

Reduce Door-to-Balloon times with the advanced LiFEGAIN

# LiFEGAIN CU-HD1



CU Medical Systems, Inc.

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# SHOULD BE ADVANCED. SHOULD BE EFFECTIVE AND...



## CLINICAL, PROFESSIONAL REVOLUTION FOR THE ADVANCED TREATMENT

Coronary heart disease (CHD) is one of the leading causes of deaths worldwide. According to the World Health Organization, 7.2 million people died of coronary heart disease in 2004. It is the number one cause of death in high-income countries with 1.33 million deaths in 2004. In the United States, CHD caused about one of every five deaths in 2005. It is the largest single killer of American males and females.

In the treatment of CHD, patients are categorized into:

- STEMI - ST elevation myocardial infarction
- NSTEMI - Non ST elevation myocardial infarction
- UA - Unstable angina

Among the three, STEMI needs immediate attention the most as it usually involves a blockage of an epicardial coronary vessel. For percutaneous coronary intervention (PCI) the American Heart Association recommends a door-to-balloon inflation time of 90 minutes.

With the LiFEGAIN CU-HD1, door-to-balloon time can be reduced by having the patient's 12-lead electrocardiogram (ECG) monitored and transmitted to the hospital while the patient is in transit.



## BEFORE THE PATIENT'S ARRIVAL AT THE HOSPITAL

Trustable defibrillator / monitor LiFEGAIN CU-HD1 being compatible with the latest IT should provide total solution for sophisticated patient care.



## TELEMETRY SYSTEM WITH LiFEGAIN CU-HD1

Time is the matter when the patient suffering from CHD is in tight situation. From the street, office, school to Emergency Room, immediate and advanced patient treatment should be provided in advance.

Currently developed, actually installed and run by CU Medical Systems the LiFEGAIN CU-HD1 with Telemetry System is the right tool to tackle the time problem.

Where there is a mobile communications network, the vital signs of the patient can be transferred to an emergency room where doctors and nurses can read them in the room while the patient is still in transit.



### REAL TIME VITAL SIGNS TRANSFERRED AND READ (INCLUDING 12 CHANNEL OF ECG)

Doctors do not have to wait until the patient's arrival since they can read all the patient's vital signs clearly in their room preparing the treatment while LiFEGAIN CU-HD1 keeps sending the signs.

### DISTANCE NOTIFICATION

Medical staff might wonder where the ambulance is located at that moment arranging necessities for the patient. The Telemetry Systems thoughtfully provides how far the ambulance is from the hospital, how long it will take to get to the hospital.

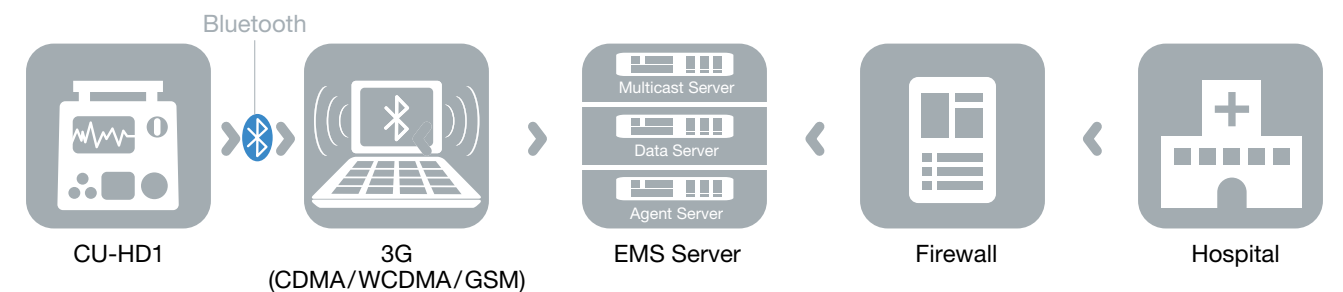
### REAL TIME VIDEO AND AUDIO

To examine exact patient condition, doctors need to see the patient's looks, to listen to the patient's claim even though they are not with doctors. Remotely but in real time and as if the medical staff is consulting the patient face to face, these function should help to give right treatment to the patient.

### REMOTELY PLACING MEDICAL ORDERS

With the vital signs, distance from the hospital, patient's look and claim, doctors can place medical orders with text message (computer) or real time audio for the immediate patient therapies.

## CONNECTING PATIENT DATA ACROSS YOUR SYSTEM





## LIFEGAIN CU-HD1 DEFIBRILLATOR / MONITOR

THE ENDLESS PROGRESS IN EMERGENCY THERAPY

Not limited to the usage in the ambulance, LIFEGAIN CU-HD1 should be a suitable defibrillator / monitor for the hospital. Compact and good sized LCD screen is enough to display physiological signals for monitoring the patient's condition. Its own software, the CU-EX2(expert2), is compatible with the telemetry system software to build and to furnish network to be able to review the patient data.

### MONITORING FEATURES

#### ECG

- 3-lead, 5-lead, and 12-lead monitoring through ECG electrodes.
- 12-lead ECG transmittable via mobile phone network and internet.
- Single lead (lead II) monitoring through defibrillation pads.
- Arrhythmia detection (Ventricular Fibrillation and Ventricular Tachycardia).
- ECG output through liquid crystal display and printer.
- ECG recording in removable SD Card.
- Lead fault detection.
- With alarm settings.
- Adjustable ECG size including auto gain.
- Adjustable frequency response (Emergency, Monitoring, Diagnostic).
- With power line frequency notch filter (50Hz, 60Hz).

#### SpO<sub>2</sub>

- Nellcor SpO<sub>2</sub> module featuring the OxiMax<sup>®</sup> Pulse Oximetry System - provides superior levels of monitor and sensor performance.
- Sensor calibration coefficients are programmed in the sensor giving the module flexibility in the accommodation of various sensors. Creates latitude for accommodating future sensor designs.
- Delivers accurate SpO<sub>2</sub> and pulse rate readings even when confronted with challenging conditions, such as patient motion combined with low perfusion. Nellcor provides the Max-Fast<sup>®</sup> Forehead Sensor especially for patients with low perfusion.
- With plethysmographic waveform display.
- Compatible with all Nellcor reusable and single-patient-use OxiMax sensors.

#### NIBP

- Automatic and manual oscillometric blood pressure measurement using NIBP module from SunTech Medical with Standard Motion Tolerance (SMT) technology.
- Accurate and reliable blood pressure monitoring, when and where you need it.
- Provided with alarms that let you know when systolic or diastolic or mean arterial pressure goes beyond the limits that you set.
- Indicated for adult, pediatric, and neonate patients.

## SUITABLE FOR THERAPIES

### HOSPITAL

#### MANUAL MODE

- Features the same impedance compensated e-cube biphasic shock waveform (biphasic truncated exponential type) as in AED mode.
- Has SYNC option for synchronized cardioversion.
- Defibrillation shocks may be delivered using defibrillation pads or paddles.
- Indicated for both adult (using adult pads or paddles) and pediatric (using pediatric pads or pediatric paddles) defibrillation.
- Paddles contain contacts for both adult and pediatric patients. When the adult contacts are removed, the paddles may be used for pediatric patients.
- Paddles have charging and shock delivery switches. Eliminates the need to press buttons on the device panel during manual defibrillation using paddles.
- Device has contact quality indicator on the LCD display that indicates whether the paddles have good contact with the patient or not.

#### NONINVASIVE PACER

- Rectangular monophasic waveform with 20 ms pulse width.
- With demand and fixed modes.
- Adjustable pacing amplitude from 5 to 200 mA.



### EMS

#### DEFIBRILLATION / AED MODE

- Features impedance compensated e-cube biphasic shock waveform (biphasic truncated exponential type).
- Preset 200 Joules shock energy into 50Ω, nonescalating.
- Text and voice prompts guide you through defibrillation and CPR
- Rescue protocol is in accordance with the American Heart Association 2005 Guidelines for CPR and ECC.
- Indicated for both adult (using adult pads) and pediatric (using pediatric pads) defibrillation.

### FIRE FIGHTERS

#### DEFIBRILLATION / AED MODE

The LIFEGAIN HD1 has been designed to meet the exacting requirements of emergency first responders.

- Transit Drop Test: tested according to MIL-STD-810F Method 516.5 with a drop height of 1.2 meters.
- IEC60529 IP Rating: IP 43  
First numeral: IP 4X: the LIFEGAIN HD1 is protected against objects 1 mm in diameter or larger.  
Second numeral: IP X3: the LIFEGAIN HD1 is protected against spraying water.

These tests assure you that the LIFEGAIN HD1 will perform in the tough environment of pre-hospital resuscitation.



# FEATURE-RICH

LIFEGAIN CU-HD1 continues to give you the rugged performance and advanced technology you need to give your patients the best care possible. Now you can track a patient's status from emergency response.

## 4 Wide full-color liquid crystal display

- Lets you view the following simultaneously
  - all 12 ECG lead or
  - 2 ECG lead or
  - 1 ECG lead and SpO<sub>2</sub> Plethysmograph
- 6 in X 3.6 in
- 800 X 480 pixels, RGB

### Screen Layout

- The following display features enable the user to quickly locate information.
  - Heart rate, SpO<sub>2</sub>, and NIBP values are shown in large numeric font size.
  - Waveforms (ECG and plethysmograph waveform) are logically grouped and clearly labeled.
  - Alarm status and limits are clearly displayed.
  - Battery pack charge level and AC mains connection icons clearly show power supply status.

## 5 Shortcut buttons for often used features such as lead selection, event marking, and printing

- Related buttons and knobs are grouped together that enables the user to locate them quickly during emergency rescues.
- Buttons are big and differentiated that can be easily manipulated even with a gloved hand.
- All monitoring and therapy ports are on the front panel of the device for ease of connection verification by the user.

## 6 Therapy and monitoring connectors are located on the front panel for easy connection and verification of connection integrity during rescue operations.

- ECG Cable, SpO<sub>2</sub>, NIBP

## 7 Integrated printer lets you print the patient's ECG automatically or manually

- Enables you to print ECG strips automatically or manually.
- In automatic printing mode, the printer prints the patient's ECG after a shock is advised.
- In manual printing mode, you may print the patient's ECG anytime during defibrillation or monitoring mode with a push of the Print Button. Strip length may be set from 30 seconds to 2 minutes.

## 3 Wide, robust handle that is easy to grip even with a gloved hand.

## 2 Operating mode and energy selection is via a rotary switch that allows quick switching between operating modes (AED, Monitor, Pacer) and energy levels in manual mode. Device turns ON automatically when an operating mode is selected.

## 1 Front

General : Big button switches that could accommodate gloved hands. Related switches are logically grouped together with distinct demarcations for ease of use.

### Rugged Construction

- The HD1 has been designed to withstand the rigors of usage in the field. You can subject it to mechanical abuse with the knowledge that it has passed stringent environmental conditions testing.

## 10 Menu knob

### Easy to navigate menu system

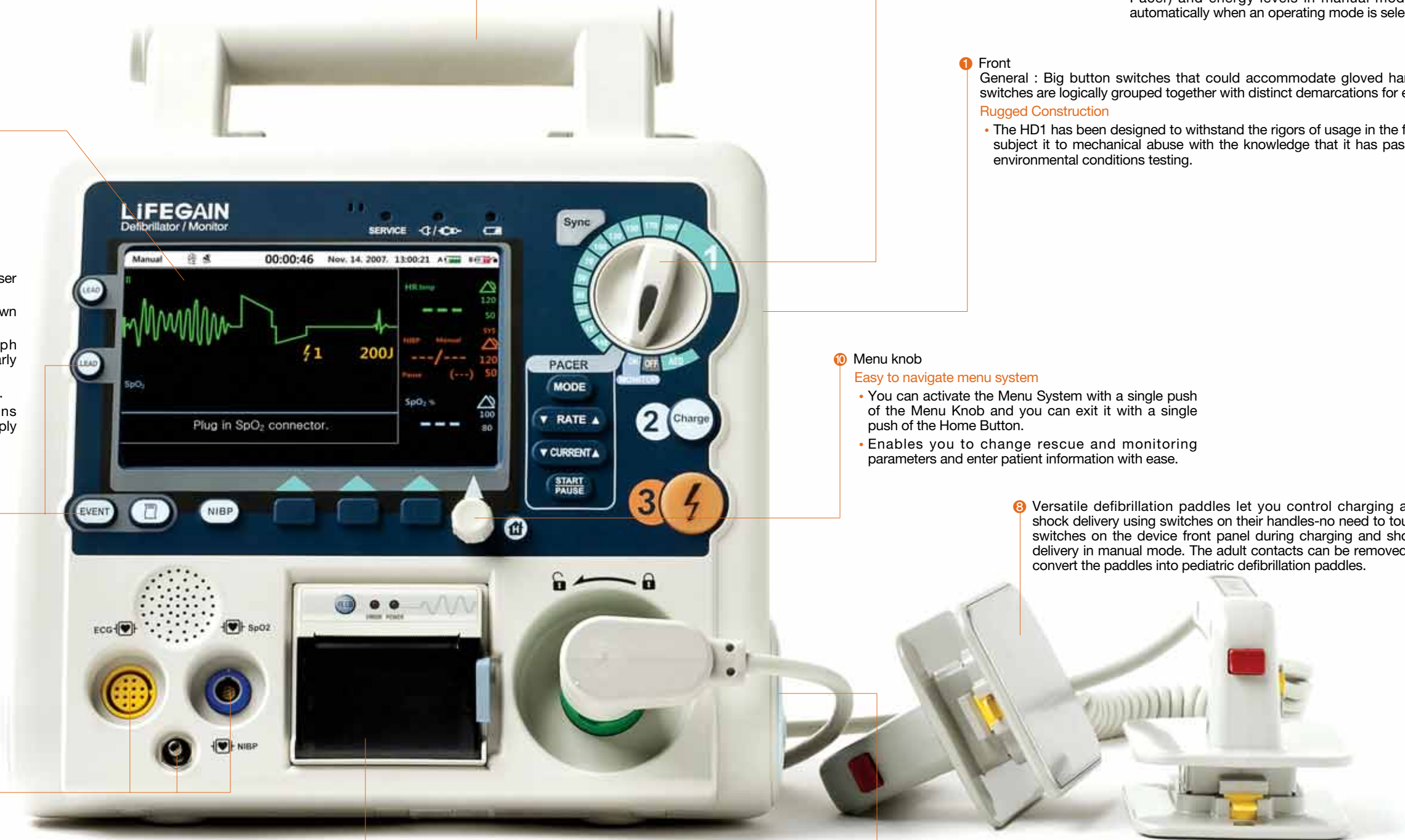
- You can activate the Menu System with a single push of the Menu Knob and you can exit it with a single push of the Home Button.
- Enables you to change rescue and monitoring parameters and enter patient information with ease.

## 8 Versatile defibrillation paddles let you control charging and shock delivery using switches on their handles-no need to touch switches on the device front panel during charging and shock delivery in manual mode. The adult contacts can be removed to convert the paddles into pediatric defibrillation paddles.

## 9 Versatile power supply system lets you power the HD1 using rechargeable lithium polymer battery pack, mains power, or a vehicle's cigar lighter jack.

### Flexible Power Supply System

- The internal power supply system of the HD1 may be supplied from various sources:
  - Rechargeable Lithium Polymer battery pack.
  - AC/DC SMPS module powered by the AC mains.
  - DC power from a vehicle's electrical system through a cigar lighter jack.
- A battery level indicator indicates the charge level of the Lithium Polymer battery pack.
- With the supply flexibility and battery level indicator, you are ensured that the HD1 will be ready for emergencies.



THE LIFE GAIN CU-HD1 IS LOADED WITH FEATURES THAT AID YOU IN EFFICIENTLY ADMINISTERING YOUR RESCUES.

## SPECIFICATIONS

### EXTERIOR VIEW

#### Dimensions(Paddle included)

326mm(W)×253mm(L)×358mm(H)  
(Width×Length×Height)

#### Weight

Body : 4.7kg / 8.2kg if paddles, cables (ECG Cable, SpO<sub>2</sub> sensor), printer paper and storage device included

Paddle (with cables) : 1.2kg

Battery, AC power module : 0.5kg, 0.7kg respectively

#### Temperature

Operating & Standby: 0°C ~ 40°C

Shipping and Storage: -20°C ~ 60°C  
(without pads)

#### Humidity

Operating: 5% ~ 95% (non condensing)

Standby: 5% ~ 95% (non condensing)

Shipping and Storage 5%~95%  
(non condensing)

#### Solids / Water Resistance

IP43

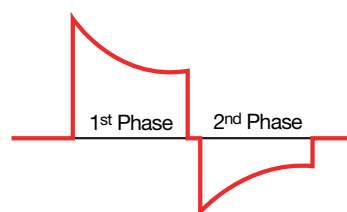
### DEFIBRILLATOR

#### Operation Mode

Semi-automatic

Manual : Sync, Asynchronous Defibrillation

#### Output Waveform(Manual / Automatic)



*e-cube* biphasic(Truncated exponential type)

\* Parameters of waveforms are adjusted according to the patient's impedance

#### Shock Delivery

Delivers shock using external paddles or disposable defibrillation pads

#### Patient Impedance Range

25~175 Ohms

### MANUAL MODE

#### Charging Time(200 Joules)

Less than 7sec. : if the rechargeable battery is fully-charged

Less than 6sec. : if an AC power module is used (only when power is more than 90%) Less

than 7sec. : If the battery has been discharged 15 times after it had been fully charged.

Less than 7 sec : If a new battery module is fully charged then discharged 15 times

#### Shock Energy Selection

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 70, 100, 120, 150, 170, 200 Joules

#### Operation Key and Button

Soft button, LEAD selection button, Print button, NIBP button Rotary switch, Charge button, Shock button, SYNC button, MENU key, HOME button

#### Indicator & Disply

LCD for ECG display, Power/Error display indicators

#### Charging Indicator

Text prompts of charge energy

Beep when charging

Shock button flashed in orange

#### Energy Selection Rotary switch

#### Patient Impedance Recognition Range

25~175 Ohms

#### Charge Switch Charge button

#### Shock Delivery Shock button

#### SYNC

Use SYNC button for synchronous cardioversion

Shock delivery is within 60 milliseconds of a QRS peak

### AED MODE

#### Charging Time(200 Joules)

Less than 7sec. : if a rechargeable battery is fully-charged

Less than 7sec. : if a new battery module is used

Less than 6sec. : if an AC power module if used (only when power is more that 90%)

Less than 7sec. : If the battery has been discharged 15 times after it had been fully charged

Less than 7 sec : If a new battery module is fully charged then discharged 15 times

#### AED Energy 200 Joules fixed

#### Text and Voice Prompt

Guides the user throughout defibrillation and CPR

#### AED Operation Key and Button

Analyze button, Stop analyze button, Shock button, CPR type 30:2/15:2, Start/Stop CPR

#### Indicator

LCD for ECG display etc., Text instruction, Alarm indication, Soft button, MENU key

#### Charging Indicator

Progress bar of the amount of energy

charged and text prompts

Beep when charging has been finished

Shock button flashes in orange

#### Patient Analysis

Analyzes the patient's ECG to determine whether defibrillation is needed or not (When the automatic patient analysis feature is enabled.)

#### Defibrillation-needed Rhythm

Ventricular Fibrillation or Fast Ventricular Tachycardia, 150bpm or above

#### Arrhythmia Detector Algorithm Performance Meets ANSI/AAMI DF80 sensitivity and specificity requirements

### PACER MODE

#### Pacing Type Non-invasive Pacing

#### Waveform

Monophasic Rectangular

#### Pacing Mode

Demand mode, Fixed mode

#### Refractory Period

340 msec (30 to 80 ppm)

240 msec (90 to 180 ppm)

#### Current Pulse Amplitude

0~200mA (±5mA)

#### Pulse Width 20ms (±10%)

#### Pacing Rate 30~180 ppm (±1.5%)

#### Pacing Transthoracic Impedance Range

25~175 Ohms

#### Operation Key and button

Mode button, Rate button, Print button, MENU key, HOME button and LEAD selection button

#### Indicator

LCD for ECG display etc., text prompt, QRS detection display, patient monitoring information display, pacing signal delivery display

#### Demand Mode Analysis

Analyzes the patient ECG to determine whether to deliver pacing energy or not in the Demand mode



### ECG MODE

#### ECG Input

ECG type : 3-Lead, 5-Lead, 12-Lead

Able to see ECG results using LCD or an

integrated printer

#### Lead Fault

Detects when the ECG cable(s) is detached (if the ECG cable is disconnected from the patient or the device)

#### Heart Rate Display

30~300 bpm (Accuracy : ±3 bpm)

#### Heart Rate Alarm Setting

Heart rate alarm setting range

Minimum: 30~300 bpm (though, it should be set to a value lower than the maximum)

Maximum: 30~300 bpm (though, it should be set to a value higher than the minimum)

#### ECG Size

5mm/mV, 10mm/mV, 20mm/mV

AUTO : 0.3~5.5mV, Display inputted ECG signals as 10mm on the screen

#### Frequency Range

Emergency : 1~30Hz (-3 dB)

Monitoring : 0.5~40Hz (-3 dB) Diagnosis : 0.05~150Hz (-3 dB) 50Hz, 60Hz Notch filter

#### Patient Isolation

CF Type

### SpO<sub>2</sub> PULSE OXIMERTY

#### Pulse Rate 20~250 bpm (±3 bpm)

#### SpO<sub>2</sub> Value 0~100% (±3 digit)

#### Perfusion 0.2%

#### SpO<sub>2</sub> Alarm Setting

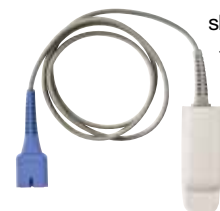
Minimum: 0~100% (though, it should be set to a value lower than the maximum)

Maximum: 0~100% (though, it

should be set to a value higher than the minimum)

Display Update Interval 6sec.

Resolution 1%



### NONINVASIVE BLOOD PRESSURE (NIBP) MEASURING DEVICE

#### Patient Category

Adult, Pediatric, Neonate

#### Measuring Method Oscillometric

#### Mode Manual / Auto mode

#### Time Interval for Auto Mode

1, 3, 5, 10, 15, 30, 60, 120 minutes

#### Display

Systolic blood pressure / Diastolic blood pressure / Mean blood pressure, Alarm setting

#### Error Range for Pressure

3mmHg

#### Measuring Range

Systolic

- Adult : 40~260mmHg

- Pediatric : 40~160mmHg

- Neonate : 20~130mmHg

Diastolic

- Adult : 20~200mmHg

- Pediatric : 20~120mmHg

- Neonate : 20~100mmHg

#### Overpressure Limit

Adult : 300mmHg

Pediatric : 300mmHg

Neonate : 150mmHg

### CUFF & CONNECTION TUBE

#### Cuff Type

Adult : 23~33 cm

(corresponding to the adult patient category)

Child : 12~19 cm

(corresponding to the pediatric patient category)

Infant : 8~13 cm (corresponding to the neonate patient category)

#### Connection Tube

Material : Polyurethane

Length : Approx. 3m



### DISPLAY

#### Type TFT Color LCD

#### Screen Size 152.4(W)×91.44(H)mm

#### Resolution 800×480×3(RGB)pixels

#### Dot Pitch 0.0635(W)×0.1905(H)mm

#### Backlight LED Life Time

20,000 hours (time when brightness is reduced to 50%)

#### ECG Viewing Time 6sec.

### EVENT STORAGE

#### External Storage SD Card (if 1GB)

Store more than 192 hours of events and ECG date

Or, store more than 8 hours of events, ECG data and Voce date

#### ECG Data Print

Output ECG directly from LIFE GAIN CU-HD1 or output ECG data by transferring it through Bluetooth communication

### INTEGRATED PRINTER

#### Printer Method Thermal line printing

#### Resolution

203 dpix/406 dpi (dpi : dot per inch<sup>2</sup>)

#### Printer Width 50mm

#### Printer Rate 25mm/sec

**Feed Rate** About 62.5mm/second

### PRINTER PAPER

#### Type Roll type

#### Size

Width : 58mm

Roll size : Minimum diameter 40mm

### BLUETOOTH

#### Frequency Range

2.402GHz~2.480GHz

#### Send Output Max. +4 dBm

#### Receive Sensitivity

-80 dBm (0.1% BER)

#### Communication Distance

Within 30m (Based on open space)

#### Miscellaneous

Transmission Method : Frequency Hopping

Spread Spectrum (FHSS)

Modulation Method : Gaussian-filtered

Frequency Shift Keying (GFSK)

### BATTERY MODE

#### Battery Type Lithium Polymer

#### Size

170mm×116mm×51mm

(Width×Length×Height)

#### Weight 0.5kg or below

#### Output

14.8 VDC

3100 mAh

#### Capacity

100 shocks (based on 200 Joules) or at least

4 hours of patient monitoring (25°C)

#### Battery Capacity Check Level 5

### AC POWER MODULE

#### Input 100~240 VAC, 50~60Hz

#### Output

18 VDC, 5 A

12 VDC, 0.5 A

#### Size

170mm×116mm×60mm

(Width×Length×Height)

#### Weight 0.7kg or below

### CAR CIGAR LIGHTER JACK

#### Output 12 VDC, 6.3 A (Max.)

#### Length 1800 ±50mm

#### Weight 0.08kg or less