



Empower • Mobilize • Manage

OVERCOMING THE POWER CHALLENGES OF MOBILE WORKSTATIONS

How ST7 LiFe Battery Technology Helps You Achieve the 20+ Hours of Daily Runtime Required for Meaningful Use / Full EMR Adoption



OVERCOMING THE POWER CHALLENGES OF MOBILE WORKSTATIONS

Introduction

In today's demanding healthcare environment, it is critical to have access to information directly at the point of care.

Fortunately, busy clinicians have a powerful tool at their disposal – the mobile workstation – which enables them to access a wide array of patient information, quickly and easily. Over the past few years, the reliance upon mobile workstations for delivering high-quality patient care has grown as technology-based applications such as electronic medical records (EMR), clinical documentation, bedside medication verification and computerized physician order entry (CPOE) have become increasingly sophisticated. Furthermore, with the recent requirements for Meaningful Use and EMR implementation, the demands on mobile workstation technology are going to increase.

The mobile workstation serves as a robust engine that enables caregivers to access a variety of important medical applications and devices via a single platform, which, because it's mobile, can be easily moved directly to a patient's bedside. By facilitating easy access to the tools and information caregivers need, mobile workstations have produced workflow efficiency gains which were once unobtainable. Unnecessary, time-consuming paperwork can be eliminated, enabling doctors and nurses to spend more quality time with patients. And, perhaps more importantly, the margin of error in delivering high-quality patient care can be greatly reduced.

For example, preventable medical errors, such as administering the wrong medications to patients, can often prove to be deadly. Each year, thousands of deaths occur because of these tragic mistakes. However, thanks to the combination of a mobile workstation with a bedside medication verification system, many of these untimely deaths can be avoided through the use of these cutting-edge technologies.

The way the medication verification system works is actually quite simple. Bar codes matching a patient to their prescribed medications can be placed on both the patient's ID bracelet and a single dose of the appropriate medication. The patient's bar coded medications can then be stored on a mobile workstation until nurses are ready to administer it. When it's time for the patient to take their medicine, their caregiver rolls the mobile workstation into their room, scans the bar codes to verify the correct patient and dose, and administers the medicine. Human error, which is the biggest cause of medication mistakes, is significantly mitigated by this automated system of checks and balances.

Mobile workstations have become a vital platform from which the implementation of technologies such as these become possible and accessible directly at the point of care.

The Challenges of Keeping Mobile Workstations “Ready-to-Go”

Despite their widespread adoption, the day-to-day, operational challenges for mobile workstations can be daunting for hospitals. Specifically, the underlying sealed lead acid (SLA) battery technologies that many mobile workstations utilize require a full hour to charge for every hour of clinician use. This cumbersome process often results in power-depleted mobile workstations lining hospital hallways, plugged into the wall and unusable, as they wait for their power sources to slowly be replenished.

Inefficient SLA Battery Technologies Make You Wait, And Wait, And Wait....

**SLA Mobile Workstation Battery Charging Ratio:
60 Minutes of Clinician Use = 60 Minutes of Recharge Time**

based on battery performance with CPU workstation

Needless to say, the ramifications of inefficient SLA battery systems have a tremendous impact on doctors and nurses who can't readily access the patient information they need. As a makeshift solution, some hospitals actually purchase extra mobile workstations to use while others charge – effectively doubling the cost, size and maintenance issues associated with their mobile workstation fleet. Other hospitals find their staff using mobile workstations that are “tethered” to recharging stations, negating the clinicians’ ability to visit patient rooms with their workstations.

In light of these issues, some mobile workstation manufacturers have tried to compensate for the slow charge time and inefficiencies of the SLA battery systems by using larger batteries in their design. However, larger batteries translate directly into heavier batteries which, obviously, affect the total weight of the mobile workstation. Since every ounce of extra weight negatively impacts the ergonomics of pushing a mobile workstation, a heavier battery presents a tremendous day-to-day disadvantage for clinicians, as well as long-term potential repercussions from dealing with all that weight.

In short, the consequences of traditional battery power systems’ shortcomings are staggering. Caregivers express frustration with not always being able to access mobile workstations when they need them. Employee morale suffers as complaints pile up. Hospitals significantly increase their operating expenses as a result of buying redundant equipment. When taken together, the bottom-line impact of inefficient SLA power systems is a barrier to proper workflow, achieving Meaningful Use and reaching full EMR adoption. This is why InfoLogix decided to create a better solution.

An Innovative Approach to Powering Mobile Workstations

For more than ten years, InfoLogix has worked with hospitals throughout the United States to help improve the quality of patient care through mobile technologies. Based on this first-hand experience, InfoLogix understands the magnitude of the problem caregivers face as they struggle to find an efficient, cost-effective way to power their mobile workstations.

As a result, InfoLogix partnered with one of the industry's leading battery manufacturers to design a better power solution specifically for mobile workstations. This included a detailed survey of IT and nursing professionals to identify new features that would be important for the next generation of mobile workstations. Not surprisingly, an overwhelming majority of respondents expressed the need for improved battery life, reliability and charge time as their top priorities.

Based on customer feedback, InfoLogix created an innovative solution from the ground up which seamlessly combines the latest battery technology with advanced engineering and design for the "real world" workflow demands of clinicians. The result is a mobile workstation power source that is significantly lighter and more efficient than older battery technologies. Best of all, its rapid charging speed can dramatically increase the availability and utilization of mobile workstations in busy hospitals, allowing caregivers to spend more quality time with patients, while significantly reducing the maintenance requirements and cost of ownership.

The result: InfoLogix's ST7 LiFe Battery System.

Lithium Iron Phosphate: Today's Most Advanced Battery Technology

InfoLogix's new ST7 LiFe Battery System is based on Lithium Iron Phosphate technology – an extremely efficient technology similar to that used in the latest electric cars – which addresses the problematic issues associated with the older SLA batteries such as their exceptionally slow charge time and heavy weight. Mobile workstations powered by SLA batteries take up to eight hours to fully charge, while the ST7 LiFe Battery charges in just a fraction of the time.

What a Difference...New ST7 LiFe Battery Is So Fast You Can Charge It While You Enjoy Your Morning Coffee

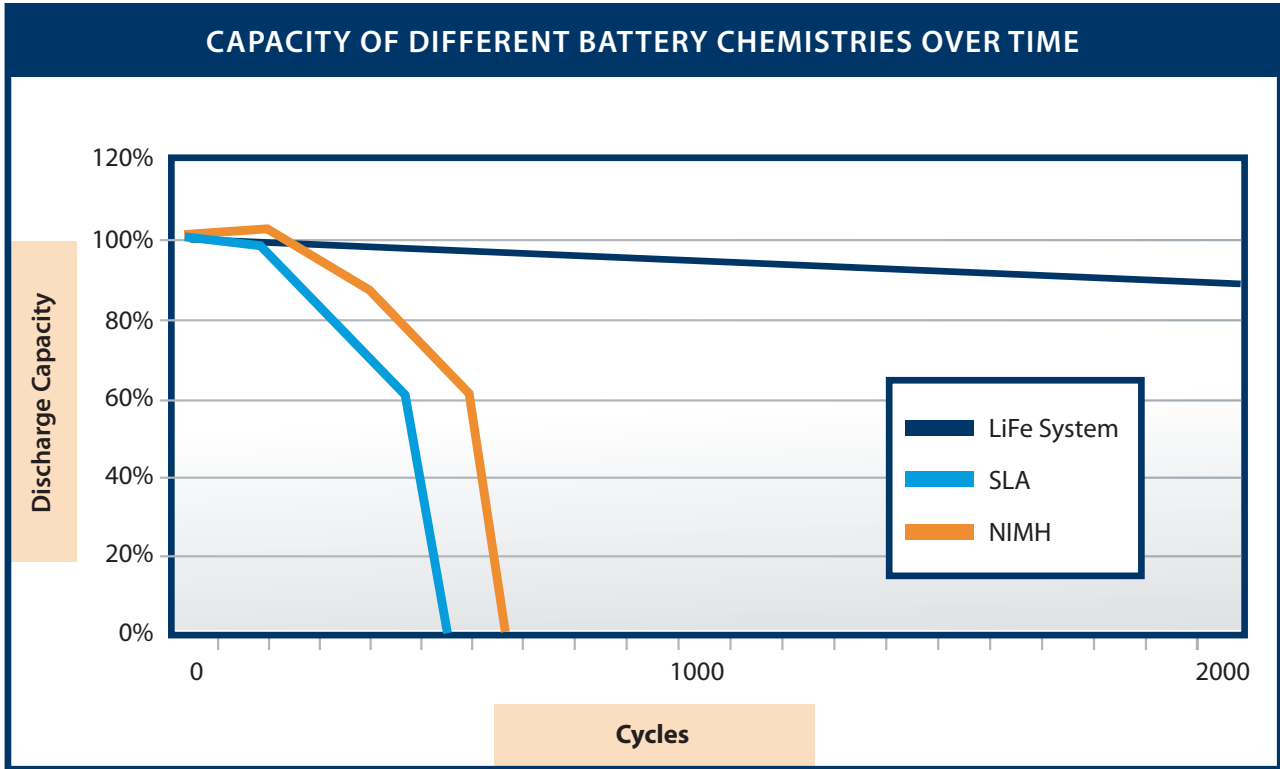
LiFe Mobile Workstation Battery Charging Ratio:
60 Minutes of Clinician Use = 10 Minutes of Recharge Time

based on battery performance with CPU workstation

In addition to storing large amounts of energy in a compact and lightweight manner, Lithium Iron Phosphate batteries have a number of important advantages over competing technologies. The ST7 LiFe Battery can also handle thousands more charge/discharge cycles than SLA batteries, which significantly extends battery life and dramatically reduces replacement costs. Additionally, the advanced technology of the ST7 LiFe Battery provides superior cell protection, eliminating the safety risks of high temperature degradation associated with SLA, lithium ion and nickel metal hydride batteries.

BATTERY TECHNOLOGIES - FEATURE COMPARISON					
	Sealed Lead Acid	NiMh	Lithium Ion	Lithium Polymer	Lithium Iron Phosphate
Weight:	Very Heavy	Heavy	Light	Very Light	Very Light
Charge Time:	6-8 hours	4-6 hours	2-4 Hours	2-4 Hours	1-2 Hours
Cycles Available:	300-500	500-800	500-800	400-500	3,000
Safety:	Safe	Safe	Less Safe	Less Safe	Very Safe

Directly above is a comparison chart of the most common power systems used in hospitals today. As you can see, the ST7 LiFe Battery produces more than five times the number of cycles compared to other batteries commonly used to power mobile workstations. Quite simply, this translates to fewer battery replacements over the life of a mobile workstation and a lower total cost of ownership. The information represented in this paper is based on mobile workstation CPU carts (carts that are driven by CPU units versus laptops) unless otherwise indicated.



Alternating Current vs. Direct Current – Which is Best for Mobile Workstations?

Most all of us rely on alternating current (AC) in our everyday lives as it is the form of power generated by utilities and distributed to us in the form of electricity. It derives its name from that fact the direction of the current reverses, or alternates, 60 times per second in the United States. Conversely, direct current (DC) is power that is contained in batteries. Unlike alternating current, it always flows in the same direction between the positive and negative terminals of a battery.

When it comes to mobile workstation power supplies, the distinction between AC power and DC power becomes an important consideration. Most mobile workstations that rely upon SLA battery technology actually use a combination of AC and DC power. The SLA battery provides DC power, as all batteries do, but then converts the DC power to AC power. Unfortunately, this process is extremely inefficient and negatively impacts the run time of the battery.

When InfoLogix created the ST7 LiFe Battery, it decided to embrace a streamlined engineering framework to avoid the problems associated with AC/DC power source conversions. As a result, it designed the ST7 LiFe Battery to run exclusively on DC power which is the type of power that most computer systems already rely upon to operate. Without the unnecessary power conversion step, the ST7 LiFe Battery enjoys higher performance in a more compact, lightweight footprint.

For example, while battery systems that utilize AC/DC power source conversions operate at 60 to 70 percent efficiency, the DC output only design can achieve significantly better results, up to as much as 90 percent efficiency. The excellent performance characteristics of the DC output only design provide tremendous day-to-day benefits for powering mobile workstations such as greater run time and a longer lasting battery. This enables users to realize up to 3,000 battery cycles, a significant improvement over traditional batteries.

Also, the DC output only design doesn't require the use of the bulky external power supply that comes with most computer systems, resulting in less cable clutter. And perhaps most importantly, the ST7 LiFe Battery weighs a dramatic 40 pounds less than traditional SLA batteries, providing a critical ergonomic benefit for caregivers who continuously push mobile workstations between patient rooms throughout their shifts.

The specialized engineering of ST7 LiFe Battery translates into a better, more efficient battery system which can help hospitals overcome their traditional power source challenges and reduce their total cost of ownership at the same time.

Better Performance Translates to a Lower Total Cost of Ownership

When evaluating the total cost of ownership for a mobile workstation battery, a variety of factors come into play. Reliability, charge time, cycle time and clinical workflow improvements are all important considerations that should be taken into account.

TOTAL COST OF OWNERSHIP OVER FIVE YEARS				
	ST7 LiFe Laptop Cart	SLA Laptop Cart	ST7 LiFe CPU Cart	SLA CPU Cart
Runtime on Full Charge (hours)	17	10	8	8
Full Recharge Time (hours)	1	6	1	8
Full Cycle Time (hours)	18	16	9	16
Battery Life (cycles)	3000	300	3000	300
Battery Life (days)	3400	333	1200	267
Battery Life (years)	9.3	0.5	4.4	0.4
No. of Replacements over 5 years	0	9	1	11
Initial Battery Cost (per unit)	\$2495	\$959	\$2495	\$1300
Replacement Battery Cost (per cart)	0	\$5310	\$936	\$6600
Total Cost of Ownership	\$2495	\$6269	\$3431	\$7900

TCO Calculations are based on the following assumptions: 1) desired run time per day is 15 hours, 2) lifecycle of a computer cart is five years, 3) replacement battery cost includes replacement cells, IT labor (3 hrs with an IT salary of \$70,000), and shipping, and 4) the results of the CPU cart battery performance are based on tests with an InfoLogix PowerCube II computer and monitor.

Hospitals who have adopted the ST7 LiFe Battery have found the **total cost of ownership to be frequently less than half of traditional SLA batteries**. The bottom line benefits are significant, but more importantly, caregivers have ready access to the equipment they need to help their patients.

Setting a New Standard for Excellence: InfoLogix's ST7 LiFe Battery

- Fastest in the healthcare industry, fully recharges in approximately an hour
- Extremely lightweight (under 20 lbs), about 1/3 the weight of traditional mobile workstation batteries
- Laboratory tested: 3,000 cycles, up to 5x longer battery life than standard mobile workstation batteries
- Run Time: Laptop 15-17 hours, PowerCube II and Monitor, 6-10 hours
- Enables greater clinician productivity by reducing charging downtime
- Safest lithium battery chemistry currently available
- More efficient DC only output, eliminates the need for a bulky external power supply or "brick"
- Slower rate of capacity loss over time than standard batteries
- Overheating resistant
- Programmable power system management software provides on-screen battery strength indicator
- 24/7 InfoLogix Help Desk support

ST7 LiFe Battery Care and Maintenance

If your organization makes the decision to invest in ST7 LiFe Battery technology, the usage guidelines to properly care for and maximize their life expectancy are very straightforward:

INFOLOGIX'S ST7 LIFE BATTERY BEST PRACTICE AND USAGE GUIDELINES	
Installation	The LiFe ST7 Battery is available pre-installed on InfoLogix's latest line of mobile workstations. It is also easy to install on the InfoLogix mobile workstations you already own.
Charging	The LiFe ST7 Battery can be plugged in to charge at any time, and will be full in about an hour. It is not necessary to let the battery fully charge before you unplug it to use.
Operation & Integration	The LiFe ST7 Battery system's three outputs can be configured to run just about any DC powered device and can easily be reconfigured to accommodate future upgrades.
Storage	The lithium iron phosphate batteries inside your LiFe ST7 Battery system can be stored for an extended amount of time (one year) with no degradation in capacity. However, it is always best to store your LiFe ST7 Battery system charged and cycle it every 30-60 days.

Engineering Excellence

As the leading provider of enterprise mobility solutions, InfoLogix is dedicated to the advancement of technology, quality engineering, user safety and ergonomics. In keeping with this spirit of innovation, InfoLogix is proud to have pioneered a smarter battery design to meet the exact needs of our healthcare customers. With the introduction of the ST7 LiFe Battery, mobile workstations can now be powered with a lightweight, efficient power source which dramatically increases the available run time of mobile workstations to up to 20+ hours per day, while increasing the quality of care delivery and decreasing the total cost of ownership for the technology.

To learn more about the ST7 LiFe Battery technology, visit us at www.infologix.com/ST7 or call 215-604-0691.

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Figures represented in this paper are based on InfoLogix engineering lab testing and are intended for general comparison purposes between the LiFe and SLA technologies and associated power management software; performance may vary given differences in workflow demands between different hospital facilities and this is not intended to be an express or implied guarantee of performance. Please contact your InfoLogix representative to discuss your specific performance parameters.

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About InfoLogix, Inc.

InfoLogix is a leading provider of enterprise mobility solutions for the healthcare and commercial industries. InfoLogix uses the industry's most advanced technologies to increase the efficiency, accuracy, and transparency of complex business and clinical processes. With 19 issued patents, InfoLogix provides mobile managed solutions, on-demand software applications, mobile infrastructure products, and strategic consulting services to over 2,000 clients in North America including Kraft Foods, Merck and Company, General Electric, Kaiser Permanente, MultiCare Health System and Stanford School of Medicine. InfoLogix is a publicly-traded company (NASDAQ: IFLG).

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