

# LIFEPAK® 15 MONITOR/DEFIBRILLATOR

Works like you work.™







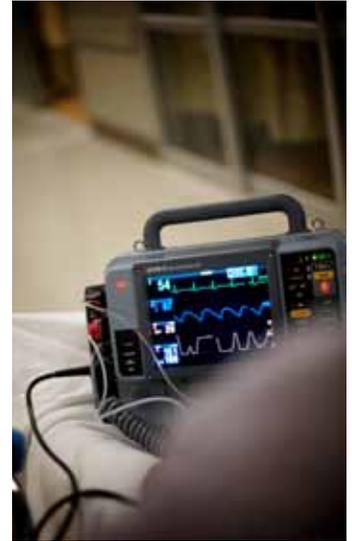




## The New Standard for Advanced Care

Your monitor is measured by what it can do for you. You need a product that has the latest clinical capabilities, is designed to provide the performance you need today and in the future, and is durable enough to ensure it continues to deliver in all the conditions you encounter when delivering patient care.

Physio-Control defibrillators have set the standard for over 50 years, and the 15 raises the bar. We are leading the way with new clinical and operational innovations, and surrounded with legendary 360 degree durability that allows for maximum mobility.



## Physio-Control supports you with the tools you need to improve patient care.

### Working WITH you

Our five decades of working with hospitals gives us the depth of knowledge to offer innovative solutions that really work.

### Continuum of care

From the streets to the emergency room to the administrative office, we offer a full suite of solutions, whether your need is code response or quality control analysis.

Our product line ranges from AEDs for minimally trained responders (LIFEPAK CR Plus and LIFEPAK 1000 defibrillator) to sophisticated devices for ACLS (LIFEPAK 12 and LIFEPAK 15 monitor/defibrillators) to the ideal hospital crash-cart device (LIFEPAK 20e defibrillator/monitor). Consistency among our products means you can count on uniform energy doses across LIFEPAK devices, swap electrodes, easily share data, and minimize training costs. We also have the most widely-used button layout and user interface in the world, to keep things simple for you.

### Quality CPR to help save more lives

Because effective CPR is so crucial in treating cardiac arrest, Physio-Control equips the new LIFEPAK 15 monitor/defibrillator with proven<sup>4</sup> CPR guidance (the CPR Metronome) and offers the LUCAS™ Chest Compression System, designed to provide effective, consistent and uninterrupted compressions according to AHA Guidelines.

In tandem with CODE-STAT™ data review software with Advanced CPR Analytics, these products give you a powerful feedback loop to drive improvements in resuscitation outcomes.

### Linking field and hospital to improve STEMI patient survival

Studies show a significant association between prehospital 12-lead ECGs and shorter door-to-balloon times for patients with Acute Coronary Syndrome (ACS). Two recent studies found the effect was strongest when the cath lab was activated while the patient was still en route to the hospital.<sup>6,8</sup> Minutes matter—if door-to-balloon time stretches from 90 minutes to 120 minutes, mortality for ACS has been shown to increase 40%.<sup>7</sup>

Receiving 12-lead ECGs from the field with the LIFEPAK 12 or LIFEPAK 15 monitor/defibrillator via the LIFENET Cardiac Care Network can help you meet the AHA/ACC 90-minute door-to-balloon guideline for patients with ST-segment elevation myocardial infarction (STEMI).<sup>8</sup> While care teams focus on patients, the STEMI Management Solution from Physio-Control securely delivers ECG data when and where it's needed, linking prehospital, emergency room, and percutaneous coronary intervention treatment teams.



### **Connecting patient data across your system**

Hospital quality and reporting standards are becoming increasingly stringent. Our data management solutions make it easy to transfer patient information from LIFEPAK devices to your PC, consolidate patient data, and analyze outcomes across your system.

Use DT EXPRESS™ Data Transfer Software to download critical event and waveform data from LIFEPAK devices to your PC, add supplemental patient data, print out a hardcopy report, and store records on a disk. Export data to CODE-STAT Data Review Software with Advanced CPR Analytics to consolidate all dispatch, treatment and outcome data into a single e-file.

### **Training tools and implementation support to keep your staff up-to-date**

We build durable products and back them with a 5-year in-hospital warranty. We make them easy to configure for your patient care protocols and we provide software upgrades as technology advances.

We realize it is time consuming and expensive to train your staff. To help you get the most out of your Physio-Control products, your sales representative will provide in-service training, and we also offer specialized instruction—ranging from self-paced CDs to live webcasts to on-site classes.

We aim to be the “gold standard” in customer education. We are committed to providing you with high quality training and education on our LIFEPAK defibrillators. Our biomed training seminars will reinforce your skills and provide you with tools to make you comfortable with the device both inside and out.



## The New Standard for Advanced Care ...in Clinical Innovation

- **The most potent escalating energy available**—ADAPTIV biphasic technology provides the option to escalate to 360J for best results. Recent studies have shown that refrillation is common among VF cardiac arrest patients and that defibrillation of recurring episodes of VF is increasingly difficult.<sup>1,2,3</sup> One study "...clearly demonstrated higher rates of VF termination and conversion to an organized rhythm with the escalating higher-energy regimen when persistent or recurrent VF necessitated delivery of multiple shocks." <sup>1</sup> The 15 gives you the option to escalate your energy dosing up to 360J for difficult-to-defibrillate patients.
- **Monitoring parameters to meet your needs**—The LIFEPAK 15 monitor/defibrillator has the ability to monitor multiple parameters such as NIBP, SpO<sub>2</sub>, End-tidal CO<sub>2</sub>, and Invasive Pressures. At the same time, the 15 offers the ability to defibrillate and pace, simplifying the amount of equipment required.
- **New monitoring parameters**—Detect hard-to-diagnose conditions and improve patient care with Masimo® Rainbow® Technology. The 15 is the first monitor integrating noninvasive monitoring for carbon monoxide and methemoglobin (to detect chemical exposures and certain drugs).
- **Advanced support for treating STEMI patients**—Easily acquire a pre-medication 12-lead ECG and then rely on the 15 to continuously monitor all 12 leads in the background and alert you to changes via our ST-Segment Trending feature. Because ECGs (and STEMI diagnosis) can change so quickly, the 15 takes ECGs at frequent intervals and alerts you to changes in a patient's ST measurement. Using your 15 in conjunction with the Web-based LIFENET STEMI Management Solution allows you to automatically share data from pre-hospital to hospital and to activate care teams.
- **Proven CPR guidance**—Demonstrated to aid users in performing compressions and ventilations within the recommended range of the AHA Guidelines,<sup>4</sup> the CPR Metronome uses audible prompts to guide you without distracting vocal critique. And get the post-event feedback you need to improve CPR performance with CODE-STAT™ data review software with Advanced CPR Analytics.



## ...in Operational Innovation

- **Maximum viewability on transports and in a patient room**—Large screen (8.4 inches diagonally), high resolution, and full-color display provide maximum viewability from all angles, making the 15 ideal for in-hospital transport.
- **Latest Lithium-ion battery technology**—Battery power that beats or matches every competitor in the market. And the smart technology included in this battery system helps you manage your battery inventory appropriately, letting you know when battery life is coming to an end.
- **Data management**—As you treat patients, collect monitoring data in your LIFEPAK monitor/defibrillator. The 15 packs 16 times the memory and has 4 times more storage space for clinical data than the 12. Easily transmit data so information flows to where it's needed. Whether you prefer the CODE SUMMARY™ printed record, or whether you want less paper, we have you covered. A variety of trending reports and event markers are available, to help you capture the data you need for patient records, clinical research, and quality assurance. And, the 15 is equipped with built-in Bluetooth® technology.
- **Upgradeable platform**—Our products are built as platforms—flexible to adapt to evolving protocols and new guidelines and upgradeable when you are ready to deliver new therapies. With 10 times more processing power and speed than the 12, the 15 is designed to grow as your needs change, helping you avoid costly premature replacements. This flexibility means the 15 is ready for the anticipated changes coming from the 2010 Guidelines.
- **Attention to detail**—We didn't overlook a thing. Finishing touches on this next-generation monitor/defibrillator include an ergonomic handle, large speed-dial wheel for easy selection, and updated, easy-to-clean keypad.

## ...with Maximum Mobility

- **Works when dropped or kicked during transport**—The LIFEPAK 15 device is the only device rated to withstand a 30" fall from bed height or a drop in transit. The double-layer screen can withstand crashes in elevators and hallways. Reinforced and redesigned cable connections lock tight for confident monitoring and therapy delivery. Easy to clean—industry-leading IP44 rating protects from fluids and substances, and exterior case and keypads are designed to help you meet requirements.
- **Always ready**—The unit's self-checking feature alerts the service team if the device needs attention—so you know it's ready when you need it. An atomic clock in the device keeps you on time.

# LIFEPAK 15 Monitor/Defibrillator

## The New Standard for Advanced Care



- 1 The only monitor/defibrillator on the market with Carbon Monoxide and Methemoglobin monitoring integrated into the device.
- 2 ST-Trending and 12-lead ECG transmissions via the LIFENET STEMI Management Solution makes the 15 a vital part of reducing door-to-balloon times.



- 3 CPR Metronome is a proven technology that actively guides users to a consistent compression rate without the need for extra external hardware.\*
- 4 Latest Lithium-ion battery technology allows for nearly six hours of run time and an approximate two-year replacement cycle.



- 5 Redesigned cable connector gives you confidence for secure therapy delivery.
- 6 Ergonomically designed handle has built-in shock absorbers for cushion.
- 7 Large screen, high resolution, and full-color display provide maximum viewability from all angles.





LIFEPAK 15 MONITOR/DEFIBRILLATOR



Control panel with buttons: 1 ON, 2 CPR, 3 ANALYZE, LEAD SIZE, SYNC, NIBP, ALARMS, OPTIONS, EVENT, ENERGY SELECT, CHARGE, PACER, RATE, CURRENT, PAUSE, SPEED DIAL, HOME SCREEN.

DANGER Explosion hazard. Do not use in the presence of flammable gases.  
WARNING Hazardous electrical output. For use only by qualified personnel.

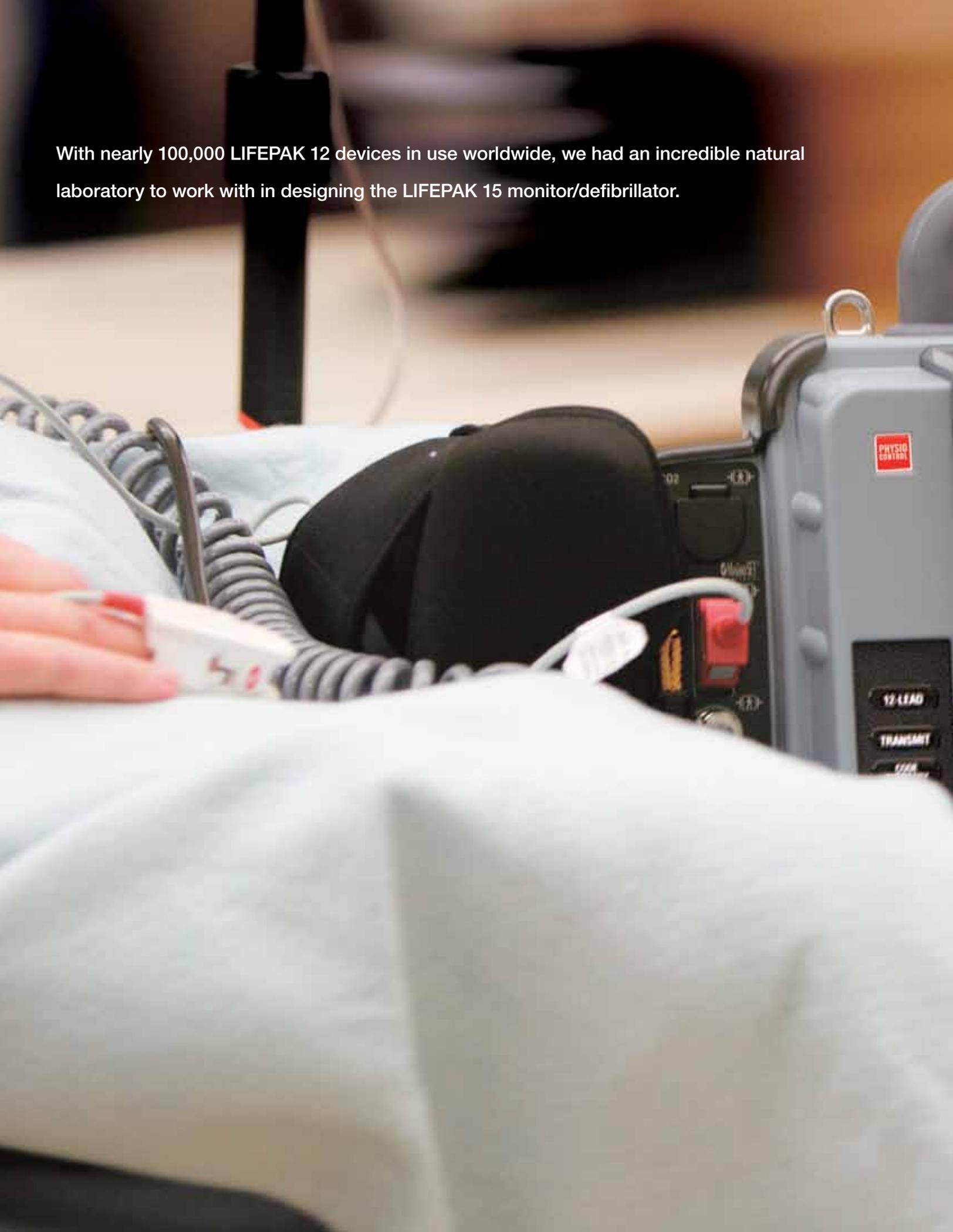
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With nearly 100,000 LIFEPAK 12 devices in use worldwide, we had an incredible natural laboratory to work with in designing the LIFEPAK 15 monitor/defibrillator.



LIFEPAK 15 MONITOR/DEFIBRILLATOR



Control panel with the following buttons and features:

- 1 ON (Green)
- 2 CPR (Green)
- 3 ANALYZE (Yellow)
- LEAD SIZE (Green)
- SYNC (Green)
- MRP (Green)
- ALARMS (Yellow)
- OPTIONS (Green)
- EVENT (Green)
- HOME SCREEN (Home icon)
- ENERGY SELECT (Green)
- CHARGE (Yellow)
- Defibrillation pad icon (Red)
- PACER (Green)
- RATE (Green)
- CHARGING (Green)
- PAUSE (Green)
- SPEED DIAL (Rotary knob)

## Building on a Proud Legacy

The pioneer in portable defibrillation and monitoring technology, Physio-Control continues to define the standard for cardiac care equipment.

Our LIFEPAK devices have been carried to the top of Mount Everest and launched into orbit on the International Space Station. More than half a million units are in use today on hospital crash carts, in cardiac catheterization labs, fire rescue rigs and ambulances worldwide. Since Physio-Control was founded in 1955, our products have helped save tens of thousands of lives and positively impacted countless more.

Even as we bring ground-breaking products to market, some things don't change. As always, the LIFEPAK name stands for a dependable, portable device that you can trust—every single day.

**A LIFEPAK device never stands on its own.** Our goal is to provide complete solutions for cardiac emergencies—from first responder through the hospital. Our products are systems. Everything works with you – whether it's accessories, disposables, flexible energy dosing, or data solutions that help you capture patient data and learn from it to improve care.



When you buy a LIFEPAK monitor/defibrillator, you get a leading-edge monitor/defibrillator and the company that stands behind it:

- Innovators continually at the forefront of improving patient care—ADAPTIV™ biphasic technology up to 360J to give patients the best chance at survival; secure, web-based flow of ECG data to help improve STEMI patient outcomes; the first defibrillator designed specifically for the hospital market; carbon monoxide monitoring to catch the number-one cause of poisoning deaths; and methemoglobin monitoring to detect chemical exposures and certain drugs.
- The pioneers of prehospital cardiac monitoring and defibrillating equipment.
- Industry-leading technical field service.
- A company that has been in business for more than five decades.

We're inspired and informed by the clinicians who use our products in life-threatening situations every day. Knowledge gained from working with some of the world's largest hospitals keeps us innovating—raising the bar on durability and clinical standards.



East 20th St  
East 20th St

Blue horizontal bar

Medical supplies on wall





Experience the legendary quality that has made LIFEPAK products and services the clear favorite around the world.

Physio-Control provides complete patient care monitoring and defibrillation solutions to reduce total cost of ownership and ensure compatibility with earlier systems whenever possible. Integrated solutions provide the right service options, disposables, cables, accessories and data offerings.

#### LIFEPAK® Defibrillator/Monitors

##### LIFEPAK 20e Defibrillator/Monitor

Building on the design of its predecessor, the LIFEPAK 20e defibrillator/monitor is compact, lightweight and easy to rush to the scene or use during transport. The 20e is highly intuitive to use, putting early, effective defibrillation into the hands of first responders. The 20e skillfully combines AED function with manual capability so that ACLS-trained clinicians can quickly and easily deliver advanced diagnostic and therapeutic care. Clinically advanced and packed with power, the 20e uses lithium-ion battery technology that provides extended monitoring time for transporting patients from one area of the hospital to another and includes ADAPTIV™ biphasic technology up to 360J.

##### LIFEPAK 1000 Defibrillator

Providing a powerful yet compact way to treat cardiac arrest patients, its intuitive, simple operation is ideal for first responders, and includes built-in flexibility for more advanced patient care. The 1000 is designed for external areas of the hospital where a simple-to-use AED with the option of manual defibrillation is required.

##### LIFEPAK CR® Plus Automated External Defibrillator

Designed for use by the first person at the scene of a sudden cardiac arrest. Ideal for the minimally trained rescuer, the CR Plus guides the rescuer step-by-step with calm, clear voice prompts. The simplicity of the CR Plus means it's ideal for non-acute hospital areas.



## **CPR Assistance**

### **LUCAS™ Chest Compression System**

Designed to provide effective, consistent and uninterrupted compressions according to AHA/ERC Guidelines, the device is used on patients in hospital and out-of-hospital settings. LUCAS is translucent, except for the hood and piston, making it the ideal chest compression device for use in the cath lab. Maintaining high-quality, hands-free compressions frees responders to focus on other lifesaving therapies.

## **LIFENET® System**

### **LIFENET STEMI Management Solution**

Enabling a seamless, secure and flexible flow of ECG data among prehospital to hospital helps you quickly identify STEMI patients, improve door-to-balloon times and reduce false-positive cath lab activations. A complete Web-based STEMI management solution, our system requires no dedicated equipment, servers or maintenance from your IT department.

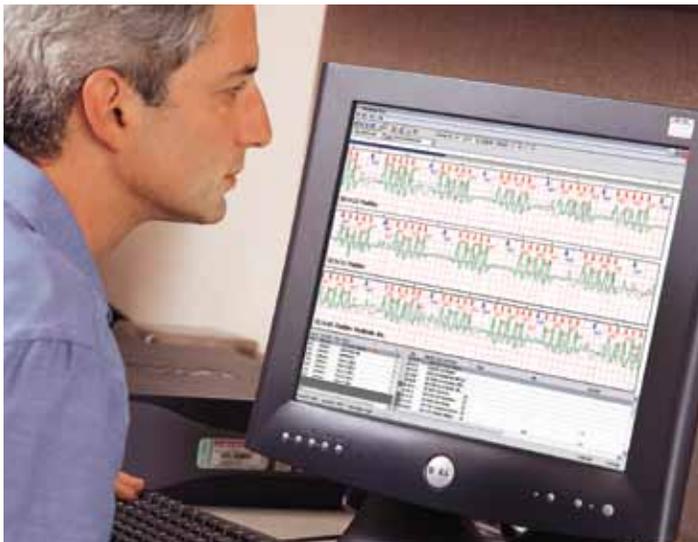


## **CODE-STAT™ Data Review Software with Advanced CPR Analytics**

This post-event review tool annotates chest compressions onto the patient's continuous ECG report and calculates CPR statistics to help you meet current AHA/ERC Guidelines. The software simplifies data collection and reporting by consolidating all dispatch, treatment and outcome data into a single e-file. Download, review, manage, and analyze emergency medical data from multiple LIFEPAK defibrillators. The application also facilitates quality analysis and business decisions, allowing creation of benchmarking and trending reports to review your system's performance.

## **DT EXPRESS™ Data Transfer Software**

Consolidate data from your sudden cardiac arrests and emergency transports into your hospital information systems. The simple Windows®-based software application manages data from LIFEPAK defibrillator/monitors. The software makes it easy to download critical event and waveform data to your PC, add supplemental patient data, print a hardcopy report, and store records on a disk. For storage and on-screen viewing of reports, export files to CODE-STAT data review software.



## GENERAL

The LIFEPAK 15 monitor/defibrillator has six main operating modes:

**AED mode:** for automated ECG analysis and a prompted treatment protocol for patients in cardiac arrest.

**Manual mode:** for performing manual defibrillation, synchronized cardioversion, noninvasive pacing, and ECG and vital sign monitoring.

**Archive mode:** for accessing stored patient information.

**Setup mode:** for changing default settings of the operating functions.

**Service mode:** for authorized personnel to perform diagnostic tests and calibrations.

**Demo mode:** for simulated waveforms and trend graphs for demonstration purposes.

## PHYSICAL CHARACTERISTICS

### Weight:

Basic monitor/defibrillator with new roll paper and two batteries installed: 8.6 kg (18.9 lb);

Fully featured monitor/defibrillator with new roll paper and two batteries installed: 9.1 kg (20.1 lb)

**Lithium-ion battery:** 0.59 kg (1.3 lb)

**Accessory bags and shoulder strap:** 1.77 kg (3.9 lb)

**Standard (hard) paddles:** 0.95 kg (2.1 lb)

**Height:** 31.7 cm (12.5 in)

**Width:** 40.1 cm (15.8 in)

**Depth:** 23.1 cm (9.1 in)

## DISPLAY

**Size (active viewing area):** 212 mm (8.4 in) diagonal; 171 mm (6.7 in) wide x 128 mm (5.0 in) high

### Resolution:

Display Type 640 dot x 480 dot color backlit LCD

**User selectable display mode:** full color or SunVue™ high contrast

**Display:** a minimum of 4 seconds of ECG and alphanumerics for values, device instructions, or prompts

**Display:** up to three waveforms

**Waveform display sweep speed:** 25 mm/sec for ECG, SpO<sub>2</sub>, IP, and 12.5 mm/sec for CO<sub>2</sub>

## DATA MANAGEMENT

The device captures and stores patient data, events (including waveforms and annotations), and continuous waveform and patient impedance records in internal memory.

The user can select and print reports, and transfer the stored information via supported communication methods.

### Report Types:

- Three format types of CODE SUMMARY™ critical event record (short, medium, and long);
- 12-lead ECG with STEMI statements
- Continuous ECG (transfer only)
- Trend Summary
- Vital Sign Summary
- Snapshot

**Memory Capacity:** Total capacity is 360 minutes of continuous ECG and 400 single waveform events.

Maximum memory capacity for a single patient includes up to 200 single waveform reports and 90 minutes of continuous ECG.

## COMMUNICATIONS

The device is capable of transferring data records by wired or wireless connection.

Serial Port RS232 communication + 12V available

Limited to devices drawing maximum 0.5 A current

Bluetooth® technology provides short-range wireless communication with other Bluetooth-enabled devices.

## MONITOR

### ECG

**ECG is monitored via several cable arrangements:**

A 3-wire cable is used for 3-lead ECG monitoring.

A 5-wire cable is used for 7-lead ECG monitoring.

A 10-wire cable is used for 12-lead ECG acquisition. When the chest electrodes are removed, the 10-wire cable functions as a 4-wire cable.

Standard paddles or QUIK-COMBO pacing/defibrillation/ECG electrodes are used for paddles lead monitoring.

### Frequency Response:

Monitor: 0.5 to 40 Hz or 1 to 30 Hz

Paddles: 2.5 to 30 Hz

### Lead Selection:

Leads I, II, III (3-wire ECG cable)

Leads I, II, III, AVR, AVL, and AVF acquired simultaneously (4-wire ECG cable)

Leads I, II, III, AVR, AVL, AVF, and C lead acquired simultaneously (5-wire ECG cable)

Leads I, II, III, AVR, AVL, AVF, V1, V2, V3, V4, V5, and V6 acquired simultaneously (10-wire ECG cable)

**ECG Size:** 4, 3, 2.5, 2, 1.5, 1, 0.5, 0.25 cm/mV (fixed at 1 cm/mV for 12-lead)

### Heart Rate Display:

20–300 bpm digital display

Accuracy: ±4% or ±3 bpm, whichever is greater

QRS Detection Range Duration: 40 to 120 msec

Amplitude: 0.5 to 5.0 mV

Heart Symbol: flashes for each QRS detection

**Common Mode Rejection (CMRR):** ECG Leads: 90 dB at 50/60 Hz

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

**Sensors:** MASIMO® Sensors including Rainbow Sensors

**Displayed Saturation Range:** 50 to 100%

**Saturation Accuracy:** 70–100% (0–69% unspecified)

### Adults/Pediatrics:

±2 digits (during no motion conditions)

±3 digits (during motion conditions)

Dynamic signal strength bar graph

Pulse tone as SpO<sub>2</sub> pulsations are detected

**SpO<sub>2</sub> Update Averaging Rate User selectable:** 4, 8, 12 or 16 seconds

**SpO<sub>2</sub> Sensitivity User selectable:** Normal, High

**SpO<sub>2</sub> Measurement:** Functional SpO<sub>2</sub> values are displayed and stored

**Pulse Rate Range:** 25 to 240 bpm

### Pulse Rate Accuracy (Adults/Pediatrics):

±3 digits (during no motion conditions)

±5 digits (during motion conditions)

Optional SpO<sub>2</sub> waveform display with autogain control

### SpCO™

**Sensor:** Only Rainbow Sensors

**SpCO Concentration Display Range:** 0 to 40%

**SpCO Accuracy:** ±3 digits

### SpMet™

**Sensor:** Only Rainbow Sensors

**SpMet Saturation Range:** 0 to 15.0%

**SpMet Display Resolution:** 0.1% up to 10%, then single digit resolution up to 15%

**SpMet Accuracy:** ±1 digit

### NIBP

**Blood Pressure Systolic Pressure Range:** 30 to 255 mmHg

**Diastolic Pressure Range:** 15 to 220 mmHg

**Mean Arterial Pressure Range:** 20 to 235 mmHg

**Units:** mmHg

**Blood Pressure Accuracy:** ±5 mmHg

**Blood Pressure Measurement Time:** 20 seconds, typical (excluding cuff inflation time)

**Pulse Rate Range:** 30 to 240 pulses per minute

**Pulse Rate Accuracy:** ±2 pulses per minute or ±2%, whichever is greater

**Operation Features Initial Cuff Pressure:** User selectable, 80 to 180 mmHg

**Automatic Measurement Time Interval:** User selectable from 2 min to 60 min

**Automatic Cuff Deflation Excessive Pressure:** If cuff pressure exceeds 290 mmHg

**Excessive Time:** If measurement time exceeds 120 seconds

### CO<sub>2</sub>

**CO<sub>2</sub> Range:** 0 to 99 mmHg

**Units:** mmHg, %, kPA

**Respiration Rate Accuracy:**

0 to 70 bpm: ±1 bpm

71 to 99 bpm: ±2 bpm

**Respiration Rate Range:** 0 to 99 breaths/minute

**Rise Time:** 190 msec

**Response Time:** 3.3 seconds (includes delay time and rise time)

**Initialization Time:** 30 seconds (typical), 10–180 seconds

**Ambient Pressure:** automatically compensated internally

**Optional Display:** CO<sub>2</sub> pressure waveform

Scale factors: Autoscale, 0–20 mmHg (0–4 Vol%), 0–50 mmHg (0–7 Vol%), 0–100 mmHg (0–14 Vol%)

### Invasive Pressure

**Transducer Type:** Strain-gauge resistive bridge

**Transducer Sensitivity:** 5µV/mmHg

**Excitation Voltage:** 5 VDC

**Connector:** Electro Shield: CXS 3102A 14S-6S

**Bandwidth:** Digital filtered, DC to 30 Hz (< -3db)

**Zero Drift:** 1 mmHg/hr without transducer drift

**Zero Adjustment:** ±150 mmHg including transducer offset

**Numeric Accuracy:** ±1 mmHg or 2% of reading, whichever is greater, plus transducer error

**Pressure Range:** -30 to 300 mmHg, in six user selectable ranges

## Invasive Pressure Display

**Display:** IP waveform and numerics

**Units:** mmHg

**Labels:** P1 or P2, ART, PA, CVP, ICP, LAP (user selectable)

## Trend

**Time Scale:** Auto, 30 minutes, 1, 2, 4, or 8 hours

**Duration:** Up to 8 hours

**ST Segment:** After initial 12-lead ECG analysis, automatically selects and trends ECG lead with the greatest ST displacement

**Display Choice of:** HR, PR (SpO<sub>2</sub>), PR (NIBP), SpO<sub>2</sub>(%), SpCO<sub>2</sub>(%), SpMet,(%), CO<sub>2</sub> (EtCO<sub>2</sub>/FICO<sub>2</sub>), RR (CO<sub>2</sub>), NIBP, IP1, IP2, ST

## ALARMS

**Quick Set:** Activates alarms for all active vital signs and includes an indicator for which alarms are active.

**VF/VT Alarm:** Activates continuous Continuous Patient Surveillance System (CPSS) monitoring in Manual mode

**Apnea Alarm:** Occurs when 30 seconds has elapsed since last detected respiration

**Heart Rate Alarm Limit Range:** Upper, 100–250 bpm; lower, 30–150 bpm

## INTERPRETIVE ALGORITHM

**12-Lead Interpretive Algorithm:** University of Glasgow 12-Lead ECG Analysis Program, includes AMI and STEMI statements

## PRINTER

**Prints continuous strip of the displayed patient information and reports**

**Paper Size:** 100 mm (3.9 in)

**Print Speed:** 25 mm/sec or 12.5 mm/sec

Optional: 50 mm/sec time base for 12-lead ECG reports

**Delay:** 8 seconds

**Autoprint:** Waveform events print automatically (user selectable)

**Frequency Response:**

Diagnostic: 0.05 to 150 Hz or 0.05 to 40 Hz

Monitor: 0.5 to 40 Hz or 1 to 30 Hz

## DEFIBRILLATOR

**Biphasic Waveform:** Biphasic Truncated Exponential

**The following specifications apply from 25 to 200 ohms, unless otherwise specified:**

**Energy Accuracy:** ±1 joule or 10% of setting, whichever is greater, into 50 ohms ±2 joules or 15% of setting, whichever is greater, into 25-175 ohms.

**Voltage Compensation:** Active when disposable therapy electrodes are attached. Energy output within ±5% or ±1 joule, whichever is greater, of 50 ohms value, limited to the available energy which results in the delivery of 360 joules into 50 ohms.

**Paddle Options:** QUIK-COMBO® pacing/defibrillation/ECG electrodes (standard). Cable Length 8 foot long (2.4 m) QUIK-COMBO cable (not including electrode assembly)

Standard paddles (optional)

## Manual Mode

**Energy Select:** 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 50, 70, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, and 360 joules

**Charge Time:** Charge time to 360 joules in less than 10 seconds, typical

**Synchronous cardioversion:** Energy transfer begins within 60 msec of the QRS peak

**Paddles Lead Off Sensing:** The transition point at which device changes from assuming that QUIK-COMBO electrodes are properly connected to patient to assuming that electrodes are not connected is 300±50 ohms.

## AED Mode

**Shock Advisory System™ (SAS):** an ECG analysis system that advises the operator if the algorithm detects a shockable or non-shockable ECG rhythm. SAS acquires ECG via therapy electrodes only.

**Shock Ready Time:** Using a fully charged battery at normal room temperature, the device is ready to shock within 20 seconds if the initial rhythm finding is "SHOCK ADVISED"

**Biphasic Output:** Energy Shock levels ranging from 150–360 joules with same or greater energy level for each successive shock

**cprMAX™ Technology:** In AED mode, cprMAX™ technology provides a method of maximizing the CPR time that a patient receives, with the overall goal of improving the rate of survival of patients treated with AEDs.

## Setup Options:

- Auto Analyze: Allows for auto analysis. Options are OFF, AFTER 1ST SHOCK
- Initial CPR: Allows the user to be prompted for CPR for a period of time prior to other activity. Options are OFF, ANALYZE FIRST, CPR FIRST
- Initial CPR Time: Time interval for Initial CPR. Options are 15, 30, 45, 60, 90, 120, and 180 seconds.
- Pre-Shock CPR: Allows the user to be prompted for CPR while the device is charging. Options are OFF, 15, 30 seconds.
- Pulse Check: Allows the user to be prompted for a pulse check at various time. Options are ALWAYS, AFTER EVERY SECOND NSA, AFTER EVERY NSA, NEVER
- Stacked Shocks: Allows for CPR after 3 consecutive shocks or after a single shock. Options are OFF, ON
- CPR Time: 1 or 2 User selectable times for CPR. Options are 15, 30, 45, 60, 90, 120, 180 seconds and 30 minutes.

## PACER

**Pacing Mode:** Demand or non-demand rate and current defaults (user configurable)

**Pacing Rate:** 40 to 170 PPM

**Rate Accuracy:** ±1.5% over entire range

**Output Waveform:** Monophasic, truncated exponential current pulse (20 +1.5 msec)

**Output Current:** 0 to 200 mA

**Pause:** Pacing pulse frequency reduced by a factor of 4 when activated

**Refractory Period:** 200 to 300 msec ±3% (function of rate)

## ENVIRONMENTAL

**Unit meets functional requirements during exposure to the following environments unless otherwise stated.**

**Operating Temperature:** 0° to 45°C (32° to 113°F); -20°C (-4°F) for 1 hour after storage at room temperature; 60°C (140°F) for 1 hour after storage at room temperature

**Storage Temperature:** -20° to 65°C (-4° to 149°F) except therapy electrodes and batteries

**Relative Humidity, Operating:** 5 to 95%, non-condensing. NIBP only: 15 to 95%, non-condensing

**Atmospheric Pressure, Operating:** -382 to 4,572 m (-1,253 to 15,000 ft). NIBP only: -152 to 3,048 m (-500 to 10,000 ft)

**Water Resistance, Operating:** IP44 (splash proof, dust and sand resistant) per IEC 529 and EN 1789 (without accessories except for 12-lead ECG cable, hard paddles, and battery pack)

**Vibration:** MIL-STD-810E Method 514.4, Propeller Aircraft - category 4 (figure 514.4-7 spectrum a), Helicopter - category 6 (3.75 Grms), Ground Mobile - category 8 (3.14 Grms), EN 1789: Sinusoidal Sweep, 1 octave/min, 10-150 Hz, ±0.15 mm/2 g

**Shock (drop):** 5 drops on each side from 18 inches onto a steel surface EN 1789: 30-inch drop onto each of 6 surfaces

**Shock (functional):** Meets IEC 60068-2-27 and MIL-STD-810E shock requirements 3 shocks per face at 40 g, 6 ms half-sine pulses

**Bump:** 1000 bumps at 15 g with pulse duration of 6 msec

**Impact, Non-operating:** IEC 60601-1 0.5 + 0.05 joule impact UL 60601-1 6.78 Nm impact with 2-inch diameter steel ball. Meets IEC62262 protection level IK 04.

**EMC:** EN 60601-1-2:2001 Medical Equipment - General Requirements for Safety - Collateral Standard: Electromagnetic Compatibility - Requirements and Tests EN 60601-2-4:2003: (Clause 36) Particular Requirements for the Safety of Cardiac Defibrillators and Cardiac Defibrillator-Monitors

**Cleaning:** Cleaning 20 times with the following: Quaternary ammonium, isopropyl alcohol, hydrogen peroxide

**Chemical Resistance:** 60 hour exposure to specified chemicals: Betadine (10% Povidone-Iodine solution), Coffee, Cola, Dextrose (5% Glucose solution), Electrode Gel/Paste (98% water, 2% Carbopol 940), HCL (0.5% solution, pH=1), Isopropyl Alcohol, NaCl solution (0.9% solution), Cosmetic discoloration of the paddle well shorting bar shall be allowed following exposure to HCL (0.5% solution).

## POWER

**Dual battery:** Capability with automatic switching

**Low battery indication and message:** Low battery fuel gauge indication and low battery message in status area for each battery

**Replace battery indication and message:** Replace battery fuel gauge indication, audio tones and replace battery message in the status area for each battery. When replace battery is indicated, device auto-switches to second battery. When both batteries reach replace battery condition, a voice prompt instructs user to replace battery.

**Battery Capacity** For two, new fully-charged batteries, 20°C (68°F)

Operating Mode	Monitoring (minutes)	Pacing (minutes)	Defibrillation (360J discharges)	
Total Capacity to Shutdown	Typical	360	340	420
	Minimum	340	320	400
Capacity After Low Battery	Typical	21	20	30
	Minimum	12	10	6

## BATTERY

### Battery Specifications

**Battery Type:** Lithium-ion

**Weight:** 0.59 kg (1.3 lb)

**Voltage:** 11.1V typical

**Capacity (rated):** 5.7 amp hours

**Charge Time (with fully depleted battery):** 4.5 hours (typical)

**Battery indicators:** Each battery has a fuel gauge that indicates its approximate charge. A fuel gauge that shows two or fewer LEDs after a charge cycle indicates that the battery should be replaced.

**Charging Temperature Range:** 5° to 35°C (41° to 95°F)

**Operating Temperature Range:** 0° to 50°C (32° to 122°F)

**Long Term (>1 day) Storage Temperature Range:** 0° to 35°C (32° to 95°F)

For more than 50 years, Physio-Control, maker of the renowned LIFEPAK defibrillators, has been developing technologies and designing devices that are legendary among first response professionals, clinical care providers and the community.

#### REFERENCES

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4. Kern KB, et al. A compression/ventilation metronome prevents hyperventilation by professional rescuers. *Circulation*. 2008; 118:S\_766 (abstract).
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8. Antman EM, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: executive summary: a report of the ACC/AHA Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines on the Management of Patients With Acute Myocardial Infarction). *Circulation*. 2004;110:588-636.

All information including comparative statements are valid as of March 2009.

For further information please contact your local Physio-Control representative or visit [www.physio-control.com](http://www.physio-control.com)



#### HEADQUARTERS / MANUFACTURING

**Physio-Control, Inc.**  
11811 Willows Road NE  
P. O. Box 97006  
Redmond, WA 98073-9706 USA  
Tel. 425 867 4000  
Toll Free. 800 442 1142  
Fax. 425 867 4121  
[www.physio-control.com](http://www.physio-control.com)

#### SALES OFFICES

**Physio-Control UK**  
Medtronic Ltd  
Suite One, Sherbourne House  
Croxley Business Park  
Watford, Herts  
WD18 8WW  
Tel. 44 1923 212 213  
Fax. 44 1923 241 004

**Canada**  
Medtronic of Canada  
6733 Kitimat Road  
Mississauga, ON  
L5N 1W3  
Tel. 888 879 0977  
Fax. 416 430 6115