

# How to succeed when deploying forklift computers in warehousing & logistics

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Expanding the reach of information technology is essential to improving efficiency and automating back-end order-fulfillment and production processes in warehousing, material handling and manufacturing.

Given the nature of the challenge, rugged forklift-mounted industrial computers often prove to be the preferred solution in the demanding physical environments of industrial warehouses and heavy manufacturing facilities.

More rugged than hand-held and tablet devices, fork truck computers bolted-in-place on adjustable mounts maximize user-friendly visibility, minimize operator distractions and largely avoid the risks of human handling. Vehicle-mounted computers don't get dropped or go curiously missing.

## What to look for:

### **1) Don't under-buy while over-paying**

Look carefully at overall system performance by evaluating actual benchmarks and comparing systems head-to-head. Beware that some manufacturers reduce their costs (but not their selling prices) by gravitating to lower-end 32-bit CPU's and smaller amounts of system DRAM. Look for systems that are fully 64-bits at the hardware level – without that, you will be permanently locked into running only lower-performing 32-bit versions of operating systems and applications.

Plan for the future recognizing that operating systems tend to get fatter and thin-client applications tend to get 'thicker'. You will want your hardware platform to comfortably support a 5 to 7-year deployment without having to undertake expensive hardware upgrades just to keep pace with software evolution.

### **2) It's ugly out there – go 100% solid-state for data storage that is immune to shock and vibration**

Everything gets a rough-ride on industrial vehicles. Forklifts see a lot of harsh physical shock and vibration. Take advantage of solid-state storage to eliminate spinning drives and the headaches of vibration induced failures. FLASH storage is 100% solid-state (no moving parts) and the technology has come a long way along a declining cost-curve.

Most vehicle-mounted industrial computers are handling 'transaction-oriented' tasks such as order-picking, cross-dock logistics, freight handling and inventory-batch transport in production environments. These applications are well supported by solid-state FLASH-based solutions.

Future-proof your selection by choosing systems that accept at least one of the latest FLASH storage card formats. At present, this generally means either CFast or mSATA flash devices. Over the horizon, next generation systems will evolve towards use of the M.2 architecture which includes support for M.2-compatible flash-based SSD's.

### 3) Integrated back-up power keeps your information flowing smoothly

Whether you're running electric or propane-powered industrial vehicles, you want an onboard computer with a fully-integrated (internal) uninterruptible power supply. An internal UPS ensures reliable system operation, protects against unexpected power interruptions and keeps your system alive during planned interruptions.

The most common scenario being the routine need to swap an electric forklift's primary battery for a freshly charged one at the end of a work-shift. This process typically takes ~20 minutes and an internal UPS keeps your vehicle computer (and your real-time information system) up and running without interruption. This also eliminates the frustrating need to restart / reboot the system once the battery change-over has been completed. When measuring efficiency, every moment counts.

### 4) Human-factors, consider your users / operators

To be successful, rugged industrial computers must be user-friendly and convenient to use. In most every logistics and material handling application this starts with bright, easy-to-read displays and glove-compatible touch screens.

Most applications seek to minimize keyboard input, relying instead on barcode scanning for automatic data entry and large-format touch-based menu driven applications that allow an operator to quickly select onscreen functions with easy 'touch buttons' without removing work-gloves.

So evaluate and compare display brightness, screen resolution and touch technology for operator comfort and usability. These are not extras and need not add extra cost. A forklift operator's job is to move material as efficiently as possible. Ensure success by selecting a system platform that is easy, reliable and convenient for the operator.

### 5) One more practical thing...it may be real *hot* or real *cold* out there...

Consider your operators physical environment and the special challenges of temperature extremes. While many warehouse settings are actually quite comfortable, others are not and may often see temperatures that are strikingly high...or low.

Are they running in sub-freezing temperatures, such as indoor cold-storage or outside in cold and weather exposed settings?

Phoenix, Arizona mid-summer uncooled? Wisconsin, Minnesota or Alaska mid-winter unheated?

Cold temperatures can result in condensation that obscures a computer's display. Especially in cold-storage operations where vehicles are often routinely moving between both hot and cold areas. Condensation on the screen obviously gets in the way, frustrates the operators and slows them down. Make sure your system manufacturer offers options for both front-surface heaters to eliminate condensation and internal system heaters if the systems will be exposed to long spells of extreme sub-zero without power.

## 6) Rugged means *RUGGED* ...without compromise

As you consider and compare systems from the top-down to ensure speed, performance and software compatibility, consider each system physically from the bottom-up to ensure rugged reliability. Any system worth its salt should be 100% fully sealed and certified to NEMA-4 / IP-66 for environmental exposure to liquids, dust and other contaminants.

Insist on fully sealed industrial connectors at *all* locations, for *all* I/O. Many manufacturers fudge on this point with the false-economy of standard PC-like connectors. What is convenient on a desktop in an office environment will often prove to be an unreliable weak-link in the rough-and-tumble world of the factory or warehouse floor.

## 7) Speaking of I/O – consider what needs to be connected

Vehicle-mounted computers in logistics and material handling applications generally need some basic, but very practical I/O connections. But look specifically for versatile interconnect support to keep all of your I/O options and future requirements open.

Does the manufacturer support both legacy and modern-day I/O connections? Perhaps you already have RS-232 serial laser scanners that you naturally want to make use of?

Look for convenient provisions for:

- A traditional external keyboard, if an onscreen 'soft-keyboard' isn't preferred
- USB ports for additional accessories (laser scanners, label printers, etc.)
- Optional external antenna connections to maximize Wi-Fi wireless range and performance

## 8) Last but not least – evaluate lead-time, technical support, spare-parts and service

You've got a business to run and performance goals to meet. You want your deployment to be successful. You *need* a system manufacturer that understands that and is fully committed and instinctively partnered in ensuring your success.

Ask for demo systems, kick-the-tires and listen carefully:

- Are you dealing directly with the manufacturer?
- Ask questions and look for responsiveness. Evaluate both sales and technical contacts.
- Can you reach strong technical support easily and conveniently? Without layers and delays?
- Check references, large-and-small – many vendors focus on cherry-picking large accounts, but it's especially meaningful if *smaller* accounts have good things to say too.
- What is the lead-time for both new systems and spare parts? Can you easily procure parts that you can most conveniently service yourself?
- Compare warranties and company longevity – Is this their primary focus? Are they deeply steeped in the industrial markets for the long-term?

About the author:

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About the company:

Citadel Computer Corporation designs and manufactures rugged industrial computers for a wide range of industrial and military markets. Incorporated 1979.

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