Preface

Thank you for purchasing our product.
Read the “Safety Precautions” thoroughly before use to ensure correct and safe use of the product.

This operation manual is for the Central Telemetry Receiver LW-7000 series (type LW-7080).
LW-7080 is capable of receiving monitoring data of 8 telemetry beds.
For operation procedures for the central monitor to be connected to LW-7000 series (e.g. DS-7700), please refer to the operation manual of the respective central monitors.

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.

About Safety Precautions: The following is a description of the safety and precaution messages used in this manual. These messages contain important points concerning LW-7080.

⚠DANGER	Failure to follow this message may cause immediate threat of death or serious injury.

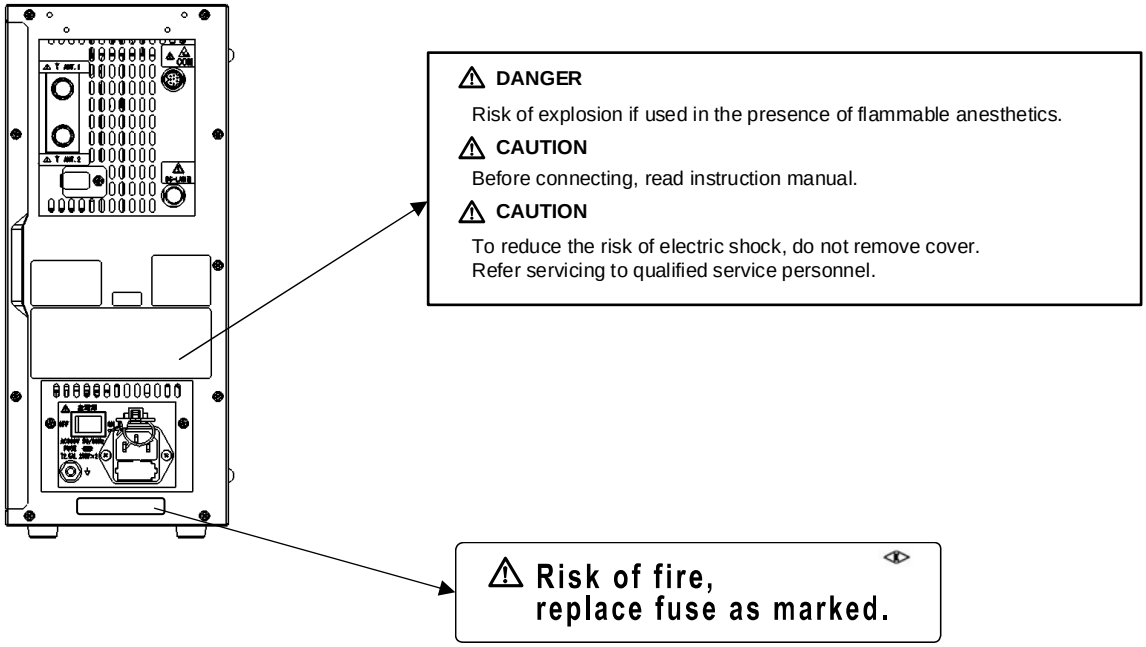
⚠WARNING	Failure to follow this message may result in death or serious injury.

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

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

Graphic Symbols

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

Symbol	Description
	Potential Equalization Terminal Indicates the terminal to equalize the potential difference when interconnecting the devices.
	Fuse Indicates the location of fuse box.
	Caution; refer to accompanying documents Indicates the need to refer to related accompanying documents before operation.
	Antenna Terminal Indicates the terminal to connect the antenna.
	Electrostatic Sensitive Part Directly touching this connector part with hands should be avoided.
	Alternating Current (Main Power Input Indicator)
	Power ON Indicates that the main power switch is in the ON position.
	Power OFF Indicates that the main power switch is in the OFF position.

Precautions for Safe Operation of Medical Electrical Equipment

⚠CAUTION	Read the following precautions thoroughly to correctly operate the device. ● Users should have a thorough knowledge of the operation before using this system. ● Pay attention to the following when installing and storing the equipment. • Do not install or store in an area where the equipment will be subject to splashing water. • Do not install or store in an area where the environmental conditions, such as atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, sodium, sulfur, will adversely affect the system. • Place the equipment on a stable surface where there is no inclination, vibration, or shock (including during transportation). • Do not install or store in an area where there are chemical or gasses are evolved. • Verify the power frequency, voltage and allowable current (or power consumption). • Ensure the grounding is proper by connecting the accompanying power cable to the hospital grade outlet. ● Before operating the system, verify the following items. • Verify the power voltage. • Check the cable connection and polarity to ensure proper operation of the equipment. • Make sure the power system has adequate earth ground. • Ensure that all cables are firmly and safely connected. • Pay special attention when the device is used in conjunction with other equipment as it may cause erroneous judgment and danger. ● During operation of the system, verify the following items. • Always observe the system and patient to ensure safe operation of the equipment. • If any abnormality is found on the equipment or patient, take appropriate measures such as ceasing operation of the equipment in the safest way for the patient. • Do not allow the patient to come in contact with the device. ● After using the system, verify the following items. • Unplug all the cables from the patient before turning off the power. • When unplugging the cables, do not apply excessive force by pulling on the cord. Pull by the connector part of the cable. • Clean the accessories and cables, and keep them together in one place. • Keep the unit clean to ensure proper operation of the next use. ● If the equipment is damaged and in need of repair, user should not attempt service. Label the unit “OUT OF ORDER” and contact Fukuda Denshi ● Do not disassemble or remodel the equipment. ● Maintenance Check • Make sure to periodically check the equipment, accessories and cables. • Before reusing the device that has been left unused for a while, make sure that the device works normally and safely. ● When using the electrosurgical knives or defibrillator with this equipment, verify proper attachment of patient ground plate, ECG electrode type for the electrosurgical knives, and paste volume, output energy for the defibrillator. Also, verify that proper ground is selected.

Precautions for Safe Operation of Medical Telemetry

⚠CAUTION	Precautions for Safe Operation of Medical Telemetry To operate the device correctly, read the following precautions carefully. • 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 between telemetry 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. In managing, be sure to follow the precautions below. • 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.

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.

Reference Refer to 6. 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 LW-7080 is available from your local Fukuda Denshi representative.

Non-Explosion Proof

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

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 LW-7080 are isolated from the power supply, but the peripheral devices are not isolated. To prevent danger of electric shock, always position the peripheral devices away from the patient.

When connecting peripheral devices to LW-7080, 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. • Use of other cables may result in increase in emission or decrease in immunity. • We cannot assure proper operation in case of the use of other cables.

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.

Precautions about Transportation

For transporting the LW-7080, pack with specified packing materials.

Reference Refer to 8. Specification/Performance for environmental condition during transportation.

Precautions about Handling the Cables

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

Precautions about the LW-7080

⚠DANGER	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.

⚠WARNING	● If the LW-7080 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. ● The installation of cables should be performed by our service representative. Users should not attempt the process. ● Danger such as electric shock may result to the operator or malfunction to the equipment may occur. ● The power cable must be connected to hospital grade outlet. ● Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. ● Use only the supplied 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.

⚠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. ● The maintenance and internal switch setting will be performed by our service representative. Users should not perform this procedure as malfunction of the equipment may occur. ● When connecting each part, verify that the main power of the each device is OFF before the procedure. ● Maintenance • Wipe the surface with the 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 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, and other problems. • Do not open the housing. • Avoid alcohol or other liquids from getting into the device.

Precautions about the Wireless Network System

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

⚠WARNING	● Make sure to set the correct channel ID. ● Some wireless combinations of telemetry transmitters may generate interference with other devices. Before selecting the channel, verify it will not interfere with other channels. ● Make sure the telemetry manager of your system is aware of any changes to the telemetry channels. ● If transmitters are used in a neighboring medical facility, your facility and the neighboring facility must make agreements on the setting of the telemetry channels to prevent telemetry interference. ● If channel ID is changed for the transmitter, make sure to replace the channel label attached to the transmitter with a new one. ● If the channel ID is changed without notifying, it will result in monitoring an incorrect patient. To avoid incorrect diagnosis, make sure that the channel ID corresponds to the patient.

Electromagnetic Compatibility

The performance of this device under electromagnetic environment complies with IEC60601-1-2:2001+A1:2004.

Precautions for Safe Operation under Electromagnetic Influence

⚠CAUTION	If any sorts of electromagnetic wave, magnetic field, or static electricity exist around the device, noise interference or malfunction of the device may occur. If any unintended malfunction or noise occurs during monitoring, check the magnetic influence and take appropriate countermeasures. The following are examples of the common cause and countermeasures. ● Cellular Phone The radio wave may cause malfunction to the device. Cellular phones and radio sets should be turned off in the room (building) where medical device is located. ● Static Electricity In a dry environment (room), static electricity is likely to occur. Take the following countermeasures. • Both operator and patient should remove any static electricity before entering the room. • Humidify the room. ● Lightning A lightning nearby may induce excessive voltage to the equipment. If any danger is suspected, use the uninterruptible power supply system. ● High frequency noise interference from other device through the power outlet • Check where the noise is originated and remove it using filtering device, etc. • Stop using the device that is originating the noise. • Use other power outlet.

EMC Guidance

This equipment complies with IEC60601-1-2:2001+A1:2004. 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 LW-7080 is intended for use in the electromagnetic environment specified below. The customer or the user of the LW-7080 should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The equipment uses RF energy that is necessary for the 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 equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network which 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 LW-7080 is intended for use in the electromagnetic environment specified below. The customer or the user of the LW-7080 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	Power supply quality should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV: differential mode ±2kV: common mode	±1kV: differential mode ±2kV: common mode	Power supply quality should be at levels characteristic of a typical location in 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 LW-7080 requires continued operation during power mains interruptions, it is recommended that the LW-7080 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 LW-7080 is intended for use in the electromagnetic environment specified below. The customer or the user of the LW-7080 should assure that it is used in such an environment.

Immunity Test	IEC60601-1-2 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz ～ 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the LW-7080, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m	$d = 1.2\sqrt{P}$ 800MHz to 800MHz $d = 2.3\sqrt{P}$ 800MHz to 2.5GHz P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: : 
Note 1 :At 80MHz and 800MHz, the higher frequency range applies. Note 2 :These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
NOTE [a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast can not be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the LW-7080 is used exceeds the applicable RF compliance level above, the DS-7080 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the LW-7080. [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 LW-7080

The LW-7080 is intended for use in an environment in which radiated RF disturbances are controlled. The customer or the user of the LW-7080 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LW-7080 as recommended below, according to the maximum output power of the communications equipment.

Rated Maximum Output Power of Transmitter (W)	Separation Distance according to Frequency of Transmitter (m)		
	150kHz to 80MHz $d = 1.2\sqrt{P}$	80MHz to 800MHz $d = 1.2\sqrt{P}$	800MHz to 2.5GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. .

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

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

Telemetry Precautions

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

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

⚠WARNING	This Radio Frequency device is susceptible to interference from other outside sources. Interference may prevent the monitoring of patients connected to this device. If problems exist, contact your local service representative. ➲Note: This device operates in the 600MHz UHF band. The exact frequency of operation depends on the destination, and has been preset for your facility, and may be identified by cross-referencing the channel designator on the device with the Telemetry Channel-Frequency Table in the transmitter operating manual.

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

Declaration of Conformity

Device : Central Telemetry Receiver
Model Name : LW-7080

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

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

The responsible party for this device is:

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

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

Optional Accessories

This section lists the accessories for the LW-7080.

⚠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

Check the package contents for all accessories. If any shortage or damage is found, please contact Fukuda Denshi.

- Cables Power Supply Cable: CS-24 (3m)
- Operation Manual

Optional Accessories

The following products are available as optional accessories for the LW-7080.
Purchase them as required.

Item	Model Type	Note
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
Connection Cable (for DS-LANII/III)	CJ-530A	Length: 2.5m
	CJ-530B	Length: 5m
	CJ-530C	Length: 10m

Contents

1. General Description

System Summary

The LW-7080 central telemetry receiver is designed to receive vital signs for 8 patients simultaneously. The LW-7080 provides the following functions.

Connection can be made directly to the DS-7700 central monitor and construct a wireless network system to monitor vital signs such as ECG, respiration, blood pressure, temperature, SpO2, and others sent by the LX-5160 or the LX-5630 telemetry transmitter or the HLX-561 telemetry transmitter module.

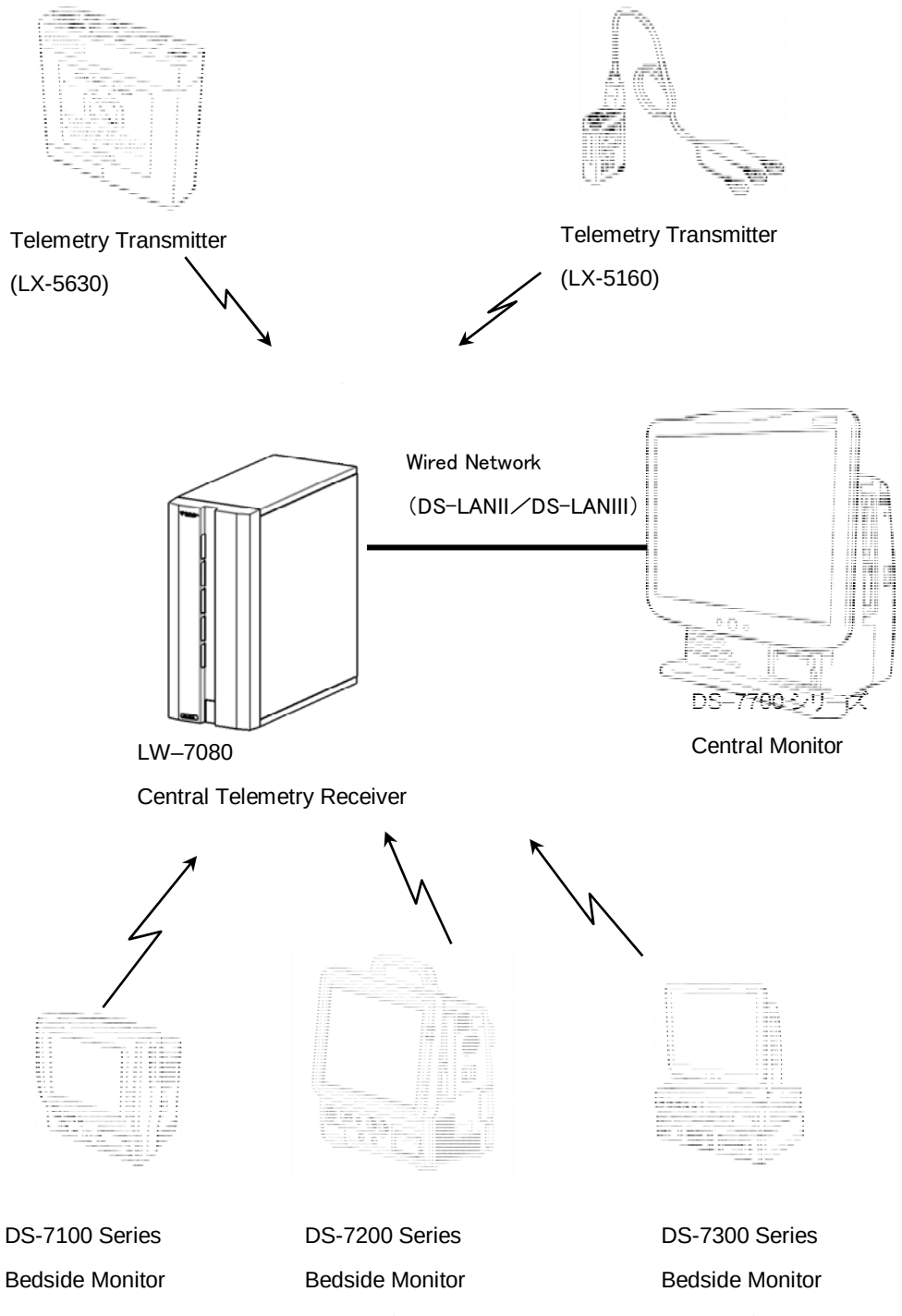
All the operation of LW-7080 can be done at the central monitor via local area network.

A typical system configuration is shown on the following page.

⚠CAUTION	Do not connect any unit other than that specified by Fukuda Denshi to the network. Normal communication may not be obtained.

System Configuration

Shown below is a system configuration incorporating the telemetry transmitter (the LX-5160 etc.), the bedside monitor (the DS-7100/7200/7300 etc.) with the transmission module (the HLX-561), and the central monitor (the DS-7700 series etc).



⚠CAUTION	● DS-5800N/NX/NX^{MB} cannot be connected to the LW-7080. ● In case of the DS-5700 system central monitor, there are some restrictions on usage of NIBP list and ST wave function. For details, please refer to our service representative.

General Description of the LW-7080

Central telemetry receiver – LW-7080

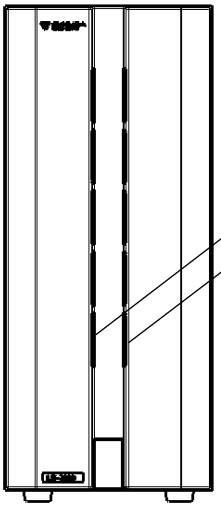
The LW-7080 central telemetry receiver is designed to receive vital signs for 8 patients from telemetry transmitters, and/or telemetry transmitter modules connected to bedside monitors. The LW-7080 provides the following functions

- Allows for monitoring and processing vital signs from 8 patients on the central monitor via local area network.
- Receives ECG, invasive blood pressures, respiration, pulse waveform, and alphanumeric data including NIBP, SpO2, temperature, and patient information.

⚠CAUTION	LW-7080 calculates heart rates, respiration rate and performs arrhythmia analysis from the received ECG and respiration waveform and sends the results to the central monitor. The displayed data or analysis results on the central monitor may differ from the bedside monitor depending on the situation.

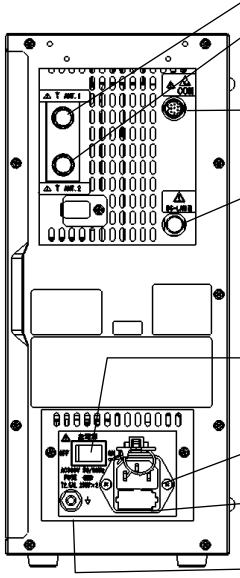
2. Names of Parts and Their Functions

Front Panel



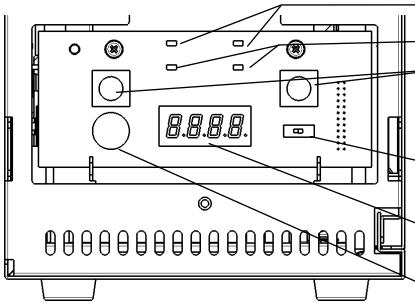
1) Power Indicator / Alarm Indicator

Rear Panel



2) Antenna Input 1
3) Antenna Input 2
4) Serial Connector (COM)
5) DS-LAN Connector
6) Main Power Switch
7) Power Supply Connector
8) Fuse Holder
9) Potential Equalization Terminal

Front Side (inside the Front Panel)



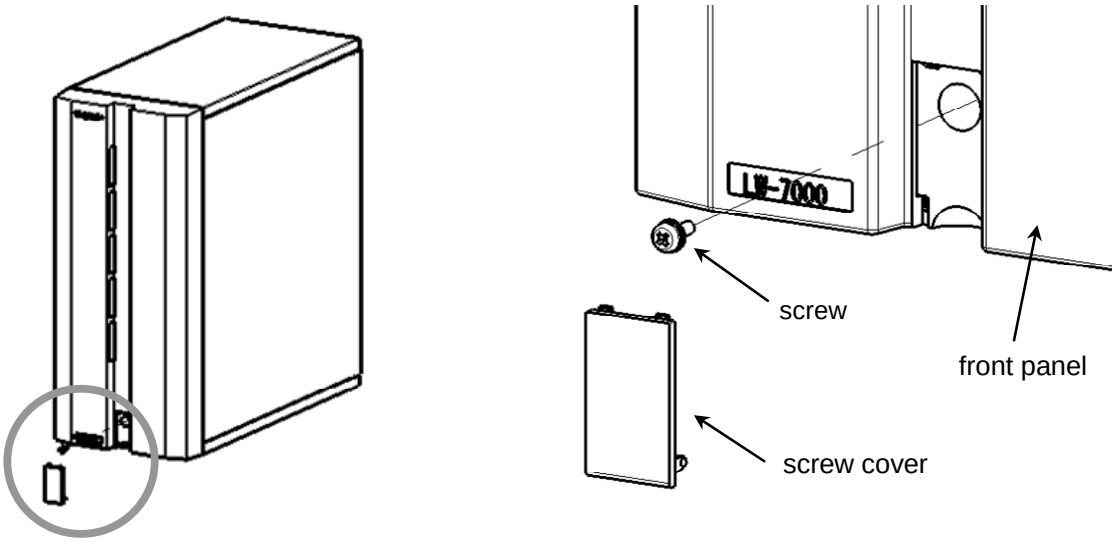
10) Power LED (Blue)
11) Alarm LED (Yellow)
12) LAN-ID Setting Switch
13) Buzzer Switch
14) 7 Segment LED (LAN-ID display)
15) Buzzer

1) Power Indicator / Alarm Indicator	Lights in blue when the AC power is supplied. Lights in yellow when an error has occurred.
2) Antenna Input 1	Connects the specified antenna or antenna installation. Superimposed voltage of +12V for the booster can be output by changing the internal switch.
3) Antenna Input 2	Connects the specified antenna or antenna installation. Superimposed voltage of +12V for the booster can be output by changing the internal switch.
4) COM Connector	(not supported)
5) DS-LAN Connector	Connects the DS-LAN equipment via CJ-522A Ethernet Branch Cable, CJ-530 Connection Cable (both optional), etc.
6) Main Power Switch	Turns ON/OFF the Power.
7) Power Supply Connector	Supplies power by connecting the accessory power cable.
8) Fuse Holder	Insert two slow-blow fuses.
9) Potential Equalization Terminal	Used as Potential Equalization Terminal when connecting with multiple external equipment.
10) Power LED (Blue)	Lights in blue when the AC power is supplied.
11) Alarm LED (Yellow)	Lights when an error has occurred.
12) LAN-ID Setting Switch	Used for setting LAN-ID.
13) Buzzer Switch	Used for silencing a buzzer. Return to the original position after use.
14) 7 Segment LED (LAN-ID display)	Displays LAN-ID.
15) Buzzer	On start-up, or if an error has occurred, a buzzer will generate. A buzzer will be silenced when turning OFF the Buzzer Switch.

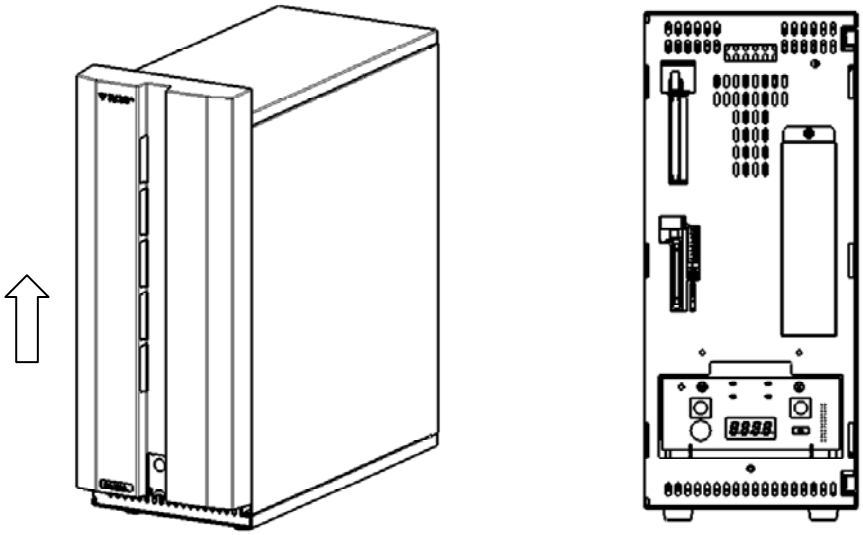
3. Preparation

Detaching the Front Panel

1 Detach the cover on the bottom (see picture below) and remove the screw.

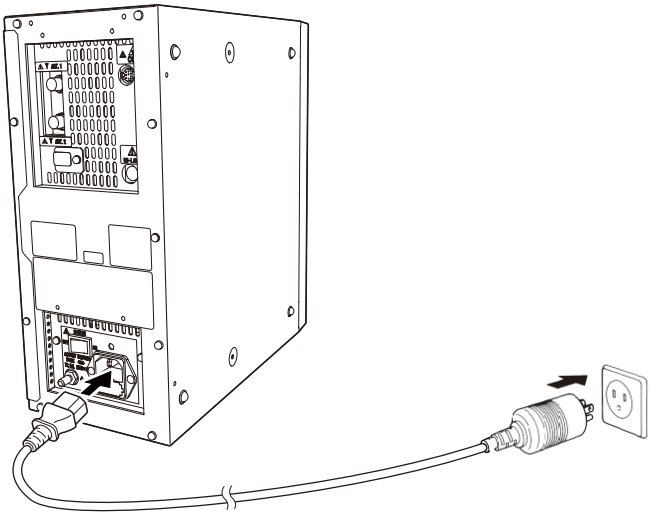


2 Slide off the front panel upward (in the direction of the arrow below).



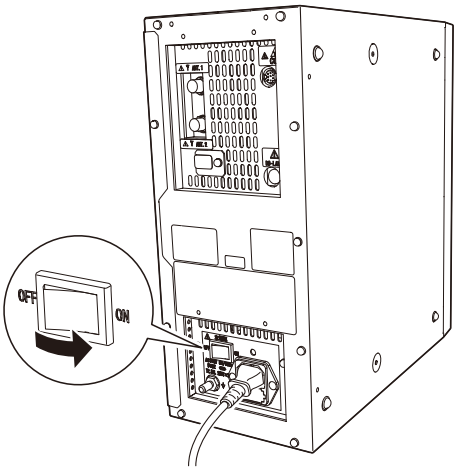
Turning ON the system

1 Connect the accessory power cable (CS-24) to the power supply connector on the rear side of the equipment. Connect the other end of the power cable to the 3-way outlet with ground terminal.



2 Turn ON the main power switch on the rear side of the unit.

The main power indicator on the front side of the unit will light in blue, and the display will turn ON.



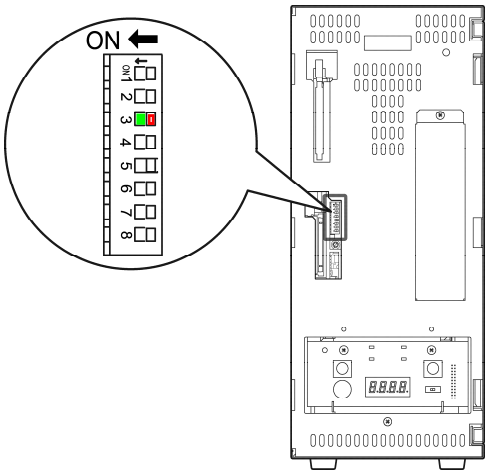
⚠WARNING	● Use only the supplied 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator. ● The power cable must be connected to hospital grade outlet. ● When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipments. Even a small potential difference may result in electric shock to the patient and the operator.

NOTE	<u>Equipotential Grounding</u> 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 equipotential terminal to the same ground terminal. This is called equipotential grounding.

DS-LANII/DS-LANIII Setup

Set up the DS-LANII or the DS-LANIII network by DIP switch No.3.

1 Setting up the DS-LAN
Selection of the DS-LANII or the DS-LANIII can be made by turning ON/OFF the DIP switch No.3; OFF will set the DS-LANII, ON will set the DS-LANIII. The factory default setting is DS-LAN II (DIP switch No.3: OFF).



Front side (inside the front panel)

2 Restore the power to the system after changing the DIP switch setting.

Setting up LAN-ID

To identify LW beds, set up LAN-ID. LAN-ID for each bed on DS-LAN should be unique to each other.

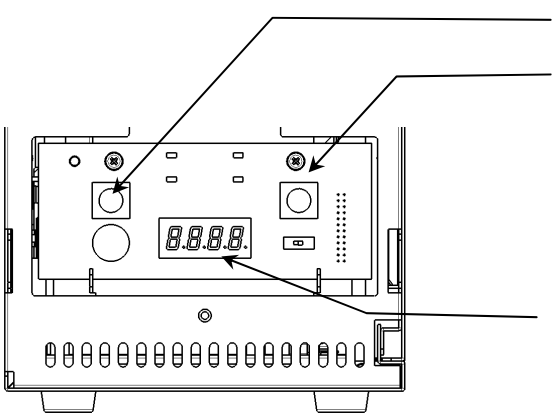
1 Press Switches to set the LAN-ID.

By pressing two LAN ID setting switch, 7 segment LED value will go up and down. (For LW-7080, the value is incremented by 8)

While setting the LAN ID, the 7 segment LED value will blink.
When switches are not operated for a while, the blinking 7 segment LED value will turn to constant ON (non-blinking) and the LAN ID will be fixed.

If LAN ID conflicts with other device, yellow LED blinks and that LAN ID cannot be selected.

NOTE	The maximum number of 7 segment LED value is as follows: The 7 segment LED value more than below cannot be set. • For DS-LANII: 41 (LAN ID:41~48) • For DS-LANIII: 89 (LAN ID:89~96)



Available LAN IDs

The LAN IDs available for Setup is as follows.
Assigned LAN ID will be displayed as “LW-001” on the DS-LAN network.

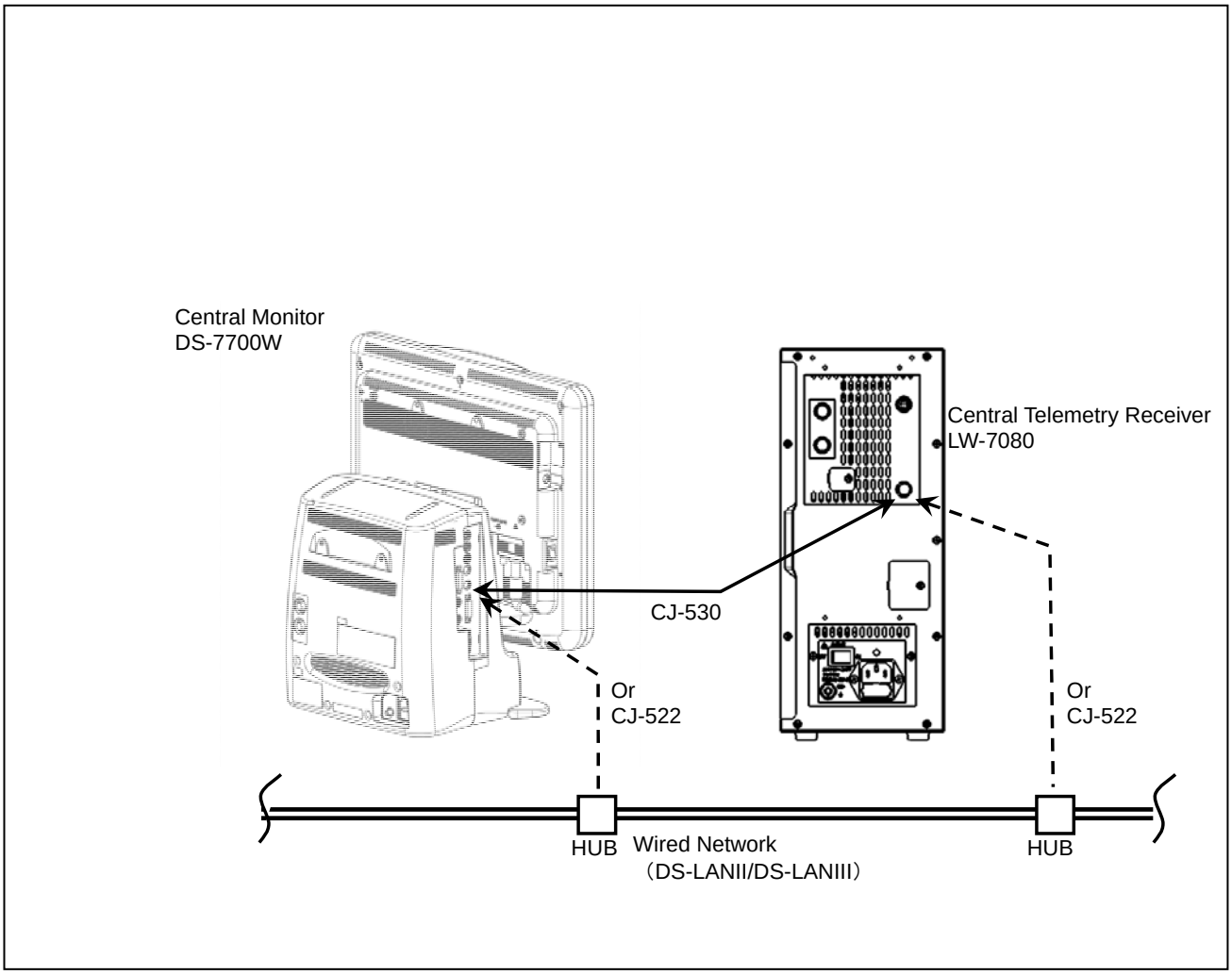
7 segment LED value	LAN IDs to be assigned on DS-LAN network	
	DS-LANII	DS-LANIII
1	001～008	001～008
9	009～016	009～016
17	017～024	017～024
25	025～032	025～032
33	033～040	033～040
41	041～048	041～048
49	—	049～056
57	—	057～064
65	—	065～072
73	—	073～080
81	—	081～088
89	—	089～096

— ：The value that cannot be set.

Connection to other devices

For connections to other devices, refer to below examples.

⚠CAUTION	● Before the connection, make sure the power to all the related devices is turned OFF. ● To prevent electrical shock hazard, connect the ground wires of the LW-7080 and the DS-7700 to the same ground reference or use the equipotential ground terminal to equalize the system grounds. ● Refer connections to your nearest Fukuda Denshi representative.



⚠WARNING	● Do not connect any unit other than that specified by Fukuda Denshi to the network. Normal communication may not be obtained. ● Use the HUB specified by Fukuda Denshi.

4. Installation

⚠WARNING	● The installation of this equipment will be performed by our service representative. The users should not attempt the installation. ● The system construction and network setup of this equipment should be performed by our service representative or system administrator of your institution.

Precautions about the Operating Environment

- The following environmental conditions should be observed when operating the LW-7080.
  - ・ Surrounding Temperature : 10 to 40°C
  - ・ Relative Humidity : 30 to 85% (non-condensing)

- The LW-7080 is intended for patient monitoring in ICU, CCU, surgery, and ward. Direct use in MRI environment or home-care should be avoided.

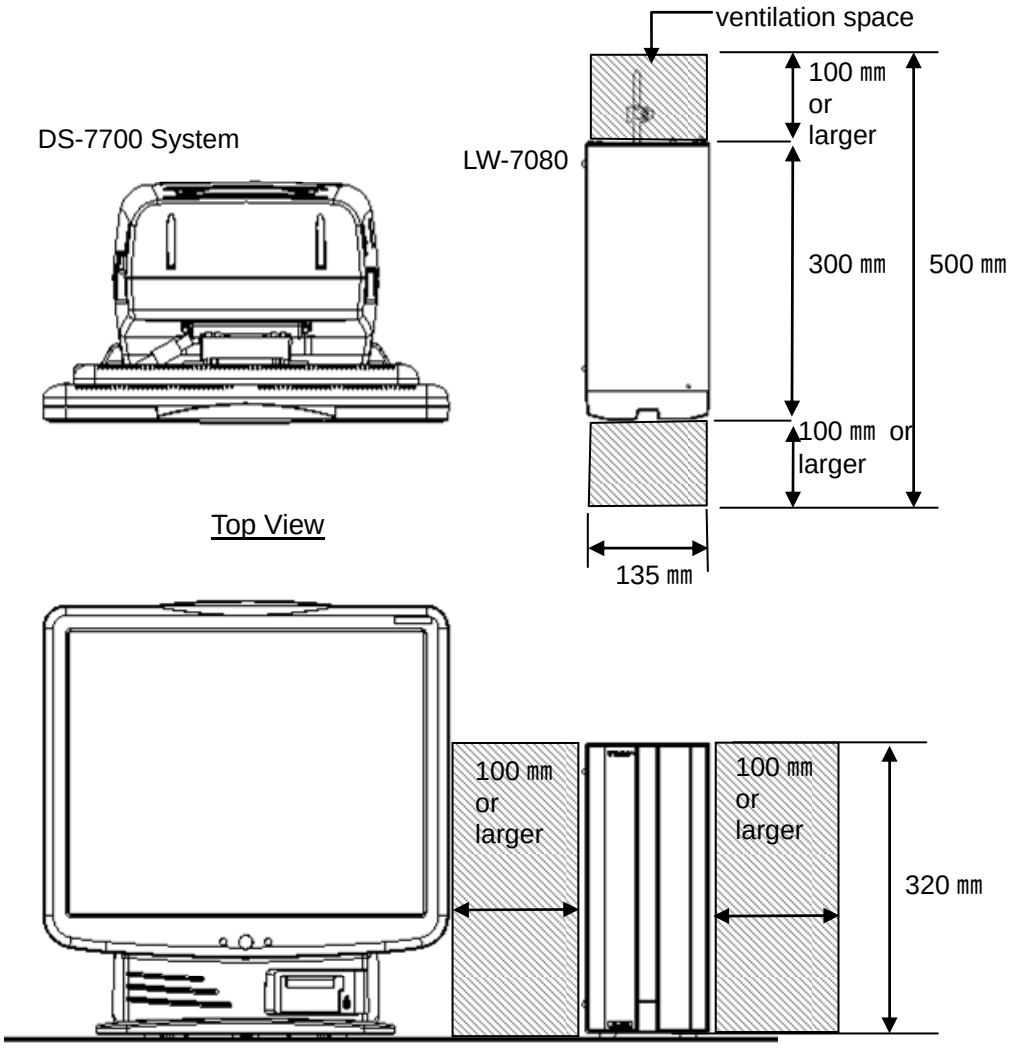
- The power source should fulfill the following condition.
  - ・Use a hospital grade 3-way outlet.
  - ・Verify power voltage and frequency before connecting to an AC power source.
  - ・Use the power source that can provide adequate power to the device.

- Pay attention when installing or storing the device. Do not install or store in the following locations.
  - ・ where chemicals are stored or gas may generate
  - ・ where the equipment will be subject to splashing water or humidity from a nebulizer or vaporizer
  - ・ where the equipment will be subject to direct sunlight
  - ・ Unstable place with inclination, vibration, or shock.

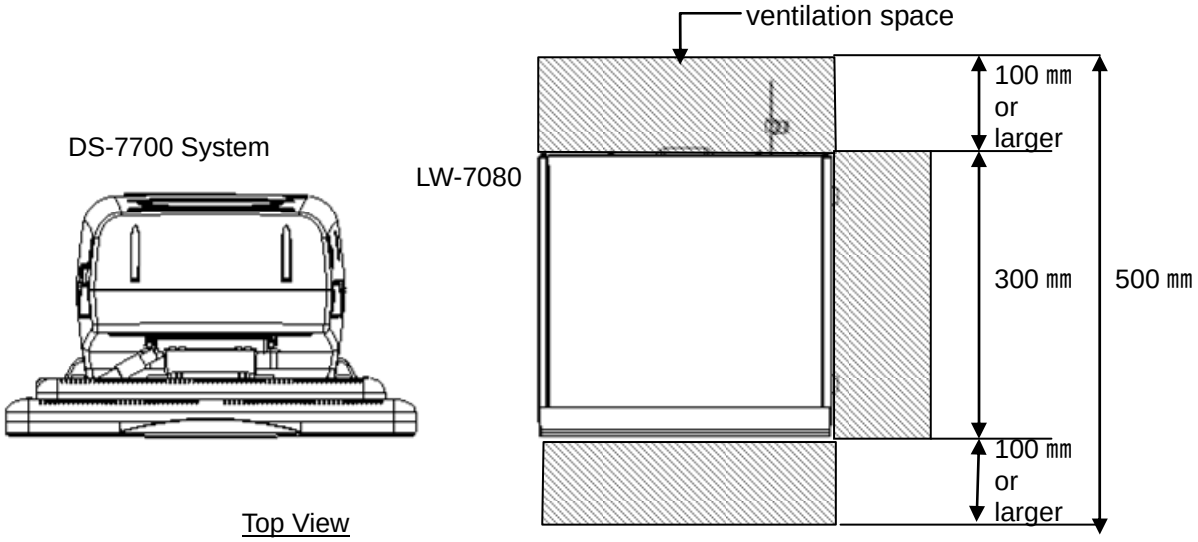
- This device is naturally cooled. Ensure proper ventilation to cool the device as shown in the next page.
  - ・ Do not install the device in the place where it is difficult to secure the space described in the next page.

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

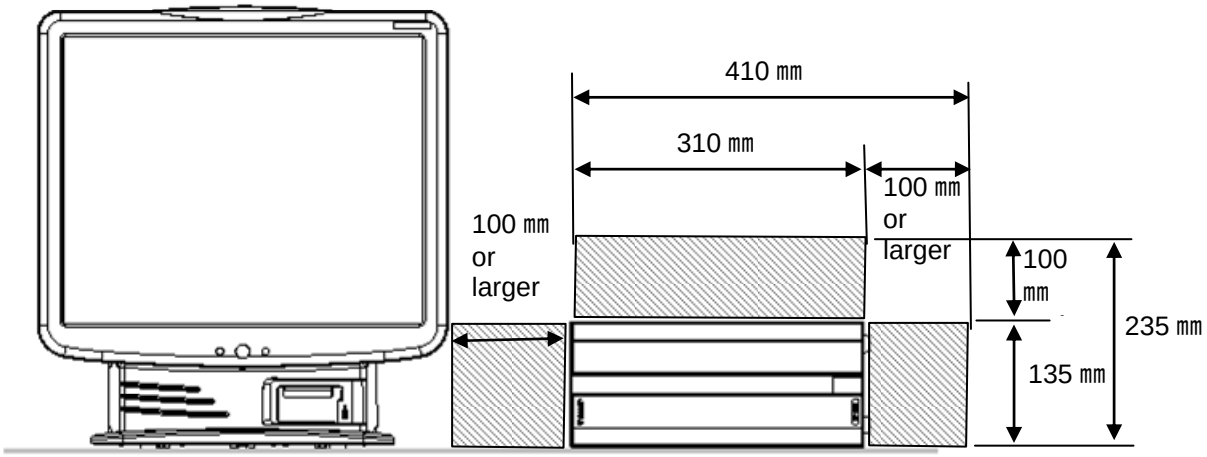
Installing the device upright



Installing the device sideways



Top View



Front View

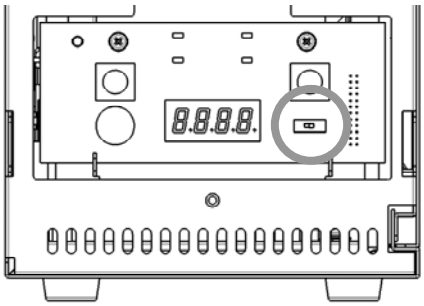
5. Settings

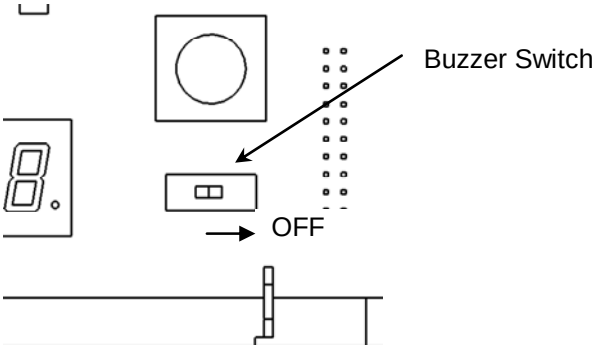
Alarm (Buzzer) Cancel

When malfunction occurs to the LW-7080, an alarm (buzzer) goes off after the LED lit in yellow.

Cancellation of the buzzer can be performed in the following procedures.
To cancel the buzzer, open the Front Panel.

1 Slide the buzzer switch to the right to cancel. Return the switch to the original position after use. Verify only the blue LED lights.





Setup Item

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

The Description of Setting at Discharge

"○": Setup item will be stored even after the discharge procedure has been performed.
"△": Setup item will be initialized to factory default setting.
"—" or Setup items without "Setting at Discharge": Common setting to this device. The setting is not changed by discharge.

●Patient Admit / Discharge

Item	*Selection*	*Default*	*Setting at Discharge*
ID	Numeric, Alphabet, Symbol (20 characters)	Blank	△
Patient Name	Numeric, Alphabet, Symbol (16 characters)	Blank	△
Pacemaker	Used, Not used	Not used	△
Patient Type	Adult, Child, Neonate	Adult	○
Sex	Male, Female	Unspecified	△
Age	0 to 150 years or 0 to 999 days	0 year	△
Birth Date	Year, Month, Day	0 year 0 month 0 date	△
Admit Date	Blank	Blank	△
Height	0～300	Blank	△
Weight	0～350	Blank	△
BSA	0～5.41	Blank	△

●Alarm Setup

Item	*Selection*	*Default*	*Setting at Discharge*
System Alarm	Suspend, ON	Suspend	—
Each Parameter	(Refer to "Admit Setup" section in the operation manual of the central monitor.)		△*

*Initializes to the value set on "Admit Setup" when discharging procedure was performed on the DS-7600/DS-7700 central monitor.

●Parameter Setup

Item		*Selection*	*Default*	*Setting at Discharge*
ECG1, ECG2	Lead	(Depends on bedside monitor, telemetry transmitter)	ECG1 Lead II ECG2 Lead I	△
	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	ECG1 ×1 ECG2 ×1	△
	AC Filter	ON, OFF	ON	○
	ECG Drift Filter	ON, OFF	ON	○
	QRS Pace Mask	ON, OFF	ON	○
	Pacemaker Pulse	ON, OFF, Distinct Color	Distinct Color	○
	QRS Detection	ECG1, ECG1+2	ECG1+2	○
RESP	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	CVA	ON, OFF	OFF	△
SpO_2	Waveform Size	×1/4, ×1/2, ×1, ×2, ×4	×1	△
	Synchronized Sound	OFF, ECG, SpO_2	ECG	○

●Recording Setup

Item	*Selection*	*Default*
Rec. Duration Alarm Recording, Periodic Recording	12sec. (fixed)	12sec.

*When the Alarm Recording or the Periodic Recording is performed on the DS-7600/DS-7700 system central monitor, the Rec. Duration setting for the central monitor will be applied.

●Receiver Setup

Item		*Selection*	*Default*
Receiver Setup*	Switch Antenna	ANT-1, ANT-2, Diversity	ANT-1
	Diversity Threshold	1～5	3
	Garbled Circuit	ON, OFF	OFF

*Receiver Setup can be performed from DS-7700 system central monitor.

●Alarm-related Setup

Item	*Selection*	*Default*
Alarm Silence Time	3 min. (fixed)	3 min.
Alarm Suspend Time	3 min. (fixed)	3 min.

If different Alarm Suspend Time is set for this unit and the DS-7600/DS-7700 system central monitor on the same network, the shorter duration will be applied.

6. Maintenance

Handling After Use

This section describes precautions for handling the equipment.

- 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.

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℃
  Storage Humidity: 10 to 95% (at 60℃)

Cleaning the Housing

This chapter explains about the cleaning of the touch panel and Housing.

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

⚠CAUTION	● Wipe the surface with the 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 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, and other problems.

Maintenance Check

This section explains the daily check and periodic check items of 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.

Following maintenance check items are for this equipment. 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.

⚠CAUTION	● Do not open the housing. ● Avoid alcohol or other liquids from getting into the device.

●Daily Check

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

●Periodic Check

Periodic inspection of medical electronic equipment is mandatory to prevent failures and accidents and to ensure safety and reliability.
Periodic maintenance may be performed by each medical institution or by a third party by concluding a “Maintenance Contract”.
For more details, contact your nearest service representative.

Daily Check List

No. _____

Inspected Date _____ Inspected by _____ Location _____

Device Type LW-7080 Serial No. _____ Date of Purchase _____

Item	Details	Criteria	Judgment
Appearance	Visually check the exterior for scratches, cracks, deformation, and rust.	No abnormality should be found.	OK / NG
Installation	Check whether the unit is installed on a level surface.	The installation area must be level and free from vibration and shock.	OK / 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.	OK / NG
LAN Connector	Visually check the plug of the unit and the LAN Connection Cable.	The cable should not be disconnected, loose connection or missing. No dust should be attached.	OK / NG
Cables	Visually check on all cables for any damage.	No damage should be found.	OK / NG
Telemetry Channel	Verify the channel IDs are as specified by the telemetry channel administrator.	It should conform to telemetry channel checklist.	OK / NG
Functions	Turn ON the monitor, and check whether this unit operates normally from the central monitor.	The waveform is properly received.	OK / NG
Periodic Inspection	Check the date of previous periodic inspection.	Should be within 1 year.	OK / NG

Comment

7. Troubleshooting

Besides the problems described below, there could be problems caused by the central monitor. Refer to the operation manual for the respective central monitor.

Telemetry

The waveform transmission is often interrupted.

Cause 1 : The patient is located too far from the receiver antenna.
Note : Make sure that the patient is located within the receiving area.

Cause 2 : There is a metallic obstruction (elevator, door, etc.) between the transmitter and receiver.
Note : Try to prevent obstruction between the transmitter and receiver.

Cause 3 : A low battery mark "  " is displayed in the waveform area for the telemetry receiving bed.
Note : Replace the transmitter battery with a new one.

A noise is interfering on the waveform, and the waveform suddenly changes.

Cause : A transmitter with the same channel ID or close frequency is used nearby.
Note : Stop using the other transmitter.

The waveform is not transmitted or displayed.

Cause 1 : The battery of the transmitter is depleted.
Note : Replace with a new battery.

Cause 2 : The battery is installed with opposite polarity.
Note : Verify the (+) (–) direction of the battery and install correctly.

Cause 3 : The antenna cable is disconnected.
Note : Connect the antenna cable securely.

Interference waveform () is displayed.

Cause 1 : A transmitter with an influencing channel ID is used nearby.
Note : Use the transmitter with a channel ID that does not interfere.

Cause 2 : The group ID of the transmitter and the DS-7700 does not match.
Note : Set the correct group ID.

Wired Network

The waveforms and numeric data for the wired network beds are not displayed on the central monitor.

Cause 1 : The DS-LAN setup is not correct.
Note : 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.
Note ：The following central monitors can not be used with the DS-LANIII network.
・DS-5700
・DS-5800N/NX/NXMB
・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.
Note ：Use a 10Base repeater HUB for DS-LANII network and a switching HUB recommended by Fukuda Denshi for DS-LANIII network.
Make sure to use the correct HUB for each network.

Cause 4 ：On the DS-LANII network, DS-5800 is set as the network-administrating monitor.
Note ：In case of DS-LANII network, it is necessary to set DS-7700 system or DS-5700 as the network-administrating monitor.

Cause 5 ：The central ID is duplicated.
Note ：Make sure to set a unique central ID for each central monitor. Set the ID in the range from 1 to 8 for DS-LANII, and 1 to 16 for DS-LANIII network..

8. Specification/Performance

Specification/LW-7080

Size

132mm (W) x 290mm (D) x 305mm (H) (±30mm, not including the protrusion)

Weight

Weight: 8.6kg±1kg

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 95% at 60°C and below

Safety

General Standard : IEC60601-1:1988+A1:1991+A2:1995 (Medical electrical equipment – Part 1: General requirements for safety)
IEC60601-1-1:2000 (Medical electrical equipment – part 1-1: General requirements for safety – Collateral standard: Safety requirements for medical electrical systems)

EMC Standard : IEC60601-1-2:2001+A1:2004 (Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests)

The type of protection against electric shock
: Class I
Waterproof Level
: IPX0 (no protection)
Usage in Presence of Flammable Gas
: Equipment inappropriate to use in presence of air/flammable anesthetics, or oxygen or nitrous oxide/flammable anesthetics.
Operation Mode : Continuous Operating Equipment

Power Requirements

Voltage : AC115V
Frequency : 50Hz/60Hz
Power Consumption : 40VA

Usable Life

6 years: According to self-certification

Performance

ECG

HR Meas. Range	: Adult/Child 0, 12 to 300bpm
	: Neonate 0, 30 to 300bpm
HR Meas. Accuracy	: ±3% or ±5bpm, whichever is greater
Voltage Receiving Range	: ±6.4mV
Lead Type	: Depends on the transmitter/bedside monitor
Frequency Characteristic	: Depends on the transmitter/bedside monitor
AC Filter	: 50Hz / 60Hz
Drift Filter	: 1.1Hz and under
Pacemaker	: Artificial pacemaker pulse display on the central monitor

Analysis Method

Arrhythmia Analysis
ST Measurement

Respiration

Meas. Method	: Depends on the transmitter/bedside monitor
RR Meas. Range	: 0, 4 to 150Bpm
RR Meas. Accuracy	: ±3Bpm
Frequency Characteristic	: Depends on the transmitter/bedside monitor
Meas. Current	: Depends on the transmitter/bedside monitor

Telemetry

No. of Receiving Beds	: Max 8 beds
Frequency	: 608 to 614MHz
Method	: Crystal Controlled PLL Type Double Super Heterodyne
Transmitter	: LX-5160/5630, HLX-561, Bedside Monitor (with HLX-561 or equivalent)
Antenna Connector	: F type
DC Power Output	: +12V 100mA (default: OFF)

Receiving Device

Spurious Emission	:100μV/m (30 to 88MHz), 150μV/m (88 to 216MHz), 200μV/m (216 to 960 MHz), 500 μV/m (above 960 MHz)
Sensitivity	:+10dBμV and below (“Too Far” level)