

DynaScope 7000 Series

Bedside Monitor

DS-7300 System

Ver.07

Operation Manual

《 Monitoring Operation 》



- 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-7300 System Version 07.



**FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR
ON THE ORDER OF A PHYSICIAN.**

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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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Composition of This Operation Manual

The DS-7300 System Operation Manual is composed of the following 3 sections.

«General Description»

This section is composed of the chapters stating the general description of the device and basic operation procedure.

- | | |
|------------------------|---|
| 1. General Description | : Describes the outline of this equipment. |
| 2. Basic Operation | : Describes the basic operation for monitoring. |
| 3. Vital Application | : Describes the procedure for vital application, etc. |

«Monitoring Operation»

This section is composed of the chapters explaining the detailed monitoring procedures and setup procedures.

- | | |
|-----------------------------------|---|
| 4. Monitoring Setup | : Describes the procedures to set the monitor according to the monitoring purpose. |
| 5. Admit / Discharge of a Patient | : Describes the procedure to admit or discharge a patient. |
| 6. Parameter Setup | : Describes the procedure to set the measurement condition, size, scale, etc. for each parameter. |
| 7. Function | : Describes about the functions such as arrhythmia analysis, trend, recall, etc. |
| 8. System Configuration | : Describes about the system configuration such as night mode, alarm mode, display mode, etc. |

«Maintenance»

This section is composed of the chapters describing the installation procedure, maintenance, technical information, accessories, etc.

- | | |
|---------------------------|--|
| 9. Installation | : Describes about the environment for use, wireless system, etc. |
| 10. Maintenance | : Describes about the maintenance, troubleshooting of this equipment. |
| 11. Technical Information | : Lists the specification, default settings, pin assignments of external connector, etc. |
| 12. Accessories | : Lists the accessories and optional accessories for this equipment. |

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.



DANGER

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



WARNING

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



CAUTION

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

NOTE

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.

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

DS-7300 System Main Unit (DSC-7300)

DANGER

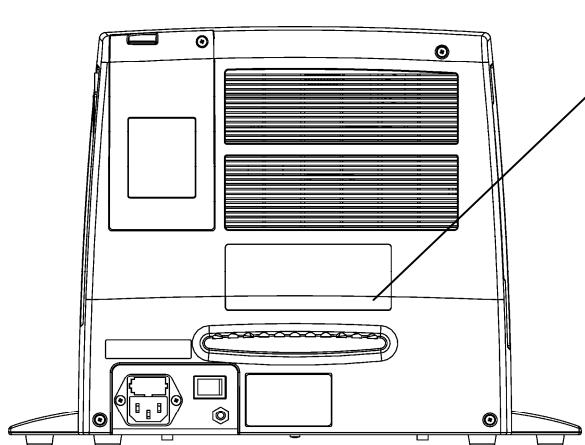
Risk of explosion if used in the presence of flammable anesthetics.

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.



DS-7300 System Super Module

DANGER

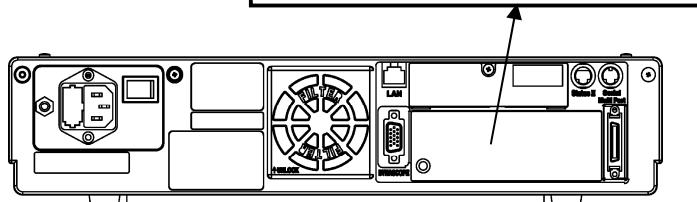
Risk of explosion if used in the presence of flammable anesthetics.

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.



<HS-720E>

Measurement Unit for Each Parameter

The measurement units for this equipment are as follows.

Detail	Parameter	Display	Unit	Default
Heart Rate / Pulse Rate	ECG	HR	bpm (beats per minute)	
	Invasive Blood Pressure	PR_IBP	bpm (beats per minute)	
	SpO ₂	PR_SpO ₂	bpm (beats per minute)	
ST Level	ECG	ST	mm, mv	mv
VPC	ECG	VPC	beat/minute	
Respiration Rate	Impedance Respiration	RR_IMP	Bpm (breaths per minute)	
	CO ₂	RR_CO ₂	Bpm (breaths per minute)	
	Ventilator	RR_VENT	Bpm (breaths per minute)	
	Gas Module	RR_GAS	Bpm	
Apnea	Impedance Respiration	APNEA	s (second)	
	CO ₂	APNEA	s (second)	
	Ventilator	APNEA	s (second)	
Invasive Blood Pressure	Invasive Blood Pressure	BP	mmHg, kPa cmH ₂ O (CVP only)	mmHg
Non-Invasive Blood Pressure	Non-Invasive Blood Pressure	NIBP	mmHg, kPa	mmHg
Arterial Oxygen Saturation	SpO ₂	SpO ₂	%	
	Perfusion Index	PI	%	
Temperature	Temperature	TEMP	°C / °F	°C
End-Tidal CO ₂ Concentration	CO ₂	EtCO ₂	mmHg, kPa, %	mmHg
Inspiratory CO ₂ Concentration	CO ₂	InspCO ₂	mmHg, kPa, %	mmHg
Cardiac Output	Cardiac Output	CO	L/minute	
	Cardiac Index	CI	L/minute/m ²	
Blood Temperature	Blood Temperature	Tb	°C / °F	°C
Injectate Temperature	Injectate Temperature	Ti	°C / °F	°C
Airway Flow	Airway Flow	AWF	L/minute	
Airway Pressure	Airway Pressure	AWP	cmH ₂ O	
Tidal Volume	Inspiratory Tidal Volume	I-TV	mL	
	Expiratory Tidal Volume	E-TV	mL	
	Tidal Volume	TV	mL	
	Inspiratory/Expiratory Ratio	I:E	(none)	
Minute Ventilation	Minute Ventilation	MV	L/minute	
	Spontaneous Minute Ventilation	SMV	L/minute	
Compliance	Compliance	COMP	mL/cmH ₂ O	
	Static Compliance	S_COMP	mL/cmH ₂ O	
	Dynamic Compliance	D_COMP	mL/cmH ₂ O	
Airway Resistance	Inspiratory Resistance	I-RES	cmH ₂ O/L/Sec	
	Expiratory Resistance	E-RES	cmH ₂ O/L/Sec	
	Static Airway Resistance	S-RES	cmH ₂ O/L/Sec	
	Dynamic Airway Resistance	D-RES	cmH ₂ O/L/Sec	
Airway Pressure	Mean Airway Pressure	MEAN	cmH ₂ O	
	Maximum Airway Pressure	PEAK	cmH ₂ O	
	Pause Airway Pressure	PAUSE	cmH ₂ O	
	Minimum Airway Pressure	P_Min	cmH ₂ O	

Detail	Parameter	Display	Unit	Default
Spontaneous Respiration	Spontaneous Respiration	S_RR	Bpm	
Peak End Expiratory Pressure	Peak End Expiratory Pressure	PEEP	cmH ₂ O	
Fraction of Inspiratory Oxygen	Fraction of Inspiratory Oxygen	FIO ₂	%	
Vigilance Data • Vigilance • Vigilance CEDV • VigilanceII • Vigileo	Mixed Venous Oxygen Saturation	SvO ₂	%	
	Central Venous Oxygen Saturation	ScvO ₂	%	
	Arterial Oxygen Saturation	SaO ₂	%	
	Oxygen Uptake Index	O ₂ EI	%	
	Oxygen Transport	DO ₂	mL/minute	
	Oxygen Consumption	VO ₂	mL/minute	
	Stroke Volume	SV	mL	
	Stroke Volume (STAT Mode)	SV_STAT	mL	
	Stroke Volume Index	SVI	mL/m ²	
	Stroke Volume Index (STAT Mode)	SVI_STAT	mL/m ²	
	Heart Rate	HR	bpm (beats per minute)	
	Mean Arterial Pressure	MAP	mmHg	
	Central Venous Pressure	CVP	mmHg	
	Continuous Cardiac Output	CCO	L/minute	
	Continuous Cardiac Output (STAT Mode)	CCO_STAT	L/minute	
	Continuous Cardiac Index	CCI	L/minute/m ²	
	Continuous Cardiac Index (STAT Mode)	CCI_STAT	L/minute/m ²	
	Systemic Vascular Resistance	SVR	dynes-sec/cm ⁵	
	Systemic Vascular Resistance Index	SVRI	dynes-sec/cm ⁵	
	Blood Temperature	BT	°C	
	Ejection Fraction	EF	%	
	Ejection Fraction (STAT Mode)	EF_STAT	%	
	End-Diastolic Volume	EDV	mL	
	End-Diastolic Volume (STAT Mode)	EDV_STAT	mL	
	End-Diastolic Volume Index	EDVI	mL/m ²	
	End-Diastolic Volume Index (STAT Mode)	EDVI_STAT	mL/m ²	
	End-Systolic Volume	ESV	mL	
	End-Systolic Volume Index	ESVI	mL	
	Stroke Volume Variance	SVV	%	
Multigas Data	End-tidal Carbon Dioxide	CO ₂ -E	mmHg, kPa, %	mmHg
	Inspired Carbon Dioxide	CO ₂ -I	mmHg, kPa, %	mmHg
	Expired Oxygen	O ₂ -E	%	
	Inspired Oxygen	O ₂ -I	%	
	Expired Nitrous Oxide	N ₂ O-E	%	
	Inspired Nitrous Oxide	N ₂ O-I	%	
	Expired Agent gas	AGT-E	%	
	Inspired Agent gas	AGT-I	%	

Detail	Parameter	Display	Unit	Default
Multigas Data	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	%	
BIS Monitor Data	Minimum Alveolar Concentration	MAC	(no unit)	
	Bispectral Index	BIS	(no unit)	
	Signal Quality Index	SQI	%	
	Electromyograph	EMG	dB	
	Suppression Ratio	SR	%	

Graphic Symbols

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

Symbols indicated on the equipment

Symbol	Description
	Caution; refer to accompanying documents Indicates the need to refer to related accompanying documents before operation.
	Equipotential Terminal Indicates the terminal to equalize the potential difference when interconnecting the devices.
	Protective Earth Indicates the protective earth inside the equipment.
	Alternating Current (Main Power Input Indicator)
	Power ON This indicates that the main power switch is in the ON position.
	Power OFF This indicates that the main power switch is in the OFF position.
	Electrostatic Sensitive Part Directly touching this connector part with hands should be avoided.
	Type CF Applied Part with Defibrillation-Proof Indicates the degree of protection against electric shock is Type CF Applied Part with defibrillation-proof.
	Type BF Applied Part with Defibrillation-Proof Indicates the degree of protection against electric shock is Type BF Applied Part with defibrillation-proof.

<i>Symbol</i>	<i>Description</i>
	Type BF Applied Part Indicates the degree of protection against electric shock is Type BF Applied Part.
	Signal Output Part
	GAS Output Part
	Signal Input Part
	TCP/IP Network Connector Connects to TCP/IP network.
	RS-232C Connector Connects the related device.
	Eject Indicates the switch to remove the recorder paper cassette.

Symbols displayed on the screen

<i>Symbol</i>	<i>Description</i>
	Alarm OFF Indicates the alarm is OFF.
	Heart Rate Synchronization Mark This mark flashes synchronizing to the heartbeat.
	Respiration Synchronization Mark This mark flashes synchronizing to the inspiration.
	Event Key This mark will be displayed when an alarm generates. Whether or not to display this icon can be selected on the monitor setup menu.
	Device Configuration Icon This mark will be displayed when device configuration has changed. Whether or not to display this icon can be selected on the monitor setup menu.
	Message Icon This mark will be displayed inside the parameter key when an alarm message is present for that parameter. Whether or not to display this icon can be selected on the monitor setup menu.
	SEC Alarm Display Indicates the SEC alarm status.
	Scroll Keys These keys will allow to scroll the screen.

Precautions for Safe Operation of Medical Electrical Equipment

⚠ CAUTION	<p>Read the following precautions thoroughly to correctly operate the device.</p> <ul style="list-style-type: none">● Users should have a thorough knowledge of the operation before using this system.● Pay attention to the following when installing and storing the equipment.<ul style="list-style-type: none">• 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.<ul style="list-style-type: none">• 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.<ul style="list-style-type: none">• 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.<ul style="list-style-type: none">• 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 remodel the equipment.● Maintenance Check<ul style="list-style-type: none">• 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.
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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 as "Institution") must decide the telemetry installation plan for the medical institution in order to prevent interference and interference between transmitters (telemetry based on destination country's radio law).● 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 throughout the medical 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 be examined so as not to generate electronic interference.● Based on the above examination result, the institution places each receiver antenna as required. <p>In managing, be sure to follow the precautions below.</p> <ul style="list-style-type: none">● The institution appoints a person to manage the wireless channels for the whole medical institution. And when using telemetry which requires zone location, the institution nominates a person to manage the wireless channels in each zone (a "Zone Manager"). However, when using such telemetry in a local medical 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 medical institution by giving proper instruction.● The Overall Manager creates a management log, list of wireless channels, management status for the whole medical institution (hereinafter referred to as the "management log"). 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-7300 system is available from your local Fukuda Denshi representative.

Precautions about the Pacemaker



WARNING

- Minute ventilation rate-adaptive implantable pacemakers can occasionally interact with certain cardiac monitoring and diagnostic equipment, causing the pacemakers to pace at their maximum programmed rate. The cardiac monitoring and diagnostic equipment may possibly send wrong information.
If such event occurs, please disconnect the cardiac monitoring and diagnostic equipment, or follow the procedures described in the operation manual of the pacemaker.
(For more details, contact FUKUDA DENSHI personnel, your institution's professionals, or your pacemaker distributors.)
 Reference
"Minute Ventilation Rate-Adaptive Pacemakers"
In the USA, 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]
- Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. See "11 Technical Information" for disclosure of the pacemaker pulse rejection capability of this equipment.

Non-Explosion Proof



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



- When using the defibrillator, keep away from the electrodes or medicament applied to the patient chest. If this is not possible, remove the electrodes or medicament before using it. If the defibrillator paddles are directly in contact with the electrodes or medicament, electrical shock may result by the discharged energy.
- When using the defibrillator, 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 using the defibrillator, do not touch the patient and the metal part of the device or cables. Electric shock may result by the discharged energy.

Electrosurgery Safety



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.

⚠ WARNING	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.
⚠ CAUTION	All the peripheral device connectors on the DS-7300 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-7300 system, it is the user's responsibility to verify that the overall system complies with IEC60601-1-1, "Collateral Standard: Safety Requirements for Medical Electrical Systems".

Precautions about the Fuse

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

⚠ WARNING	Use only the cables specified by Fukuda Denshi. <ul style="list-style-type: none">• Use of other cables may result in increase in emission or decrease in immunity.• We are not liable of the performance if product other than specified is used.
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Precautions about the DS-7300 System

 DANGER	<p>When connecting to other device, contact Fukuda Denshi service representative. Danger such as electric shock may result to the patient and operator.</p>
 WARNING	<ul style="list-style-type: none">● Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. If done so by mistake, the DS-7300 system cannot deliver its maximum performance and the connected units may be damaged, resulting in a safety hazard.● If the DS-7300 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. If using the equipment under condition other than specified, contact our service representative.● Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.● The power cable must be connected to hospital grade outlet.● 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 patient type selection influences the precision of the QRS detection and NIBP measurement. Make sure the correct selection is made.● The pacemaker use selection influences the precision of the QRS detection and arrhythmia analysis. Make sure the correct selection is made.● If the QRS pace pulse mask function is set to <input type="checkbox"/> OFF, <input type="checkbox"/> 10ms or <input type="checkbox"/> 20ms, a decrease in heart rate may not generate HR or ASYSTOLE alarms due to erroneously detected QRS. Set this function to <input type="checkbox"/> OFF, <input type="checkbox"/> 10ms or <input type="checkbox"/> 20ms only if you are sure that pacing failure will not occur, or when the patient can be constantly monitored.● When measuring the SpO₂ of patient with high fever or peripheral circulatory insufficiency, check the sensor attachment periodically and change the attachment site. The temperature of attachment site will rise 2 to 3°C due to the sensor heat which may result in compression necrosis and burn injury.● For the following case, accurate measurement of SpO₂ may not be possible.<ul style="list-style-type: none">• Patient with excessive abnormal hemoglobin (COHb, MetHb)• Patient with the pigment injected to the blood• Patient receiving CPR treatment• When a sensor is applied to a limb with NIBP cuff, arterial catheter, or intracatheter• When measuring at site with venous pulse• Patient with body motion• Patient with small pulse● Before the NIBP measurement, make sure the patient type (<input type="checkbox"/> Adult / <input type="checkbox"/> Child / <input type="checkbox"/> Neonate) is properly selected. Otherwise, correct measurement cannot be performed, and congestion or other injury may result.● Use only the specified accessories.● For HS-710E, 720E, 702E, and HC-500, always consider the circumference of the intubation tube when using the airway adapter. If inappropriate airway adapter is used for a patient with low ventilation, CO₂ may mix in to the inspired air resulting in incorrect measurement, or apnea detection may become difficult.

 WARNING	<ul style="list-style-type: none"> ● When the system alarm is suspended, all the alarm will be suspended even if the parameter alarm is set to ON. Also, the alarm event will not be stored as recall. ● If the upper/lower alarm limit of the parameter is set to OFF, or arrhythmia alarm is set to OFF, alarm will not function even if the system alarm is set to ON. Pay attention when setting them OFF. ● When a parameter is in a connector-off condition, the alarm will be generated only on the bedside monitor and not on the central monitor. If the waveform/numeric data is not displayed for a monitored parameter, check the patient's condition and pay attention not to miss the connector-off condition. ● 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. ● 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. <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 PR is set as the HR/PR alarm source on the DS-7300, HR alarm will be set to OFF on the central monitor. ● The HR/PR alarm will not be generated unless the parameter key corresponded to the selected HR/PR source is displayed. Be sure to display the parameter key for the HR/PR source. ● If PURITAN-BENNETT Ventilator is used, APNEA alarm will not generate when ventilator is the RR/APNEA alarm source. ● When selecting Silence or Time Only for the night mode, pay attention not to miss any important alarm by simultaneously monitoring the bed on other monitors such as central monitor. ● The RR/APNEA alarm will not be generated unless the parameter key corresponded to the selected RR/APNEA source is displayed. Be sure to display the parameter key for the RR/APNEA source. ● Fix the monitor on an adapter before setting on the trolley. Verify it is securely locked. Fixing on with 2 screws will ensure more safe use. If not securely fixed, the monitor may fall off the trolley which may damage the monitor or cause injury. ● When lifting this device, hold the bottom part of the main unit and not the display unit. ● When attaching the display unit to the main unit, insert the display unit to the attaching guide on the main unit from top and push in until a click sound can be heard. Verify that it is securely locked. ● About the Air Filter for Cooling Fan (Super Module, Input Box) <ul style="list-style-type: none"> • When the air filter is washed with neutral detergent, dry it completely before reattaching. If the moisture is remained on the air filter, it may damage the equipment. • The air filter must be attached. If the equipment is used with the air filter detached, it may damage the equipment.
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 CAUTION	<ul style="list-style-type: none"> ● Systems <ul style="list-style-type: none"> • This equipment is intended to be used for only one patient. • The installation of this equipment should be performed by our service representative or a person who is well acquainted with this equipment. • 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. • When the product is used in regions whose voltage is other than 220-240V, a cable appropriate to the regulations and voltage of the country in which the product is being used shall be used.
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 CAUTION

- The display panel utilizes exclusive fluorescent light for the backlight. Since this fluorescent light deteriorates with its life cycle, the display may become dark, scintillate, or may not light in long term use. In such case, contact your nearest service representative.
- 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. In addition, do not apply pressure to whole or part of the panel for a prolonged time.
- Do not use the touch panel with the film 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.
- Turning off the power of the LC-7315T/LC-7319T Display Unit will also turn off the power of the Input Box.
- As the Super Module and DSC-7300 communicates via Input Box, the power of the Input Box must be always turned ON even if the module is not inserted in the Input Box.
- There are following restrictions when recording on the HR-500 Module.
 - Only manual recording, periodic recording, alarm recording, recall recording can be performed on the HR-500.
 - If the measurement unit of BP is "kPa", BP waveform, BP numeric data, and NIBP numeric data will be treated as non-measured data.
 - If the TEMP measurement unit is "°F", the TEMP numeric data will be treated as non-measured data.
 - For the non-measured parameter, the waveform will not be printed, and numeric data will be printed as "— —" or left blank.
 - The numeric data displayed as "xxx" will be printed as "— —".
 - The QRS classification symbol of "S" will be printed as "N" on the HR-500.
 - The waveform recording is not possible for some scale depending on the parameter.
 - If the HR alarm source is BP, ECG will not be recorded. PR_IBP data will be printed for the HR data instead.
 - If the RR/APNEA alarm source is other than impedance respiration, the respiration waveform will not be recorded.
 - If the RR/APNEA alarm source is other than CO₂/GAS, the CO₂ waveform will not be recorded.
- When connecting the BIS monitor, make sure that the power of the patient monitor and the BIS monitor is turned OFF.
- ECG Monitoring
 - Use only the specified relay cables, lead cables, and electrodes.
 - The conductive parts of electrodes and associated connectors for applied parts, including the neutral electrode, should not contact other conductive parts including earth.
 - The indication for continuous use of the electrode is about one day.
 - Replace the electrode if the skin contact gets loosen due to perspiring, etc.
 - When an electrode is attached at the same location for a long time, some patients may develop a skin irritation. Check the patient's skin condition periodically and change the electrode site as required.
 - For stable arrhythmia detection and ECG monitoring, verify proper electrode placement, lead, waveform size, and filter mode selection. If not properly selected, it may cause erroneous detection.

CAUTION

- If different types of electrodes are used at the same time, the difference between the polarization potential from each electrode may interfere monitoring. Make sure to use electrodes of the same type.
- The threshold level for arrhythmia detection and QRS detection changes with ECG waveform size. Set a proper waveform size for monitoring. When the waveform size is $\times 1/4$, $\times 1/2$, or $\times 1$, the detection threshold is $250\mu V$. When the waveform size is $\times 2$ or $\times 4$, the detection threshold is $150\mu V$.
- The QRS detection leads, arrhythmia detection leads, monitoring leads on the central monitor, recording leads are fixed as ECG1 and ECG2. Especially for arrhythmia detection, set the most appropriate leads with high QRS for ECG1 and ECG2.
- Automatic size/position of the ECG is effective only at the time the **AUTO** key is pressed. This does not continually adjust size and position.
- The ESIS mode can largely reduce the artifact such as electrosurgery noise and EMG, but it may also reduce the QRS amplitude. The ESIS mode should be selected only during electrosurgery.
- 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.
- 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 Monitoring
 - When the following relay cables are used, respiration cannot be measured.
 - Relay Cable CI-700E_3 (FA) (Electrosurgery-proof, 3-electrode)
 - Relay Cable CI-700E_4 (FA) (Electrosurgery-proof, 4-electrode)
 - Relay Cable CI-700E_5 (FA) (Electrosurgery-proof, 5-electrode)
 - When a defibrillator is used during respiration monitoring, a large offset voltage will be placed on the ECG electrodes, which may cause interruption of monitoring for a few seconds.
- SpO₂ Monitoring
 - If the sensor site is too thick, thin, deeply pigmented, or deeply colored (ex. nail polish, dye, or pigmented cream), it may lead to inaccurate measurements. In such case, reposition the sensor or choose an alternate sensor for use on a different site.
 - If irritation such as skin reddening or skin fit appears with the sensor use, change the attachment site or stop using the sensor.
 - When fixing the sensor with a tape, do not wind the tape too tight. At the same time, check the blood flow constantly so that congestion is not generated at the peripheral.
 - Even a short duration of attachment may inhibit the blood flow and generate compression necrosis and burn injury.
 - Change the sensor attachment site at regular time intervals (about 4 hours). The temperature of attachment site will rise 2 to $3^{\circ}C$ due to the sensor heat which may result in compression necrosis and burn injury.
 - As skin for neonate / low birth weight infant is immature, change the sensor attachment site more frequently depending on the condition. Direct sunlight to the sensor area can cause a measurement error. Place a black or dark cloth over the sensor.
 - Excessive light may cause inaccurate measurements. In such cases, cover the sensor with opaque material.

⚠ CAUTION	<ul style="list-style-type: none"> • When not performing the measurement, unplug the relay cable and sensor from the SpO₂ connector. Otherwise, the measurement data may be erroneously displayed by the ambient light. • Precautions for Reusable Type Sensors <ul style="list-style-type: none"> ▪ The light-emitting part of the sensor should be over the root of the fingernail. Do not insert the finger too far into the sensor as it may hurt the patient. ▪ The DS-100A is intended for use on finger of adults weighing over 40 kg (approximate). Do not use them on children or neonates. Also do not apply them on the thumb or toe. ▪ The DS-100A must be moved to a new site at least every 4 hours. Because individual skin condition affects the ability of the skin to tolerate sensor placement, it may be necessary to change the sensor site more frequently with some patients. If skin integrity changes, move the sensor to another site. • Precautions for Single-Use Type Sensors <ul style="list-style-type: none"> ▪ Do not wind the tape too strong. It may obstruct the blood flow. ▪ The sensor is contraindicated for use on patients who exhibit allergic reactions to the adhesive tape. ▪ The Nellcor® sensor OXISENSOR™ MAX Fast can be reused on the same patient as long as the adhesive tape attaches without slippage. But do not reuse it on other patients. It is intended for single patient use only. ▪ For the Nellcor® single-use type sensors, the site must be inspected every 8 hours to ensure adhesion, skin integrity, and correct optical alignment. If skin integrity changes, move the sensor to another site. ▪ Do not reuse the sensor by resterilizing it. ▪ Dispose the sensor after use. In the event of damage to the sterile packaging, do not use it. • NIBP Monitoring <ul style="list-style-type: none"> ▪ Select the appropriate cuff size which best fits the arm circumference. If the cuff size is inappropriate, it may cause measurement error. ▪ Do not use a cuff which is worn out. The cuff may burst during inflation. ▪ If there is any air leakage, correct NIBP measurement cannot be performed. Make sure that the connection is secure. ▪ Correct NIBP measurement cannot be performed if artificial heart lung machine is used or if the pulse is difficult to detect. ▪ Pay attention when measuring the NIBP of patient with bleeding disorders or hyper coagulation. The cuff inflation may cause petechia or circulatory failure by blood clot. ▪ Do not apply the cuff to the arm or thigh where vein is secured. The blood may backflow causing the chemical injection to cease. ▪ Check the condition of cuff-applied part on the patient during measurement so that the blood circulation will not be blocked over long period of time by the squashed or bent cuff hose. ▪ If the air hose is twisted, or weighed down, the cuff air cannot be exhausted. Properly arrange the cuff and air hose. ▪ Check the patient's condition constantly while measuring over long period of time with interval of 2.5 minutes or less. Also, periodically check the blood circulation while performing periodic measurement over long period of time. Congestion may occur at the measuring site. ▪ The following factors may affect the NIBP value. <ul style="list-style-type: none"> ▪ Body motion, arrhythmia, convulsion ▪ Continuous noise such as cardiac massage ▪ Periodic electromagnetic noise ▪ For the following situation, measurements will be terminated. <ul style="list-style-type: none"> When the measurement time has exceeded 120 seconds for adult, 90 seconds for child, 60 seconds for neonate. When the inflation value has exceeded 310mmHg for adult, 210mmHg for child, 160mmHg for neonate.
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 CAUTION

- If used with the incorrect patient type, it will not only cause erroneous measurement, but the inflating level for the adult may be applied to child or neonate causing dangerous situation to the patient.
- The 1-minute interval measurement will always start from 00 second. Pressing the **1min start** key will start the measurement from the next 00 second.
- The 1-minute interval measurement will automatically stop after 10 minutes and returns to the previous interval mode setup.
- The alarm function will be ineffective for the BP value measured by Quick SYS regardless of the ON/OFF selection of NIBP alarm.
- If the mean BP display is set to OFF, the mean BP alarm will not be generated. Also the mean BP will not be displayed for the tabular trend or the NIBP list function if the display is set to OFF.
- BP Monitoring
 - When the main power is turned ON, the BP value will not be displayed until zero balance is performed. However, if the power is turned ON within 5 minutes after the power is turned OFF, the previous zero balance information will be maintained, and BP value will be displayed. If HB-500 BP Module is used, the balance information will be maintained for 1 minute.
 - Each time the blood pressure transducer or tubing is replaced, the zero balance procedure is required to ensure accurate measurements.
 - “Perform zero balance” message will not be displayed unless the three-way cocks of all pressure transducers are opened to air. If the status is not displayed, or if “Open stop cock to air” message is displayed, check if the three-way cock of pressure transducers are opened to air. The zero balance procedure is required for the following case.
 - When starting the measurement.
 - When the position of the heart has changed due to body movement.
 - When the position of the transducer has changed.
 - When measuring for a long period of time and there is a possibility of measurement error due to change in ambient temperature, etc.
 - When the connector is connected / disconnected, or transducer is replaced.
 - When the power has been turned OFF for more than 5 minutes.
 - Note that Systolic Pressure (SYS) = Peak Systolic Pressure (PSP) for the graphic trend, data base, and alarm setup.
 - When ECG is not measured, PDP cannot be calculated.
 - When HB-500 is used, do not set the BP label to IAP. PDP will not be calculated and displayed as “—”. S/D/M will not be displayed either.
 - The BP data (SYS/DIA/Mean) not displayed will not generate the BP alarm or be displayed for the tabular trend function. Select the appropriate display type according to the monitoring purpose.
- Temperature Monitoring
 - Do not reuse the probe cover. It is intended for single patient use only.
- CO₂ Monitoring (HS-710E, 720E, 702E)
 - If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the “CO₂ Module Priority” set on the “Input Box Setup” (Monitor Setup). With the default setting, the HC-500 will be prioritized.
 - Perform calibration after 20 minutes when the main power of the Super Module is turned ON.
 - Do not disconnect the sampling tube during calibration. If disconnected, calibration will cease.
 - Conduct CO₂ calibration for the following case.
 - When 4,000 operating hours has elapsed from the last calibration date or once a year whichever comes first.
 - When EtCO₂ measurement is not stable or accuracy is degraded compared with other measuring device.
 - When the patient monitor was not used for a while, or when EtCO₂ was not measured for a while.

 CAUTION

- CO₂ Monitoring (HS-720C, 702C: Respirationics® Capnostat5)
 - If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the "CO₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.
 - The disposable airway adapter should be opened just before use. Do not sterilize it.
 - Do not reuse the disposable airway adapter.
 - Do not sterilize the airway adapter using autoclave methods.
- CO₂ Monitoring (HC-500)
 - The airway adapter should be attached with the thicker side facing to the patient. If attached oppositely, it may damage the CO₂ sensor or airway adapter. If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the "CO₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.
- Multigas Monitoring (Poet IQ 8500A)
 - When performing the O₂ cell drift check and calibration, read and follow the instructions listed on the gas cylinder labels. Do not use the calibration gas cylinder if it is beyond the expiration date.
 - Use only the specified calibration gas. Proper calibration is not possible if unapproved calibration gas is used.
 - Make sure to restart the Poet IQ 8500A after the calibration. Otherwise, Poet IQ 8500A will not function properly.
 - If O₂ gain adjustment is started without supplying the calibration gas, the message, "Check calibration gas." will be displayed and O₂ gain adjustment will cease.
 - If O₂ offset adjustment is started without opening to air, the message, "Check calibration gas." will be displayed and O₂ offset adjustment will cease.
 - If O₂ offset is adjusted, it is necessary to readjust the O₂ gain. If O₂ offset adjustment was not necessary, O₂ gain readjusting screen will not be displayed.
- Alarm
 - 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.
 - The alarm message for the arrhythmia alarm will continue to be displayed for 30 seconds after the alarm is resolved.
 - While the "LEAD OFF" message is displayed, HR alarm and arrhythmia alarm will not function. Leaving this condition unresolved may result in missing a sudden change of the patient. Promptly check the electrodes when this message is displayed.
 - For HS-710E, 720E, 702E, and HC-500 Module, the upper EtCO₂ alarm will not generate if the upper limit is set to 100mmHg/13.4kPa and above as the measurement range is 0 to 99mmHg / 0 to 13.3kPa.
 - 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.
 - For the SpO₂ measurement, whether to use the SEC alarm function and its threshold selection should be based on the patient's clinical indication portent and medical evaluation. (For Nellcor® SpO₂ unit)
 - If the SpO₂ alarm and SEC alarm setup is set to OFF, the SEC alarm integral value will be set to 0. (For Nellcor® SpO₂ unit)
 - The alarm silence ON/OFF setup will remain effective even when the power is turned OFF. Be cautious not to miss any important alarm by leaving the alarm silenced.
 - Pay attention not to set the alarm volume too low to avoid missing any important alarms.

 CAUTION

- System Configuration
 - When waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
 - If the display of waveform / numeric data labeled as BP1 or ART is set to OFF, the BP pulse rate will not be displayed.
 - When the waveform and numeric data display for SpO₂ is set to OFF, the pulse rate measured by SpO₂ will not be displayed either.
 - When the waveform and numeric data display for CO₂ is set to OFF, RR measured by CO₂ will not be displayed either.
 - When the waveform and numeric data display for the gas module is set to OFF, RR measured by the gas module will not be displayed.
 - If the time/date is not correctly set, or changed during monitoring, malfunction may occur to NIBP measurement, periodic recording, trend, NIBP list data.
 - If the time/date is changed during monitoring, patient's age will not be recalculated.
- Patient Admit / Discharge
 - 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.
 - The setup for the alarm mode and display mode remains stored even when the power is turned off or when discharging procedure is performed. Before monitoring, make sure the current monitoring mode is suitable for the patient's condition.
 - Resuming monitoring will resume the alarm in suspension.
- ST Measurement
 - For the lead which the electrode is detached, the reference waveform setup cannot be performed. Check if the electrode is correctly attached, and perform the setup again.
- CF Card
 - Use only the specified CF card.
 - Use only the CF card formatted with this device.
 - Restart the system after reading the setup data from the CF card. The setup data will become effective after the system is restarted.
 - Reading the patient data from the CF card will erase all previous patient data stored in the patient monitor.
- 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 cleaning 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 a soft cleaning cloth provided as optional accessory or with an eyeglass cleaning cloth.
 - 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 equipment 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.



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| CAUTION | <ul style="list-style-type: none">• Do not open the housing.• If you accidentally wet the device, dry it completely and verify it operates safely before usage.• Replace the components periodically as specified. |
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- Do not open the housing.
- If you accidentally wet the device, dry it completely and verify it operates safely before usage.
- Replace the components periodically as specified.

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

⚠ WARNING	<ul style="list-style-type: none">● 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.
⚠ CAUTION	<ul style="list-style-type: none">● If performing wired network transmission, configure the display so that the numeric data corresponded to the waveform is displayed. If not, the displayed waveform or numeric data may not be transmitted.● The Bed ID is factory set to 000. If connected to the wired network with the ID unchanged, monitoring on the central monitor will not be possible.● When connecting to the wired network, verify that the Bed ID does not duplicate with other bedside monitors. Otherwise, monitoring on the central monitor for both bedside monitors will not be possible.● Make sure to set the bed ID in the following range.<ul style="list-style-type: none">• For DS-LANII network: 001 to 048• For DS-LANIII network: 001 to 100● As the DS-7300 do not have the arrhythmia template display and 12-lead ST display function, these displays on the central monitor will not be corresponded.● If connected to a wired network, time/date will be the same with the central monitor. Even if the time/date is changed on the DS-7300 system, it will be corrected to the time/date of the central monitor.● The setups for "HR Low Limit for VT" and "HR Low Limit for Run" cannot be performed on some central monitors.● On a wired network, the alarm generated on the DS-7300 will be transmitted to the central monitor with 2.5 seconds delay.● If ECG lead (ECG1 or ECG 2) is changed on the DS-7300 while monitoring ST display on the central monitor, the ST display will be distorted. Redrawing the ST display will return the display to normal.● The respiration waveform and RR value based on the RR/APNEA alarm source selected on the DS-7300 will be displayed on the central monitor. The monitoring RR and APNEA will be the same as the one monitored on the DS-7300.● If the measurement unit of CO₂ concentration is "mmHg", and 99mmHg is selected for "CO₂ (mmHg) Upper Limit for LAN, Telemetry" on the monitor setup menu, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg.● If BP is selected for "HR/PR source" (Or, if Auto selects BP for HR/PR Source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_IBP value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list. In case of DS-LANIII network, refer to the operation manual for the central monitor.● There are following restrictions when connecting the DS-7300 system to the DS-LANII network.<ul style="list-style-type: none">• When DS-5800N/NX/NX^{MB} is used as a central monitor, recall, graphic trend, and tabular trend will not be displayed. Also, Σ recording cannot be performed.• On the ST display, overlap waveform will not be displayed on the DS-5800N/NX/NX^{MB} until 15 minutes have passed since the reference waveform is set on the DS-7300.• If the measurement unit for BP (mmHg/kPa) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.• When the temperature unit is °F, the temperature data will not be transmitted. It will be treated as not measured data, and will not be displayed on the central monitor. Also, alarm limit setup on the central monitor cannot be performed.

 CAUTION

- Arrhythmia alarm of TACHY, BRADY, COUPLET, PAUSE, TRIGEMINY will not be transmitted.
- Arrhythmia alarm of "SLOW_VT" will be transmitted as "VT".
- On the DS-LANII network, waveform, numeric data, alarm of BP7, BP8, TEMP3–8 will not be transmitted. Also, the displayable waveform, numeric data, alarm differs depending on the connected central monitor. Refer to the operation manual for the respective central monitor.
- If DS-7600 system is used as the central monitor, O₂, N₂O, AGENT alarm will not be generated on the central monitor.
- If the HR/PR source is BP, ECG waveform will not be transmitted on a wired network. On the central monitor, PR_IBP value will be displayed for HR. However, HR value from ECG will be displayed for the NIBP list and ST measurement list.
- If the RR/APNEA alarm source is other than impedance respiration, respiration waveform will not be transmitted on a wired network.
- If the RR/APNEA alarm source is other than CO₂/GAS, CO₂ waveform will not be transmitted on a wired network.
- For numeric data displayed as "xxx", maximum or minimum value of measurable range will be transmitted.
- The numeric data displayed as "——" will be treated as not measured data.
- There are following restrictions when connecting the DS-7300 system to the DS-LANIII network.
 - When connecting to the DS-LANIII network, select **DS-LANIII** under "DS-LAN Setup" in the Monitor Setup menu and restart the system before connecting the LAN cable.
 - 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.
 - If using a HUB for network construction, use the HUB recommended by Fukuda Denshi.
 - The displayable waveform, numeric data, alarm will differ depending on the central monitor. Please also refer to the operation manual of the central monitor.
- There are following restrictions when recording the DS-7300 data on the central monitor recorder or the AU-5500N 8ch Recorder.
 - The AU-5500N can be connected to DS-LANII network only. Do not connect it to DS-LANIII network. Malfunction may occur to the network.
 - Only manual recording, alarm recording, periodic recording, and recall recording can be performed on the AU-5500N.
 - If the measurement unit of BP is kPa, the BP waveform, BP numeric data, and NIBP numeric data will be treated as not measured data.
 - If the measurement unit of temperature is °F, the temperature data will be treated as not measured data.
 - When a parameter is not measured, the waveform for that parameter will not be recorded, and measurement data will be recorded as "——" or blank.
 - The measurement data displayed as "xxx" will be recorded as "——" on the central monitor recorder.
 - The "S" (QRS symbol) printed on the HS built-in recorder will be printed as "N" on the central recorder, AU-5500N, and HR-500 Recorder Module.
 - For the waveform recording and graphic trend recording, some parameters may not be able to be recorded depending on the scale.
 - When performing tabular trend recording or graphic trend recording on the central recorder, some numeric data may not be recorded depending on the parameter. Also, there are some graphic trend scales that cannot be recorded.
 - If BP is the HR/PR source, ECG will not be recorded on the central recorder. PR_IBP value will be printed instead for the HR value.
 - If the RR/APNEA alarm source is other than impedance respiration, respiration waveform will not be output on the central recorder.



(Continued from previous page)

- If the RR/APNEA alarm source is other than CO₂/GAS, CO₂ waveform will not be output on the central recorder.
- When graphic trend recording, tabular trend recording, or NIBP list recording is output on the central monitor recorder from the DS-7300, HR measurement value from ECG will be recorded for the HR value and ST trend.

Precautions about the Wired Network System (AU-5500N 1:N Network)



- The AU-5500N can be connected to DS-LANII network only. Do not connect it to DS-LANIII network. Malfunction may occur to the network.
- The bed ID is factory set to "000". If used on a wired network with the default ID unchanged, recording on the AU-5500N will not be possible.
- When using on a wired network, make sure that there are no other bedside monitors with the same ID. If there are more than one bedside monitors with the same bed ID, the duplicated bedside monitors cannot record on the AU-5500N.
- For 1:N network, set the bed ID in the range from 001 to 016.
- When connecting the AU-5500N to a 1:N network, internal switch setting of the AU-5500N is required. For details, refer to our service representative.

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

- A password can be set to access the channel ID setup menu to allow only the telemetry channel administrator to change the channel ID.
- Some 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.

CAUTION

- On a wireless network, the alarm generated on the DS-7300 will be transmitted to the central monitor with 15 seconds delay.
- If performing telemetry transmission, configure the display so that the numeric data corresponded to the waveform is displayed. If not, the displayed waveform or numeric data may not be transmitted.
- The setup of channel ID and group ID should be performed only by our service representative. Users should not perform this procedure as malfunction of the equipment may occur.
- If the measurement unit is “°F” and “kPa” on the DS-7300 system, it will be converted to “°C” and “mmHg” respectively when transmitted to the central monitor. If the measurement unit “°F” and “kPa” are set on the central monitor, it will be reconverted to the value in “°F” and “kPa” after transmitted to the central monitor.
- On a wireless network system, O₂, N₂O, AGT alarm generation will not be transmitted to the central monitor.
- For the alarm generation on the bedside monitor, maximum of 15 seconds delay will occur for the alarm generation on the central monitor.
- BP waveform with a scale above the programmed scale can not be properly transmitted. When transmitting the BP waveform, check the displayed BP waveform scale.
- If the measurement unit of CO₂ concentration is “mmHg”, and 99mmHg is selected for “CO₂(mmHg) Upper Limit for LAN, Telemetry” on the monitor setup menu, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg.

Precautions about Ventilator Monitoring

<p>⚠ WARNING</p>	<ul style="list-style-type: none">● The ventilator alarm on this monitor should be used as supplementary function. Check the patient's condition, ventilator alarm sound and message occasionally.● The ventilator alarm sound is set to OFF at factory default setting. The alarm sound can be turned ON on the volume setup menu.● If the DS-7300 system does not generate an alarm even though the ventilator is generating an alarm, or if any other malfunction occurs, immediately check the ventilator, DS-7300 system, cable, and replace the cable if necessary. If the malfunction persists, stop using the device.● When a ventilator is connected to the DS-7300, verify that "Vent. Online" message is displayed for the connection status. The DS-7300 will not detect the ventilator alarm unless the "Vent. Online" condition is achieved.● The alarm generation on the DS-7300 system is not assured if the alarm other than specified generates at the ventilator.● See For details of the specified alarms, refer to △WARNING on P2-27 "2. Basic Operation Ventilator Alarm Input".● The Evita 2 dura / Evita 4 / Evita XL / Savina acquires alarm information from the serial port. The ventilator alarm that cannot be acquired from the serial port is not guaranteed. For corresponding alarm, refer to the service representative of the ventilator manufacturer.● The DS-7300 system will not correspond to the following alarms generated on the Evita 4 / Evita XL / Evita 2 dura.<ul style="list-style-type: none">• O₂ monitoring disabled alarm, CO₂ alarm disabled alarm, Oximeter alarm disabled alarm, Neo. volume measurement inoperable alarm, Minute volume alarm disabled alarm, Minute volume alarm low off alarm, Tidal volume alarm high off alarm, Apnea alarm off alarm, Nebulizer active alarm● The DS-7300 system will not correspond to the following alarms generated on the Savina.<ul style="list-style-type: none">• O₂ monitoring disabled alarm, Minute volume alarm disabled alarm, Minute volume alarm low off alarm, Tidal volume alarm high off alarm, Apnea alarm off alarm, Nebulizer active alarm● For the Evita 4 / Evita XL / Evita 2 dura / Savina, there is a communication delay of 3 seconds between the DS-7300 system and the ventilator. Therefore, if the alarm generated at the ventilator is resolved within 3 seconds, the ventilator alarm may not be generated at the DS-7300 system.
<p>⚠ CAUTION</p>	<ul style="list-style-type: none">● The ventilator operation should be performed by well-trained and authorized personnel.● For connecting the DS-7300 system and ventilator, use only the specified connection cable.● Verify that the DS-7300 system and the ventilator are properly connected.● When connecting the cable, verify that the main power of the DS-7300 system and the ventilator is OFF.● For the SV-900, PB, Evita, Savina ventilator, ventilator alarm factor cannot be transmitted to the central monitor.● The ventilator alarm factor will not be displayed on the bedside monitor.● Check occasionally the communication status of the DS-7300 and the ventilator.● Verify that the ventilator alarm is not generated, and the "Vent. Online" message is displayed.● The confirmation display will be displayed until the proper communication with the ventilator is resumed. When the communication is resumed, the screen will automatically return to the home display.● When disconnecting the ventilator and the DS-7300, make sure to select OFF on the "Check external alarm" display which appears when the power of the ventilator is turned OFF, or when the cable is disconnected.

 CAUTION	<ul style="list-style-type: none"> When connecting the PURITAN-BENNETT ventilator, follow the precautions below. <ul style="list-style-type: none"> The serial port (RS-232C) of the ventilator should be set as follows. Refer to the service representative of the ventilator manufacturer. <table border="0"> <tr><td>Baud Rate</td><td>:</td><td>9600bit/s</td></tr> <tr><td>Data Bit</td><td>:</td><td>8bit</td></tr> <tr><td>Parity Bit</td><td>:</td><td>none</td></tr> <tr><td>(Stop Bit)</td><td>:</td><td>(1bit)</td></tr> </table> The DS-7300 system detects the “ventilator alarm” when the nurse call port on the ventilator outputs the alarm signal. For details of ventilator setup and alarm signal output condition from the nurse call port, refer to the service representative of the ventilator manufacturer. When connecting the Evita2dura / Evita4 / Evita XL / Savina ventilator, the serial port (RS-232C) setup of the ventilator should be as follows. Refer to the service representative of the ventilator manufacturer. <table border="0"> <tr><td>For Evita2dura / Evita4 / Evita XL</td></tr> <tr><td>Protocol</td><td>:</td><td>Medibus</td></tr> <tr><td>Baud Rate</td><td>:</td><td>19200bps</td></tr> <tr><td>Data Bit</td><td>:</td><td>8bit</td></tr> <tr><td>Parity Bit</td><td>:</td><td>Even</td></tr> <tr><td>Stop Bit</td><td>:</td><td>1bit</td></tr> <tr><td>For Savina</td></tr> <tr><td>Protocol</td><td>:</td><td>Medibus</td></tr> <tr><td>Baud Rate</td><td>:</td><td>9600bps</td></tr> <tr><td>Data Bit</td><td>:</td><td>8bit</td></tr> <tr><td>Parity Bit</td><td>:</td><td>None</td></tr> <tr><td>Stop Bit</td><td>:</td><td>1bit</td></tr> </table> For PURITAN-BENNETT ventilator, AWP and AWF waveform cannot be displayed or recorded. Only the numeric data will be displayed. For PURITAN-BENNETT ventilator, P-V curve and F-V curve cannot be displayed or recorded. Only the numeric data will be displayed. 	Baud Rate	:	9600bit/s	Data Bit	:	8bit	Parity Bit	:	none	(Stop Bit)	:	(1bit)	For Evita2dura / Evita4 / Evita XL	Protocol	:	Medibus	Baud Rate	:	19200bps	Data Bit	:	8bit	Parity Bit	:	Even	Stop Bit	:	1bit	For Savina	Protocol	:	Medibus	Baud Rate	:	9600bps	Data Bit	:	8bit	Parity Bit	:	None	Stop Bit	:	1bit
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Stop Bit	:	1bit																																											

Precautions for Use of SpO₂ Sensor

 DANGER	<p>Burn Risk in Using SpO₂ Sensor</p> <p>In SpO₂ monitoring, always use the sensor/relay cable specified by Fukuda Denshi. If any other sensor/relay cable is used, a high temperature rise of the sensor may place the patient in danger of burns. If there are any questions regarding the sensor/relay cable use for SpO₂ measurements of this device, please contact Fukuda Denshi service representative.</p>
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Precautions for Use of NIBP Cuff

 CAUTION	<p>This product contains natural rubber latex which may cause allergic reactions. (FDA: Medical Alert on Latex Products, “Allergic Reactions to Latex-Containing Medical Devices”, Food & Drug Administration, 9200 Corporate Blvd., Rockville, MD 20850, 1991.)</p>
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Disposing of Equipment, Accessories, or Components

 CAUTION	<p>When disposing of the equipment, accessories, or components, use an industrial waste distributor. Do not dispose of as ordinary waste.</p>
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Precautions about Transportation

For transporting the DS-7300 system, pack with specified packing materials.



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

Precautions about RTC or Data Backup

CAUTION

- The DS-7300 system is equipped with a built-in clock. When the power of the DS-7300 system 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 5-minute (approx.) data backup using the secondary battery. The data may not be protected if the power is turned off within 30 minutes from power on.

To Prepare for Emergency Use

Accessories / Optional Accessories

- (1) The ECG electrodes are consumables. Always prepare extra supplies of electrodes.
- (2) Check if any wire break on the patient cables once a week.

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.</p> <p>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><ul style="list-style-type: none">• 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><ul style="list-style-type: none">• Check where the noise is originated and remove it using filtering device, etc.• Stop using the device that is originating the noise.• Use other power outlet.
---	--

EMC Guidance

This 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-7300 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7300 system should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The DS-7300 system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	
Harmonic Emissions IEC61000-3-2	Class A	The DS-7300 system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage Fluctuations/ Flicker Emissions IEC61000-3-3	Complies	

●Compliance to the Electromagnetic Immunity (1)

The DS-7300 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7300 system 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) IEC61000-4-2	±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 IEC61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	±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. IEC61000-4-11	<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-7300 system requires continued operation during power mains interruptions, it is recommended that the DS-7300 system is powered from an uninterruptible power supply.
Power Frequency (50/60Hz) Magnetic Field IEC61000-4-8	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-7300 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7300 system should assure that it is used in such an environment.

Immunity Test	IEC60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Conducted RF IEC61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the DS-7300 system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance $d = 1.2 \sqrt{P}$

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-7300 system is used exceeds the applicable RF compliance level above, the DS-7300 system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the DS-7300 system.

^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-7300 System

The DS-7300 system is intended for use in an environment in which radiated RF disturbances are controlled. The customer or the user of the DS-7300 system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DS-7300 system as recommended below, according to the maximum output power of the communications equipment.

<i>Rated Maximum Output Power of Transmitter (W)</i>	<i>Separation Distance according to Frequency of Transmitter (m)</i>		
	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.

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Chapter 4

Monitoring Setup

This chapter describes the setup procedure according to the monitoring purpose.

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Display Configuration

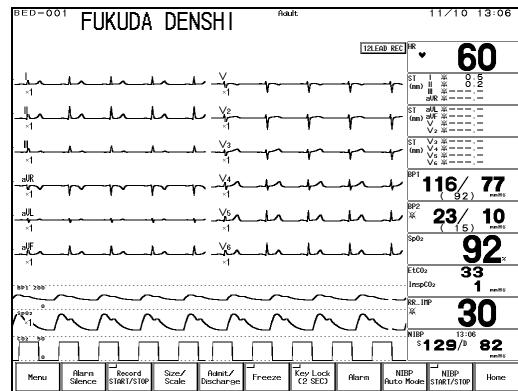
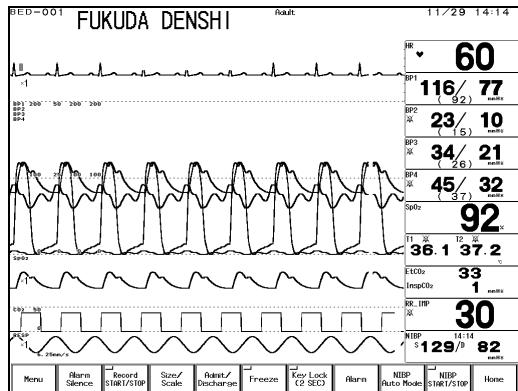
For Easier View

The monitoring display can be configured according to the monitoring purpose. There are 5 types of basic display mode, which are Standard, 12-lead, Extended 1, Extended 2, and Enlarged. For the "Standard" mode, graphic trend, ventilator, tabular trend, NIBP list, OCRG, block cascade can be simultaneously displayed.

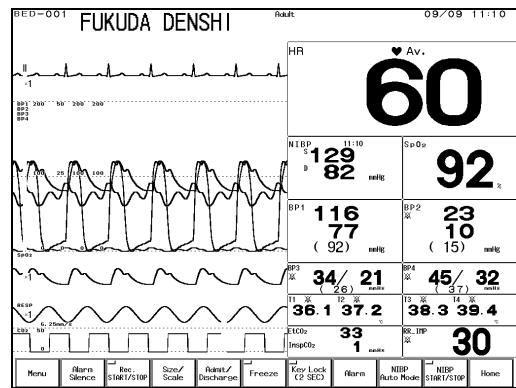
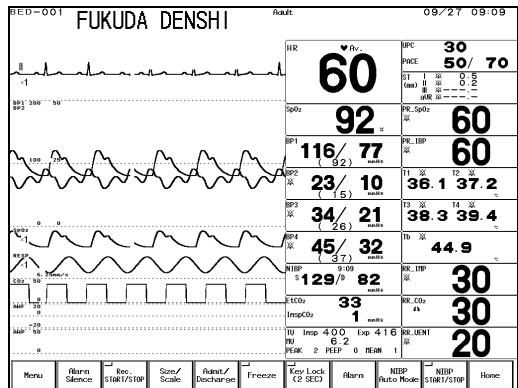
NOTE

For the LC-7319T (19-inch display unit), the display mode of "Extended 1" and "Extended 2" cannot be configured.

[Display Example of LC-7315T]

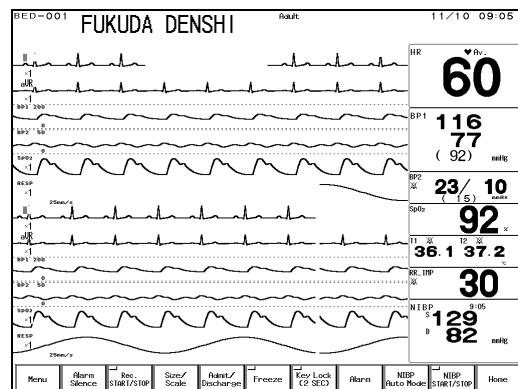
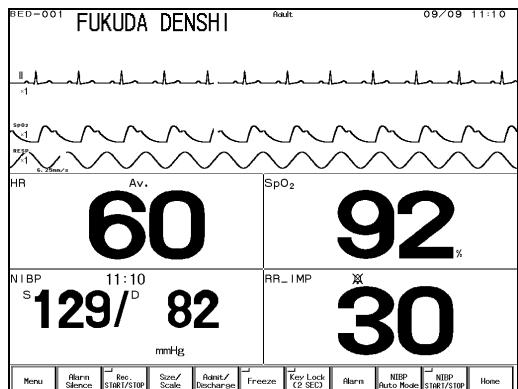


<Standard>



<Extended 1>

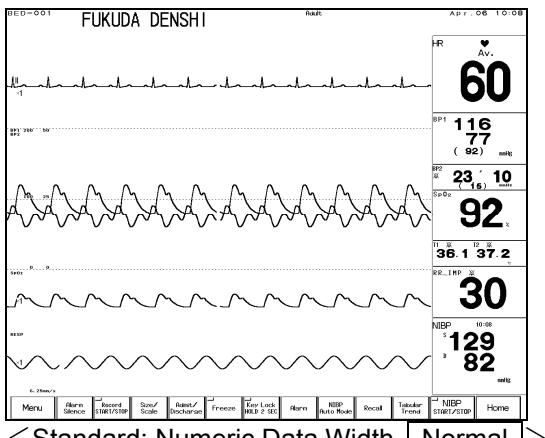
<Extended 2>



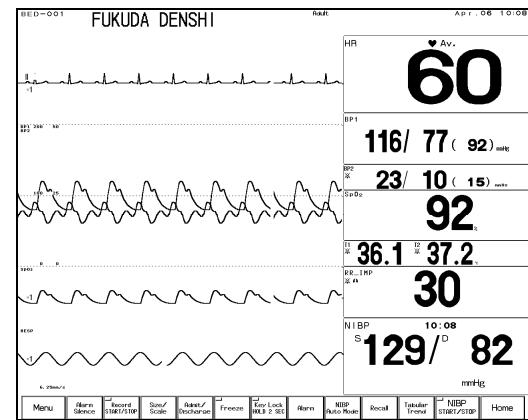
<Enlarged>

<Block Cascade>

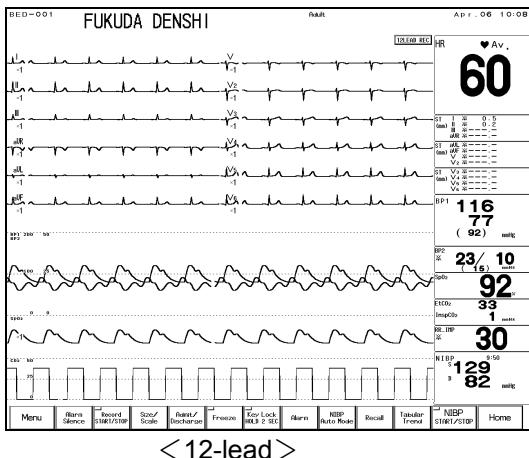
[Display Example of LC-7319T]



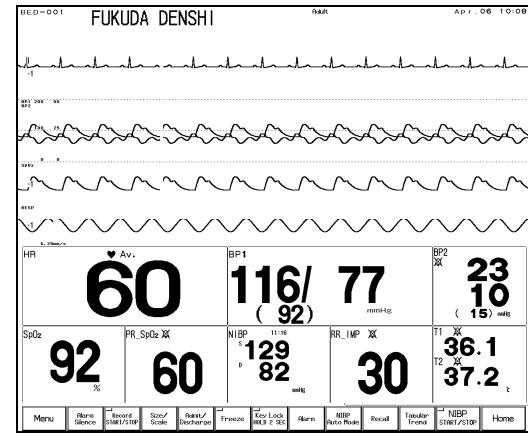
<Standard: Numeric Data Width Normal>



<Standard: Numeric Data Width Wide>



<12-lead>



<Enlarged>

Also, 5 patterns of configured display can be programmed using the display mode setup function. By preprogramming the configuration to each display mode, the display configuration setups at admittance of patient can be simplified by just selecting one of the display modes.



For display mode setup procedure, refer to “8. System Configuration Display Mode To Program the Display Mode”

To Configure the Display

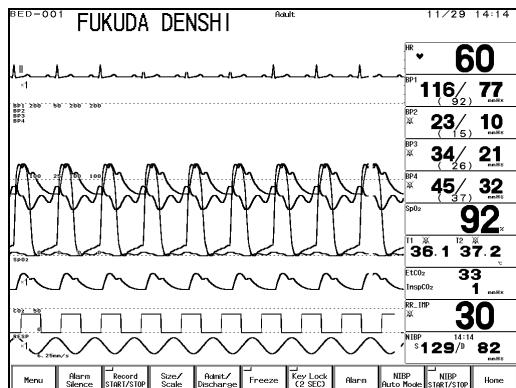
Standard Mode

For the standard mode, maximum of 12 waveforms and 10 numeric data can be displayed for the LC-7315T, and maximum of 17 waveforms and 14 numeric data can be displayed for the LC-7319T. On the waveform display area, graphic trend, ventilator, tabular trend, NIBP list, OCRG can be also displayed. If block cascade is selected, full disclosure waveform can be displayed.

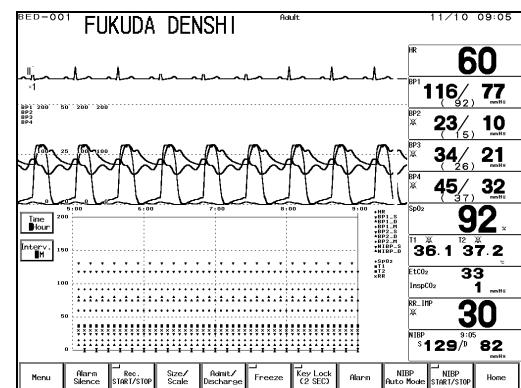
For the LC-7319T, the numeric data width (Normal / Wide) can be also selected.

The waveform display duration is approximately 9 seconds for the LC-7315T and approximately 12.5 seconds for the LC-7319T.

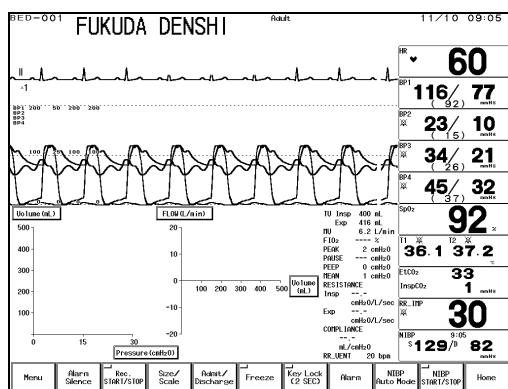
【Display Example of LC-7315T】



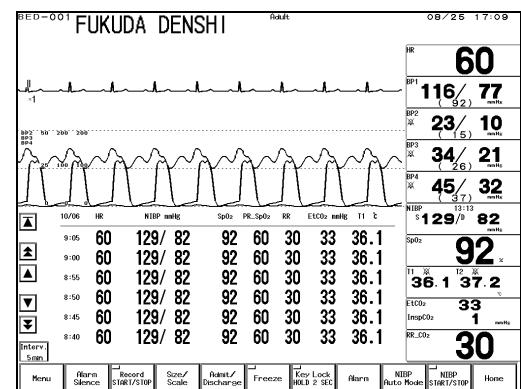
<Standard>



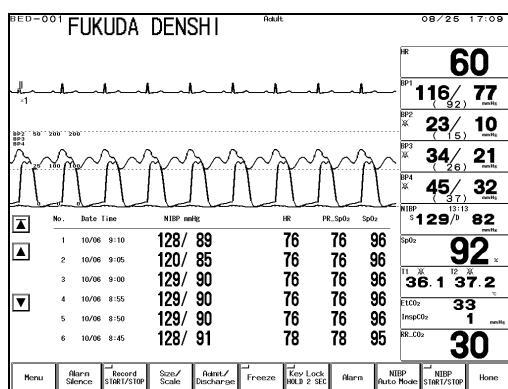
<Standard (Graphic Trend)>



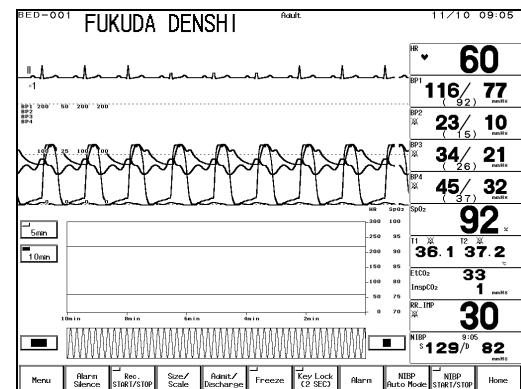
<Standard (Ventilator)>



<Standard (Tabular Trend)>

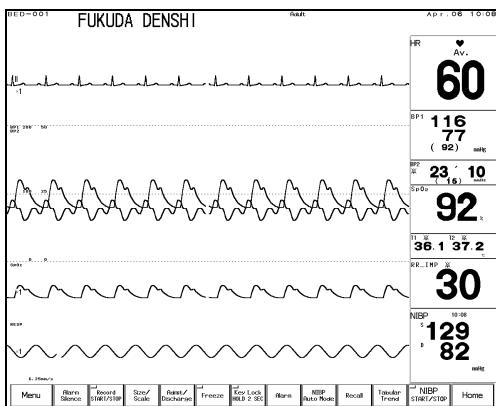


<Standard (NIBP List)>

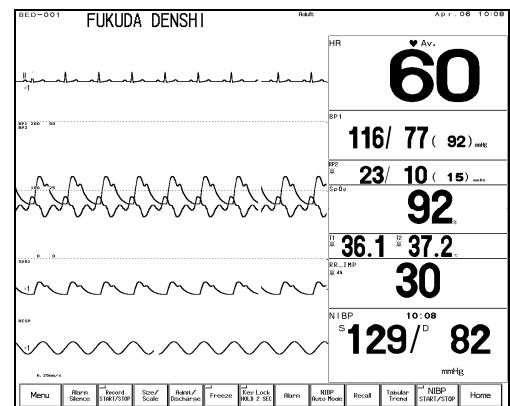


<Standard (OCRG)>

【Display Example of LC-7319T】

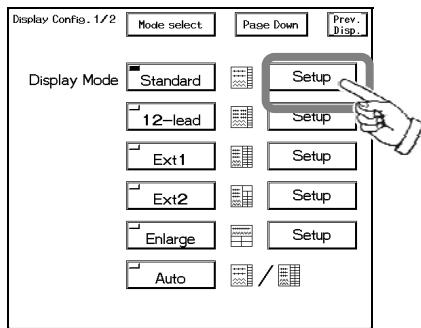


<Standard: Numeric Data Width [Normal]>



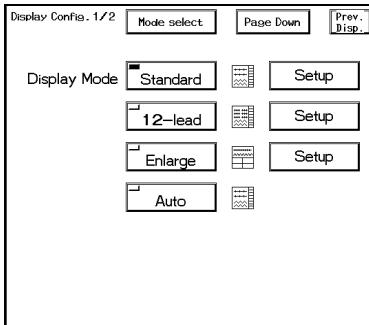
<Standard: Numeric Data Width [Wide]>

- 1 Press the **Menu** → **Display Config.** keys.



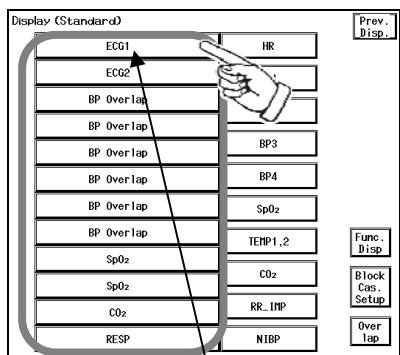
Press the **Setup** key.

<Display Configuration Menu for LC-7315T>



<Display Configuration Menu for LC-7319T>

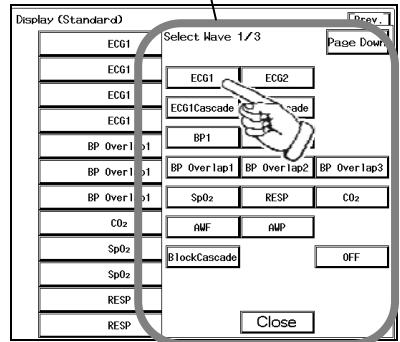
2 Select the waveform to display.



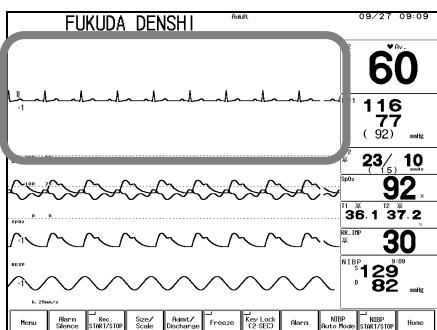
Pressing one of the waveform display location will display the waveform selection window. Select the parameter.

Selecting the parameter on the waveform selection window will sequentially assign the parameter from the top. To change the selection, pressing the waveform display location key will allow reselecting the parameter for that location.

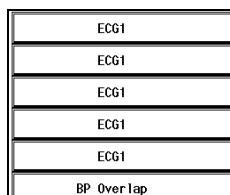
<Waveform Display Location Key>



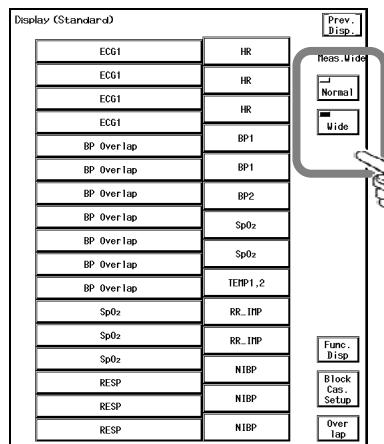
<Waveform Selection Window>



If the same parameter is repeatedly selected, the waveform display area for that parameter will be enlarged.

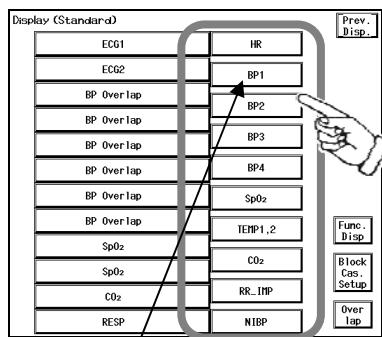


3 If the LC-7319T is used, select **Normal** or **Wide** for the numeric data width.



<Standard Display Setup Menu for the LC-7319T>

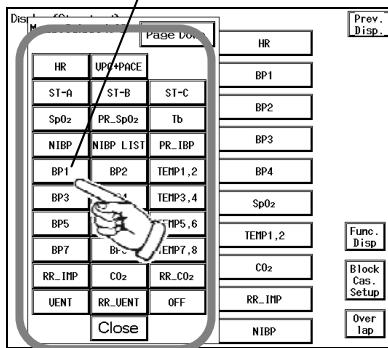
4 Select the numeric data to display.



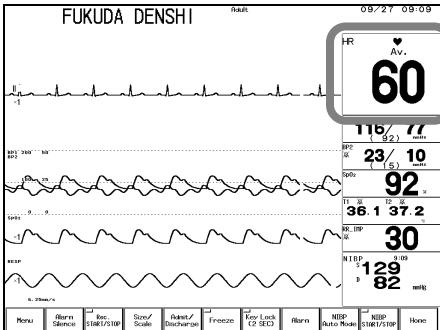
Pressing one of the numeric data display location will display the numeric data selection window. Select the parameter.

Selecting the parameter on the numeric data selection window will sequentially assign the parameter from the top. To change the selection, pressing the numeric data display location key will allow reselecting the parameter for that location.

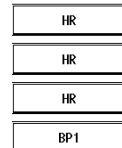
<Numeric Data Display Location Key>



<Numeric Data Selection Window>

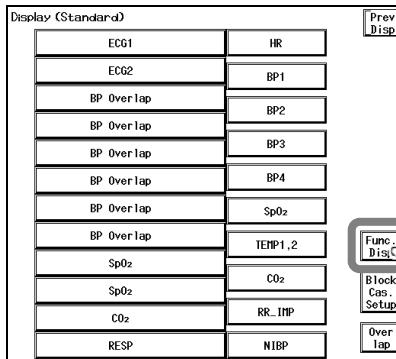


The numeric data display layout can be changed. By repeatedly selecting the same parameter, the numeric data display area for that parameter will be enlarged. The parameter can be repeatedly selected for up to 3 times.

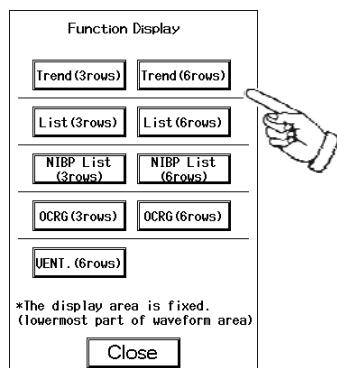


For details of the data which will be displayed by selecting each key, refer to "The Corresponding Key for Each Numeric Data Box" in this chapter.

5 Select the function display.



Press the **Func. Disp.** key and display the function display selection window.



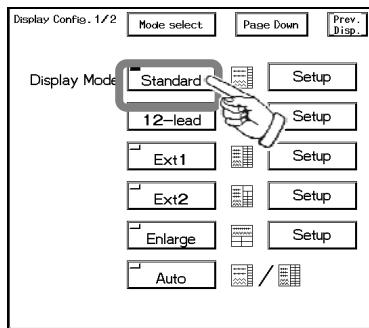
Select the function display from **Trend**, **List**, **NIBP List**,

OCRG, **VENT.**.

3 rows / 6 rows indicates the size to display the graphic trend and OCRG.

<Function Display Tool>

6 Select “Standard” for the display mode.



Press the **Prev. Disp.** key to display the display configuration menu.

Then, press the **Standard** key for the display mode.

CAUTION

If performing telemetry or wired network transmission, configure the display so that the numeric data corresponding to the waveform is displayed.
If not, the displayed waveform or numeric data may not be transmitted.

NOTE

- After configuring the display, press the **Home** key and verify the programmed display configuration.
- To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select **Backup** for “Display Config.” on the “Backup at Discharge” menu (Monitor Setup).
For display mode setup procedure, refer to “8. System Configuration Display Mode”.

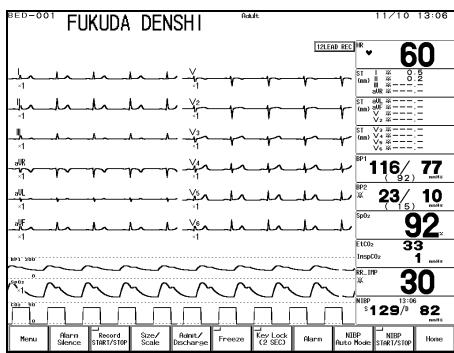
To Configure the Display

12-lead Mode

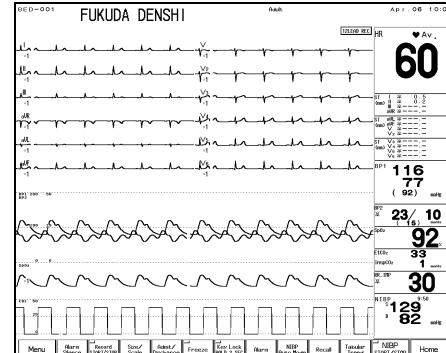
The 12-lead mode displays 12-lead ECG waveforms and other selected waveforms (respiration, SpO₂, etc.). ECG waveforms are displayed in segments at the center of the waveform display area. The number of waveforms and numeric data that can be displayed are as follows.

	For LC-7315T	For LC-7319T
Waveforms (Display Duration)	ECG 12-lead (4.5 sec.) + Other waveforms: max. 3 (approx. 9 sec.) Total: Max. 15 waveforms	ECG 12-lead (6.2 sec.) + Other waveforms: max. 8 (approx. 12.5 sec.) Total: Max. 20 waveforms
Numeric Data	Max. 10 numeric data	Max. 14 numeric data

[Display Example of LC-7315T]

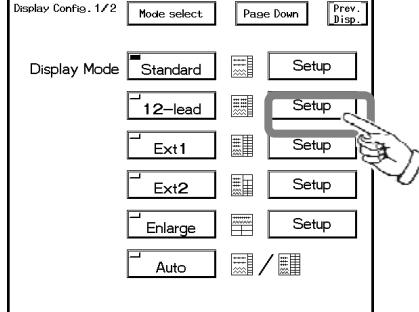


[Display Example of LC-7319T]



- Press the **Menu** → **Display Config.** keys and display the display configuration menu.
Then press the **Setup** key for the 12-lead mode.

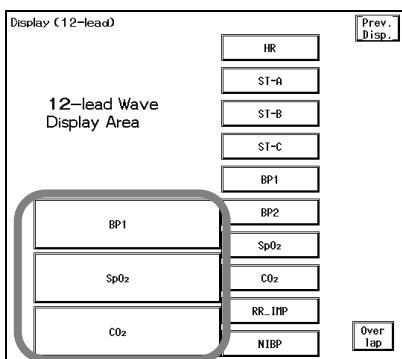
The display configuration menu will be displayed.



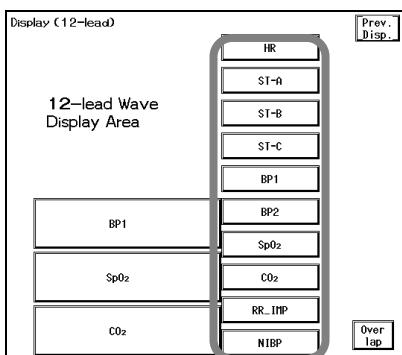
<Display Configuration Menu>

- Select the waveform and numeric data to display.

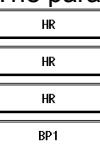
Pressing the waveform display location key will display the waveform parameter selection window. Select the parameter.



<Waveform Display Location Key>



Pressing one of the numeric data display location will display the numeric data selection window. Select the parameter.
The numeric data display layout can be changed. By repeatedly selecting the same parameter, the numeric data display area for that parameter will be enlarged.
The parameter can be repeatedly selected for up to 3 times.

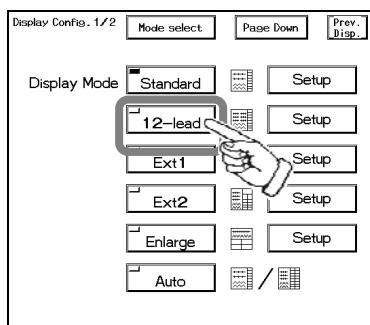


<Numeric Data Display Location Key>



For details of the data which will be displayed by selecting each key, refer to "The Corresponding Key for Each Numeric Data Box" in this chapter.

3 Select 12-lead for the display mode.



Press the **Prev. Disp.** key to display the display configuration menu.
Then, press the **12-lead** key for the display mode.



If performing telemetry or wired network transmission, display the numeric data corresponding to the waveform. If not, the displayed waveform or numeric data may not be transmitted.

NOTE

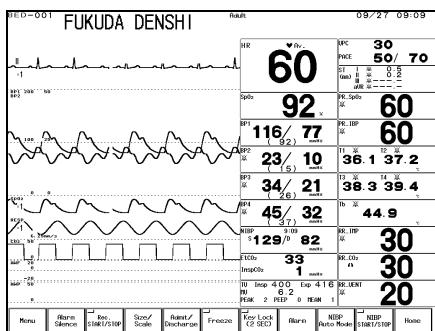
- After configuring the display, press the **Home** key and verify the programmed display configuration.
- To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select **Backup** for "Display Config." on the "Backup at Discharge" menu (Monitor Setup).
For display mode setup procedure, refer to "8. System Configuration Display Mode".



The 12-lead waveform can be recorded on the built-in recorder.
For setup procedure of 12-lead waveform recording format, refer to "4. Monitoring Setup Recording Setup Recorder Setup".

To Configure the Display

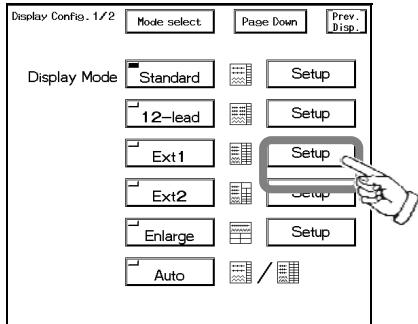
The Extended 1 mode is available only for the LC-7315T. Maximum of 12 waveforms and 20 numeric data can be displayed. The waveform display duration is about 6.5 seconds.



NOTE For the 19-inch Display (LC-7319T), "Extended 1" mode is not available.

- 1 Press the **Menu** → **Display Config.** keys and press the **Setup** key for the Ext1 mode.**

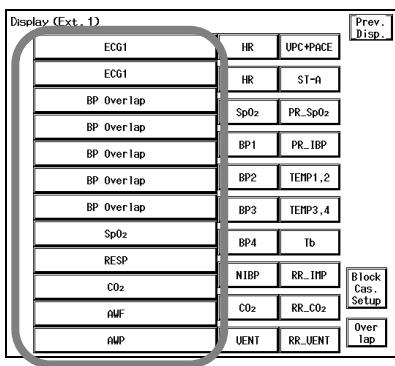
The display configuration menu will be displayed.



<Display Configuration Menu>

- 2 Select the waveform to display.**

Pressing the waveform display location key will display the waveform parameter selection window. Select the parameter.



<Waveform Display Location Key>

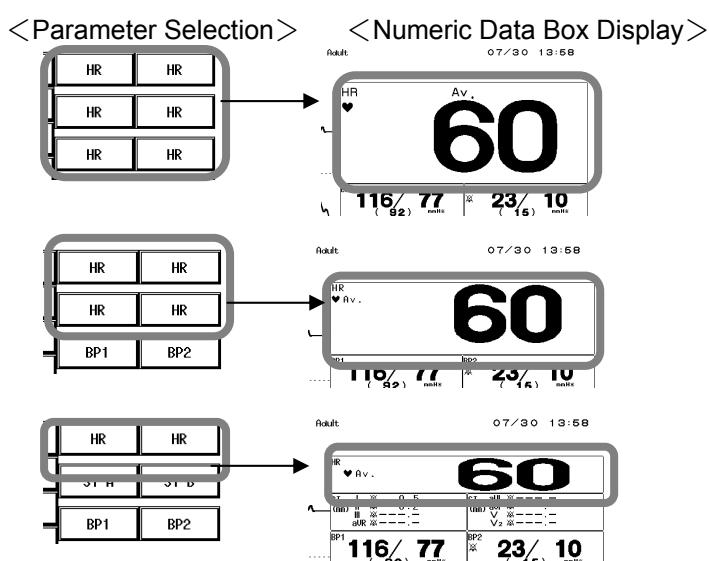
- 3 Select the numeric data to display.**

Display Ext. 1	
ECG1	HR
ECG1	UPC+PACe
BP Overlap	HR
BP Overlap	ST-A
BP Overlap	SpO ₂
BP Overlap	PR_SpO ₂
BP Overlap	BP1
BP Overlap	PR_IBP
BP Overlap	BP2
BP Overlap	TEMP1,2
BP Overlap	BP3
BP Overlap	TEMP3,4
SpO ₂	BP4
RESP	Tb
CO ₂	NIBP
ANF	RR_IMP
AMP	CO ₂
	RR_CO ₂
	UENT
	RR_UENT
Block Setup Over lap	

Pressing one of the numeric data display location will display the numeric data selection window. Select the parameter.

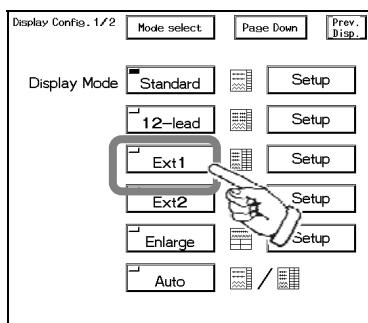
<Numeric Data Display Location Key>

By repeatedly selecting the same parameter, the numeric data display area for that parameter will be enlarged. The same parameter can be repeatedly assigned for up to 3 rows and 2 columns.



For details of the data which will be displayed by selecting each key, refer to "The Corresponding Key for Each Numeric Data Box" in this chapter.

4 Select Extended 1 mode for the display mode.

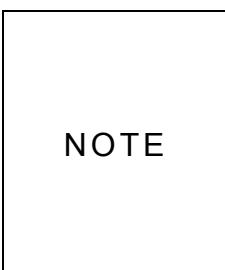


Press the [Prev. Disp.] key to display the display configuration menu.

Then, press the [Ext1] key for the display mode.



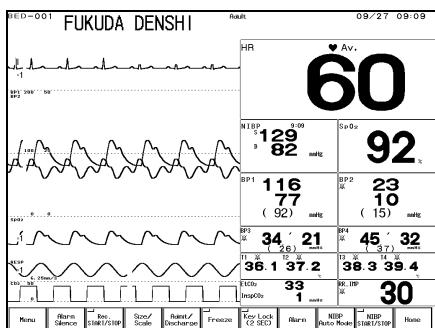
If performing telemetry or wired network transmission, display the numeric data corresponding to the waveform. If not, the displayed waveform or numeric data may not be transmitted.



- After configuring the display, press the [Home] key and verify the programmed display configuration.
- To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select [Backup] for "Display Config." on the "Backup at Discharge" menu (Monitor Setup). For display mode setup procedure, refer to "8. System Configuration Display Mode".

To Configure the Display

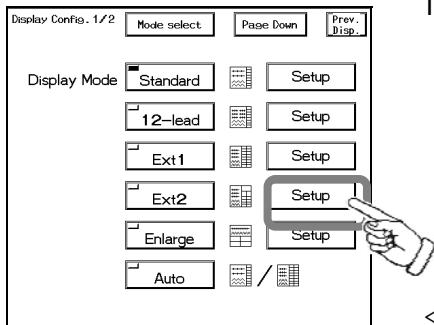
The Extended 2 mode is available only for the LC-7315T. Maximum of 12 waveforms and 11 numeric data can be displayed. The waveform display duration is about 6.5 seconds.



NOTE For the 19-inch Display (LC-7319T), "Extended 2" mode is not available.

- 1 Press the **Menu** → **Display Config.** keys, and press the **Setup** key for the Ext2 mode.

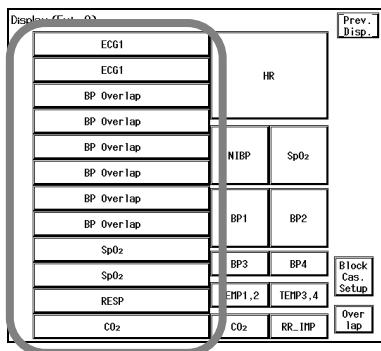
The display configuration menu will be displayed.



<Display Configuration Menu>

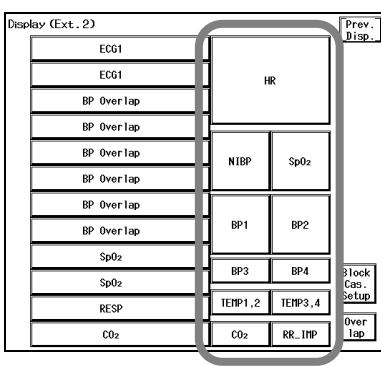
- 2 Select the waveform and numeric data to display.

Pressing the waveform display location key will display the waveform parameter selection window. Select the parameter.



<Waveform Display Location Key>

Pressing one of the numeric data display location key will display the numeric data selection window. Select the parameter.
The numeric data display layout is fixed.

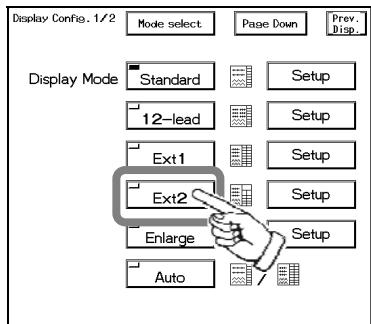


<Numeric Data Display Location Key>



For details of the data which will be displayed by selecting each key, refer to "The Corresponding Key for Each Numeric Data Box" in this chapter.

3 Select Extended 2 mode for the display mode.



Press the [Prev. Disp.] key to display the display configuration menu.

Then, press the [Ext2] key for the display mode.

CAUTION

If performing telemetry or wired network transmission, display the numeric data corresponding to the waveform. If not, the displayed waveform or numeric data may not be transmitted.

NOTE

- After configuring the display, press the [Home] key and verify the programmed display configuration.
- To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select [Backup] for “Display Config.” on the “Backup at Discharge” menu (Monitor Setup).
For display mode setup procedure, refer to “8. System Configuration Display Mode”.

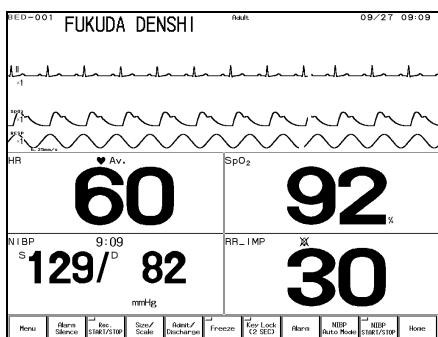
To Configure the Display

Enlarge Mode

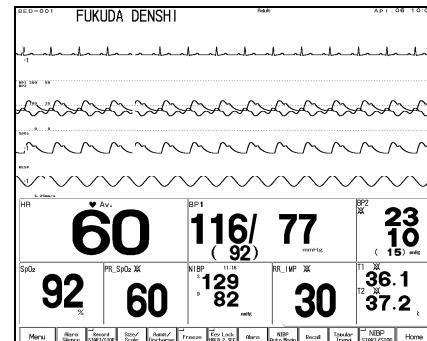
The “Enlarge Mode” displays the numeric data in enlarged format. The number of waveforms and numeric data that can be displayed are as follows.

	For LC-7315T	For LC-7319T
Waveform (Display Duration)	Max. 5 waveforms (approx. 12 sec.)	Max. 10 waveforms (approx. 15.3 sec.)
Numeric Data	Max. 4 numeric data	Max. 8 numeric data

【Display Example of LC-7315T】

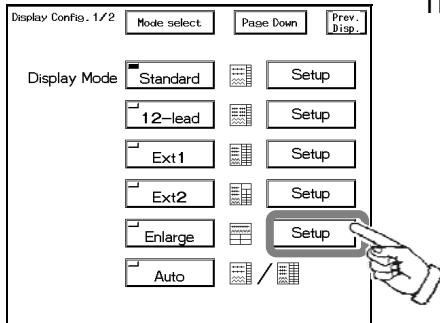


【Display Example of LC-7319T】



- 1 Press the **Menu** → **Display Config.** keys and press the **Setup** key for the Enlarge mode.

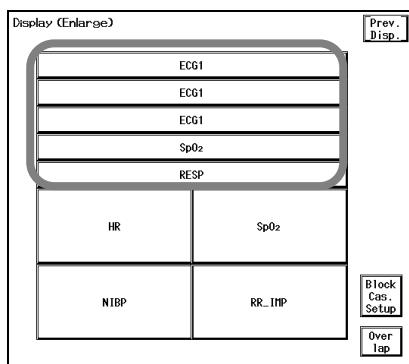
The display configuration menu will be displayed.



<Display Configuration Menu>

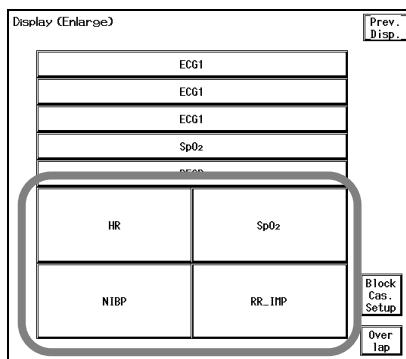
- 2 Select the waveform to display.

Pressing the waveform display location key will display the waveform parameter selection window. Select the parameter.



<Waveform Display Location Key>

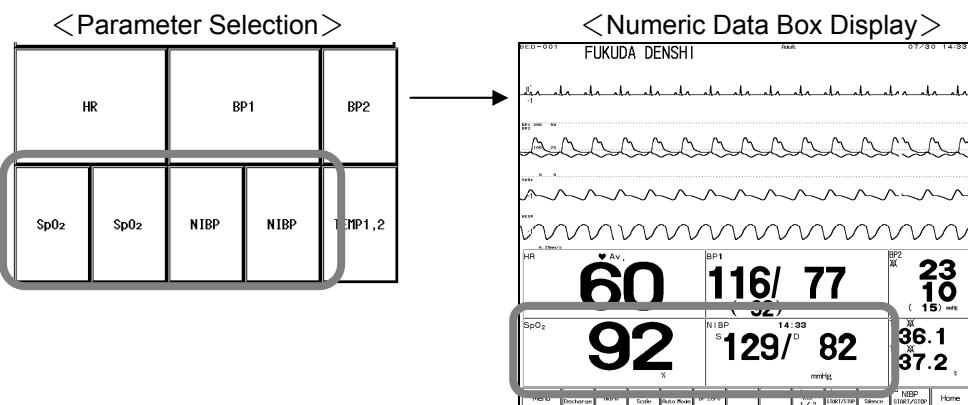
3 Select the numeric data to display.



Pressing one of the numeric data display location will display the numeric data selection window. Select the parameter.

<Numeric Data Display Location Key>

On the LC-7319T, selecting the same parameter twice for the lower row will widen the numeric data display area.



For details of the data which will be displayed by selecting each key, refer to "The Corresponding Key for Each Numeric Data Box" in this chapter.

CAUTION	If performing telemetry or wired network transmission, display the numeric data corresponded to the waveform. If not, the displayed waveform or numeric data may not be transmitted.
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NOTE	<ul style="list-style-type: none">After configuring the display, press the Home key and verify the programmed display configuration.To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select Backup for "Display Config." on the "Backup at Discharge" menu (Monitor Setup). For display mode setup procedure, refer to "8. System Configuration Display Mode".
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To Configure the Display

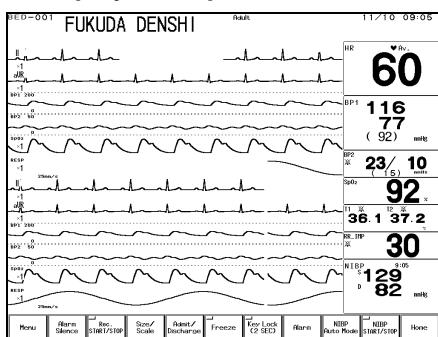
Block Cascade

For the standard, extended 1, extended 2, and enlarge mode, block cascade waveform can be displayed.

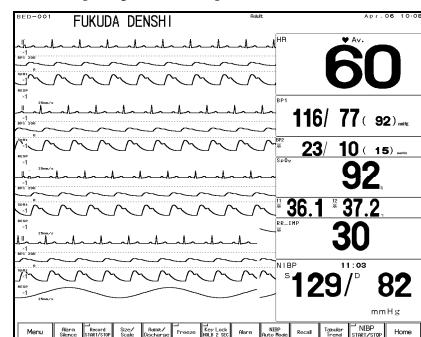
For the LC-7315T, when the display configuration is standard mode with 2 waveforms block cascade, the waveform display duration is about 54 seconds (6 blocks x 9 sec.). When the display configuration is extended mode with 2 waveforms block cascade, the waveform display duration is about 39 seconds (6 blocks x 6.5 sec.).

For the LC-7319T, when [Normal] is selected for the numeric data width and the display configuration is standard mode with 2 waveforms block cascade, the waveform display duration is about 75 seconds (6 blocks x 12.5 sec.).

[Display Example of LC-7315T]

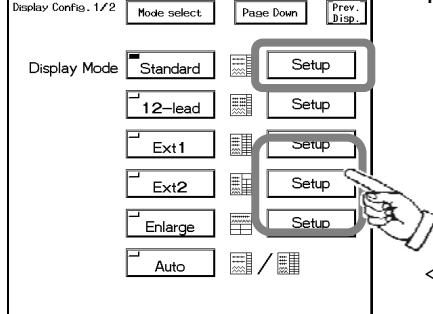


[Display Example of LC-7319T]



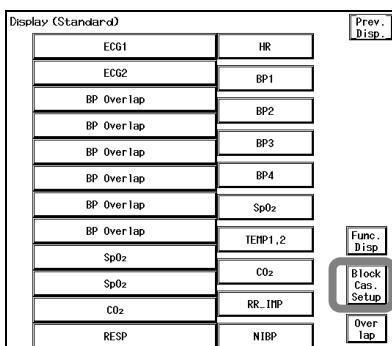
- 1 Press the **Menu** → **Display Config.** keys and press the **Setup** key for the display mode to set the block cascade.

The display configuration menu will be displayed.

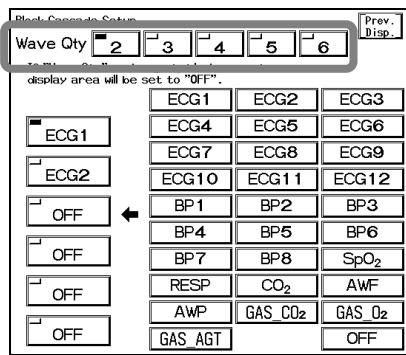


<Display Configuration Menu>

- 2 Set the block cascade.

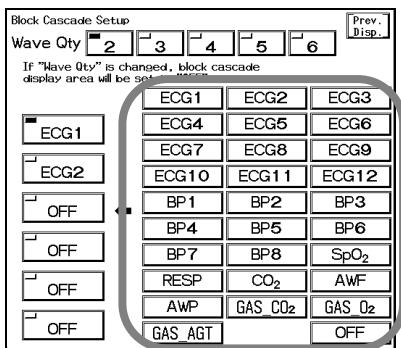


Pressing the **Block Cas. Setup** key will display the block cascade setup menu. Select the waveform quantity and parameter for the block cascade display.

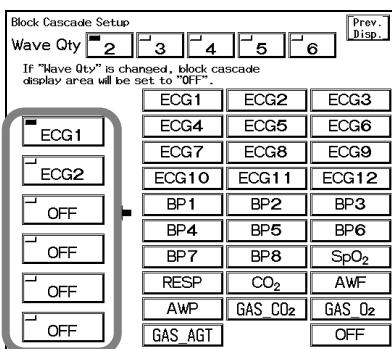


Select the waveform quantity for the block cascade from [2], [3], [4], [5], [6].

<Block Cascade Setup Menu>



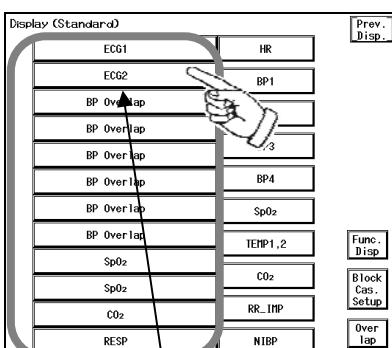
Select the parameter for the block cascade display.



To change the selection, press the waveform display location key, and then the parameter selection key.

After the selection, press the [Prev. Disp.] key.

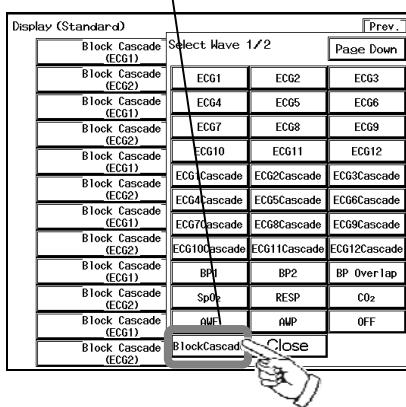
3 Select block cascade for the displaying waveform.



Pressing the waveform location key will display the waveform parameter selection window. Select [Block Cascade].

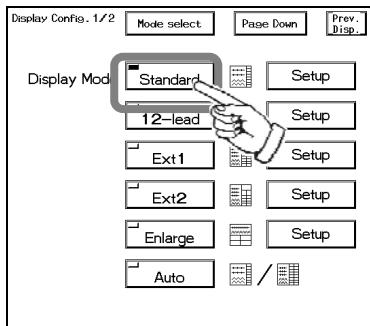
Pressing the block cascade key will set the block cascade for the set quantity.

<Waveform Display Location Key>



<Waveform Parameter Selection Window>

4 Select the display mode which the block cascade was set.



Press the **Prev. Disp.** key to access the display configuration menu.

Then, select the display mode which the block cascade was set.

CAUTION

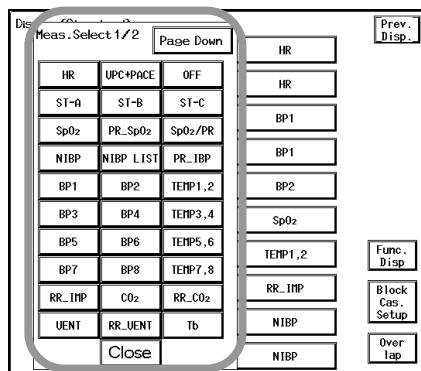
If performing telemetry or wired network transmission, display the numeric data corresponding to the waveform. If not, the displayed waveform or numeric data may not be transmitted.

NOTE

- After configuring the display, press the **Home** key and verify the programmed display configuration.
- The block cascade setup is common for all display modes.

The Corresponding Key for Each Numeric Data Box

The numeric data to be displayed can be selected on the measurement selection tool on the display configuration setup menu. Refer following for the corresponding key for each numeric data box.



<Display Configuration Setup Menu
Measurement Selection Tool (1st Page)>



For details of the displayed data for each numeric data box, refer to "Display Configuration Description of the Display ●Numeric Data Box Display (for each parameter)".

[Measurement Selection Tool / 1st Page]

Meas. Select 1/2			Page Down
HR	UPC+PACE	OFF	
ST-A	ST-B	ST-C	
SpO ₂	PR_SpO ₂	SpO ₂ /PR	
NIBP	NIBP LIST	PR_IBP	
BP1	BP2	TEMP1,2	
BP3	BP4	TEMP3,4	
BP5	BP6	TEMP5,6	
BP7	BP8	TEMP7,8	
RR_IMP	CO ₂	RR_CO ₂	
UENT	RR_UENT	T _b	
Close			

HR	Heart Rate	HR 60	
UPC+PACE	VPC, Pace Beat	UPC 30	
ST-A	ST-B	ST-C	
ST-A	ST-B	ST-C	ST Level
SpO ₂	SpO ₂ Value	SpO ₂ 92 %	
PR_SpO ₂	Pulse Rate (SpO ₂)	PR_SpO ₂ 60	
SpO ₂ +PR	SpO ₂ Value and Pulse Rate	SpO ₂ 92 PR 60	
NIBP	NIBP Value	NIBP 14:17 \$129/D 82 mmHg	
NIBP LIST	NIBP List	14:15 128/ 14:10 120/ 14:05 129/ 14:00 129/ 89 85 90 90	
PR_IBP	Pulse Rate (BP)	PR_IBP 60	
BP1	to BP8	BP1 116/ (92) 77 mmHg	
TEMP1,2	to TEMP7,8	T ₁ T ₂ 36.1 37.2 °C	
RR_IMP	Respiration Rate (Impedance)	RR_IMP 30	
CO ₂	EtCO ₂ Value / InspCO ₂ Value	EtCO ₂ 33 InspCO ₂ 1 mmHg	
RR_CO ₂	Respiration Rate (CO ₂)	RR_CO ₂ 30	
UENT	Ventilator Data	TU Insp 400 Exp 416 MU 6.2 PEAK 2 PEEP 0 MEAN 1	
RR_UENT	Respiration Rate (Ventilator)	RR_UENT 20	
T _b	Blood Temperature (When CO is measured)	T _b 44.9 °C	

[Measurement Selection Tool / 2nd Page]

Meas. Select 2/2	Page Up	
GAS (CO₂+AGENT+O₂+N₂O)		
GAS (AGENT+O₂+N₂O)		
GAS_CO ₂	GAS_O ₂	GAS_N ₂ O
GAS_AGENT	RR_GAS	Cursor Ref.
SvO ₂ +CO	STOP WATCH	Cursor
BIS		
HEMO (SU+SUR+RUW+RUSW)		
HEMO-I (SUI+SURI+RUWI+RUSWI)		
Close		

GAS (CO₂+AGENT+O₂+N₂O)

Multigas Data (CO₂, AGT, O₂, N₂O)
If the numeric data box is 2-row or 3-row size and when 2 types of anesthetic gases are detected, the data for second anesthetic gas (AGT2) will be also displayed. It will not be displayed if not detected.
MAC value will be displayed if set to ON.

GAS (AGENT+O₂+N₂O)

Multigas Data (AGT, O₂, N₂O)
If 2 types of anesthetic gases are detected, the data for second anesthetic gas (AGT2) will be also displayed. It will not be displayed if not detected.

MAC value will be displayed if set to ON.

GAS_CO₂ CO₂ Concentration
(Gas Module)

GAS_O₂ O₂ Concentration
(Gas Module)

GAS_N₂O N₂O Concentration
(Gas Module)

GAS_AGENT Agent Concentration
(Gas Module)

If 2 types of anesthetic gases are detected, the data for second anesthetic gas (AGT2) will be also displayed. It will not be displayed if not detected.

MAC value will be displayed if set to ON.

RR_GAS Respiration Rate (Gas Module)

Cursor Ref. Reference Cursor

SvO₂+CO Oximeter Data

*Displayed data will differ depending on the used oximeter.

STOP WATCH Stop Watch

Cursor Measurement Cursor

BIS BIS Value

HEMO (SU+SUR+RUW+RUSW)

HEMO-I (SUI+SURI+RUWI+RUSWI)

Hemodynamic (Based on Vigilance data)

CO ₂	I	1	E	38 mmHg
AGT		3.5		1.2%
O ₂		21		16%
N ₂ O		30		0% 3.8

CO ₂	I	1	E	38 mmHg
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

AGT	I	3.5	E	1.2%
O ₂		21		16%
N ₂ O		30		0%

ISO	I	3.5	E	1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

GAS_CO ₂	I	1	E	38 mmHg
GAS_O ₂	I	21	E	16%
GAS_N ₂ O	I	30	E	0%
GAS_AGENT	I	3.5	E	1.2%

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

RR_GAS	I	20	E	
Cursor (Ref.: BP1)		0		
SvO ₂		83%		
CO AUG		5.3	L/min	

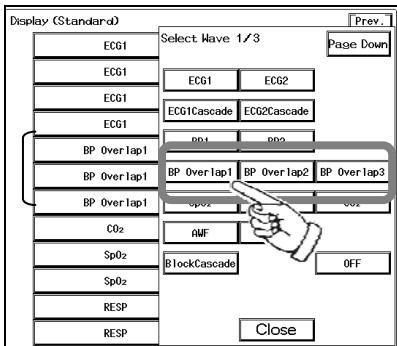
GAS	I	3.5	E	1.2%
ISO		3.5		1.2%
HAL		2.3		1.1%
O ₂		21		16% MAC
N ₂ O		30		0% 3.8

BP Waveform Overlap Display

By assigning “BP Overlap” to waveform display area, BP waveforms can be displayed overlapped to that area. 3 combinations can be set for the BP overlap waveforms.

1 Assign “BP Overlap” to the waveform display area.

3 waveforms
can be
displayed for
this case.



[BP Overlap1], [BP Overlap2], or [BP Overlap3] can be assigned.

If [BP Overlap1] is assigned, the waveforms set for BP Overlap1 will be displayed.

Similarly, if [BP Overlap2] or [BP Overlap3] is assigned, the waveforms set for BP Overlap2, BP Overlap3 will be displayed respectively.

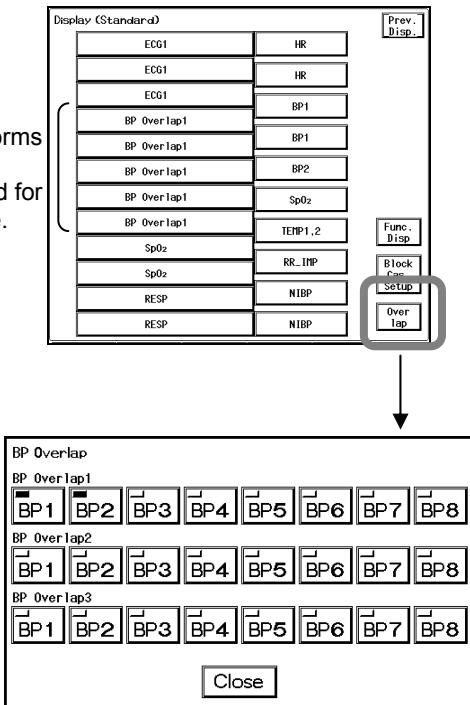
<Waveform Parameter Selection Tool>

The number of waveforms that can be displayed depends on the assigned numbers of “BP Overlap” to the display area.

For the display above, 3 waveforms for BP Overlap1 can be displayed as it is assigned to 3 waveform display areas.

2 Select the parameters for BP Overlap1, BP Overlap2, and BP Overlap3.

5 waveforms
can be
displayed for
this case.



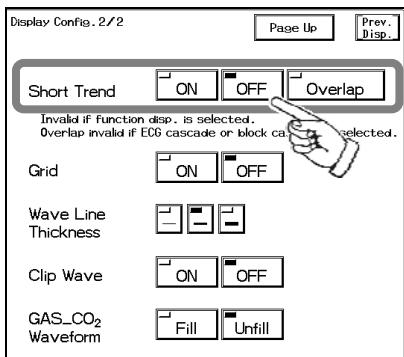
Press the [Overlap] key to display the BP overlap waveform parameter selection tool.

Select the parameters for each group
(BP Overlap1/BP Overlap2/BP Overlap 3).

Short Trend Display

The short trend can be displayed on the home display.

- 1 Press the **Menu** → **Display Config.** → **Page Down** keys.



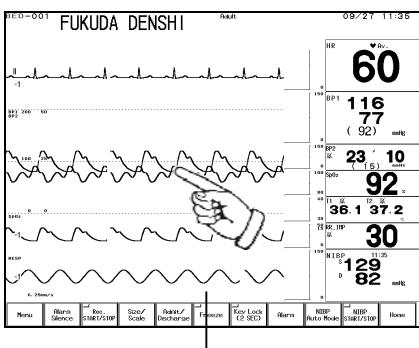
The display configuration menu will be displayed.

Short Trend Selection

- ON** will display the short trend on the home display.
- OFF** will not display the short trend on the home display.
- Overlap** will display the waveform and short trend overlapped.

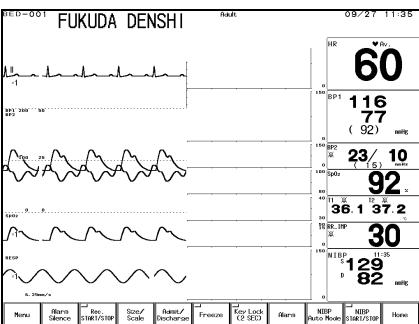
<Display Configuration Menu>

- 2 Select the display duration for the short trend.



The short trend can be displayed in 5 minutes increments from 0 minute to 30 minutes.

Pressing the waveform display area will change the short trend display duration according to the pressed location.

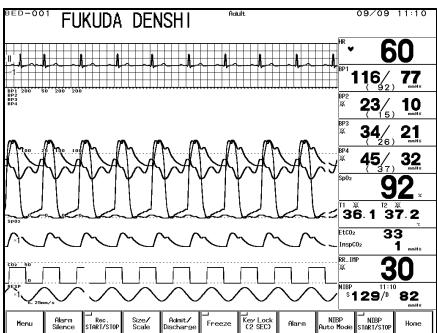


NOTE

The short trend can be displayed only for the standard display mode. However, if graphic trend, ventilator, OCRG, tabular trend, or NIBP list is displayed, short trend cannot be displayed.

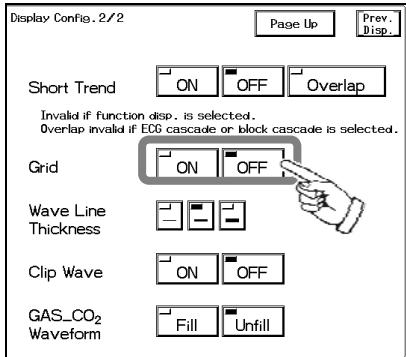
Waveform Grid Display

The ECG waveform can be displayed on the grid.



- 1 Press the **Menu** → **Display Config.** → **Page Down** keys.

The display configuration menu will be displayed.



Grid Selection

ON will display the grids on the home display.
OFF will not display the grids on the home display.

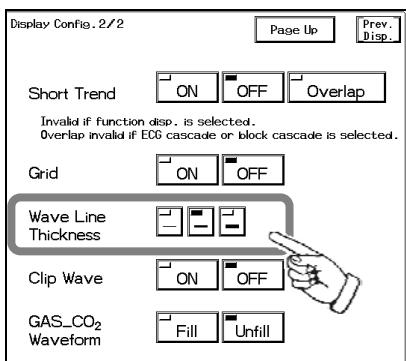
<Display Configuration Menu>

Wave Line Thickness

The thickness of the displayed waveforms can be selected from 3 levels.

- 1 Press the **Menu** → **Display Config.** → **Page Down** keys.

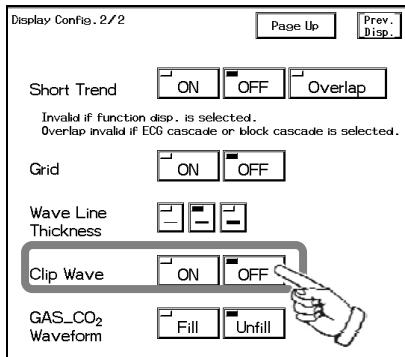
Select the wave line thickness from 3 levels.



Waveform Clipping

If the waveform amplitude exceeds the waveform display area, whether or not to clip the exceeded part can be selected.

- 1 Press the **Menu** → **Display Config.** → **Page Down** keys.



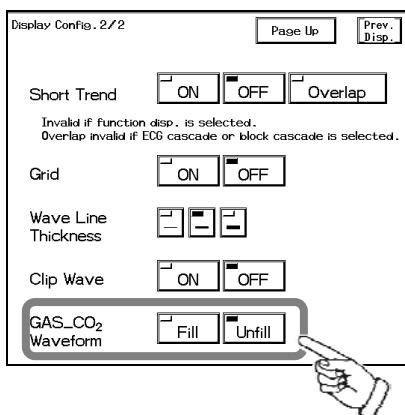
ON will display the exceeded part of the waveform in straight line.

OFF will display the whole part of waveform even if it exceeds the display area. However, the exceeded part may not be displayed depending on the sweep speed of the waveform displayed above or below the gas waveform.

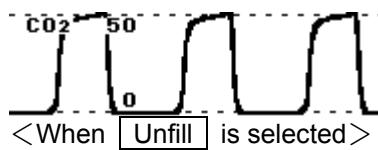
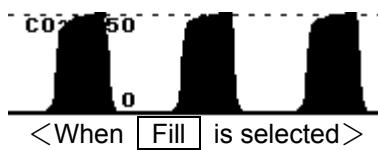
GAS CO₂ Waveform Fill/Unfill Setup

Whether or not to fill inside the CO₂ waveform can be selected.

- 1 Press the **Menu** → **Display Config.** → **Page Down** keys.



Fill will fill inside the CO₂ waveform.



To Configure the Display

Auto Mode and Display Optimization

The home display layout can be automatically configured by setting the display mode to **Auto**, or pressing the **Optimize Display** key preprogrammed as user key.

For the LC-7315T, the display will be automatically configured to either "Standard" mode or "Extended 1" mode depending on the quantity of the measured parameters. For the LC-7319T, the display will be automatically configured to "Standard" (Numeric Data Width: **Wide**) mode.

NOTE

- The parameter that is not measured will not be displayed.
- The low priority parameter may not be displayed.
In such case, the Device Configuration Icon  will not be displayed.
- Some parameters (ST, etc.) are not included in the optimization setup selection.
To display these parameters on the home display, set the display configuration manually.

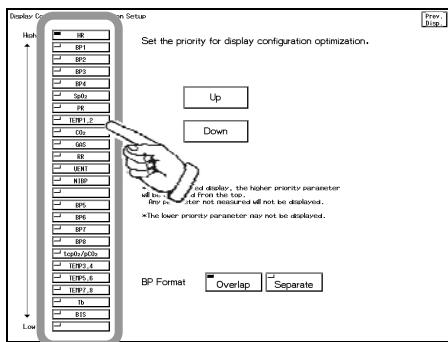
● Set the Display Priority

Set the display priority of the parameters for optimized display configuration.

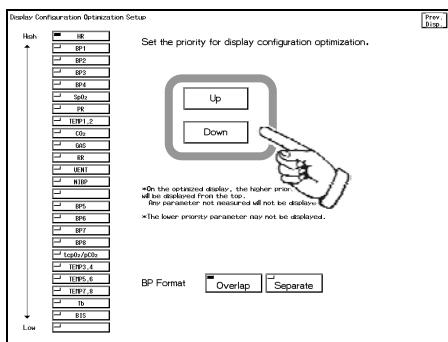
1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **Display Optim. Setup** keys.

The display configuration optimization setup menu will be displayed.

2 Set the order of priority for displaying the parameters.



Select the parameter to change the order of priority.



Use the **Up** or **Down** keys to change the order of priority for that parameter.

3 Select whether to overlap or separate the BP waveform display.

BP Format **Overlap** **Separate**

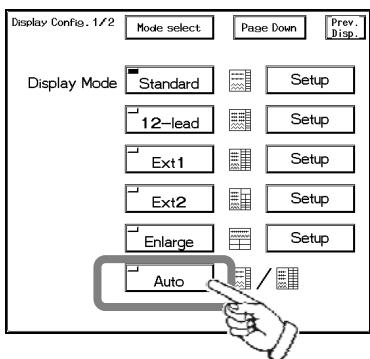
NOTE PR includes PR_SpO₂ and PR_IBP.

●Optimize the Display

Select **Auto** for the display mode, or press the **Optimize Display** key preprogrammed as user key.

For the LC-7315T, the display will be automatically configured to either "Standard" mode or "Extended 1" mode depending on the quantity of the measured parameters. For the LC-7319T, the display will be automatically configured to "Standard" (Numeric Data Width: **Wide**) mode.

- 1 To optimize the display using the auto mode function, press the **Menu** → **Display Config.** keys and display the display configuration menu.**



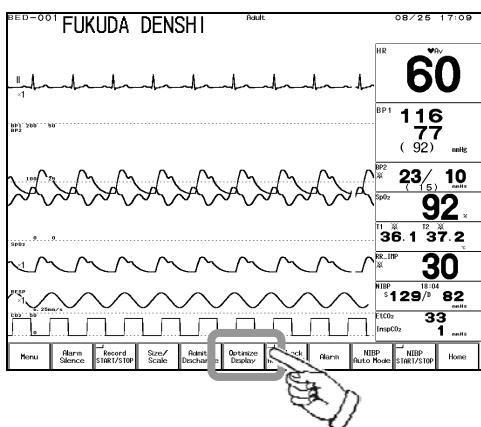
Select **Auto** for the display mode, and return to the home display.

The home display will be automatically configured by arranging the currently measured parameters according to the display priority set on the display optimization setup menu.

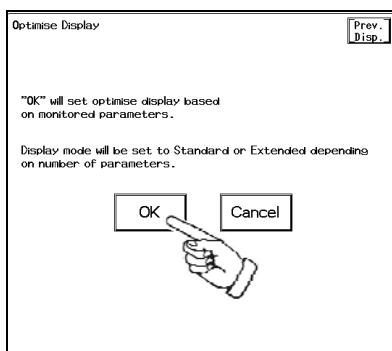
Each time the probe or sensor is plugged/unplugged, the home display will be reconfigured.

<Display Configuration Menu>

- 2 Another way to optimize the display is to press the **Optimize Display** key preprogrammed as user key.**



- 3 The confirmation message will be displayed. Pressing the **OK** key will optimize the display.**



For the LC-7315T, the display mode will be either "Standard" mode or "Ext. 1" mode depending on the number of parameters.

For the LC-7319T, the display mode will be "Standard" mode.

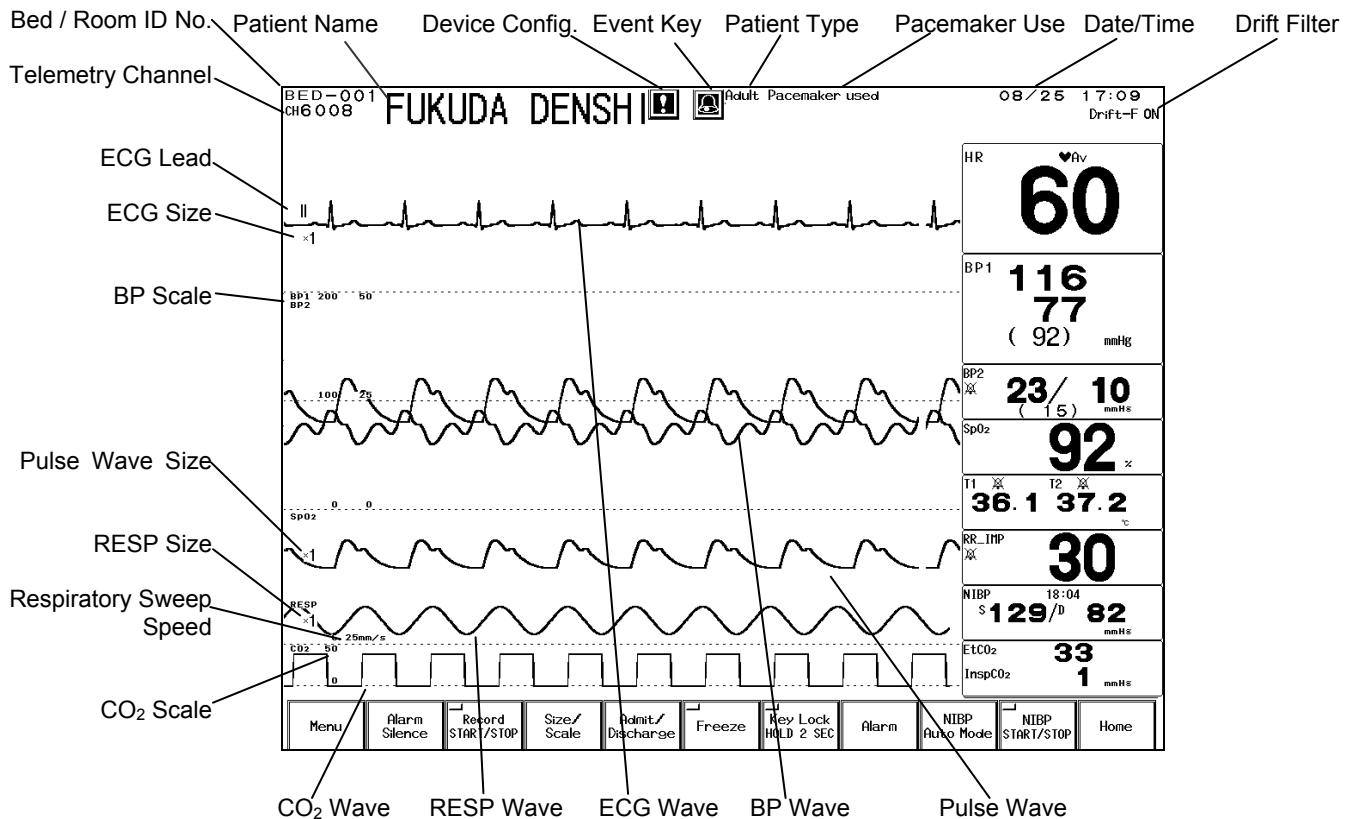
NOTE

- The optimized display configuration will be overwritten to the current display configuration (Standard / Ext. 1).
- To maintain the configured display even after the power is turned OFF or after the discharge procedure, store the configuration to one of the display modes, or select **Backup** for "Display Config." on the "Backup at Discharge" menu (Monitor Setup). For display mode setup procedure, refer to "8. System Configuration Display Mode".

Description of the Display

This section explains the displayed item on the home display.

●Waveform Display Area



Bed / Room ID No.

Displays the 4-digit Bed ID and 3-digit (000–999) Room ID.

Telemetry Channel (When HLX-561 is connected)

Displays the telemetry channel ID.

Date / Time

Displays the current date (month, day) and time (hour, minute).

Patient Name / Patient Type

Displays the patient name and patient type (adult / child / neonate) selected on the admit menu.

Pacemaker Use

When “Used” is selected for “Pacemaker” on the admit menu, “Pacemaker used” will be displayed.

Drift Filter

When drift filter is set to ON, “Drift-F ON” will be displayed.

Depending on the setup, enlarged clock can be displayed instead of drift filter message.



For procedure to select the drift filter or enlarged clock display, refer to “8. System Configuration Monitor Setup”

Respiratory Sweep Speed

Displays the sweep speed for the impedance respiration waveform, CO₂ waveform, AWP, AWF waveform.

Event Key

This touch key will be displayed at alarm occurrence. Even when the alarm is resolved, this key will remain to be displayed until it is pressed. Pressing this key will silence the alarm and display the recall display. The event key display can be selected ON or OFF.



For ON/OFF of Event Key, refer to "8. System Configuration Monitor Setup".

Device Configuration Icon

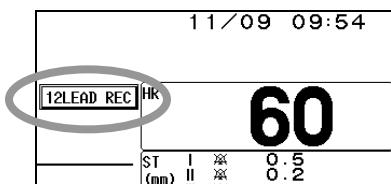
This icon will be displayed when the setup is not corresponded to the probe actually connected to the Super Module or to the module actually inserted to the Input Box. Pressing this icon will display the check connection screen. The icon will automatically disappear when the error is resolved.



For ON/OFF of Device Configuration Icon display, refer "8. System Configuration Monitor Setup"

For Device Configuration Icon, refer to "9. Installation Device Configuration Icon"

12LEAD REC key

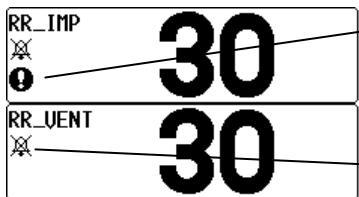


This key will be displayed when the display mode is "12-lead". Pressing the key will record the 12-lead waveform on the built-in recorder.



For setup procedure of 12-lead waveform recording format, refer to "4. Monitoring Setup Recording Setup Recorder Setup"

● Numeric Data Box Display (for all parameters)



Message Icon

When the parameter box size is too small to display the message inside, a message icon will be displayed instead to indicate that message is present.

Alarm OFF Mark

Displayed when the alarm is set OFF.

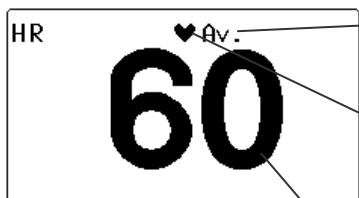


For procedure to select ON/OFF of message icon display, refer to "8. System Configuration Monitor Setup".

●Numeric Data Box Display (for each parameter)



For the corresponding numeric data selection key (display configuration setup menu) for each of the following numeric data box, refer to "Corresponding Key for Each Numeric Data Box" in this chapter.



HR Average (Instant / Average)

Displays the averaging method of HR. ("HR Average" on ECG configuration menu)

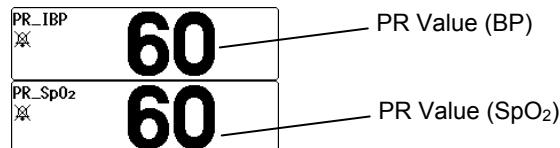
HR / PR Synchronization Mark

Synchronizing to the set HR/PR alarm source, a mark will be displayed. If **[SpO₂]** is selected for "Pulse Tone" (ECG config.), the mark will be displayed inside the PR_SpO₂ numeric data box regardless of the HR/PR alarm source setup.

HR / PR Parameter

Displays HR / PR value.

When the value exceeds the measurable range, "xxx" will be displayed.

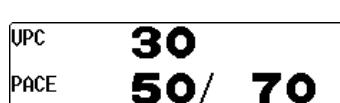


SpO₂ Value

Displays the arterial oxygen saturation measurement value.

SEC Alarm Indicator (HS-710, 710E, 720, 720E, 720C, 702C, 702E)

Displayed when the SEC alarm is set.



VPC Value (1 minute)

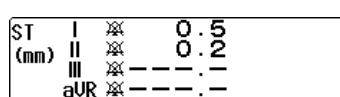
Displays the VPC rate for the last 1 minute.

"- - -" will be displayed during arrhythmia learning.

Pace Beats (1 minute) / Total Beats (1 minute)

Pace beats and total beats for the last 1 minute will be displayed.

"- - -" will be displayed during arrhythmia learning.



ST Level

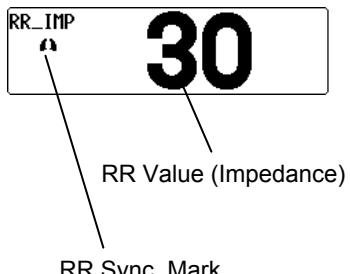
ST levels will be displayed. "- - -" will be displayed for the following case.

- during arrhythmia learning.
- during lead-off condition.
- when "N" or "S" is not detected for QRS within 30 seconds.
- when reference waveform is not set for ST measurement.

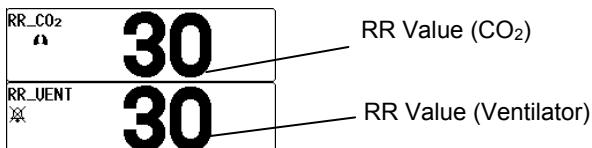


The leads displayed inside the ST level box can be changed.

For procedure, refer to "●Set the Leads for ST Data Box" of this section.

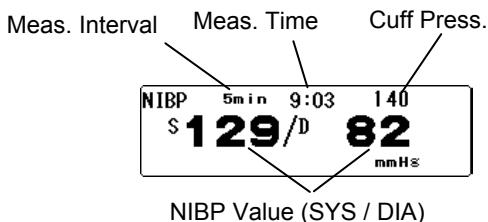
**RR Value**

Displays the impedance RR / CO₂ RR measurement value corresponded to the respiration synchronization source. When the measurable range is exceeded, "xxx" will be displayed. When the ECG relay cable for electrosurgical knife is used, or when impedance measurement is set to OFF, impedance RR will not be displayed.

**RR Synchronization Mark**

Synchronizing to the set RR/APNEA alarm source, a mark will be displayed inside the parameter box.

NOTE	The RR synchronization mark will not be displayed when ventilator is the RR/APNEA alarm source, and when the measurement is performed by PURITAN-BENNETT ventilator.
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**NIBP Measurement Interval**

The NIBP measurement interval will be displayed. If the automatic mode is set to OFF, it will be left blank.

If Backup (Resume auto mode by manual measurement) is selected for "NIBP Auto Mode" on the "Backup at Discharge" menu (Monitor Setup), the NIBP measurement will be in standby condition when the patient is discharged. (if periodic measurement is ON) In this case, periodic measurement will resume when the measurement is performed manually, or when the measurement interval is changed.

NIBP Measurement Time

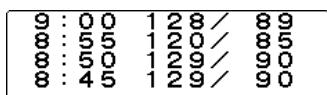
Displays the start time of NIBP measurement.

NIBP Cuff Pressure

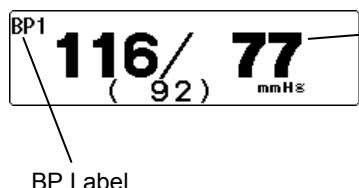
Displays the cuff pressure during NIBP measurement.

NIBP Value

Displays the NIBP measurement value (SYS / DIA / Mean). The mean NIBP display can be set to ON or OFF on the NIBP configuration menu. The value will be displayed as "— —" when the preprogrammed NIBP erase time has elapsed.

**NIBP List**

The latest 4/8/12 data of NIBP list will be displayed. The number of displaying data depends on the size of parameter box.

**BP Value**

SYS/DIA/Mean BP value will be displayed. On the BP configuration menu, ON/OFF of mean BP display can be selected. If the measurable range is exceeded, "xxx" will be displayed. If transducer is not connected or BP zero balance is not performed, "— —" will be displayed.

BP Label

The BP label setup for the blood pressure will be displayed.

PAP	34	21	mmHg
PCWP	23	11:11	
IAP	45	32	mmHg
PDP	(37)	35	mmHg
ICP	48		
CPP	44		mmHg

PCWP Value, PCWP Measured Time

When the BP label is PAP, PCWP (Pulmonary Capillary Wedge Pressure) and measured time can be displayed.

PDP Value

When the BP label is IAP, PDP (Peak Diastolic Pressure) of IABP can be displayed.

Systolic Pressure (SYS) = Peak Systolic Pressure (PSP).

CPP Value

When the BP label is ICP, and artery pressure is labeled as ART, CPP (Cerebral Perfusion Pressure) can be measured. CPP = Mean Value of Arterial Pressure – Mean Value of Intracranial Pressure If the CPP value is less than 0, ICP or ART is not measured, or zero balance has not been performed for ICP or ART, the value will be displayed as “---”. Also, alarm cannot be set for CPP.

BP1	MEAN_WAVE
116	77
(92)	mmHg

MEAN_WAVE

Displayed when mean waveform is set ON (BP configuration menu.).

T1	T2
36.1	37.2
°C	

TEMP Label

The label set for the temperature will be displayed.

TEMP Value

Displays the temperature measurement value. The YSI-400 temperature sensor can be used. When the measurable range is exceeded, “xxx” will be displayed. When the YSI-700 is used, “---” will be displayed for the measurement value.

Tb	44.9
°C	

Blood Temperature

By using the thermodilution catheter for the CO measurement, blood temperature can be displayed. When the measurable range is exceeded, “xxx” will be displayed.

EtCO ₂	33
InspCO ₂	1
	mmHg

EtCO₂ Value / InspCO₂ Value

Displays the end-tidal CO₂ concentration and inspiratory CO₂ concentration measurement value.

The measurement unit can be selected from mmHg / kPa / % on the CO₂ configuration menu.

TU	Insp	400	Exp	416
MU		6.2		
PEAK	2	PEEP	0	MEAN 1
SvO ₂	83	%		
CO AUG	5.3	L/min		
CI AUG	2.8	L/min/m ²		

Ventilator Measurement

When a ventilator is connected, the ventilator measurement data will be displayed.

Oximeter Data

When oximeter (Vigilance / Vigilance CEDV / Vigilance II / Vigileo / OXIMETRIX3 / Q-vue / Q2 Computer) is connected, the oximeter data (SvO₂, CO, etc.) will be displayed.

The displayed data will differ depending on the used oximeter.

Oximeter	Displayed Data				
Vigilance (CCO mode / STAT OFF / Index OFF)	SvO ₂ (ScvO ₂)	CCO	EDV	BT	—
Vigilance (CCO mode / STAT ON / Index OFF)	SvO ₂ (ScvO ₂)	CCO STAT	EDV STAT	BT	—
Vigilance (CCO mode / STAT OFF / Index ON)	SvO ₂ (ScvO ₂)	CCI	EDVI	BT	—
Vigilance (CCO mode / STAT ON / Index ON)	SvO ₂ (ScvO ₂)	CCI STAT	EDVI STAT	BT	—
Vigilance (ICO mode)	SvO ₂ (ScvO ₂)	CO AVG	CI AVG	—	—
Oximetrix3	SvO ₂	CO AVG	CI AVG	—	—
Q-vue (CCO mode)	—	CCO	CCI	BT	—
Q-vue (CCO not measured)	—	CO AVG	CI AVG	—	BSA
Oximetrix3 + Q-vue (CCO mode)	SvO ₂	CCO	CCI	BT	—
Oximetrix3 + Q-vue (CCO not measured)	SvO ₂	CO AVG	CI AVG	—	BSA
Q2 Computer (CCO mode)	SvO ₂	CCO	CCI	BT	—
Q2 Computer (CCO not measured)	SvO ₂	CO AVG	CI AVG	—	BSA

Hemodynamic Data (Vigilance)

Based on the CCO data measured by the Vigilance (or Vigilance CEDV / VigilanceII / Vigileo), the following hemodynamic data are calculated and displayed every second based on the following condition.

SU	6 5
SUR	1 3 6 3
RW	0 .5 4
RUSW	8 .1
SUI	3 8
SURI	2 3 0 4
RUWI	0 .3 2
RUSWI	4 .2

- Measured on CCO mode of Vigilance. (not displayed for ICO mode)
- SvO₂ parameter key (oximeter numeric data box) is displayed.
- BP label is set as ART, PAP, CVP.

(If the unit is "kPa", the data is converted to "mmHg" for calculation.)

Parameter	Description	Equation
SV	Stroke Volume (mL/beat)	$\frac{\text{CCO} \times 1000}{\text{HR}}$
SVR	Systemic Vascular Resistance (dynes·sec·cm ⁻⁵)	$\frac{(\text{MAP} - \text{CVP}) \times 79.90}{\text{CCO}}$
RVW	Right Ventricular Work (kg·m)	$\text{CCO} \times (\text{MPAP} - \text{CVP}) \times 0.0136$
RVSW	Right Ventricular Stroke Work (g·m)	$\text{SV} \times (\text{MPAP} - \text{CVP}) \times 0.0136$
SVI	Stroke Volume Index (mL/beat/m ²)	$\frac{\text{SV}}{\text{BSA}}$
SVRI	Systemic Vascular Resistance Index (dynes·sec·cm ⁻⁵ ·m ²)	$\text{SVR} \times \text{BSA}$
RVWI	Right Ventricular Work Index (kg·m/m ²)	$\frac{\text{RVW}}{\text{BSA}}$
RVSWI	Right Ventricular Stroke Work Index (g·m/m ²)	$\frac{\text{RVSW}}{\text{BSA}}$

NOTE	The hemodynamic data based on Vigilance data will not be displayed on the Vigilance / Vigileo list. Only the data directly acquired from the Vigilance will be displayed on the Vigilance / Vigileo list.
------	---

CO ₂	1	E
AGT	3 .5	3 .8 mmHg
O ₂	2 1	1 2 %
N ₂ O	3 0	1 6 %

Gas Data

When Poet IQ 8500A is connected, the gas data (CO₂ / anesthetic gas / O₂ / N₂O concentration) will be displayed.

TIMER1	H M S
TIMER2	00:00:00

Stopwatch Key

Functions as stopwatch.

BIS	43	SQI 88 %
EMG	40 dB	
SR	25 %	

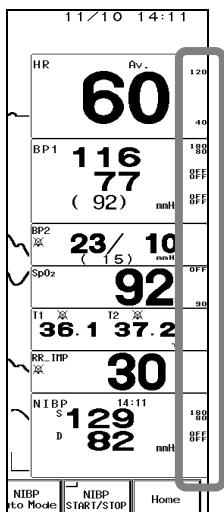
BIS Data

When the A-2000 BIS Monitor is connected, BIS data (BIS, SQI, EMG, SR) will be displayed.

If SQI value is below 50%, the background color will turn gray.

If SQI value is below 15%, BIS value and SR value will disappear.

● Alarm Limit Display



Alarm Limit

The alarm limit can be displayed beside each measurement value. If ON is selected for the individual alarm, the alarm limit will be displayed. The upper and lower limit will be displayed at upper and lower row respectively.

For BP and NIBP, each alarm limit of SYS, DIA, mean BP will be displayed from the top. ON/OFF of alarm limit display can be selected.



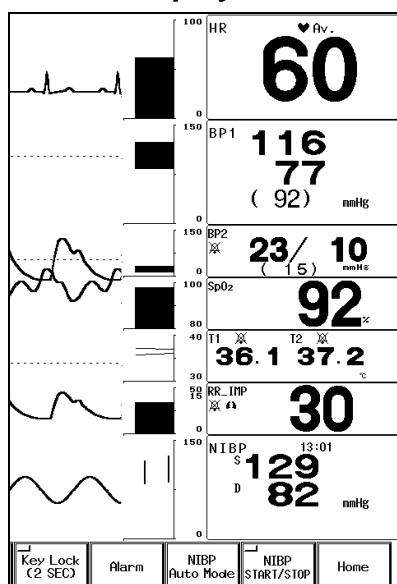
Refer to "4. Monitoring Setup Alarm Setup" for ON/OFF of alarm limit display.

NOTE

The alarm limit cannot be displayed for the following numeric data box.

- GAS(CO₂+AGENT+O₂+N₂O)
- GAS(AGENT+O₂+N₂O)

● Short Trend Display



Short Trend Display Trend Scale

Short Trend Display

Short trend can be displayed beside the measurement data. Pressing the waveform display area will change the displayed trend time to the pressed position.

The trend display is in 5-minute increment from 0 minute to 30 minutes.

Trend Scale

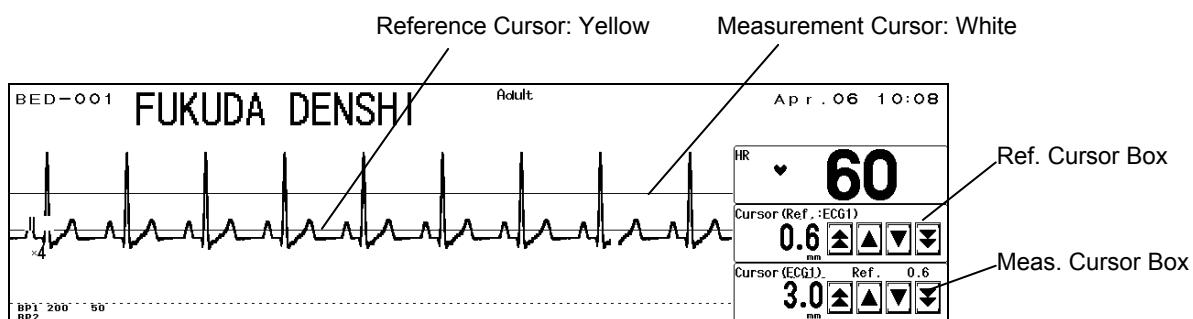
The short trend scale will be displayed between the short trend and measurement data.

The displayed scale will be in accordance with the scale set on the graphic trend menu.

● Cursor Display

By configuring the [Cursor] and [Cursor Ref] to the numeric data display area, measurement cursor (white) and reference cursor (yellow) can be displayed on the selected waveform (ECG or BP) to verify the waveform amplitude.

The cursor position can be moved up or down using the keys.



Reference Cursor Box (Ref.: Reference Waveform)

Displays the reference value for the measurement.

(The measurement unit set on the monitor setup menu will be displayed.)

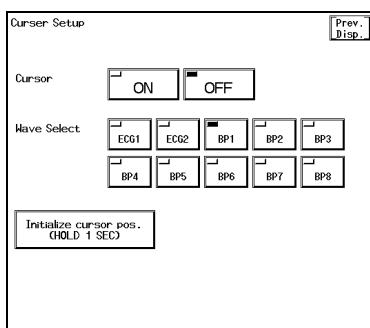
The displayed reference value will change when the cursor is moved up or down using the keys.

Measurement Cursor Box

Displays the measurement value (difference between the reference value).

The displayed measurement value will change when the cursor is moved up or down using the keys.

Pressing the cursor box will display the cursor setup menu.



Select ON/OFF of cursor display, and select the parameter to display the cursor.

Pressing the [Initialize cursor pos.] key for more than 1 second will initialize the cursor position to the following position.

Ref. Cursor: 0mV (0mm) position for ECG
0mmHg (0kPa / 0cmH₂O) position for BP

Meas. Cursor: 0mV (0mm) position for ECG
1/2 scale position for BP

NOTE

- The cursor will not be displayed if the cursor value exceeds the display range. If the cursor is not displayed although the cursor display is set to ON, initialize the cursor position.
- The displayed scale in the cursor box may not accurately represent the BP cursor position. This is because the BP waveform resolution differs according to the waveform display area size.

20-----

10-----

← For example, if the cursor is positioned at 10kPa, 9.9kPa may be displayed in the cursor box.

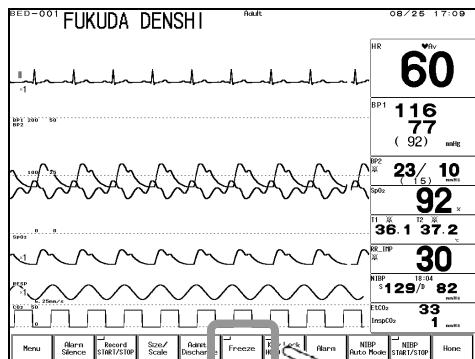
0-----

●Freeze Mode Cursor Display

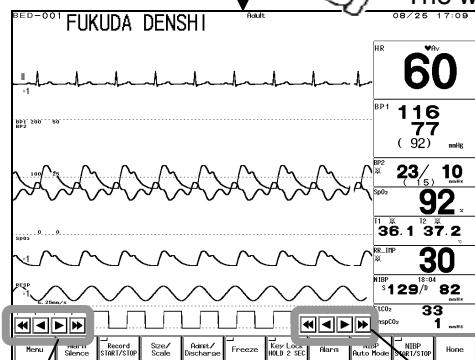
By selecting ON for “Freeze Mode Cursor Display” of the monitor setup menu, a vertical cursor (BP data cursor and interval measurement cursor) can be displayed on the home display when the **Freeze** (user key) is pressed.

The cursor can be moved freely and BP value at any cursor position can be displayed. It can be also used to measure the time interval between each cursor.

1 Press the **Freeze** key preprogrammed as user key.



The waveform will freeze and the cursor arrow key will be displayed.

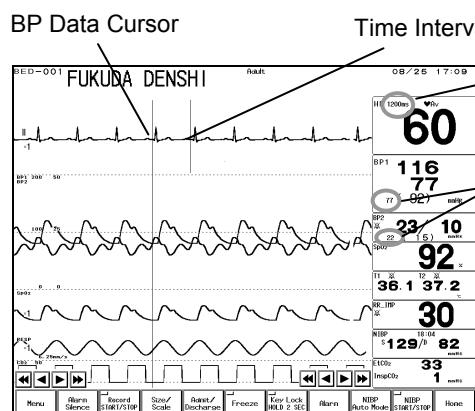


Arrow key for BP data cursor

Arrow key for time interval cursor

Pressing the arrow key will display each cursor.

- White: BP data cursor
- Yellow: Time interval cursor

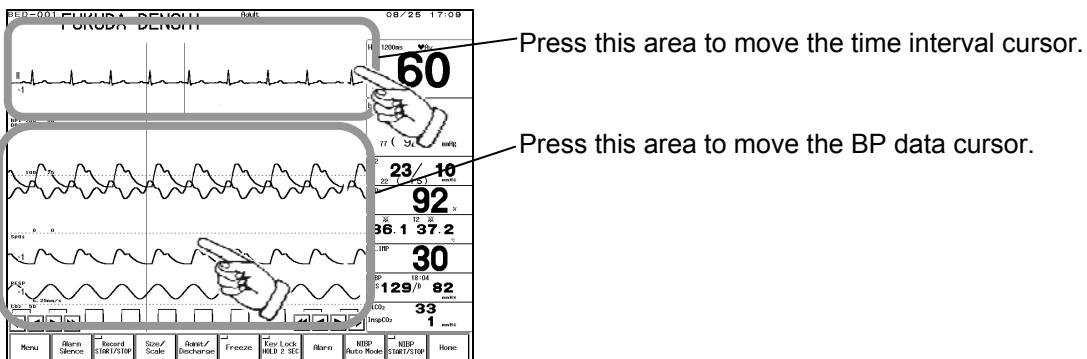


In the HR data box, time interval (unit: ms) between the BP data cursor and time interval cursor will be displayed.

In the BP data box, BP value at cursor position will be displayed.

2 The cursors can be moved freely using the keys.

The cursors can be also moved by directly pressing the waveform area.
The time interval and BP value will be updated each time the cursor is moved.



3 To erase the cursors, press the **Freeze** (user key) key.

NOTE	<ul style="list-style-type: none"> ● The freeze mode cursor cannot pass over the erase bar (black bar erasing the old waveform). ● The freeze mode will not be automatically cancelled with the freeze mode cursor displayed. ● The display width of short trend cannot be changed with the freeze mode cursor displayed. ● An error exists between the displayed waveform and cursor position. (For the sweep speed of 25mm/s; an error of 1dot[max.12msec] to the right of the cursor position)
------	---

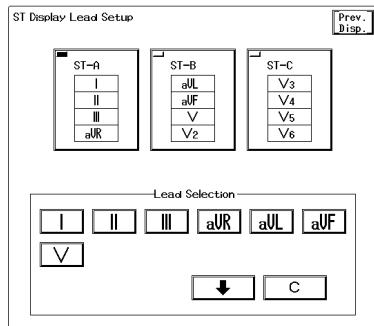
●Lead Selection for ST Data Box

The ST value for 4 leads can be displayed in the ST data box. 3 groups (A, B, C) of lead combination can be programmed.

ST	I	0.5
(mm)	II	0.2
	III	- - - . -

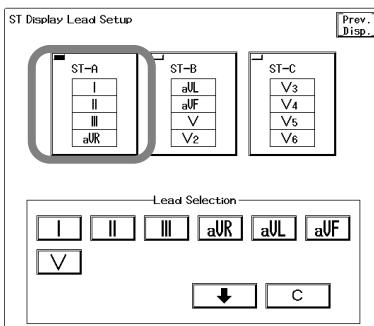
aUR - - - . -

- 1 Press the **Menu** → **System Configuration** → **ST Disp. Lead Setup** keys.

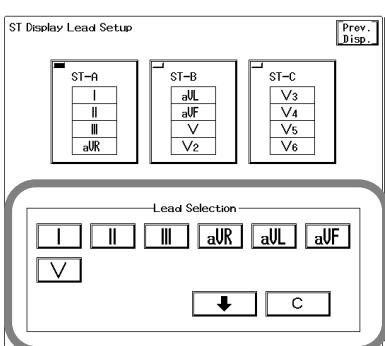


The ST Display Lead Setup menu will be displayed.
Set the displaying lead for each group.

- 2 Select the group to perform the setup and select the lead for that group.



Select the group from **ST-A**, **ST-B**, **ST-C**.



Select the lead to be displayed. Pressing the lead key will sequentially set the lead to the selected group from the top.

Description of Alarm Message and Alarm Sound

This section explains about the message displayed on the home display.

There are vital alarm message and equipment status alarm message which will be displayed at the top of the home display.

The alarms are classified in level 1, level 2, level 3, level 4, and the alarm message will be displayed according to the priority of level 1>level 2>level 3>level 4.

The color of the displayed messages are red for level 1, yellow for level 2, blue for level 3, and white for level 4.

The alarm tone will be different depending on the alarm system setting (IEC/FUKUDA DENSHI).

Alarm Level	Description	Tone	Displayed Color
Level 1	Life Threatening Alarm	Continuous beep tone	Red
Level 2	Cautionary Alarm	Beep tone every 5 seconds	Yellow
Level 3	Treatment Needed Alarm	Single beep tone	Blue
Level 4	Notification Alarm	Display Only	White



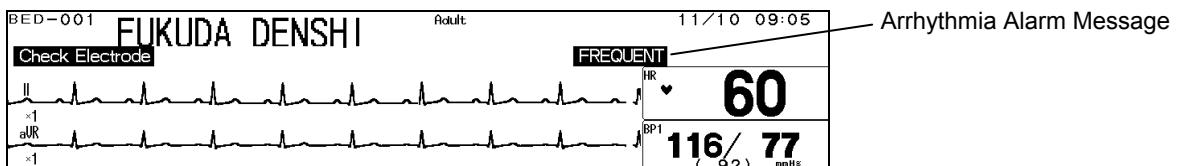
- Alarm messages will be displayed according to the priority. (Level 1 → Level 2 → Level 3 → Level 4)
- For the same alarm level, the alarm message for the newer alarm will be displayed.



The alarm system setting (IEC/FUKUDA DENSHI) can be performed on the monitor setup menu. For procedure, refer to "8. System Configuration Monitor Setup ●Auditory Alarm Signal" (Default: FUKUDA DENSHI)

●Vital Alarm Message

The vital alarm message is generated when a measurement exceeds the alarm limit, or when arrhythmia is detected.



There are 2 types of alarm messages, numeric alarm message and arrhythmia alarm message. If the 2 types of alarm generate at the same time, the numeric alarm message and arrhythmia alarm message will be alternately displayed for 2 seconds each. The message will be displayed according to the priority of the alarm level. If the alarms of the same level generate, the message for the newer alarm will be displayed.



The alarm message for the arrhythmia alarm will continue to be displayed for 30 seconds after the alarm is resolved.

Life Threatening Alarm (Alarm Level 1)

Parameter	Message
HR	“Lower HR alarm”
	“Upper HR alarm”
PR (SpO ₂ , BP)	“Lower PR alarm”
	“Upper PR alarm”
BP (BP1/ART)	“Lower BP1 alarm” or “Lower ART alarm”
	“Upper BP1 alarm” or “Upper ART alarm”
SpO ₂	“Lower SpO ₂ alarm”
	“Upper SpO ₂ alarm”
Respiration (Impedance, CO ₂ , Ventilator)	“Apnea alarm”
	“Lower RR alarm”
	“Upper RR alarm”
NIBP	“Lower NIBP alarm”
	“Upper NIBP alarm”
CO ₂	“Upper EtCO ₂ alarm”
	“Lower EtCO ₂ alarm”
Arrhythmia	“ASYSTOLE”
	“VF”
	“VT”
	“SLOW VT”
	“TACHY”
	“BRADY”
	“RUN”
Multigas (Poet IQ 8500A)	“Lower RR alarm”
	“Upper RR alarm”
	“Apnea alarm”
	“Upper CO ₂ -E alarm”
	“Lower CO ₂ -E alarm”
	“Upper CO ₂ -I alarm”
	“Lower O ₂ -E alarm”
	“Upper O ₂ -E alarm”
	“Lower O ₂ -I alarm”
	“Upper O ₂ -I alarm”
	“Upper N ₂ O-I alarm”
	“Lower (AGT label)-E alarm”
	“Upper (AGT label)-E alarm”
	“Lower (AGT label)-I alarm”
	“Upper (AGT label)-I alarm”
	“Upper MAC alarm”

Cautionary Alarm (Alarm Level 2)

Parameter	Message
BP (BP2–8)	“Lower BP* alarm” or “Lower (label) alarm”
	“Upper BP* alarm” or “Upper (label) alarm”
ST1–12	“Lower ST* alarm”
	“Upper ST* alarm”
Temperature (TEMP1–8)	“Lower TEMP* alarm” or “Lower (label) alarm”
	“Upper TEMP* alarm” or “Upper (label) alarm”
CO ₂	“Upper InspCO ₂ alarm”
Arrhythmia	“PAUSE”
	“COUPLET”
	“BIGEMINY”
	“TRIGEMINY”
	“FREQUENT”

* indicates the channel no. of BP and TEMP.

Treatment Needed Alarm (Alarm Level 3)

Parameter	Message
None	

Notification Alarm (Alarm Level 4)

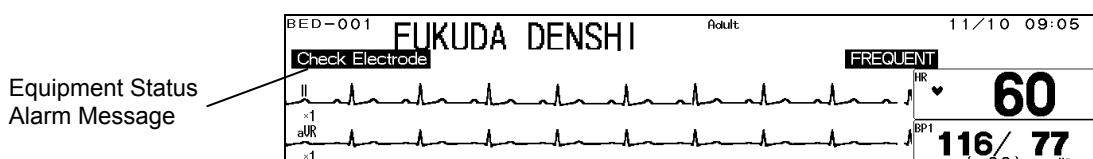
Parameter	Message
All Alarm	“Alarm suspend (* * * sec)”
Arrhythmia	“LEARN” “ARRHY OFF”

NOTE

- (* * * sec) of the “Alarm suspend (* * * sec)” message indicates the remaining time to suspend the alarm.
- The “ARRHY OFF” message will be displayed when the ASYSTOLE, VF, VT, SLOW_VT, and HR alarm is OFF.

● Equipment Status Alarm Message

The equipment status alarm message will be displayed when proper monitoring cannot be performed. The alarm message will be displayed according to the priority of the alarm level. If more than one alarm with the same level is generated, the alarm message for the newer alarm will be displayed.



Cautionary Alarm (Alarm Level 2)

Item	Message
ECG	“Check electrodes”
Impedance Respiration	“Cannot analyze” ^{※1}
Arrhythmia	“Check SpO ₂ sensor” “SpO ₂ sensor fault” “No pulse detect”
SpO ₂	“NIBP measurement failed.” ^{※2}
NIBP	“Check filter line” “CO ₂ unit error” “pO ₂ /pCO ₂ Heat Error” “pO ₂ /pCO ₂ Temp Diff Error” “pO ₂ /pCO ₂ Temp Range Error” “pO ₂ /pCO ₂ Membrane Error”
CO ₂ (Super Module)	

<i>Item</i>	<i>Message</i>
Connector Off	"ECG disconnect"
	"BP * disconnect"
	"SpO ₂ disconnect"
	"TEMP * disconnect"
	"CO ₂ disconnect"
	"CO disconnect"
	"Multiport * disconnect"
	"pO ₂ /pCO ₂ disconnect"
Relay Cable Off	"BP * relay cable disconnect"
	"TEMP * relay cable disconnect"
Super Module	"Check Super Module connection."
	"Check HS-700 cooling fan."
	"Check HS-700 software version"
Input Box	"Check IB-7300 connection"
	"Check IB-7300 cooling fan"
Telemetry	"Check LX battery"

* indicates the channel no. of BP and TEMP.

※¹ This alarm will generate only when "Suspend Arrhy. Analysis during Noise Interference" is set to ON under Ward Setup (Preset Menu).

※² "NIBP measurement failed." will be displayed only if "Alarm Occurrence at NIBP Failure" is set to ON on the alarm setup menu. (Default: OFF)

 WARNING	When a parameter is in a connector-off condition, the alarm will be generated only on the bedside monitor and not on the central monitor. If the waveform/numeric data is not displayed for a monitored parameter, check the patient's condition and pay attention not to miss the connector-off condition.
---	---

 CAUTION	When the "Check Super Module connection" alarm generates, the DS-7300 system may not function properly.
--	---

NOTE	The "Connector Off" alarm can be cancelled by pressing the Alarm Silence key. Before silencing the alarm, make sure that the disconnected connector is unnecessary.
-------------	--

Treatment Needed Alarm (Alarm Level 3)

<i>Item</i>	<i>Message</i>
NIBP	"Check NIBP hose"
Impedance Respiration	"CVA detected"
ECG	"Pacemaker detection error"

Notification Alarm (Alarm Level 4)

<i>Item</i>	<i>Message</i>
Operation	"Wave freeze"
	"Touch key OFF"
	"Night mode"
ECG	"ECG failed"
	"Artifact"
	"ECG Unit Error"
ECG, Impedance Respiration	"Check electrodes"
BP	"BP * transducer OFF"
	"BP * not zero balanced"
	"Incorr. BP cable"
Temperature	"Wrong temp probe"
	"TEMP auto check"
	"TEMP unit check"

Item	Message
SpO ₂ (HS-710, 710E, 720, 720E, 720C, 702C, 702E)	"Motion artifact"
	"SpO ₂ unit error"
CO ₂ (Super Module) CO ₂ (Super Module) (HS-720C, 702C)	"CO ₂ unit error"
	"CO ₂ unit error"
	"CO ₂ sensor failure"
	"CO ₂ warm up"
	"CO ₂ cal required"
	"Check CO ₂ adapter"
	"Wrong CO ₂ sensor"
NIBP	"NIBP unit error"
	"Initializing NIBP"
Super Module Built-in Recorder	"Recorder error"
	"Paper out" *
	"Check magazine" *
	"Recorder busy"
All Alarm	"Alarm Mute"
Telemetry	"Telemetry unit error"
Super Module	"Sub-CPU error"
	"Analog board error"
	"Check HS rec. connection"
	"HS-700 hardware error"
	"Check Super Module Rotary SW."
Main Unit	"DSC-7300 Hardware error"
	"Check DSC-7300 Rotary SW."
LCD Unit	"Display Unit Hardware error"
Input Box	"IB-7300 not configured"
	"IB-7300 hardware error"
	"Check IB-7300 Rotary SW."
Device Configuration	"Check device config."
Network Recorder	"Recorder error (8ch)"
	"Recorder busy (8ch)"
	"Check magazine (8ch)"
	"Paper Out (8ch)"
	"Recorder error (Cent.)"
	"Recorder busy (Cent.)"
	"Paper Out (Cent.)"
CO ₂ (HC-500)	"CO ₂ hard error"
	"CO ₂ warm up"
	"Check sensor"
	"CO ₂ zero cal?"
	"CO ₂ adapter cal?"

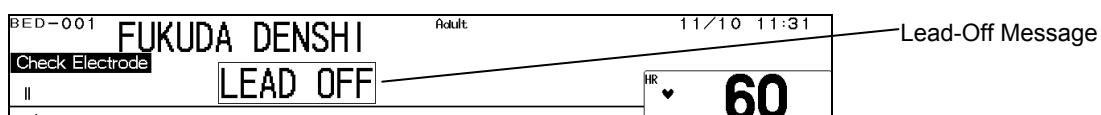
* indicates the channel no. of BP and TEMP.

* If [OFF] is selected for "Built-in Rec. Status Display" on "Monitor Setup" of the preset menu, these messages will not be displayed.

●Lead-Off Message

If the ECG electrodes are detached, HR alarm and arrhythmia alarm will not be generated.
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.



⚠ CAUTION	While the "LEAD OFF" message is displayed, HR alarm and arrhythmia alarm will not function. Leaving this condition unresolved may result in missing a sudden change of the patient. Promptly check the electrodes when this message is displayed.
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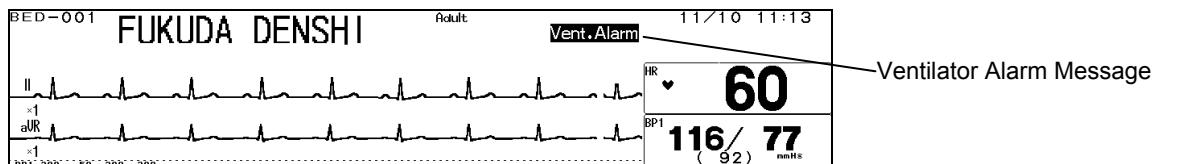
● Ventilator Alarm Message

When a ventilator is connected to the DS-7300, ventilator alarm and the connection status alarm will be generated.

The alarm message with the higher alarm level 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.
------------------	--

[Ventilator Alarm Message]



Life Threatening Alarm (Alarm Level 1)

Parameter	Message
Ventilator	"Vent. Alarm"

! WARNING	The ventilator alarm sound is set to OFF at factory default setting. For procedure to turn ON the alarm sound, refer to "Volume Setup" (P4-51).
------------------	--

[Connection Status Alarm Message]



Life Threatening Alarm (Alarm Level 1)

Parameter	Message
Ventilator	"Vent. Invalid"

Cautionary Alarm (Alarm Level 2)

Parameter	Message
None	

Treatment Needed Alarm (Alarm Level 3)

Parameter	Message
None	

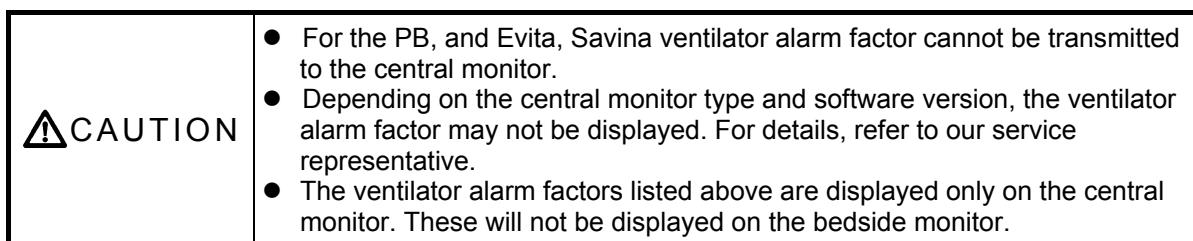
Notification Alarm (Alarm Level 4)

Parameter	Message
Ventilator	"Vent. Disable"
	"Vent. Online"

● Ventilator Alarm Factor

For the SV-300, Servo-i, Servo-s, ventilator alarm factor if specified will be notified and displayed on the central monitor.

Displayed Alarm Message	Description
VENT AWP	Airway Pressure Alarm
VENT MV	Minute Ventilation Alarm
VENT APNEA	Apnea Alarm
VENT CONT. HP	Continuous High Pressure Alarm
VENT Upper FiO ₂	FiO ₂ Upper Limit Alarm
VENT Lower FiO ₂	FiO ₂ Lower Limit Alarm
VENT Upper CO ₂	EtCO ₂ Upper Limit Alarm
VENT Lower CO ₂	EtCO ₂ Lower Limit Alarm
VENT Upper RR	RR Upper Limit Alarm
VENT Lower RR	RR Lower Limit Alarm
VENT PEEP	PEEP Low Alarm
VENT COMM	Power OFF, Cable disconnected, Standby condition, etc.
VENT URGENT	Other high level alarm
VENT	Other ventilator alarm

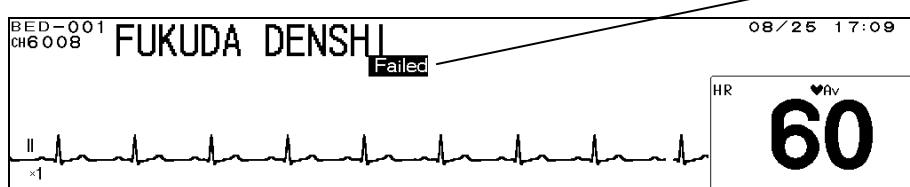


● Gas Alarm Message

When monitoring gas data of the Poet IQ 8500A, the following alarm messages may be displayed according to the condition.

If more than one alarm generate at the same time, maximum of 25 alarms will be stacked, and sequentially displayed in 2 seconds interval.

【Gas Alarm Message】



Life Threatening Alarm (Alarm Level 1)

Equipment	Message
None	

Cautionary Alarm (Alarm Level 2)

Equipment	Message
Poet IQ 8500A	“AGT: BENCH FAIL”
	“AGT: IR FAIL”
	“AGT: PNEUMATICS”
	“AGT: BADCAL”
	“O2: SENSOR”
	“AGT: NO EXHAUST”
	“MIXED AGENT”*
	“AGT: INSERT TRAP”
	“AGT: OCCLUSION”
	“WRONG AGENT”



* The alarm level of “Mixed Agents” message can be selected from level 2 or level 4.
(Default: Level 2)
→ “8. System Configuration Hospital Setup ●Alarm Level of “Mixed Agents””

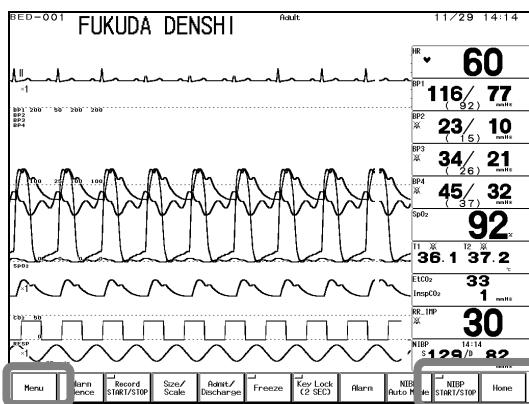
Treatment Needed Alarm (Alarm Level 3)

Equipment	Message
Poet IQ 8500A	“GAS MODULE DISCONNECT”
	“REPLACE TRAP”
	“AGT: WARMING”
	“AGT: AUTO CAL”

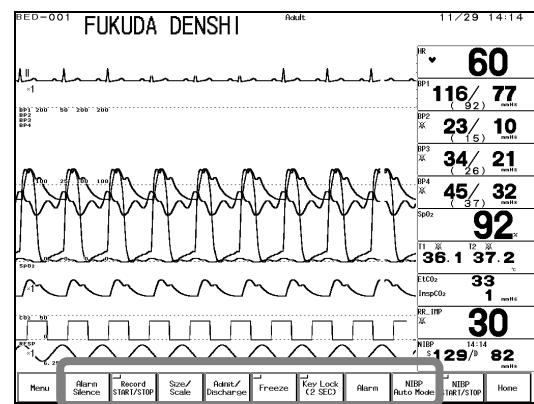
For Easier Use

Key Setup

The DS-7300 system operation is performed through the touch keys displayed on the screen. The touch keys consist of fixed keys (menu, Home / Enlarge, NIBP Start/Stop) and 6 or 8 user keys (8 or 10 user keys for LC-7319T) which can be programmed according to the monitoring purpose.



<Fixed Keys>



<User Keys>

[When LC-7315T is used]

Menu	Alarm Silence	Rec. START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (HOLD 2 SEC)	Alarm	NIBP Auto Mode	NIBP START/STOP	Home
------	---------------	-----------------	-------------	------------------	--------	-----------------------	-------	----------------	-----------------	------

<Large Key Size: 3 fixed keys, 6 user keys>

Menu	Alarm Silence	Record START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (2 SEC)	Alarm	NIBP Auto Mode	NIBP START/STOP	Home
------	---------------	-------------------	-------------	------------------	--------	------------------	-------	----------------	-----------------	------

<Small Key Size: 3 fixed keys, 8 user keys>

[When LC-7319T is used]

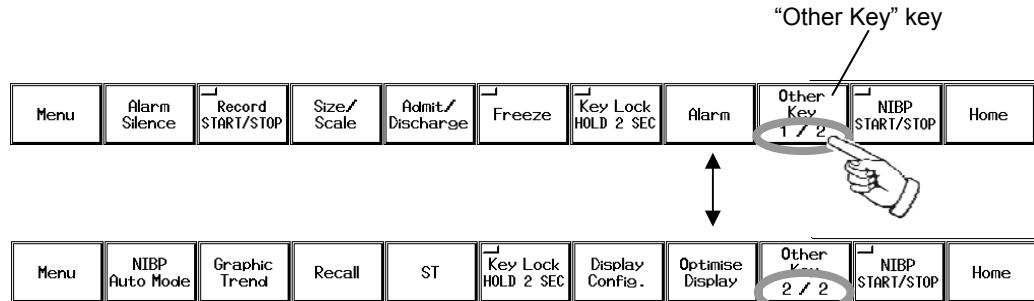
Menu	Alarm Silence	Rec. START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (HOLD 2 SEC)	Alarm	NIBP Auto Mode	NIBP START/STOP	Home
------	---------------	-----------------	-------------	------------------	--------	-----------------------	-------	----------------	-----------------	------

<Large Key Size: 3 fixed keys, 8 user keys>

Menu	Alarm Silence	Record START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock HOLD 2 SEC	Alarm	NIBP Auto Mode	NIBP START/STOP	Home
------	---------------	-------------------	-------------	------------------	--------	---------------------	-------	----------------	-----------------	------

<Small Key Size: 3 fixed keys, 10 user keys>

By preprogramming the **Other Key** as user key, 2 pages of user keys can be programmed and pressing the **Other Key** key allows to switch the user key selection.

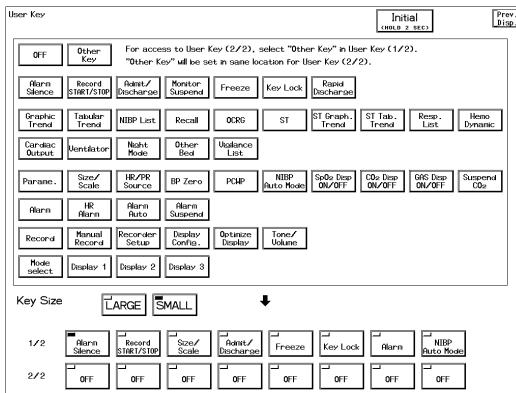


Other than the user key setup, the menu key setup allows to change the menu display key configuration, and key mask setup allows to erase the unnecessary keys on the function menu display and system configuration menu display according to user's preference.

To Set the User Keys

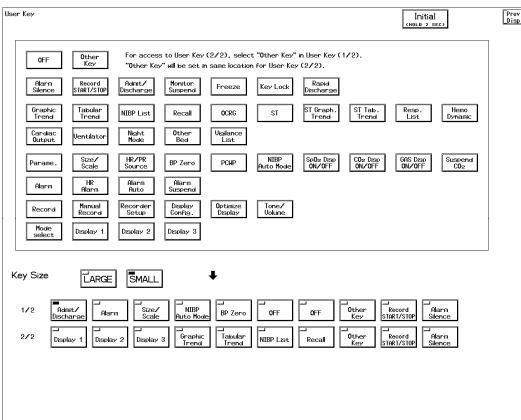
The user keys can be programmed for quick access to the frequently used menu.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **User Key** keys.



The user key setup menu will be displayed.

<User Key Setup Menu for LC-7315T>



<User Key Setup Menu for LC-7319T>

- 2 Select a position to set the user key.

[When LC-7315T is used]

Key Size **LARGE** **SMALL**

Selecting **Large** for the key size will allow setup of user key 1–6.

Alarm Silence	Rec. START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (HOLD 2 SEC)
---------------	-----------------	-------------	------------------	--------	-----------------------

The key location is the same as the home display.

Key Size **LARGE** **SMALL**

Selecting **Small** for the key size will allow setup of user key 1–8.

Alarm Silence	Record START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (2 SEC)	Alarm	NIBP Auto Mode
---------------	-------------------	-------------	------------------	--------	------------------	-------	----------------

[When LC-7319T is used]

Key Size **LARGE** **SMALL**

Selecting **Large** for the key size will allow setup of user key 1–8.

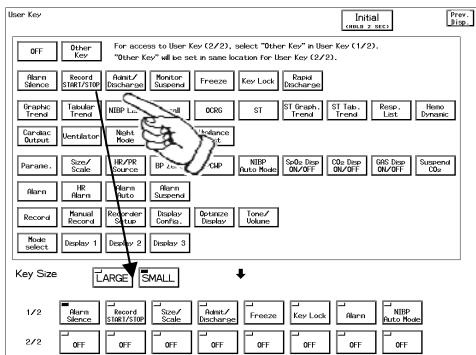
Alarm Silence	Rec. START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock (HOLD 2 SEC)	Alarm	NIBP Auto Mode
---------------	-----------------	-------------	------------------	--------	-----------------------	-------	----------------

Key Size **LARGE** **SMALL**

Selecting **Small** for the key size will allow setup of user key 1–10.

Alarm Silence	Record START/STOP	Size/ Scale	Admit/ Discharge	Freeze	Key Lock HOLD 2 SEC	Alarm	NIBP Auto Mode	Recall	Tabular Trend
---------------	-------------------	-------------	------------------	--------	---------------------	-------	----------------	--------	---------------

3 Select the function for the user key.



Select the location to set the user key. Then, select the function for the user key.

Selecting **Other Key** key will allow to program 2 pages of user keys.

The **Other Key** key will be located at the same position for both first and second page.

User Key	Function
Alarm Silence	Silences the alarm for fixed amount of time.
Record START/STOP	Starts/stops manual recording.
Admit / Discharge	Displays admit/discharge menu.
Monitor Suspend	Displays the confirmation display whether to suspend monitoring or not.
Freeze	Temporarily stops the waveform trace. By pressing the Record START/STOP key during freeze mode, the waveform in freeze mode can be recorded. When "Freeze Mode Cursor" (monitor setup) is set ON, a cursor will be displayed.
Key Lock	Turns ON/OFF the touch key operation. This function can be used when cleaning the touch screen.
Rapid Discharge	Displays confirmation screen (latest 12 NIBP list data), and erases patient data, patient information, monitoring condition, etc. (same function as discharge procedure.)
Graphic Trend	Displays graphic trend.
Tabular Trend	Displays tabular trend.
NIBP List	Displays NIBP list.
Recall	Displays recall.
OCRG	Displays OCRG.
ST Display	Displays the ST measurement menu.
ST Graphic	Displays the ST graphic trend.
ST Tabular	Displays the ECG 12-lead ST value in tabular format.
Resp. List	Displays the respiration measurement value in tabular format.
Hemodynamic	Hemodynamic calculation menu will be displayed.
Cardiac Output	CO measurement menu will be displayed.
Ventilator	P-V, F-V menu will be displayed.
Night Mode	Turns ON / OFF the night mode.
Other Bed	Displays the other bed display menu.
Vigilance List	Displays the Vigilance data list when the Vigilance (or Vigilance CEDV/VigilanceII/Vigileo) oximeter is used.
Parameter	Displays the parameter setup menu.
Lead · Size	Displays the keys to adjust the size, scale, baseline position of the displayed waveform.
HR Source	Sequentially selects the HR source in the order of ECG → SpO ₂ → BP1/ART*→ Auto → ECG. * BP1/ART can be selected when ECG/SpO₂/BP is set for HR/PR source on the monitor setup menu.
BP Zero	Performs zero balance of BP1 to BP8.
PCWP	Displays the PCWP measurement menu.
NIBP Auto Mode	Displays the NIBP measurement interval setup menu.
SpO ₂ Disp ON/OFF	Turns ON/OFF the SpO ₂ display.
CO ₂ Disp ON/OFF	Turns ON/OFF the CO ₂ display.
GAS Disp ON/OFF	Turns ON/OFF the GAS display.

User Key	Function
Suspend CO ₂	Suspends CO ₂ Measurement.
Alarm	Displays alarm setup menu.
HR Alarm	Displays the HR/PR alarm setup menu.
Alarm Auto	Automatically determines the alarm range from the current measurement value.
Alarm Suspend	Suspends the alarm.
Record	Displays the recording setup menu.
Manual Record	Displays the manual record setup menu.
Recorder Setup	Displays the recorder setup menu.
Display Config.	Displays the display configuration menu.
Optimize Display	The confirmation message for optimizing the display will appear. The display will be automatically configured according to the priority set on the "Display Configuration Optimization Setup" (monitor setup).
Tone/Volume	Displays the tone/volume setup menu.
Mode Select	Displays the alarm mode/display mode selection menu to set during surgery.
Display 1 (2, 3)	Switches the home display to Mode 1 (2, 3) preprogrammed on the display mode setup (preset menu).
Other Key	Switches the first page and second page of the user key.
OFF	User key will not be displayed.

4 Initialize the user key setup.



Pressing the **Initial** key for more than 2 seconds will initialize the user key setup to factory setting.

The factory setting is as follows.

LC-7319T

User Key 1: Alarm Silence
 User Key 2: Rec. START/STOP
 User Key 3: Size / Scale
 User Key 4: Admit / Discharge
 User Key 5: Freeze
 User Key 6: Key Lock
 User Key 7: Alarm
 User Key 8: NIBP Auto Mode

LC-7319T

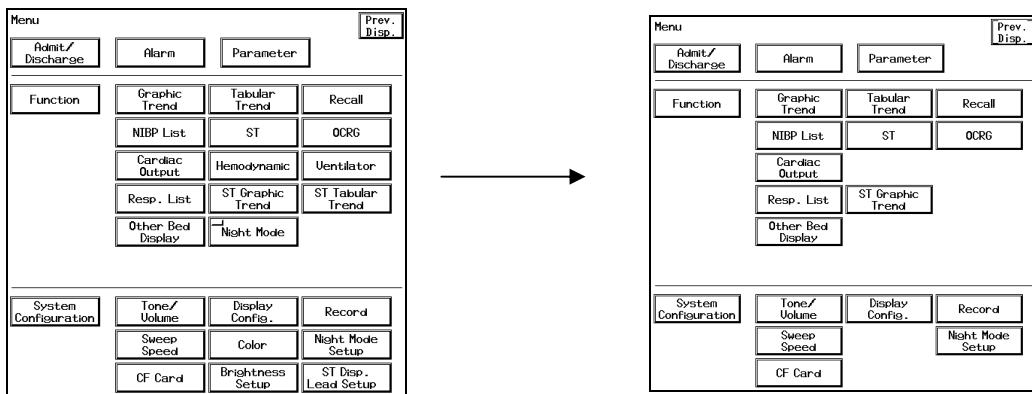
1/2 User Key 1: Admit / Discharge
 User Key 2: Alarm
 User Key 3: Size / Scale
 User Key 4: NIBP Auto Mode
 User Key 5: BP Zero
 User Key 6: OFF
 User Key 7: OFF
 User Key 8: Other Key
 User Key 9: Rec. START/STOP
 User Key 10: Alarm Silence

2/2 User Key 1: Display 1
 User Key 2: Display 2
 User Key 3: Display 3
 User Key 4: Graphic Trend
 User Key 5: Tabular Trend
 User Key 6: NIBP List
 User Key 7: Recall
 User Key 8: Other Key
 User Key 9: Rec. START/STOP
 User Key 10: Alarm Silence

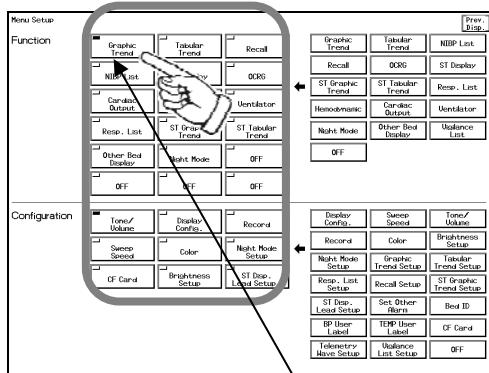
To Configure the Menu Display

Menu Key Setup

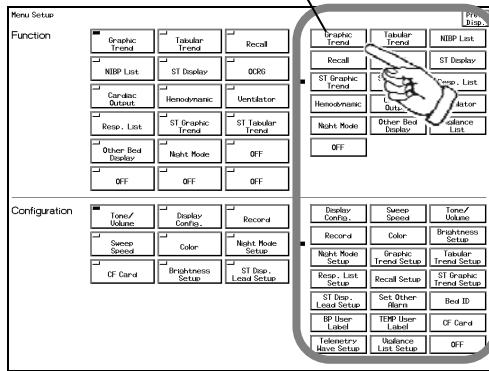
The menu display can be configured for easier use.



- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **Menu Setup** keys.



Select the key location.



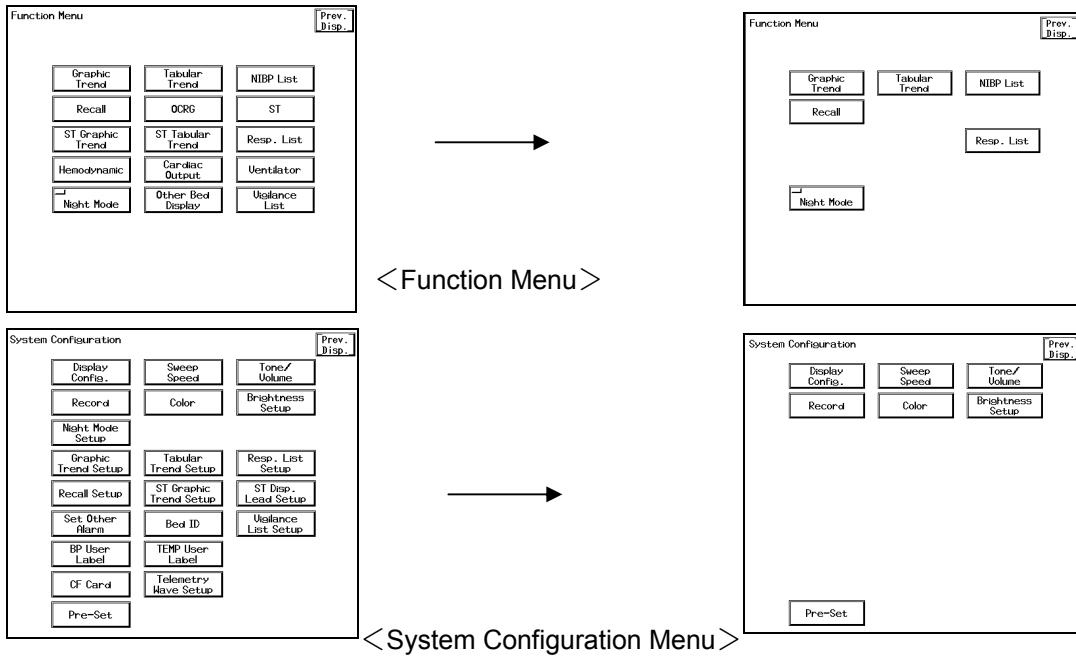
Select the key for the location.

Select function key for the function key location, and configuration key for the configuration key location.

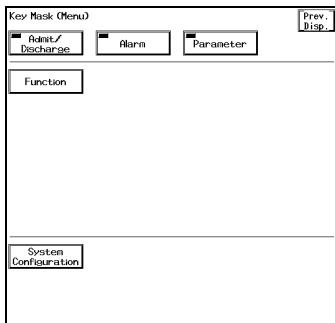
Erasing the Unnecessary Keys

Key Mask Setup

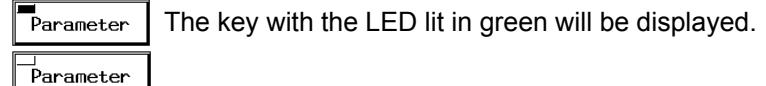
The unnecessary keys on the function menu and configuration menu can be erased.



- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **Key Mask** keys.



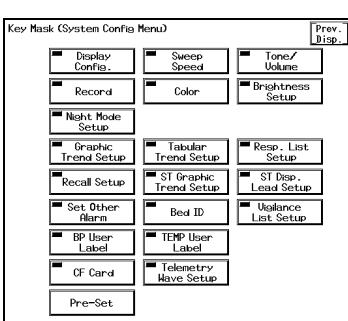
Select the keys to be displayed on the menu display.



Press the **Function** key to select the keys to be displayed on the function menu.

Press the **System Configuration** key to select the keys to be displayed on the function menu.

The green LED will extinguish by pressing the key.
The key with the LED extinguished will not be displayed.



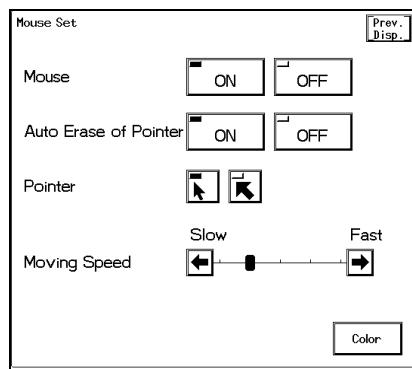
The green LED will extinguish by pressing the key.
The key with the LED extinguished will not be displayed.

Mouse Setup

(For LC-7319T)

When the LC-7319T (19-inch display unit) is used, optional mouse can be connected which allows to control the displayed keys using the mouse.
In this section, mouse setup procedure is explained.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **Mouse Set** keys.



The Mouse Setup menu will be displayed.

- 2 Select whether to use (**ON**) or not use (**OFF**) the mouse.



If **OFF** is selected, the mouse operation will not be possible even if connected.

- 3 Select ON/OFF of automatic erase function of the pointer.



ON will automatically erase the pointer if the mouse is not used for 5 minutes. By moving or clicking the mouse, the pointer will be displayed again.

OFF will not automatically erase the pointer.

- 4 Set the pointer shape.

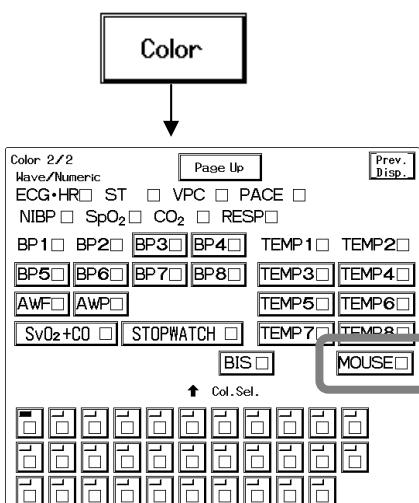


- 5 Set the moving speed of the pointer.



Adjust the moving speed using the arrow keys.

- 6 Press the **Color** key to display the second page of the color setup menu.



The color of the mouse pointer can be selected.

On the DS-7300 system, waveform can be recorded by manual recording, periodic recording, alarm recording, and freeze recording. Graphic recording such as graphic trend, tabular trend can be also performed.

This section describes the procedure for the following recording.

- Manual Recording
- Periodic Recording
- Alarm Recording
- Freeze Recording
- Graphic Recording (Graphic Trend, Tabular Trend, Recall, NIBP List, etc.)
- Telemetry Remote Recording

When the IB-7300 Input Box is connected and the HR-500 Recorder Module is used, manual recording, periodic recording, alarm recording, and recall recording can be performed on the HR-500 Recorder Module.

However, if HS built-in recorder and HR-500 Recorder Module are both used, one of the recorder must be selected on the recorder setup menu.

The output recorder for recall recording (graphic recording / manual recording) can be also set on the recording setup menu.

 CAUTION	<p>There are following restrictions when recording on the HR-500 Recording Module.</p> <ul style="list-style-type: none">• Only manual recording, periodic recording, alarm recording, recall recording can be performed on the HR-500.• If the measurement unit of BP is “kPa”, BP waveform, BP numeric data, and NIBP numeric data will be treated as non-measured data.• If the TEMP measurement unit is “°F”, the TEMP numeric data will be treated as non-measured data.• For the non-measured parameter, the waveform will not be printed, and numeric data will be printed as “—” or left blank.• The numeric data displayed as “xxx” will be printed as “—”.• The QRS classification symbol of “S” will be printed as “N” on the HR-500.• The waveform recording is not possible for some scale depending on the parameter.• If the HR alarm source is BP, ECG will not be recorded. PR_IBP data will be printed for the HR data instead.• If the RR/APNEA alarm source is other than impedance respiration, the respiration waveform will not be recorded.• If the RR/APNEA alarm source is other than CO₂/GAS, the CO₂ waveform will not be recorded.
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Manual Recording

● To Start / Stop the Recording

For manual recording (standard recording), pressing the **Record START/STOP** key will start / stop the recording. Pressing this key during periodic recording, alarm recording, graphic recording, or recall recording will cease the recording in process.



Recording Setup



Not recording



Recording in process

Also, the output recorder status for manual recording will be displayed inside the **Record START/STOP** key.

Message	Description
None	Normal Operation
PAPER OUT	No recording paper
MAGAZINE	Check the magazine.
CHECK?	Other abnormality.



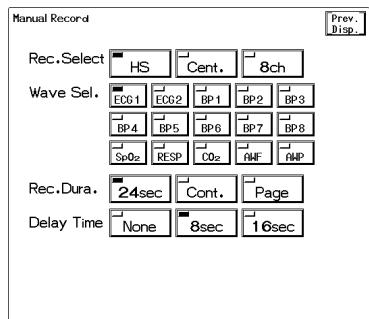
● Manual Recording Setup

The manual recording can be started from the time the key is pressed, or 8 sec. / 16 sec. prior to the time the key is pressed.

The recording can be set to automatically stop after 24 seconds or continue to record until the **Record START/STOP** key is pressed again.

NOTE	If the Super Module without the recorder (HS-710, HS-710E) is connected and the telemetry transmitter module is used, remote recording on the central monitor can be performed by selecting HS for the manual recording output recorder and pressing the Record Start/Stop key.
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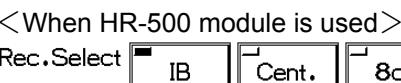
1 Press the **Menu** → **System Configuration** → **Record** → **Manual Record** keys.



The manual recording setup menu will be displayed.

<When HS built-in recorder is used>

2 Select the output recorder.



HS will record on the super module recorder. To record on the recorder module of the input box,

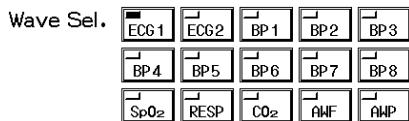
IB will record on the HR-500 module.

Cent. will record on the 3ch recorder connected to the central monitor.

8ch will record on the 8ch recorder connected to the wired network.

The central monitor recorder will be the one with the smallest central ID. 8ch recorder selection can be performed on the recorder setup menu.

3 Select the waveform for recording.



Up to 3 waveforms can be selected. If the output recorder is 8ch recorder, up to 8 waveforms can be selected.

The waveform position will be automatically adjusted when recording.

If central recorder or 8ch recorder is selected as output recorder, **BP7**, **BP8** can not be selected.

4 Select the duration for recording.



Select the duration from **24sec** or **Cont.**.

24sec will automatically stop the recording after 24 seconds.

If 8ch recorder is selected as output recorder, **Page** can be selected. Page recording outputs by one page.

5 Select the delay time for recording.



None will start the recording from the time the

Rec. START/STOP key is pressed.

8sec, **16sec** will start the recording 8 sec. / 16 sec. prior to the time the key is pressed.

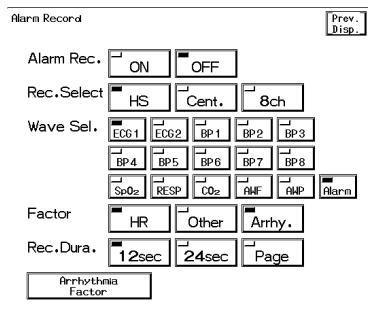
NOTE	<ul style="list-style-type: none"> ● The IB key for the “Recorder Selection” will be displayed by setting Yes for “Input Box (IB-7300)” on the monitor setup menu, and setting No for “HS Recorder” on the recorder setup menu or connecting the Super Module without a recorder (HS710, 710E). ● If None is selected for the manual recording delay time, QRS classification will not be output. To record the QRS classification, select 8sec or 16sec for the delay time.
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Alarm Recording

The recording will automatically start at occurrence of numeric alarm or arrhythmia alarm.

NOTE	<ul style="list-style-type: none"> The alarm detection is performed each second, and if more than one alarm occurs at the same time, one data will be stored according to the priority of alarm factor. Maximum of 3 alarm data can be stored, but if the same or higher priority alarm is newly generated exceeding 3 data, the older recording data will be replaced with the newly generated alarm recording data. The stored data will be erased when recorded. Priority of alarm recording factor ; ASYSTOLE > VF > VT > SLOW VT > TACHY > BRADY > RUN > HR(HR / PR_SpO₂ / PR_IBP) > APNEA > BP1(or ART) > SpO₂ > NIBP > RR(RR_IMP / RR_CO₂ / RR_GAS / RR_VENT) > EtCO₂ > GAS(CO₂_E / CO₂_I / AGT_E / AGT_I / AGT2_E / AGT2_I / O₂_E / O₂_I / N₂O_I) > PAUSE > COUPLET > BIGEMINY > TRIGEMINY > FREQUENT > BP2 > BP3 > BP4 > BP5 > BP6 > BP7 > BP8 > ST > TEMP > Tb > InspCO₂ If recording on the central monitor recorder or AU-5500N 8ch recorder, alarm recording and recall recording cannot be performed for the following alarm factor; BP7, BP8, T3-T8, TACHY, BRADY, SLOW_VT, COUPLET, PAUSE, TRIGEMINY
------	--

1 Press the **Menu** → **System Configuration** → **Record** → **Alarm Record** keys.



The alarm recording setup menu will be displayed.

<When HS recorder is used>

2 Select the output recorder

HS will record on the Super Module recorder.

IB will record on the HR-500 module.

Cent. will record on the 3ch recorder connected to the central monitor.

8ch will record on the 8ch recorder connected to the wired network.

The central monitor recorder of the smallest ID will be used. 8ch recorder selection can be performed on the recorder setup menu.

NOTE	HS is the default setting for the alarm recording output recorder. If using the Super Module without a built-in recorder (HS-710, HS-710E), make sure to select IB , Cent. , or 8ch for the output recorder.
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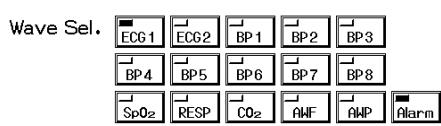
3 Select the waveform for recording.

Up to 3 waveforms can be selected. If the output recorder is 8ch recorder, up to 8 waveforms can be selected.

The waveform position will be automatically adjusted when recording.

Alarm will record the waveform which generated the alarm.

If central recorder or 8ch recorder is selected as output recorder, **BP7**, **BP8** can not be selected.



4 Select the recording factor.

Factor HR Other Arrhy.

Select the recording factor for alarm recording.

HR will start the alarm recording when the HR or PR alarm is generated.

Other will start the alarm recording when the numeric alarm other than HR and PR alarm is generated.

Arrhy. will start the alarm recording when the arrhythmia alarm is generated.

5 Select the recording duration.

Rec.Dura. 12sec 24sec Page

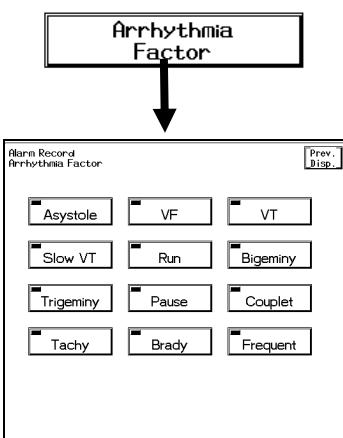
Select the recording duration from 12sec, 24sec.

The recording will automatically stop after the selected time.
If 8ch recorder is selected as output recorder, Page can be selected.

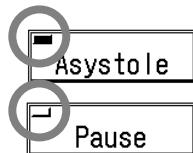
NOTE	The delay time differs depending on the recording time.				
	Recording Time	Delay Time			
		Adult		Child	Neonate
		Numeric Alarm	Arrhythmia Alarm		
	12 sec.	12 sec.	12 sec.	8 sec.	12 sec.
	24 sec.	16 sec.	16 sec.	16 sec.	16 sec.

6 Select the arrhythmia type.

If arrhythmia is selected for the recording factor, select the arrhythmia type.



Pressing the Arrhythmia Factor key will display the arrhythmia selection window for alarm recording.



Selected as alarm recording factor.

Not selected as alarm recording factor.

7 Start the alarm recording.

Alarm Rec. ON OFF

ON will automatically start the recording at alarm occurrence.
If alarm recording is not required, select OFF.

NOTE	The data at alarm occurrence time will be recorded.
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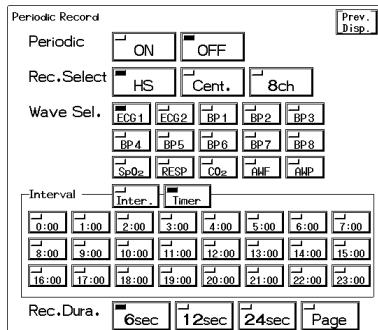
Periodic Recording

The recording will be automatically performed with the selected interval. Periodic recording can be performed on the central monitor connected on the wired network system.

NOTE

- If the periodic recording was interrupted due to paper out, etc., only the latest periodic recording will be performed when it becomes recordable again.
- QRS judgment will not be output for the periodic recording.

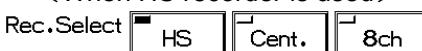
1 Press the **Menu** → **System Configuration** → **Record** → **Periodic Record** keys.



The periodic recording setup menu will be displayed.

<When HS recorder is used>

<When HS recorder is used>



HS will record on the Super Module recorder.

IB will record on the HR-500 module.

Cent. will record on the central monitor recorder.

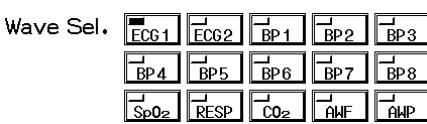
8ch will record on the 8ch recorder connected to the DS-LANII network.

The central monitor recorder of the smallest central ID will be used. 8ch recorder selection can be performed on the recorder setup menu.

NOTE

HS is the default setting for the periodic recording output recorder. If using the Super Module without a built-in recorder (HS-710, HS-710E), make sure to select **IB**, **Cent.**, or **8ch** for the output recorder.

2 Select the output recorder.



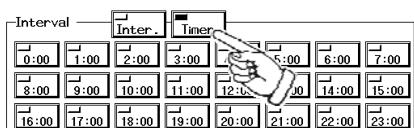
Up to 3 waveforms can be selected. If the output recorder is 8ch recorder, up to 8 waveforms can be selected.

The waveform position will be automatically adjusted when recording.

If central recorder or 8ch recorder is selected as output recorder, **BP7**, **BP8** can not be selected.

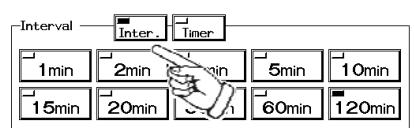
3 Select the waveform for recording.

Interval recording and timer recording can be selected for periodic recording.



Press the **Timer** key.

The recording will automatically start at the programmed time. Select the time to start recording.



Press the **Inter.** key.

The recording will automatically start with the selected interval. If 5 min. is selected, recording will start at 10:00, 10:05, ... 10:25.

If 60 min. is selected, recording will start at 10:00, 11:00, ... 12:00.

5 Select the recording duration.

Rec.Dura. 6sec 12sec 24sec Page

Select the duration from **6 sec**, **12 sec**, **24 sec**, **Page** keys.

The recording will automatically stop after the selected time.

If **8ch** is selected for the recorder, **Page** can be selected.

6 Start the periodic recording.

Periodic ON OFF

ON will activate the periodic recording with the selected interval. If periodic recording is not necessary, select **OFF**.

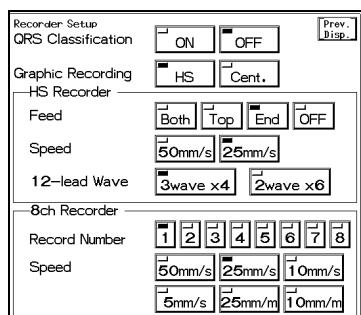
NOTE

8ch key for Recorder Selection will be displayed only when DS-LANII network is used.

Recorder Setup

The recording condition common to manual, periodic, alarm recording, and output recorder for graphic recording can be set.

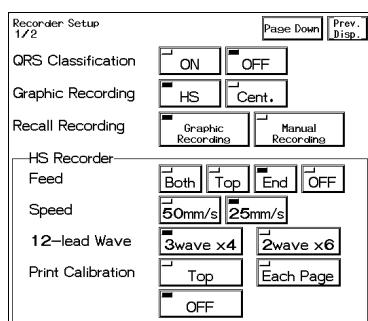
1 Press the **Menu** → **System Configuration** → **Record** → **Setup** keys.



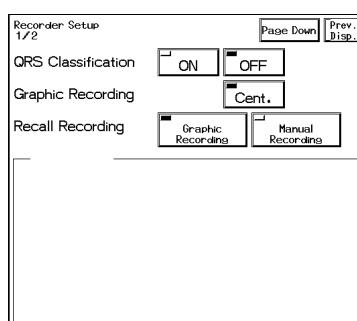
The recorder operation setup menu will be displayed.

The display will differ depending on the used recorder (HS built-in recorder or HR-500 Recorder Module inserted in the input box.)

<When HS recorder is used>



<When HR-500 module is used>



2 Select ON/OFF of QRS classification symbol recording.

QRS Classification ON OFF

ON will record the QRS classification symbol on to the ECG waveform.

Symbol	Description
N (Normal)	Normal QRS beat
V (VPC)	Ventricular Extrasystole
S (SVPC)	Supraventricular 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

NOTE	<ul style="list-style-type: none"> ● The QRS classification symbol cannot be recorded for the manual recording without delay time and periodic recording. To record the QRS classification symbol, set the delay time to 8 seconds or 16 seconds for manual recording. ● The "S" (QRS symbol) printed on the HS built-in recorder will be printed as "N" on the central recorder, AU-5500N, and HR-500 Recorder Module.
-------------	---

3 Select the output recorder for the graphic recording.

Graphic Recording

<input type="checkbox"/> HS	<input type="checkbox"/> Cent.
-----------------------------	--------------------------------

 HS will record on the Super Module recorder. Cent. will record on the central monitor recorder.

The central monitor recorder of the smallest ID will be used.

When HR-500 module is used, only Cent. can be selected.

4 Select the output recorder for recall recording

Recall Recording

<input type="checkbox"/> Graphic Recording	<input type="checkbox"/> Manual Recording
--	---

 Graphic Recording will output on the recorder selected at procedure 3. Manual Recording will output on the recorder for manual recording.

5 Set the recorder operation for the HS recorder.

NOTEThis setup can be performed only when the HS recorder is effective by setting Yes for "HS Recorder" on the Recorder Setup menu.HS Recorder
Feed

<input type="checkbox"/> Both	<input type="checkbox"/> Top	<input type="checkbox"/> End	<input type="checkbox"/> OFF
-------------------------------	------------------------------	------------------------------	------------------------------

Set the paper feed operation for the recorder.

 Both will start the recording from the perforation, and feeds the paper to the next perforation after recording so that the paper can be easily cut off. Top will start the recording from the perforation, and will not feed the paper after recording. End will start the recording from the position where the previous recording ended, and feeds the paper to the next perforation after recording so that the paper can be easily cut off. OFF will start the recording from the position where the previous recording ended, and will not feed the paper after recording.

Speed

<input type="checkbox"/> 50mm/s	<input type="checkbox"/> 25mm/s
---------------------------------	---------------------------------

Set the recording speed for the super module recorder.

12-lead Wave

<input type="checkbox"/> 3wave x4	<input type="checkbox"/> 2wave x6
-----------------------------------	-----------------------------------

Set the recording format for the 12-lead waveform.

 3wave x4 will record 3 waveforms/row x 4 rows.

1st row: I, II, III / 2nd row: aVR, aVL, aVF / 3rd row: V1, V2, V3 / 4th row: V4, V5, V6

 2wave x6 will record 2 waveforms/row x 6 rows.

1st row: I, II / 2nd row: III, aVR / 3rd row: aVL, aVF / 4th row: V1, V2 / 5th row: V3, V4 / 6th row: V5, V6

Select whether or not to print the calibration waveform.

Print Calibration

<input type="checkbox"/> Top	<input type="checkbox"/> Each Page
OFF	

 Top will print the calibration waveform at the beginning of the waveform. Each Page will print the calibration waveform on each page. OFF will not print the calibration waveform.

6 Press the **Page Down** key and select the 8ch recorder and recording speed.

8ch Recorder

Record Number

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
----------------------------	----------------------------	----------------------------	----------------------------	----------------------------	----------------------------	----------------------------	----------------------------

The wired network system is capable of connecting maximum of eight 8ch recorders. Select the recorder number if 8ch recorder is selected as output recorder.

The recorder number which is not connected to the network cannot be selected.

Speed	<input type="checkbox"/> 50mm/s	<input type="checkbox"/> 25mm/s	<input type="checkbox"/> 10mm/s
	<input type="checkbox"/> 5mm/s	<input type="checkbox"/> 25mm/m	<input type="checkbox"/> 10mm/m

Set the recording speed for the 8ch recorder.

This setup will not be displayed if DS-LANIII network is used. AU-5500N 8-channel Recorder cannot be used on the DS-LANIII network.

7 If HR-500 Module and HS recorder is simultaneously used, select which recorder to use.

HS Recorder

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Select "No" if using the input box recorder.

When using the HS built-in recorder, select Yes.

When using the HR-500 Recorder Module, select No.

Freeze Recording

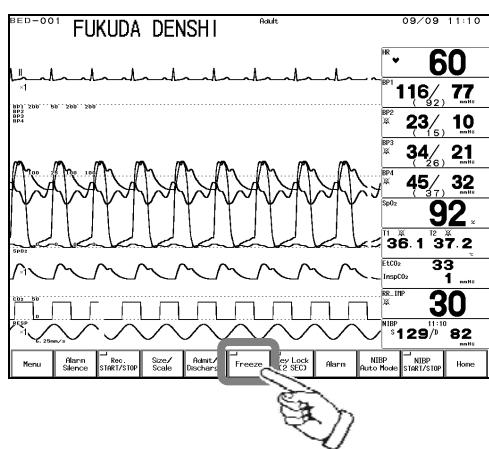
The waveform display can be frozen and recorded from 12 seconds prior to the frozen point.

The recording duration is fixed as 12 seconds.

To freeze the waveform display, the **Freeze** key needs to be assigned as user key.

1 Freeze the waveform display.

Press the **Freeze** key on the user key.



2 Start freeze recording.

Press the **Record START/STOP** key to record the displayed waveform.

The freeze recording will be output to the HS built-in recorder or HR-500 Recorder Module.

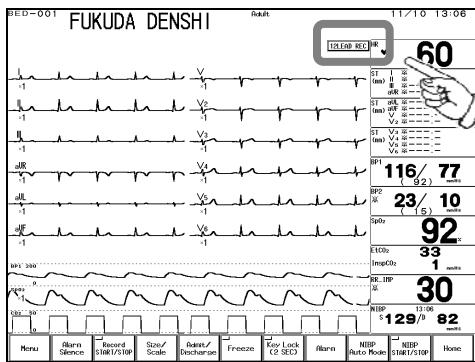
The waveform set for the manual recording will be recorded.

12-lead Waveform Recording

When the 12-lead display mode is set, pressing the [12LEAD REC] key displayed on the home display will record the 12-lead waveform.

1 Set the display mode to 12-lead display.

The 12-lead waveform can be recorded only on the HS recorder. The [12LEAD REC] key will be displayed on the home display.



2 Record the 12-lead waveform.

Pressing the [12LEAD REC] key will start the recording.

- On the recorder setup menu, select [HS Recorder] for the graphic recording output recorder.
- Select the recording format (3 wavex4, 2 wavex6) on the recorder setup menu.
- The recording duration is fixed as 6 seconds.
- Each waveform will be recorded with a same phase.

Graphic Recording (Graphic/Tabular Trend, etc.)

Graphic trend recording, tabular trend recording, NIBP list recording, recall recording, and Vigilance list recording can be performed.

 Reference

Refer to respective section of "7. Function" for recording procedure.

Graphic Trend

3 (three) parameters from the following can be selected for graphic recording.

Parameter	Description
HR	HR, PR (PR_SpO ₂), PR (PR_IBP)
ST	ST(I), ST(II), ST(III), ST(aVR), ST(aVL), ST(aVF), ST(V), ST(V2), ST(V3), ST(V4), ST(V5), ST(V6)
VPC	VPC beats
BP1	BP1 (SYS / Mean / DIA)
BP2	BP2 (SYS / Mean / DIA)
BP3	BP3 (SYS / Mean / DIA)
BP4	BP4 (SYS / Mean / DIA)
BP5	BP5 (SYS / Mean / DIA)
BP6	BP6 (SYS / Mean / DIA)
BP7	BP7 (SYS / Mean / DIA)
BP8	BP8 (SYS / Mean / DIA)
PDP	Peak Diastolic Pressure
CPP	Cerebral Perfusion Pressure
NIBP	NIBP (SYS / Mean / DIA)
SpO ₂	SpO ₂ value
TEMP1, TEMP2	TEMP1, TEMP2
TEMP3, TEMP4	TEMP3, TEMP4
TEMP5, TEMP6	TEMP5, TEMP6
TEMP7, TEMP8	TEMP7, TEMP8
Tb	Blood Temperature
RR	Impedance Resp. (RR), CO ₂ Resp. (RR_CO ₂), Ventilator Resp. (RR_VENT)
APNEA	Apnea Time (Impedance, CO ₂ , Ventilator)
CO ₂	EtCO ₂ /InspCO ₂
Svo ₂	Mixed Venous Oxygen Saturation
ScvO ₂	Central Venous Oxygen Saturation
CCO	Continuous Cardiac Output
CCI	Continuous Cardiac Index
BT	Blood Temperature (Vigilance Data)
GAS_O ₂	O ₂ _E/O ₂ _I
ΔO ₂	Oxygen uptake
GAS_N ₂ O	N ₂ O_E/N ₂ O_I
GAS_AGT	AGT_E/AGT_I, AGT2_E/AGT2_I
GAS_CO ₂	CO ₂ _E/CO ₂ _I
MAC	MAC value
BIS	BIS Monitor Data
EVENT1	ASYSTOLE, VF, VT, SLOW_VT, RUN, BIGEMINY
EVENT2	TRIGEMINY, PAUSE, COUPLETT, TACHY, BRADY, FREQUENT

Tabular Trend

17 parameters from the following can be displayed / recorded as tabular trend.

Parameter	Description
HR	HR, PR (PR_SpO ₂), PR (PR_IBP)
ST	ST (I), ST (II), ST (III), ST (aVR), ST (aVL), ST (aVF), ST (V), ST (V2), ST (V3), ST (V4), ST (V5), ST (V6)
VPC	VPC beats
BP	BP (SYS): BP1-S, BP2-S, BP3-S, BP4-S, BP5-S, BP6-S, BP7-S, BP8-S BP (Mean): BP1-M, BP2-M, BP3-M, BP4-M, BP5-M, BP6-M, BP7-M, BP8-M BP (DIA): BP1-D, BP2-D, BP3-D, BP4-D, BP5-D, BP6-D, BP7-D, BP8-D
PDP	Peak Diastolic Pressure
CPP	Cerebral Perfusion Pressure
PCWP	PCWP (Pulmonary Capillary Wedge Pressure)
NIBP	NIBP (SYS / Mean / DIA): NIBP-S, NIBP-M, NIBP-D
SpO ₂	SpO ₂ value
TEMP	T1, T2, T3, T4, T5, T6, T7, T8
Tb	Blood Temperature
RR	Impedance Resp. (RR), CO ₂ Resp. (RR_CO ₂), Ventilator Resp. (RR_VENT)
APNEA	Apnea Time (Impedance, CO ₂ , Ventilator)
EtCO ₂	EtCO ₂ value
InspCO ₂	InspCO ₂ value
SvO ₂	Mixed Venous Oxygen Saturation
ScvO ₂	Central Venous Oxygen Saturation
CCO	Continuous Cardiac Output
CCI	Continuous Cardiac Index
BT	Blood Temperature (Vigilance Data)
CO ₂ E/CO ₂ I	End-tidal Carbon Dioxide/ Inspired Carbon Dioxide
O ₂ E/O ₂ I	Expired Oxygen/ Inspired Oxygen
N ₂ O E/ N ₂ O I	Expired Nitrous Oxide/ Inspired Nitrous Oxide
AGT_E/AGT_I	Expired Agent gas/ Inspired Agent gas
AGT2_E/AGT2_I	Expired Agent gas/ Inspired Agent gas
MAC	MAC value
BIS	BIS, BIS_SQI, BIS_EMG, BIS_SR (BIS Monitor Data)

NIBP List

The numeric data for the following parameters can be recorded.

Parameter	Description
HR	HR
PR_SpO ₂	PR (PR_SpO ₂)
SpO ₂	SpO ₂ value
NIBP	NIBP (SYS / Mean / DIA)

Recall

The waveform and numeric data at alarm occurrence will be recorded with the following setup.

Parameter	Description
Waveform (Max. 2)	ECG1, ECG2, BP1–BP8, SpO ₂ , CO ₂ , RESP
Numeric	HR, ST, NIBP, BP1–BP8, RR, APNEA, SpO ₂ , T1–T8, Tb, CO ₂
Arrhythmia Factor	ASYSTOLE, VF, VT, SLOW VT, RUN, BIGEMINY, TRIGEMINY, PAUSE, COUPLET, TACHY, BRADY, FREQUENT
Recording Duration	12 sec.

Respiration List

17 parameters from the following can be selected for list recording.

Parameter	Description
RR_IMP	Impedance RR
RR_CO ₂	CO ₂ RR
RR_VENT	Ventilator RR
SpO ₂	SpO ₂ value
APNEA	Apnea time (Impedance, CO ₂ , Ventilator)
E-TV	Expiratory Tidal Volume
I-TV	Inspiratory Tidal Volume
MV	Minute Ventilation
SMV	Spontaneous Minute Ventilation
P_PEAK	Maximum Airway Pressure
P_PAUSE	Pause Airway Pressure
PEEP	Peak End Expiratory Pressure
P_MEAN	Mean Airway Pressure
D-RES	Dynamic Resistance
S-RES	Static Resistance
D-COMP	Dynamic Compliance
S-COMP	Static Compliance
P_Min	Minimum Airway Pressure
S_RR	Spontaneous Respiration
FIO ₂	Fractional Concentration of Inspiratory Gas
EtCO ₂	EtCO ₂ value
SvO ₂	Mixed Venous Oxygen Saturation
ScvO ₂	Central Venous Oxygen Saturation
CCO	Continuous Cardiac Output
CCI	Continuous Cardiac Index
CO ₂ _E	End-tidal Carbon Dioxide
CO ₂ _I	Inspired Carbon Dioxide
O ₂ _E	Expired Oxygen
O ₂ _I	Inspired Oxygen
N ₂ O_E	Expired Nitrous Oxide
N ₂ O_I	Inspired Nitrous Oxide
AGT_E, AGT2_E	Expired Agent gas
AGT_I, AGT2_I	Inspired Agent gas
MAC	MAC value

Vigilance List

17 parameters from the following can be selected for list recording.

Parameter	Description
SvO ₂	Mixed Venous Oxygen Saturation
ScvO ₂	Central Venous Oxygen Saturation
SaO ₂	Arterial Oxygen Saturation
O ₂ EI	Oxygen Uptake Index
DO ₂	Oxygen Transport
VO ₂	Oxygen Consumption
SV	Stroke Volume
SV_STAT	Stroke Volume (STAT Mode)
SVI	Stroke Volume Index
SVI_STAT	Stroke Volume Index (STAT Mode)
HR	Heart Rate
MAP	Mean Arterial Pressure
CVP	Central Venous Pressure
CCO	Continuous Cardiac Output
CCO_STAT	Continuous Cardiac Output (STAT Mode)
CCI	Continuous Cardiac Index
CCI_STAT	Continuous Cardiac Index (STAT Mode)
SVR	Systemic Vascular Resistance
SVRI	Systemic Vascular Resistance Index
B_Temp	Blood Temperature
EF	Ejection Fraction
EF_STAT	Ejection Fraction (STAT Mode)
EDV	End-Diastolic Volume
EDV_STAT	End-Diastolic Volume (STAT Mode)
EDVI	End-Diastolic Volume Index
EDVI_STAT	End-Diastolic Volume Index (STAT Mode)
ESV	End-Systolic Volume
ESVI	End-Systolic Volume Index
SVV	Stroke Volume Variance

Telemetry Remote Recording

For the Super Module without the recorder (HS-710, HS-710E), telemetry remote recording can be performed if the telemetry transmitter module is used.

Select **[HS]** for the manual recording output recorder and press the **[Record Start/Stop]** key. The remote recording will be performed on the central monitor which is monitoring the corresponded bed.



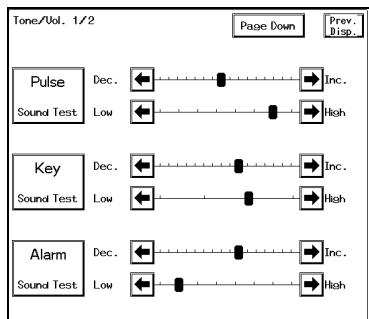
Refer to operation manual of the central monitor for recording waveform and recording duration.

Volume Setup

Pulse Tone, Alarm Sound, etc.

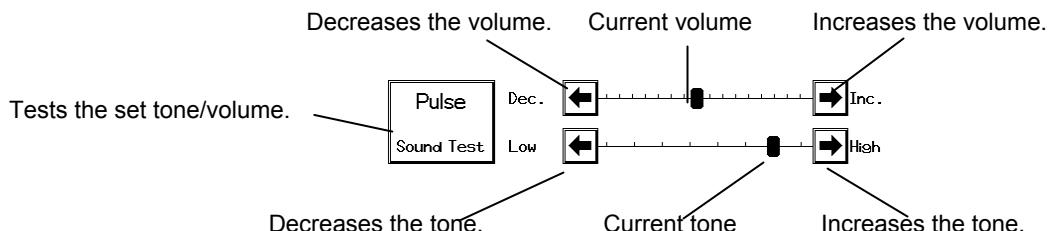
This menu allows volume setup of the pulse tone, alarm sound, key sound and other bed alarm sound. The ON/OFF of ventilator alarm sound can be also selected.

- 1 Press the **Menu** → **Tone / Volume** keys.

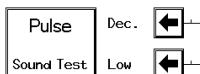


The tone/volume setup menu will be displayed.

<Tone/Volume Setup Menu>



- 2 Set the tone/volume for the pulse sound.



The HR synchronized sound, SpO₂ synchronized sound, BP synchronized sound can be adjusted.

NOTE

The tone setup is only effective for HR synchronized sound and BP synchronized sound. The tone for SpO₂ synchronized sound will change according to the SpO₂ value. The tone will increase as the SpO₂ value increases and decreases as the SpO₂ value decreases.

- 3 Set the tone/volume for the key sound.

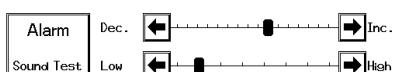


The tone/volume of the key sound can be adjusted.

NOTE

The pulse sound and key sound will be silenced if set to the minimum volume.

- 4 Set the tone/volume for the alarm sound.

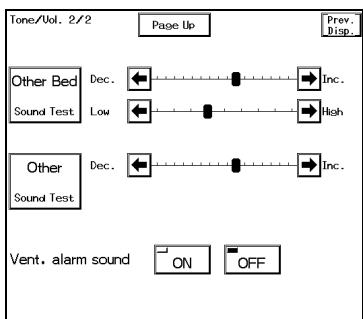


The volume of the numeric data alarm, arrhythmia alarm, equipment status alarm can be adjusted.

CAUTION

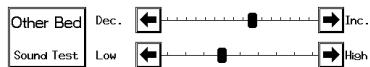
Pay attention not to set the alarm volume too low to avoid missing any important alarms.

- 5** Press the **Page Down** key and adjust the tone/volume of the other bed alarm sound and other sound.



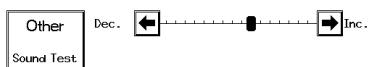
Adjust the tone/volume of the other bed alarm and other sound.

- 6** Set the tone/volume for the other bed alarm sound.



The tone/volume of the other bed alarm sound can be adjusted.

- 7** Set the volume for the other sound.



The volume of the sound which notifies the completion of BP zero balance, NIBP measurement, etc. can be adjusted.

- 8** Select ON/OFF for the ventilator alarm sound.

Vent. alarm sound

<input type="checkbox"/>	ON	<input checked="" type="checkbox"/>	OFF
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If ventilator alarm sound is not necessary, select **OFF**.
To generate an alarm sound in a same volume with the numeric data alarm and arrhythmia alarm, select **ON**.

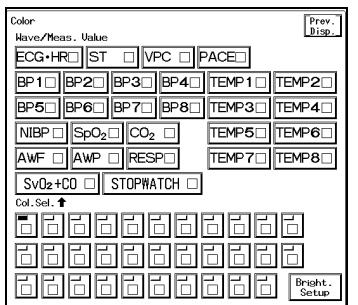
Color / Brightness Setup

This menu allows the setup of the colors of numeric data / waveform and brightness of the display.

Color Setup (Numeric Data, Waveform)

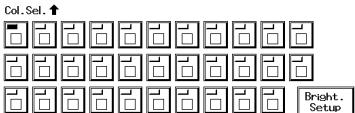
The displayed color for each parameter can be selected from the 32-color palette.

- 1 Press the **Menu** → **System Configuration** → **Color** keys.



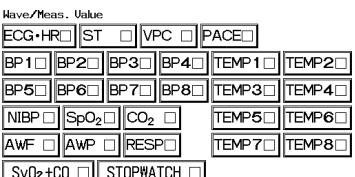
<Color Setup Menu>

- 2 Select the color from the 32-color palette.



Press the key of the desired color.

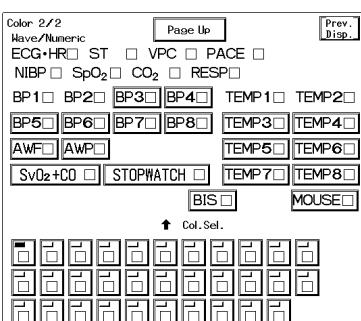
- 3 Assign the selected color to the parameter.



Press the parameter key to assign the selected color.

The selected color for the parameter will be applied to the waveform, numeric data, graphic trend, and tabular trend.

- 4 Press the **Page Down** key, and set the color for each parameter with the same procedure.

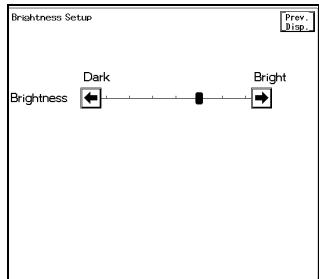


Selecting **MOUSE** will allow to set the color of the mouse pointer.

Brightness Setup

The brightness of the display can be adjusted.

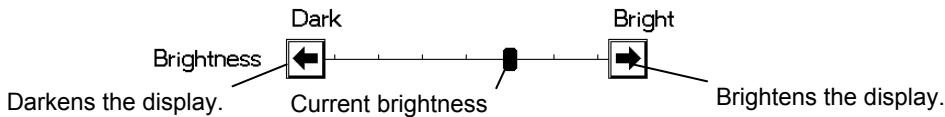
- 1 Press the **Menu** → **System Configuration** → **Brightness Setup** keys.



<Brightness Setup Menu>

- 2 Adjust the brightness.

Use the **[←]**, **[→]** keys to adjust the brightness.



The display panel utilizes exclusive fluorescent light for the backlight. Since this fluorescent light deteriorates with its life cycle, the display may become dark, scintillate, or may not light in long term use. In such case, contact your nearest service representative.

This section explains the procedure to set the wireless network channel and transmitting waveform.

By connecting the telemetry transmitting module (HLX-561) to the DS-7300, wireless network system can be constructed.

Once the transmitting channel ID and group ID are programmed, these will be stored on the telemetry transmitter module even after the main power is turned OFF.



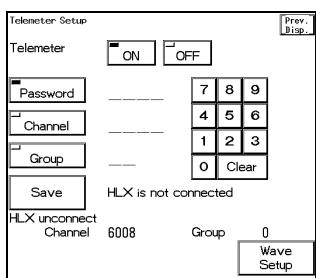
Before using the telemetry transmitter module (HLX-561), set the port to connect the HLX-561 in advance. Refer to "8. System Configuration Hospital Setup Serial Communication Setup".

CAUTION	<ul style="list-style-type: none">When performing telemetry transmission, the numeric data corresponding to the waveform should be selected for display. Otherwise, the displayed waveform or numeric data may not be transmitted.The setup of channel ID and group ID should be performed only by our service representative. Users should not perform this procedure as malfunction to the equipment may occur.If the measurement unit is “°F” and “kPa” on the DS-7300 system, it will be converted to “°C” and “mmHg” respectively when transmitted to the central monitor. If the measurement unit “°F” and “kPa” are set on the central monitor, it will be reconverted to the value in “°F” and “kPa” after transmitted to the central monitor.BP waveform with a scale above the programmed scale can not be properly transmitted. When transmitting the BP waveform, check the displayed BP waveform scale.On a wireless network system, O₂, N₂O, AGT alarm generation will not be transmitted to the central monitor.For the alarm generation on the bedside monitor, maximum of 15 seconds delay will occur for the alarm generation on the central monitor.If the measurement unit of CO₂ concentration is “mmHg”, and 99mmHg is selected for “CO₂(mmHg) Upper Limit for LAN, Telemetry” on the monitor setup menu, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg.
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Channel ID Setup

It is necessary to set the channel ID in order to connect to the wireless network.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Hospital Setup** → **Telemeter Setup** keys.



<Telemetry Setup Menu>

- 2 Select ON/OFF for telemetry transmission.

- 3 Enter the password.



Press the **Password** key, and enter the password.
Use the numeric keypad to enter the password. (6413 or 7300)
The entered number will be displayed as “* * * *”.

4 Enter the channel ID.



Press the **Channel** key, and enter the channel ID.

Use the numeric keypad to enter the 4-digit medical telemetry channel ID.

5 Enter the group ID.



Press the **Group** key, and enter the group ID.

Use the numeric keypad to enter the group ID in the range from 00–63.

6 Save the telemetry channel ID and group ID.



Press the **Save** key to store the channel ID and group ID. Verify that the “Complete” message is displayed.

If an error is found on the password, channel ID, or group ID, the following message will be displayed.

- | | |
|--|--|
| “Invalid password”
“Invalid data” | : The entered password is incorrect. Enter the password again and press the Save key.
: The entered channel ID or group ID is outside the programmable range. Enter the ID within the range and press the Save key. |
|--|--|

7 Verify the stored telemetry channel ID and group ID.

Channel 6008

Group 0

WARNING	<ul style="list-style-type: none"> ● A password can be set to access the channel ID setup menu to allow only the telemetry channel administrator to change the channel ID. ● Some 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.
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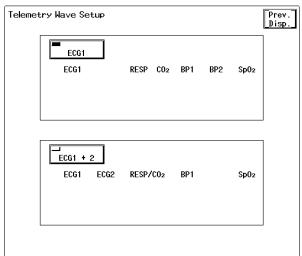
NOTE	When the DS-7300 system indicates that the measurement data is out of range (“xxx” display), the minimum or maximum value of the range will be displayed at the central monitor.		
	HR RR BP TEMP CO₂ (mmHg) CO₂ (kPa, %)	[Out of range] 301bpm or above 151Bpm or above –51mmHg or below 301mmhg or above –6.8kPa or below 40.1kPa or above –0.1°C or below 50.1°C or above 31.9°F or below 122.1°F or above 100mmHg or above 13.3 (kPa, %) or above	[Central Monitor] Calculates based on ECG waveform. 150Bpm Calculates if impedance respiration. –50mmHg 300mmHg –6.7kPa 40.0kPa If the measurement unit is kPa, it will be converted to mmHg when transmitted to the central monitor. 0°C 46.1°C 32°F 115.0°F If the measurement unit is °F, it will be converted to °C when transmitted to the central monitor. 99mmHg 13.2 (kPa, %)

*If the temperature measurement value is 46.1°C (115.0°F) or above, 46.1°C (115.0°F) will be displayed at the central monitor.

Transmitting Waveform Setup

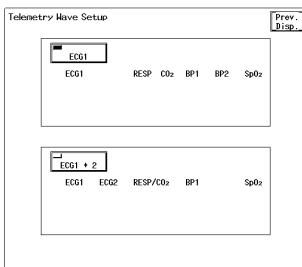
This function allows to select the transmitting waveform.

- 1 Press the **Menu** → **System Configuration** → **Telemetry Wave Setup** keys.



<Telemetry Wave Setup Menu>

- 2 Select the waveform to transmit.



Select the waveform to transmit from **ECG1**, **ECG1+2**.

Selecting **ECG1** will transmit ECG1, CO₂, RESP, BP1, BP2, SpO₂. However, if APNEA source is CO₂, respiration waveform will not be transmitted.

Selecting **ECG1+2** will transmit ECG1, ECG2, CO₂/RESP, BP1, SpO₂.

CO₂ and RESP waveform to be transmitted will be in accordance with APNEA source setup.

CAUTION

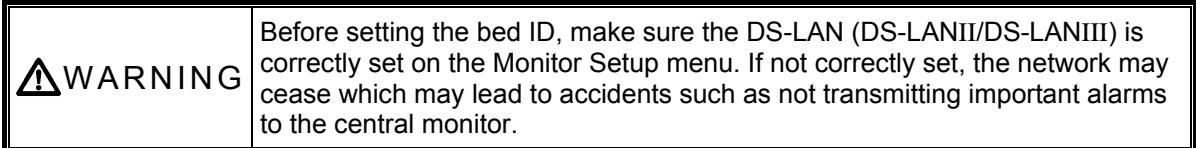
- If the temperature unit is °F and BP unit is kPa, it will be converted to °C and mmHg respectively when transmitted.
- BP waveform with a scale above the programmed scale can not be properly transmitted. When transmitting the BP waveform, check the displayed BP waveform scale.
- On a wireless network system, O₂, N₂O, AGT alarm generation will not be transmitted to the central monitor.
- If the measurement unit of CO₂ concentration is "mmHg", and **99mmHg** is selected for "CO₂(mmHg) Upper Limit for LAN, Telemetry" on the monitor setup menu, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg.

NOTE

The waveform not displayed on the home display can not be transmitted.

Wired Network Connection

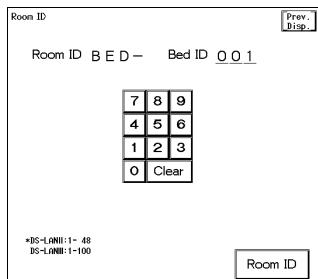
This section describes the procedure to set the Room / Bed ID.
The set Room / Bed ID will be remain stored even when the power is turned off.



Room / Bed ID Setup

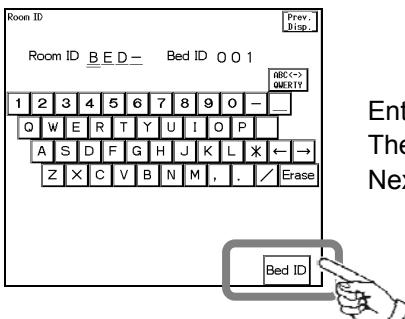
To connect to a wired network (DS-LANII, DS-LANIII, or 1:N network), it is necessary to set the Room / Bed ID.

- 1 Press the **Menu** → **Admit / Discharge** → **Bed ID** keys.



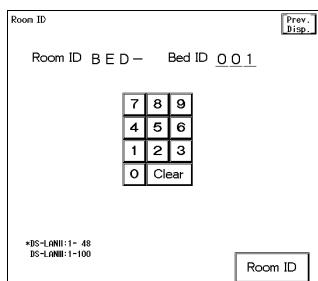
<Room / Bed ID Setup Menu>

- 2 Set the Room ID.



Enter the Room ID using the alphanumeric keypad.
The entered ID will be displayed on the upper left of the screen.
Next, press the **Bed ID** key to display the Bed ID menu.

- 3 Set the Bed ID.



Enter the Bed ID using the numeric keypad.
The entered ID will be displayed on the upper left of the screen.
When connecting to the DS-LANII network, set the ID in the range from 001 to 048.
When connecting to the DS-LANIII network, set the ID in the range from 001 to 100.
When connecting to the 1:N network (DS-LANII network with AU-5500N as administrator), set the ID in the range from 001 to 016.

⚠ CAUTION

- If performing wired network transmission, configure the display so that the numeric data corresponded to the waveform is displayed. If not, the displayed waveform or numeric data may not be transmitted.
- The bed ID is factory set to "000". If used on a wired network with the default ID unchanged, monitoring will not be possible.
- When using on a wired network, make sure that there are no other bedside monitors with the same ID. If there are more than one bedside monitors with the same bed ID, the duplicated bedside monitors cannot be monitored.
- Make sure to set the bed ID in the following range.
 - For DS-LANII network: 001 to 048
 - For DS-LANIII network: 001 to 100
 - For 1:N network: 001 to 016
- As the DS-7300 do not have the arrhythmia template display and 12-lead ST display function, these displays on the central monitor will not be corresponded.
- If connected to a wired network, time/date will be the same with the central monitor. Even if the time/date is changed on the DS-7300 system, it will be corrected to the time/date of the central monitor.
- The setups for "HR Low Limit for VT" and "HR Low Limit for Run" cannot be performed on some central 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.
- If ECG lead (ECG1 or ECG 2) is changed on the DS-7300 while monitoring ST display on the central monitor, the ST display will be distorted. Redrawing the ST display will return the display to normal.
- The respiration waveform and RR value based on the RR/APNEA alarm source selected on the DS-7300 will be displayed on the central monitor. RR and APNEA will be the same as the one monitored on the DS-7300.
- If [BP1] is selected for "HR/PR source" (Or, if [Auto] selects BP1 for HR/PR source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_BP value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list.
In case of DS-LANIII network, refer to the operation manual for the central monitor.
- There are following restrictions when connecting the DS-7300 system to the DS-LANII network.
 - When DS-5800N/NX/NX^{MB} is used as a central monitor, recall, graphic trend, and tabular trend will not be displayed. Also, Σ recording cannot be performed.
 - On the ST display, overlap waveform will not be displayed on the DS-5800N/NX/NX^{MB} until 15 minutes have passed since the reference waveform is set on the DS-7300.
 - If the measurement unit for BP (mmHg/kPa) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
 - When the temperature unit is °F, the temperature data will not be transmitted. It will be treated as not measured data, and will not be displayed on the central monitor. Also, alarm limit setup on the central monitor cannot be performed.
 - Arrhythmia alarm of Tachy, Brady, Couplet, Pause, Trigeminy will not be transmitted.
 - Arrhythmia alarm of "SLOW_VT" will be transmitted as "VT".
 - On a DS-LANII network, waveform, numeric data, alarm of BP7, BP8, TEMP3–8 will not be transmitted. Also, the displayable waveform, numeric data, alarm differs depending on the connected central monitor. Refer to the operation manual for the respective central monitor.
 - If DS-7600 system is used as the central monitor, O₂, N₂O, AGENT alarm will not be generated on the central monitor.
 - If the RR/APNEA alarm source is other than impedance respiration, the respiration waveform will not be transmitted on a wired network.
 - If the RR/APNEA alarm source is other than CO₂, the CO₂ waveform will not be transmitted on a wired network.

 CAUTION	<ul style="list-style-type: none">• For numeric data displayed as "xxx", maximum or minimum value of measurable range will be transmitted.• The numeric data displayed as "— —" will be treated as not measured data.• If the measurement unit of CO₂ concentration is "mmHg", and 99mmHg is selected for "CO₂(mmHg) Upper Limit for LAN, Telemetry" on the monitor setup menu, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg.● There are following restrictions when connecting the DS-7300 system to the DS-LANIII network.<ul style="list-style-type: none">• 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.• If using a HUB for network construction, use the HUB recommended by Fukuda Denshi.• The displayable waveform, numeric data, alarm will differ depending on the central monitor. Please also refer to the operation manual of the central monitor.● There are following restrictions when recording the DS-7300 data on the central monitor recorder or the AU-5500N 8ch Recorder.<ul style="list-style-type: none">• The AU-5500N can be connected to DS-LANII network only. Do not connect it to DS-LANIII network. Malfunction may occur to the network.• Only manual recording, alarm recording, periodic recording, recall recording can be performed on the AU-5500N.• If the measurement unit of BP is kPa, the BP waveform, BP numeric data, and NIBP numeric data will be treated as not measured data.• If the measurement unit of temperature is °F, the temperature data will be treated as not measured data.• When a parameter is not measured, the waveform for that parameter will not be recorded, and measurement data will be recorded as "— —" or blank.• The measurement data displayed as "xxx" will be recorded as "— —" on the central monitor recorder.• The "S" (QRS judgment) printed on the built-in recorder will be printed as "N" on the central recorder, AU-5500N, and HR-500 Recorder Module.• For the waveform recording and graphic trend recording, some parameters may not be able to be recorded depending on the scale.• When performing tabular trend recording or graphic trend recording on the central recorder, some numeric data may not be recorded depending on the parameter. Also, there are some graphic trend scales that cannot be recorded.• If the HR/PR source is BP, ECG will not be recorded on the central recorder. PR_IBP value will be printed instead for the HR value.• If the RR/APNEA alarm source is other than impedance respiration, the respiration waveform will not be output on the central recorder.• If the RR/APNEA alarm source is other than CO₂, the CO₂ waveform will not be output on the central recorder.• When graphic trend recording, tabular trend recording, or NIBP list recording is output on the central monitor recorder from the DS-7300, HR measurement value from ECG will be recorded for the HR value and ST trend.
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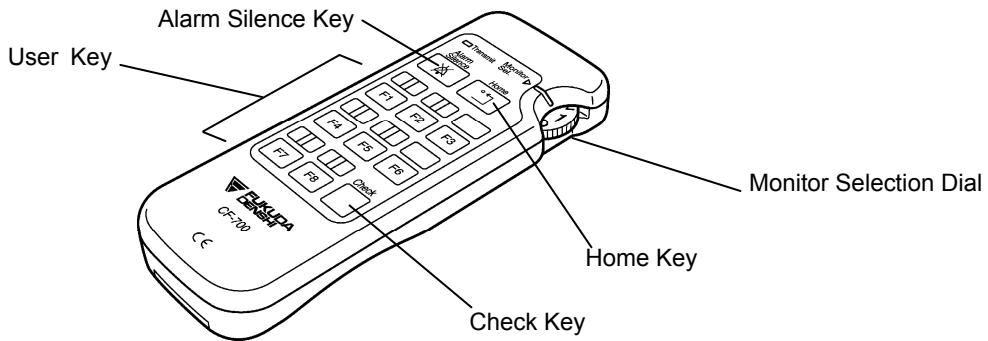
NOTE	When the DS-7300 system indicates that the measurement data is out of range ("xxx" display), the minimum or maximum value of the range will be displayed at the central monitor.		
	【Out of range】		【Central Monitor】
	HR	301bpm or above	300bpm
	RR	151Bpm or above	150Bpm
	BP	-51mmHg or below 301mmhg or above -6.8kPa or below 40.1kPa or above -0.1°C or below 50.1°C or above 31.9°F or below 122.1°F or above	-50mmHg 300mmHg -6.7kPa 40.0kPa 0°C 50.0°C 32°F (DS-LANIII only) 122°F (DS-LANIII only)
	TEMP	100mmHg or above	99mmHg
	CO ₂	13.3 (kPa, %)	13.2 (kPa, %)

Remote Control Setup

This section explains the setup procedure to use the optional remote control unit, CF-700.

About the Remote Control Unit

There are 11 keys on the remote control unit of which 8 keys are user keys.



Monitor Selection Dial

The remote control bed ID to control can be selected. The remote control bed ID should be preprogrammed on each bedside monitor. Maximum of 8 monitors can be controlled on one remote control unit.

Check Key

Displays the remote control bed ID on the bedside monitor. Also, pressing one of the function keys (ex. NIBP START/STOP key) will display a message on the monitor which will ask you to press this Check key.

Alarm Silence Key

This key functions the same as the **Alarm Silence** key on the bedside monitor.

Home Key

This key functions the same as the **Home** key on the bedside monitor.

User Key (F1–F8)

The function for each key can be assigned on the bedside monitor.

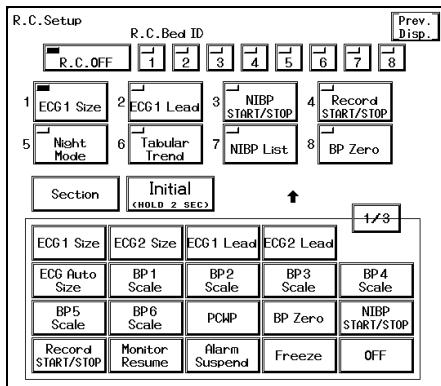
Key	Default	Function
F1	ECG1 Size	Switches the ECG1 size each time the key is pressed. ×1/4→×1/2→×1→×2→×4→×1/4
F2	ECG1 Lead	Switches the ECG1 lead each time the key is pressed. 3-electrode: I→II→III→I 4-electrode: I→II→III→aVR→aVL→aVF→I 5-electrode: I→II→III→aVR→aVL→aVF→V→I 10-electrode: I→II→III→aVR→aVL→aVF→V1→V2→V3→V4→V5→V6→I
F3	NIBP START/STOP	Starts/stops the NIBP measurement. Pressing this key will display a message on the monitor to press the "Check" key. When the "Check" key is pressed, the measurement will start. To cancel the process, press the "Home" key. Pressing this key during the measurement will stop the measurement.
F4	Record START/STOP	Starts/stops the manual recording.
F5	Night Mode	Sets ON/OFF of the Night Mode.
F6	Tabular Trend	Displays list data.
F7	NIBP List	Displays NIBP list.
F8	BP Zero	Starts BP zeroing.

Remote Control Setup

Assign function to 8 user keys on the remote control unit.

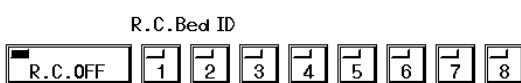
- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **R.C. Setup** keys.

The remote control unit setup menu will be displayed.



- 2 Set the remote control bed ID.

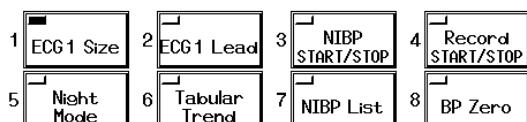
Set the bed ID which will respond to monitor selection dial on the remote control unit.



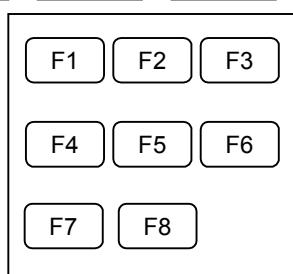
Select the bed ID from **1** to **8**.

Select **R.C. OFF** if not using the remote control function.

- 3 Select the key location.



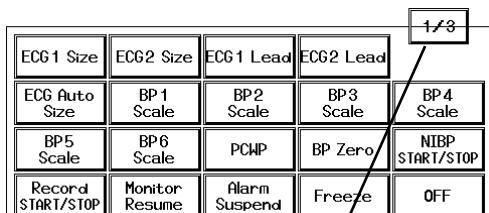
Select the key location of the remote control unit to change or assign a function.



The "F1" key on the remote control unit is the same key as the "1" key on the remote control setup menu.

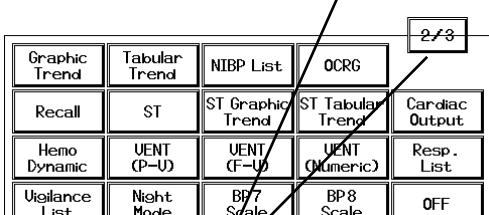
Key Location on the Remote Control Unit

- 4 Select the function.



Select the function to be assigned for the selected key location.

Pressing the function key will assign the function to the selected key location.



Use the **1/3**, **2/3**, **3/3** keys to switch the page for function selection.

Switch page

Functions that can be assigned to the User Keys

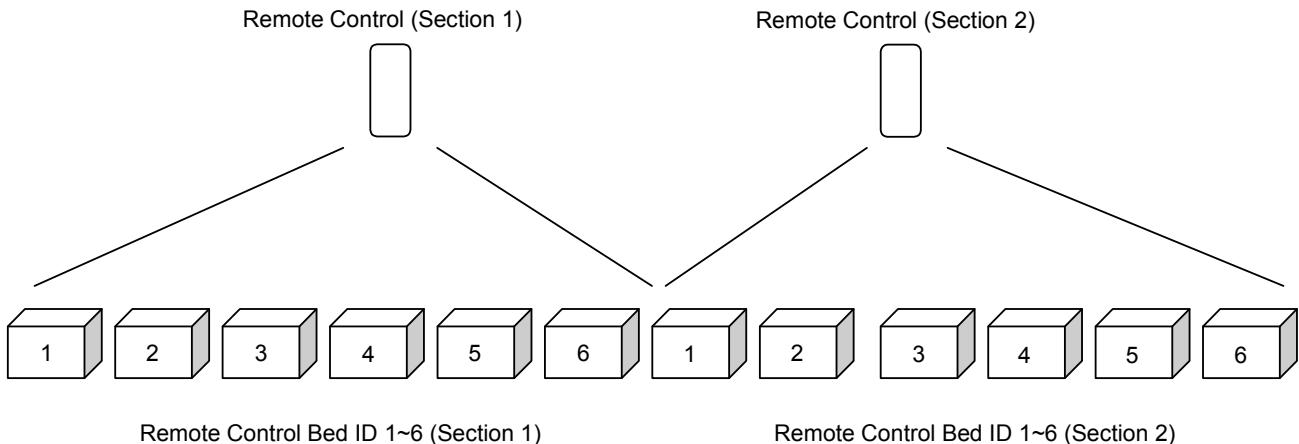
Function	Description
ECG1 Size ECG2 Size	Switches the ECG1 (ECG2) size each time the key is pressed. $\times 1/4 \rightarrow \times 1/2 \rightarrow \times 1 \rightarrow \times 2 \rightarrow \times 4 \rightarrow \times 1/4$
ECG1 Lead ECG2 Lead	Switches the ECG1 (ECG2) lead each time the key is pressed. 3-electrode: I → II → III → I 4-electrode: I → II → III → aVR → aVL → aVF → I 5-electrode: I → II → III → aVR → aVL → aVF → V → I 10-electrode: I → II → III → aVR → aVL → aVF → V1 → V2 → V3 → V4 → V5 → V6 → I
ECG Auto Size	Automatically adjusts the ECG size to 10mm. This function is effective only when the key is pressed.
BP1 (to BP8) Scale	Switches the BP1 (to 8) scale each time the key is pressed. 20 → 50 → 75 → 100 → 150 → 200 → 250 → 300 → 20 (mmHg) 4 → 8 → 12 → 16 → 20 → 24 → 32 → 40 (kPa)
PCWP	If the BP label is PAP, PCWP input menu will be displayed.
BP Zero	Starts zeroing for all BP. It will not function unless the transducers for all BP is opened to air.
NIBP START/STOP	Starts/stops the NIBP measurement. Pressing this key will display a message on the monitor to press the "Check" key. When the "Check" key is pressed, the measurement will start. To cancel the process, press the "Home" key. Pressing this key during the measurement will stop the measurement.
Record START/STOP	Starts/stops the manual recording. The recording duration set on the manual recording setup menu will be applied.
Monitor Resume	Resumes monitoring when the monitoring is suspended.
Alarm Suspend	Suspends the alarm for fixed amount of time. When pressed during the alarm is suspended, the alarm function will resume.
Freeze	Temporarily stops the waveform trace. Pressing the key again will resume the waveform trace.
Graphic Trend	Displays the graphic trend.
Tabular Trend	Displays the tabular trend.
NIBP List	Displays the NIBP list.
OCRG	Displays the OCRG.
Recall	Displays the recall data.
ST	Displays the ST measurement display.
ST Graphic Trend	Displays the ST graphic trend.
ST Tabular Trend	Displays the ST tabular trend.
Cardiac Output	CO measurement menu will be displayed. This key will not start the CO measurement.
Hemodynamic	Hemodynamic calculation menu will be displayed.
VENT (P-V)	Displays P-V loop on the ventilator display.
VENT (F-V)	Displays F-V loop on the ventilator display.
VENT (Numeric)	Displays numeric data on the ventilator display.
Resp. List	Displays respiration list.
Vigilance List	Displays Vigilance list/
Night Mode	Turns ON/OFF the Night Mode.
Config. Enlarge	Switches the display configuration to "Enlarge" mode. Pressing the key again will return the display to previous configuration.
Config. 12LEAD	Switches the display configuration to "12-lead" mode. Pressing the key again will return the display to previous configuration.
OFF	Turns OFF the key operation.

5 Check the setting.

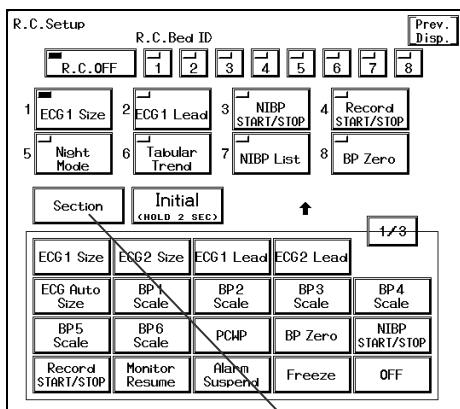
 CAUTION	<ul style="list-style-type: none"> Do not set the same remote control bed ID to more than one monitors on the same floor. Otherwise, it may cause to remote control more than one monitors at the same time. After the remote control setup, check that the remote control unit is properly operating.
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Section Setup

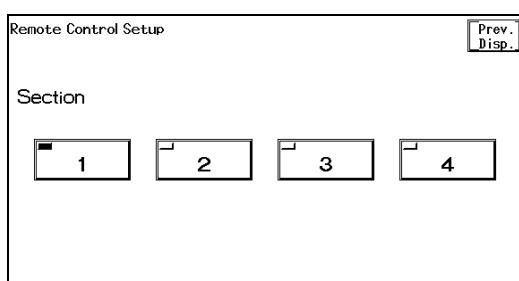
One remote control unit can control a maximum of 8 monitors. When controlling more than 8 monitors, it is necessary to set a section for remote control. If the section is not properly set, the remote control may unintentionally control 2 monitors at the same time. The set section number must be the same between the remote control unit and the monitor.



- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **R.C. Setup** keys.



Press the **Section** key.



Set the section number corresponding to the remote control unit from **1** to **4**.



For procedure to set the section on the remote control unit, refer to the operation manual of the remote control unit.

Alarm Pole Setup

Notifying the Alarm by Light

This monitor is equipped with an alarm pole.

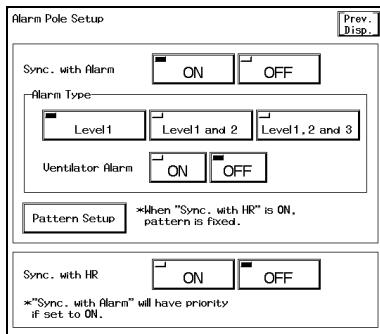
The alarm generation can be indicated with the alarm pole flashing and can be seen from distance.
The alarm pole can be also synchronized with HR.

The alarm pole function setup can be performed for (1) flashing at alarm generation, and for (2) flashing synchronized with HR.

● Flashing the Alarm Pole at Alarm Generation

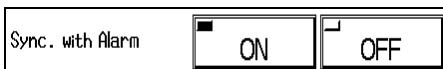
The alarm level to flash the alarm pole and the flash pattern for each alarm level can be set.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **Alarm Pole** keys.



The alarm pole setup menu will be displayed.

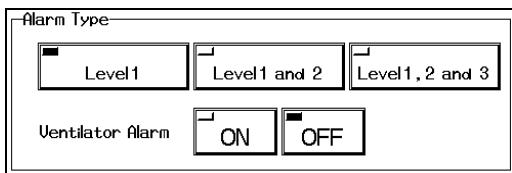
- 2 Select whether the alarm pole should flash at alarm generation.



To flash at alarm generation, select **ON**.

To not flash at alarm generation, select **OFF**.

- 3 Select the alarm type to flash the alarm pole.

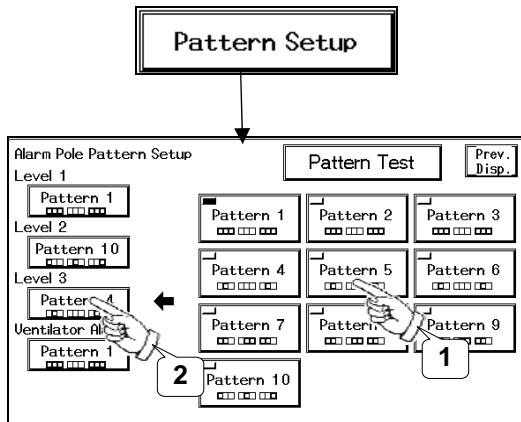


Select the alarm level to flash the alarm pole from **Level 1**, **Level 1 and 2**, and **Level 1, 2, and 3**. Whether to flash the alarm pole at ventilator alarm generation can be also selected. **ON** will flash the alarm pole at ventilator alarm generation.



For alarm description of Level 1, 2, 3, and ventilator alarm, refer to P4-39 "Description of Alarm Message and Alarm Sound".

4 Set the alarm pole flash pattern for each alarm level.



Press the [Pattern Setup] key to display the alarm pole flash pattern setup menu.

Assign the flash pattern for each alarm level.

- 1) First, select the flash pattern from [Pattern 1] to [Pattern 10].

The alarm pole consists of 3 blocks.

(Left: Red, Middle: Red/Orange/Green, Right: Red)
The ways these 3 blocks flash are different for each pattern.

By pressing the [Pattern Test] key, the flashing of the selected pattern can be verified.

- 2) Next, press the alarm level key to assign the selected 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)

Default Setting

Alarm Level	Pattern	Flash				
Level 1	Pattern 1	(Red, Red, Red)→(· · ·)→(Red, Red, Red)→(· · ·)→(Red, Red, Red)	480ms	480ms	480ms	480ms
Level 2	Pattern 10	(Red · ·)→(· · ·)→(· Red ·)→(· · ·)→(· · Red)	480ms	240ms	480ms	240ms
Level 3	Pattern 4	(· Red ·)→(· · ·)→(· Red ·)→(· · ·)→(· Red ·)	480ms	480ms	480ms	480ms

●Flashing the Alarm Pole Synchronized with HR

The alarm pole can be flashed synchronizing with HR.

1 Select whether to flash the alarm pole synchronizing to the heartbeat.

Sync. with HR	<input checked="" type="checkbox"/> ON	<input type="checkbox"/> OFF
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To synchronize with HR, select [ON]. The middle LED will flash in green synchronized with HR.

To not synchronize with HR, select [OFF].

NOTE	<ul style="list-style-type: none"> When asystole is generated, the green LED at middle part of the alarm pole will remain lighted. However, if "Sync. with Alarm" is set to ON, the fixed flash pattern for the asystole alarm (Level 1: Pattern 1) will have priority. If the parameter other than ECG is selected as "HR/PR Alarm Source" on ECG (SpO₂, BP) setup menu, the alarm pole will not flash synchronizing with the pulse.
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Alarm Setup

To Set the Alarm Condition

This section explains the setup of alarm suspension and upper / lower alarm limit. On the alarm setup menu, ON/suspend of system alarm, ON/OFF and upper / lower alarm limit of each parameter can be set.

Also, 5 patterns of alarm setting can be programmed using the alarm mode setup function. By preprogramming the alarm setting to each alarm mode, the alarm setups at admittance of patient can be simplified by just selecting one of the alarm modes.



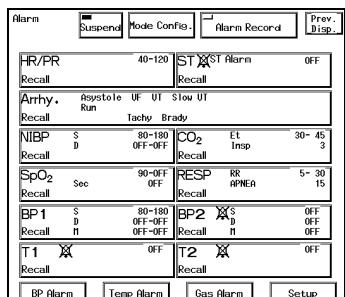
For alarm mode setup procedure, refer to "8. System Configuration Alarm Mode Setup To Program the Alarm Mode"

To Set the System Alarm (ON or Suspend)

The system alarm can be set to ON or suspend, but it cannot be turned OFF.

WARNING	<ul style="list-style-type: none">When the system alarm is suspended, all the alarm will be suspended even if the parameter alarm is set to ON. Also, the alarm event will not be stored as recall.If the upper/lower alarm limit of the parameter is set to OFF, or arrhythmia alarm is set to OFF, alarm will not function even if the system alarm is set to ON. Pay attention when setting them OFF.
----------------	---

1 Press the **Menu → **Alarm** keys.**



The alarm setup menu will be displayed.

2 When the **Suspend key LED is extinguished, the system alarm is ON.**

The alarm ON/OFF function and alarm limit for each parameter is effective.



3 When the **Suspend key LED is lighted, the system alarm is suspended.**

Pressing the **Suspend** key when the LED is extinguished will light the LED and temporarily suspends the system alarm.

While the alarm is suspended, "Alarm Suspend (* * * sec)" message will be displayed.
(* * * sec.) indicates the remaining time.

The alarm will turn ON when the suspended time completes.



Alarm Suspend Message



To Silence the System Alarm

The alarm sound can be silenced for fixed amount of time. This setting will not affect the alarm message. If the alarm cause still remains at completion of silence time, the alarm sound will generate again. Also, if another alarm with the same or higher priority occurs during the alarm silence time, the alarm sound for the new alarm will generate.



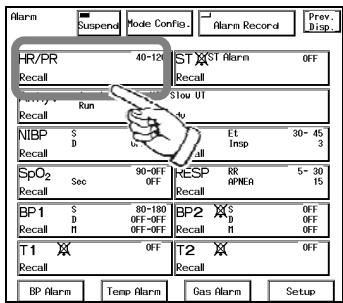
●Precautions about Silencing the Alarm

- 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 recall and alarm recording will function.
- If the **Alarm Silence** 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 condition for all parameters will be ceased in the event of any of the following.
 - When the main power is turned ON.
 - When the system alarm status (ON / suspend) is changed.
 - When monitoring is suspended on the patient admit / discharge menu.
 - When the alarm mode is changed on the patient admit / discharge menu.
 - When the patient has discharged.
- The alarm silence condition for each parameter will be ceased in the event of any of the following.
 - When the alarm silence time for the parameter is completed.
 - When automatic alarm is selected for the parameter.
 - When the alarm is turned OFF for the parameter.
- If **Linked to each new occurrence** is selected for "Status Alarm Control" in the alarm setup menu, the status alarm sound will not resume after the alarm silence time unless a new status alarm generates.

Alarm Setup for Each Parameter

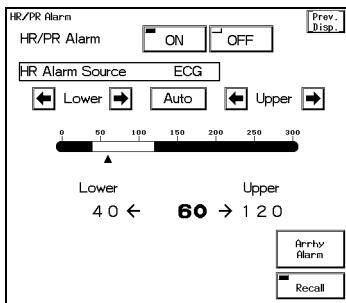
The alarm for each parameter can be turned ON or OFF, and upper and lower alarm limit can be set.

- 1 Press the **Menu** → **Alarm** keys.



The alarm setup menu will be displayed.

- 2 Select the parameter to display the alarm setup menu.



The alarm setup menu for each parameter will be displayed.

<HR/PR Alarm Setup Menu>

Display	Description
	Displays the upper and lower alarm limit and the current measurement (▲). The limits can be adjusted by directly pressing the bar display or using the arrow keys.
Lower Upper 4 0 ← 60 → 1 2 0	Displays lower limit←current value→upper limit.

Key	Item	Description
<input type="checkbox"/> ON <input type="checkbox"/> OFF	Individual Alarm	Selecting ON will generate the alarm. Selecting OFF will not generate the alarm.
<input type="button"/> Lower <input type="button"/> Upper	Lower Alarm Limit	Sets the lower alarm limit. The lower limit will be turned OFF when a value below the range is selected.
<input type="button"/> Upper <input type="button"/> Lower	Upper Alarm Limit	Sets the upper alarm limit. The upper limit will be turned OFF when a value above the range is selected.
<input type="button"/> Auto	Automatic Setup	Automatically sets the limits corresponding to the current value. If the limit is turned OFF, it will remain OFF. The system alarm and parameter alarm will be in a ON condition.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu. (Monitor Setup).



For alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

3 Select ON/OFF and set upper and lower alarm limit for the parameter alarm.

Numeric Data Key	Item	Description
HR/PR Recall	HR / PR / BPR	ON, OFF 20–300bpm
ST <input checked="" type="checkbox"/> ST Alarm Recall	ST1–ST12	ST All Alarm ON, OFF ST1–ST12 ±2.0mV Individual Alarm ON, OFF
BP1 <input checked="" type="checkbox"/> Recall	BP1	ON, OFF 0–300mmHg 0–40.0kPa
BP2 <input checked="" type="checkbox"/> Recall	BP2	ON, OFF 0–300mmHg 0–40.0kPa
SpO ₂ <input checked="" type="checkbox"/> Recall	SpO ₂	ON, OFF 50–100%
RESP <input checked="" type="checkbox"/> Recall	RR	ON, OFF 5–150bpm (Adult) 2–150bpm (Child, Neonate)
	APNEA (Upper Limit)	ON, OFF 5–20 sec.
T1 <input checked="" type="checkbox"/> Recall	TEMP1	ON, OFF 30–50°C 86–122°F
T2 <input checked="" type="checkbox"/> Recall	TEMP2	ON, OFF 30–50°C 86–122°F
NIBP <input checked="" type="checkbox"/> Recall	NIBP	ON, OFF 10–300mmHg 1.5–40.0kPa
CO ₂ <input checked="" type="checkbox"/> Recall	EtCO ₂	ON, OFF 1–115mmHg 0.1–15.0kPa 0.1–15.0%
	InspCO ₂ (Upper Limit)	ON, OFF 1–24mmHg 0.1–3.0kPa 0.1–3.0%

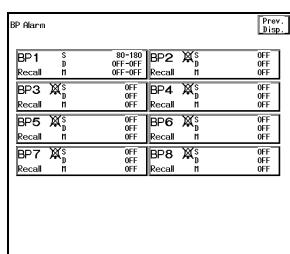


For HS-710E, 720E, 702E, and HC-500 Module, the upper EtCO₂ alarm will not generate if the upper limit is set to 100mmHg/13.4kPa and above as the measurement range is 0–99mmHg / 0–13.3kPa.

4 Set ON/OFF and upper and lower limit for each BP alarm (BP1–8).



Pressing the **BP Alarm** key will display the alarm setup menu for BP1–BP8.

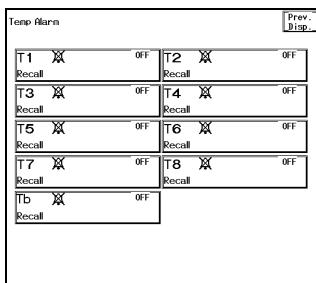


Set ON/OFF and upper and lower limit (0–300mmHg / 0–40.0kPa) for each BP alarm by pressing the **BP1** to **BP8** keys.

5 Set ON/OFF and upper and lower limit for each temperature alarm (T1–8).

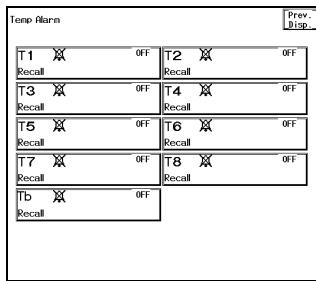


Pressing the **Temp Alarm** key will display the alarm setup menu for T1–T8.



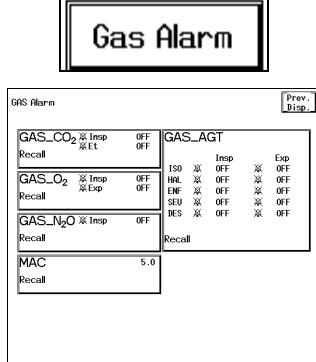
Set ON/OFF and upper and lower limit (30–50°C / 86–122°F) for each temperature alarm by pressing the **[T1]** to **[T8]** keys.

6 Set ON/OFF and upper and lower limit for blood temperature.



Press the **[Tb]** key to set ON/OFF and upper and lower limit (30–45°C / 86–113°F) for the blood temperature.

7 Set ON/OFF and upper and lower limit for each gas alarm.



Pressing the **[Gas Alarm]** key will display the gas alarm setup menu.

Press the **[GAS_CO₂]** / **[GAS_O₂]** / **[GAS_N₂O]** / **[GAS_AGT]** / **[MAC]** keys, and set ON/OFF and upper/lower limit for each gas alarm.

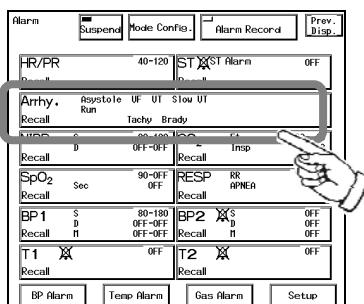


On a wireless network system, O₂, N₂O, AGT alarm generation will not be transmitted to the central monitor. On the DS-LANII network, these alarms will not be transmitted depending on the type of central monitor.

Arrhythmia Alarm Setup

The arrhythmia alarm can be turned ON or OFF, and arrhythmia detection level can be set.

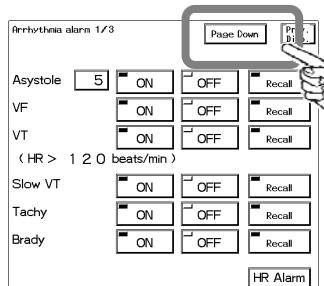
1 Press the **[Menu]** → **[Alarm]** keys.



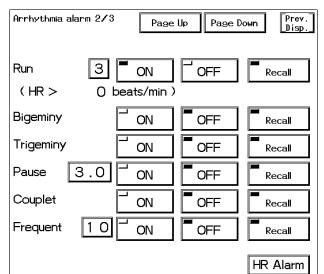
The alarm setup menu will be displayed.

Press the **[Arrhy.]** key to display the arrhythmia alarm setup menu.

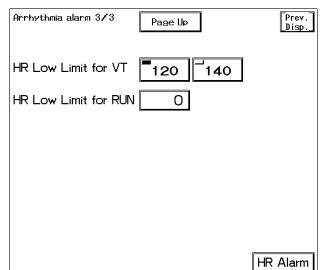
2 Set the alarm condition for each arrhythmia. Pressing the **Page Down key will display the next page.**



The alarm setup menu for Asystole, VF, VT, Slow_VT, Tachy, Brady will be displayed.



On the 2nd page, the alarm setup menu for Run, Couplet, Bigeminy, Trigeminy, Pause, Frequent will be displayed.



On the 3rd page, analysis condition for VT and RUN can be set.

Page	Item
Page 1/3	Asystole, VF, VT, Slow_VT, Tachy, Brady
Page 2/3	Run, Couplet, Bigeminy, Trigeminy, Pause, Frequent
Page 3/3	HR Low Limit for VT, HR Low Limit for RUN

●To Set ON/OFF the Arrhythmia Alarm



Selecting **ON** will generate the arrhythmia alarm.
Selecting **OFF** will not generate the arrhythmia alarm.

Page	Item	Selection
Page 1/3	Asystole	ON (ON, OFF)
	VF	ON (ON, OFF)
	VT	ON (ON, OFF)
	Slow_VT	ON (ON, OFF)
	Tachy	ON, OFF
	Brady	ON, OFF
Page 2/3	Run	ON, OFF
	Couplet	ON, OFF
	Bigeminy	ON, OFF
	Trigeminy	ON, OFF
	Pause	ON, OFF
	Frequent	ON, OFF

CAUTION	There are following restrictions when connecting the DS-7300 system to the DS-LANII network.
	<ul style="list-style-type: none"> • Arrhythmia alarm of TACHY, BRADY, COUPLET, PAUSE, TRIGEMINY will not be transmitted. • Arrhythmia alarm of "SLOW_VT" will be transmitted as "VT".

NOTE	The "Arrhythmia alarm OFF" message will be displayed when the ASYSTOLE, VF, VT, SLOW_VT, and HR alarm is OFF.
-------------	---



If ON is selected for "Asystole, VF, VT" on the hospital setup menu, Asystole, VF, VT, Slow_VT alarm can not be set to OFF.

→ "8. System Configuration Hospital Setup Asystole, VF, VT"

● To Set the Arrhythmia Detection Level

Select the level to detect each arrhythmia.

- 1 Pressing the detection level key (ex. **5** for Asystole) for each arrhythmia will display the window to adjust the detection level.

Set the detection level

Item	Range
ASYSTOLE	3 to 10 sec.
RUN	2 to 8 beats
PAUSE	1.5 to 5 sec.
FREQUENT	1 to 50 beats/min.

● To Set the HR Low Limit for VT

Set the condition to detect VT.

HR Low Limit for VT

120 **140**

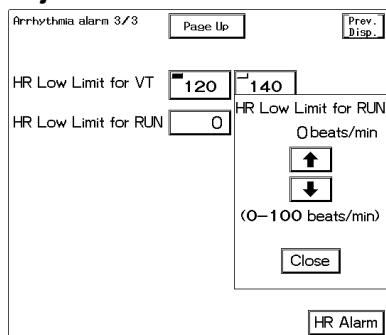
Select the HR low limit to detect VT from 120 or 140bpm.

If HR is below the set value, it will be detected as Slow_VT.

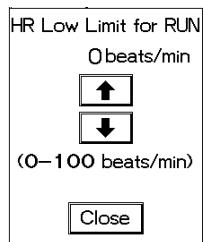
●To Set the HR Low Limit for RUN

Set the condition to detect RUN.

- 1 Pressing the detection level key (ex. [0] for the following screen) will display the window to adjust the detection level.**



- 2 Set the detection level.**



Use the arrow keys to set the detection threshold.
It can be set in the range from 0 to 100bpm.

- 3 Close the window to adjust the detection level.**



Press the [Close] key.



- 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.
- If the wired network system (DS-LANII/DS-LANIII) is constructed, the setups for "HR Low Limit for VT" and "HR Low Limit for Run" cannot be performed on some central monitors.

- 4 Close the window to adjust the detection level.**



Press the [Close] key.

●Alarm Limit for TACHY, BRADY

The arrhythmia detection level for tachycardia (Tachy) and bradycardia (Brady) alarm links with the upper and lower alarm limit for HR / PR.

The tachycardia (Tachy) alarm generates when the measurement exceeds the HR / PR upper alarm limit. When the upper alarm limit is OFF, alarm will not generate.

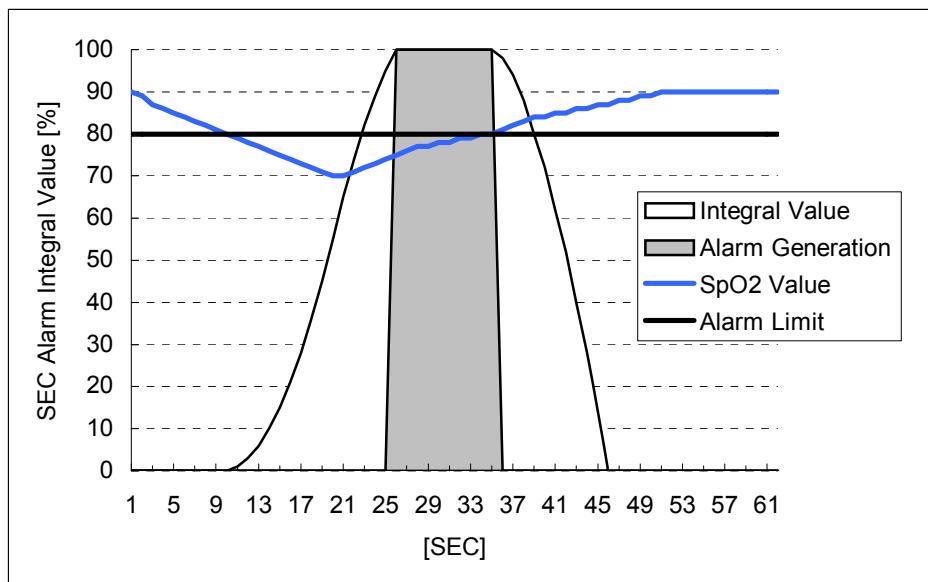
The bradycardia (Brady) alarm generates when the measurement is below the HR / PR lower alarm limit. When the lower alarm limit is OFF, alarm will not generate.

SpO₂ SEC Alarm Setup (HS-710, 710E, 720, 720E, 720C, 702C, 702E)

When the SpO₂ value is unstable around the lower alarm limit, the frequently generated alarm may be bothersome. The SEC alarm function controls these frequent alarms.

This function generates the alarm only when the integral value (the accumulation of difference between the alarm limit and SpO₂ value at every second) reaches the preprogrammed SEC alarm threshold value.

The integral value of the SEC alarm is calculated as follows.



On this graph, the SEC alarm threshold value is set as 100.

The SpO₂ value begins to fall below the alarm limit at approximately 10 seconds. At the same time, the integral value begins to increase.

(Alarm limit) – (SpO₂ value) is accumulated each second.

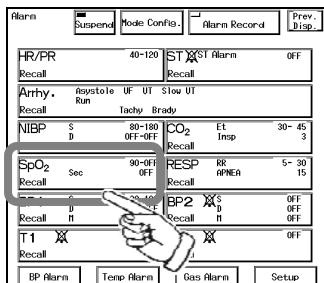
At around 25 seconds, the integral value reaches 100 and the alarm is generated.

At approximately 36 seconds, the SpO₂ value returns to the level within the alarm limit, and at the same time, the integral value begins to decrease. $\{(\text{Alarm limit}) - (\text{SpO}_2 \text{ value})\} \times 2$ is subtracted each second.

Also, there is a safety net when setting the SEC alarm function. This safety net is for the case when the SpO₂ value frequently falls below the alarm limit but does not last long enough to reach the SEC alarm threshold.

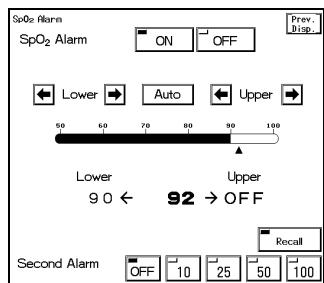
If the SpO₂ value falls below the limit 3 times or more during the last 60 seconds, an alarm will be generated even if the SEC alarm threshold is not reached.

1 Press the **Menu** → **Alarm** keys.

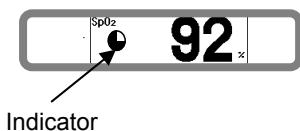


The alarm setup menu will be displayed.

2 Press the **SpO₂** key to display the alarm setup menu.



3 Select the SEC alarm value according to the alarm frequency.



If **10** / **25** / **50** / **100** is selected, a circular SEC alarm indicator will be displayed inside the parameter key. As the integral value increases, the indicator will begin to fill, and when it is completely filled, an alarm will be generated.

If **OFF** is selected, this SEC alarm indicator will not be displayed.

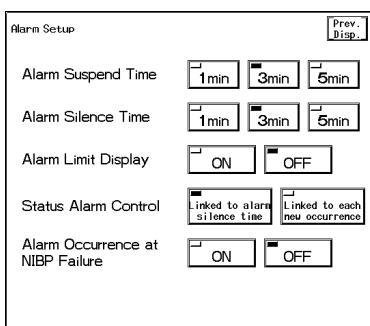


- Whether to use the SEC alarm function and its threshold selection should be based on the patient's clinical indication portent and medical evaluation.
- If the SpO₂ alarm and SEC alarm setup is set to OFF, the SEC alarm integral value will be set to 0.

Alarm Suspend / Alarm Silence Time

The time for suspending the system alarm and suspending the alarm sound can be selected.

1 Press the **Menu** → **Alarm** → **Setup** keys.



The alarm setup menu will be displayed.

2 Select the time for "Alarm Suspend Time".

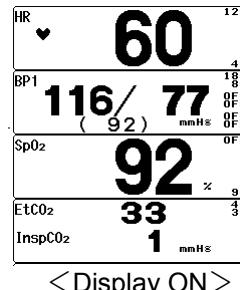
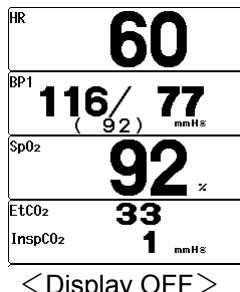
Alarm Suspend Time Select the appropriate time for alarm suspend time.

3 Select the time for "Alarm Silence Time".

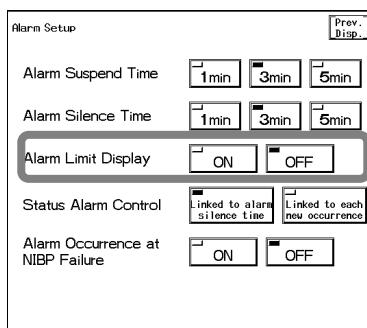
Alarm Silence Time Select the appropriate time for alarm silence time.

ON / OFF of Alarm Limit Display

The alarm limit can be selected to display or not display on the home display.



- 1 Press the **Menu** → **Alarm** → **Setup** keys.



The alarm setup menu will be displayed.

- 2 Select ON or OFF for alarm limit display.

Alarm Limit Display ON OFF Select **ON** or **OFF**.

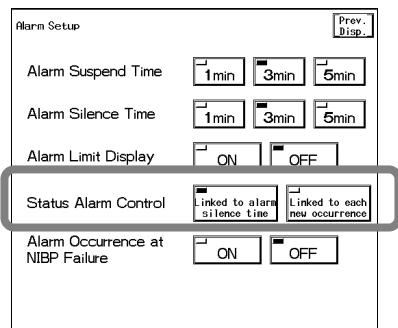
NOTE	<ul style="list-style-type: none">● The alarm limit for the parameter with the alarm turned OFF will not be displayed regardless of this setup.● The alarm limit cannot be displayed for the following numeric data box.<ul style="list-style-type: none">• GAS(CO₂+AGENT+O₂+N₂O)• GAS(AGENT+O₂+N₂O)
------	---

Alarm Silence Time for Equipment Status Alarm

The alarm silence time for the following equipment status alarm can be set.

- "Check electrodes"
- "SpO₂ sensor fault"
- "Check SpO₂ sensor"
- "No pulse detect"
- "SpO₂ Low Perfusion"
- "Pulse search"
- "Check filter line"
- "CO₂ unit error"
- "Check HS-700 cooling fan"
- "Check LX battery"

1 Press the **Menu** → **Alarm** → **Setup** keys.



The alarm setup menu will be displayed

2 Set the "Status Alarm Control".

Status Alarm Control



Linked to alarm silence time will silence the alarm when the **Alarm Silence** key is pressed for fixed amount of time set on "Alarm Silence Time".

- If the alarm cause still remains at completion of silence time, the alarm sound will generate again.
- If the same alarm occurs during the alarm silence time, the alarm sound will not generate.
- If the new alarm occurs during the alarm silence time, the alarm sound for the new alarm will generate.

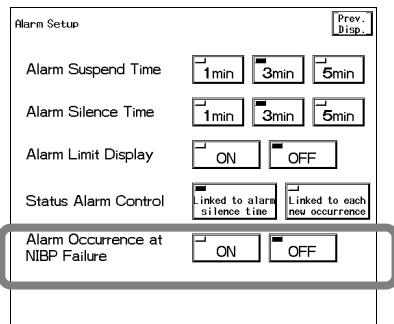
Linked to each new occurrence will silence the alarm when the **Alarm Silence** key is pressed until the situation changes.

- The alarm will be silenced as long as the alarm cause remains.
- If the alarm cause is resolved during the alarm silence time, the alarm silence will be cancelled.
- If the same alarm generates again during the alarm silence time, the alarm sound will generate.

ON/OFF of Alarm Occurrence at NIBP Failure

The NIBP measurement failure can be notified by alarm.

- 1 Press the **Menu** → **Alarm** → **Setup** keys.



The alarm setup menu will be displayed.

- 2 Select ON or OFF for "Alarm Occurrence at NIBP Failure".

Alarm Occurrence at
NIBP Failure

ON OFF

ON will display a "NIBP measurement failed." message when NIBP measurement fails.

OFF will not display a message.

Blank Page

Chapter 5

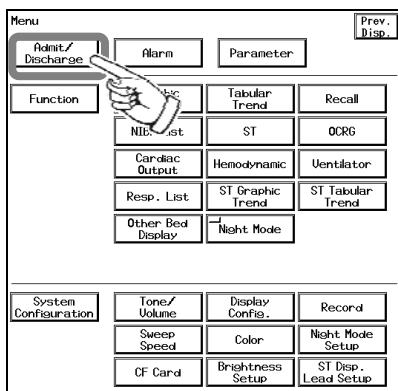
Admit / Discharge of a Patient

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

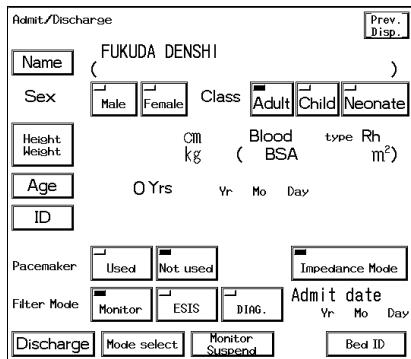
Admit / Discharge of a Patient	5-2
Admitting a Patient	
Name, Sex, and Age.....	5-3
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Patient ID	5-4
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Patient Sex.....	5-6
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●Display Modes (For LC-7319T).....	5-14
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Admit / Discharge of a Patient

This menu allows setup of admitting, discharging, suspend monitoring of a patient, and selection of the display configuration mode and alarm mode according to the monitoring purpose.



- 1 Press the **Menu** → **Admit / Discharge** keys.



The admit / discharge menu will be displayed.



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.

Admitting a Patient

Name, Sex, and Age

This menu allows entering of patient's name, ID, age, and selection of patient type (adult, child, neonate) and pacemaker use (used, not used), which affects the monitoring accuracy.

Reference

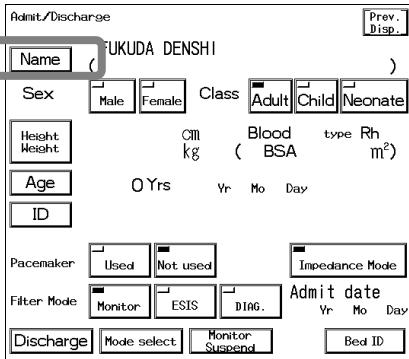
Whether to display or not display the following keys on the admit menu can be selected.

- **[Impedance Mode]** key
- **[Filter Mode]** key (**Monitor** / **ESIS** / **DIAG.**)
- **[Bed ID]** key

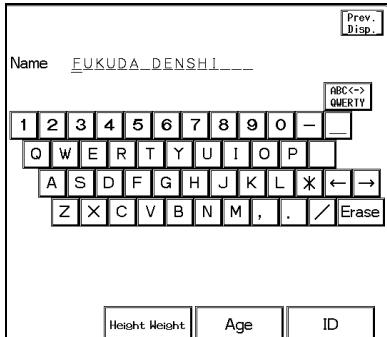
For procedures, refer to "8. System Configuration Hospital Setup"

Patient Name

For entering the patient's name, up to 16 letters can be used.

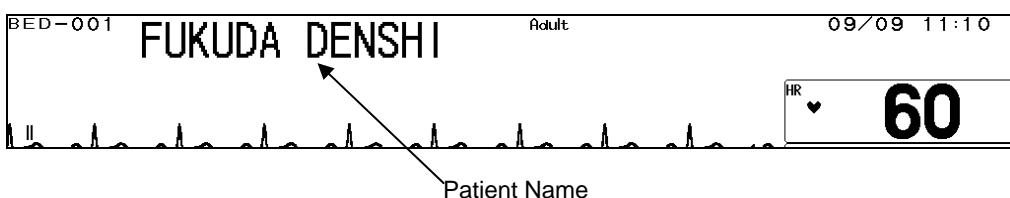


1 Press the **Name** key.



Enter the name using the alphanumeric keypad.

2 The entered patient's name will be displayed on the home display.



Patient Name

Patient ID

Up to 20 characters of alphabets, numbers, or symbols can be used for the patient ID.
Enter the ID according to the monitoring purpose. The entered ID will be output on the recording paper.

The form includes fields for Name (FUKUDA DENSHI), Sex (Male/Female), Height/Weight (cm/kg), Age (Yrs/Mo/Day), and medical history (Pacemaker, Filter Mode, Discharge). A box labeled 'ID' is highlighted with a red border.

1 Press the **ID** key.

The keypad screen shows the ID '1234' entered. It features a numeric keypad (1-9, 0, *, #) and a QWERTY keyboard. A small icon in the top left corner says 'Reference'.

Enter the ID using the alphanumeric keypad.

20 digits can be input, but only 10 digits can be transmitted through the wired network (DS-LANII). On the hospital setup of the preset menu, set which 10 digits to send to the central monitor.

If DS-LANIII network is used, all 20 digits can be transmitted to the central monitor.

 Refer to "8. System Configuration Patient ID Transmission Starting Digit for DS-LAN" for procedure to set the 10-digit patient ID.

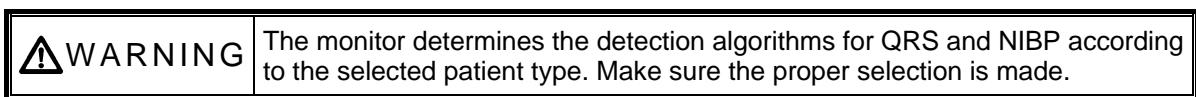
Patient Type

The selection of patient type affects the accuracy of NIBP measurement, HR measurement, and RR measurement. Also the delay time to generate the measurement data alarm will change according to the patient type.

	Adult	Child	Neonate
NIBP measurement range	10–280mmHg	10–180mmHg	10–120mmHg
HR	0bpm, 12–300bpm	0bpm, 30–300bpm	0bpm, 1.6–40Hz
Filter Mode	Monitor	0.5–40Hz	1.6–40Hz
	ESIS	1.6–15Hz	1.6–15Hz
	Diagnosis	0.05–100Hz	1.6–100Hz
Impedance Respiration		1.5Hz	2.5Hz
Alarm delay time		5 sec.	0 sec.

The alarm delay time is the function to prevent frequent generation of the measurement data alarm by holding the alarm generation for the duration of each delay time.

The alarm delay time applies to the measurement data alarm for the following parameters; HR / PR, BP, RR, SpO₂, TEMP, EtCO₂ / InspCO₂, TACHY, BRADY.

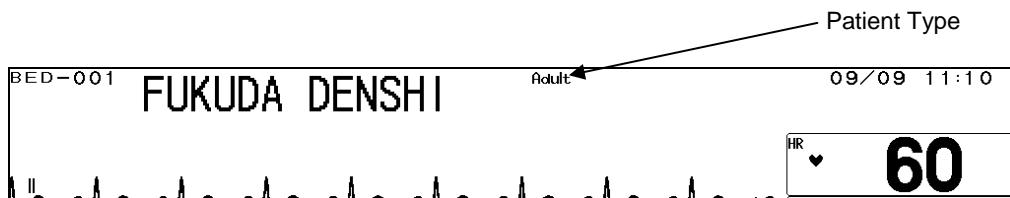


1 Select the patient type.

Admit/Discharge
Name: FUKUDA DENSHI
Sex: Male
Height: kg
Age: 0 Yrs
ID:
Pacemaker: Used
Filter Mode: Monitor
Discharge:

Select from **Adult**, **Child**, or **Neonate**.

2 The selected patient type will be displayed on the home display.



Patient Sex

Select the patient's sex from male or female. The default is set as undetermined. The selected sex will be output on the recording paper.

- 1 Select **Male** or **Female**.

The screenshot shows a medical record entry form. In the 'Sex' row, there are two radio buttons: 'Male' (unchecked) and 'Female' (checked). Other options like 'Class' (Adult, Child, Neonate), 'Height' (cm and kg), 'Age' (Yrs, Mo, Day), and 'ID' are also visible. At the bottom, there are buttons for 'Pacemaker' (Used, Not used), 'Filter Mode' (Monitor, ESIS, DIAG.), and 'Discharge' (Mode select, Monitor Suspend).

This selection will not affect the measurement accuracy of the monitoring.

Pacemaker Use

● Pacemaker Use Selection

If the patient is wearing a pacemaker, the monitor will identify the pacemaker pulse and insert an artificial pulse onto the ECG waveform for easy identification. By detecting the pacemaker pulse, it prevents to erroneously detect QRS as pacemaker pulse when pacing waveform does not appear (pacing failure). The arrhythmia analysis analyzes pacing beat as P (pacemaker beat) or F (fusion beat) to prevent erroneous judgment of VPC.

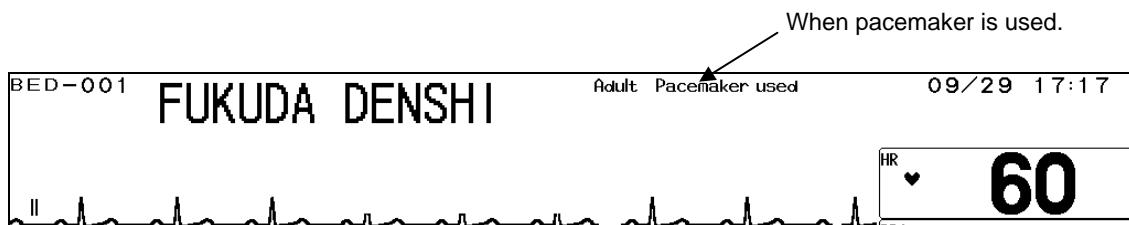


The pacemaker selection influences the precision of the QRS detection and arrhythmia analysis. Make sure the correct selection is made.

- 1 Select **Used** or **Not used** for pacemaker use.

The screenshot shows the same medical record entry form as before. In the 'Pacemaker' row, the 'Used' button is checked, while 'Not used' is unchecked. Other fields like 'Filter Mode' and 'Discharge' are also present.

- 2 The pacemaker use will be displayed on the home display.



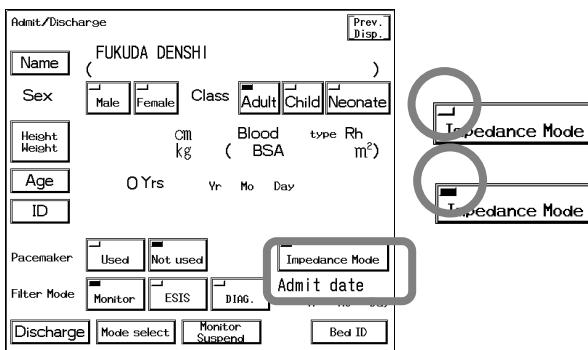
When pacemaker is used.

●Impedance Respiration Measurement

The respiration measurement using the impedance method conducts high-frequency and weak current between the ECG electrodes attached to the patient, and measures the potential difference between the electrodes caused by thoracic movement using the synchronous rectification system. For the patient using the adaptive (minute ventilation) pacemaker, the pacemaker measurement signal and the high-frequency current of this equipment interferes with each other which causes incorrect respiration measurement.

If the patient is using an adaptive (minute ventilation) pacemaker, set the impedance respiration measurement OFF.

- 1 Press the **[Impedance Mode]** key.



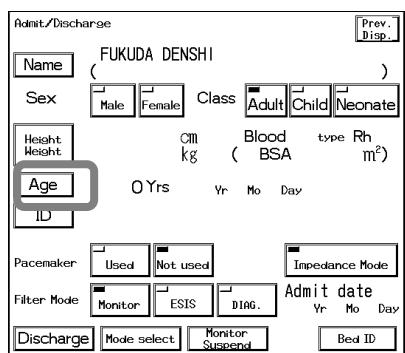
If the LED is extinguished, the impedance respiration measurement is stopped.

If the LED is lighted, the impedance respiration measurement can be performed.

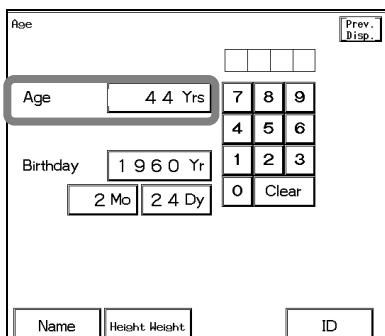
Patient Age

There are two ways to set patient's age. One is to enter the birth date which will automatically calculate the age, and the other is to directly enter the age using the numeric keypad.

If **[Neonate]** is selected as patient type, the age in days will be displayed.



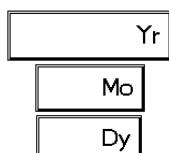
- 1 Press the **[Age]** key, and enter patient's age.



To directly enter the age, use the numeric keypad to enter the age and press the **[Yrs]** key.

The entered age will be displayed inside the key.

- 2 Enter the patient's birth date using the numeric keypad. The age will be automatically calculated.



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

The entered year, month, day will be displayed inside the **[Yr]**, **[Mo]**, **[Dy]** keys respectively.

Discharging a Patient

Erasing Name, Data, etc.

This menu allows to clear the patient name, ID, age, and past measurement data such as tabular trend, graphic trend, and recall data.

By pressing the **Rapid Discharge** key preprogrammed as user key, a discharge process can be performed.

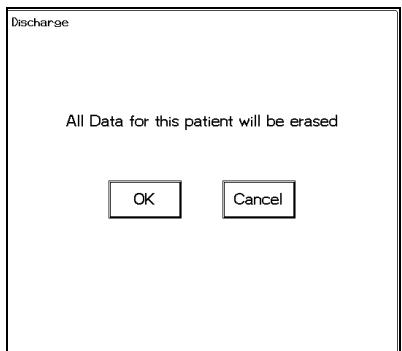


Once the data is erased by the discharge process, the data cannot be restored.
Be cautious when performing the discharge process.

Discharging Procedure

1 Press the **Discharge** key.

The confirmation display will appear. If the **Discharge** key is pressed by mistake, press the **Cancel** key to return to the previous display.



2 Erase the patient data.

To initialize the patient data and patient information, press the **OK** key. The data will be initialized and returns to the home display selected for the display mode. The alarm setup will be initialized to the selected alarm mode.

Data	Description
Patient Data	Erases the data of graphic trend, tabular trend, NIBP list, recall, ST Display, OCG, cardiac output, hemodynamic, P-V / F-V control data, vigilance list. The setup condition of recall setup, tabular trend setup, graphic trend setup, vigilance list will remain.
Patient Information	Erases the data of patient name, ID, sex, age. The patient type will not be initialized.
Measurement Condition	Pacemaker use will be set to unused, and impedance respiration measurement will be set to ON. The BP zero-balance condition will be cleared.

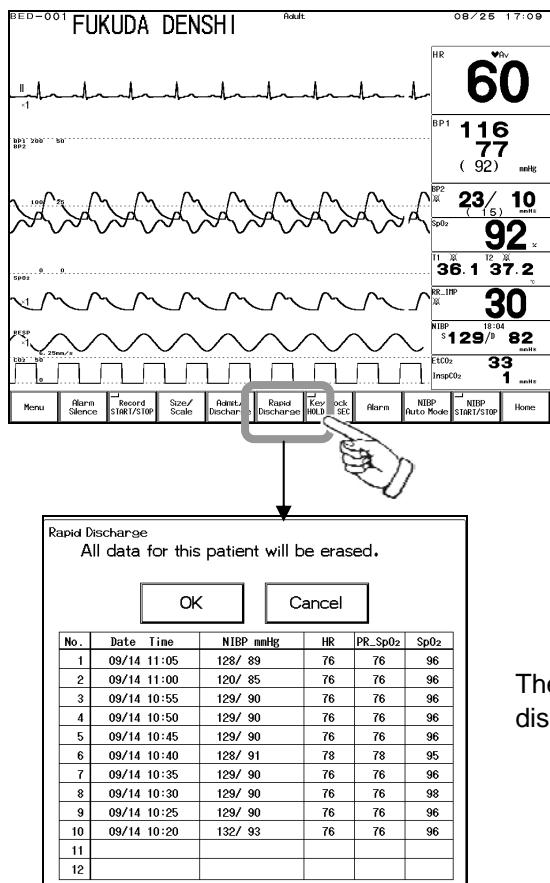
NOTE

- Depending on the setup of “Backup at Discharge” on the monitor setup menu, some data may not be initialized.
- If discharge procedure is performed during stopwatch operation, the counting will stop and the stopwatch time will be reset to “00:00:00”.

Discharge Procedure by User Key

The patient's monitoring data (trend data), patient information, monitoring condition can be initialized by pressing the **Rapid Discharge** key preprogrammed as user key.
This key will function the same as the discharge procedure.

1 Press the **Rapid Discharge** key preprogrammed as user key.



2 Pressing the **OK** key will initialize the patient data.

The confirmation message for erasing the data will be displayed.

Monitoring Mode Selection

Alarm / Display Mode

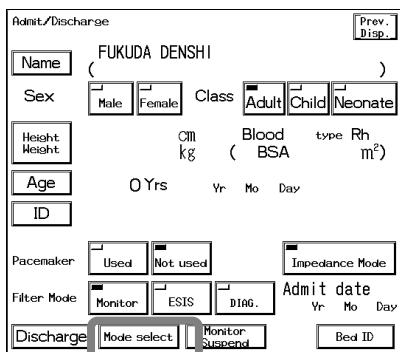
This menu allows to select the alarm mode and display mode.

The alarm setting and display configuration can be each selected from 5 modes depending on the monitoring purpose. Select the appropriate mode when admitting a patient.

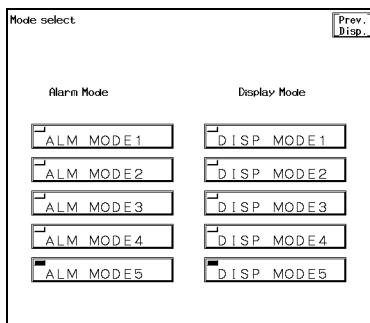
CAUTION

The setup for the alarm mode and display mode remains stored even when the power is turned off or when discharging procedure is performed. Before monitoring, make sure the current monitoring mode is suitable for the patient's condition.

Mode Selection

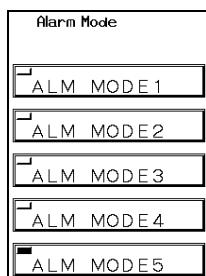


- 1 Press the **Mode Select** key.



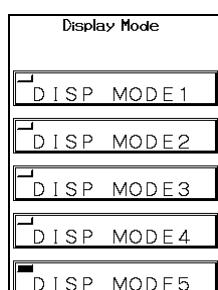
The mode selection menu for alarm mode and display mode will be displayed.

- 2 Select an alarm mode from the selection.



Select from the **ALM MODE1** to **ALM MODE5** keys to set an alarm setup mode which meets the monitoring purpose. The setup for the alarm mode remains stored even when the power is turned off or when discharging procedure is performed. The previously selected alarm mode will be effective if the selection is not made.

- 3 Select a display mode from the selection.



Select from the **DISP MODE 1** to **DISP MODE5** keys to set a display configuration mode which meets the monitoring purpose. The setup for the display mode remains stored even when the power is turned off or when discharging procedure is performed. The previously selected display configuration mode will be effective if the selection is not made.

●Display Modes (For LC-7315T)

Item	Default Setting	Backup
Display Mode	1	○
Mode 1	Display Mode	Standard
	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂ , CO ₂
	Ext. 1	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP, VPC+PACE, ST-A, NIBP_LIST Wave: ECG1, BP overlap, SpO ₂ , RESP
	Ext. 2	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, TEMP3/4, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP, CO ₂
	Enlarged Display	Numeric: HR, SpO ₂ , RR-IMP, NIBP Wave: ECG1, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 1
	Short Trend	OFF
	Grid	OFF
	Wave Line	Medium
	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill
Mode 2	Display Mode	Ext. 2
	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂ , CO ₂
	Ext. 1	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP, VPC+PACE, ST-A, NIBP_LIST Wave: ECG1, BP overlap, SpO ₂ , RESP
	Ext. 2	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, TEMP3/4, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP, CO ₂
	Enlarged Display	Numeric: HR, SpO ₂ , RR-IMP, NIBP Wave: ECG1, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 2
	Short Trend	OFF
	Grid	OFF
	Wave Line	Medium
	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill

Item	Default Setting	Backup
Display Mode	Standard	○
Standard	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , CO ₂ , RESP	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂ , CO ₂	
Ext. 1	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP, VPC+PACE, ST-A, NIBP LIST Wave: ECG1, BP overlap, SpO ₂ , RESP	
Ext. 2	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, TEMP3/4, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP, CO ₂	
Enlarged Display	Numeric: HR, SpO ₂ , RR-IMP, NIBP Wave: ECG1, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade	ECG1, ECG2	
Comment	CONFIG. 3	
Short Trend	OFF	
Grid	OFF	
Wave Line	Medium	
Clip Wave	OFF	
GAS_CO ₂ Wave	Unfill	
Display Mode	12-lead	○
Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂ , CO ₂	
Ext. 1	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP, VPC+PACE, ST-A, NIBP_LIST Wave: ECG1, BP overlap, SpO ₂ , RESP	
Ext. 2	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, TEMP3/4, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP, CO ₂	
Enlarged Display	Numeric: HR, SpO ₂ , RR-IMP, NIBP Wave: ECG1, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade	ECG1, ECG2	
Comment	CONFIG. 4	
Short Trend	OFF	
Grid	OFF	
Wave Line	Medium	
Clip Wave	OFF	
GAS_CO ₂ Wave	Unfill	

Item	Default Setting	Backup
Mode 5	Display Mode	Standard
	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, ECG2, BP overlap, SpO ₂ , Trend (6 rows)
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂ , CO ₂
	Ext. 1	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP, VPC+PACE, ST-A, NIBP_LIST Wave: ECG1, BP overlap, SpO ₂ , RESP
	Ext. 2	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ , TEMP1/2, TEMP3/4, CO ₂ , RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP, CO ₂
	Enlarged Display	Numeric: HR, SpO ₂ , RR-IMP, NIBP Wave: ECG1, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 5
	Short Trend	OFF
	Grid	OFF
	Wave Line	Medium
	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill

○

●Display Modes (For LC-7319T)

Item	Default Setting	Backup
Display Mode	1	<input type="radio"/>
Mode 1	Display Mode	Standard
	Standard	Numeric: HR, BP1, BP2, SpO ₂ +PR, TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP Width: Wide
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ +PR, CO ₂ , RR-IMP, NIBP Wave: ECG12, BP overlap, SpO ₂ , RESP
	Enlarged Display	Numeric: HR, BP1, BP2, SpO ₂ , PR, NIBP, RR_IMP, TEMP1/2 Wave: ECG1, BP overlap, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 1
	Short Trend	OFF
	Grid	OFF
	Wave Line	Medium
Mode 2	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill
	Display Mode	Standard
	Standard	Numeric: HR, SpO ₂ +PR, RR-IMP, NIBP, NIBP LIST Wave: ECG1, SpO ₂ , RESP Width: Wide
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP overlap, SpO ₂ , RESP
	Enlarged Display	Numeric: HR, BP1, BP2, SpO ₂ , PR, NIBP, RR_IMP, TEMP1/2 Wave: ECG1, BP overlap, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 2
	Short Trend	OFF
Mode 3	Grid	OFF
	Wave Line	Medium
	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill
	Display Mode	Standard
	Standard	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ +PR, TEMP1/2, CO ₂ , RR-CO ₂ , NIBP Wave: ECG1, BP overlap, SpO ₂ , CO ₂ Width: Wide
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP overlap, SpO ₂ , RESP
	Enlarged Display	Numeric: HR, BP1, BP2, SpO ₂ , PR, NIBP, RR_IMP, TEMP1/2 Wave: ECG1, BP overlap, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade	ECG1, ECG2
	Comment	CONFIG. 3
	Short Trend	OFF
	Grid	OFF
	Wave Line	Medium
	Clip Wave	OFF
	GAS_CO ₂ Wave	Unfill

Item	Default Setting	Backup
Display Mode	12-lead	○
Standard	Numeric: HR, BP1, BP2, BP3, BP4, SpO ₂ +PR, TEMP1/2, VENT, CO ₂ , RR-CO ₂ , NIBP Wave: ECG1, BP overlap, SpO ₂ , AWP, AWF, CO ₂ Width: Wide	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP overlap, SpO ₂ , RESP	
Enlarged Display	Numeric: HR, BP1, BP2, SpO ₂ , PR, NIBP, RR_IMP, TEMP1/2 Wave: ECG1, BP overlap, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade	ECG1, ECG2	
Comment	CONFIG. 4	
Short Trend	OFF	
Grid	OFF	
Wave Line	Medium	
Clip Wave	OFF	○
GAS_CO ₂ Wave	Unfill	
Display Mode	Standard	
Standard	Numeric: HR, VPC+PACE, BP1, BP2, SpO ₂ +PR, TEMP1/2, ST-A, ST-B, ST-C, RR-IMP, NIBP Wave: ECG1–12, BP overlap, SpO ₂ , RESP Width: Wide	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, BP2, SpO ₂ , CO ₂ , RR-IMP, NIBP Wave: ECG12, BP overlap, SpO ₂ , RESP	
Enlarged Display	Numeric: HR, BP1, BP2, SpO ₂ , PR, NIBP, RR_IMP, TEMP1/2 Wave: ECG1, BP overlap, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade	ECG1, ECG2	
Comment	CONFIG. 5	
Short Trend	OFF	
Grid	OFF	
Wave Line	Medium	
Clip Wave	OFF	
GAS_CO ₂ Wave	Unfill	

●Alarm Modes

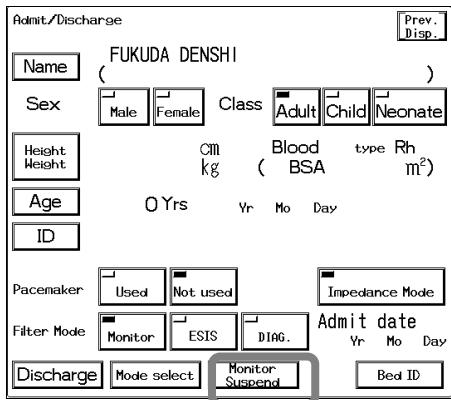
<i>Item</i>	<i>Default Setting</i>
Alarm Mode	1
HR	ON, 40–120
ASYSTOLE	ON, 5 sec.
VF	ON
VT	ON, HR Low Limit: 120bpm
SLOW_VT	ON
RUN	ON, 3 beats, HR Low Limit: 40bpm
COUPLET	OFF
PAUSE	OFF, 3.0 sec.
BIGEMINY	OFF
TRIGEMINY	OFF
FREQUENT	OFF, 10 beats
TACHY	ON
BRADY	ON
STI, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6	All Alarm: OFF, Indiv. Alarm: OFF, OFF–OFF
BP1	ON, SYS: 80–180 DIA: OFF–OFF MEAN: OFF–OFF
Alarm Mode 1–5	BP2–8
RR	OFF, SYS: OFF–OFF DIA: OFF–OFF MEAN: OFF–OFF
APNEA	ON, 15 sec.
SpO ₂	ON, 90–OFF / SEC Alarm OFF
NIBP	ON, SYS: 80–180 DIA: OFF–OFF MAP: OFF–OFF
TEMP1–8, Tb	OFF, OFF–OFF
EtCO ₂	ON, 30–45mmHg / 4.0–6.0kPa / 4.0–6.0%
InspCO ₂	ON, 3mmHg / 0.4kPa / 0.4%
CO ₂ _E	OFF, OFF–OFF
CO ₂ _I	OFF, OFF–OFF
O ₂ _E	OFF, OFF–OFF
O ₂ _I	OFF, OFF–OFF
N ₂ O_I	OFF, OFF–OFF
AGT_E	OFF, OFF–OFF
AGT_I	OFF, OFF–OFF
MAC	OFF, OFF

Suspend Monitoring

Suspend / Resume Monitoring

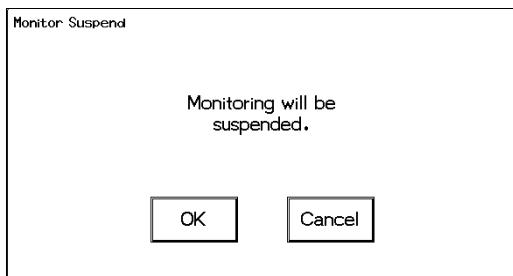
This menu allows to suspend and resume monitoring when a patient temporarily leaves the bed. Turning the power OFF will erase the recall and ST measurement data, but with this suspend monitoring function, data measurement, alarm generation, automatic measurement, and automatic recording can be suspended without erasing any data and setup condition.

To Suspend Monitoring



1 Press the **Monitor Suspend** key.

The confirmation menu will be displayed. If the **Monitor Suspend** key is pressed by mistake, press the **Cancel** key to return to the previous display.



2 Confirm the monitoring suspension.

Pressing the **OK** key will return to the home display with the **Resume** key displayed. The numeric data display and waveform display on the home display will be suspended and only the **Resume** key will be effective.



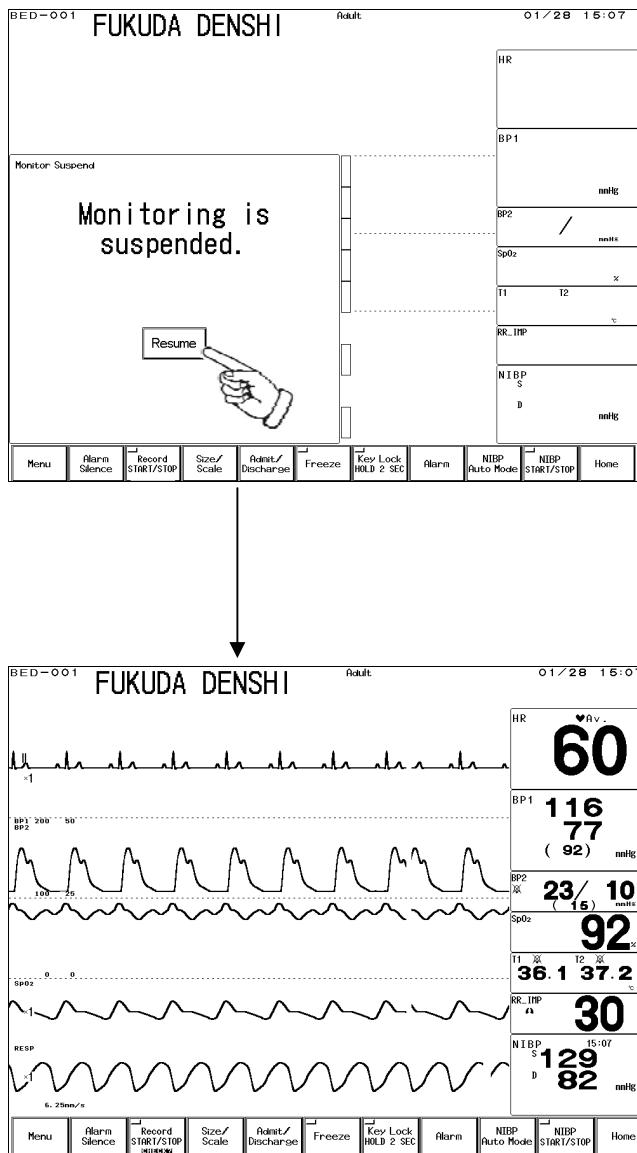
NOTE

- The telemetry transmission will cease when monitoring is suspended. Note that the square wave will be displayed on the central monitor indicating the too far condition of the telemetry.
- The stopwatch counting will continue even when the monitoring is suspended.

To Resume Monitoring

- 1 Press the **Resume** key.

The monitor suspend display will be cleared and monitoring will resume.



CAUTION Resuming monitoring will also resume the alarm in suspension.

Chapter 6

Parameter Setup

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Parameter Setup

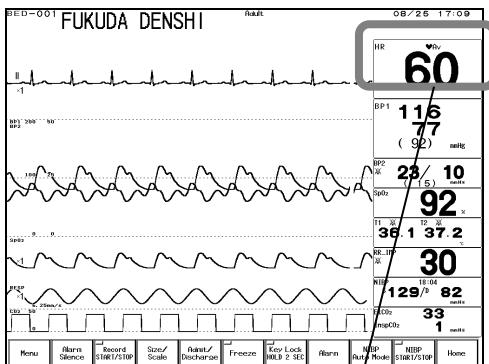
Setting the Monitoring Condition

This menu allows setup of measurement condition, waveform size, scale, etc. of ECG, BP, NIBP, SpO₂, RESP, TEMP, CO₂, and vigilance data.

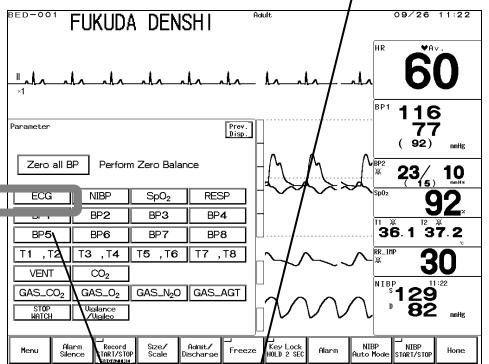
To Display the Parameter Setup Menu

Press the **Menu** → **Parameter** keys to display the parameter setup menu, and select the parameter. On the parameter setup menu, BP zero balance can be performed.

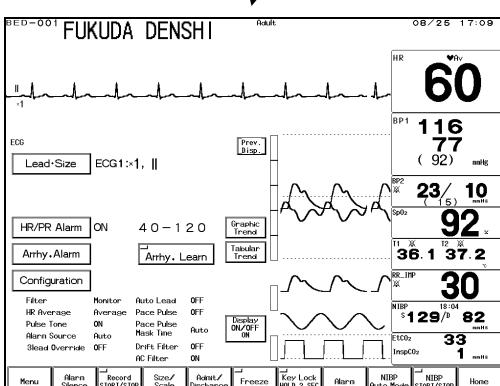
The parameter setup menu for each parameter can be also accessed by pressing the parameter key where numeric data is displayed.



Press the parameter key (numeric data box).



Press the **Menu** → **Parameter** keys to display the parameter setup menu, and select the parameter.



<ECG Parameter Setup Menu>

By selecting **Store** for "Parameter Key Operation" in the monitor setup menu, the previously displayed screen can be directly accessed when pressing the parameter key.

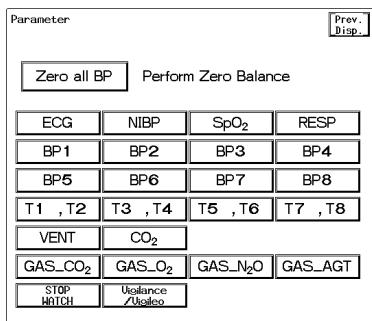


For setup procedure, refer to "8. System Configuration Monitor Setup".

Zero Balance of All Pressure Lines

If all the displayed BP's are opened to air, the zero balance procedure for all BP can be performed. If any of the BP is in progress of measurement, perform the zero balance on each BP parameter setup menu.

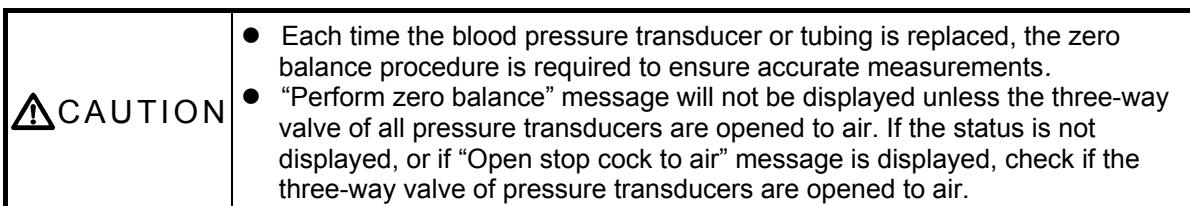
- 1 Open the three-way valve of all pressure transducers to air.
- 2 Press the **Zero All BP** key when “Perform zero balance” message is displayed.



Verify the BP waveform is positioned at zero, and “0” is displayed for the BP value. A message, “BP zero complete” will be displayed when the procedure is complete. A message, “BP zero failed” will be displayed if the process fails. The three-way valve may not be opened to air, artifact may be present, or the transducer may be defective.

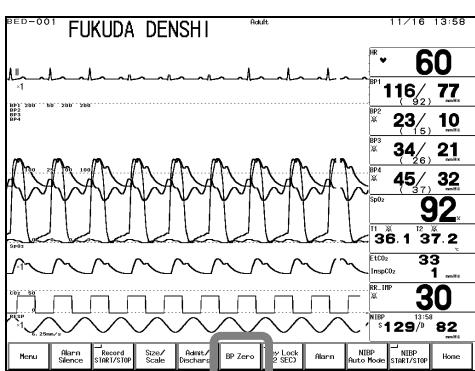
Check the cause and try the zero balance procedure again. A message, “BP zero drift” will be displayed when the interface cable is not connected. Check if the cable is firmly connected.

- 3 Close the three-way valve when the zero balance is complete.



Zero Balance of All Pressure Lines (User Key)

The zero balance procedure of all pressure lines can be performed using the user key. If any of the BP is in progress of measurement, perform the zero balance on each BP parameter setup menu.



- 1 Open the three-way valve of all pressure transducers to air.
- 2 Press the **Zero All BP** key when “READY” message is displayed inside the user key.

Verify the BP waveform is positioned at zero, and “0” is displayed for the BP value. A message, “COMPLETE” will be displayed when the procedure is complete. A message, “COMPLETE” will be displayed when the process fails. The three-way valve may not be opened to air, artifact may be present, or the transducer may be defective.

Check the cause and try the zero balance procedure again.

A message, “DRIFT” will be displayed when the interface cable is not connected. Check if the cable is firmly connected.

- 3 Close the three-way valve when the zero balance is complete.

[BP zero status displayed inside the user key]



BP zero status

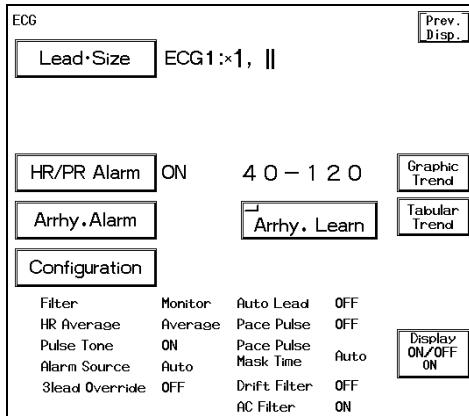
No display	: Open stop cock to air
MEASURE	: Open stop cock to air
READY	: Ready to perform zero balance.
BP ZERO	: BP zero in progress
FAILED	: BP zero failed
COMPLETE	: BP zero complete
DRIFT	: BP zero drift

CAUTION

- Each time the blood pressure transducer or tubing is replaced, the zero balance procedure is required to ensure accurate measurements.
- “READY” message will not be displayed unless the three-way valve of all pressure transducers are opened to air. If the status is not displayed, or if “MEASURE” message is displayed, check if the three-way valve of pressure transducers are opened to air.

ECG

The ECG measurement condition can be set on this menu.

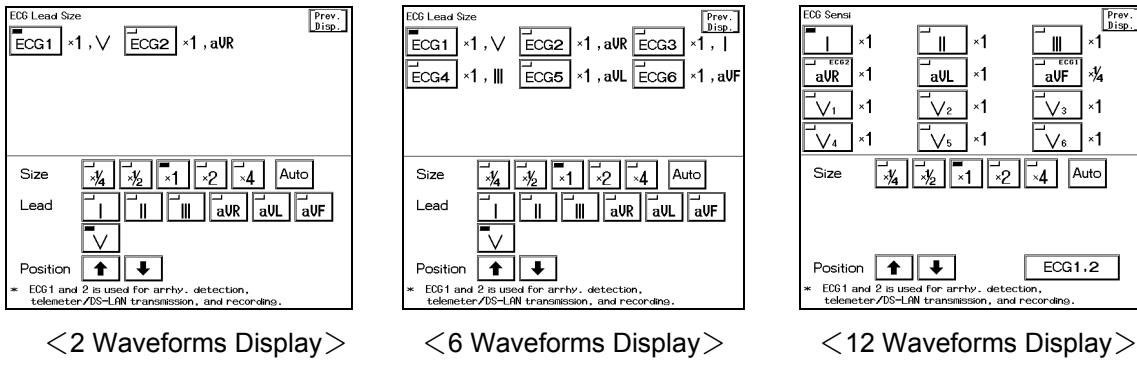


- Lead, Size** : Sets the waveform size and lead for ECG display and recording.
HR Alarm : Sets ON/OFF of HR alarm, and sets upper and lower alarm limit.
Arrhy. Alarm : Sets ON/OFF and detection threshold for each arrhythmia alarm.
Configuration : Sets the condition for measuring ECG and HR.
Arrhy. Learn : The monitor learns the normal QRS at ECG electrode replacement or at misdetection of the arrhythmia analysis.

ECG Waveform Size and Lead

- 1 Press the **Lead, Size** key to display the size / lead setup menu.**

Select the lead and size for the waveform to display on the home display.



- 2 Select the ECG channel to set the lead, size, and baseline position.**

ECG1 ×1, || ECG2 ×1, aVR

Select the ECG channel by pressing the **ECG*** key.
The selected channel key LED will light.

- 3 Select the waveform size.**

Size $\frac{1}{4}$ $\frac{1}{2}$ 1 2 4 Auto

Select the waveform size for displaying and recording.
Pressing the **Auto** key will automatically adjust the ECG amplitude to 10mm. The automatic adjustment is effective only when the key is pressed.

Size	×1/4	×1/2	×1	×2	×4
Voltage (10mm)	4mV	2mV	1mV	500μV	250μV

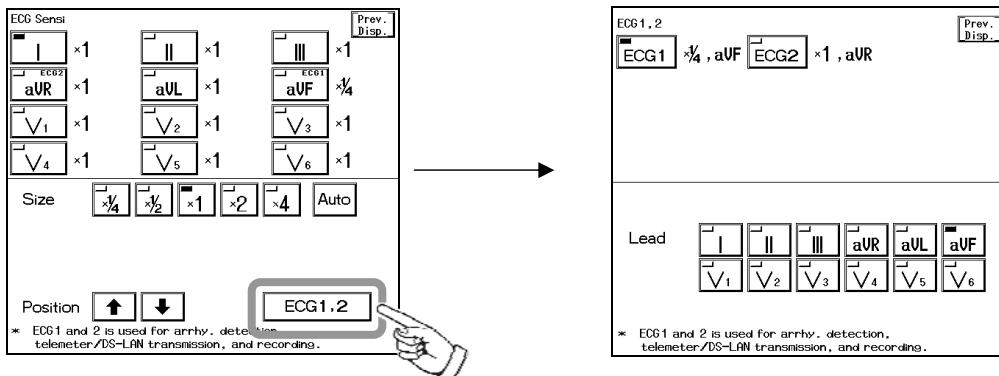
CAUTION	<ul style="list-style-type: none"> The threshold level for arrhythmia detection and QRS detection changes with ECG waveform size. Set a proper waveform size for monitoring. When the ECG waveform size is $\times 1/4$, $\times 1/2$, or $\times 1$, the detection threshold is 250 μV. When the ECG waveform size is $\times 2$ or $\times 4$, the detection threshold is 150 μV. Automatic size/position of the ECG is effective only at the time the AUTO key is pressed. This does not continuously adjust the size and position.
----------------	---

4 Select the lead for ECG1, ECG2.

The leads can be selected from 3 leads, 6 leads, 7 leads, or 12 leads depending on the connected ECG relay cable.

ECG Relay Cable	Lead
3-electrode	I II III
4-electrode	I II III aVR aVL aVF
5-electrode	I II III aVR aVL aVF V
10-electrode	I II III aVR aVL aVF V₁ V₂ V₃ V₄ V₅ V₆

When the 12-lead display configuration is used, press the **ECG1, 2** key to display the lead selection menu.



CAUTION	The QRS detection leads, arrhythmia detection leads, monitoring leads on the central monitor, recording leads are fixed as ECG1 and ECG2. Especially for arrhythmia detection, set the most appropriate leads with high QRS amplitude for ECG1 and ECG2.
----------------	--

5 Set the baseline position.

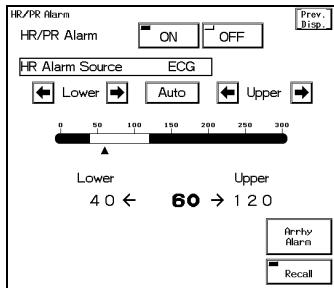
Position

If the waveform is difficult to see due to ECG amplitude, set the 0mV baseline position.

The baseline position for the waveform display and recording will be adjusted.

HR Alarm

- 1 Press the **HR Alarm** key to display the alarm setup menu.



Select ON/OFF of HR/PR alarm, and set the upper and lower alarm limit.

The common alarm value for HR measured from ECG, PR measured from SpO₂, PR measured from BP can be set.
The upper and lower limit can be set in 5 bpm increments.

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the HR/PR alarm. Selecting OFF will not generate the HR/PR alarm.
Lower Upper	Lower Alarm Limit	Sets the lower alarm limit (20–295bpm). Setting a value 20bpm or below will turn OFF the alarm.
Upper Auto	Upper Alarm Limit	Sets the upper alarm limit (25–300bpm). Setting a value 300bpm or above will turn OFF the alarm.
Auto	Automatic Setup	Automatically sets the upper limit to +40bpm, and the lower limit to -40bpm to the current value.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for “Alarm” on the “Backup at Discharge” menu (Monitor Setup).

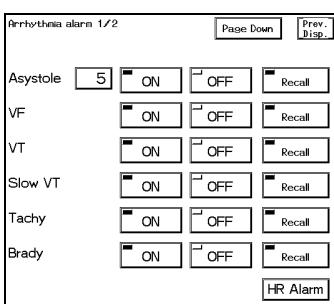


For the alarm mode setup procedure, refer to “8. System Configuration Alarm Mode”.

Arrhythmia Alarm

- 1 Press the **Arrhy.** key to display the arrhythmia alarm setup menu.

ON/OFF of each arrhythmia alarm and analysis threshold level can be set.

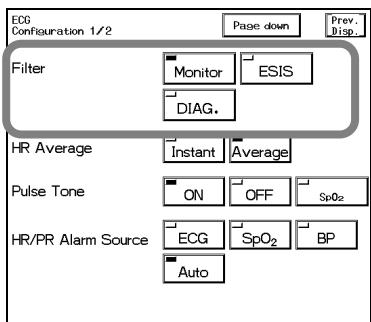


Refer to “4. Monitoring Setup Alarm Setup” for details.

Filter Mode Selection

The waveform frequency characteristic can be selected from Monitor Mode, ESIS Mode, or Diagnosis Mode according to the monitoring purpose. Each mode has different frequency characteristic. The selected filter mode will be printed when recording.

- 1 Press the **Config.** key.



The configuration menu for selecting a filter will be displayed.

- 2 Select the filter mode from **Monitor**, **ESIS**, or **Diag.**.

Monitor Mode

Patient Type	Frequency Characteristic
Adult / Child	0.5–40Hz
Neonate	1.6–40Hz

This is the standard mode for ECG monitoring. The upper frequency is set to 40Hz to reduce artifact caused by EMG, etc.

ESIS Mode (When electrosurgery-proof ECG relay cable is used)

Patient Type	Frequency Characteristic
Adult / Child	1.6–15Hz
Neonate	1.6–15Hz

The upper frequency is set to 15Hz, so that it can largely reduce the high-frequency artifact.

Diagnosis Mode

Patient Type	Frequency Characteristic
Adult / Child	0.05–100Hz
Neonate	1.6–100Hz

Select this mode if ST measurement or high frequency ECG monitoring is performed.

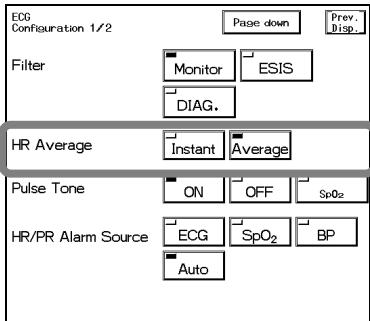
As the lower frequency is set to 0.05Hz, ST level can be accurately measured.

NOTE	When the filter mode is changed, a notch will appear on the ECG waveform due to the change in frequency characteristic. An ECG tracing on grid paper. A vertical rectangle highlights a notch in the baseline between two heartbeats. The tracing shows a regular rhythm with a slight downward deflection at the end of each complex, which becomes more pronounced within the highlighted area.
------	--

HR Average Selection

The averaging method of HR measured from ECG can be selected.

- 1 Press the **Config.** key.



The configuration menu for selecting HR average method will be displayed.

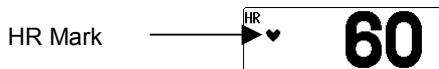
- 2 Select **Instant** or **Average**.

Selecting **Instant** will display the HR measured from RR interval of each heartbeat.

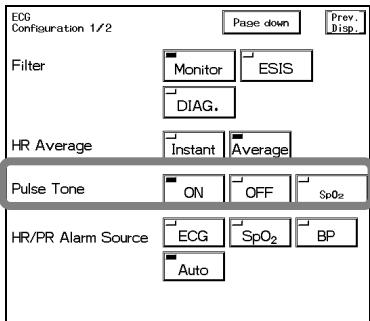
Selecting **Average** will display the HR measured from 6 seconds of heartbeat for adult and child, and 3 seconds of heartbeat for neonate.

HR Synchronization Mark and Pulse Tone

The HR mark synchronized to ECG or PR can be displayed inside the parameter key.
ON/OFF of HR pulse tone can be also set.



- 1 Press the **Config.** key.



The configuration menu for setting the pulse tone will be displayed.

- 2 Select from **ON** / **OFF** / **SpO₂**.

OFF will not display the synchronized mark. The pulse tone will not be generated.

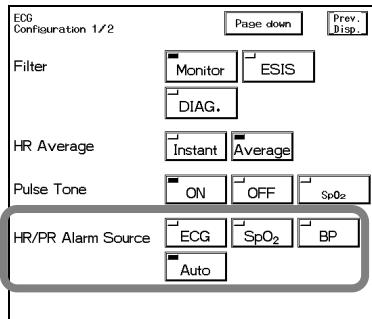
ON will display the synchronized mark. The pulse tone will be generated.

SpO₂ will always synchronize to SpO₂ for synchronized mark/tone regardless of the "HR/PR Alarm Source" setup.

HR/PR Alarm Source

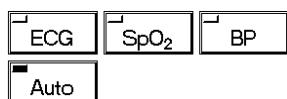
The parameter to display the HR synchronized mark and to generate the HR/PR alarm can be selected from ECG, SpO₂, and BP (BP1 or ART).

1 Press the **Config.** key.



The configuration menu for selecting the HR/PR alarm source will be displayed.

2 Select a parameter.



Selecting **ECG** will generate the alarm based on HR measured from ECG. HR synchronized mark will be displayed.

Selecting **SpO₂** will generate the alarm based on PR measured from SpO₂. SpO₂ synchronized mark will be displayed.

Selecting **BP** will generate the alarm based on PR measured from BP (BP1 or ART). BP synchronized mark will be displayed.

However **BP** can be selected only when **ECG/SpO₂/BP** is selected for "HR/PR Source" of the monitor setup menu.

Selecting **Auto** will automatically select the measurable HR source in the priority of ECG>SpO₂>BP. If the corresponded parameter key is displayed, alarm generation will be also effective.

6

ECG

WARNING

- The HR/PR alarm will not be generated unless the parameter key corresponded to the selected HR/PR source is displayed. Be sure to display the parameter key for the HR/PR source.
- 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 PR is set as the HR/PR alarm source on the DS-7300, HR alarm will be set to OFF on the central monitor.

CAUTION

If **BP** is selected for "HR/PR source" (Or, if **Auto** selects BP for HR/PR Source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_IBP value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list.

In case of DS-LANIII network, refer to the operation manual for the central monitor.

Automatic Lead Switching

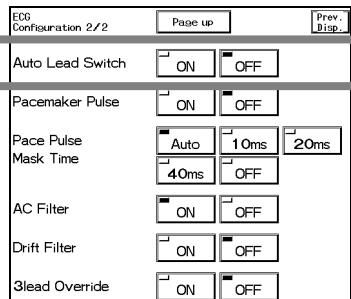
When the lead off condition occurs, the "Check Electrodes" message will be displayed and a new ECG lead will be automatically set if the Automatic Lead Switching is set to ON.

The automatic lead switching will be performed for ECG 1 and ECG 2.

Lead Switching

Type	Electrode Off	Auto Lead Selected	
		ECG1	ECG2
4-electrode cable	RA	III	III
	LA	II	II
5-electrode cable	RA / RA+V	III	III
	LA / LA +V	II	II
	V	II	aVR
10-electrode cable	RA / RA+V	III	III
	LA / LA +V	II	II
	V, V2-V6	II	aVR

- 1 Press the **Config.** → **Page Down** keys.



The configuration menu for selecting the automatic lead switching will be displayed.

- 2 Select **ON** or **OFF**.

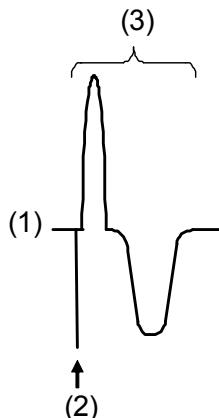
OFF will not switch the lead when an electrode comes off.

ON will automatically switch to another lead when an electrode comes off.

Pacemaker Pulse

The artificial pace pulse can be displayed by superimposing it on the ECG waveform. The artificial pace pulse will be displayed in yellow.

Pacemaker Pulse Detection Algorithm



- (1) ECG Signal Input
Inputs ECG signal.
- (2) Suspension of Pacemaker Pulse and QRS Detection
Signals with high frequency and large amplitude will be detected as a pacemaker pulse. When a pacemaker pulse is detected, QRS detection will be suspended for a certain amount of time to prevent the pacemaker pulse erroneously detected as QRS.
- (3) Canceling Arrhythmia Detection
Arrhythmia detection will be cancelled to avoid detecting the waveform succeeding the pacemaker pulse as an abnormal beat.

WARNING

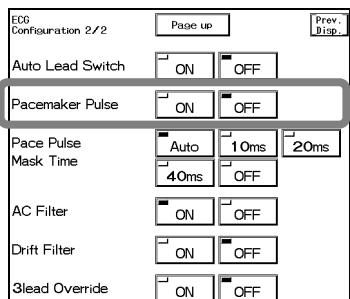
Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. See "11 Technical Information" for disclosure of the pacemaker pulse rejection capability of this equipment.

CAUTION

Precautions about Pacemaker Pulse Detection

- 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.
- When the spontaneous QRS and pacemaker pulse overlaps (as in a fusion beat), QRS detection will be suspended and the heart rate will be reduced.
- If a pacemaker pulse is continuously detected due to AC frequency interference, QRS detection will be suspended and the heart rate will be reduced. Also arrhythmia detection will not be possible.

1 Press the **Config.** → **Page Down** key.



The configuration menu to select artificial pacemaker pulse will be displayed.

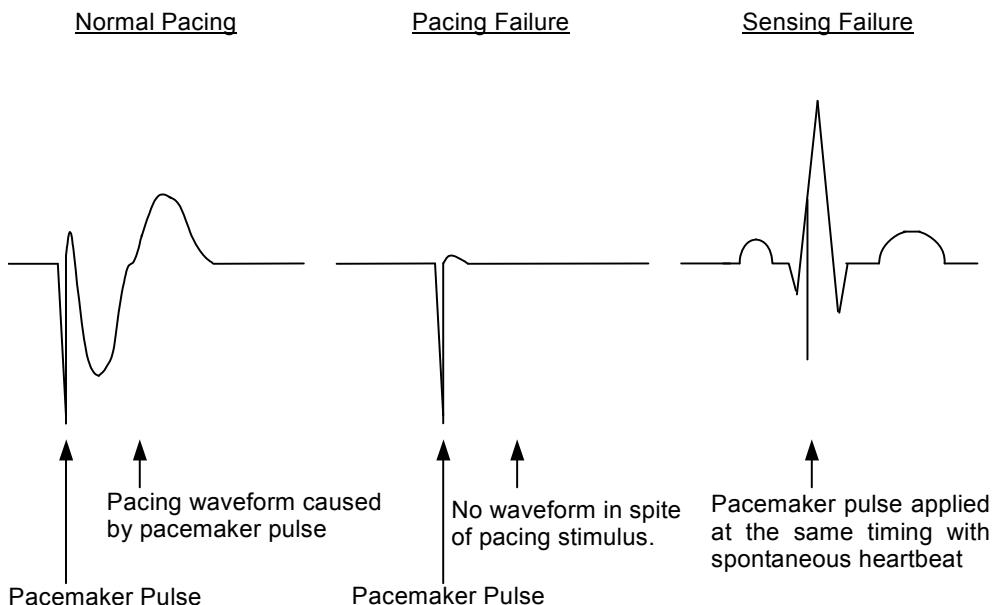
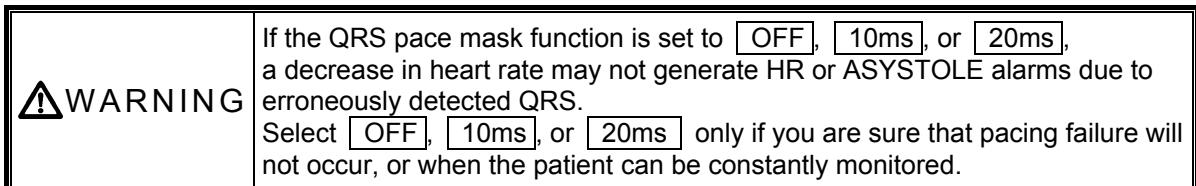
2 Select **ON** or **OFF**.

OFF will not display the pacemaker artificial pulse.

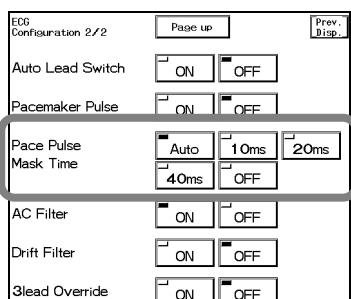
ON will display the pacemaker artificial pulse in a different color from the ECG waveform. This will automatically be set to **ON** when "Used" is selected for pacemaker use on the patient admit / discharge menu.

QRS Pace Pulse 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 pulse 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 pulse mask" function may erroneously mask the QRS and cause the heart rate measurement to decrease. To avoid this, QRS pace pulse mask function can be set to **OFF**, **10ms**, or **20ms** for correct measurement of the heart rate. (default setting : ON)



- 1 Press the **Config.** → **Page Down** keys.



The configuration menu for selecting pace pulse mask time will be displayed.

- 2 Select the pace pulse mask time.

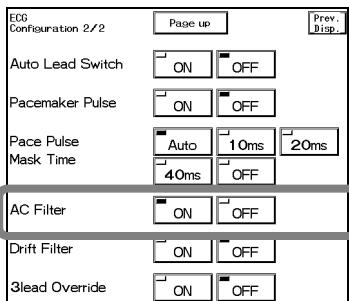
Select from **10ms**, **20ms**, **40ms** depending on the pace spike amplitude or presence of fusion beat.

Selecting **Auto** will automatically select the pace pulse mask time from 20ms, 30ms, or 40ms depending on the pace spike amplitude.

Selecting **OFF** will set the mask time to 0ms.

AC Filter

- 1 Press the **Config.** → **Page Down** keys.



The configuration menu for selecting the AC filter will be displayed.

- 2 Select **ON** or **OFF** for the AC filter.

Selecting **ON** will set the AC filter which attenuates the AC noise of 50–60Hz.

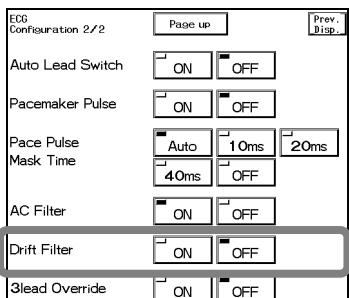
Selecting **OFF** will not set the AC filter.

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.

6
ECG

- 1 Press the **Config.** → **Page Down** keys.



The configuration menu to select the ECG drift filter will be displayed.

- 2 Select **ON** or **OFF** for the ECG drift filter.

Selecting **ON** will set the ECG drift filter and controls the baseline drift.

When the ECG drift filter is set, the patient signal display will delay about 0.5 seconds.

The message, "Drift-F ON" will be displayed on the home display.

Selecting **OFF** will not set the ECG drift filter.



Message



Instead of "Drift-F ON" message, the enlarged time can be displayed depending on the setup.
For procedures, refer to "8. System Configuration Monitor Setup".

3-lead Override

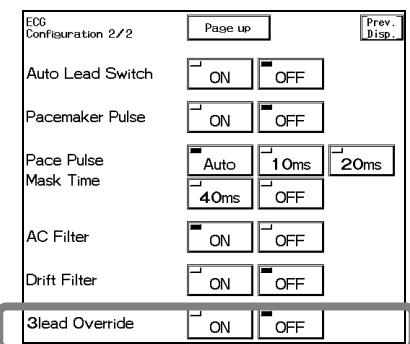
When a 5-lead or 10-lead relay cable is used with a 3-lead cable, the device will judge as lead-off condition and display the “LEAD OFF” message.

This can be avoided by selecting ON for “3-lead Override”.

NOTE

If 4-lead, 5-lead, or 10-lead relay cable is used with all the lead cables and electrodes connected, but **ON** is selected for “3-lead Override”, the device will acknowledge that only 3 electrodes are used and displays only one waveform. Also, artifact may interfere on the waveform, and lead-off condition cannot be correctly displayed. When setting **ON** for “3-lead Override”, use only 3 electrodes of L, R, and F.

- 1 Press the **Config.** → **Page Down** keys.

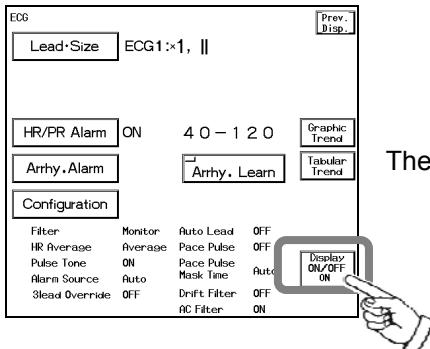


The configuration menu to set the “3-lead Override” will be displayed.

- 2 If using the 3-lead cable, select **ON**.

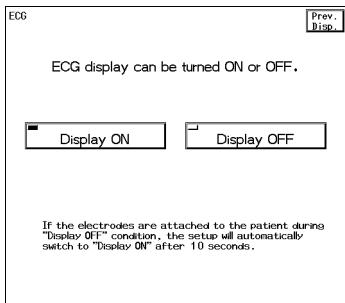
ON/OFF of Parameter Display

- 1 Press the **Display ON/OFF** key.



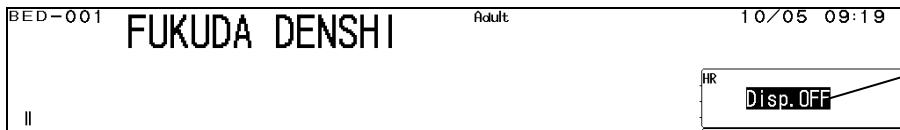
The confirmation display for ON/OFF of ECG display will appear.

- 2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



The Disp. OFF message will be displayed inside the parameter key.

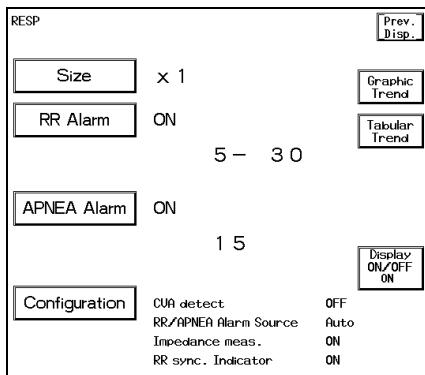
When ECG electrodes are attached to the patient with the ECG display set to OFF, the ECG waveform and numeric data will be automatically displayed after 10 seconds.



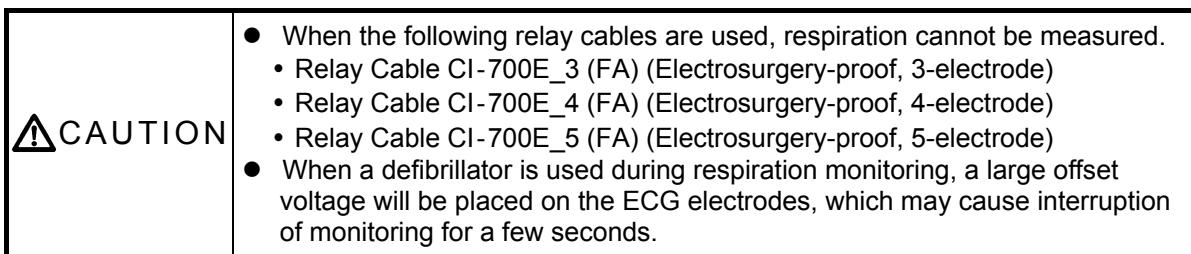
CAUTION When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.

Respiration

This menu allows setup for the impedance respiration measurement and CO₂ respiration measurement.

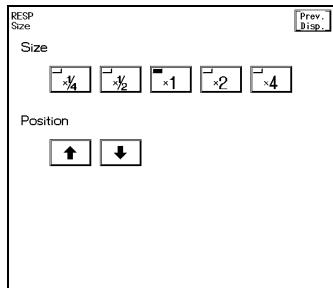


- Size** : Selects the waveform size to display impedance respiration.
RR Alarm : Selects ON/OFF of respiration rate alarm, and sets upper and lower alarm limits.
APNEA Alarm : Selects ON/OFF of apnea alarm and sets upper alarm limit.
Configuration : Sets the respiration monitoring configuration.



Respiration Waveform Size

- 1 Press the [Size] key to display the size setup menu.**



Select the waveform size and baseline position to display and record the impedance respiration waveform.

- 2 Select the waveform size.**

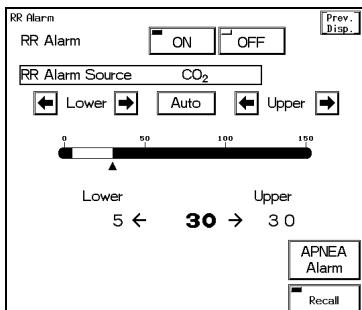
Select the size from $\times 1/4$, $\times 1/2$, $\times 1$, $\times 2$, $\times 4$.

- 3 Set the baseline position using the , keys.**

Adjust the baseline position if the waveform is hard to see due to the waveform amplitude.

RR Alarm

- 1 Press the **RR Alarm** key to display alarm setup menu.



Set ON/OFF of RR alarm and upper and lower alarm limit. The alarm will be set common to RR measured from impedance respiration waveform or RR measured from CO₂ waveform. The adjustable increment for upper and lower limit depends on the patient type.
Adult / Child : 5Bpm increment
Neonate : 2Bpm increment

NOTE	If the alarm is based on the RR measured from CO ₂ waveform, RR alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.
-------------	--

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the RR alarm. Selecting OFF will not generate the RR alarm.
Lower Upper	Lower Alarm Limit	Sets the lower alarm limit (5–145Bpm / 2–148Bpm). Setting a value 5Bpm or below will turn OFF the alarm.
Lower Upper	Upper Alarm Limit	Sets the upper alarm limit (10–150Bpm / 4–150Bpm). Setting a value 150Bpm or above will turn OFF the alarm.
Auto	Automatic Setup	Automatically sets the upper limit to +20Bpm, and the lower limit to -20Bpm to the current value.

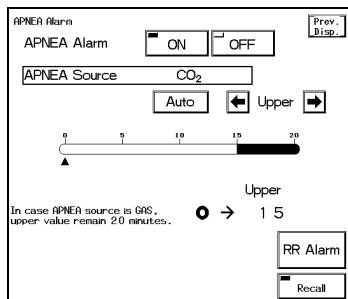
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).



For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

Apnea Alarm

- 1 Press the **Apnea Alarm** key to display the alarm setup menu.



Set ON/OFF of apnea alarm and upper limit of apnea time. Apnea will be set common to apnea time measured from impedance respiration waveform or apnea time measured from CO₂ waveform. The upper limit can be set in 1-second increment. There is no lower limit.

WARNING	<ul style="list-style-type: none">The purpose of this apnea 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.)If PURITAN-BENNETT Ventilator is used, APNEA alarm will not generate if ventilator is selected for RR/APNEA Alarm Source.
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NOTE	If the alarm is based on the apnea time measured from CO ₂ waveform, apnea alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.
-------------	---

Key	Item	Description
 <input type="checkbox"/> ON <input type="checkbox"/> OFF	Individual Setup	Selecting <input type="checkbox"/> ON will generate the apnea alarm. Selecting <input type="checkbox"/> OFF will not generate the apnea alarm.
 <input type="checkbox"/> Upper 	Upper Alarm Limit	Sets the upper alarm limit (5–20sec.). Setting a value equal to or above 20sec. will turn OFF the alarm.
 Auto	Automatic Setup	Sets the apnea alarm value set for the currently selected alarm mode.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select Backup for “Alarm” on the “Backup at Discharge” menu (Monitor Setup).

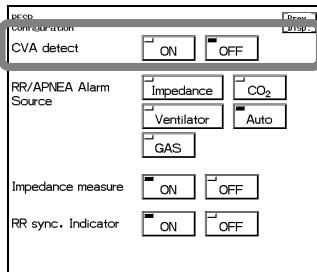


For the alarm mode setup procedure, refer to “8. System Configuration Alarm Mode”.

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, for 20 seconds or over (10 seconds or over for neonates) and the CVA detection function set to ON, the “CVA detected” message will be displayed, and an alarm sound will be generated. This function will be effective only when Impedance is set as the RR/APNEA alarm source.

- 1 Press the **Configuration** key on the RESP setup menu.



The configuration menu to set the CVA detection will be displayed.

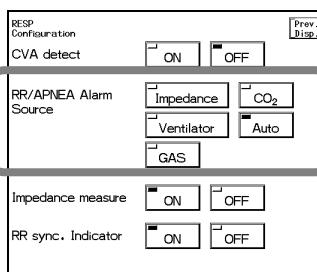
- 2 Select **ON** or **OFF**.

ON will generate an alarm and display a message when CVA is detected.
OFF will not perform CVA detection.

RR/APNEA Source

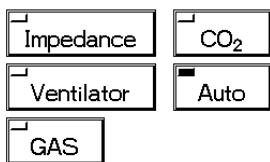
The parameter to display the RR synchronized mark and to generate the RR/APNEA alarm can be selected from impedance RR, CO₂ RR, and ventilator RR.

- 1 Press the **Configuration** key on the RESP setup menu.



The configuration menu to select RR source, APNEA source will be displayed.

2 Select the parameter.



Selecting **Impedance** will generate RR alarm based on the impedance respiration curve. Impedance synchronized mark will be displayed.

Selecting **CO₂** will generate RR alarm based on the CO₂ waveform. CO₂ synchronized mark will be displayed.

Selecting **Ventilator** will generate RR alarm based on RR measured by the ventilator. Ventilator synchronized mark will be displayed.

Selecting **Auto** will automatically select the measurable parameter in the priority of CO₂>ventilator>impedance, and generates alarm if the corresponded parameter key is displayed on the home display.



WARNING The RR/APNEA alarm will not be generated unless the parameter key corresponded to the selected RR/APNEA source is displayed. Be sure to display the parameter key for the RR/APNEA source.



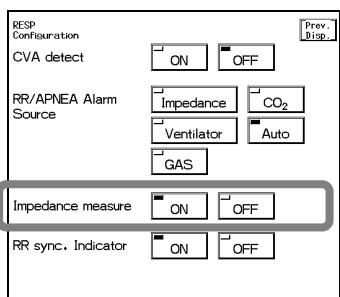
- If RR/APNEA alarm source is other than impedance respiration (Or, if **Auto** selects the RR source other than impedance respiration), the respiration waveform will not be transmitted on the DS-LANII network, and will not be recorded on the central recorder.
- If the "RR source" is other than CO₂ or GAS (Or, if **Auto** selects the RR source other than CO₂ or GAS), the CO₂ waveform will not be transmitted on the DS-LANII network, and will not be recorded on the central recorder.
- In case of DS-LANIII network, please refer to the operation manual of the central monitor.

Impedance Respiration Measurement

The respiration measurement using the impedance method conducts high-frequency and weak current between the ECG electrodes attached to the patient, and measures the potential difference between the electrodes caused by thoracic movement using the synchronous rectification system. For a patient using the adaptive (minute ventilation) pacemaker, the pacemaker measurement signal and the high-frequency current of this equipment interferes with each other which causes incorrect respiration measurement.

If the patient is using an adaptive (minute ventilation) pacemaker, set the impedance respiration measurement OFF.

1 Press the **Configuration** key on the RESP setup menu.



The configuration menu to set the impedance respiration measurement will be displayed.

2 Select **ON** or **OFF**.

ON will perform standard impedance respiration measurement.

OFF will stop the impedance respiration measurement and will not display the impedance respiration waveform and RR. A high frequency electric discharge which is a measurement signal will be also ceased.

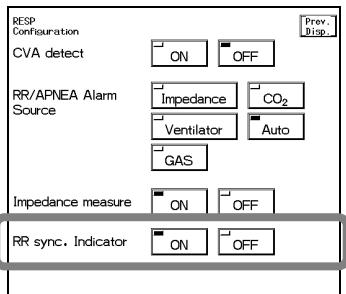
RR Synchronization Mark

The RR mark synchronized to impedance respiration or CO₂ waveform will be displayed inside the parameter key.

NOTE

If PURITAN-BENNETT Ventilator is used, RR synchronization mark will not be displayed when **Ventilator** is selected for "RR/APNEA Alarm Source".

- 1 Press the **Configuration** key on the RESP setup menu.



The configuration menu to set the RR synchronized mark will be displayed.

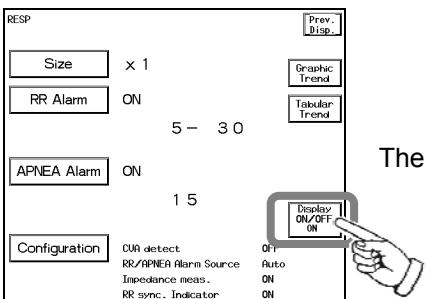
- 2 Select **ON** or **OFF**.

OFF will not display the synchronized mark.
ON will display the synchronized mark.



ON/OFF of Parameter Display

- 1 Press the **Display ON/OFF** key.

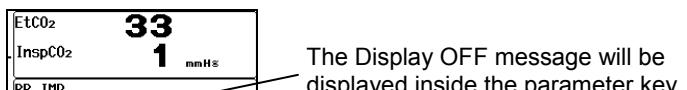
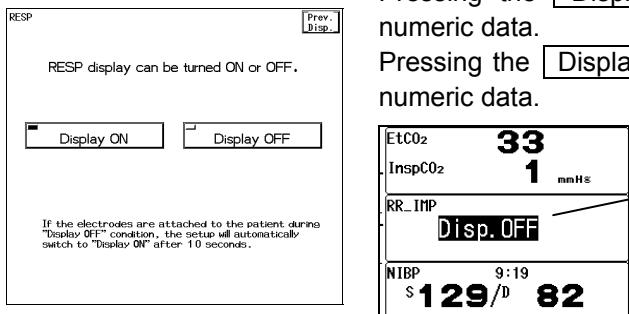


The confirmation display for ON/OFF of RESP display will appear.

- 2 Select **Display ON** or **Display OFF**.

Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



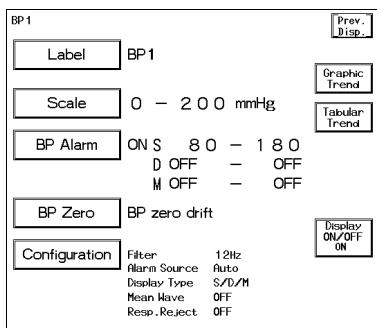
When ECG electrodes are attached to the patient with the respiration display set to OFF, the respiration waveform and numeric data will be automatically displayed after 10 seconds.

CAUTION

When waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.

Invasive Blood Pressure (BP1–BP8)

This menu allows setup of the measurement condition for BP1–BP8.



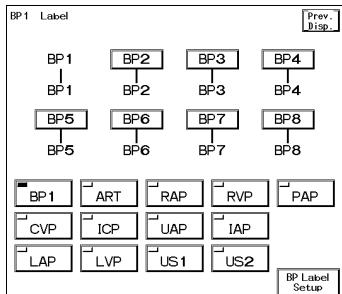
- Scale : Selects the scale for BP waveform display.
- BP Alarm : Sets the upper and lower alarm limit of systolic, diastolic, mean blood pressure and ON/OFF of the alarm.
- BP Zero : Performs zero balance.
- Configuration : Sets the BP monitoring condition.

CAUTION

When the main power is turned ON, the BP value will not be displayed until the zero balance is performed. Make sure to perform the zero balance. However, if the power is turned ON within 5 minutes after the power is turned OFF, the previous zero balance information will be maintained, and BP value will be displayed. If HB-500 BP Module is used, the balance information will be maintained for 1 minute.

BP Label

- 1 Press the **Label** key.



The BP label setup menu will be displayed.
Select the BP label for display and recording.

- 2 Select the scale.

Select from **BP***, **ART**, **RAP**, **RVP**, **PAP**, **CVP**, **ICP**, **UAP**, **IAP**, **LAP**, **LVP**, **US1**, **US2**.

[The Description of Each Label]

- ART (Arterial Pressure)
- RAP (Right Atrial Pressure)
- RVP (Right Ventricular Pressure)
- PAP (Pulmonary Artery Pressure)
- CVP (Central Venous Pressure)
- ICP (Intra-cranial Pressure)
- UAP (Umbilical Artery Pressure)
- IAP (Intra-aortic Balloon Pumping Pressure)
- LAP (Left Atrial Pressure)
- LVP (Left Ventricular Pressure)
- US1 (BP User Label 1)
- US2 (BP User Label 2)

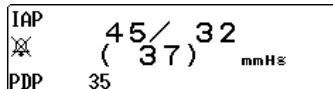
Refer to "8. System Configuration Label Setup" for procedure to set the BP user label.

NOTE	<p><u>Default BP Label</u></p> <p>If the Super Module and HB-500 BP Module are used simultaneously, the priority for the default BP label is higher for the Super Module. Then, the next priority will be in the order of the slot number of the input box.</p> <p>For example, if "BP1, 2" is used for the Super Module, and HB-500 are inserted in input box slot 1 and 2, "BP3, 4" will be assigned to the HB-500 in slot 1, and "BP5, 6" will be assigned to the HB-500 in slot 2.</p>
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● When the BP Label is IAP

When the BP label is IAP, PDP (Peak Diastolic Pressure) will be displayed in addition to systolic, diastolic, and mean pressure.

Note that Systolic Pressure (SYS) = Peak Systolic Pressure (PSP)



⚠ CAUTION	<ul style="list-style-type: none"> ● Note that Systolic Pressure (SYS) = Peak Systolic Pressure (PSP) for the graphic trend, data base, and alarm setup. ● When ECG is not measured, PDP cannot be calculated. ● When HB-500 is used, do not set the BP label to IAP. PDP will not be calculated and displayed as "—". S/D/M will not be displayed either.
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● When the BP Label is CVP

When the BP label is CVP, the measurement unit can be selected from "mmHg", "kPa" or "cmH₂O". The measurement unit can be selected on the preset menu. The selected unit will be displayed on the BP parameter key.



Refer to "8. System Configuration Hospital Setup" for CVP measurement unit setup.

● When the BP Label is ICP

When the BP label is ICP, labeling the artery pressure as ART will allow measuring the CPP (Cerebral Perfusion Pressure). CPP = Mean Arterial Pressure — Intracranial Pressure.

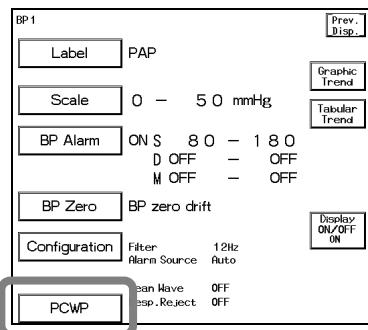
If CPP is negative value, the value will not be displayed. Also, alarm cannot be set for CPP.



PCWP Measurement

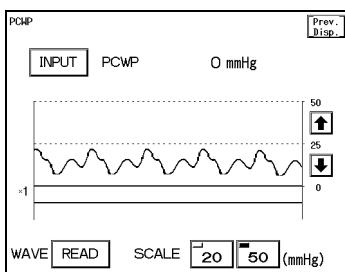
When PAP is set as BP label, the mean value can be displayed as PCWP (Pulmonary Capillary Wedge Pressure).

1 Set the BP label to PAP, and display the BP menu.



If the BP label is set to PAP, the **PCWP** key will be displayed on the BP menu.

2 Press the **PCWP** key.



The PCWP measurement display will appear.

3 Press the **WAVE** **READ** key.

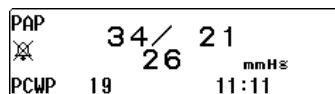
PCWP waveform and respiration waveform will be displayed.
The cursor point indicates the current mean pressure.

4 Use the **↑**, **↓** keys to manually set the PCWP value.

Move the cursor to manually set the PCWP value.
Select the waveform scale from 20 or 50mmHg.

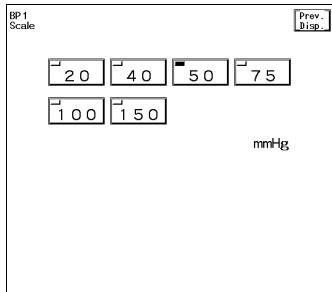
5 Press the **INPUT** key.

Press the **INPUT** key when the PCWP value is correctly set.
The PCWP value will be displayed inside the PAP (BP label) parameter box with the measurement time.
Also, the value will be input to the graphic trend.



BP Scale

- 1 Press the **Scale** key



The BP scale setup menu will be displayed.
Select the full scale for displaying and recording.
The scale selection will differ depending on the label.

BP Label	Scale
BP1–BP8, UAP, User Label	20, 50, 75, 100, 150, 200, 250, 300 (mmHg)
	4, 8, 12, 16, 20, 24, 32, 40 (kPa)
ART, LVP, IAP	50, 75, 100, 150, 200, 250, 300 (mmHg)
	8, 12, 16, 20, 24, 32, 40 (kPa)
PAP, RVP	20, 40, 50, 75, 100, 150 (mmHg)
	4, 6, 8, 12, 16, 20 (kPa)
CVP, RAP, LAP	10, 20, 30, 40, 50 (mmHg)
	2, 4, 5, 6, 8 (kPa)
	20, 40 (cmH ₂ O) * only for CVP
ICP	5, 10, 15, 20, 50, 100 (mmHg)
	1, 2, 3, 4, 8, 16 (kPa)

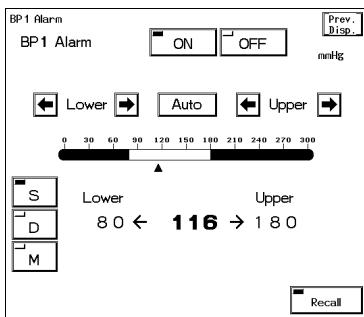
- 2 Select one scale from the displayed selection.



The BP waveform with a scale above the programmed scale will not be properly transmitted on a wireless network. Select a proper scale for the waveform.

BP Alarm

- 1 Press the **BP Alarm** key.



The BP alarm setup menu will be displayed.
Select ON/OFF of BP alarm and set the upper and lower alarm limit for systolic (S), diastolic (D), and mean (M) BP.

The alarm value should be set for each unit. (mmHg / kPa)
The adjustable increment will be according to the "BP Alarm Increment" setting. (Normal / Small).
The adjustable increment for upper and lower limit changes from 50mmHg / 7kPa.

	"BP Alarm Increment" Setup	
	When Normal	When Small
0–50mmHg	2mmHg increment	1mmHg increment
50–300mmHg	5mmHg increment	
0–7kPa	0.2kPa increment	0.1kPa increment
7–40kPa	0.5kPa increment	

Key	Item	Description
[ON] [OFF]	Individual Alarm	Selecting [ON] will generate BP alarm. Selecting [OFF] will not generate BP alarm.
[S] [D] [M]		Select from SYS (systolic BP), DIA (diastolic BP), MEAN (mean BP).
[←] Lower [→]	Lower Alarm Limit	Sets the lower alarm limit (0–295mmHg / 0–39.5kPa). Setting a value equal to or below 0mmHg/0kPa will turn OFF the alarm.
[←] Upper [→]	Upper Alarm Limit	Set the upper limit (2–300 mmHg / 0.2–40.0kPa). Setting a value equal to or above 300 mmHg / 40.0kPa will turn OFF the alarm.
[Auto]	Automatic Setup	When the BP label is BP1/ART, the upper and lower limit will be automatically set to +40mmHg / +5kPa and -20mmHg / -3kPa respectively to the current value. When the BP label is other than BP1/ART, the upper and lower limit will be automatically set to +20%, -20% respectively to the current value.

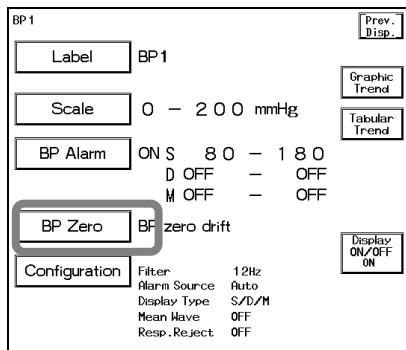
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select [Backup] for “Alarm” on the “Backup at Discharge” menu (Monitor Setup).

Reference

For the alarm mode setup procedure, refer to “8. System Configuration Alarm Mode”.

Zero Balance of Pressure Lines

- 1 Open the three-way valve of the pressure transducer to air.
- 2 Press the [BP zero] key.



Verify the BP waveform is positioned at zero, and “0” is displayed for the BP value. A message, “BP zero complete” will be displayed when the procedure is complete. A message, “BP zero failed” will be displayed when the process fails. The three-way valve may not be opened to air, artifact is present, or the transducer may be defective. Check the cause and try the zero balance procedure again.
A message, “BP zero drift” will be displayed when the interface cable is not connected. Check if the cable is firmly connected.

- 3 Close the three-way valve when the zero balance is complete.

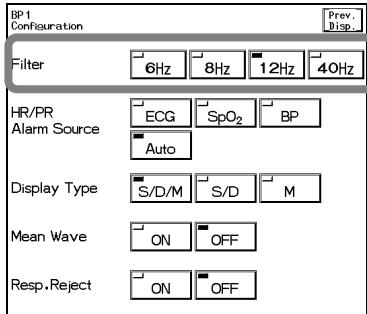


CAUTION Each time the blood pressure transducer or tubing is replaced, the zero balance procedure is required to ensure accurate measurements.

Filter Selection

An artifact may interfere on the BP waveform depending on the combination of BP measurement circuit. Select an appropriate filter from the low-pass filter of 6Hz, 8Hz, 12Hz, or 40Hz.

- 1 Press the **Configuration** key.



The configuration menu to select the filter will be displayed.

- 2 Select the filter.

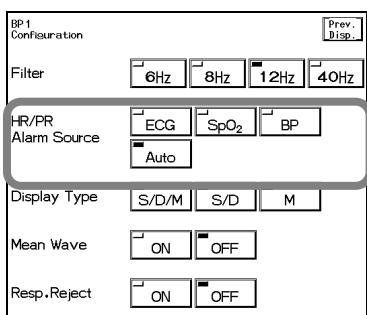
Select an appropriate filter from **6Hz**, **8Hz**, **12Hz**, **40Hz**.

HR/PR Alarm Source (BP1 or ART)

The parameter to display the HR synchronized mark and to generate the HR/PR alarm can be selected from ECG, SpO₂, or BP (BP1 or ART).

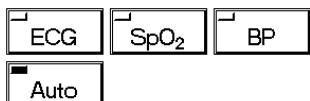
If BP1 and ART are measured simultaneously, ART will be prioritized.

- 1 Press the **Configuration** key.



The configuration menu to select the HR/PR alarm source will be displayed.

- 2 Select a parameter.



ECG will generate the alarm based on HR measured from ECG.
HR synchronized mark will be displayed.

SpO₂ will generate the alarm based on PR measured from SpO₂.
SpO₂ synchronized mark will be displayed.

BP will generate the alarm based on PR measured from BP (BP1 or ART). BP synchronized mark will be displayed.

However **BP** can be selected only when **ECG/SpO₂/BP** is selected for "HR/PR Alarm Source" of the monitor setup menu.

Auto will automatically select the measurable HR source in the priority of ECG>SpO₂>BP. If the corresponded parameter key is displayed, alarm generation will be also effective.

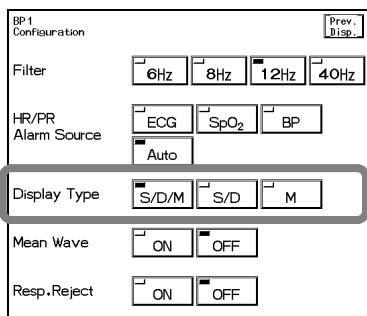
WARNING	<ul style="list-style-type: none"> The HR/PR alarm will not be generated unless the parameter key corresponded to the selected HR/PR source is displayed. Be sure to display the parameter key for the HR/PR source. The alarm for the parameter not selected for the "HR/PR Alarm Source" (ECG/SPO₂/BP) will be set to OFF on the DS-7600 Central Monitor. <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 PR is set as the HR/PR alarm source on the DS-7300, HR alarm will be set to OFF on the central monitor.
CAUTION	<p>If BP is selected for "HR/PR source" (Or, if Auto selects BP for HR/PR Source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_IBP value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list.</p> <p>In case of DS-LANIII network, refer to the operation manual for the central monitor.</p>
NOTE	<ul style="list-style-type: none"> If the HR/PR alarm source is BP, the PR will be displayed as "---" if the corresponded BP (ART or BP1) is not measured. If BP1 or ART is measured by the HB-500, the PR will be displayed as "---". To measure the PR, use the Super Module.

Display Selection of Numeric Data

The display type of BP numeric data can be selected from systolic / diastolic / mean, systolic / diastolic, or mean BP. The BP alarm will not be generated unless the data is displayed.

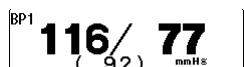
If the BP label is CVP, ICP, IAP, PAP, the display type is fixed.

1 Press the **Configuration** key.

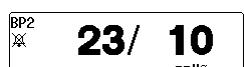


The display type selection will be displayed.

2 Select the display type.



S/D/M will display the systolic / diastolic / mean pressure.



S/D will display systolic / diastolic pressure.



M will display only the mean pressure.

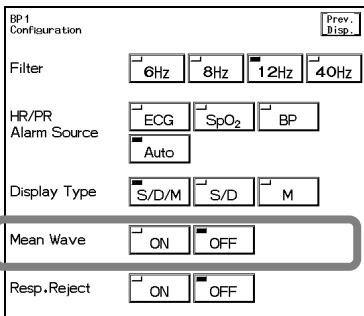
CAUTION

The BP data (SYS/DIA/Mean) not displayed will not generate the BP alarm or be displayed for the tabular trend function. Select the appropriate display type according to the monitoring purpose.

Mean BP Waveform Display

The mean BP waveform can be selected to be continuously displayed on the home display.

- 1 Press the **Configuration** key.



The mean waveform display selection will be displayed.

- 2 Select ON/OFF of mean BP waveform display.



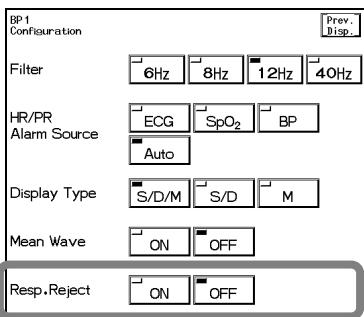
Selecting **ON** will display the mean BP waveform and "MEAN_WAVE" will be displayed inside the parameter key.

Respiration Rejection Filter

The BP waveform baseline drift caused by the respiration influence can be prevented by setting ON the respiration rejection filter.

NOTE If BP is measured by the HB-500 module, respiration rejection filter cannot be set.

- 1 Press the **Configuration** key.

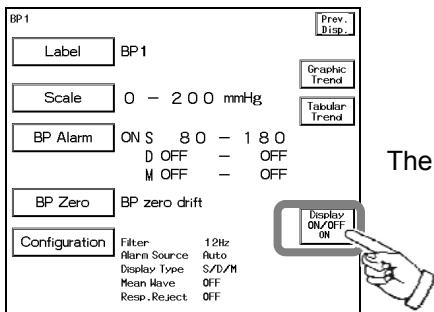


The respiration rejection filter selection will be displayed.

- 2 Select **ON** or **OFF** for the respiration rejection filter.

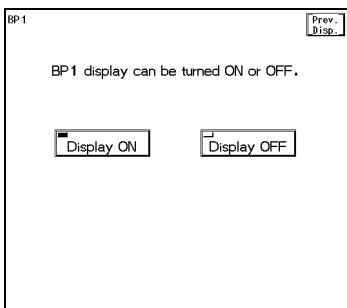
ON/OFF of Parameter Display

1 Press the **Display ON/OFF** key.



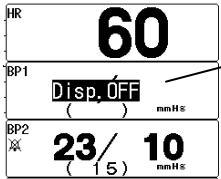
The confirmation display for ON/OFF of BP display will appear.

2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



The Display OFF message will be displayed inside the parameter key.

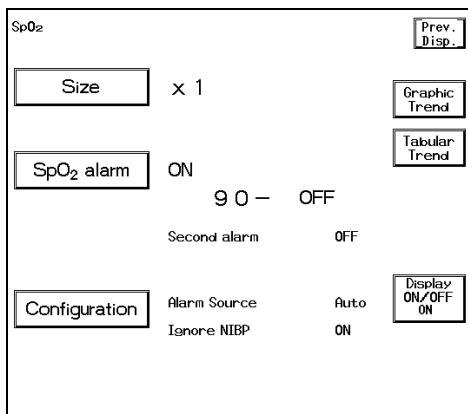
⚠ CAUTION

- When waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- If the display of waveform / numeric data labeled as BP1 or ART is set to OFF, the BP pulse rate will not be displayed.

SpO₂

(HS-710, 710E, 720, 720E, 720C, 702C, 702E)

This menu allows the setup of SpO₂ monitoring condition for NELLCOR[®] SpO₂ unit.



Size : Sets the pulse wave size.

SpO₂ Alarm : Sets ON/OFF of alarm, upper and lower alarm limit, and SEC alarm.

Configuration : Sets the SpO₂ monitoring configuration.

⚠ CAUTION

Take the following precautions when monitoring over long periods of time.

- To avoid skin rash or low-temperature burn, it is recommended to change the measurement position several times a day.
Be especially careful when continuously using on neonates, infants, or patients with peripheral circulatory disturbance.
- Direct sunlight to the sensor area can cause a measurement error.
Place a black or dark cloth over the sensor in these environments.
When not measuring, unplug the relay cable and sensor from the SpO₂ connector. Otherwise, the outside light may affect to falsely display measurements.

⚠ CAUTION

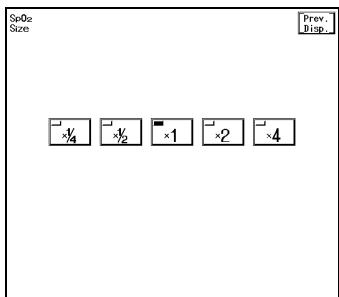
- The DS-100A is intended for use on finger of adults weighing over 40 kg (approximate). Do not use them on children or neonates. Also do not apply them on the thumb or foot.
- The light-emitting part of the sensor should be over the root of the fingernail. Do not insert the finger too far into the sensor as it may hurt the patient.
- The DS-100A is not designed for long-term use. Remove the sensor every 4 hours. If any inhibition is detected in tissue blood flow, replace it or move the sensor to another finger.
- Measuring on a limb with NIBP cuff, arterial catheter, or intracatheter may result in incorrect measurement.

⚠ CAUTION

Do not secure the adhesive tape too tight as it may obstruct the blood flow.

Pulse Wave Size

- 1 Press the **Size** key.



The pulse wave size setup menu will be displayed.
Select the waveform size for displaying and recording.

- 2 Select the waveform size.

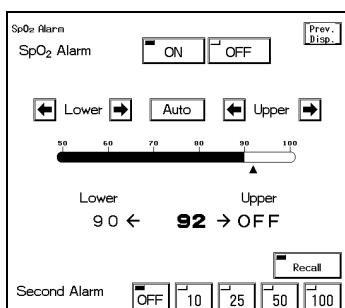
Select the size from **x1/4**, **x1/2**, **x1**, **x2**, **x4**.

SpO₂ Alarm

- 1 Press the **SpO₂ Alarm** key to display the alarm setup menu.

Select ON/OFF of SpO₂ alarm, and set the upper and lower alarm limit.

Also, when the SpO₂ value is unstable around the lower alarm limit, the frequently generated alarm can be corrected by setting the SEC (second) alarm function.



Refer to "4. Monitoring Setup SpO₂ SEC Alarm Setup" for details of SEC alarm setup procedure.

The upper and lower limits can be set in 1% increment.

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the SpO ₂ alarm. Selecting OFF will not generate the SpO ₂ alarm.
Lower Upper	Lower Alarm Limit Upper Alarm Limit	Sets the lower alarm limit (50–99%). Setting a value 50% or below will turn OFF the alarm. Sets the upper alarm limit (52–100%). Setting a value 100% or above will turn OFF the alarm.
Auto	Automatic Setup	Automatically sets the upper limit to OFF, and the lower limit to 95% to the current value.

NOTE	Whether to use the SEC (second) alarm function and its threshold selection should be based on the patient's clinical indication pertinent and medical evaluation.
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To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

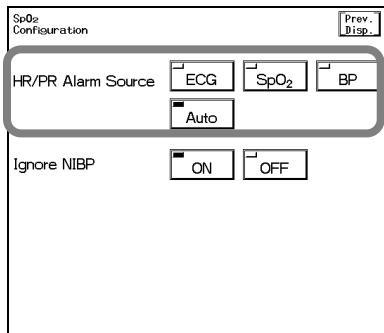


For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

HR/PR Alarm Source

The parameter to display the HR synchronized mark and to generate the HR/PR alarm can be selected from ECG, SpO₂, and BP (BP1 or ART).

1 Press the **Configuration** key.

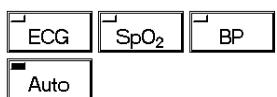


The configuration menu to select the HR/PR source will be displayed.

2 Select a parameter.

Selecting **ECG** will generate the alarm based on HR measured from ECG. HR synchronized mark will be displayed.

Selecting **SpO₂** will generate the alarm based on PR measured from SpO₂. SpO₂ synchronized mark will be displayed.



Selecting **BP** will generate the alarm based on PR measured from BP (BP1 or ART). BP synchronized mark will be displayed.

BP can be selected only when **ECG/SpO₂/BP** is selected for "HR/PR Alarm Source" of the monitor setup menu.

Selecting **Auto** will automatically select the measurable HR source in the priority of ECG>SpO₂>BP. If the corresponded parameter key is displayed, alarm generation will be also effective.

⚠ WARNING

- The HR/PR alarm will not be generated unless the parameter key corresponded to the selected HR/PR source is displayed. Be sure to display the parameter key for the HR/PR source.
- 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 PR is set as the HR/PR alarm source on the DS-7300, HR alarm will be set to OFF on the central monitor.

⚠ CAUTION

If **BP** is selected for "HR/PR source" (Or, if **Auto** selects BP for HR/PR Source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_IBP value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list.
In case of DS-LANIII network, refer to the operation manual for the central monitor.

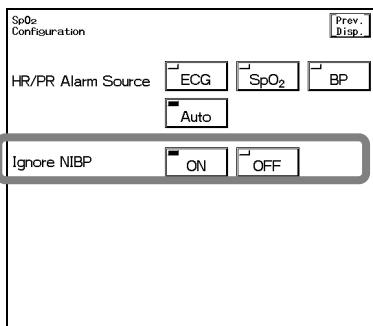
SpO₂ Alarm during NIBP Measurement

This setup is to be made when the SpO₂ sensor and NIBP cuff is placed on the same limb for measurement.

During the NIBP measurement, the cuff inflation restricts the blood flow which disables the correct detection of the SpO₂ value and PR, and may generate an improper alarm.

Selecting **OFF** will not generate the alarm until the NIBP measurement is complete. Similarly, when the HR source is set as **SpO₂**, the PR alarm will not be generated during NIBP measurement.

- 1 Press the **Configuration** key.



The configuration menu to set “Ignore NIBP” will be displayed.

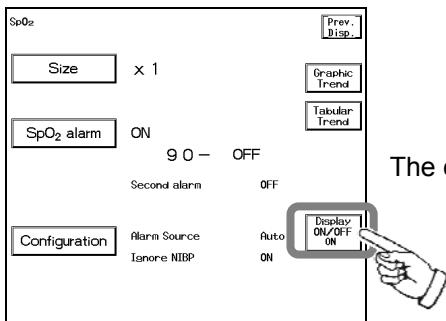
- 2 Select **ON** or **OFF**.

ON will generate the alarm during NIBP measurement.

OFF will not generate the SpO₂/PR alarm during NIBP measurement.

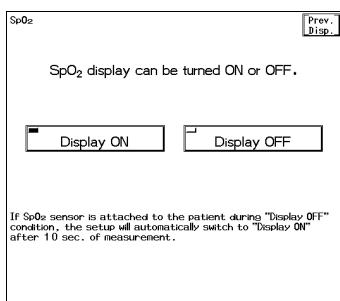
ON/OFF of Parameter Display

- 1 Press the **Display ON/OFF** key.



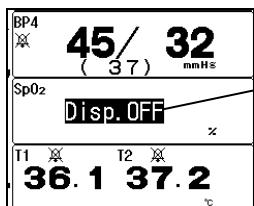
The confirmation display for ON/OFF of SpO₂ display will appear.

- 2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



The Disp. OFF message will be displayed inside the parameter key.

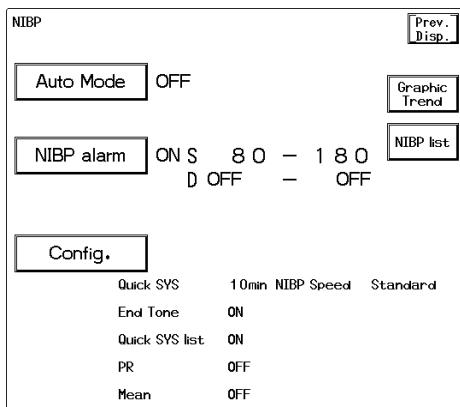
When SpO₂ sensor is attached to the patient with the SpO₂ display set to OFF, and SpO₂ is measured for 10 seconds, the pulse wave and numeric data will be automatically displayed.

⚠ CAUTION

- When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- When the waveform and numeric data display is set to OFF, the pulse rate measured by SpO₂ will not be displayed either.

Non-Invasive Blood Pressure

This menu allows the setup of NIBP monitoring condition.

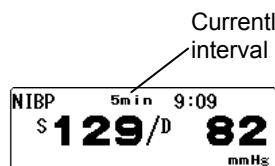


- Auto Mode : Sets the automatic interval measurement and starts the 1-minute interval measurement and Quick SYS measurement.
NIBP Alarm : Sets the ON/OFF of NIBP alarm and upper / lower limit of systolic, diastolic, and mean BP.
Configuration : Sets the NIBP monitoring configuration.

⚠ CAUTION	For the following situation, measurements will be terminated. <ul style="list-style-type: none">• When the measurement time has exceeded 120 seconds for adult, 90 seconds for child, 60 seconds for neonate.• When the inflation value has exceeded 310mmHg for adult, 210mmHg for child, 160mmHg for neonate.
⚠ CAUTION	If used with the incorrect patient type, it will not only cause erroneous measurement, but the inflating level for the adult may be applied to child or neonate causing a dangerous situation to the patient.

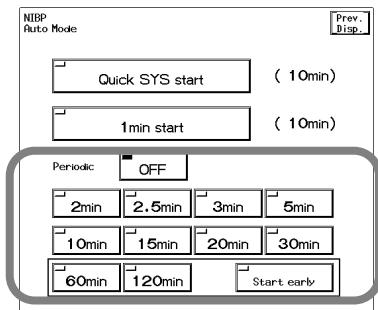
NIBP Automatic Measurement

Non-invasive blood pressure can be measured automatically at selected time intervals. If Quick SYS measurement is performed during the NIBP automatic measurement, the automatic measurement will automatically resume when Quick SYS measurement completes.



When NIBP automatic measurement is set, the set interval time will be displayed inside the parameter key.

- 1 Press the **Auto Mode** key.



The measurement interval setup menu for the automatic measurement will be displayed.

2 Select the interval time.

Select from **2 min** / **2.5 min** / **3 min** / **5 min** / **10 min** / **15 min** / **20 min** /
30 min / **60 min** / **120 min**.

Select **OFF** if not performing the interval measurement.

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.

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

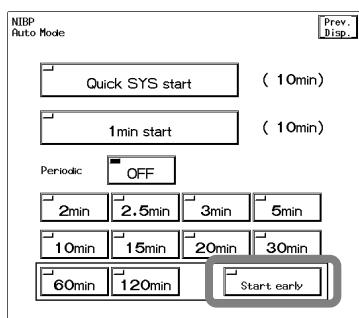
2.5 min. : 13:15, 13:17:30, 13:20, . . .

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

5 min. : 13:15, 13:20, 13:25, . . .

120 min. : 14:00, 16:00, 18:00, . . . (The measurement will start at every even hours.)

3 Press **Start early** to start the measurement 5 minutes early.



If **60min** or **120min** is selected for interval time, the measurement will start 5 minutes early.

If outputting the data to PC and other external equipment using the PC communication function of this device, an error may be generated to the NIBP measurement time depending on the input interval of the external equipment. As this device outputs the data at completion of NIBP measurement, if the external equipment inputs the data at 60 minutes interval, 60 minutes time lag will occur. By starting the measurement 5 minutes early, this time lag between the external equipment can be minimized.

NOTE

When using the DS-LANIII network and if "Timer" is selected for NIBP measurement on the central monitor, NIBP auto mode will be set OFF on the DS-7300, but the measurement will start at fixed time according to the central monitor setting.

The NIBP measurement interval condition at discharge and at power ON can be set on the monitor setup menu.

• "NIBP Auto Mode" on "Backup at Discharge" menu

OFF / **Backup** / **Backup (Resume auto mode by manual measurement)**

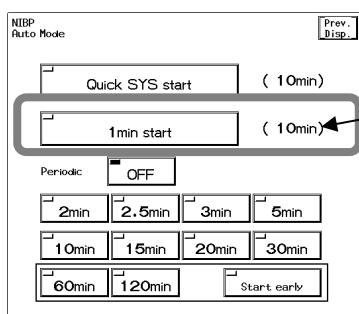
• "NIBP Measurement Interval at Power ON" : **According to Setup** / **2.5min. when OFF** /
5min. when OFF

• "NIBP Measurement at Power ON" : **According to Setup** / **Resume Manually**

NIBP 1-Minute Interval Measurement

The 1-minute interval measurement will automatically stop after 10 minutes and returns to the previous interval mode setup.

1 Press the **Auto Mode** key.



The measurement interval setup menu to start the 1-minute interval measurement will be displayed.

Measurement Duration

2 Press the **1min Start** key to start the 1-minute interval measurement.

Pressing the **NIBP START/STOP** key will not stop the 1-minute interval measurement.

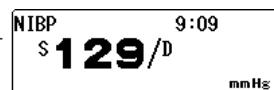
To cancel the measurement, press the **[1min Start]** key again.

⚠ CAUTION

- The 1-minute interval measurement will always start from 00 second. Pressing the **[1min Start]** key will start the measurement from the next 00 second.
- The 1-minute interval measurement will automatically stop after 10 minutes and returns to the previous interval mode setup.

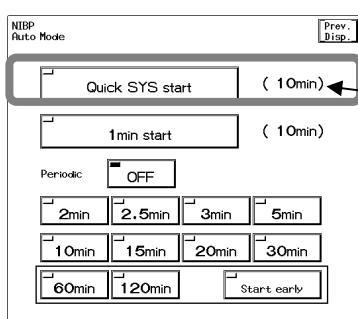
Quick SYS Start

The NIBP measurement can be continuously performed for 3 min. / 5 min. / 10 min. If any abnormality on the cuff hose, etc. is found during the Quick SYS, the continuous measurement will be ceased.



Only the systolic blood pressure will be measured and displayed.

1 Press the **[Auto Mode]** key.



The measurement interval setup menu to start the Quick SYS will be displayed.

Measurement Duration

2 Start the Quick SYS.

Pressing the **[Quick SYS Start]** key will start the continuous measurement.

To cease the measurement, press the **[NIBP START/STOP]** key, or press again the **[Quick SYS Start]** key.

The duration of continuous measurement can be selected on the "Quick SYS" of the NIBP configuration menu.

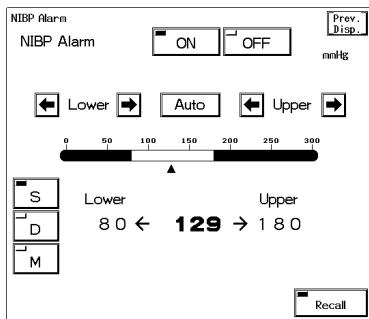
The continuous measurement will automatically cease after the selected duration from **[3min]**, **[5min]**, or **[10min]**.

⚠ CAUTION

The alarm function will be ineffective for the BP value measured by Quick SYS regardless of the ON/OFF selection of NIBP alarm.

NIBP Alarm

- 1 Press the **NIBP Alarm** key.



The alarm setup menu will be displayed.

Set ON/OFF of NIBP alarm, upper and lower alarm limits of systolic (S), diastolic (D), mean (M) NIBP.

Set the alarm value for each measurement unit (mmHg / kPa).

The upper and lower limit can be set in 5mmHg / 0.5kPa increment.

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the NIBP alarm. Selecting OFF will not generate the NIBP alarm.
S D M		Select from S (systolic BP), D (diastolic BP), or M (mean BP).
← Lower →	Lower Alarm Limit	Sets the lower alarm limit (10–295mmHg / 1.5–39.5kPa). Setting a value 10mmHg / 1.5kPa or below will turn OFF the alarm.
← Upper →	Upper Alarm Limit	Sets the upper limit (15–300mmHg / 2.0–40.0kPa). Setting a value 300mmHg / 40.0kPa or above will turn OFF the alarm.
Auto	Automatic Setup	Automatically sets the upper limit to +40mmHg / +5kPa to the current value, and the lower limit to –20mmHg / –3kPa to the current value.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).



For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

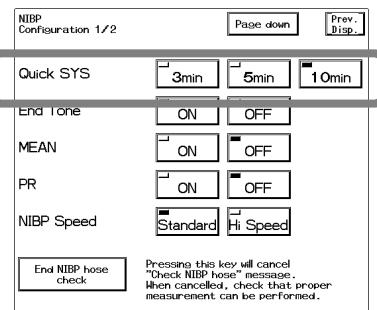
Whether or not to generate an alarm at NIBP measurement failure can be set. (Default: OFF) For details, refer to "4. Monitoring Setup Alarm Setup ON/OFF of Alarm Occurrence at NIBP Failure".

Quick SYS Measurement Duration

The duration of Quick SYS can be selected from 3 min., 5 min., and 10 min.

The long duration of continuous measurement may congest the blood stream of the measured location. Set the duration according to the patient condition.

- 1 Press the **Configuration** key.



The NIBP configuration menu to set the Quick SYS will be displayed.

- 2 Select the measurement duration.

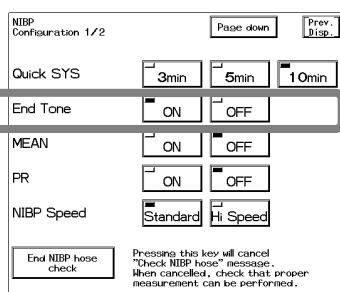
Select an appropriate time from **[3min]**, **[5min]**, **[10min]**.

Quick SYS will automatically cease after the selected duration.

End of Measurement Tone

By selecting ON for the “End Tone”, a tone will be generated when the NIBP measurement completes.

- 1 Press the **Configuration** key.



The NIBP configuration menu to set the “End Tone” will be displayed.

- 2 Select **ON** or **OFF**.

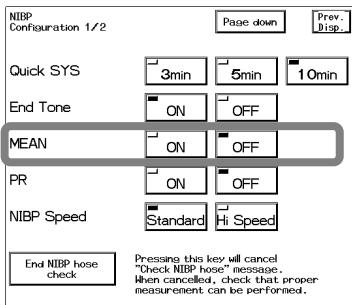
ON will generate a tone when the measurement completes.

OFF will not generate a tone when the measurement completes.

Mean BP Display

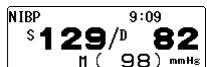
The ON/OFF of mean BP display can be selected.

- 1 Press the **Configuration** key.

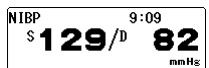


The NIBP configuration menu for setting the mean BP display will be displayed.

- 2 Select **ON** or **OFF**.



ON will display the mean BP.



OFF will not display the mean BP.

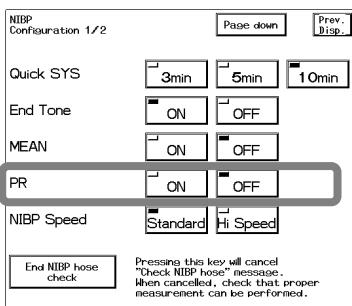


If the mean BP display is set to OFF, the mean BP alarm will not be generated. Also, the mean BP will not be displayed for the tabular trend or the NIBP list function if the display is set to OFF.

Pulse Rate Display

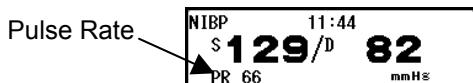
The pulse rate measured during NIBP measurement can be displayed. This pulse rate is only for display. It will not generate alarm, or be displayed for the list function.

- 1 Press the **Configuration** key.



The configuration menu to set the pulse rate display will appear.

- 2 Select **ON** or **OFF**.



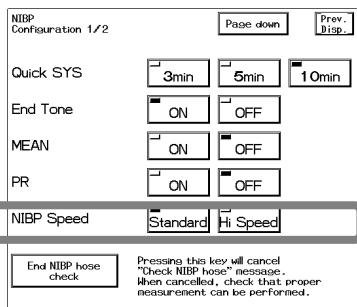
ON will display the pulse rate.

OFF will not display the pulse rate.

NIBP Speed

The NIBP cuff inflation speed can be selected from standard or high speed.

1 Press the Configuration key.



The NIBP configuration menu to select the cuff inflation speed will be displayed.

2 Select the NIBP speed.

Select an appropriate speed from Standard or Hi Speed.

When Standard is selected, it will take about 10 seconds to inflate to 300mmHg with 500cc tank connected.

When Hi Speed is selected, it will take about 6 seconds to inflate to 300mmHg with 500cc tank connected. (for adult)

When an adult cuff is wrapped around an arm with a space allowing one finger fitting in between the cuff and arm, the speed to inflate to 190mmHg is within 11 seconds for normal speed, and within 7 seconds for high speed.

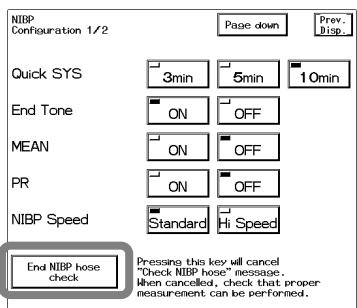
NOTE

The NIBP speed setup is effective only when adult or child is selected for patient type. The NIBP speed for neonate will be fixed in spite of the speed selection.

Clearing the NIBP Air Hose Check Message

The "NIBP hose check" message will be displayed when air hose connection is defective or when air hose is bent. The message will be automatically cleared when defective part is corrected, but it can also be cleared by pressing the End NIBP hose check key.

1 Press the Configuration key.



Pressing the End NIBP hose check key will clear the displayed message.

NOTE

After resolving the cause of air hose check message, verify that NIBP can be properly measured.

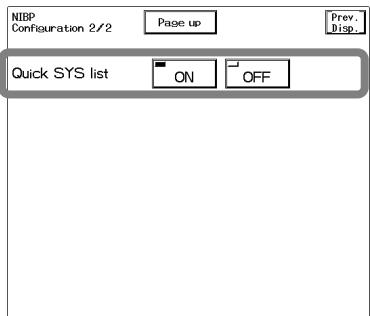
Reference

Refer to "10. Maintenance Troubleshooting" for the cause of air hose check.

Quick SYS List

The Quick SYS measurement value can be input in the NIBP list.

- 1 Press the **Configuration** → **Page Down** keys.



The configuration menu to set the Quick SYS list input will be displayed.

- 2 Select **ON** or **OFF**.

Quick SYS

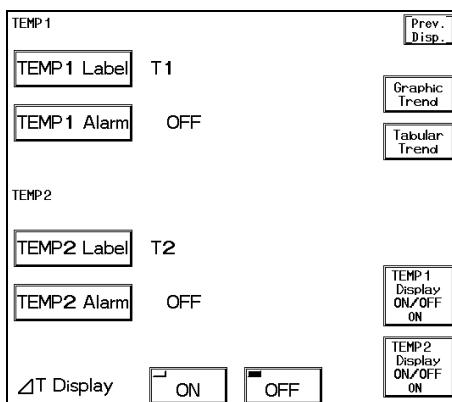
NIBP mmHg	HR	PR-SpO ₂	SpO ₂
128/	76	76	96
120/	76	76	96
129/	76	76	96
129/	76	76	96
129/	76	76	96
128/ 91	78	78	95
129/ 90	76	76	96
129/ 90	76	76	98
129/ 90	76	76	96
132/ 93	76	76	96

ON will input the systolic value to NIBP list.

OFF will not input the systolic value to NIBP list.

Temperature (T1-T8)

This menu allows to set the monitoring condition of TEMP 1-8.



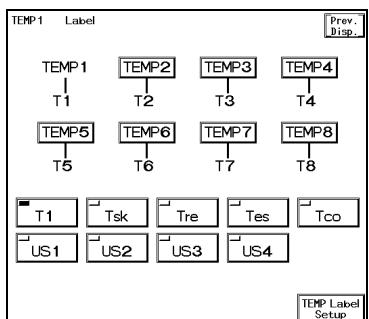
TEMP* Alarm: Sets ON/OFF of temperature alarm, and upper and lower alarm limits.

TEMP* Label: Set the temperature measuring location.

(* indicates T1-T8)

Temperature Label

- 1 Press the **TEMP* Label** key.



The temperature label setup menu will be displayed.

- 2 Select the label.

Select from **T***, **Tsk**, **Tre**, **Tes**, **Tco**, **US1**, **US2**, **US3**, **US4**.

[Description of Each Label]

T1-T8 (Default)

Tsk (Skin Temperature)
Tre (Rectal Temperature)
Tes (Esophageal Temperature)
Tco (Core Temperature))

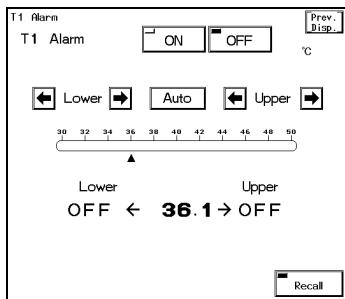
US1 (Temperature User Label 1)
US2 (Temperature User Label 2)
US3 (Temperature User Label 3)
US4 (Temperature User Label 4)



Refer to "8. System Configuration Label Setup" for temperature user label setup.

Temperature Alarm

- 1 Press the **TEMP*** **Alarm** key.



The alarm setup menu will be displayed.
Select ON/OFF of temperature alarm, and set the upper and lower alarm limit.

The alarm limit can be set for each measurement unit (°C / °F).
The upper and lower limit can be set in increments of 0.5°C / 1.0°F.

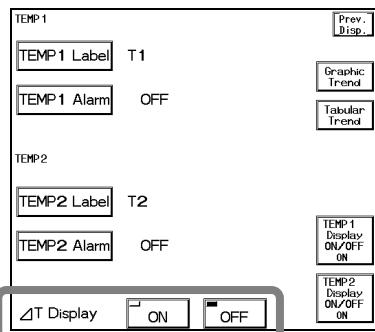
Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the TEMP alarm. Selecting OFF will not generate the TEMP alarm.
Lower Upper	Lower Alarm Limit	Sets the lower alarm limit (30.0–49.0°C / 86.0–120.0°F). Setting a value 30.0°C / 86.0°F or below will turn the alarm OFF.
Upper Auto	Upper Alarm Limit	Sets the upper alarm limit (31.0–50.0°C / 88.0–122.0°F). Setting a value 50.0°C / 122.0°F or above will turn the alarm OFF.
Auto	Automatic Setup	Automatically sets the upper limit to +2.0°C / +4.0°F to the current value, and lower limit to -2°C / -4.0°F to the current value.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).



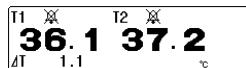
For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

ΔT Display

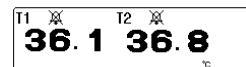


The difference of two temperature value can be displayed in absolute value. The combination of TEMP 3 and TEMP 4, TEMP 5 and TEMP 6, TEMP 7 and TEMP 8 is possible.

- 1 Select **ON** or **OFF**.



ON will display the ΔT value.

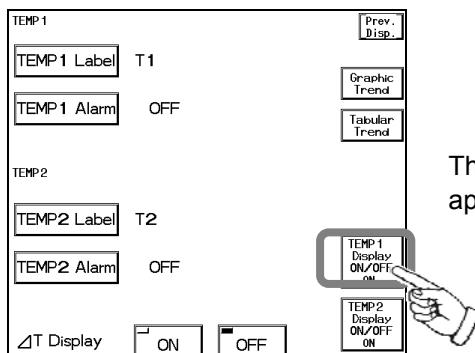


OFF will not display the ΔT value.

NOTE The alarm can not be set for ΔT .

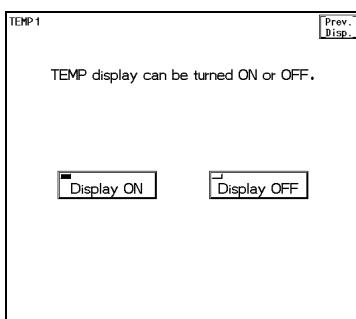
ON/OFF of Parameter Display

- 1 Press the **Display ON/OFF** key.

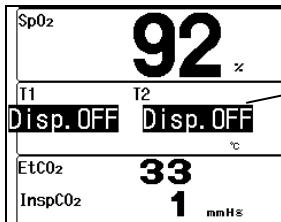


The confirmation display for ON/OFF of TEMP display will appear.

- 2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the numeric data.
Pressing the **Display OFF** key will not display the numeric data.



The Display OFF message will be displayed inside the parameter key.



When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.

CO₂ Concentration

(HS-710E, 720E, 702E)

This menu allows to set the monitoring condition of CO₂ concentration when CO₂ measurement unit manufactured by Oridion® is used.

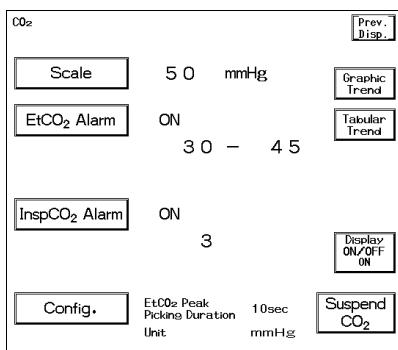
- For parameter setup of the HS-720C, 702C, (RESPIRONICS®), refer to P6-61 "CO₂ Concentration (HS-720C, 702C)".

The model type of the Super Module can be verified on the rear side of the Super Module.



Rated Label

- For parameter setup when using the HC-500 CO₂ Module, refer to P6-68 "CO₂ Concentration (HC-500)".



Scale : Sets the CO₂ waveform scale.

EtCO₂ Alarm : Sets ON/OFF of EtCO₂ alarm, and upper and lower alarm limits.

InspCO₂ Alarm : Sets ON/OFF of InspCO₂ alarm and upper alarm limit.

Configuration : Sets CO₂ monitoring conditions.

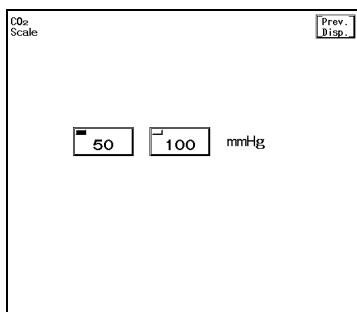
Suspend CO₂ : Suspends CO₂ measurement temporarily.



If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the "CO₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.

CO₂ Scale

- Press the **Scale** key.



The scale setup menu will be displayed.

<Scale setup menu for the unit in mmHg>

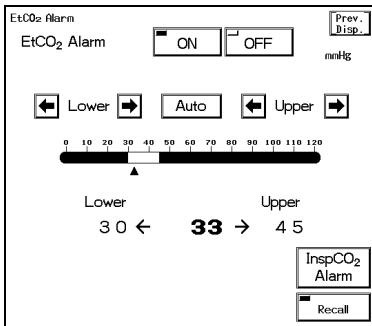
- Select the CO₂ waveform scale for displaying and recording.

For the measurement unit in mmHg, select the scale from **50**, **100**.

For the measurement unit in kPa and %, select the scale from **4**, **8**, **10**.

EtCO₂ (End-Tidal CO₂) Alarm

- 1** Press the **EtCO₂ Alarm** key.



The alarm setup menu will be displayed.

Select ON/OFF of EtCO₂ alarm, and set the upper and lower alarm limits.

Alarm condition should be set for each unit (mmHg / kPa / %). Upper and lower alarm limits can be set in increments of 1mmHg, 0.1kPa, and 0.1%.

NOTE

EtCO₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.

Key	Item	Description
[ON] [OFF]	Individual Alarm	Selecting ON will generate the EtCO ₂ alarm. Selecting OFF will not generate the EtCO ₂ alarm.
[Lower] [Upper]	Lower Alarm Limit	Sets the lower alarm limit (1–98mmHg, 0.1–13.1kPa, 0.1–13.1%). Setting a value equal to or below 1mmHg, 0.1kPa, 0.1% will turn the alarm OFF.
[Upper] [Lower]	Upper Alarm Limit	Sets the upper alarm limit (3–115mmHg, 0.3–15.0kPa, 0.3–15.0%). Setting a value equal to or above 115mmHg, 15.0kPa, 15.0% will turn the alarm OFF.
Auto	Automatic Setup	Automatically sets the upper alarm limit to +10mmHg, +1.3kPa, +1.3% to the current value, and the lower alarm limit to -10mmHg, -1.3kPa, -1.3% to the current value.

CAUTION

For HS-710E, 720E, 702E, and HC-500 Module, the upper EtCO₂ alarm will not generate if the upper limit is set to 100mmHg/13.4kPa and above as the measurement range is 0–99mmHg / 0–13.3kPa.

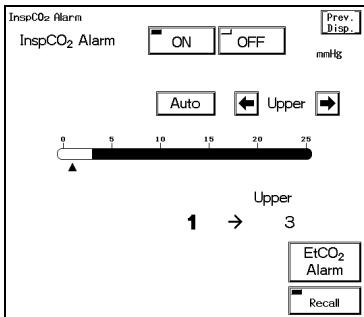
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

Reference

For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

InspCO₂ (Inspiratory CO₂) Alarm

- 1 Press the **InspCO₂ Alarm** key.



The alarm setup menu will be displayed.

Select ON/OFF of InspCO₂ alarm, and set the upper alarm limit.

Set the alarm condition for each measurement unit (mmHg / kPa / %).

Upper alarm limit can be set in increments of 1mmHg, 0.1kPa, 0.1%.

Lower alarm limit cannot be set.

NOTE

InspCO₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.

Key	Item	Description
<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF	Individual Alarm	Selecting ON will generate the InspCO ₂ alarm. Selecting OFF will not generate the InspCO ₂ alarm.
<input type="checkbox"/> Upper <input type="checkbox"/>	Upper Alarm Limit	Sets the upper alarm limit (1–24mmHg, 0.1–3.0kPa, 0.1–3.0%). Setting a value equal to or above 24mmHg, 3.0kPa, 3.0% will turn the alarm OFF.
<input type="checkbox"/> Auto	Automatic Setup	Automatically sets the upper alarm limit to 3mmHg, 0.4kPa, 0.4% to the current measurement.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

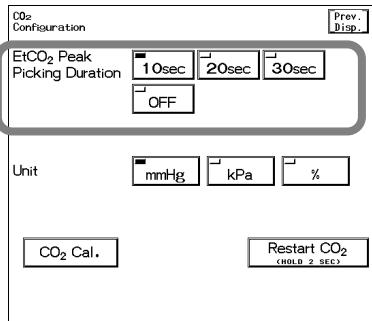


For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

EtCO₂ Peak Picking Duration

The duration to pick the EtCO₂ maximum value can be selected from 10 sec., 20 sec., 30 sec., or OFF.

- 1 Press the **Configuration** key.



The CO₂ configuration menu to select the EtCO₂ peak picking duration will be displayed.

- 2 Select the peak picking duration.

Select the duration to pick the EtCO₂ maximum value from **10sec**, **20sec**, **30sec**.

If **OFF** is selected, EtCO₂ value for each respiration will be displayed.

As the EtCO₂ value display is updated each second, EtCO₂ value for each respiration can not be displayed if respiration rate is above 60 Bpm.

Measurement Unit

The measurement unit can be selected from mmHg, kPa, or %.



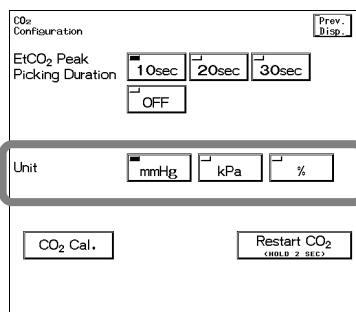
The alarm setup is necessary for each measurement unit.

When a measurement unit is changed, make sure to set the alarm condition for the changed unit.



If the measurement unit is changed frequently, the continuity of the graphic trend and tabular trend may be lost.

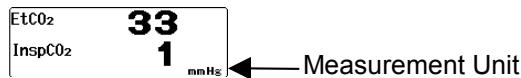
- 1 Press the **Configuration** key.



The CO₂ configuration menu to select the measurement unit will be displayed.

- 2 Select the measurement unit from **mmHg**, **kPa**, **%**.

The graphic trend and tabular trend will be displayed with the selected measurement unit.



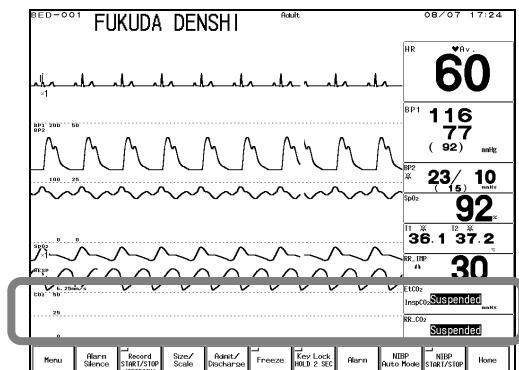
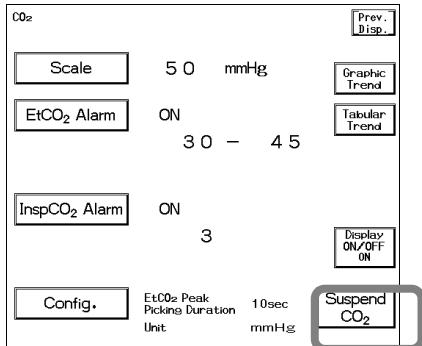
Suspending CO₂ Measurement

The CO₂ measurement can be temporarily suspended by stopping the CO₂ pump operation.

⚠ WARNING

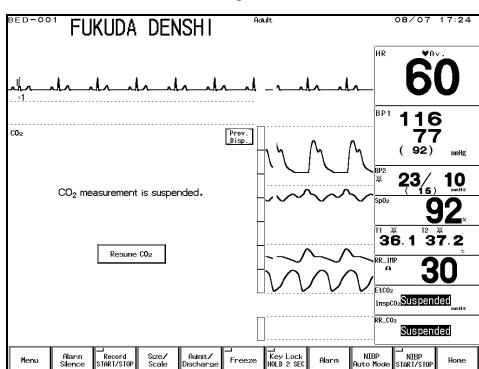
When performing expectoration treatment to the patient with a ventilator connected, make sure to suspend the CO₂ measurement before the treatment. Otherwise, water may enter into the pump causing the equipment to be damaged.

1 Press the **Suspend CO₂** key.



The pump operation will stop, CO₂ waveform and numeric data display will disappear, and "Suspended" will be displayed inside the CO₂, RR_CO₂ numeric data box.

2 If the CO₂ numeric data box (or RR_CO₂ numeric data box) is pressed when the CO₂ measurement is suspended, the following display will appear.



Press the **Resume CO₂** key to resume the CO₂ measurement.

For the following case, CO₂ measurement will automatically resume.

- When 15 minutes has elapsed since the measurement was suspended.
- When the patient is discharged.
- When the power was turned OFF for 5 minutes or more and turned ON again.

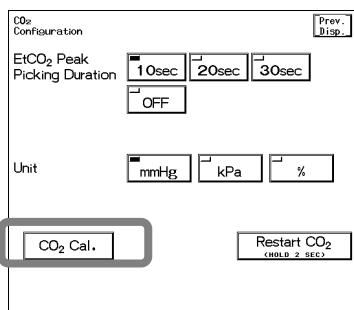
⚠ CAUTION

- When the CO₂ measurement is suspended, the CO₂ alarm generation and CO₂ data input to the tabular/graphic trend will also cease.
- If CO₂ is selected as the "RR/APNEA Alarm Source", RR alarm/APNEA alarm will not be generated when the CO₂ measurement is suspended.

CO₂ Calibration

CO₂ calibration can be performed using calibration gas. Calibration should be conducted once a year or after 4,000 operating hours (whichever comes first) or when any measurement error is found.

- 1 Press the **Configuration** key.

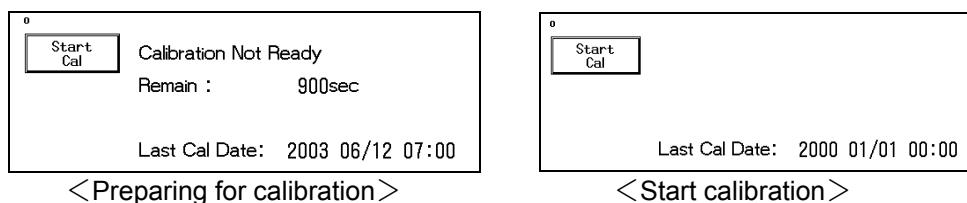


The CO₂ configuration menu with the **CO₂ Cal.** key will be displayed.

- 2 Press the **CO₂ Cal.** key to display the calibration menu.

Due to precision matter, CO₂ calibration cannot be started until 20 minutes has elapsed after the power was turned ON.

During this time, **Start Cal** key will be displayed in gray which indicates that the key is ineffective. The message, "Calibration not ready" and the remaining time for preparation will be displayed.

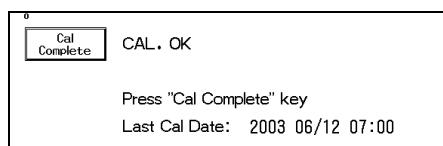


<Preparing for calibration>

<Start calibration>

- 3 Press the **Start Cal** key and conduct calibration according to the displayed messages.
- 4 The message, "Feed CAL. GAS" will be displayed. Press the injection button to inject the calibration gas.
- 5 The message, "Calc. Gas can be removed" will be displayed. Stop pressing the injection button to cease the injection.
- 6 The message, "CAL. OK" will be displayed. "Last Cal. Date" will be updated to the current date.

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



- 7 Press the **Cal Complete** key to end the calibration.

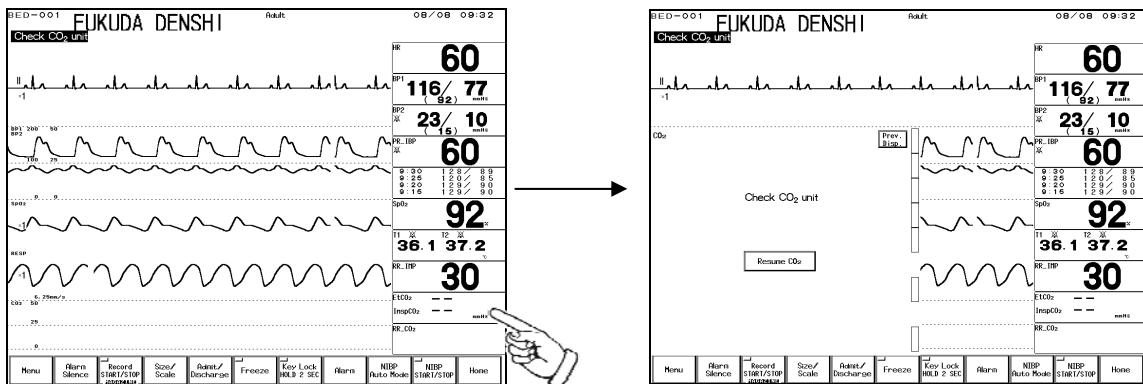
CAUTION

- Perform calibration after 20 minutes from turning ON the power of the HS-700 (Super Module).
- Do not disconnect the sampling tube during calibration. If disconnected, calibration will cease.

Restarting CO₂ Measurement (Restarting the Pump Operation)

The pump will cease functioning when erroneous condition such as blocked exhaust tube, sampling tube or nasal prong is detected. When the pump ceases functioning, "Check CO₂ unit" message will be displayed. After resolving the problem, press the **Resume CO₂** key and resume the measurement.

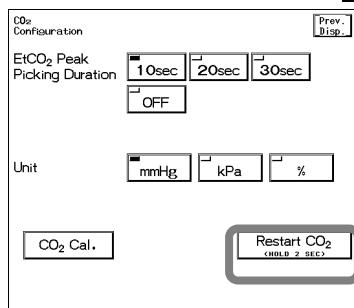
- When an error is detected, "Check CO₂ unit" message will be displayed. Pressing the CO₂ numeric data box will display the screen with **Resume CO₂** key.



- Press the **Resume CO₂** key.

The CO₂ measurement can be also resumed by pressing the **Menu** → **Parameter** → **CO₂** → **Config.** keys.

On the displayed screen, press the **Restart CO₂** key for 2 seconds.



If the "Check CO₂ unit" message is not displayed, **Restart CO₂** key will not function.

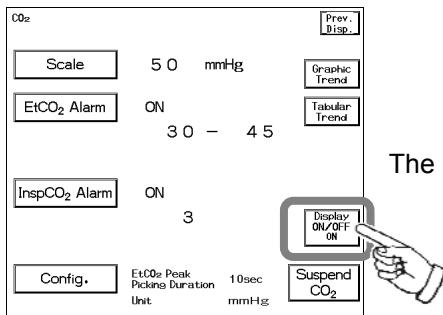
- Check that the measurement is resumed.

The sampling pump will start to function, and the "Check CO₂ unit" message will disappear. Check that the message has disappeared and the measurement data is displayed.

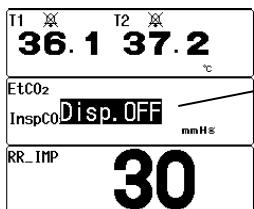
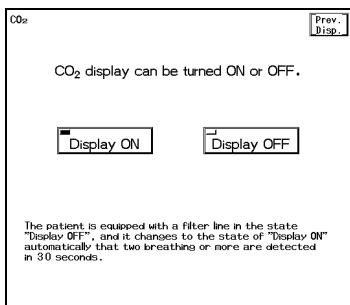
NOTE	If the "Check CO ₂ unit" message does not disappear after the measurement is resumed, the replacement of CO ₂ unit part may be necessary. Contact our service representative.
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ON/OFF of Parameter Display

1 Press the **Display ON/OFF** key.



2 Select **Display ON** or **Display OFF**.



The Display OFF message will be displayed inside the parameter key.

If the filter line is applied to the patient and more than 2 respirations are detected in 30 seconds during "Display OFF" condition, the display will automatically return.

CAUTION

- When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- When the waveform and numeric data display is set to OFF, the respiration rate measured by CO₂ will not be displayed either.

CO₂ Concentration

(HS-720C, 702C: Capnostat 5)

This menu allows to set the monitoring condition of CO₂ concentration when Capnostat 5 sensor (Mainstream Method) manufactured by RESPIRONICS® is used.

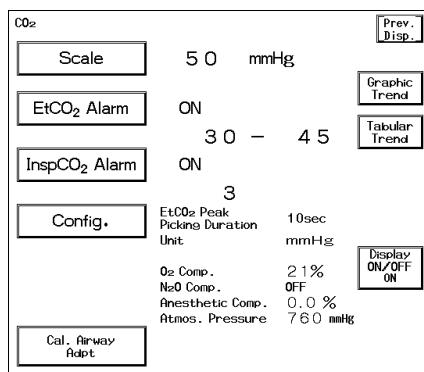
- For parameter setup of the HS-710E, 720E, 702E (Oridion®), refer to P6-55 "CO₂ Concentration (HS-710E, 720E, 702E)".

The model type of the Super Module can be verified on the rear side of the Super Module.



Rated Label

- For parameter setup when using the HC-500 CO₂ Module, refer to P6-68 "CO₂ Concentration (HC-500)".



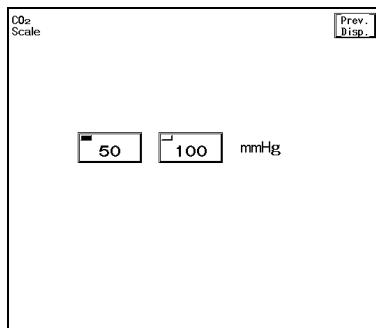
- Scale : Sets the CO₂ waveform scale.
EtCO₂ Alarm : Sets ON/OFF of EtCO₂ alarm, and upper and lower alarm limits.
InspCO₂ Alarm : Sets ON/OFF of InspCO₂ alarm and upper alarm limit.
Configuration : Sets CO₂ monitoring conditions.



If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the "CO₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.

CO₂ Scale

- 1 Press the **Scale** key.



The scale setup menu will be displayed.

<Scale setup menu for the unit in mmHg>

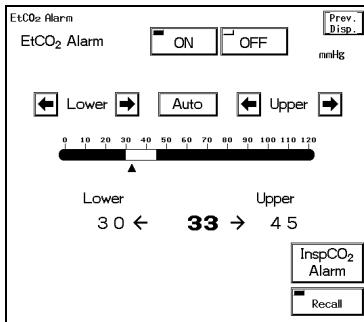
- 2 Select the CO₂ waveform scale for displaying and recording.

For the measurement unit in mmHg, select the scale from **50**, **100**.

For the measurement unit in kPa and %, select the scale from **4**, **8**, **10**.

EtCO₂ (End-Tidal CO₂) Alarm

- 1 Press the **EtCO₂ Alarm** key.



The alarm setup menu will be displayed.

Select ON/OFF of EtCO₂ alarm, and set the upper and lower alarm limits.

Alarm condition should be set for each measurement unit (mmHg / kPa / %).

Upper and lower alarm limits can be set in increments of 1mmHg, 0.1kPa, and 0.1%.

NOTE

EtCO₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the EtCO ₂ alarm. Selecting OFF will not generate the EtCO ₂ alarm.
Lower Upper	Lower Alarm Limit	Sets the lower alarm limit (1–98mmHg, 0.1–13.1kPa, 0.1–13.1%). Setting a value equal to or below 1mmHg, 0.1kPa, 0.1% will turn the alarm OFF.
Upper Lower	Upper Alarm Limit	Sets the upper alarm limit (3–115mmHg, 0.3–15.0kPa, 0.3–15.0%). Setting a value equal to or above 115mmHg, 15.0kPa, 15.0% will turn the alarm OFF.
Auto	Automatic Setup	Automatically sets the upper alarm limit to +10mmHg, +1.3kPa, +1.3% to the current value, and the lower alarm limit to -10mmHg, -1.3kPa, -1.3% to the current value.

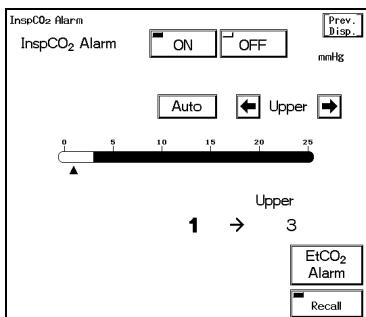
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).



For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

InspCO₂ (Inspiratory CO₂) Alarm

- 1 Press the **InspCO₂ Alarm** key.



The alarm setup menu will be displayed.
Select ON/OFF of InspCO₂ alarm, and set the upper alarm limit.
Set the alarm condition for each measurement unit (mmHg / kPa / %).
Upper alarm limit can be set in increments of 1mmHg, 0.1kPa, 0.1%.
Lower alarm limit cannot be set.

NOTE	InspCO ₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.
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Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the InspCO ₂ alarm. Selecting OFF will not generate the InspCO ₂ alarm.
Upper	Upper Alarm Limit	Sets the upper alarm limit (1–24mmHg, 0.1–3.0kPa, 0.1–3.0%). Setting a value equal to or above 24mmHg, 3.0kPa, 3.0% will turn the alarm OFF.
Auto	Automatic Setup	Automatically sets the upper alarm limit to 3mmHg, 0.4kPa, 0.4% to the current measurement.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

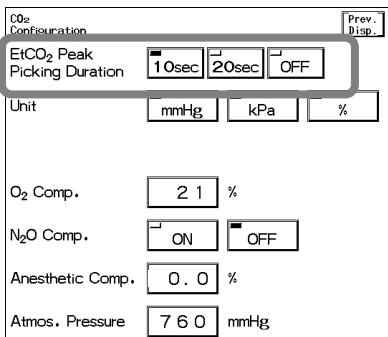


For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

EtCO₂ Peak Picking Duration

The duration to pick the EtCO₂ maximum value can be selected from 10 sec., 20 sec., or OFF.

- 1 Press the **Configuration** key.



The CO₂ configuration menu to select the EtCO₂ peak picking duration will be displayed.

- 2 Select the peak picking duration.

Select the duration to pick the EtCO₂ maximum value from **10sec**, **20sec**.

If **OFF** is selected, EtCO₂ value for each respiration will be displayed.

As the EtCO₂ value display is updated each second, EtCO₂ value for each respiration cannot be displayed if respiration rate is above 60 Bpm.

Measurement Unit

The measurement unit can be selected from mmHg, kPa, or %.

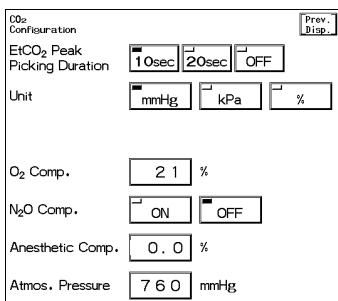


The alarm setup is necessary for each measurement unit.
When a measurement unit is changed, make sure to set the alarm condition for the changed unit.



If the measurement unit is changed frequently, the continuity of the graphic trend and tabular trend may be lost.

- 1 Press the **Configuration** key.



The CO₂ configuration menu to select the measurement unit will be displayed.

- 2 Select the measurement unit from **mmHg**, **kPa**, **%**.

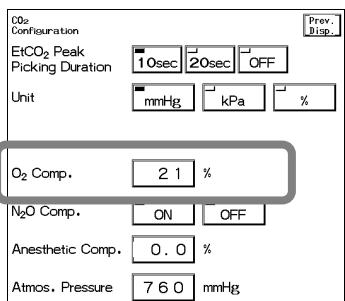
The graphic trend and tabular trend will be displayed with the selected measurement unit.



O₂ Compensation

When the oxygen concentration exceeds 60%, the CO₂ value tends to be displayed lower than the actual value. By setting the O₂ compensation ON, this can be adjusted.

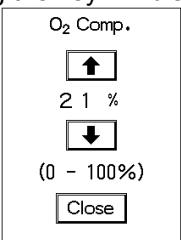
- 1 Press the **Configuration** key.



The CO₂ configuration menu to set the O₂ compensation will be displayed.

- 2 Set the O₂ compensation.

Pressing the key will display the tool box to set the value.



Use the **↑** **↓** keys to adjust the O₂ compensation (O₂ concentration).

The O₂ compensation can be set in 1% increment for the value up to 30%, and 5% increment for the value above 30%.

Press the **Close** key after setting the O₂ compensation.



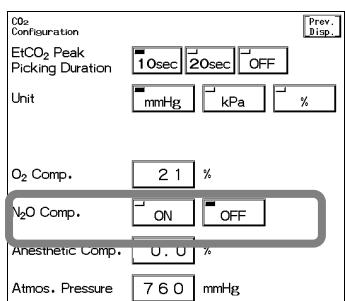
The value cannot be changed if the total value of O₂ compensation and anesthetic gas compensation exceeds 100%. In such case, change the O₂

	compensation value after changing the anesthetic gas compensation value.
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N₂O Compensation

If N₂O is present in the respiration circuit, the CO₂ value tends to be displayed higher than the actual value. By setting the N₂O compensation ON, this can be adjusted.

- 1 Press the **Configuration** key.



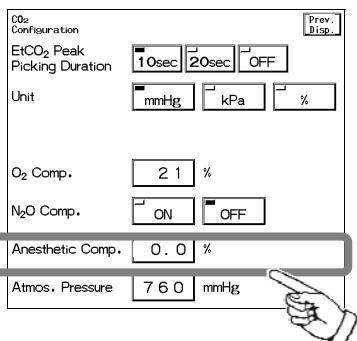
The CO₂ configuration menu to set the N₂O compensation will be displayed.

- 2 Select ON/OFF for “N₂O Comp”.

Anesthetic Gas Compensation

By inputting the anesthetic gas concentration, compensation can be made to display more accurate value.

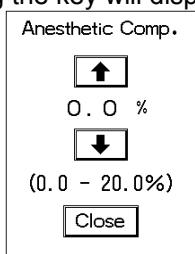
- 1 Press the **Configuration** key.



The CO₂ configuration menu to set the anesthetic gas compensation will be displayed.

- 2 Set the anesthetic gas compensation.

Pressing the key will display the tool box to set the value.



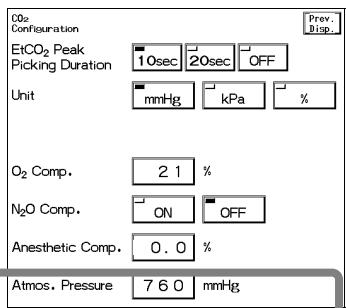
Use the **↑** **↓** keys to adjust the anesthetic gas compensation (anesthetic gas concentration), and press the **Close** key.

NOTE	The value cannot be changed if the total value of O ₂ compensation and anesthetic gas compensation exceeds 100%. In such case, change the O ₂ compensation value after changing the anesthetic gas compensation value.
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Atmospheric Pressure Compensation

The atmospheric pressure can be adjusted to compensate for pressure differences.

- 1 Press the **Configuration** key.

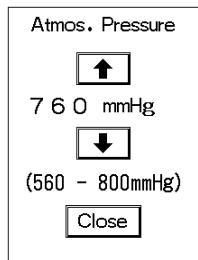


The CO₂ configuration menu to set the atmospheric pressure will be displayed.

Pressing the key will display the tool box to set the atmospheric pressure.

- 2 Set the atmospheric pressure.

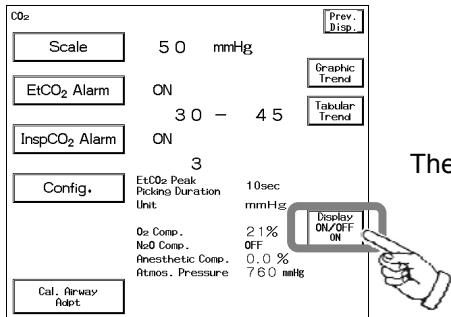
Pressing the key will display the tool box to set the value.



Use the **↑**, **↓** keys to adjust the atmospheric pressure (mmHg), and press the **Close** key.

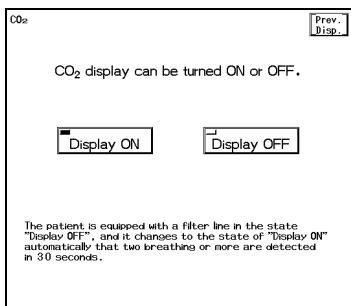
ON/OFF of Parameter Display

1 Press the **Display ON/OFF** key.



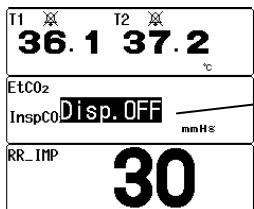
The confirmation display for ON/OFF of CO₂ display will appear.

2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



The Display OFF message will be displayed inside the parameter key.

If the filter line is applied to the patient and more than 2 respirations are detected in 30 seconds during "Display OFF" condition, the display will automatically return.

⚠ CAUTION

- When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- When the waveform and numeric data display is set to OFF, the respiration rate measured by CO₂ will not be displayed either.

In this section, measurement procedure and monitoring setup procedure of the CO₂ concentration using the HC-500 module is explained.

CAUTION

If the Super Module and the HC-500 (CO₂ Module) are simultaneously used, the CO₂ measurement priority will be according to the "CO₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.

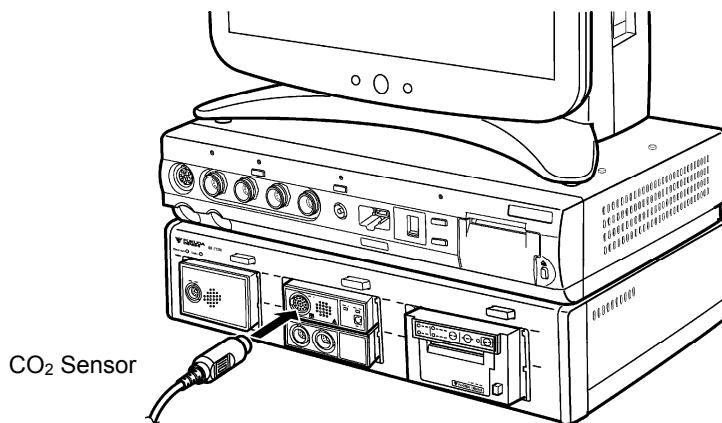
NOTE

During the calibration, the measurement data will be displayed as "— —". The measurement data during calibration may be included in the trend data causing discontinuity.

Preparation to Measure the CO₂ Concentration

1 Connect the CO₂ sensor to the CO₂ input connector on the CO₂ module.

CO₂ sensor will automatically begin warming up.



The sensor requires a warming up process to achieve stable operating temperature. This process is performed automatically in any of the following situation:

- When the power of the monitor is turned on.
- When the CO₂ sensor is plugged into the module.

During the warm up period, the message "Warm up" will be displayed on the monitor.

Warm up process will require 2 minutes or more.

When the warm up completes, the message will disappear.

2 Perform the zero calibration process after the "Warm up" message disappears.

Plug in the sensor to the zero calibration cell "→0←" (gray).

Zero calibration will automatically start.

The zero calibration process must be also performed for the following case.

- When Capnostat sensor is replaced.
- When "Zero cal?" message is displayed.
- When the value is not within 36–40mmHg at the time the sensor is attached to the reference cell.

During calibration, "Zero cal **sec" message will appear on the monitor, and starts the countdown.

During calibration, ZERO LED on the CO₂ module will light.

When the calibration properly completes, a short "beep" tone will be generated.

This tone will be generated after about 15 seconds, and the countdown display will disappear.

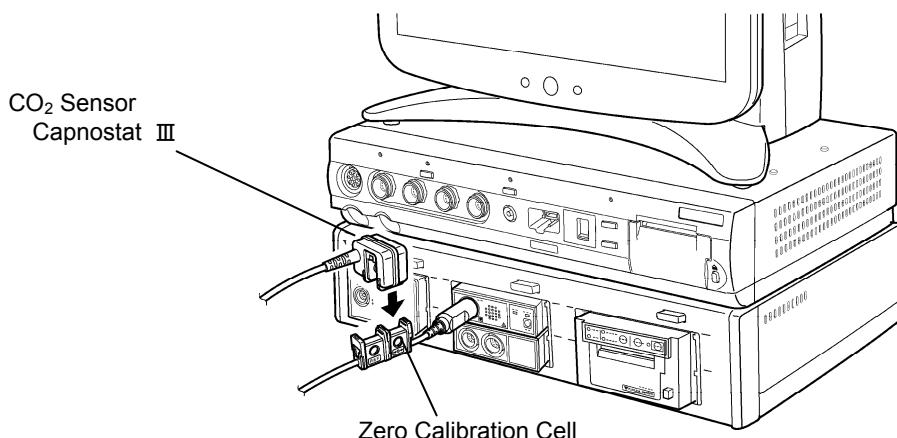
The ZERO LED on the CO₂ module will turn off.

Remove the sensor from the zero calibration cell.

When an error occurs, a high and longer tone will be generated.

If the zero calibration does not complete within 20 seconds, an error tone will be generated.

The countdown display will disappear, but ZERO LED on the CO₂ module will remain to be lighted.
Start the zero calibration process again. If the error persists, the sensor may be damaged.



3 Perform the reference calibration process. Plug in the CO₂ sensor to the reference cell "REF" (white).

Reference calibration will automatically start.

The reference calibration process must be also performed for the following case.

- When the zero calibration is performed.
- When continuously performing CO₂ measurement. (Daily calibration is recommended.)

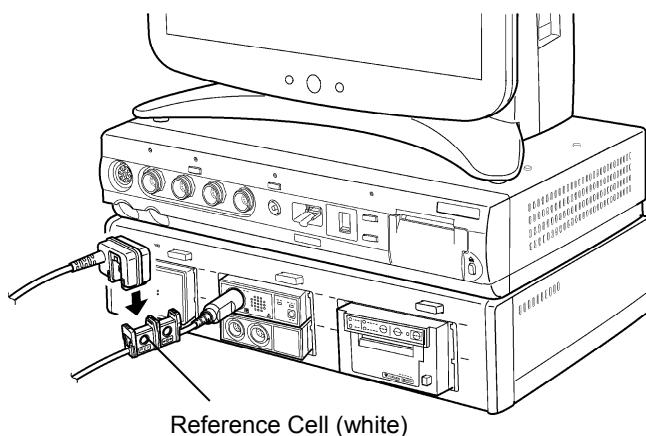
During calibration, "Reference cal **sec" message will appear on the monitor. After about 5 seconds, a "beep" tone will be generated and countdown display will disappear.

Remove the sensor from the reference cell.

When an error occurs, a high and longer tone will be generated.

When an error tone generates, remove the CO₂ sensor from the reference cell, and start again from the zero calibration.

An error tone will be also generated when the reference calibration does not complete within 10 seconds. Start again from the zero calibration. After the zero calibration, perform the reference calibration again.

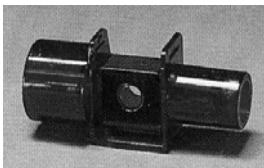


4 Prepare an airway adapter suitable for the patient.

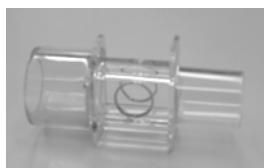
There are 4 types of airway adapters. Select the appropriate adapter according to the used endo-tracheal tube size.

**Airway Adapter (Adult) 7007**

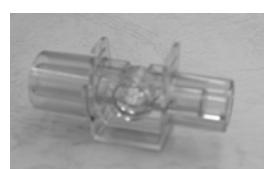
For patients using an endo-tracheal tube greater than 4.0 mm in diameter. Reusable Type

**Airway Adapter (Neonate) 7053**

For patients using an endo-tracheal tube less than, or equal to 4.0 mm in diameter. Reusable Type

**Disposable Airway Adapter (Adult) 6063**

For patients using an endo-tracheal tube greater than 4.0 mm in diameter. Cannot reuse.

**Disposable Airway Adapter (Neonate) 6312**

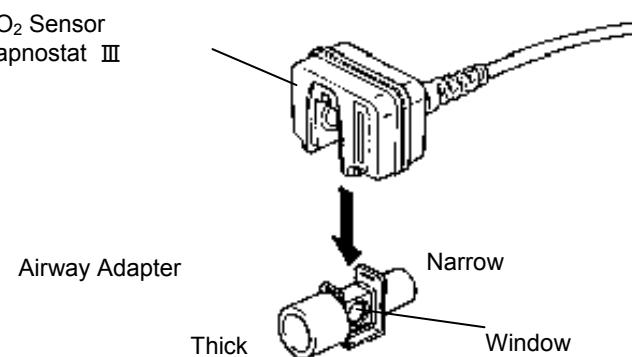
For patients using an endo-tracheal tube less than, or equal to 4.0 mm in diameter. Cannot reuse.

WARNING	<ul style="list-style-type: none"> Select an appropriate airway adapter according to the endo-tracheal tube size. If inappropriate airway adapter is used for the patient with low ventilation, CO₂ may mix in to the inspiration causing incorrect data or difficulty in apnea detection.
----------------	---

5 Verify that the warm up is complete, and attach the CO₂ sensor to the airway adapter until a “click” sound is heard.

This process should be performed before connecting the airway adapter to the respiration circuit.

CAUTION	Make sure to attach the airway adapter in correct direction. Otherwise, it may damage the CO ₂ sensor or airway adapter.
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6 Calibrate the airway adapter.

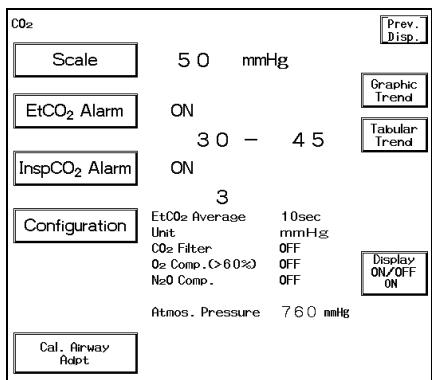
The airway adapter calibration must be performed before connecting to the respiration circuit. Calibration must be also performed for the following case.

- When the airway adapter is replaced
- When “Adapter cal?” message is displayed.

Use a clean airway adapter.

When reusing, wash the adapter, wipe the window with a swab after air dry, and sterilize (EOG, etc.) before use.

- 7** Press the **Menu** → **Parameter** → **CO₂** keys and display the CO₂ menu.
 Press the **Cal. Airway Adpt** key to start the calibration.



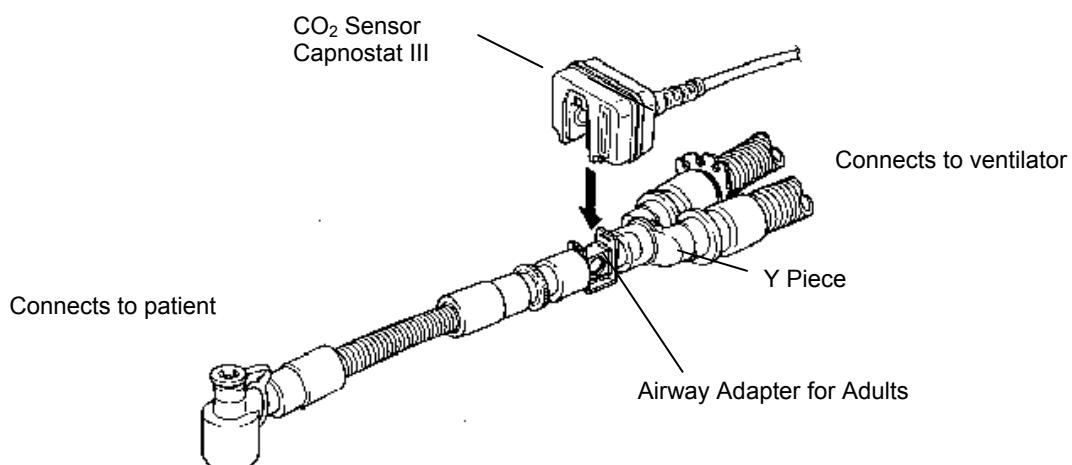
Pressing the **Cal. Airway Adpt** key will start the calibration and lasts for about 20 seconds. During the calibration, "Zero cal **sec" message will be displayed, and starts the countdown. During calibration, Adapter LED on the CO₂ module will light.

After about 15 seconds, a "beep" tone will be generated and the countdown display will disappear. The Adapter LED on the CO₂ module will turn off.
 Connect the airway adapter to the respiration circuit.

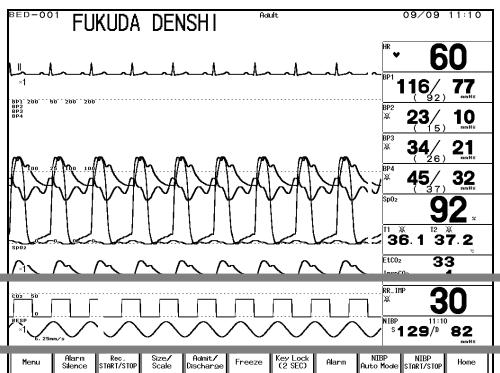
If the zero calibration does not complete within 20 seconds, an error tone will be generated. The countdown display will disappear, but Adapter LED on the CO₂ module will remain to be lighted. Perform the airway adapter calibration again. If the error persists, start again from the zero calibration process.

If the respiration is detected within the last 20 seconds, an error tone will be generated and calibration will not start. The Adapter LED will not light. In such case, wait for 20 seconds or more and perform calibration again.

- 8** Verify that the airway adapter calibration is properly completed, and attach the airway adapter to the patient's respiration circuit. Then, attach the CO₂ sensor to the airway adapter.
 Attach the airway adapter between the patient's circuit wye and intubation tube. The CO₂ sensor should be facing upward.



9 Verify that the CO₂ waveform, EtCO₂ value, InspCO₂ value are displayed.



Adjust the scale, set the measurement unit, alarm, etc. as necessary.

CO₂ Concentration Monitoring Setup

This menu allows to set the monitoring condition of CO₂ concentration when HC-500 CO₂ Module is used.

- For parameter setup of the HS-710E, 720E, 702E(Oridion[®]), refer to P6-55 "CO₂ Concentration (HS-710E, 720E, 702E)".
The model type of the Super Module can be verified on the rear side of the Super Module.

Reference
Rated Label
- For parameter setup of the HS-720C, 702C (RESPIRONICS[®]), refer to P6-61 "CO₂ Concentration (HS-720C, 702C)".

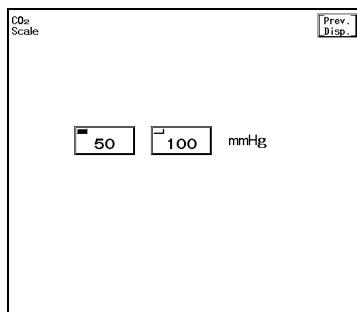
CO ₂	
Scale	50 mmHg
EtCO ₂ Alarm	ON
InspCO ₂ Alarm	ON
Configuration	EtCO ₂ Average: 30 - 45 Unit: 10sec mmHg CO ₂ Filter: OFF O ₂ Comp. > 60%: OFF N ₂ O Comp.: OFF Atmos. Pressure: 760 mmHg Display ON/OFF: ON Cal. Airway Adapt

- Scale : Sets the CO₂ waveform scale.
 EtCO₂ Alarm : Sets ON/OFF of EtCO₂ alarm, and upper and lower alarm limits.
 InspCO₂ Alarm : Sets ON/OFF of InspCO₂ alarm and upper alarm limit.
 Configuration : Sets CO₂ monitoring conditions.

CAUTION	If the Super Module and the HC-500 (CO ₂ Module) are simultaneously used, the CO ₂ measurement priority will be according to the "CO ₂ Module Priority" set on the "Input Box Setup" (Monitor Setup). With the default setting, the HC-500 will be prioritized.
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CO₂ Scale

- 1 Press the **Scale** key.



The scale setup menu will be displayed.

<Scale setup menu for the unit in mmHg>

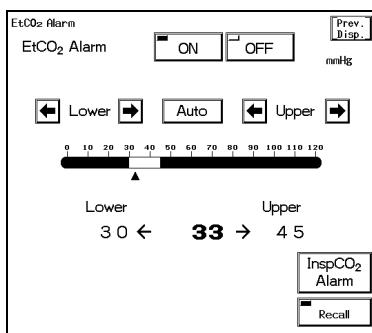
- 2 Select the CO₂ waveform scale for displaying and recording.

For the measurement unit in mmHg, select the scale from **50**, **100**.

For the measurement unit in kPa and %, select the scale from **4**, **8**, **10**.

EtCO₂ (End-Tidal CO₂) Alarm

- 1 Press the **EtCO₂ Alarm** key.



The alarm setup menu will be displayed.

Select ON/OFF of EtCO₂ alarm, and set the upper and lower alarm limits.

Alarm condition should be set for each unit (mmHg / kPa / %). Upper and lower alarm limits can be set in increments of 1mmHg, 0.1kPa, and 0.1%.

NOTE	EtCO ₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.
------	---

Key	Item	Description
ON OFF	Individual Alarm	Selecting ON will generate the EtCO ₂ alarm. Selecting OFF will not generate the EtCO ₂ alarm.
Lower Upper	Lower Alarm Limit	Sets the lower alarm limit (1–98mmHg, 0.1–13.1kPa, 0.1–13.1%). Setting a value equal to or below 1mmHg, 0.1kPa, 0.1% will turn the alarm OFF.
Upper Lower	Upper Alarm Limit	Sets the upper alarm limit (3–115mmHg, 0.3–15.0kPa, 0.3–15.0%). Setting a value equal to or above 115mmHg, 15.0kPa, 15.0% will turn the alarm OFF.
Auto	Automatic Setup	Automatically sets the upper alarm limit to +10mmHg, +1.3kPa, +1.3% to the current value, and the lower alarm limit to -10mmHg, -1.3kPa, -1.3% to the current value.

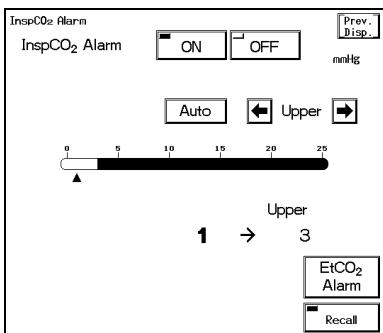
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).



For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

InspCO₂ (Inspiratory CO₂) Alarm

- 1 Press the **InspCO₂ Alarm** key.



The alarm setup menu will be displayed.

Select ON/OFF of InspCO₂ alarm, and set the upper alarm limit.

Set the alarm condition for each unit (mmHg / kPa / %).

Upper alarm limit can be set in increments of 1mmHg, 0.1kPa, 0.1%. Lower alarm limit cannot be set.

NOTE

InspCO₂ alarm will not generate unless 2 or more respiration is detected within 30 seconds after power ON or after discharge.

Key	Item	Description
<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF	Individual Alarm	Selecting ON will generate the InspCO ₂ alarm. Selecting OFF will not generate the InspCO ₂ alarm.
<input type="checkbox"/> Upper <input checked="" type="checkbox"/>	Upper Alarm Limit	Sets the upper alarm limit (1–24mmHg, 0.1–3.0kPa, 0.1–3.0%). Setting a value equal to or above 24mmHg, 3.0kPa, 3.0% will turn the alarm OFF.
<input type="checkbox"/> Auto	Automatic Setup	Automatically sets the upper alarm limit to 3mmHg, 0.4kPa, 0.4% to the current measurement.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

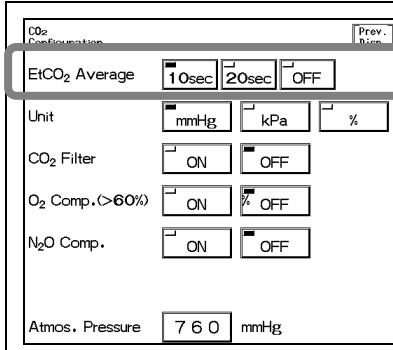


For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

EtCO₂ Average Duration

The duration to measure the EtCO₂ value can be selected from 10 sec., 20 sec., or OFF.

- 1 Press the **Configuration** key.



The CO₂ configuration menu to select EtCO₂ measurement duration will be displayed.

- 2 Select the duration to measure the EtCO₂ value.

10sec, **20sec** will display the maximum EtCO₂ value for the selected duration.

If **OFF** is selected, EtCO₂ value for each respiration will be displayed.

As the EtCO₂ value display is updated each second, EtCO₂ value for each respiration can not be displayed if respiration rate is above 60 Bpm.

Measurement Unit

The measurement unit can be selected from mmHg, kPa, or %.

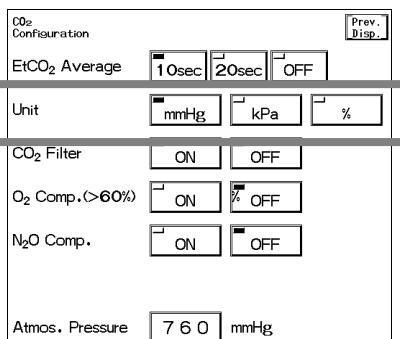


The alarm setup is necessary for each measurement unit.
When a measurement unit is changed, make sure to set the alarm condition for the changed unit.



If the measurement unit is changed frequently, the continuity of the graphic trend and tabular trend may be lost.

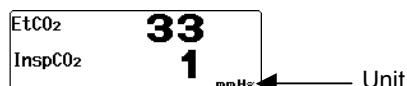
- 1 Press the **Configuration** key.



The CO₂ configuration menu to select the measurement unit will be displayed.

- 2 Select the measurement unit from **mmHg**, **kPa**, **%**.

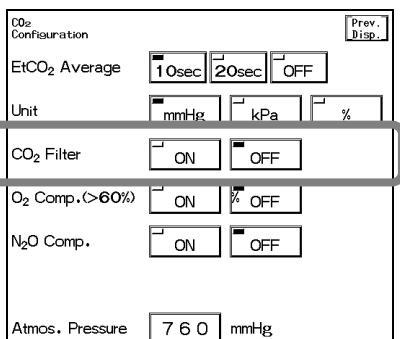
The graphic trend and tabular trend will be displayed with the selected measurement unit.



CO₂ Filter

By setting the CO₂ filter, artifacts such as cardiogenic oscillations can be eliminated.

- 1 Press the **Configuration** key.



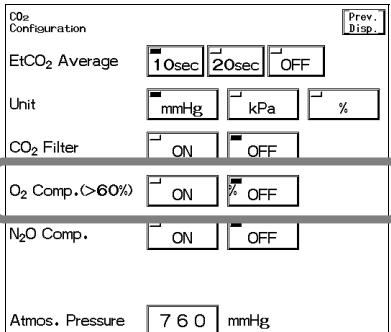
The CO₂ configuration menu to set the CO₂ filter will be displayed.

- 2 Select ON/OFF for "CO₂ Filter".

O₂ Compensation

When the oxygen concentration exceeds 60%, the CO₂ value tends to be displayed lower than the actual value. By setting the O₂ compensation ON, this can be adjusted.

- 1 Press the **Configuration** key.



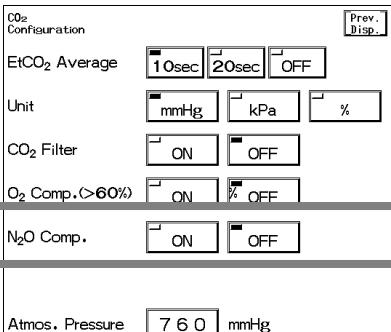
The CO₂ configuration menu to set the O₂ compensation will be displayed.

- 2 Select ON/OFF for "O₂ Comp. (>60%)".

N₂O Compensation

If N₂O is present in the respiration circuit, the CO₂ value tends to be displayed higher than the actual value. By setting the N₂O compensation ON, this can be adjusted.

- 1 Press the **Configuration** key.



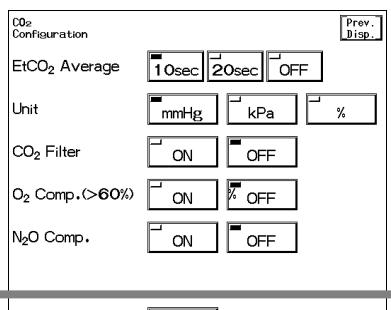
The CO₂ configuration menu to set the N₂O compensation will be displayed.

- 2 Select ON/OFF for "N₂O Comp.".

Atmospheric Pressure Compensation

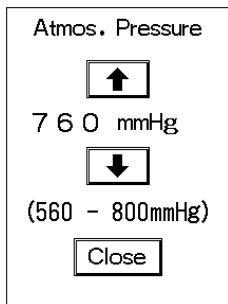
The atmospheric pressure can be adjusted to compensate for pressure differences.

- 1 Press the **Configuration** key.



The CO₂ configuration menu to set the atmospheric pressure will be displayed.

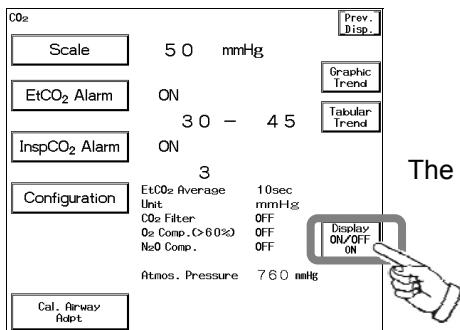
Pressing the key will display the tool box to set the atmospheric pressure.



- 2** Use the **▲**, **▼** keys to adjust the atmospheric pressure (mmHg/ kPa), and press the **Close** key.

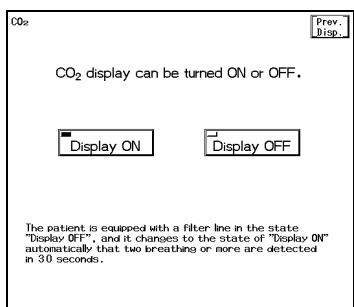
ON/OFF of Parameter Display

- 1** Press the **Display ON/OFF** key.



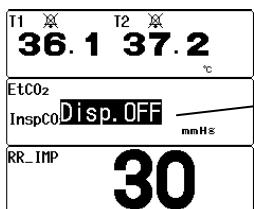
The confirmation display for ON/OFF of CO₂ display will appear.

- 2** Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the waveform and numeric data.

Pressing the **Display OFF** key will not display the waveform and numeric data.



The Display OFF message will be displayed inside the parameter key.

If the filter line is applied to the patient and more than 2 respirations are detected in 30 seconds during "Display OFF" condition, the display will automatically return.

CAUTION

- When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- When the waveform and numeric data display is set to OFF, the respiration rate measured by CO₂ will not be displayed either.

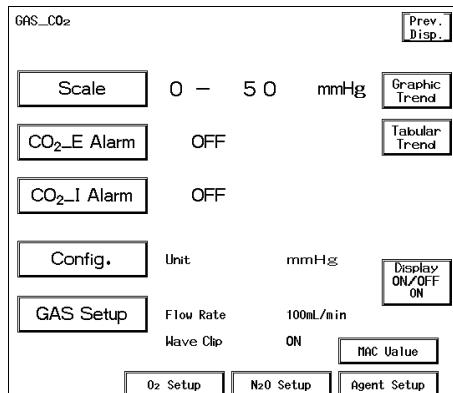
Multigas Data

(Poet IQ 8500A)

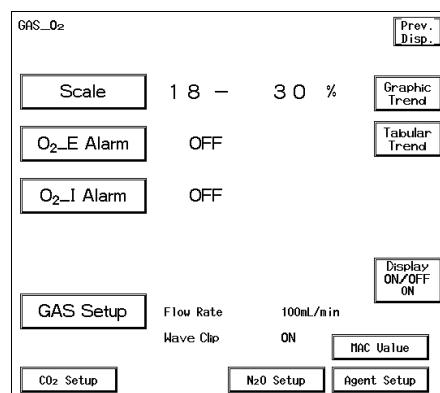
In this section, the monitoring condition setup of CO₂, O₂, N₂O and anesthetic agent concentration measured by the Poet IQ 8500A is explained.

⚠ CAUTION

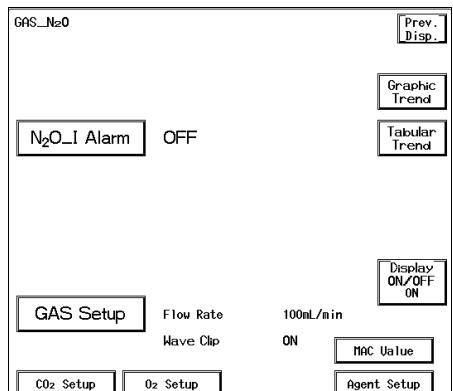
If the Super Module and the gas module are simultaneously used, the CO₂ measurement will be performed by the gas module.



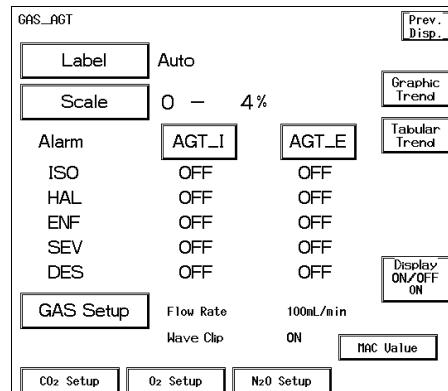
[GAS_CO₂ Menu]



[GAS_O₂ Menu]



[GAS_N₂O Menu]



[GAS_AGT Menu]

GAS_CO₂ Menu

- Scale : Sets the scale for CO₂ waveform display.
- CO₂_E Alarm : Sets ON/OFF of CO₂_E alarm and upper/lower alarm limits.
- CO₂_I Alarm : Sets ON/OFF of CO₂_I alarm and upper alarm limit.
- Setup : Sets the measurement unit of CO₂.

GAS_O₂ Menu

- Scale : Sets the scale for O₂ waveform display.
- O₂_E Alarm : Sets ON/OFF of O₂_E alarm and upper/lower alarm limits.
- O₂_I Alarm : Sets ON/OFF of O₂_I alarm and upper alarm limit.

GAS_N₂O Menu

- N₂O_I Alarm : Sets ON/OFF of N₂O_I alarm and upper alarm limit.

GAS_AGT Menu

- Label : Sets anesthetic gas type.
- Scale : Sets the scale for anesthetic gas concentration waveform display.
- AGT_I Alarm : Sets ON/OFF of AGT_I alarm and upper/lower alarm limits.
- AGT_E Alarm : Sets ON/OFF of AGT_E alarm and upper alarm limit.

MAC Value Setup

- Display : Sets ON/OFF of the MAC display inside the numeric data display area.
- MAC Value Alarm : Sets ON/OFF of the MAC value alarm and upper limit.
- MAC Value Calculation Constant : Sets the calculation constant for MAC value.

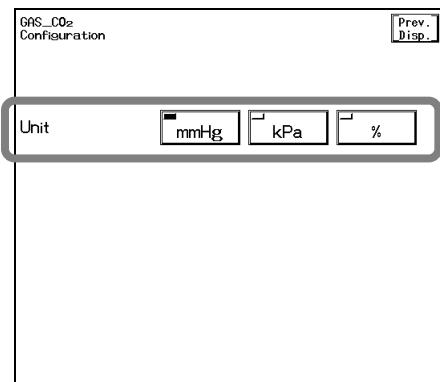
CO₂ Concentration Measurement Unit

The measurement unit of CO₂ concentration can be selected from mmHg, kPa, %.

CAUTION

- The measurement unit setup for the CO₂ concentration on the gas module and for the EtCO₂ concentration on the Super Module/HC-500 are independent.
- When a measurement unit is changed, make sure to set the alarm condition for that unit. The alarm setup is necessary for each measurement unit.

1 Press the **Config.** key on the GAS_CO₂ menu.



The measurement unit selection will be displayed.

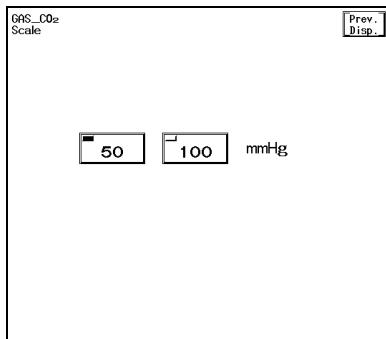
2 Select the measurement unit from **mmHg**, **kPa**, **%**.

For the graphic trend and tabular trend, the gas module data will be displayed with the selected measurement unit.



Gas Waveform Scale

- 1 Press the **Scale** key on the GAS_CO₂ menu to set the scale for CO₂ concentration waveform.



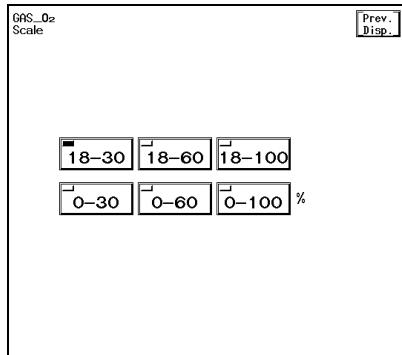
The scale setup menu will be displayed.

When the unit is mmHg, select the scale from **50**, **100**.

When the unit is kPa or %, select the scale from **4**, **8**, **10**.

<Scale Setup Menu for "mmHg">

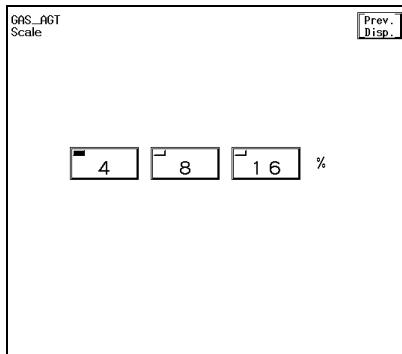
- 2 Press the **Scale** key on the GAS_O₂ menu to set the scale for O₂ concentration waveform.



The scale setup menu will be displayed.

Select the scale from **18-30**, **18-60**, **18-100**, **0-30**, **0-60**, **0-100** %.

- 3 Press the **Scale** key on the GAS_AGT menu to set the scale for anesthetic gas concentration waveform.



The scale setup menu will be displayed.

Select the scale from **4**, **8**, **16** %.

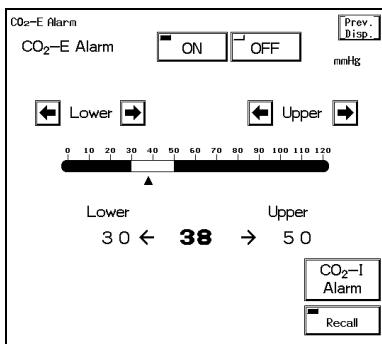
Alarm Setup

●CO₂ Concentration Alarm

⚠ CAUTION

- The measurement unit setup for the CO₂ concentration on the gas module and for the EtCO₂ concentration on the Super Module/HC-500 are independent.
- When a measurement unit is changed, make sure to set the alarm condition for that unit. The alarm setup is necessary for each measurement unit.

CO₂-E Alarm

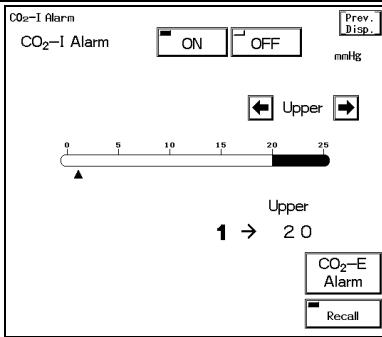


The alarm setup should be performed for each measurement unit. (mmHg / kPa / %).

The upper/lower limit can be set in 1mmHg / 0.1kPa / 0.1% increments.

Lower Limit	Set the lower limit in the range from 1–98mmHg / 0.1–13.1kPa / 0.1–13.1%. The lower limit will be set OFF if 1mmHg / 0.1kPa / 0.1% or below is set.
Upper Limit	Set the upper limit in the range from 3–115mmHg / 0.3–15.0kPa / 0.3–15.0%. The upper limit will be set OFF if 115mmHg / 15.0kPa / 15.0% or above is set.

CO₂-I Alarm



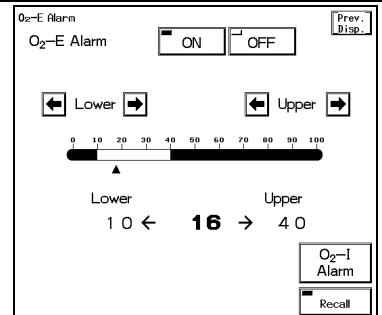
The alarm setup should be performed for each measurement unit. (mmHg / kPa / %).

The upper limit can be set in 1mmHg / 0.1kPa / 0.1% increments.

Lower Limit	(no setup)
Upper Limit	Set the upper limit in the range from 1–24mmHg / 0.1–3.0kPa / 0.1–3.0%. The upper limit will be set OFF if 24mmHg / 3.0kPa / 3.0% or above is set.

●O₂ Concentration Alarm

O₂-E Alarm

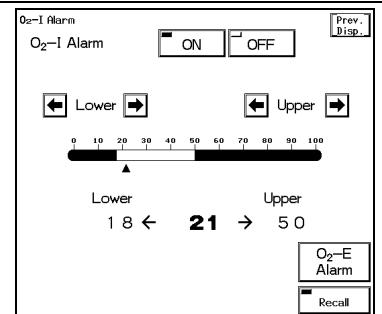


The upper/lower limit can be set in 5% increments.

Lower Limit Set the lower limit in the range from 10–60%.
The lower limit will be set OFF if 10% or below is set.

Upper Limit Set the upper limit in the range from 40–100%.
The upper limit will be set OFF if 100% or above is set.

O₂-I Alarm

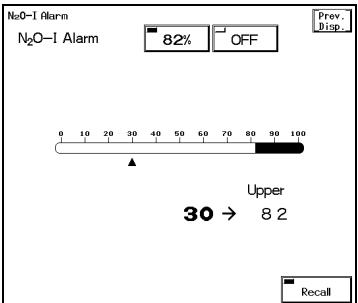


The upper/lower limit can be set in 2% increments.

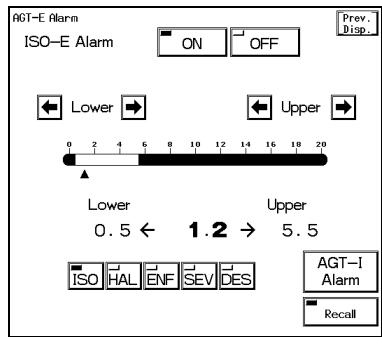
Lower Limit Set the lower limit in the range from 18–60%.
The lower limit will be set OFF if 18% or below is set.

Upper Limit Set the upper limit in the range from 40–100%.
The upper limit will be set OFF if 100% or above is set.

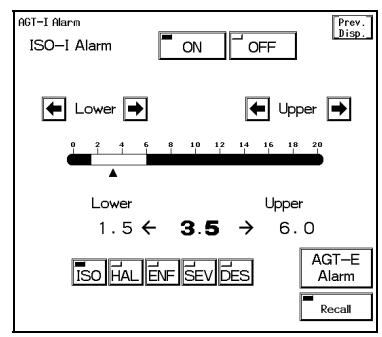
● N₂O-I (Inspired Nitrous Oxide) Alarm

N ₂ O-I Alarm	
	<p>The N₂O-I alarm will generate if 82% is selected. The N₂O-I alarm will not generate if OFF is selected.</p>

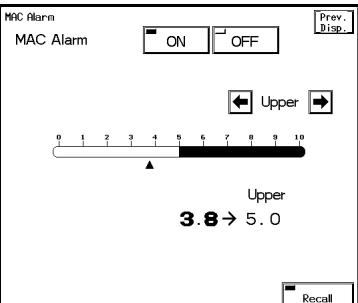
● Anesthetic Gas Concentration Alarm

AGT-E Alarm					
	<p>The upper/lower limit can be set in 0.5% increment.</p> <table border="1"> <tr> <td>Lower Limit</td><td>The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.</td></tr> <tr> <td>Upper Limit</td><td>The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.</td></tr> </table>	Lower Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.	Upper Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.
Lower Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.				
Upper Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.				

AGT-I Alarm

AGT-I Alarm					
	<p>The upper/lower limit can be set in 0.5% increment.</p> <table border="1"> <tr> <td>Lower Limit</td><td>The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.</td></tr> <tr> <td>Upper Limit</td><td>The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.</td></tr> </table>	Lower Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.	Upper Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.
Lower Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 0.5–4.0% SEV: 0.5–5.0% DES: 0.5–12.0% The lower limit will be set OFF if the value below the adjustable range is set.				
Upper Limit	The adjustable range differs depending on the anesthetic gas label. ISO, HAL, ENF: 3.0–6.0% SEV: 3.0–8.0% DES: 8.0–20.0% The upper limit will be set OFF if the value above the adjustable range is set.				

MAC Alarm

MAC Alarm			
	<p>The upper limit can be set in 0.1% increment.</p> <table border="1"> <tr> <td>Upper Limit</td><td>0.1–9.9 The upper limit will be set OFF if the value above the adjustable range is set.</td></tr> </table>	Upper Limit	0.1–9.9 The upper limit will be set OFF if the value above the adjustable range is set.
Upper Limit	0.1–9.9 The upper limit will be set OFF if the value above the adjustable range is set.		

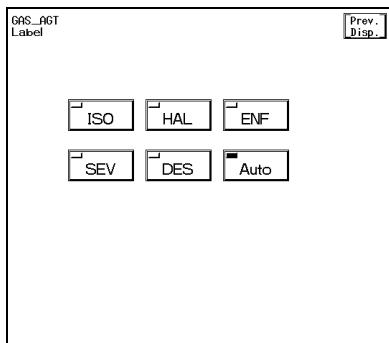
To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select **Backup** for “Alarm” on the “Backup at Discharge” menu (Monitor Setup).



For the alarm mode setup procedure, refer to “8. System Configuration Alarm Mode”.

Anesthetic Gas Label

- 1 Press the **Label** key on the GAS_AGT menu.



The GAS_AGT Label menu will be displayed.

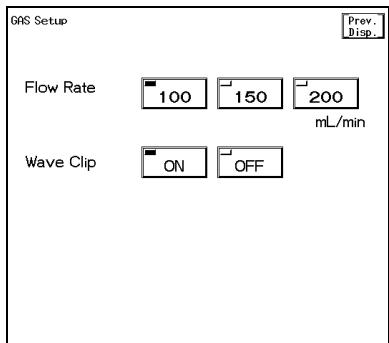
- 2 Set the label for the anesthetic gas.

Select the label from **ISO**, **HAL**, **ENF**, **SEV**, **DES**.

If **Auto** is selected, the label will be automatically set according to the detected anesthetic gas. If the gas module detects the different anesthetic gas type from the set label, the alarm sound will generate, and “Agent Mismatch” message will be displayed.

Gas Setup Menu

- 1 Press the **GAS Setup** key on the Gas menu.



The GAS Setup menu will be displayed.

- 2 Select the sampling flow rate from **100**, **150**, **200** mL/min.

- 3 Select **ON** or **OFF** for gas waveform clip function.

If the gas waveform exceeds the waveform display area, whether or not to clip the exceeded part can be selected.

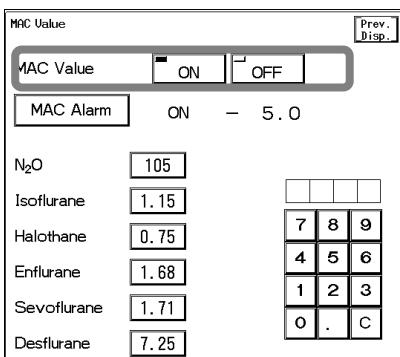
MAC Value Display

The MAC value can be displayed inside the numeric data display area.

NOTE

The MAC value will not be displayed unless ON is selected for "MAC Display". Perform the setup as necessary.

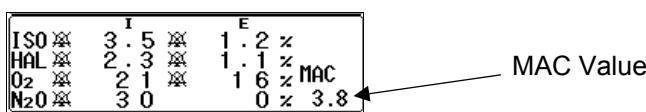
- 1 Press the **MAC Value** key on the corresponded gas menu (GAS_CO₂, GAS_O₂, GAS_N₂O, GAS_AGT).



Select ON or OFF for "MAC Display".

ON will display the MAC value inside the numeric data display area.

OFF will not display the MAC value.



MAC Value Calculation Constant

The calculation constant for MAC value can be set.

The MAC value is calculated from the following formula.

$$MAC = \frac{N_2O_E}{X(N_2O)} + \frac{AGT1_E}{X(AGT1)} + \frac{AGT2_E}{X(AGT2)}$$

N₂O_E : Expired N₂O (%)

AGT1_E : Expired Primary Agent (%)

AGT2_E : Expired Secondary Agent (%)

X (N₂O) : N₂O Constant

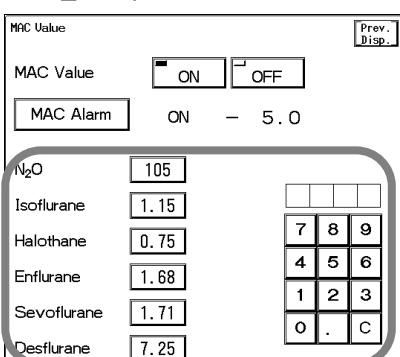
X (AGT1) : Primary Agent Constant

X (AGT2) : Secondary Agent Constant

NOTE

The MAC value will not be displayed unless ON is selected for "MAC Display". Perform the setup as necessary.

- 1 Press the **MAC Value** key on the corresponded gas menu (GAS_CO₂, GAS_O₂, GAS_N₂O, GAS_AGT).



The MAC value setup menu will be displayed.

If you want to change the displayed default value, input the numbers using the numeric keypad.

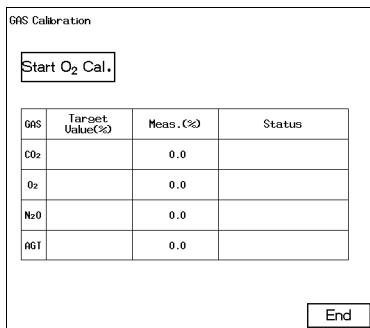
Then, press the key for the corresponding constant.

O₂ Cell Calibration

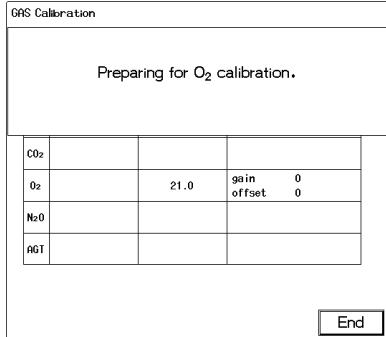
This section explains the procedure to calibrate the O₂ cell.

The O₂ cell needs to be replaced once a year. After the replacement, calibrate the O₂ cell following the procedure below.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Monitor Setup** → **GAS Calibration** to open the GAS Calibration menu.



- 2 Press the **Start O₂ Cal.** key.



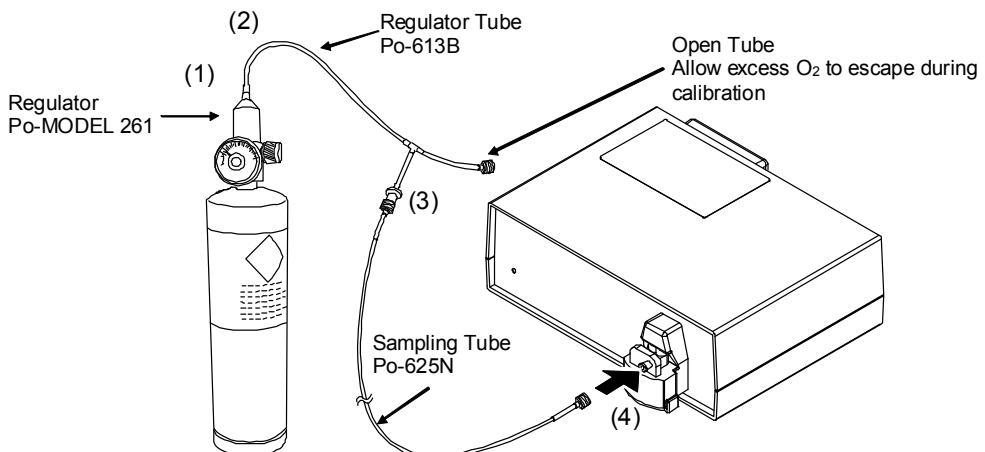
The message, "Preparing for O₂ calibration." will be displayed.

During the preparation process, the O₂ calibration process cannot be cancelled.

NOTE When the power is turned ON, O₂ calibration cannot be started until warming up of the Multigas Module completes.

- 3 Connect the specified calibration gas cylinder to the multigas module according to the following procedure.

- (1) Screw a regulator (Model Type: Po-MODEL261) onto the cylinder.
- (2) Connect the regulator tube (Model Type: 613B) to the regulator.
- (3) Attach a sampling tube (Model Type: 625N) to the end of the regulator tube.
- (4) Install a new water trap on the multigas module. Connect the other end of the sampling tube to the water trap.



CAUTION

Use only the specified calibration gas. Proper calibration is not possible if unapproved calibration gas is used.

4 Adjust the O₂ gain.

GAS Calibration			
Start to supply calibration gas.			
		<input type="button" value="OK"/>	<input type="button" value="Cancel"/>
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
<input type="button" value="End"/>			

When the preparation of O₂ calibration is complete, O₂ gain and O₂ offset value will be displayed, and the message, "Start to supply calibration gas." will appear.

Turn on the valve of the regulator to supply calibration gas. Verify that the gas escaping from the open tube can be heard, and press the key.

To cancel the O₂ calibration, press the key.

GAS Calibration			
Adjusting O ₂ gain.			
		<input type="button" value="Cancel"/>	
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
<input type="button" value="End"/>			

The message, "Adjusting O₂ gain." will be displayed.

To cancel the O₂ calibration, press the key.

CAUTION

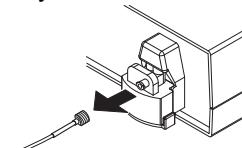
If O₂ gain adjustment is started without supplying the calibration gas, the message, "Check calibration gas." will be displayed and O₂ gain adjustment will cease.

5 Adjust the O₂ Offset.

GAS Calibration			
Stop to supply calibration gas and open to air.			
		<input type="button" value="OK"/>	<input type="button" value="Cancel"/>
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
<input type="button" value="End"/>			

When the O₂ gain adjustment is complete, the message, "Stop to supply calibration gas and open to air." will be displayed.

Turn off the valve to stop supplying calibration gas. Remove the sampling line from the water trap, and press the key.



To cancel the O₂ calibration, press the key.

GAS Calibration			
Adjusting O ₂ offset.			
		<input type="button" value="Cancel"/>	
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
<input type="button" value="End"/>			

The message, "Adjusting O₂ offset." will be displayed.

To cancel the O₂ calibration, press the key.

⚠ CAUTION

If O₂ offset adjustment is started without opening to air, the message, "Check calibration gas." will be displayed and O₂ offset adjustment will cease.

6 Readjust the O₂ gain.

GAS Calibration			
Start to supply calibration gas.			
		OK	Cancel
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
End			

The message, "Start to supply calibration gas." will be displayed.

Connect the sampling line to the water trap.

Supply the calibration gas, and press the **OK** key.

To cancel the O₂ calibration, press the **Cancel** key.

GAS Calibration			
Adjusting O ₂ gain.			
		Cancel	
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
End			

The message, "Adjusting O₂ gain." will be displayed.

To cancel the O₂ calibration, press the **Cancel** key.

⚠ CAUTION

If O₂ offset is adjusted, it is necessary to readjust the O₂ gain.
If O₂ offset adjustment was not necessary, O₂ gain readjusting screen will not be displayed.

7 Update the O₂ calibration data.

GAS Calibration			
Update calibration data?			
		YES	NO
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
End			

When the O₂ gain adjustment is complete, the message "Update calibration data?" will be displayed.

Stop supplying the calibration gas, and press the **Yes** key.

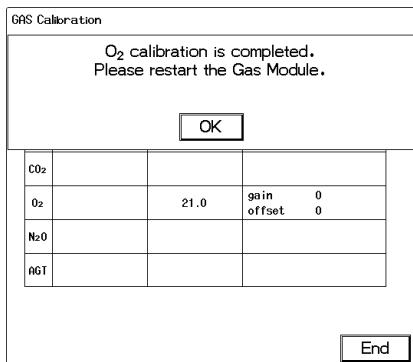
Pressing the **No** key will cancel the O₂ calibration.

GAS Calibration			
Updating calibration data.			
CO ₂			
O ₂	21.0	gain offset	0 0
N ₂ O			
AGT			
End			

The message, "Updating calibration data." will be displayed.

During the updating process, O₂ calibration process cannot be canceled.

8 O₂ calibration process is complete.



When the updating of O₂ calibration data is complete, the message, "O₂ calibration is completed. Please restart the Gas Module" will be displayed.

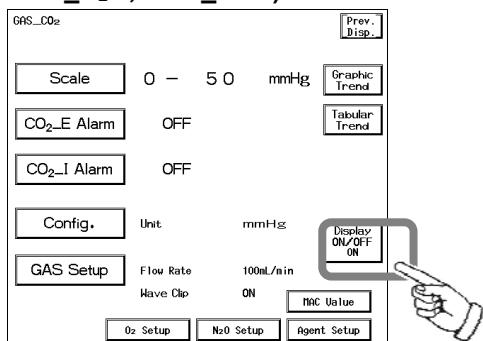
Press the **OK** key and restart the Poet IQ 8500A.



Make sure to restart the Poet IQ 8500A after the calibration. Otherwise, Poet IQ 8500A will not function properly.

ON/OFF of Parameter Display

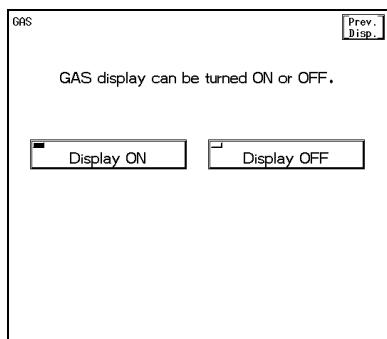
- 1 Press the **Display ON/OFF** key on the corresponded gas menu (GAS_CO₂, GAS_O₂, GAS_N₂O, GAS_AGT).



The Display ON/OFF selection will be displayed.

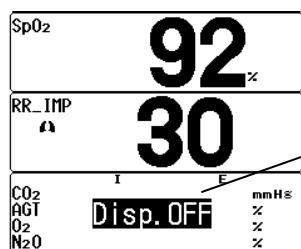
[GAS_CO₂ Menu]

- 2 Select **Display ON** or **Display OFF**.



Pressing the **Display ON** key will display the gas data.

Pressing the **Display OFF** key will not display the gas data.



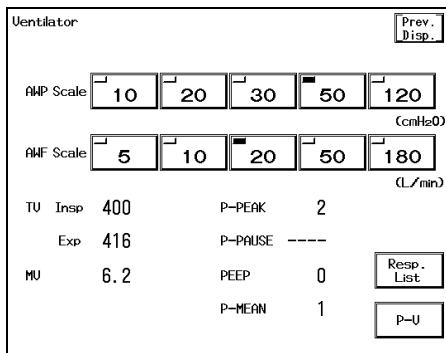
The Display OFF message will be displayed inside the parameter key.



- When the waveform and numeric data display is set to OFF, the alarm generation and tabular/graphic trend data input will also cease.
- When the waveform and numeric data display is set to OFF, the respiration rate measured by the gas module will not be displayed either.

Ventilator

This menu allows to set the ventilator monitoring condition.



AWP Scale : Sets the scale for AWP (airway pressure) waveform.

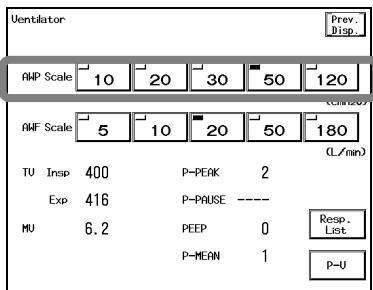
AWF Scale : Sets the scale for AWF (airway flow) waveform.



CAUTION For PURITAN-BENNETT Ventilator, AWP and AWF waveform cannot be displayed or recorded. Only the numeric data will be displayed.

AWP Scale

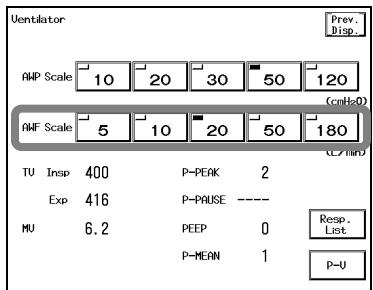
1 Select the scale.



Select the appropriate scale from **10**, **20**, **30**, **50**, or **120**.

AWF Scale

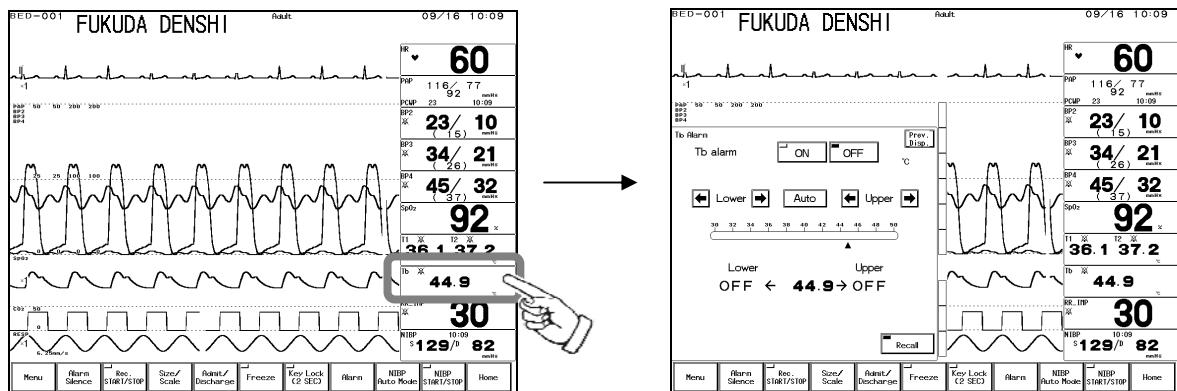
1 Select the scale.



Select the appropriate scale from **5**, **10**, **20**, **50**, or **180**.

Tb (Blood Temperature)

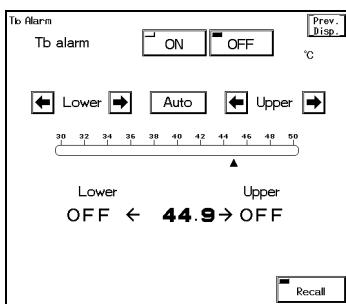
When thermodilution catheter is used to measure the cardiac output, the blood temperature can be monitored.



Tb Alarm : Sets ON/OFF of blood temperature alarm and upper and lower alarm limits.

Tb Alarm

- 1 Select ON/OFF of blood temperature alarm and set upper and lower alarm limits.



The alarm setup should be performed for each measurement unit (°C / °F).

The upper and lower limit can be set in increments of 0.5°C / 1.0°F.

Key	Item	Description
<input type="checkbox"/> ON <input type="checkbox"/> OFF	Individual Alarm	Selecting <input type="checkbox"/> ON will generate the TEMP alarm. Selecting <input type="checkbox"/> OFF will not generate the TEMP alarm.
<input type="button"/> Lower <input type="button"/>	Lower Alarm Limit	Sets the lower alarm limit (30.0–44.0°C / 86.0–111.0°F). Setting a value 30.0°C / 86.0°F or below will turn the alarm OFF.
<input type="button"/> Upper <input type="button"/>	Upper Alarm Limit	Sets the upper alarm limit (31.0–45.0°C / 88.0–113.0°F). Setting a value 45.0°C / 113.0°F or above will turn the alarm OFF.
<input type="button"/> Auto	Automatic Setup	Automatically sets the upper limit to +2.0°C / +4.0°F to the current value, and lower limit to -2°C / -4.0°F to the current value.

To maintain the alarm setting even after the power is turned OFF or after the discharge procedure, store the setting to one of the alarm modes, or select Backup for "Alarm" on the "Backup at Discharge" menu (Monitor Setup).

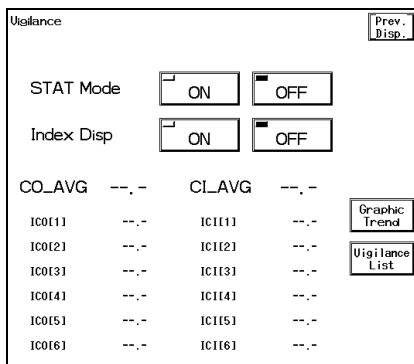


For the alarm mode setup procedure, refer to "8. System Configuration Alarm Mode".

Vigilance Data

When Vigilance, Vigilance CEDV, VigilanceII, or Vigileo (oximeter/CCO measurement device manufactured by Baxter) is used, Vigilance data display can be selected from several modes.

[ICO Mode]



STAT Mode : When Vigilance is in CCO mode, STAT mode display can be set ON or OFF.
Index Disp. : When Vigilance is in CCO mode, Index display can be set ON or OFF.

When the Vigilance is in ICO mode, the 6 latest data of ICO (Intermittent Cardiac Output) and ICI (Intermittent Cardiac Index) will be displayed.

STAT Mode / Index Display

- 1 **ON** / **OFF** of STAT Mode and **ON** / **OFF** of Index display can be selected on the Vigilance display.

[STAT Mode **OFF**, Index Display **OFF**]

SvO ₂	83	%
CCO	5.0	L/min
EDV	160	mL
BT	38.5	°C

SvO₂ (or ScvO₂), CCO, EDV, BT data will be displayed inside the SvO₂+CO numeric data box.

[STAT Mode **OFF**, Index Display **ON**]

SvO ₂	83	%
CCI	2.5	L/min/m ²
EDVI	80	mL/m ²
BT	38.5	°C

By setting the Index display ON, CCI, EDVI data will be displayed instead of CCO and EDV.

[STAT Mode **ON**, Index Display **OFF**]

SvO ₂	83	%
CCO_STAT	5.0	L/min
EDV_STAT	160	mL
BT	38.5	°C

By setting the STAT mode ON, CCO_STAT, EDV_STAT data will be displayed instead of CCO and EDV.

[STAT Mode **ON**, Index Display **ON**]

SvO ₂	83	%
CCI_STAT	2.5	L/min/m ²
EDVI_STAT	80	mL/m ²
BT	38.5	°C

By setting the STAT mode and Index display ON, CCI_STAT, EDVI_STAT will be displayed instead of CCO and EDV.

Stopwatch

By setting the stopwatch key on the home display, a stopwatch function can be used.

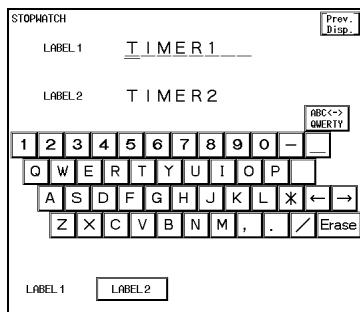


TIMER1, 2 : Starts/stops the stopwatch function.

LABEL1, 2 : A label can be set for each timer.

Label Setup

1 Press the **LABEL** key.



The stopwatch label setup menu will be displayed.
Enter 8 characters using alphanumeric keypad.

Start / Stop of Stopwatch



START will start the stopwatch.

STOP will suspend the counting and pressing **START** again will resume the counting.

RESET will reset the stopwatch time display to "00:00:00".

If **RESET** is pressed during the counting, the counting will restart from "00:00:00".

NOTE

- If discharge procedure is performed during stopwatch operation, the counting will stop and the stopwatch time will be reset to "00:00:00".
- The stopwatch counting will continue even when the monitoring is suspended.

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Chapter 7

Function

This chapter describes the function such as arrhythmia analysis, trend, and recall.

Arrhythmia Analysis Definition, etc.	7-2
Arrhythmia Definition	7-2
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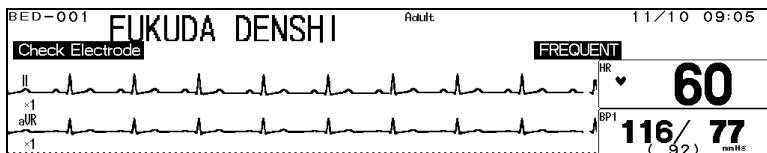
Arrhythmia Analysis

Definition, etc.

This section explains the arrhythmia analysis, alarm setup procedure, etc.

Arrhythmia Definition

The arrhythmia detection is performed by learning the normal waveform of the patient and determining VPC by comparing the waveform (QRS pattern) and R-R interval of each heartbeat. A pattern matching is performed with the VPC detected from R-R interval, QRS amplitude, QRS area, QRS polarity, etc., and determines as VPC after discriminating the noise and VPC.



●QRS Classification

The QRS analysis is performed by comparing with the learned waveform and QRS pattern matching.

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

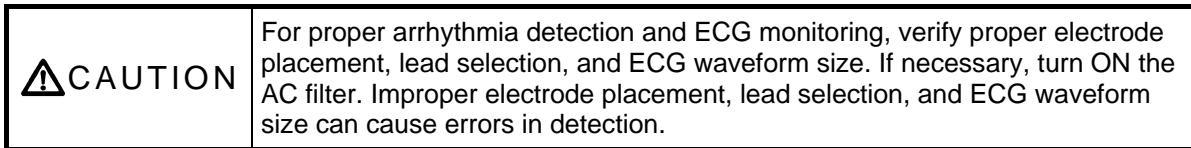
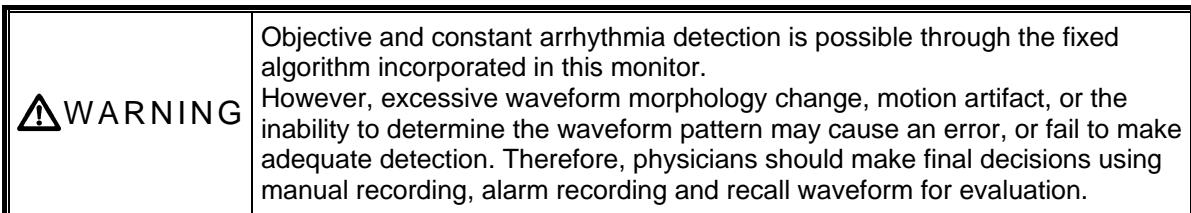
●Arrhythmia Type

The alarm is generated according to the arrhythmia classification of normal QRS and VPC.

Type	Meaning	Detection Criteria
ASYSTOLE	Cardiac Arrest	Cardiac arrest is detected for more than preprogrammed time.
VF	Ventricular Fibrillation	A random, rapid electrical activity of the heart is detected.
VT	Ventricular Tachycardia	9 or more continuous ventricular beats are detected and HR is same or above the preprogrammed value (140bpm or 120bpm).
SLOW_VT		9 or more continuous ventricular beats are detected. (HR: 100–140bpm or 100–120bpm)
TACHY	Tachycardia	HR is over the upper alarm limit.
BRADY	Bradycardia	HR is below the lower alarm limit.
RUN	Consecutive VPC	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	2 continuous VPC beats are detected.
PAUSE		Cardiac arrest exceeding the preprogrammed value is detected.
BIGEMINY	Ventricular Bigeminy	3 or more continuous QRS pattern of V-N is detected.
TRIGEMINY	Ventricular Trigeminy	3 or more continuous QRS pattern of V-N-N is detected.
FREQUENT	Frequent VPC	VPC exceeding the preprogrammed value is detected within 1 minute.



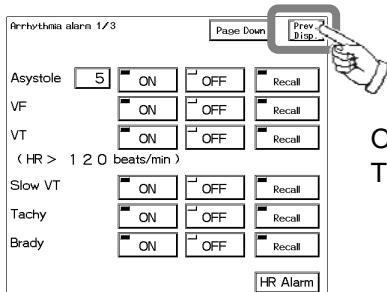
Refer to "8. System Configuration Hospital Setup" for setup of HR reference for VT analysis.



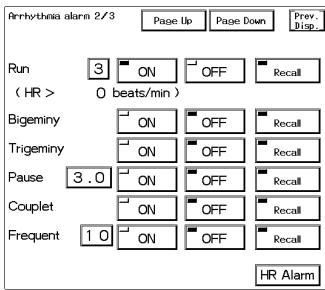
To Set the Arrhythmia Alarm

ON/OFF of arrhythmia alarm and reference of arrhythmia analysis can be set.

- 1 Press the **Menu** → **Alarm** → **Arrhy.** keys.



On page 1/3, the alarm setup menu of Asystole, VF, VT, Slow_VT, Tachy, Brady will be displayed.



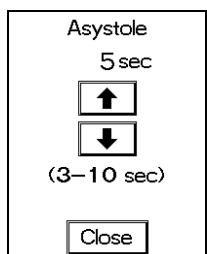
On page 2/3, the alarm setup menu of Run, Bigeminy, Trigeminy, Pause, Couplet, Frequent will be displayed.

Page	Arrhythmia
Page 1/3	ASYSTOLE, VF, VT, SLOW_VT, TACHY, BRADY
Page 2/3	RUN, COUPLET, BIGEMINY, TRIGEMINY, PAUSE, FREQUENT

- 2 Set the reference range.

Asystole ON OFF Recall

Pressing the reference value key will display the **↑** **↓** keys.

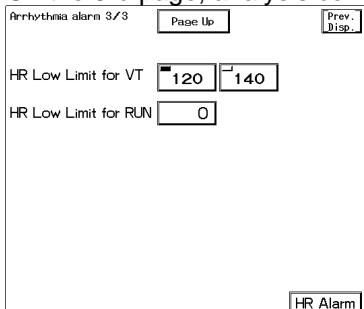


Use the **↑** **↓** keys to set the reference value.
After setting the reference value, press the **Close** key.

<Arrhythmia Reference Range>

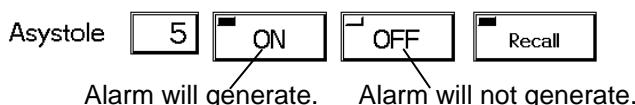
Arrhythmia	Reference Range	Default
ASYSTOLE	3 to 10 sec.	5 sec.
RUN	2 to 8 beats	3 beats
PAUSE	1.5 to 5 sec.	3 sec.
FREQUENT	1 to 50 beats/min.	10 beats/min.

On the 3rd page, analysis condition for VT and RUN can be set.



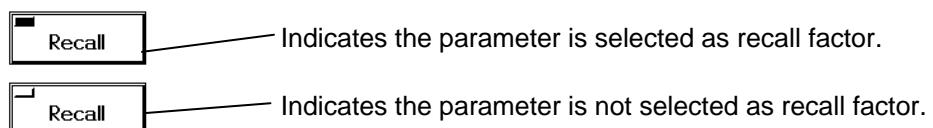
Arrhythmia	HR Low Limit	Default
VT	120bpm, 140bpm	120bpm
RUN	0 to 100bpm	40bpm

3 Select ON or OFF for the alarm.



4 Select ON or OFF for recall factor.

ON/OFF of recall factor can be set on the alarm setup menu.



Pressing the **Recall** key will switch the ON/OFF selection.

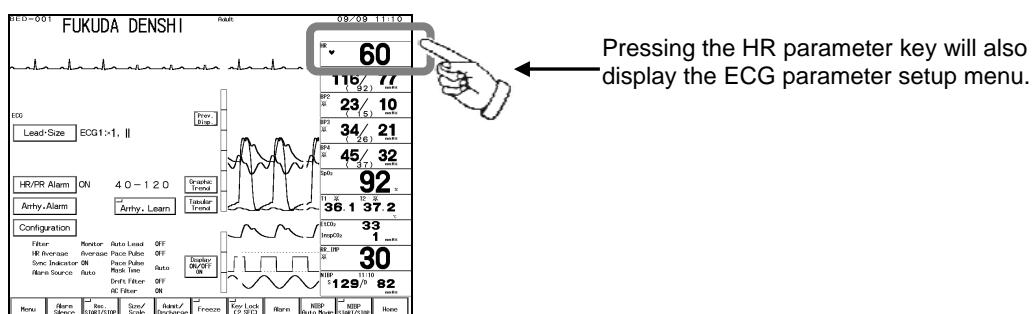
To Perform Arrhythmia Learning

Learning of normal ECG largely affects the accuracy of arrhythmia analysis.

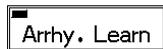
If any error occurs in arrhythmia detection and QRS judgment, performing arrhythmia learning will recover the original analyzing accuracy. Arrhythmia learning will be performed for about 20 beats for the normal ECG, but it may take longer if the heartbeat is unstable.

During arrhythmia learning, arrhythmia alarm other than ASYSTOLE, TACHY, BRADY will not be generated.

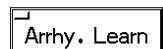
1 Press the **Menu** → **Parameter** → **ECG** keys.



2 Start arrhythmia learning.



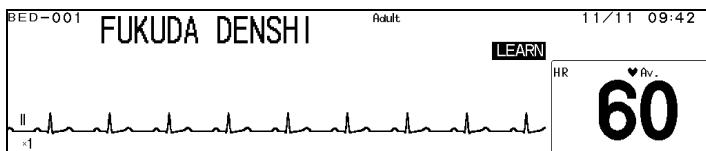
Learning arrhythmia



Pressing the key with the LED off will start arrhythmia learning.

Pressing the key while learning arrhythmia will not stop the learning.

3 During arrhythmia learning, a message will be displayed.



NOTE

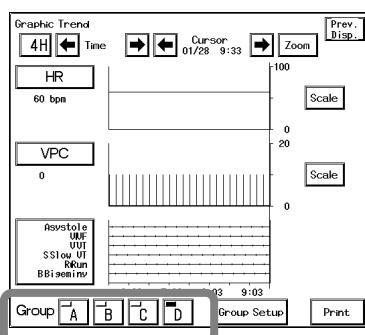
If pacemaker is used, LED on the **Arrhy. Learn** key will not light and the "LEARN" message will not be displayed although the arrhythmia learn procedure is performed.

This section explains the graphic trend function and printing procedure.

To Display the Graphic Trend

The graphic trend menu can be accessed from the menu, or from the preprogrammed user key. If the data is displayed on the home display, the 24 hours graphic trend data in 1-minute interval will be automatically stored and displayed.

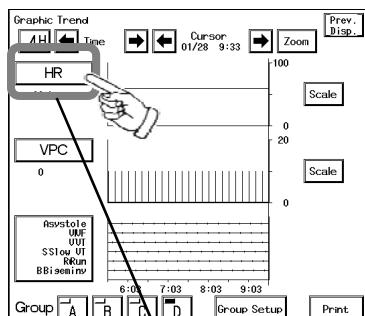
- 1** Press the **Menu** → **Function** → **Graphic Trend** keys.



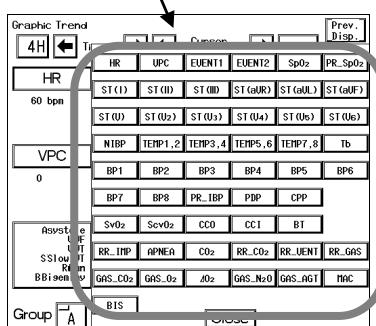
The graphic trend menu will be displayed.

The display will switch by pressing the A, B, C, D keys.

- 2** The Group D display will allow selecting the parameter for numeric data on the trend menu.



Pressing the parameter selection key will display the selection for display.

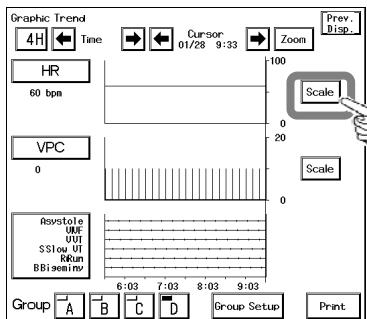


Select a parameter and press the **Close** key.

Parameter	Description
HR	Heart Rate
VPC	VPC beats
EVENT1	ASYSTOLE, VF, VT, SLOW_VT, RUN, BIGEMINY
EVENT2	TRIGEMINY, PAUSE, COUPLET, TACHY, BRADY, FREQUENT
SpO ₂	SpO ₂ value
PR_SpO ₂	SpO ₂ pulse rate
ST(I), ST(II), ST(III), ST(aVR), ST(aVL), ST(aVF), ST(V1), ST(V2), ST(V3), ST(V4), ST(V5), ST(V6)	ST level
NIBP	Noninvasive Blood Pressure (SYS / DIA)
TEMP1,2, TEMP3,4, TEMP5,6, TEMP7,8	Temperature
Tb	Blood Temperature (Cardiac Output Measurement)
BP1, BP2, BP3, BP4, BP5, BP6, BP7, BP8	Blood Pressure (SYS / Mean / DIA)
PR_IBP	Blood Pressure Pulse Rate (BP1 or ART)
PDP	Peak Diastolic Pressure of IABP
CPP	Cerebral Perfusion Pressure
SvO ₂	Mixed Venous Oxygen Saturation
ScvO ₂	Central Venous Oxygen Saturation
CCO	Continuous Cardiac Output
CCI	Continuous Cardiac Index
BT	Blood Temperature
RR_IMP	Impedance Respiration Rate
APNEA	Apnea Time (Impedance, CO ₂ , ventilator)
CO ₂	EtCO ₂ / InspCO ₂
RR_CO ₂	CO ₂ Respiration Rate
RR_VENT	Ventilator Respiration Rate
RR_GAS	Respiration Rate (Gas)
GAS_O ₂	Oxygen Concentration (Gas)
ΔO ₂	Oxygen Intake
GAS_N ₂ O	Nitrous Oxide Concentration (Gas)
GAS_AGT	Anesthetic Gas Concentration (Gas)
GAS_CO ₂	Carbon Dioxide Concentration (Gas)
MAC	Minimum Alveolar Concentration
BIS	BIS Monitor Data

NOTE	<ul style="list-style-type: none"> ● The apnea time will be stored when it exceeds the alarm threshold level. If lower than the alarm threshold level, it will be stored as "0 (zero)". ● If "GAS" is selected as the RR/APNEA source, APNEA (apnea time) will not be stored for the graphic trend.
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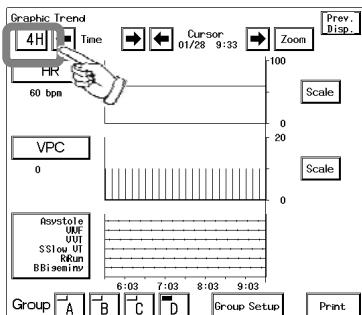
3 Select the scale for display.



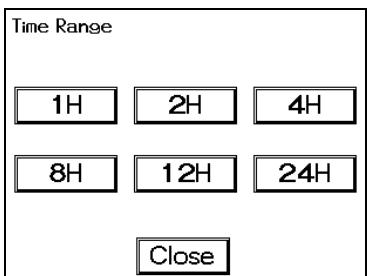
Pressing the [Scale] key will switch the scale according to the displayed parameter as shown below.

Parameter	Scale	Unit
HR	100, 200, 300	bpm
VPC	20, 50, 100	beat
EVENT	none	
SpO ₂	0–100, 50–100, 80–100	%
PR_SpO ₂	100, 200, 300	bpm
ST(I), ST(II), ST(III), ST(aVR), ST(aVL), ST(aVF), ST(V1), ST(V2), ST(V3) , ST(V4), ST(V5), ST(V6)	±0.2, ±0.5, ±1.0, ±2.0 ±2, ±5, ±10, ±20	mV mm
NIBP	20, 50, 100, 150, 200, 300 4, 8, 16, 20, 24, 40	mmHg kPa
TEMP1,2, TEMP3,4, TEMP5,6, TEMP7,8	20–45, 30–40 68–113, 86–104	°C °F
Tb	20–45, 30–40 68–113, 86–104	°C °F
BP1, BP2, BP3, BP4, BP5, BP6, BP7, BP8	20, 50, 100, 150, 200, 300 4, 8, 16, 20, 24, 40	mmHg kPa
PR_IBP	100, 200, 300	bpm
PDP	20, 50, 100, 150, 200, 300 4, 8, 16, 20, 24, 40	mmHg kPa
CPP	20, 50, 100, 150, 200, 300 4, 8, 16, 20, 24, 40	mmHg kPa
SvO ₂	0–100, 50–100, 80–100	%
ScvO ₂	0–100, 50–100, 80–100	%
CCO	6.0, 12.0, 20.0	L/min
CCI	6.0, 12.0, 20.0	L/min/m ²
BT	20–45, 30–40	°C
RR_IMP	50, 100, 150	bpm
APNEA	15, 30	
CO ₂	4.0, 8.0, 10.0 50, 100	mmHg kPa
RR_O ₂	50, 100, 150	bpm
RR_VENT	50, 100, 150	bpm
RR_GAS	50, 100, 150	bpm
GAS_O ₂	50, 100	%
ΔO ₂	3.0, 4.0, 9.0	%
GAS_N ₂ O	50, 100	%
GAS_AGT	4.0, 8.0, 10.0	%
GAS_CO ₂	4.0, 8.0, 10.0 50, 100 50, 100	mmHg kPa %
MAC	5.0, 10.0	(no unit)
BIS	0–100 fixed	(no unit)

4 Select the display time range.



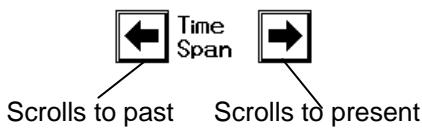
Pressing the display time range key will display the time range selection tool.



Select the time range for the graphic trend.

Time Range	Resolution
1 hour	1 min.
2 hour	1 min.
4 hour	1 min.
8 hour	2 min.
12 hour	3 min.
24 hour	6 min.

5 Select the time span.

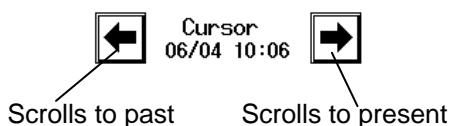


Scrolls the graphic trend display to past or present data with the selected time range.

Pressing the key will scroll the display to the past data with the selected time range.

Pressing the key will scroll to the present data with the selected time range.

6 Move the cursor.

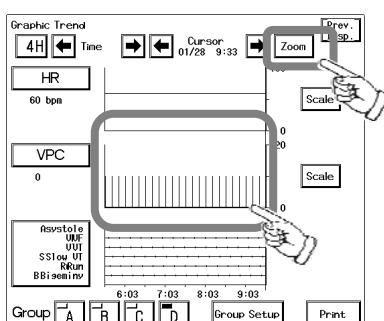


The data of selected time can be displayed by moving the cursor.

Pressing the key will scroll to the past data

Pressing the key will scroll to the present data.

7 Enlarge the display.



Pressing the key will display the 1-hour data with the cursor time in center.

Directly pressing the graph area will move the cursor position.

8 Print the graphic trend data.

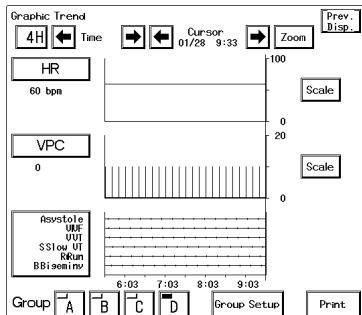


The displayed graphic trend data will be printed.

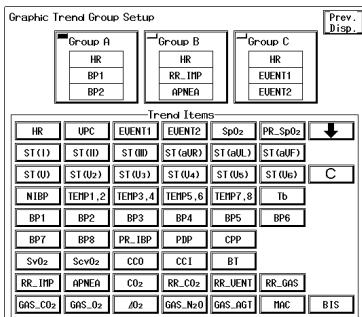
NOTE	The following graphic trend data cannot be printed on the central monitor recorder. <ul style="list-style-type: none"> • BP7, BP8 trend, TEMP3-8 trend • BP trend, NIBP trend, PDP trend, CPP trend when the BP measurement unit is kPa. • TEMP trend, Tb trend when the temperature measurement unit is °F.
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Graphic Trend Group Setup

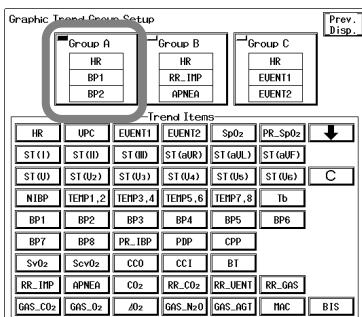
Each trend group displays combination of 3 parameters simultaneously. 3 types of trend group can be programmed.



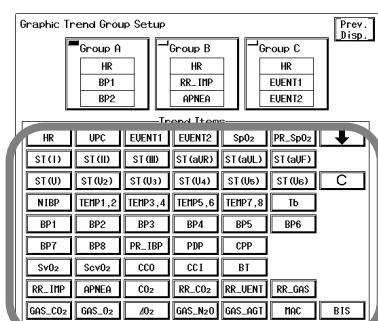
- 1 Press the **Menu** → **Function** → **Graphic Trend** → **Group Setup** keys.



- 2 Select the trend group to set the parameters.

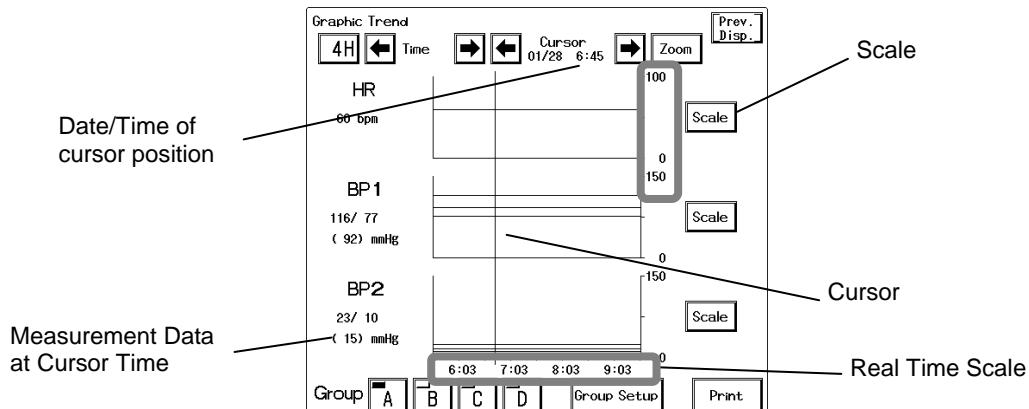


Select the trend group by pressing the **Group A**, **Group B**, or **Group C** key.



Select the parameter by pressing the displayed parameter keys.
Pressing the parameter key will sequentially set the 3 (three) parameters from the top.

The Description of the Display



The measured data will be compressed for the 8-hour / 12-hour / 24-hour display.

Parameter	Compressed Form
HR	Mean Value
VPC	Maximum Value
EVENT	Logical Sum
SpO ₂	Mean Value
PR_SpO ₂	Mean Value
ST	Mean Value
NIBP	Current Value
TEMP	Mean Value
BP	Mean Value
PR_IBP	Mean Value
PDP	Mean Value
CPP	Mean Value
SvO ₂	Mean Value
ScvO ₂	Mean Value
CCO	Mean Value
CCI	Mean Value
BT	Mean Value
RR_IMP	Mean Value
APNEA	Maximum Value
CO ₂	Mean Value
RR_CO ₂	Mean Value
RR_VENT	Mean Value
BIS	Mean Value
MAC	Mean Value

Tabular Trend

Display/Print

This section explains the tabular trend function and printing procedure.

To Display the Tabular Trend

The tabular trend menu can be accessed from the menu, or from the preprogrammed user key. The 24 hours data in 1-minute interval will be automatically stored and displayed if the data is displayed on the home display.

- 1 Press the **Menu** → **Function** → **Tabular Trend** keys.

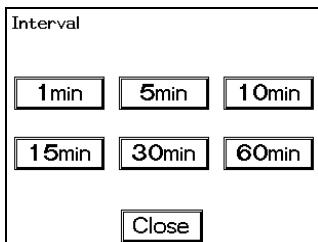
Tabular Trend		Shift	Interv. 10M	Page	Prev. Disp.
01/28	8:20	8:30	8:40	8:50	9:00
HR	60	60	60	60	60
UPC	0	0	0	0	0
ST(1) mm	0.5	0.5	0.5	0.5	0.5
ST(10) mm	0.2	0.2	0.2	0.2	0.2
BPL.S mmHg	116	116	116	116	116
D mmHg	77	77	77	77	77
I mmHg	92	92	92	92	92
BPL.S mmHg	23	23	23	23	23
D mmHg	10	10	10	10	10
I mmHg	15	15	15	15	15
Spo2	92	92	92	92	92
RR_IMP	30	30	30	30	30
ETCO2_mmHg	33	33	33	33	33
RR_CO2	30	30	30	30	30
APNEA	10	10	10	10	10
T1 °C	36.1	36.1	36.1	36.1	36.1
T2 °C	37.2	37.2	37.2	37.2	37.2

The tabular trend of 17 parameters will be displayed.

- 2 Select the time interval.

Interv. 60M

Pressing the time interval key will display the time interval selection tool.



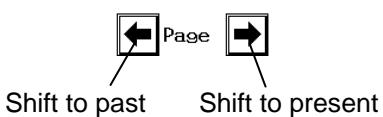
Select the time interval for the tabular trend display.

Selecting **5M** will display the data in real time such as 10:00, 10:05, 10:25.

Selecting **60M** will display the data in real time such as 10:00, 11:00, 12:00.

If the list is displayed at 10:35, the data from 10:00 will be displayed.

- 3 Shift the page.



The page can be shifted past or present by page with the displayed time interval.

Pressing the **←** key will shift one page to the past data.

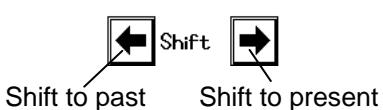
Pressing the **→** key will shift one page to the present data.

The data will be listed in 8 columns.

If 5-minute time range is selected and the starting time on the list is 10:00, 35 minutes from 10:00 to 9:25 will be listed in 1 page.

Pressing the **←** key will display the tabular trend from 9:20 to 8:45.

- 4 Shift the displayed column.



The tabular trend data can be shifted.

Pressing the **←** key will shift the display to past.

Pressing the **→** key will shift the display to present.

- 5 Print the tabular trend data.

Print

The displayed tabular trend data will be printed.

NOTE

The following tabular trend data cannot be printed on the central monitor recorder.

- BP7, BP8 trend, TEMP3–8 trend
- BP trend, NIBP trend, PDP trend, CPP trend, PCWP trend when the BP measurement unit is kPa.
- TEMP trend, Tb trend when the temperature measurement unit is °F.

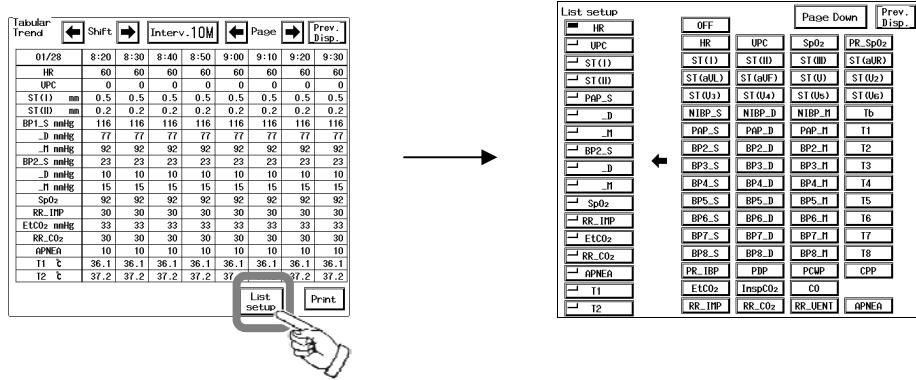
The Description of the Display

Tabular Trend	Shift	Interval	Page	Prev. Disp.
	01/28	8:20 8:30 8:40 8:50 9:00 9:10 9:20 9:30		
HR	60	60 60 60 60 60 60 60 60		
UPC	0	0 0 0 0 0 0 0 0		
ST(I) mm	0.5	0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5		
ST(II) mm	0.2	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2		
BP1_S mmHg	116	116 116 116 116 116 116 116 116		
_D mmHg	77	77 77 77 77 77 77 77 77		
_M mmHg	92	92 92 92 92 92 92 92 92		
BP2_S mmHg	23	23 23 23 23 23 23 23 23		
_D mmHg	10	10 10 10 10 10 10 10 10		
_M mmHg	15	15 15 15 15 15 15 15 15		
SpO2	99	99 92 92 92 92 92 92 92		
RR_IMP	30	30 30 30 30 30 30 30 30		
ETCO2_mmHg	33	33 33 33 33 33 33 33 33		
RR_CO2	30	30 30 30 30 30 30 30 30		
APNEA	10	10 10 10 10 10 10 10 10		
T1 °C	36.1	36.1 36.1 36.1 36.1 36.1 36.1 36.1 36.1		
T2 °C	37.2	37.2 37.2 37.2 37.2 37.2 37.2 37.2 37.2		
			List setup	Print

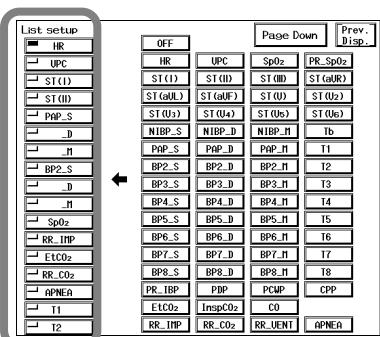
For the data when the measurement was not performed (before admittance) or when the monitoring was suspended, the time will be displayed as “—:—”. Also, if the data is not displayed on the home display, or the BP is not zero balanced, the data will be displayed as “- - -”.

Parameter Setup for Tabular Trend

1 Press the **List Setup** key on the tabular trend menu to display the tabular trend setup menu.

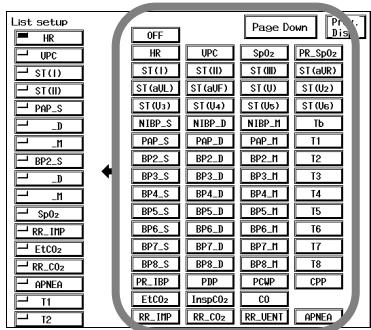


2 Select the position on the list.



Select the position.
There are 17 positions on the list to set the parameter.

3 Select the parameter for display.



Select the parameter to display for the previously selected position.
The position will automatically shift downward to allow consecutive parameter selection.

NOTE

The apnea time will be stored when it exceeds the alarm threshold level. If lower than the alarm threshold level, it will be stored as "0 (zero)".

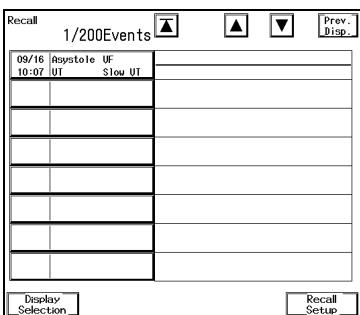
Recall

Display/Print

This section explains the recall menu function and printing procedure.

To Display the Recall Menu

The recall menu can be accessed from the menu, or from the preprogrammed user key.



When the assigned alarm factor occurs, the waveform (12 seconds) and numeric data at alarm occurrence will be stored for up to 200 data.

The recall data to be displayed can be selected on the display selection menu.

On the recall list display, 5 compressed recall waveform will be displayed. Pressing one of the compressed recall waveform will enlarge the waveform.

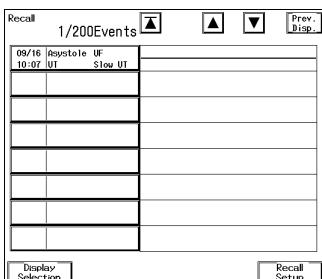


7

Recall

● Recall List Display

- 1 Press the **Menu** → **Function** → **Recall** keys.

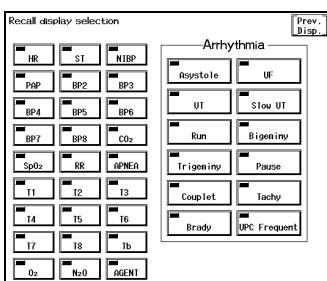


The recall list will be displayed.

The compressed 7 sec. waveform will be displayed.

The alarm occurrence time, the recall factor occurred at the same time, and the compressed waveform of recall waveform 1 will be displayed.

- 2 Select the recall factor to display on the recall list.



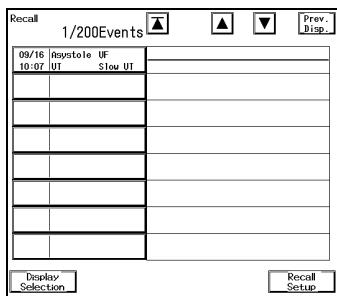
Press the **Display Selection** key and select the recall factor.

Select the numeric data, arrhythmia to display as recall factor.

If the key LED is lighted, recall data will be displayed.

If the key LED is extinguished, recall data will not be displayed.

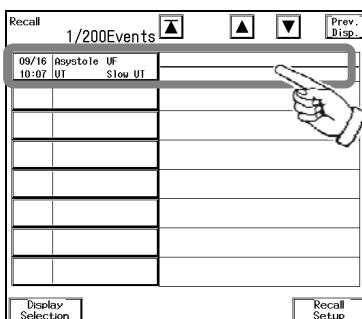
3 Switch the recall list display.



- The newest 8 data will be displayed from the recall list.
- Shifts the recall list to newer data by 1 page (8 data).
- Shifts the recall list to older data by 1 page (8 data).

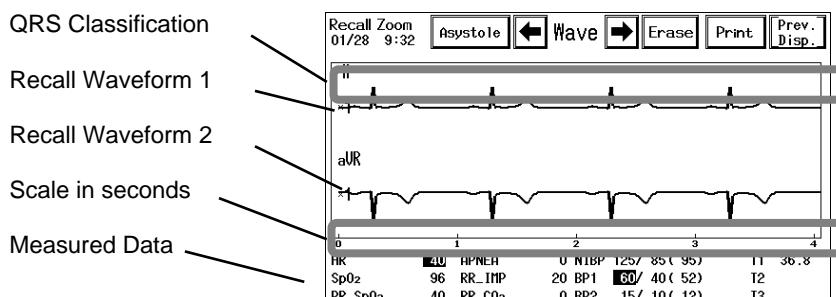
To Display and Record the Enlarged Recall Waveform

On the recall list display, pressing one of the recall factor will display the enlarged recall waveform.
On the enlarged recall waveform display, the recall waveform will be displayed in 25mm/s and by using the cursor, the data before and after the alarm occurrence can be checked.

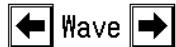


Press one of the recall factors on the recall list.

1 Pressing one of the recall factors will display the enlarged recall waveform.



2 Shift the waveform left or right.

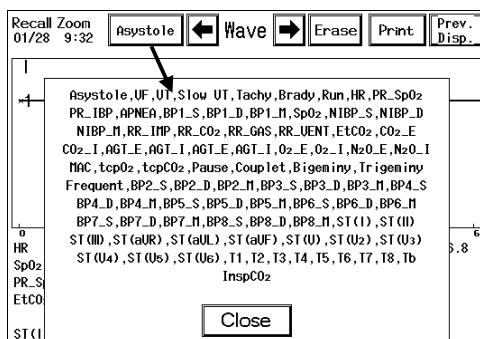


The recall waveform display can be shifted to left or right.

key will shift to the older data.

key will shift to the newer data.

3 The alarm factor occurred at the same time will be displayed.



Pressing the recall factor key will display the recall factor occurred at the same time.

4 Print the recall waveform.



Pressing the **[Print]** key will print the displayed recall waveform and numeric data.

The output recorder can be selected from the output recorder set for graphic recording or manual recording.



Refer to "4. Monitoring Setup Recording Setup" for printing setup procedure.

5 Erase the recall waveform.

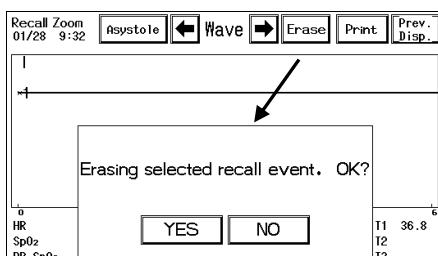
Erase the unnecessary recall waveform.



Pressing the **[Erase]** key will display the confirmation message.

YES will erase the waveform and displays the recall list display.

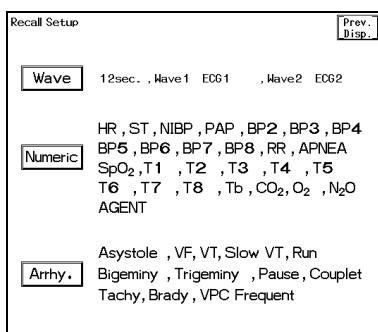
NO will return to the previous display.



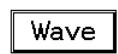
To Set the Recall Condition

On the recall menu, the storing condition at alarm occurrence can be set.

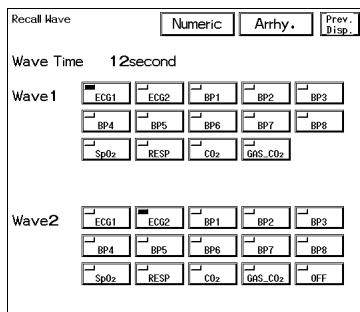
The recall waveform and recall factor (numeric data, arrhythmia) can be selected.



1 Select the recall waveform.



Pressing the **[Wave]** key will display the menu to select the recall waveform.

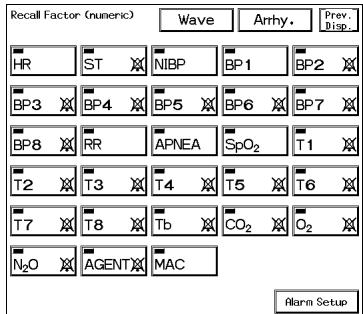


Up to 2 waveforms can be selected for recall waveform.
Select the recall waveform from Wave 1 and Wave 2.
The key with the LED lighted is the selected waveform.

2 Select the recall factor (numeric data).

Numeric

Pressing the **Numeric** key will display the menu to select the numeric data recall factor.



Select the recall factor by pressing the keys.

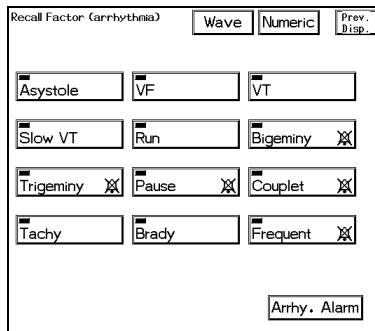
The key with the LED lighted will be the recall factor.

The alarm OFF mark will be displayed inside the parameter key if the alarm is set to OFF for that parameter.

3 Select the recall factor (arrhythmia).

Arrhy.

Pressing the **Arrhy.** key will display the menu to select the arrhythmia alarm factor.



Select an arrhythmia for recall factor. The key with LED lighted will be the recall factor.

The alarm OFF mark will be displayed inside the arrhythmia key if the alarm is set to OFF for that arrhythmia.

NOTE

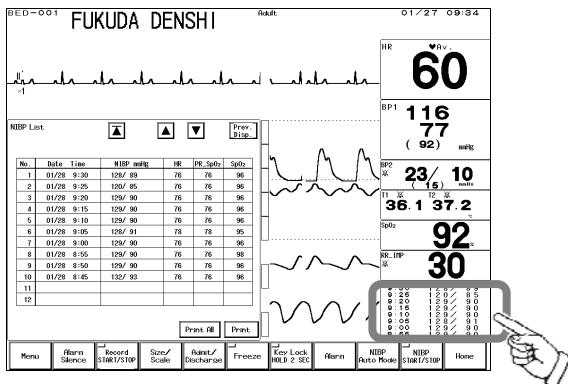
The recall waveform will start with the following delay time tracing back from the alarm occurrence.

	Adult	Child	Neonate	
			Meas. Data Alarm	Arrhy. Alarm
Delay Time	12 sec.	12 sec.	8 sec.	12sec.

This section explains the NIBP list function and printing procedure.

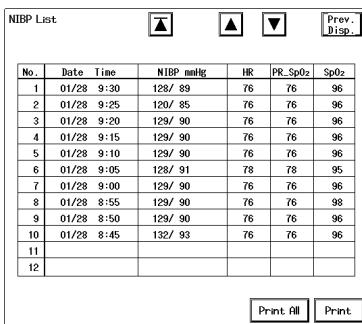
To Display the NIBP List

The NIBP list display can be accessed from the menu, preprogrammed user key, or parameter key.



On the NIBP list, NIBP data and HR, SpO₂ pulse rate, SpO₂ value at the commencement of NIBP measurement will be stored and displayed for 120 NIBP measurements.

- 1** Press the **Menu** → **Function** → **NIBP List** keys.



The NIBP list will be displayed.

- Displays the newest 12 data of the NIBP list.
- Shifts the display to newer data by 1 page (12 data).
- Shifts the display to older data by 1 page (12 data).

- 2** Print the NIBP list.

Print All

All the data stored on NIBP list will be printed on the HS-700 recorder.

Print

Currently displayed NIBP list will be printed.

NOTE

If the measurement unit of BP is kPa, the data cannot be printed on the central monitor recorder.

The Description of the Display

NIBP List					
No.	Date Time	NIBP mmHg	HR	PR_SpO ₂	SpO ₂
1	01/28 9:30	128/ 89	76	76	96
2	01/28 9:25	120/ 85	76	76	96
3	01/28 9:20	129/ 90	76	76	96
4	01/28 9:15	129/ 90	76	76	96
5	01/28 9:10	129/ 90	76	76	96
6	01/28 9:05	128/ 91	78	78	95
7	01/28 9:00	129/ 90	76	76	96
8	01/28 8:55	129/ 90	76	76	98
9	01/28 8:50	129/ 90	76	76	96
10	01/28 8:45	132/ 93	76	76	96
11					
12					

The mean BP will be displayed on the NIBP list only if it is displayed on the home display. If HR or SpO₂ is not measured, or not correctly measured at the commencement of NIBP measurement, the measured data will be displayed as “— —”.

For Quick SYS measurement, only the SYS (highest BP value) will be displayed.

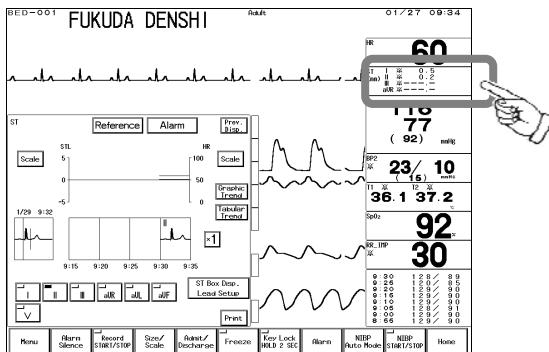
NOTE

If the NIBP measurement was not completed, the data will not be displayed on the NIBP list. At some telemetry center, the time and measurement will be displayed as “00:00” and “— —” respectively.

This section describes the operation procedure for the ST display and alarm setup.

To Display the ST Measurement Menu

The ST display can be accessed from the menu, preprogrammed user key, or parameter key.

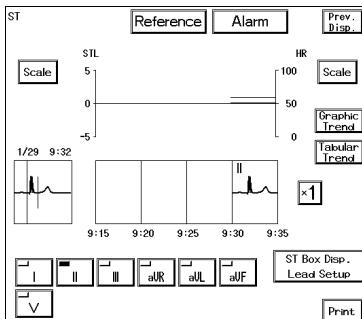


On the ST display, the averaged ECG waveform of 16 beats will be superimposed for 5 minutes. 3 frames of superimposed waveform will be displayed. Also, HR and ST level will be simultaneously displayed as graphic trend. ST1 will be measured for each lead. On the ST display, ST alarm limit and ST reference point / measurement point can be set.

NOTE

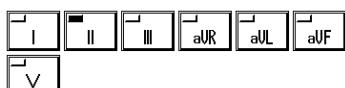
- If 3-lead cable is used, measurement will be performed for only the displayed leads.
- “— — —” will be displayed for ST level for the following case.
 - during arrhythmia learning.
 - during lead-off condition.
 - when “N” or “S” is not detected for QRS within 30 seconds.
 - when reference waveform is not set for ST measurement.

1 Press the **Menu** → **Function** → **ST Display** keys.



The ST display will appear.

2 Select the superimposed waveform.



Select the lead to display.

3 Select the waveform size for the superimposed waveform.

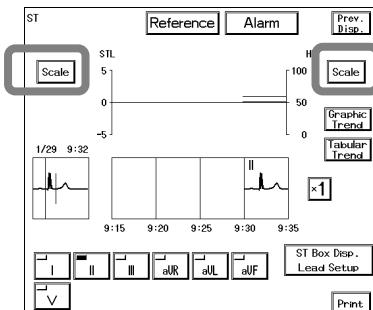


Pressing the key will sequentially change the key as follows;
 $x1/4 \rightarrow x1/2 \rightarrow x1 \rightarrow x2 \rightarrow x4 \rightarrow x1/4$

NOTE

The selection of displayed waveform size for the superimposed waveform synchronizes with the ECG waveform size on the home display.

4 Select the trend scale.



Select the displaying scale for the trend.

Trend	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

5 Print the ST display.

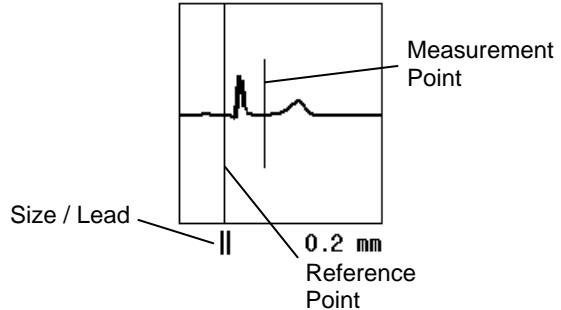
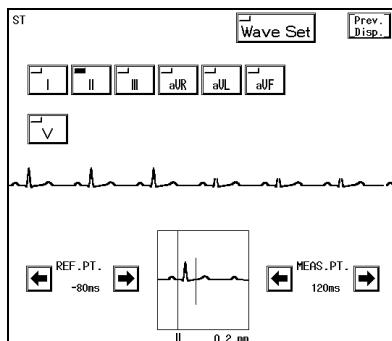


Prints the currently displayed graphic trend, waveform on the ST display.

To Set the Reference Waveform

The reference waveform and reference / measurement point for measuring the ST level can be set on this menu.

- 1 Press the **Menu** → **Function** → **ST Display** → **Reference** keys to display the reference waveform setup menu.



- 2 Read the waveform by pressing the **Wave Set** key.



16 beats average of the ECG judged as normal QRS by arrhythmia analysis will be read. If during arrhythmia learning, or if VPC is present, the reference waveform setup will take more than 16 beats.



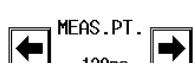
During the reference waveform setup, the key LED will light.

- 3 Set the reference point on the ST display.



The reference point can be set in the range of -240 to 0ms in increments of 10ms from the peak of QRS to the P wave direction.

- 4 Set the measurement point on the ST display.



The measurement point can be set in the range of 0 to 560ms in increments of 10ms from the peak of QRS to the T wave direction.
Moving the cursor will display the currently measured ST value.

CAUTION

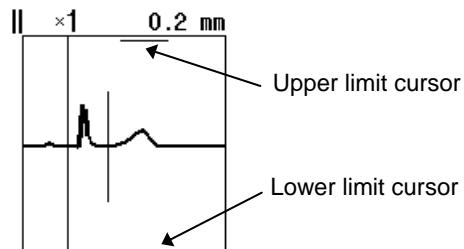
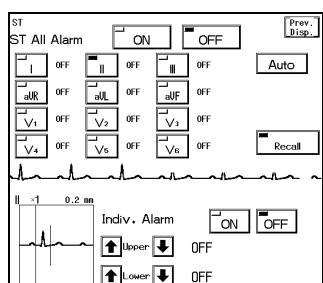
For the lead which the electrode is detached, the reference waveform setup cannot be performed. Check if the electrode is correctly attached, and perform the setup again.

● ST Alarm Setup

The ST upper value and lower value compared with the reference waveform will be set.

The alarm value is to be set for each measurement unit (mm / mV). The upper and lower limit can be set in 1mm / 0.1mV increment.

- 1 Press the **Menu** → **Function** → **ST Display** → **Alarm** keys to display the alarm setup menu.



- 2 Select ON/OFF for "ST All Alarm".

ST All Alarm

ON will generate ST alarm.

However, the alarm will not generate for the lead which individual alarm is set to **OFF**.

OFF will not generate ST alarm.

- 3 Select the lead to set the alarm limit.

I	20.0	II	20.0	III	20.0
aVR	-20.0	aVL	-20.0	aVF	-20.0
V1	20.0	V2	20.0	V3	20.0
V4	-20.0	V5	-20.0	V6	-20.0

Press one of the lead keys to set the alarm limit.

- 4 Set the upper and lower alarm limit.

 Upper

Use the **↑**, **↓** keys to adjust the alarm limit.

 Lower

Item	Description
Lower Alarm Limit	Select the lower alarm limit ($\pm 20\text{mm} / \pm 2.0\text{mV}$). Alarm will be set to OFF if the value $-20\text{mm} / -2.0\text{mV}$ or lower is selected.
Upper Alarm Limit	Select the upper alarm limit ($\pm 20\text{mm} / \pm 2.0\text{mV}$). Alarm will be set to OFF if the value $+20\text{mm} / +2.0\text{mV}$ or above is selected.

- 5 Select ON/OFF of "Indiv. Alarm".

Indiv. Alarm

ON will generate the ST alarm for the selected lead.

OFF will not generate the ST alarm for the selected lead.

- 6 Select "Auto" for automatically setting the alarm limit.

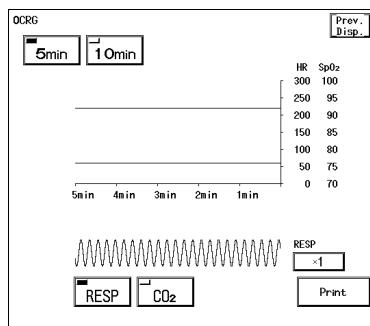
Pressing the **Auto** key will automatically set the upper alarm limit to current ST value $+0.2\text{mV}$ ($+2\text{mm}$), and lower alarm limit to current ST value -0.2mV (-2mm).

Selecting "Auto" will automatically turn ON the ST alarm.

If the upper or lower limit is OFF, the limits will remain OFF.

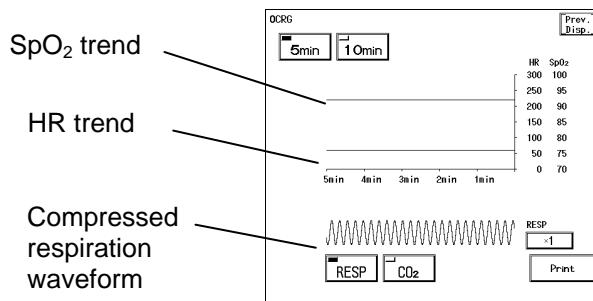
This section describes the procedure to display the OCRG.

The OCRG display can be accessed from the menu, or from the preprogrammed user key.



On the OCRG display, compressed respiration waveform, HR trend and SpO₂ trend are displayed simultaneously.

1 Press the [Menu] → [Function] → [OCRG] keys to display the OCRG.



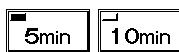
The trend scale is fixed as follows.
HR : 0–300bpm
SpO₂ : 70–100%

2 Select the respiration waveform.



Select [RESP] or [CO₂] to display the compressed respiration waveform from impedance respiration (RESP) or CO₂ waveform.

3 Select the displaying duration.



Select a displaying duration from [5min] or [10min].

4 Select the waveform size for compressed respiration waveform.



Pressing the size key will sequentially change the waveform size.

Respiration Waveform	Size, Scale
Impedance, RESP	x1/4 → x1/2 → x1 → x2 → x4 → x1/4
CO ₂	100 → 50 → 100 (unit : mmHg) 4 → 8 → 10 → 4 (unit : % or kPa)

5 Print the OCRG display.



The currently displayed graphic trend and compressed waveform on the OCRG display will be printed.

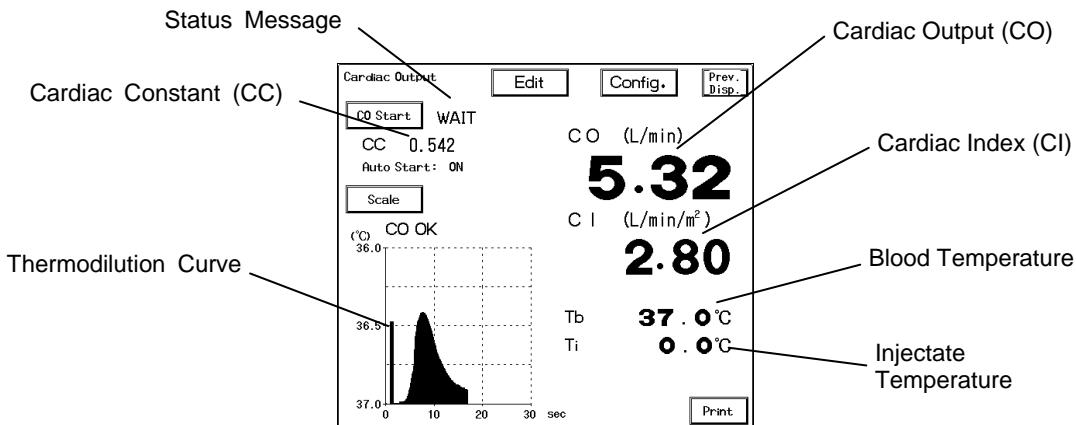
NOTE

The OCRG cannot be printed on the central monitor recorder.

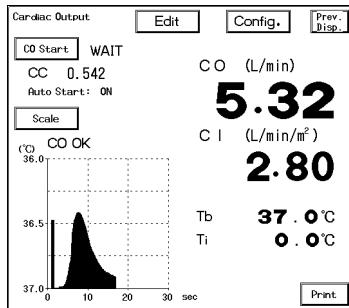
This section explains about the cardiac output measurement using the thermodilution method, setup procedure for catheter type, and procedure for editing the measurement result.

To Display the Cardiac Output Menu

The cardiac output menu can be accessed from the menu, or from the preprogrammed user key.



- 1 Press the **Menu** → **Function** → **Cardiac Output** keys.



The cardiac output menu will be displayed.
The message will be displayed depending on the status.
The measurement can be started when "READY" is displayed.

●Message List

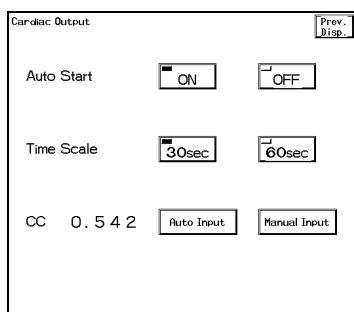
Message	Description
Status Message	
WAIT	Preparing for measurement. Also displayed when catheter relay cable is not connected to the CO module, or when thermodilution catheter is not connected.
READY	Ready to begin the measurement.
BUSY	In process of measurement.
END	End of measurement.
Result Status	
CO_OK	CO is correctly measured.
UPPER_FAULT	Measurement error • Blood temperature is out of measurable range after the injection. • Thermistor connector and relay cable is not properly connected. • Line is cut on the sensor or relay cable.
PEAK_FAULT	Measurement error • Peak of thermodilution curve can not be detected. • Thermistor connector and relay cable is not properly connected. • Line is cut on the sensor or relay cable.
LOWER_FAULT	Measurement error • Blood temperature has not returned to stable condition after measurement. • Thermistor connector and relay cable is not properly connected. • Line is cut on the sensor or relay cable.
SENSOR_ERROR	Measurement error • Thermistor connector and relay cable is not properly connected. • Line is cut on the sensor or relay cable.
OVER RANGE	Measurement error • CO value is out of measurable range.

The result status will be displayed for 30 seconds after completion of measurement.

Cardiac Output Setup

Before measuring the cardiac output, set the measurement condition such as ON/OFF of auto start, injection condition, etc.

- 1 Press the **Menu** → **Function** → **Cardiac Output** → **Config.** keys.



The cardiac output configuration menu will be displayed.
Set the measurement condition such as ON/OFF of auto start, displaying scale of thermodilution curve, CC value for injection, etc.

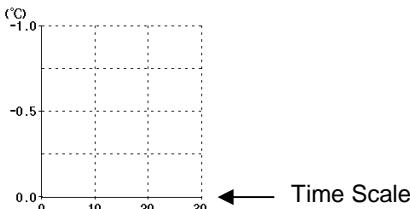
- 2 Set ON/OFF of “Auto Start”.

Auto Start **ON** **OFF**

ON will automatically start the measurement without pressing the **CO Start** key.
OFF will start the measurement when **CO Start** key is pressed.
 Even when **ON** is selected, the measurement can be manually started by pressing the **CO Start** key.

3 Set the time scale.

Time Scale

 30sec 60secSelect the time scale of thermodilution curve from 30sec / 60sec

4 Set the computation constant.

CC 0. 5 4 2

 Auto Input Manual Input

Auto Input key will automatically input a pre-determined computation constant into the formula for the cardiac output calculation. The constant is dependent on the size of the catheter and the injection volume.

Manual Input key will allow to manually input the computation constant for the used catheter.

【Auto Input of CC】

CC Auto Input	Relay Cable	Probe Off		
Manuf.	<input type="checkbox"/> BIOSENSORS	<input type="checkbox"/> BD	<input type="checkbox"/> EDWARDS	
Catheter Size (F)	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input checked="" type="checkbox"/> 7	<input type="checkbox"/> 7.5
Inj. Volume(mL)	<input type="checkbox"/> 3	<input type="checkbox"/> 5	<input checked="" type="checkbox"/> 10	
Inj. Temp.	<input type="checkbox"/> Ice	<input type="checkbox"/> Room		
cc	0. 0 0 0			
<input type="checkbox"/> INPUT <input type="checkbox"/> Cancel				

Select the catheter manufacturer from BIOSENSORS, BD, EDWARDS, catheter size (F) from 5, 6, 7, 7.5, and injection volume (mL) from 3, 5, 10.

When the above items are selected, CC value will be automatically set.

(BD: Becton Dickinson)

Inj. Temp.

 Ice Room

CC

0. 0 0 0

 INPUT Cancel

When using a relay cable which can not measure the injectate temperature, select from the two selections.

When measuring at 0°C, select Ice, and when measuring at room temperature, select Room.

When CC is set, finalize it by pressing the Input key. If the CC does not correspond to the used catheter, or if you desire to return to the previous CC value, press the Cancel key, and input the value manually.

【Manual Input of CC】

CC Manual Input	History Input		
<input type="checkbox"/> BIOSENS	0.000	0.000	0.000
<input type="checkbox"/> BD	0.000	0.000	0.000
<input type="checkbox"/> EDWARDS	Manufacturer		
Inj. Temp.	<input type="checkbox"/> Ice	<input type="checkbox"/> Room	
cc	7	8	9
	4	5	6
	1	2	3
	0	.	C
<input type="checkbox"/> INPUT <input type="checkbox"/> Cancel			

Switch the manufacturer and select the CC for the used catheter. Up to 6 types of recently used CC can be programmed for each 3 manufacturers. Pressing the Manufacturer key will switch the manufacturer name.

Inj. Temp.

 Ice Room

When using the catheter relay cable, CJ-7382 or CJ-382 (for HF-700), make sure to set the "Injectate Temperature"

CC

0. 0 0 0

 INPUT Cancel

After setting the CC value, press the Input key to finalize the value.

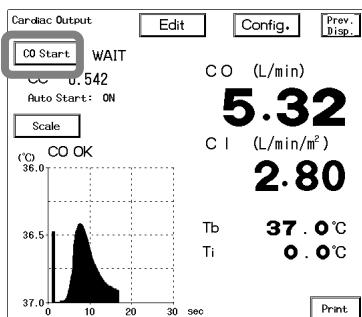
To Measure the Cardiac Output

The measurement can be started when "READY" is displayed.

If "WAIT", "BUSY", "CO_OK" message is displayed, the measurement cannot be started. Wait until it is ready for measurement. Particularly when "WAIT" message is continuously displayed, verify that catheter relay cable is properly connected to cardiac output module, and thermodilution catheter is securely connected.

1 Display the cardiac output menu.

2 Start the measurement.



Press the **CO Start** key, and inject as soon as the beep sound generates
If "Auto Start" is set to ON, injecting without pressing the **CO Start** key will automatically start the measurement by detecting the blood temperature change.
When the measurement is complete, CO and CI value will be displayed.

3 Print the measurement result.



Pressing the **Print** key will print the displayed thermodilution curve, cardiac output, and cardiac index.

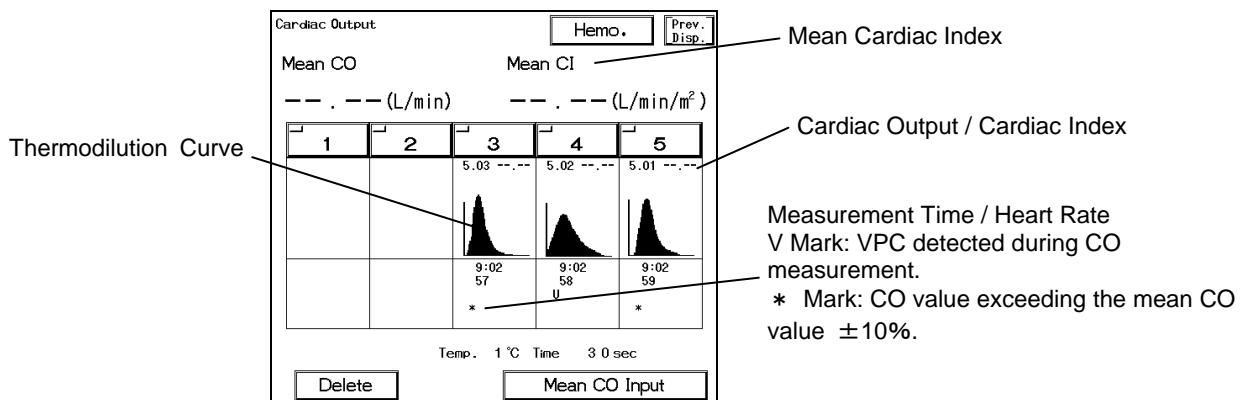
NOTE

- Before injecting, check that the Ti (injectate temperature) setting is correct.
- When repeatedly performing the measurement, inject at intervals of 30–60 seconds
- In the following cases, measurements may be inaccurate.
 - Shunt disease, tricuspid regurgitation or pulmonic regurgitation.
 - During exercise stress
As body temperature differs sequentially by exercise, constant CO value cannot be measured.
 - Excessive Arrhythmia
Body Temperature varies non-continuously as a result of arrhythmia.
Accurate CO value cannot be measured.
 - CI value will be displayed if BSA is previously entered in the patient admit/discharge menu.
- The CI value will not be displayed unless height/weight or BSA value is input on the admit / discharge menu.

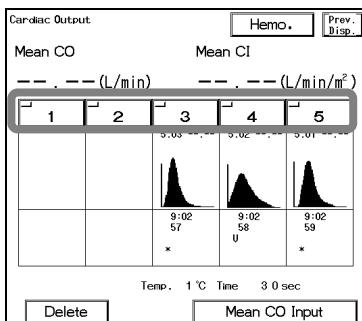
To Edit the Cardiac Output Data

By performing the CO measurement continuously, mean CO and mean CI can be calculated by editing the measurement result.

Mean Cardiac Output

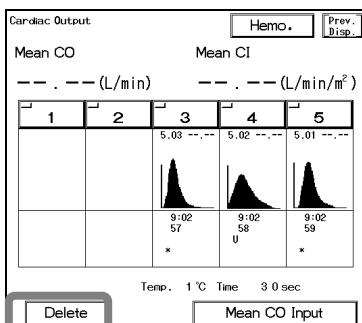


1 Press the **Menu** → **Function** → **Cardiac Output** → **Edit** keys.



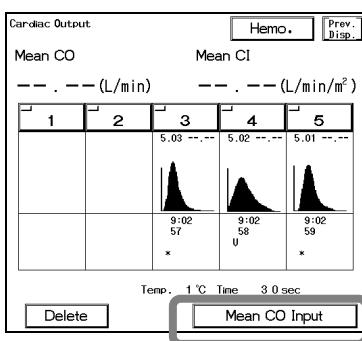
The cardiac output edit menu will be displayed.
The mean CO and mean CI value obtained from the measurement result will be displayed.
The data can be excluded from averaging by extinguishing the key LED of the corresponded data.

2 Delete the measurement result.



Pressing the **Delete** key will delete the measurement data of the thermodilution curve with the key LED extinguished.

3 Input the data to the list.



Pressing the **Mean CO Input** key will input the displayed mean CO data to the list.

NOTE	If the height, weight, and BSA are changed on the patient admit menu, the average CI will be recalculated. As the CI will not be recalculated after the hemodynamic calculation, store the average CI by hemodynamic calculation before changing the height, weight, and BSA.
-------------	--

This section explains the procedure for hemodynamics calculation and printing.

Hemodynamic		<input type="button" value="New"/>	<input type="button" value="Edit"/>	<input type="button" value="Prev. Disp."/>
<input type="text" value="01/28"/> <input type="text" value="09:34:00"/>				
<input type="button" value="Delete"/>		<input type="button" value="Print"/>		
Input Data		Calculated Data		
Height : cm Height : kg CO : 5.00 L/min HR : 60 bpm ART S : mmHg D : mmHg M : mmHg PAP S : mmHg D : mmHg M : mmHg CVP : mmHg PCWP : 23 mmHg		BSA : CI : SU : SUI : SUR : SURI : PUR : PURI : LUH : LUHI : LUSH : LUSHI : RUH : RUHI : RUSH : RUSHI :		

●Calculation Data

Data	Description	Formula
BSA	Body Surface Area (m^2)	$h^{0.725} \times w^{0.425} \times 71.84 \times 10^{-4}$ (Dubois Formula)
CI	Cardiac Index (L/min/ m^2)	$\frac{CO}{BSA}$
SV	Stroke Volume (mL/beat)	$\frac{CO \times 1000}{HR}$
SVI	Stroke Volume Index (mL/beat/ m^2)	$\frac{SV}{BSA}$
SVR	Systemic Vascular Resistance (dynes·sec·cm $^{-5}$)	$\frac{(MAP - CVP) \times 79.90}{CO}$
SVRI	Systemic Vascular Resistance Index (dynes·sec·cm $^{-5} \cdot m^2$)	SVR \times BSA
PVR	Pulmonary Vascular Resistance (dynes·sec·cm $^{-5}$)	$\frac{(MPAP - PCWP) \times 79.90}{CO}$
PVRI	Pulmonary Vascular Resistance Index (dynes·sec·cm $^{-5} \cdot m^2$)	PVRI \times BSA
LVW	Left Ventricular Work (kg·m)	$CO \times (MAP - PCWP) \times 0.0136$
LVWI	Left Ventricular Work Index (kg·m/ m^2)	$\frac{LVW}{BSA}$
LVSW	Left Ventricular Stroke Work (g·m)	$SV \times (MAP - PCWP) \times 0.0136$
LWSWI	Left Ventricular Stroke Work Index (g·m/ m^2)	$\frac{LVSW}{BSA}$
RVW	Right Ventricular Work (kg·m)	$CO \times (MPAP - CVP) \times 0.0136$
RVWI	Right Ventricular Stroke Work Index (kg·m/ m^2)	$\frac{RVW}{BSA}$
RVSW	Right Ventricular Stroke Work (g·m)	$SV \times (MPAP - CVP) \times 0.0136$
RWSWI	Right Ventricular Stroke Work Index (g·m/ m^2)	$\frac{RVSW}{BSA}$

NOTE

The blood pressure unit for hemodynamics is mmHg. The unit, kPa, cmH₂O cannot be used.

To Display the Hemodynamics Data

The latest 5 hemodynamics data will be displayed.

- 1 Press the **Menu** → **Function** → **Hemodynamic** keys.

Input Data		Calculated Data	
01/28 09:34:00		BSA :	CI :
Height : cm		SU :	SU1 :
Weight : kg		SUR :	SUR1 :
CO : 5.00 L/min		PUR :	PURI :
HR : 60 bpm		LUM :	LUM1 :
ART S : mmHg		LUSH :	LUSH1 :
D : mmHg		RUM :	RUM1 :
M : mmHg		RUSH :	RUSH1 :
PAP S : mmHg			
D : mmHg			
M : mmHg			
CVP : mmHg			
PCWP : 23 mmHg			
Delete		Print	

The hemodynamics menu will be displayed.

- 2 Select the data to display.

Input Data		Calculated Data	
01/28 09:34:00		BSA :	CI :
Height : cm		SU :	SU1 :
Weight : kg		SUR :	SUR1 :
CO : 5.00 L/min		PUR :	PURI :
HR : 60 bpm		LUM :	LUM1 :
ART S : mmHg		LUSH :	LUSH1 :
D : mmHg		RUM :	RUM1 :
M : mmHg		RUSH :	RUSH1 :
PAP S : mmHg			
D : mmHg			
M : mmHg			
CVP : mmHg			
PCWP : 23 mmHg			
Delete		Print	

Select the data to display the calculation result by pressing the data selection key.

On the data selection key, calculated date and time will be displayed.

- 3 Print the calculation data.



The currently displayed hemodynamics calculation data will be printed.

To Calculate the Newly Input Hemodynamics Data

The hemodynamics calculation can be performed using the newly input data.

The data can be manually input using the ten keys, or the current measurement data can be automatically input.

- 1 Press the **Menu** → **Function** → **Hemodynamics** → **New** keys.

Input Data		Calculated Data	
Height : cm		BSA :	CI :
Weight : kg		SU :	SU1 :
BSA : m²		SUR :	SUR1 :
HR : bpm		PUR :	PURI :
CO : L/min		LUM :	LUM1 :
MAP : mmHg		LUSH :	LUSH1 :
MPAP : mmHg		RUM :	RUM1 :
CVP : mmHg		RUSH :	RUSH1 :
PCWP : mmHg			
		Auto	Calc.

The hemodynamics menu to input the new data will be displayed.

2 Automatically input the current measurement data.

The screenshot shows the 'Hemodynamic' input screen. On the left is a vertical list of parameters: Height, Weight, BSA, HR, CO, MAP, MPAP, CVP, and PCWP. Each parameter has a unit indicator (cm, kg, m², bpm, L/min, mmHg) and a blank input field. To the right of the list is a numeric keypad with digits 7, 8, 9 at the top, 4, 5, 6 in the middle, and 1, 2, 3 at the bottom. Below the keypad are buttons for 'Auto' and 'Calc.'. A hand is pointing to the 'Auto' button.

The data already set (height, weight, etc.) and measured data (HR, etc.) will be automatically input.

MAP (ART), MPAP (PAP), CVP (CVP) can be automatically input by setting the BP label.

If **Auto** key is pressed after inputting the data, the input data will be cleared.

NOTE

Only the BP data with the unit "mmHg" can be automatically input.

3 Input the data using the numeric keypad.

The screenshot shows the 'Hemodynamic' input screen. The layout is identical to the previous one, with parameters on the left and a numeric keypad on the right. A hand is pointing to the 'Calc.' button.

Input the data using the ten keys, and press the corresponded key from **Height**, **Weight**, **BSA**, **CO**, **HR**, **MAP**, **CVP**, **MPAP**, **PCWP**.

BSA will be automatically calculated when height and weight is input, but it can be also manually input using the ten keys.

【Input Data】

Data	Description (Unit)
Height	(cm)
Weight	(kg)
BSA	Body Surface Area (m ²)
CO	Cardiac Output (L/min)
HR	Heart Rate (bpm)
MAP	Mean Artery Pressure (mmHg)
MPAP	Mean Pulmonary Artery Pressure (mmHg)
CVP	Central Venous Pressure (mmHg)
PCWP	Pulmonary Capillary Wedge Pressure (mmHg)

NOTE

If the height, weight, BSA is changed on the patient admit/discharge menu, mean CI will be recalculated. However, the hemodynamic will not be recalculated with the new CI data.

4 Calculate the hemodynamics.

The screenshot shows the 'Hemodynamic' input screen. The layout is identical to the previous ones, with parameters on the left and a numeric keypad on the right. A hand is pointing to the 'Calc.' button.

After inputting the data, press the **Calc.** Key.

The calculation result will be displayed.

To cancel the calculation, press the **Prev. Disp.** key.

To Edit the Hemodynamics Data

The hemodynamics data can be edited.

- 1 Press the **Menu** → **Function** → **Hemodynamic** keys.

Input Data		Calculated Data	
01/28	09:34:00	BSA :	CI :
Height :	cm	SU :	SUR :
Weight :	kg	SUR :	SURI :
CO :	5.00 L/min	PUR :	PURI :
HR :	60 bpm	LUM :	LUMI :
ART S :	mmHg	LUSH :	LUSHI :
D :	mmHg	RW4 :	RW4I :
M :	mmHg	RW8 :	RW8I :
PAP S :	mmHg	RUSH :	RUSHI :
D :	mmHg		
M :	mmHg		
CUP :	mmHg		
PCWP :	23 mmHg		

Delete **Print**

Select the hemodynamics data to perform editing.

- 2 Press the **Edit** key and edit the data.

Height	75.0 cm
Weight	80.0 kg
BSA	1.95 m ²
HR	60 bpm
CO	5.00 L/min
MAP	0.0 mmHg
MPAP	5 mmHg
CVP	1.2 mmHg
PCWP	8 mmHg

Auto **Calc.**

Input the value using the ten keys, and press the corresponded key from **Height**, **Weight**, **BSA**, **CO**, **HR**, **MAP**, **CVP**, **MPAP**, **PCWP** keys.

- 3 Recalculate the hemodynamics data.

Height	175.0 cm
Weight	80.0 kg
BSA	1.95 m ²
HR	60 bpm
CO	5.00 L/min
MAP	100 mmHg
MPAP	5 mmHg
CVP	1.2 mmHg
PCWP	8 mmHg

Auto **Calc.**

After inputting the data, press the **Calc.** key.
The calculation result will be displayed.

To cancel the calculation, press the **Prev. Disp.** key.
The date/time will not change after recalculation.

Ventilator

P-V, F-V Loop Display

By connecting the ventilator, P-V loop (airway pressure / ventilation) and F-V loop (airway flow / ventilation) can be monitored on the ventilator display.

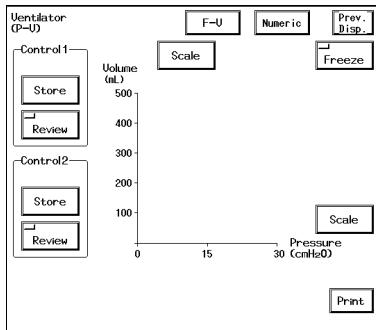


For PURITAN-BENNETT ventilator, P-V loop and F-V loop cannot be displayed or printed. Only the numeric data will be displayed.

P-V Loop

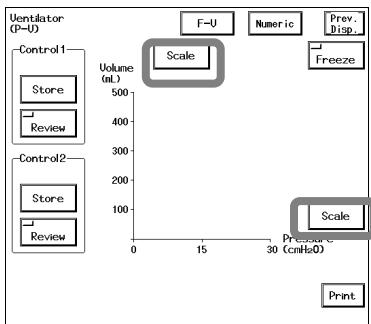
The P-V loop is sampled each 60ms and displayed for each respiration. The beginning of the loop is displayed in white, and the rest of the loop is displayed in cyan. The horizontal axis shows AWP (Unit: cmH₂O), and vertical axis shows Volume (Unit: mL).

- 1 Press the **Menu** → **Function** → **Ventilator** keys.



The P-V loop display will appear.

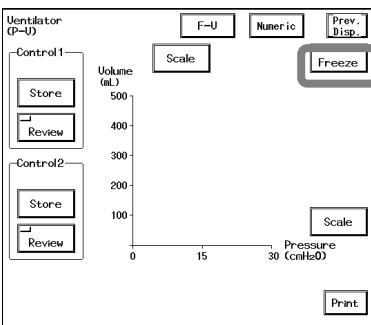
- 2 Select the scale for P-V loop.



The scale will change as the **Scale** key is pressed.

- Vertical Axis (Volume)
Select from 250 / 500 / 750 / 1000 (mL).
- Horizontal Axis (Pressure)
Select from 10 / 20 / 30 / 50 / 120 (cmH₂O).

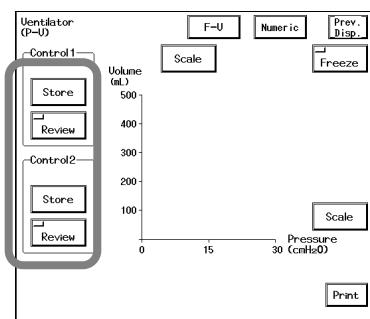
- 3 Freeze the loop drawing.



Pressing the **Freeze** key will stop the P-V loop drawing.
Pressing the key again will resume the waveform trace.

4 Program the reference loop.

The control loop can be programmed to see the change in P-V loop.



Pressing the **Store** key will store the displayed P-V loop as control loop. Pressing the **Review** key will display the stored control loop. The control loop 1 will be displayed in yellow, and control loop 2 will be displayed in green.

5 Print the P-V loop.



The currently displayed P-V loop will be printed.

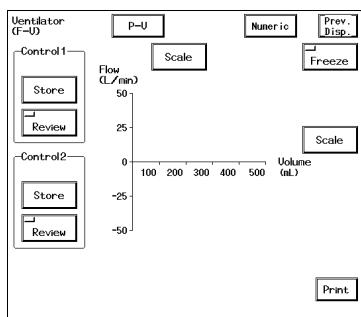
NOTE

The P-V loop cannot be printed on the central monitor recorder.

F-V Loop

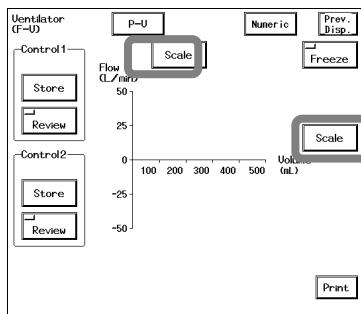
The F-V loop is sampled each 60ms and displayed for each respiration. The beginning of the loop is displayed in white, and the rest of the loop is displayed in cyan. The horizontal axis shows AWF (Unit: L/min), and vertical axis shows Volume (Unit: mL).

1 Press the **Menu** → **Function** → **Ventilator** → **F-V** keys.



The F-V loop will be displayed.

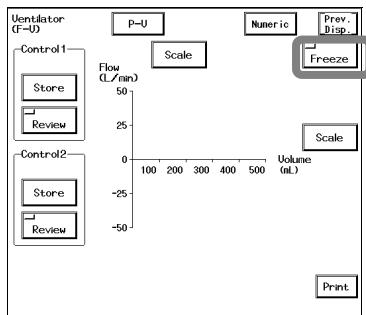
2 Select the scale for F-V loop.



The scale will change as the **Scale** key is pressed.

- Vertical Axis (Flow)
Select from ± 20 / ± 50 / ± 180 (L/min).
- Horizontal Axis (Volume)
Select from 250 / 500 / 750 / 1000 (mL).

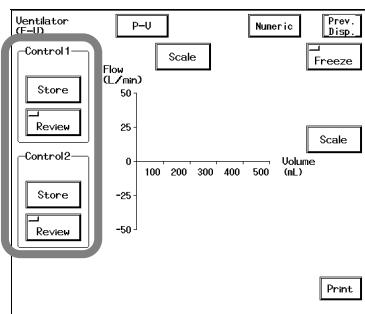
3 Freeze the loop drawing.



Pressing the **Freeze** key will stop the F-V loop drawing.
Pressing the key again will resume the waveform trace.

4 Program the reference loop.

The control loop can be programmed to see the change in F-V loop.



Pressing the **Store** key will store the displayed F-V loop as the control loop. Pressing the **Review** key will display the stored control loop.
The control loop 1 will be displayed in yellow, and control loop 2 will be displayed in green.

5 Print the F-V loop.

Print

The currently displayed F-V loop will be printed.

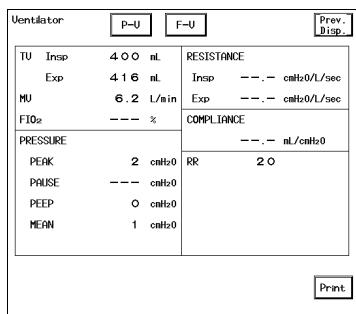
NOTE

The F-V loop cannot be printed on the central monitor recorder.

Displaying the Ventilator Measurement

The numeric data measured by the ventilator can be displayed.

1 Press the **Menu** → **Function** → **Ventilator** → **Numeric** keys.



The ventilator display will appear.

2 Print the measurement data.

Print

The currently displayed ventilator measurement data will be printed.

Respiration List

Display/Print

This section explains about the respiration list display and printing procedure.

To Display the Respiration List

The respiration list display can be accessed from the menu, or from the preprogrammed user key. If the respiration data is displayed on the home display, 24 hours of data will be automatically stored and displayed in 1-minute interval.

- 1 Press the **Menu** → **Function** → **Resp. List** keys.

Resp. List	← Shift	→	Interv.10M	← Page	→	Prev. Disp.
01/28	8:20	8:30	8:40	8:50	9:00	9:10
RR_IINP	30	30	30	30	30	30
RR_CO2	30	30	30	30	30	30
RR_MEAN	20	20	20	20	20	20
SpO2	92	92	92	92	92	92
P_PEAK	2	2	2	2	2	2
P_PAUSE	0	0	0	0	0	0
P_MEAN	1	1	1	1	1	1
PEEP	0	0	0	0	0	0
E_TU	416	416	416	416	416	416
I_TU	400	400	400	400	400	400
MU	6.2	6.2	6.2	6.2	6.2	6.2
E_RES	0.0	0.0	0.0	0.0	0.0	0.0
I_RES	0.0	0.0	0.0	0.0	0.0	0.0
CIMP	0.0	0.0	0.0	0.0	0.0	0.0
FI02	0	0	0	0	0	0
ETCO2 mmHg	33	33	33	33	33	33
HPNEA	10	10	10	10	10	10

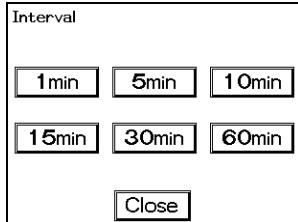
List
setup **Print**

The respiration list of 17 parameters will be displayed.

- 2 Select the displaying interval.

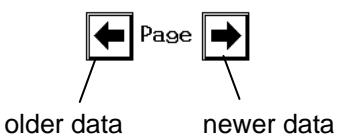
Interv.10M

Pressing the time interval key will display the time interval selection tool.



Select the time interval for the respiration list display.

- 3 Switch the page.



The page will be switched by one page with the displayed time interval.

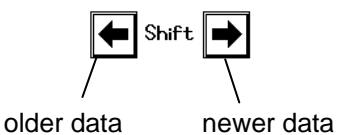
← key will display the previous page listing the older data.
→ key will display the next page listing the newer data.

The respiration list will be displayed in 8 columns.

If 5-minute interval is selected and if the list starts from 10:00, 35 minutes data from 10:00 to 9:25 will be displayed in 1 page.

Pressing the ← key will display the list of 9:20 to 8:45.

- 4 Shift the displayed columns.



The displayed list will be shifted by one column.

← key will shift the display to older data by one column.
→ key will shift the display to newer data by one column.

- 5 Print the respiration list.

Print

The currently displayed respiration list will be printed.

The Description of the Display

Latest Date Latest Time

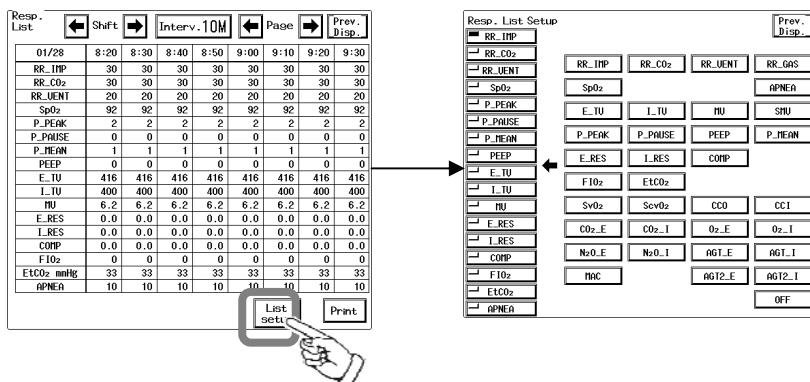
01/28	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30
RR_IMP	30	30	30	30	30	30	30	30
RR_CO2	30	30	30	30	30	30	30	30
RR_UENT	20	20	20	20	20	20	20	20
SpO2	92	92	92	92	92	92	92	92
P_PEAK	2	2	2	2	2	2	2	2
P_PAUSE	0	0	0	0	0	0	0	0
P_MEAN	1	1	1	1	1	1	1	1
PEEP	0	0	0	0	0	0	0	0
E_TU	416	416	416	416	416	416	416	416
I_TU	400	400	400	400	400	400	400	400
MU	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
E_RES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I_RES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F102	0	0	0	0	0	0	0	0
EtCO2 mmHg	33	33	33	33	33	33	33	33
APNEA	10	10	10	10	10	10	10	10

List setup Print

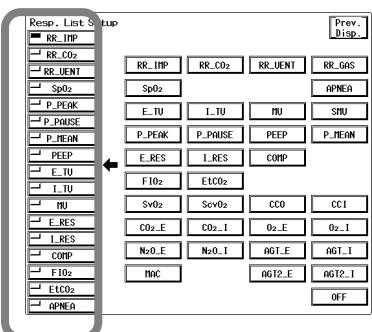
If the time is before the admitted time or if monitoring is suspended, the time will be displayed as "—:—". Also, if the measured data is not displayed on the home display, or BP zero balance is not performed, the data will be displayed as "—:—".

Respiration List Setup

- Press the **List Setup** key on the respiration list display.

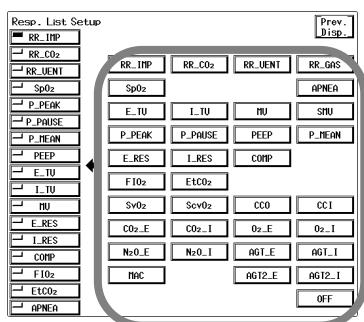


- Select the display position on the list.



Maximum of 17 parameters can be displayed on the list.

- Select the parameter to display.



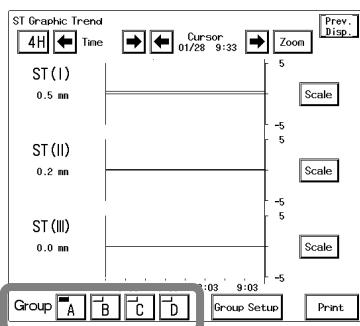
Select the parameter by pressing the corresponded key.
The display will automatically shift downward to allow continuous parameter selection.

This section explains about the ST graphic trend display and printing procedure.

To Display the ST Graphic Trend

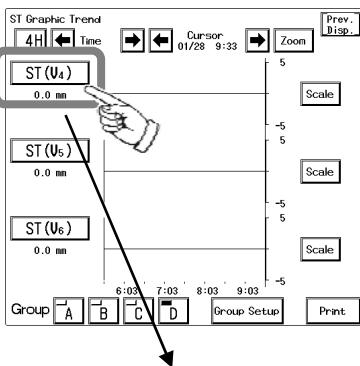
The ST graphic trend display can be accessed from the menu, or from the preprogrammed user key. If the ST data is displayed on the home display, 24 hours of data will be automatically stored and displayed in 1 minute interval.

- 1 Press the **Menu** → **Function** → **ST Graphic Trend** keys.

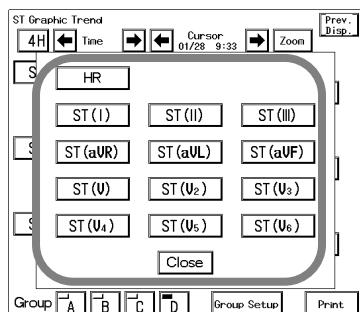


The ST graphic trend will be displayed.
Pressing one of the Group **A**, **B**, **C**, **D** key will switch the display.

- 2 Displaying Group D will allow parameter selection on the ST graphic trend menu.

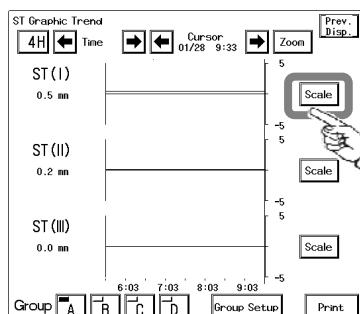


Select the position to set the parameter.



Select the parameter and press the **Close** key.

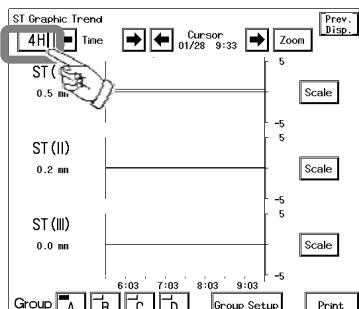
- 3 Select the displaying scale.



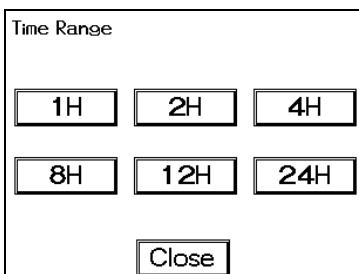
Pressing the **Scale** key will sequentially switch the scale depending on the displayed parameter as follows.

Parameter	Scale	Unit
HR	100, 200, 300	bpm
ST	±0.2, ±0.5, ±1.0, ±2.0	mV
	±2, ±5, ±10, ±20	mm

4 Select the displaying time span.



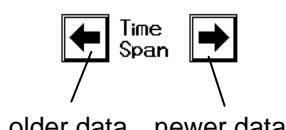
Pressing the display time range key will display the time range selection tool.



Select the time range for the ST graphic trend.

Time Range	Resolution
1 hour	1 min.
2 hours	1 min.
4 hours	1 min.
8 hours	2 min.
12 hours	3 min.
24 hours	6 min.

5 Shift the display.

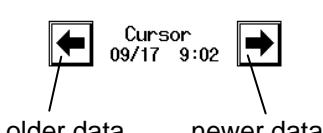


The ST trend display can be shifted to the older or newer data with the currently displayed time span.

← key will display the older data by the selected time span.

→ key will display the newer data by the selected time span.

6 Move the cursor.

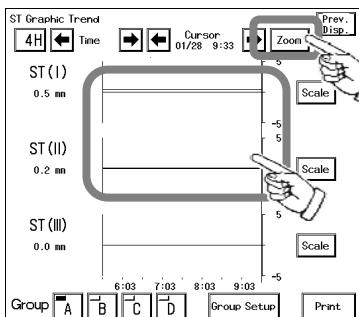


The cursor can be moved to older or newer data. The time and data at cursor point will be displayed.

← key will display the older data.

→ key will display the newer data.

7 Enlarge the display.



Pressing the **Zoom** key will display 1 hour of data with the cursor point at center.

Directly pressing the graph area will move the cursor position.

8 Print the ST graphic trend.

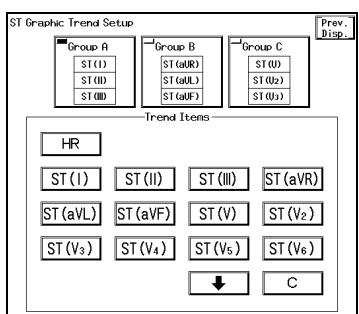


The currently displayed ST graphic trend will be printed.

ST Graphic Trend Group Setup

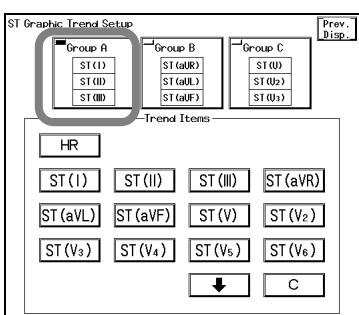
Each trend group displays combination of 3 parameters simultaneously. 3 types of trend group can be programmed.

1 Press the **Menu** → **Function** → **ST Graphic Trend** → **Group Setup** keys.

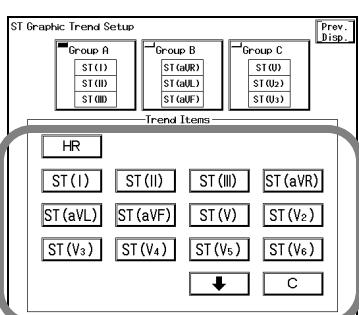


The ST graphic trend group setup menu will be displayed.
On this menu, parameters to display for Group A, Group B, and Group C can be selected.

2 Select the trend group to set the parameters.

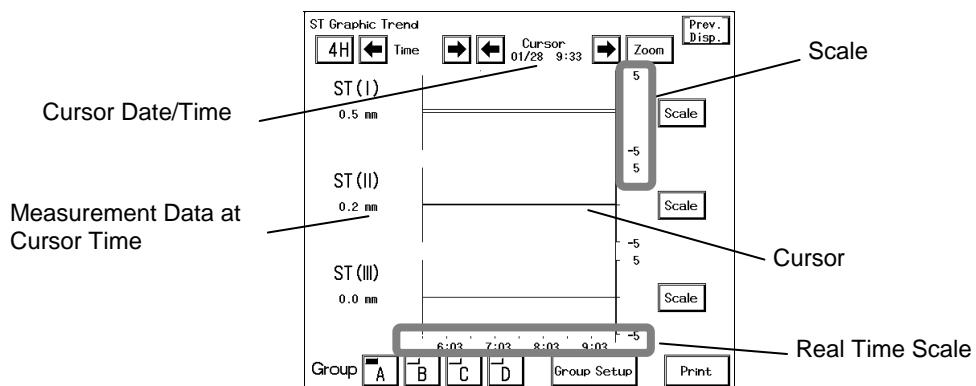


Select the trend group by pressing the **Group A**, **Group B**, or **Group C** key.



Select the parameter by pressing the displayed parameter keys.
Pressing the parameter key will sequentially set the 3 (three) parameters from the top.

The Description of the Display



The measured data will be compressed for the 8-hour / 12-hour / 24-hour display.

Parameter	Compressed Form
HR	Mean Value
ST	Mean Value

This section explains about the ST tabular trend display and printing procedure.

To Display the ST Tabular Trend

The ST tabular trend display can be accessed from the menu, or from the preprogrammed user key. If the ST data is displayed on the home display, 24 hours of data will be automatically stored and displayed in 1 minute interval.

- 1 Press the **Menu** → **Function** → **ST Tabular Trend** keys.

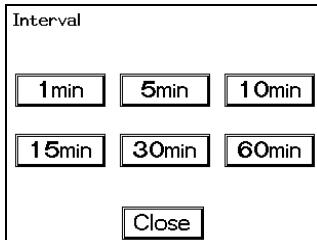
ST Tab Trend									
	Shift	Interv.10M	Page	Prev Disp.					
01/28	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	
HR	60	60	60	60	60	60	60	60	
ST(I)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
ST(II)	mm	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ST(III)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aVR)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aVL)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aVF)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V1)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V2)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V3)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V4)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V5)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V6)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(V6)	mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
									Print

Each ST level of I, II, III, aVR, aVL, aVF, V₁, V₂, V₃, V₄, V₅, V₆, and HR will be displayed in list format.

- 2 Select the display interval.

Interv.10M

Pressing the time interval key will display the time interval selection tool.



Select the time interval for the tabular trend display.

If **5M** is selected, the time will be displayed in real time as follows. 10:00, 10:05, ...10:25.

If **60M** is selected, it will be displayed as 10:00, 11:00, 12:00.

If the ST tabular trend is displayed at 10:35, the data will be displayed from 10:00.

- 3 Switch the page.



The page will be switched by one page with the displayed time interval.

← key will display the previous page listing the older data.

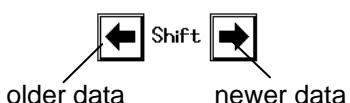
→ key will display the next page listing the newer data.

The ST tabular trend will be displayed in 8 columns.

If 5-minute interval is selected and if the ST trend starts from 10:00, 35 minutes of data from 10:00 to 9:25 will be displayed in 1 page.

Pressing the **←** key will display the ST trend from 9:20 to 8:45.

- 4 Shift the displayed columns.



The displayed tabular trend can be shifted by one column.

← key will shift the display to older data by one column.

→ key will shift the display to newer data by one column.

5 Print the tabular trend.

Print

The currently displayed ST tabular trend will be printed.

The Description of the Display

ST Tab Trend									
	← Shift	→	Interv. 10M	← Page	→	Prev. Disp.			
01/28	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30	
HR	60	60	60	60	60	60	60	60	
ST(I) mn	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
ST(II) mn	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ST(III) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aUR) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aUL) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(aVF) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U2) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U3) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U4) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U5) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ST(U6) mn	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Latest Measurement Date

Latest Measurement Time

For the data when the measurement was not performed (before admittance) or when the monitoring was suspended, the time will be displayed as “—:—”.

If the lead can not be monitored depending on the ECG lead cable, the data display will be left blank, and if the ST reference point is not set, the data will be displayed “- - -”.

This section explains about the function to display the waveform and numeric data of other bedside monitors and to set alarms for other bedside monitors.

To use this function, wired network (DS-LANII or DS-LANIII) connection is required.

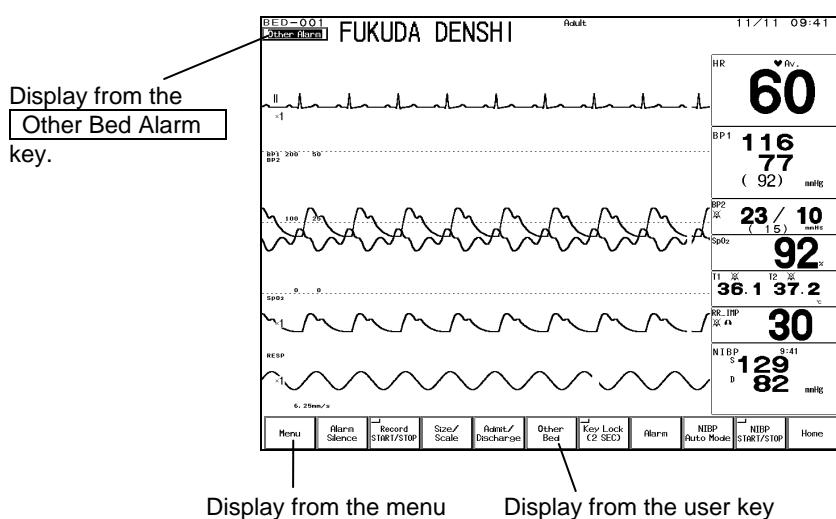
NOTE

Other bed display function is not possible on a wired network if AU-5500N 8ch Recorder is set as administrator (1:N network).

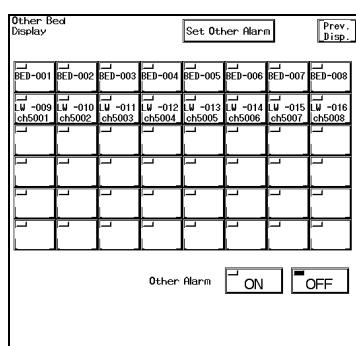
Other Bed Display

The other bed display can be accessed from the menu or from the preprogrammed user key.

Also, by setting the other bed alarm ON, **Other Bed Alarm** key will be displayed when other bedside monitor generates an alarm. By pressing this **Other Bed Alarm** key, the display for the other bed can be accessed.



- 1 Press the **Menu** → **Function** → **Other Bed Display** keys to display the other bed selection menu.



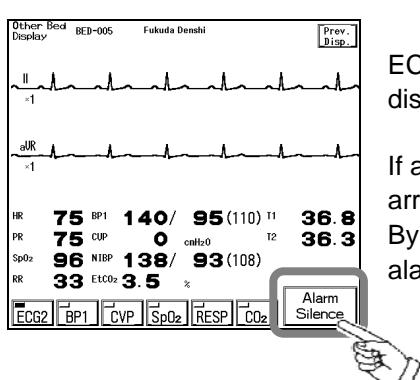
On the other bed selection menu, select the Room / Bed ID to display. For the DS-LANII network, there are 48 beds selection, and for the DS-LANIII network, there are 100 beds selection.

The Room / Bed ID for the alarm generating bed will be displayed in red.

The bed displaying this menu will be displayed in gray.

The key LED for the bed selected as the other bed alarm generating bed will be lighted.

- 2 Press the Room / Bed ID key and access the display for the other bed.



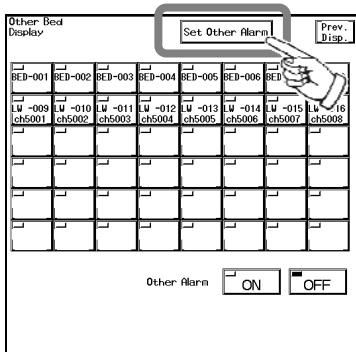
ECG waveform and numeric data for the selected bed will be displayed.

If an alarm is generated for this bed, the physiological alarm / arrhythmia alarm message will be displayed.

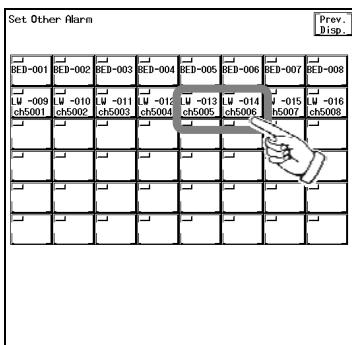
By pressing the **Alarm Silence** key on the other bed display, the alarm sound for the displayed bed can be silenced.

Other Bed Alarm Setup

From the bedside monitors connected to the wired network, the bed to generate the other bed alarm and ON/OFF of other bed alarm display can be performed.



1 Select the bed to generate the other bed alarm.

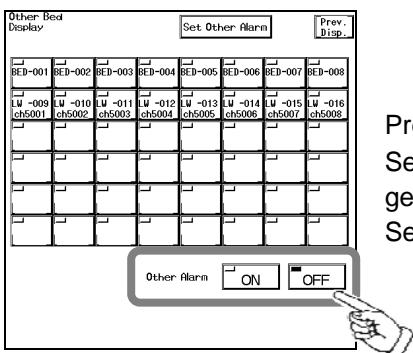


Press the **Set Other Alarm** key to display the other bed alarm setup menu.

Select the bed to generate the other bed alarm.

The key LED for the bed selected as the other bed alarm generating bed will be lighted.

2 Select **ON** for the other bed alarm.



Press the **Prev. Disp.** key to display the other bed selection menu.

Selecting **ON** will generate the other bed alarm when an alarm generates at the other bed.

Selecting **OFF** will not generate the other bed alarm.

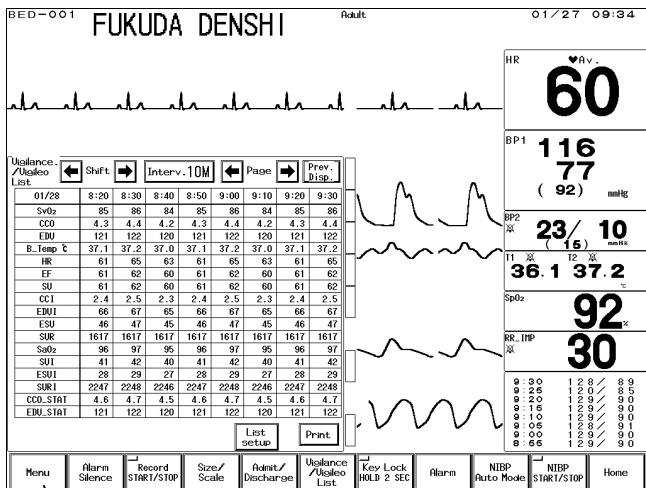
Vigilance/Vigileo List

Display/Print

By connecting the Vigilance, Vigilance CEDV, VigilanceII, Vigileo (oximeter /CCO measurement device manufactured by Baxter), the Vigilance data such as SvO₂ (mixed venous oxygen saturation), CO (cardiac output) can be displayed in list format.

To Display the Vigilance/Vigileo List

The Vigilance/Vigileo list can be accessed from the menu, or from the preprogrammed user key. If the data is displayed on the home display, the 24 hours of data in 1-minute interval will be automatically stored and displayed.

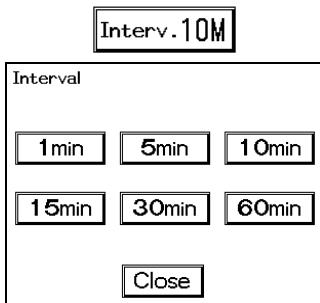


Display from the menu key.

Display from the user key.

1 Press the **Menu** → **Function** → **Vigilance /Vigileo List** keys.

2 Select the display interval.



Pressing the time interval key will display the time interval selection tool.

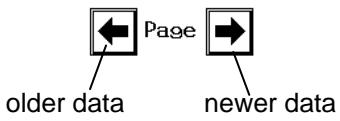
Select the time interval for the tabular trend display.

If **5M** is selected, the time will be displayed in real time as follows. 10:00, 10:05, ...10:25.

If **60M** is selected, it will be displayed as 10:00, 11:00, 12:00.

If the Vigilance/Vigileo list is displayed at 10:35, the data will be displayed from 10:00.

3 Switch the page.



The page will be switched by one page with the displayed time interval.

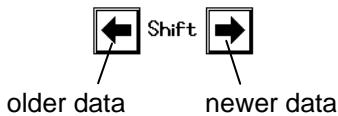
← key will display the previous page listing the older data.
→ key will display the next page listing the newer data.

The Vigilance/Vigileo list will be displayed in 8 rows.

If 5-minute interval is selected and if the list starts from 10:00, 35 minutes of data from 10:00 to 9:25 will be displayed in 1 page.

Pressing the **←** key will display the Vigilance/Vigileo list from 9:20 to 8:45.

4 Shift the displayed rows.



The displayed list can be shifted by one column.
← key will shift the display to older data by one column.
→ key will shift the display to newer data by one column.

5 Print the Vigilance/Vigileo list.



The currently displayed Vigilance/Vigileo list will be printed.

The Description of the Display

Vigilance-Vigileo List										
Latest Measurement Date	Shift	Interv.10M	Page	Prev. Disp.	Latest Measurement Time					
01/28	8:20	8:30	8:40	8:50	9:00	9:10	9:20	9:30		
SvO ₂	85	86	84	85	86	84	85	86		
CCO	4.3	4.4	4.2	4.3	4.4	4.2	4.3	4.4		
EDU	121	122	120	121	122	120	121	122		
B.Temp °C	37.1	37.2	37.0	37.1	37.2	37.0	37.1	37.2		
HR	61	65	63	61	65	63	61	65		
EF	61	62	60	61	62	60	61	62		
SU	61	62	60	61	62	60	61	62		
CCI	2.4	2.5	2.3	2.4	2.5	2.3	2.4	2.5		
EDUI	66	67	65	66	67	65	66	67		
ESU	46	47	45	46	47	45	46	47		
SUR	1617	1617	1617	1617	1617	1617	1617	1617		
SaO ₂	96	97	95	96	97	95	96	97		
SUI	41	42	40	41	42	40	41	42		
ESUI	28	29	27	28	29	27	28	29		
SURI	2247	2248	2246	2247	2248	2246	2247	2248		
CCO_STAT	4.6	4.7	4.5	4.6	4.7	4.5	4.6	4.7		
EDU_STAT	121	122	120	121	122	120	121	122		

For the data when the measurement was not performed (before admittance) or when the monitoring was suspended, the time will be displayed as "—:—".

Also, if the data is not displayed on the home display, it will be displayed as "— —" on the list.

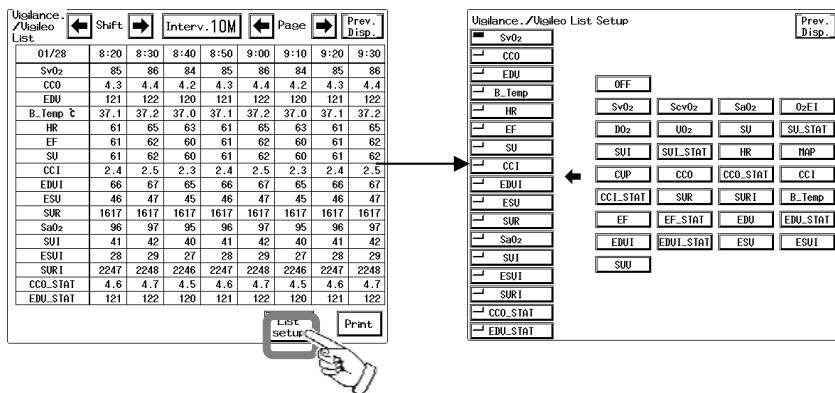


The SVR, SVRI, MAP, CVP value on the Vigilance/Vigileo list can be selected from value of Vigilance or value calculated on the patient monitor. For procedure, refer to "8. System Configuration Monitor Setup ● Vigilance/Vigileo List SVR, SVRI calculation".

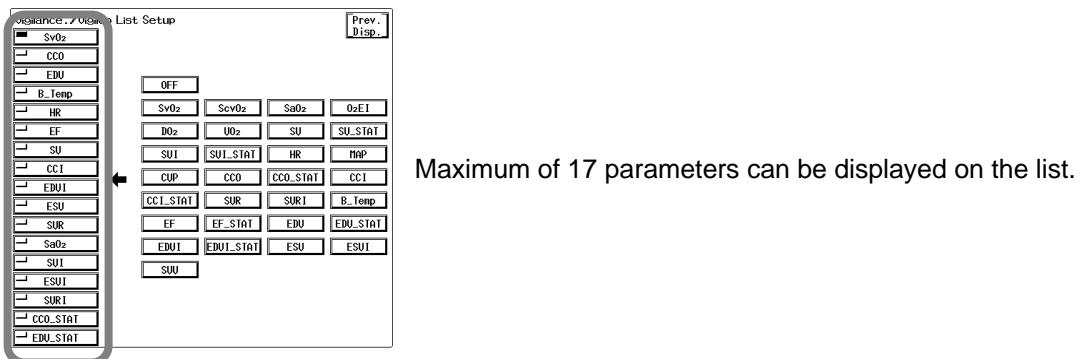
Vigilance / Vigileo List Setup

The parameter to display on the Vigilance/Vigileo list can be selected.

- Press the **List Setup** key on the Vigilance/Vigileo list display.

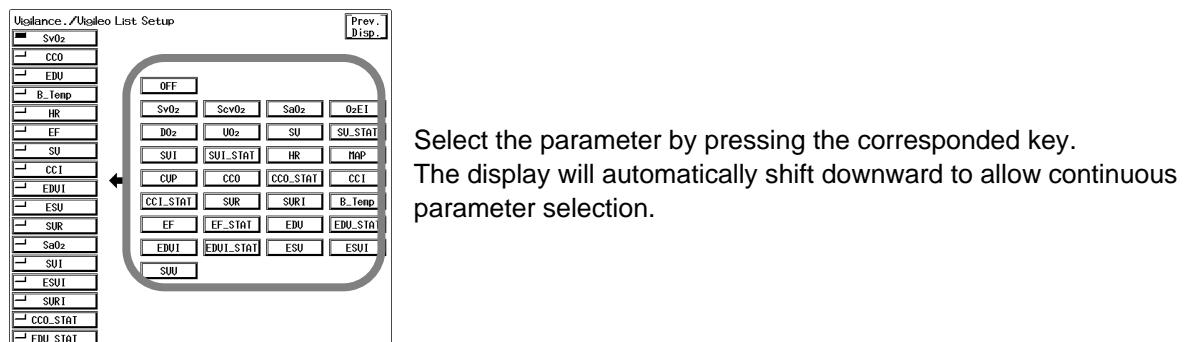


- Select the display position on the list.



Maximum of 17 parameters can be displayed on the list.

- Select the parameter to display.



Select the parameter by pressing the corresponded key.

The display will automatically shift downward to allow continuous parameter selection.

Blank Page

Chapter 8

System Configuration

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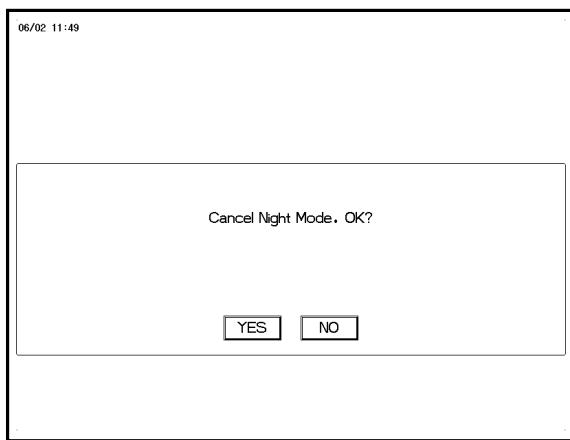
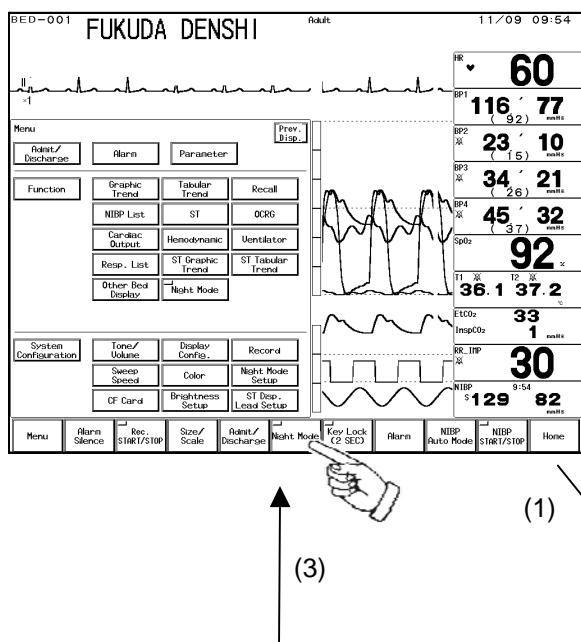
This section explains the procedure to set the night mode.

About the Night Mode

The display brightness and alarm volume can be set to night mode when turning off the light of the ward or when the patient is asleep.

The night mode can be manually set to ON, or automatically set to ON by preprogramming the time to turn ON/OFF the night mode.

Operation flow when the night mode is set to “Time Display Only”

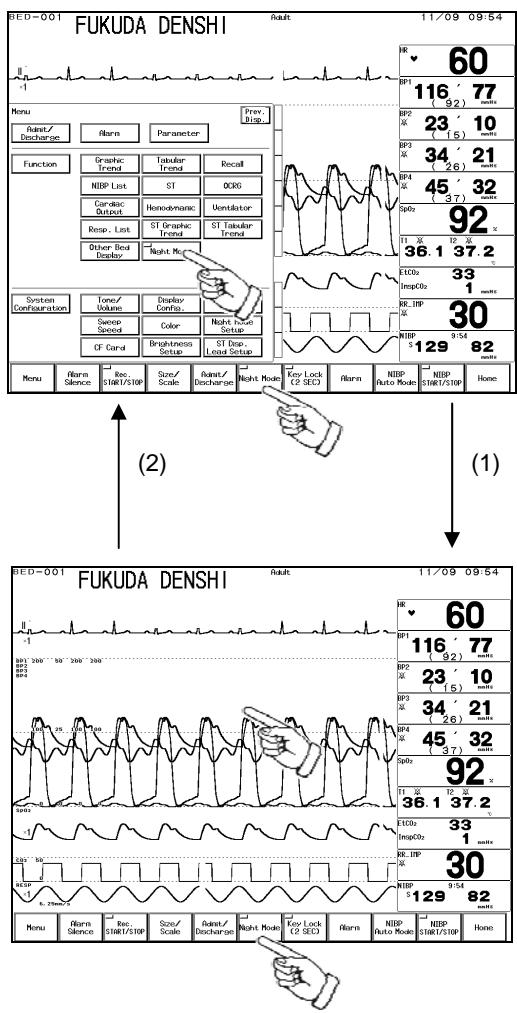


- (1) The night mode can be turned ON manually by pressing the **Night Mode** key on the menu display or the **Night Mode** key preprogrammed as user key. It can be also automatically turned ON at the preprogrammed time.



- (2) Pressing the screen will display the confirmation message to cancel the night mode.
- (3) Pressing the **YES** key will cancel the night mode.

Operation flow when the night mode is set to “Slightly Dark” or “Dark”



- (1) The night mode can be turned ON manually by pressing the **Night Mode** key on the menu display or the **Night Mode** key preprogrammed as user key. It can be also automatically turned ON at the preprogrammed time.

- (2) During the night mode, a message, "Night Mode Active" will be displayed.
To cancel the night mode, select **Any Key** for "Night Mode Cancel" on the hospital setup of the preset menu. Touching anywhere on the screen will cancel the night mode.
Selecting **Night Mode Key** will cancel the night mode by pressing again the **Night Mode** key on the menu display or **Night Mode** key preprogrammed as user key.



Refer to "8. System Configuration Hospital Setup" for procedure to cancel the night mode.

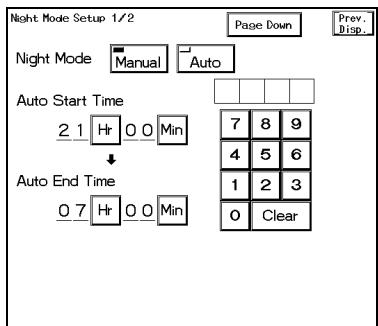
NOTE	<ul style="list-style-type: none"> ● Even when the automatic night mode is set, the night mode can be manually set to ON using the user key. In this case, the night mode will automatically set to OFF at the preprogrammed time. ● The night mode can not be set when the ventilator alarm is generated.
-------------	--

To Set the Night Mode

The time to start and stop the night mode, and the night mode display can be set.

●Night Mode Start/End Setup

- 1 Press the **Menu** → **System Configuration** → **Night Mode Setup** keys.



The night mode setup menu will be displayed.

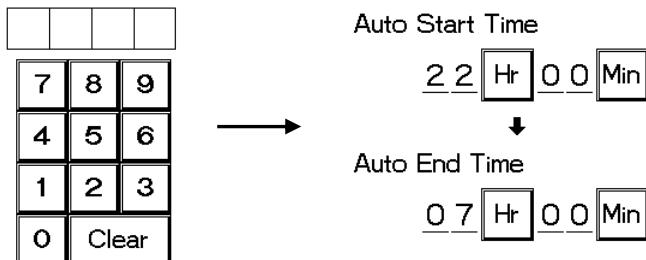
- 2 Select **Manual** or **Auto** to start the night mode.

Night Mode Manual Auto

Manual key will start the night mode manually by pressing the **Night Mode** key set as user key.

Auto will start the night mode automatically at the preprogrammed time. If automatic night mode is set to ON, the night mode can be manually turned ON using the user key or remote control.

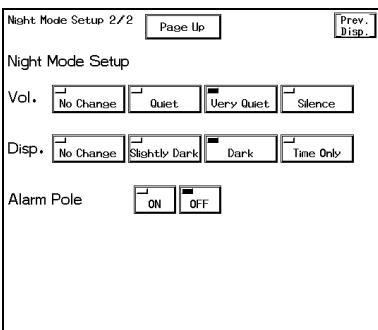
- 3 Set the “Auto Start Time” and “Auto End Time” of the night mode. (Only for the automatic night mode)



Enter the hour and minute using the numeric keypad and press the **Hr** key, **Min** key for the start time and complete time.

●Night Mode Display Setup

- 1 Press the **Page Down** key on the Night Mode Setup (1/2).



The second page of the night mode setup menu will be displayed.

2 Set the volume for the night mode.

This volume setup will be effective for all sounds such as key sound and alarm sound.

Vol.	<input type="checkbox"/> No Change	<input checked="" type="checkbox"/> Quiet	<input type="checkbox"/> Very Quiet	<input type="checkbox"/> Silence
------	------------------------------------	---	-------------------------------------	----------------------------------

Selection	Actual Volume
No Change	Standard volume
Quiet	Third level from the minimum
Very Quiet	Minimum volume
Silence	No sound

 WARNING	When selecting Silence , pay attention not to miss any important alarm by simultaneously monitoring the bed on other monitors such as central monitor.
--	---

3 Select the display brightness of the Night Mode.

Disp.	<input type="checkbox"/> No Change	<input type="checkbox"/> Slightly Dark	<input checked="" type="checkbox"/> Dark	<input type="checkbox"/> Time Only
-------	------------------------------------	--	--	------------------------------------

Selection	Actual Brightness
No Change	Standard display
Slightly Dark	80% of maximum brightness
Dark	50% of maximum brightness
Time Only	Only the time will be displayed. The message will disappear after 1 minute from starting the night mode.

 WARNING	When selecting Time Only , pay attention not to miss any important alarm by simultaneously monitoring the bed on other monitors such as central monitor.
--	---

4 Select ON/OFF of alarm pole for the night mode.

Alarm Pole	<input type="checkbox"/> ON	<input checked="" type="checkbox"/> OFF
------------	-----------------------------	---

Selection	Alarm Pole
ON	The alarm pole will light during the night mode.
OFF	The alarm pole will not light during the night mode.

This section explains the procedure to program the alarm mode.

About the Alarm Mode

On the DS-7300 system, 5 patterns of alarm mode can be programmed according to the monitoring purpose.

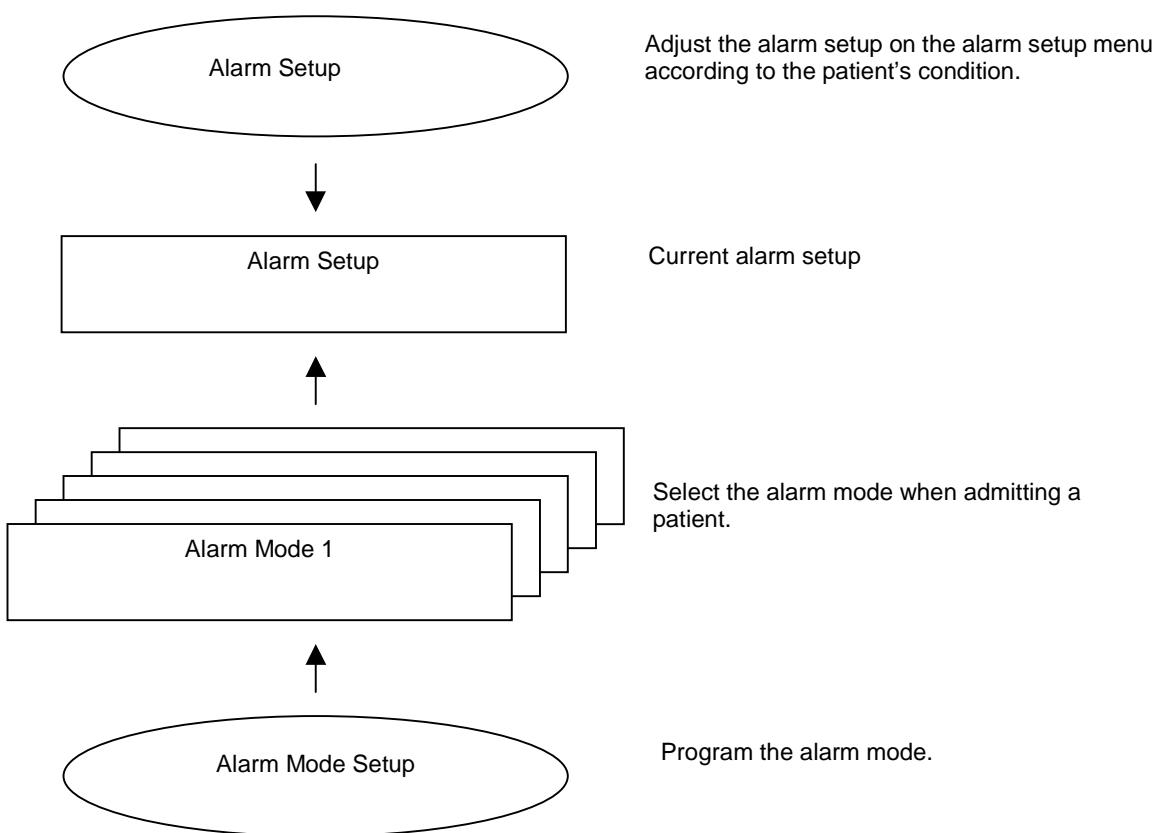
Setting all the alarm condition for each time the patient is admitted may be troublesome.

To simplify this procedure, 5 patterns of alarm mode other than default setting can be programmed according to the monitoring purpose.

By preprogramming the setups to each alarm mode, alarm setups at admitting procedure can be simplified by just selecting the alarm mode.

It is recommended to program the alarm mode in rough classification such as patient's age, monitoring purpose (ICU or surgery), and if necessary, perform unique setup for each patient.

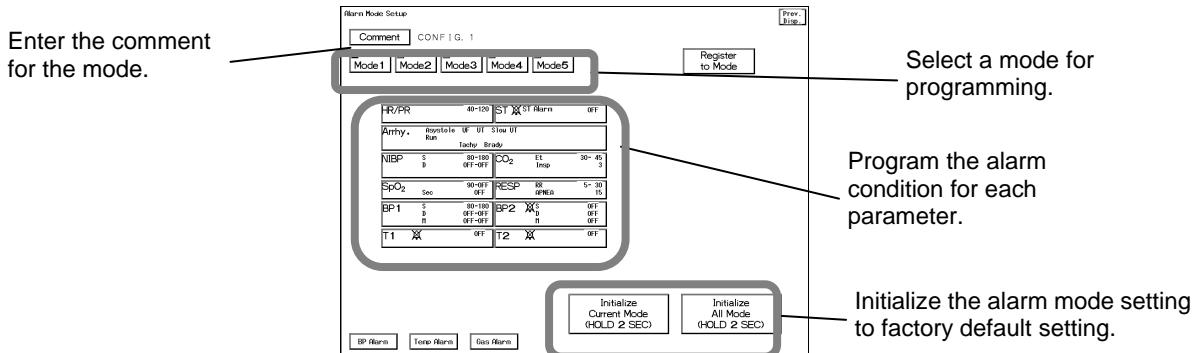
WARNING	It is recommended to program the alarm mode in rough classification such as patient's age, monitoring purpose (ICU or surgery), and if necessary, perform unique setup for each patient.
----------------	--



To Program the Alarm Mode

Programming the alarm condition for each alarm mode can be performed on the standard alarm setup menu. The default setting can be changed for each alarm mode.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Alarm Mode Setup** keys.



NOTE

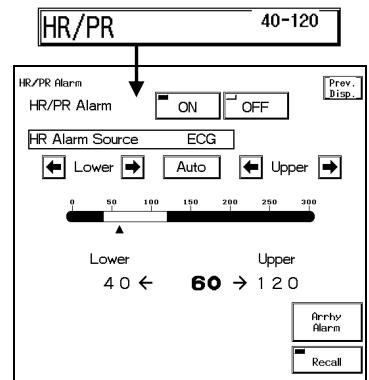
On the alarm mode setup menu, the setup of currently selected alarm mode will be displayed. Changing the mode and returning to the home display will set the alarm value with the setup of the last selected mode.

- 2 Select a mode for programming.

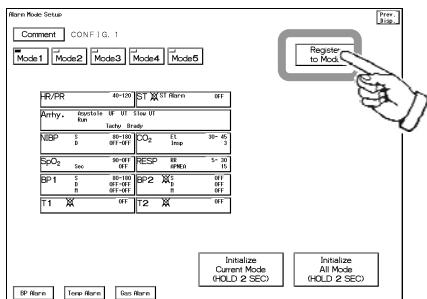


Select the mode to program the alarm condition.

- 3 Program the alarm condition.

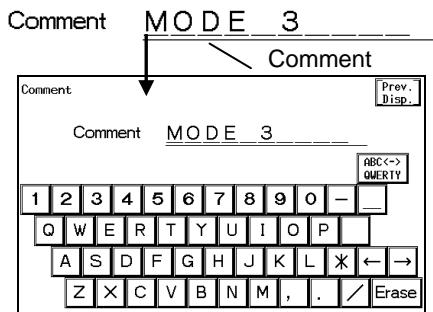


The programmed alarm condition will be displayed inside the numeric data key.
The programmed value and alarm OFF mark will be displayed simultaneously.
Pressing the numeric data key will display the alarm setup menu which allows to change the alarm condition.



Pressing the **Register to Mode** key will register the current alarm condition to the alarm mode (1–5) selected at procedure 2.

4 Enter a comment.

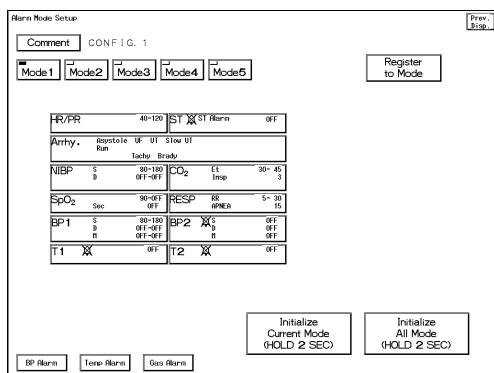


Pressing the **Comment** key will display the keyboard display. Enter the comment using the keyboard.

To Initialize the Alarm Mode

The alarm mode setting can be initialized to factory default setting.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Alarm Mode Setup** keys.



Initialize Current Mode will initialize the currently selected alarm mode to factory default setting.

Initialize All Mode will initialize all alarm modes (Mode1 to Mode5) to factory default setting.



For factory default setting of the alarm mode, refer to "11. Technical Information".

Monitor Setup

Setup for Each Monitor

This section describes the setup items that can be set individually for each monitor.

Monitor Setup 1/5 Time/Date Super Module Setup Key Mask Menu Setup Display Optim. Setup Backup at discharge	Monitor Setup 2/5 Set Password Multiport Connection User Key GAS Calibration Input Box Setup	Monitor Setup 3/5 Message Icon Check discharge at power ON Password Discharge Mode Event Key Drift Filter display/ Exp clock display	Monitor Setup 4/5 BP Alarm Increment CO ₂ (mmHg) upper limit for LAN, telemetry AU-5500N Administrator Mode NIBP measurement interval at power ON. NIBP Measurement at Power ON	Monitor Setup 5/5 Built-in Rec. Status Display Vigilance/Vigileo SVR, SVRI Calc. DS-LAN Setup Auditory Alarm Signal
--	--	---	--	--

About the Monitor Setup

The monitoring condition can be set for each monitor on the monitor setup menu.

First Page (1/5)

- Time/Date
- Program Version
- Multiport Connection
- Key Mask
- Alarm Pole Setup
- GAS Calibration
- Input Box Setup
- Set Password
- Super Module Setup
- R.C. Setup
- User Key
- Menu Setup
- Display Optim. Setup
- Backup at Discharge

Second Page (2/5)

- Message Icon
- Password
- Event Key
- Check Discharge at Power ON
- Discharge Mode
- Drift Filter Display / Exp Clock Display

Third Page (3/5)

- HR/PR Alarm Source
- Freeze Mode Cursor
- Parameter Key Operation
- Input Box (IB-7300)
- Device Configuration Icon

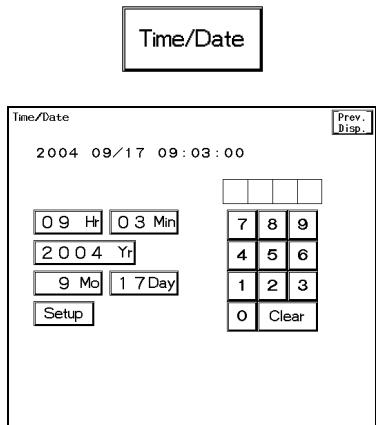
Fourth Page (4/5)

- BP Alarm Increment
- CO₂ (mmHg) upper limit for LAN, telemetry
- AU-5500N Administrator Mode
- NIBP Measurement Interval at Power ON
- NIBP Measurement at Power ON

Fifth Page (5/5)

- Built-in Rec. Status Display
- Vigilance/Vigileo SVR, SVRI Calc.
- DS-LAN Setup
- Auditory Alarm Signal

● Time/Date Setup



[Time / Date] key will display the time/date setup menu.

Enter the time/date using the numeric keypad, and press the corresponded key.

For example, to change the time from 2min to 5min, enter [5] on the numeric keypad.

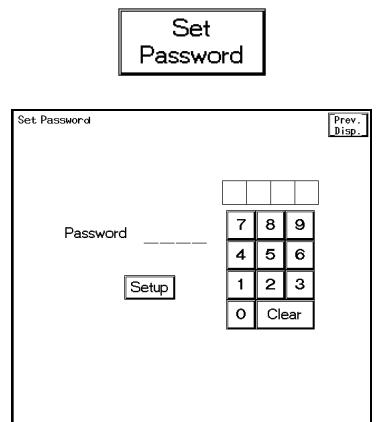
Next, press the [02 Min] key.

Then, press the [Setup] key to finalize the setup.

⚠ CAUTION

- If the time/date is not correctly set, or changed during monitoring, malfunction may occur to NIBP measurement, periodic recording, trend, NIBP list data.
- If the time/date is changed during monitoring, patient's age will not be recalculated.
- When connected to a wired network, the same time/date with the central monitor will be set.
Even if the time/date is changed on the DS-7300 system, it will be corrected to the time/date of the central monitor.

● Password Setup



A 4-digit password to be entered on the preset menu can be set.

If the password is set to ON in the monitor setup menu, a password will be required to access the preset menu.

Enter the numbers, and press the [Setup] key.

The programmed password will be displayed when the setup is complete.

●Program Version

Program
Version

Program Version	Version	Date	Comment
DSC-7300	V02-01 (#0002)	2004/08/01	
Boot Version	WE-01		
Display	V01-01 (#0001)		
HS-700	V02-01 (#0002)	0000/00/00	
IB-7300	() 0000/00/00		
Module version			

The software information will be displayed.

Pressing the **Program Version** key will display software version of the monitor, produced date, and comment.

The software version required for the DS-7300 system will be displayed.

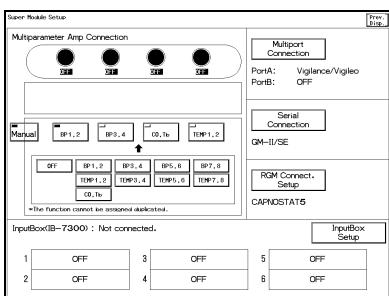
- DSC-7300 Main Unit Software
- Display Unit Software (LC-7315T / LC-7319T)
- HS-700 Super Module Software
- IB-7300 Input Box (when used)

The boot version will be also displayed.

Pressing the **Module Version** key will display the equipment information of the parameter module used on the IB-7300, and the equipment connected to serial connector of the main unit.

●Super Module Setup, Serial Connection Setup

Super Module
Setup



The BP, TEMP, CO cable to connect to the Super Module and respective connector location can be set.

Pressing the **Super Module Setup** key will display the Multiparameter Amplifier Connection setup menu.

Select the connecting procedure from **Fixed** or **Manual**.

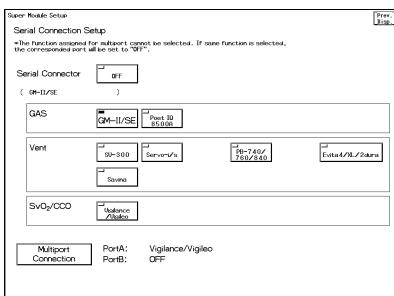
Fixed: Automatically sets in the order of BP1/2, BP3/4 from the left, and TEMP1/2, TEMP3/4 from the right. CO cable can be connected to any connector, but selectable BP and TEMP channel will be restricted.

Manual: Any channel and cable can be selected for the 4 connectors.

When the Input Box is used, only **Manual** can be selected.



For details of setup procedure, refer to "3. Vital Application Super Module Setup for BP, TEMP, CO Measurement".



By pressing the **Serial Connection** key on the Super Module setup menu, the device to connect to the serial connector can be selected.

If not connecting any device, select **OFF**.

NOTE

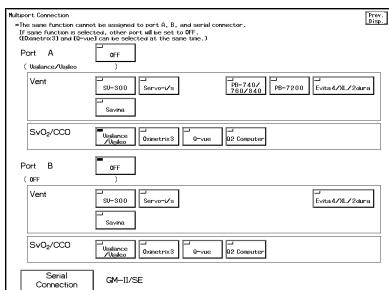
If communication with ventilator is already established through the serial connector, it is necessary to disconnect the communication in order to change the selection on this menu.

● Multiport Connection



Sets the device to connect to the multiport relay cable of the Super Module.

Pressing the **Multiport Connection** key will display the Multiport Connection setup menu.



Select the device to connect to Port A or Port B. If not connecting the device, select OFF.

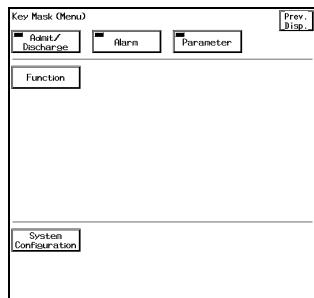
NOTE	<ul style="list-style-type: none">● The same device cannot be selected to Port A, B, and serial connector.● If communication with ventilator is already established through the corresponding port, it is necessary to disconnect the communication in order to change the selection on this menu.
-------------	---

● Key Mask



Unnecessary keys on the Menu display can be erased.

Pressing the **Key Mask** key will display Key Mask display to select the key to erase from the Menu display.

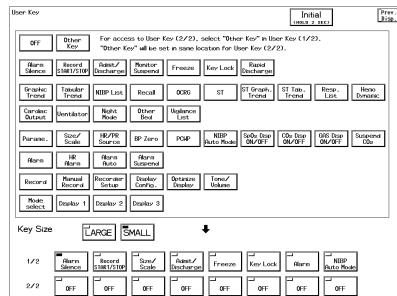


For details, refer to “4. Monitoring Setup Key Setup
Erasing the Unnecessary Keys”

● User Key Setup



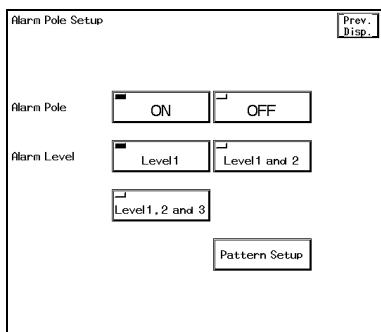
6 or 8 user keys (8 or 10 for the LC-7319T) can be programmed to be displayed on the home display. Pressing the **User Key** key will display the user key setup menu.



Refer to “4. Monitoring Setup Key Setup” for details.

● Alarm Pole Setup

**Alarm Pole
Setup**



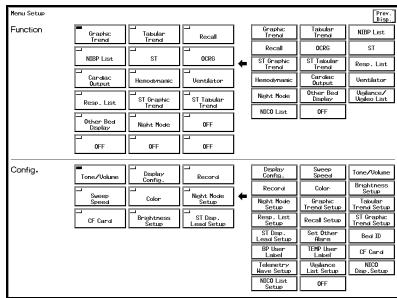
Sets the function for the alarm pole located at the top of the monitor.
Press the **Alarm Pole Setup** key to display the alarm pole setup menu.



Refer to “4. Monitoring Setup Alarm Pole Setup” for details.

● Menu Setup

Menu Setup



Sets the key and location to display on the menu display.
Press the **Menu Setup** key to display the Menu Setup display.



Refer to “4. Monitoring Setup Key Setup To Configure the Menu Display” for details.

● Display Optimization Setup

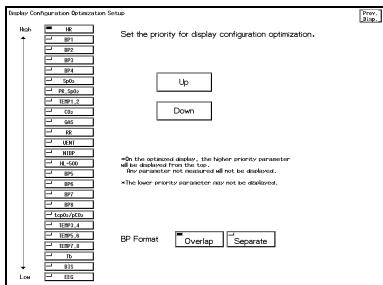
Sets the display priority when the display configuration is optimized.

**Display Optim.
Setup**

Press the **Display Optim. Setup** to display the Display Configuration Optimization Setup Screen.

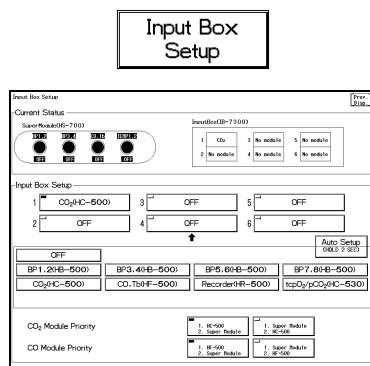


For details, refer to “4. Monitoring Setup Display Configuration Optimizing the Display Configuration”.



●Input Box Setup

Sets the modules to use with the Input Box and the priority of the modules for CO₂ measurement and CO measurement.

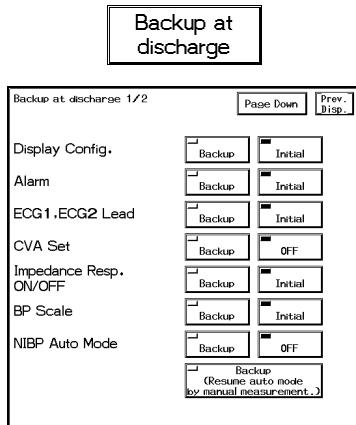


Press the **Input Box Setup** key to display the Input Box Setup Screen.



For details, refer to “3. Vital Application Input Box Setup”.

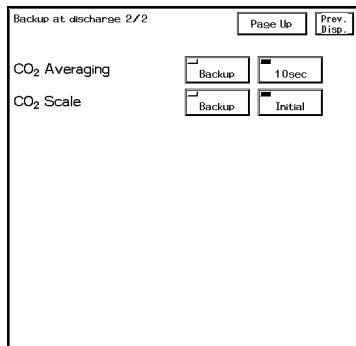
●Backup at Discharge



Press the **Backup at discharge** key to display the “Backup at Discharge” screen.

Switch the page using the **Page Down** / **Page Up** keys.

Select whether to backup or to initialize after discharge for each item.



Select **Backup** if you do not want to initialize the item after the discharge procedure.

Initial will initialize the item to factory default setting after the discharge procedure.

- If **Initial** is selected for “Display Config.” and “Alarm”, the currently selected display mode and alarm mode will be initialized.
- Select **Backup** or **OFF** for “CVA Set”.
- Select **Backup** or **10sec** for “CO₂ Averaging”.

【NIBP Auto Mode】

Whether or not to back up the NIBP Auto Mode after discharge can be selected.



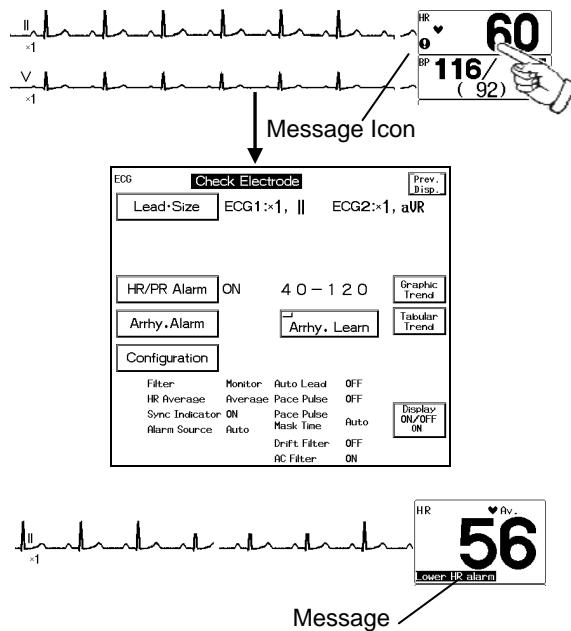
Selecting **OFF** will turn off the NIBP auto mode after the discharge procedure.

Selecting **Backup** will back up the NIBP auto mode even after the discharge procedure. It will function even if the patient is not admitted.

Backup (Resume auto mode by manual measurement) will resume the NIBP auto mode when the next admitted patient has first started the manual measurement. NIBP will be periodically measured at the same interval with the previous patient. Until the NIBP auto mode is resumed or the interval is changed, “Standby” will be displayed inside the NIBP numeric data box.

●Message Icon

Message Icon ON OFF Select ON/OFF to display message icon.



When there are many numeric data display, the parameter key size will be reduced which may disable the message to be displayed inside the parameter key.

In such case, an icon will be displayed inside the parameter key to indicate that there is a message.

The message can be checked by pressing the parameter key with the icon, and displaying the parameter setup menu.

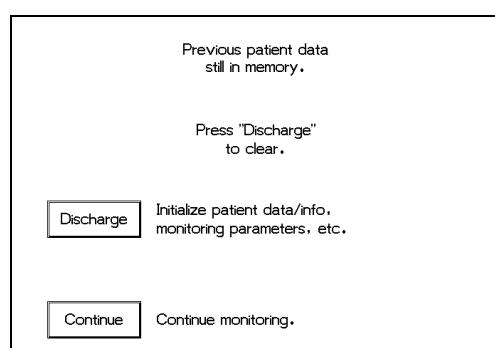
If the parameter key size is large, a message will be displayed inside the parameter key.

●Check Discharge at Power ON

Check discharge at power ON ON OFF

The trend data and NIBP list data will remain stored even when the power is turned OFF. To start monitoring a new patient, it is necessary to perform discharge procedure on patient admit/discharge menu, and clear the data of previous patient.

This function allows to select ON/OFF of discharge confirmation display when previous data remains at power ON.



<Discharge Confirmation at Power ON>

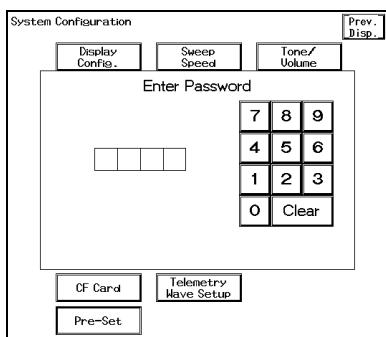
● Password

Sets the password requirement to access the preset menu.

Password

ON	OFF
----	-----

Selecting **ON** will require to enter password to access the preset menu.



A 4-digit password can be set on the monitor setup menu. Also, "7300" can be used as maintenance password.

● Monitoring Condition after Discharge

Sets the monitoring condition after the patient has discharged.

Discharge Mode

Suspend	Admit
---------	-------

Admit will continue monitoring after discharge.

Suspend will suspend monitoring after discharge.

Numeric data display will be erased and alarm generation, NIBP periodic measurement and periodic recording will not be performed.



● Event Key

Displays event key on the home display at alarm occurrence.

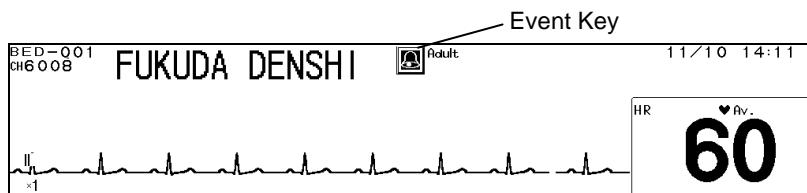
Event Key

ON	OFF
----	-----

ON will display the event key on the home display at alarm occurrence.

OFF will not display the event key on the home display.

Pressing the event key will suspend the alarm sound and display the recall menu.



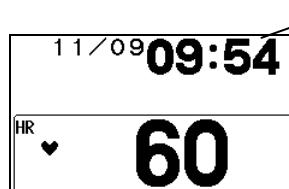
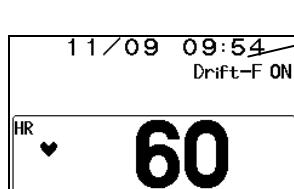
● Drift Filter display / Exp. clock display

Drift Filter display/
Exp. clock display

Drift Filter Disp.	Exp. clock Disp.
--------------------	------------------

Drift Filter Disp. will display the drift filter status.

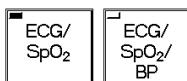
Exp. clock Disp. will not display the drift filter status and displays the enlarged time instead.



●HR/PR Source

This setup will allow HR/PR source selection of **ECG/SpO₂** or **ECG/SpO₂/BP**.

HR/PR Source



ECG/SpO₂ will allow HR/PR source selection from ECG or SpO₂.

ECG/SpO₂/BP will allow HR/PR source selection from ECG, SpO₂, or BP.



The HR/PR source selection can be performed on each configuration menu of ECG/SpO₂/BP1 (or ART).

For the setup procedure, refer to "6. Parameter Setup HR/PR Alarm Source".

CAUTION

If **BP** is selected for "HR/PR source" (Or, if **Auto** selects BP for HR/PR Source), ECG waveform will not be transmitted on the DS-LANII wired network. PR_IPB value will be displayed for the HR value on the central monitor. However, HR value from ECG will be displayed for the ST measurement list. In case of DS-LANIII network, refer to the operation manual for the central monitor.

NOTE

If HR/PR alarm source is BP, and ART is not selected as the first BP label, BP1 will be the HR/PR alarm source. If BP1 is not measured at this time, PR_IPB value will be blank.

●Input Box (IB-7300)

Select whether to use the Input Box or not.

Input Box
(IB-7300)



Yes

No

Selecting "Yes" for Input Box will switch the Super Module Setup to "Manual".
OK?

OK

Cancel

Pressing "OK" will display the Super Module Setup menu.

If **Fixed** is selected for "Multiparameter Amplifier Connection" on the Super Module Setup (Monitor Setup), and **Yes** is selected for "Input Box (IB-7300)", a confirmation message will be displayed.

The Multiparameter Amplifier Connection setup will be switched to **Manual** when the Input Box is used.

If OK, Press the **OK** key.

If the Input Box setup is changed to **No**, the Input Box cannot be used.

If OK, Press the **OK** key.

If "No" is selected for Input Box,
the input box will not function.
OK?

OK

Cancel

OK

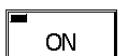
NOTE If the Input Box is connected, **Yes** must be selected.

●Freeze Mode Cursor

When the **Freeze** key preprogrammed as user key is pressed, Freeze Mode Cursor will be displayed on the home display.

By moving this cursor, BP value at cursor position can be displayed, and interval time between the cursors can be measured.

Freeze Mode Cursor



ON

OFF

Select **ON** to display the Freeze Mode Cursor.



For details of Freeze Mode Cursor, refer to "4. Monitoring Setup Display Configuration Freeze Mode Cursor Display".

●Device Configuration Icon

When the DS-7300 system composition changes, and checking or changing the setup is required, the Device Configuration Icon will be displayed.

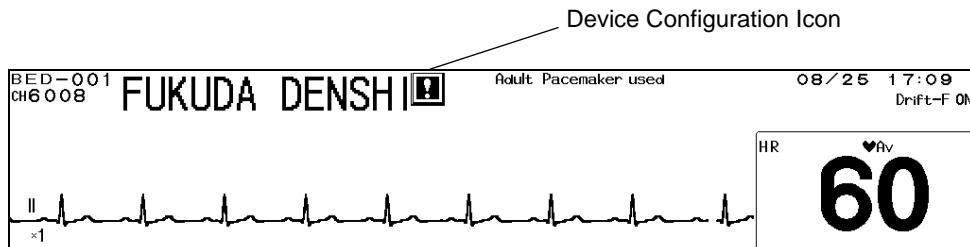
Device Configuration
Icon



will display the Device Configuration Icon.

will not display the Device Configuration Icon.

Pressing the Device Configuration Icon will display the screen to check the device configuration.



For details of Device Configuration Icon, refer to "9. Installation Device Configuration Icon".

●Parameter Key Operation

Whether or not to store the screen accessed from the parameter key (numeric data box) can be selected.

By storing the parameter key operation, the previously accessed screen can be directly displayed.

Parameter Key
Operation



Store will store the screen accessed from the parameter key. The next time the parameter key is pressed, the previously accessed screen will be directly displayed.

Not Store will not store the parameter key operation. The next time the parameter key is pressed, the initial screen (ex. ECG menu if HR parameter key is pressed) will be displayed.

●BP Alarm Increment

The BP alarm increment can be selected from **Normal** or **Small**.

	When Normal is selected	When Small is selected
0–50mmHg	2mmHg increment	1mmHg increment
50–300mmHg	5mmHg increment	
0–7kPa	0.2kPa increment	0.1kPa increment
7–40kPa	0.5kPa increment	

BP Alarm Increment

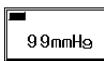


Select **Normal** or **Small**.

●CO₂ (mmHg) Upper Limit for LAN, Telemetry

When the measurement unit of CO₂ is mmHg, whether or not to limit the CO₂ value to 99mmHg when transmitting to the central monitor connected by LAN or telemetry can be selected.

CO₂ (mmHg) upper limit
for LAN, telemetry



No limit will transmit the actual CO₂ value to the central monitor even if the value exceeds 99mmHg.

99mmHg will transmit the CO₂ value as 99mmHg if the value exceeds 99mmHg.

●AU-5500N Administrator Mode

AU-5500N
Administrator Mode



Select **ON** to construct a network with AU-5500N as administrator.

If directly connecting the AU-5500N (DIP SW3 ON) without connecting the wired central monitor, select "Yes".
If "Yes" is selected, this device cannot be monitored on the wired central monitor.

OK?

YES

NO

ON will display the confirmation window.

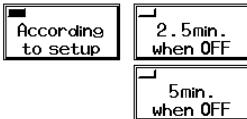
To construct a network with AU-5500N as administrator, select **YES**.

Memo **[1:N Network Construction (Administrator: AU-5500N 8ch Recorder)]**
A network can be constructed without using a central monitor such as DS-7600 and connecting one AU-5500N and maximum of 16 DS-7300 system monitors. For this network, AU-5500N will function as the network administrator.

●NIBP Measurement Interval at Power ON

The NIBP measurement interval at power ON can be selected from the following selection.

NIBP measurement
interval at power ON.



According to setup will set the NIBP measurement interval at power ON to the same interval before power OFF.

2.5min. when OFF will set the NIBP measurement interval to **2.5min** if the interval is OFF at power ON. If the interval other than OFF is set, the set interval will be applied.

5min. when OFF will set the NIBP measurement interval to **5min** if the interval is OFF at power ON. If the interval other than OFF is set, the set interval will be applied.

If the discharge procedure is performed at power ON, this selection will be effective only if "Backup" or "Backup [Resume auto mode by manual measurement]" is selected for "NIBP Auto Mode (Backup at Discharge)".

●NIBP Measurement at Power ON

NIBP Measurement
at Power ON

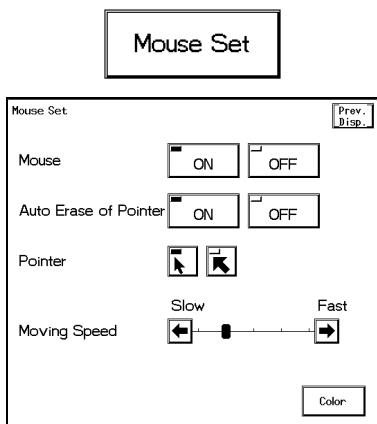


According to Setup will automatically start the NIBP measurement according to current setup when the power is turned ON.

Resume Manually will not start the NIBP measurement until it is started manually when the power is turned ON. After it is started manually, the measurement will be performed periodically with the set interval.

●Mouse Setup (For LC-7319T)

When the LC-7319T (19-inch display unit) is used, optional mouse can be connected which allows to control the displayed keys using the mouse.



Press the **Mouse Set** key to display the Mouse Setup menu.



For details, refer to "4. Monitoring Setup Mouse Setup".

●Built-in Recorder Status Display

Whether or not to display the built-in recorder status message such as "Paper Out" or "Magazine check" can be selected.

Built-in Rec.
Status Display



●SVR, SVRI Calculation for Vigilance/Vigileo List

The SVR, SVRI, MAP, CVP value to be displayed on the Vigilance/Vigileo list can be selected from value obtained from Vigilance or patient monitor.

Vigilance/Vigileo
SVR, SVRI Calc.



●DS-LAN Setup

The DS-LAN network type can be selected.

DS-LAN Setup



*To validate the setup, you need to restart the system.

NOTE

- When the "DS-LAN Setup" is changed, make sure that the same setting is made on the central monitor. If the setting is different, proper communication cannot be performed.
The following central monitors can connect to DS-LANII network only. When connecting these central monitors, make sure all monitors in the same wired network is set to **DS-LANII**.
DS-5700, DS-5800N/NX/NX^{MB}, DS-7600/7600W (software version of V05 and prior)
- To validate the "DS-LAN Setup", it is necessary to restart the system. Make sure to restart the system when the setting is changed for "DS-LAN Setup".

●Auditory Alarm Signal

The alarm sound can be selected from Fukuda Denshi original sound or IEC standard sound.

Auditory Alarm Signal



This section describes the procedure to program the mode for display configuration.

About the Display Mode

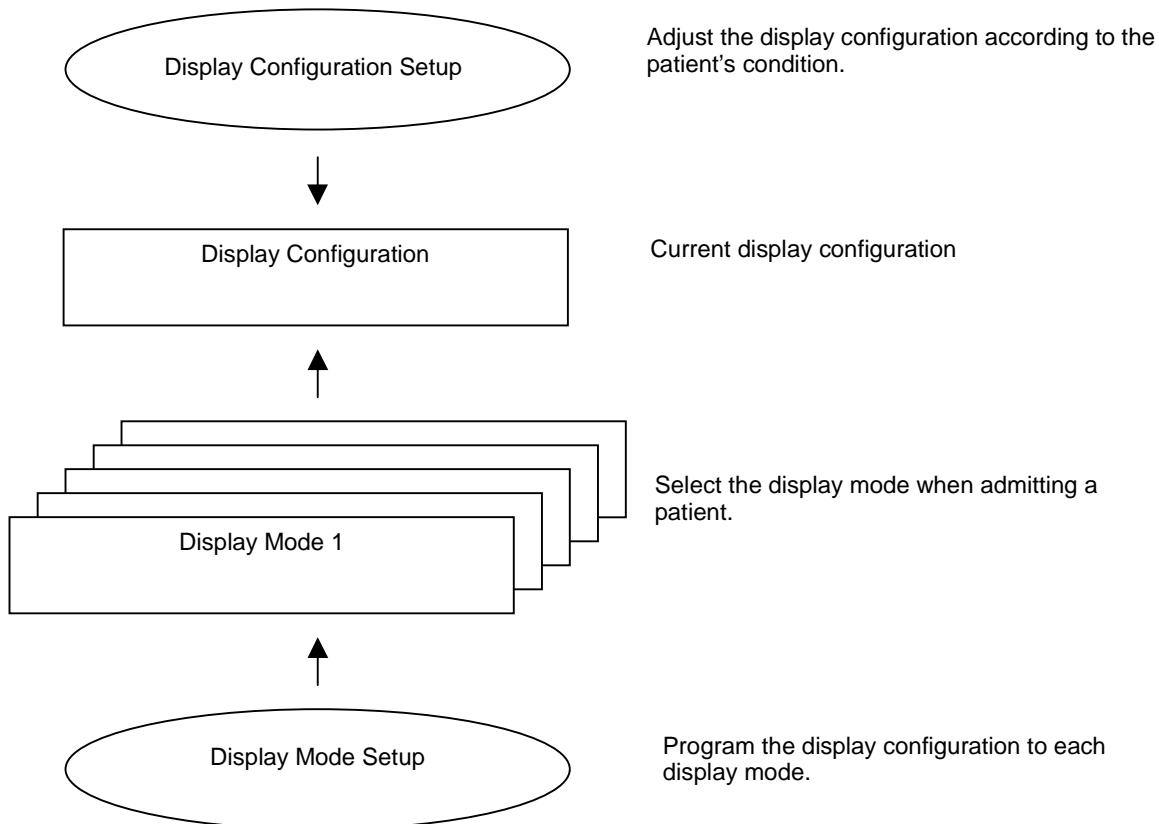
On the DS-7300 system, 5 patterns of display configuration can be programmed according to the monitoring purpose.

Setting the display configuration for each time the patient is admitted or each time the parameter is added or deleted may be troublesome.

To simplify this procedure, 5 patterns of display configuration other than default setting can be programmed according to the monitoring purpose.

By preprogramming the configuration to each display mode, display configuration setups at admitting procedure can be simplified by just selecting the display mode.

It is recommended to program the display mode in rough classification such as patient's condition, monitoring purpose (ICU or surgery), and if necessary, perform unique setup for each patient.



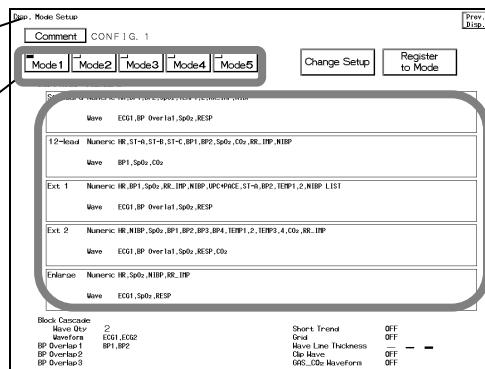
To Program the Display Mode

Programming the display configuration for each display mode can be performed on the display configuration setup menu. The default setting can be changed for each display mode.

1 Press the [Menu] → [System Configuration] → [Pre-Set] → [Display Mode Setup] keys.

Enter a comment for each mode.

Select a mode for programming.



Program the display configuration. Standard, 12-lead, Extension 1, Extension 2, and Enlarge can be programmed.

2 Select a mode for programming.

[Mode1] [Mode2] [Mode3] [Mode4] [Mode5] Select a mode to program the display configuration.

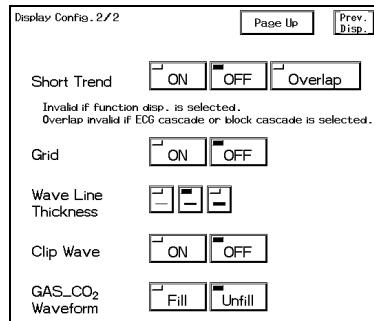
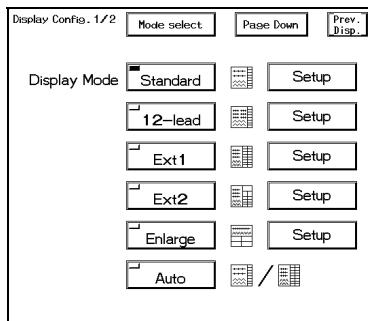
NOTE

On the display mode setup menu, the setup of currently selected mode will be displayed. Changing the mode and returning to the home display will set the display configuration to the setup of the last selected mode.

3 Program the display configuration for the mode.

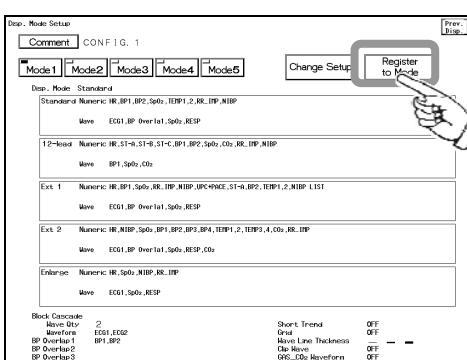
Change Setup

Press the [Change Setup] key, and set the display configuration.



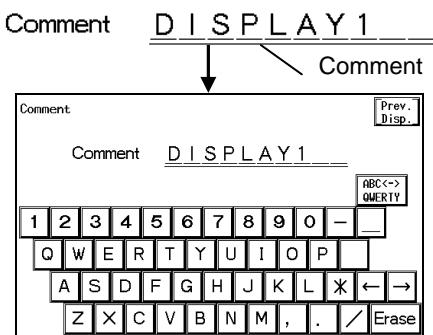
Reference

For display configuration setup procedure, refer to "4. Monitoring Setup Display Configuration"



Pressing the [Register to Mode] key will register the current display configuration setup to the display mode (1–5) selected at procedure 2.

4 Enter a comment.



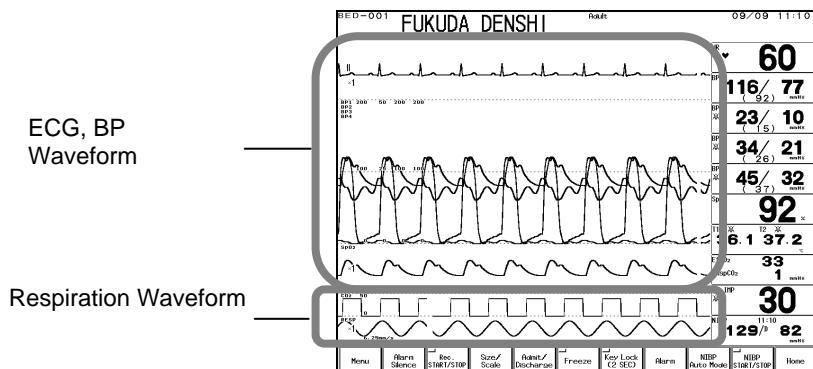
Pressing the **Comment** key will display the keyboard to enter the comment.

Sweep Speed

Waveform Display Speed/Time

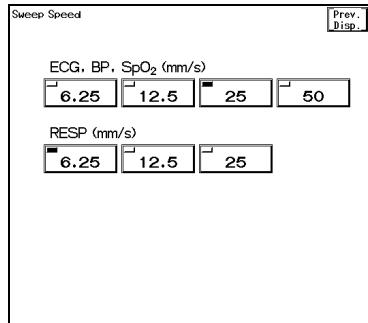
This section describes the procedure to set up the sweep speed of the waveform display.

The sweep speed can be set separately for ECG/BP waveform and respiration waveform.



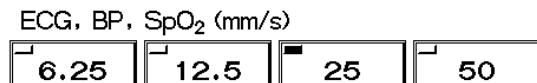
Display Unit Display Config. Selection	Display Time					
	LC-7315T			LC-7319T		
	Standard	Ext.1, Ext.2	Enlarged	Standard	Normal	Wide
50mm/S	4.5 sec.	3.25 sec.	6.0 sec.	6.25 sec.	4.85 sec.	7.65 sec.
25mm/S	9.0 sec.	6.5 sec.	12.0 sec.	12.5 sec.	9.7 sec.	15.3 sec.
12.5mm/S	18.0 sec.	13.0 sec.	24.0 sec.	25 sec.	19.4 sec.	30.6 sec.
6.25mm/S	36.0 sec.	26.0 sec.	48.0 sec.	50 sec.	38.8 sec.	61.2 sec.

- 1 Press the **Menu** → **System Configuration** → **Sweep Speed** keys.

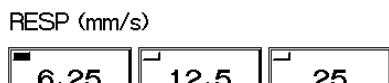


The sweep speed setup menu will be displayed.

- 2 Set the sweep speed for ECG, BP, SpO₂ waveform.



- 3 Select the sweep speed for respiration waveform.

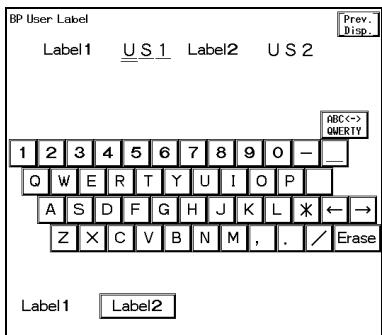


This section describes the procedure to program the user label for BP and TEMP.

To Set the BP User Label

Any 3 letters can be programmed as BP user label. Up to 2 BP user labels can be set.

- 1 Press the **Menu** → **System Configuration** → **BP User Label** keys.



The BP User Label Setup menu will be displayed.

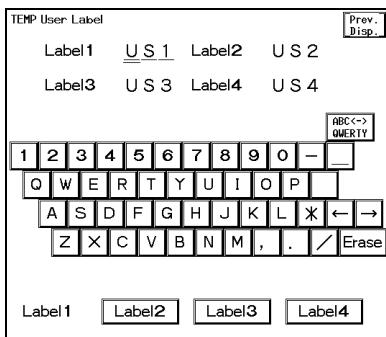
- 2 Set the label for Label 1 or Label 2.

Enter 3 letters using alphabet, number, and symbol keys.

To Set the Temperature User Label

Any 3 letters can be programmed as TEMP user label. Up to 4 TEMP user labels can be set.

- 1 Press the **Menu** → **System Configuration** → **TEMP User Label** keys.



The TEMP user label setup menu will be displayed.

- 2 Set the label for Label 1/2/3/4.

Enter 3 letters using alphabet, number, and symbol keys.

Hospital Setup

Setup for Each Hospital

This section explains about the different setup for each hospital.

Date	11/10	Nov. 10	10 Nov.
Alarm Mute	ON	OFF	
Arrhy. Analysis Filter	Disp Waveform	Fixed	
Serial Comm. Setup	NIBP Data Erase Time	Status Output Setup	
Unit	Telemeter Setup		

Trend Clip	ON	OFF
BP Record Scale	40mm	20mm
Suspend Arrhy. Analysis during Noise Interference (MEAN,NIBP)	ON	OFF
MEAN Calculation	Wave	Calc.
Night Mode Cancel	Anr Key	Ncht. Mode Key
Asystole , VF, VT (Neonate, only Asystole)	ON	ON/OFF

DS-LAN Pat. ID Tx	←	1 char.	→
Admit/Discharge Key Setup	Full	Light	
Password for Alarm Setup	ON	OFF	
Mixed Agents Alarm Level	Level2	Level4	

A different monitoring condition can be set for each hospital.

First Page (1/3)

- Date
- Alarm Mute
- Arrhythmia Analysis Filter
- Serial Communication Setup
- NIBP Data Erase Time
- Status Output Setup
- Unit
- Telemeter Setup

Second Page (2/3)

- Trend Clip
- BP Record Scale
- Suspend Arrhy. Analysis during Noise Interference
- MEAN Calculation
- Night Mode Cancel
- Asystole, VF, VT

Third Page (3/3)

- DS_LAN Pat. ID Tx
- Admit/Discharge Key Setup
- Password for Alarm Setup
- Password for Alarm Setup

●Date Format

Date Selects the date format for display and recording.

●Alarm Mute

Alarm Mute

<input type="button" value="ON"/>	<input type="button" value="OFF"/>
-----------------------------------	------------------------------------

The alarm sound can be silenced at time of alarm occurrence. Even if the minimum volume is set for the alarm sound, some sound will be generated. To avoid shocking the patient from the alarm sound, or if alarm sound is not necessary, alarm sound can be silenced. This function will not affect recall and alarm recording.



The alarm silence ON/OFF setup will remain effective even when the power is turned OFF. Be cautious not to miss any important alarm by leaving the alarm silenced.

●Arrhythmia Analysis Filter

Arrhy. Analysis Filter

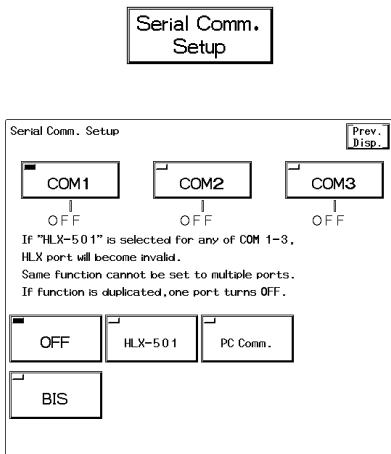
<input type="button" value="Disp Waveform"/>	<input type="button" value="Fixed"/>
--	--------------------------------------

Sets the ECG filter to perform arrhythmia analysis.

: the filter mode selected on admit menu or ECG configuration menu will be set.

: the filter will be fixed as 1.0–30Hz regardless of the filter mode selection.

●Serial Communication Setup

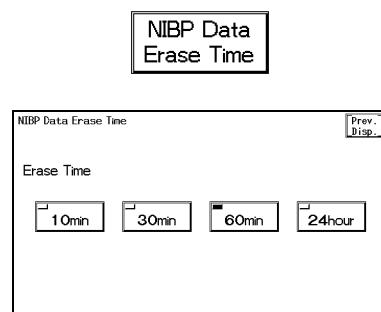


This device is equipped with 3 serial ports to connect to other devices.

Press the **Serial Comm. Setup** key to select the connecting device.

If the telemetry transmitter module (HLX-561) is a built-in type, do not select **HLX-501**.

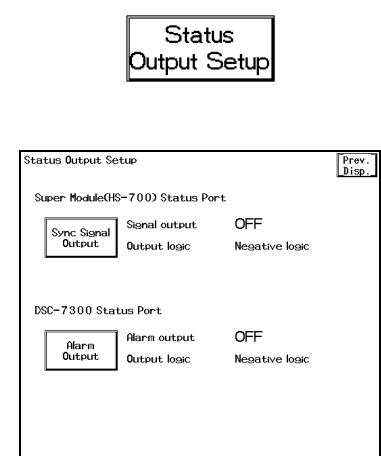
●NIBP Data Erase Time



Set the time to erase the NIBP data. Press the **NIBP Data Erase Time** key to display the setup menu for the erase time.

Select the time from **10min**, **30min**, **60min**, **24hour**. When the selected time passes, the NIBP data will be erased.

●Status Output Setup



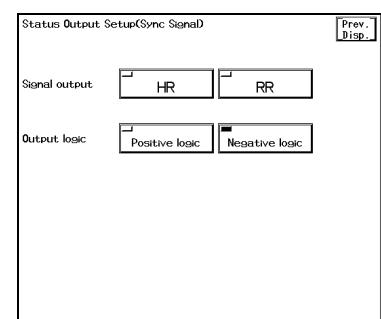
This Super Module is capable to output the synchronized signal (HR, RR) and alarm.

Also, this device can output the generating alarm to external device. Pressing the **Status Output Setup** key allows to set the details of synchronized signal output and alarm output.

Pressing the **Sync Signal Output** key will display the menu to select the synchronized signal (HR, RR) and output logic (positive logic, negative logic).

Pressing the **Alarm Output** key will display the menu to select the alarm to output and output logic (positive logic, negative logic).

Synchronized Signal Output Setup (Output from Super Module)



Select the Super Module output signal from **HR**, **RR**. **HR** will output a synchronized signal according to the selected HR source (ECG, SpO₂, BP1).

RR will output a signal synchronized to the impedance respiration.

Select the output logic from **Positive Logic**, **Negative Logic**.

Positive logic outputs the synchronized signal in plus, and negative logic outputs the synchronized signal in minus.



Refer to the "HS-700 Super Module Operation Manual" for connector pin assignments of the output signal.

Alarm Output Setup

Select the alarm to output.

Level 1 will output the signal when the level 1 alarm generates.

Level 1 and 2 will output the signal when level 1 or level 2 alarm generates.

Level 1, 2 and 3 will output the signal when level 1, level 2, or level 3 alarm generates.

APNEA will output the signal when apnea alarm generates.

Select **OFF** if not necessary to output the alarm.

Select the output logic from **Positive Logic**, **Negative Logic**, **Pulse**.

Positive logic outputs the signal in plus, and negative logic outputs the signal in minus.

A square wave of 440ms cycle is output for **Pulse**.



Refer to "11. Technical Information External Connection" for connector pin assignments of the output signal.

NOTE

The equipment status alarm will be output as level 3.

Select **Level 1, 2, and 3** when outputting the equipment status alarm.

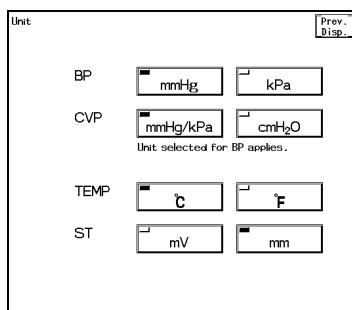
●Measurement Unit Setup

Select the unit for the measurement.



Changing the unit will erase the tabular trend data and graphic trend data.

Also, perform the alarm setup again as alarm condition should be set for each measurement unit.



BP : Changes the unit for BP and NIBP.

CVP : Changes the unit for CVP. (When BP label is CVP.)

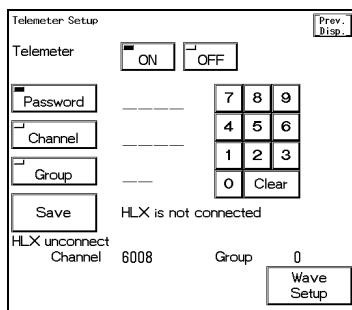
TEMP : Changes the unit for temperature.

ST : Changes the unit for ST measurement.

●Telemetry Channel Setup (When HLX-561 is connected)



Set the channel ID for the telemetry transmitter. Pressing the **Telemeter Setup** key will display the telemetry setup menu.



Refer to "4. Monitoring Setup Telemetry Setup" for telemetry setup.

● Trend Clip

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

Trend Clip

<input checked="" type="checkbox"/> ON	<input type="checkbox"/> OFF
--	------------------------------

ON will indicate the exceeded portion with straight line at upper (lower) limit.
 OFF will not display the exceeded portion.

● BP Recording Scale

BP Record Scale

<input checked="" type="checkbox"/> 40mm	<input type="checkbox"/> 20mm
--	-------------------------------

Select the scale height for the BP1~8 waveform when recording.

● Suspend Arrhy. Analysis during Noise Interference

Suspend Arrhy. Analysis during Noise Interference

<input checked="" type="checkbox"/> ON	<input type="checkbox"/> OFF
--	------------------------------

When a noise is interfering on the ECG signal, arrhythmia analysis can be suspended.

ON will suspend arrhythmia analysis for fixed duration (5 sec.) when a noise is continuously interfering.

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.

● MEAN Calculation (ART, NIBP)

MEAN Calculation (ART, NIBP)

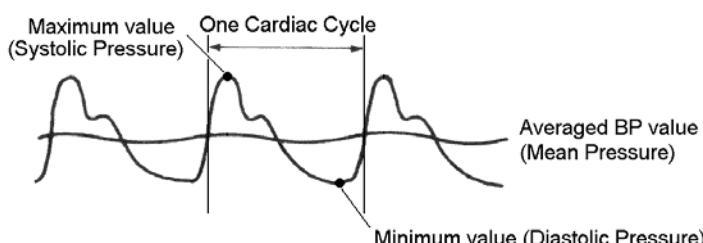
<input type="checkbox"/> Wave	<input checked="" type="checkbox"/> Calc.
-------------------------------	---

The mean blood pressure value of BP and NIBP can be selected to be measured from the waveform from calculation.

Calc. : Calculates the mean BP from the following calculation.

$$\text{Mean BP} = (\text{Systolic BP} + \text{Diastolic BP} \times 2) \div 3$$

Wave : Measures the mean BP as follows.



● Night Mode Cancel

Select the procedure to cancel the night mode when "Slightly Dark" or "Dark" is set.

Night Mode Cancel

<input type="checkbox"/> Any key	<input checked="" type="checkbox"/> Night Mode key
----------------------------------	--

Any Key will cancel the night mode by pressing anywhere on the screen.

Night Mode Key will cancel the night mode by pressing the

Night Mode key preprogrammed as user key or Night Mode key on the menu display.

● Asystole, VF, VT

Asystole , VF, VT
(only asystole for neonate)

<input checked="" type="checkbox"/> ON	<input type="checkbox"/> ON/OFF
--	---------------------------------

ON will not allow the alarms for asystole, VF, VT, Slow_VT to be turned off in the arrhythmia alarm setup menu.

ON/OFF will allow the alarms for asystole, VF, VT, Slow_VT to be turned ON or OFF.



Refer to "4. Monitoring Setup To Set ON/OFF of Arrhythmia Alarm" for arrhythmia alarm setup.

●Patient ID Transmission Starting Digit for DS-LAN

On the DS-7300 system, patient ID of up to 20 digits can be set, but only 10 digits can be transmitted on a wired network. This setup allows to set the starting digit of the 10 digits to be transmitted.

On the DS-LANIII network, if **Center** is selected for the recorder and recording is started on the DS-7100, the central monitor recorder can print only up to 10 digits. This setup will set the starting digit to be printed. However, all 20 digits can be displayed on the central monitor.

DS-LAN Pat. ID Tx



1 char.



: The starting digit will shift to left.



: The starting digit will shift to right.

NOTE

On the DS-7300 system, patient ID of up to 20 digits can be set, but only 10 digits can be transmitted on a DS-LANII network.

●Admit/Discharge Key Setup

Whether or not to display the following keys on the admit menu can be selected.

- **Impedance Mode** key
- Filter Mode (**Monitor**) / **ESIS** / **DIAG.**
- **Bed ID** key

Admit/Discharge
Key Setup



Full will display the above keys.

Light will not display the above keys. If these keys are not necessary to be displayed, select **Light**.

●Password for Alarm Setup

Whether or not to require password for alarm setup menu can be selected.

Password for
Alarm Setup



ON will require password for alarm setup menu.

OFF will not require password for alarm setup menu.

This section explains about transferring the setup data using the optional CF card. To set all the monitors in the same ward to the same alarm setup and display configuration may take large amount of time. However this process can be simplified by performing the setup on one monitor, and copying the data to all the other monitors using the CF card.

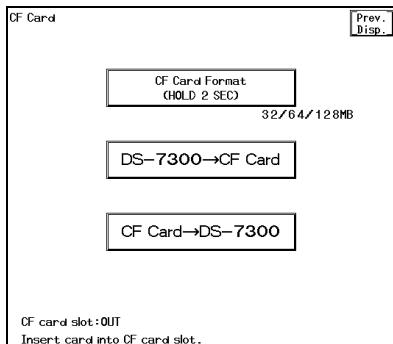
CAUTION

- Use only the specified CF card. (Flash Memory Card FCF-128)
- Use only the CF card formatted with this device.

NOTE

When using a CF card with write protect function, make sure to cancel the write protect function before data transfer.

- 1** Press the **Menu** → **System Configuration** → **CF Card** keys.



The CF card menu will be displayed.

Data Transfer (DS-7300 → CF Card)

The data can be transferred from the monitor to the CF card.

- 1** Insert the CF card to CF card slot 1.

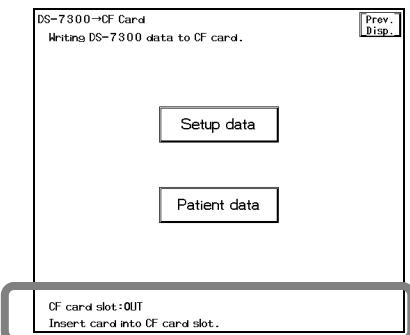
- 2** Write data to the CF card

DS-7300→CF Card

The data will be transferred from the monitor to the CF card.

Press the **DS-7300 → CF Card** key to select the data type to transfer.

- 3** Select the data type.



Setup data key will transfer the setup data such as alarm setup, display configuration, parameter setup to the CF card.

Patient data key will transfer the patient data such as admitting data (name, age, ID, etc.), graphic trend and tabular trend. Recall data, OCFG, ST measurement and short trend data can not be transferred.

If the CF card is not inserted to the card slot, a message will be displayed.

4 Confirm if OK to write the data to the CF card.

Press the **YES** key if you are sure to overwrite the CF card data with the monitor data.

Write setup data to CF card.
OK?
YES NO

<Setup Data>

Write patient data to CF card.
OK?
YES NO

<Patient Data>

Data Transfer (CF Card → DS-7300)

The data can be transferred from the CF card to the monitor.

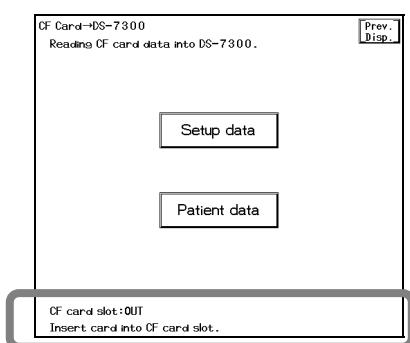
1 Insert the IC card to IC card slot.

2 Read the data from the CF card.

CF Card→DS-7300

The data will be transferred from the CF card to the monitor.
Press the **CF Card → DS-7300** key to select the data type to transfer.

3 Select the data type.



Setup Data key will transfer the setup data such as alarm setup, display configuration, parameter setup from the CF card.
Patient Data key will transfer the patient data such as admitting data (name, age, ID, etc.), graphic trend and tabular trend from the CF card.

If the CF card is not inserted to the card slot, a message will be displayed.

4 Confirm if OK to read the data from the CF card.

Press the **YES** key if you are sure to overwrite the monitor data with the CF card data.

Read setup data from CF card.
OK?
YES NO

*If BP or TEMP unit of measurement is different from current setup, all the corresponded trend data and recall data will be initialized.
*After reading setup data, power the unit again.

<Setup Data>

Read patient data from CF card.
OK?
YES NO

*If BP or TEMP unit of measurement is different from current setup, all the corresponded trend data and recall data will be initialized.

<Patient Data>

NOTE	When the data reading procedure is complete, the display will return to the home display.
-------------	---

CAUTION	<ul style="list-style-type: none">● Restart the system after reading the setup data from the CF card. The setup data will become effective after the system is restarted.● Reading the patient data from the CF card will erase all previous patient data stored in the patient monitor.
----------------	---

CF Card Format

- 1 Insert the CF card to CF card slot 1.**
- 2 Format the CF card.**

CF Card Format
(HOLD 2 SEC)

Pressing the **CF Card Format** key for more than 2 seconds will automatically determine the CF card type (32/64/128Mbyte), and starts formatting.

Data for Transfer

The setup data such as monitoring condition, alarm setup, and patient data such as graphic trend data and tabular trend data can be transferred.

Setup Data

Data		Description
Parameter Setup		Stores the monitoring condition (size, lead, etc.) for all the monitoring parameters.
Alarm Setup		Stores the alarm threshold level.
System Configuration	ST Meas. Condition	Stores the current setup.
	Record	
	Sweep Speed	
	Tone / Volume	
	Color / Brightness	
	Display Configuration	
	Night Mode Setup	
	Graphic Trend Setup	
	Tabular Trend Setup	
	Resp. List Setup	
	Vigilance List Setup	
	Recall Setup	
	ST Graphic Trend Setup	
	ST Display Lead Setup	
Pre-Set	Set Other Alarm	
	BP User Label	
	TEMP User Label	
	Telemetry Wave Setup	
	Alarm Mode Setup	Stores the current setup.
	Display Mode Setup	
	Hospital Setup (Excluding some data)	
	Monitor Setup (Excluding some data)	

Patient Data

Data		Description
Patient Information		Stores patient information such as name, ID, age, sex, pacemaker use, patient type.
Graphic Trend Data		Stores 24 hours of graphic trend data.
Tabular Trend Data		Stores 24 hours of tabular trend data.

Error Message

CF card slot : OUT

Cause : CF card is not inserted or not correctly set in the CF card slot.
Solution : Set the CF card into the CF card slot.

Invalid CF card.

Cause : Unspecified CF card is used.
Solution : Set the specified CF card into the CF card slot.

No data on the CF card.

Cause : There is no data on the CF card.
Solution : Check if the correct CF card is being used, or rewrite the data on the CF card.

CF card error.

Cause 1 : An error has been detected when writing/reading data on the CF card.
Solution : If the error has been detected during writing, try again.
If the error has been detected during reading, data might not be correctly written on the CF card. Rewrite the data after formatting and try the procedure again.

Cause 2 : The software version of the DSC-7300 main unit is older than that of the data stored in the CF card.
Solution : The data of newer software version cannot be read.
Update the software version of the DSC-7300.

Cause 3 : There is no more space on the CF card to write the data.
Solution : Format the CF card.



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