

INDUSTRY 4.0: A MOBILITY CHECKLIST FOR MANUFACTURERS



THE SMART FACTORY

Today's era of manufacturing automation is creating what is referred to as "the smart factory." A smart factory is described as a highly digitized and connected manufacturing facility that relies on technologies like cloud computing, the Internet of Things (IoT), robotics, big data and analytics, mobile technology, and eventually artificial intelligence to streamline and improve operations.

Smart factories are the culmination of the Fourth Industrial Revolution, referred to as Industry 4.0. In a smart factory, production processes are flexible and run almost autonomously with the ability to self-correct in real time. As a result, employees are no longer focused on repetitive, labor-intensive tasks but rather on handling exceptions and higher-level work.

A 2017 CapGemini¹ study found that early adopters of Industry 4.0 have realized production gains of 20 percent in their smart factories with improvements in on-time delivery, productivity and labor costs. With such impressive business results, it's no surprise that manufacturers are

embracing the trend. The same study reports that 76 percent of manufacturers either have a smart factory initiative in place or are in the process of planning one.¹

MOBILE SOLUTIONS ENABLE INDUSTRY 4.0

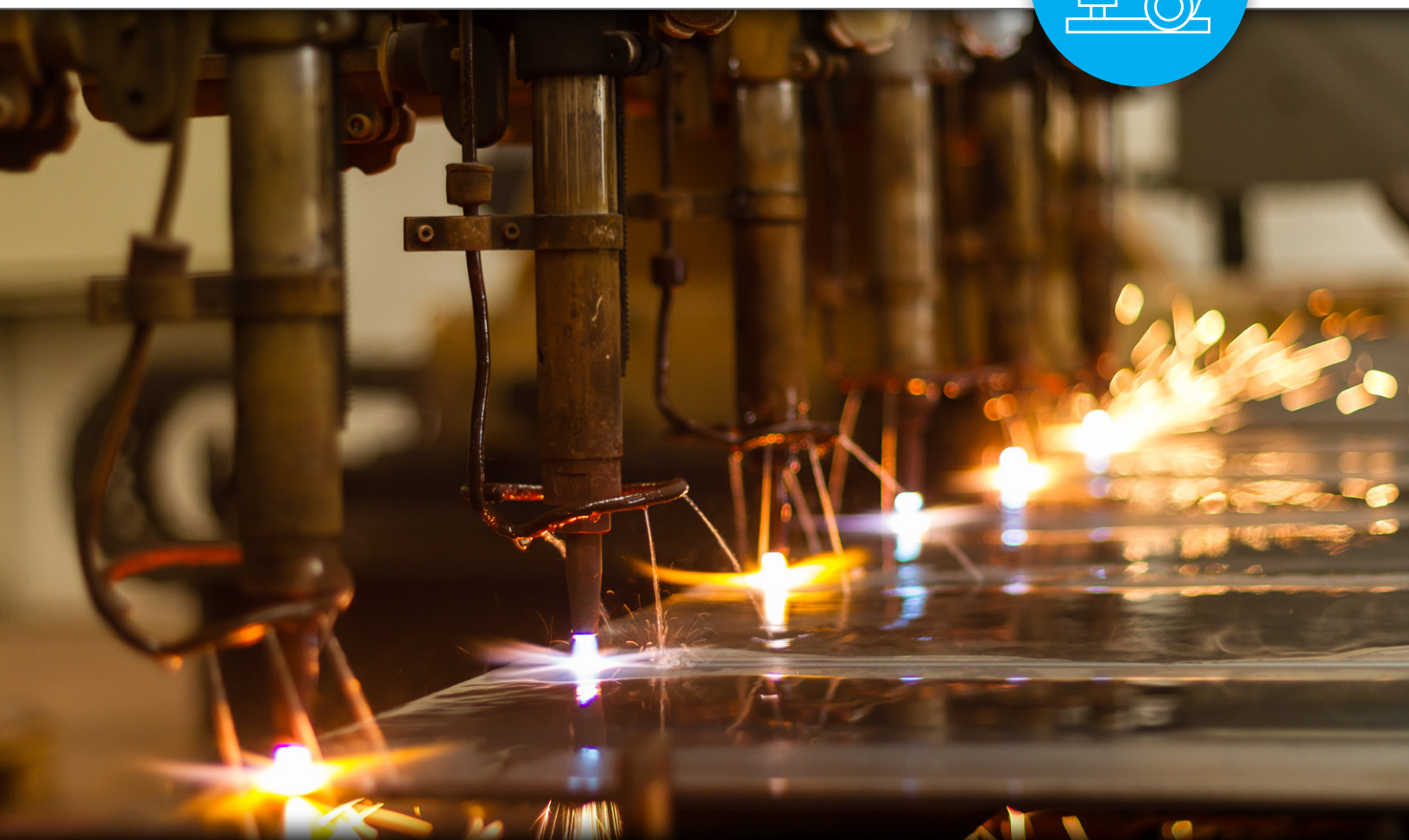
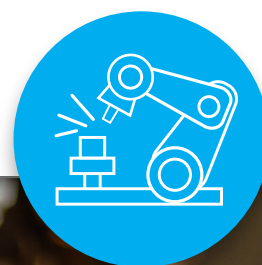
Mobile devices connected to cloud-based applications become the conduit through which plant managers and workers access and act on information across all areas of the plant, from the warehouse to the shop floor. Employees work in an agile, responsive environment that streamlines operations and maximizes uptime with distributed intelligence and insight delivered directly to their devices and in real time.

Achieving Industry 4.0 requires a complete digital transformation of the factory environment with Industrial Internet of Things (IIoT)-embedded machines, cloud computing and big data analytics, and machine-learning algorithms to keep production on track. While the business value may be clear, most factories still aspire to be smart factories. Forrester reports 58 percent of manufacturers have launched digital transformation initiatives while only 19 percent have completed their journey.² Mobile solutions that connect workers and physical systems are a crucial first step.

Early mobility initiatives can dramatically improve worker productivity with better task management. Companies further along will be able to gain additional benefits by using

high-performing enterprise mobile devices as powerful edge computing machines that decrease latency by processing data closer to the source.

The purpose of this guide is to help companies select an enterprise mobile solution that connects workers and plant managers to production systems and the supply chain for improved operational efficiency, increased visibility and better decision-making across manufacturing operations.



WHAT'S HOLDING MANUFACTURERS BACK?

Today many manufacturers are in the early stages of digitalization and still utilize manual, paper-based processes across areas of operations. While most plants are using mobile solutions for communications and notifications, they may have a long way to go before they are fully mobile within a smart factory environment. Some reasons for these delays include legacy equipment, the cost to upgrade and challenging plant conditions.



LEGACY EQUIPMENT

Much factory equipment and systems are rooted in legacy technologies that don't easily connect to modern networking systems or take advantage of today's powerful mobile devices. While factory machinery continues to function as specified, the electronic interfaces built into them may be technologically dated. For example, many of them require mobile devices that connect to serial ports (RS-232) for data collection and control. Consumer-grade systems are not equipped with these interface options, whereas enterprise-grade, rugged devices can be equipped with these interface options.

For example, the Panasonic TOUGHBOOK® 20, a fully rugged 2-in-1 laptop, and the TOUGH PAD® FZ-G1 tablet can be configured with serial, Ethernet, HDMI and USB connections.



COSTS TO UPGRADE

When evaluating the costs to upgrade to mobile technologies, manufacturers may be tempted to first consider consumer devices and protective cases because of the perceived cost savings. However, analyst data shows that rugged laptops and tablets deliver a higher return on investment than consumer-grade devices, contributing to a lower total cost of ownership (TCO).³ And while a price gap exists between consumer-grade mobile devices and enterprise-grade rugged devices, the difference is shrinking.

The price differential is even smaller when decision makers consider the features and device performance that manufacturers need to operate over full shifts or around-the-clock operations. Rugged enterprise-grade devices, even at the higher price point, make even more sense when you look at the true cost of a device over its lifetime—its TCO. Rugged devices are more durable and better suited for the harsh manufacturing conditions, even over a consumer device in a protective case.

TOUGHBOOK laptops, tablets and handhelds, for example, have a longer expected life cycle than consumer devices and boast the lowest failure rate in the industry, even among other rugged hardware. In situations where failure is not an option, TOUGHBOOK devices are more

than five times more reliable than the average laptop used by businesses across the United States,⁴ lasting longer and providing a low TCO. In addition, with fewer failures, the plant experiences less worker downtime, fewer repairs, and lower costs overall.



CHALLENGING PLANT CONDITIONS

Industrial environments have specialized needs that call for mobile devices that can operate in adverse conditions and still deliver best-in-class performance, even when faced with rough handling across all areas of the factory and warehouse. Dust, dirt, moisture, grease and accidental drops prove challenging for consumer-grade mobile equipment. Rugged mobile devices are specifically built for these and other harsh or hazardous conditions. Rugged devices certified with ingress protection (IP), MIL-SPEC and hazardous location (HazLoc) ratings can stand up to the plant environment and outperform consumer-grade devices.



PURPOSE-BUILT ENTERPRISE MOBILE DEVICES: GAME CHANGERS

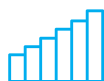
Despite the challenges of industrial environments, mobile solutions that rely on rugged, purpose-built, enterprise-grade computers can help manufacturers stand out from the competition. Rugged mobile devices up the manufacturing game, providing access to real-time data and insights that help employees work smarter and faster. Businesses can realize the following benefits:



INCREASED OPERATIONAL EFFICIENCY

Mobile workers can perform tasks at any location within (or even away from) the facility, eliminating the need for them to return to single fixed points for information. Rugged devices such as Panasonic TOUGHBOOK® laptops, tablets and handhelds provide access to automated processes, making it convenient and simple to access and collect data, update reports, document conditions and access documentation on the go.

Access to real-time data also provides immediate insight into key performance indicators (KPIs), helping plant managers monitor operations. For example, monitoring asset performance can help you stay on top of how well equipment is functioning. And equipment service and repair can be managed with preventive maintenance schedules based on the actual condition of the machines to keep machinery operating at peak performance at lower costs. You can use analytics for inventory and parts planning and set up alerts to make sure items are always available. Complex equipment and plant inspections that use automated checklists and audits can be shared with the back office to inform detailed reporting.

**IMPROVED WORKER PRODUCTIVITY**

Connected to manufacturing execution systems (MES) like Panasonic PanaCIM®, workers can display lists of tools, find the location of work to be done, access documentation and take advantage of training. In the warehouse, real-time inventory checks ensure managers can keep track of the movement of items upon delivery, increasing productivity and reducing loss. Tasks can be completed in less time and with greater accuracy, and orders get out the door more quickly and efficiently with picking and packing solutions tied to back-end customer orders.

**STREAMLINED REGULATORY COMPLIANCE**

Compliance with regulations, particularly track and trace, is a growing issue for manufacturers. The integration of rugged mobile devices with data capture systems, such as barcodes or RFID, provides significantly more insight into all stages of production and the supply chain over paper-based systems. Mobile solutions can provide time-stamped updates, improve product recall processes, notify managers of production bottlenecks or inventory shortages, and increase accuracy by eliminating transposition errors when information is transferred from paper to digital systems.

**IMPROVED EMPLOYEE RETENTION**

With an aging workforce, manufacturers are looking to attract younger talent. These workers expect a digital work environment with mobile devices as flexible and easy to use as the devices they use at home. However, enterprises must take precautions to protect the enterprise and its data. While younger workers appreciate constant access to information, their devices don't always feature security that protects applications, data and devices or secure information access.

**ENHANCE CUSTOMER RELATIONSHIPS**

Smart factories reorient the focus from products to the customer across the entire manufacturing process. For example, a visual quality check using mobile devices to layer augmented reality (AR) images of the ideal against a test sample from the production lot can improve product quality. Capturing quality data can help pinpoint improvement areas early, minimizing wasted labor, material and equipment time. Visibility into product inventory can help your sales team deliver more accurate availability and quotes, and mobile payment card readers can process payments instantly—driving sales revenue. Field service repair technicians can access work orders, service histories, service level agreements and parts inventory for more efficient visits and faster resolution of customer problems.



MANUFACTURING TECHNOLOGY CHECKLIST

There are many factors to consider when investing in a mobile device. Use this checklist to help you find the right mobile device for your specific manufacturing requirements. You'll find that TOUGHBOOK® rugged mobile devices are a great option for manufacturing—engineered to be durable and reliable and to withstand hard usage in a range of harsh conditions.

USE CASE

To select the best form factor (laptop, tablet or handheld), evaluate how the device will be used on the job. Your use case also dictates which options you need, such as keyboards, touch screens or voice input, user access card readers, thermal cameras, and more. Many manufacturing environments find they need a combination of computers, tablets and handhelds to meet the requirements of tasks and conditions across the facility. Consider Panasonic TOUGHBOOK mobile devices, which are available in several formats, including laptops, 2-in-1s, tablets and handhelds.

MOUNTING AND CARRYING OPTIONS

Mobile industrial workers need secure and reliable ways to carry or mount their devices to keep them readily accessible and safe. Vehicles—forklifts, for example—should be equipped with rugged mounts installed professionally. Carry options can include hand straps, belt holsters, pistol grips and shoulder straps. Panasonic offers a wide range of compatible accessories and vehicle mounts designed for convenience and worker safety.

ADDITIONAL ACCESSORIES

Your use case will also dictate the kinds of accessories you will need, such as longer-life batteries, rapid chargers, AC adapters, car

adapters and digital stylus pens. TOUGHBOOK mobile devices are customizable to fit the specific needs of manufacturers and can be configured to fit the specific needs of your workers.

PRODUCTIVITY & SECURITY

RELIABILITY

In manufacturing, mobile devices must be able to withstand hard handling and keep performing flawlessly to avoid production downtime. Broken screens and cracked housings can stop a job in the middle of a critical operation, requiring the employee to find a replacement. Your workers need their mobile devices to do their jobs and downtime is not an option. You'll find that TOUGHBOOK devices have the lowest failure rate in the industry, even among other rugged devices, making them reliable enough to use every day.⁴

MULTISHIFT OPERATION

Shops that work multiple shifts generally pass mobile equipment from one shift operator to the next without much time to dock and recharge. TOUGHBOOK laptops, tablets and handhelds come with long-life batteries, and many can be swapped out quickly ("hot swappable") for even longer performance. Quick or multibay chargers keep devices available across shifts.



SECURITY

Security should be built into factory systems at multiple levels starting with the device chip set, software and networking components. Choose enterprise-grade rugged mobile devices over consumer-grade devices which rely on software add-ons to secure applications and network only. TOUGHBOOK® mobile devices have security built into the firmware. Our ProServices team can also deploy data and device protection software from our partner Absolute.



SCREEN VISIBILITY

Look for enterprise-grade devices with screens designed to be viewed in a range of lighting and weather conditions—from dark interiors to bright sunlight and rain—and then test the device during the pilot phase. Look for sunlight-viewable and rain-sensing, glove-touch screens available with TOUGHBOOK mobile devices.

FEATURES



COMPATIBILITY WITH LEGACY EQUIPMENT

Manufacturers continue to use legacy equipment with interface technologies like serial ports (RS-232) to communicate with control and data-collection functions. Modern consumer-grade mobile devices generally rely on USB ports (when they have ports), which don't allow them to connect to these older systems. Determine the types of interfaces in use on the shop floor and select mobile equipment with the right ports. TOUGHBOOK mobile devices are designed for manufacturing with multiple port options, including serial ports and Ethernet connections.



WIRELESS CAPABILITIES

Wi-Fi connections in manufacturing plants can be subject to interference from factory structures like duct work or machines with electrostatic discharge and breaker panels. Look for devices that have robust connection capabilities and antennae specially designed for reliability and reach. Panasonic tests and selects high performing antenna modules in the industry, engineered to provide durability and exceptional reliability and reach.



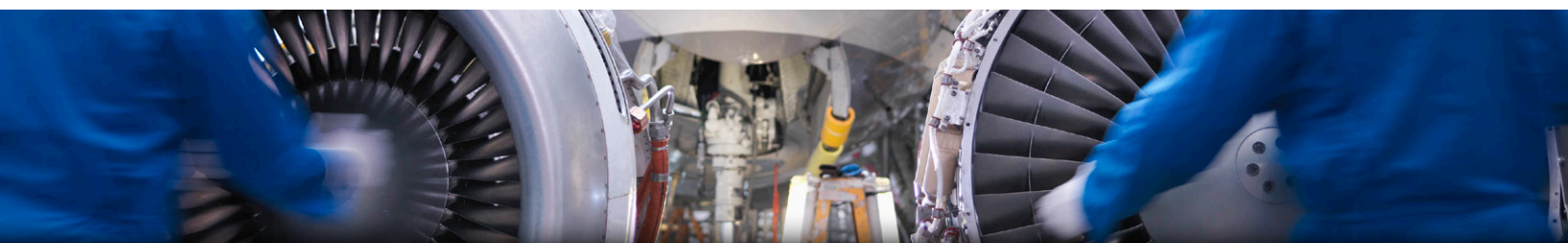
SCANNING CAPABILITIES

Look for a handheld or tablet that can scan multiple types of tags (barcodes, RFID). For greater speed and less user effort, opt for an ergonomically designed angled scanner that enables workers to scan and use the touchscreen at the same time. Panasonic offers several rugged tablets and handhelds that can be used in the warehouse setting for fast, easy and accurate scanning.



THERMAL CAMERAS

Your field service or equipment maintenance team can benefit from thermal or infrared cameras that identify heat radiation to help perform inspections and proactively identify equipment hot spots like electrical and mechanical faults and cooling system failures. By integrating these cameras into a mobile device, a worker no longer needs to carry a separate expensive piece of equipment. The TOUGHBOOK® FZ-G1 rugged tablet is available with an integrated thermal/infrared camera.



SAFETY & DURABILITY



EXTREME CONDITIONS

Select devices that will perform in all temperature ranges and environmental conditions in your plant without requiring special housings or treatment.



INGRESS PROTECTION RATINGS

IP code ratings identify whether a device can keep water, dust and dirt from entering the housing and causing damage to components. Consumer-grade mobile devices typically have lower IP ratings than rugged devices, making them more susceptible to damage from the conditions in manufacturing environments. Look for enterprise-grade devices with IP ratings that meet and exceed the conditions in your facilities. For example, a device rated IP65 is certified to be “dust tight” and protected against water from a nozzle.



MIL-STD RATINGS

MIL-STD or MIL-SPEC ratings certify that a device meets certain equipment standards established by the U.S. military. For example, MIL-STD-810G is a series of tests designed by the U.S. Department of Defense to determine the “environmental worthiness and overall durability of material system design” of certain types of objects. MIL-STD-810G covers a variety of scenarios like drops and vibrations, extreme temperatures, high altitudes, water resistance, and dust intake. For a truly durable mobile device that will survive mission-critical jobs, buyers should make sure a device has third-party validation of all MIL-SPEC claims to ensure it will meet their performance needs. TOUGHBOOK® mobile devices undergo more than 50 checks and tests that ensure their ruggedness and durability.



HAZARDOUS LOCATION SAFE

Look for rugged mobile devices that conform to the ANSI 12.12.01-2000 HazLoc standard, which provides a level of protection from sparking or electromagnetic discharge that could cause an explosive event in certain environments. Panasonic offers several models with HazLoc certification.



WASHABILITY/SANITIZATION

Some production lines require device sanitization in which screens or the entire unit must be washed without causing harm or compromising the operation of the unit. Look for devices certified to be washable or sanitized without damage.



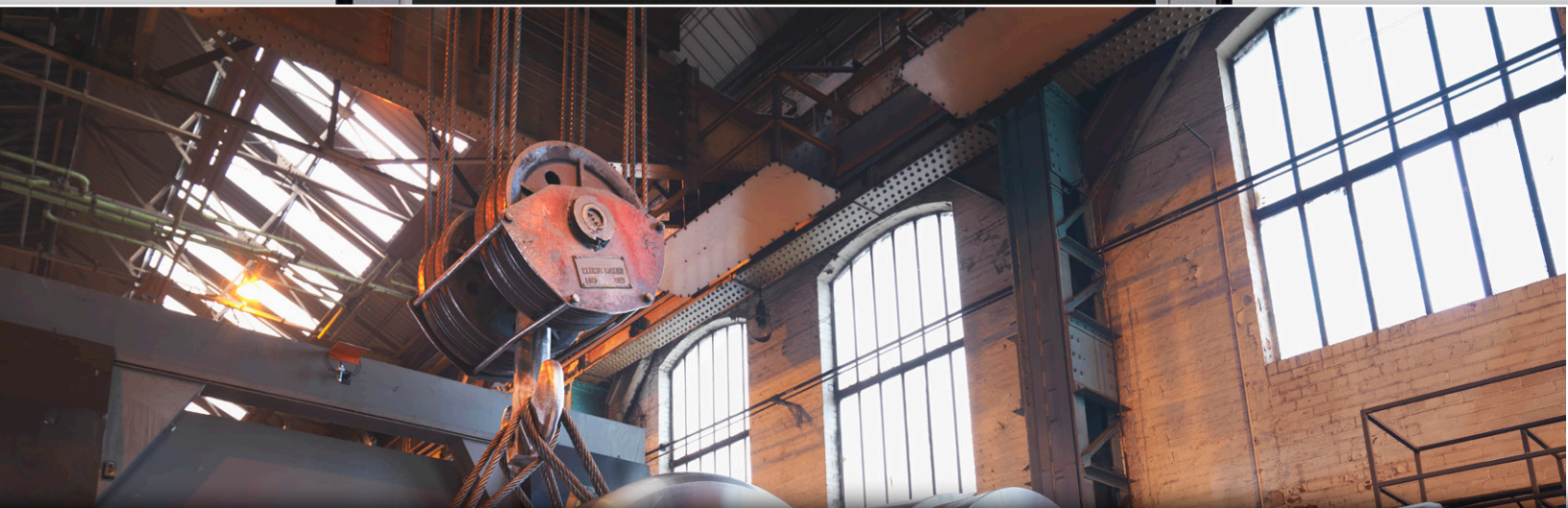
SERVICE & SUPPORT

✓ WARRANTY AND SUPPORT OPTIONS

To keep operations on track, mobile devices that fail need fast turnaround on repairs and the availability of spares. Look closely at warranties and additional support services to make sure your device provider guarantees a quick response. Panasonic offers a standard three-year warranty with options for extended or special warranties. For example, a Smart Battery warranty keeps workers productive with fresh, new batteries by monitoring capacity so you can switch them out and eliminate the need for emergency overnight replacements.

✓ PLANNING AND DEPLOYMENT SERVICES

Getting your mobile solution up and running is time consuming. Depending on the size of your IT department, you may want a solution provider that can help you plan a solution that works within your budget, augment your IT staff, streamline deployment with bundled kits, field-test and pilot programs, and offer an active line for 24/7 troubleshooting service. Panasonic offers two levels of deployment services ranging from getting your team up to speed quickly and longer-term services that cover the life of the warranty.



PANASONIC TOUGHBOOK MOBILE SOLUTIONS FOR MANUFACTURING

Panasonic offers a range of TOUGHBOOK® rugged mobility devices purpose-built for the manufacturing industry. Available in a variety of form factors, including laptops, 2-in-1s, tablets and handhelds, our rugged devices are designed to withstand the harsh environments of the shop floor and the warehouse. With a choice of Android™ or Windows® 10 operating systems, and featuring long-life batteries and daylight-readable, gloved multi-touch screens ranging from 4.7 to 14 inches in size, TOUGHBOOK devices are ideal for inventory management, asset tagging and quality control. Special capabilities include thermal cameras to help with equipment repairs, extra ports for data collection and hazardous locations certification.



As a core manufacturer, Panasonic sets the industry standard for reliability with a **less than 2% failure rate**.⁴ Because we are a manufacturing company ourselves, Panasonic's history with mobile solutions in manufacturing is extensive, giving us a deep understanding of the complexities involved in the coordination of capital, people, process and product across your company.

**TO LEARN MORE ABOUT HOW PANASONIC CAN HELP YOUR BUSINESS,
VISIT OUR MANUFACTURING INDUSTRY PAGE. ►**

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