Emdoor INFO

SMART MANUFACTURING SOLUTIONS

Leading A-Share Listed Company in Rugged Terminals

Stock Code: 001314

YOUR ONE-STOP RUGGED COMPUTING SOLUTION PROVIDER

Smart Manufacturing Solutions

Smart Manufacturing Solutions Overview

Smart manufacturing is an advanced manufacturing process, system and mode that integrates the new generation of information technologies such as Internet of Things (IoT), cloud computing, and big data into all aspects of manufacturing activities such as design, production, management, and service. It has functions such as self-perception of information depth, self-decision-making of intelligent optimization, and self-execution of precise control.

Emdoor Information's smart manufacturing solutions are mainly built around workshops, factories, supply chains and other scenarios. With the help of rugged mobile computers and fixed industrial panel PC, technologies such as the IoT and AI are introduced to realize the automated transformation of production lines, improve production efficiency, reduce production costs and facilitate refined production. Thereby, various key manufacturing fields such as semiconductors, electronic products, automotives & new energy vehicles, food & beverage processing, and textiles are able to achieve intelligent transformation and upgrading.

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Smart Manufacturing Solutions

Inventory & Warehouse Management

RUGGED HANDHELD

RUGGED TABLET

RUGGED NOTEBOOK

PANEL PC

Inventory & Warehouse Management: Inbound/Outbound, Shelving & Picking

Key Challenges:

The era of digitalization is exposing the shortcomings of traditional warehousing operations in key processes such as inbound, outbound, and sorting. They are gradually unable to meet enterprises' requirements for efficiency, cost, and accuracy, exposing problems such as **low efficiency, poor accuracy, and rough management**. This not only restricts the improvement of operational efficiency, but also makes it difficult to meet the needs of refined management.

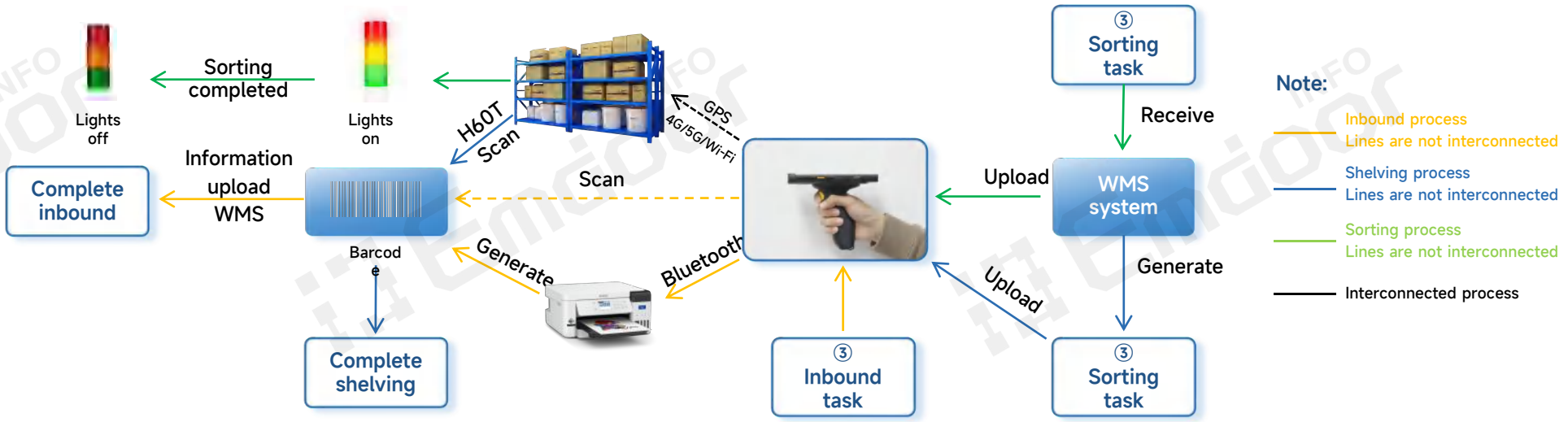
The transformation of warehousing operations toward intelligent and digital solutions is imperative.

- **Low efficiency**
- **Chaotic shelving**
- **High error rate**
- **Network latency**

Inventory & Warehouse Management: Inbound/Outbound, Shelving & Picking

Solution:

The **H60T rugged handheld terminal**, by integrating advanced technologies, works in coordination with the WMS warehouse management system to enable efficient operations for inbound, outbound, and sorting.



Solution Process

- Staff use the H60T handheld to scan cargo barcodes with its professional 2D scanning engine, and the inbound information is automatically transmitted to the WMS warehouse management system.
- The built-in GPS plans the optimal sorting route, with the screen clearly displaying cargo information to guide staff in quickly and accurately locating items.
- With 5G dual-SIM dual-standby and dual-band Wi-Fi, the network connection is fast and stable, and operation data is uploaded to the WMS system in real time.
- The removable battery supports continuous operation, while the Type-C 10W fast charging and docking charger provide long-lasting endurance for warehouse tasks.

Solution Value

- Shorten cargo turnover cycles and increase warehouse throughput.
- Ensure high data accuracy, achieving strong consistency between inventory records and actual stock.
- Significantly reduce labor costs and equipment wear.
- Electronic records, enabling full traceability of cargo data.

Recommended Product

Rugged Handheld Terminal H60T

Contact Scanning Handle

- 5.99-inch large screen size 14mm ultra-thin body
- Integrated international-grade professional 2D scanning engine
- Dual-mode 5G communication & dual-band Wi-Fi with intelligent switching
- 4500mAh/3.8V high-capacity battery, removable design
- IP65 rated dustproof & waterproof

Inventory & Warehouse Management: Forklift Transport

Key Challenges:

Forklift transport serves as a critical tool for cargo handling in many large manufacturers, yet it increasingly struggle to meet demands for efficiency, safety, and cost-effectiveness. This has exposed numerous issues such as **information delays, management chaos, and operational risks**.

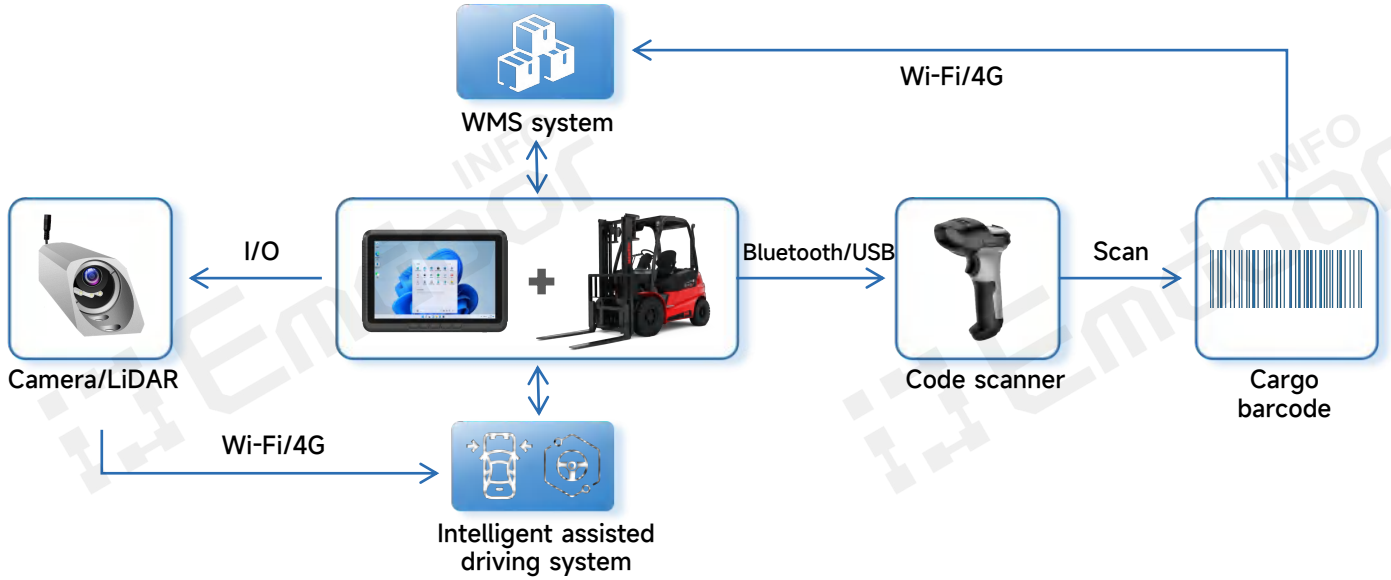
In this context, the **digital transformation and upgrading of forklifts** have become an inevitable trend in the **development of the warehouse management industry**.

- **Information delays**
- **Low efficiency**
- **Management chaos**
- **Safety hazards**

Inventory & Warehouse Management: Forklift Transport

Solution:

Emdoor Information's vehicle PC is positioned within the forklift cab. Combined with leading data acquisition hardware and user-friendly warehouse management software, it forms a comprehensive forklift retrofit solution that further enhances operational efficiency and safety.



Solution Process

- The vehicle PC is installed in the forklift cab using the vehicle mount, and supports any angle adjustment.
- Seamlessly connect with the warehouse management WMS system or ERP system to facilitate precise execution of tasks such as command reception, warehouse location query, cargo handling, data entry.
- Using Bluetooth or USB port to connect to the code scanner, staff can quickly scan the cargo label and report it to the backend system in real time through Wi-Fi or 4G.
- Integrated with multiple sensors such as cameras and LiDAR, paired with an intelligent driver assistance system, it continuously monitors the surrounding environment and optimizes route navigation in real time.

Solution Value

- Mainstream system with rich interfaces, enabling easy portable deployment for forklifts.
- Information standardized operations greatly improve efficiency and accuracy.
- Adapt to complex warehouse environments and ensure safe and smooth forklift operation.
- Improve labor efficiency, substantially reduce labor and operational costs.

Recommended Product

Vehicle PC V10J

Vehicle Mount Kit

- Intel® N5100 processor Windows 11 system
- Wi-Fi, Bluetooth, 4G & GPS/GLONASS/Beidou
- USB/RS232/RS485/gigabit ethernet port/CAN port expansion
- Supports VESA and RAM mount installation methods for secure mounting
- Wide temperature and wide voltage range compatible with multiple power modes

Inventory & Warehouse Management: Cold Chain Warehousing

Key Challenges:

Cold chain warehousing faces persistent challenges, especially for food processing manufacturers: conventional electronic devices suffer **significant performance degradation below -20°C, paper-based records are inefficient, and wireless signals are easily to attenuate**—all hindering the smooth and efficient circulation of goods.

In this context, enterprises must establish **a closed-loop data system spanning the entire cold chain warehousing process from inbound to distribution** to enhance operational efficiency and precision.

- **Low temperature delay**
- **Risk of disconnection**
- **Short endurance**
- **Insufficient protection**

Inventory & Warehouse Management: Cold Chain Warehousing

Solution:

Emdoor Information's **rugged handheld terminals** can be deployed in cold storage places in front warehouses, food processing plants, and distribution centers. They are able to scan and verify information smoothly when ambient temperature changes sharply, and empower cold chain scenarios to reduce costs and increase efficiency through digital technology.

Solution Process

- The scanning window and screen glass adopt sealing technology to reach IP68 waterproof level, effectively reducing mirror fogging caused by temperature difference and easily coping with cold storage scenarios.
- The screen supports glove and wet hand touch. Wearing gloves in cold storage or water droplets on the screen will not affect screen operation.
- Equipped with WMS warehouse management system and long-range scanning engine, it can quickly scan QR codes on high-level shelves to retrieve cargo information, and upload relevant data in real time via Wi-Fi.
- 5800mAh specialized battery ensures prolonged operation for more than 12 hours in low-temperature environments.

Solution Value

- Work in extreme cold chain environments down to -20°C, minimizing equipment wear.
- Stronger performance with more stable signal transmission.
- Specialized large battery design supports prolonged operation in low-temperature environment.
- Improve labor efficiency, substantially reduce labor and operational costs.

Recommended Product

Rugged Handheld Terminal H68T

Hand Strap

- 6.56 inches
  Supports multi-touch, wet hand and glove touch
- Optional long-range scanning engine
  Reading range up to 10 meters
- 5800mAh large battery
  Battery life up to all day
- Helio G99 high-performance platform
- IP68 rating
  1.5m drop resistance

Inventory & Warehouse Management: Inventory Counting

Key Challenges:

Inventory counting is the core step of warehousing management. However, traditional manual counting gradually fails to meet the needs of modern warehousing in terms of efficiency, accuracy and cost control, revealing issues such as **data lag, heavy reliance on manual labor, and frequent errors and omissions**.

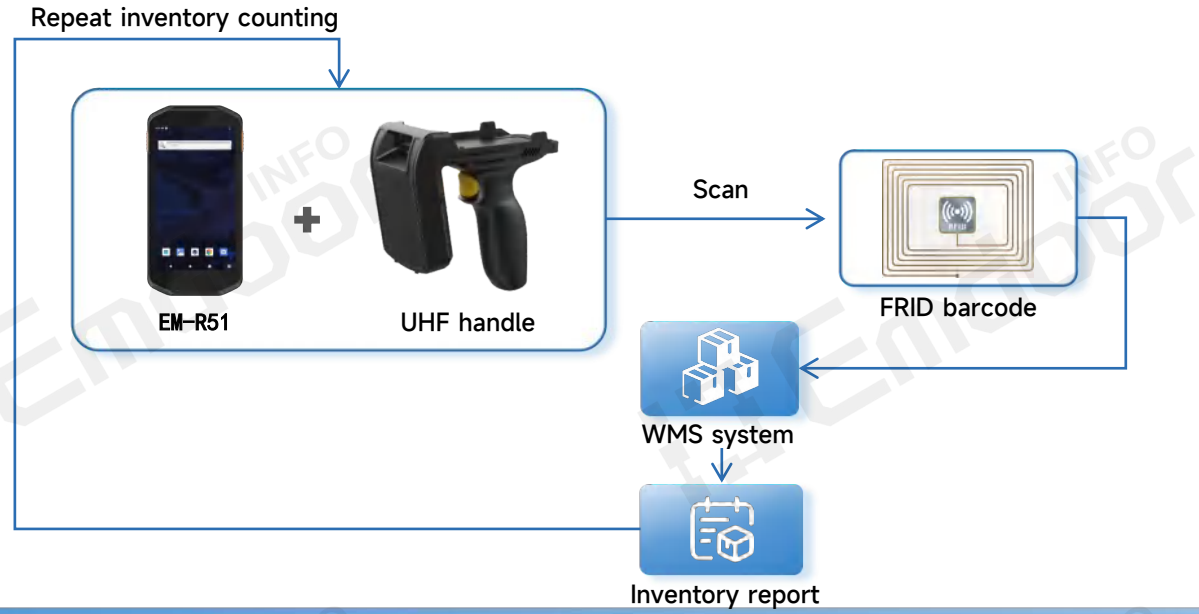
In this context, **intelligent and digital inventory counting solutions** have become an inevitable trend for the warehousing industry to enhance its competitiveness.

- **Low efficiency**
- **Poor accuracy**
- **Difficult to read**
- **Complicated procedures**

Inventory & Warehouse Management: Inventory Counting

Solution:

Emdoor Information's handheld terminals, paired with UHF scanning handles, enable intelligent upgrades for inventory counting. Combined with the WMS warehouse management system, they empower staff to complete item counting efficiently and accurately, while providing real-time visibility into stock fluctuations within the warehouse.



Solution Process

- Equipped with a high-performance barcode scanning engine, it can quickly read damaged, wrinkled, and low-contrast barcodes. Paired with an UHF scanning handle, it enables long-range batch reading of RFID tags.
- The device supports dual-mode networking via 5G and Wi-Fi, with scanning data instantly uploaded to the Warehouse Management System (WMS) for real-time inventory updates.
- It features a 5-point capacitive touchscreen and a customizable Kiosk mode to lock non-business applications, preventing staff distraction.
- It is designed to withstand dusty, humid, and high-intensity warehouse operations. A high-capacity battery supports all-day intensive stocktaking, minimizing interruptions caused by device downtime.

Solution Value

- High-frequency dynamic inventory counting, ensuring rapid improvement in efficiency.
- Ensure high data accuracy, achieving strong consistency between inventory records and actual stock.
- High-frequency inventory counting, significantly reduces labor costs and equipment wear.
- Electronic records, enabling traceability of the whole inventory counting process.

Recommended Product

Rugged Handheld Terminal EM-R51

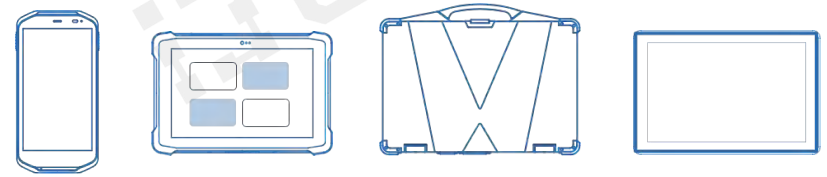
UHF Handle

- RK3568 processor Android 12
- Equipped with 4000mAh high-capacity battery
- 5G, Wi-Fi, Bluetooth, GPS/Beidou
- Supports free selection and configuration of 2D functional modules
- Equipped with scratch-resistant 5-point capacitive touch screen

02

Smart Manufacturing Solutions

Workshop Industrial Automation



RUGGED HANDHELD | RUGGED TABLET | RUGGED NOTEBOOK | PANEL PC

Workshop Industrial Automation: Equipment Automation Control

Key Challenges:

Equipment automation is becoming increasingly popular in industrial production, gradually replacing traditional manual operations.

However, in practical applications, equipment status **cannot be collected in real time, and scheduling systems respond with delays**, further affecting the stability and efficiency of production line.

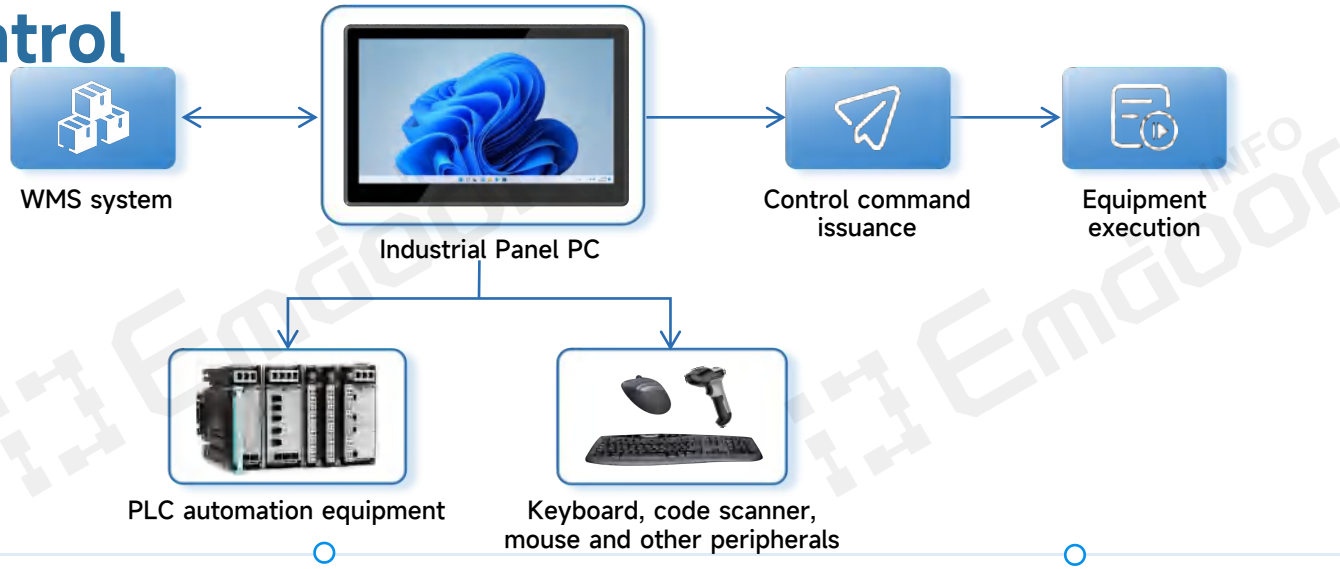
Therefore, introducing industrial computer systems with **precise control and real-time data processing** capabilities is particularly important for establishing an efficient and unified production plan execution system.

- Low efficiency
- Information delays
- Safety hazards
- Execution gap

Workshop Industrial Automation: Equipment Automation Control

Solution:

Emdoor Information's industrial panel PC combines **high-performance computing modules, rich industrial interfaces and accurate data acquisition capabilities** to build an integrated solution for equipment automation control, helping to realize intelligent and efficient production processes.



Solution Process

- Equipped with a high-performance processor and industrial motherboard, featuring a wide range of industrial interfaces such as RJ45 and RS232, it enables real-time data interaction with PLCs and other automation equipment.
- Supports real-time analysis and processing of on-site data, enhancing control response speed for PLCs and other automation equipment, and facilitating intelligent scheduling and precise decision-making in production processes.
- Adopts an IP65-rated capacitive touch front panel, allowing operators to directly view process flows and adjust process parameters on the panel, achieving visualization and human-machine interactive operations.
- Supports Wi-Fi/4G wireless communication, enabling real-time transmission of key operational data to the MES system, ensuring unified data collection and coordinated backend scheduling to maintain a well-orchestrated production pace.

Solution Value

- Anti-electromagnetic interference, with wide temperature and voltage range to ensure stability in industrial environments.
- Touch-based interface improves human-machine interaction efficiency.
- Delivers precise control and efficient operations, optimizing production processes and reducing failure rates.
- Real-time production data acquisition supports process optimization and quality control.

Recommended Product

Industrial Panel PC
P10A, P15A, P21A

PPC Hook Assembly

- Intel® Core™ i5-1235U processor
  Windows 11
- Wi-Fi 6 wireless network card
  Bluetooth 5.1, 4G
- IP65 dustproof & waterproof front panel
  Supports 10 points capacitive screen
- USB/RS232/RJ45 /HDMI/audio interface
- Wide temperature & voltage, anti-electromagnetic interference

Workshop Industrial Automation: MES Production Execution

Key Challenges:

Under the flexible production requirements of **multiple models, large-scale, and small batches**, the traditional production management model has gradually revealed issues such as **data lag, execution gap, and slow response to anomalies**. This results in difficulties in implementing production plans, low resource utilization rates, and slow response of production lines.

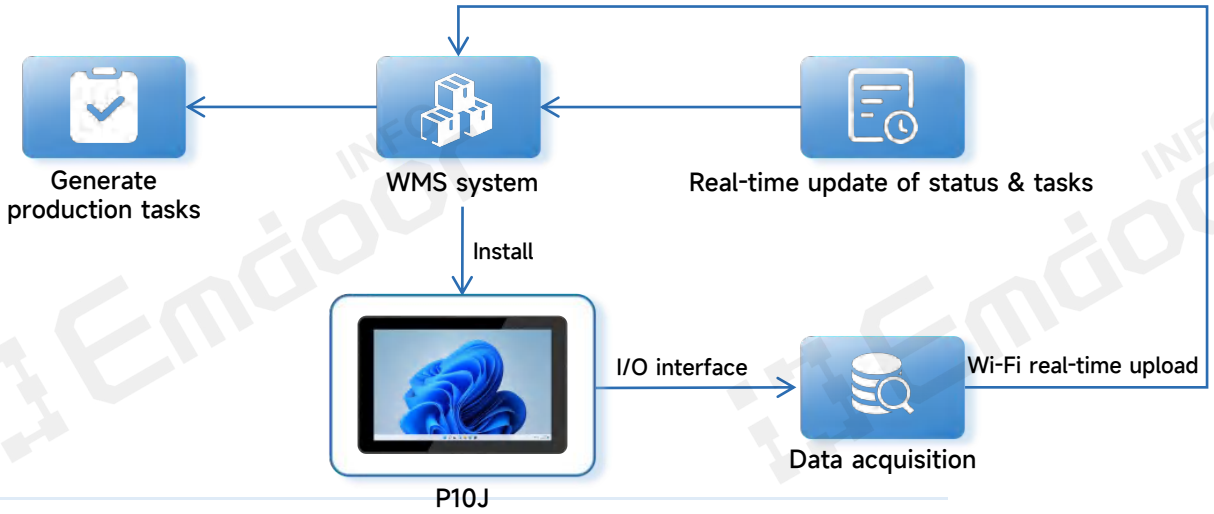
Manufacturing companies urgently need the use of the MES system to achieve **process transparency and real-time data**, so as to comprehensively improve execution & management efficiency, and support efficient & stable smart manufacturing processes.

- Data lag
- Execution gap
- Slow response
- Low efficiency

Workshop Industrial Automation: MES Production Execution

Solution:

Emdoor Information's industrial panel PC is deployed at the workshop production station, cooperates with the MES system to **collect work order progress and production data in real time**, realizing precise management of production execution and improving data transparency & production efficiency.



Solution Process

- The industrial panel PC is installed above workshop workstations, supporting multiple mounting options such as wall-mounting and arm-mounting to meet different station requirements.
- Seamlessly integrated with the MES (Manufacturing Execution System), system tasks can be dispatched in real time to each workstation's panel, with data instantly transmitted back to the backend.
- Equipped with a capacitive touchscreen, it supports task confirmation and progress feedback operations, while its rich industrial interfaces enable real-time collection and upload of production data.
- The MES system intelligently schedules based on equipment status and material availability, dynamically adjusting production plans and providing real-time visibility of the entire manufacturing process.

Solution Value

- Real-time tracking of production processes improves product quality and process consistency.
- Real-time collection and analysis of production data allows rapid identification of bottlenecks and abnormal workstations, optimizing resource allocation.
- Optimizes inventory and material flow management, ensuring continuous and efficient production line operation.
- From work order issuance to task execution, the entire process is traceable, supporting quality tracking and continuous improvement.

Recommended Product

Industrial Panel PC
P10J, P15J, P21J

Arm-mounted Kit

- Intel® Celeron™ N5100 processor
  Windows 11
- IP65 dustproof & waterproof front panel
  Strong shock resistance
- Multiple I/O ports: USB, LAN, DB9, HDMI, etc.
- Dual-band Wi-Fi, Bluetooth 5.0, 4G
- Standard PPC hook assembly, supports multiple installation methods including embedded and wall-mounted configurations.

Workshop Industrial Automation: ESOP Work Instructions

Key Challenges:

In manufacturing workshops, Standard Operating Procedures (SOPs) are the key tools to ensure product consistency and process standardization. However, the traditional paper-based instruction method shows issues such as **untimely update, version confusion, inconsistent implementation**, which have seriously affected production efficiency and product quality.

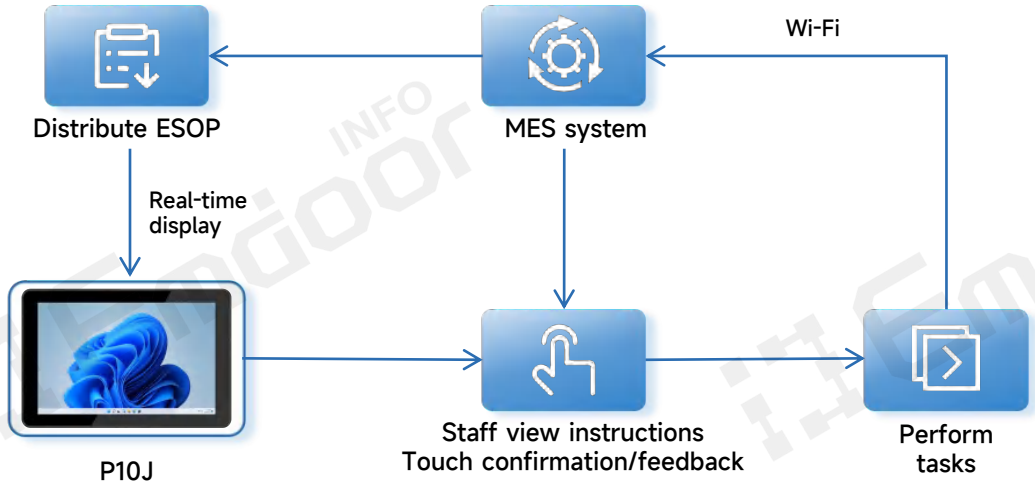
Therefore, the **digitalization and visualization** of work instruction through ESOP system has become an inevitable choice for smart manufacturing upgrading.

- Slow update
- Error-prone
- Version confusion
- Inconsistent implementation

Workshop Industrial Automation: ESOP Work Instructions

Solution:

Emdoor Information's industrial panel PC are deployed at key stations at the production site. Combined with the enterprise ESOP system, they realize **digitalization, visualization, and real-time push** of work instructions, which not only improves **work efficiency** but also provides **full product traceability**.



Solution Process

- The industrial panel PC is installed above workshop workstations, supporting multiple mounting options such as wall-mounting and arm-mounting to meet different station requirements.
- The backend ESOP system automatically generates electronic work instructions, which are quickly distributed to each workstation panel via Wi-Fi or 4G, ensuring consistency of content and timeliness.
- The ESOP system is interconnected with the MES system, automatically pushing matched work instructions based on assigned tasks, with content updated in real time.
- A large HD touchscreen allows staff to manually switch to the latest ESOP by product or employee ID.

Solution Value

- MES and ESOP systems work together to deliver precise work instructions.
- Work instructions are updated in real time with unified versions, eliminating execution errors.
- Multiple display formats enhance operational accuracy and efficiency.
- Rapid task switching improves responsiveness in multi-product manufacturing.

Recommended Product

Industrial Panel PC
P10J, P15J, P21J

Arm-mounted Kit

- Intel® Celeron™ N5100 processor
  Windows 11
- IP65 dustproof & waterproof front panel
  Strong shock resistance
- Multiple I/O ports: USB, LAN, DB9, HDMI, etc.
- Dual-band Wi-Fi, Bluetooth 5.0, 4G
- 1920*1080 HD large screen

Workshop Industrial Automation: Real-time Production Dashboards

Key Challenges:

Real-time production dashboard is an important tool to realize transparency and refinement of workshop management. Traditional methods rely on manual data collection, resulting in delayed information. This **makes it difficult for managers to learn the production status in time, leading to inefficient decision-making** that impact the production schedule and overall efficiency.

In this context, the **digital upgrading** of real-time production dashboard has become an inevitable trend for manufacturing enterprises to improve their production management capabilities.

- Low efficiency
- Information delays
- Management chaos
- Slow response

Workshop Industrial Automation: Real-time Production Dashboards

Solution:

As the real-time production dashboard of the workshop, Emdoor Information's industrial panel PC integrates multi-source data and **displays key information such as production line status, equipment health, and quality indicators in real time**. It helps managers accurately grasp workshop dynamics, improve decision-making efficiency and production transparency.

Solution Process

- The industrial panel PC can be installed at designated locations using a PPC hook assembly, supporting multiple installation methods such as embedded and wall-mounted setups to adapt to different workshop layouts.
- It features a 21.5-inch 16:9 high-definition capacitive touchscreen with an industrial-grade front panel design, delivering clear production data display and precise touch operation to ensure efficient interaction.
- Seamlessly integrated with the MES (Manufacturing Execution System), it enables real-time collection of core production data such as output, yield, and equipment operating status, presenting key production metrics in graphical form.
- Supports remote monitoring and data analysis, providing reliable data support and a decision-making foundation for smart manufacturing.

Solution Value

- Clear visibility of production status enhances on-site management efficiency.
- Rapid response to production anomalies reduces the risk of losses.
- Data-driven decision-making optimizes production schedule and resource allocation.
- Improved workshop collaboration promotes transparent management.

Recommended Product

Industrial Panel PC P21J

Wall-mounted Kit

- Intel® Celeron™ N5100 processor Windows 11
- IP65 dustproof & waterproof front panel Strong shock resistance
- Multiple I/O ports: USB, LAN, DB9, HDMI, etc.
- Dual-band Wi-Fi, Bluetooth 5.0, 4G
- 1920*1080 HD large screen

Workshop Industrial Automation: Mobile Workstations

Key Challenges:

In traditional production management, workstation terminals are fixed and systems are fragmented, resulting in a lack of visual monitoring across production processes. Operators must frequently move between different workstations to perform tasks or retrieve information, leading to **delayed responses, inconvenient data collection, and inefficient material flow**—factors that severely restrict flexible production and lean management in the workshop.

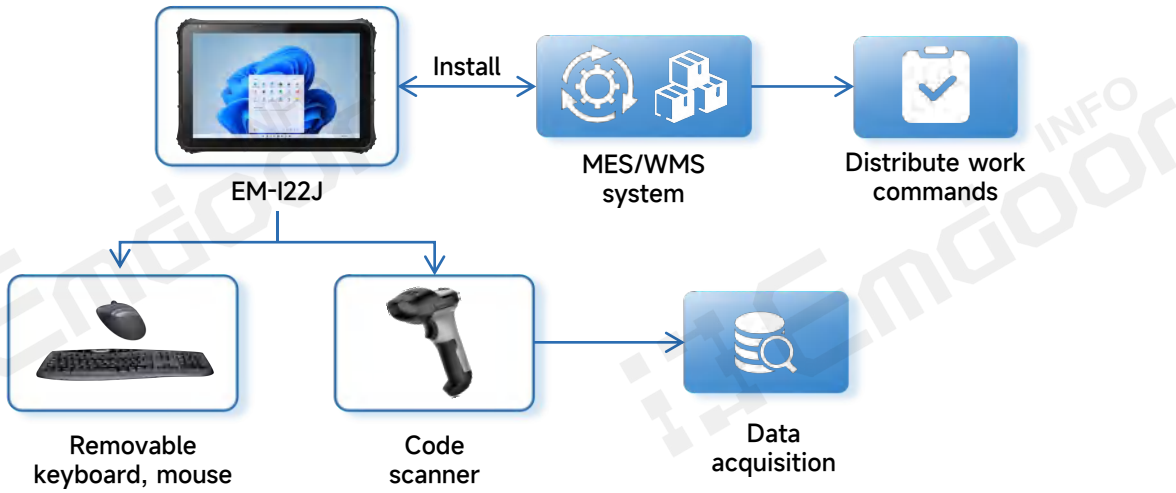
In this context, the introduction of mobile workstations equipped with rugged tablets has become an important breakthrough for achieving **informatization, automation, and visualization on the production floor**.

- Delayed response
- Inefficient material flow
- Inconvenient data collection
- Lack of visual monitoring

Workshop Industrial Automation: Mobile Workstations

Solution:

As the core equipment of intelligent mobile workstations, Emdoor Information's rugged tablets are deployed in mobile carts or handheld operation scenarios. They integrate computing, collection and wireless communication functions to support operators to **access data and perform tasks anytime and anywhere, and improve workshop operations flexibility and information transparency**.



Solution Process

- Rugged tablets can be placed on mobile carts or used handheld, allowing flexible deployment across various factory work scenarios, adapting to changing production schedules and enabling frontline staff to respond quickly.
- Seamlessly integrated with MES/ERP systems, they support real-time task assignment and full-process control, including task status updates, quality records, and production reporting.
- The tablet features a 10 points capacitive touchscreen and supports removable peripherals such as keyboard and mouse, accommodating different user preferences and complex operational scenarios.
- It also supports data collection devices such as code scanners, allowing operators to read material information in real time and provide operation feedback, achieving synchronized task and data management.

Solution Value

- Real-time data collection and synchronized updates provide full visibility of production processes.
- Mobile carts enable flexible movement, optimizing personnel and material flow paths and improving workflow coordination.
- Accurate data collection and production assessment reduce resource waste and optimize production line configuration.
- Designed to withstand high dust, vibration, and other harsh industrial environments, ensuring stable system operation.

Recommended Product

Rugged Tablet EM-I22J Removable Keyboard

Intel® Celeron™ N5100 processor
Windows 11

IP65 dustproof & waterproof, 10 points capacitive screen

Multiple I/O ports: USB, LAN, DB9, HDMI, etc.

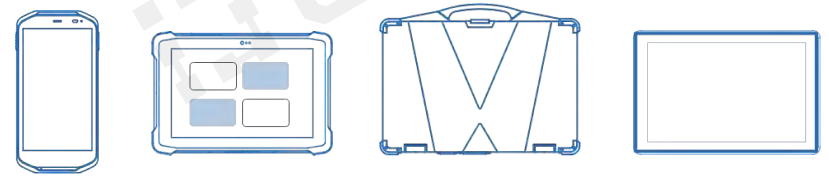
Dual-band Wi-Fi, Bluetooth 5.0, 4G

Optional 1D/2D scanning engine, NFC

03

Smart Manufacturing Solutions

Quality Inspection & Traceability



RUGGED HANDHELD

RUGGED TABLET

RUGGED NOTEBOOK

PANEL PC

Quality Inspection & Traceability: AI & AOI Automatic Inspection

Key Challenges:

The wave of new technologies is driving rapid transformation in the industrial manufacturing sector. Take quality inspection as an example: traditional manual inspection methods involve **high labor costs, limited flexibility**, and are prone to common issues such as missed or incorrect inspections, resulting in low yield rates.

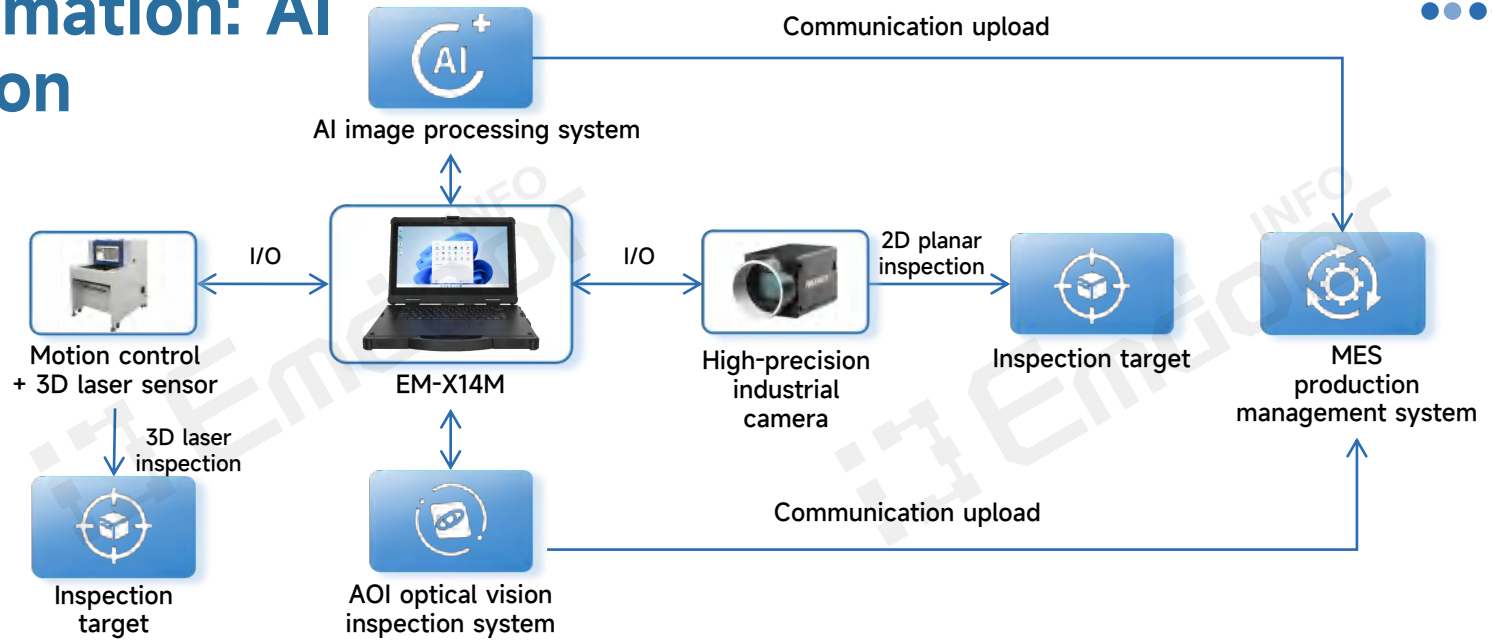
By applying artificial intelligence and optical technologies to this process, traditional manufacturers can more effectively address cost and market challenges, **accelerate industrial upgrading, and achieve a competitive leap**.

- Increased production costs
- Changes in market demand
- Low yield rates
- Limited flexibility

Workshop Industrial Automation: AI & AOI Automatic Inspection

Solution:

Using an AI rugged notebook, leveraging local heterogeneous AI computing power, deep learning algorithms, and edge computing technologies, it assists AI systems and AOI optical vision inspection equipment in performing 2D and 3D product quality inspections, comprehensively improving quality control and product standards.



Solution Process

- The AI rugged notebook connects to a high-precision industrial camera, integrating deep learning algorithms and AI image processing software to perform model training, image capture, and analysis of target products' appearance, identifying and marking surface defects such as scratches and deformations.
- The AOI optical vision inspection system uses a 3D laser sensor to perform 3D inspections of component assembly, screw height, and wire routing angles. The AI rugged notebook compares the captured feature data with reference templates and makes comprehensive quality judgments based on established standards.
- When appearance defects or quality issues are detected, the system immediately issues an alert and transmits real-time feedback to production management systems such as MES via high-speed communication modules and interfaces.

Solution Value

- Easy to install and deploy, seamlessly integrating with third-party or existing systems.
- Supports both online and offline inspection through local AI computation.
- Achieves higher accuracy and faster inspection speed compared to human visual inspection.
- Machines do not experience tiredness, eliminating errors such as missed or incorrect inspections.

Recommended Product

AI Rugged Notebook EM-X14M

- Intel® Core™ Ultra 7 Processor Windows + AI
- Thunderbolt 4 high-speed interface
- Wi-Fi 6 technology, optional 4G and 5G
- Dual battery design, with removable large battery
- IP65 and MIL-STD-810H certified, built to withstand harsh environments

Quality Inspection & Traceability: Quality Process Control

Key Challenges:

In the manufacturing industry, quality control runs throughout the entire production process—from raw material procurement to product processing, packaging, and transportation—requiring **strict quality control measures** to ensure product quality and safety.

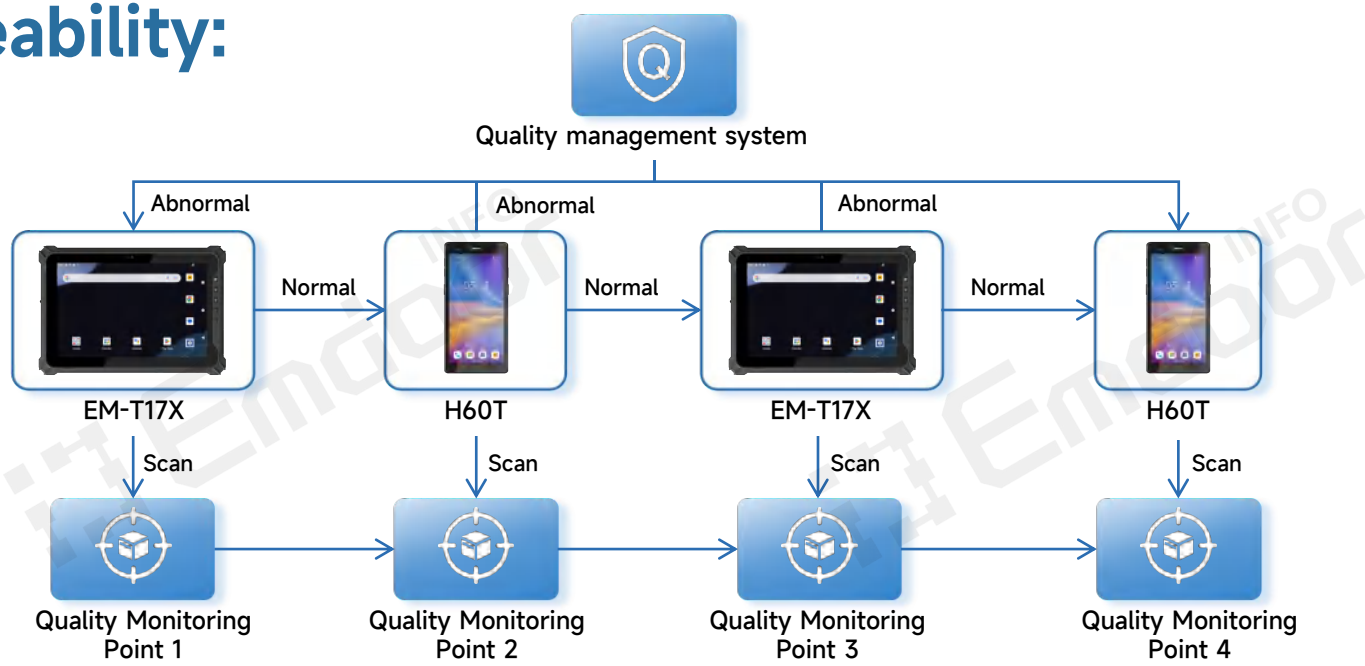
However, in practice, there are still many challenges, such as **irregular inspection processes and lack of accountability among inspectors**. These issues often result in frequent quality problems during production, **affecting customer satisfaction, market share, and brand reputation**.

- Prone to errors in employee record-keeping
- Irregular quality control practices
- Challenges in tracing production responsibility
- Difficulty in retaining and standardizing quality knowledge

Quality Inspection & Traceability: Quality Process Control

Solution:

Assigning each product and component a unique digital identity code, and leveraging the digital and IoT technologies of rugged mobile terminals, enables seamless connectivity across all links of quality process management—covering people, materials, and information—thereby achieving full-process and full-lifecycle quality control in product manufacturing.



Solution Process

- Each quality inspection point is equipped with a dedicated rugged mobile terminal, forming a complete quality management system in line with production process requirements. This system connects the entire workflow—from work order issuance, barcode verification, and quality recording to data upload, traceability, and information management.
- At each inspection point, the rugged mobile terminal scans the barcode attached to the product or component to retrieve inspection issues and instantly feedback quality information. If the result is normal, the product proceeds to the next process. If an anomaly is detected, the system is immediately alerted to identify and resolve the issue in time.
- If a quality issue arises after the product is sold, a simple scan using the rugged mobile terminal allows instant traceability back to the source and the responsible personnel.

Solution Value

- Strengthened end-to-end management ensures compliance with inspection procedures and quality requirements.
- Paperless operation significantly improves inspection efficiency.
- Improved production quality helps prevent or reduce the occurrence of defective products.
- Complete quality traceability clearly defines the responsibilities of production and inspection staff.

Recommended Product

Rugged Tablet EM-T17X

Hand Strap

Rugged Handheld Terminal H60T

Hand Strap

- ARM architecture processor Android operating system
- Flagship design with an ergonomic grip
- Integrated professional 2D scanning engine
- 500W front camera + 1300W rear HD camera
- Removable high-capacity battery

04

Smart Manufacturing Solutions

Equipment Predictive Maintenance

RUGGED HANDHELD

RUGGED TABLET

RUGGED NOTEBOOK

PANEL PC

Equipment Predictive Maintenance: Predictive Equipment Maintenance

Key Challenges:

The traditional maintenance mode for industrial equipment mainly relies on scheduled servicing or post-failure repairs. With this approach, enterprises find it difficult to monitor equipment operating status and performance parameters in real time, making it **impossible to accurately predict maintenance needs** or issue early warnings for timely responses.

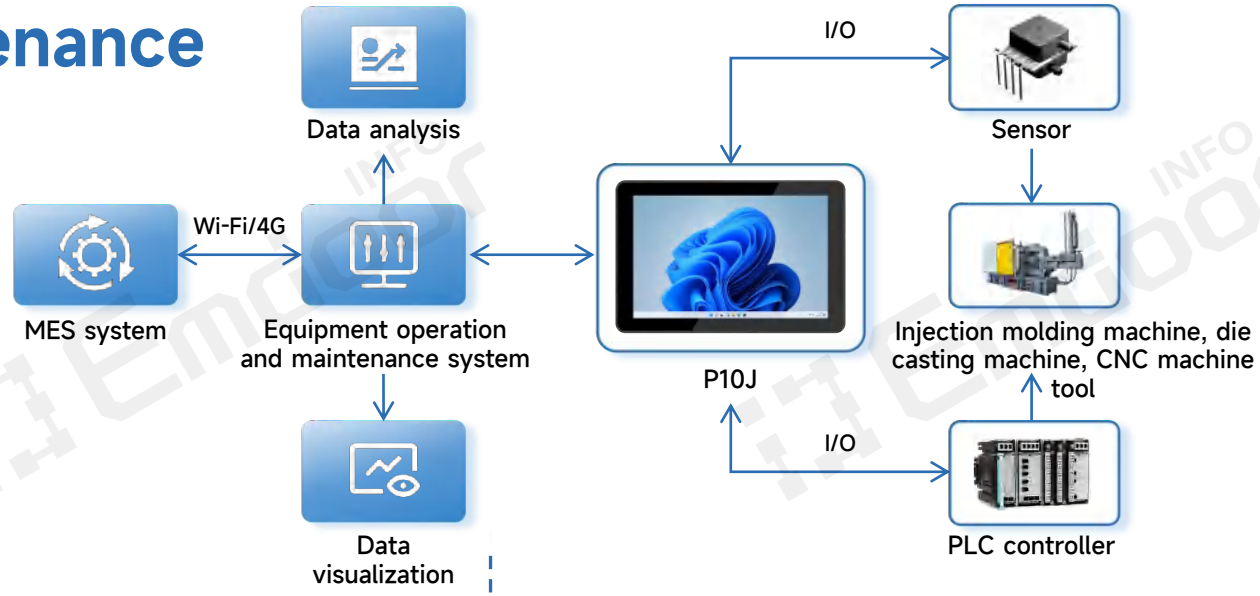
As a result, **equipment utilization remains low, failure handling costs are high**, and production progress is disrupted, leading to delays in planned operations.

- Inefficient maintenance
- Low equipment utilization
- High failure handling costs
- Production plan delays

Equipment Predictive Maintenance: Predictive Equipment Maintenance

Solution:

By installing Emdoor Information's industrial panel PC on the intelligent production equipment in the production workshop, the industrial panel PC can be used to **collect and monitor the operating status of the equipment in real time, and timely discover potential issues and perform maintenance**.



Solution Process

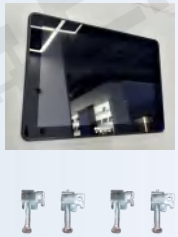
- The industrial panel PC connects with sensors, PLC controllers, and other equipment components to collect real-time operational data—such as temperature, vibration, current, and voltage—and reports it to the equipment operation and maintenance system in real time.
- The operation and maintenance system analyzes the collected data to monitor and predict equipment health. When abnormalities occur, it automatically issues alerts and provides fault diagnosis information, helping maintenance personnel quickly locate issues and take corrective actions.
- The equipment operation and maintenance system also reports equipment failures and maintenance records to the MES system, providing production staff with valuable insights for production planning and optimization.

Solution Value

- Real-time visibility into equipment operating conditions to detect potential failures.
- Improved equipment efficiency with reduced downtime.
- Lower maintenance costs and optimized allocation of production resources.
- Enhanced safety management, reducing accident risks.

Recommended Product

Industrial Panel PC P10J



PPC Hook Assembly

- Intel® Celeron™ N5100 processor with Windows 11 OS
- Multiple I/O ports: USB, LAN, DB9, HDMI, etc.
- Dual-band Wi-Fi, Bluetooth 5.0, expandable 4G
- Fully enclosed fanless design 24/7 uninterrupted operation
- Easy installation with support for embedded and multiple mounting methods

Equipment Predictive Maintenance: Equipment Inspection

Key Challenges:

Traditional inspection relies heavily on manual operations, which are not only inefficient but also highly susceptible to interference from on-site environmental factors. In addition, manual inspection routes often **lack scientific planning, making efficiency difficult to guarantee**, while **missed or delayed inspections** occur frequently—sometimes even causing **production line shutdowns**.

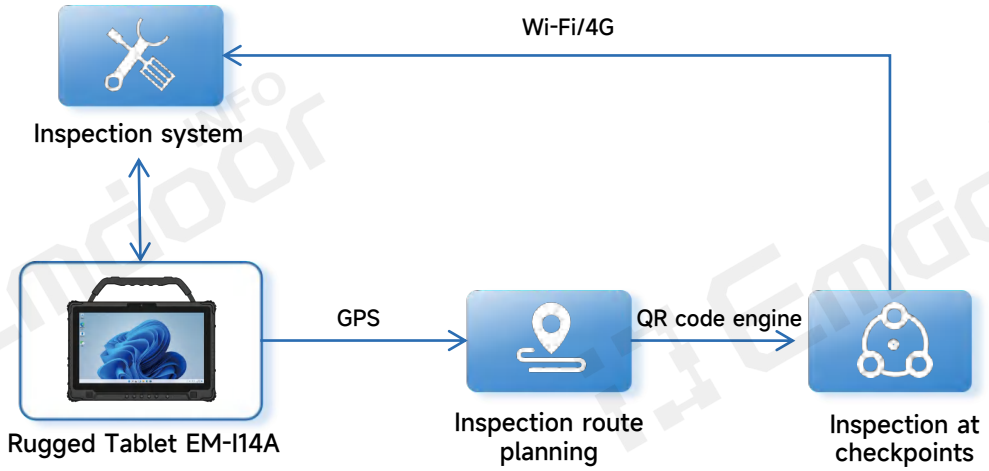
At the same time, inspection tasks are often complex and demanding. If inspection devices **lack sufficient endurance**, it becomes difficult to support the completion of the entire inspection process.

- Poor compatibility of inspection tools
- Missed inspections and low efficiency
- Short endurance
- On-site environmental challenges

Equipment Predictive Maintenance: Equipment Inspection

Solution:

As a terminal device **integrating information collection, processing and transmission**, Emdoor Information's rugged tablet computer can not only **greatly improve the efficiency and accuracy of inspections**, but also **effectively reduce labor costs and safety risks** when applied to factory equipment inspections.



Solution Process

- Inspection personnel receive their daily task list on a rugged tablet, including equipment lists, inspection routes, and inspection standards.
- Using a 2D scanning engine or camera, the tablet can quickly identify equipment and automatically link it with the relevant inspection items.
- Through Bluetooth or I/O ports, the tablet connects to sensors such as vibration sensors or infrared thermometers to collect and upload inspection data in real time. Equipment parameters can also be entered manually or via a stylus.
- The rugged tablet automatically summarizes the data, performs real-time analysis, generates standardized reports, and pushes any detected anomalies to the maintenance department for follow-up, ensuring issues are fully resolved.

Solution Value

- High compatibility reduces the number of devices inspectors need to carry.
- Pre-planned inspection tasks and routes minimize human error.
- High-capacity battery supports full-day inspection needs.
- Industrial-grade protection ensures reliability in harsh factory environments.

Recommended Product

Rugged Tablet EM-I14A

Robust Carry Handle

- 12th Gen Intel® Core™ i5/i7 processor
- Thunderbolt 4, USB, HDMI, LAN, and serial ports
- Dual-battery system with hot-swappable large battery
- NFC support with optional QR code scanning module
- IP65 dustproof and waterproof, with 1.2m drop resistance

Equipment Predictive Maintenance: Asset Management

Key Challenges:

Certainly, factory equipment asset management faces the following prominent challenges: manual inventory relies on memory, making it **prone to errors and inefficiency**. Asset updates—such as inbound, transfers, or maintenance—are delayed, leading to **large discrepancies in records**. Procurement, finance, and IT systems are fragmented, **making collaboration difficult**. Extreme environments (oil, dust, high or low temperatures) increase equipment failures and the **risk of data loss**.

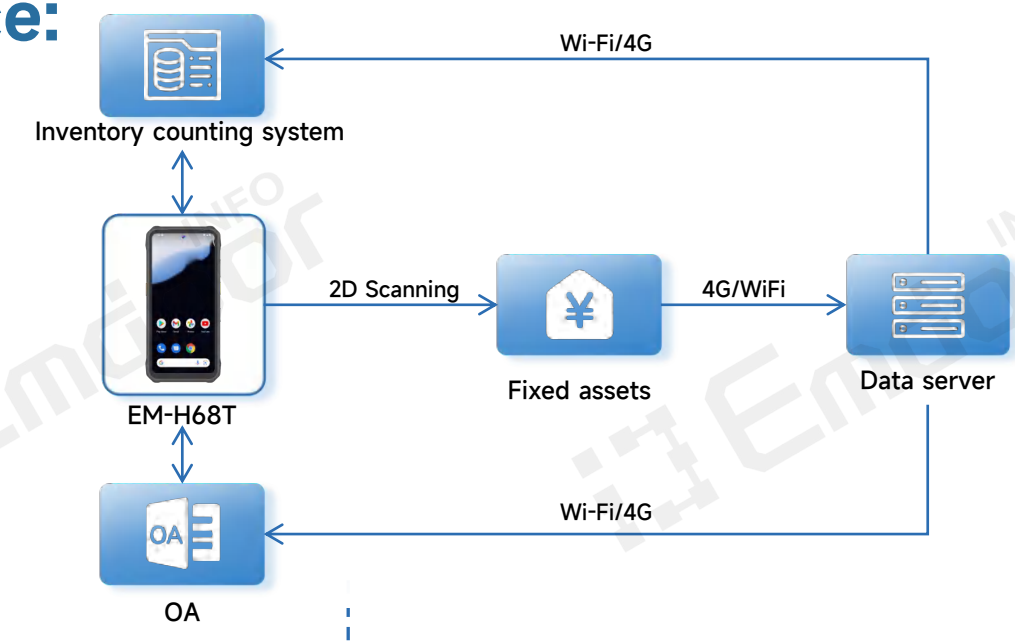
These issues **severely limit asset management accuracy and production stability**, highlighting the urgent need for a digital upgrade to achieve full-process control.

- Time-consuming inventory
- Update delay
- Information silos
- Extreme environments

Equipment Predictive Maintenance: Asset Management

Solution:

Leveraging Emdoor Information's rugged handheld terminals, which **integrate barcode technology and wireless communication**, fixed asset information can be quickly collected using mature barcode solutions. This **improves asset management efficiency and enables more rational resource allocation**.



Solution Process

- The rugged handheld terminal is equipped with a professional 2D scanning engine, capable of reading barcodes at distances of up to 10 meters and easily handling various sizes and types of codes.
- It supports multiple network transmission methods, including 4G, dual-band Wi-Fi, and Bluetooth 5.1, enabling real-time data upload to the backend to generate asset records without the need for secondary entry or processing.
- Powered by a high-performance platform, it is fully compatible with asset management EMS and office automation (OA) systems, breaking down information silos.
- With IP68 protection and a wide operating temperature range of -20°C to 60°C, it easily withstands harsh production environments.

Solution Value

- Increases inventory efficiency and reduces dependence on manual labor.
- Eliminates human errors, ensuring data accuracy.
- Adapts to extreme environments, guaranteeing stable device operation.
- Optimizes management processes and supports data-driven decision-making.

Recommended Product

Rugged Handheld Terminal H68T

Hand Strap

- Optional long-range scanning engine
  Reading range up to 10 meters
- 4G/Dual-band Wi-Fi/Bluetooth 5.1
- Helio G99 high-performance platform
- 6.56-inch large screen, supports glove touch
- IP68 rating, 1.5m drop resistance

05

Smart Manufacturing Solutions

Safety & Environmental Monitoring

RUGGED HANDHELD | RUGGED TABLET | RUGGED NOTEBOOK | PANEL PC

Safety & Environmental Monitoring: Personnel Monitoring & Management

Key Challenges:

As the industrial intelligence process continues to advance, the demand for smart manufacturing has grown beyond just intelligent production lines. **Intelligent management** of production line personnel behavior has become a critical part of the manufacturing digitalization process.

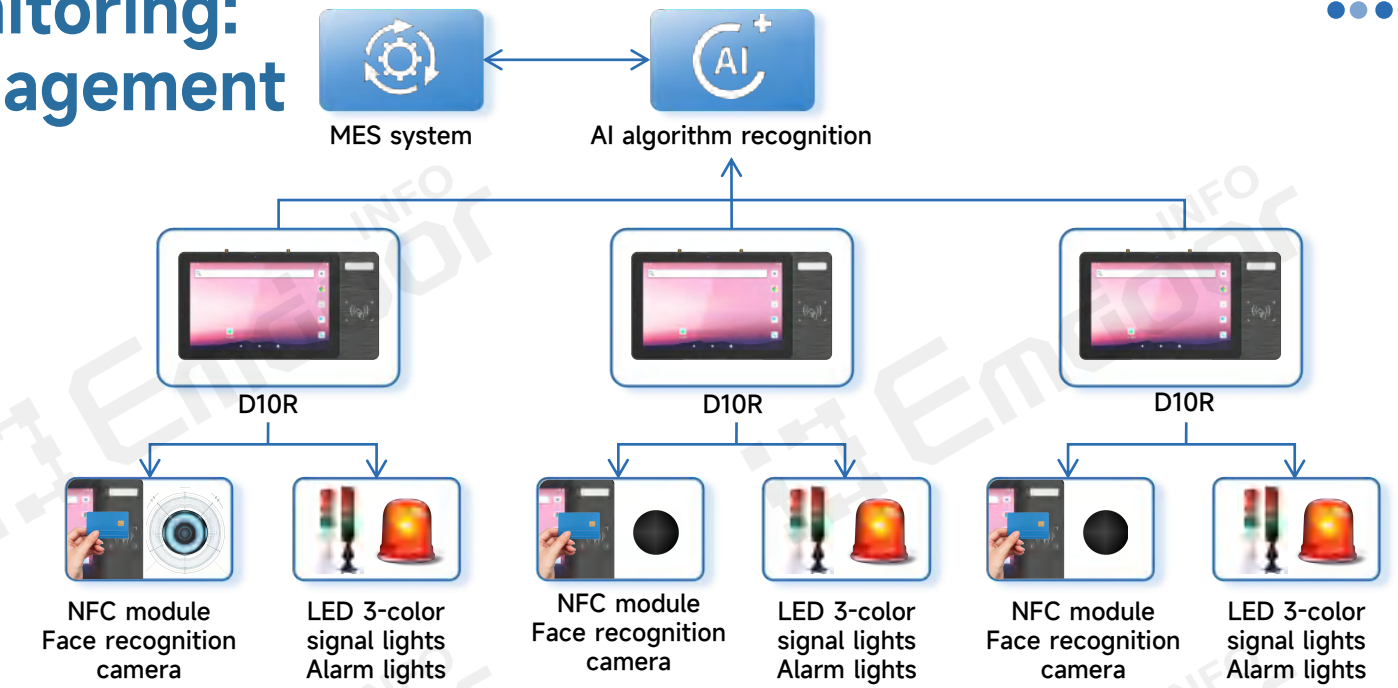
Especially at workstation positions, every action and operation of frontline staff directly impacts **production efficiency** and **product quality**. Therefore, establishing an **intelligent monitoring system** for personnel and workstation status is essential.

- Low staff efficiency
- Omission of operational steps
- Inappropriate work practices and attire
- Potential safety hazards and risks of accidents

Safety & Environmental Monitoring: Personnel Monitoring & Management

Solution:

During the production process, **placing digital signage at each station** allows their computing power, scalability, and stability to **support a comprehensive personnel monitoring and management system**. This system not only records the **on-duty time** of production line personnel but also **monitors any operational anomalies** in their work.



Solution Process

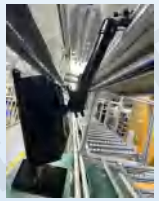
- Each workstation is equipped with a digital signage that leverages its AI-grade hardware platform combined with AI algorithms and model data to accurately monitor personnel attendance, production operations, and various safety hazards, while maintaining seamless integration with MES systems.
- NFC integration allows employees to clock in and out, recording on-duty time, off-duty time, and total working hours.
- Optional facial recognition camera uses intelligent behavior analysis and identification technology to detect actions such as item handling, movement paths, insertion positions, action sequences, and compliance with dress code and operational procedures.
- Built-in LED 3-color signal light and support for external alarm lights enable real-time monitoring and alerting of abnormal behaviors, triggering immediate alarms when anomalies are detected.

Solution Value

- Improves production efficiency, optimizes resource allocation, and ensures product quality.
- Detects off-duty or absentee situations, enhancing management effectiveness.
- Monitors errors such as missed placement, missed picking, or missed operations to prevent mistakes.
- Provides early warnings for potential accidents or hazards, ensuring production safety.

Recommended Product

Digital Signage
D10R



Arm-mounted
Kit

- Rockchip RK3568, AI-grade application capabilities
- IP65-rated front panel with 10.1-inch high-brightness display
- Front panel integrates LED 3-color signal light and dual-band NFC module
- Optional face recognition camera and barcode scanning module
- Rich I/O interfaces for external alarm lights, sensors, and other peripherals

Safety & Environmental Monitoring: Environmental Monitoring

Key Challenges:

Environmental monitoring is an essential part of production workshop operations, especially in areas with safety hazards such as Class A warehouses, hazardous sources, **dust-explosive zones, and confined spaces**. Monitoring the environment is critical to ensuring the smooth and safe operation of production workshops.

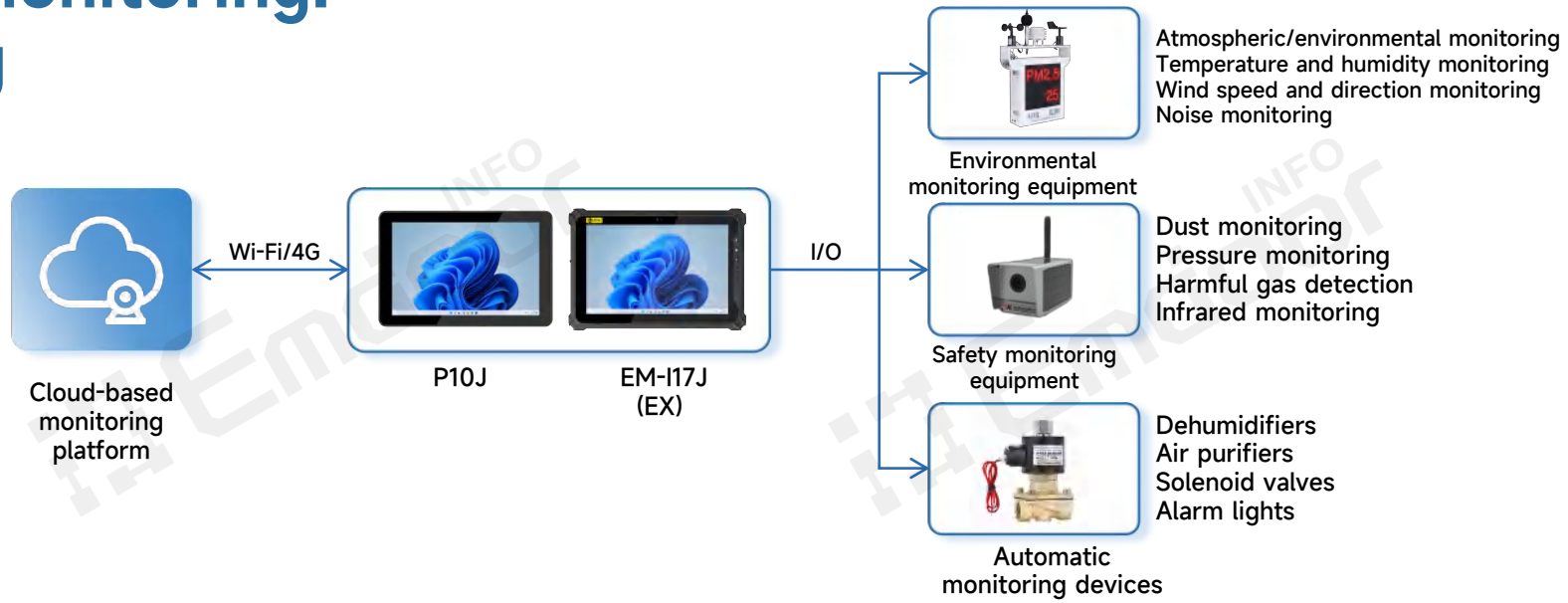
For example, in food and medical device production, environmental monitoring ensures products are manufactured and packaged under consistent conditions, preventing particulate and microbial contamination. In pharmaceutical and chemical production, it helps detect dust particle concentrations, reducing the risk of dust generation and explosions. However, many enterprises still rely on traditional **manual recording**, leading to i**naccurate environmental data and poor process control**.

- Demand for intelligent development
- Inefficiency of manual recording
- Difficulty in process control
- Need for heightened safety awareness

Safety & Environmental Monitoring: Environmental Monitoring

Solution:

Industrial panel PCs or rugged tablets are used to reliably connect with various environmental monitoring sensors and analyzers—such as atmospheric pollutant detectors, temperature/pressure sensors, to collect and transmit production environment data accurately and in real time. This ensures efficient and stable production while maintaining product consistency and workplace safety.



Solution Process

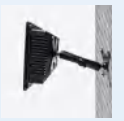
- In fixed production environments, stationary industrial panel PCs are connected to automation control systems and smart sensors to continuously monitor and record environmental parameters such as temperature, humidity, differential pressure, airflow velocity, and air cleanliness. They can also control automated equipment to adjust environmental conditions, ensuring all parameters remain within the specified range.
- In mobile production environments, personnel carry rugged tablets to record monitoring information such as sampling locations and times. These tablets are fully compatible with portable monitoring devices, allowing direct data entry.
- Industrial panel PCs and rugged tablets transmit sensor and monitoring data in real time over the network to a central data center, ensuring data accuracy and continuity, and providing a reliable basis for environmental assessment, analysis, and production operations.

Solution Value

- Precise monitoring and control of environmental parameters, reducing fluctuations
- Ensures consistent quality across all product batches
- Reduces environmental hazards, mitigating accident risks
- Meets evolving production demands and regulatory requirements

Recommended Product

Industrial Panel PC P10J



Wall-mounted Kit

Rugged Tablet EM-I17J (EX)

- Intel® Celeron™ N5100 processor
- Windows 11 system
- Multiple I/O ports: USB, LAN, DB9, HDMI, etc.
- Dual-band Wi-Fi, Bluetooth 5.0, expandable 4G
- Fully enclosed fanless design, supporting 24/7 continuous operation
- Easy installation with multiple mounting options, including wall-mount
- Portable and mobile design
- ATEX Zone 2/22 explosion-proof certification
- 3-in-1 expansion interface, standard LAN port
- Optional DB9 or USB Type-A serial port
- Jasper Lake platform processor Celeron® N5100

Safety & Environmental Monitoring: Energy Consumption Management

Key Challenges:

As public awareness of environmental protection continues to grow, the manufacturing industry faces increasing **environmental pressures**. This is especially demanding for energy, chemical, and large-scale industrial enterprises, which generate substantial amounts of **waste gas, wastewater, and solid waste** during production. Without **effective treatment**, these byproducts can cause **serious environmental pollution**.

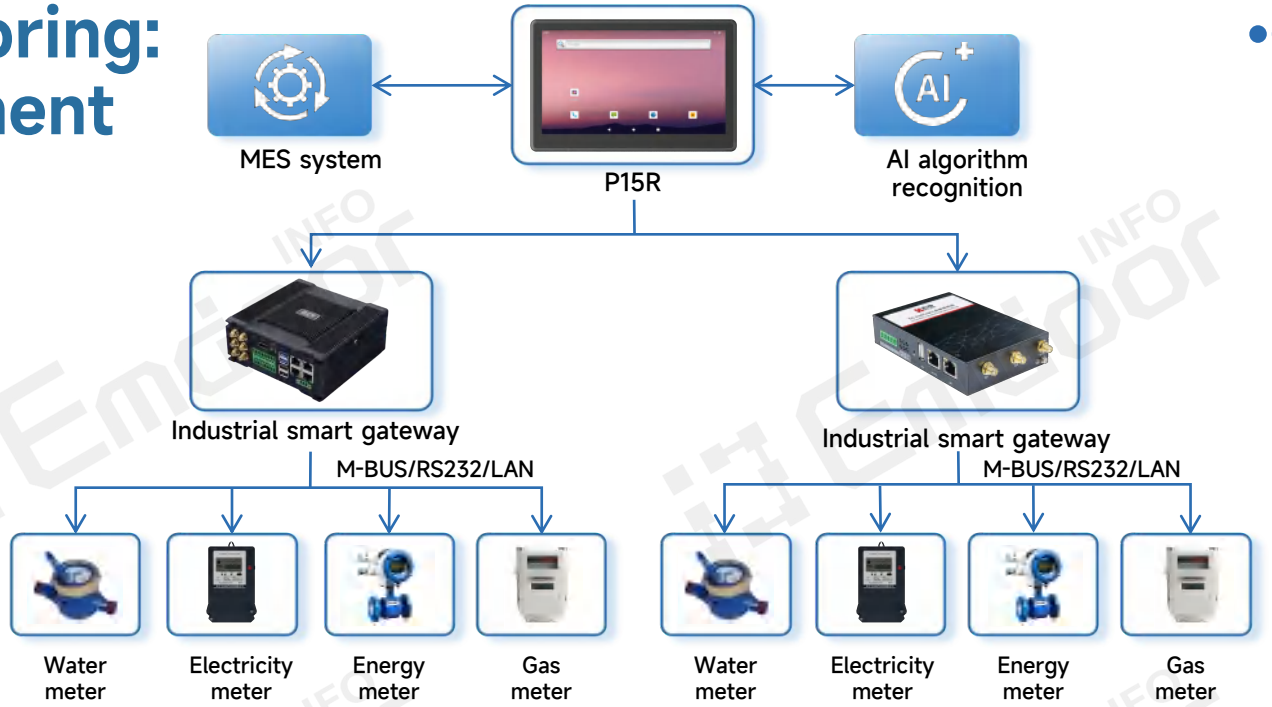
Additionally, factories are energy-intensive facilities with complex energy consumption patterns. **Effectively reducing energy usage can lower energy costs** and support **sustainable development** for manufacturing enterprises. However, traditional enterprise energy management modes have numerous shortcomings, leaving companies struggling to manage energy consumption efficiently.

- Increasing environmental pressures
- Stricter regulatory requirements
- Lack of unified data collection and management
- Difficulty integrating and analyzing data

Safety & Environmental Monitoring: Energy Consumption Management

Solution:

By **installing sensors** on enterprise power, water, gas supply lines, and energy-consuming equipment, and leveraging industrial panel PCs to **visualize** energy consumption, companies can achieve **comprehensive, real-time, and accurate energy data collection and control**. This provides an effective way to overcome challenges in energy management and improve energy efficiency.



Solution Process

- The industrial panel PC connects to various meters and sensors via RS232 serial ports or LAN gateway ports to collect data on water, electricity, oil, and gas consumption. It continuously gathers detailed parameters such as energy usage, equipment operating power, current, and voltage.
- Through wired or wireless communication networks, the industrial panel PC transmits data to an energy monitoring platform for real-time production energy consumption monitoring.
- The platform performs statistical analysis, calculations, and assessments of the collected energy consumption data, providing timely feedback on energy utilization.
- When connected to power or variable frequency motor equipment, the industrial panel PC can optimize energy use by cutting off power during waste or adjusting motor speed and voltage frequency.

Solution Value

- Enhances control over pollutant emissions during production, meeting environmental standards.
- Effectively reduces energy consumption costs and equipment operation risks.
- Replaces manual data collection, saving labor costs and improving production efficiency.
- Promotes green, efficient, and intelligent development for enterprises.

Recommended Product

Industrial Panel PC P15R

Wall-mounted Kit

- RK3568 processor with built-in high-performance NPU
- Rich I/O expansion interfaces
- Onboard Wi-Fi and Bluetooth, expandable 4G/5G modules
- Durable design with anti-electromagnetic interference and anti-vibration, dustproof, and waterproof
- Supports desktop and wall-mount installation for easy deployment

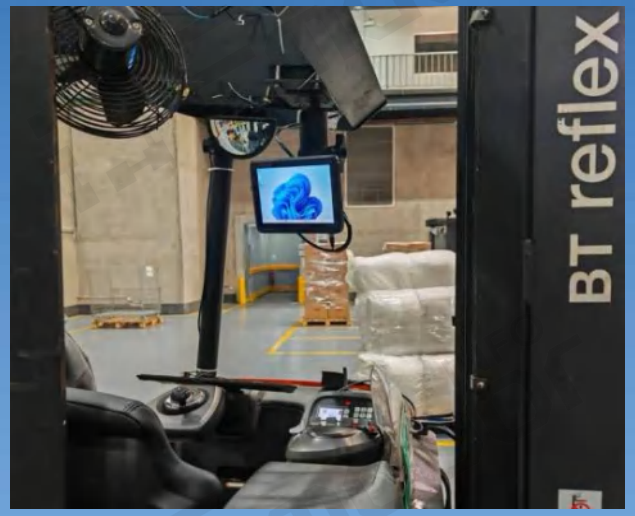
Typical Cases

01

A high-tech enterprise achieved full-process transparency and traceable smart warehousing through deep integration of Emdoor rugged H60T handheld terminals with their WMS.

Client: A high-tech electronics enterprise
Product: H60T rugged handheld terminal
Application: Inventory & warehouse management (inbound/outbound, shelving & picking)

02



Emdoor rugged vehicle PC V10J helps build an intelligent warehouse system, enabling fully digital management of forklift operations.

Client: A well-known home furnishing brand
Product: V10J vehicle PC
Application: Inventory & warehouse management (forklift transport)

03

AI rugged notebooks, combined with AI and AOI inspection technology, assist an electronics technology company in producing higher-quality products.

Client: An electronics technology company
Product: EM-X14M rugged notebook
Application: Quality inspection & traceability (AOI automatic inspection)

Typical Cases

04

An electronics factory integrates ESOP and MES system to create an intelligent production line, achieving improvements in both product quality and delivery efficiency.

Client: An electronics technology company
Product: P17A industrial panel PC
Application: Workshop industrial automation (MES production execution/ESOP work instructions)

05

Emdoor rugged terminals perform strict pre-shipment quality inspections, helping an automotive factory deliver high-quality vehicles more quickly.

Client: A well-known automotive company in Anhui Province
Products: EM-Q16 rugged tablet
EM-Q51 rugged handheld terminal
Application: Quality inspection & traceability (quality process control)

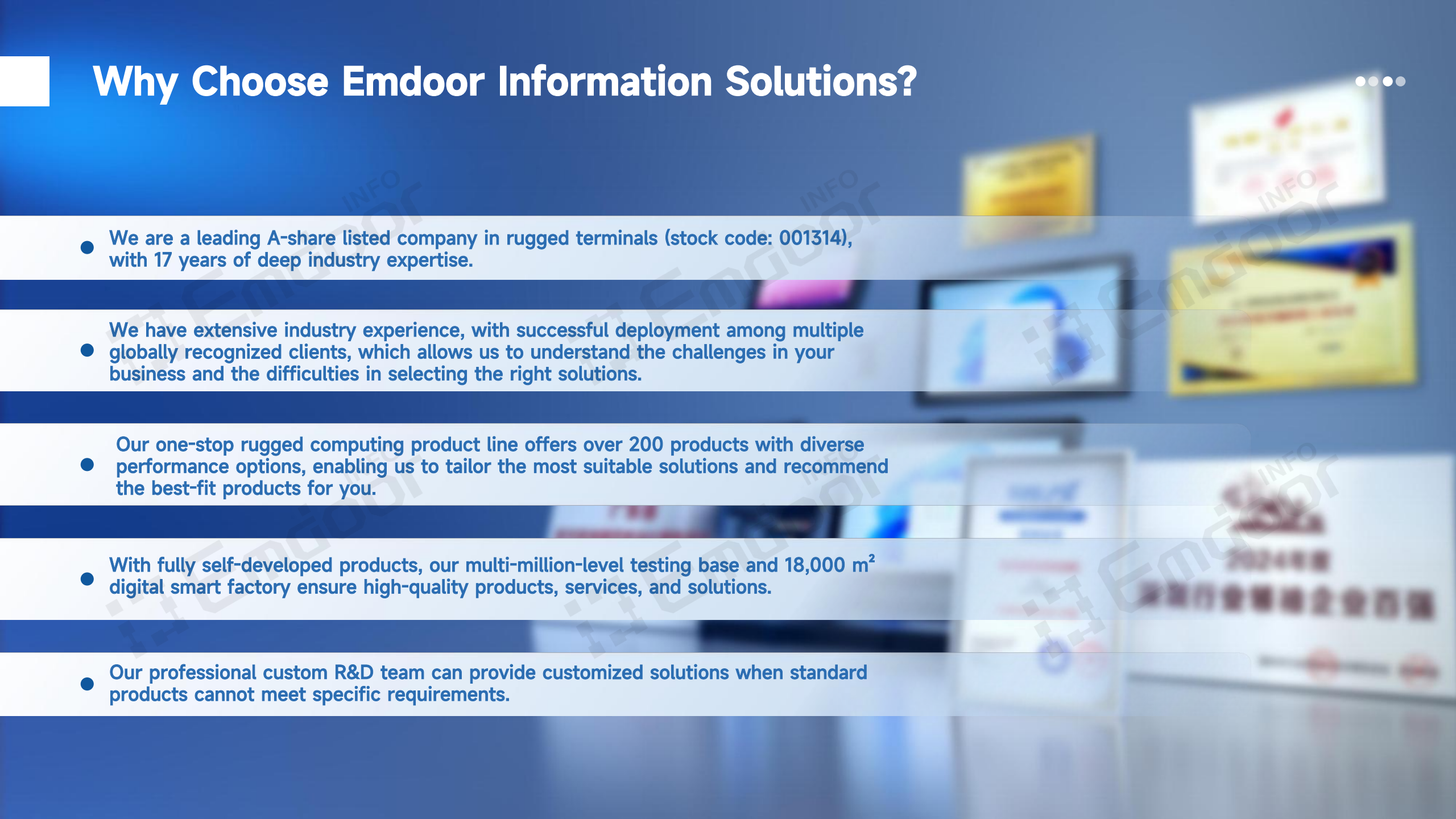
06

How an automotive manufacturer realize intelligent production management through Emdoor rugged digital signage and MDM systems.

Client: A leading automotive manufacturer in China
Product: D10R digital signage
Application: Safety & environmental monitoring (personnel monitoring & management)

Why Choose Emdoor Information Solutions?

- We are a leading A-share listed company in rugged terminals (stock code: 001314), with 17 years of deep industry expertise.
- We have extensive industry experience, with successful deployment among multiple globally recognized clients, which allows us to understand the challenges in your business and the difficulties in selecting the right solutions.
- Our one-stop rugged computing product line offers over 200 products with diverse performance options, enabling us to tailor the most suitable solutions and recommend the best-fit products for you.
- With fully self-developed products, our multi-million-level testing base and 18,000 m^2 digital smart factory ensure high-quality products, services, and solutions.
- Our professional custom R&D team can provide customized solutions when standard products cannot meet specific requirements.



YOUR ONE-STOP RUGGED COMPUTING SOLUTION PROVIDER

Smart Manufacturing Solutions
Product Selection Table

Model	H68T Rugged Handheld Terminal	EM-I17J (EX) Rugged Tablet	EM-X14M Rugged Notebook	D10R Digital Signage	P15J Industrial Panel PC	V10J Vehicle PC
Host	H68T (8G/128G) H68T (8G/256G)	EM-I17J (EX) (8G/128G)	EM-X14M (16G/256G) EM-X14M (32G/256G)	D10R (4G/64G)	P15J (8G/128G)	V10J (8G/128G)
Optional Modules	2D 2D (10m long-range code scanning)	4G 3-in-1 module (RJ45) 3-in-1 module (RS232) 3-in-1 module (USB 2.0) 2D NFC	Touch panel SSD 4G 5G Single GPS Single Glonass NFC	4G 2D Front camera	4G	4G NFC
Standard Accessories	33W adapter Type-C cable Hand strap	65W adapter Type-C cable Hand strap	19V/3.78A adapter DC cable	12V/4A adapter DC cable Wi-Fi antenna	12V/4A adapter DC cable PPC Hook Assembly Wi-Fi antenna	Wi-Fi rod antenna GPS vehicle mushroom antenna Power adapter cable (to φ5.5 power port)
Power Adapter	33W adapter	65W adapter	19V/3.78A adapter	12V/4A adapter	12V/4A adapter	19V/3.42A cigarette lighter adapter 12V/4A adapter
Optional Accessories	Docking charger Tempered glass screen protector Semi-enclosed vehicle mount Fully enclosed vehicle mount	Docking charger Vehicle mount Car charger Tempered glass screen protector Quad charging dock	Battery Quad charging dock	/	/	4G rod antenna GPS rod antenna 19V/3.42A cigarette lighter adapter 12V/4A adapter Power adapter cable (to 4 loose cables) Wide voltage module RAM mount VESA mount Function adapter cable (to USB 2.0 × 2 + USB 2.0/CAN, to RS232+RS485, to RS232 × 2, to 12 loose cables)

YOUR ONE-STOP RUGGED
COMPUTING SOLUTION PROVIDER

Leading A-Share Listed Company in
Rugged Terminals

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