

# ePaper Smart Factory Solutions

8 Success Cases to Accelerate ePaper Implementation in Manufacturing

- ✓ Warehouse
- ✓ Assembly Line
- ✓ AGV Robots
- ✓ Production Line
- ✓ Co-work Space



**DeviceOn/ePaper**

**ADVANTECH**

*Enabling an Intelligent Planet*

[www.advantech.com](http://www.advantech.com)

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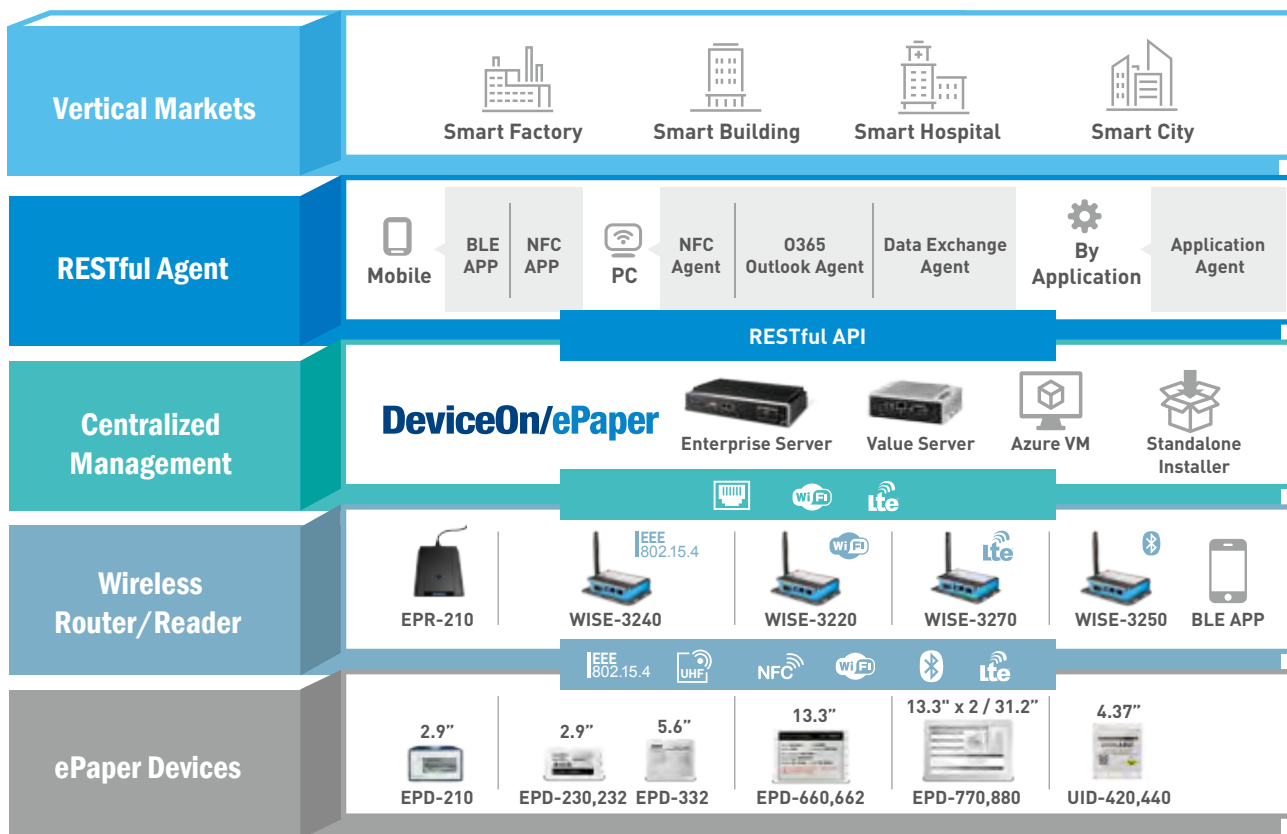


## DeviceOn/ePaper

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# Advantech Wireless ePaper Solutions

Advantech provides hardware and software integrated wireless ePaper solutions that accelerate the implementation of a wide range of applications. These solutions, comprising ePaper devices, routers, and DeviceOn/ePaper software, are used in smart warehouse and factory digital signs, industrial equipment peripherals, and public workspaces. Advantech's DeviceOn/ePaper enables easy visualized system management, and provides diverse RESTful APIs that ease integration within existing applications.



## Product features



### Ultra-low Power

Efficient power-saving design



### Fast Transmission

Update 10,000 ePaper devices in one hour



### 2-way Communication

End devices can report data accuracy, battery levels, and abnormal statuses

## DeviceOn/ePaper

### Centralized ePaper Manager

Visualized user interface for content management and system maintenance



### OTA Upgrade

Regular system patches and updates



### AES-128 Security

AES-128 encryption and data compression



### EPD Roaming

EPD can on-line in different WISE-3240 automatically in large field-site



### Network Self-Configuration

Auto-organized network groups with self-reported status





# Shortening Production Line Communication Threads in Factories



## Background

Most traditional factory production trolleys are manually operated, despite the development of more efficient systems. For production lines that have to handle a massive number of orders, taking a manual approach often makes it difficult to accurately track the data across processes.

- What product/material is on the trolleys?
- What is the work order number?
- How long until an order must be shipped?
- What is the next step in the current process?
- Who is accountable?

Moreover, human error, similar products, and poor handover practices can easily lead to time wastage and cause mistakes in production. Remedying such problems also incurs additional costs. Thus, production lines need clear SOPs to overcome these problems.

## System Requirements

Advantech's M9 facility uses around 200 factory trolleys to transport partially complete products throughout different production stages. Many of these trolleys are often moving around the work area at the same time. To improve trolley management, the facility required EPD device that could be online at all times for real-time data tracking. This would eliminate the need to memorize which trolleys are carrying which items, when items entered production, where they started/finished, and so on.

EPDs were adopted to streamline production and make it more efficient. Ideally, operators would simply need to read their EPD to view current instructions and distinguish between WIPs. It should also allow central management to monitor and control production more efficiently. Most importantly, it needed to give full visibility over material status and trolley location.



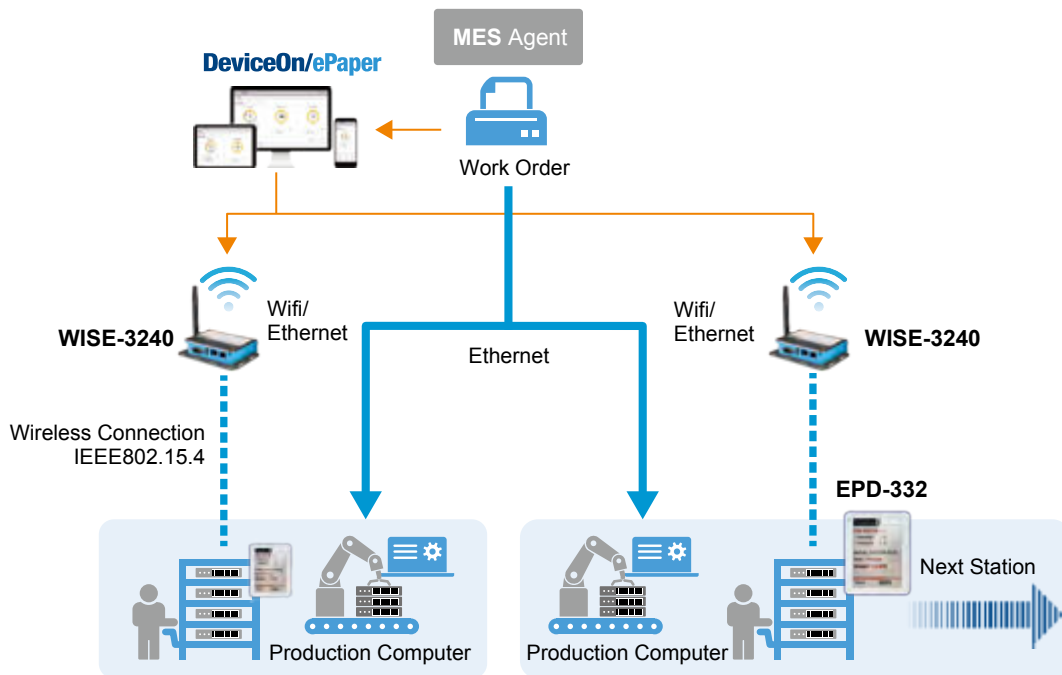


## System Implementation

DeviceOn/ePaper played a critical role in the deployment of the solution, particularly because of the powerful management capabilities it brings for handling image pre-processing and edge device management. Advantech's EPD-332 ePaper device can visualize images which have been pre-processed by DeviceOn/ePaper and it was significantly reduced the image design effort. It also ensured that data and images were consistent during both deployment and daily operation.

Moreover, because the trolleys need to be moved throughout the factory during production, WISE-3240s were deployed to make wireless signal completely cover the factory. Indeed, EPD-332 can roaming between different WISE-3240 without off-line issue in factory field site.

## System Architecture

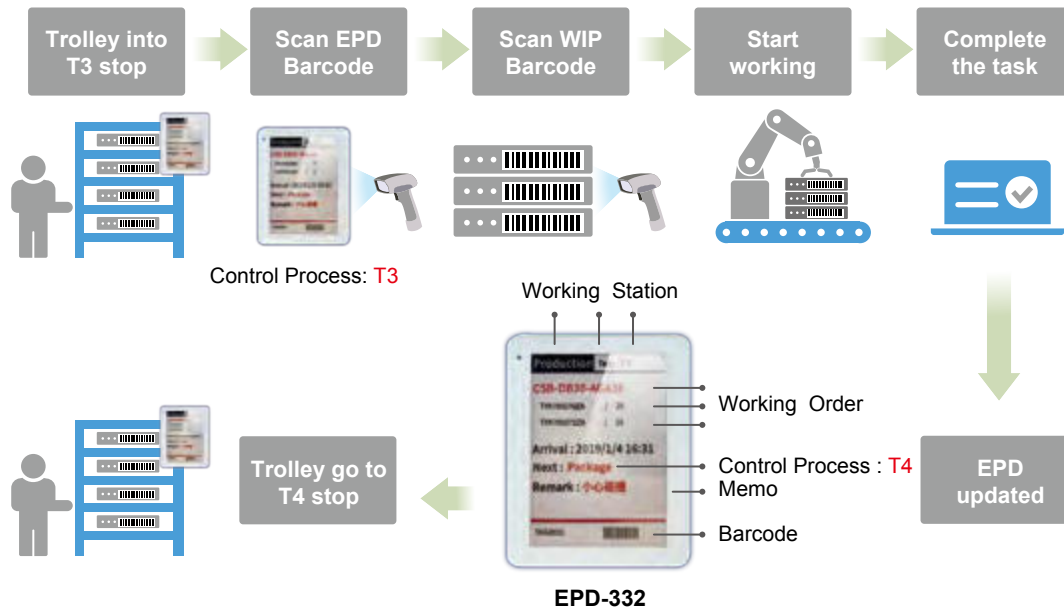


### Benefits

- EPDs can be moved throughout the production field but still remain connected for real-time updates.
- Operators can locate trolleys, thus eliminating missing trolleys from the management report.
- EPDs have LED indicators to provide visualized information to improve production times and efficiency. In this case, it has reduced inquiry times and error rates by 5% per month.

### Device List

1. Deviceon/ePaper on the ARK-2250L
2. 4 WISE-3240
3. 200 EPD-332



To meet the demands of the smart factory production lines, Advantech provides an ePaper solution suite and offers a full range of ePaper products. With the RESTful API, DeviceOn/ePaper is easy to integrate into different application solutions, and its features have been rigorously test and validated. The EPD-332 can be employed in production lines to help monitor production materials throughout all stages of production. Because it enables the more accurate tracking of material status, ERP systems can operate more efficiently for remaining material to assign to next working order. Consequently, management can easily adjust the status of orders and stock.

In this case, the proposed solution enabled operators to read the name and quantity of materials on a trolley from their EPD-332. Overall, it improved inventory and production management efficiency through real-time tracking of production data via DeviceOn/ePaper. In this case, operators can scan QR codes to deduct the quantity of material and then the stock levels could be adjusted in ERP, and instructions could be displayed on the EPDs to give information on which station trolleys needed to be moved to. The wireless network from the WISE-3240 setup also enabled management to locate EPDs and trolleys anywhere in the work area.

In summary, this solution has now saved 30–40 minutes of daily work effort and has also helped management obtain real-time information across their entire production line.

# Stock Information Visualized in a Smart Warehouse



## Background

With increasing demand for smart warehouses, current trends focus on determining how to speed up logistical processes such as loading, unloading, picking, refilling, and checking. In seeking to improve the efficiency and accuracy of their logistical operations, many warehouses need to work within the constraints of their current system and architecture. In this project, a key issue was determining how to provide visualized support for workers without needing them to carry an extra handset to check information.

In recent decades, ePaper technology has been widely used for inventory management in supermarkets. Such systems generally involve using tags to track inventory, as these tags can work for years without any maintenance. Thus, they are also suitable for warehouses with similar setups, although they would need to be optimized for picking and related stock status updates.

## System Requirements

Advantech's RMA Center is equipped with 10 rows of two-way storage cabinets containing an inventory of more than 5000 materials and components. With a manual tracking system, warehouse operators need to rely on storage coding logic and inventory organization to locate any components they need. Because this requires inventory information to be manually updated after picking, there is an increased risk of missed updates or data errors. It also wastes operators' time locating materials and can lead to inaccurate stock numbers. Thus, Advantech's ePaper Solution was adopted to increase the RMA Center's efficiency and stock management accuracy through data visualization.

## System Implementation

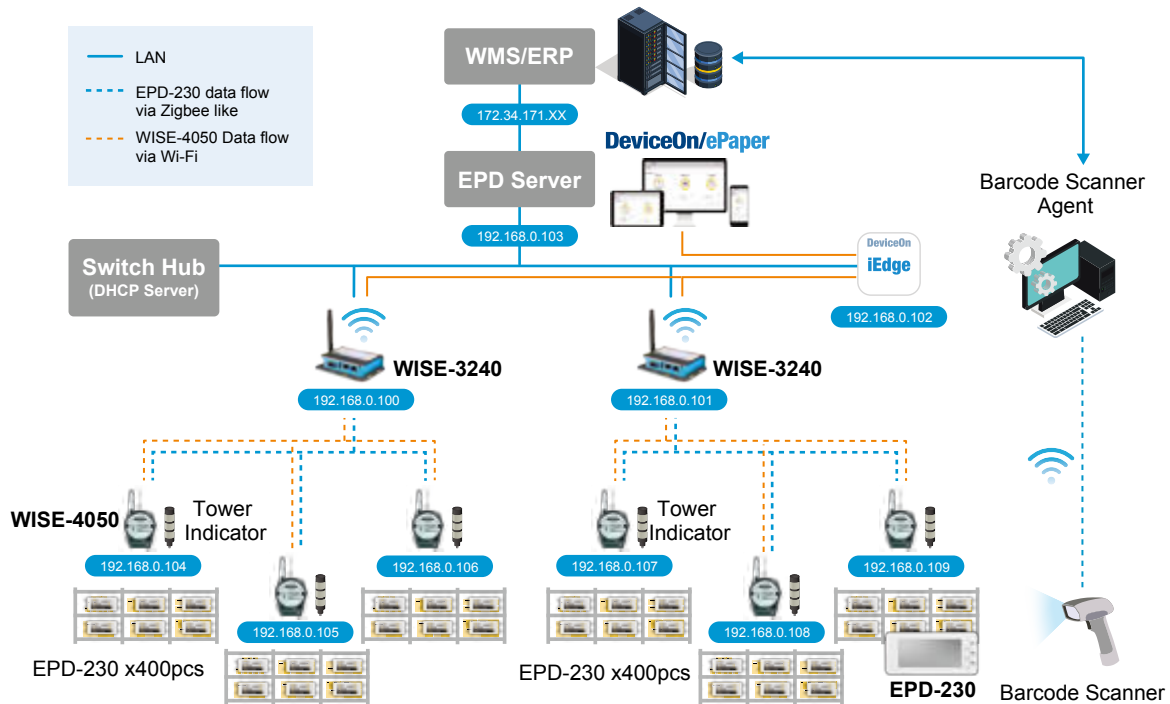
In this solution, when operators submit a request to the ERP, it connects to the DeviceOn/ePaper software via the RESTful API. DeviceOn/ePaper can send commands to WISE-3240 for EPD and WISE-4050 for tower stack lights. Operators can follow the tower stack lights and EPD's instruction to collect accurate materials and update server at the same time.





The RMA Center tested ePapers from multiple vendors, and selected this Advantech EPD Solution. To ensure high performance and stability, the selected architecture comprised the compact ARK-2250L Fanless Box PC installed with DeviceOn/ePaper, WISE-3240 Wireless Router, EPD-230 ePaper device, and WISE-4050 Wireless I/O Module for tower stack lights. Since DeviceOn/ePaper utilizes the RESTful API and provide user-friendly interface, the RMA Center was able to easily integrate the solution into the existing WMS and ERP without the assistance of a system integrator.

## System Architecture



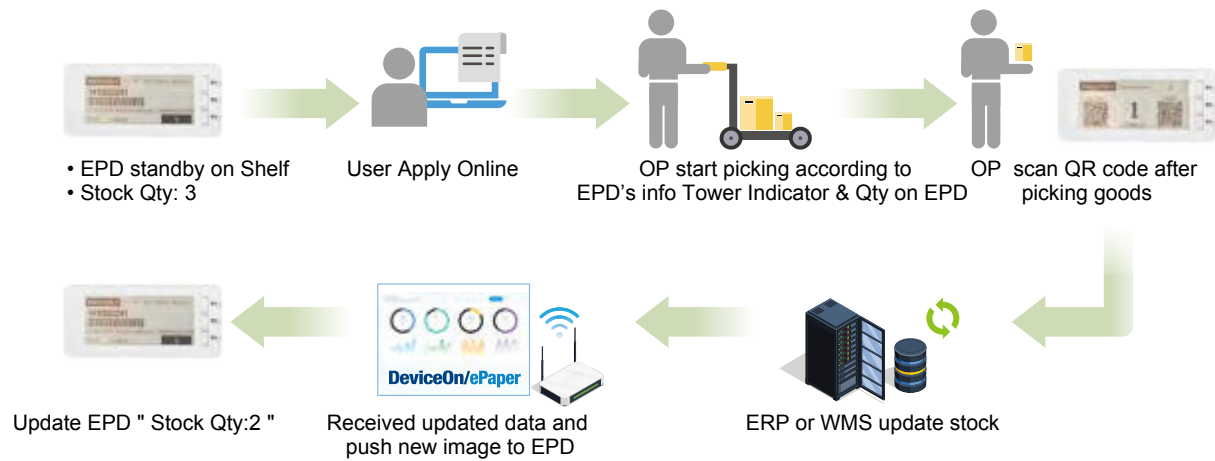
### Benefits

- Leverages tower indicators and EPDs for visual guidance during picking. And the process could be controlled by DeviceOn/ePaper
- Reduce manpower from 3 to 1 person and working hours from 3 days to 4 hours per month

### Device List

1. DeviceOn/ePaper & I-Edge Agent on the ARK-2250L
2. 20 WISE-3240
3. 3000 EPD-230
4. 40 WISE-4050
5. 40 Tower Indicator
6. iEdge Server

## Why Advantech



The EPD-230 is a 2.9" wireless ePaper device that empower warehouse operators to easily locate goods and verify components according to work orders. Coupled with DeviceOn/ePaper, all data can be automatically updated on existing RMA inventory management control systems, thereby greatly improving inventory management efficiency. When implemented at Advantech's RMA Center, the EPD-230 not only increased picking efficiency and reduced human errors, but it also improved the accuracy of inventory records. This solution has helped Advantech more effectively manage material inventories at 15 repair centers around the world.

The primary advantages of the EPD-230 include its ability to visualize inventory data and streamline picking. In manual inventory systems, the process of locating, verifying, and updating inventory is time-consuming and is prone to inaccuracy due to human error. Moreover, because materials in a manual setting need to be organized and stored according to a specific logic, only experienced workers can reliably retrieve them. This also relates to receiving, counting, and restocking all inventory, which introduces the probability of picking tasks being delayed and material requests being disrupted.

The proposed solution also uses LED lights as indicators to help personnel with locating inventory. This combined with the automated verification and inventory updates has greatly improved the center's operational efficiency and accuracy. With guidance from light towers and the EPD-230, engineers can now retrieve materials by themselves, thus eliminating the need for picking personnel. It generally takes less than one minute for engineers to collect the materials they need and return to their tasks, which has greatly reduced production downtime while increasing productivity. Additionally, because the EPD-230 has three built-in LEDs and buttons, it can be used by three engineers at the same time—they simply need to follow the LED color specific to their work order. Thus, the solution has not only accelerated repairs, but it has also enabled more accurate inventory management to help realize the goal of centralized planning and global execution.

In warehouses, inventory planning and management must consider product sales, field-based wear and tear, failure rates, lead time, and so on. Managers with sufficient experience are critical to ensuring sufficient inventory while avoiding over- or understocking. Thus, Advantech hopes to extend the implementation of this solution to its 15 overseas repair centers. This will ensure managers at headquarters understand the inventory situation at each center, better enabling them to perform centralized material replenishment planning based on cumulative stock levels. Implementing this centralized plan at all repair centers will ensure sufficient local supplies and eliminate global inventory stagnation. Thus, Advantech has improved the operating efficiency of its repair centers around the world by effectively reducing repair times resulting from material shortages. This has ensured consistent global repair services and ultimately increased customer satisfaction and loyalty.

# Recording Assembly Status in Cleanroom Production



## Background

Our client is a medical assemblies company with class 7& 8 cleanroom assembly lines. While labelling the current status of WIP products in a production line seems simple and straightforward, this was not possible in this case because normal paper cannot be used in a cleanroom environment. The company had been using expensive dust-free paper to overcome this, but this was often neglected due to the high cost. In fact, recording all production information in real time proved to be virtually impossible, and this caused considerable problems in the production process.

## System Requirements

The company's work bins each contain about 1000 pieces. For each bin in the cleanroom, the material and WIP status need to be updated regularly, because clearly indicating the WIP and material status on each bin makes it easier for the next worker to complete their job.

To more effectively record information, the company required an ePaper device that could be easily embedded into the bins. Thus, the EPDs needed to be battery-less, slim, and light enough for installation into the bins. Moreover, this paperless system was an ideal fit for the company's ESG policies.

## System Implementation

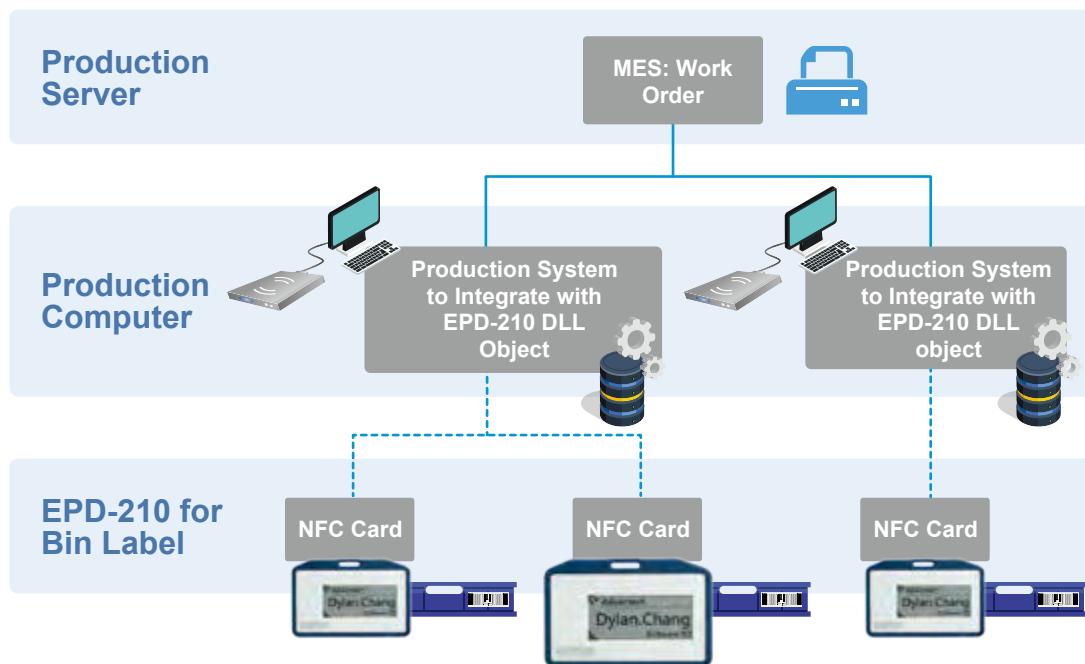
After a rigorous selection process, the company opted for a solution based around Advantech's EPD-210 series and its software package. The solution came with dynamic libraries and sample code for easy integration into their current system. This was essential to ensure the data which can be received to generate image. Finally, those data and images can be delivered to EPD-210 via NFC reader.





Besides EPD image storage of 4736 bytes, Advantech's flagship EPD-210 provides extra 320 bytes for customers to write User data. Operators simply need to detect the EPD-210 and then the computer can receive those 320 bytes of data. This also enables the automatic updating of production data without any manual effort. At the same detection, EPD can receive image and power on an NFC reader as well. After an image has been transmitted, the operator can then return the EPD to the bin.

## System Architecture



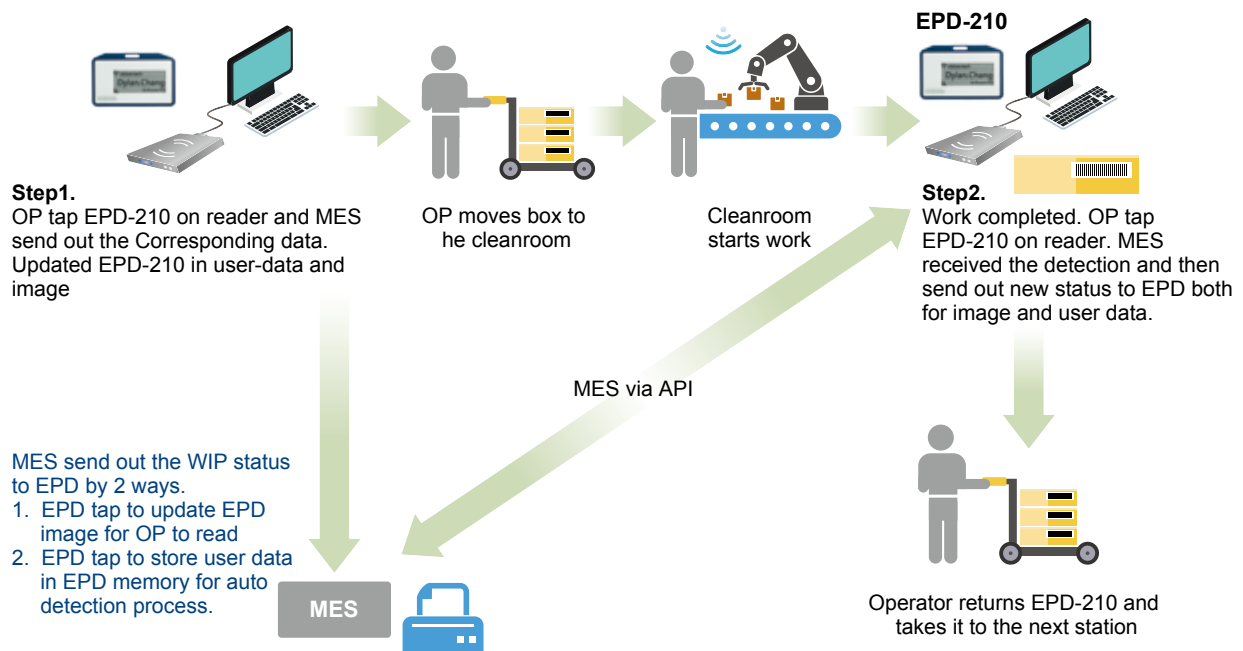
### Benefits

- Dust-free EPD for displaying and updating real-time WIP status in the cleanroom
- NFC detection to trigger the data and image transmission without manual input in production line
- Easy integration with ready-software-package into the existing production system

### Device List

1. 5 EPR-210
2. 1000 EPD-210
3. Advantech EPD-210 DLL object to integrated into customer's system. Which can received data and generate image to EPD

## Why Advantech



To meet a wide variety of smart factory requirements in different environments, Advantech provides total solutions with a full range of EPDs. In this case, the company needed to stop using paper in order to eliminate the risk of dust particles being introduced into the cleanroom. In fact, because the proposed solution was battery-less, the cost was not higher than using dust-free paper. Also, Advantech provided comprehensive training on how to use the sample code, which made implementing the solution simple and fast. Advantech provides comprehensive solutions with EPD and software, which makes them the best choice for customers to build IoT automation scenarios.

# Enhanced AGV Robots Accuracy in Logistics



## Background

The AGV robot market has grown in recent years, particularly because of their widespread use in logistics in manufacturing industries. When combined with WMS and MES information management platforms, AGV robots can efficiently, accurately, and flexibly complete material handling tasks to make production more flexible, thus enhancing an enterprise's competitiveness.

## System Requirements

Large mobile ODM factories in China maintain a certain distance between material warehouses and production lines. This makes AGVs highly invaluable for transporting materials to production, because it saves considerably on human resources and time. However, even though the AGVs can carry materials to the production lines, operators still need to load/unload goods and confirm that materials match the relevant work order. Normally, an operator will print out the material items and work orders and manually check whether they are correct. This involves checking each item on a work order, correcting any errors, and dispatching the materials to the production line. Customers need a new solution with ePapers to show those information to speed up the process of material delivering.

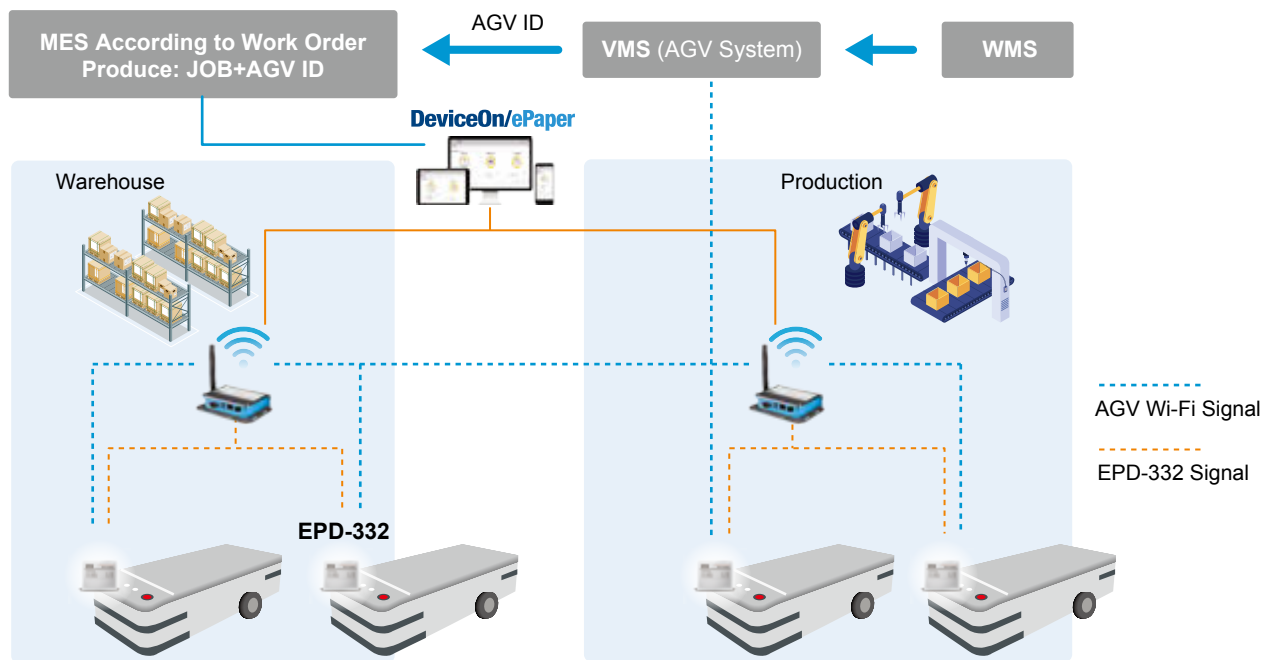
## System Implementation

Advantech's EPD-332 was installed on the AGVs to provide SMT information in real time. Since the AGVs could be in any location in the factory, roaming and retry features were critical considerations in the system design. To automate this process, the EPD-332 was set up to automatically update a material's stock status. With the EPD-332's roaming support, the AGVs can be tracked from the warehouse to production so long as they remain within the network signal area. While EPD is in bad signal, DeviceOn/ePaper and WISE-3240 will re-try and update the EPD. In this case, the EPDs needed to display information including AGV ID, production line ID/ stop, and working order/ material PN/ quantity, which could be shown as a QR code or barcode.





## System Architecture



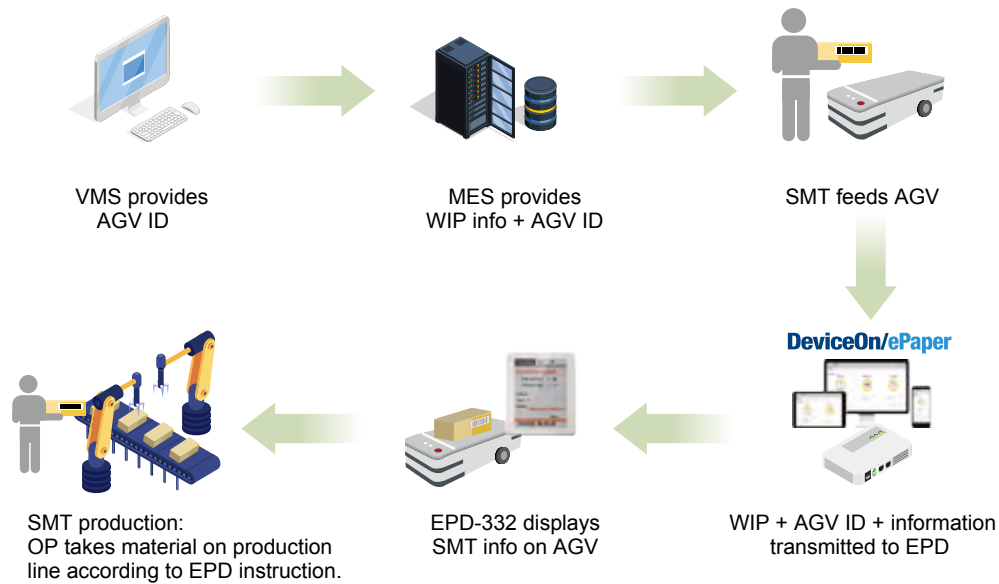
### Benefits

1. Operators can load/unload materials directly without extra queries once an AGV arrives
2. Roaming enables the EPDs to remain online in different areas of the factory so that production information can be delivered anywhere, anytime
3. MES and WMS data for WIPs can be displayed on the EPDs via the RESTful API

### Device List

1. 4 WISE-3240
2. 20 EPD-332
3. ARK-1123H

## Why Advantech



Manufacturers typically encounter many difficulties when implementing ePaper applications by themselves. When upgrading production processes, relying on a professional system integrator's expertise is critical because the most of technology implement is complex and takes lots of effort. In this case, the customer cooperated with Advantech directly to obtain a complete solution, and this greatly reduced the threshold for introducing an ePaper solution into their manufacturing process. Under Advantech's architecture, the RESTful API can be leveraged to bridge operations with the DeviceOn/ePaper software. During the integration process, this customer required a retry feature and customized API. Because of Advantech's extensive R&D capacity, our EPD Solution was able to quickly implement this tailored solution to meet the customers' specific needs.

# Improving Rail Equipment Maintenance in China



## Background

Urban developments in China over the past few decades have seen the rise of many digitized mega cities. The increased daily transportation needs of commuters in these cities has emphasized the importance of public transportation services as a primary service where ensuring services operate normally is critical. Key to this is making sure servers remain online, because any server failure could affect the entire system. For underground transportation systems, regular and accurate equipment inspections across the entire network are crucial to preventing machine errors or system bugs. One particular challenge in this case was determining how to maintain equipment and servers using the current system but without increasing the human resource cost.

## System Requirements

A rail transportation authority in China needed a more effective solution to maintain a diverse selection of equipment in cabinets. Each cabinet required an ePaper device to display the machine server status, maintenance log, and a task list for that cabinet. Once maintenance tasks have been completed, any updates on the machine status needed to be reflected on the EPD. Maintenance personnel also need to use their signoff QR code on an hourly basis to ensure they are properly fulfilling their work duties. This means that the communication quality of EPDs should be stable to keep all works on-line.

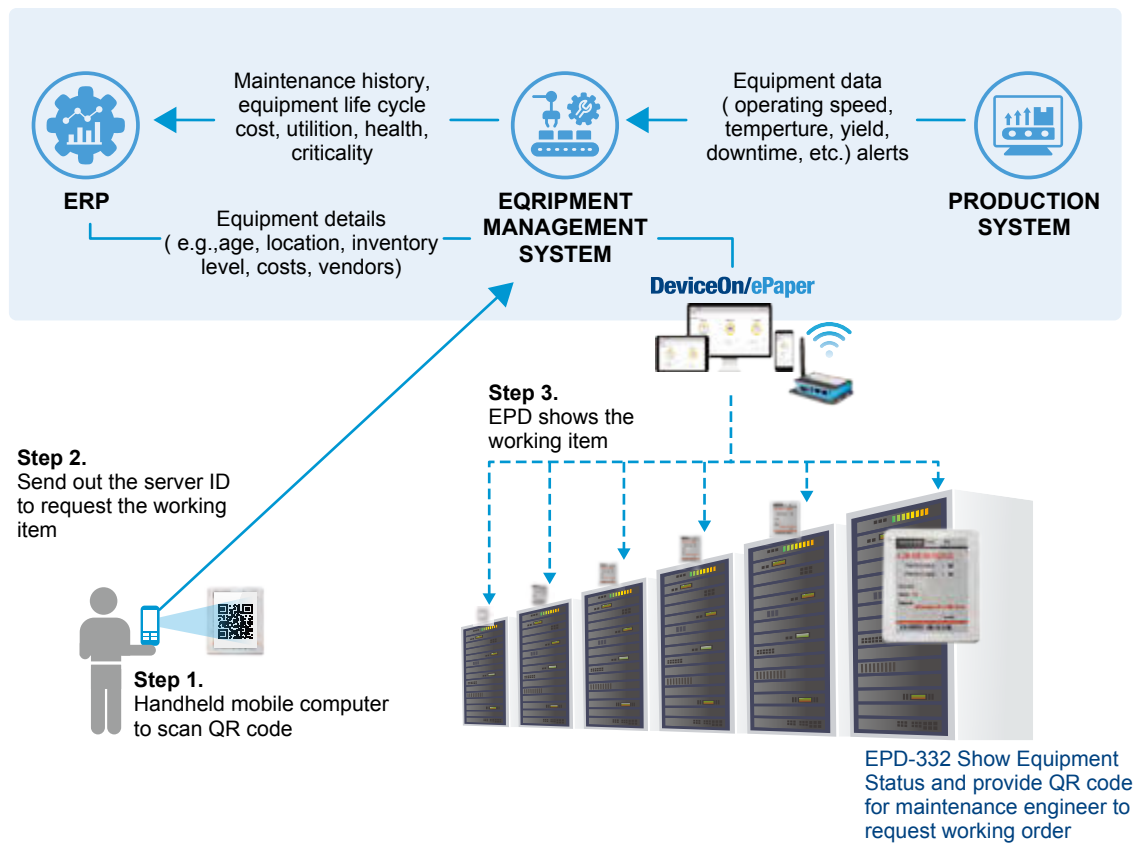
## System Implementation

Using EPDs to provide dynamic QR codes was a convenient way for engineers to sign off and organize their maintenance tasks. Also, being able to utilize multiple pages to display maintenance records and manuals was useful because it meant that maintenance personnel do not need to carry large documents with them. The EPD-332 can access and update data in real time when daily tasks are completed, showing the latest status of computer assets. However, in cases where underground networks are unstable, the EPD-332 displays a “disconnected” icon to inform the user that the information on the EPD might not be up to date.





## System Architecture



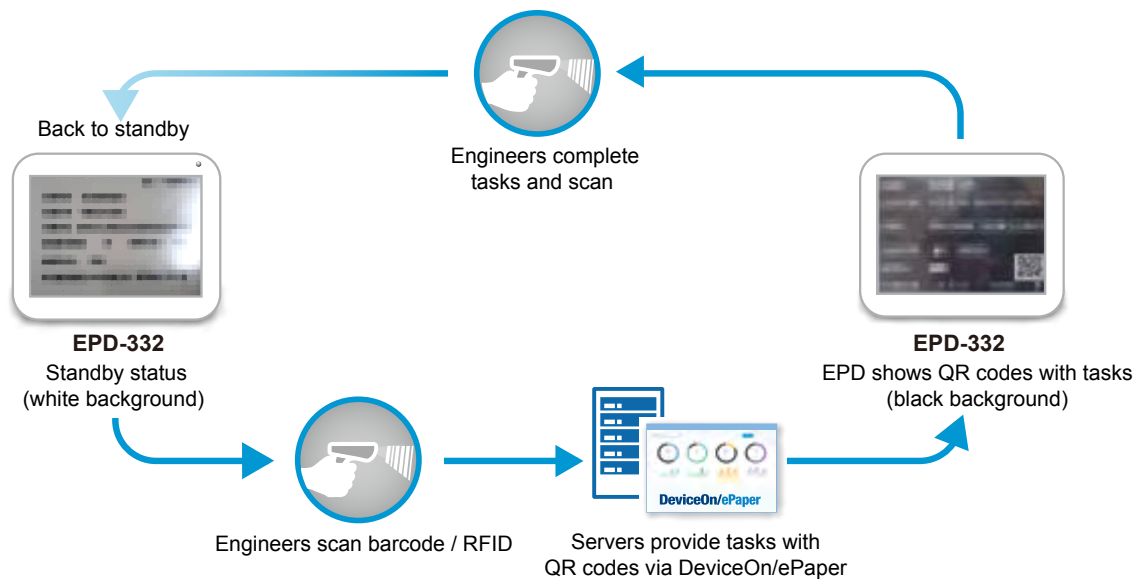
### Benefits

- Maintenance execution rate increased by 100%
- Dynamic QR codes help management track daily maintenance operations and whether engineers have fulfilled their work duties
- EPDs display maintenance records and manuals to minimize extra queries

### Device List

1. Deviceon/ePaper on the ARK-2250L
2. 20 WISE-3240
3. 200 EPD-332

## Why Advantech



Advantech developed its Wireless ePaper Solutions by leveraging over 30 years of experience to design a series of products that satisfy the needs of various industries. Once installed and activated, all EPDs automatically connect to the network without complex setup procedures. In this case, the EPD-332 is equipped with a built-in battery that supports many years of operation, eliminating the hassle of frequent recharging. Regarding software and hardware design, the EPD-332 has 4 key features that improve application flexibility. First, the solution has an LED indicator that acts like physical buttons that can be pressed to display the required information on the EPD. Second, using the RESTful API, system integrators can easily integrate other equipment into our Wireless ePaper Solutions. Third, DeviceOn/ePaper software features a visualization interface that allows systems integrators to simply drag and drop graphs for easier template design. This allows EPD images to be dynamically customized for different types of data. Finally, with DeviceOn/ePaper, users can remotely manage the EPD devices and upgrade the firmware at no additional cost.

With the growing ubiquity of IoT devices, Advantech's Wireless ePaper Solutions offer the advantages of simple installation, wireless control, ultra-low power consumption, and a user-friendly interface. They are set to become the next HMI solution for networked devices, enabling innovative, intelligent IoT applications for a wide range of industries.

# Increasing the Efficiency of Collaborative Robots



## Background

A collaborative robot, or co-robot, is a robot intended for direct human–robot interaction in smart factories. In contrast to traditional industrial robot applications, co-robots do not need to be isolated; in fact, communication among robots, systems, and humans is critical. Advantech's ePaper devices (EPDs) have been designed to automatically deliver manufacturing information, such as work orders, materials, and quantities. Operators can directly check the display on EPDs and easily place the correct materials on the co-robot for dispatch to production. This results in the accuracy during tight production, thus shortening production times.

## System Requirements

The customer required an EPD solution that could be easily integrated into their existing ERP or WMS system using a preconfigured API. The proposed system would need to display ERP system and manufacturing data and transmit it to EPDs in order to implement a completely automatic ePaper solution. EPD is easily installed without any wires. It prevents the robotic arms from any unnecessary damage. In this way, EPD can visualize information so that on-site personnel can easily check the working-orders and collect the accurate materials.

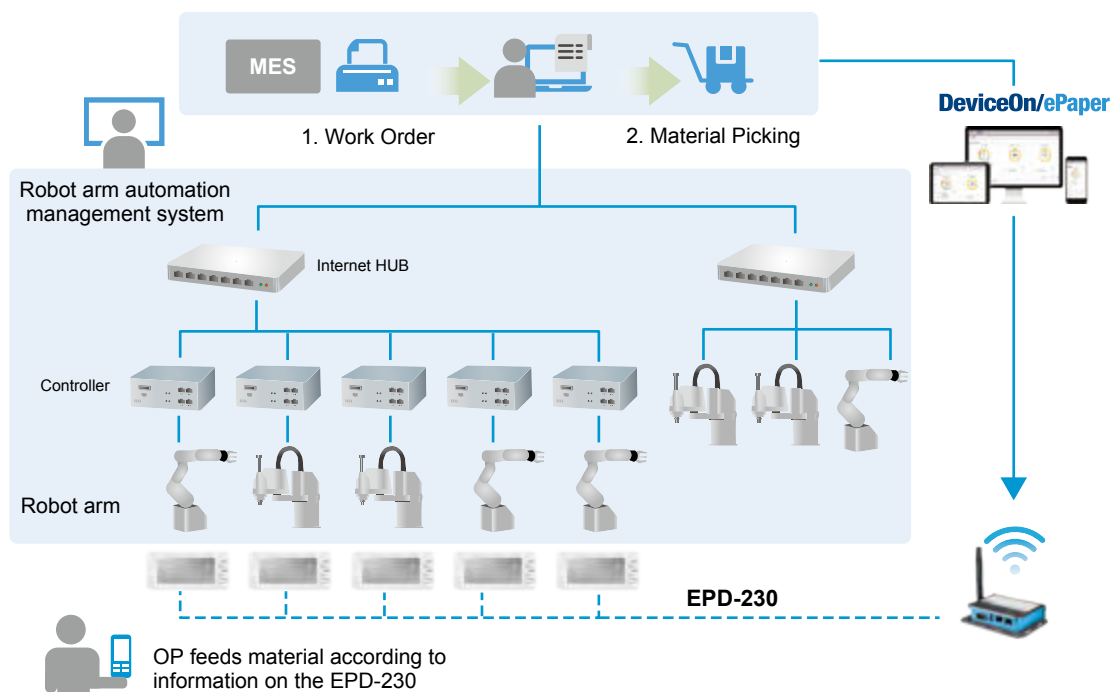
## System Implementation

The proposed Wireless ePaper Solution was developed with the DeviceOn/ePaper software at its core. This software can be customized to provide various IoT solutions for device management, including hardware, software, and peripherals. In this case, DeviceOn/ePaper was established for image generator, task scheduler, and event analytics; device management, and OTA tasks. The proposed total solution integrated DeviceOn/ePaper, network routers, and EPDs to deliver features including device roaming, two-way communication, and event log collection. It was also optimized for ultra-low power consumption and data retry. The complete RESTful API also made system integration much easier.



To control the co-robots in this case, DeviceOn/ePaper was integrated into the customer's WMS so that production staff could input working orders in order to obtain the required packing materials. The EPDs then show the relevant part numbers and quantities for operators to pick. After the materials are picked, their barcodes are scanned and the WMS automatically deducts the quantities from inventory. This makes it easier for stock managers to control materials and track errors from detailed device logs. To help monitor the material status, the EPDs can indicate the stock status; when stock levels are below a set threshold, this is indicated in red so that operators can be flagged to inspect the work orders to avoid any production lines from being stopped. The EPDs realize human—robot communication via visualization of picking, packing, and production information, all with an ultra-low power consumption setup.

## System Architecture



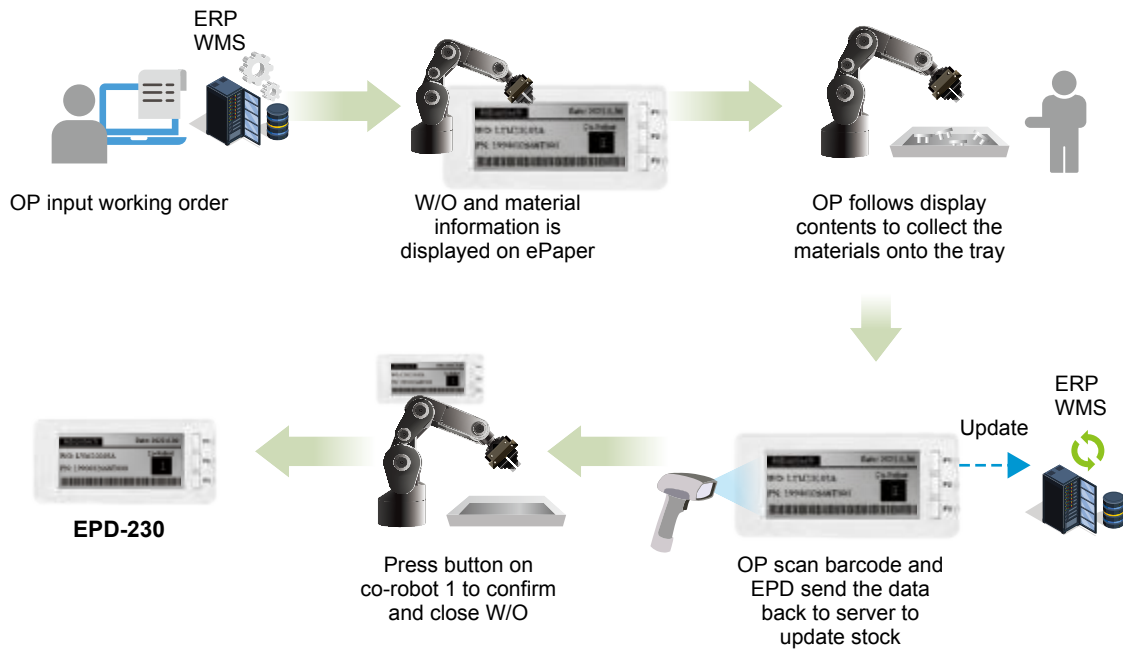
### Benefits

- Integrates easily with current production management systems to help control work orders and materials
- Enhances production management for increased efficiency and fewer human errors
- Shortens flow times to improve production capacity
- Green product design boosts environmental awareness at factories
- Collaborative robot application makes up for shortages in both human resources and machines

### Device List

1. DeviceOn/ePaper on the ARK-1123
2. WISE-3240
3. 50 EPD-230

## Why Advantech



In contrast to other price tags, Advantech DeviceOn/ePaper software is a perpetual license. Users can either purchase our hardware with first 500 connection licenses or go to Advantech marketplace to subscribe its package. Users could perform device management upon receiving and apply various application-ready APIs to integrate with their existing solution. Advantech EPD-230 is a place-and-play design which could be easily installed in the field site without wires. The most important is its battery life time is up to 50,000 times of image updates, which greatly helps reduce manpower in production process. After EPD-230 being installed, operators can rely on it to put materials onto the tray without printing paper or handheld device inquiry.

In fact, Advantech's ePaper devices have been comprehensively tested to ensure they meet industrial requirements, and they have been successfully implemented in various applications, including warehouses, production lines, meeting rooms, hospitals, and bus stops.



# Integrating Seamlessly into a Multi-System, Multi-Site Factory



## Background

The Taiwan Optical Lens Factory has three factory buildings in the same area. Their working steps in the past are as following.

1. When a work order is received, warehouse operators print out the materials listed on the work order.
2. Warehouse personnel then need to locate all the materials by manually reading the labels on inventory boxes, and then move the boxes to the production line of the relevant factory area.
3. Production workers then start work following the work order and listed materials.
4. Once this process has been completed, a new label is printed and pasted back on the material box, and then the work order status is printed separately. The trolley is then sent to the next station.

This means that information becomes available to each department only after the previous step in the workflow has been completed and the work order has been passed onto next station. Furthermore, having to rely on manual and printed data introduces room for errors and consumes human and material resources. In fact, the factory needed the solution to track and view all work orders with material information without any paper work.

## System Requirements

The EPD-230 ePaper Solution needed to sync visualization, verification, and stock information in real time. As a leading supplier in mobile's supply chain, the customer has around 5000 storage bins that needed to be coordinated using a system that accounted for visualization, EPDs, and RFID. The solution to facilitate picking materials and automatically updating stock levels via the DeviceOn/ePaper software. In addition, each trolley was to be fitted with around ten EPD-230s, all of which needed updated images once ever 1–2 minutes.

There are 2 systems and tagrets that needed to be intgrated with the EPDs. First was the WMS, because the customer required an automatic picking process. The EPDs and LED can assist with making the picking process more efficient and accuate. Second was the RFID system used in the producton process, where RFID signals were to be used as a trigger for the EPDs to update their visualizaiotn for operators to easily verify and follow work orders.

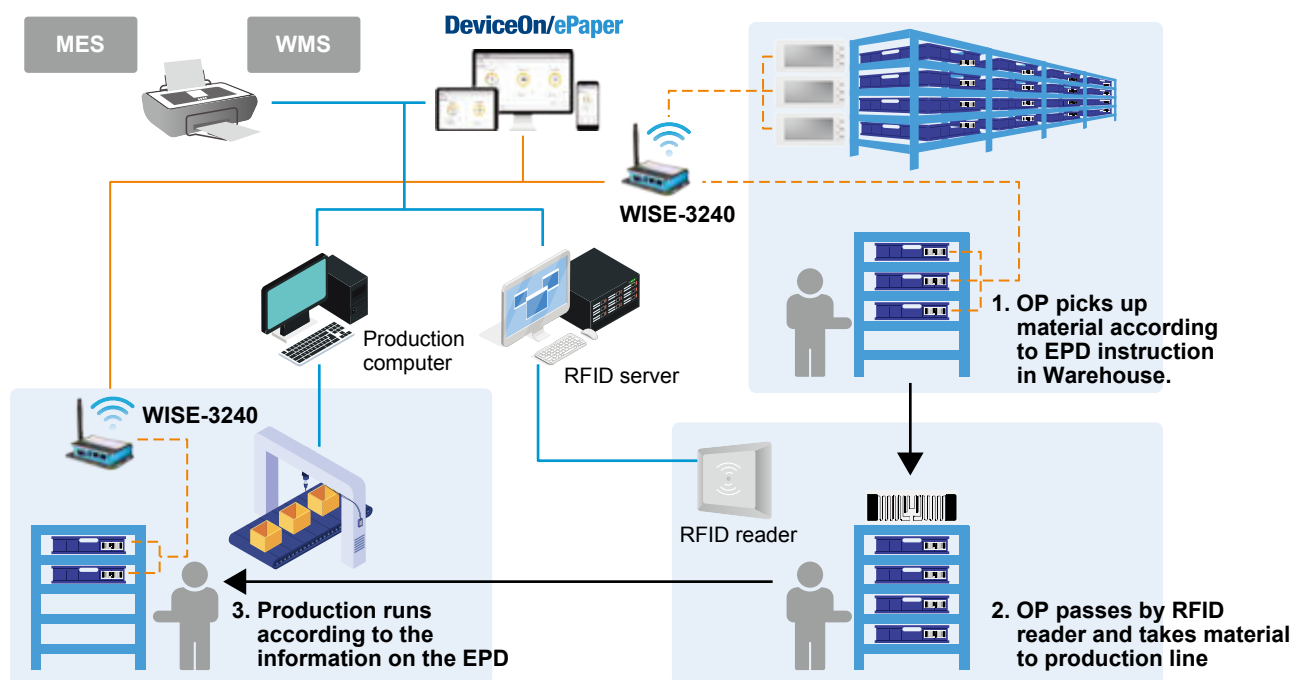


## System Implementation

In the warehouse, it already had a RFID label on material boxes. This meant we could use the same boxes to embed the EPD-230 in hardware improvement. For the SW development, system can bind the RFID to MAC address of EPD-230 for material management. When the working order is issued, EPD shows the picking information on material box. Operator collects according to EPD instruction, and then pass by the RFID reader gate to production line. ERP will deduct the stock due to the detection of RFID. In production lines, MES sends out the WIP process to DeviceOn/ ePaper and EPD will be updated automatically after WIP job are completed.

Moreover, the proposed solution augmented the current system by adding a visualization feature that allowed on-site personnel to clearly understand the steps and work items that need to be executed.

## System Architecture



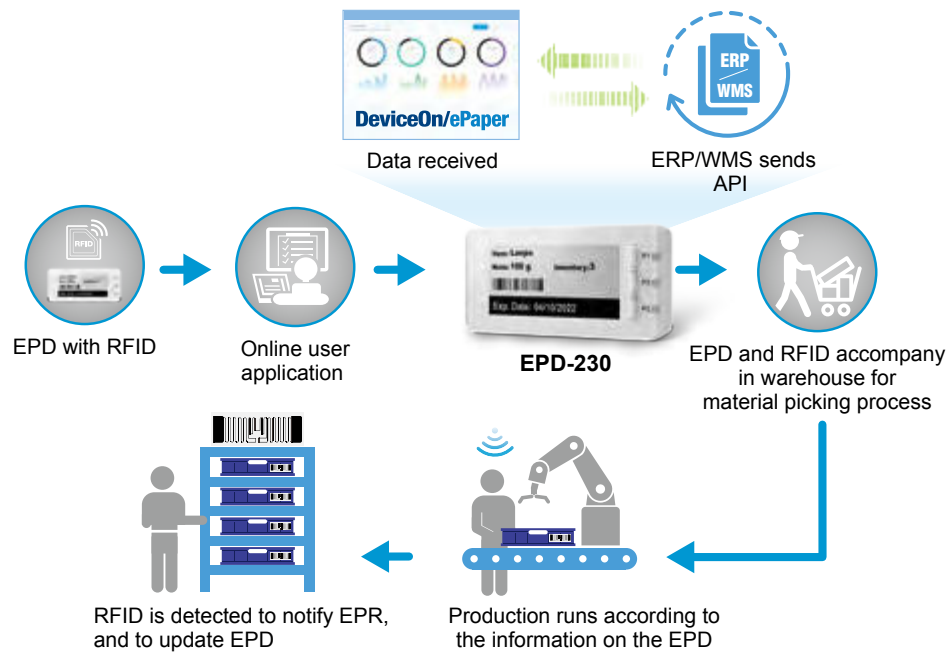
### Benefits

- Combines with RFID to show material processing/stock status in real time
- LED indicator and pick information are visualized to help improve the picking process
- Sleeping duration is adjustable for different scenario to have quick response

### Device List

1. DeviceOn/ePaper on the ARK-2250L
2. 50 WISE-3240
3. 5000 EPD-230

## Why Advantech



Advantech's Wireless ePaper Solutions provide hardware and software-integrated systems for wireless EPDs, routers, and servers. DeviceOn/ePaper can accelerate implementation in a wide range of applications, such as signage in smart warehouses, factories, and public spaces. The DeviceOn/ePaper software package enables easy management of entire systems, either locally or remotely and across different network protocols. System integrators and developers can focus on their own application development to control EPDs by using the RESTful API to integrate them easily into DeviceOn/ePaper.

Initially, the customer tested using 2 commercial brand price tags. Later, they encountered several problems:

1. The commercial price tag could not sustain the stress test, experiencing downtime within about 2 weeks.
2. Application needed a flexible API to construct different scenarios, but the price tag did not provide.
3. The signal from the some price tags would overlap, meaning that the RFID readers in the field cannot be used at the same time.
4. The commercial platform did not have a user-friendly interface or allow users to design their own layouts. Users also needed professional programmers to help manage the system.
5. The battery life varied greatly unless expensive Japanese batteries were used and pretest with stringent criteria.
6. When the price tag were moved into different areas, it would go off-line and lose its real-time connection with the router.
7. The wake-up price tag mechanism could not be adjusted immediately.

After one year of testing Advantech's solution, the error rate currently stands at only 1 in 10,000, demonstrating the advantage of Advantech's solutions, which can bring to any project to accelerate the automation process with ESG concept.

# Meeting Room and Work Space Management



## Background

With ongoing advancements in IoT, smart buildings are becoming increasingly more prevalent in society. Before the COVID-19 pandemic, the conversation on smart buildings largely centered around smart meeting rooms with integrated digital signage. Solutions were primarily designed to help organizations better manage and use their office spaces. However, the pandemic has given rise to other features in smart buildings, including shared work space and video conference suite management. Because people no longer stay in the same work space all the time, new challenges have arisen regarding how to more efficiently manage work spaces.

Advantech's ePaper Solution Suite includes an agent that works with Microsoft Outlook, Office 365, and Google Calendar. This can help IT departments for system integration effortless. With product fixture, Advantech's ePaper Solutions can be easily mounted on meeting room doors or wall, work spaces, or VCS doors. With a smart battery design and effective power management, ePaper devices (EPDs) can work for years without needing to be recharged.

## System Requirements

- An interface for the visualization of meeting room resources so that workers can easily locate meetings or work areas.
- An easy way for workers to book a meeting room or workspace, either online or from a physical device
- A solution that can be integrated with the existing meeting room management system without requiring additional software development effort

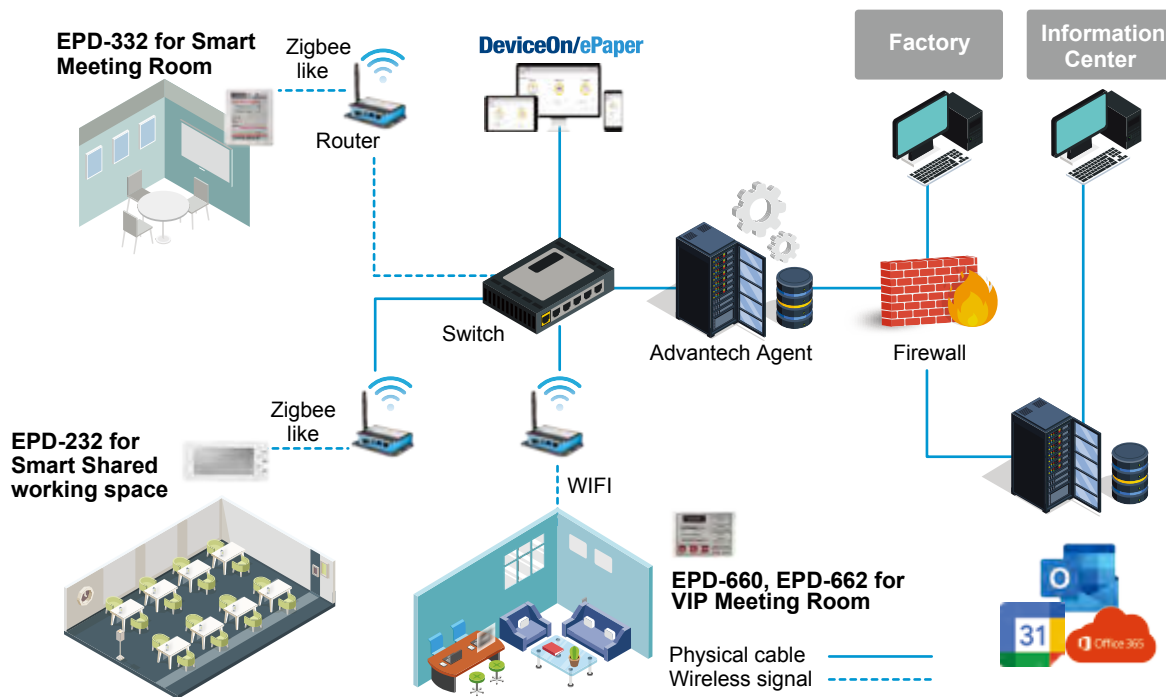
## System Implementation

We installed EPD-332 ePaper device in over 30 meeting rooms so that employees could easily check for any reservations and monitor the usage of all rooms. The EPD-332 comes with an Outlook Exchange and Office365 Calendar agent to acquire reservation data for display. (An agent for Google Calendar is also available.



## System Architecture

Because of the COVID-19 pandemic, some people no longer work in their offices all the time, with many companies arranging shared working spaces with EPD-232s installed for employees to use. Since some employees no longer have a fixed work station, they need to book a seat for certain work days. The EPD-232 can display the booking status and is easy to find with its LED indicator.



### Benefits

1. Paperless process for greener working conditions
2. Easy to verify booking owners
3. ePaper displays the booking status for daily schedules
4. High stability and performance to support real-time processing
5. Real-time employee online information management

### Device List

1. DeviceOn/ePaper on the ARK-2250L
2. 10 WISE-3240
3. 30 EPD-332
4. 50 EPD-232



## Why Advantech



Advantech's ePaper solution makes it possible for customers to book rooms via Microsoft Outlook Exchange, Office365, or their personal Google Calendar. The EPD-230, EPD-232, EPD-332 and EPD-662 require low maintenance and can help save time finding meeting rooms or work spaces in an office.

The EPDs can display detailed information about how meeting rooms, work spaces, and other resources are actually being used. Diversified products with integrated services, whether they're from small sizes with ultra-low power saving or large sizes with easy-to-install Wi-Fi EPD, or from color ePapers, Advantech will provide a full range of products for customers to choose from.

Advantech's extensive experience and achievements in IoT and smart buildings can help customers quickly create stable solutions. Many of Advantech's smart buildings and relevant applications are currently in use at the Linkou Smart Park, including equipment monitoring, smart conference rooms, smart conference cabins, smart bus stops, smart street lights, and more. Our solutions can be integrated into various platforms such as Microsoft Outlook Exchange, O365, and Google Calendar. Furthermore, with its wide range of service bases around the world, Advantech is definitely an excellent partner for cooperation to develop smarter buildings.