

DynaScope 7000 Series

Bedside Monitor

DS-7200 System

Ver.08

Operation Manual

《 Maintenance 》



- 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-7200 System Version 08.

⚠ CAUTION

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

CAUTION:

- This device for sale by or on the order of a physician.
- The company and product names used in this manual are trademarks or registered trademarks.
- If this manual has pages missing or out of order, contact Fukuda Denshi for replacement.
- Only physician or persons instructed by physicians are allowed to use the equipment.
- The information contained in this document is subject to change without notice due to improvement in the equipment.

Blood pressure measurements determined with this device are equivalent to those obtained by a trained observer using the cuff/stethoscope auscultation method, within the limits prescribed by the American National Standard, Electronic or automated sphygmomanometers.

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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-7200 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.

⚠ DANGER

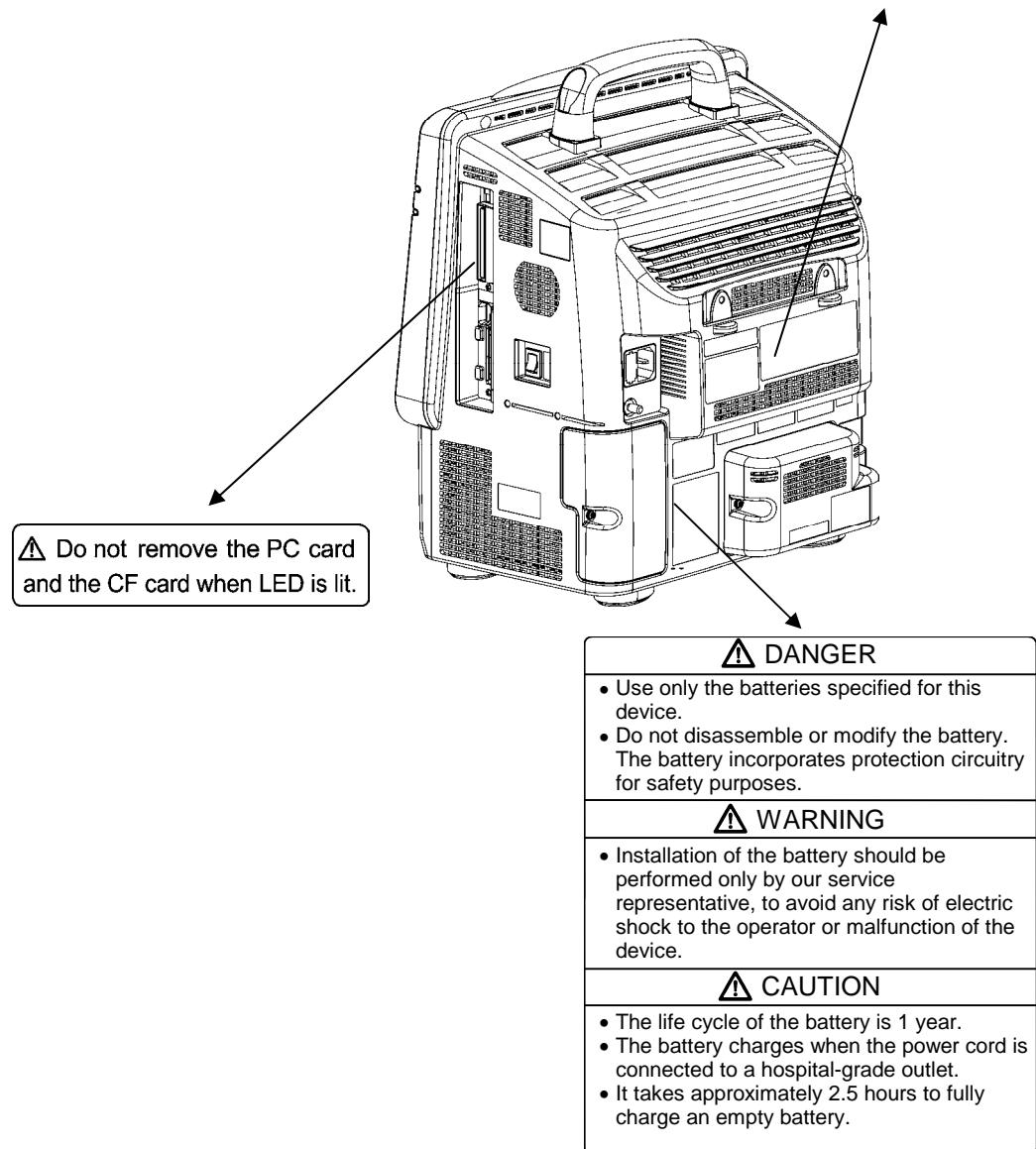
Risk of explosion if used in the presence of flammable anesthetics.

⚠ 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.



HU-71/HU-72/HU-73 Option Unit

⚠ DANGER

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

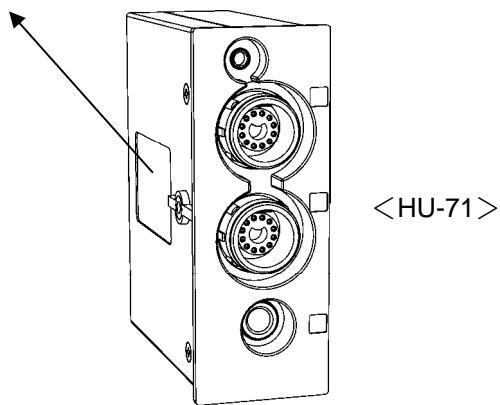
⚠ CAUTION

Before connecting, read instruction manual.

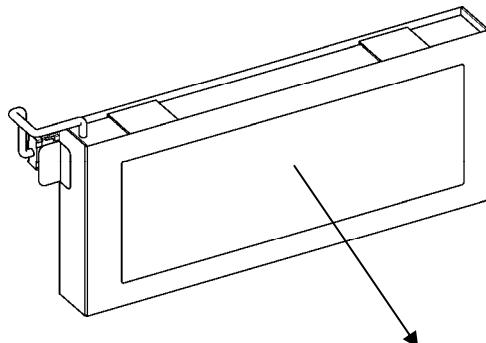
⚠ CAUTION

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

Refer servicing to qualified service personnel.



OAO-12B Battery Pack



Li-ion リチウムイオン電池パック

Li-ion Battery Pack



形 式 / Type :	OAO-12B
電 壓 / Voltage :	14.8V DC

容 量 / Capacity : 6600mA·h
製造番号 / Lot No.



⚠ 危険

昇熱、発火、破裂、液漏れの危険がありますので次の事項をお守り下さい。
・電池パックを機器に接続するときは、コネクタの向きを確かめ密着に装着して下さい。
・この電池パックは指定の機器以外には使用しないで下さい。
・電池の充電は指定の機器本体のみで行って下さい。
・電池パックは機器本体のみで行って下さい。
・電池や電子部品のショートや過温、分解をしないで下さい。
・火中投入、加熱、高溫下での放置、充電をしないで下さい。
・クリップ、ビンなど金属製の物と一緒に保管しないで下さい。
・電池には寿命があります劣化した電池パックは使用しないで下さい。
・電池パックに針金刺したり、ハマーで叩いたり、曲がつけたり、外縁テープを剥がしたり、キスをつけないで下さい。
・取り扱うごとに資源の有効活用のため、リサイクルにご協力ください。
リサイクル処理は弊社販売店・代理店に提出いただくか、各自治体の処理方法に従ってください。

To effectively use these limited resources, your cooperation in recycling the battery will be appreciated.
For recycling procedure, refer to Fukuda Denshi service representative, or follow the local regulations.

製造元：フクダ電子株式会社

Distributed by : Fukuda Denshi Co.,Ltd.

製造元：ファルタ・マイクロ・バッテリー・プライベート・リミテッド

Manufactured by : VARTA Microbattery Pte.,LTD.

⚠ DANGER

Please follow the precautions below, as improper use of the battery may cause heat, fire, explosion, or leakage.

- When installing the battery pack to the equipment, ensure the connector direction is correct.
- Do not use the battery pack with an equipment other than specified.
- The battery must be charged on specified equipment.
- Do not short the electrode or terminal, or remove/disassemble the battery.
- Do not throw into the fire, heat, or leave/charge the battery under high temperature.
- Do not store the battery with metal such as clip or pin.
- The battery deteriorates with time. Do not use the deteriorated battery pack.
- Do not drive a nail in, hit with a hammer, step on the battery pack, or peel off or scratch the exterior tube.
- Do not apply strong impact or throw the battery pack.



MADE IN KOREA

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	
	Invasive Blood Pressure	PR_IBP	bpm	
	SpO ₂	PR_SpO ₂	bpm	
	Non-Invasive Blood Pressure	PR_NIBP	bpm	
ST Level	ECG	ST	mm, mv	mm
VPC	ECG	VPC	bpm	
Respiration Rate	Impedance Respiration	RR_IMP	Bpm	
	CO ₂	RR_CO ₂	Bpm	
	Ventilator	RR_VENT	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	Expiratory Tidal Volume	E_TV	mL	
	Inspiratory Tidal Volume	I_TV	mL	
	Tidal Volume	TV	mL	
	Inspiratory/Expiratory Ratio	I:E	(none)	
Respiratory Minute Volume	Minute Volume	MV	L/minute	
	Spontaneous Minute Volume	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	Expiratory Resistance	E_RES	cmH ₂ O/L/Sec	
	Inspiratory Resistance	I_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	

bpm: beats per minute

Bpm: breaths per minute

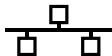
Detail	Parameter	Display	Unit	Default
Spontaneous Respiration	Spontaneous Respiration	S_RR	Bpm	
Peak End Expiratory Pressure	Peak End Expiratory Pressure	PEEP	cmH ₂ O	
Fraction of Inspiratory Oxygen	Fraction of Inspiratory Oxygen	FIO ₂	%	
Vigilance Data • Vigilance • Vigilance CEDV • VigilanceII • Vigileo	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	%	
BIS Monitor Data	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.
	Inhibition The operation is inhibited. Refer to the instruction.
	Protective Earth Indicates the protective earth inside the equipment.
	Alternating Current (Main Power Input Indicator)
	Direct Current
	Battery Charge (Battery Charge Indicator)
	"OFF" for a Part of an Equipment Indicates the "OFF" condition for a part of an equipment.
	"ON" for a Part of an Equipment Indicates the "ON" condition for a part of an equipment.
	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.
	Type BF Applied Part Indicates the degree of protection against electric shock is Type BF Applied Part.
	Signal Output Part
	GAS Output Part

<i>Symbol</i>	<i>Description</i>
	Signal Input Part
	Manufactured Date
	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

Symbol	Description
	Battery Mark During battery operation, battery status will be displayed.
	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.
	TCON Antenna Mark Indicates the receiving condition of the Bidirectional Wireless Communication Module (HTC-702).
	SEC Alarm Display Indicates the SEC alarm status.
	Scroll Keys These keys will allow to scroll the screen.
	Laser Printer This mark will be displayed when a laser printer connected to the TCP/IP network is used.
	Laser Printer Output Indicates the current printing progress.

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.• Do not install the equipment in a location where it is difficult to unplug the power cable.● 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 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-7200 system is available from your local Fukuda Denshi representative.

Precautions about the Pacemaker



- Minute ventilation rate-adaptive implantable pacemakers can occasionally interact with certain cardiac monitoring and diagnostic equipment, causing the pacemakers to pace at their maximum programmed rate. The cardiac monitoring and diagnostic equipment may possibly send 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.)



"Minute Ventilation Rate-Adaptive Pacemakers"

FDA alerts health professionals that minute ventilation rate-adaptive implantable pacemakers can occasionally interact with certain cardiac monitoring and diagnostic equipment, causing pacemakers to pace at their maximum programmed rate.

[Based on a safety bulletin issued by FDA Center for Devices and Radiological Health on October 14, 1998]

- 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 this manual 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 defibrillating, keep away from the electrodes or medicament applied to the patient chest. If this is not possible, remove the electrodes or medicament before defibrillating.
If the defibrillator paddles directly contact the electrodes or medicament, electrical shock may result by the discharged energy.
- When defibrillating, make sure that the electrodes, sensor cables, or relay cables are firmly connected to the device.
Contacting the metal part of the disconnected cable may result in electrical shock by the discharged energy.
- When defibrillating, do not touch the patient and the metal part of the device or cables. Electric shock may result by the discharged energy.
- This equipment will return to standard operating mode within 10 seconds. The stored data will not be affected. The measurement accuracy will temporarily decrease during defibrillation, but it will not compromise the safety of patient and the equipment.

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

WARNING

- 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-7200 system are isolated from the power supply. The connecting peripheral devices should comply with IEC 60601-1 or should be isolated with the isolation transformer in compliance with IEC 60601-1. To prevent danger of electric shock, always position the peripheral devices away from the patient.

When connecting peripheral devices to DS-7200 system, it is the user's responsibility to verify that the overall system complies with IEC 60601-1-1, "Collateral Standard: Safety Requirements for Medical Electrical Systems".

Precautions about 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.

Accessories and Optional Accessories

WARNING

Use only the cables specified by Fukuda Denshi.
Not only the DS-7200 cannot deliver its maximum performance but may also result in increase in emission or decrease in immunity.

Precautions about the DS-7200 System

 DANGER	<p>When connecting to other device, contact Fukuda Denshi service representative.</p> <p>Danger such as electric shock may result to the patient and operator.</p>
 WARNING	<ul style="list-style-type: none">● The DS-7200 system is not a life-support equipment.● The DS-7200 system is not intended for use during patient transport outside a healthcare facility, and is not considered as mobile equipment.● Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. If done so by mistake, the DS-7200 system cannot deliver its maximum performance and the connected units may be damaged, resulting in a safety hazard.● If the DS-7200 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 supplied 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.● The power cable must be connected to the 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 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.● The patient classification 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 mask function is set to OFF, 10ms, or 20ms, the pace pulse may be erroneously be detected as a QRS complex and HR/Asystole Alarms may not generate due to incorrect HR (counting pace pulse as QRS complex). Select OFF, 10ms, or 20ms only if you are sure that pacing failure will not occur, or when the patient can be constantly monitored.● Be cautious when setting the "SpO₂ Averaging" duration as the SpO₂ alarm is based on the displayed SpO₂ value which is averaged from the duration set in "SpO₂ Averaging". The alarm occurrence time will be affected or may not occur for the transient value of SpO₂ depending on the set duration. (For Masimo® SpO₂ unit)● 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 the 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

⚠ WARNING

- Use only specified NIBP cuff. Refer to “12. Optional Accessories”, for list of specified NIBP cuffs. These accessories may be purchased from Fukuda Denshi or NIBP cuff manufacturer that Fukuda Denshi recommends.
- Before the NIBP measurement, make sure the patient classification (Adult / Child / Neonate) is properly selected. Otherwise, correct measurement cannot be performed, and congestion or other injury may result.
- Use nonconductive parts for the BP circuit other than the transducer. Otherwise, the operator may get an electric shock if he/she touches a conductive part during defibrillation.
- For MGU-721 with CAPNOSTAT 5® CO₂ sensor, use only specified airway adapter manufactured by “Respironics Novametrix, LLC”. Refer to “12. Optional Accessories”, for list of specified “Respironics Novametrix, LLC” airway adapters. These accessories may be purchased from Fukuda Denshi or any authorized “Respironics Novametrix, LLC” distributor.
- For MGU-722, use only specified breath sampling products manufactured by “Oridion Medical 1987 Ltd.”. Refer to “12. Optional Accessories”, for list of specified “Oridion Medical 1987 Ltd.” FilterLine® sampling products. These accessories may be purchased from Fukuda Denshi or any authorized “Oridion Medical 1987 Ltd.” distributor.
- When monitoring CO₂ (MGU-721/MGU-722), 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.
- 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. Make sure that the connector is securely connected. 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 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-7200, HR alarm will be set to OFF on the central monitor.
- The purpose of the 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.)
- When “Alarm System” setting (IEC/FUKUDA DENSHI) is changed on the Monitor Setup menu, make sure to check the alarm sound and alarm indicator.
- When PURITAN-BENNETT Ventilator is used, APNEA alarm will not generate if ventilator is the RR/APNEA alarm source.

 **WARNING**

- When selecting **Silence**, **Time Disp. Only** or **OFF** (Alarm Pole) for the night mode, pay attention not to miss any important alarm by simultaneously monitoring the bed on other monitors such as central monitor.
- For 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.
- 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.
- When lifting this device, hold the handle of the main unit.
- The "QRS SYNC" signal (No. 1) of the Status II connector is a delay output. (delay: 30 to 75msec, signal width: 100msec). Do not use it as a synchronizing signal for the defibrillator. Make sure the delay time of QRS SYNC signal fulfills the specifications of the connected device.
- Analog signal is a delay output. (about 35ms for ECG, BP) When connecting to a device using vital signs as trigger signals (ex. IABP), make sure the delay time fulfills the specifications of the connected device. The delay time may differ depending on the waveform shape or artifact interference.
- The slave monitor output of the DS-7200 is not isolated. If connecting a commercially available display unit which does not comply with IEC 60601, use an isolation transformer to ensure there is no excessive electric leakage current for safety of the operator and the patient.
- We cannot assure proper operation if TCP/IP network is connected incorrectly. When changing the network setting or upgrading the printer, contact our service representative.
- Make sure not to duplicate the IP address for DS-7200 system, laser printer, and the server.
- As DS-7200 is not corresponded to DHCP (Dynamic Host Configuration Protocol) IP address, set the IP address excluded at DHCP if DHCP server is in the network configuration.
- Be careful not to confuse the HUB used for the DS-LANII/III network and the HUB for the TCP/IP network. We cannot assure proper operation if used improperly.
- Use a 10M repeater HUB recommended by Fukuda Denshi for the DS-LANII network. If a 100M HUB or a switching HUB is used, a communication error may occur.
- On the network configuration menu, when a setting is changed and **Enter** key is pressed, a caution message will be displayed. All monitoring operation will be suspended until the system is restarted.

⚠ CAUTION

- Systems
 - This equipment is intended to be used for only one patient.
 - The installation of this equipment and its option unit should be performed by our service representative or a person who is well acquainted with this equipment.
 - The internal switch setting will be performed by our service representative. Users should not open the maintenance cover.
 - PC Card Slot will be used by our service representative for maintenance purpose. Users should not use it.
 - The software upgrading will be performed by our service representative. The users should not attempt it.
 - Use only the accessories specified for this device. Otherwise, proper function cannot be executed.
 - Do not reuse a disposable product.
 - For quality improvement, specifications are subject to change without prior notice.
 - When the product is used in regions whose voltage is other than 110-120V, a cable appropriate to the regulations and voltage of the country in which the product is being used shall be used.
 - The display panel utilizes exclusive fluorescent light for the backlight. Since this fluorescent light deteriorates by the life cycle, the display may become dark, scintillate, or may not light by the long term use. In such case, contact your nearest service representative.
 - 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 any part of the panel for a prolonged time.
 - Do not use the touch panel with the film or adhesive tape attached. Malfunction of the touch panel or damage may result.
 - As the touch panel is made of glass, a strong impact may cause damage. Pay attention not to hit or drop the touch panel.
 - Do not press the touch panel with strength or twist your finger on the panel. It may cause malfunction or damage the touch panel.
 - Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will be reduced in few hours or half a day after the power is turned ON.
 - When changing the CO₂ option unit (MGU-721/MGU-722), it is necessary to perform setting on the "Change Equipment Configuration (CO₂)" of the CONFIGURATION menu.
 - If not using the monitor for a long time, turn OFF the power switch.
 - When connecting the BIS monitor, make sure that the power of the patient monitor and the BIS monitor is turned OFF.
 - The connector of COM (1 to 3), StatusII (1 to 5), and analog output are isolated.
 - If the power supply is interrupted due to power failure, etc., the following will occur.
 - If the power supply is resumed within 5 minutes, setup data are backed up and monitoring before the power failure can be resumed.
 - If the power failure continues for more than 5 minutes, data such as ST data, OCRG data will be initialized. (For details, refer to "11 Technical Information Setup Item".)
 - For the CO₂ option unit (MGU-721/ MGU-722), it will be initialized and enter into warm-up state even if the power failure is within 30 seconds.
- 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.

 CAUTION

- The indication for continuous use of the electrode is about one day.
- Replace the electrode if the skin contact gets loose due to perspiration, etc.
- When an electrode is attached to the same location for a long period, some patients may develop skin irritation. Check the patient's skin condition periodically and change the electrode site as required.
- For stable arrhythmia detection and ECG monitoring, verify proper electrode placement, lead, waveform size, and filter mode selection. If not properly selected, it may cause erroneous detection.
- Always use the same type of electrodes. If different types of electrodes are used at the same time, the difference between the polarization potential from each electrode may interfere monitoring.
- 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 μ V. When the waveform size is $\times 2$ or $\times 4$, the detection threshold is 150 μ V.
- When arrhythmia is present, HR measurement accuracy may be degraded.
- Select the appropriate lead for ECG1, 2 to be used for arrhythmia detection, telemeter, central monitor transmission, and recording.
- The selected lead for ECG1, 2 will be used for recall waveform and recording waveform as well as for arrhythmia analysis.
- 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 the 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 the pacemaker pulse detection.
- If signals similar to a pacemaker pulse are present, such as electric blanket noise or excessive AC frequency noise, these may be erroneously detected and displayed as a pacemaker pulse.
- When a spontaneous QRS and pacemaker pulse overlap (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.
- Respiration Monitoring
 - When the following relay cables are used, respiration cannot be measured.
 - Relay Cable CI-700E-3 (FA) (defibrillation and electrosurgery-proof, 3-electrode)
 - Relay Cable CI-700E-4 (FA) (defibrillation and electrosurgery-proof, 4-electrode)
 - Relay Cable CI-700E-5 (FA) (defibrillation and 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.

 CAUTION	<ul style="list-style-type: none"> ● SpO₂ Monitoring <ul style="list-style-type: none"> • If the nail is rough, dirty, or manicured, accurate measurement will not be possible. Change the finger or clean the nail before attaching the probe and sensor. • The Dyna Alert estimates the change in circulatory dynamics from the photoplethysmogram (SpO₂) of the finger. Therefore, if the photoplethysmogram (SpO₂) is measured on the toe or forehead (with MAX-FAST), the Dyna Alert may not function depending on the patient's condition. • 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 interval, which is specified for each SpO₂ sensor. 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. • As skin for neonate / low birth weight infant is immature, change the sensor attachment site more frequently depending on the condition. • Excessive light may cause inaccurate measurements. In such cases, cover the sensor with opaque material. • 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. • The pulse wave is normalized for SpO₂ measurement. It does not indicate perfused blood volume. Check proper probe attachment by observing the pulse wave. • 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-Patient-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® OxiMax® sensor 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. • The Masimo® LNOP sensor can be reused on the same patient as long as the light emitting and receiving part is clean, and if it is still adhesive to the skin. But do not reuse it on other patients. It is intended for single patient use only. • For the Nellcor® single patient use type sensors, the site must be inspected every 8 hours (MAX-FAST®: 12 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.
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 CAUTION	<ul style="list-style-type: none"> • For Masimo® sensor, change the sensor attachment site every 4 hours for the reusable sensor, and every 8 hours for the disposable sensor. Exercise extreme caution with poorly perfused patients; skin erosion and pressure necrosis can be caused when the sensor is not frequently moved. Assess site at least every 2 hours with poorly perfused patients. • The SpO₂ patient cables (PC04, PC08, and PC12) are intended for Masimo SET sensors only. Connect them only to DS-7210M. If connected to other device, it will not function properly. • Measuring on a limb with NIBP cuff, arterial catheter, or intracatheter may result in incorrect measurement. • For additional warnings, cautions or contraindications when using sensors with DS-7210 Nellcor® model or DS-7210M Masimo® model, refer to each SpO₂ sensor instruction manual. • If SpO₂ measurement failure occurs due to the reason such as sensor detachment from the patient, SpO₂ measurement data will be displayed as “---”. Be cautious as numeric data alarm will not generate in such case. • Precautions for DS-7210M Masimo® Model <ul style="list-style-type: none"> • The measurable pulse rate range is 25 to 240bpm. “xxx” will be displayed if 25bpm and below or 240bpm and above is measured. • If High is selected for pulse wave sensitivity on the SpO₂ setup menu, the sensor-detached detection will become somewhat inaccurate. • If OFF is selected for “PI Display” under the SpO₂ configuration setup, “SpO₂ Low Perfusion” alarm will be indicated by message display only. The alarm sound will not be generated. ● 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. • Do not reuse the disposable NIBP cuff. • 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 the 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. • Pay attention not to bend the cuff hose. • 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. • 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
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⚠ CAUTION

- When a PTG (SpO₂) sensor is applied to the toe or forehead, the Dyna Alert may not function depending on the patient's condition.
- When using the Dyna Alert function, be aware of these risks and do not increase the NIBP interval time by relying only on the Dyna Alert function.
- After the Dyna Alert NIBP measurement, the next Dyna Alert NIBP measurement cannot be performed for 2.5 minutes.
- The Dyna Alert will not properly function for the following cases.
 - If peripheral circulatory insufficiency or very low BP is developed.
 - If highly-frequent arrhythmia is generated.
 - If an artificial heart lung machine is used.
 - If a large noise from body movement or electric surgery equipment is interfering.
 - If autonomic nerve or circulatory dynamics is largely affected by medication.
- For the following situation, measurements will be terminated.

When the measurement time has exceeded 160 seconds for adult and child, 80 seconds for neonate.

When the inflation value has exceeded 300mmHg for adult, 210mmHg for child, and 150mmHg for neonate.
- If used with the incorrect patient classification, it will not only cause erroneous measurement, but the inflating level for the adult may be applied to child or neonate causing dangerous situation to the patient.
- The 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 12 minutes.
- 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
 - Do not reuse disposable product for BP measurement.
 - 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 the BP value will be displayed.
 - Each time the blood pressure transducer or tubing is replaced, the zero balance procedure is required to ensure accurate measurements.
 - “Perform zero balance” message will not be displayed unless the three-way valves 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 valve of pressure transducers are opened to air.
 - “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.
 - 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.

⚠ CAUTION	<ul style="list-style-type: none"> • Note that the 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. • The undisplayed BP data (SYS/DIA/Mean) will not generate a BP alarm or be displayed in the tabular trend. Select the appropriate display type according to the monitoring purpose. ● CO₂ Monitoring (MGU-722) <ul style="list-style-type: none"> • All FilterLine® sampling products are for single patient use only. • Perform calibration after Initialization Time (max. 180 seconds has elapsed since the power is turned ON). • Do not disconnect the sampling tube during calibration. If disconnected, calibration will cease when the sampling tube is disconnected. • Conduct CO₂ calibration for the following case. If the CO₂ gas calibration is not performed at a specified interval, CO₂ measurement accuracy may be affected and also subsequent gas calibration may not be possible. <ul style="list-style-type: none"> ▪ For the following case, a message, "Calibrate the CO₂ unit (MGU-722)" or "The periodic calibration of the CO₂ unit (MGU-722) is approaching" will be displayed at power ON. Conduct CO₂ calibration. <ul style="list-style-type: none"> When the accumulated measurement time exceeds 1200 hours from first use. When 1 year has elapsed from the last calibration date. When the accumulated measurement time exceeds 4000 hours from the last calibration date. ▪ When EtCO₂ measurement is not stable or accuracy is degraded compared with other measuring device conduct CO₂ calibration. ● CO₂ Monitoring (MGU-721 with CAPNOSTAT® 5 CO₂ sensor) <ul style="list-style-type: none"> • 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. • 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. • 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. ● Alarm <ul style="list-style-type: none"> • The alarm priority is high for level 1 (life threatening alarm), medium for level 2 (cautionary alarm), and low for level 3 (treatment needed 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. • On the DS-7200, HR alarm and PR alarm cannot be set to ON at the same time. • 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. • Even during "LEARN" status, alarm for HR, ASYSTOLE, VF, TACHY, BRADY will be generated. • Even during "Cannot analyze" alarm generation, alarm for HR, ASYSTOLE, VF, TACHY, BRADY will be generated. • 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.
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⚠ CAUTION

- Regardless of ON/OFF setting of "Suspend Arrhy. Analysis during Interference" under Hospital Setup (Preset Menu), the "Cannot analyze" alarm will generate when analysis is suspended for more than 30 seconds.
- The measurement range and alarm range differs for the following parameters. Be cautious not to set the alarm limit outside the measurement range. Otherwise, the alarm will not generate.
 - PR for DS-7210M (Masimo® Model)
Measurement Range: 25 to 240bpm
(If 25bpm and below or 240bpm and above is measured, "xxx" will be displayed.)
Alarm Range: 20 to 300bpm
 - NIBP
Measurement Range: 10 to 280mmHg
Alarm Range: 10 to 300mmHg
 - CO₂ for MGU-722 (Microstream® CO₂ Unit)
Measurement Range: 0 to 99mmHg/0 to 13.3kPa
Alarm Range: 1 to 115mmHg/0.1 to 15.0kPa
- 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 mute 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.
- System Configuration
 - When the waveform and numeric data display for each parameter is set to OFF, the alarm generation and tabular/graphic trend for the corresponded parameter will be also set to OFF.
 - If the display of waveform / numeric data labeled as BP1 or ART is set to OFF, the pulse rate derived from BP will not be displayed either.
 - When the waveform and numeric data display for SpO₂ is set to OFF, the pulse rate derived from SpO₂ will not be displayed either.
 - When the waveform and numeric data display for the CO₂ measurement unit (MGU-721 or 722) is set to OFF, the respiration rate measured by the CO₂ measurement unit will not be displayed either.
 - If the time/date is not correctly set, or changed during monitoring, malfunction may occur to NIBP measurement, periodic recording, trend, NIBP list data, and age calculation from the birth date.
 - If the time/date is changed, the time/date for the trend, NIBP list, recall data will also change.
 - If the time/date is changed during monitoring, the patient's age will not be recalculated.
 - Do not set the same remote control bed ID to more than one monitors of 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.
- 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 alarm mode and display mode remains stored even when the power is turned OFF or when discharging procedure is performed. However, if the built-in backup battery is depleted when the power is turned ON, the alarm mode setting will be initialized to default setting.
 - Resuming monitoring will resume the alarm in suspension.
 - After the information for a new patient is acquired by searching the patient data server, make sure to perform the admit process by pressing the **Admit as new patient** key.

 CAUTION	<ul style="list-style-type: none"> ● ST Measurement <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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. ● TCP/IP Network Connection <ul style="list-style-type: none"> • After setting the IP address, etc. for the laser printer, make sure to turn OFF and back ON the power of the printer. ● Maintenance <ul style="list-style-type: none"> • 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. • Do not open the housing. • If you accidentally wet the device, dry it completely and verify it operates safely before usage. • If the patient monitor was stored for some while, leave the monitor at the operating environment (10 to 40°C, 30 to 85%) before usage. • Replace the components periodically as specified.
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Precautions about the Wired Network System (DS-LAN II/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.● Before setting the bed ID, make sure that the DS-LAN (DS-LANII/DS-LANIII) is correctly set on the Monitor Setup menu. If not correctly set, the network may cease which may lead to accidents such as not transmitting life threatening alarms to the central monitor.
⚠ CAUTION	<ul style="list-style-type: none">● When connecting to the DS-LAN network, perform "DS-LAN Setup" in the Monitor Setup menu and restart the system before connecting the LAN cable.● 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 connected to the wired network, make sure that there are no other bedside monitors with the same Bed ID. If there are more than one bedside monitors with the same Bed ID, the duplicated bedside monitors cannot be monitored on the central monitor.● 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-7200 does 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-7200 system, it will be corrected to the time/date of the central monitor.● On some central monitors depending on the model type or software version, the setups for "HR Low Limit for VT" and "HR Low Limit for Run" cannot be performed.● On a wired network, the alarm generated on the DS-7200 will be output to the network with a maximum delay of 1 second, and to the central monitor with a total delay of 2.5 seconds.● In case of DS-LANII network, if the HR/PR source is [BP] (Or, if [Auto] selects BP for HR/PR source), the ECG waveform will not be transmitted on the network. On the central monitor, PR_IBP value will be displayed instead of HR. However, on some central monitor depending on the model type, the HR value from ECG will be displayed on the NIBP list and ST measurement list. Refer to the operation manual for the respective central monitor. In case of DS-LANIII network, refer to the operation manual for the central monitor.● In case of DS-LANII network, if the RR/APNEA alarm source is other than [Impedance] (Or, if [Auto] selects a setting other than impedance for RR/APNEA alarm source), the respiration waveform will not be transmitted on the network. In addition, if the RR/APNEA alarm source is other than [CO₂] (Or, if [Auto] selects a setting other than CO₂ for RR/APNEA alarm source), the CO₂ waveform will not be transmitted on the network. In case of DS-LANIII network, refer to the operation manual for the central monitor.● Depending on the central monitor model type, the ST display will be distorted if the ECG lead (ECG1 or ECG 2) is changed on the DS-7200. Redrawing the ST display will return the display to normal.

 CAUTION

- On the central monitor, the respiration waveform and RR value based on the RR/APNEA alarm source selected on the DS-7200 will be displayed. The RR and APNEA monitored on the central monitor and the DS-7200 will be the same.
- 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-7200 system to the DS-LANII network.
 - Make sure that the “DS-LAN Setup” on all the bedside monitors and central monitors are set to [DS-LANII] before connecting the monitors to the 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. For the ST display, overlap waveform will not be displayed on the DS-5800N/NX/NX^{MB} until 15 minutes have passed since the reference waveform is set on the DS-7200.
 - 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.
 - If a central monitor which does not support the “kPa” measurement unit is used, and the measurement unit on the bedside monitor is set to “kPa”, BP waveform/numeric data, NIBP data, NIBP list, etc. in “kPa” unit will be treated as not measured data and will not be displayed on the central monitor. Also, the alarm limit setup from the central monitor cannot be performed.
 - 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 wired network, waveform, numeric data, alarm of TEMP3 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.
 - For numeric data displayed as “×××”, maximum or minimum value of measurable range will be transmitted.
 - The numeric data displayed as “—” will be treated as not measured data.
 - If the SpO₂ (PR_SpO₂) lower alarm limit is set, and “—” is displayed for the SpO₂ (PR_SpO₂) value due to a cause such as SpO₂ sensor off, etc. on the bedside monitor, it will be notified as SpO₂ (PR_SpO₂) lower alarm on some central monitors even if the alarm is not generated on the bedside monitor.
 - If using a HUB for the DS-LANII network construction, make sure to use a repeater HUB recommended by Fukuda Denshi.

 CAUTION

- There are following restrictions when connecting the DS-7200 system to the DS-LANIII network.
 - In order to connect to the DS-LANIII network, the software version needs to be the version which supports the DS-LANIII. For details, refer to our service representative.
 - Make sure that the “DS-LAN Setup” on all the bedside monitors and central monitors are set to **DS-LANIII** before connecting the monitors to the network.
 - If the measurement unit for BP (mmHg/kPa) and temperature (°C/°F) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
 - If using a HUB for the DS-LANIII network construction, make sure to use a switching HUB recommended by Fukuda Denshi.
 - The displayable waveform, numeric data, alarm will differ depending on the central monitor model type. Please also refer to the operation manual of the central monitor.
- There are following restrictions when recording the DS-7200 data on the central monitor recorder.
 - The DS-7200 can not perform the recording with the AU-5500N recorder.
 - 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 built-in recorder will be printed as “N” on the central recorder.
 - 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** (Or, if **Auto** selects BP for 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** (Or, if **Auto** selects other than impedance for RR/APNEA alarm source), respiration waveform will not be output on the central recorder.
 - If the RR/APNEA alarm source is other than **CO₂** (Or, if **Auto** selects other than CO₂ for RR/APNEA alarm source), 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-7200, HR measurement value from ECG will be recorded for the HR value and ST trend.

Precautions about the Wireless Network System

DANGER

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

WARNING

- A password can be set to access the channel ID setup menu to allow only the telemetry channel administrator to change the channel ID.
- Some wireless combinations of telemetry transmitters may generate interference with other devices.
- Before selecting a channel, verify that it will not interfere with other channels.
- Make sure the telemetry manager of your system is aware of any changes to the telemetry channels.
- If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference.

CAUTION

- On a wireless network, the alarm generated on the DS-7200 will be transmitted to the central monitor with 15 seconds delay.
- If the BP unit is kPa and temperature unit is °F, the measurement value will be converted to mmHg and °C respectively when transmitting to the central monitor. If kPa/°F is used as the unit on the central monitor, the measurement value will be reconverted to kPa/°F.
- 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.
- 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 for Use of the Bidirectional Wireless Communications (TCON)

⚠ CAUTION	<ul style="list-style-type: none">● When using the TCON system, pay attention to the following.<ul style="list-style-type: none">• The medical institution (hereinafter referred to as "Institution") must execute investigation required to prevent interference including types of radio waves, frequencies, and antenna power if wireless equipment is already installed and being used in the facility.• Even if this device is installed within the range of radio communication, the communication may not be possible due to noise or multi-path phasing etc. Always consider this thoroughly before use.• Do not install this device in an area where it will be subject to splashing water. Water entering the equipment may cause the equipment to malfunction or be damaged.● In managing the TCON system, make sure to follow the precautions below.<ul style="list-style-type: none">• The Institution should appoint a person (hereinafter referred as the "Overall Manager") to manage the wireless devices for the whole facility.• When installing the TCON, the Overall Manager has to receive an explanation of the precautions for use of the TCON from the manufacturer or sales representative.• The Overall Manager is responsible for the maintenance and storage of the equipment.• The Overall Manager should create a management log (hereinafter referred to as the "log"), which contains a list of the management status of the wireless channels for the whole facility. When assigning or changing wireless channels, register it in the log, and give proper instructions to the TCON user.• The user needs to verify the transmitting/receiving operation before use.• If interference or breakdown occurs in the communication, the TCON user is required to stop using the TCON and to inform the Overall Manager of the problem. The Overall Manager is to deal with the problem properly and/or contacts the nearest Fukuda Denshi representative for service.● Precautions for operations<p>The Bidirectional Wireless Communications Module (TCON) uses radio waves to transmit data. Therefore, necessary precautions need to be taken for the characteristics and difficulties of using the device that emits radio waves. The TCON user should fully understand these precautions beforehand, and use the TCON device safely.</p><p>Furthermore, situations in which interference may occur are outlined below. In such cases, pay special attention to the condition of the patient connected to the bedside monitor, and eliminate the cause of interference.</p><ol style="list-style-type: none">1. The patient's data may become mixed with a different patient's data due to interference.<ul style="list-style-type: none">• When there are multiple TCON communication devices set to the same TCON ID and channel (group).2. When symptoms such as being unable to communicate, unstable communication, or poor reception may occur.<ul style="list-style-type: none">• When the radio communication is bad because there are metal, concrete, or other such obstacles between the Bidirectional Wireless Communications Modules (TCON).• When a different wireless device is using the same frequency (channel).• When there are other TCON devices nearby using different channels (groups).• When a cell telephone or other wireless device is being used nearby.• When citizens broadcast bands such as amateur radio or truck radios are used in the vicinity of the TCON operating area.
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⚠ CAUTION

- When a computer or word processor, or electrical device that has an internal computer, is used near the TCON device antenna.
- When the TCON device is installed or moved to a location that is outside the radio communication range.
- If a nearby different TCON group is set with a TCON channel frequency that is too close to the channel frequency set for the current TCON group.
- Follow the instructions of the Overall Manager for the wireless channel when setting the TCON ID or channel (group) to prevent interference within the same institution.
- For the TCON ON/OFF setup, if the “OFF” is selected, the message such as “Check TCON Comm.” will not be displayed.
- Check that the TCON radio wave strength between the central monitor and bedside monitor is sufficient. Make sure that “” mark is displayed.
- Check that the TCON Channel (Group) is the same for the bedside monitor and the central monitor in the same TCON group.
- Do not move the TCON device during operation. Otherwise, symptoms such as being unable to communicate, unstable communication, or poor reception may occur.
- There are following restrictions when connecting the DS-7200 system to the TCON Network.
 - If the measurement unit for temperature is “°F”, the central monitor can not receive the measurement data for temperature. In addition, the alarm settings for temperature can not be operated from the central monitor.
 - If the measurement unit for BP is “kPa”, the central monitor can not receive the measurement data for NIBP, BP1, and BP2. In addition, the alarm settings for NIBP, BP1, and BP2 can not be operated from the central monitor.
 - The NIBP measurement cannot be started from the central monitor via TCON system if the NIBP measurement interval is set to / / / or during the 1-minute measurement. However, it can be stopped.
 - If the measurement unit of CO₂ concentration is “mmHg”, the CO₂ value of 100mmHg or above will be transmitted as 99mmHg even within measurement range.

Precautions about the Ventilator Monitoring

 WARNING	<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-7200 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-7200 system, cable, and replace the cable if necessary. If the malfunction persists, stop using the device.● After connecting the ventilator and the DS-7200, ensure that "Vent. Online" message is displayed for the connection status. Otherwise, the DS-7200 will not detect the ventilator alarm.● The alarm generation on the DS-7200 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 "2. Basic Operation Ventilator Alarm Input".● The Evita2dura / Evita4 / EvitaXL / 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-7200 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● There is a communication delay of 3 seconds between the DS-7200 system and the Evita ventilator. Therefore, if the alarm generated at the ventilator is resolved within 3 seconds, the ventilator alarm may not be generated at the DS-7200 system.● The DS-7200 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● There is a communication delay of 3 seconds between the DS-7200 system and the Savina ventilator. Therefore, if the alarm generated at the ventilator is resolved within 3 seconds, the ventilator alarm may not be generated at the DS-7200 system.
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 CAUTION

- The ventilator operation should be performed by well-trained and authorized personnel.
- For connecting the DS-7200 system and ventilator, use only the specified connection cable.
- Verify that the DS-7200 system and the ventilator are properly connected.
- When connecting the cable, verify that the main power of the DS-7200 system and the ventilator is OFF.
- For the SV-900, PB, Evita, and Savina ventilator alarm factor cannot be transmitted to the central monitor.
- Depending on the central monitor type and software version, ventilator alarm factor may not be displayed. For details, refer to our service representative.
- Check occasionally the communication status of the DS-7200 and the ventilator.
- Verify that the ventilator alarm is not generated, and the "Vent. Online" message is displayed.
- The "Check external alarm" 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-7200, 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.
- When connecting the PURITAN-BENNETT ventilator, follow the precautions below.
 - The serial port (RS-232C) of the ventilator should be set as follows.
Refer to the service representative of the ventilator manufacturer.
Baud Rate : 9600bps
Data Bit : 8bit
Parity Bit : None
(Stop Bit) : (1bit)
 - The DS-7200 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.
 - For Evita 2 dura / Evita 4 / 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
 - For PURITAN-BENNETT ventilator, AWP and AWF waveform cannot be displayed or recorded. Only the numeric data will be displayed.
 - For SV-300 and Servo-i/s, P-V loop and F-V loop cannot be displayed or printed. In addition, Insp Resistance, Exp Resistance, Compliance value cannot be displayed or printed on the ventilator numeric data display.
 - For SV-900, P-V loop, F-V loop and numeric data cannot be displayed or printed. Only the alarms will be generated.
 - For PURITAN-BENNETT ventilator, P-V loop and F-V loop cannot be displayed or recorded. Only the numeric data will be displayed.

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.</p> <p>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 Masimo® Model: DS-7210M

 CAUTION	<p>No Implied License</p> <p>Possession or purchase of this device does not convey any express or implied license to use the device with unauthorized sensors or cables which would, alone, or in combination with this device, fall within the scope of one or more of the patents relating to this device.</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	When disposing of the equipment, accessories, or components, use an industrial waste distributor. Do not dispose of as ordinary waste.
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Precautions about Transportation

For transporting the DS-7200 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	<ul style="list-style-type: none">The DS-7200 system is equipped with a built-in clock. When the power of the DS-7200 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.
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Precautions for Use of Lithium-Ion Battery Pack

 DANGER	<ul style="list-style-type: none">● This battery pack is intended for exclusive use with the DS-7200 system (or other specified equipment). Do not use with other equipment. Otherwise, the performance and life cycle of the battery pack deteriorates, and may cause leakage, heating, fuming, ignition, and explosion of the battery.● Do not disassemble or remodel the battery pack. If the security apparatus or protector inside the battery pack gets damaged, it may cause leakage, heating, fuming, ignition, and explosion of the battery.● Do not use the battery pack if leaked or transformed. If the security apparatus inside the battery pack is damaged, it may cause leakage, heating, fuming, ignition, and explosion of the battery.● When installing the battery to the device, ensure the connector direction is correct. If installed in opposite direction, it may cause leakage, heating, fuming, ignition, and explosion.● If the leaked solution of the battery gets into the eyes, do not rub the eyes. Wash thoroughly with clean water and immediately receive medical treatment from the doctor. If not treated soon, it may cause serious injury.
 WARNING	<ul style="list-style-type: none">● If the leaked solution of the battery gets on to the skin or clothes, immediately wash down with rinse water. If not treated soon, it may cause serious injury.● If the charging operation does not complete within specified time, immediately remove the battery pack from the monitor and unplug the power cable. Otherwise, it may cause leakage or heating of the battery.● Do not throw the battery pack into fire or apply heat. The insulator may melt, gas exhaust vent or security apparatus may get damaged, or electrolyte may ignite causing leakage, heating, fuming, ignition, and explosion of the battery.● Do not connect the (+) and (-) terminals of the battery with a wire or any other metal. Also, do not carry or store the battery with any metal such as necklace, hairpins, etc. The battery may short causing excessive current flow which may result in leakage, heating, fuming, ignition, and explosion of the battery, or heating of the metal (wire, necklace, hairpin, etc.)● Do not directly solder on to the battery pack. The heat may melt the insulator or damage the security apparatus which may result in leakage, heating, fuming, ignition, and explosion of the battery.● Do not put the battery pack in microwave oven or a pressure cooker. If heated suddenly or if sealed condition breaks, it may result in leakage, heating, fuming, ignition, and explosion of the battery.● Do not drive a nail in, hit with a hammer, step on the battery pack, or peel off or scratch the exterior tube. The battery may explode and transform causing short-circuit which may result in leakage, heating, fuming, ignition, and explosion of the battery.

 WARNING	<ul style="list-style-type: none"> ● Do not apply strong impact or throw the battery pack. This may result in leakage, heating, fuming, breakage, ignition, and explosion of the battery. Also, if the security apparatus incorporated in the battery gets damaged, the battery charges with abnormal current and voltage, which results in leakage, heating, fuming, ignition, and explosion. ● Do not get the battery pack wet with water, sea water or chemicals. If the security apparatus incorporated in the battery gets damaged, it may result in leakage, heating, fuming, ignition, and explosion of the battery pack. ● Do not connect the battery pack directly to power outlet or cigarette heater socket in a car. A high voltage application will cause excessive current flow and abnormal chemical reaction inside the battery. This may result in leakage, heating, fuming, ignition, and explosion of the battery. ● Do not use or leave the battery in a high temperature (80°C or over) such as near the fire or heater. If the resin separator gets damaged by heat, the battery pack may become unusable, or may short causing leakage, heating, fuming, ignition, and explosion. ● If the battery is leaking or generating an abnormal odor, immediately remove the battery away from the fire. The leaked electrolyte may cause heating, fuming, ignition, and explosion.
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 CAUTION	<ul style="list-style-type: none"> ● Do not peel off or scratch the exterior tube. ● Do not use or leave the battery in high temperature. It may result in leakage or deterioration of the performance / life cycle of the battery. ● Immediately stop using the battery if any abnormality is found during use. ● Do not use / store the battery in reach of infants. ● If not using the device for a long period of time, turn OFF the power of the monitor and unplug the power cable. Otherwise, it may result in leakage of the battery pack. ● When disposing of the Lithium-Ion Battery Pack, use an industrial waste distributor. Do not dispose of as ordinary waste. ● Users should not attempt to install or replace the battery pack. For installation and replacement of the battery pack, contact our service representative.
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To Prepare for Emergency Use

1. Accessories / Optional Accessories
 - (1) The ECG electrodes are consumable products. Always prepare extra supplies of electrodes.
 - (2) Verify that there is no wire break on the patient cable. Check the operation once a week.
2. Battery Pack
 - (1) The battery self-discharges even when not in use. If there is any possibility to use the battery in emergency, the power cable should be always connected to the power receptacle. To fully charge the empty battery, it takes approximately 3 hours when the monitor is not operating, and approximately 10 hours when the monitor is operating.



Refer to "2. Basic Operation To Use with the Battery Pack"

- (2) The performance of the battery deteriorates with repeated use. To maintain the initial performance, replace the battery at least once a year. It is recommended to indicate the start usage date on the battery so that the replacing date can be easily recognized.

Electromagnetic Compatibility

The performance of this device under electromagnetic environment complies with IEC 60601-1-2 (2007).

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.
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EMC Guidance

This equipment complies with IEC60601-1-2 (2007). However, if portable transmitter or wireless LAN equipment is used extremely nearby, the electromagnetic influence may largely exceed the compliance level and may cause unexpected phenomenon such as noise interference on the waveform, etc.

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-7200 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7200 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-7200 system uses RF energy only for its internal functioning of the equipment itself. 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	This DS-7200 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.
Harmonic Emissions IEC 61000-3-2	Not applicable	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Not applicable	

●Compliance to the Electromagnetic Immunity (1)

The DS-7200 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7200 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) IEC 61000-4-2	±6kV contact ±8kV air	±6kV contact ±8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient / burst IEC 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV: differential mode ±2kV: common mode	±1kV: differential mode ±2kV: common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U _T (>95% dip in U _T) for 0.5 cycle 40% U _T (60% dip in U _T) for 5 cycles 70% U _T (30% dip in U _T) for 25 cycles <5% U _T (>95% dip in U _T) for 5sec.	<5% U _T (>95% dip in U _T) for 0.5 cycle 40% U _T (60% dip in U _T) for 5 cycles 70% U _T (30% dip in U _T) for 25 cycles <5% U _T (>95% dip in U _T) for 5sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the DS-7200 system requires continued operation during power mains interruptions, it is recommended that the DS-7200 system is equipped with an internal battery (option) or is powered from an uninterruptible power supply.
Power Frequency (50/60Hz) Magnetic Field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

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

●Compliance to the Electromagnetic Immunity (2)

The DS-7200 system is intended for use in the electromagnetic environment specified below. The customer or the user of the DS-7200 system should assure that it is used in such an environment.

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the DS-7200 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 cannot 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-7200 system is used exceeds the applicable RF compliance level above, the DS-7200 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-7200 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-7200 System

The DS-7200 system is intended for use in an environment in which radiated RF disturbances are controlled. The customer or the user of the DS-7200 system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DS-7200 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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	5. Admit / Discharge of a Patient	Describes the procedure to admit or discharge a patient.	5
	6. Parameter Setup	Describes the procedure to set the measurement condition, size, scale, etc. for each parameter.	6
	7. Function	Describes about the functions such as arrhythmia analysis, trend, recall, etc.	7
	8. System Configuration	Describes about the system configuration such as night mode, alarm mode, display mode, etc.	8
Maintenance	9. Installation	Describes about the environment for use, wireless system, etc.	9
	10. Maintenance	Describes about the maintenance, troubleshooting of this equipment.	10
	11. Technical Information	Lists the specification, default settings, pin assignments of external connector, etc.	11
	12. Accessories	Lists the accessories and optional accessories for this equipment.	12

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Installation

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Precautions for Installing the Equipment

This section describes the environmental condition to use the DS-7200.



The installation of this equipment should be performed by our service representative or a person who is well acquainted with this equipment.

Precautions about the Operating Environment

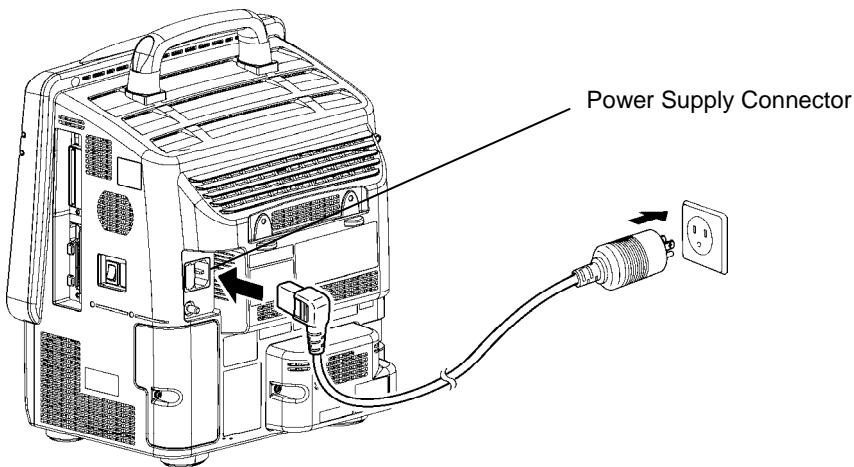
- The following environmental conditions should be observed when operating the DS-7200.
 - Surrounding Temperature : 10 to 40°C
 - Relative Humidity : 30 to 85% (non-condensing)
- The DS-7200 is intended for patient monitoring in ICU, CCU, surgery, and ward. Direct use in MRI environment or home-care should be avoided.
- The power source should fulfill the following condition.
 - Use a hospital grade 3-way outlet. If a hospital grade outlet is not available, make sure to connect the equipotential ground terminal with the accessory ground cable.
 - Verify the power voltage and frequency before connecting to an AC power source.
 - Use a power source that can provide adequate power to the device.
- Pay attention when installing or storing the device. Do not install or store in the following locations.
 - where chemicals are stored or gases may be present
 - where the equipment will be subject to splashing water or humidity from a nebulizer or vaporizer
 - where the equipment will be subject to direct sunlight
 - Unstable place with inclination, vibration, or shock.
 - where it is difficult to unplug the power cable
- Ensure proper ventilation to cool the device.
 - A minimum space of 5 cm is required between vents on the rear side of the monitor and the wall. If the monitor is embedded in a wall or surrounded by a wall, a minimum space of 10 cm is required.
- DS-7200 must be placed on a level surface. If installed sideways, water or chemicals may enter the equipment and cause damage. For the built-in recorder, it may cause the recording paper to get jammed.



If the DS-7200 system is used in an environment not fulfilling the above conditions, not only the monitor will not deliver its maximum performance, but also damage to the equipment may occur and safety can not be ensured. If using in an environment other than specified above, contact our service representative.

Power Source and Ground Connection

Connect the accessory power cable (CS-34) to the hospital grade outlet with ground terminal.



WARNING

- Use only the supplied 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.
- The power cable must be connected to the 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.

NOTE

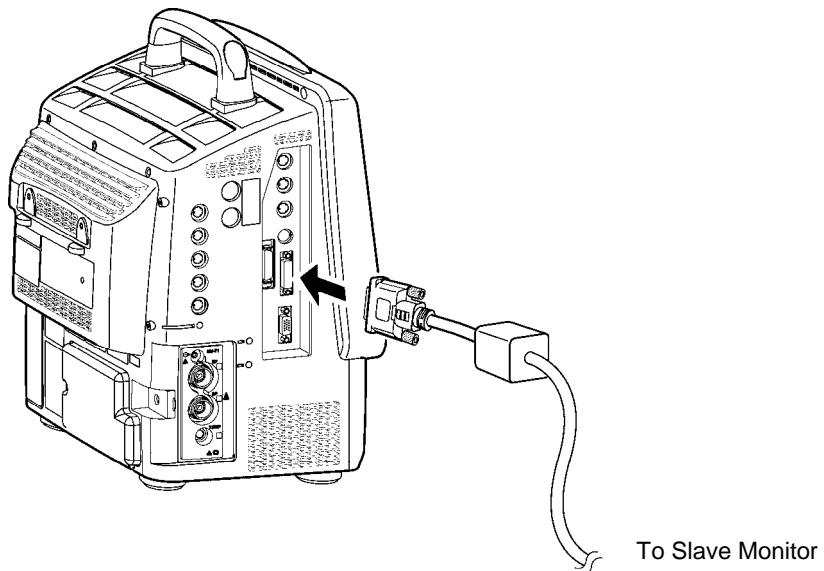
Equipotential Grounding

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

Connecting the Slave Monitor

The patient monitor is equipped with DVI-I connector for slave monitor output which allows connection of commercially available display unit by digital connection or analog RGB connection. When connecting, contact our service representative.

WARNING	The slave monitor output of the DS-7200 is not isolated. If connecting a commercially available display unit which does not comply with IEC 60601, use an isolation transformer to ensure there is no excessive electric leakage current for safety of the operator and the patient.
----------------	--



Slave Monitor Specification

- A commercially available monitor satisfying the following condition should be used.
 - Resolution : XGA size (1024dot x 768dot)
 - Horizontal Frequency: 48.4kHz
 - Vertical Frequency : 60Hz
 - Cable Length : when connecting analog RGB monitor 10m(max)^{*1}
when connecting digital monitor 10m(max)^{*2}
- *1 : For analog RGB connection, commercial DVI-I male↔ VGA HD15 female connector changer and VGA cable are required.
: If using a cable longer than 3m, use low-loss cable to maintain the performance.
- *2 : For digital connection, use the following digital display connection cable to maintain the performance.

<i>Model Type</i>	<i>Length</i>
CJZ-01SS3	3m
CJZ-01SS5	5m
CJZ-01SS10	10m

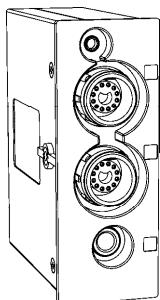
Attaching the Option Unit

There are following 3 types of Option Unit. Only 1 unit can be attached at a time.

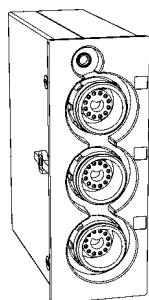
【Lineup of Option Unit】

Model Type	Measurement Parameter		
	BP	TEMP	Cardiac Output
HU-71	2ch	1ch	No
HU-72	3ch	No	No
HU-73	1ch	1ch	Yes

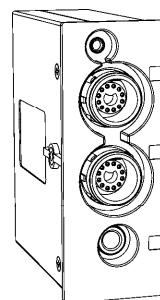
HU-71



HU-72



HU-73



The DS-7200 will be delivered with the option unit attached.



Users should not attempt to attach the option unit to the monitor.

Attaching the CO₂ Unit

The following CO₂ unit can be connected to the DS-7200. Only 1 unit can be connected at a time.

MGU-721 : RGM Interface Unit (Mainstream CO ₂ Interface Unit)	It is used by connecting the Capnostat 5 (RESPIRONICS®).
MGU-722 : Microstream® CO ₂ unit	It is used by connecting the sampling tube manufactured by Oridion® Medical 1987 Ltd.

The DS-7200 will be delivered with the CO₂ unit attached.

 CAUTION	Users should not attempt to attach the CO ₂ unit to the monitor. When changing the CO ₂ option unit (MGU-721/MGU-722), it is necessary to perform setting on the "Change Equipment Configuration (CO ₂)" of the CONFIGURATION menu.
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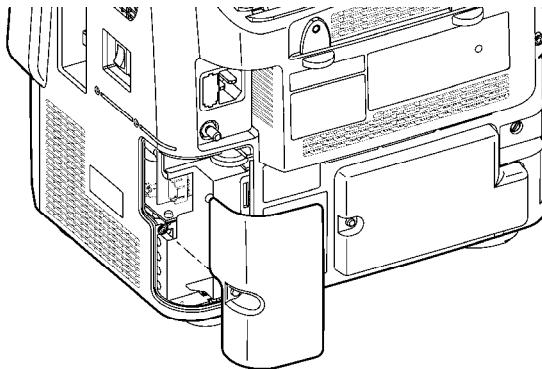
Attaching the OAO-12B Battery Pack

By using the optional battery pack, the DS-7200 can be used during transportation.

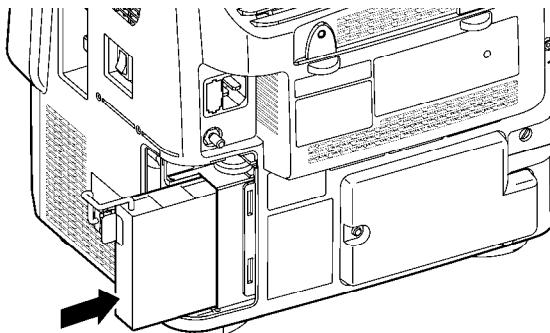
⚠ CAUTION

The battery pack will be installed by our service representative. Users should not attempt the process.

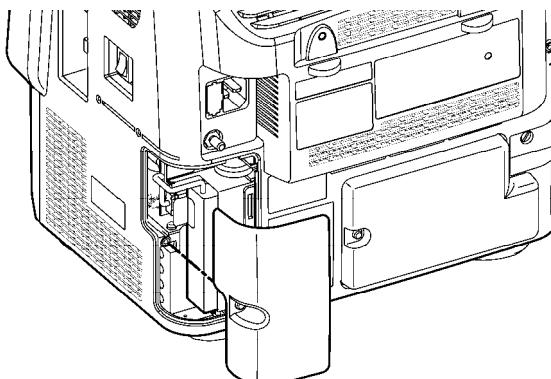
- 1 Remove the screw on the battery cover and detach the cover from the rear of the DS-7200.



- 2 Insert the battery in the arrow direction.



- 3 Screw on the battery cover.

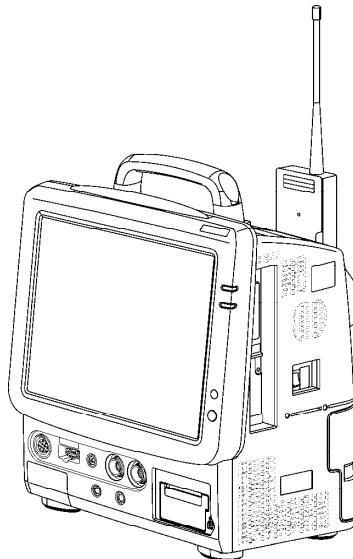
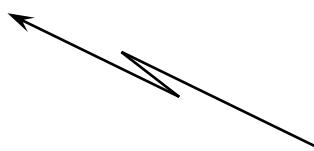
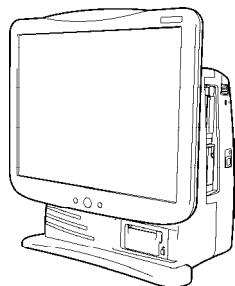


Wireless Network Construction

This section explains the procedure on how to use this equipment with telemetry system.

The DS-7200 system incorporates a telemetry transmitter module to construct a wireless network system which enables to display the data measured on the DS-7200 on the central monitor.

DS-7600 System Central Monitor



DS-7200 System Bedside Monitor

DANGER

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

WARNING

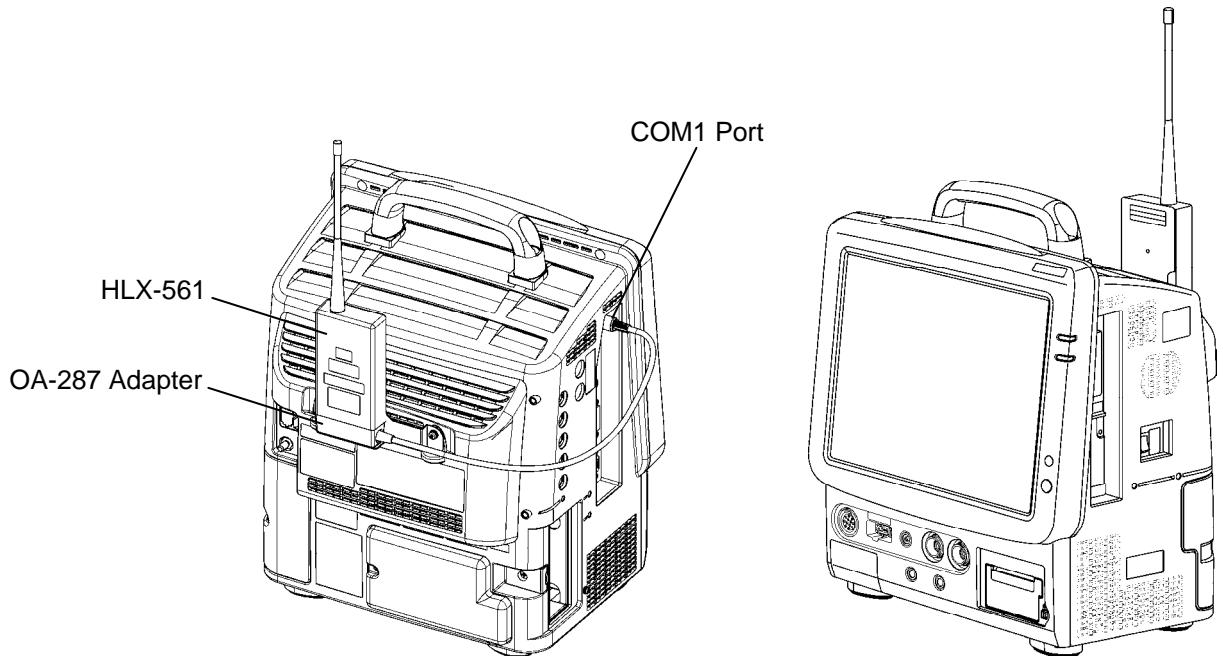
- A password can be set to access the channel ID setup menu to allow only the telemetry channel administrator to change the channel ID.
- Some wireless combinations of telemetry transmitters may generate interference with other devices.
- Before selecting a channel, verify that it will not interfere with other channels.
- Make sure the telemetry manager of your system is aware of any changes to the telemetry channels.
- If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference.

CAUTION

The setup of channel ID and group ID should be performed only by the telemetry manager of your system or our service representative. Users should not perform this procedure as malfunction to the equipment may occur. A password requirement can be set to change the channel ID and group ID.

To Attach the Telemetry Module

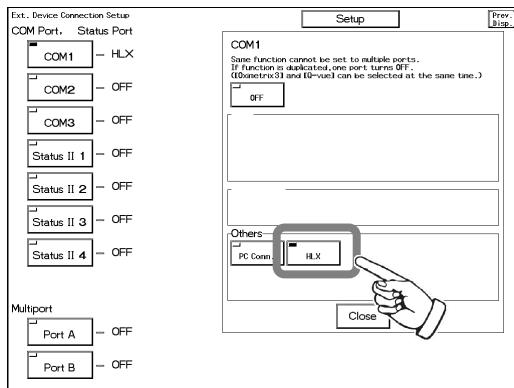
- 1 Connect the HLX-561 to the COM1 connector on the DS-7200 using the optional OA-287 Adapter.



Reference

Refer to the ASSEMBLY INSTRUCTION of OAT-8172A to use HLX-801 instead of HLX-561.

- 2 Press the **Menu** → **System Configuration** → **Pre-Set** → **Hospital Setup** → **Ext. Device Connection** → **COM1** keys.



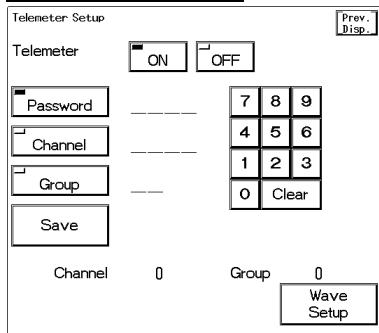
Select **HLX** for COM1 Port.

Channel ID Setup

Once the transmitting channel ID and group ID are programmed, these will be retained even after the main power is turned OFF.

1 Insert the program software card.

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



The telemeter setup menu will be displayed.

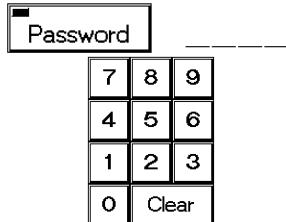
3 Select ON/OFF of telemetry transmission.

Telemeter **ON** **OFF**

If **OFF** is selected, telemetry transmission will not be performed. The channel ID on the home display will be displayed as "ch OFF".

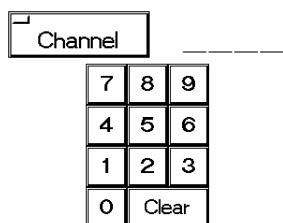
To perform telemetry transmission, select **ON**.

4 Enter the password.



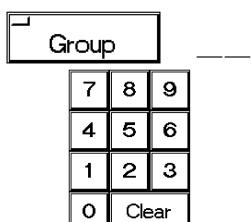
Press the **Password** key, and enter the password.
The entered number will be displayed as "****".

5 Set 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.
The set channel ID will be displayed on the upper left of the home display.

6 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 of 00 to 63.

7 Save the channel ID and group ID.

Save

Pressing the **Save** key will 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.

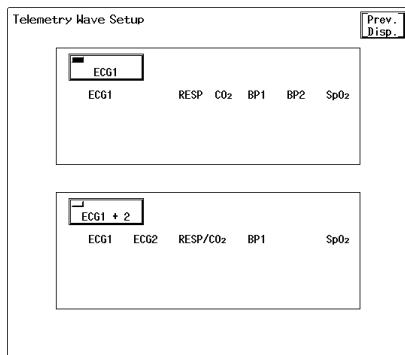
- "Invalid password"** : The entered password is incorrect. Enter the password again and press the **Save** key.
- "Invalid data"** : The entered channel ID or group ID is outside the allowable range. Enter the ID again and press the **Save** key.

8 Verify the stored channel ID and group ID.

【Example】

Channel 1 0 0 2 Group 0

9 Press the **Wave Setup** key to display the Telemetry Wave Setup menu.



Select the transmitting waveform from **ECG1** or **ECG1+2**.

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

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

One of the waveform from CO₂ and RESP will be transmitted depending on the APNEA source selection.

⚠ CAUTION

- If the BP/TEMP measurement unit is kPa/°F, it will be converted to mmHg/°C when transmitted to the central monitor.
- 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.
- On a wireless network, the alarm generated on the DS-7200 will be transmitted to the central monitor with 15 seconds delay.
- BP waveform with a scale above the programmed scale cannot 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.

NOTE	<ul style="list-style-type: none"> When the DS-7200 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 Display】	
	HR RR	301bpm and above 151Bpm and above	Calculates based on ECG waveform. 150Bpm
	BP	–51mmHg (–6.8kPa) and below 301mmHg (40.1kPa) and above	Calculates if impedance respiration. –50mmHg (–6.7kPa) 300mmHg (40.0kPa)
	TEMP	–0.1°C (31.9°F) and below 50.1°C (122.1°F) and above	If the measurement unit is kPa, it will be converted to mmHg when transmitted to the central monitor. 0°C (32°F) 46.1°C (115.0°F)
	CO ₂ (mmHg) CO ₂ (kPa, %)	100mmHg and above 13.3 (kPa, %) and above	If the measurement unit is °F, it will be converted to °C when transmitted to the central monitor. 99mmHg 13.2 (kPa, %)
	<ul style="list-style-type: none"> *If the temperature measurement value is 46.1°C (115.0°F) and above, 46.1°C (115.0°F) will be displayed at the central monitor. 		
	<ul style="list-style-type: none"> The waveform not displayed on the home display will not be transmitted even if set on the Telemetry Wave Setup menu. 		

Wired Network Construction

This section describes the procedure on how to use this monitor on a wired system.

There are following 2 types of DS-7200 system wired network composition.

1) DS-LANII Network Connection

The central monitor (DS-7600, DS-5700, etc.) with central ID “1” will function as the network administrator.

2) DS-LANIII Network Connection

The central monitor (DS-7600, etc.) with central ID “1” will function as the network administrator.



The setting for the wired network (DS-LANII/ DS-LANIII) can be performed on the Monitor Setup menu. For procedure, refer to "8. System Configuration ●DS-LAN Setup".

⚠ WARNING

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

⚠ CAUTION

- When connecting to the DS-LAN network, perform “DS-LAN Setup” in the Monitor Setup menu and restart the system before connecting the LAN cable.
- 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 connected to the wired network, make sure that there are no other bedside monitors with the same Bed ID. If there are more than one bedside monitors with the same Bed ID, the duplicated bedside monitors cannot be monitored on the central monitor.
- 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
- As the DS-7200 does 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-7200 system, it will be corrected to the time/date of the central monitor.
- On some central monitors depending on the model type or software version, the setups for “HR Low Limit for VT” and “HR Low Limit for Run” cannot be performed.
- On a wired network, the alarm generated on the DS-7200 will be output to the network with a maximum delay of 1 second, and to the central monitor with a total delay of 2.5 seconds.
- In case of DS-LANII network, if the HR/PR source is **BP** (Or, if **Auto** selects BP for HR/PR source), the ECG waveform will not be transmitted on the network. On the central monitor, PR_IBP value will be displayed instead of HR. However, on some central monitor depending on the model type, the HR value from ECG will be displayed on the NIBP list and ST measurement list. Refer to the operation manual for the respective central monitor.
- In case of DS-LANIII network, refer to the operation manual for the central monitor.

 CAUTION

- In case of DS-LANII network, if the RR/APNEA alarm source is other than **Impedance** (Or, if **Auto** selects a setting other than impedance for RR/APNEA alarm source), the respiration waveform will not be transmitted on the network. In addition, if the RR/APNEA alarm source is other than **CO₂** (Or, if **Auto** selects a setting other than CO₂ for RR/APNEA alarm source), the CO₂ waveform will not be transmitted on the network. In case of DS-LANIII network, refer to the operation manual for the central monitor.
- Depending on the central monitor model type, the ST display will be distorted if the ECG lead (ECG1 or ECG 2) is changed on the DS-7200. Redrawing the ST display will return the display to normal.
- On the central monitor, the respiration waveform and RR value based on the RR/APNEA alarm source selected on the DS-7200 will be displayed. The RR and APNEA monitored on the central monitor and the DS-7200 will be the same.
- 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-7200 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. For the ST display, overlap waveform will not be displayed on the DS-5800N/NX/NX^{MB} until 15 minutes have passed since the reference waveform is set on the DS-7200.
 - 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.
 - If a central monitor which does not support the "kPa" measurement unit is used, and the measurement unit on the bedside monitor is set to "kPa", BP waveform/numeric data, NIBP data, NIBP list, etc. with "kPa" unit will be treated as not measured data and will not be displayed on the central monitor. Also, the alarm limit setup from the central monitor cannot be performed.
 - 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 wired network, waveform, numeric data, alarm of TEMP3 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.
 - 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 SpO₂ (PR_SpO₂) lower alarm limit is set, and "——" is displayed for the SpO₂ (PR_SpO₂) value due to a cause such as SpO₂ sensor off, etc. on the bedside monitor, it will be notified as SpO₂ (PR_SpO₂) lower alarm on some central monitors even if the alarm is not generated on the bedside monitor.

⚠ CAUTION

- There are following restrictions when connecting the DS-7200 system to the DS-LANIII network.
 - If the measurement unit for BP (mmHg/kPa) and temperature (°C/°F) is different between the bedside monitor and the central monitor, the corresponding waveform and numeric data will not be displayed on the central monitor.
 - The displayable waveform, numeric data, alarm will differ depending on the central monitor model type. Please also refer to the operation manual of the central monitor.
- There are following restrictions when recording the DS-7200 data on the central monitor recorder.
 - The DS-7200 can not perform the recording with the AU-5500N recorder.
 - 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 built-in recorder will be printed as “N” on the central recorder.
 - 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** (Or, if **Auto** selects BP for 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** (Or, if **Auto** selects other than impedance for RR/APNEA alarm source), respiration waveform will not be output on the central recorder.
 - If the RR/APNEA alarm source is other than **CO₂** (Or, if **Auto** selects other than CO₂ for RR/APNEA alarm source), 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-7200, HR measurement value from ECG will be recorded for the HR value and ST trend.

When the DS-7200 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.

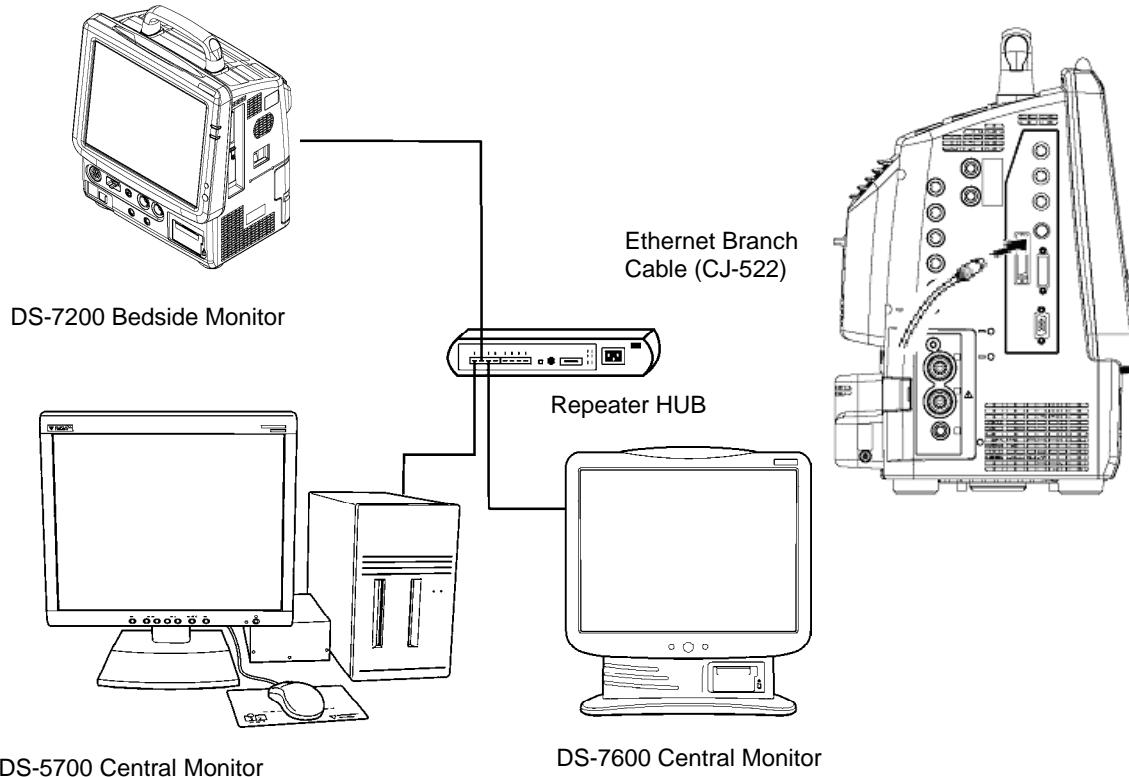
NOTE

	【Out of range】	【Central Monitor】
HR	301bpm or above	300bpm
RR	151Bpm or above	150Bpm
BP	–51mmHg or below 301mmhg or above	–50mmHg 300mmHg
	–6.8kPa or below	–6.7kPa
	40.1kPa or above	40.0kPa
TEMP	–0.1°C or below 50.1°C or above	0°C 50.0°C
	31.9°F or below 122.1°F or above	32°F (DS-LANIII only) 122°F (DS-LANIII only)
CO ₂	100mmHg or above	99mmHg
CO ₂	13.3 (kPa, %)	13.2 (kPa, %)

DS-LANII Connection

By connecting a LAN cable to the DS-LAN connector on the DS-7200, a wired network can be constructed.

The DS-7600 system, DS-5700, and other central monitor with the central ID “1” will function as the network administrator.



DS-7200 Bedside Monitor

Ethernet Branch
Cable (CJ-522)

Repeater HUB

DS-7600 Central Monitor

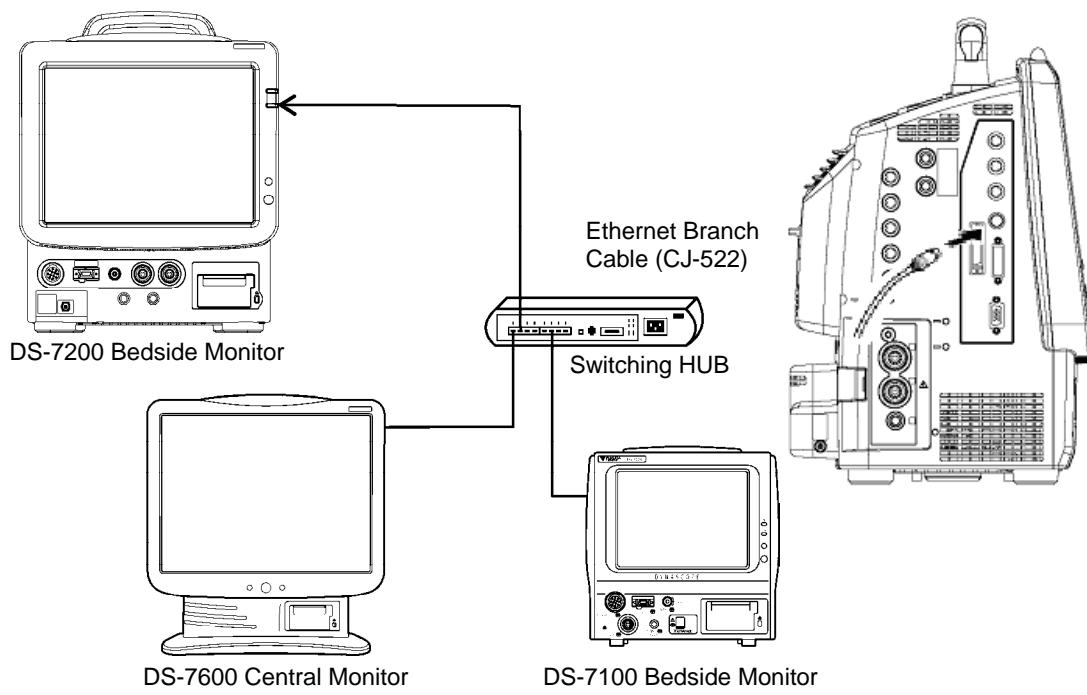
⚠ CAUTION

- Make sure that the “DS-LAN Setup” on all the bedside monitors and central monitors are set to **DS-LANII** before connecting the monitors to the network.
- When connected to the DS-LANII network, set the Bed ID in the range from “001” to “048”.
- If using a HUB for the DS-LANII network construction, make sure to use a repeater HUB recommended by Fukuda Denshi.

DS-LANIII Connection

By connecting a LAN cable to the DS-LAN connector on the DS-7200, a wired network can be constructed.

The DS-7600 system and other central monitor with the central ID “1” will function as the network administrator.

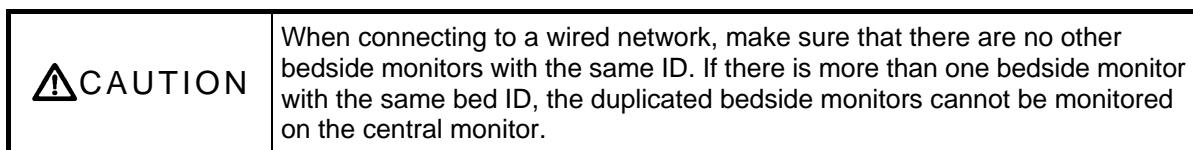
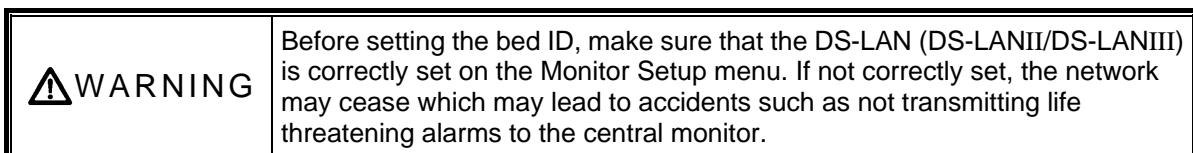


CAUTION

- In order to connect to the DS-LANIII network, the software version needs to be the version which supports the DS-LANIII. For details, refer to our service representative.
- Make sure that the “DS-LAN Setup” on all the bedside monitors and central monitors are set to **DS-LANIII** before connecting the monitors to the network.
- When connected to the DS-LANIII network, set the Bed ID in the range from “001” to “100”.
- If using a HUB for the DS-LANIII network construction, make sure to use a switching HUB recommended by Fukuda Denshi.

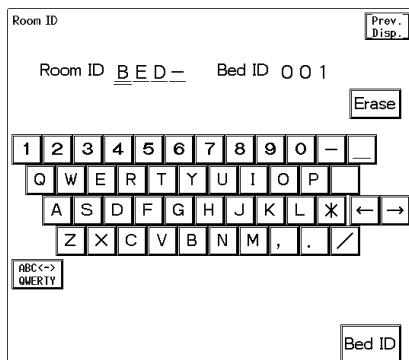
Room/Bed ID Setup

To connect to a wired network, it is necessary to set the Room/Bed ID. Once the Room/Bed ID is set, it will be stored even after the power is turned OFF.



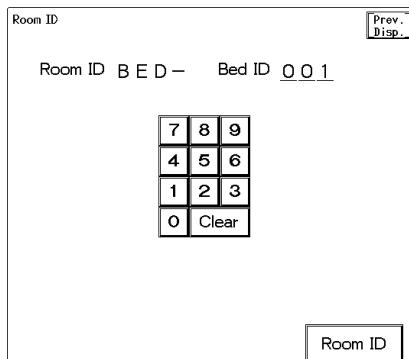
1 Press the **Menu** → **Admit / Discharge** → **Bed ID** keys.

2 Set the Room ID.



The Room / Bed ID setup menu will be displayed.
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.

For DS-LAN II network, set the ID in the range from 001 to 048.

For DS-LANIII network, set the ID in the range from 001 to 100.

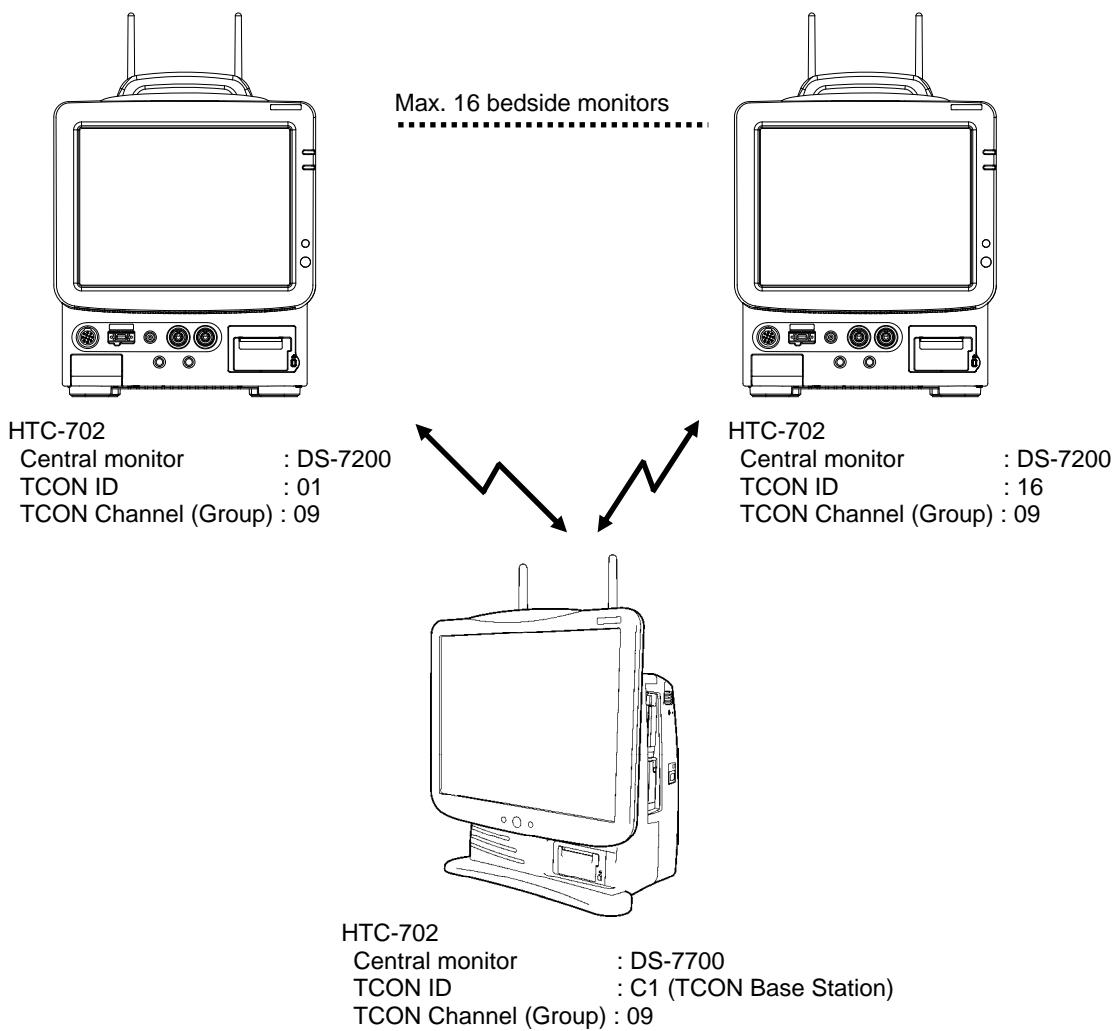
Bidirectional Wireless Communications (TCON) System

This section explains the setup procedure to use the optional bidirectional wireless communications module, HTC-702.

Using the HTC-702, bidirectional wireless communications with the central monitor (DS-7700, etc.) is possible.

- The numeric data measured on the DS-7200 can be transmitted to the central monitor.
- The alarm limits can be set both on the bedside monitor and central monitor.
- NIBP start/stop control can be performed from the central monitor.

TCON System Configuration Example



- CAUTION**
- Check that the TCON radio wave strength between the central monitor and bedside monitor is sufficient. Make sure that “” mark is displayed.
 - Check that the TCON Channel (Group) is the same for the bedside monitor and the central monitor in the same TCON group.
 - Do not move the TCON device during operation. Otherwise, symptoms such as being unable to communicate, unstable communication, or poor reception may occur.

 CAUTION

- When using the TCON system, pay attention to the following.
 - The medical institution (hereinafter referred to as "Institution") must execute investigation required to prevent interference including types of radio waves, frequencies, and antenna power if wireless equipment is already installed and being used in the facility.
 - Even if this device is installed within the range of radio communication, the communication may not be possible due to noise or multi-path phasing etc. Always consider this thoroughly before use.
 - Do not install this device in an area where it will be subject to splashing water. Water entering the equipment may cause the equipment to malfunction or be damaged.
- In managing the TCON system, make sure to follow the precautions below.
 - The Institution should appoint a person (hereinafter referred as the "Overall Manager") to manage the wireless devices for the whole facility.
 - When installing the TCON, the Overall Manager has to receive an explanation of the precautions for use of the TCON from the manufacturer or sales representative.
 - The Overall Manager is responsible for the maintenance and storage of the equipment.
 - The Overall Manager should create a management log (hereinafter referred to as the "log"), which contains a list of the management status of the wireless channels for the whole facility. When assigning or changing wireless channels, register it in the log, and give proper instructions to the TCON user.
 - The user needs to verify the transmitting/receiving operation before use.
 - If interference or breakdown occurs in the communication, the TCON user is required to stop using the TCON and to inform the Overall Manager of the problem. The Overall Manager is to deal with the problem properly and/or contacts the nearest Fukuda Denshi representative for service.

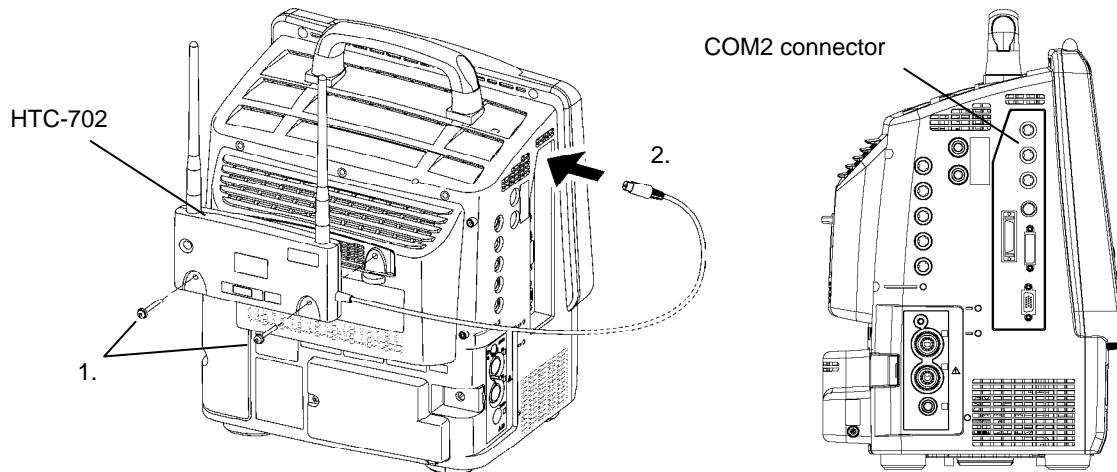
⚠ CAUTION

- Precautions for operations
The Bidirectional Wireless Communications Module (TCON) uses radio waves to transmit data. Therefore, necessary precautions need to be taken for the characteristics and difficulties of using the device that emits radio waves. The TCON user should fully understand these precautions beforehand, and use the TCON device safely.
Furthermore, situations in which interference may occur are outlined below. In such cases, pay special attention to the condition of the patient connected to the bedside monitor, and eliminate the cause of interference.
 1. The patient's data may become mixed with a different patient's data due to interference.
 - When there are multiple TCON communication devices set to the same TCON ID and channel (group).
 2. When symptoms such as being unable to communicate, unstable communication, or poor reception may occur.
 - When the radio communication is bad because there are metal, concrete, or other such obstacles between the Bidirectional Wireless Communications Modules (TCON).
 - When a different wireless device is using the same frequency (channel).
 - When there are other TCON devices nearby using different channels (groups).
 - When a cell telephone or other wireless device is being used nearby.
 - When citizens broadcast bands such as amateur radio or truck radios are used in the vicinity of the TCON operating area. When the TCON device is installed or moved to a location that is outside the radio communication range.
 - When a computer or word processor, or electrical device that has an internal computer, is used near the TCON device antenna.
 - When the TCON device is installed or moved to a location that is outside the radio communication range.
 - If a nearby different TCON group is set with a TCON channel frequency that is too close to the channel frequency set for the current TCON group.
- Follow the instructions of the Overall Manager for the wireless channel when setting the TCON ID or channel (group) to prevent interference within the same institution.
 - For the TCON ON/OFF setup, if the "OFF" is selected, the message such as "Check TCON Comm." will not be displayed.
 - Follow the instructions of the Overall Manager for the wireless channel when setting the TCON ID or channel (group) to prevent interference within the same institution.
 - For the TCON ON/OFF setup, if the "OFF" is selected, the message such as "Check TCON Comm." will not be displayed.
 - There are following restrictions when connecting the DS-7200 system to the TCON Network.
 - If the measurement unit for temperature is "°F", the central monitor can not receive the measurement data for temperature. In addition, the alarm settings for temperature can not be operated from the central monitor.
 - If the measurement unit for BP is "kPa", the central monitor can not receive the measurement data for NIBP, BP1, and BP2. In addition, the alarm settings for NIBP, BP1, and BP2 can not be operated from the central monitor.
 - The NIBP measurement cannot be started from the central monitor via TCON system if the NIBP measurement interval is set to **2 min** / **2.5 min** / **3 min** / **5 min** or during the 1-minute measurement. However, it can be stopped.
 - If the measurement unit of CO₂ concentration is "mmHg", the CO₂ value of 100mmHg or above will be transmitted as 99mmHg even within measurement range.

HTC-702 Connection

Install the HTC-702 at the back of the DS-7200.

1. Fix the HTC-702 to the DS-7200 in place using the screws (2 locations), which are included in the HTC-702 accessories.
2. Connect the Connecting Plug of the HTC-702 cable to the COM2, serial connector, on the left side of the DS-7200.



If it is difficult to install the HTC-702 at the back of the DS-7200 due to limitations of space, the optional OA-702, Wall mount & tabletop stand for HTC-702, is available.

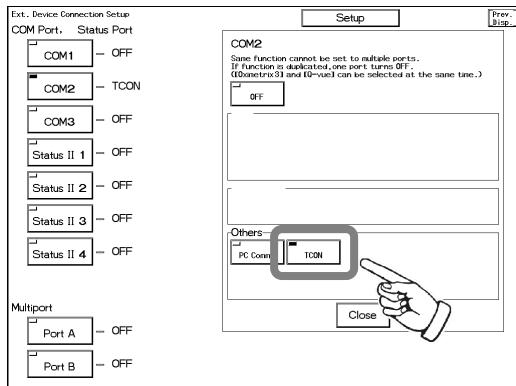


Refer to the "OA-702, Wall mount & tabletop stand for HTC-702, Instruction Manual" for detailed information of attaching HTC-702 to OA-702.

TCON ID / TCON Channel Setup

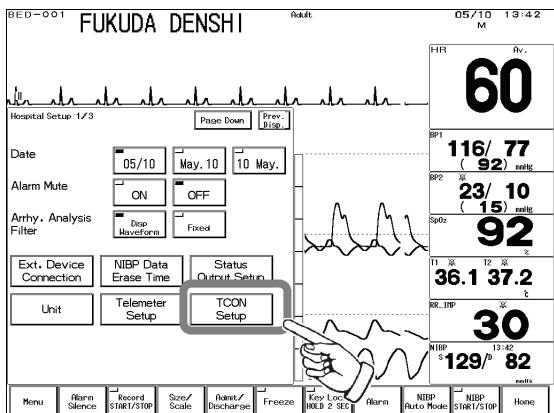
To connect to the TCON network, TCON ID / TCON Channel Setup are required.
The set TCON ID /TCON Channel will be effective even after the power is turned OFF.

- 1 Press the **Menu** → **System Config.** → **Pre-Set** → **Hospital Setup**
→ **Ext. Device Connection** → **COM2** keys.

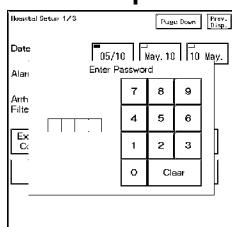


Select **TCON** for the COM2 port.

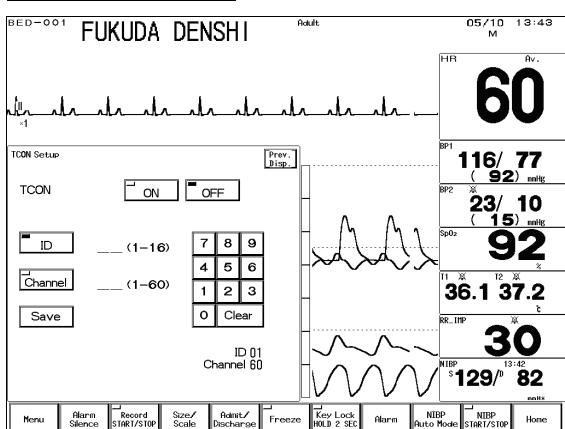
- 2 Press the **Menu** → **System Config.** → **Pre-Set** → **Hospital Setup**
→ **TCON Setup** keys.



- 3 Enter the password to display the TCON Setup screen.



Use the numeric keypad to enter the password
The entered number will be displayed as “* * * *”.



- 4** Enter the TCON ID used in the bidirectional communications group and the TCON channel for the module.

 ID ____ (1-16)

Press the **ID** key, and enter the TCON ID.

Use the numeric keypad to enter the ID in the range from 01 to 16. The ID should not be duplicated with other bedside monitor with the same TCON channel (group).

- 5** Enter one TCON channel used in the same TCON Group.

 Channel ____ (1-60)

Press the **Channel** key, and enter the TCON Channel.

Use the numeric keypad to enter the TCON channel in the range from 01 to 60. The same channel should be set for the monitors within the same TCON group (channel).

- 6** Save the TCON ID and channel.

Press the **Save** key to store the TCON ID and Channel.

If an error is found on the TCON communication, the "Check TCON Comm." message will be displayed.

 Save

If the entered TCON ID or channel is outside the programmable range or one of them is left blank, **Save** key will not function. Enter the appropriate TCON ID or channel and press the **Save** key again.

- 7** Verify the stored TCON ID and channel.

ID 01
Channel 20

- 8** Start the TCON communication.

TCON

 ON  OFF

ON will turn ON the bidirectional wireless communication.

OFF will turn OFF the bidirectional wireless communication.

Setup Item Synchronizing within the Same Network / TCON System

When monitoring on a wired network (DS-LANII/DS-LANIII) or TCON system, some settings will synchronize with other monitors in the same network. (If a setting is changed on one monitor, the same change will apply to the other monitor.)

Also, there are some operations that will synchronize with other monitors. (If a operation is performed on the DS-7200, the same operation will be performed on the central monitor.)

The following list shows the setup items/operations which will synchronize within the same network (DS-LANII/DS-LANIII) or TCON system. However, there are some items with "Yes" (synchronize) that may not synchronize depending on the type of central monitor. Please also refer to the operation manual of the central monitor.

Ex) Sex (Male/Female)

The same setting will apply to all monitors within the same network. If the sex is changed on the DS-7200, it will also change on the central monitor. And, if the sex is changed on the central monitor, it will also change on the bedside monitor.

NOTE	Depending on the type of central monitor, not all setup items listed below are available and cannot be synchronized. Please also refer to the operation manual of the central monitor.		
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DS-7200 Operation	Synchronize within the Same Network		Synchronize within the TCON System
	DS-LANII	DS-LANIII	
Monitoring			
Discharge	Yes	Yes	Yes
Monitor Suspend	No	No	No
ON/OFF of Night Mode	No	Yes	Yes
NIBP Measurement	No	Yes	Yes

DS-7200 Setup Item	Synchronize within the Same Network		Synchronize within the TCON System
	DS-LANII	DS-LANIII	
Admit/Discharge			
Patient ID	Yes (Only 10 digits)	Yes	Yes
Patient Name	No	Yes	Yes
Sex (Male/Female)	Yes	Yes	Yes
Age	Yes	Yes	Yes
Height	Yes	Yes	Yes
Weight	Yes	Yes	Yes
BSA	Yes	Yes	Yes
Blood Type	No	No	No
Birth Date	Yes	Yes	Yes
Patient Classification	Yes	Yes	Yes
Pacemaker	Yes	Yes	Yes
Impedance Mode	No	No	No
Filter Mode	No	No	No
Room/Bed ID	Bed ID	Yes (Only display)	Yes (Only display)
	Room ID	Yes (Only display)	Yes (Only display)

Setup Item	Synchronize within the Same Network		Synchronize within the TCON System
	DS-LANII	DS-LANIII	
Alarm			
Alarm Suspend	Yes	Yes	Yes
Alarm Silence	Yes	Yes	No
HR, PR_SpO ₂ , PR_IBP	Yes	Yes	Yes
ASYSTOLE	Yes (Max. 8sec.)	Yes	Yes
VF	Yes	Yes	Yes
VT	Yes	Yes	Yes
SLOW_VT	No (Synchronize with VT)	Yes	Yes
RUN	Yes	Yes	Yes
COUPLET	No	Yes	Yes
PAUSE	No	Yes	Yes
BIGEMINY	Yes	Yes	Yes
TRIGEMINY	No	Yes	Yes
FREQUENT	Yes	Yes	Yes
TACHY	No	Yes	Yes
BRADY	No	Yes	Yes
HR Low Limit for VT ^{*1}	Yes	Yes	Yes
HR Low Limit for RUN ^{*1}	Yes	Yes	Yes
ST1-ST12 (mm)	Yes	Yes	Yes
ST1-ST12(mV)	Yes	Yes	Yes
BP1(mmHg) ^{*2}	Yes	Yes	Yes
BP1 (kPa) ^{*2}	Yes	Yes	No
BP2-BP5 (mmHg) ^{*2}	Yes	Yes	No
BP2-BP5 (kPa) ^{*2}	Yes	Yes	No
CVP (mmHg) ^{*2}	Yes	Yes	Yes
CVP (cmH ₂ O) ^{*2}	Yes	Yes	Yes
RR_IMP, RR_CO ₂ , RR_VENT ^{*3}	Yes	Yes	Yes
RR_GAS	Yes	Yes	Yes
APNEA	Yes	Yes	Yes
SpO ₂	Yes	Yes	Yes
NIBP (mmHg)	Yes	Yes	Yes
NIBP (kPa)	Yes	Yes	No
TEMP1-TEMP3 (°C)	Yes (Only T1, T2)	Yes (Only T1, T2)	Yes (Only T1, T2)
TEMP1-TEMP3 (°F)	No	Yes (Only T1, T2)	No
Tb (°C)	No	No	No
Tb (°F)	No	No	No
EtCO ₂ (mmHg)	Yes	Yes	Yes
EtCO ₂ (kPa)	Yes	Yes	Yes
EtCO ₂ (%)	Yes	Yes	Yes
InspCO ₂ (mmHg)	Yes	Yes	Yes
InspCO ₂ (kPa)	Yes	Yes	Yes
InspCO ₂ (%)	Yes	Yes	Yes

*¹ On some central monitors depending on the model type or software version, the setups for "HR Low Limit for VT" and "HR Low Limit for RUN" cannot be performed.

*² When operating on the central monitor, the increment on the central monitor will be applied regardless of the "BP Alarm Increment" setting. Refer to the operation manual of the central monitor.

*³ When operating on the central monitor, the increment on the central monitor will be applied regardless of the "RR Alarm Increment" setting or the patient classification setting. Refer to the operation manual of the central monitor.

Setup Item	Synchronize within the Same Network		Synchronize within the TCON System	
	DS-LANII	DS-LANIII		
Alarm				
Alarm Setup				
Alarm Suspend Time	No	No	No	
Alarm Silence Time	No	No	No	
Alarm Limit Display	No	No	No	
Status Alarm Control	No	No	No	
Alarm Occurrence at NIBP Failure	No	No	No	
Parameter Setup				
ECG				
Lead	Yes	Yes	No	
Size	Yes	Yes	No	
Filter	Yes	Yes	No	
Pulse Tone	No	No	No	
HR/PR Alarm Source	No	No	No	
Auto Lead Switch	Yes	Yes	No	
Pacemaker Pulse	Yes	Yes	No	
Pace Pulse Mask Time	Yes	Yes (Only Display)	No	
AC Filter	Yes	Yes	No	
ECG Drift Filter	Yes	Yes	No	
3 lead Override	No	No	No	
Pace Pulse Detection	Yes	Yes	Yes	
RESP				
Size	Yes	Yes	No	
CVA detect	Yes	Yes	Yes	
RR/APNEA Alarm Source	No	No	No	
Impedance Measurement	No	No	No	
RR Sync. Indicator	No	No	No	
SpO₂ (DS-7210)				
Size	Yes	No	No	
SpO ₂ SEC Alarm	No	No	No	
HR/PR Alarm Source	No	No	No	
Ignore NIBP	No	No	No	
SpO₂ (DS-7210M)				
Size	Yes	No	No	
HR/PR Alarm Source	No	No	No	
Ignore NIBP	No	No	No	
SpO ₂ Averaging	No	No	No	
Pulse Sensitivity	No	No	No	
FAST SAT	No	No	No	
PI Display	No	No	No	
Signal IQ Wave	No	No	No	
NIBP				
Auto Mode	No	Yes	Yes	
Quick Measurement	No	No	No	
End of Measurement Tone	No	No	No	
MAP Display	No	No	No	
Dyna Alert Function	No	No	No	
Pump Setup	No	No	No	
Sight Inflation	No	No	No	
PR Display	No	No	No	
Oscillograph Display	No	No	No	

Setup Item	Synchronize within the Same Network		Synchronize within the TCON System	
	DS-LANII	DS-LANIII		
Parameter Setup				
BP1–BP5				
Scale	Yes (Only BP1–5)	Yes	No	
Label	Yes (Only BP1–5)	Yes (Only Display)	No	
Filter	No	No	No	
HR/PR Alarm Source (BP1 or ART)	No	No	No	
Display Type	No	No	No	
Mean Wave	No	No	No	
Resp. Rejection Filter	No	No	No	
TEMP1–TEMP3				
Label	Yes	Yes (Only Display)	No	
ΔT Display	No	No	No	
CO₂ (MGU-721)				
Scale	No ⁴	No	No	
EtCO ₂ Peak Picking Duration	No	No	No	
Unit	No ⁴	No	No	
O ₂ Compensation	No	No	No	
N ₂ O Compensation	No	No	No	
Anesthetic Compensation	No	No	No	
Atmospheric Pressure	No	No	No	
CO₂ (MGU-722)				
Scale	No ⁴	No	No	
EtCO ₂ Peak Picking Duration	No	No	No	
Unit	No ⁴	No	No	
VENT				
AWP Scale	No ⁴	No	No	
AWF Scale	No ⁴	No	No	
Cardiac Output				
Auto Start	No	No	No	
Time Scale	No	No	No	
Patient Data Review				
Graphic Trend	No	No	No	
Tabular Trend	No	No	No	
OCRG	No	No	No	
Recall	No	No	No	
ST Measurement				
Ref. Point / Meas. Point	Yes	Yes	No	
Ventilator	No	No	No	
Respiration List	No	No	No	
ST Trend	No	No	No	
Vigilance/Vigileo List	No	No	No	

*⁴ On some central monitors depending on the model type, the synchronization is available.

Setup Item	Synchronize within the Same Network		Synchronize within the TCON System	
	DS-LANII	DS-LANIII		
System Configuration				
Tone/Volume				
Pulse Sound	No	No	No	
Key Sound	No	No	No	
Alarm Sound	No	No	No	
Other Bed Sound	No	No	No	
Other Sound	No	No	No	
Ventilator Alarm Sound	No	No	No	
Manual Recording Setup				
Recorder Selection	Yes	No	No	
Waveform Selection	Yes	No	No	
Recording Duration	Yes	No	No	
Delay Time	Yes	No	No	
Alarm Recording Setup				
ON/OFF	Yes	No	No	
Recorder Selection	Yes	No	No	
Waveform Selection	Yes	No	No	
Recording Duration	Yes	No	No	
Alarm Factor	Yes	No	No	
Arrhythmia Factor	Yes	No	No	
Periodic Recording Setup				
ON/OFF	Yes	No	No	
Recorder Selection	Yes	No	No	
Waveform Selection	Yes	No	No	
Periodic Interval	Yes	No	No	
Interval	Yes	No	No	
Timer	Yes	No	No	
Recording Duration	Yes	No	No	
Recorder Setup				
QRS Classification	No	No	No	
Graphic Recording	No	No	No	
Recall Recording	No	No	No	
Built-in Recorder	No	No	No	
Sweep Speed			No	
ECG, BP, SpO ₂	No	No	No	
RESP	No	No	No	
Night Mode Setup				
Manual/Auto	No	Yes	Yes	
Auto Start Time	No	No	No	
Auto End Time	No	No	No	
Volume	No	No	No	
Display	No	No	No	
ON/OFF of Alarm Pole	No	No	No	
Color, Brightness Setup				
Color	No	No	No	
Brightness	No	No	No	
ST Disp. Lead Setup				
All Settings	No	No	No	
Other Bed Setup				
Other Bed Alarm Setup	No	No	No	
BP User Label				
Label 1, 2	No	No	No	
TEMP User Label				
Label 1, 2, 3, 4	No	No	No	
Telemetry Wave Setup				
All Setup	No	No	No	
Stop Watch Label				
Label 1, 2	No	No	No	
Preset				
Display Mode				
Mode 1-5 Setup Items	No	No	No	
Alarm Mode				
Mode 1-5 Setup Items	No	No	No	

Setup Item	Synchronize within the Same Network		Synchronize within the TCON System
	DS-LANII	DS-LANIII	
Preset / Hospital Setup			
Date Format	No	No	No
Alarm Mute	No	No	No
Arrhythmia Analysis Filter	No	No	No
Trend Clip	No	No	No
BP Recording Scale	No	No	No
Suspend Arrhy. Analysis during Noise Interference	No	No	No
MAP Calculation	No	No	No
Night Mode Cancel	No	No	No
Asystole, VF, VT	No	No	No
DS-LAN Patient ID Tx	No	No	No
Admit/Discharge Key Setup	No	No	No
HR/PR Low Limit during Alarm Auto Setting	No	No	No
Serial Communication Setup	No	No	No
NIBP Data Erase Time	No	No	No
Status Output Setup	No	No	No
Unit	No	No	No
Telemeter Setup	No	No	No
Preset /Monitor Setup			
Message Icon	No	No	No
Check discharge at power ON	No	No	No
Password	No	No	No
Discharge Mode	No	No	No
Event Key	No	No	No
Drift Filter display/Exp clock display	No	No	No
HR/PR Alarm Source	No	No	No
Freeze Mode Cursor	No	No	No
Parameter Key Operation	No	No	No
BP Alarm Increment	No	No	No
CO ₂ (mmHg) upper limit for LAN, telemetry	No	No	No
Battery Operation	No	No	No
Store all alarms to "Recall"	No	No	No
Buzzer Tone (speaker) Failure	No	No	No
Built-in Rec. Status Display	No	No	No
Vigilance/Vigileo SVR, SVRI Calculation	No	No	No
Alarm Level	No	No	No
Alarm System	No	No	No
DS-LAN Setup	No	No	No
Level 3 Alarm Sound	No	No	No
RR Alarm Increment	No	No	No
Patient Name on Home Display	No	No	No
Key Mask	No	No	No
User Key	No	No	No
Alarm Pole Setup	No	No	No
Menu Setup	No	No	No
Display Optimization Setup	No	No	No
R.C. Setup			
ID	No	No	No
Section	No	No	No
Key	No	No	No
Backup at Discharge			
Display Config.	No	No	No
Alarm	No	No	No
ECG1, ECG2 Lead	No	No	No
CVA Set	No	No	No
Impedance Resp. ON/OFF	No	No	No
BP Scale	No	No	No
NIBP Auto Mode	No	No	No
EtCO ₂ Peak Picking Duration	No	No	No
CO ₂ Scale	No	No	No

Ventilator

The DS-7200 system can be connected to a ventilator via multiport relay cable (CJM-01SR0.6), status II connector (1 to 5) or COM connector (COM3). By connecting a ventilator, ventilator measurement data and ventilator alarm can be monitored on the patient monitor. Also, ventilator alarm can be notified to the central monitor via telemetry or wired network.

This section describes the procedure on how to connect the DS-7200 and a ventilator, and to input the ventilator measurement and alarm.

NOTE

Only one ventilator can be connected to each DS-7200 system.

When connecting to a ventilator, check the corresponded software version of the ventilator.

Ventilator	Corresponded Software Version
SV900	Not specified
SV300	Not specified
Servo-i	v1.5 / v2.0 / v3.0
Servo-s	v2.0 / v3.0
PB7200	26300-85-V
PB740	M
PB760	H
PB840	K
Evita 2 dura	04.14
Evita 4	04.14
Evita XL	05.10
Savina	03.01

WARNING

- The ventilator alarm on this monitor should be used as supplementary function. Check the patient's condition, ventilator alarm sound and message occasionally.
- The Evita2dura / Evita4 / EvitaXL / 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.

CAUTION

- The ventilator operation should be performed by well-trained and authorized personnel.
- For connecting the DS-7200 and a ventilator, use only the specified connection cable.
- Verify that the DS-7200 and the ventilator are properly connected.
- When connecting the cable, verify that the main power of the DS-7200 and the ventilator is OFF.

Ventilator Connection

Use the following cables for connecting each ventilator.

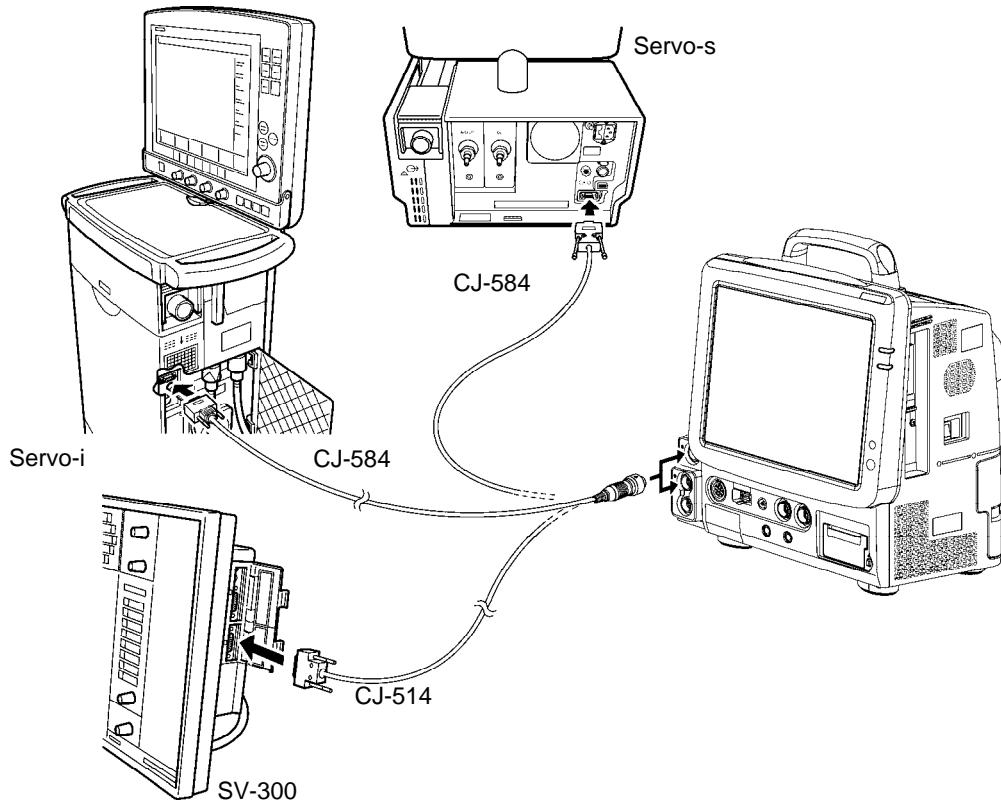
Ventilator	Ventilator Cable		
	For Multiport Relay Cable Connection	For StatusII Connector (1 to 5) Connection	For COM Connector (COM3) Connection
Servo Ventilator 900C/900D/900E	(Connection not possible)	CJ-400RI-70SV9	CJ-500
Servo Ventilator 300/300A	CJ-514	CJ-401RI-70SV3	CJ-501
Servo Ventilator Servo-i/Servo-s	CJ-584	CJ-402RI-70SVi	CJ-502
PURITAN-BENNETT Ventilator 7200ae/7200e	CJ-518, CJ-525A (Qty. 1 each)	(Connection not possible)	(Connection not possible)
PURITAN-BENNETT Ventilator 740/760/840	CJ-527, CJO-02RR4 (Qty. 1 each)	CJ-403RI-70PB	CJ-504
Dräger Medical® Ventilator Evita 4/Evita XL/ Evita 2 dura/Savina	CJ-583	CJ-402RI-70SVI	CJ-502

⚠ 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> <tr><td>Baud Rate</td><td>: 9600bps</td></tr> <tr><td>Data Bit</td><td>: 8bit</td></tr> <tr><td>Parity Bit</td><td>: None</td></tr> <tr><td>(Stop Bit)</td><td>: (1bit)</td></tr> </table> The DS-7200 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. <ul style="list-style-type: none"> For Evita 2 dura / Evita 4 / Evita XL <table> <tr><td>Protocol</td><td>: Medibus</td></tr> <tr><td>Baud Rate</td><td>: 19200bps</td></tr> <tr><td>Data Bit</td><td>: 8bit</td></tr> <tr><td>Parity Bit</td><td>: Even</td></tr> <tr><td>Stop Bit</td><td>: 1bit</td></tr> </table> For Savina <table> <tr><td>Protocol</td><td>: Medibus</td></tr> <tr><td>Baud Rate</td><td>: 9600bps</td></tr> <tr><td>Data Bit</td><td>: 8bit</td></tr> <tr><td>Parity Bit</td><td>: None</td></tr> <tr><td>Stop Bit</td><td>: 1bit</td></tr> </table> 	Baud Rate	: 9600bps	Data Bit	: 8bit	Parity Bit	: None	(Stop Bit)	: (1bit)	Protocol	: Medibus	Baud Rate	: 19200bps	Data Bit	: 8bit	Parity Bit	: Even	Stop Bit	: 1bit	Protocol	: Medibus	Baud Rate	: 9600bps	Data Bit	: 8bit	Parity Bit	: None	Stop Bit	: 1bit
Baud Rate	: 9600bps																												
Data Bit	: 8bit																												
Parity Bit	: None																												
(Stop Bit)	: (1bit)																												
Protocol	: Medibus																												
Baud Rate	: 19200bps																												
Data Bit	: 8bit																												
Parity Bit	: Even																												
Stop Bit	: 1bit																												
Protocol	: Medibus																												
Baud Rate	: 9600bps																												
Data Bit	: 8bit																												
Parity Bit	: None																												
Stop Bit	: 1bit																												
NOTE	<ul style="list-style-type: none"> StatusII-5 connector and multiport connector cannot be used simultaneously. The selection of which connector to use can be performed on the “External Device Connection Setup” of the Hospital Setup menu. For procedure, refer to “8. System Configuration –Hospital Setup– ●External Device Connection Setup”. StatusII-1 connector does not have the communication function for Evita 4 / XL / 2 dura / Savina. Connect the connection cable to StatusII-2 to 5 connector when communicating with Evita 4 / XL / 2 dura / Savina through the StatusII connector. 																												

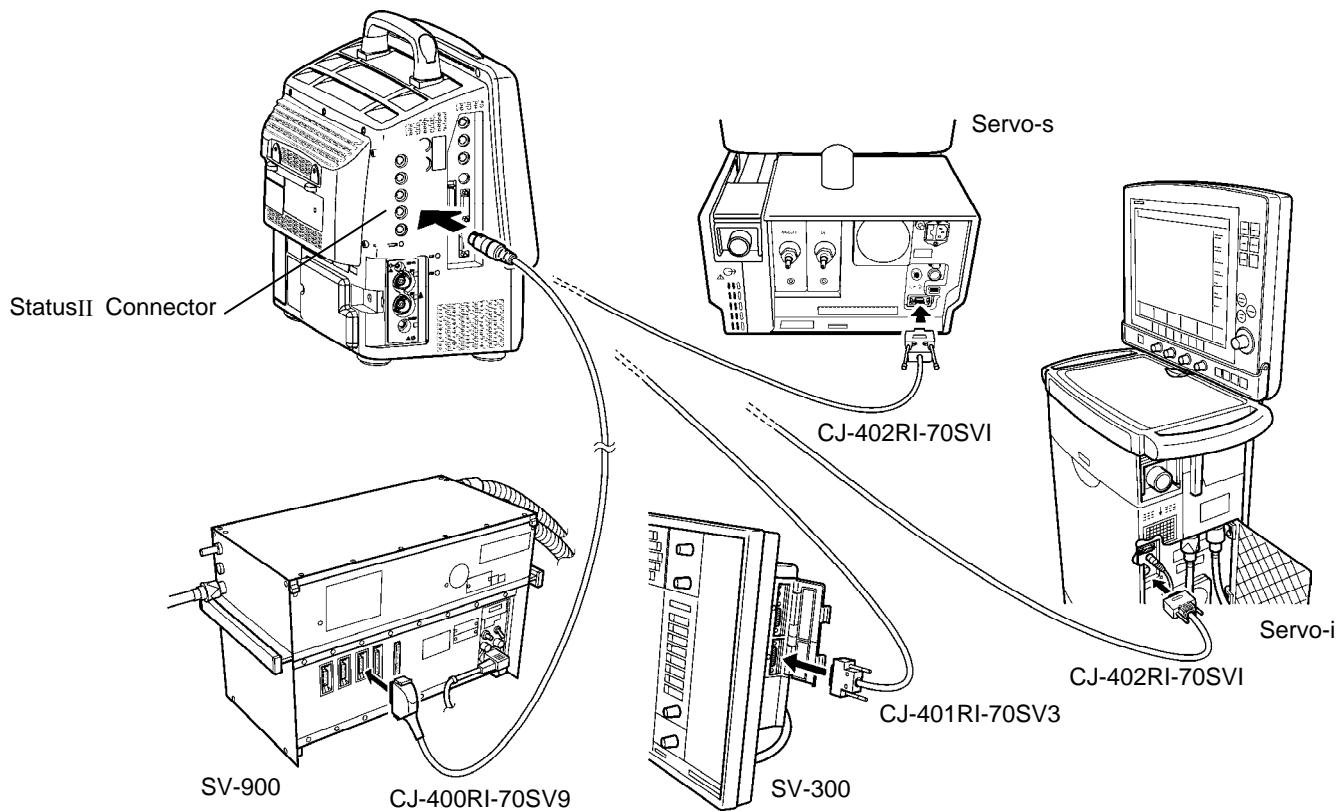
●Connection of Servo Ventilator via Multiport Relay Cable

【For SV-300, Servo-i/s】

The SV-300 and Servo-i/s can be connected to either port A or B of the multiport relay cable.

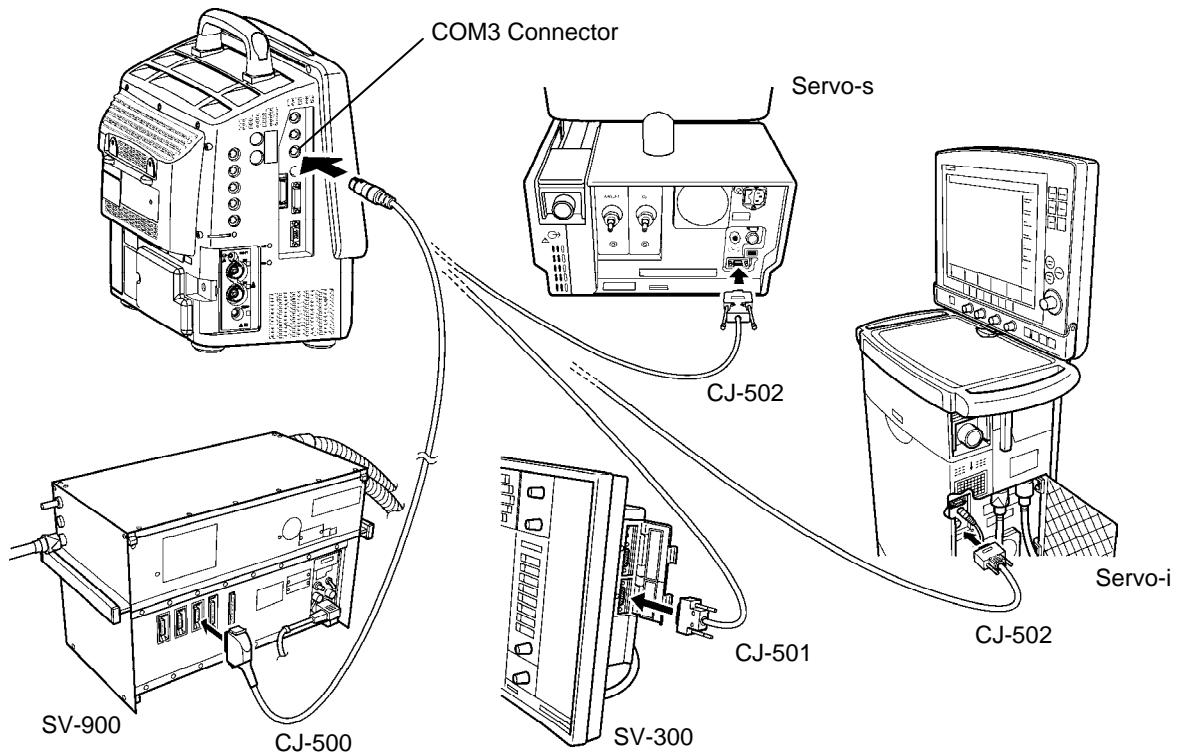


●Connection of Servo Ventilator via StatusII Connector (1 to 5)



●Connection of Servo Ventilator via COM3 Connector

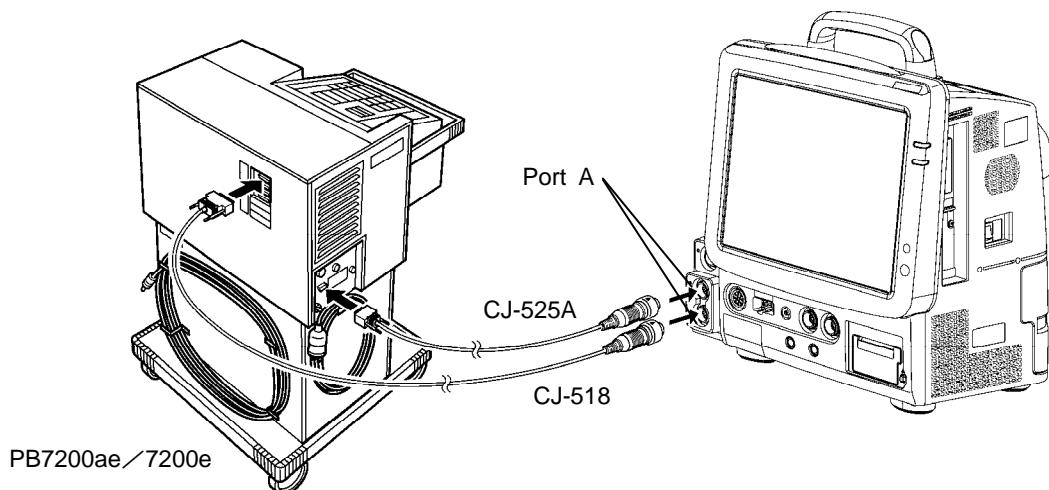
[Connection of Servo Ventilator via Serial Connector]



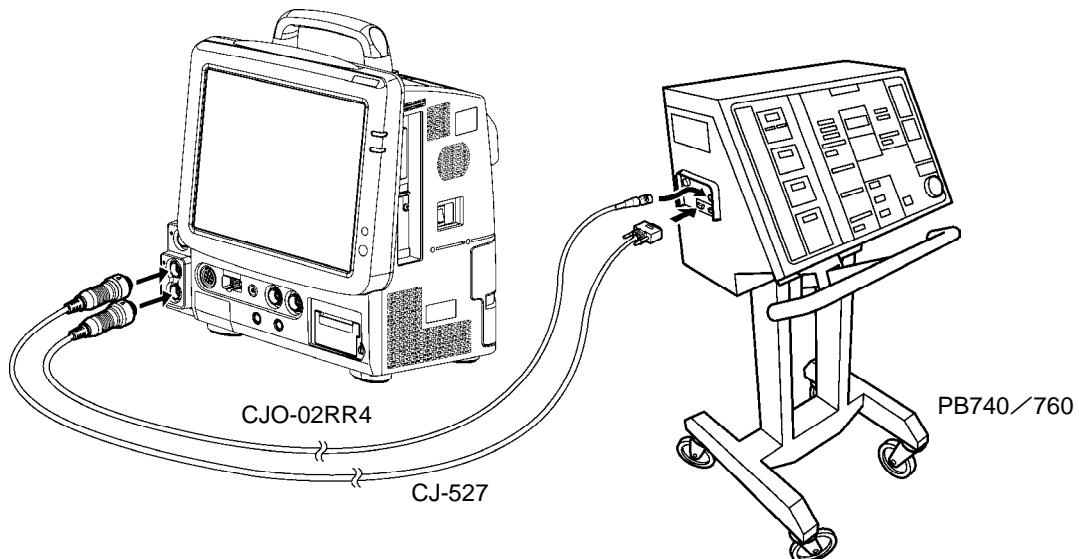
●Connection of PURITAN-BENNETT Ventilator via Multiport Relay Cable

The PURITAN-BENNETT ventilator can be connected to port A of the multiport relay cable.

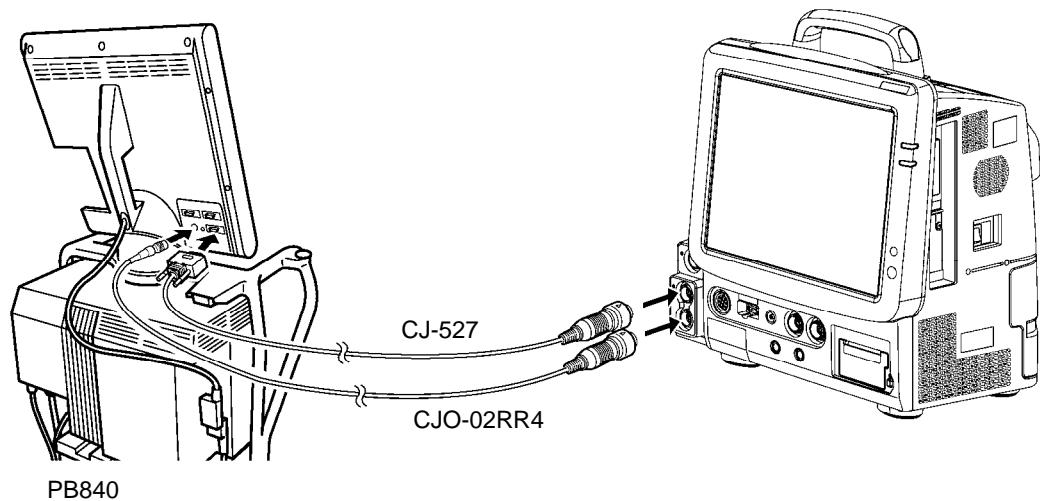
[For PB7200ae/7200e Ventilator]



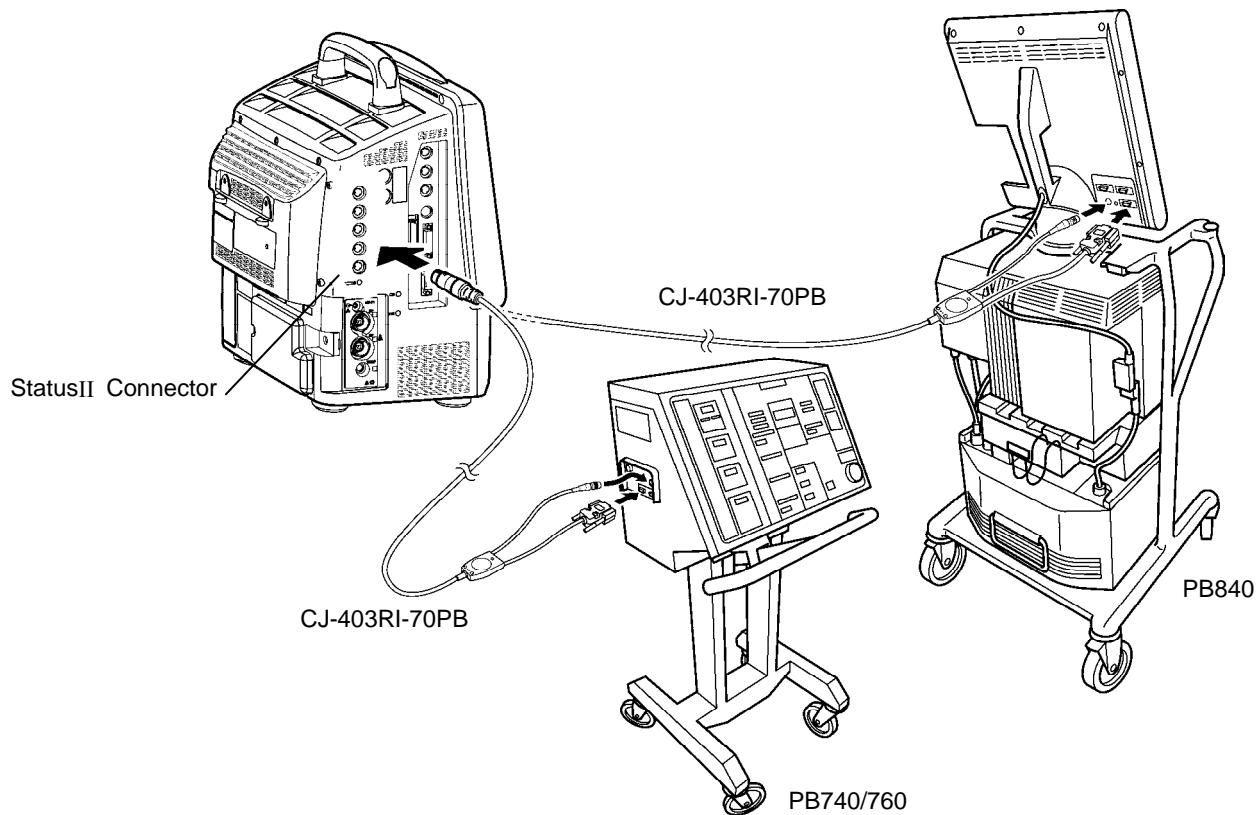
【PB740/760 Ventilator】



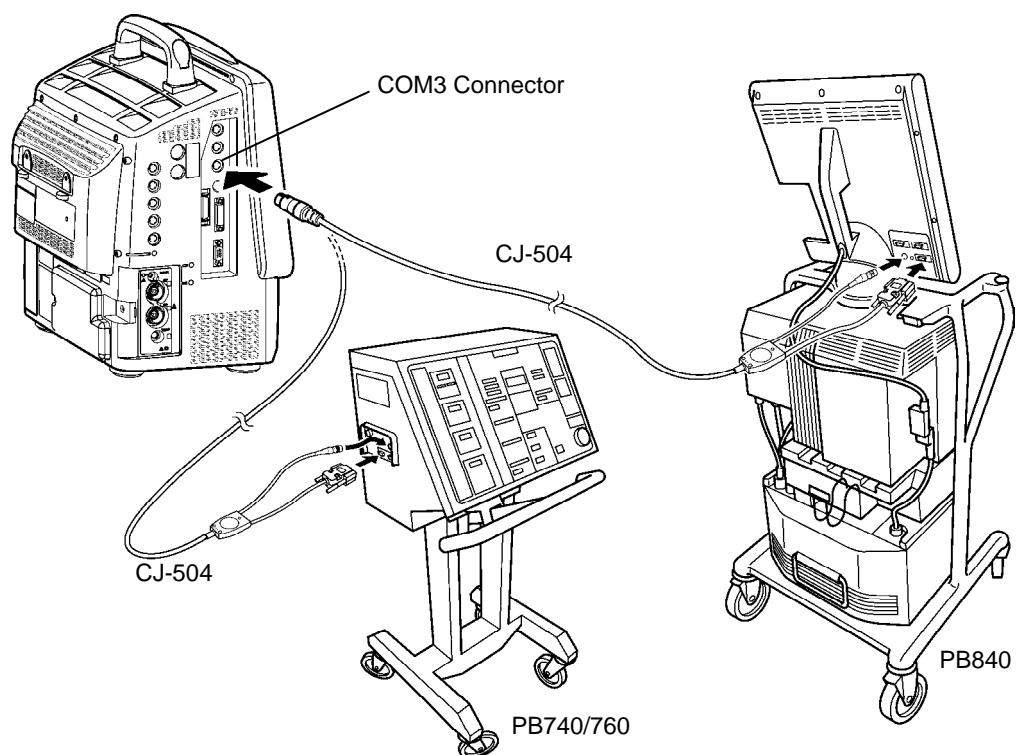
【For PB840 Ventilator】



●Connection of PURITAN-BENNETT Ventilator via StatusII Connector (1 to 5)

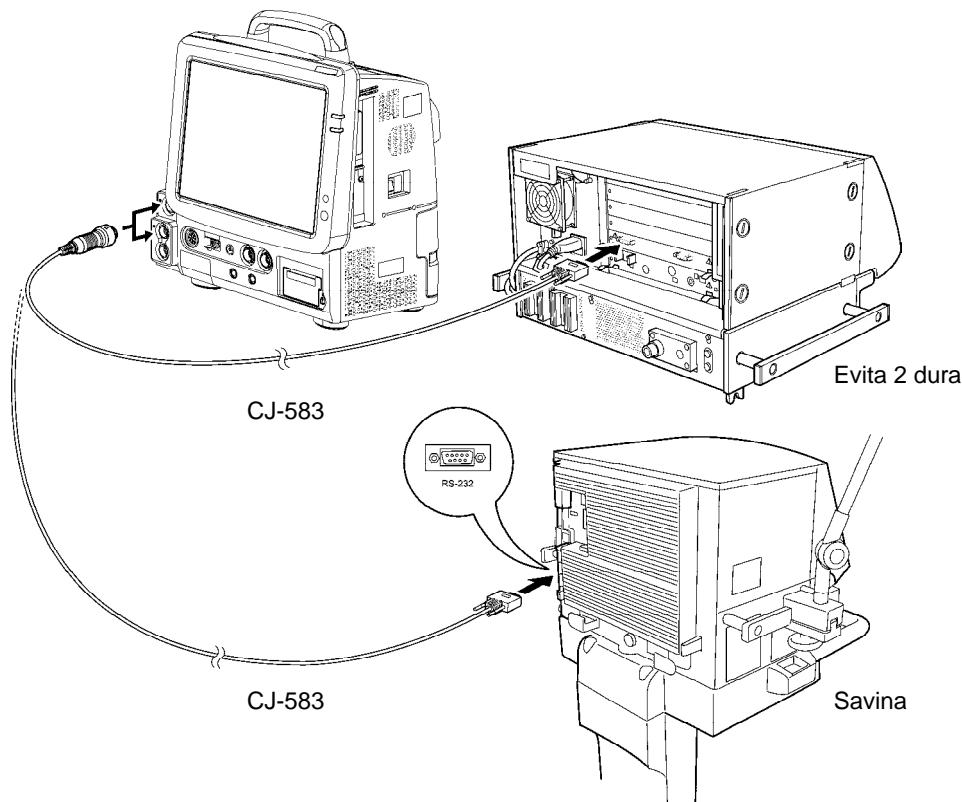


●Connection of PURITAN-BENNETT Ventilator via COM3 Connector

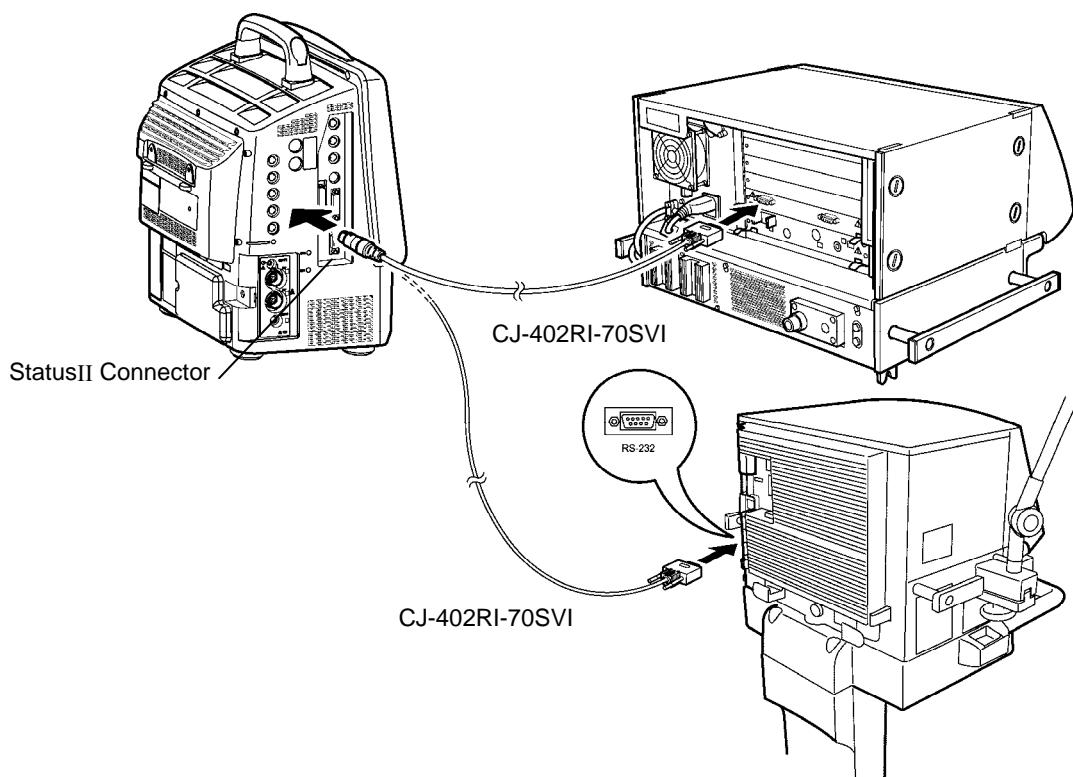


●Connection of Evita / Savina Ventilator via Multiport Relay Cable

Evita/Savina ventilator can be connected to port A or port B of the multiport relay cable.

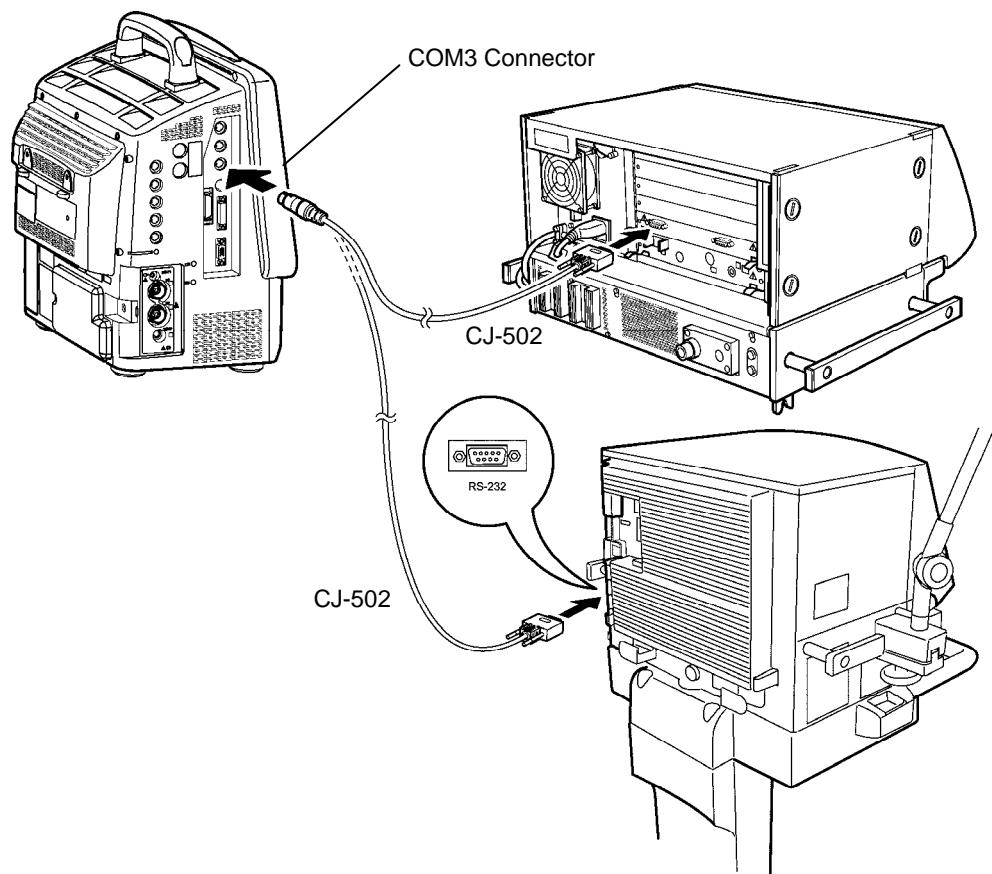


●Connection of Evita / Savina Ventilator via Status II Connector (2 to 5)



NOTE	StatusII-1 connector does not have the communication function for Evita 4 / XL / 2 dura / Savina. Connect the connection cable to StatusII-2 to 5 connector when communicating with Evita 4 / XL / 2 dura / Savina through the StatusII connector.
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●Connection of Evita / Savina Ventilator via COM3 Connector



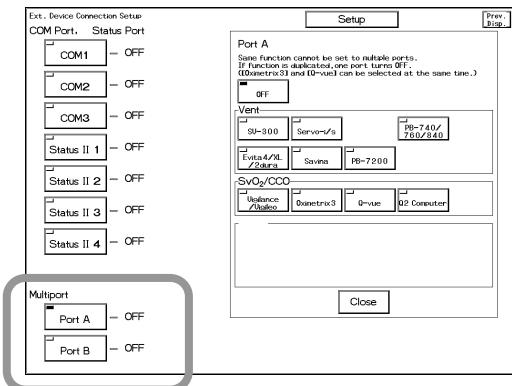
Ventilator Selection

To display the ventilator alarm, serial communication setup is required.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Hospital Setup** → **Ext. Device Connection** keys.

The external device connection setup menu will be displayed.

- 2 If the ventilator is connected to multiport relay cable, select the port (**PortA** or **PortB**) which it is connected.



Select the ventilator displayed at the right.

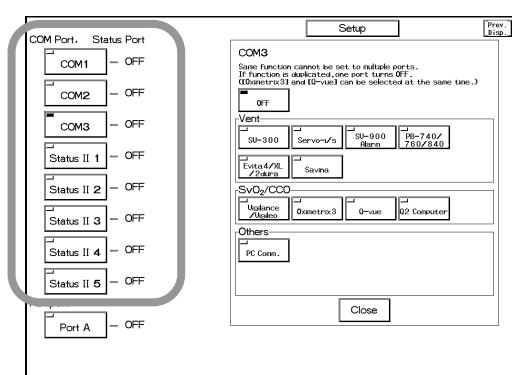
For Port A, **SV-300**, **Servo-i/s**, **PB-740/760/840**, **Evita4/XL/2dura**, **Savina**, **PB-7200** can be selected.

For Port B, **SV-300**, **Servo-i/s**, **Evita4/XL/2dura**, **Savina** can be selected.

NOTE

- The PURITAN-BENNETT ventilator can be connected to only port A of multiport relay cable.
- 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.

- 3 If the ventilator is connected to StatusII or COM3 connector, press the **COM3** or one of **Status II 1** to **Status II 5** key.



Select the ventilator from **SV-300**, **Servo- i/s**, **SV-900 Alarm**, **PB-740/760/840**, **Evita4/XL/2dura**, **Savina**.

NOTE

- For the SV-900, only alarm signals can be acquired.
- 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.
- StatusII-1 connector does not have the communication function for Evita 4 / XL / 2 dura / Savina. Connect the connection cable to StatusII-2 to 5 connector when communicating with Evita 4 / XL / 2 dura / Savina through the StatusII connector.

Oximeter

The DS-7200 can be connected to an oximeter and CCO measurement device via multiport relay cable, Status II connector (1 to 5) or COM connector (COM1 to 3).

By connecting an oximeter and CCO measurement device, oximeter data can be unified on the patient monitor. This section describes the procedure on how to connect the DS-7200 and an oximeter.

The oximeter can be connected to either port A or B of the multiport relay cable.
The OXIMETRIX3 and Q-vue can be used in conjunction.

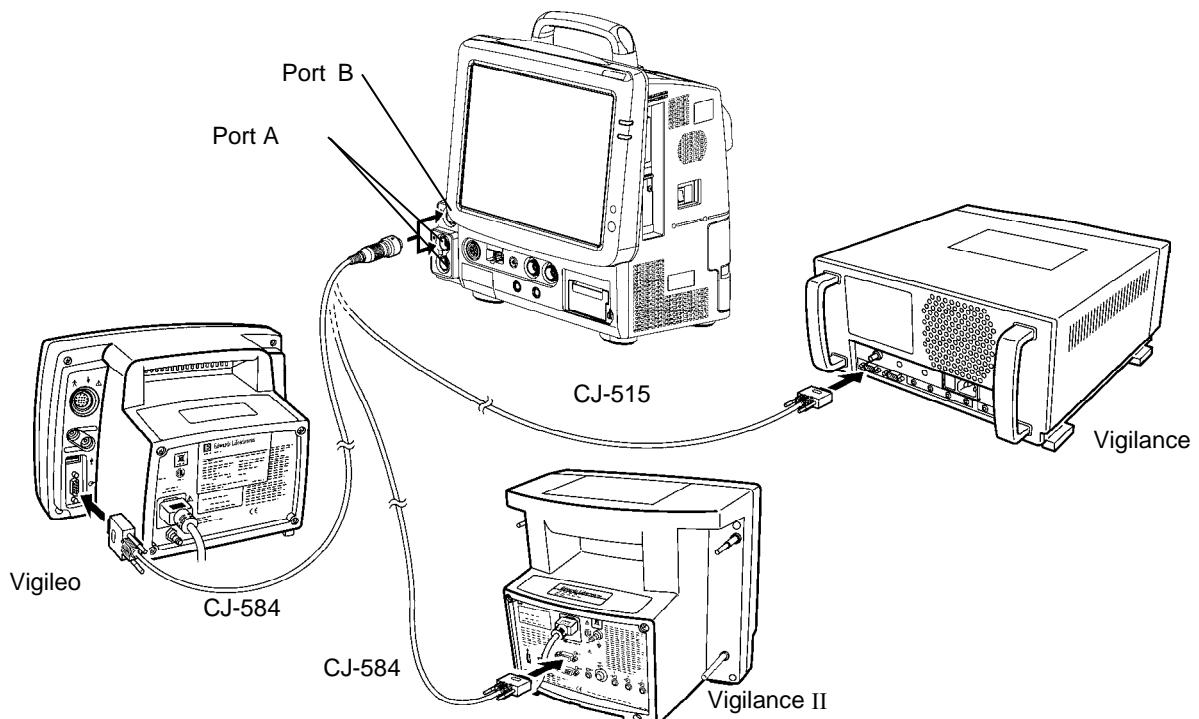
Oximeter Connection

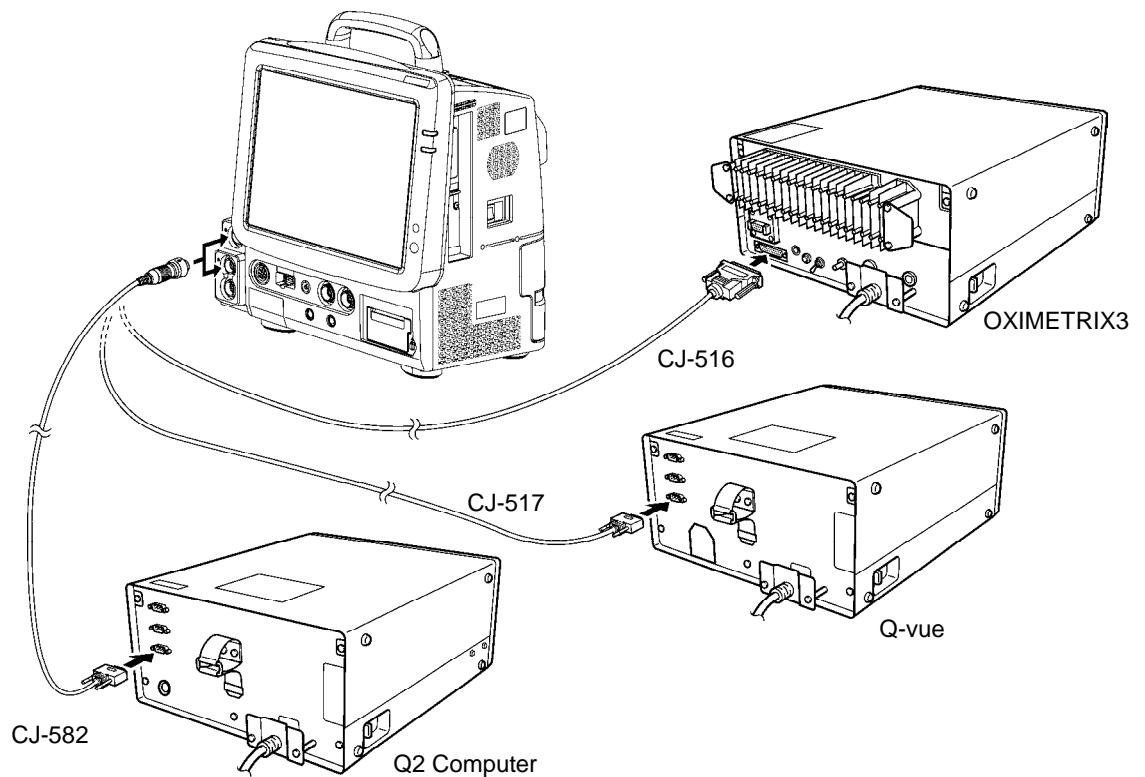
Oximeter, CCO measurement Device	Oximeter Cable		
	via Multiport	via Status II Connector (1 to 5)	via COM Connector (COM1 to 3)
Vigilance	CJ-515 (Q'ty: 1)	CJ-406RI-70VIGI	CJO-04RS4
Vigilance CEDV	CJ-515 (Q'ty: 1)	CJ-406RI-70VIGI	CJO-04RS4
VigilanceII	CJ-584 (Q'ty: 1)	CJ-402RI-70SVI	CJ-502
Vigileo	CJ-584 (Q'ty: 1)	CJ-402RI-70SVI	CJ-502
OXIMETRIX3	CJ-516 (Q'ty: 1)	CJ-405RI-70PB72	CJ-508
Q-vue	CJ-517 (Q'ty: 1)	CJ-406RI-70VIGI	CJO-04RS4
Q2 Computer	CJ-582 (Q'ty: 1)	CJ-406RI-70VIGI	CJO-04RS4

NOTE	StatusII-5 connector and multiport connector cannot be used simultaneously. The selection of which connector to use can be performed on the "External Device Connection Setup" of the Hospital Setup menu. For procedure, refer to "8. System Configuration -Hospital Setup- ●External Device Connection Setup".
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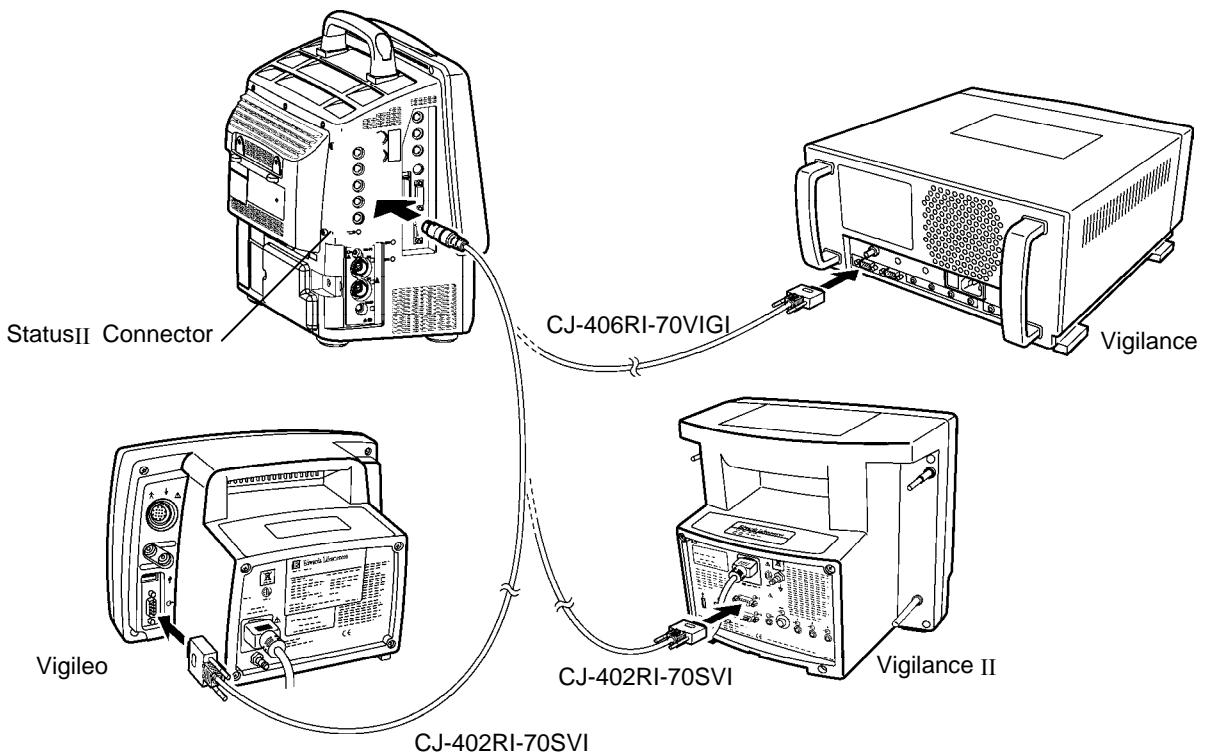
●Connection via Multiport Relay Cable

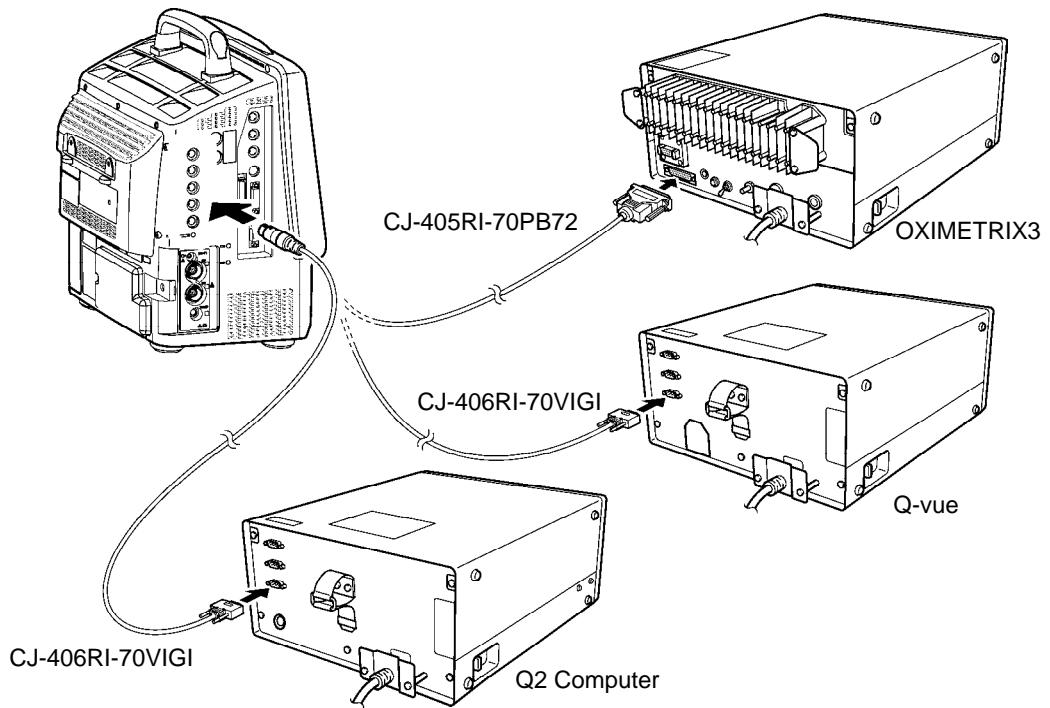
The oximeter can be connected to either Port A or Port B of the multiport relay cable.



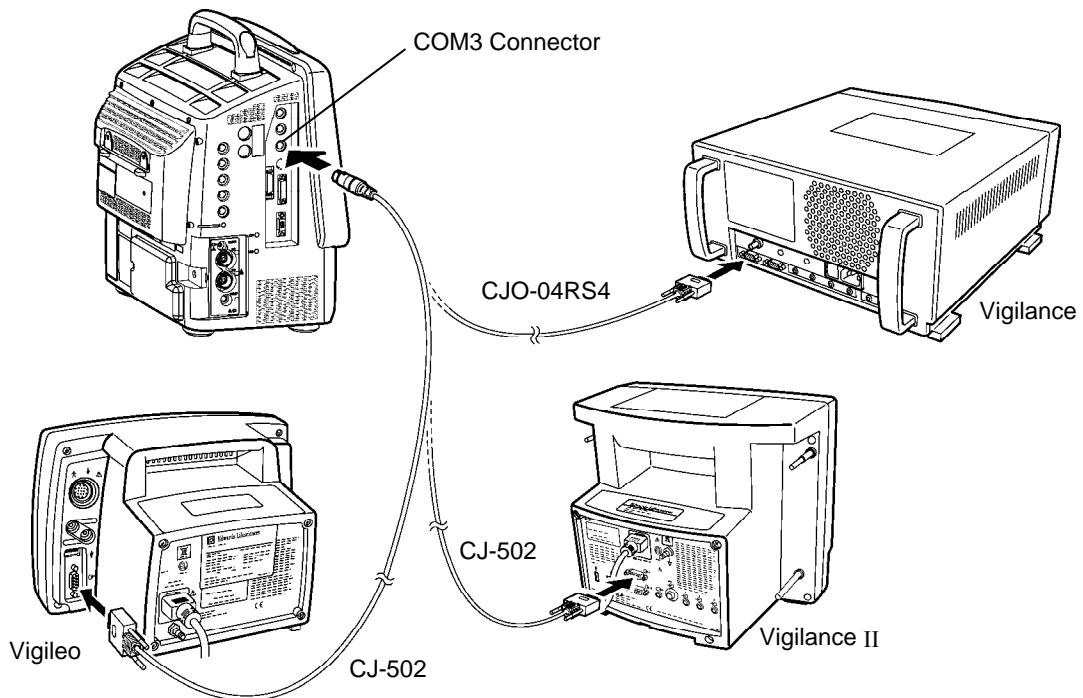


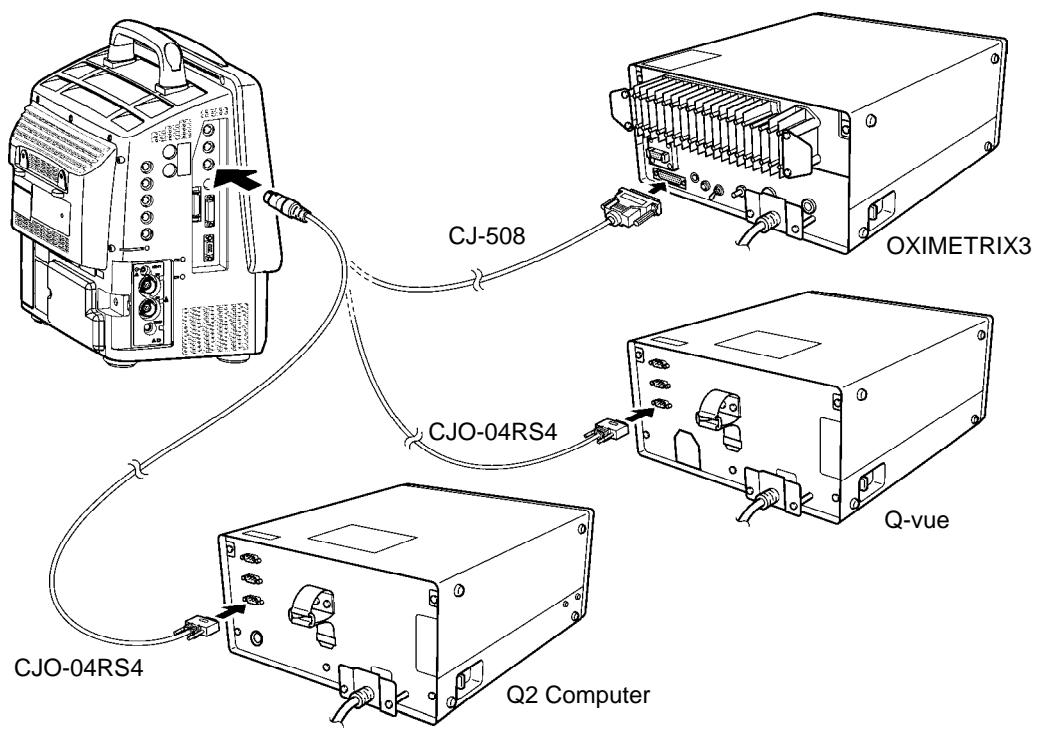
● Connection via Status II Connector (1 to 5)





●Connection via COM3 Connector





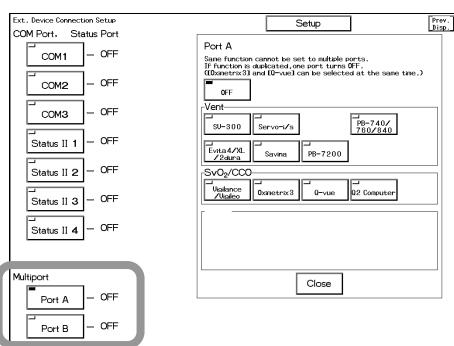
Oximeter Selection

To display the oximeter data, external device connection setup is required.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Hospital Setup** → **Ext. Device Connection** keys.

The external device connection setup menu will be displayed.

- 2 If the oximeter is connected to multiport relay cable, press the **Port A** or **Port B** key which the oximeter is connected.

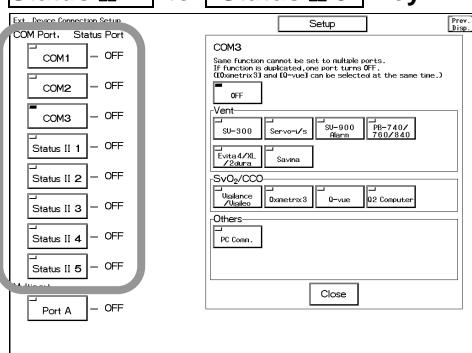


Select the oximeter from **Vigilance/Vigileo**, **Oximetrix3**, **Q-vue**, **Q2 Computer**.

NOTE

- The Oximetrix3 and Q-vue can be used in conjunction, but Vigilance (Vigilance CEDV, VigilanceII, Vigileo) and Q2 Computer cannot be used in conjunction with other oximeters.
- 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.

- 3 If the oximeter is connected to Status II or COM3 connector, press the **COM3** or one of **Status II 1** to **Status II 5** key.



Select the oximeter from **Vigilance/Vigileo**, **Oximetrix3**, **Q-vue**, **Q2 Computer**.

NOTE

- If communication with ventilator is already established through the corresponding port, it is necessary to disconnect the communication in order to change the selection on this menu.

●Oximeter Network Setup

If the network setup on the monitor and the oximeter is not corresponded, measured data will not be displayed on the monitor.

The network setup on the monitor is fixed to the default setting of each oximeter and cannot be changed. Make sure that the network setup of the connecting oximeter is in default setting.

- For Vigilance/Vigileo

The network setup for the Vigilance/Vigileo should be as follows.

- Device: IFM Out
- Baud Rate: 19200bps
- Parity Bit: None
- Stop Bit: 1
- Data Bit: 8
- Flow Control: 2 sec.

For procedure to check the Vigilance/Vigileo network setup, refer to the operation manual for the Vigilance/Vigileo.

- For Q2 Computer

The network setup for the Q2 Computer should be as follows.

- Baud Rate: 9600bps
- Parity Bit: ODD
- Stop Bit: 1
- Data Bit: 7

For procedure to check the Q2 Computer network setup, refer to the operation manual for the Q2 Computer.

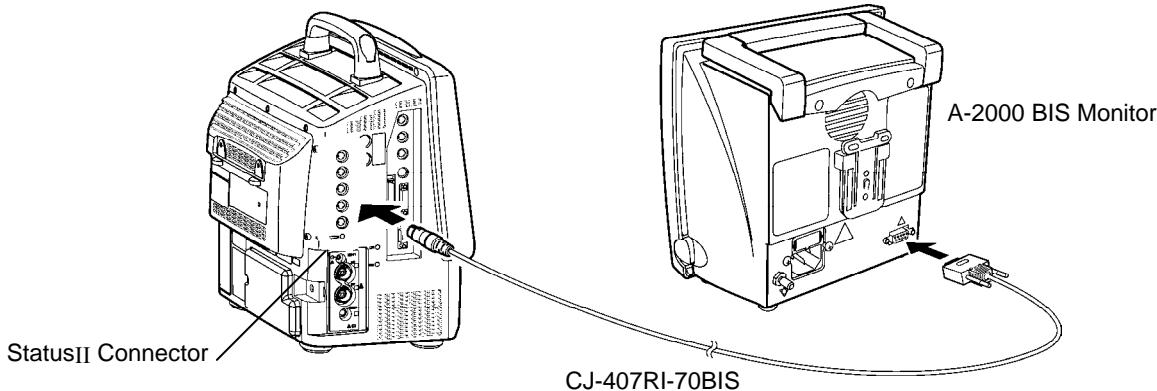
BIS Monitor

By connecting the A-2000 BIS Monitor (ASPECT® MEDICAL SYSTEMS), the patient's recovery condition from anesthesia can be monitored with numeric data.

BIS Monitor Connection

CAUTION	When connecting the cable, make sure that the power of the patient monitor and the BIS monitor is turned OFF.
NOTE	StatusII-5 connector and multiport connector cannot be used simultaneously. The selection of which connector to use can be performed on the "External Device Connection Setup" of the Hospital Setup menu. For procedure, refer to "8. System Configuration -Hospital Setup- ●External Device Connection Setup".

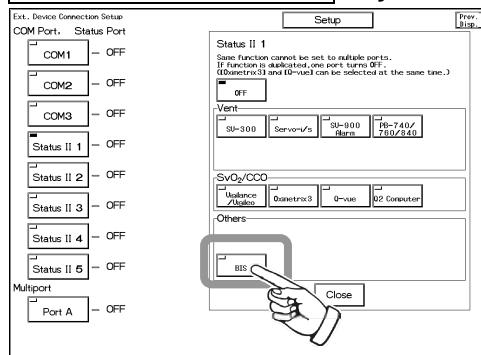
- 1 Connect the BIS connection cable (CJO-407RI-70BIS) to the StatusII connector (1 to 5) on the DS-7200 and serial port on the BIS monitor.



External Device Connection Setup

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

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Hospital Setup** → **Ext. Device Connection** keys.



Select **BIS** for the StatusII connector (1 to 5) which the BIS Monitor is connected.

●BIS Monitor Network Setup

The BIS monitor network setup should be set to "ASCII".

For procedure to change the BIS monitor network setup, refer to the operation manual for the BIS monitor.

TCP/IP Network Connection

By connecting the DS-7200 system to the TCP/IP network, 12-lead waveform can be output on the laser printer.

Before using the laser printer, IP address and other settings must be performed.

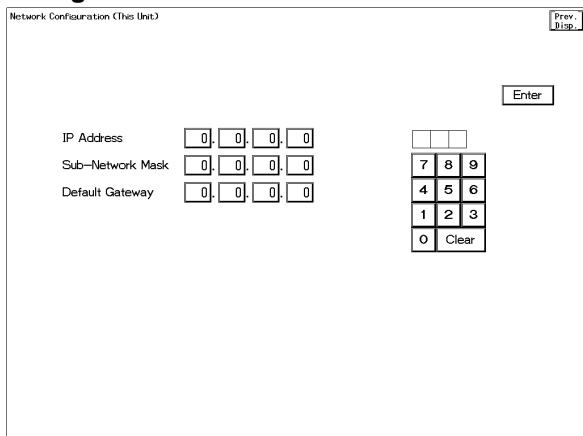
WARNING

- We cannot assure proper operation if TCP/IP network is connected incorrectly. When changing the network setting or upgrading the printer, contact our service representative.
- When connecting to an existing network, follow the instruction of the network administrator.
- Make sure not to duplicate the IP address for DS-7200 system, laser printer, and the server.
- As DS-7200 is not corresponded to DHCP (Dynamic Host Configuration Protocol) IP address, set the IP address excluded at DHCP if DHCP server is in the network configuration.

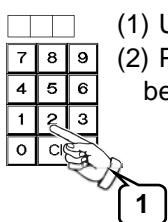
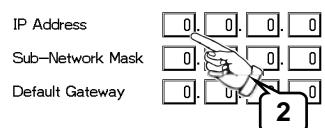
Network Configuration (This Unit)

First, set the IP address, sub-network mask, default gateway for the DS-7200.

- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Configuration** → enter password → **Network Config.** → **This Unit** keys to display the network configuration menu.



- 2 Set the IP address for the DS-7200 system.



- (1) Use the numeric keys to enter the numbers.
- (2) Press the corresponded key. The input numbers will be displayed inside the key.

- 3 Set the sub-network mask.

Sub-Network Mask **255.255.255.0**

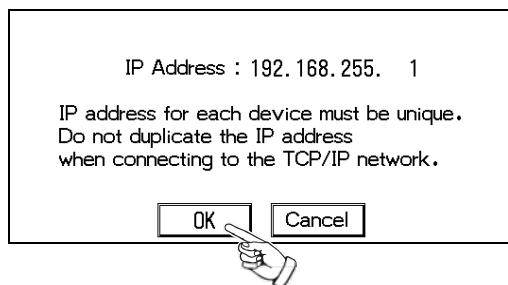
Use the same procedure above to enter the sub-network mask.

4 Set the default gateway.

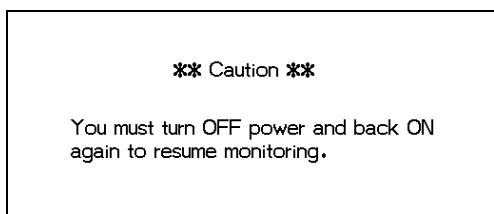
Default Gateway 0. 0. 0. 0

Use the same procedure above to enter the default gateway.

5 Press the key to finalize the setup.



On the confirmation display, press the key.



When the setup is changed, the system needs to be restarted.

Turn OFF the power.

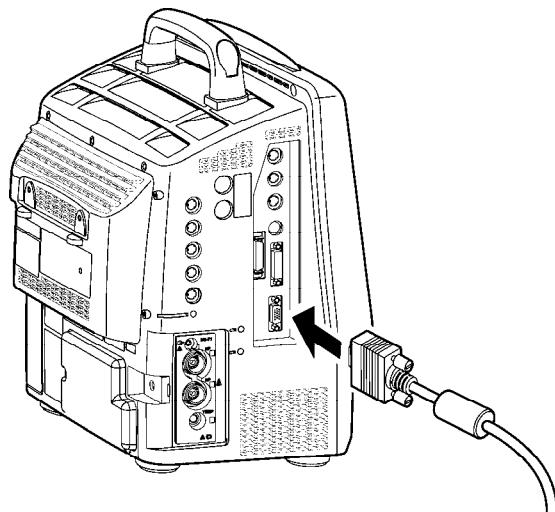


WARNING When the caution message is displayed, all operation controls will not be possible until the system is restarted.

6 Connect the CJ-761 LAN Interface Cable (Cross) to the DS-7200 system. Refer to the next section for procedures.

To Connect the DS-7200 to the TCP/IP Network

- 1 Connect the CJ-761 LAN Interface Cable (cross) to the DS-7200 system and the other side to the network equipment such as laser printer.



WARNING

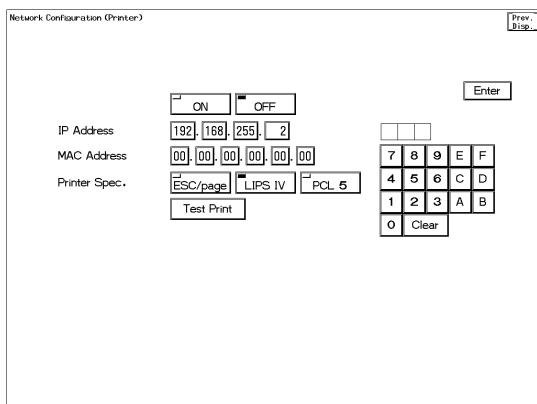
Be careful not to confuse the HUB for the DS-LANII network and the TCP/IP network. We cannot assure proper operation if incorrect network is connected.

- 2 Turn ON the power of the DS-7200 system.

Network Configuration (Printer)

Set the IP address, MAC address, and printer specification for the laser printer.

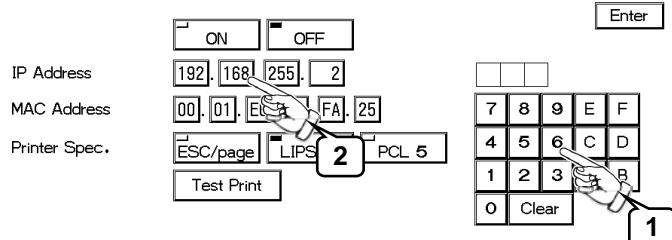
- 1 Press the **Menu** → **System Configuration** → **Pre-Set** → **Configuration** → enter password → **Network Config.** → **Printer** keys.



- 2 Set **ON/OFF** of printer operation.



- 3 Set the IP address of the printer.



- (1) Use the numeric keys to enter the numbers.
- (2) Press the corresponded key. The input numbers will be displayed inside the key.

- 4 Set the MAC address of the printer.

MAC Address **00.01.E6.2C.FA.25**

MAC (Media Access Control) address is an address assigned for each network equipment.
Refer to the operation manual of the printer network board. Use the alphanumeric keys (0–9, A–F) to input the address.

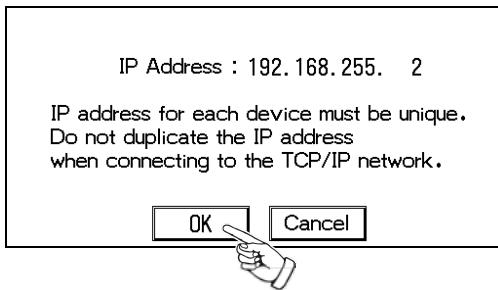
- 5 Select the printer specification.

Printer Spec. **ESC/page LIPS IV PCL 5**

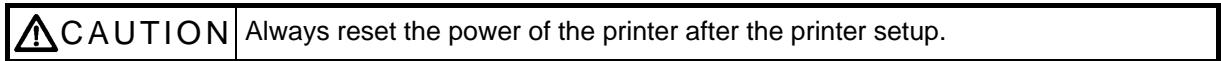
Refer to the operation manual of the printer.

- 6 Press the **Enter** key to finalize the setup.





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

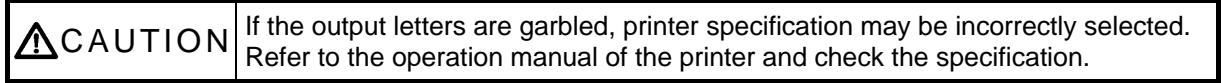


7 Perform test printing.

Press the **Test Print** key and check if the printing is correctly performed.



For procedure to set the output recorder for the 12-lead waveform recording, refer to "4. Monitoring Setup Recording Setup 12-Lead Waveform Recording".



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Chapter 10

Maintenance

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This section describes precautions for handling the equipment.



If you accidentally wet the device, dry it completely and verify it operates safely before usage.

Handling After Use

- Do not apply excessive force when disconnecting the cables. Always pull on the connector housing and not on the cable.
- Clean the unit, accessories, and cables, and keep them together in one place for next use.
- Always check for adequate supply of disposable accessories such as ECG electrodes. If any shortage, contact our service representative and supply as necessary.

Handling the Display Panel

- The display panel utilizes exclusive fluorescent light for its backlight. As this fluorescent light tube has product life cycle, it needs to be replaced periodically. If the display becomes dark, flickers, or does not light, contact your nearest service representative.
- Although the LCD utilizes highly accurate picture elements, occasionally, there may be a few pixels which do not light or constantly lights. Please note that this is not an equipment failure, and will not affect monitoring operation.
- Due to its material characteristic, the touch panel expands/contracts depending on the temperature/humidity. When the touch panel is left unused for a while, or when the ambient temperature is low, the surface film of the touch panel may expand, but this is not an abnormal condition. This expansion will reduce itself in a few hours or half a day after the power is turned ON.

This section describes about the storage of the device and recording paper.

Storing the Device

- Store in a place where the device will not be exposed to splashing water.
- Store in a place where the device will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust or atmosphere containing salt or sulfur.
- Store in a level area where the device is not exposed to vibration and shock (including during transportation).
- The following environmental conditions should be observed when storing the device.
Storage Temperature : -10 to 60°C
Storage Humidity : 10 to 95% at 60°C (non-condensing)
Storage Atmospheric Pressure : 700 to 1060hPa



CAUTION

If the patient monitor was stored for some while, leave the monitor at the operating environment (10 to 40°C, 30 to 85%) before usage.

Storing the Recording Paper

The DS-7200 system utilizes heat sensitive recording paper. If placed in a high temperature for a long period of time, the print may become indistinct, and unable to read. When storing, follow the precautions below.

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

Cleaning

Touch Panel and Housing

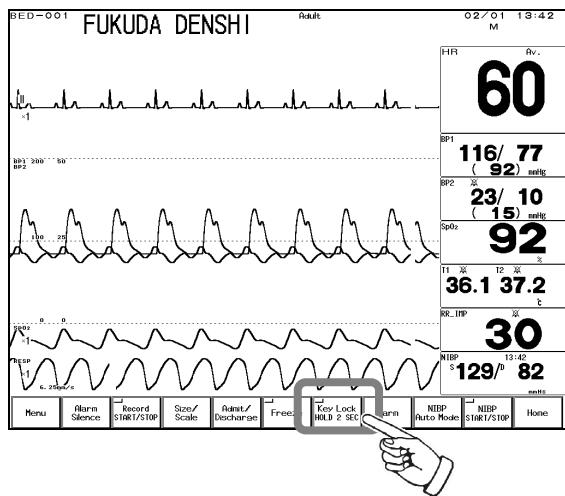
This chapter explains about the cleaning of the device and sensors.

Cleaning the Display Panel

Since this device incorporates a touch panel, fingerprints and other stains are likely to appear on the touch panel.

Follow the procedure below to clean the touch panel.

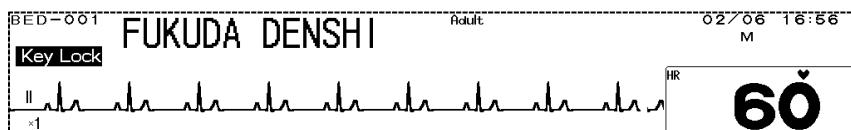
1 Press the **Key Lock** key for more than 2 seconds.



The **Key Lock** key needs to be preprogrammed as user key.
For procedure to set the user key, refer to "4. Monitoring Setup Key Setup To Set the User Keys".

If the touch panel was not touched for 30 seconds, the key lock condition will be automatically cancelled. In such case, press the **Key Lock** key again.

2 Clean the touch panel.



While the "Key Lock" message is displayed, the touch panel key will be deactivated.
If "LEAD OFF" or other message is displayed, the key lock message will not be displayed.

3 Wipe the touch panel using cleaning cloth.

4 Press again the **Key Lock** key for more than 2 seconds.

The message will disappear and the keys will be active again.



- 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 the soft cleaning cloth provided as optional accessory or with an eyeglass cleaning cloth.

Cleaning the Housing

Clean the housing using tightly squeezed gauze or an absorbent cotton cloth dampened with alcohol or a neutral cleanser.

CAUTION	<ul style="list-style-type: none">● Clean the equipment frequently so stains can be removed easily.● To prevent injury, it is recommended to wear gloves when cleaning the equipment.● Do not allow liquids or cleaning solution to enter the monitor or connectors.● Do not use organic solvents, thinner, toluene or benzene to avoid damaging the resin case.● Do not polish the housing with abrasive or chemical cleaner.● When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the monitor or connectors.● Use only neutral detergent to clean the housing. Do not use a chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent or chemicals (cleanser, thinner, benzine, benzol, and synthetic detergent for house and furniture), or sharp-edged tools. The surface resin coating may be damaged, resulting in discoloration, scratches, or other problems.
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Cleaning the ECG Lead Cable, Relay Cable

- Do not use thinner, toluene, or other organic solvents to clean the cables.
- After using the cables, clean with neutral detergent or 70% isopropyl alcohol. Do not pull the cable and do not hold the connector part when cleaning.
(It may degrade the cable coating and result in damage. Particularly organic solvents and antiseptic solution such as cresol soap solution will degrade the cable coating.)
- After cleaning, dry it completely before usage.
- Do not use high temperature sterilization such as steam or EOG method.

Disinfecting the Blood Pressure Transducers

Disinfect the blood pressure transducers according to the manufacturer's guidelines.

10
Cleaning

Cleaning/Disinfecting/Sterilizing the Temperature Probe

Clean/Disinfect/Sterilize the temperature probe according to the guidelines provided with the probe product.

Cleaning the Cardiac Output Relay Cable

- Disinfect the cardiac output relay cable according to the manufacturer's guidelines.
- When cleaning, follow the procedure below.
 - (1) Wipe the cable using 70% isopropyl alcohol cotton.
 - (2) Dry it completely with air before reusing.

Cleaning and Disinfecting the SpO₂ Sensor

[NELLCOR® Sensor]

- Do not soak the transducer in water or antiseptic solution.
- Wipe the Durasensor® (DS-100A) with disinfectant such as 70% alcohol. Do not sterilize by applying radioactive rays, steam, or ethylene oxide.
- The OxiMax® can be reused on the same patient as long as the adhesive tape attaches without slippage. Do not resterilize and reuse it on other patients. It is intended for single patient use only.

[MASIMO® Sensor]

- Do not soak or immerse the sensor or patient cable in any liquid solution. (Sensor and connector are not water-proof.)
- Do not sterilize the sensor and cable by irradiation, steam, or ethylene oxide.
- Clean the Masimo reusable sensor (LNOP® DCI) and patient cable using the following procedure.
 - (1) Remove the sensor from the patient. Disconnect the patient cable from the sensor.
 - (2) Disconnect the sensor from the DS-7200.
 - (3) Wipe the sensor and cable using 70% isopropyl alcohol cotton.
 - (4) Dry the sensors and cables prior to placement on a patient.
- The Masimo single-use type sensor can be reused on the same patient as long as the light emitting and receiving part is clean, and if it is still adhesive to the skin.
The adhesiveness will return by cleaning with alcohol and completely drying it. Do not resterilize and reuse it on other patients.

Cleaning and Sterilizing the Airway Adapter (for Capnostat5)

- Wash in lukewarm sudsy water. Then dip in antiseptic solution (ex. glutaraldehyde) for low-temperature sterilization. Desiccate after rinsing in aseptic water.
- Use EOG (Ethylene Oxide Gas) to sterilize. Proper ventilation must be performed.
- Before re-using an airway adapter, make sure the window is desiccated and no residue is left. Check if the adapter is not damaged by the operation or cleaning / sterilization.



- Do not sterilize the airway adapter using autoclave methods.
- Do not reuse / re-sterilize the disposable airway adapter.

This section describes about the handling and storage of the battery pack.

Handling the Battery

- The battery pack can be continually used for more than 500 times (or about 1 year) under normal temperature, but the continuous use will degrade the battery and shorten the usable time.
- When the battery operation time becomes short even after it is fully charged, the battery pack needs to be replaced.
- When the battery pack level becomes low, charge the battery well in advance for the next use.
- The battery should be charged at room temperature (10 to 30°C).
- When the DS-7200 system is operated by battery, and if empty mark is displayed for the battery condition, CF card format, read/write process cannot be performed.
- When using the battery for the first time, or using after leaving it for a while, be sure to charge the battery before use by connecting the power supply cable.

Storing the Battery

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

Storage Temperature and Humidity of the Battery Pack

- Store in an environment specified below without corrosive gas.

Storage Period	Storage Temperature	Storage Humidity
Within 30days	–10 to 60°C	65±20%
30 days to 90 days	–10 to 45°C	
90 days to 1year	–10 to 35°C	

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

Long-term Storage

- If the battery is left installed in the monitor without use for long period of time, the electrolyte may leak, or inactivation of the battery may occur which degrades the capacity recovery after storage. When storing the monitor with battery installed for long period of time, remove the battery from the monitor, or supply AC power to the monitor and perform rapid charging every 2 to 3 months.

Maintenance Check

Daily and Periodic Check

This section explains the daily check and periodic check items for the device.

About the Maintenance Check

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

To ensure safety, reliability, and high performance, a "Daily Check" and "Periodic Inspection" must be performed. We are not liable for any accident arising from lack of maintenance.



- Do not open the housing of this device.
- Avoid alcohol or other liquids from getting into the equipment.

● Daily Check

Perform daily inspection using the "Daily Check List" on the next page.

● Periodic Check

The safety check conformed to IEC 60601 must be performed at least once a year for this equipment. Periodic inspection of medical electronic equipment is mandatory to prevent failures and accidents and to ensure safety and reliability.

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

For more details, contact your nearest service representative.

Periodic Replacement Parts

To ensure reliability of safety, function, and performance for this device, the following parts must be replaced periodically. When replacing, contact our service representative.

The periodic replacement period for each part is as follows.

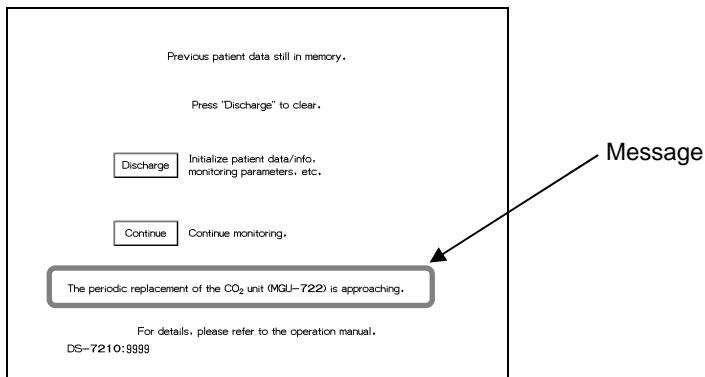
Short-Term Backup Battery	3 years
LCD Unit	50,000 hours or 6 years whichever earlier
MGU-722	20,000 hours (EtCO ₂ meas. accumulated time)
NIBP Unit	100,000 times of measurement
Recorder Unit	350 hours (Recording accumulated time)
OAO-12B Battery Pack	500 time of usage or 1 year whichever earlier

NOTE	The display panel utilizes exclusive fluorescent light for its backlight. As this fluorescent light tube has a product life cycle, it needs to be replaced periodically. If the display becomes dark, flickers, or does not light, contact your nearest service representative.
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The periodic replacement parts must be replaced at specified period.

When the periodic replacement period approaches for the MGU-722, NIBP unit, or short-term backup battery, a message will be displayed on the “Check Discharge at Power ON” screen to notify the user.



When the periodic replacement period approaches, “Check Discharge at Power ON” screen will be displayed regardless of the ON/OFF setting on the Monitor Setup menu. After checking the message, press the [Continue] key to start monitoring. Even if the key is not pressed, monitoring will automatically start after 30 seconds.

Displayed Period	Displayed Color	Displayed Message
From 3 weeks before the replacement period	Green	“The periodic replacement of the CO ₂ unit (MGU-722) is approaching.”
		“The periodic replacement of the NIBP unit is approaching.”
		“The periodic replacement of the short-term backup battery is approaching.”
After the replacement period	Yellow	“Replace the CO ₂ unit (MGU-722).”
		“Replace the NIBP unit.”
		“Replace the short-term backup battery.”



For details, refer to “2. Basic Operation To Start Monitoring Discharge Confirmation at Power ON”.

Daily Check List

No. _____

Inspected Date	Inspected by	Location
Device Type DS-7200	Serial No.	Date of Purchase
Device Type (Option Unit)	Serial No.*	
Device Type (Option Unit)	Serial No.*	

Item	Details	Criteria	Judgment
Appearance	Visually check the exterior for scratches, cracks, deformation, and rust.	No abnormality should be found.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Installation	Check whether the unit is installed on a level surface.	The installation area must be level and free from vibration and shock.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
	Check whether the unit is installed in a place susceptible to adverse environment.	The environmental condition (ex. temperature, humidity) of the installed place should be as specified. The unit should not be subjected to splashing water.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Functions	Turn ON the monitor, and check whether it operates normally.	The home display appears, and the lamp located at the right side of the display panel lights.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
		The date and time should be correct.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Cables	Visually check all cables for any damage.	No damage should be found.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Periodic Inspection	Check the date of previous periodic inspection.	Should be within 1 year.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
CO₂ Calibration (MGU-722)	Check the date of previous calibration date. Day ____ Year ____ Month ____ (*2 Refer to the following  CAUTION.)	Should be within 1 year.	<input type="checkbox"/> OK / <input type="checkbox"/> NG
Battery Pack (OAO-12B)	Check the date of starting the usage. Day ____ Year ____ Month ____	Should be within 1 year.	<input type="checkbox"/> OK / <input type="checkbox"/> NG

*1 To check the serial number for the HU-71/72/73 Option Units, it is necessary to remove them from the DS-7200. When checking the serial number, contact our service representative. The "Serial No." column can be used to fill in other information such as the device management number of your hospital.

*2  CAUTION: If the CO₂ gas calibration is not performed at a specified interval, CO₂ measurement accuracy may be affected and also subsequent gas calibration may not be possible.

Comment

Software Version



The software upgrading will be performed by our service representative. Users should not attempt the process.

The current software version can be verified on the following screen.

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

Program Version			
	Version	Date	Comment
DS-7200	V01-01 (#0144)	2007/11/08	DYNASCOPE DS-7200
Boot Version	U01-01		
Display	V01-01 (#0001)		
NIBP MAIN-CPU	0000/00/00		
NIBP SUB-CPU	0000/00/00		
HU Module	HU-73		
CO ₂ Module	Microstream		

The software version of each unit and currently attached module type will be displayed.

- DS-7200 Software Version
- Display Unit Software Version
- NIBP MAIN CPU Software Version
- NIBP SUB CPU Software Version
- HU Module Type
- CO₂ Module Type

The software version of external device will be also displayed by pressing the **Module Version** key.

Module version				
Port, Slot	Module	Version	Date	Comment
com1				
com2				
com3				
StatusII 1				
StatusII 2				
StatusII 3				
StatusII 4				
StatusII 5				

The software version information for the external device connected to each port will be displayed.

Troubleshooting

This section explains the troubleshooting for each case.

ECG

The “Check Electrodes” message is displayed.

- Cause 1 : The electrode is detached, or is not making good electrical contact with the skin.
Solution : • Check if the electrodes are properly attached.
 • Replace the electrode, or check the lead cable.
- Cause 2 : Even though the “3-lead Override” (ECG configuration) is set to ON, electrodes other than LA, RA, LL are connected.
Solution : Set the “3-lead Override” to OFF.
 Or, detach the electrodes other than LA, RA, LL.

The “ECG Low Amplitude” message is displayed.

- Cause 1 : The ECG amplitude is 0.25mV or below for the waveform size of $\times 1$, $\times 1/2$, $\times 1/4$, and 0.150mV or below for the waveform size of $\times 2$, $\times 4$.
Solution : Change the electrode attachment site, or select the lead with higher QRS amplitude.
Note : Using 4-electrode or 5-electrode/10-electrode instead of 3-electrode allows more accurate QRS detection.
- Cause 2 : The electrode contact is poor.
 Electrical blanket or other noise source is near the patient.
Solution : Attach the electrodes firmly.
 • Replace the lead cable if defective.
 • If any noise source is near the patient, locate it away from the patient as much as possible.
- Cause 3 : Even though the “3-lead Override” (ECG configuration) is set to ON, electrodes other than LA, RA, LL are connected.
Solution : Set the “3-lead Override” to OFF.
 Or, detach the electrodes other than LA, RA, LL.

ECG waveform contains noise.

The “Artifact” message is displayed.

- Cause 1 : The electrode contact is poor.
 Electrical blanket or other noise source is near the patient.
Solution : Attach the electrodes firmly.
 • Replace the lead cable if defective.
 • If any noise source is near the patient, locate it away from the patient as much as possible.
- Cause 2 : EMG is interfering.
Solution : • Change the electrode site to a location where EMG will less likely to interfere.
 • Select ESIS mode for the filter mode.
Note : Selecting ESIS mode for the filter mode will decrease the QRS amplitude and may result in not counting the heart rate.
- Cause 3 : Even though the “3-lead Override” (ECG configuration) is set to ON, electrodes other than LA, RA, LL are connected.
Solution : Set the “3-lead Override” to OFF.
 Or, detach the electrodes other than LA, RA, LL.

The “Check Electrodes” message is displayed.

- Cause 1 : The electrode contact with the skin is poor. There is substantial contact resistance between the electrodes.
- Solution : Replace all the electrodes.
Use the electrodes of the same type.
- Cause 2 : Even though the “3-lead Override” (ECG configuration) is set to ON, electrodes other than LA, RA, LL are connected.
- Solution : Set the “3-lead Override” to OFF.
Or, detach the electrodes other than LA, RA, LL.

The “ECG Unit Error” message is displayed.

- Cause : A communication error with the ECG measuring unit exists.
- Solution : A broken wire or failure of the ECG unit can be considered.
Contact our service representative.

The measured data is displayed as “xxx”.

- Cause : The heart rate is outside the measurement range.
- Solution : • Check the electrode application.
• Replace the electrode, or check the lead cable.

Heart rate is not counted. Heart rate is low.

- Cause : The ECG waveform amplitude is below the QRS detection level (0.3mV).
- Solution 1 : Change the electrode site, or select a lead with higher QRS amplitude.
- Note : Using 4-electrode or 5-electrode/10-electrode instead of 3-electrode allows more accurate QRS detection.
Also, if large amount of noise is interfering, the noise may be erroneously detected as QRS. It is recommended to change the electrode site and increase the ECG amplitude.
- Solution 2 : Increase the waveform size. By increasing the waveform size, small QRS wave will become detectable. However, noise may be also detected.

Heart rate is not counted, and “LEAD OFF” message is displayed.

- Cause 1 : The electrode of the displayed lead type is detached, or is not making good electrical contact with the skin.
- Solution : • Check the electrode application.
• Replace the electrode, or check the lead cable.
- Cause 2 : Even though the “3-lead Override” (ECG configuration) is set to ON, electrodes other than LA, RA, LL are connected.
- Solution : Set the “3-lead Override” to OFF.
Or, detach the electrodes other than LA, RA, LL.

Artificial pacemaker is not displayed.

- Cause 1 : On the admit / discharge menu, **Not used** is selected for the pacemaker use.
- Solution : Select **Used** for the pacemaker use.
- Cause 2 : In the ECG configuration menu, “Pacemaker Pulse” is set to **OFF**.
- Solution : Select **ON** for “Pacemaker Pulse”.

The “Pacing detection error” message is displayed.

- Cause : The pacemaker pulse is detected 16 pulses or more per second.
- Solution 1 : Attach the electrodes firmly.
• Replace the lead cable if defective.
• If any noise source is near the patient, locate it away from the patient as much as possible.
- Solution 2 : If the patient is not wearing a pacemaker, set to **Not used** for the pacemaker use in the patient admit/discharge menu.

The “ECG Disconnected” message is displayed.

Cause : When the ECG relay cable is disconnected during ECG monitoring, this message will be displayed.

Solution 1 : To silence the alarm, press the **Alarm Silence** key.

Solution 2 : To continue monitoring, plug in the ECG relay cable. This will clear the message and silence the alarm.

The “Cannot analyze” message is displayed.

Cause : Regardless of ON/OFF setting of “Suspend Arrhy. Analysis during Noise Interference” under Hospital Setup (Preset Menu), the “Cannot analyze” alarm will generate when analysis is suspended for more than 30 seconds.

Solution : Check the electrode attachment, and remove the noise source.

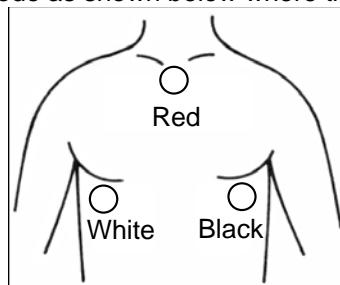
- Check if electrodes and lead cables are properly attached.
- Replace the electrode, lead cable if defective.
- If any noise source is near the patient, locate it away from the patient as much as possible.
- If EMG is interfering, change the electrode site to a location where EMG will less likely to interfere.

Respiration

The “CVA detected” message is displayed.

Cause : Heartbeat is interfering and superimposed on the respiration waveform.

Solution : Place the electrode as shown below where the heartbeat will be less likely to interfere.



“0” is displayed for respiration rate, or apnea alarm is generated.

Cause : The respiration waveform amplitude is below the detection level (0.2Ω).

Solution 1 : Change the electrode site.

Solution 2 : Increase the waveform size.

The respiration waveform and respiration rate is not displayed.

Cause 1 : The ECG relay cable designed for electrosurgical knife is used.

Solution : The impedance respiration can not be measured if the cable designed for electrosurgical knife is used. Use the standard ECG relay cable if not using the electrosurgical knife.

Cause 2 : The impedance respiration measurement is ceased.

Solution : Turn ON the impedance respiration measurement on the admit / discharge menu or RESP configuration menu.

Note : If the pacemaker with the minute ventilation measuring function is used, turn OFF the impedance respiration measurement. Otherwise, both the pacemaker and the monitor will not be able to perform accurate measurement.

The measured data is displayed as “xxx”.

Cause : The respiration rate is outside the measurement range.

Solution : • Check the electrode application.

- Replace the electrode, or check the lead cable.

Invasive Blood Pressure

The “BP* Transducer OFF” message is displayed.

Cause : The BP (either one of BP1 to BP5) transducer is not connected.
Solution : Connect the transducer.

The “BP* Zeroing Required” message is displayed.

Cause : The BP zero balance has not been performed since the power is turned ON.
Solution : Open the three-way valve on the transducer to air and perform a zero balance.

The measured data is displayed as “- - -”.

Cause : The BP zero balance has not been performed since the power is turned ON.
Solution : Open the three-way valve of the transducer to air and perform zero balance.

BP value and waveform are not displayed properly.

Cause : Blood pressure line has not been zero balanced.
Solution : Open the three-way valve of the transducer to air and perform zero balance.

The measured data is displayed as “xxx”.

Cause : The BP value is outside the measurement range.
Solution : Perform a zero balance again.

The “BP* Disconnected” message is displayed.

Cause : When the BP interface cable is disconnected during BP monitoring, this message will be displayed.
Solution 1 : To silence the alarm, press the **Alarm Silence** key.
Solution 2 : To continue monitoring, plug in the BP interface cable. This will clear the message and silence the alarm.

SpO₂ (Nellcor[®] Model: DS-7210)

10

Troubleshooting

The “Check SpO₂ Sensor” message is displayed.

Cause : The sensor is detached from the patient.
Solution 1 : Check if the sensor is properly attached to the patient.
Solution 2 : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “Pulse search” message is displayed.

Cause : The amplitude of the pulse waveform is too low, or the sensor is not positioned correctly.
Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “No pulse detect” message is displayed.

Cause : The amplitude of the pulse waveform is too low, or the sensor is not positioned correctly.
Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “Motion artifact” message is displayed.

Cause : There is excessive body motion of the patient.
Solution : Change the sensor position where the body motion will have less effect.

The pulse waveform is not displayed, or interrupted.

Situation : “Check SpO₂ Sensor” is displayed.
Cause 1 : The amplitude of the pulse waveform is too low, or the sensor is not positioned correctly.
Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

Cause 2 : Sensor is defective.
Solution : Replace the sensor.

Cause 3 : SpO₂ sensor is not firmly connected to the SpO₂ input connector.
Solution : Make sure the SpO₂ sensor is securely connected.

Cause 4 : Sensor is exposed to light.
Solution : Place a black or dark cloth over the sensor to avoid direct sunlight. Also when not used, avoid placing the sensor in light or unplug the sensor from the connector.

The SpO₂ measurement is unstable.

Cause : There is excessive body motion from the patient which prevents correct measurement.
Solution : 1. Have the patient lie still as much as possible.
 2. Relocate the sensor, or change the sensor position where body motion will have less influence.

The “SpO₂ Unit Error” message is displayed.

Cause 1 : There is a communication failure with the SpO₂ measurement unit.
Solution : A defective cable or SpO₂ unit failure can be considered.
 Contact our service representative.

Cause 2 : Sensor is defective.
Solution : Replace the sensor.

The “Replace SpO₂ Sensor” message is displayed.

Cause 1 : The sensor is not connected securely.
Solution : Connect the sensor securely.

Cause 2 : Sensor is defective.
Solution : Replace the sensor.

Cause 3 : A wrong sensor is used.
Solution : Replace the sensor. For details of usable sensors, refer to P12-4 “Optional Accessories SpO₂ Measurement”.

The “SpO₂ Disconnected” message is displayed.

Cause : When the SpO₂ relay cable is disconnected during SpO₂ monitoring, this message will be displayed.
Solution 1 : To silence the alarm, press the **Alarm Silence** key.
Solution 2 : To continue monitoring, plug in the SpO₂ relay cable. This will clear the message and silence the alarm.

SpO₂ (Masimo® Model: DS-7210M)

The “Replace SpO₂ Sensor” message is displayed.

Cause 1 : The sensor is not connected securely.
Solution : Connect the sensor securely.

Cause 2 : The sensor is defective.
Solution : Replace the sensor.

Cause 3 : A wrong sensor is used.
Solution : Replace the sensor. For details of usable sensors, refer to P12-4 “Optional Accessories SpO₂ Measurement”.

The “Check SpO₂ Sensor” message (yellow) is displayed.

Cause : The sensor is detached from the patient.
Solution 1 : Check if the sensor is properly attached to the patient.
Solution 2 : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “SpO₂ Low Perfusion” message is displayed.

Cause : The amplitude of the pulse waveform is too low, or the sensor is not positioned correctly.
 Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “SpO₂ pulse search” message is displayed.

Cause : The amplitude of the pulse waveform is too low, or the sensor is not positioned correctly.
 Solution : Check if the light emitting part and light receiving part of the sensor LED is aligned.

The “Check SpO₂ Sensor” message (blue) is displayed.

Cause : The sensor is exposed to too much ambient light. The detecting part of the sensor is not covered appropriately.
 Solution 1 : Turn down or turn off the light.
 Solution 2 : Avoid the sensor from exposure to ambient light.
 Solution 3 : Relocate the sensor position.

The “SpO₂ Interference Detected” message is displayed.

Cause : External signal or energy is interfering with the measurement.
 Solution : Remove the external interference if possible.

The “Unknown SpO₂ Sensor” message is displayed.

Cause : Unrecognizable sensor is connected.
 Solution : Replace the sensor.

The “SpO₂ Low Signal IQ” message is displayed.

Cause : There is excessive body motion or the sensor position is not appropriate.
 Solution 1 : Check if the light emitting part and light receiving part of the sensor LED is aligned.
 Solution 2 : Relocate the sensor to which the body motion will have less influence.

The “SpO₂ Unit Error” message is displayed.

Cause : There is a communication failure with the SpO₂ measurement unit.
 Solution : A defective cable or SpO₂ unit failure can be considered. Contact our service representative.

The “SpO₂ Disconnected” message is displayed.

Cause : The SpO₂ relay cable is disconnected during SpO₂ monitoring.
 Solution 1 : To silence the alarm, press the **Alarm Silence** key.
 Solution 2 : To continue monitoring, plug in the SpO₂ relay cable. This will clear the message and silence the alarm.

Non-Invasive Blood Pressure

The cuff does not inflate although the pump is operating.

Cause 1 : The air hose is not firmly connected, and the air is leaking.
 Solution : Check if the air hose is properly connected.

Cause 2 : The cuff size does not correspond with the selected patient type.
 Solution : Check if the cuff size corresponds with the selected patient type.

The monitor repeats the measurement, or “- - -” is displayed for the numeric data.

Cause 1 : The measurement accuracy is not reliable due to body motion artifact.
 Solution : Have the patient stay still as much as possible during the measurement.

Cause 2 : The pulse is too small to acquire reliable measurement accuracy.
 Solution : Check if the cuff application is proper, and if the cuff size corresponds with the selected patient type.

The “Check NIBP Cuff, Air Hose” message is displayed.

- Cause : The applied pressure to the cuff has exceeded the maximum limit. The measurement time has exceeded the maximum limit.
- Solution : Check if the cuff application is proper, if the cuff size is corresponded to the selected patient type, or if the air hose is not bent. After checking the above, perform the measurement again.
If the same message is displayed again, a failure of the equipment can be considered. Cease the measurement, and contact our service representative.

The “NIBP Unit Error” message is displayed.

- Cause : The zero balancing has failed, and measurement could not be started.
- Solution : The body movement or other artifact may cause zero balance failure. During the measurement, have the patient stay still as much as possible.
If the same message is displayed again, the failure of the equipment can be considered. Cease the measurement, and contact our service representative.

The “NIBP measurement failed.” message is displayed.

- Cause : The pressure applied to the cuff or the measurement time has exceeded the limit, and measurement could not be performed.
- Solution : Check if the cuff is properly attached to the patient, or cuff size is correct. Also check if the air hose is not bent, and perform the measurement again.
If the same message is displayed again, equipment failure can be considered. Contact our service representative.

The time of measurement disappears and the numeric data is displayed as “- - -”.

- Cause : The NIBP data will be deleted when the preprogrammed NIBP erase time has elapsed.
- Solution : Select the appropriate time for NIBP data erase time from 10min, 30min, 60min, 24hrs which best fits the monitoring purpose.

The “System Error” message in the numeric data box does not disappear.

- Cause : The system error message may remain to be displayed even after the error cause is resolved.
- Solution : The message can be cleared by pressing the **Cancel NIBP System Error** key on the second page of the NIBP configuration menu. If the message still remains, equipment failure can be considered. Contact our service representative.

Temperature

The “Unknown Temp. Sensor” message is displayed.

- Cause 1 : The 700 series (Measurement Specialties, Inc) is used.
- Solution : Use the 400 series temperature probe (Measurement Specialties, Inc) for measurement.
- Cause 2 : There is a contact failure of the temperature probe.
- Solution : Check if the temperature probe is properly attached.

The numeric data is displayed as “xxx”.

- Cause : The temperature measurement is outside the measurement range.
- Solution : Check if the temperature probe is properly attached.

The “TEMP Disconnected” message is displayed.

- Cause : When the temperature sensor is disconnected during temperature monitoring, this message will be displayed.
- Solution 1 : To silence the alarm, press the **Alarm Silence** key.
- Solution 2 : To continue monitoring, plug in the temperature sensor. This will clear the message and silence the alarm.

The “TEMP auto check” message is displayed. The numeric data is displayed as “- - -”.

- Cause : The temperature is calibrated once every hour on this monitor. During calibration, the numeric data will be displayed as “- - -”.

Solution : The calibration will complete in 10 seconds. If the calibration does not complete within 10 seconds, cease the measurement and contact our service representative.

The “TEMP Unit Error” message is displayed.

Cause : Error is detected during temperature calibration.

Solution : A unit failure can be considered. Cease the measurement and contact our service representative.

Cardiac Output

The CO value varies more than $\pm 10\%$ for consecutive measurements.

Cause 1 : The injection method is not appropriate.

Solution : Inject within 1 to 3 seconds.

Cause 2 : Injection temperature is not appropriate.

Solution : If iced injectate is used, pay attention not to warm the injector with hands.

Cause 3 : The thermistor location is not appropriate.

Solution : Reposition the thermistor.

Cause 4 : Arrhythmia event has occurred during the measurement.

Solution : Wait until the patient has stable heart rhythm.

Cause 5 : There was patient body movement during measurement.

Solution : Have the patient stay still during the measurement.

Cause 6 : The patient’s hemodynamics has changed during measurement.

Solution : Wait until the patient has stable hemodynamics.

Abnormal measurement value is displayed.

Cause : The catheter size, injectate volume, catheter constant (CC) are not correct.

Solution : Set the proper condition, CC value for the used catheter.

The blood temperature (T_b), injectate temperature (T_i) are not displayed on the monitor.

Cause : The catheter is not properly connected.

Solution : Securely connect the catheter.

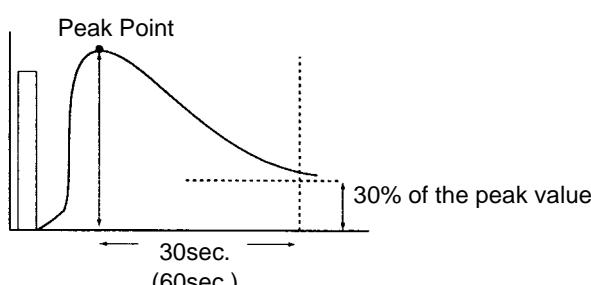
The thermodilution curve is deformed.

Cause : The injection is not smooth, steady motion.

Solution : Injection should be performed within 1 to 3 seconds.

The baseline of the thermodilution curve is displaced to the minus side. The “Lower Fault” message is displayed on the monitor.

Cause : The blood temperature has not returned to a stable condition after measurement.

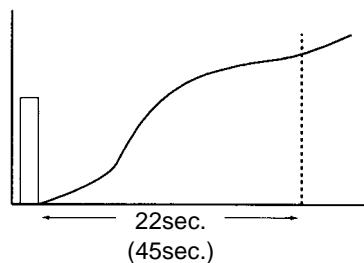


The thermodilution curve did not return to the cut off point soon enough. The temperature must return to a point that is 30% of the peak value within 30 seconds (or 60 seconds depending on the setup).

Solution : If performing continuous measurement, wait for 30 to 60 seconds and check that “Ready” is displayed before performing the next measurement.

The thermodilution curve is low. The “Peak Fault” message is displayed on the monitor.

Cause : The peak of the thermodilution curve cannot be detected.

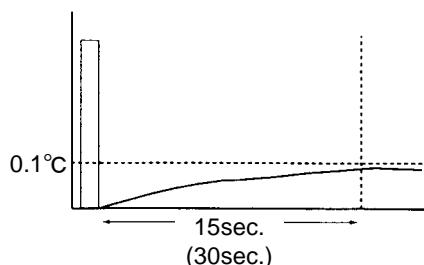


After injection, the peak of the thermodilution curve was not determined within 22 seconds (when the time scale is "30 sec") or 45 seconds (when the time scale is "60 sec").

Solution : The thermistor may be contacting the pulmonary artery wall. Reposition the thermistor and measure again.

The “Upper Fault” message is displayed on the monitor.

Cause : After the injection, the blood temperature is out of the measurement range.



After injection, the blood temperature is out of the measurement range. The thermodilution curve did not rise above 0.1°C within 15 seconds (when the time scale is "30 sec") or 30 seconds (when the time scale is "60 sec").

Solution : Use the iced injectate, and measure again.

The “Over Range” message is displayed on the monitor.

Cause : The CO value is out of the calculation range.

Solution : The area of the thermodilution curve is too large to calculate. Perform the measurement again.

The measurement is interrupted, and the error message, “Upper Fault”, “Peak Fault”, “Lower Fault”, “Sensor Error” is displayed on the monitor.

Cause 1 : The thermistor connector and relay cable are not securely connected.

Solution : Correct measurement cannot be performed unless the thermistor connector and relay cable are securely connected. Check the connection and perform the measurement again.

Cause 2 : The sensor or relay cable is defective.

Solution : If the sensor or cable is defective, measurement can not be performed. Replace the sensor or cable and perform the measurement again.

The “CO disconnect” message is displayed on the monitor.

Cause : This message will be displayed when the catheter relay cable is disconnected during monitoring the cardiac output.

Solution 1 : To silence the alarm, press the **Alarm Silence** key.

Solution 2 : To continue monitoring, plug in the catheter relay cable. The message display and alarm sound will be cancelled.

CO₂ Concentration (Option Unit: MGU-722)

The “Check Sample Line” message is displayed.

Cause : The sampling line is clogged.
Solution : Replace the sampling line.

The “Self-diag CO₂” message does not disappear.

Cause : An error has occurred to the self-check procedure at power ON.
Solution : The CO₂ unit failure can be considered.

The “Initializing CO₂” message does not disappear.

Cause : An error has occurred during the initialization at power ON.
Solution : The CO₂ unit failure can be considered.

The “Check CO₂ unit” message is displayed.

Cause 1 : The exhaust connector is clogged.
Solution : After checking the exhaust system and removing the clog, press the “Restart CO₂” key on the CO₂ configuration menu.

Cause 2 : The sampling line or nasal prong is clogged.
Solution : After checking the inhalation system and removing the clog, press the “Restart CO₂” key on the CO₂ configuration menu.

Cause 3 : The CO₂ unit needs to be replaced.
Solution : Contact our service representative.

The “CO₂ Unit Error” message is displayed.

Cause : There is a communication error with the CO₂ unit.
Solution : The wire break or CO₂ unit failure can be considered.
Contact our service representative.

There is substantial measurement error.

Cause 1 : 20 minutes have not yet elapsed since the power is turned ON.
Solution : For 20 minutes from turning ON the power, there will be a substantial measurement error.

Cause 2 : The calibration is not properly performed.
Solution : Perform CO₂ calibration again.

The “Check Sample Line” message is displayed.

Cause : When the filter line is disconnected during CO₂ monitoring, this message will be displayed.
Solution 1 : To cease monitoring, press the **Alarm Silence** key to clear the message and silence the alarm.
Solution 2 : To continue monitoring, plug in the filter line. This will clear the message and silence the alarm.

The “Check CO₂ Exhaust Port” message is displayed.

Cause : The exhaust line is clogged.
Solution : Replace the exhaust tube.

The “CO₂ Cal. Required” message is displayed.

Cause : Calibration has not been performed.
Solution : Accurate measurement cannot be performed unless the calibration is performed.
Follow the procedure on P3-33 “Procedure for Calibration”.

CO₂ Concentration (Option Unit: MGU-721)

The “CO₂ Unit Error” message is displayed.

Cause : There is a failure in the CO₂ unit.
Solution : Stop using the unit and contact our service representative.

The “CO₂ Sensor Failure” message is displayed.

Cause 1 : The CO₂ sensor temperature is higher than 50°C.
Solution : Remove any heat generating source around the sensor.

Cause 2 : The CO₂ sensor is defective.
Solution : Replace the CO₂ sensor.

Note : If error persists, the CO₂ unit may be damaged. Stop using the unit and contact our service representative.

The “Zero CO₂ Adapter” or “Check CO₂ Adapter” message is displayed.

Cause : The CO₂ sensor is not zero balanced.
Solution : Perform the airway adapter calibration.

The “Check CO₂ Adapter” message is displayed.

Cause 1 : The airway adapter is unclean.
Solution : A clean airway adapter must be used. If reusing an airway adapter, clean and air-dry it. Then, wipe the window with swab, and sterilize (EOG, etc.) before use.

Cause 2 : The airway adapter is disconnected from the sensor.
Solution : Securely connect the airway adapter to the sensor.

Note : If the error persists, calibrate the airway adapter.
If the error still persists, perform the calibration again in the order of zero calibration, reference calibration, and airway adapter calibration.

The “Unknown CO₂ Sensor” message is displayed.

Cause : The connected CO₂ sensor is not applicable.
Solution : Connect the applicable CO₂ sensor.

The “CO₂ Disconnected” message is displayed.

Cause : The Capnostat 5 is disconnected during CO₂ monitoring.
Solution1 : To cease monitoring, press the **Alarm Silence** key to clear the message and silence the alarm.
Solution2 : To continue monitoring, plug in the Capnostat 5. This will clear the message and silence the alarm.

Wired Network (DS-LAN II/ DS-LAN III)

The data cannot be displayed on the central monitor.

Cause 1 : The DS-LAN setup is not correct.
Solution : Make sure that the DS-LAN Setup (DS-LANII/DS-LANIII) for all bedside monitors and central monitors in the same network are the same. If the DS-LAN setting is changed, make sure to restart the system.

Cause 2 : A central monitor which is not compatible with the DS-LANIII network is used.
Solution : The following central monitors can not be used with the DS-LANIII network.

- DS-5700
- DS-5800N/NX/NX^{MB}
- DS-7600/7600W with software version V05 and prior

When using these central monitors, all monitors in the same network should be set to DS-LANII.

- Cause 3** : Inappropriate HUB is used.
Solution : Use a repeater HUB recommended by Fukuda Denshi for DS-LANII network and a switching HUB recommended by Fukuda Denshi for DS-LANIII network.
- Cause 4** : The bed ID is duplicated in the same network.
Solution : If bedside monitors with the same bed ID exist in the same network, communication is not possible. Make sure to set a unique bed ID for each bedside monitor.
- Cause 5** : An equipment not specified by Fukuda Denshi is connected to the network.
Solution : Do not connect PC, printer, or other unspecified equipment to the network.
- Cause 6** : The DS-LAN cable is not properly connected.
Solution : The DS-LAN connection will be performed by our service representative. Contact our service representative.

On the central monitor, ECG waveform is not displayed although other waveforms are displayed.

- Cause** : Under the ECG configuration menu, "HR/PR Alarm Source" is set to **[BP]**.
 Or, "HR/PR Source" is set to **[Auto]**, and BP is automatically selected due to lead-off, etc.
- Solution 1** : Select **[ECG]** or **[SpO₂]** for "HR/PR Alarm Source".
- Solution 2** : Under the Monitor Setup menu, select **[ECG/SpO₂]** for "HR/PR Source".
 If this selection is made, the system will not automatically select BP for HR/PR source.

On the central monitor, CO₂ waveform is not displayed although CO₂ numeric data is displayed.

- Cause 1** : Under the respiration configuration menu, "RR/APNEA Alarm is set to **[Impedance]**.
Cause 2 : Under the respiration configuration menu, "RR/APNEA Alarm is set to **[Ventilator]**.
Solution : Select **[CO₂]** for "RR/APNEA Alarm Source".
 In this case, RR and apnea alarm will be generated based on CO₂ measurement.

On the central monitor, impedance respiration waveform is not displayed although RR numeric data is displayed.

- Cause 1** : Under the respiration configuration menu, "RR/APNEA Alarm Source" is set to **[CO₂]**.
Cause 2 : Under the respiration configuration menu, "RR/APNEA Alarm Source" is set to **[Ventilator]**.
Solution : Select **[Impedance]** for "RR/APNEA Alarm Source".
 In this case, RR and apnea alarm will be generated based on impedance measurement.

NOTE	<ul style="list-style-type: none"> ● The impedance respiration waveform will not be displayed if [CO₂] is set for "RR/APNEA Alarm Source". AWF, AWP waveform will be displayed. ● The CO₂ respiration waveform will not be displayed if [Impedance] is set for "RR/APNEA Alarm Source". AWF, AWP waveform will be displayed. ● Both the CO₂ and impedance respiration waveform will not be displayed if [Ventilator] is set for "RR/APNEA Alarm Source".
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Although the PR alarm is set on the central monitor, it returns to previous setting after a short time.

- Cause 1** : **[ECG]** is selected for "HR/PR Alarm Source" in the SpO₂ configuration menu.
Cause 2 : **[BP]** is selected for "HR/PR Alarm Source" in the SpO₂ configuration menu.
Solution : Select **[SpO₂]** for "HR/PR Alarm Source".
 In this case, HR and PR alarm will be generated based on SpO₂ measurement.

Although the HR alarm is set on the central monitor, it returns to previous setting after a short time.

- Cause** : **[SpO₂]** is selected for "HR/PR Alarm Source".
Solution : Select **[ECG]** for "HR/PR Alarm Source".
 In this case, HR and PR alarm will be generated based on ECG measurement.

CAUTION	On the DS-7200 system, HR and PR alarm cannot be set to ON simultaneously.
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The “DS-LANII Disconnected” or “DS-LANIII Disconnected” message is displayed.

- Cause : The CJ-522 Ethernet branch cable is not properly connected.
Solution : Connect the CJ-522 Ethernet branch cable properly.

Telemetry

There is no reception at the telemetry center.

- Cause : The channel ID or group ID do not correspond with the telemetry receiver.
Solution : Set the correct channel ID and group ID.

The impedance respiration waveform cannot be received at the telemetry center.

- Cause 1 : Under the respiration configuration menu, "RR/APNEA Alarm Source" is set to **CO₂**.
Cause 2 : Under the respiration configuration menu, "RR/APNEA Alarm Source" is set to **Ventilator**.
Solution : Set the "RR/APNEA Alarm Source" to **Impedance**.

The BP waveform of 100mmHg or above cannot be properly received.

- Cause : The BP waveform and scale is not corresponded.
Solution : When the BP waveform is above 100mmHg, set the BP scale above 100mmHg.

The “Telemetry Unit Failure” message is displayed.

- Cause : Cannot communicate with the telemetry unit.
Solution : Wire break or breakdown of telemetry transmission unit can be considered. Contact our service representative.

TCON

Can not communicate with the central monitor. The “Chk TCON Receive” message is displayed.

- Cause 1 : The distance from the central monitor is too far.
Solution : Rearrange the monitor position so that it is not too far from the central monitor.
- Cause 2 : The TCON setup is not correct.
Solution : Check whether the TCON ID and/or channel corresponds to the central monitor.
- Cause 3 : The TCON module is disconnected from the monitor.
Solution : Securely connect the cable of the TCON module to the serial connector on the monitor.

The “Check TCON Comm.” message is displayed.

- Cause : A communication error occurred between the TCON module and the monitor.
Solution : Check the connection between the TCON module and the monitor.
Check whether **TCON** is selected for the COM2 port on the “Ext. Device Connection Setup” under “Hospital Setup”.

The “TCON Interference” message is displayed.

- Cause : The TCON ID is duplicated with other monitor in the same TCON group (channel).
Solution : Make sure to set a unique TCON ID for each bedside monitor within the same TCON group (channel).

Remote Control Unit

The remote control does not function.

- Cause 1 : The monitor number selected on the remote control is not correct.
Solution : Select the correct monitor number.
- Cause 2 : The section number does not correspond to the monitor and the remote control.
Solution : Set the correct section number.

The remote control does not properly function.

- Cause : The remote control setting on the monitor does not correspond to the function key on the remote control unit.
 Solution : Check the remote control setup on the monitor.

General**Nothing is displayed but the main power indicator is lighted.**

- Cause : A system error has occurred.
 Solution : Turn off the power, unplug the power cable, and contact our service representative.

The “Adjusting” message is displayed. Numbers are displayed large on the display.

- Cause : This is the test mode. Stop using the device immediately.
 Solution : Restart the system. The test mode will be cancelled.
 If the same situation is observed again, contact our service representative.
 Turn off the DIP switch No.1.

The data is initialized each time the power is turned ON.

- Cause 1 : The internal switch is set to initialize.
 Solution : The internal switch setting needs to be changed. Contact our service representative. Set the rotary switch to 0.
- Cause 2 : The battery for backup memory is depleted.
 Solution : The battery needs to be replaced. Contact our service representative.

The display is not clear.

- Cause 1 : The display is not clear.
 Solution : Due to the LCD display characteristic, the visible range is limited. Adjust to the appropriate brightness.
- Cause 2 : The night mode is set.
 Solution : Cancel the night mode.

The system does not start although the power switch is turned ON.

- Cause 1 : The power cable is not connected.
 Solution : Turn off the power and connect the power cable.
- Cause 2 : Incorrect CF card is inserted.
 Solution : Remove the CF card, and turn OFF the power. Turn OFF the DIP switch No. 8 and turn ON the power again.

The clock shows incorrect time when using on a wired network (DS-LANII).

- Cause : The clock of the network administrator (central monitor with central ID: 001) is not correct.
 Solution : When using on a wired network, the clock of all connected monitors will synchronize with that of network administrator. Make sure the clock of the network administrator is correct.

The screen not intended is displayed.

- Cause 1 : If Store is selected for “Parameter Key Operation” (Monitor Setup), the last screen displayed from the parameter key will be stored. The next time the parameter key is pressed, the stored screen will be directly displayed.
 Solution : Press the Prev. Disp key on the displayed screen to return to the top screen of the parameter setup menu. Or, select Not Store for “Parameter Key Operation”.
- Cause 2 : The pressed position on the touch panel and the position where the equipment detected do not correspond.
 Solution : The touch panel adjustment needs to be performed. Contact our service representative.

The clock is often delayed. The “Check Backup Battery” message is displayed.

- Cause : The battery for the backup memory is depleted. Check if the time is delayed when the power is turned off.
Solution : The battery needs to be replaced. Contact our service representative.

The “MAIN Unit Failure” message is displayed.

- Cause : The hardware failure of the main unit can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “Display Unit Failure” message is displayed.

- Cause : The hardware failure of the display unit can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “HU Module Failure” message is displayed.

- Cause : The hardware failure of the option unit (HU-71/72/73) can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “Sub Unit Failure” message is displayed.

- Cause : The hardware failure of the sub unit can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “Analog Unit Failure” message is displayed.

- Cause : The analog board failure can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “High Internal Temperature” message is displayed.

- Cause : The temperature inside the equipment is increasing. The equipment failure can be considered.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “Display Unit Backlight Failure” message is displayed.

- Cause : The fluorescent light of the display unit may be damaged.
Or, the lifetime of the LCD unit has expired and needs to be replaced.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

“Check Rotary SW” message is displayed.

- Cause : The rotary switch is not set to “0 (zero)”.
Solution : If the rotary switch is not set to “0”, the equipment will not function properly. Immediately turn OFF the power and cease using the equipment. Contact our service representative.

The “Check DIP-SW” message is displayed.

- Cause : The DIP switch setting is incorrect.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

The “Multiport-* Disconnected” message is displayed.

- Cause : The CJM-01SR0.6 Multiport Relay Cable is disconnected.
Solution1 : To cease monitoring, press the **Alarm Silence** key to clear the message and silence the alarm.

Solution2 : To continue monitoring, plug in the multiport relay cable. This will clear the message and silence the alarm.

The “Check Equip. Config. (CO₂)” message is displayed.

Cause : The actually connected CO₂ unit and “Change Equip. Config. (CO₂)” setting ([Preset] → [Configuration] → [Change Equip. Config. (CO₂)]) does not correspond.

Solution : The “Change Equip. Config. (CO₂)” should be properly set.
The setup will be performed by our service representative. Contact our service representative.

The “Check Memory Card” message is displayed.

Cause : The card is remained inside the card slot.

Solution : Remove the card.

Battery

The operation time is short although the battery is charged.

Cause 1 : The battery life has expired.

Solution : The battery pack is a consumable product. Replace it once a year.

Cause 2 : The ambient temperature is too high or too low.

Solution : For safety, the charging operation will be in a standby mode when the battery pack temperature becomes excessively high or low.
Charging will automatically resume when appropriate temperature is reached.
Charge the battery in an ambient temperature of 10 to 30°C.

The charge lamp on the patient monitor does not light.

Cause 1 : The AC power cable is disconnected.

Solution : Plug in the AC power cable.

The battery pack can be charged only during the AC operation.

Cause 2 : The battery pack is not installed.

Solution : The battery pack is optional accessory. To purchase the battery pack, contact our service representative.

Cause 3 : The battery life has expired.

Solution : Replace the battery pack.

Cause 4 : The connector between the battery pack and the monitor is disconnected.

Solution : It is necessary to check inside the equipment if the connector is disconnected. Contact our service representative.

Solution : The battery pack failure can be also considered. Contact our service representative.

During the charging procedure, the charge lamp (orange) does not switch to charge complete status (green) and turns OFF.

Cause 1 : The battery pack temperature is too high or too low.

Solution : For safety, the charging operation will be in a standby mode when the battery pack temperature becomes excessively high or low.
The charging will automatically resume when appropriate temperature is reached.

Cause 2 : The breakdown of battery pack can be considered.

Solution : If the charging operation does not complete within the specified charging time, the charging operation will cease for safety purpose.
Contact our service representative and replace the battery pack.

Cause 3 : The battery life has expired.

Solution : Replace the battery pack.

The “Charge the battery.” message is displayed.

Cause 1 : The remaining battery capacity is low.

- Solution : The remaining operation time is less than 20 minutes. Plug in the AC power cable and charge the battery.
- Cause 2 : The AC power cable is disconnected.
 Solution : Plug in the AC power cable.
 The battery pack can be charged only during the AC operation.

Ventilator

The “VENT alarm” message is displayed.

- Cause : The following alarm has generated on the ventilator.
- Parameter alarm such as AWP, MV, FiO₂
 - Technical alarm such as battery replacement
- Solution : Check the alarm cause of the ventilator, and take appropriate action.

The “Vent. Disable”, “Vent. Invalid” message is displayed. The ventilator screen is also displayed.

- Cause 1 : The cable is not properly connected.
 Solution : Securely connect the ventilator cable to appropriate connector.

- Cause 2 : The power of the ventilator is turned OFF.
 Solution : Turn ON the power of the ventilator.

- Cause 3 : The ventilator is in standby mode.
 Solution : Start the ventilation on the ventilator.

- Cause 4 : The communication setup of the DS-7200 system and ventilator is not corresponded.
 Solution : The communication setup of the DS-7200 system and ventilator is fixed as follows.
 Check the communication setup of the ventilator.
 For procedures, refer to the operation manual of the ventilator.

Servo-900/300 / i / s
 No communication setup

Evita 2dura / 4 / XL

Baud Rate	: 19200bps
Parity Bit	: EVEN
Data Bit	: 8 bit
Stop Bit	: 1 bit
Communication	: MEDIBUS

PB-7200 / 740 / 760 / 840

Baud Rate	: 9600bps
Parity Bit	: None
Data Bit	: 8 bit
Stop Bit	: 1 bit

Savina

Baud Rate	: 9600bps
Parity Bit	: None
Data Bit	: 8 bit
Stop Bit	: 1 bit
Communication	: MEDIBUS

Oximeter

The measurement data is not displayed.

Cause 1 : The cable is not properly connected.

Solution : Securely connect the following cable to multiport relay cable and each corresponded device.

Oximeter, CCO measurement Device	Oximeter Connection Cable		
	via Multiport Relay Cable (Port A or Port B)	via COM Connector (COM3)	via Status II Connector (1-5)
Vigilance	CJ-515 (Q'ty: 1)	CJO-04RS4	CJ-406RI-70VIGI
Vigilance CEDV	CJ-515 (Q'ty: 1)	CJO-04RS4	CJ-406RI-70VIGI
VigilanceII	CJ-584 (Q'ty: 1)	CJ-502	CJ-402RI-70SVI
Vigileo	CJ-584 (Q'ty: 1)	CJ-502	CJ-402RI-70SVI
OXIMETRIX3	CJ-516 (Q'ty: 1)	CJ-508	CJ-405RI-70PB72
Q-vue	CJ-517 (Q'ty: 1)	CJO-04RS4	CJ-406RI-70VIGI
Q2 Computer	CJ-582 (Q'ty: 1)	CJO-04RS4	CJ-406RI-70VIGI

Cause 2 : The multiport connection is not properly set.

Solution : Select **Vigilance/Vigileo**, **Oximetrix3**, **Q-vue** or **Q2Computer** on the multiport connection setup menu.

Cause 3 : The measurement data is not displayed on the oximeter display.

Solution : The measurement data of SvO_2 , CO, etc. will not be displayed on the monitor unless the data is displayed on the oximeter display. Check if the data is displayed on the oximeter display.

Cause 4 : The CCO is not measured.

Solution : The monitor will display CCO/CCI data only during the process of CCO measurement on the oximeter. When CCO is in wait or failure condition and CO AVG data is stored in Q-vue or OXIMETRIX3, CO AVG data will be displayed.

Cause 5 : The BSA is not input.

Solution : To display the CCI data on the monitor, it is necessary to input the BSA to the Q2 Computer. To display the CI AVG data, it is necessary to input the CO AVG and BSA to the Q2 Computer. For procedures, refer to the operation manual of the Q2 Computer. For Q-vue/OXIMETRIX3, CI AVG, BSA cannot be displayed on the monitor as BSA cannot be received from the Q-vue/OXIMETRIX3.

Cause 6 : The network setup of DS-7200 and the oximeter is not corresponded.

Solution : The network setup of DS-7200 is fixed to the default setting of each oximeter and cannot be changed. Check if the network setup of connecting oximeter is in default setting. In case of Vigilance/Vigileo, check if the network is set as follows.

- Device: IFM Out
- Baud Rate: 19200bps
- Parity Bit: None
- Stop Bit: 1
- Data Bit: 8
- Flow Control: 2 sec.

For procedure to check the Vigilance/Vigileo network setup, refer to the operation manual for the Vigilance/Vigileo.

In case of Q2 Computer, check if the network is set as follows.

- Baud Rate: 9600bps
- Parity Bit: ODD
- Stop Bit: 1
- Data Bit: 7

For procedure to check the Q2 Computer network setup, refer to the operation manual for the Q2 Computer.

- Cause 7 : The software version of Vigilance is not corresponded.
Solution : If the Vigilance without the STAT function is connected, the STAT data will not be displayed. Check the software version of the Vigilance.

An error is caused between the data of Q2 Computer and bedside monitor.

- Cause : Due to difference such as number of significant digit, an error may be caused between the displayed data and transmitted data of the Q2 Computer. Also, updating of monitor data may be delayed due to transmission delay which causes the difference of value between the Q2 Computer.

The CO average value is displayed although not measured.

- Cause : The past CO data is stored in OXIMETRIX3, Q-vue, Q2 Computer.
Solution : Clear the stored CO data in the OXIMETRIX3, Q-vue, Q2 Computer before connecting to multiport relay cable.

BIS Monitor

The numeric data is not displayed.

- Cause 1 : The external device connection setup is not correctly performed.
Solution : Properly select the BIS monitor on the external device connection setup.

- Cause 2 : If SQL value is lower than 15, BIS data and SR data will not be displayed.
Solution : Refer to the BIS operation manual and set the SQL value above 15.

- Cause 3 : The communication setup of the BIS monitor is incorrect.
Solution : ASCII should be set to communicate with the DS-7200.
Check the communication setup and verify that it is set to ASCII.
Refer to the BIS operation manual for procedures.

Recorder

No recording is performed.

- Situation : The "Check Rec. Paper (Built-in)" message is displayed on the upper left of the screen.
The "PAPER OUT" message is displayed inside the **Record START/STOP** key.

- Cause : There is no recording paper in the recorder cassette.
Solution : Install a new pad of paper into the cassette.

- Situation : The "Check Cassette (Built-in)" message is displayed.
The "CASSETTE" message is displayed inside the **Record START/STOP** key.

- Cause : The cassette of the built-in recorder is open.
Solution : Close the cassette firmly.

- Situation : The "Check Paper (Central)" message is displayed.
The "PAPER OUT" message is displayed inside the **Record START/STOP** key.

- Cause : There is no recording paper in the central recorder.
Or, central recorder (DS-5700) cassette is open.
Solution : Install a new pad of paper into the cassette.
Close the recorder cassette if it is open.

- Situation : The "Check Cassette (Central)" message is displayed.
The "CASSETTE" message is displayed inside the **Record START/STOP** key.

- Cause : The central recorder (DS-7600) cassette is open.
Solution : Close the central recorder (DS-7600) cassette.

- Situation : No message is displayed, but recording can not be performed.
Cause : The recording paper is not correctly installed. The front and backside of the paper is set oppositely.
Solution : The "END" printed side of the paper should be facing down in the cassette.

The second waveform and third waveform are not recorded.

- Situation : The second waveform and third waveform are not recorded for manual recording or alarm recording.
Cause : The second waveform and third waveform are not set on the recording setup menu.
Solution : Set the second waveform and the third waveform on each recording setup menu.

The “Check Built-in Recorder” message is displayed.

The “CHECK?” message is displayed inside the Record START/STOP key.

- Cause 1 : The paper is jammed inside recorder.
Solution : Open the cassette, and install the paper properly.
Cause 2 : The thermal head temperature increase or other failure of the recorder has occurred.
Solution : Damage to the thermal head or other failure can be considered. Contact our service representative.

The “Check Central Recorder” message is displayed.

The “CHECK?” message is displayed inside the Record START/STOP key.

- Cause : The thermal head temperature increase or other failure of the Central Recorder has occurred.
Solution : Damage to the thermal head or other failure can be considered. Contact our service representative.

The “Built-in Recorder Unit Failure” message is displayed.

- Cause : There is a communication failure with the built-in recorder.
Solution : Wire break or built-in recorder failure can be considered.
Contact our service representative.

Laser Printer

The recording is not performed on the laser printer.

- Cause 1 : The paper cassette is empty.
Solution : Install the recording paper in to the paper cassette.
Cause 2 : The paper cassette is not firmly closed.
Solution : Close the paper cassette.
Cause 3 : Other monitor is in process of recording.
Solution : Suspend the ongoing recording or wait until the recording is complete.
Cause 4 : The printer is in offline mode.
Solution : Set the printer to online mode.
Cause 5 : The connection cable to the printer is disconnected.
Solution : Securely connect the cable to the printer.
Cause 6 : The network setup for the laser printer is not performed.
Solution : Refer to our service representative.
Cause 7 : Breakdown of the HUB has occurred.
Solution : Check the LED on the HUB if it is properly communicating.
If the LED is not lighted, contact our service representative.
Cause 8 : The network board of the laser printer is malfunctioning.
Solution : Check if any error message or error code is displayed on the printer LCD.
If displayed, contact our service representative.

Data transfer error to the printer has occurred.

- Cause 1 : Printer is set to offline mode.
Solution : Set the printer mode to online mode.

Cause 2 : Printer cable is disconnected.
Solution : Connect the printer cable.

Printer recording does not stop.

Cause : Printing operation was performed too frequently.
Solution : Wait until all the printing completes or press the  **Cancel** key.
Do not turn off the power of the printer during recording as it may cause a printing error.

The printed output is incomplete or frame only.

Cause 1 : The recorder cover or paper cassette was opened during recording, or the printer was left out of paper for a certain time and recording has resumed with the oldest data deleted.
Solution : Do not open the recorder cover or paper cassette during recording. Also, supply new pad of paper immediately when the paper is out.

Cause 2 : The system was restarted during recording.
Solution : Do not restart the system during recording.

Printer output is garbled.

Cause 1 : The power of the printer was reset during recording.
Solution : When resetting the printer power, it should be done after the recording is complete.

Cause 2 : The printer specification is not properly set.
Solution : Refer to the printer operation manual for the correct specification.

Chapter 11

Technical Information

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Specification / Performance

This section states the specification and performance of this equipment.

Specification

Size/Weight

DS-7210/DS-7210M

Size 310 (W) × 245 (D) × 351 (H) mm (not including the option unit and protrusion)
Weight 9.9kg ± 1kg (not including the accessories)

HU-71/HU-72/HU-73 (Option Unit)

Size 37(W) × 90(D) × 99(H) mm (not including the protrusion)
Weight 180g ± 20g

MGU-721/MGU-722 (Option Unit)

Size 141.5(W) × 41(D) × 79(H) mm (not including the protrusion)
Weight MGU-721 200g ± 50g
MGU-722 260g ± 50g

Environmental Condition

Operating Temperature : 10 to 40°C
Operating Humidity : 30 to 85% (non-condensing)
Transport / Storage Temperature : -10 to 60°C
Transport / Storage Humidity : 10 to 90% at 40°C (non-condensing)
Transport / Storage Atmospheric Pressure : 700 to 1060hPa

Safety

General Standard:

IEC 60601-1:1988 (Medical electrical equipment – Part 1: General requirements for safety)

Amendment A1 to IEC 60601-1:1991, Amendment A2 to IEC 60601-1:1995

UL 60601-1: 2003, with updates to 2006 *

(Medical electrical equipment – Part1: General requirements for safety)

CAN/CSA C22.2 No.601.1-M90, with updates to 2005*

(Medical electrical equipment – Part1: General requirements for safety)

*The above 2 standards applies only for the product with UL/cUL Classification mark on the rating label.

EMC Standard:

IEC 60601-1-2: 2007 (Medical electrical equipment – Part 1: General requirements for safety –

2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

The class of protection against electric shock :

Class I Equipment, Internally Powered Equipment

The type of protection against electric shock:

ECG/RESP (Impedance) : Type CF Applied Part

SpO₂ : Type CF Applied Part

TEMP : Type CF Applied Part

BP : Type CF Applied Part

Cardiac Output : Type CF Applied Part

NIBP : Type BF Applied Part

CO₂ : Type BF Applied Part

Protection against Defibrillation Discharge : Provided

Operation Mode : Continuous Operating Equipment

Waterproof Level : IPX0 (no protection)

Equipment Type for Transfer : Portable Equipment

Protection against Ignition of Flammable Anesthetic : Not provided

Power Requirements

Voltage	AC 100 to 240V ±10%	DC14.8V
Frequency	50Hz or 60Hz	—
Power Consumption	90VA	80W

Usable Life

6 years : According to self-certification
Refer to "10. Maintenance Periodic Replacement Parts" for components requiring periodic replacement.

Performance

Display

Device	: 12.1 inch TFT Color LCD
Resolution	: 1024x768 pixel
Function Control	: Touch Keys
Waveform Trace	: Stationary Trace
Sweep Speed	: ECG/SpO ₂ /BP (6.25mm/s, 12.5mm/s, 25mm/s) RESP/CO ₂ (6.25mm/s, 12.5mm/s, 25mm/s)
Parameter	: ECG, HR, RESP, TEMP, SpO ₂ (Arterial Oxygen Saturation), PR, BP, NIBP, CO ₂ , Cardiac Output, Blood Temperature

Operation

Touch Screen : Eight-Wire Resistive Analog Touch Screen

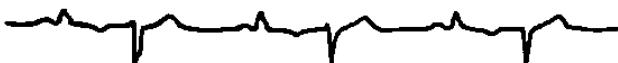
Alarm Function

Volume	Tone	Sound Pressure (dB)	
		“Alarm System” Setting FUKUDA DENSHI	“Alarm System” Setting IEC
Highest	Highest	86.0	88.5
	Lowest	78.9	84.4
Lowest	Highest	46.1	45.2
	Lowest	42.1	41.5

ECG

Lead Type	: Wired 3-electrode, 4-electrode, 5-electrode, 10-electrode
Frequency Characteristic	: Monitor Mode Adult/Pediatric: 0.5 to 40Hz Neonate: 1.6 to 40Hz ESIS Mode Adult/Pediatric/Neonate: 1.6 to 15Hz Diagnosis Mode 3-electrode Adult/Ped./Neo. 0.05 to 100Hz 4, 5, 10-electrode Adult/Ped./Neo. 0.05 to 150Hz
Input Impedance	: 5MΩ or above (at input frequency of 10Hz)
Max. Input Voltage	: ±10mV
Polarization Voltage	: ±825mV or above
Common Mode Rejection Ratio	: 80 dB or above
HR Meas. Range	: Adult 0, 12 to 300bpm Neonate 0, 30 to 300bpm
HR Meas. Accuracy	: ±3bpm
HR Display	
Response Time	: Average HR Adult/Child: average of 6 sec., Neonate: average of 3 sec. Instant HR Latest RR interval is used to calculate HR of every second
Waveform Size Selection	: ×1/4 (2.5mm/mV) ×1/2 (5mm/mV) × 1 (10mm/mV) × 2 (20mm/mV) × 4 (40mm/mV)
Waveform Display Accuracy	: Less than ± 10%
Defibrillation Proof	: Provided
Transient Characteristic	: 3.2 sec, 0.3 sec, 0.1 sec (time constant can be changed)
Tall T-wave Rejection Capability	: 1.2mV T-wave can be removed.
Heart rate meter accuracy and response to irregular rhythm	

80bpm Ventricular Bigeminy : 80bpm



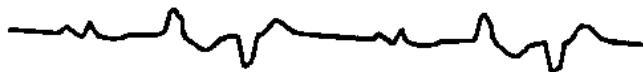
60bpm Slow Alternating Ventricular Bigeminy : 60bpm



120bpm Rapid Alternating Ventricular Bigeminy : 120bpm



90bpm Bidirectional Systoles : 90bpm



Response time of heart rate meter to change in heart rate

HR change from 80bpm to 120bpm : Range 5.2 to 6.2 sec. Average 5.6 sec.

HR change from 80bpm to 40bpm : Range 5.1 to 6.2 sec. Average 5.6 sec.

Time to ALARM for tachycardia

Ventricular Tachycardia 1mVpp, 206bpm : Range 7.7 to 8.5 sec. Average 8.2 sec.



Ventricular Tachycardia 2mVpp, 206bpm : Range 6.5 to 7.4 sec. Average 7.0 sec.

Ventricular Tachycardia 0.5mVpp, 206bpm : Range 9.8 to 11.3 sec. Average 10.8 sec.

Ventricular Tachycardia 2mVpp, 195bpm : Range 6.5 to 7.3 sec. Average 6.9 sec.



Ventricular Tachycardia 4mVpp, 195bpm : Range 6.5 to 7.4 sec. Average 7.0 sec.

Ventricular Tachycardia 1mVpp, 195bpm : Range 9.0 to 9.5 sec. Average 9.2 sec.

Pacemaker Pulse Display Capability

3-electrodes : Pulse is detected with the selected lead.

4, 5, 10-electrodes : If lead I, II, III is selected for ECG1, pulse is detected with the selected lead. If aVR, aVL, aVF is selected, pulse is detected with lead II, lead I, lead III respectively.

If V1 to V6 is selected, the pulse detecting lead will differ depending on the type of equipment.

Type A: detected with lead II

Type B: detected with selected lead

Pulse Width : 0.5 to 2ms

Amplitude : ± 2 to ± 700 mV

NOTE For the pulse detecting lead for V1 to V6, refer to our service representative.

Rejection of Pacemaker Pulse

a) Pacemaker Pulse without Over/Uncapture:

Capable to reject pulses of pulse width 0.1 to 2ms, amplitude ± 2 to ± 700 mV

b) Pacemaker Pulse with Over/Uncapture:

Rejection is not possible.

Pacer Pulse Detector Rejection of Fast ECG Signals

Slew Rate: 2V/s

Respiration

Method : Impedance Method

Frequency Characteristic : 1.5Hz (adult, child) / 2.5Hz (neonate)

Transient Characteristic : Time Constant 1.5 sec.

Current : 100μ A or lower, $66.7\text{kHz} \pm 5\%$

Measurement Range : 0, 4 to 150Bpm

Accuracy : ± 3 Bpm

Base Impedance : 500Ω to $2k\Omega$

Max. Input Delta Impedance	: Base Impedance $\pm 5\Omega$
Waveform Size Selection/	
Detectable Delta Impedance	: $\times 1/4$ (2.5mm/ Ω) / 1.6 to 10 Ω $\times 1/2$ (5mm/ Ω) / 0.8 to 10 Ω $\times 1$ (10mm/ Ω) / 0.4 to 10 Ω $\times 2$ (20mm/ Ω) / 0.2 to 10 Ω $\times 4$ (40mm/ Ω) / 0.1 to 10 Ω
Waveform Display Accuracy	: Less than $\pm 20\%$

Temperature

Method	: Thermistor Method
Probe	: 400 series, Measurement Specialties, Inc. (Main unit and HU-71, HU-73 unit)
Measurement Range	: 0 to 50°C/32.0 to 122.0°F
Accuracy	: $\pm 0.2^\circ\text{C}$ (25°C or above, below 45°C) $\pm 0.4^\circ\text{C}$ (below 25°C , above 45°C)
No. of Channels	: 2 channels for main unit, maximum 3 channels with HU-71, HU-73
Measurement	
Response Time	: Less than 150 sec.

SpO₂ (Arterial Oxygen Saturation)

Nellcor® Model (DS-7210)

Method	: 2 Wavelength Pulse Wave Method
Measurement Range	: 1 to 100%
Resolution	: 1%
Accuracy	: Adult 70 to 100% $\pm 2\%$ Neonate 70 to 100% $\pm 2\%$ The accuracy depends on the used sensor. Refer to the operation manual of the used sensor for details.
PR Measurement Range	: 20 to 250bpm
PR Accuracy	: $\pm 3\text{bpm}$
SpO ₂ Display	: Functional SpO ₂ is displayed. (Measures oxygenated hemoglobin and deoxygenated hemoglobin)

Masimo® Model (DS-7210M)

Method	: 2 Wavelength Pulse Wave Method
Measurement Range	: 1 to 100%
Resolution	: 1%
Accuracy	: Adult 70 to 100% $\pm 2\%$ Neonate 70 to 100% $\pm 3\%$ The accuracy depends on the used sensor. Refer to the operation manual of the used sensor for details.
PR Measurement Range	: 25 to 240bpm
PR Accuracy	: $\pm 3\text{bpm}$
Perfusion Index	: 0.02 to 20%
SpO ₂ Display	: Functional SpO ₂ is displayed. (Measures oxygenated hemoglobin and deoxygenated hemoglobin)

Blood Pressure

Transducer Sensitivity	: 5 μV / V / mmHg
Measurement Range	: -50 to 300 mmHg/-6.6 to 40.0kPa
Frequency Characteristic	: DC to 6Hz / 8Hz / 12Hz / 40Hz
Accuracy	: $\pm 2\%$ of full scale or within $\pm 1\text{mmHg}$ (0.1kPa)
Zero Balance Range	: within $\pm 150\text{mmHg}$
Measurement Range	: Adult 20 to 300bpm Neonate 30 to 300bpm
Accuracy	: The larger of $\pm 3\%$ or 1bpm
No. of Channels	: 2 channels for main unit, maximum 5 channels with HU-72

NIBP (Non-Invasive Blood Pressure)

Method	: Oscillometric Method
Measurement Range	: Adult 10 to 280mmHg/1.3 to 37.3kPa Child 10 to 180mmHg/1.3 to 24.0kPa Neonate 10 to 130mmHg/1.3 to 17.3kPa

Resolution	: 1mmHg
Static Pressure Accuracy	: $\pm 3\text{mmHg}/0.4\text{kPa}$
PR Measurement Range	: 40 to $240\text{bpm} \pm 2\%$ or $\pm 2\text{bpm}$ (whichever greater)
Deflation Speed	: $5 \pm 1\text{mmHg/sec}$ (Quick Measurement OFF) $10 \pm 2\text{mmHg/sec}$ (Quick Measurement ON)
Safety Mechanism	: Adult 300mmHg or above Child 210mmHg or above Neonate 150mmHg or above

CO₂ Concentration (for MGU-722)

The performance is according to the Oridion Medical 1987 Ltd. MiniMediCO₂ Microstream® CO₂ Module specification.

Method	: Infra-Red Solid-State, Microstream
CO ₂ Measurement Range	: 0 to 99mmHg (at sea level)
CO ₂ Resolution	: 1mmHg
CO ₂ Accuracy	: 0 to 38mmHg: $\pm 2\text{mmHg}$ 39 to 99mmHg: $\pm (5\% \text{ of reading} + 0.08\% \text{ for every } 1\text{ mmHg above } 38\text{ mmHg})$
Flow Rate	: 50ml/min (+15ml/min, -7.5ml/min) flow measured by volume
Initialization Time	: Typically 30 seconds (maximum 180 seconds). At full accuracy when value appears.
RR Measurement Range	: 0 to 150bpm
RR Measurement Accuracy	: 0 to 70Bpm: $\pm 1\text{Bpm}$ 71 to 120Bpm: $\pm 2\text{Bpm}$ 121 to 150Bpm: $\pm 3\text{Bpm}$
Response Time	: 2.9 seconds (Typical)
Calibration Interval	: Initial calibration after 1,200 operating hours, then once a year or after 4,000 operating hours, whichever comes first.

CO₂ Concentration (for MGU-721)

The performance is according to the Respiromics Novametrix, LLC. RESPIRONICS® Capnostat 5 Mainstream CO₂ sensor (1015928) specification.

Transducer Type	: Mainstream CO ₂ sensor
Principle of Operation	: Non-dispersive infrared (NDIR) single beam optics, dual wavelength, no moving parts.
Initialization Time	: Capnogram, ETCO ₂ and respiratory rate displayed in less than 15 seconds, at an ambient temperature of 25° C, full specifications within 2 minutes
CO ₂ Measurement Range	: 0 to 150mmHg 0 to 19.7% 0 to 20 kPa (Barometric Pressure supplied by DS-7210/7210M)
Rise Time	: Less than 60 ms - Adult Reusable or Single- Patient- Use Airway Adapter Less than 60 ms - Infant reusable or Single- Patient- Use Airway Adapter
CO ₂ Resolution	: 0.1 mmHg 0 to 69 mmHg 0.25 mmHg 70 to 150 mmHg (DS-7210/7210M CO ₂ Resolution: 1mmHg)
CO ₂ Accuracy	: 0 to 40mmHg: $\pm 2\text{mmHg}$ 41 to 70mmHg: $\pm 5\%$ 71 to 100mmHg: $\pm 8\%$ 101 to 150mmHg: $\pm 10\%$
CO ₂ Stability	: Short Term Drift: Drift over four hours shall not exceed 0.8 mmHg maximum. Long Term Drift: Accuracy specification will be maintained over a 120 hour period.
CO ₂ Noise	: RMS noise of the sensor shall be less than or equal to 0.25 mmHg at 7.5% CO ₂
RR Measurement Range	: 0 to 150Bpm
RR Measurement Accuracy	: $\pm 1\text{Bpm}$

Compensations	
(DS-7210/7210M controlled)	: Barometric pressure 400-850 mmHg. Operator selectable O ₂ , N ₂ O, HE and Agent compensation (* DS-7210/7210M does not support the HE compensation.)
Calibration	: No routine user calibration required. An airway adapter zero is required when changing to a different style of airway adapter.

Cardiac Output (When HU-73 is used)

Measurement Method	: Thermodilution Method
Measurement Range	: 0.1 to 20L/min
Measurement Accuracy	: 0.1 to 10L/min: less than $\pm 10\%$ 10 to 20L/min: less than $\pm 15\%$
Measurement Temperature Range and Accuracy	
Blood Temperature	: 17 to 45°C $\pm 0.3^\circ\text{C}$
Injectate Temperature	: -1 to 35°C $\pm 0.5^\circ\text{C}$

Recording

Recording Speed	: 50mm/s, 25mm/s (Error: within $\pm 5\%$)
Resolution	
Head Direction	: 8 dots/mm
Feed Direction	: 40 lines/mm (at recording speed of 25mm/s)
Rec. Waveform	: 3 waveforms
Rec. Type	: Waveform Recording, List Recording, Graphic Recording
Detection	: Paper out, page mark, magazine error, printhead temperature
Protective Circuit	: Printhead overcurrent, printhead overheating, motor overcurrent, surge current

Analog Waveform Output

Output Voltage	: ECG output 1V/mV (fixed), BP output 1V/100mmHg (fixed)
Output Voltage Accuracy	: within $\pm 10\%$ (Both ECG and BP output)
Analog Output	
Frequency Range	: ECG Output 0.5 to 20Hz BP Output DC to 40Hz
Delay Time	: 35ms and below (Both ECG and BP waveform)
Output Impedance	: 100Ω $\pm 5\%$
Load Impedance	: 1kΩ to ∞
Pacemaker Pulse	: No Pacemaker Pulse

External Connection

Pin Assignments

This section explains the connector pin assignments.

RS-232C Connector Output Signal

COM1 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Hi Level Reset
2	NC	No Connection	---
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	NC	No Connection	---
8	NC	No Connection	---

COM2 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Hi Level Reset
2	DIG_L	Digital Output (LOAD)	TTL (Extended Function)
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	DIG_D	Digital Output (DATA)	TTL (Extended Function)
8	DIG_C	Digital Output (CLK)	TTL (Extended Function)

COM3 Connector

No.	Signal Type	Description	Signal Level
1	RESET	Port Reset	TTL Hi Level Reset
2	ALM2_H	External Alarm Input	TTL Hi Level
3	TxD	Serial Transmit Data Output	RS232C
4	SG	Signal GND	
5	RxD	Serial Receive Data Input	RS232C
6	+5V	+5V	+5V power supply (150mA)
7	ALM2_L	External Alarm Input	TTL Lo Level
8	NC	No Connection	---

Status I/O Signal (Status II Connector)

No.	Signal Type	Description	Signal Level
1	QRS SYNC (Status II-1)	QRS SYNC Output	Logic TTL
	Reserved (Status II-2-5)	Reserved	Do not connect anything.
2	ALM_OUT2+ *	Alarm Output 2+ (Isolation)	Photo MOS Relay Contact
3	TxD	Serial Transmit Data Output	RS232C
4	RxD/ALARM 1IN	Serial Receive Data Input / Alarm Input 1 under 25V (against GND)	RS232C / Logic
5	ALARM 2IN+ (Logic)	Alarm Input 2+ (Isolation)	Logic Input (5mA)
6	ALARM 2IN- (Return)	Alarm Input 2- Return (Isolation)	Return
7	+5V	+5V	+5V power supply (150mA)
8	ALM_OUT2- *	Alarm Input 2- (Isolation)	Photo MOS Relay Contact
9	SG	Signal GND	—

* Alarm status will be output. Sets to ON at alarm condition.



- The “QRS SYNC” signal (No. 1) is a delay output. (delay: 30 to 75msec, signal width: 100msec). Do not use it as a synchronizing signal for the defibrillator.
- Make sure the delay time of QRS SYNC signal fulfills the specifications of the connected device.

ECG Analog Output Connector

ECG Waveform Output :

If lead I, II, III is selected, the waveform of the selected lead will be output.

If aVR, aVL, aVF is selected, the waveform of lead II, lead I, lead III will be output respectively.

If V1 to V6 is selected, the lead of the output waveform will differ depending on the equipment type.

Type A: Lead II will be output, Type B: Selected lead will be output.

The frequency characteristic of the filter is fixed as 0.5 to 20Hz, and sensitivity is fixed as 1V/mV.

Accuracy of ECG Output Sensitivity : within 1V/mV±10%

Output Impedance : $100\Omega \pm 5\%$

Load Impedance : $1k\Omega$ to ∞

Pacemaker Pulse : None

NOTE	For lead type of analog output waveform, refer to our service representative.
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IBP Analog Output Connector

BP Waveform Output :

BP1 waveform will be output.

The frequency characteristic of the filter is fixed as DC to 40Hz, and sensitivity is fixed as 1V/100mmHg.

Accuracy of BP Output Sensitivity :

within 1V/100mmHg \pm 10%

Output Impedance : 100Ω \pm 5%

Load Impedance : 1kΩ to ∞



- Analog signal is a delay output. (about 35ms for ECG, BP)
When connecting to a device using vital signs as trigger signals (ex. IABP), make sure the delay time fulfills the specifications of the connected device.
- The delay time may differ depending on the waveform shape or artifact interference.



The connector of COM (1 to 3), StatusII (1 to 5), and analog output are isolated.

Setup Item

Default and Backup

This section lists selection, default setting, and backup status for each setup item.

Backup Item

- “○” : Setup item will be retained even when the power is turned OFF.
- “△” : Setup item will be retained even when the power is turned OFF. When discharging procedure is performed, the value will be reset to initial setting.
- “—” : Setup item will be reset to initial setting when the power is turned OFF.
- /△ : Setup item will be retained even after discharge if **Backup** is selected for “Backup at Discharge” in the monitor setup menu. If **Initial** is selected, the setup item will be initialized after discharge.
Alarm setup will be initialized with the selected alarm mode.
Display configuration will be initialized with the selected display mode.



Refer to “8. System Configuration Monitor Setup” for “Backup at Discharge” setup.

Patient Admit / Discharge

Item	Selection		Default	Backup
Patient Name	Numeric, Alphabet, Symbol (16 characters)		Blank	△
Sex	Male, Female		Undetermined	△
Age	0 to 150 years or 0 to 999 days		0 year	△
Height	0.0 to 300.0cm		0.0cm	△
Weight	0.0 to 350.0kg		0.0kg	△
BSA	0.00 to 9.99m ²		0.00 m ²	△
Blood Type	A, B, O, AB Rh +/–		Blank	△
Birth Date	Year, Month, Day		Blank	△
ID	Numeric, Alphabet, Symbol (20 characters)		Blank	△
Patient Classification	Adult, Child, Neonate		Adult	○
Pacemaker	Used, Not used		Not used	△
Impedance Measurement	ON, OFF		ON	○/△
Filter Mode	Monitor, Diagnosis, ESIS		Monitor	○
Admit Date	Year, Month, Day		Blank	△
Room/Bed ID	Bed ID	0 to 999		0
	Room ID	Numeric, Alphabet, Symbol (4 characters)		BED—

Alarm Setup

Item	Selection	Default	Backup
System Alarm	Suspend, ON	Suspend	—
HR, PR_SpO ₂ , PR_IBP	ON, OFF 20 to 300bpm	ON 40 to 120bpm	O/Δ
ASYSTOLE	ON, OFF 3 to 10 sec.	ON 5 sec.	
VF	ON, OFF	ON	
VT	ON, OFF	ON	
SLOW_VT	ON, OFF	ON	
RUN	ON, OFF 2 to 8 beats	ON 3 beats	
COUPLET	ON, OFF	OFF	
PAUSE	ON, OFF 1.5 to 5 sec.	OFF 3.0 sec.	
BIGEMINY	ON, OFF	OFF	O/Δ
TRIGEMINY	ON, OFF	OFF	
FREQUENT	ON, OFF 1 to 50 beats / min.	OFF, 10 beats	
TACHY	ON, OFF	ON	
BRADY	ON, OFF	ON	
HR Low Limit for VT	120, 140bpm	120bpm	
HR Low Limit for RUN	0, 30 to 100bpm	40bpm	
ST1 to ST12 (mm)	ST All Alarm ON, OFF Indiv. Alarm ON, OFF -20mm to +20mm	ST All Alarm OFF Indiv. Alarm OFF OFF to OFF	O/Δ
ST1 to ST12 (mV)	ST All Alarm ON, OFF Indiv. Alarm ON, OFF -2.0mV to +2.0mV	ST All Alarm OFF Indiv. Alarm OFF OFF to OFF	O/Δ
BP1 (mmHg)	ON, OFF 0 to 300mmHg	ON S 80 to 180 D OFF to OFF M OFF to OFF	O/Δ
BP1 (kPa)	ON, OFF 0 to 40.0kPa	ON S 10.0 to 24.0 D OFF to OFF M OFF to OFF	
BP2 to BP5 (mmHg)	ON, OFF 0 to 300mmHg	OFF S OFF to OFF D OFF to OFF M OFF to OFF	O/Δ
BP2 to BP5 (kPa)	ON, OFF 0 to 40.0kPa	ON S OFF to OFF D OFF to OFF M OFF to OFF	
CVP (mmHg)	ON, OFF 0 to 300mmHg	OFF S OFF to OFF D OFF to OFF M OFF to OFF	O/Δ
CVP (cmH ₂ O)	ON, OFF 0 to 40 cmH ₂ O	OFF S OFF to OFF D OFF to OFF M OFF to OFF	
RR_IMP, RR_CO ₂ , RR_VENT	ON, OFF 5 to 150Bpm	ON 5 to 30Bpm	O/Δ

Item	Selection	Default	Backup
APNEA	ON, OFF 5 to 20 sec.	ON 15 sec.	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
SpO ₂	ON, OFF 50 to 100%	ON 90% to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
NIBP (mmHg)	ON, OFF 10 to 300mmHg	ON S 80 to 180mmHg D OFF to OFF M OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
NIBP (kPa)	ON, OFF 1.5 to 40.0kPa	ON S 10.0 to 24.0kPa D OFF to OFF M OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
TEMP1 to TEMP3 (°C)	ON, OFF 30 to 50°C	OFF OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
TEMP1 to TEMP3 (°F)	ON, OFF 86 to 122°F	OFF OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
Tb (°C)	ON, OFF 30 to 45°C	OFF OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
Tb (°F)	ON, OFF 86 to 113°F	OFF OFF to OFF	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
EtCO ₂ (mmHg)	ON, OFF 1 to 115mmHg	ON 30 to 45mmHg	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
EtCO ₂ (kPa)	ON, OFF 0.1 to 15.0kPa	ON 4.0 to 6.0kPa	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
EtCO ₂ (%)	ON, OFF 0.1 to 15.0%	ON 4.0 to 6.0%	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
InspCO ₂ (mmHg)	ON, OFF 1 to 24mmHg	ON 3mmHg	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
InspCO ₂ (kPa)	ON, OFF 0.1 to 3.0kPa	ON 0.4kPa	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
InspCO ₂ (%)	ON, OFF 0.1 to 3.0%	ON 0.4%	<input type="radio"/> O/ <input checked="" type="radio"/> Δ
Alarm Setup	Alarm Suspend	1, 3, 5 min.	<input type="radio"/> O
	Alarm Silence	1, 3, 5 min.	<input type="radio"/> O
	Alarm Limit	ON, OFF	<input type="radio"/> O
	Status Alarm Control	Linked to alarm silence time, Linked to each new occurrence	<input type="radio"/> O
	Alarm Occurrence at NIBP Failure	ON, OFF	<input type="radio"/> O

NOTE	If Backup is selected for "Backup at Discharge" on the monitor setup menu, the set value will be stored even after the discharge procedure is performed. If Initial is selected, the alarm setup will be initialized with the selected alarm mode.
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Parameter Setup

	Item	Selection	Default	Backup
ECG	Lead	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6	ECG1 ECG2 ECG3 ECG4 ECG5 ECG6 ECG7 ECG8 ECG9 ECG10 ECG11 ECG12	II V I III aVL avF V1 V2 V3 V4 V5 V6 O/Δ
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	ECG1 to 12	×1 △
	Filter Selection	Monitor, ESIS, Diagnosis	Monitor	○
	HR Average	Instant, Average	Average	○
	Pulse Tone	ON, OFF, SpO ₂	ON	○
	HR/PR Alarm Source	Auto, ECG, SpO ₂ , BP	Auto	○
	Automatic Lead Switch	ON, OFF	OFF	○
	Pacemaker Pulse	ON, OFF	OFF	○
	Pace Pulse Mask Time	Auto, 10ms, 20ms, 40ms, OFF	Auto	△
	AC Filter	ON, OFF	ON	○
	ECG Drift Filter	ON, OFF	OFF	○
	3-lead Override	ON, OFF	OFF	○
RESP	Pace Pulse Detection	Low, Med., High	Med.	○
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	CVA	ON, OFF	OFF	O/Δ
	RR Source	Auto, Impedance, Ventilator, CO ₂	Auto	○
	Impedance Meas.	ON, OFF	ON	○
SpO ₂ (DS-7210)	RR Sync. Indicator	ON, OFF	ON	○
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	SpO ₂ SEC Alarm	OFF, 10, 25, 50, 100	OFF	○
	HR/PR Source	Auto, ECG, SpO ₂ , BP	Auto	○
SpO ₂ (DS-7210M)	Ignore NIBP	ON, OFF	ON	○
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	HR/PR Alarm Source	Auto, ECG, SpO ₂ , BP	Auto	○
	Ignore NIBP	ON, OFF	ON	○
	SpO ₂ Averaging	2–4sec, 4–6sec, 8sec, 10sec, 12sec, 14sec, 16sec	8sec	○
	Pulse Sensitivity	High, Low	Low	○
	FAST SAT	ON, OFF	OFF	○
	PI Display	ON, OFF	ON	○
NIBP	Signal IQ Wave	ON, OFF	OFF	○
	Auto Mode	OFF, 2min, 2.5min, 3min, 5min, 10min, 15min, 20min, 30min, 60min, 120min	OFF	O/Δ*
	Quick Measurement	ON, OFF	OFF	○
	End Tone	ON, OFF	ON	○
	Mean	ON, OFF	OFF	○
	Dyna Alert	ON, OFF	OFF	○
	Pump Setup	Normal, Silent	Normal	○
	Sight Inflation	ON, OFF	ON	○
	PR	ON, OFF	OFF	○
	Oscillograph	ON, OFF	OFF	○

NOTE	* Whether to initialize or back up the NIBP auto mode can be set on the "NIBP Auto Mode" on "Backup at Discharge" menu (Monitor Setup). For details, refer to "8. System Configuration Monitor Setup ●Backup at Discharge".
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Item	Selection	Default	Backup
BP1 to BP5	Scale * (* Selectable scale depends on the BP label.)	20, 50, 75, 100, 150, 200, 250, 300mmHg 4, 8, 12, 16, 20, 24, 32, 40kPa	200mmHg 50mmHg (BP2) 24kPa 8kPa (BP2)
	Label	BP*, ART, RAP, RVP, PAP, CVP, ICP, UAP, LAP, LVP, Label 1, Label 2	BP* indicates BP1 to BP5
	Filter	6, 8, 12, 40Hz	12Hz
	HR/PR Source (BP1 or ART)	Auto, ECG, SpO ₂ , BP	Auto
	Display Type	S/D/M, S/D, M	S/D/M
	Mean	ON, OFF	OFF
	Resp. Reject	ON, OFF	OFF
	TEMP1 to TEMP3	T*, Tsk, Tre, Tes, Tco, Label 1, Label 2	T* (T1 to T3)
CO ₂ (MGU-722)	Scale	50, 100mmHg	50mmHg
		4, 8, 10kPa	4kPa
		4, 8, 10%	4%
	EtCO ₂ Peak Picking Duration	10, 20, 30 sec., OFF	10 sec.
CO ₂ (MGU-721 and Capnostat5)	Scale	mmHg, kPa, %	mmHg
		50, 100mmHg	50mmHg
		4, 8, 10kPa	4kPa
		4, 8, 10%	4%
	EtCO ₂ Peak Picking Duration	10, 20sec, OFF	10sec
	Unit	mmHg, kPa, %	mmHg
	O ₂ Comp.	0 to 100%	21%
	N ₂ O Comp.	ON, OFF	OFF
VENT	Anesthetic Comp..	0.0 to 20.0%	0.0%
	Atmos. Pressure	400 to 850mmHg	760mmHg
Cardiac Output	AWP Scale	10, 20, 30, 50, 120cmH ₂ O	50 cmH ₂ O
	AWF Scale	5, 10, 20, 50, 180 L/min	20L/min
Cardiac Output	Auto Start	ON, OFF	ON
	Time Scale	30 sec, 60 sec.	30 sec

Review Function Setup

Item		Selection	Default	Backup
Graphic Trend	Group A	HR, EVENT1, EVENT2, VPC, SpO ₂ , PR_SpO ₂ , ST (I to V6), NIBP, TEMP1,2, TEMP3, Tb, BP1 to 5, PR_IBP, PDP, CPP, SvO ₂ , ScvO ₂ , CCO, CCI, BT, RR_IMP, APNEA, CO ₂ , RR_CO ₂ , RR_VENT	HR, BP1, BP2	<input type="radio"/>
	Group B		HR, RR_IMP, APNEA	<input type="radio"/>
	Group C		HR, EVENT1, EVENT2	<input type="radio"/>
	Duration	1, 2, 4, 8, 12, 24 hours	4 hours	<input type="radio"/>
	Scale	HR, PR_SpO ₂ , PR_IBP: 100, 200, 300bpm ST: ±0.2, ±0.5, ±1.0, ±2.0mV ±2, ±5, ±10, ±20mm VPC: 20, 50, 100 beats BP1 to 5, PDP, CPP: 20, 50, 100, 150, 200, 300mmHg 4, 8, 16, 20, 24, 40kPa NIBP: 100, 150, 200, 300mmHg 16, 20, 24, 40kPa TEMP1 to 3, Tb: 20–45, 30–40 °C 68–113, 86–104 °F SpO ₂ : 0–100, 50–100, 80–100% RR_IMP, RR_VENT, RR_CO ₂ : 50, 100, 150Bpm APNEA: 15, 30 sec. CO ₂ : 50, 100mmHg 4, 8, 10kPa 4, 8, 10% SvO ₂ : 0–100, 50–100, 80–100% ScvO ₂ : 0–100, 50–100, 80–100% CCO: 6, 12, 20L/min CCI: 6, 12, 20L/min/m ² BT: 20–45, 30–40°C	HR: 100bpm ST: ±0.5mV ±5mm VPC: beats BP1 to 5: 150mmHg 20kPa NIBP: 150mmHg 20kPa TEMP1 to 3: 30–40 °C 86–104 °F SpO ₂ : 80–100% RR: 50Bpm APNEA: 15 sec. CO ₂ : 50mmHg 4.0kPa 4.0% SvO ₂ : 0–100% ScvO ₂ : 0–100% CCO: 6L/min CCI: 6L/min/m ² BT: 20–45°C BIS: 0–100 fixed	<input type="radio"/>
		Duration	1, 5, 10, 15, 30, 60min.	<input type="radio"/>
		HR, VPC/min, VPC/hour, ST (I to V6), NIBP-S/D/M, BP1 to BP5 S/D/M, PR_IBP, PDP, PCWP, CPP, SpO ₂ , PR_SpO ₂ , EtCO ₂ , InspCO ₂ , CO, RR_IMP, RR_CO ₂ , RR_VENT, APNEA, Tb, T1 to T3, SvO ₂ , ScvO ₂ , BT, CCO, CCI, BIS, BIS_SQI, BIS_EMG, BIS_SR	HR, VPC/min, ST(I), ST(II), BP1_S/D/M, BP2_S/D/M, SpO ₂ , RR_IMP, EtCO ₂ , RR_CO ₂ , APNEA, T1, T2	<input type="radio"/>

Item	Selection		Default	Backup
Recall	Waveform	ECG1, ECG2, BP1 to BP5, SpO ₂ , RESP, CO ₂	Wave 1: ECG1 Wave 2: ECG2	<input type="radio"/>
	Recall Factor (Numeric)	HR (HR/SpO ₂ /IBP): ON, OFF ST: ON, OFF NIBP: ON, OFF BP1 to BP5: ON, OFF RR (IMP/CO ₂ /VENT): ON, OFF APNEA: ON, OFF SpO ₂ : ON, OFF TEMP1to TEMP3: ON, OFF Tb: ON, OFF CO ₂ : ON, OFF	HR (HR/SpO ₂ /IBP): ON ST: OFF NIBP: ON BP1 to 5: ON RR (IMP/CO ₂ /VENT): ON APNEA: ON SpO ₂ : ON TEMP1 to 3: ON Tb: ON CO ₂ : ON	<input type="radio"/>
	Recall Factor (Arrhythmia)	Asystole: ON, OFF VF: ON, OFF VT: ON, OFF Slow VT: ON, OFF Run: ON, OFF Couplet: ON, OFF Pause: ON, OFF Bigeminy: ON, OFF Trigeminy: ON, OFF Frequent: ON, OFF Tachy: ON, OFF Brady: ON, OFF	Asystole: ON VF: ON VT: ON Slow VT: ON Run: ON Couplet: ON Pause: ON Bigeminy: ON Trigeminy: ON Frequent: ON Tachy: ON Brady: ON	<input type="radio"/>
	Recall Display Selection	HR (HR/SpO ₂ /IBP): ON, OFF ST: ON, OFF NIBP: ON, OFF BP1 to BP5: ON, OFF RR (IMP/CO ₂ /VENT): ON, OFF APNEA: ON, OFF SpO ₂ : ON, OFF TEMP1 to TEMP3: ON, OFF Tb: ON, OFF CO ₂ : ON, OFF Asystole: ON, OFF VF: ON, OFF VT: ON, OFF Slow VT: ON, OFF Run: ON, OFF Couplet: ON, OFF Pause: ON, OFF Bigeminy: ON, OFF Trigeminy: ON, OFF Frequent: ON, OFF Tachy: ON, OFF Brady: ON, OFF	HR (HR/SpO ₂ /IBP): ON ST: OFF NIBP: ON BP1 to BP5: ON RR (IMP/CO ₂ /VENT): ON APNEA: ON SpO ₂ : ON TEMP1 to 3: ON Tb: ON CO ₂ : ON Asystole: ON VF: ON VT: ON Slow VT: ON Run: ON Couplet: ON Pause: ON Bigeminy: ON Trigeminy: ON Frequent: ON Tachy: ON Brady: ON	<input type="radio"/>
	OCRG	Display Time	5, 10min.	<input type="radio"/>
	OCRG	Waveform	Impedance Resp., CO ₂	<input type="radio"/>
ST Meas.	Meas. Point	0 to 560ms	120ms	<input type="radio"/>
	Ref. Point	0 to -240ms	-80ms	<input type="radio"/>
	HR Scale	0–100, 0–200, 0–300	0–100	<input type="radio"/>
	ST Scale	±2.0, ±5.0, ±10.0, ±20.0 (mm) ±0.2, ±0.5, ±1.0, ±2.0 (mV)	±5.0mm ±0.5mV	<input type="radio"/>

Item		Selection	Default	Backup
Ventilator	P_V loop	Volume (mL): 250, 500, 750, 1000 Pressure (cmH ₂ O): 10, 20, 30, 50, 120	500mL 30cmH ₂ O	<input type="radio"/> <input type="radio"/>
	F_V loop	Flow (L/min): ±20, ±50, ±180	±180L/min	<input type="radio"/>
		Volume (mL): 250, 500, 750, 1000	500mL	<input type="radio"/>
	Interval	1, 5, 10, 15, 30, 60 min.	10 min.	<input type="radio"/>
Resp. List	List Selection	RR_IMP, RR_CO ₂ , RR_VENT, SpO ₂ , APNEA, E-TV, I-TV, MV, SMV, P_PEAK, P_PAUSE, PEEP, P_MEAN, E-RES, I-RES, COMP, SvO ₂ , ScvO ₂ , CCO, CCI, EtCO ₂ , FIO ₂	RR_IMP, RR_CO ₂ , RR_VENT, SpO ₂ , P_PEAK, P_PAUSE, P_MEAN, PEEP, E-TV, I-TV, MV, E-RES, I-RES, COMP, FIO ₂ , EtCO ₂ , APNEA	<input type="radio"/>
ST Graphic Trend	Group A	HR, 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(I), ST(II), ST(III)	<input type="radio"/>
	Group B		ST(aVR), ST(aVL), ST(aVF)	<input type="radio"/>
	Group C		ST(V1), ST(V2), ST(V3)	<input type="radio"/>
	Group D		ST(V4), ST(V5), ST(V6)	<input type="radio"/>
	Time	1, 2, 4, 8, 12, 24 hours	4 hours	<input type="radio"/>
	Scale	±0.2, ±0.5, ±1.0, ±2.0mV, ±2, ±5, ±10, ±20mm	±0.5mV, ±5mm	<input type="radio"/>
Vigilance/Vigileo List	List Setup	SvO ₂ , ScvO ₂ , SaO ₂ , DO ₂ , VO ₂ , O ₂ Cons, SV, SV_STAT, SVI, SVI_STAT, HR, MAP, CVP, CCO, CCO_STAT, CCI, CCI_STAT, SVR, SVRI, B_Temp, EF, EF_STAT, EDV, EDV_STAT, EDVI, EDVI_STAT, ESV, ESVI, SVV	SvO ₂ , CCO, EDV, B_Temp, HR, EF, SV, CCI, EDVI, ESV, SVR, SaO ₂ , SVI, ESVI, SVRI, CCO_STAT, EDV_STAT	<input type="radio"/>
Full Disc. Waveform Rec.	ECG Size	×1/4, ×1/2, ×1, ×2, ×4	×1	<input type="radio"/>
	Meas. Qty	1, 2, 3, 4, 5, 6	1	<input type="radio"/>
	Wave Qty	1, 2, 3, 6	1	<input type="radio"/>
	Meas. Selection	HR, VPC+PACE, ST-A, ST-B, ST-C, SpO ₂ , PR_SpO ₂ , SpO ₂ +PR, NIBP, RR_IMP, CO ₂ , RR_CO ₂ , BP1, BP2, PR-IBP, TEMP1, TEMP2, TEMP1,2, TEMP3, BP3, BP4, BP5, Tb	HR, NIBP, SpO ₂ +PR, RR-IMP, BP1, TEMP	<input type="radio"/>
	Waveform Selection	ECG(I), ECG(II), ECG(III), ECG(aVR), ECG(aVL), ECG(aVF), ECG(V/V1), ECG(V2), ECG(V3), ECG(V4), ECG(V5), ECG(V6), RESP, SpO ₂ , CO ₂ , BP1, BP2, BP3, BP4, BP5	ECG(II), SpO ₂ , RESP, BP1, BP2, CO ₂	<input type="radio"/>

NOTE	<ul style="list-style-type: none"> The data of graphic trend and tabular trend will be stored even when the power is turned OFF. The data of ST, OCRG, recall will be stored for 5 minutes even when the power is turned OFF.
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System Configuration Setup

● Tone/Volume Setup

	Item	Selection	Default	Backup
Tone/Volume	Pulse	Volume: 16 levels Tone: 8 types	Level 8 from left Level 7 from left	<input type="radio"/>
	Key	Volume: 16 levels Tone: 4 types	Level 10 from left Level 3 from left	<input type="radio"/>
	Alarm	Volume: 16 levels Tone: 8 types	Level 10 from left Level 2 from left	<input type="radio"/>
	Other Bed	Volume: 16 levels Tone: 9 types	Level 10 from left Level 4 from left	<input type="radio"/>
	Others	Volume: 16 levels	Level 10 from left	<input type="radio"/>
	Ventilator Alarm	ON, OFF	OFF	<input type="radio"/>

● Display Configuration

	Item	Default Setting	Backup
	Display Mode	1	<input type="radio"/>
Mode 1	Display Mode	Standard	<input type="radio"/>
	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap, SpO ₂ , RESP	<input type="radio"/>
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, SpO ₂	<input type="radio"/>
	Ext. 1	Numeric: (Left) HR, BP1, SpO ₂ , NIBP (Right) VPC+PACE, ST-A, BP2, TEMP1/2, RR-IMP, NIBP_LIST Wave: ECG1, BP overlap, SpO ₂ , RESP	<input type="radio"/>
	Ext. 2	Numeric: HR, NIBP, SpO ₂ , BP1, BP2, TEMP1, TEMP2, CO ₂ , RR-CO ₂ Wave: ECG1, BP overlap, SpO ₂ , CO ₂	<input type="radio"/>
	Enlarged Display	Numeric: HR, SpO ₂ , NIBP, RR-IMP Wave: ECG1, SpO ₂ , RESP	<input type="radio"/>
	BP Overlap	BP1, BP2, BP3, BP4	<input type="radio"/>
	Block Cascade Setup	ECG1, ECG2	<input type="radio"/>
	Comment	CONFIG. 1	<input type="radio"/>
	Short Trend	OFF	<input type="radio"/>
	Grid	OFF	<input type="radio"/>
	Wave Line Thickness	Medium	<input type="radio"/>
	Wave Clip	OFF	<input type="radio"/>

Item	Default Setting	Backup
Display Mode	Ext. 2	○
Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap 1, SpO ₂ , RESP	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, RESP	
Ext. 1	Numeric: (Left) HR, BP1, SpO ₂ , NIBP (Right) VPC+PACE, ST-A, BP2, TEMP1/2, RR-IMP, NIBP_LIST Wave: ECG1, BP overlap1, SpO ₂ , RESP	
Ext. 2	Numeric: HR, NIBP, SpO ₂ , BP1, BP2, TEMP1/2, CO ₂ , RR-CO ₂ , Wave: ECG1, BP overlap1, SpO ₂ , CO ₂	
Enlarged Display	Numeric: HR, SpO ₂ , NIBP, RR-IMP Wave: ECG1, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade Setup	ECG1, ECG2	
Comment	CONFIG. 2	
Short Trend	OFF	
Grid	OFF	
Wave Line Thickness	Medium	
Wave Clip	OFF	
Display Mode	Standard	○
Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, CO ₂ , RR-CO ₂ , NIBP Wave: ECG1, BP overlap1, SpO ₂ , CO ₂	
12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, RESP	
Ext. 1	Numeric: (Left) HR, BP1, SpO ₂ , NIBP (Right) VPC+PACE, ST-A, BP2, TEMP1/2, RR-IMP, NIBP LIST Wave: ECG1, BP overlap1, SpO ₂ , RESP	
Ext. 2	Numeric: HR, NIBP, SpO ₂ , BP1, BP2, TEMP1/2, CO ₂ , RR-CO ₂ , Wave: ECG1, BP overlap1, SpO ₂ , CO ₂	
Enlarged Display	Numeric: HR, SpO ₂ , NIBP, RR-IMP Wave: ECG1, SpO ₂ , RESP	
BP Overlap	BP1, BP2, BP3, BP4	
Block Cascade Setup	ECG1, ECG2	
Comment	CONFIG. 3	
Short Trend	OFF	
Grid	OFF	
Wave Line Thickness	Medium	
Wave Clip	OFF	

Item	Default Setting	Backup
Mode 4	Display Mode	12-lead
	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, BP overlap1, SpO ₂ , RESP
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, RESP
	Ext. 1	Numeric: (Left) HR, BP1, SpO ₂ , NIBP (Right) VPC+PACE, ST-A, BP2, TEMP1/2, RR-IMP, NIBP_LIST Wave: ECG1, BP overlap1, SpO ₂ , RESP
	Ext. 2	Numeric: HR, NIBP, SpO ₂ , BP1, BP2, TEMP1/2, CO ₂ , RR-CO ₂ , Wave: ECG1, BP overlap, SpO ₂ , CO ₂
	Enlarged Display	Numeric: HR, SpO ₂ , NIBP, RR-IMP Wave: ECG1, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade Setup	ECG1, ECG2
	Comment	CONFIG. 4
	Short Trend	OFF
	Grid	OFF
	Wave Line Thickness	Medium
	Wave Clip	OFF
	Display Mode	Standard
Mode 5	Standard	Numeric: HR, BP1, BP2, SpO ₂ , TEMP1/2, RR-IMP, NIBP Wave: ECG1, ECG2, BP overlap1, SpO ₂ , Trend (5 rows)
	12-lead	Numeric: HR, ST-A, ST-B, ST-C, BP1, SpO ₂ , RR-IMP, NIBP Wave: ECG12, BP1, RESP
	Ext. 1	Numeric: (Left) HR, BP1, SpO ₂ , NIBP (Right) VPC+PACE, ST-A, BP2, TEMP1/2, RR-IMP, NIBP_LIST Wave: ECG1, BP overlap1, SpO ₂ , RESP
	Ext. 2	Numeric: HR, NIBP, SpO ₂ , BP1, BP2, TEMP1/2, CO ₂ , RR-CO ₂ , Wave: ECG1, BP overlap1, SpO ₂ , CO ₂
	Enlarged Display	Numeric: HR, SpO ₂ , NIBP, RR-IMP Wave: ECG1, SpO ₂ , RESP
	BP Overlap	BP1, BP2, BP3, BP4
	Block Cascade Setup	ECG1, ECG2
	Comment	CONFIG. 5
	Short Trend	OFF
	Grid	OFF
	Wave Line Thickness	Medium
	Wave Clip	OFF

NOTE	If Backup is selected for "Backup at Discharge" of the monitor setup menu, the set value will be stored even after the discharge procedure is performed. If Initial is selected, the display configuration will be initialized with the selected display mode.
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●System Configuration Menu

	Item	Selection	Default	Backup
Manual Recording	Rec. Select	Built-in, Cent.	Built-in	<input type="radio"/>
	Wave Select	ECG1, ECG2, BP1 to BP5, SpO ₂ , RESP, CO ₂ , AWF, AWP	ECG1	<input type="radio"/>
	Rec. Duration	24 sec., Cont.	24 sec.	<input type="radio"/>
	Delay Time	None, 8sec., 16 sec.	8 sec.	<input type="radio"/>
Alarm Recording	Alarm Record	ON, OFF	OFF	<input type="radio"/>
	Rec. Select	Built-in, Cent.	Built-in	<input type="radio"/>
	Wave Select	ECG1, ECG2, BP1 to BP5, SpO ₂ , RESP, CO ₂ , AWF, AWP, Alarm Factor	ECG1, Alarm Factor	<input type="radio"/>
	Rec. Duration	12, 24 sec.	12 sec.	<input type="radio"/>
	Alarm Factor	HR (HR/PR/BPR) Numeric Data, Arrhythmia	HR (HR/PR/BPR) Arrhythmia	<input type="radio"/>
Periodic Recording	Arrhythmia Record	Asystole, VF, VT Slow VT, Run, Bigeminy, Trigeminy, Pause, Couplet, Tachy, Brady, Frequent	Asystole, VF, VT Slow VT, Run, Bigeminy, Trigeminy, Pause, Couplet, Tachy, Brady, Frequent	<input type="radio"/>
	Periodic Record	ON, OFF	OFF	<input type="radio"/>
	Rec. Select	Built-in, Cent.	Built-in	<input type="radio"/>
	Wave Select	ECG1, ECG2, BP1 to BP5, SpO ₂ , RESP, CO ₂ , AWF, AWP	ECG1	<input type="radio"/>
	Interval	Inter., Timer	Timer	
	Interval	5, 10, 15, 30, 60 min.	120 min.	<input type="radio"/>
	Timer	0:00 to 23:00 (1:00 interval)	none	<input type="radio"/>
12-Lead Record Setup	Rec. Duration	6, 12, 24 sec.	12 sec.	<input type="radio"/>
	Recorder	Built-in, Laser	Built-in	<input type="radio"/>
	Rec. Format	Built-in	3 Waves×4, 2 Waves×6	<input type="radio"/>
		Laser	3 Waves×4, 3 Waves ×4+Rhy., 6 Waves ×2, 12 Waves	
	Position	Center, Proportional, OFF	OFF	<input type="radio"/>
	Wave Format	Regular, Reverse	Regular	<input type="radio"/>
	Recorder Auto Scale	ON, OFF	OFF	<input type="radio"/>
	Print Calibration	ON, OFF	ON	<input type="radio"/>
	Lead Boundary (For laser printer)	ON, OFF	OFF	<input type="radio"/>
Record Setup	QRS Classification	ON, OFF	OFF	<input type="radio"/>
	Graphic Recording Recorder	Built-in, Cent.	Built-in	<input type="radio"/>
	Recorder	Feed: Both, Top, End, OFF	End	<input type="radio"/>
		Speed : 50mm/s, 25mm/s	25mm/s	<input type="radio"/>
		Print Calibration Top, Each Page, OFF	OFF	<input type="radio"/>
	Recall Recording	Graphic Recording, Manual Recording	Graphic Recording	<input type="radio"/>
Sweep Speed	ECG, BP, SpO ₂	50, 25, 12.5, 6.25mm/s	25mm/s	<input type="radio"/>
	RESP	25, 12.5, 6.25mm/s	6.25mm/s	<input type="radio"/>

Item	Selection	Default	Backup
Night Mode	Mode	Manual, Auto	<input type="radio"/>
	Start Time	00:00 to 23:59	<input type="radio"/>
	Complete Time	00:00 to 23:59	<input type="radio"/>
	Volume	No change, Quiet, Very quiet, Silence	<input type="radio"/>
	Display	No change, Time Disp. Only, Slightly Dark, Dark	<input type="radio"/>
	Alarm Pole	ON, OFF	<input type="radio"/>
	Slave Monitor	ON, OFF, OFF (Time Only)	<input type="radio"/>
Color	ECG/HR	32 colors	<input type="radio"/>
	ST		<input type="radio"/>
	VPC		<input type="radio"/>
	PACE		<input type="radio"/>
	BP1		<input type="radio"/>
	BP2		<input type="radio"/>
	BP3		<input type="radio"/>
	BP4		<input type="radio"/>
	BP5		<input type="radio"/>
	NIBP		<input type="radio"/>
	SpO ₂		<input type="radio"/>
	TEMP1 to 3		<input type="radio"/>
	RESP		<input type="radio"/>
	CO ₂		<input type="radio"/>
	AWF		<input type="radio"/>
	AWP		<input type="radio"/>
	SvO ₂ +CO		<input type="radio"/>
	STOPWATCH		<input type="radio"/>
	BIS		<input type="radio"/>
Brightness	Brightness	7 levels	<input type="radio"/>
ST Display Lead Setup	ST_A	I, II, III, aVR, aVL, aVF, V1 to V6	<input type="radio"/>
	ST_B		<input type="radio"/>
	ST_C		<input type="radio"/>
Other Bed Alarm		1 to 48 beds ON/OFF	All Beds OFF <input type="radio"/>
BP User Label	Label 1	3 alphanumeric letters	US1 <input type="radio"/>
	Label 2		US2 <input type="radio"/>
TEMP User Label	Label 1	3 alphanumeric letters	US1 <input type="radio"/>
	Label 2		US2 <input type="radio"/>
STOP WATCH Label	Label 1	8 alphanumeric letters	TIMER1 <input type="radio"/>
	Label 2		TIMER2 <input type="radio"/>

● Hospital Setup

Item	Selection	Default	Backup
Date	07/19, Jul.19, 19.Jul	07/19	<input type="radio"/>
Alarm Silence	ON, OFF	OFF	<input type="radio"/>
Arrhy. Analysis Filter	Disp Waveform, Fixed	Disp Waveform	<input type="radio"/>
Trend Clip	ON, OFF	ON	<input type="radio"/>
BP Record Scale	20, 40mm	40mm	<input type="radio"/>
Suspend Arrhy. Analysis during Noise Interference	ON, OFF	OFF	<input type="radio"/>
MEAN Calculation (ART, NIBP)	Waveform, Calculation	Waveform	<input type="radio"/>
Night Mode Cancel	Any Key, Night Mode Key	Any Key	<input type="radio"/>
Asystole, VF, VT	ON, ON/OFF	ON	<input type="radio"/>
DS-LAN Pat. ID Tx	1st to 11th character	1st character	<input type="radio"/>
Admit/Disch Key Setup	Full, Light	Full	<input type="radio"/>
HR/PR Low Limit during Alarm Auto Setting	OFF, 30bpm, 40bpm	OFF	<input type="radio"/>
Password for Alarm Setup	ON, OFF	ON	<input type="radio"/>
Rec. Paper	A4, LETTER	A4	<input type="radio"/>
External Device Connection	COM1	PC Comm., HLX, OFF	OFF * <input type="radio"/>
	COM2	PC Comm., TCON, OFF	OFF * <input type="radio"/>
	COM3	SV-300, Servo-i/s, SV-900 Alarm, PB-740/760/840, Evita 4/XL/2Dura, Savina, Vigilance/Vigileo, Oximetrix 3, Q-vue, Q2 Computer, PC Comm., OFF	OFF * <input type="radio"/>
	StatusII (1 to 5)**	SV-300, Servo-i/s, SV-900 Alarm, PB-740/760/840, Evita 4/XL/2Dura, Savina, Vigilance/Vigileo, Oximetrix 3, Q-vue, Q2 Computer, BIS, OFF	OFF * <input type="radio"/>
	Multiport A	SV-300, Servo-i/s, PB-740/760/840, Evita 4/XL/2Dura, Savina, PB-7200, Vigilance/Vigileo, Oximetrix 3, Q-vue, Q2 Computer, OFF	OFF * <input type="radio"/>
	Multiport B	SV-300, Servo-i/s, Evita 4/XL/2Dura, Savina, Vigilance/Vigileo, Oximetrix 3, Q-vue, Q2 Computer, OFF	OFF * <input type="radio"/>
	Setup	Status II 5, Multiport B	Multiport B <input type="radio"/>
	NIBP Data Erase Time	10, 30, 60 min, 24 hour	60 min <input type="radio"/>
Status Output Setup	Sync. Sygnal Output	HR, RR	HR * <input type="radio"/>
		Positive Logic, Negative Logic	Positive Logic * <input type="radio"/>
	Alarm Output	OFF, APNEA, Level 1, Level 1 and 2, Level 1, 2 and 3	Level 1 * <input type="radio"/>
		Positive Logic, Negative Logic, Pulse	Positive Logic * <input type="radio"/>
Unit	BP	mmHg, kPa	mmHg <input type="radio"/>
	CVP	mmHg/kPa, cmH ₂ O	mmHg/kPa <input type="radio"/>
	TEMP	°C, °F	°C <input type="radio"/>
	ST	mm, mV	mm <input type="radio"/>

Item	Selection	Default	Backup
Telemeter Setup	Function	ON, OFF	<input checked="" type="radio"/>
	Channel	0801–0879, 0900–0979 1000–1079, 1100–1179 1200–1279, 1300–1379	Depends on the telemeter
	Group	00–63	00 *
	Wave Setup	ECG1, ECG1+2	ECG1
TCON Setup	TCON	ON, OFF	<input checked="" type="radio"/>
	TCON ID	01 to 16	<input checked="" type="radio"/>
	TCON Channel	01 to 60	<input checked="" type="radio"/>

NOTE	For the item with * mark, the setting is backed up. Performing F-start (turning the power ON with the rotary switch set to F) will not initialize the setting.
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NOTE	** StatusII-1 connector does not have the communication function for Evita 4 / XL / 2 dura / Savina. Connect the connection cable to StatusII-2 to 5 connector when communicating with Evita 4 / XL / 2 dura / Savina through the StatusII connector.
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●Monitor Setup

Item	Selection	Default	Backup
Message Icon	ON, OFF	OFF	<input type="radio"/>
Check Discharge at Power ON	ON, OFF	ON	<input type="radio"/>
Backup at Discharge	ON, OFF	OFF	<input type="radio"/>
Password	ON, OFF	OFF	<input type="radio"/>
Discharge Mode	Admit, Suspend	Admit	<input type="radio"/>
Event Key	ON, OFF	ON	<input type="radio"/>
Drift Filter Display/Exp. clock display	Drift Filter Display/Exp. clock display	Drift Filter Display	<input type="radio"/>
HR/PR Alarm Source	ECG/SpO ₂ , ECG/SpO ₂ /BP	ECG/SpO ₂	<input type="radio"/>
Freeze Mode Cursor	ON, OFF	ON	<input type="radio"/>
Parameter Key Operation	Store, Not Store	Not Store	<input type="radio"/>
BP Alarm Increment	Normal, Small	Normal	<input type="radio"/>
CO ₂ (mmHg) Upper Limit for LAN, Telemetry	No limit, 99mmHg	99mmHg	<input type="radio"/>
Battery Operation	Normal, Power Save	Power Save	<input type="radio"/>
Store all alarms to "Recall"	OFF, ON	OFF	<input type="radio"/>
Buzzer Tone (Speaker) Failure	Enable, Disable	Enable	<input type="radio"/>
Built-in Rec. Status Display	ON, OFF	ON	<input type="radio"/>
Vigilance/Vigileo SVR, SVRI Calc.	Vigilance, DS-7200	Vigilance	<input type="radio"/>
Alarm Level	Standard, User	Standard	<input type="radio"/>
Alarm System	FUKUDA DENSHI, IEC	IEC	<input type="radio"/>
DS-LAN Setup	DS-LANII (10Mbps), DS-LANIII (100Mbps)	DS-LANII (10Mbps) *	<input type="radio"/>
Level 3 Alarm Sound	One time, 15s interv.	One time	<input type="radio"/>
Low Limit Alarm Vol.	16 levels	Level 1 from left	<input type="radio"/>
RR Alarm Increment	Normal, Small	Normal	<input type="radio"/>
Patient Name on Home Display	ON, OFF	ON	<input type="radio"/>
Remote Control Setup	ID	R.C. OFF, 1 to 8	<input type="radio"/>
	Section	1 to 4	<input type="radio"/>
	Key	ECG1 Size, ECG2 Size, ECG1 Lead, ECG2 Lead, ECG Auto Size, BP Zero, BP1 to BP5 Scale, PCWP, NIBP START/STOP, Record START/STOP, Monitor Resume, Alarm Suspend, Freeze, Night Mode, Graphic Trend, Tabular Trend, NIBP List, ST, ST Graphic Trend, ST Tabular Trend, Recall, Cardiac Output, VENT(P-V), VENT(F-V), VENT(Numeric), OCRG, Hemodynamic, Resp. List, Vigilance List, Config, Enlarge, Config. 12LEAD	F1: ECG1 Size F2: ECG1 Lead F3: NIBP START/STOP F4: Record START/STOP F5: Night Mode F6: Tabular Trend F7: NIBP List F8: BP Zero

Item		Selection	Default	Backup
Key Mask	Menu	All Key (excluding function, system config.)	All Key	<input type="radio"/>
	Function	All Key	All Key	<input type="radio"/>
	System Config.	All Key (excluding pre-set)	All Key	<input type="radio"/>
	Pre-Set Menu	All Key	All Key	<input type="radio"/>
User Key	Selection	OFF, Other Key, Alarm Silence, Rec. START/STOP, Admit/Discharge, Monitor Suspend, Freeze, Key Lock, Rapid Discharge, Graphic Trend, Tabular Trend, NIBP List, Recall, OCRG, ST Graph. Trend, ST Tab. Trend, ST, Resp. List, Hemodynamic, Cardiac Output, Ventilator, Night Mode, Other Bed, Vigilance List, Parameter, Size/Scale, HR/PR Source, BP Zero, PCWP, NIBP Auto Mode, SpO ₂ Disp ON/OFF, CO ₂ Disp ON/OFF, Suspend CO ₂ , Alarm, HR Alarm, Alarm Auto, Alarm Suspend, Record, Manual Record, Recorder Setup, Display Config., Optimize Display, Tone/Volume, Mode Select, Display 1, Display 2, Display 3	(from left) Alarm Silence Record START/STOP Size/Scale Admit/Discharge Freeze Key Lock Alarm NIBP Auto Mode	<input type="radio"/>
	Key Size	Large, Small	Small	<input type="radio"/>
Alarm Pole	Sync. with Alarm	ON, OFF	ON	<input type="radio"/>
	Alarm Level	Level 1, Level 1 and 2, Level 1, 2, and 3	Level 1	<input type="radio"/>
	Ventilator Alarm	ON, OFF	ON	<input type="radio"/>
	Pattern Setup	Pattern 1 to 10	Level 1: Pattern 1 Level 2: Pattern 10 Level 3: Pattern 4 Ventilator: Pattern 1	<input type="radio"/>
	Sync. with HR	ON, OFF	OFF	<input type="radio"/>
Menu Setup	Function	Graphic Trend, Tabular Trend, NIBP List, Recall, OCRG, ST Display, ST Graphic Trend, ST Tabular Trend, Resp. List, Hemodynamic, Cardiac Output, Ventilator, Night Mode, Other Bed Display, Vigilance/Vigileo List, OFF	Graphic Trend, Tabular Trend, NIBP List, Recall, OCRG, ST Display, ST Graphic Trend, ST Tabular Trend, Resp. List, Hemodynamic, Cardiac Output, Ventilator, Night Mode, Other Bed Display, OFF	<input type="radio"/>
	Configuration	Display Config., Sweep Speed, Tone/Volume, Record, Color, Brightness Setup, Night Mode Setup, Graphic Trend Setup, Tabular Trend Setup, Resp. List Setup, Recall Setup, ST Graphic Trend Setup, ST Disp. Lead Setup, Set Other Alarm, Bed ID, BP User Label, TEMP User Label, CF Card, Telemetry Wave Setup, Vigilance List Setup, OFF	Tone/Volume, Display Config., Record, Sweep Speed, Color, Night Mode Setup, CF Card, Brightness Setup, ST Disp. Lead Setup	<input type="radio"/>

Item		Selection	Default	Backup
Display Optim. Setup	Priority		(From higher priority) HR, BP1, BP2, BP3, BP4, SpO ₂ , PR, TEMP1·2, CO ₂ , RR, VENT, NIBP, BP5, TEMP3, -Tb, BIS	<input type="radio"/>
	BP Format	Overlap, Separate	Overlap	<input type="radio"/>
Backup at Discharge	Display Config.	Backup, Initial	Initial	<input type="radio"/>
	Alarm	Backup, Initial	Initial	<input type="radio"/>
	ECG1, ECG2 Lead	Backup, Initial	Initial	<input type="radio"/>
	CVA Set	Backup, OFF	OFF	<input type="radio"/>
	Impedance Resp. ON/OFF	Backup, Initial	Initial	<input type="radio"/>
	BP Scale	Backup, Initial	Initial	<input type="radio"/>
	NIBP Auto Mode	Backup, OFF, Backup (Resume auto mode by manual measurement)	OFF	<input type="radio"/>
	EtCO ₂ Peak Picking Duration	Backup, 10sec.	10 sec.	<input type="radio"/>
	CO ₂ Scale	Backup, Initial	Initial	<input type="radio"/>

NOTE

For the item with * mark, the setting is backed up. Performing F-start (turning the power ON with the rotary switch set to F) will not initialize the setting.

Alarm Mode Setup

<i>Item</i>	<i>Selection</i>	<i>Backup</i>
Alarm Mode	1	
HR	ON, 40 to 120bpm	
Asystole	ON, 5 sec.	
VF	ON	
VT	ON	
Slow VT	ON	
Run	ON, 3 beats	
Couplet	OFF	
Pause	OFF, 3.0 sec.	
Bigeminy	OFF	
Trigeminy	OFF	
Frequent	OFF, 10 beats	
Tachy	ON	
Brady	ON	
HR Low Limit for VT	120bpm	
HR Low Limit for RUN	40bpm	
STI, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6	All Alarm OFF Indiv. Alarm OFF OFF to OFF	
Alarm Mode 1 to 5	ON BP1 S 80 to 180mmHg D OFF to OFF M OFF to OFF	○
BP2 to BP5	OFF S OFF to OFF D OFF to OFF M OFF to OFF	
RR	ON 5 to 30Bpm	
APNEA	ON 15 sec.	
SpO ₂	ON, 90% to OFF SEC Alarm, OFF	
NIBP	ON S 80 to 180mmHg D OFF to OFF M OFF to OFF	
TEMP1 to TEMP3, Tb	OFF OFF to OFF	
EtCO ₂	ON 30 to 45mmHg 4.0 to 6.0kPa 4.0 to 6.0%	
InspCO ₂	ON 3mmHg 0.4kPa 0.4%	

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Chapter 12

Accessories

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Accessories

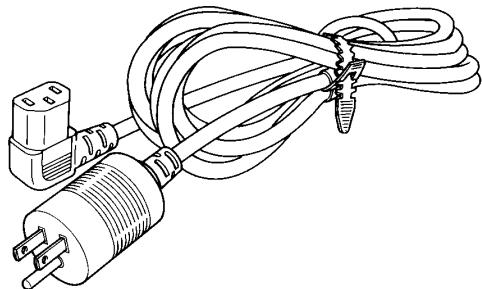
This section lists the accessories for the DS-7200 system.

⚠ CAUTION

- Use only the accessories specified for this device. Otherwise, proper function cannot be executed.
- For quality improvement, specifications are subject to change without prior notice.

Accessories

Power Cable: CS-34 (115V, 3m)



⚠ CAUTION

When the product is used in regions whose voltage is other than 110-120V, 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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Optional Accessories

The following products are available as optional accessories for the DS-7200 system. Purchase them as required.

CAUTION	<ul style="list-style-type: none">● 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.
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ECG, Impedance Respiration Measurement

Item	Model Type	Description	
ECG Lead Cable	3380.0648.13	3-electrode	AAMI
ECG Lead Cable	CMF-700-3 (FA)	3-electrode	AAMI
ECG Lead Cable	500398800	4-electrode	AAMI
ECG Lead Cable	CMF-700-4 (FA)	4-electrode	AAMI
ECG Lead Cable	3380.0661.13	5-electrode	AAMI / 5-electrode (limb for 10-electrode) AAMI, 60cm
ECG Lead Cable	CMF-700-5 (FA)	5-electrode	AAMI
ECG Lead Cable	3380.0661.15	5-electrode (limb for 10-electrode)	AAMI, 90/150cm
ECG Lead Cable	CMF-702-5 (FA)	5-electrode (limb for 10-electrode)	AAMI, 90/150cm
ECG Lead Cable	500403200	5-electrode (chest for 10-electrode)	AAMI
ECG Lead Cable	CMF-700-5C (FA)	5-electrode (chest for 10-electrode)	AAMI
ECG Relay Cable	CI-700D-3 (FA)	3-electrode (defibrillation-proof)	
ECG Relay Cable	CI-700E-3 (FA)	3-electrode (defibrillation and electrosurgery-proof)	*
ECG Relay Cable	CI-700D-4 (FA)	4-electrode (defibrillation-proof)	
ECG Relay Cable	CI-700E-4 (FA)	4-electrode (defibrillation and electrosurgery-proof)	*
ECG Relay Cable	CI-700D-5 (FA)	5-electrode (defibrillation-proof)	
ECG Relay Cable	CI-700E-5 (FA)	5-electrode (defibrillation and electrosurgery-proof)	*
ECG Relay Cable	500403000	10-electrode (defibrillation-proof)	AAMI
ECG Relay Cable	CIO-06CRL-A	10-electrode (defibrillation-proof)	AAMI

CAUTION	* Fukuda Denshi recommends using the electrosurgery-proof type ECG relay cable during electrosurgery. However, when using the electrosurgery-proof type ECG relay cable, respiration measurement cannot be performed.
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Invasive Blood Pressure Measurement

Item	Model Type	Description
Interface Cable (for CDX III / Press)	CJ-369	For use with Argon Medical Devices CDX III / Press Disposable Pressure Transducers
Interface Cable (for DTX Plus)	CJ-410	For use with Becton-Dickinson DTX Plus Disposable Pressure Transducers
Interface Cable (for TruWave)	CJ-428	For use with Edwards TruWave Disposable Pressure Transducers

Non-Invasive Blood Pressure Measurement

Item	Model Type	Description
Adult Cuff (Large)	CUF-7101	Width 17cm, Reusable
Adult Cuff (Medium)	CUF-7102A	Width 14.5cm, Reusable
Adult Cuff (Small)	CUF-7103	Width 11cm, Reusable
Pediatric Cuff	CUF-7104	Width 10.5cm, Reusable
Infant Cuff	CUF-7105	Width 8.5cm, Reusable
NIBP Air Hose (1.5m)	OA-7109A	
NIBP Air Hose (3.5m)	OA-7109B	
NIBP Extension Hose (1.5m)	OA-7110A	
NIBP Extension Hose (3.5m)	OA-7110B	

Item	Model Type	Description
Tempa-Kuff® Neonatal Cuff Infant #5	99750	Disposable, Latex-Free, 40/box
Tempa-Kuff® Neonatal Cuff Neonatal Extra Large #4	99848	Disposable, Latex-Free, 40/box
Tempa-Kuff® Neonatal Cuff Neonatal Large #3	99729	Disposable, Latex-Free, 40/box
Tempa-Kuff® Neonatal Cuff Neonatal Medium #2	99890	Disposable, Latex-Free, 40/box
Tempa-Kuff® Neonatal Cuff Neonatal Small #1	99801	Disposable, Latex-Free, 40/box
Adapter	CUFJ-NO1	

*Tempa-Kuff® Neonatal Cuffs, manufactured by TRIMLINE Medical Products Corporation.

Temperature Measurement

Item	Model Type	Q'ty	Description
Rectal Temperature Probe (for adult)	401	1	
Rectal Temperature Probe (for pediatric)	402	1	
Body Surface Temperature Probe	409B	1	

* 400 series general purpose temperature probe, manufactured by Measurement Specialties, Inc.

SpO₂ Measurement (Nellcor® Type: DS-7210)

Item	Model Type	Description
Durasensor®	DS-100A	
OxiMax®	MAX-N	MAXN (Box of 24)
OxiMax®	MAX-I	MAXI (Box of 24)
OxiMax®	MAX-P	MAXP (Box of 24)
OxiMax®	MAX-A	18" cable, MAXA (Box of 24)
OxiMax®	MAX-R	MAXR (Box of 24)
OxiMax®	MAXPAC	MAX-A × 2, MAX-N × 2
OxiMax®	MAX-FAST	MAXFAST (Box of 24)
SpO ₂ Relay Cable	DOC-10	

SpO₂ Measurement (Masimo® Type: DS-7210M)

Item	Model Type	Description
Masimo SET Sensor	LNOP® DCI	
Masimo SET Sensor	LNOP® Neo	
Masimo SET Sensor	LNOP® Neo-L	
Masimo SET Sensor	LNOP® NeoPt	
Masimo SET Sensor	LNOP® NeoPt-L	
Masimo SET Sensor	LNOP® Inf-L	
Masimo SET Sensor	LNOP® Pdt	
Masimo SET Sensor	LNOP® Adt	
Masimo SET Sensor	LNOP® Adt Long	
SpO ₂ Patient Cable	PC04	1.2m
SpO ₂ Patient Cable	PC08	2.4m
SpO ₂ Patient Cable	PC12	3.6m

CO Measurement (HU-73)

Item	Model Type	Description
Catheter Relay Cable	CJ-382	
Flow-through Sensor Relay Cable	CJ-413	
In-line Sensor Relay Cable	CJ-412	
Injectate Probe Relay Cable	CJ-411	

CO₂ Concentration Measurement (MGU-722)

Item	Model Type	Description
Intubated EtCO₂		
Filterline® Set		For Short term use
Adult/Pediatric	XS04620	
Adult/Pediatric 100 count	010579	
Adult/Pediatric Long	007768	
Filterline® H Set		For Long term use
Adult/Pediatric	XS04624	
Adult/Pediatric 100 count	010580	
Adult/Pediatric Long	007737	
Infant/Neonates	006324	
Infant/Neonates Long	007738	
VitaLine™ H Set		For Long term use
Adult/Pediatric	010787	
Infant/Neonates	010807	
Non-Intubated EtCO₂		
Smart CapnoLine® Plus		For Oral Nasal, Short term use
Adult/Intermediate	009818	
Adult/Intermediate 100 count	010209	
Adult/Intermediate Long	010340	
Adult/Intermediate Long 100 count	010339	
Adult/Intermediate O ₂	009822	
Adult/Intermediate O ₂ 100 count	010210	
Adult/Intermediate O ₂ Long	009826	
Adult/Intermediate O ₂ Long 100 count	010341	
Smart CapnoLine		For Oral Nasal, Short term use
Pediatric	007266	
Pediatric O ₂	007269	
Pediatric O ₂ Long	007443	

Item	Model Type	Description
Non-Intubated EtCO₂ (continued)		
Smart CapnoBloc™		For Oral Nasal, Short term use
Smart CapnoBloc	010037	
Smart CapnoBloc 100 count	010333	
Smart CapnoBloc O ₂	010131	
Smart CapnoBloc O ₂ 100 count	010335	
Smart CapnoBloc Long	010047	
Smart CapnoBloc Long 100 count	010337	
Smart CapnoBloc Long O ₂	010128	
Smart CapnoBloc Long O ₂ 100 count	010338	
O ₂ /CO ₂ Nasal FilterLine®		For Nasal, Short term use
Adult	010207	
Adult	010208	
Adult O ₂	006912	
Adult O ₂	010304	
Adult Long	010342	
Adult Long	010343	
Adult O ₂ Long	007739	
Adult O ₂ Long	010344	
Pediatric O ₂	006913	
Pediatric O ₂ Long	007740	
Nasal/NIV Line™		For Nasal, Short term use
Adult	008174	
Pediatric	008175	
Infant/Neonatal	XS04476	
Smart CapnoLine H Plus		For Oral Nasal, Long term use
Adult/Intermediate O ₂	010433	
Adult/Intermediate O ₂ 100 count	010625	
Smart CapnoLine H		For Oral Nasal, Long term use
Pediatric	010581	
Pediatric O ₂	010582	
CapnoLine H		For Nasal, Long term use
Adult	008177	
Pediatric	008178	
Infant/Neonate	008179	
Adult O ₂	008180	
Pediatric O ₂	008181	

*Packaged in 25 units unless otherwise specified.

Calibration Accessories

Item	Model Type	Description
Calibration kit	0304653ORFBD	The calibration kit includes: 1. Calibration Gas Canister (5%CO ₂ , 21% O ₂ , Bal.N ₂) 2. T-piece connector 3. Calibration FilterLine®

CO₂ Concentration Measurement (MGU-721 with Resironics Novametrix, LLC. CAPNOSTAT® 5 CO₂ sensor)

Item	Model Type	Description
CAPNOSTAT® 5 CO ₂ sensor	1015928	
Single-Patient Use Adult Airway Adapter	6063-00	Single patient use, for ET tube sizes > 4.0mm (10 per box)
Single-Patient Use Neonatal Airway Adapter	6312-00	Single patient use, for ET tube sizes = < 4.0mm (10 per box)
Single-Patient Use Adult Airway Adapter with Mouthpiece	6421-00	Single patient use, for non-intubated patients (10 per box)
Reusable Adult Airway Adapter	7007-00 7007-01	Reusable, for ET tube sizes > 4.0mm (7007-00: 10 per box, 7007-01: 1 per box)
Reusable Neonatal Airway Adapter	7053-00 7053-01	Reusable, for ET tube sizes = < 4.0mm (7053-00: 10 per box, 7053-01: 1 per box)
Cable Management Straps	6934-00	(Package of 5)
Capnostat® 5 CO ₂ Sensor Holding Clips	8751-00	(50 per box)
CAPNO ₂ mask™ - adult large	9960LGE-00	Single patient use, for non-intubated large adults
CAPNO ₂ mask™ - adult standard	9960STD-00	Single patient use, for non-intubated adults
CAPNO ₂ mask™ - pediatric	9960PED-00	Single patient use, for non-intubated adults pediatric patients

Others

Item	Model Type	Description
Ground Cable	CE-11	
Battery Pack	OAO-12B	
Flash Memory Card (CF Card)	FCF-128	For data transfer
Flash Memory Card (CF Card)	FCF-16GA	For full disclosure waveform recording (16GB)
Relay Cable Clamp	OAO-16A	
Remote Control Unit	CF-700	
Recording Paper	OP-124TE	
Cleaning Cloth	OA-57	
Ethernet Branch Cable (For DS-LANII/III)	CJ-522A	Length: 1m
	CJ-522B	Length: 2m
	CJ-522C	Length: 4m
	CJ-522D	Length: 10m
	CJ-522E	Length: 20m
LAN Connection Cable (Cross)	CJ-761	For TCP/IP, Length: 2.5m
Digital Display Connection Cable (For slave monitor)	CJZ-01SS3	Length: 3m
	CJZ-01SS5	Length: 5m
	CJZ-01SS10	Length: 10m
Multiport Relay Cable	CJM-01SR0.6	
Telemetry Transmitter Module	HLX-561	
	HLX-801	
Wire Adapter	OA-287	For HLX-561
HLX Mount Kit	OAO-17A	For attaching the HLX-561 to the monitor.
HLX-801 Mounting Bracket	OAT-8172A	For attaching the HLX-801 to the monitor.
Bidirectional Wireless Communications Module	HTC-702	
Wall mount & tabletop stand for HTC-702	OA-702	

[External Equipment Connection Cable]

External Equipment	Model Type	Description
For multiport relay cable connection		
SV-300	CJ-514	
Servo-i / Servo-s, VigilanceII, Vigileo	CJ-584	
PB-7200ae / 7200e	CJ-518 CJ-525A	
PB-740 / 760 / 840	CJO-02RR4 CJ-527	
Evita 4 / XL / 2 dura / Savina	CJ-583	
Vigilance, Vigilance CEDV	CJ-515	
OXIMETRIX3	CJ-516	
Q-vue	CJ-517	
Q2 Computer	CJ-582	
For serial connection (COM3)		
SV-900	CJ-500	
SV-300	CJ-501	
OXIMETRIX3	CJ-508	
PB-740 / 760 / 840	CJ-504	
Servo-i / Servo-s, Evita 4 / XL / 2 dura / Savina, Vigilance II, Vigileo	CJ-502	
Vigilance, Vigilance CEDV, Q-vue, Q2 Computer	CJO-04RS4	
For Status II connector (1 to 5)*		
SV-900	CJ-400RI-70SV9	
SV-300	CJ-401RI-70SV3	
Servo-i / Servo-s, VigilanceII, Vigileo, Evita 4 / XL / 2 dura / Savina	CJ-402RI-70SVI	
PB-740 / 760 / 840	CJ-403RI-70PB	
Vigilance, Vigilance CEDV, Q-vue, Q2 Computer	CJ-406RI-70VIGI	
OXIMETRIX3	CJ-405RI-70PB72	
BIS	CJ-407RI-70BIS	

NOTE

* StatusII-1 connector does not have the communication function for Evita 4 / XL / 2 dura / Savina. Connect the connection cable to StatusII-2 to 5 connector when communicating with Evita 4 / XL / 2 dura / Savina through the StatusII connector.

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