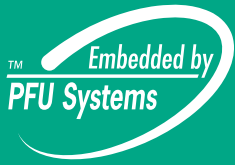


# Case Study



### Stinger Industries, LLC Mobile Workstations for the Health Care Industry



With permission from Stinger Industries, LLC

The Stinger Solution Mobile Workstation

#### The Opportunity

Stinger Industries of Murfreesboro, Tennessee, USA, specializes in information workstations for the health care industry. The medical computer electronics market is growing at an 8.8% CAGR, estimated at \$265M in 2002, and expected to reach \$313M by 2004, according to Electronic Trend Publications, Inc.. Untethered access to patient records, physician's schedules and emergency numbers, medication prescriptions, computer aided diagnostics applications, etc. makes it possible to react faster in administering treatment, and cuts cost. With the Stinger Solution series of mobile workstations by Stinger Industries, such access is now a reality. With cost cutting and productivity improvement demands in health care IT, Stinger Industries is experiencing strong and growing demand for its mobile workstations.

#### The Product

The Stinger Solution series is a complete line of network ready, self-contained, rugged, mobile workstations, designed for any environment, including wet and crisis areas. A key feature is the tough, fluid resistant desktop with keyboard, integrated mouse, and a 15-inch or 17-inch VGA TFT panel. Dual PC CardBus slots provide expansions for wireless Ethernet networking, while integrated 10/100Base-T Ethernet provides wire-line network connectivity. Other options include touch screens and sound.

Flexibility is a key feature of Stinger's entire product line. The Stinger Solution's desktop or head assembly is attached securely to a lightweight pneumatic pole assembly with Stinger's popular Feathertouch™ feature. Users can easily raise and lower desktop surface from seated to ergonomic standing positions without the need for tooling adjustments. The five-wheel base support turns nimbly, maneuvering easily through crowded spaces.

The workstations are based on innovative, modular design concepts, with an adjustable base that operates on either mobile DC or stationary AC power. A choice of industrial strength power systems and the elimination of unnecessary power-draining features of off-the-shelf PCs allows the Stinger Solution to operate between eight and sixteen hours on a single charge, exceeding run times demanded by hospitals. In industry standard tests of ten two-minute sessions per hour, Stinger engineers measured run times of over ten hours and over sixteen hours with the smallest and largest standard power systems, respectively.



a Fujitsu company

PFU Systems™

A totally unique design feature is the embedded PC, which is securely shielded from debris and fluids behind the monitor. The sealed CPU, hard disk drive and ports help deter theft and eliminate employee infringement. Easy access for maintenance and upgrades are achieved through modular components. A complete change of hard drive and CPU can be made in three minutes or less. Performance choices from 266MHz to 700MHz with memory expansion to 256MB SDRAM, provide flexible price/performance options optimized for the industry's most arduous requirements. The Stinger Solution comes with interchangeable options such as a stationary AC-wall, desk or floor mounted assembly, a variety of colors, accessories and power systems.

### The Challenge

Stinger Industries faced the challenge of designing an entire line of four mobile workstation models from scratch within an aggressive time-line and budget. Where Stinger Industries' engineering and manufacturing core competence is in advanced mechanical design, it faced an enormous risk and challenge if it would have to expand its design and manufacturing facilities to incorporate embedded computers. The design criteria called for the integration of the computer in a modular, compact, and commanding design of no more than 5"x7"x3" (L x W x H) in footprint, created for a single platform with a range of performance options from 266MHz to 700MHz. The design criteria also called for a modular IO configuration for legacy I/O and network interfaces, both wire-line and wireless. Additional requirements were for support of a 15 or 17-inch VGA TFT display panel with optional touch interface, a keyboard, mouse, integrated 2.5" hard disk with large storage capacity, dual 32-bit PC CardBus slots, 10/100Base-T Ethernet interface, and extensive APM and ACPI power management support in the BIOS for off-the-shelf operating systems. And finally, to match the slow replacement rate of IT infrastructure in the health care industry, Stinger Industries needed to guarantee availability of this configuration with a three-year warranty period.

### The Solution

The design team at Stinger Industries turned to PFU Systems for outsourcing design and manufacturing. PFU Systems met all the design criteria using its custom product services, its Plug-N-Run System-On-Modules (SOM), and NetCARD carrier board. The custom product services included electronic design, integration of the computer sub-assembly and testing for quality assurance. Basing the design around the Plug-N-Run and the NetCARD carrier board, the focus was on system integration, verification, assembly, and quality assurance. The Plug-N-Run's standardized thermal, mechanical and electrical module-to-board interface offered a proven, snap-in, embedded x86 host module with performance scalable from 166MHz to 700MHz and higher. This made it possible to use a single NetCARD carrier board platform, eliminating the need for multiple motherboard designs with CPU and chipset combination limitations. The full array of I/O functionality – 10/100 Base-T Ethernet, multiple serial I/O channels and PC CardBus slots – on the NetCARD allowed such functionality to be provided off-the-shelf.

With an MTBF exceeding 5 years and with shock and vibration specifications of 50G and 2.2G, respectively, the Plug-N-Run went beyond the requirements for reliability and ruggedness. As the integrated BIOS of the Plug-N-Run is specially designed with support for APM and ACPI power management, the mobile workstation product could easily meet power management requirements using a standard off-the-shelf operating system with such support. The Plug-N-Run met the challenge of small form factor with its ultra-compact size of only 5" x 3" x 0.5" (L x W x H), the smallest footprint available, integrating a cooling fan to ensure Stinger's fluid and debris shield would not overheat.

"With PFU Systems' design and manufacturing expertise our designers were able to focus primarily on product specification and back-end integration issues, making it possible for our marketing and sales teams to obtain customer commitments for this product in record time. The use of the Plug-N-Run System-On-Module guarantees extended product life, high reliability and future performance requirements.

By combining this small, robust, embedded computer with our fluid-resistant desktop assembly and light, interchangeable Levitator workstation bases, we gave nursing, IT and administration a total Stinger Solution from one vendor ", said Gary Coonan, President and CEO of Stinger Industries LLC.

### The Alternatives

The designers at Stinger Industries had the alternatives of a standard laptop design, which would have made it impossible for Stinger to maintain modularity and compactness, an SBC, SOM products from PFU Systems' competitors, or designing the x86 host module from scratch. The latter was not an option because of customer deadlines and the costs and risks involved for Stinger Industries with this approach. Choosing a standard off-the-shelf SBC would have resulted in a sub-optimal form, fit, function ratio, and consequently in an unfavorable cost. Even an SBC with perfect form, fit, function ratio would have meant severely limited choices of supply, performance scalability, and consequently higher costs. Further comparing the Plug-N-Run and competing SOM products, Stinger Industries quickly recognized that the Plug-N-Run offered superior benefits, such as a feature rich BIOS designed specifically to support the essential low-power operation, complete and accurate technical documentation, a rugged design, and a high level of quality with over five years of MTBF. The combination of the Plug-N-Run and NetCARD provided superior form-fit-function and price/performance value over competing approaches and products. PFU Systems' custom product services offered Stinger Industries a one-stop solution to expand its product line without adding heavy investments beyond its core design and manufacturing capabilities while drastically reducing their development time, risk, and cost.

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