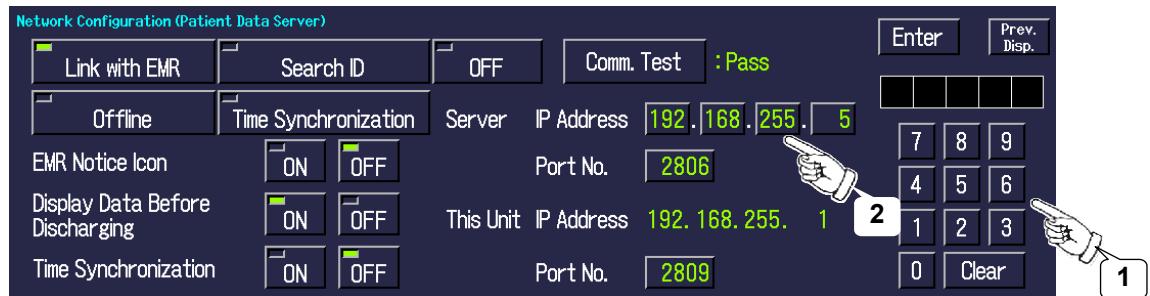
"Yes": Can display, edit, and change settings.

"No": Cannot display, edit, and change settings.

Patient Data Server Setup

1 Press the **Menu** → **System Config.** → **Pre-set** → enter password → **Network Config.** → **Patient Server** keys to display the patient data server setup screen. Select **Link with EMR** on this screen.

2 Input the IP address and port number of the patient data server.



- 1) Input the IP address number using the numeric keypad.
- 2) Press the corresponding key. The input number will be displayed inside the key.
- 3) Input the port number using the same procedure above.

Port No. **2301**

Input the port number using the numeric keypad.

NOTE	Input the port number recommended for the used patient data server.
-------------	---

3 Set the port number of the DS-7600 system.

This Unit IP Address **192.168.255.1**
Port No. **2305**

The displayed IP address for "This Unit" cannot be changed on this screen. If necessary, it can be changed on the Network Configuration (This Unit) screen.

Input the port number using the same procedure explained in procedure 2 above.

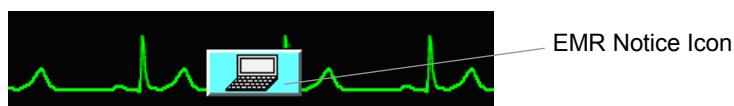
NOTE	The port number in the range of 1024 to 65535 can be input. The recommended port number is "2809".
-------------	---

4 Set ON/OFF for "EMR Notice Icon".

EMR Notice Icon **ON** **OFF**

ON will display the EMR notice icon on the home display when a patient is admitted on EMR. Pressing this icon will display the patient admit/discharge menu.

OFF will not display EMR notice icon.



This setup should be performed by our service representative or your network administrator.

5 Set ON/OFF for “Display Data Before Discharging”.

When a patient is discharged from EMR, the patient will be also discharged on the DS-7600 system. If EMR link function is not used, the discharge operation will erase the review data for that patient. But if EMR link function is used, the review data for the discharged patient will remain for later reference. The review data that can be displayed after the discharge operation are as follows.

- Graphic Trend
- Tabular Trend
- Recall (List, Enlarged Display)
- NIBP List
- ST Waveform
- 12-Lead ST
- Full Disclosure Waveform (Compressed, Enlarged Display)
- Full Disclosure Waveform (Slave/Compressed, Slave/Enlarged)

Display Data Before
Discharging  

ON will display the review data for the patient discharged from the EMR.

OFF will not display the review data for the patient discharged from the EMR.

6 Select ON/OFF for “Time Synchronization”.

Time Synchronization  

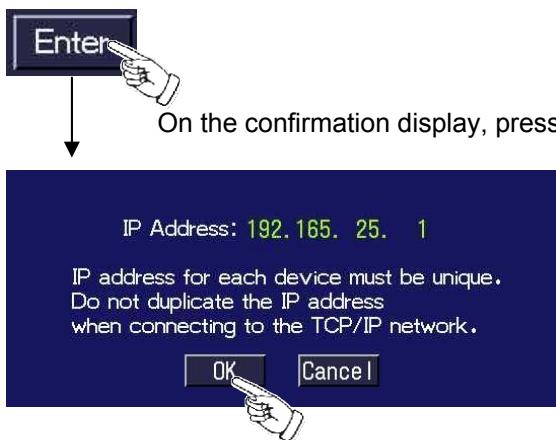
ON will synchronize the time with patient data server by communicating with the server every 1 minute.

However, if higher priority time synchronization is present (refer below), this setting will be invalid.

OFF will not synchronize the time with patient data server.

NOTE	<p>【Priority of the Time Synchronization】 The time will be synchronized with the following priority.</p> <ul style="list-style-type: none">1) Administrating monitor, if wired network is constructed.2) SNTP server, if used.3) Patient server, if used, and if “Time Synchronization” on Patient Data Server setup is set to ON, or if Time Synchronization is selected.
-------------	---

7 Press the **Enter** key and finalize the setup.



8 Press the **Comm Test** key and check if the communication is properly performed.

Comm. Test : **Pass**

If properly communicating, “Pass” will be displayed. If any failure, “Fail” will be displayed. In such case, check the network setting, and perform the setup again.

Admit/Discharge on the EMR



For details on EMR admit/discharge process, refer to P3-15 “3. Admit/Discharge of a Patient Admit/Discharge on the EMR”.

To Suspend the EMR Link Function

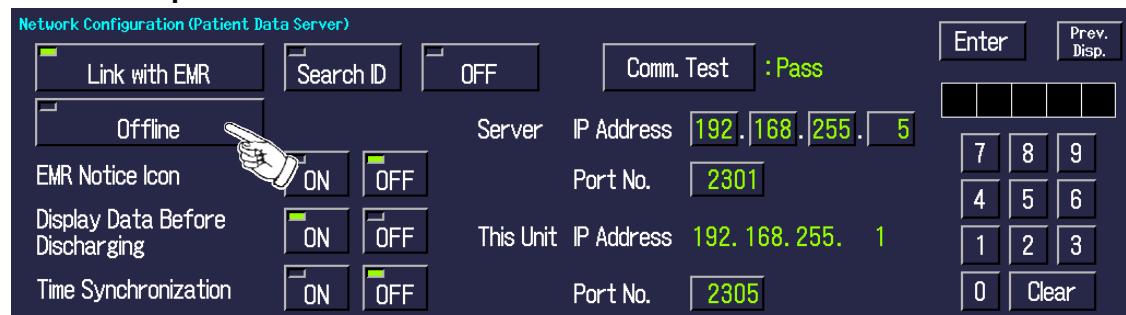
When there is a communication failure between the DS-7600 system and patient data server, “Check EMR comm.” message will be displayed.

In such case, suspending the EMR link function will allow to perform the patient admit/discharge operation (admit/discharge, edit patient ID, bed transfer/exchange) on the DS-7600 system.

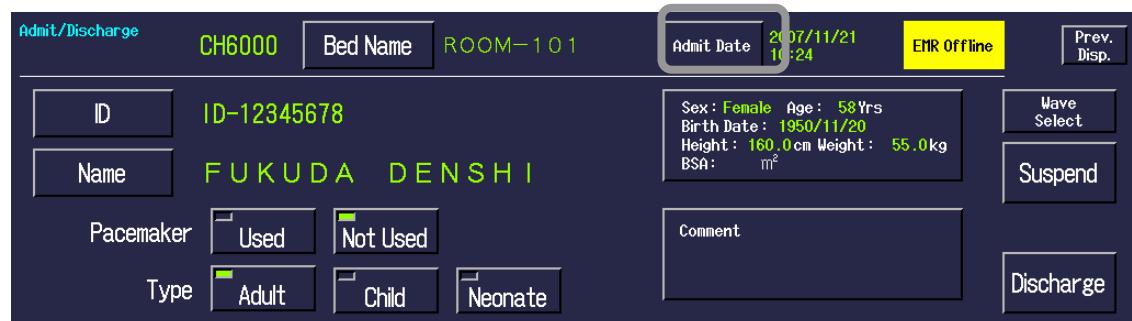


During this offline condition, admit/discharge on the EMR will not be linked to the DS-7600 system.

- 1 To suspend the EMR link function, press the **Offline** key on the Patient Data Server setup menu.**



During the offline condition, “EMR Offline” message will be displayed on the patient admit/discharge menu and system status message area.



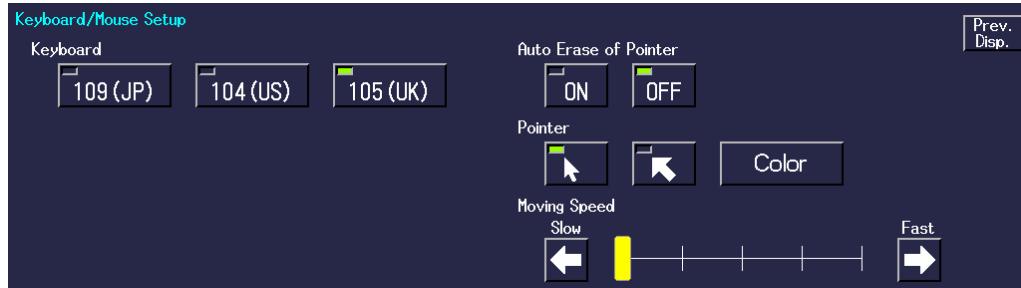
- 2 To resume the EMR link function, press the **Offline** key again on the Patient Data Server setup menu to turn OFF the key LED.**

This setup should be performed by our service representative or your network administrator.

Keyboard / Mouse Setup (DS-7600W Series Only)

For the DS-7600W series, connecting the optional mouse and keyboard allows touch panel key control using a mouse, and character input using a keyboard.
When using the mouse and keyboard, perform the following setup.

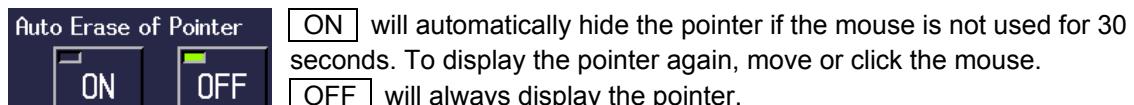
- 1 Press the **Menu** → **System Config.** → **Pre-set** → enter password
→ **Keyboard / Mouse Setup** keys to display the Keyboard / Mouse Setup menu.



- 2 Select the keyboard type.



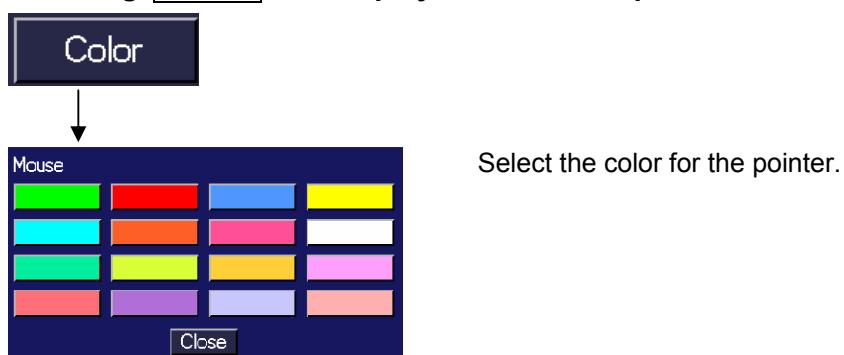
- 3 Select ON or OFF for auto erase function of the pointer.



- 4 Select the pointer shape.



- 5 Selecting **Color** will display the color setup menu.



- 6 Set the pointer speed.

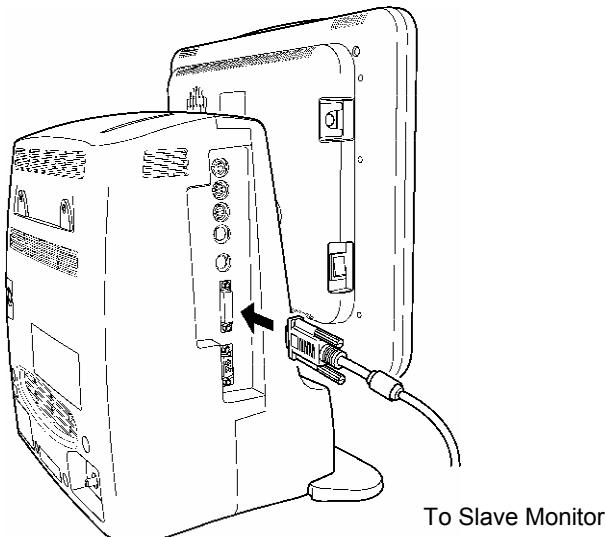


Using the Slave Monitor

The patient monitor is equipped with a DVI-I connector for slave monitor output which allows connection of standard display unit with digital connection or analog RGB connection. For the DS-7600W series, the slave monitor display can be selected from the same display as the main monitor or full disclosure waveform. For the DS-7600 series, the slave monitor display is fixed as the same display as the main monitor.

Connecting the Slave Monitor

When connecting, contact our service representative.



Slave Monitor Specification

A commercially available monitor satisfying the following condition should be used.

- Resolution* : XGA size (1024dot × 768dot) (For DS-7600 series)
SXGA size (1280dot × 1024dot) (For DS-7600W series)
 - Horizontal Frequency : 48.4kHz (For DS-7600 series)
64.0kHz (For DS-7600W series)
 - Vertical Frequency : 60Hz (For both DS-7600 series and DS-7600W series)
 - Cable Length : when connecting analog RGB monitor 10m (max)^{*1}
when connecting digital monitor 10m (max)^{*2}
- ^{*1} : For analog RGB connection, commercial DVI-I male↔VGA HD15 female connector changer and VGA cable are required.
: If using a cable longer than 3m, use low-loss cable to maintain the performance.
- ^{*2} : For digital connection, use the CJZ-01SS3 digital display connection cable to maintain the performance.

Model Type	Length
CJZ-01SS3	3m
CJZ-01SS5	5m
CJZ-01SS10	10m



*Do not use any slave monitors which does not satisfy the required display resolution even if it is capable of displaying higher resolution than the actual resolution. If such monitor is used, the display screen image will not be properly shown.

This setup should be performed by our service representative or your network administrator.

Slave Monitor Setup (DS-7600W Series Only)

- 1 Press the **Menu** → **System Config.** → **Pre-Set** → enter password
→ **Slave Mon. Setup** keys and display the slave monitor setup menu.



- 2 Select the output data for the slave monitor.

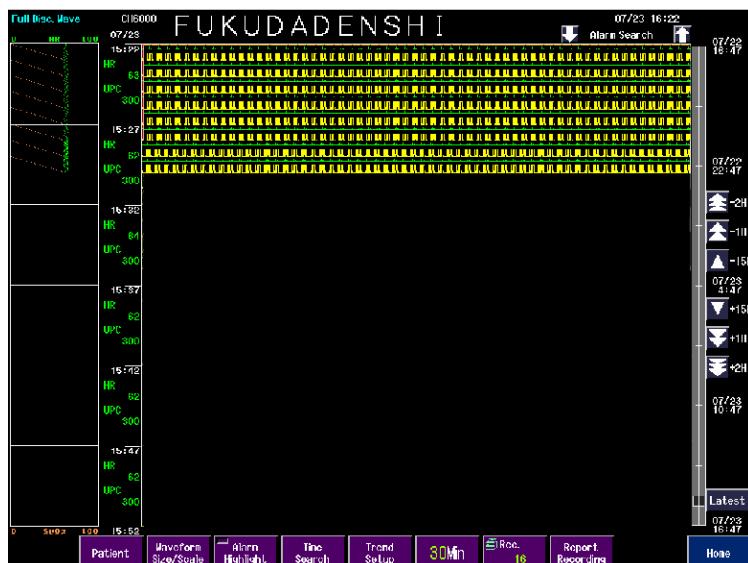
Output Selection Slave Full Disc. Slave will output the same display with the main monitor.
Full Disc. will output the full disclosure waveform.

- 3 Select the location for the slave monitor.

Slave Monitor Location Left Right Select Left if locating the slave monitor to the right side of the main monitor.
Select Right if locating the slave monitor to the left side of the main monitor.

●Full Disclosure Waveform Display on the Slave Monitor (DS-7600W Series Only)

If **Full Disc.** is selected for "Output Selection" on slave monitor setup, full disclosure waveform data can be displayed on the slave monitor.



Reference

For details of full disclosure waveform display, refer to "7. Review Function Full Disclosure Waveform Recording (Optional Function)"

Chapter 10

Maintenance

This chapter describes about the maintenance and troubleshooting of this equipment.

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This section describes precautions for handling the equipment.

Handling After Use

- Do not apply excessive force when disconnecting the cables. Always pull on the connector housing and not on the cable.
- Clean the unit, accessories, and cables, and keep them together in one place for next use.
- Always check for adequate supply of consumables such as ECG electrodes.
If any shortage, contact our service representative and supply as necessary.

Handling the Touch Panel

- The touch panel utilizes exclusive fluorescent light for the backlight.
As this fluorescent light tube has product life cycle, it needs to be replaced periodically.
If the display becomes dark, flickers, or does not light, contact your nearest service representative.
- Although the LCD utilizes highly accurate picture elements, occasionally, there may be few pixels which does not light or constantly lights. Please note that this is not an equipment failure, and will not affect monitoring operation.
- Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will be reduced in few hours or half a day after the power is turned ON.

This section describes about the storage of the device and the recording paper.

Storing the Device

- Store in a place where the device will not be exposed to splashing water.
- Store in a place where the device will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust or atmosphere containing salt or sulfur.
- Store in a level area where the device is not exposed to vibration and shock (including during transportation).
- The following environmental conditions should be observed when storing the device.
 Storage Temperature : -10–60°C
 Storage Humidity : 10–95% (at 60°C)

Storing the Recording Paper

The DS-7600 system utilizes heat sensitive recording paper. If placed in a high temperature for long period of time, the print may become indistinct, and unable to read. 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 or 122 °F or above).
- Do not store the paper in polyvinyl chloride bag.
- Do not expose the paper to alcohol, hydrochloric acid, or ester ketone.
- Avoid using adhesive agents other than water-based glue.

This chapter explains about the cleaning of the touch panel and Housing.

Cleaning the Touch Panel

Since this device incorporates a touch panel, fingerprints and other stains are likely to appear on the touch panel. Follow the procedure below to clean the touch panel.

⚠ CAUTION

- A special coating is applied to the surface of the touch panel. Do not wipe the surface with a cloth or gauze with coarse texture. Wipe the surface with the soft cleaning cloth provided as optional accessory or with an eyeglass cleaning cloth.
- If stains cannot be removed from the touch panel surface, wipe softly with dry or ethanol dampened cleaning cloth. Never use strong-acidic cleaning solution.

Cleaning the Housing

Clean the housing using tightly squeezed gauze or an absorbent cotton cloth dampened with alcohol or a neutral cleanser.

⚠ CAUTION

- Clean the equipment frequently so stains can be removed easily.
- To prevent injury, it is recommended to wear gloves when cleaning the equipment.
- Do not allow liquids or cleaning solution to enter the monitor or connectors.
- Do not use organic solvents, thinner, toluene and benzene to avoid damaging the resin case.
- Do not polish the housing with abrasive or chemical cleaner.
- When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the monitor or connectors.
- Use only neutral detergent to clean the housing. Do not use 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. The surface resin coating may be damaged, resulting in discoloration, scratches, and other problems.

This section explains the daily check and periodic check items of the device.

About the Maintenance Check

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

To ensure safety, reliability, and high performance, a “Daily Check” and “Periodic Inspection” must be performed. We are not liable for any accident arising from lack of maintenance.



- Do not open the housing of this device.
- Avoid alcohol or other liquids from getting into the equipment.

● Daily Check

Perform daily inspection using the “Daily Check List” on the next page.

● Periodic Check

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

Periodic maintenance may be performed by each medical institution or by a third party by concluding a “Maintenance Contract”.

For more details, contact your nearest service representative.

Periodic Replacement Parts

To ensure reliability of safety, function, and performance of this device, the following components must be replaced periodically. When replacing, contact our service representative.

Short Term Backup Battery Replacing Period: 3 years according to the used frequency



The periodic replacement parts must be replaced at specified period.

NOTE

- To protect the data during voltage dip, short interruptions and voltage variations on power supply input lines or during short duration of power turned OFF, this monitor performs 10-minute (approx.) data backup using the secondary battery. The data such as trend data, NIBP list data, ST data, recall data may not be protected if the power is turned off within 30 minutes from power on.
- If the short-term backup battery is continuously used without replacement, the short-term backup time may become extremely short or backup may not be performed at all. However, this will not affect the normal monitoring.
- The display panel utilizes exclusive fluorescent light for the backlight. As this fluorescent light tube has product life cycle, it needs to be replaced periodically. If the display becomes dark, flickers, or does not light, contact your nearest service representative.

Maintenance Display

On the maintenance display, maintenance procedure such as touch panel adjustment, recorder adjustment, and maintenance test can be performed.



CAUTION

The maintenance procedure will be performed by our service representative. Users should not attempt this procedure as malfunction may result to the device.

LAN Information

Information such as the connection status of the equipment connected to the network system will be displayed.

Software Version Information

The software version of the DS-7600 and each module (recorder, telemeter, etc.) can be verified on this display.

Daily Check List

No. _____

Inspected Date _____ Inspected by _____ Location _____

Device Type DS-7680/DS-7600L/
DS-7680W/DS-7640W/DS-7600WL Serial No. _____ Date of Purchase _____

Item	Details	Criteria	Judgment
Appearance	Visually check the exterior for scratches, cracks, deformation, and rust.	No abnormality should be found.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Installation	Check whether the unit is installed on a level surface.	The installation area must be level and free from vibration and shock.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
	Check whether the unit is installed in a place susceptible to adverse environment.	The environmental condition (ex. temperature, humidity) of the installed place should be as specified. The unit should not be subjected to splashing water.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Functions	Turn ON the monitor, and check whether it operates normally.	The home display appears, and the lamp located at the right side of the display panel lights.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
		The date and time should be correct.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
		The waveform is properly received and displayed.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
		Pressing the manual record key  will start recording on the recorder.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Cables	Visually check on all cables for any damage.	No damage should be found.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Telemetry Channel	Verify the channel IDs are as specified by the telemetry channel administrator.	It should conform to telemetry channel checklist.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Periodic Inspection	Check the previous periodic inspection date.	It should be within 1 year.	<input type="checkbox"/> OK / <input type="checkbox"/> NG

Comment

Troubleshooting

The troubleshooting for each case is explained in this section.

Other than the troubles stated below, troubles of the bedside monitor, telemetry transmitter, or other device can be considered.

Refer also to the operation manual of those devices.

Wired Network, TCP/IP Network

The waveforms and numeric data for the wired network beds are not displayed.

Cause 1 : The DS-LAN setup is not correct.

Solution : Make sure that the DS-LAN Setup (DS-LANII/DS-LANIII) for all bedside monitors and central monitors in the same network are the same. If the DS-LAN setting is changed, make sure to restart the system.

Cause 2 : A central monitor which is not compatible with the DS-LANIII network is used.

Solution : The following central monitors can not be used with the DS-LANIII network.

- DS-5700
- DS-5800N/NX/NX^{MB}
- DS-7600/7600W with software version V05 and prior

When using these central monitors, all monitors in the same network should be set to DS-LANII.

Cause 3 : Inappropriate HUB is used.

Solution : Use a 10Base repeater HUB for DS-LANII network and a recommended switching HUB for DS-LANIII network.

Make sure to use the correct HUB for each network.

Cause 4 : On the DS-LANII network, DS-5800 is set as the network-administrating monitor.

Solution : In case of DS-LANII network, it is necessary to set DS-7600 system or DS-5700 as the network-administrating monitor.

Cause 5 : The central ID is duplicated.

Solution : Make sure to set a unique central ID for each central monitor. Set the ID in the range from 1 to 8 for DS-LANII, and 1 to 16 for DS-LANIII network.

Telemetry

The waveform transmission is often interrupted.

Cause 1 : The patient is located too far from the receiver antenna.

Solution : Make sure that the patient is located within the receiving area.

Cause 2 : There is a metallic obstruction (elevator, door, etc.) between the transmitter and receiver.

Solution : Try to prevent obstruction between the transmitter and receiver.

Cause 3 : A low battery mark “■” is displayed in the waveform area for the telemetry receiving bed.

Solution : Replace the battery of the transmitter.

A noise is interfering on the waveform, and the waveform suddenly changes.

Cause 1 : A transmitter with the same channel ID or close frequency is used nearby.

Solution : Stop using the other transmitter.

Cause 2 : The AC filter frequency is not selected correctly.

Solution : Set the correct frequency (50Hz or 60Hz) for “AC Filter” on the soft switch menu.

Cause 3 : **OFF** is selected for the AC filter.

Solution : Select **ON** for the “AC Filter” on the ECG setup menu.

Cause 4 : **OFF** is selected for the ECG drift filter.

Solution : Select **[ON]** for the ECG drift filter on the ECG setup menu.

The waveform is not transmitted or displayed.

Cause 1 : The battery of the transmitter is depleted.
 Solution : Replace with a new battery.

Cause 2 : The battery is installed with opposite polarity.
 Solution : Verify the (+) (-) direction of the battery and install correctly.

Cause 3 : The antenna cable is disconnected.
 Solution : Connect the antenna cable securely.

Interference waveform () is displayed.

Cause 1 : A transmitter with an influencing channel ID is used nearby.
 Solution : Use the transmitter with a channel ID that does not interfere.

Cause 2 : The group ID of the transmitter and the DS-7600 does not match.
 Solution : Set the correct group ID.

Bed Registration

A bed cannot be selected on the bed registration menu.

Cause 1 : The remaining displayable bed is 0.
 Solution : The maximum numbers of beds that can be registered are 16 beds.
 Cancel the registration for the bed which is not monitored.

Situation : The bed is wired network bed, and bed ID or channel ID is not displayed.

Cause 1 : The wired network setup is incorrect.
 Solution : Check the wired network connection.

Cause 2 : The DS-LAN setup is not correct.

Solution : Make sure that the DS-LAN Setup (DS-LANII/DS-LANIII) is correct.

Cause 3 : The central ID, room/bed ID is incorrect.

Solution : Check if the central ID, room/bed ID of the DS-7600 and the monitors connected to the DS-LANII/DS-LANIII are not duplicated. If duplicated, set the correct ID.

Alarm

Alarm does not generate. Alarm is not displayed.

Cause 1 : Alarm is suspended.
 Solution : Cancel the **[Alarm Suspend]** selection on the menu display.

Cause 2 : The alarm for the parameter is set to **[OFF]**.

Solution : On the alarm setup menu for the parameter, set the alarm **[ON]**.

Cause 3 : The alarm threshold level is not set for the parameter.

Solution : Set the upper/lower alarm threshold level on the alarm setup menu for the parameter.

Alarm does not generate.

Cause : The volume of the alarm sound is too low.
 Solution : If the alarm sound is set too low, the sound may be hard to recognize.
 Increase the volume of the alarm sound and technical alarm sound on the tone/volume setup menu.

Arrhythmia alarm does not generate. Arrhythmia alarm is not displayed.

Cause 1 : Alarm is suspended.

Solution : Cancel the **Alarm Suspend** selection on the menu display.

Cause 2 : The arrhythmia alarm is set to **OFF**.

Solution : Set the alarm **ON** on the arrhythmia alarm setup menu.

The alarm for Slow VT, Couplet, Pause, Trigeminy cannot be set.

Cause : Depending on the system construction, Slow VT, Couplet, Pause, Trigeminy cannot be analyzed.



For details of the difference of display/setup depending on the system construction, refer to "4. Parameter Setup/Monitoring on the Home Display / Display according to the Network Construction ●Arrhythmia Display Setup".

The “NIBP measurement failed.” alarm does not generate.

Cause : The DS-LANII network is used.

Solution : Use the DS-LANIII network. The “NIBP measurement failed.” alarm generates only for the bed connected to the DS-LANIII network.

The “Cannot analyze” message is displayed.

Cause : When “Suspend Arrhy. Analysis during Noise Interference” under Alarm Related Setup is set to ON, and arrhythmia analysis has been continuously suspended for more than 30 seconds due to continuous noise interference or EMG, this message will generate.

Solution : Check the electrode attachment, and remove the noise source.

- Check if electrodes and lead cables are properly attached.
- Replace the electrode, lead cable if defective.
- If any noise source is near the patient, locate it away from the patient as much as possible.
- If EMG is interfering, change the electrode site to a location where EMG will less likely to interfere.

Display

A certain parameter cannot be displayed.

Cause 1 : The parameter is not set to be displayed on the bedside monitor connected to the network.

Solution : Set the parameter to be displayed on the bedside monitor.

Cause 2 : The parameter is set OFF on the “Parameter ON/OFF” menu.

Solution : Set the parameter ON on the “Parameter ON/OFF” menu.

(**Menu** → **Param. Setup** → **Parameter ON/OFF**)

Waveform and numeric data for certain bed cannot be displayed.

Cause 1 : For the DS-LANII/III network system, there is no central monitor with the central ID 001.

Or, the central ID is duplicated

Solution : The central monitor with the central ID: 001 will function as network-administrating monitor and controls the whole network segment. One of the central monitors must have the central ID: 001.

Also, central ID must not be duplicated among the central monitors.

Cause 2 : The channel ID is not correct.

Solution : Set the correct channel ID on the channel setup menu of the preset menu.

Cause 3 : Monitoring is suspended for that bed.

Solution : Resume monitoring.

Cause 4 : A low battery mark “” is displayed in the waveform area for that bed.

Solution : Replace the transmitter battery with a new one.

Cause 5 : The bed is not selected on the display configuration setup menu.
 Solution : Select the bed to be displayed on the display configuration setup menu.

Cause 6 : The waveform is not selected to be displayed on the display configuration setup menu.
 Solution : Select the waveform to be displayed on the display configuration setup menu.

Cause 7 : The bedside monitor is not properly connected to the DS-LANII/DS-LANIII network.
 Solution : Connect using the Ethernet branch cable (CJ-522) or LAN interface cable (CJ-530).

Cause 8 : The software version of the telemetry receiver does not correspond.
 Solution : Contact our service representative.

The waveform / numeric data for particular bed are not displayed on the DS-5800N/NX/NX^{MB} connected to the DS-LANII network system.

Cause : 3 or more DS-5800N/NX/NX^{MB} are used.
 Solution : On the DS-5800N/NX/NX^{MB} Central Monitor, the same patient data (both home display and individual display) cannot be displayed simultaneously on 3 central monitors. The same patient data can be displayed simultaneously on maximum of 2 central monitors.

The measurement data is displayed as “- - -”.

Cause : The data is outside the measurement range.
 Solution : Check the cable connection status for that parameter.
 • For ECG, RESP: check the electrode attachment.
 • For BP: perform BP zero balance.

Artificial pacemaker is not displayed.

Cause 1 : “Pacemaker” is set to **Not Used** on the patient admit menu.
 Solution : Select **Used** for the pacemaker use on patient admit menu.

Cause 2 : “Pace Pulse” is set to **OFF** on the ECG configuration menu.
 Solution : Set the artificial pacemaker to **ON** or **Distinct Color** on the ECG configuration menu.

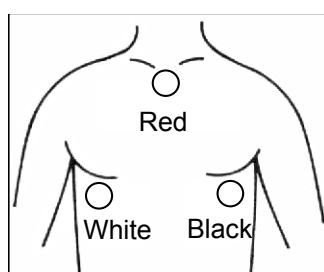
Cause 3 : On the bedside monitor, artificial pacemaker is not set to be displayed.
 Solution : Display the artificial pacemaker on the bedside monitor.
 For procedure, refer to the operation manual for each bedside monitor.

The heart rate is not counted, and the “Chk Electrode” message and  mark is displayed.

Cause : The electrode is detached, or is not making good electrical contact with the skin.
 If the lead type is not displayed, 2 or more electrodes are detached.
 Solution : • Check if the electrodes are properly attached.
 • Replace the electrode, or check the lead cable.

The “CVA detected” message is displayed.

Cause : Heartbeat is interfering and superimposed on the respiration waveform.
 Solution : Place the electrode as shown below where the heartbeat will be less likely to interfere.



“0” is displayed for respiration rate, or apnea alarm is generated.

Cause : The respiration waveform amplitude is below the detection level (0.2Ω).

Solution : Change the electrode site.

The pulse waveform is not displayed. The “Chk SpO₂ sensor” message is displayed.

Cause 1 : The sensor is detached from the patient.

Solution : Check if the sensor is properly attached to the patient.

Cause 2 : The amplitude of the pulse waveform is low, or the sensor is not positioned correctly.

Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

Cause 3 : Sensor is defective.

Solution : Replace the sensor.

Cause 4 : SpO₂ sensor is not firmly connected to the SpO₂ input connector.

Solution : Make sure the SpO₂ sensor is securely connected.

Cause 5 : Sensor is exposed to light.

Solution : Place a black or dark cloth over the sensor to avoid direct sunlight. When not used, avoid placing the sensor in light or unplug the sensor from the connector.

The BP numeric data, BP waveform, NIBP numeric data are not displayed.

Cause : The BP unit (mmHg/kPa) is different between the bedside monitor and central monitor.

Solution : If the BP unit (mmHg/kPa) is different between the bedside monitor and central monitor, BP numeric data, NIBP numeric data, NIBP list will not be transmitted from the bedside monitor. These will be treated as not measured data, and will not be displayed on the DS-7600. Alarm limit setup on the DS-7600 cannot be performed either. Set the same unit for bedside monitor and central monitor.

The temperature numeric data is not displayed.

Cause 1 : The temperature unit (°C/°F) is different between the bedside monitor and central monitor.

Solution : If the temperature unit (°C/°F) is different between the bedside monitor and central monitor, the temperature data will not be transmitted from the bedside monitor. It will be treated as not measured data, and will not be displayed on the DS-7600. Alarm limit setup on the DS-7600 cannot be performed either. Set the same unit for bedside monitor and central monitor.

Cause 2 : The temperature unit °F is set on the DS-LANII bedside monitor.

Solution : When the temperature unit °F is set on the DS-LANII bedside monitor, temperature data will not be transmitted from the bedside monitor. It will be treated as not measured data, and will not be displayed on the DS-7600. Alarm limit setup on the DS-7600 cannot be performed either. When the DS-LANII network is used, set the temperature unit to °C on the bedside monitor.

The BP measured data is displayed as “- - -”.

Cause : The BP zero balance has not been performed since the power is turned ON.

Solution : Open the three-way cock of the transducer to air and perform zero balance.

The NIBP numeric data is displayed as “- - -”.

Cause 1 : The measurement accuracy is not reliable due to body motion artifact.

Solution : Have the patient stay still as much as possible during the measurement.

Cause 2 : The pulse is too small to acquire reliable measurement accuracy.

Solution : Check if the cuff application is proper, and if the cuff size corresponds to the selected patient type.

The CO₂ is measured on the bedside monitor, but the waveform and numeric data are not displayed on the DS-7600.

Cause 1 : The software version of the HLX-561 Telemetry Transmitter Module on the bedside monitor is V01-07 or prior.

Solution : Update the HLX-561 software version.

Cause 2 : CO₂ is measured on the DS-5400 Bedside Monitor with the software version V03-02 or prior.

Solution : Update the DS-5400 software version.

Cause 3 : CO₂ is measured on the DS-5300 Bedside Monitor.

Solution : The DS-5300 is not capable to transmit the CO₂ data. Use other bedside monitor.

Built-in Recorder

The “Paper Out” message is displayed.

Cause : There is no recording paper.

Solution : Install a new pad of paper into the paper cassette.

The “Check Magazine” message is displayed.

Cause 1 : The paper cassette is open.

Solution : Close the cassette firmly.

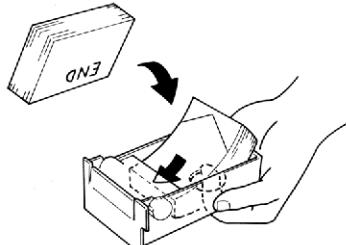
Cause 2 : The paper is jammed inside the cassette.

Solution : Open the cassette, and install the paper properly.

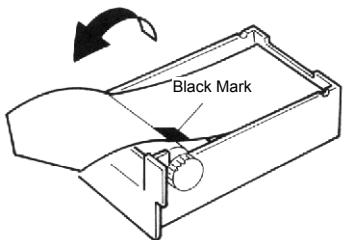
The “Paper Out” and “Check Magazine” message is not displayed, but recording cannot be performed.

Cause : The recording paper is not correctly installed. The front and backside of the paper is set oppositely.

Solution 1 : The “END” printed side of the paper should be facing down in the paper cassette.



Solution 2 : Place the paper so that the thermal printing side (side with black mark) is facing top.



The “Paper Jam” message is displayed.

Cause : The paper is jammed.

Solution : Open the cassette, and install the paper properly.

The recorder paper cassette does not open even though the cassette release button is pressed.

Cause : The recording paper has come off the paper feed roller inside the cassette.

Solution : Turn off the power of the monitor.

While pressing the cassette release button, use a Phillips-head screwdriver to lightly

lift up the recorder and pull out the cassette.
Properly set the recording paper inside the cassette, and turn on the power of the monitor.
Cut the recording paper along the perforated line.

The ECG waveform is recorded, but the second and third waveforms are not recorded.

Cause : The second waveform and third waveform are not set on the recording setup menu.
Solution : Set the second waveform and the third waveform on each recording setup menu.

Alarm recording does not function.

Cause 1 : The alarm recording mode is set to OFF.
Solution : On the recording setup menu, set the alarm recording [ON].
Also, set the second waveform and third waveform for recording and the alarm factor to generate the alarm recording.

Cause 2 : Alarm setup for the parameter is set to OFF.
Solution : On the alarm setup menu for the parameter, set the alarm [ON].
Also, set the upper and lower alarm limit.

Periodic recording does not function.

Cause : The periodic recording mode is set to OFF.
Solution : On the recording setup menu, set the periodic recording [ON].
Also, set the second waveform and third waveform to be recorded along with recording time / interval.

Telemetry remote recording does not function.

Cause 1 : The event button on the transmitter such as LX-5120 is not pressed long enough to transmit the signal to the DS-7600.
Solution : Press the event button for more than 3 seconds.

Cause 2 : The telemetry remote recording is set to [OFF] when using the transmitter such as LX-5160, LX-5630.
Solution : Set the "LX Remote Rec." to [ON] on the recorder setup menu.

Remote recording does not function.

Cause : A recorder is equipped on the bedside monitor.
Solution : Perform the recording on the bedside monitor. If the bedside monitor is equipped with a recorder, remote recording will not function.

The "Check Recorder" message is displayed.

Cause : The thermal head temperature has increased.
Solution : A damage to the thermal head can be considered.
Contact our service representative.

Laser Printer

The recording is not performed on the laser printer.

Cause 1 : The paper cassette is empty.
Solution : Install the recording paper in to the paper cassette.

Cause 2 : The paper cassette is not firmly closed.
Solution : Close the paper cassette.

Cause 3 : Other monitor is in process of recording.
Solution : Suspend the ongoing recording or wait until the recording is complete.

Cause 4 : The printer is in offline mode.
Solution : Set the printer to online mode.

Cause 5 : The connection cable to the printer is disconnected.
 Solution : Securely connect the cable to the printer.

Cause 6 : The network setup for the laser printer is not performed.
 Solution : Refer to our service representative.

Cause 7 : Improper cable is used.
 Solution : Use cross cable if directly connecting the DS-7600 system and the printer, and use straight cable if connecting to the HUB.

Cause 8 : The network board of the laser printer is malfunctioning.
 Solution : Check if any error message or error code is displayed on the printer LCD.
 If displayed, contact our service representative.

Data transfer error to the printer has occurred.

Cause 1 : Printer is set to offline mode.
 Solution : Set the printer mode to online mode.

Cause 2 : Printer cable is disconnected.
 Solution : Connect the printer cable.

Printer recording does not stop.

Cause : Printing operation is performed too frequently.
 Solution : Wait until all the printing completes, or delete the stack data.
 Do not turn off the power of the printer during recording as it may cause a printing error.

The printed output is incomplete or frame only.

Cause 1 : The recorder cover or paper cassette is opened during recording, or the printer was left out of paper for a certain time and recording has resumed with the oldest data deleted.
 Solution : Do not open the recorder cover or paper cassette during recording. Also, supply new pad of paper immediately when the paper is out.

Cause 2 : The system was restarted during recording.
 Solution : Do not restart the system during recording.

Printer output is garbled.

Cause : The power of the printer is reset during recording.
 Solution : When resetting the printer power, it should be done after the recording is complete.

The record key turned to gray and cannot be pressed.

Cause : The stack data has reached the maximum recordable number (64).
 Solution : Wait until the number of stack data decreases.
 Or, press the **Cancel** key to delete the stack data.

PC/CF Card

The “There is no card in the slot.” message is displayed on the PC/CF card menu.

Cause : The PC/CF card is not inserted, or not correctly inserted to the card slot.
 Solution : Set the card correctly to the card slot.

The “Error reading from card.” or “Error writing to card.” message is displayed on the data transfer display.

Cause : Error is detected during read/write process.
 Solution : If the error is caused during writing, restart the process again.
 If the error is caused during reading, correct data may not be written on the card.

Format the card and rewrite the data on the card. Then, perform the process again.

The “Check PC/CF Card” message is displayed in the system status message display area at the upper part of the home display.

Cause 1 : Unspecified card is used.

Solution : Use the FCF-1000 or FCF-16GA CF card for storing the full disclosure waveform

Cause 2 : The card is not properly inserted.

Solution : Remove the card and insert again properly.

Cause 3 : Failed to write full disclosure waveform due to card damage, etc.

Solution : Replace with a new card.

Cause 4 : The number of times of write operation for the CF card has reached its maximum capacity.

Solution : Replace with a new card.

The data cannot be transferred. The key on the data transfer display cannot be pressed.

Cause 1 : The card is defective.

Solution : Do not use the defective card. Use a new card.

Cause 2 : Unspecified card is used.

Solution : Use the FCF-128 CF card for data transfer.

Cause 3 : Write-protect function is used on the CF card.

Solution : Cancel the write-protect function.

EMR Link Function

The “Check EMR comm.” Message is displayed.

Cause 1 : There is a communication failure between the DS-7600 system and the patient data server.

Solution : Check the communication status of the DS-7600 system, patient data server, and EMR machine.

Cause 2 : The network setup is incorrect.

Solution : On the network configuration setup menu, set the correct IP address and port number.



For network setup procedure, refer to “9. Installation EMR Link Function Patient Data Server Setup”.

Cause 3 : The patient data server system has gone down.

Solution : Check if the patient data server is properly operating. If not, refer to the operation manual of the patient data server.

Cause 4 : The connection cable is disconnected.

Solution : Verify that the DS-7600 system, patient data server, EMR machine is connected properly. If not, connect them properly.

General

Pulse sound is not generated.

Cause 1 : The “Pulse Sound” is set to **OFF** on the tone/volume setup menu.
Or, the lowest volume is set.

Solution : Set the “Pulse Sound” to **ON**. Or, increase the volume.

Cause 2 : The synchronizing sound setup is incorrect.

Solution : Select **ECG** or **SpO₂** correctly for “Sync Tone” on the ECG or SpO₂ setup

menu.

Cause 3 : The synchronized tone is set to generate on the pre-assigned bed only.

Solution : If **ECG SpO₂ Menu** is selected for "Sync. Tone Bed Selection" on the soft switch menu, the synchronized tone generating bed will be fixed to one bed. (If synchronized tone is set on the ECG or SpO₂ menu for one of the beds, the synchronized tone setup for all other beds will be set OFF.)

To change the synchronized tone generating bed, set the synchronized tone OFF (on the ECG or SpO₂ setup menu) for the currently assigned bed and set the synchronized tone for newly assigning bed.



"4. Parameter Setup Parameter Setup 【ECG·SpO₂】 Synchronized Tone Setup"

For setup procedure of "Sync. Tone Bed Selection" (Selected Bed, ECG/SpO₂ Menu), refer to "9 Installation Procedure to Start Monitoring 5-3 Set the soft switch".

The data was initialized when the power was turned ON.

Cause : The power has been turned OFF for more than 10 minutes.

Solution : When the power has been turned OFF for more than 10 minutes, the data of graphic trend, tabular trend, NIBP list, ST measurement, recall will be erased.

To retain the data, turn ON the power within 10 minutes.

The data is initialized each time the power is turned ON.

Cause 1 : The internal switch is set to initializing.

Solution : The internal switch setup needs to be changed.
Contact our service representative.

Cause 2 : The battery for the backup memory has depleted.

Solution : The battery needs to be replaced. Contact our service representative.

The display is not clear.

Cause : The display brightness is not adjusted.

Solution : Due to the LCD display characteristic, the visible range is limited.
Adjust to the appropriate brightness.

The system does not start although the power switch is turned ON.

Cause 1 : The power cable is not connected.

Solution : Turn off the power and connect the power cable.

Cause 2 : The display unit is not properly connected to the main unit.

Solution : Properly connect the main unit and the display unit.

The "Check Backup Battery" message is displayed.

Cause : The battery for the backup memory has depleted.

Solution : The battery needs to be replaced. Contact our service representative.

The time is displayed in yellow.

Cause : The time synchronization with the SNTP server or patient data server was not correctly performed.

Solution : If the time is incorrect, set the correct time.
Check the connection with the SNTP or patient data server.

Mouse / Keyboard

The mouse pointer does not move.

Cause 1 : The used monitor is DS-7600 series.

Solution : For the DS-7600 series, the mouse control function is not supported.

Cause 2 : A mouse other than the recommended one is used.

Solution : Other mouse may not function on the DS-7600W system, or may suddenly stop

functioning. Use the recommended mouse.

The mouse stopped functioning.

Cause 1 : The mouse is not recognizing the control signal from the DS-7600W system.

Solution 1 : Press the **Home** key at the lower right of the screen to reset the mouse control signal. If the mouse still does not function, the mouse connector may be disconnected. Ensure that the connection is secure.

The keyboard does not function.

Cause 1 : The used monitor is DS-7600 series.

Solution 1 : For the DS-7600 series, the keyboard function is not supported.

Cause 2 : The keyboard is directly connected to the display unit.

Solution 1 : The keyboard will not function if directly connected to the display unit. Make sure to connect it using a PS/2 Splitter Cable.

Cause 3 : A keyboard other than the recommended one is used.

Solution 1 : Other keyboard may not function on the DS-7600W system, or may suddenly stop functioning. Use the recommended keyboard.

Cause 4 : The keyboard and mouse are not properly connected.

Solution 1 : A keyboard mark and a mouse mark are indicated on the PS/2 Splitter Cable. Properly connect the keyboard and mouse to the corresponding connectors.

The keyboard stopped functioning.

Solution 1 : The keyboard connector may be disconnected.

If it does not function within 30 seconds, securely plug in the connector again.

Slave Monitor

Nothing is displayed on the slave monitor, or the display flickers.

Cause 1 : The display resolution does not satisfy the specification.

Solution 1 : Use a slave monitor with resolution of XGA (1024dot × 768dot) for DS-7600 series, and SXGA (1280dot × 1024dot) for DS-7600W series. Do not use any slave monitors which does not satisfy the required display resolution even if it is capable of displaying higher resolution than the actual resolution. If such monitor is used, the display screen image will not be properly shown.

Cause 2 : Synchronization failure.

Solution 1 : Use the monitor which satisfies the following horizontal/vertical frequency.

• Horizontal Frequency : 48.4kHz (For DS-7600 series)

64.0kHz (For DS-7600W series)

• Vertical Frequency : 60Hz (For both DS-7600 series and DS-7600W series)

Cause 3 : Improper cable is used.

Solution 1 : For digital connection, use the CJZ-01SS display connection cable. There are 3 different types of CJZ-01SS, which are:

Model Type	Length
CJZ-01SS3	3m
CJZ-01SS5	5m
CJZ-01SS10	10m

Chapter 11

Technical Information

This chapter lists the specification, default setting, and connector pin assignments.

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Specification / Performance

This section states the specification and performance of this equipment.

Specification

Size

DS-7600 Series

350 ± 10(W) × 244 ± 10(D) × 387 ± 10(H) mm (not including the protrusion)

DS-7600W Series

440 ± 30(W) × 264 ± 20(D) × 480 ± 30(H) mm (not including the protrusion)

Weight (not including the accessory)

DS-7600 Series : 12.5 ± 1.5kg

DS-7600W Series : 14.5 ± 1.5kg

Environmental Condition

Operating Environment

Ambient Temperature : 10 to 40°C

Relative Humidity : 30 to 85 % (non-condensing)

Transport / Storage Temperature

Ambient Temperature : -10 to 60°C

Relative Humidity : 10 to 95 % (non-condensing)

Safety

General Standard : IEC 60601-1:1988

(Medical electrical equipment – Part 1: General requirements for safety)

Amendment A1 to IEC 60601-1:1991

Amendment A2 to IEC 60601-1:1995

IEC 60601-1-1:2000

(Medical electrical equipment – Part 1-1: General requirements for safety – Collateral standard: Safety requirements for medical electrical systems)

UL 60601-1: 2003, with updates to 2006 * (Medical electrical equipment – Part1: General requirements for safety)

CAN/CSA C22.2 No.601.1-M90, with updates to 2005* (Medical electrical equipment – Part1: General requirements for safety)

*The above 2 standards applies only for the product with UL/cUL Classification mark on the rating label.

EMC Standard

: IEC 60601-1-2:2001

(Medical electrical equipment – Part 1: General requirements for safety 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

The type of protection

against electric shock : Class I

Power Requirements

Voltage

: DS-7680/DS-7640W/DS-7680W AC115V

DS-7600L/DS-7600WL

AC115V (for product with UL/cUL Classification mark)

AC100 to 240V (for product without UL/cUL Classification mark)

Frequency

: 50Hz or 60Hz

Power Consumption : 150VA

Usable Life

6 years : According to self-certification

Refer to "10. Maintenance Periodic Replacement Parts" for components requiring periodic replacement.

Performance

Display

Device	: TFT Color LCD
Size	: DS-7600 series: 15 inch (diagonal) DS-7600W series: 19 inch (diagonal)
Resolution	: DS-7600 series: 1024 × 768 XGA DS-7600W series: 1280 × 1024 SXGA
Waveform Trace	: Stationary Trace
No. of displaying waveform	: Max. 21 waveforms
Parameter	: ECG, RESP, TEMP, SpO ₂ , BP1–6, NIBP, CO ₂ , O ₂ , N ₂ O, AGENT, MAC
Waveform	: ECG, RESP, BP, SpO ₂ , CO ₂ , O ₂ , AGENT
Sweep Speed	: ECG, SpO ₂ , IBP: 12.5, 25mm/sec. RESP, CO ₂ , O ₂ , AGENT: 6.25, 12.5, 25mm/sec.

Function Control

Touch Panel Method

Input / Output Interface

Main Unit

Serial Connector (COM1, COM2, COM3)
Status Input / Output Connector
DS-LAN Connector
Slave Output Connector
LAN Connector
PC Card, CF Card
Antennal Input (not applicable for DS-7600L/DS-7600WL)

Display Unit

External Device Connector

Analysis Method

Arrhythmia Analysis

ST Measurement

ECG

Meas. Range	: Adult/Child 0, 12 to 300bpm±3% Neonate 0, 30 to 300bpm
Size	: ¼, ½, 1, 2, 4
Voltage Receiving Range	: ±6.4mV
Lead Type	: as per transmitter/bedside monitor
Frequency	
Characteristic	: Depends on the transmitter/bedside monitor
AC Filter	: 50Hz / 60Hz
Drift Filter	: Shuts off 1.1Hz and under
Pacemaker	: Artificial pacemaker pulse display

Respiration

Meas. Method	: Depends on the transmitter/bedside monitor
Meas. Range	: 0, 4 to 150Bpm
Frequency	
Characteristic	: Depends on the transmitter/bedside monitor
Meas. Current	: Depends on the transmitter/bedside monitor

Blood Pressure

Meas. Range	: Depends on the transmitter/bedside monitor
Frequency	
Characteristic	: Depends on the transmitter/bedside monitor
Meas. Accuracy	: Depends on the transmitter/bedside monitor
No. of Channels	: Max. 6 channels

Non-Invasive Blood Pressure

Meas. Method	: Depends on the transmitter/bedside monitor
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Receiving Range : Depends on the transmitter/bedside monitor
Meas. Accuracy : Depends on the transmitter/bedside monitor

Arterial Oxygen Saturation (SpO₂)

Meas. Method : Depends on the transmitter/bedside monitor
SpO₂ Receiving Range : Depends on the transmitter/bedside monitor
PR Receiving Range : Depends on the transmitter/bedside monitor
Meas. Accuracy : Depends on the transmitter/bedside monitor

Temperature

Meas. Method : Depends on the transmitter/bedside monitor
Receiving Range : Depends on the transmitter/bedside monitor
Meas. Accuracy : Depends on the transmitter/bedside monitor
No. of Channels : Max. 2 channels

CO₂ Concentration

Meas. Method : Depends on the transmitter/bedside monitor
Meas. Range : Depends on the transmitter/bedside monitor
Frequency
Characteristic : Depends on the transmitter/bedside monitor
Meas. Accuracy : Depends on the transmitter/bedside monitor

Gas Concentration

Meas. Method : Depends on the bedside monitor
Meas. Range : Depends on the bedside monitor
Meas. Accuracy : Depends on the bedside monitor

Full Disclosure Waveform Recording

Continuous Storing of Patient Data: 24 hours or more (When CF card is used)

3ch Recorder

No. of waveform : Max. 3 waveforms
Recording Method : Thermal Recording
Paper Width : 50mm
Print Width : 48mm
Rec. Speed : 25mm / sec.
Waveform Type : ECG, RESP, SpO₂, IBP, CO₂
Status : paper out, page mark, magazine open, thermal head temperature, etc.
Protection Circuit : thermal head overcurrent, thermal head overheat, motor overcurrent, surge current

Telemetry (not applicable for DS-7600L/DS-7600WL)

No. of Receiving Beds : Max 8 beds
Frequency : 608 to 614MHzMH
Method : Crystal Controlled PLL Type Double Super Heterodyne
Transmitter : LX-5160/5630, HLX-561, Bedside Monitor (with HLX-561 or equivalent)
Antenna Connector : F type
DC Power Output : +12V 100mA (default OFF)

Receiving Device

Spurious Emission : 100µV/m (30 to 88MHz)
150µV/m (88 to 216MHz)
200µV/m (216 to 960MHz)
500µV/m (above 960MHz)
Sensitivity : 10dB μ and below ("Too Far" level)

Setup Item

Default and Backup

This section lists selection, default setting, and backup status for each setup item.

【Backup Item】

- “○” : Setup item will be stored even after the discharge procedure has been performed.
“△” : Setup item will be initialized to initial setting or to settings performed for “Admit Setup”.

Patient Admit / Discharge

Item	Selection	Default	Backup
ID	Numeric, Alphabet, Symbol (20 characters)	Blank	△
Patient Name	Numeric, Alphabet, Symbol (16 characters)	Blank	△
Comment	Numeric, Alphabet, Symbol (30 characters)	Blank	△
Pacemaker	Used, Not used	Not used	△
Patient Type	Adult, Child, Neonate	Adult	○
Sex	Male, Female	Unspecified	△
Age	0 to 150 years or 0 to 999 days	0 year	△
Birth Date	Year, Month, Day	0 year 0 month 0 date	△
Admit Date	Blank	Blank	△
Height	0 to 300	Blank	△
Weight	0 to 350	Blank	△
BSA	0 to 5.41	Blank	△
Bed Name		No selection	△

Alarm Setup

Item	Selection	Default	Backup
System Alarm	Suspend, ON	Suspend	—
Each Parameter	(Refer to “Admit Setup”)		△*

*Initializes to the value set on “Admit Setup”.

Parameter Setup

	Item	Selection	Default	Backup
ECG1, 2	Lead	(Depends on the bedside monitor, transmitter)	ECG1 Lead II ECG2 Lead I	△
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	ECG1 ×1 ECG2 ×1	△
	Baseline Position	-20mm to +20mm	ECG1 -5mm ECG2 ±0mm	△
	Synchronized Sound	OFF, ECG, SpO ₂	ECG	○
	AC Filter	ON, OFF	ON	○
	ECG Drift Filter	ON, OFF	ON	○
	QRS Pace Mask	ON, OFF	ON	○
	Pace Pulse	ON, OFF, Distinct Color	Distinct Color	○
	QRS Detection	ECG1, ECG1+2	ECG1+2	○
RESP	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	CVA	ON, OFF	OFF	△
SpO ₂	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	Synchronized Sound	OFF, ECG, SpO ₂	ECG	○
NIBP	Auto Mode	OFF, Interval, Timer	OFF	△
	Periodic Interval	2min, 2.5min, 3min, 10min, 15min, 20min, 30min, 60min, 120min, OFF	120min	○
	Timer	0:00, 1:00, 2:00… 21:00, 22:00, 23:00	(No setting)	○
BP	Scale	20, 50, 75, 100, 150, 200, 250, 300mmHg	200mmHg	△
CO ₂	Measurement Unit	mmHg, kPa, %	mmHg	○
	Scale	50, 100mmHg 4, 8, 10kPa 4, 8, 10%	100mmHg 8kPa 8%	△
GAS	O ₂ Scale	18-30, 18-60, 18-100, 0-30, 0-60, 0-100%	18-30%	○
	AGT Scale	4, 8, 16%	4%	○
	GAS Alarm	ON, OFF	ON	○
Parameter ON/OFF	ECG	ON, OFF	ON	△*
	BP1-6	ON, OFF	ON	
	NIBP	ON, OFF	ON	
	SpO ₂	ON, OFF	ON	
	RESP	ON, OFF	ON	
	CO ₂	ON, OFF	ON	
	TEMP	ON, OFF	ON	
	SvO ₂ /CCO	ON, OFF	ON	
	GAS	ON, OFF	ON	

*Initializes to the value set on "Admit Setup".

Review Function Setup

NOTE	The data of graphic trend, NIBP list, ST data, recall will be stored for 10 minutes even when the power is turned OFF.
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●Graphic Trend

Item	Selection	Default	Backup
Display Sel.	Group A, Group B, Group C, Group D, EVENT	Group A	<input type="radio"/>
Group A	HR, ST, VPC, BP1–6, NIBP, SpO ₂ , PR, RR, APNEA, CO ₂ , TEMP, SvO ₂ , CCO, CCI, BT, GAS_CO ₂ , GAS_O ₂ , ΔO ₂ , GAS_N ₂ O, GAS_AGT, MAC	HR, ST, VPC	<input type="radio"/>
Group B		HR, RESP, APNEA	<input type="radio"/>
Group C		HR, SpO ₂ , PR	<input type="radio"/>
Group D		HR, BP1, BP2	<input type="radio"/>
EVENT	HR, ST1, ST2, BP1–6, NIBP, SpO ₂ , PR, RESP, APNEA, EtCO ₂ , InspCO ₂ , T1, T2, Asystole, VF, VT, Slow VT, Run, Couplet, Pause, Bigeminy, Trigeminy, Frequent, Tachy, Brady	Asystole, VF, VT, Run, Frequent	<input type="radio"/>
Time	1, 2, 4, 8, 12, 24 hours	1 hour	<input type="radio"/>
Scale	HR: 100, 200, 300bpm ST: ±0.2, ±0.5, ±1.0, ±2.0mV ±2, ±5, ±10, ±20mm VPC: 20, 50, 100 beats BP1–6: 20, 50, 100, 150, 200, 300mmHg CVP: 20, 40cmH ₂ O NIBP: 20, 50, 100, 150, 200, 300mmHg TEMP: 0–40, 20–45, 30–40°C SpO ₂ : 0–100, 50–100, 80–100% PR: 100, 200, 300bpm RR: 50, 100, 150Bpm APNEA: 15, 30 sec. CO ₂ : 50, 100mmHg 4, 8, 10kPa 4, 8, 10% SvO ₂ : 0–100, 50–100, 80–100% CCO : 0.0–6.0, 0.0–12.0, 0.0–20.0L/min CCI : 0.0–6.0, 0.0–12.0, 0.0–20.0L/min/m ² BT : 0–40, 20–45, 30–40°C GAS_CO ₂ : 50, 100mmHg 4.0, 8.0, 10.0% 4.0, 8.0, 10.0kPa GAS_O ₂ : 0–50, 0–100% ΔO ₂ : 3, 6, 9% GAS_N ₂ O : 0–50, 0–100% GAS_AGT : 4, 8, 10% MAC : 5, 10	HR: 100bpm ST: ±0.5mV ±5mm VPC: 20 beats BP1–6: 150mmHg CVP: 20, 40 cmH ₂ O NIBP: 150mmHg TEMP: 30–40°C SpO ₂ : 80–100% PR: 100bpm RR: 50Bpm APNEA: 30 sec. CO ₂ : 50mmHg 4.0kPa 4.0% SvO ₂ : 0–100% CCO: 6L/min CCI: 6L/min/m ² BT: 20–45°C GAS_CO ₂ : 50mmHg 4.0kPa 4.0% GAS_O ₂ : 0–50% ΔO ₂ : 3% GAS_N ₂ O : 0–50% GAS_AGT : 4% MAC : 5	<input type="radio"/>

●Tabular Trend

Item	Selection	Default	Backup
Time	1, 5, 10, 15, 30, 60 min.	60 min.	<input type="radio"/>
Parameter	HR, ST, VPC, BP1–6, SpO ₂ , PR, RR, APNEA, CO ₂ , TEMP, SvO ₂ , CCO, CCI, BT, GAS_CO ₂ , GAS_O ₂ , GAS_N ₂ O, GAS_AGT, MAC	HR, ST, VPC, RESP, APNEA, SpO ₂ , PR, BP1, BP2, TEMP	<input type="radio"/>

●Recall

Item	Selection	Default	Backup
Waveform Setup	ECG1, ECG2, BP1–6, SpO ₂ , RESP, CO ₂ , Alarm	Waveform 1: ECG1, Waveform 2: OFF	<input type="radio"/>
Display Selection	HR, ST1, ST2, BP1–6, NIBP, SpO ₂ , PR, RR, APNEA, EtCO ₂ , InspCO ₂ , T1, T2, Ventilator, Periodic, Telemeter, Asystole, VF, VT, Slow VT, Run, Couplet, Pause, Bigeminy, Trigeminy, Frequent, Tachy, Brady	All	<input type="radio"/>

●ST / 12-Lead ST

Item	Selection	Default	Backup
Reference Point	-240 to 0ms	-80mS	<input type="radio"/>
Measurement Point	0 to 560mS	120mS	<input type="radio"/>

●Full Disclosure Waveform

Item	Selection	Default	Backup
Waveform Selection	Waveform 1	OFF*	<input type="radio"/>
	Waveform 2		<input type="radio"/>
	Waveform 3		<input type="radio"/>
Display Selection (Compressed)	Waveform 1	OFF*	<input type="radio"/>
	Waveform 2		<input type="radio"/>
	Waveform 3		<input type="radio"/>
Zoom Waveform Recording (For FCF-16GA)	Quantity of Waveforms	3Waves×30sec., 6Waves×10sec.	3Waves×30sec.
	Waveform Selection	ECG1, ECG2, BP1, BP2, SpO ₂ , RESP, CO ₂ , OFF	1: OFF* 2: OFF 3: OFF
Report Recording	Report Periods 1	0:00 to 12:00 (12 hours)	<input type="radio"/>
	Report Periods 2		<input type="radio"/>
	Report Periods 3		<input type="radio"/>

*ECG1 will be selected when formatted.

System Configuration

● Recording

	<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Manual Recording	Wave Select	ECG1, ECG2, SpO ₂ , RESP, CO ₂ , BP1–6	ECG1	<input type="radio"/>
	Rec. Duration	12 sec., 24 sec., Cont.	24 sec.	<input type="radio"/>
	Delay Time	None, 8 sec.	8 sec.	<input type="radio"/>
Alarm Recording	Mode	ON, OFF	OFF	<input type="radio"/>
	Wave Select	ECG1, ECG2, SpO ₂ , RESP, CO ₂ , Alarm Factor, BP1–6	ECG1	<input type="radio"/>
	Alarm Factor	HR, ST1, ST2, BP1–6, NIBP, SpO ₂ , PR, RR, APNEA, EtCO ₂ , InspCO ₂ , T1, T2, Asystole, VF, VT, Slow VT, RUN, Couplet, Pause, Bigeminy, Trigeminy, Frequent, Tachy, Brady	HR, Asystole, VF, VT, Slow VT, RUN, Tachy, Brady	<input type="radio"/>
Periodic Recording	Mode	Recorder, Recall, OFF	OFF	<input type="radio"/>
	Wave Select	ECG1, ECG2, SpO ₂ , RESP, CO ₂ , BP1–6	ECG1	<input type="radio"/>
	Interval	1, 2, 3, 5, 10, 15, 20, 30, 60, 120 min.	60 min.	<input type="radio"/>
	Timer	0:00, 1:00, 2:00, ..., 21:00, 22:00, 23:00	none	<input type="radio"/>
12-Lead Record Setup	Rec. Format	3Waves×4, 3Waves×4+Rhy., 6Waves×2, 12Waves	3Waves×4	<input type="radio"/>
	Position	Center, Proportional, OFF	OFF	<input type="radio"/>
	Wave Format	Regular, Reverse	Regular	<input type="radio"/>
	Recorder Auto Scale	ON, OFF	OFF	<input type="radio"/>
	Cal. Waveform	ON, OFF	OFF	<input type="radio"/>
	Lead Boundary	ON, OFF	OFF	<input type="radio"/>
Output Recorder	Graphic Trend	Built-in, Laser	Built-in	<input type="radio"/>
	Tabular Trend		Built-in	<input type="radio"/>
	NIBP List		Built-in	<input type="radio"/>
	Recall (Enlarged)		Built-in	<input type="radio"/>
	ST Measurement		Built-in	<input type="radio"/>
	Full Disc. Compressed		Built-in	<input type="radio"/>
	Full Disc. Enlarged		Built-in	<input type="radio"/>
	12-Lead Record		Built-in	<input type="radio"/>

●Display Configuration

Item		Selection	Default	Backup
Display Configuration	Layout	1bed 8waves, 2beds 4waves, 2beds 8waves, 4beds 2waves, 4beds 4waves, 6beds 1wave, 6beds 3waves, 8beds 1wave, 8beds 2waves, 12beds 1wave, 16beds 1wave	8beds 1wave	<input type="radio"/>
	Name	Zoom, Normal	Normal	<input type="radio"/>
	Bed Name	Zoom, Normal, OFF	OFF	<input type="radio"/>
	Meas Zoom	All Beds, Each Bed	All Beds	
	Short Trend	ON, OFF, Overlap	OFF	<input type="radio"/>
Home Display Configuration	No. of numeric data	1, 2, 3, 4, 5, 8	1	<input type="radio"/>
	Waveform Selection	ECG1, ECG2, BP1–6, SpO ₂ , RESP, CO ₂ , OFF, Patient Name	Wave 1: ECG1 Wave 2: RESP Wave 3: OFF Wave 4: OFF Wave 5: OFF Wave 6: OFF Wave 7: OFF Wave 8: OFF	<input type="radio"/>
	Numeric Data Selection	HR, HR/Alarm, HR/ST, ST, VPC, ST/VPC, RR, RR/Alarm, BP1–6, SpO ₂ , SpO ₂ /PR, PR, NIBP, NIBP List, NIBP Meas., CO ₂ , T1/T2, SvO ₂ /CCO, 12ST-A, 12ST-B, 12ST-C, 12ST-D, OFF, GAS_CO ₂ , GAS_O ₂ , GAS_N ₂ O, GAS_AGT	Numeric 1: HR Numeric 2: RR Numeric 3: SpO ₂ /PR Numeric 4: NIBP Numeric 5: OFF Numeric 6: OFF Numeric 7: OFF Numeric 8: OFF	<input type="radio"/>
	Meas Area Sel.	Areas 10, 9, 8, 7, 6, 5, 4, 3, 2	All ON	<input type="radio"/>
Individual Display Configuration	No. of parameters	Parameters 10, 9, 8, 7, 6, 5, 4, 3, 2	3	<input type="radio"/>
	Waveform Selection	ECG1, ECG2, BP1–6, SpO ₂ , RESP, CO ₂ , OFF, Patient Name	Wave 1: ECG1 Wave 2: SpO ₂ Wave 3: OFF Wave 4: OFF Wave 5: RESP	<input type="radio"/>
	Numeric Data Selection	HR, HR/Alarm, HR/ST, ST, VPC, ST/VPC, RR, RR/Alarm, BP1–6, SpO ₂ , SpO ₂ /PR, PR, NIBP, NIBP List, NIBP meas., CO ₂ , T1/T2, SvO ₂ /CCO, 12ST-A, 12ST-B, 12ST-C, 12ST-D, OFF, GAS_CO ₂ , GAS_O ₂ , GAS_N ₂ O, GAS_AGT	Numeric 1: HR/Alarm Numeric 2: RR Numeric 3: SpO ₂ /PR Numeric 4: NIBP Numeric 5: NIBP List Numeric 6: BP1 Numeric 7: BP2 Numeric 8: T1/T2 Numeric 9: OFF Numeric 10: OFF	<input type="radio"/>
	12-Lead ST Lead Selection	12ST-A 12ST-B 12ST-C 12ST-D	I, II, III aVR, aVL, aVF V ₁ , V ₂ , V ₃ V ₄ , V ₅ , V ₆	<input type="radio"/>

●Color

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
HR, ECG	16 colors	Green	<input type="radio"/>
BP1		Red	<input type="radio"/>
BP2		Cyan	<input type="radio"/>
BP3		Yellow	<input type="radio"/>
BP4		Green	<input type="radio"/>
BP5		Orange	<input type="radio"/>
BP6		Pink	<input type="radio"/>
NIBP		White	<input type="radio"/>
SpO ₂ , PR		Yellow	<input type="radio"/>
RR, APNEA		White	<input type="radio"/>
CO ₂		White	<input type="radio"/>
TEMP		White	<input type="radio"/>
SvO ₂ , CCO		White	<input type="radio"/>
MAC		White	<input type="radio"/>

●Brightness

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Brightness	7 levels	4th level from "Dark"	<input type="radio"/>

●Tone / Volume

<i>Item</i>		<i>Selection</i>	<i>Default</i>	<i>Backup</i>
HR Sound	Function	ON, OFF	ON	<input type="radio"/>
	Volume	16 levels	Level 8	<input type="radio"/>
	Tone	8 levels	Level 6	<input type="radio"/>
Alarm Sound	Volume	16 levels	Level 8	<input type="radio"/>
	Tone	8 levels	Level 1	<input type="radio"/>
Key Sound	Volume	16 levels	Level 6	<input type="radio"/>
	Tone	4 levels	Level 2	<input type="radio"/>
Technical Alarm Sound	Volume	16 levels	Level 8	<input type="radio"/>
	Tone	4 levels	Level 2	<input type="radio"/>

●Sweep Speed

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
ECG, BP, SpO ₂	12.5, 25mm/s	25mm/s	<input type="radio"/>
Respiration	6.25, 12.5, 25mm/s	6.25mm/s	<input type="radio"/>

●Monitor Suspend Setup

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Label 1 to 15	Maximum 15 characters	Blank	<input type="radio"/>

Preset Function

● Bed Registration

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Bed Registration	—	DS-7640W: only RF1 to 4 DS-7680/DS-7680W: only RF1 to 8 DS-7600L/DS-7600WL: none	<input type="radio"/>

● Channel Setup

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Channel	—	none	<input type="radio"/>

● Central ID

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Room ID	alphanumeric, symbol (4 characters)	CNT-	<input type="radio"/>
Central ID	1 to 16	1	<input type="radio"/>

● Recorder Operation

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
LX Remote Rec.	ON, OFF	OFF	<input type="radio"/>
Rec. Paper BP Scale	20mm, 40mm	40mm	<input type="radio"/>
Rec. Paper CO ₂ Scale	20mm, 40mm	40mm	<input type="radio"/>
Meas. Info. Rec.	ON, OFF	OFF	<input type="radio"/>
Paper Feed to Top	ON, OFF	OFF	<input type="radio"/>
Paper Feed to End	ON, OFF	ON	<input type="radio"/>
QRS Classification	ON, OFF	OFF	<input type="radio"/>
Print Calibration	Top, Each Page, OFF	OFF	<input type="radio"/>

●Alarm Related Setup

Item		Selection	Default	Backup
Alarm Silence Time		1 to 5 min.	3 min.	<input type="radio"/>
Alarm Suspend Time		1 to 5 min.	3 min.	<input type="radio"/>
Too Far Alarm	Function	ON, OFF	OFF	<input type="radio"/>
	Duration	5, 6, 7, 8, 9, 10, 15, 20, 30, 40, 50, 60 sec.	7 sec.	<input type="radio"/>
Chk TLM Battery Alarm		ON, OFF	ON	<input type="radio"/>
Asystole/VF/VT Alarm Setup		ON/OFF, ON	ON	<input type="radio"/>
Suspend Arrhy. Analysis during Noise Interference		ON, OFF	OFF	<input type="radio"/>
During "Check SpO ₂ Sensor"	Alarm Judgment	ON, OFF	ON	<input type="radio"/>
	Message	ON, OFF	ON	<input type="radio"/>
	Alarm Sound	ON, OFF	ON	<input type="radio"/>
During "NIBP measurement failed."	Alarm	ON, OFF	ON	<input type="radio"/>
During Lead OFF	Alarm Judgment	ON, OFF	ON	<input type="radio"/>
	Alarm Recording	ON, OFF	ON	<input type="radio"/>
	Lead OFF message	ON, OFF	ON	<input type="radio"/>
	Lead OFF Alarm Interval	5, 30, 60 sec.	5 sec.	<input type="radio"/>
Alarm Pole Output Setup		Level 1, Level 2, Level 3, Ventilator, Event Key, Pulse Sound	Level 1, Ventilator	<input type="radio"/>
Alarm Pole Pattern Setup	Level 1	Pattern 1 to 10	Pattern 1	<input type="radio"/>
	Level 2		Pattern 10	<input type="radio"/>
	Level 3 /		Pattern 4	<input type="radio"/>
	Ventilator		Pattern 1	<input type="radio"/>
Alarm Wave Background		Lighting, Normal	Lighting	<input type="radio"/>
Event Key		ON, OFF	ON	<input type="radio"/>

●Soft Switch

Item	Selection	Default	Backup
Display measurement error on NIBP list	ON, OFF	ON	<input type="radio"/>
Date	4/17, Apr. 17, 17 Apr.	Apr. 17	<input type="radio"/>
Disregard Artifact Ch. at QRS Detect	ON, OFF	ON	<input type="radio"/>
Drift Filter	All Beds ON, All Beds OFF, Each Bed	All Beds ON	<input type="radio"/>
AC Filter	50Hz, 60Hz	60Hz	<input type="radio"/>
Setup at Discharge	Admit, Suspend	Admit	<input type="radio"/>
Home Display	All Beds Display, Indiv. Display	Indiv. Display	<input type="radio"/>
Patient ID Starting Column	1 to 10	1	<input type="radio"/>
Rec. Paper	A4, Letter	Letter	<input type="radio"/>
Wave Thickness	3 levels (Thin, Medium, Thick)	2nd Level (Medium)	<input type="radio"/>
12-Lead	ON, OFF	OFF	<input type="radio"/>
Sync Tone Bed Selection	Selected Bed, ECG/SpO ₂ Menu	Selected Bed	<input type="radio"/>
Sync Mark	Standard, Emphasize	Standard	<input type="radio"/>
Monitor Suspend's Message Selection	ON, OFF	OFF	<input type="radio"/>
Monitor Suspend Time	ON, OFF	OFF	<input type="radio"/>

●Measurement Unit

Item	Selection	Default	Backup
ST measurement unit	mm, mV	mV	<input type="radio"/>
BP	mmHg, kPa	mmHg	<input type="radio"/>
TEMP	°C, °F	°C	<input type="radio"/>
Height/Weight	cm/kg, in/lb	cm/kg	<input type="radio"/>
CO ₂ Atmospheric Setup	Pressure Unit	760 mmHg mmHg	<input type="radio"/>

●Bed Name Registration

Item	Selection	Default	Backup
Bed Name Registration	alphanumeric, symbols (16 characters)	Not registered	<input type="radio"/>

●User Key

<i>Item</i>	<i>Selection</i>	<i>Default</i>		<i>Backup</i>
No. of User Keys (Only DS-7600)	7, 9	9		<input type="radio"/>
(From left) User Key 1		DS-7600	DS-7600W	<input type="radio"/>
		Admit/ Discharge	Admit/ Discharge	
User Key 2	【Admit/Discharge】 Admit/Discharge, Discharge, Suspend 【Alarm】	Alarm	Alarm	<input type="radio"/>
User Key 3	Alarm Setup, Alarm Silence, HR Alarm, ST Alarm, Arrhy. Alarm, BP*(1–6) Alarm, NIBP Alarm, SpO ₂ Alarm, RESP Alarm, CO ₂ Alarm, TEMP Alarm, 12L ST Alarm, GAS Alarm	Size/Scale	Size/Scale	<input type="radio"/>
User Key 4	【Function】 Graphic Trend, Tabular Trend, Recall, NIBP List, ST Display, Full Disc. Wave, Night Mode, Rec. All Beds, 12-Lead Wave, 12-Lead ST	Graphic Trend	Arrhy. Relearn	<input type="radio"/>
User Key 5		Recall	Graphic Trend	<input type="radio"/>
User Key 6	【Display Setup】 Size/Scale, Meas Qty, Meas Zoom 【Parameter】 Param. Setup, ECG, BP*(1–6), NIBP, SpO ₂ , RESP, CO ₂ , GAS, Arrhy. Relearn, Parameter ON/OFF	Display Config.	Recall	<input type="radio"/>
User Key 7		Meas. Zoom	Display Config.	<input type="radio"/>
User Key 8	【System Config.】 System Config., Record, Color, Display Config., Bright. Setup, Sweep Speed, Bed Transfer, Tone/Volume	Meas. Qty	Meas Zoom	<input type="radio"/>
User Key 9		Alarm Silence	Meas. Qty	<input type="radio"/>
User Key 10 (Only DS-7600W)			Alarm Silence	<input type="radio"/>

●Serial Communication

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
COM1	OFF, Meas	OFF	<input type="radio"/>
COM2		OFF	<input type="radio"/>
COM3		OFF	<input type="radio"/>

●Network Configuration

Item		Selection	Default	Backup
This Unit	IP Address	alphanumeric keys (0 to 9, A to F)	0. 0. 0. 0	<input type="radio"/>
	Sub-network Mask		0. 0. 0. 0	<input type="radio"/>
	Default Gateway		0. 0. 0. 0	<input type="radio"/>
Printer	Operation	ON, OFF	OFF	<input type="radio"/>
	IP Address	alphanumeric keys (0 to 9, A to F)	0. 0. 0. 0	<input type="radio"/>
	MAC Address		00. 00. 00. 00. 00. 00	<input type="radio"/>
	Printer Spec.	ESC/page, LIPS IV, PCL 5	PCL 5	<input type="radio"/>
Data Server	Function	ON, OFF	OFF	<input type="radio"/>
	IP Address	Numbers: 0 to 9	0. 0. 0. 0	<input type="radio"/>
	Port No.		2000	<input type="radio"/>
Patient Data Server (When "OFF")	Function	Link with EMR, Search ID, Time Synchronization, OFF	OFF	<input type="radio"/>
	Server IP Address	Numbers: 0 to 9	0. 0. 0. 0	<input type="radio"/>
	Server Port No.		2806	<input type="radio"/>
Patient Data Server (When "Link with EMR")	EMR Notice Icon	ON, OFF	ON	<input type="radio"/>
	Display Data Before Discharging	ON, OFF	OFF	<input type="radio"/>
	Time Synchronization	ON, OFF	OFF	<input type="radio"/>
	Server IP Address	Numbers: 0 to 9	0. 0. 0. 0	<input type="radio"/>
	Server Port No.		2806	<input type="radio"/>
	This Unit IP Address		0. 0. 0. 0	<input type="radio"/>
	This Unit Port No.	Numbers: 0 to 9	2809	<input type="radio"/>
Patient Data Server (When "Search ID")	Server IP Address	Numbers: 0 to 9	0. 0. 0. 0	<input type="radio"/>
	Server Port No.		2806	<input type="radio"/>
	Time Synchronization	ON, OFF	OFF	<input type="radio"/>
Patient Data Server (When "Time Synchronization")	Server IP Address	Numbers: 0 to 9	0. 0. 0. 0	<input type="radio"/>
	Server Port No.		2806	<input type="radio"/>
	Time Zone	-12:00 to +13:00	00:00 (Greenwich Mean Time)	<input type="radio"/>
SNTP Server	Function	ON, OFF	OFF	<input type="radio"/>
	IP Address	Alphanumeric keys (0 to 9)	0. 0. 0. 0	<input type="radio"/>
HL7 Server	Function	ON, OFF	OFF	<input type="radio"/>
	Port No.	Numbers: 0 to 9	2900	<input type="radio"/>

●Keyboard / Mouse Setup (DS-7600W Series Only)

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Auto Erase of Pointer	ON, OFF	ON	<input type="radio"/>
Pointer			<input type="radio"/>
Moving Speed	0 (slow) to 4 (fast) : 5 levels	1	<input type="radio"/>
Color	16 colors	White	<input type="radio"/>
Keyboard	109(JP), 104(US), 105(UK)	105(UK)	<input type="radio"/>

●Slave Monitor Setup (DS-7600W Series Only)

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
Output Selection	Slave, Full Disc.	Slave	<input type="radio"/>
Slave Monitor Location	Left, Right	Right	<input type="radio"/>

●DS-LAN Setup

<i>Item</i>	<i>Selection</i>	<i>Default</i>	<i>Backup</i>
DS-LAN Setup	DS-LANII, DS-LANIII	DS-LANII	<input type="radio"/>

●Admit Setup

Item	Selection	Default	Backup
Parameter ON/OFF	ON, OFF	All parameter ON	<input type="radio"/>
Alarm			
HR	ON, OFF 20 to 300bpm	ON 40 – 120	<input type="radio"/>
ASYSTOLE	ON, OFF 3 to 10 sec.	ON 5 sec.	<input type="radio"/>
VF	ON, OFF	ON	<input type="radio"/>
VT	ON, OFF	ON	<input type="radio"/>
SLOW_VT	ON, OFF	ON	<input type="radio"/>
RUN	ON, OFF 2 to 8 beats	ON 3 beats	<input type="radio"/>
COUPLET	ON, OFF	OFF	<input type="radio"/>
PAUSE	ON, OFF 1.5 to 5 sec.	OFF 3 sec.	<input type="radio"/>
BIGEMINY	ON, OFF	OFF	<input type="radio"/>
TRIGEMINY	ON, OFF	OFF	<input type="radio"/>
FREQUENT	ON, OFF 1 to 50bpm	OFF, 10bpm	<input type="radio"/>
TACHY	ON, OFF	ON	<input type="radio"/>
BRADY	ON, OFF	ON	<input type="radio"/>
HR Low Limit for VT	120bpm, 140bpm	120bpm	<input type="radio"/>
HR Low Limit for RUN	0, 30 to 100bpm	40bpm	<input type="radio"/>
ST	ON, OFF ST1 ±2.0mV / ±20mm ST2 ±2.0mV / ±20mm	OFF ±1.0mV / ±10mm	<input type="radio"/>
BP1 (mmHg)	ON, OFF 0 to 300mmHg	ON SYS 80 – 180 DIA OFF – OFF MEAN OFF – OFF	<input type="radio"/>
BP2–6 (mmHg)	ON, OFF 0 to 300mmHg	OFF SYS 80 – 180 DIA OFF – OFF MEAN OFF – OFF	<input type="radio"/>
CVP (cmH ₂ O)	ON, OFF 0 to 40cmH ₂ O	OFF OFF – OFF	<input type="radio"/>
RR	ON, OFF 5 to 150Bpm	OFF 5 – 30	<input type="radio"/>
APNEA	ON, OFF 5 to 20 sec.	ON 15 sec.	<input type="radio"/>
SpO ₂	ON, OFF 50 to 100%	ON 90 – OFF	<input type="radio"/>
PR	ON ,OFF 20 to 300bpm	OFF 40 – 120	<input type="radio"/>
NIBP (mmHg)	ON, OFF 0 to 300mmHg	ON SYS 80 – 180 DIA OFF – OFF MEAN OFF – OFF	<input type="radio"/>
TEMP (°C))	ON, OFF 30 to 50°C	OFF OFF – OFF	<input type="radio"/>
EtCO ₂ (mmHg)	ON, OFF 1 to 100mmHg	OFF 30 – 45mmHg	<input type="radio"/>
EtCO ₂ (kPa)	ON, OFF 0.1 to 15.0kPa	OFF 4.0 – 6.0kPa	<input type="radio"/>
EtCO ₂ (%)	ON, OFF 0.1 to 15.0%	OFF 4.0 – 6.0%	<input type="radio"/>
InspCO ₂ (mmHg)	ON, OFF 1 to 4mmHg	OFF 3mmHg	<input type="radio"/>
InspCO ₂ (kPa)	ON, OFF 0.1 to 0.4kPa	OFF 0.4kPa	<input type="radio"/>
InspCO ₂ (%)	ON, OFF 0.1 to 0.4%	OFF 0.4%	<input type="radio"/>
GAS	ON, OFF	ON	<input type="radio"/>

Data Transfer by the PC/CF Card

The following list shows the data which can be transferred using the PC/CF card. (patient data / setup data)

● Data Transfer of Patient Data

Setup Item	Data Transfer by PC/CF Card
Patient Information	
Patient ID	Yes
Patient Name	Yes
Pacemaker Use	Yes
Patient Type	Yes
Comment	Yes
Height / Weight / BSA	Yes
Birth Date / Age	Yes
Gender	Yes
Alarm	
Alarm Suspend	—
Alarm Silence	—
HR Alarm Setup	Yes
Asystole Alarm Setup	Yes
VF Alarm Setup	Yes
VT Alarm Setup	Yes
Slow VT Alarm Setup	Yes
Run Alarm Setup	Yes
Couplet Alarm Setup	Yes
Pause Alarm Setup	Yes
Bigeminy Alarm Setup	Yes
Trigeminy Alarm Setup	Yes
Frequent Alarm Setup	Yes
Tachy Alarm Setup	Yes
Brady Alarm Setup	Yes
HR Low Limit for VT	Yes
HR Low Limit for RUN	Yes
ST1 Alarm Setup	Yes
ST2 Alarm Setup	Yes
12-Lead ST Alarm	Yes
BP1-BP6 Alarm Setup	Yes
NIBP Alarm Setup	Yes
RR Alarm Setup	Yes
APNEA Alarm Setup	Yes
SpO ₂ Alarm Setup	Yes
PR Alarm Setup	Yes
EtCO ₂ Alarm Setup	Yes
InspCO ₂ Alarm Setup	Yes
TEMP1 Alarm Setup	Yes
TEMP2 Alarm Setup	Yes
GAS Alarm Setup	Yes
Parameter Setup	
ECG Parameter Setup	
Arrhythmia Relearn	—
ECG1 Lead	—
ECG1 Size	Yes
ECG1 Baseline Position	Yes
ECG2 Lead	—
ECG2 Waveform Size	Yes
ECG2 Baseline Position	Yes

Setup Item	Data Transfer by PC/CF Card
Synchronized Tone	Yes
AC Filter	Yes
Drift Filter	Yes
QRS Pace Mask	Yes
Pace Pulse	Yes
QRS Detect	Yes
BP1-BP6 Parameter Setup	
BP Waveform Scale	Yes
NIBP Parameter Setup	
NIBP Auto Mode	Yes
SpO ₂ Parameter Setup	
SpO ₂ Waveform Size	Yes
Sync Tone (Refer to ECG setup.)	—
RESP Parameter Setup	
RESP Waveform Size	Yes
CVA Detect	Yes
CO ₂ Parameter Setup	
CO ₂ Waveform Scale	Yes
CO ₂ Measurement Unit	Yes
GAS Parameter Setup	
O ₂ Waveform Scale	Yes
AGT Waveform Scale	Yes
Parameter ON/OFF	
All Setup	Yes
Function	
Graphic Trend / Tabular Trend	
All Setup	Yes
Recall	
Waveform Selection	—
Display Selection	Yes
Full Disclosure Waveform	
All Setup	—
ST Display	
Ref. Point / Meas. Point	Yes
System Configuration	
Record	
All Setup	Yes
Color Setup	
All Setup	Yes
Display Configuration	
Home Display Config.	Yes
Indiv. Display Config.	Yes

●Data Transfer of Setup Data

Setup Item	Data Transfer by PC/CF Card
System Configuration	
Display Configuration	
Display Layout	—
Short Trend	Yes
Patient Name Zoom	Yes
Brightness Setup	
Brightness	—
Tone / Volume	
All Setup	—
Sweep Speed	
All Setup	Yes
Monitor Suspend Setup	
All Setup	Yes
Preset	
Recorder Setup	
LX Remote Rec.	Yes
Rec. Paper BP Scale	Yes
Rec. Paper CO ₂ Scale	Yes
Meas. Information Rec.	Yes
Paper Feed to Top	Yes
Paper Feed to End	Yes
QRS Classification	Yes
Meas Info. Rec.	Yes
Print Calibration	Yes
Bed Register	
Registered Beds	—
Channel Setup	
Channel No. for Each Bed	—
Group ID	—
Stored Channel No.	Yes
Soft Switch	
Display Meas. Error on NIBP List	Yes
Date	Yes
Disregard Artifact Ch. at QRS Detect	Yes
Drift Filter	—
AC Filter	Yes
Setup at Discharge	Yes
Home Display	Yes
Patient ID Starting Column	Yes
Rec. Paper	Yes
Wave Thickness	Yes
12-Lead	Yes
Sync Tone Bed Selection	Yes
Sync Mark	Yes
Monitor Suspend's Message Selection	Yes
Monitor Suspend Time	Yes
Measurement Unit	

Setup Item	Data Transfer by PC/CF Card
All Setup	Yes
Serial Communication Setup	
COM port function assignment	—
Bed Name Registration	
Bed Name	Yes
User Key *	
All Setup	Yes
Clock	
Date / Time	—
Central ID	
All Setup	—
Network Configuration	
This Unit	No
Printer	Yes
Data Server	Yes
Patient Server	Yes
SNTP Server	Yes
HL7 Server	Yes
Alarm Related Setup	
Alarm Silence Time	Yes
Alarm Suspend Time	Yes
Too Far Alarm	Yes
Chk TLM Battery Alarm	Yes
Asystole/VF/VT Alarm Setup	Yes
Suspend Arrhy. Analysis during Noise Interference	Yes
During "Check SpO ₂ Sensor"	
Alarm Judgment	Yes
Message	Yes
Alarm Sound	Yes
During Lead OFF	
Alarm Judgment	Yes
Alarm Record	Yes
Lead OFF Message	Yes
Lead OFF Alarm Interval	Yes
During "NIBP measurement failed." Alarm	Yes
Alarm Pole Output Setup	Yes
Alarm Wave Background	Yes
Event Key	Yes
Admit Setup	
All Setup	Yes
Slave Monitor Setup (DS-7600W series only)	
All Setup	Yes

 CAUTION

- The data transfer is possible only between DS-7600 system central monitors. The data cannot be transferred to bedside monitor.
- If the software version of the two DS-7600 central monitors are different, the data transfer may not be possible, or part of the data may not be transferred.
(The data transfer from the newer version monitor to the older version monitor is not possible.) For details, refer to our service representative.
- *For the data transfer from DS-7600 series to DS-7600W series, or from DS-7600W series to DS-7600 series, the user keys settings will not be transferred.

External Connection

Pin Assignments

This section lists the connector pin assignments.

RS-232C Connector Output Signal (Serial Connector)

● COM1 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Hi Level Reset
2	NC	No Connection	—
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	NC	No Connection	—
8	NC	No Connection	—

● COM2 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Level Reset
2	DIG_L	Digital Output (LOAD)	TTL (Extended Function)
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	DIG_D	Digital Output (DATA)	TTL (Extended Function)
8	DIG_C	Digital Output (CLK)	TTL (Extended Function)

● COM3 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Hi Level Reset
2	Reserve	Reserve	
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	Reserve	Reserve	
8	NC	No Connection	—

Status I/O Signal (Status II Connector)

※ This connector is not supported for the DS-7600 system.

No.	Signal Type	Description
1	Reserve	Reserve
2	Reserve	Reserve
3	Reserve	Reserve
4	Reserve	Reserve
5	Reserve	Reserve
6	Reserve	Reserve
7	+5V	+5V power supply (150mA)
8	Reserve	Reserve
9	GND	Power Supply Ground

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Chapter 12

Accessories

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Accessories

Accessories

This section lists the accessories for the DS-7600 system.



- Use only the accessories specified for this device. Otherwise, proper function cannot be executed.
- For quality improvement, specifications are subject to change without prior notice.

Accessories

Power Supply Cable: CS-24 (3m)

Parts Replacement Label

This Operation Manual

Optional Accessories

The following products are available as optional accessories for the DS-7600 system.
Purchase them as required.



- Use only the accessories specified for this device. Otherwise, proper function cannot be executed.
- For quality improvement, specifications are subject to change without prior notice.

<i>Item</i>	<i>Model Type</i>	<i>Description</i>
Recording Paper	OP-124TE	
Cleaning Cloth	OA-57	
CF Card	FCF-1000	For full disc. waveform
	FCF-16GA	For full disc. waveform
	FCF-128	For data transfer
Ethernet Branch Cable (for DS-LANII/III)	CJ-522A	Length: 1m
	CJ-522B	Length: 2m
	CJ-522C	Length: 4m
	CJ-522D	Length: 10m
	CJ-522E	Length: 20m
LAN Interface Cable (for DS-LANII/III)	CJ-530A	Length: 2.5m
	CJ-530B	Length: 5m
	CJ-530C	Length: 10m
LAN Interface Cable (Cross)	CJ-761	Length: 2.5m (for TCP/IP)
Digital Display Interface Cable	CJZ-01SS3	Length: 3m
	CJZ-01SS5	Length: 5m
	CJZ-01SS10	Length: 10m
RS-232C Cable (Cross)	CJ-725	For serial connection of numeric data
PS/2 Splitter Cable	—	For DS-7600W series only
Mouse (PS/2 Mouse)	—	For DS-7600W series only
Keyboard (PS/2 Keyboard)	—	For DS-7600W series only

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