

CE 0086

Operation Manual  
LC-7019FT  
Display Unit

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Thank you for purchasing our product.  
Read the “Safety Precautions” thoroughly before use to ensure correct and safe use of the product.  
Please also refer to the operation manual of the central monitor to be connected to the LC-7019FT.

CE 0086

This device bears the CE label in accordance with the provisions of Medical Device Directive 93/42/EEC.

For EU

THE PERSONS RESPONSIBLE FOR PLACING DEVICES ON THE EC MARKET UNDER MDD 93/42/EEC.  
FUKUDA DENSHI UK  
13 WESTMINSTER COURT, HIPLEY STREET OLD WOKING, SURREY GU22 9LG, U.K.

### Safety Precautions

Make sure to follow the precautions indicated below, as these are important messages related to safety. The followings are descriptions and graphic symbols of the safety and precaution messages used in this manual.

<b>⚠DANGER</b>	Failure to follow this message may cause immediate threat of death or serious injury.
<b>⚠WARNING</b>	Failure to follow this message may result in death or serious injury.
<b>⚠CAUTION</b>	Failure to follow this message may cause injury or failure to the equipment.
<b>NOTE</b>	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.

**⚠DANGER**

- If the fuse blows, contact Fukuda Denshi Service Representative. Do not continue using it as internal damage to the equipment may be considered.
- When connecting to other device, perform equipotential grounding. Danger such as electric shock may result to the patient and operator.

**⚠WARNING**

- Damage to the display panel may cause leakage of liquid crystal. In such case, do not touch the leaked liquid crystal with bare hands, or put it into your mouth as it may cause intoxication. If the liquid crystal accidentally enters the eyes or mouth, wash off immediately with water and consult a physician.
- 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.
- Use only the cables specified by Fukuda Denshi.
- Use of other cables may result in increase emission or decrease in immunity. If the LC-7019FT is used under an environment not fulfilling the specified condition, not only that the equipment cannot deliver its maximum performance, the equipment may be damaged and safety cannot be ensured.
- Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator.
- The LC-7019FT does not have a speaker. When using this unit as a multimonitor for monitoring system, alarm (tone) will be produced on the main monitor side. Please check for the audibility of the main monitor alarm while monitoring the display on the LC-7019FT.

**⚠CAUTION (For USA)**

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

**⚠CAUTION**

Read the following precautions thoroughly to correctly operate the device.

- Users should have a thorough knowledge of the operation before using this system.
- Pay attention to the following when installing and storing the equipment.
  - Do not install or store in an area where the equipment will be subject to splashing water.
  - Do not install or store in an area where the environmental conditions, such as atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, sodium, sulfur, will adversely affect the system.
  - Place the equipment on a stable surface where there is no inclination, vibration, or shock (including during transportation).
  - Do not install or store in an area where there are chemical or gasses stored.
  - Verify the power frequency, voltage and allowable current (or power consumption).
  - Ensure the grounding is proper by connecting the accompanying power cable to the hospital grade outlet.
- Before operating the system, verify the following items.
  - Verify the power voltage.
  - Check the cable connection and polarity to ensure proper operation of the equipment.
  - Make sure the power system has adequate earth ground.
  - Ensure that all cables are firmly and safely connected.
  - Pay special attention when the device is used in conjunction with other equipment as it may cause erroneous judgment and danger.
- 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 it. Pull by the connector part of the cable.
  - Clean the accessories and cables, and keep them together in one place.
- 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.
- For further quality improvement, specifications and/or appearance of this unit are subject to change without prior notice.
- The fluorescent light tube of this equipment contains mercury. Please follow local ordinances or regulations for its disposal. When disposing of the equipment, accessories, or components, use an industrial waste distributor. Do not dispose of as ordinary waste.
- Exposing LCD panel to intense light may deteriorates display property. Do not expose the panel to direct sunlight or strong ultra violet (UV) light for long period of time.
- 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.
- Although the LCD utilizes highly accurate picture elements, occasionally, there may be few pixels which do not light or constantly light. Please note that this is not an equipment failure, and will not affect monitoring operation.
- Do not use the touch panel with film or adhesive tape attached to it. It may cause malfunction or damage the touch panel.
- As the touch panel is made of glass, a strong impact may cause damage. Pay attention not to hit or drop the equipment.

**⚠CAUTION**

- Always operate the touch panel with fingers or a touch panel pen. Do not touch with a pen-point or other hard-edged instruments. It may cause malfunction or damage the touch panel. In addition, do not apply pressure for a prolonged time to any part of the 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 a few hours or half a day after the power is turned ON.
- The maintenance and internal switch setting will be performed by our service representative. Users should not perform this procedure as malfunction of the equipment may occur.
- The power cable must be connected to a hospital grade outlet.
- Do not connect unit or cable not authorized by Fukuda Denshi to any I/O connector. If done so by mistake, the device cannot deliver its maximum performance and the connected units may be damaged, resulting in a safety hazard.
- Use only the specified interface cable or external equipment. Otherwise, proper function cannot be executed.

### 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.  
To reduce the risk of electric shock, do not remove cover.  
Refer servicing to qualified service personnel.



**Risk of fire,  
replace fuse as marked.**

### Graphic Symbols

The following are the symbols and their meaning indicated on the equipment.

Symbol	Description
	<u>Potential Equalization Terminal</u> Indicates the terminal to equalize the potential difference when interconnecting the devices.
	<u>Caution; refer to accompanying documents</u> Indicates the need to refer to related accompanying documents before operation.
	<u>Signal Input Part</u> Indicates that the connector is signal input terminal.
	<u>Year of Manufacture</u> Indicates the manufactured year.
	<u>WEEE (Waste Electrical and Electronics Equipment)</u> Indicates a separate collection for electrical and electronic equipment.

### General Description

LC-7019FT is an extended display unit with touch panel function and can be connected to a monitoring system.  
The LC-7019FT can only be connected to the DS-7700W series (19 inch type display). Ask Fukuda Denshi service representative for types of connectable central monitors.

[LC-7019FT Main Unit]

### Features

- When connected to a central monitor, multi display or full disclosure wave form can be displayed.
- Easily viewable 19 inch widescreen colour LCD
- The operation can be performed by touch panel. The user keys arranged at the lower part of the display are used to access the respective menu. For more details, please refer to the operation manual of the monitoring system to be connected.

**⚠CAUTION**

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

- Connecting the optional mouse and keyboard allows mouse control of the touch panel keys and keyboard input.
- An alarm pole is equipped, which notifies the alarm with different flash patterns according to the priority level.
- LC-7019FT does not have a speaker. Alarm (tone) will be produced on the main monitor display only.

### Composition of Parts and Their Functions

①LCD Touch panel  
Operation is performed using the touch keys.

②Alarm Indicator (Alarm Pole)  
Notifies the alarm by blinking.

③Power Indicator  
Lights when the AC power is supplied.

- When the AC power is supplied, power switch turned ON, and the display cable is connected: Green
- When the AC power is supplied, power switch turned OFF, or the display cable is not connected: Orange
- Operation error : Red
- Light will be OFF when the AC power is not supplied.

1

2

- ④ Remote Control Sensor  
Receives the infrared remote control signal.
- ⑤ Ambient Light Sensor  
Detects the ambient light.
- ⑥ Potential Equalization Terminal  
Used for equipotential connection.
- ⑦ Serial Connector  
Connect the central monitor via serial communication cable.
- ⑧ Power Supply Connector (with fuse holder)  
Connects the power supply cable. (fuse is stored inside the holder.)
- ⑨ External Equipment Connector  
The specified PS/2 external equipment can be connected  
PS/2 external equipment can be connected to the LC-7019FT via the specified interface cable. For details, refer to our service representative.
- ⑩ Power Supply Switch  
Turns ON/OFF the Power.
- ⑪ Video Connector  
Connect the central monitor via digital display connection cable.

## Connecting Procedures

### ⚠ WARNING

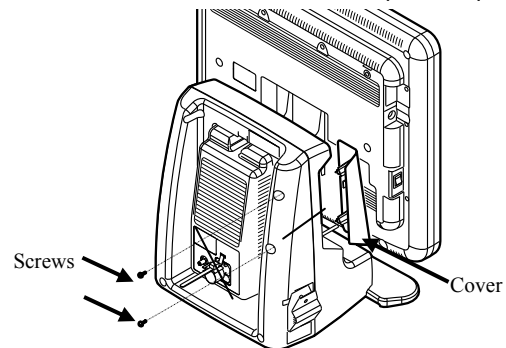
- The installation of this equipment will be performed by our service representative. Users should not perform this procedure as electric shock may result to the patient and operator or malfunction of the equipment may occur.
- Unplug the power cable before the procedure.
- Before the connection, make sure to turn OFF the external equipment.
- When lifting this device, hold the bottom part of the main unit and not the display unit.
- Use only the cables specified by Fukuda Denshi. Use of other cables may cause malfunction or damage the equipment.

### Procedure 1. Connect the specified cable to the LC-7019FT

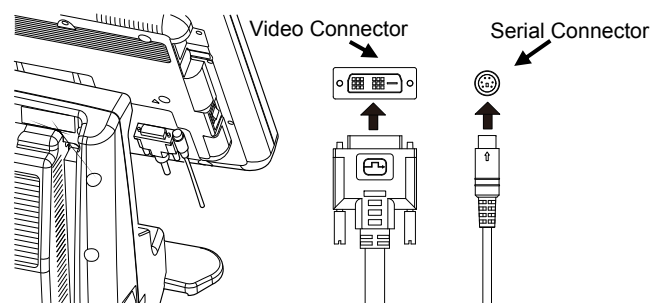
Connect the accessory digital display connection cable and serial communication cable.

Connect the accessory digital display connection cable CJZ-01SS3 to the video connector on this device. Then, connect the accessory serial communication cable CJO-11DD3 to the serial connector on this device.

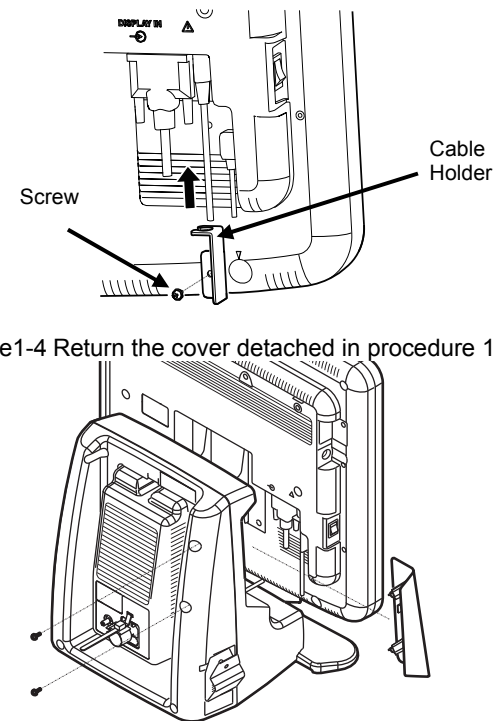
Procedure1-1 Unscrew the screws (x2) on the back and detach the cover and turn up the display.



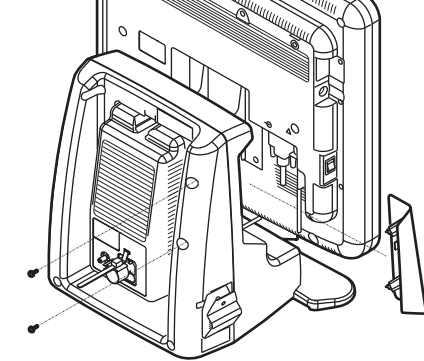
Procedure1-2 Connect the digital display connection cable and serial communication cable.



Procedure1-3 Return the display to its original position and attach the accessory cable holder to prevent from disconnecting. Adjust the cable holder to the upper right as shown below.



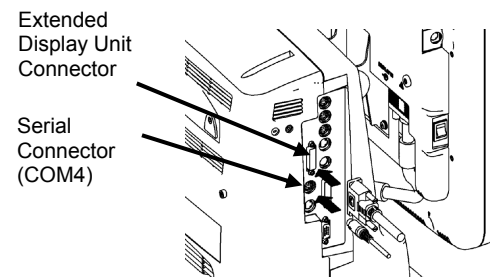
Procedure1-4 Return the cover detached in procedure 1-1.



### Procedure 2. Connect the central monitor

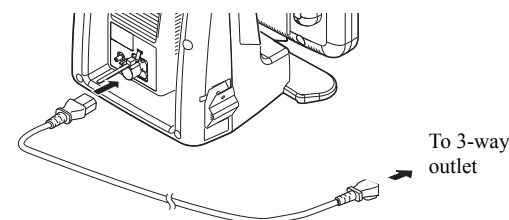
Connect the DS-7700W series central monitor to the LC-7019FT. Connect the digital display connection cable (hooked up to the LC-7019FT) to the extended video output connector.

Then, connect the serial communication cable (hooked up to the LC-7019FT) to the extended display serial connector on the DS-7700W series central monitor.

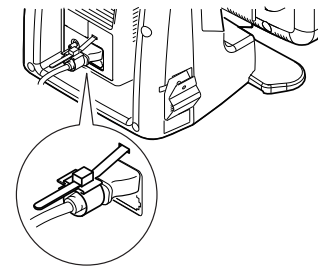


### Procedure 3. Connect the power cable

Procedure3-1 Connect the accessory power cable (CS-18 or CS-24) to the power supply connector on the rear side of the main unit. Connect the other end of the power cable to the 3-way outlet with ground terminal.

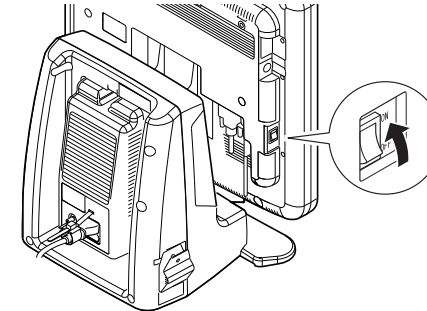


Procedure3-2 Fix the AC power cable with a clamp to prevent from disconnecting.



### Procedure 4. Turn On the Device

Turn ON the power supply switch located at the left side of the display unit. The power indicator will light in green.

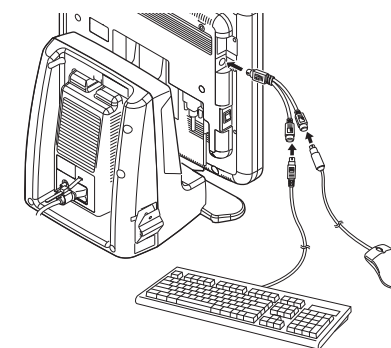


### Procedure 5. Connect the keyboard and mouse (optional)

By connecting a keyboard, character input can be performed using the keyboard. Also, by connecting a commercially available mouse, the touch panel keys can be controlled by clicking the mouse. Use a PS/2 keyboard and PS/2 mouse.

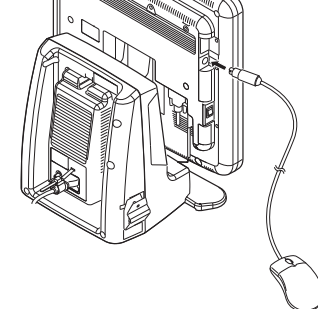
Procedure5-1 For users using both the keyboard and mouse, or using the mouse only.

Connect the PS/2 Splitter Cable to the external equipment connector located at the left side of the display unit. Then, connect the keyboard and mouse to the PS/2 Splitter Cable. On the PS/2 Splitter Cable, a keyboard mark and a mouse mark is indicated. Properly connect to the corresponding connectors.



Procedure 5-2 For users using only the mouse.

Connect the mouse directly to the external equipment connector located at the left side of the display unit.



### ⚠ WARNING

Use only the cables specified by Fukuda Denshi. Use of other cables may cause malfunction or damage this equipment.

### NOTE

Keyboard or mouse connected to the central monitor can be used to control this equipment.

## Setting up the LC-7019FT

### Procedure 1. Select the display unit

From the DS-7700W series central monitor, touch **Menu** > **System Config** > **Preset** > enter Password > **Extended Display Unit Setup** to display Multimonitor Setup screen.

### Procedure 2. Select the contents to display on the LC-7019FT

**Full Disc.** will output the full disclosure waveform.  
**Multi Display** will display the multi monitor screen.  
**OFF** will not display any data on this device.

### Procedure 3. Determine where to place the LC-7019FT

Select **Left** if locating the device to the left side of the main monitor.  
Select **Right** if locating the device to the right side of the main monitor.

### NOTE

The display function and set up method of this device may differ depending on the software version on the monitoring system. For more details, please refer to the operation manual of the monitoring system.

## Troubleshooting

**Nothing is displayed on the screen, or the display flickers.**

Cause 1 : The digital display connection cable is not properly connected.  
Solution : Verify that the display cable is properly connected.

Cause 2 : The digital display connection cable is damaged.  
Solution : Contact our service representative.

Cause 3 : Improper cable is used.  
Solution : Use the accessory digital display connection cable CJZ-01SS3.

Cause 4 : Incorrect main monitor setting.  
Solution : Make sure the monitoring system settings are correct.

**The touch panel does not function properly.**

Cause 1 : The touch panel cable is not properly connected.  
Solution : Verify that the touch panel cable is properly connected.

Cause 2 : Improper cable is used.  
Solution : Use the accessory touch panel cable.

Cause 3 : A scratch on the touch panel surface or foreign object entering the touch panel junction may cause misdetection of the key area.  
Solution : The touch panel needs to be replaced. Contact our service representative for service.

### NOTE

- 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.
- The service life of LCD backlight largely depends on the operating temperature.

**There is an offset in the touch panel.**

Cause : The detecting location may become misaligned due to change over time.  
Solution : Calibration needs to be performed. Contact our service representative.

### ⚠ CAUTION

The setup will be performed by our service representative. Users should not perform this procedure as incorrect calibration may cause malfunction of the equipment.



**The mouse pointer does not move.**

- Cause : A mouse other than the recommended one is used.  
Solution : Other mouse may not function on the LC-7019FT, or may suddenly stop functioning. Use the recommended mouse.

**The keyboard does not function.**

- Cause 1 : The keyboard is directly connected to the display unit.  
Solution : The keyboard will not function if directly connected to the display unit. Make sure to connect it using a PS/2 splitter cable.
- Cause 2 : A keyboard other than the recommended one is used.  
Solution : Other keyboard may not function on the LC-7019FT, or may suddenly stop functioning. Use the recommended keyboard.
- Cause 3 : The keyboard and mouse are not properly connected.  
Solution : A keyboard mark and a mouse mark are indicated on the PS/2 splitter cable. Properly connect the keyboard and mouse to the corresponding connectors.

**The keyboard stopped functioning.**

- Solution : The keyboard cable may be disconnected. If it does not function within 30 seconds, securely plug in the cable again.

## Maintenance

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 the LC-7019FT. To ensure safety, reliability, and high performance, a “Daily Check” and “Periodic Inspection” must be performed. Please be aware that Fukuda Denshi is not liable of any accidents arising from lack of daily check.

### Daily Check

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

### Periodic Inspection

The safety check conformed to IEC 60601-1 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.

#### CAUTION

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

## Cleaning

### Cleaning the Housing

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

### Cleaning the Display Panel

Since this device incorporates a touch panel, fingerprints and other stains are likely to appear on the touch panel.  
Wipe the touch panel using cleaning cloth supplied as accessory.

#### CAUTION

- A special coating is applied to the surface of the touch panel. Do not wipe the surface with a cloth or gauze with coarse texture. Wipe the surface with the soft cleaning cloth provided as optional accessory or with an eyeglass cleaning cloth.
- If stains cannot be removed from the touch panel surface, wipe softly with a dry or ethanol dampened cleaning cloth. Never use strong-acidic cleaning solution.
- 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 open the housing.
- Do not allow liquids or cleaning solution to enter the monitor or connectors.

#### CAUTION

- Do not use organic solvents, thinner, toluene and benzene to avoid damaging the resin case.
- Do not polish the housing with abrasive or chemical cleaner.
- When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the monitor or connectors.

#### CAUTION

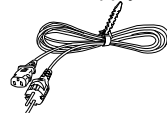
Use only neutral detergent to clean the housing. Do not use chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent and chemicals (cleanser, thinner, toluene, benzene, benzol, and synthetic detergent for house and furniture), or sharp-edged tools. The surface resin coating may be damaged, resulting in discoloration, scratches, and other problems.

## Accessories / Optional Accessories

### Accessories

Item	Q'ty
Power Supply Cable: CS-18*	1
Power Supply Cable: CS-24**	1
Digital Display Connection Cable: CJZ-01SS3 (3m)	1
Serial Communication Cable: CJO-11DD3 (3m)	1
Cable Holder	1
Operation Manual	1

Power Supply Cable



CS-18\*  
(AC220-240V)



CS-24\*\*  
(AC110-120V)

#### CAUTION

A cable appropriate to the regulations and voltage of the country in which the product is being used shall be used.

### Optional Accessories

To ensure product quality, use the specified Optional Accessories.

Item/Model Type	Note
Cleaning Cloth: OA-57	
Patient Nameplate: OTO-09A	
PS/2 Splitter Cable	For mouse, keyboard connection. Use the product recommended by Fukuda Denshi.
Mouse (PS/2 Mouse)	Use the product recommended by Fukuda Denshi.
Keyboard (PS/2 Keyboard)	Use the product recommended by Fukuda Denshi.

## Specification

### Size

434 ± 20(W) × 251 ± 20(D) × 473 ± 20(H) mm (not including the protrusion)

### Weight (not including the accessory)

11.5 ± 2.0 kg

### Environmental Condition

Operating Environment

Surrounding Temperature : 10 ~ 40°C  
Relative Humidity : 30 to 85% (non-condensing)

Transport / Storage Environment

Surrounding Temperature : -10 ~ 60°C  
Relative Humidity : 10 to 95% (non-condensing)

### Safety

General Standard : IEC 60601-1:1988+A1:1991+A2:1995  
EN60601-1:1990+A1:1993+A2:1995 (Medical electrical equipment – Part 1: General requirements for safety)

IEC60601-1-1:2000

EN 60601-1-1:2001

(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

EN60601-1-2:2001+A1:2006

(Medical electrical equipment – Part 1-2: General requirements for safety- Collateral standard: Electromagnetic compatibility - Requirements and tests)

The type of protection against electric shock

: Class I

Operation Mode : Continuous Operating Equipment

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.

### Power Requirements

Voltage : AC 100-240V

Frequency : 50/60Hz

Power Consumption : 90VA

### Usable Life

6 years: according to self-certification

## Function

### Display Unit

Display : TFT Color LCD

Size : 19 inch (diagonal)

Resolution : 1280 x 1024 SXGA

### Function Control

Touch Screen Method

### Input/Output Interface

Video Connector (Use the accessory cable).

Serial Connector (Use the accessory cable).

External Equipment Connector (Use the optional accessories).

Infrared Remote Control Input (Use the optional accessories).

## 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.

- Cellular phones and radio sets should be turned off in the room (building) where medical device is located.
- 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.
- 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 LC-7019FT is intended for use in the electromagnetic environment specified in below tables. It should be assured that the device is used in such an environment.

Guidance and manufacturer's declaration - electromagnetic emissions		
The LC-7019FT is intended for use in the electromagnetic environment specified below. The customer or user of the LC-7019FT should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The LC-7019FT uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The LC-7019FT is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network which supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/Flicker emissions IEC 61000-3-3	Complies	

### Compliance to the Electromagnetic Immunity (1)


The LC-7019FT is intended for use in the electromagnetic environment specified in below tables. It should be assured that the device is used in such an environment.

Guidance and manufacturer's declaration - electromagnetic immunity			
The LC-7019FT is intended for use in the electromagnetic environment specified in below tables. The customer or the user of the LC-7019FT 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 <sub>T</sub> (>95% dip in U <sub>T</sub> ) for 0.5 cycle  40% U <sub>T</sub> (60% dip in U <sub>T</sub> ) for 5 cycles  70% U <sub>T</sub> (30% dip in U <sub>T</sub> ) for 25 cycles  <5% U <sub>T</sub> (>95% dip in U <sub>T</sub> ) for 5sec.	<5% U <sub>T</sub> (>95% dip in U <sub>T</sub> ) for 0.5 cycle  40% U <sub>T</sub> (60% dip in U <sub>T</sub> ) for 5 cycles  70% U <sub>T</sub> (30% dip in U <sub>T</sub> ) for 25 cycles  <5% U <sub>T</sub> (>95% dip in U <sub>T</sub> ) for 5sec.	Mains power quality should be that of a typical commercial or hospital environment.  If the user of the LC-7019FT requires continued operation during power mains interruptions, it is recommended that the LC-7019FT 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<sub>T</sub> is the AC mains voltage prior to application of the test level.

Compliance to the Electromagnetic Immunity (2)

The LC-7019FT is intended for use in the electromagnetic environment specified in below tables. It should be assured that the device is used in such an environment.

Guidance and manufacturer’s declaration - electromagnetic immunity			
The LC-7019FT is intended for use in the electromagnetic environment specified in below tables. The customer or user of the LC-7019FT 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 to 80MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the LC-7019, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.  Recommended Separation Distance $d = 1.2 \sqrt{P}$
Radiated RF IEC 61000-4-3	3V/m 80MHz to 2.5GHz	3V/m	$d = 1.2 \sqrt{P}$ 80MHz to 800MHz $d = 2.3 \sqrt{P}$ 800MHz to 2.5GHz  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 <sup>a)</sup> , should be less than the compliance level in each frequency range <sup>b)</sup> . 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 <sup>a)</sup> 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 LC-7019FT used exceeds the applicable RF compliance level above, the LC-7019FT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the LC-7019FT.  <sup>b)</sup> 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 LC-7019FT.

The LC-7019FT is intended for use in an environment in which radiated RF disturbances are controlled. The electromagnetic interference can be prevented by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LC-7019FT system as recommended below, according to the maximum output power of the communications equipment.

Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the LC-7019FT.			
The LC-7019FT is intended for use in an environment in which radiated RF disturbances are controlled. The customer or the user of the LC-7019FT can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LC-7019FT 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.			

Daily Check List

No. \_\_\_\_\_

Inspected Date \_\_\_\_\_ Inspected by \_\_\_\_\_ Location \_\_\_\_\_

Device Type \_\_\_\_\_ 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
Functions	Connect this device to the monitoring system. Turn ON the monitor, and check whether it operates normally.	The indicator on the display panel should light.	OK / NG
		The display contents set from the central monitor should be displayed.	OK / NG
		The touch panel should be operable.	OK / NG
Cables	Visually check on all cables for any damage.	No damage should be found.	OK / NG
Periodic Inspection	Check the date of previous periodic inspection.	Should be within 1 year.	OK / NG

Comment

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