

INDUSTRY

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Global Success Stories

# Enabling Industry 4.0 with Advantech

From many years, Advantech has applied Industry 4.0 practices in its manufacturing centers. Advantech's Industry 4.0 journey began with equipment connectivity and process visualization solutions, and continues with optimization processes and cloud connectivity. Data is the key to improving efficiency in all of Advantech's smart factories and the Industry 4.0 situation room is the factory's

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nerve center where data is collected, analyzed, and visualized for real-time management and data-driven decision-making.

Advantech is an avid user and provider of Industry 4.0 solutions. We provide value-added products, solutions, and services that help customers to implement smart factory processes and experience the benefits Industry 4.0 efficiencies bring. In our experience, we have

found that hardware/software integration is a major bottleneck for system integrators. Accordingly, we actively seek partnerships so that the products and services we offer really help system integrators adopt Industry 4.0 practices more easily.

By working together we are committed to the performance and success of your business in the future of Industry 4.0.



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## Pharmaceutical Industry

*Advantech Industry 4.0 Solutions, Excellence in Pharmaceutical Manufacturing*

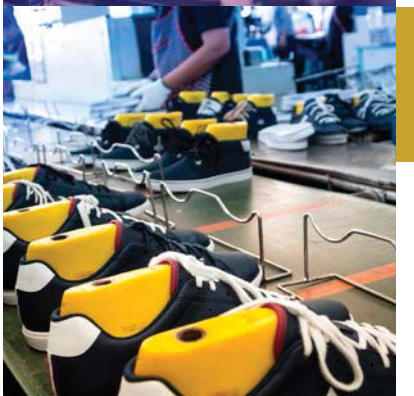
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A large orange industrial robotic arm is the central focus, positioned in a factory setting. The arm is complex, with various cables and mechanical components visible. In the background, another robotic arm is visible, and the factory floor is filled with industrial equipment and structural elements like steel beams and overhead cranes. The lighting is bright, typical of a large industrial facility.

# Maximizing Productivity

The Era of Industry 4.0 marks the redefinition of manufacturing processes for the automobile industry. Together, Advantech and Industry 4.0 will deliver greater efficiency, reduced overhead, and increased productivity.

# Automotive Industry



***Advantech Integrated  
Industry 4.0 Solutions,  
the Key to Automotive  
Manufacturing Profitability.***



# SEEING is BELIEVING

## Simple Process Visualization Solutions for Automotive Production Lines

Advantech's WebAccess/CNC technology provides enhanced production line efficiency through seamless data acquisition and visualization

### Overview

- Japanese auto parts manufacturer
- Automotive industry

### Challenge

- Data acquisition and visualization of production lines

### Solutions

- WebAccess/CNC
- Equipment connectivity
- Process visualization

### Benefits

- Single package data integration
- Reduced engineering time
- Increased dashboard visibility

The production lines of parts manufacturers for major automotive brands require cutting-edge precision and coordination. Timing is critical to maximizing their productivity, and maintaining quality control relies on a complex chain of robotic arms, sensors, and other instruments working seamlessly.

One parts manufacturer in Japan recently faced a specific problem hindering the coordination of their production lines; namely, the inability to efficiently collect and visualize data from their FANUC CNC machines. The company needed a means of easily collecting and displaying data on power and air consumption as well as grinding wheel wear, which were to be used for machine analysis. However, the manufacturer's in-house operations and IT engineers lacked the time and knowledge to establish an effective strategy.

### **WebAccess/CNC: A Solution for Seamless Integration**

Advantech's WebAccess/CNC is a software solution for the networking of CNC machines. In the case of this parts manufacturer, WebAccess/CNC allowed

for the integration of the manufacturer's entire data acquisition solution into a single package. WebAccess/CNC provides major CNC and I/O device monitoring capabilities as well as support for a range of protocols that enable the connection of common industrial devices and PLCs.

Advantech provided an end-to-end solution that included WebAccess/CNC, an UNO-2483G high-performance automation computer, an EKI-5528I 8FE unmanaged Ethernet switch, ADAM-4000 series I/O modules, and an FPM-7151W industrial monitor, thus delivering a complete package that enabled the manufacturer to realize real-time information management and status visualization from any of its FANUC CNC machines, QR code readers, and related sensors. This resulted in a more streamlined and extensive process control.

### Maximizing Efficiency and Enhanced Dashboard Visibility

Advantech's WebAccess/CNC also brought the manufacturer significant savings in terms of engineering time. Broadly speaking, the software platform allows for the real-time monitoring of the connection status, operation mode, alarm status, availability, and equipment cycle times of any connected CNC machines. A more specific example is the manufacturer's need for grinding wheel wear data; WebAccess/CNC achieved this via real-time monitoring of spindle loading, which facilitated the rapid analysis of tool wear and rendered the process of identifying any damage more efficient.

Another feature serving to maximize CNC efficiency is the system's CNC alarm feature, which provides specific alarms from CNC records; this can serve as a crucial reference for machine maintenance, aiding the manufacturer's in-house engineers and line workers with foreseeing potential problems before they arise, thus preventing unnecessary machine downtime for repairs. Also assisting to achieve this end, the maintenance configuration interface provides basic preventive maintenance functions and manufacturer contact information in the event that any assistance is required.

The clear visualization of critical data is not limited to a single command center or monitor; rather, Advantech's

WebAccess/CNC solution dashboard display is available to individual production line workers, further aiding in enhancing productivity. For example, tablets and other mobile devices can be set up to have dashboard access, allowing the remote monitoring and adjustment of production status.

### Simple Solutions for Complex Problems

In summary, production lines involve complex interactions among sophisticated machinery and technology; while such systems are necessarily complex, the solutions to problems involving production lines do not need to be. By providing the manufacturer with a fully integrated software/hardware package, Advantech quickly solved their data acquisition and visualization problems, enhancing their productivity by simplifying their CNC machine engineering and maintenance needs.

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**Complex needs**  
**Simplified solutions**  
**Enhanced productivity**

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## Product Solutions

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**WebAccess/CNC**

CNC Machine  
Monitoring Solution



**UNO-2483G**

Intel® Core™  
i7/i3/Celeron®  
Regular-Size  
Automation Computer



**FPM-7151W**

15.6" Industrial Monitor  
with Projected  
Capacitive Touchscreen



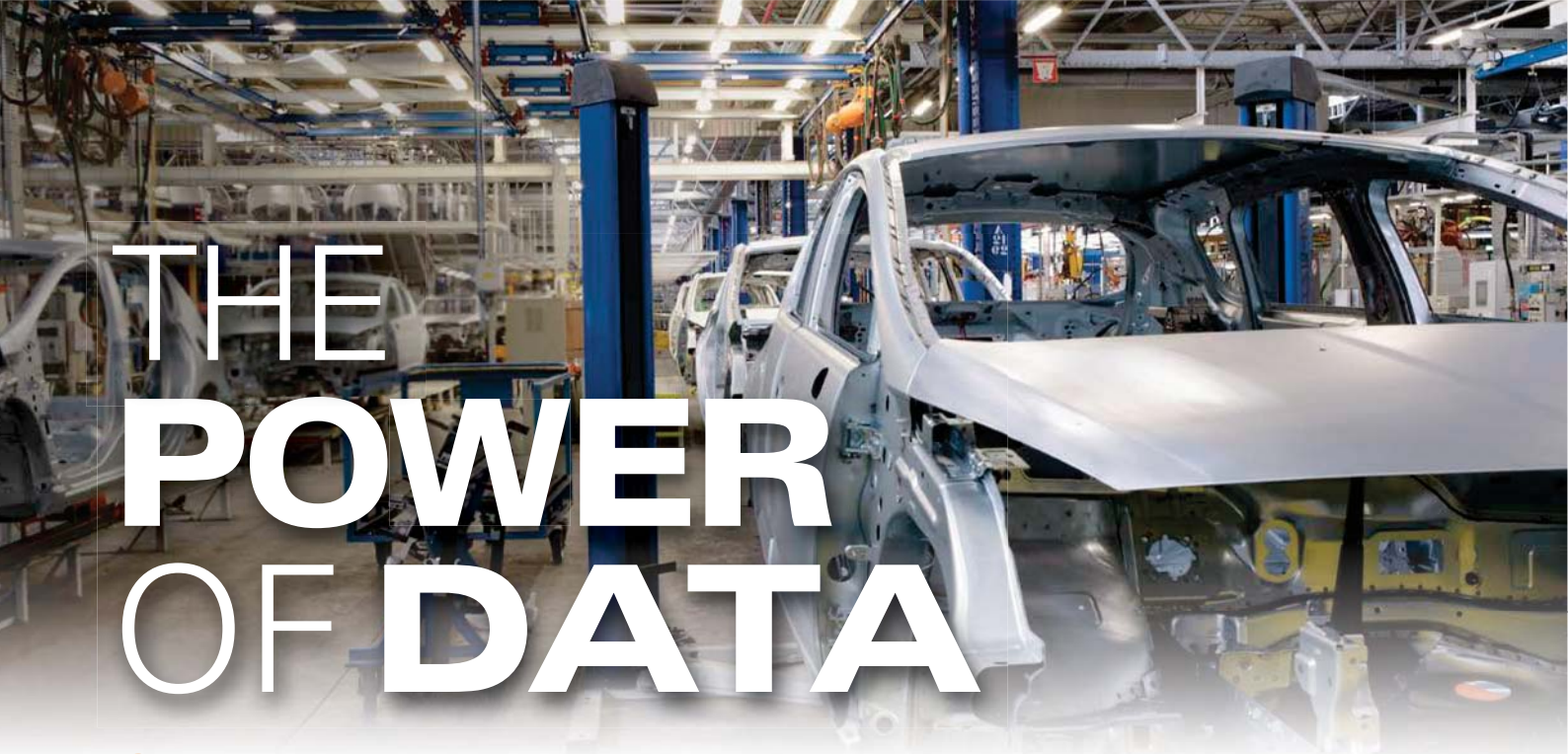
**EKI-5528I**

8FE Unmanaged  
Ethernet Switch  
ATEX/C1D2/IECEX



**ADAM-4000 Series**

RS-485  
I/O Modules



# THE POWER OF DATA

## Cutting-Edge Asset Management Solutions for Maximized Efficiency

Advantech's WebAccess/SCADA technology optimizes production line efficiency through seamless data acquisition and visualization

### Overview

- Italian software solution provider

### Challenge

- Supports a range of different equipment and machines

### Solutions

- WebAccess/SCADA
- Asset management
- Energy management

### Benefits

- Excellent return on investment
- Reduced production waste
- Energy saving

### Net Surfing

With an increasingly competitive global marketplace, major

auto parts manufacturers require that their production lines exploit every available technological innovation to ensure that they maximize their value and efficiency. Auto production lines, however, are highly complex; they rely on the seamless coordination of a complex chain of robotic arms, sensors, and other instruments, such that building upon their existing infrastructure requires a high level of expertise and understanding of relevant technologies.

Recently, an Italian manufacturer of transmissions, engines, drivelines, and fasteners sought to develop a company-wide optimization program aimed at enhancing the asset management and energy consumption of their existing machinery and infrastructure by improving the condition monitoring process and obtaining the scale to manage overall equipment effectiveness. Through close cooperation with Net Surfing Srl, our new WISE-PaaS Alliance VIP partner based in Italy, we determined that the parts maker required an open technology solution for data acquisition and monitoring. A critical requirement was that it had to support a range of different equipment and machines such that no existing hardware would need to be replaced. Furthermore, the system would need to

be user-friendly for operators, with an easy-to-use and intuitive dashboard that could be viewed on a range of devices including smartphones and tablets.

### **WebAccess/SCADA: Browser-Based Software for the Automation of Complex Industrial Processes**

The client began the optimization program by applying high-tech sensors on ovens and in compressor rooms in order to facilitate heat treatment and consumption analysis. Concurrently, to develop the desired predictive maintenance and energy-saving system, they also needed to acquire production data from other equipment and machines such as PLCs and dedicated counters (e.g., relevant physical parameters such as temperature, pressure, flow, and vibration levels). To bring all of this field data together in a meaningful manner, an IT asset management system was needed.

Advantech's WebAccess/SCADA, combined with the Infor EAM platform, provided the foundation for the overall solution. WebAccess/SCADA provides businesses with a browser-based software package used for supervisory control and data acquisition. The software facilitates intelligent analytics via the user-friendly HTML5-based dashboard. Users can quickly and easily create customized information pages by using widgets that show analysis charts and diagrams.

### **Open Interface for a Real-Time Database**

WebAccess/SCADA technology made the integration of the entire system possible, allowing for the acquisition and monitoring of energy consumption and production data from each piece of equipment, including data for the aforementioned physical parameters in addition to data on the compressor room, electricity consumption, cooling system, pumps, and so on. In summary, all of the critical information from the client's factory floor could finally be brought together

and visualized in a single intuitive platform.

In practice, with this optimized production process monitoring, the company was able to enjoy substantial energy savings and more easily implement regular production stoppages every 6 months for ordinary maintenance and repairs. They also gained the necessary knowledge to replace worn parts in advance before breakage, thus preventing costly unscheduled stoppages and thereby further enhancing production line efficiency. The system likewise lowered production waste while also making remote control of some machines (e.g., compressors) possible. Collectively, these outcomes improved the company's overall performance by 4%–5% without any replacement of existing machinery. Moreover, the system delivered an excellent return on investment; in fact, the system proved to be so beneficial that it was estimated that it would pay for itself within just one year.

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## **Maximized Efficiency Seamless Data Acquisition Fully Integrated Solutions**

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### **Simple Solutions for Complex Problems**

In summary, cutting-edge production lines require complex interactions among a wide range of sophisticated hardware and software, but while such systems are necessarily complex, the solutions to any production line problems do not need to be. By providing the manufacturer with a fully integrated software/hardware package, Advantech and its partner Net Surfing Srl quickly solved their data acquisition and visualization obstacles, enhancing the client's productivity by simplifying their production line optimization and maintenance needs.

## **Product Solutions**

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### **WebAccess/SCADA**

Industrial IoT Application  
Software Platform



### **ADAM-4570**

2-port RS-232/422/485  
Serial Device Server



# MAXIMUM MODERNIZATION

## How Advantech's Innovative Solutions Are Advancing Manufacturing in Thailand

By enabling seamless data acquisition and visualization, Advantech's WebAccess/SCADA technology is amplifying the production line efficiency of the nation's manufacturers

### Overview

- Automation system integrator in Thailand

### Challenge

- Equipment upgrade without replacing existing equipment

### Solutions

- WebAccess/SCADA
- Data acquisition

### Benefits

- Rapid deployment and cost-effective installation
- Operation efficiency improvement
- Data analysis for intelligent management



In Thailand's export-oriented economy, manufacturing is the primary driver of economic development and growth. However, although globalization provides increasing opportunities to sell Thai products around the world, it also fosters fierce competition between rival companies. In this ever more competitive market environment, manufacturers must leverage every innovation available to maximize the value and efficiency of their production lines.

Yet, most factories in Thailand have limited space for new equipment. Facilities also vary widely in terms of environmental conditions and the ease of adding new cabling. Moreover, with limited margins leaving little funding for infrastructure investments, most Thai manufacturers cannot afford to even replace existing equipment. Considering these constraints, an effective equipment monitoring system must be sufficiently compact and flexible to allow installation in diverse factory environments and to support a wide range of machinery and equipment.

IBCON Co., Ltd. is an automation systems supplier and systems integrator that assists Thai manufacturers with overcoming technical challenges, and Advantech's intelligent wireless monitoring solutions have proven critical to their ongoing success.

## Building Factories of the Future, Today

With more than 20 years of experience in Thailand's industrial automation industry, IBCON has gained considerable expertise in modernizing manufacturing infrastructure. Because most Thai manufacturers still conduct manual machine monitoring, IBCON sought to improve management efficiency by developing equipment monitoring systems capable of automatic data collection, which would then reduce maintenance costs and streamline workflows. However, rather than developing such systems on a factory-by-factory basis, IBCON wanted an off-the-shelf SCADA-based platform that could be applied to a wide range of factory environments and equipment. Along with integrated software and hardware, this solution needed to include wireless I/O modules for data collection in order to minimize wiring and installation time. A compact yet durable industrial computer was also required to serve as a gateway for transmitting data to the back-end control room.

Fortunately, Advantech had all the required solutions as well as the expertise to combine them into a single package that offers tremendous functionality and maximum versatility. Specifically, Advantech supplied its WISE-4050 wireless I/O modules, UNO-2473G embedded automation computer, and WebAccess/SCADA browser-based software to provide a platform solution that is easy to develop, configure, and deploy. Using this platform, IBCON was able to quickly design an innovative and cost-effective monitoring system that could be easily deployed in a range of factory environments.

### Massive Functionality in an All-in-one Package

Advantech's WebAccess/SCADA provides manufacturers with a browser-based software package for supervisory control and data acquisition (SCADA) operations. With the provision of a user-friendly HTML5-based dashboard equipped with extensive libraries and development tools for designing unique animated graphics displays, real-time data graphs, and data/alarm log reports,

WebAccess/SCADA also facilitates data analysis for intelligent management functions, such as scheduling control and trend analysis. Because the WebAccess/SCADA platform acts as a web server and can support up to 1,024 client devices without additional licensing, users can access the platform remotely via any browser or mobile device. This enables remote monitoring and control of all machines in order to further enhance productivity.

Advantech's WISE-4050 wireless I/O modules feature 4 digital input/output channels and are currently well-known wireless I/O modules available on the market. The inclusion of wireless modules in Advantech's platform solution allows IBCON to implement wireless data collection with RTC timestamps to ensure transmission accuracy and provide expansion flexibility.

Compared to conventional 4U industrial automation computers, Advantech's UNO-2473G has a relatively small form factor, reducing the amount of space needed for installation. UNO-2473G also features a rugged fanless design, wide operating temperature range (-20 ~ 60 °C), and rapid heat dissipation capabilities, making it well-suited for operation in harsh industrial environments. Considering these features, Advantech's UNO-2473G is ideal for IBCON's clients in Thailand, whose factories typically have limited space for new equipment.

### Simple Solutions for Complex Problems

For manufacturers and systems integrators such as IBCON, Advantech's intelligent industrial automation solutions offer substantial development convenience and efficiency by integrating wireless hardware with powerful software, reducing system complexity and streamlining installation. Modern production lines rely on complex operations involving multiple computers and industrial machines. Although such operations are highly complex, production line systems and solutions don't have to be. By providing Advantech's fully integrated WebAccess/SCADA software/hardware package, IBCON enables Thai manufacturers to quickly modernize their facilities in order to increase productivity, maximize profitability, and remain competitive in the global marketplace of tomorrow.

## Product Solutions



### WebAccess/SCADA

Industrial IoT  
Application Software Platform



### UNO-2473G

Intel® ATOM™ E3845/Celeron®  
J1900 Processor Regular-Size  
Automation Computer



### WISE-4050

4-ch Digital Input and  
4-ch Digital Output  
IoT Wireless I/O Module



# Scaling and Adoption Trends

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For smart factories, there is a crucial path to enhancing productivity and intelligent management — the ideal process visualization solution.

# Electronic Manufacturing



***Advantech Integrated Solutions,  
Sustainable Profitability  
in Electronic Manufacturing***

# SMALLER IS BETTER



## Production Management Solutions for Greater Manufacturing Precision

**WebAccess/SCADA & WISE-4000 series  
for seamless data acquisition and  
visualization**

### VETEC

Semiconductor and related equipment fabrication requires exacting precision and rigorous attention to detail. In fact, the manufacturers of such products must rely on clean room environments in which the temperature and humidity are strictly controlled and possible contaminants are eliminated to the utmost degree possible. The products themselves are highly valuable, so any production line problems that may occur, whether due to environmental issues, accidents, or equipment failure, can be extremely costly.

Recently, a semiconductor equipment manufacturer in Korea faced just such issues, which were compounded by their production managers' lack of clear information regarding production line status and the specific causes for any delays. Fortunately, by working with VETEC, Advantech's WISE-PaaS Alliance VIP partner in Korea, the manufacturer was able to initiate critical improvements to their production line monitoring, enhancing the production management and factory environment monitoring, while ensuring that potential problems are fixed before they get out of hand.

#### Overview

- Korean system integrator
- Semiconductor industry

#### Challenge

- Production line status monitoring and management

#### Solutions

- WebAccess/SCADA
- Process visualization

#### Benefits

- Production optimization
- Unexpected downtime avoidance

## Maximizing the Massive Power of Raw Data

The company's most critical need, in simple terms, was ensuring the ability to collect, visualize, and utilize critical data as quickly and efficiently as possible. However, their existing system lacked important capabilities needed to make this possible. For example, individual line workers had no means of quickly reporting production problems, and important information regarding the problems that did occur often went unrecorded, allowing them to reoccur with unacceptable frequency.

However, thanks to Advantech's cutting-edge asset management software, VETEC knew that they could provide a solution. First, VETEC installed Advantech's WebAccess/SCADA on the factory intranet. Next, tablets connected to the WebAccess/SCADA system were placed at key positions along the production line. Finally, Advantech's WISE-4000 wireless I/O modules were installed to provide real-time monitoring of key clean room environmental information.

## An All-in-one System for Seamless Integration

These solutions sound simple, but when used together, they yielded tremendous improvements. The WebAccess/SCADA software allowed production status information for each line worker to be linked directly to the SCADA server, which in turn allowed the production information to be recorded, processed, and analyzed to allow for comprehensive management of the entire factory's production status. With key information displayed on a user-friendly HTML5-based dashboard, the WebAccess/SCADA facilitated data analysis for intelligent management functions, such as scheduling control and trend analysis.

Better still, because the platform acts as a web server, the dashboard display was made available to individual line workers and managers out on the

factory floor via its connectivity to the WebAccess ThinClient tablets. Using the tablets, each line worker can quickly generate an alarm that is immediately sent to managers monitoring the SCADA system whenever any sort of emergency occurs, thus reducing response times for emergency situations. Furthermore, line workers are required to input the reasons for any stoppage, allowing managers to more efficiently identify problems that must be prioritized, in addition to potentially foreseeing potential problems before they arise, thus preventing unnecessary downtime for equipment repairs.

So, by including Advantech's WISE-4000 wireless I/O modules, VETEC's solution platform allowed the manufacturer to easily implement real-time data collection of key clean room parameters such as temperature, humidity, and dust, and ensuring that the use of air conditioners and other critical equipment can be precisely controlled, thereby avoiding unnecessary downtimes and reducing wasted energy.

## Simple Solutions for Complex Problems

In summary, semiconductor production lines require complex interactions among a wide range of sophisticated hardware and software, but while this manufacturing process is necessarily complex, the solutions to any production line problems don't have to be. For smart factory integrators such as VETEC, Advantech's intelligent industrial automation solutions offer substantial development, convenience, and efficiency by integrating key software and hardware components, reducing system complexity, and streamlining installation. Thanks to VETEC's expertise and Advantech's state-of-the-art solutions, Korea's semiconductor equipment manufacturers are already enjoying enhanced productivity, improved product quality, and better worker satisfaction.

## Product Solutions

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### WebAccess/SCADA

Industrial IoT Application  
Software Platform



### WISE-4000 Series

2.4 GHz IEEE 802.11b/g/n  
WLAN I/O Module

# BETTER *BY* DESIGN



## Software and Hardware Integration Delivering Key Precision Solutions

### Seamless data acquisition and visualization for EMS provider

For a top 15 EMS company headquartered in Singapore, global leadership is defined by the ability to provide unrivaled capacities in design and development, product and process engineering, and technical support for a wide range of complex, high-value products. With expertise ranging from mechanical and electronic systems design to regulatory compliance engineering and software design development, the company provides its partners and clients, which include leading electronics companies around the world, with best-in-class solutions to maximize the efficiency and value of their supply chains and operations.

As a leading supplier of technology services, this top 15 EMS provider ensures that its own suppliers offer premium capabilities for the solutions the company subsequently provides to its partners. Thus, when these partners required a reliable and efficient solution for consolidating and visualizing data from numerous surface mount technology (SMT) production line machines, the company knew exactly where to turn – Advantech. By providing a solutions package featuring Advantech's unrivaled asset monitoring technology, this top 15 EMS provider elevated their clients' production line operations to a new level of efficiency and precision, further underscoring the company's reputation as an industry leader.

#### Overview

- A top 15 EMS company headquartered in Singapore

#### Challenge

- Production status data collection and visualization

#### Solutions

- Equipment connectivity
- Process visualization

#### Benefits

- Solution ready platform for quick implementation
- Remote dashboard monitoring
- Production efficiency and quality control improvement

## Making the Most of the Data at Hand

The advanced technologies used in today's SMT production lines allow for unprecedented levels of automation and optimization. By proactively monitoring these assets, manufacturers can ensure maximum production efficiency through optimization and preemptive maintenance to prevent unexpected system downtime. Leveraging such capabilities, however, necessitates the correct data. Nonetheless, without effective access and visualization, the correct data has minimal value for production managers.

A number of the EMS company's clients encountered this issue. Specifically, although various sensors collected critical data from production line machines, the machine data was not consolidated in the cloud nor visualized to facilitate critical improvements to the production line and prevent costly interruptions. However, using Advantech's SRP-FPV220 and WISE-4000 solutions for data integration and production optimization, the top 15 EMS company could provide its clients with an asset monitoring solution for diverse production line facilities.

### Advantech's SRP-FPV220 Solution Ready Platform for Seamless Data Integration

Featuring Advantech's WebAccess/SCADA software, along with a suite of other functionalities, the SRP-FPV220 platform allows data from shop floor devices to be easily collected via various communication protocols, such as Modbus, OPC UA, and MQTT. The data is then used to generate automatic Excel reports of production activities. The platform's 100% web-based dashboard allows users to view visual production information, such as yield rate trends, equipment utilization, and downtime alarms, at any time via an HTML5 browser on any desktop or mobile device.

Meanwhile, Advantech's WISE-4000 series of

wireless sensing devices can be easily integrated with the solution-ready platform. These devices allow manufacturers to collect real-time data of key production line parameters for monitoring and precisely controlling operations in order to eliminate unnecessary downtime caused by equipment failures, while also reducing energy wastage.

### Simple Solutions for Complex Problems

Although electronics manufacturing involves complex interactions between an array of sophisticated production line hardware and software, production line problems



can be resolved with comparatively simple solutions. Leading technology services providers can recognize exceptional innovations when they see them, and they know that Advantech's industrial automation solutions offer substantial development convenience and efficiency by integrating key software and hardware components, reducing system complexity, and streamlining installation. Using Advantech's state-of-the-art technology, a leading EMS company is able to provide its clients with the exact solutions they require, keeping them and the company itself at the forefront of technological innovation.

## Product Solutions



### Equipment Connectivity Solution / SRP-FPV220

Preinstalled  
WebAccess/SCADA  
Pro. Runtime 1500 tags



Intel® Core™ i3  
Regular-Size  
Automation Computer



4-ch Universal Input and  
2-ch Digital Output  
IoT Wireless I/O Module



### WISE-4000 Series

2.4 GHz IEEE 802.11b/g/n  
WLAN I/O Module

# LEADING *THE* PACK



## How Elite Semiconductor Solution Providers Stay Ahead of the Game

**Advantech's WebAccess/SCADA and WebAccess/CNC technology provide seamless data acquisition and visualization for even the toughest production line environments.**

### Overview

- Equipment provider headquartered in Malaysia
- Electronics manufacturing

### Challenge

- Monitoring CNC & AGV status

### Solutions

- WebAccess/SCADA
- WebAccess/CNC
- Process visualization

### Benefits

- Process visualization
- Quality improvement
- Productivity enhancement

Advantech products fulfill critical needs for countless manufacturing firms, including a worldwide leader in the supply of assembly and packaging equipment for the semiconductor and electronics industries. As the only company in the world offering state-of-the-art equipment for all major steps in the manufacturing process, this Advantech partner is unmatched in both the range of products it offers – including complete in-line systems for the microelectronics, semiconductor, photonics, and optoelectronics industries – and its degree of process expertise.

While maintaining its position as a leading provider of cutting-edge equipment, the firm also expects only the best from its partners and suppliers. So, when it needed to solve a critical problem in monitoring the status of CNC machines and AGVs in certain factory floor environments, the firm knew exactly where to turn. With assistance from Advantech's best-in-class equipment monitoring technology, the company found a simple solution to their clients' needs, underscoring its reputation as an industry-leading firm.

## Superior Equipment Monitoring in All Kinds of Environments

The production lines of semiconductor and electronics manufacturers require cutting-edge precision and coordination. Timing is critical to maximizing their productivity, and the maintenance of quality control relies on the seamless interaction of a complex chain of robotic arms, sensors, and other instruments. At the same time, various pieces of equipment must be replaced from time to time. As such, the use of wired technologies for equipment monitoring results in costly delays when equipment must be replaced, as any wiring must be painstakingly detached from the old equipment and re-attached to the new.

These drawbacks have been partly responsible for the rapid advancement in wireless monitoring technologies in recent years. However, even wireless technologies can face obstacles, such as high levels of machine-generated noise and heat, in certain factory environments, and these environmental factors can lead to difficulties in asset monitoring. For example, optimal Wi-Fi signals for wireless monitors may be required in order to overcome intense machine noise, whereas an inadequate network will hinder greatly a monitor's ability to efficiently collect and visualize data from factory equipment such as CNC machines and AGVs.

### An All-in-one Package for Real-time Data Integration

By combining Advantech's WebAccess/SCADA and WebAccess/CNC technology with other key Advantech products (such as the UNO-2483G, EKI-6331GN and ADAM-6250), the customer was able to offer its clients an asset monitoring solution for all kinds of factory environments. Advantech's WebAccess/SCADA provides businesses with a browser-based software package for supervisory control and data acquisition, facilitating intelligent analytic services through the use of a user-friendly HTML5-based dashboard. Meanwhile, the WebAccess/CNC platform allows for real-time

monitoring of the connection status, operation mode, alarm status, availability, and equipment cycle times of any connected CNC machines.

These software solutions, in turn, can be easily integrated with Advantech's hardware solutions such as the UNO-2483G, a fanless embedded automation computer with highly ruggedized embedded operating system. CNC machines connect with EKI-6332GN, a feature-rich wireless AP/Client that provides reliable wireless connectivity for industrial environments, and ADAM-6250, a digital I/O Modbus TCP module. The solutions monitor and analyze CNC machine uptime and the material racks for AGV usage.

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## Streamlined Installation Efficient Integration All-in-one Solutions

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### Simple Solutions for Complex Problems

In summary, the production lines for semiconductor and electronics manufacturers require complex interactions among a wide range of sophisticated hardware and software, but while these production lines are necessarily complex, the solutions to any production line problems don't have to be. As an industry leader, the customer knows quality when they see it, and they know that Advantech's intelligent industrial automation solutions offer substantial development convenience and efficiency by integrating key software and hardware components, reducing system complexity, and streamlining installation. With the assistance of Advantech's state-of-the-art technology, the firm provides its clients with exactly the solutions they need, keeping this global leader far ahead of the pack.

## Product Solutions

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**WebAccess/SCADA**

Industrial IoT  
Application Software  
Platform



**WebAccess/CNC**

CNC Machine  
Monitoring Solution



**UNO-2483G**

Intel® Core™ i7/i3/Celeron  
Regular-Size  
Automation Computer



**EKI-6332GN**

IEEE 802.11 b/g/n  
Wi-Fi AP/Client



**ADAM-6250**

15-ch Isolated  
Digital I/O Modbus  
TCP Module

# Intelligent Manufacturing

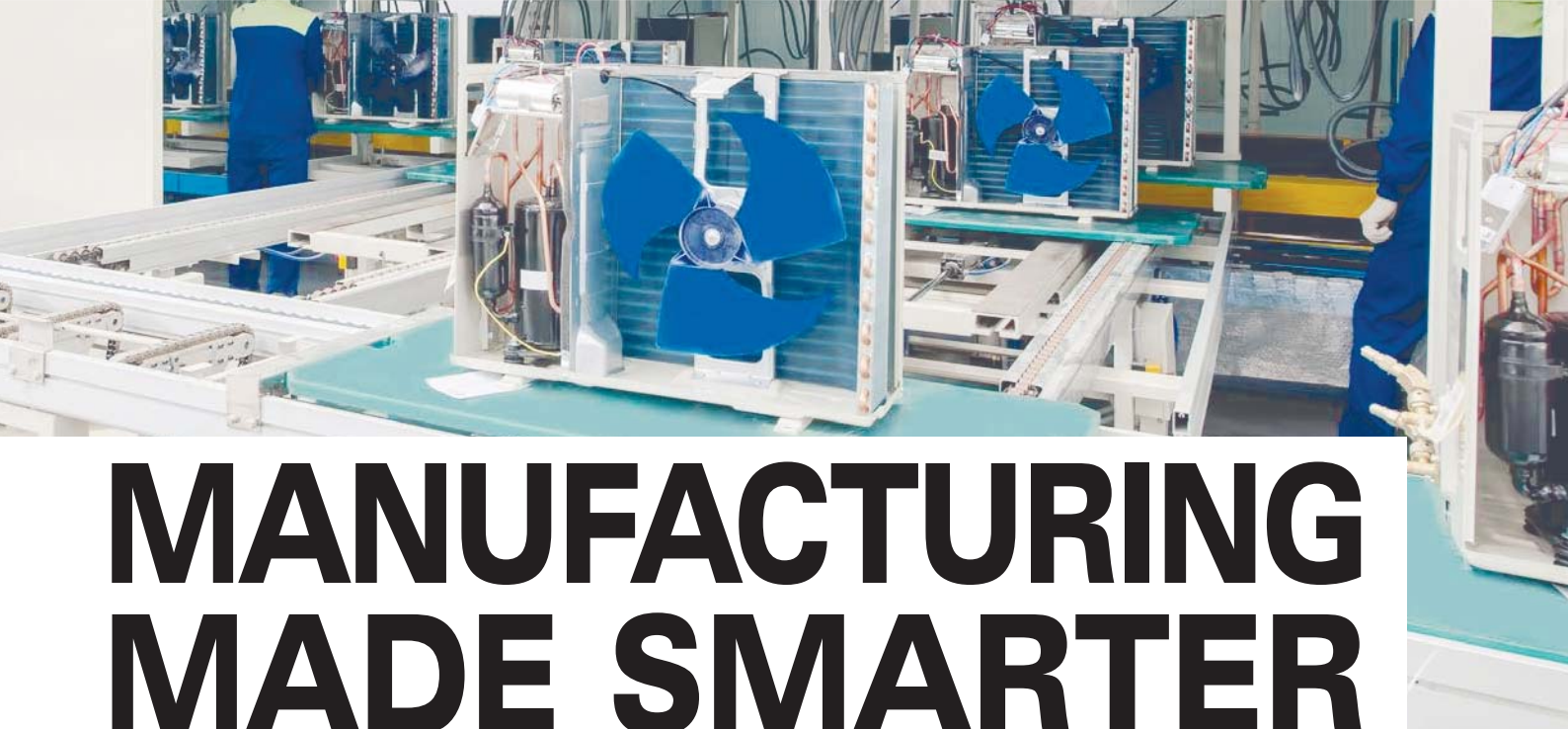
Advantech's intelligent industry solutions power the home appliance manufacturing transformation. Adapt the factory floor in real time to reduce system complexity, increase quality, and streamline operations.



# Home Appliance Manufacturing



***Efficiency  
Competitiveness  
Profitability***



# MANUFACTURING MADE SMARTER

## How Advantech's Machine Data Acquisition Solutions Take Manufacturing to the Next Level

Advantech's SRP-FEC220 and SRP-FPV220 solutions make machine monitoring and optimization easier than ever.

### Overview

- Home appliance manufacturer in Thailand

### Challenge

- Track productivity and key parameter of the process

### Solutions

- Equipment connectivity
- Process visualization

### Benefits

- Real-time machine control and production monitoring
- Costly downtime avoidance
- Data-driven process optimization

Staying on top isn't easy, especially in today's increasingly competitive global marketplace, and for one of the world's leading manufacturers of home appliances, maintaining an edge over the competition means working smarter, not just harder. Fortunately, Advantech's solution ready platforms, including the SRP-FEC220 and SRP-FPV220, constitute iFactory (intelligent factory) solutions that combine key hardware and software into a single package, providing this major manufacturer with unparalleled versatility and substantial cost savings.

As a leading provider of products ranging from air conditioners and filters to heating and ventilation systems, this Advantech partner must effectively monitor a wide variety of complex production lines. In modern manufacturing however, the production lines for even very different types of products share certain fundamental commonalities, such that by actively managing production line assets, whether through adjustments to coordination or the avoidance of costly downtime through preventive maintenance, manufacturers can ensure that production is optimized. So making the most of such capabilities means making every second count, and that's where Advantech's iFactory SRPs can make all the difference: every bit of data can help to ensure the fastest output possible, and Advantech's iFactory solutions make it possible for production managers to access and visualize all available data in a highly effective manner.

## Ensuring 100% Data Acquisition with Advantech's SRP-FEC220 Solution

In order to maximize equipment performance and reliability, production managers and engineers must make constant improvements through data analysis of machine operations, which allow them to adjust settings to ensure equipment coordination while limiting power consumption. However, the data provided by various production line assets is sometimes contradictory or otherwise unclear due to the sensors, meters, or PLC controllers being limited in connectivity or because different devices from different vendors may each have their own proprietary protocols.

By combining the necessary hardware and software elements into a single comprehensive package, Advantech's SRP-FEC220 is easy and intuitive to configure, saving valuable time and effort while ensuring smooth and independent access to controllers. The platform equips production managers with 100% data acquisition by supporting 450 PLC communication drivers and utilizing self-defined communication protocols, plus a distributed digital I/O module to completely acquire controller status, temperature, humidity, and other sensor data. With pre-installed WebAccess/HMI, 1500 runtime tags, a 6-channel digital input, and 6-channel power relay Modbus TCP module, SRP-FEC220 substantially reduces engineering time through intuitive UI settings to rapidly covert protocols for a maximum of 15 different branded PLCs simultaneously. This can serve as a crucial reference for machine maintenance, aiding the manufacturer's in-house engineers and line workers with foreseeing potential problems before they arise, thus preventing unnecessary machine downtime for repairs.

## Working Smarter with Process Visualization Solutions

Advantech's process visualization solution, SRP-FPV220 lets production managers easily acquire all the data they need from shop-floor devices via multiple communication

protocols such as Modbus, OPC UA, and MQTT, and then automatically generates Excel reports of production activities. Its 100% web-based dashboard provides users with visualized production information such as yield rate trends, equipment utilization, or downtime alarms, available anytime on any mobile device supporting HTML5 browsers. Valuable information about field equipment, energy consumption, and environmental conditions can also be stored in the SQL database. Open APIs, such as RESTful SignalR, are also supported to facilitate integration with existing IT systems.

SRP-FPV220 provides real-time dynamic numerical value displays, pipeline and dynamic flow diagrams, bar charts, and histograms. Set up active alarm messages and even email alarms in order to be alerted to any problem and prevent others from developing. Increase the value of legacy equipment with multiple protocols conversion, while improving manufacturing efficiency through real-time production monitoring and machine status diagnosis. For one world leader in home appliance manufacturing, the SRP-FPV220 offers an unmatched asset monitoring solution for its production lines of their vast range of products.

## Simple Solutions for Complex Problems

Leading manufacturers know that Advantech's intelligent industrial automation solutions let them work smarter, not just harder, offering substantial development convenience and efficiency by integrating wireless hardware with powerful software, reducing system complexity, and streamlining installation. Modern production lines rely on complex operations involving multiple computers and industrial machines. Although such operations are highly complex, production line systems and solutions don't have to be. With Advantech's SRP-FEC220 and SRP-FPV220 solutions, global leaders can increase their productivity, maximize their profitability, and stay on top in the global marketplace.

## Product Solutions



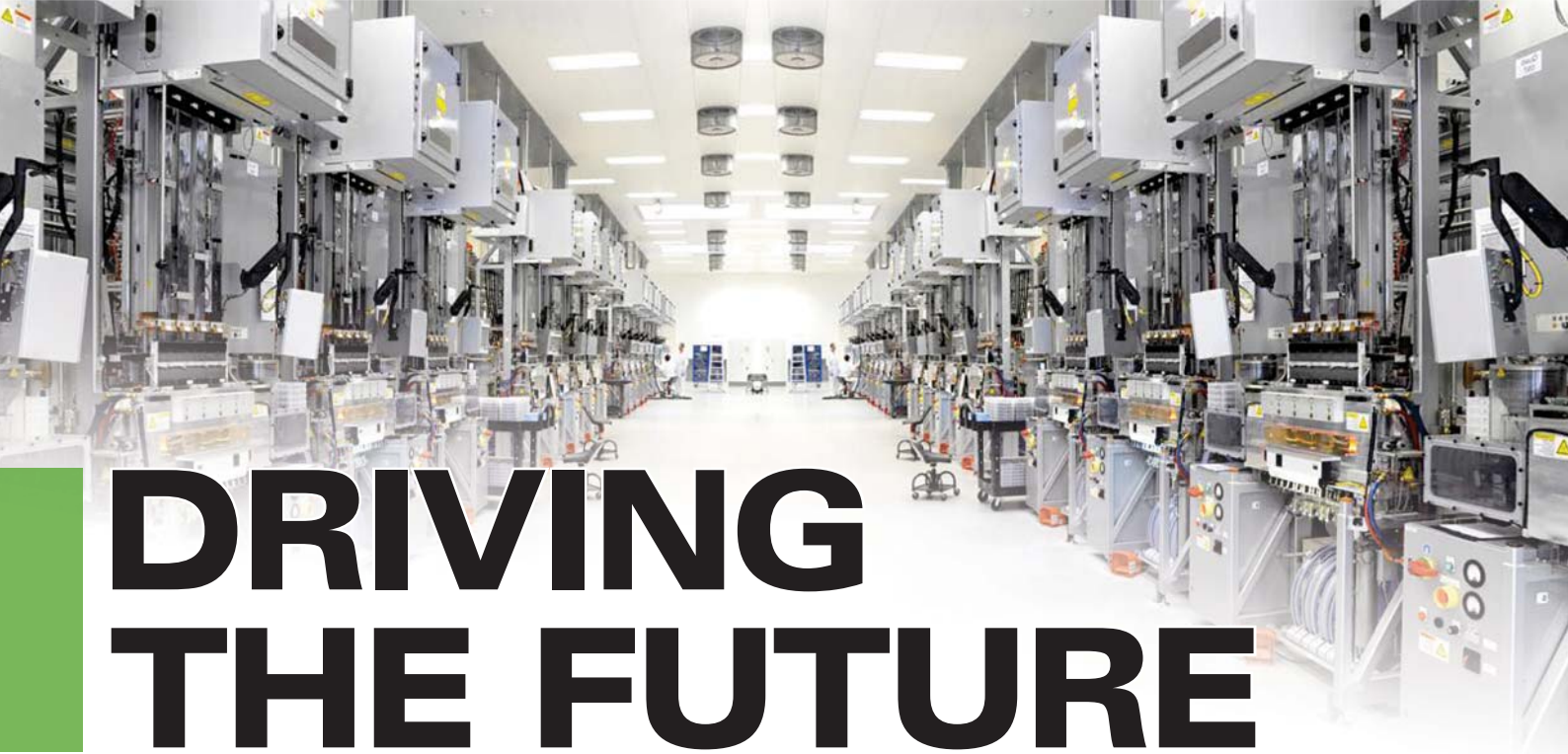
Equipment Connectivity Solution / SRP-FEC220

Pre-installed WebAccess/HMI Runtime 1500 Tags	Intel® Atom™ Pocket-Size Automation Computer	6-ch Digital Input 6-ch Power Relay Modbus TCP Module
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Process Visualization Solution / SRP-FPV220

Pre-installed WebAccess/SCADA Pro Runtime 1500 Tags	Intel® Core™ i3 Regular-Size Automation Computer	4-ch Universal Input 2-ch Digital Output IoT Wireless I/O Module
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# DRIVING THE FUTURE

## How Advantech's Innovative Solutions Are Spurring the Evolution of Manufacturing in Indonesia

Advantech's cutting-edge technology enhances production line efficiency through seamless data acquisition and visualization.

### Overview

- Indonesian manufacturer
- Home appliance industry

### Challenges

- Machine status and production monitoring
- Combine machine and robot in one controller

### Solutions

- Equipment connectivity
- CODESYS open control solution

### Benefits

- Real-time machine control and production monitoring
- Centralized machine control

Since 2009, a leading manufacturer in Indonesia has been providing key solutions to corporate partners from around the world, from Sweden and the US to Japan and Malaysia. With areas of expertise including machine design, material selection, and process design, the company provides its clients with best-in-class solutions to maximize the efficiency and value of their own products and operations.

As this young company strives to grow its reputation and competitiveness still further, it has to have only the best from its own suppliers. So, when it needed equipment monitoring solutions to further bolster the output of its production line processes, the company knew exactly where to turn. With assistance from Advantech's best-in-class equipment monitoring technology, the leading manufacturer found a number of simple solutions to their needs, ramping up their production line efficiency through seamless data acquisition and visualization using every innovation available to maximize the value and efficiency of their production lines. At the same time, the realities of global competition require manufacturers' budgets to be as lean as possible, leaving only limited funding for infrastructure investments. Considering these

constraints, an effective equipment monitoring system must be sufficiently compact and flexible to allow installation in diverse factory environments and to support a wide range of machinery and equipment.

Fortunately, Advantech offered all the needed solutions, as well as the expertise to combine them into a single package offering tremendous functionality and maximum versatility. Specifically, Advantech supplied its iFactory SRP-FEC210 CODESYS solution-ready platform, EKI-5526I unmanaged switches, ADAM-4571 and ADAM-4571L data gateways to provide a platform solution that was easy to develop, configure, and deploy. Using the same platform, cost-effective monitoring systems could be quickly deployed for use in a wide range of factory environments.

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## Remote Control Cost-Effective Data Accessibility

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### Flexible Functionality for the Future

Advantech's iFactory SRP-FEC210 is a complete application-ready platform that includes a high-performance Intel Atom® multi-core processor, fanless DIN-rail compact form factor, Windows® 7 Professional for Embedded Systems, and CODESYS control runtime and visualization software. By allowing users to easily achieve an open control solution, the SRP-FEC210 enables real-time PLC or PLC/Softmotion control with flexible Fieldbus options such as PROFINET, EtherCAT, EtherNet/IP, and Modbus TCP/RTU, in addition to providing data visualization in parallel on different HMI clients. The EKI-5526I provides 16 10/100Mbps Ethernet ports with memory buffers

that support store-and-forward mechanism, ensuring that all data is properly transmitted. The switch has a redundant power supply to prevent data loss should the first power input fail, as well as current overload protection to prevent damage.

Advantech's ADAM-4571 and ADAM-4571L are fast and cost-effective data gateways between serial and Ethernet interfaces that also provide remote management and data accessibility to RS-232/422/485 devices. The maximum transmission speed of the units is 230 kbps, ensuring high-speed data exchanges, and the devices also come with a Windows utility, allowing them to be easily configured without further programming. In addition to ensuring that current hardware investments are protected, these reliable units also ensure future network expandability, and since the protocol conversion is transparent, all existing devices could be seamlessly integrated within an Ethernet network. As such, the units could be used for various applications and purposes, including security systems, factory automation, transportation, and more.

### Simple Solutions for Complex Problems

For growing precision parts and furnace manufacturers, Advantech's intelligent automation solutions provide unparalleled development convenience and efficiency by integrating wireless hardware with powerful software, reducing system complexity, and streamlining installation. Modern production lines rely on complex operations involving multiple computers and industrial machines, and while such operations are necessarily highly complex, production line systems and solutions don't have to be. By providing a fully integrated software/hardware package, Advantech enabled one of Indonesia's leading precision parts and furnace manufacturers to quickly modernize their facilities in order to increase productivity, maximize profitability, and remain competitive in the global marketplace of tomorrow.

## Product Solutions

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### Equipment Connectivity Solution / SRP-FEC210

Preinstalled CODESYS  
SoftMotion & Visualization  
(Target & Web) Runtime

Intel® Atom™  
Quad-Core DIN-Rail PC  
4GB RAM, 128G SSD, MRAM,  
CANopen Microsoft® Windows  
Embedded 7 Pro



### ADAM-4571

1-port  
RS-232/422/485  
Serial Device Server



### EKI-5526I

16FE Unmanaged  
Ethernet Switch  
ATEX/C1D2/IECEx




## **Excellence in Productivity**

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**Leadership is investing in operational excellence. Advantech aims to transform advanced technologies into established practices allowing industry leaders to change key manufacturing performance measures.**

“

***Improving the Economics  
of Compliance***



# FUTURE OF PHARMA MANUFACTURING

**Advantech Industry 4.0 Solutions,  
Excellence in Pharmaceutical Manufacturing**

## Overview

- One of the biggest manufacturers in Brazil's pharmaceutical industry

## Challenge

- Automatic DAQ for ensuring production traceability without manual operations

## Solutions

- DAQ solution
- HMI solution

## Benefits

- 20% increase in production
- 8% cost reduction
- OEE improvement



Among the various types of manufacturers, pharmaceutical manufacturers may face the greatest requirements of all in terms of product quality and attention to detail. Drug makers must, above all, strictly maintain the quality and safety of their products, as the release of any low-quality products could adversely impact consumer health and severely damage their brands and bottom lines. Given these concerns and related concerns about the security of their data and production processes, pharmaceutical manufacturers have been slower than other manufacturers to embrace and fully realize the potential of IoT technologies. Nonetheless, the power of IoT-based asset management solutions to increase production line efficiency and profitability is undeniable, such that drug makers who fail to innovate, risk being left behind.

With roots dating back to 1936 and more than 3,600 employees, União Química is one of the biggest players in Brazil's burgeoning pharmaceutical industry. In spite of its long history and strong sales, however, the firm, like many other drugmakers, was being

held back by its reliance on outdated production methods. Specifically, the firm's managers found their production lines hampered by a low productivity and a lack of efficient quality monitoring, as well as a lack of remote connectivity enabling easy access to critical production line data. Fortunately, Advantech offered them the key solutions they needed to boost the firm's productivity and connectivity while enhancing quality monitoring.

### **Modern Innovations for a Conservative Industry**

One key distinguishing feature in drug manufacturing is the necessity of carefully documenting each step of the production process for compliance. These strict requirements spring, of course, from past concerns surrounding product quality and consumer safety. Historically, these requirements led pharmaceutical manufacturers to store production information in paper records for future reference, but this approach also made it difficult for production managers to make process improvements.

Modern data acquisition technologies, however, have increasingly rendered such past practices both obsolete and unnecessary. With smart production lines featuring IIoT-enabled solutions, drug makers can store and access critical data in real time in order to better monitor production processes, ensuring the increased visibility and integration of information, which in turn lets production managers make timely decisions to increase productivity while still ensuring product quality.

### **Faster, Smarter, and Safer Production with Advantech's ADAM-6250 and HMI Solutions**

Such changes, however, are far from automatic, but in Advantech, União Química found a partner with all the necessary expertise. Working closely

with Orange Pharma IT, Advantech developed an automatic data acquisition system to ensure product traceability without manual operations, while also enabling remote connectivity through a cloud computing system.

Advantech's ADAM-6250 digital I/O module and HMI operator interfaces formed the backbone of this enhanced data acquisition system. An ideal data acquisition device for the modern IIoT-enabled production facility, the ADAM-6250 offers daisy chain connection with auto-bypass protection, remote monitoring, and control with mobile devices, and group configuration capability for multiple module setups, in addition to a suite of other features. Advantech's HMI monitoring solutions combine high-performance panel PCs with low-power web terminals, making them ideal process visualization tools for monitoring workflows in smart factory production lines.

### **Simple Solutions for Complex Problems**

Advantech's data acquisition solutions have provided União Química with a better understanding of the performance and utilization of their production line equipment, including the ability to predict maintenance needs and prevent breakdowns. With these advantages, the drug maker has increased its productivity by 20% while reducing costs by 8%. The production lines for modern pharmaceutical manufacturing require modular automation for modular pharmaceutical production in order to scale production up or down according to market needs, all the while ensuring that product quality and consumer safety are never neglected. By providing União Química with a fully integrated IIoT-enabled data acquisition system, Advantech quickly solved the firm's data acquisition.

## **Product Solutions**

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**PPC-3150S**

15" Fanless Panel PC with  
Intel® Celeron® N2930 Processor



**ADAM-6250**

15-ch Isolated  
Digital I/O Modbus TCP Module



# FASTER & SAFER

## Advantech SRP-FPV240 ThinManager® Solution, Greater Quality Assurance for Enhanced Productivity

MES/ERP

ADVANTECH  
**WISE-PaaS**  
Edge Intelligence Platform

 **THINMANAGER**  
A Rockwell Automation Technology

### Overview

- FDA regulated pharmaceutical primary packaging container manufacturer in USA

### Challenge

- Centralized management of all production process in four manufacturing sites from HQ

### Solutions

- ThinManager® ready client
- Process visualization

### Benefits

- Easy deployment and maintenance
- Centralized management
- Advanced data security

The pharmaceutical industry is heavily regulated for obvious reasons. Above all, drug makers and associated manufacturers, such as pharmaceutical container makers, must maintain strict quality controls to ensure the safety of their products, as any faulty products could adversely impact consumer health, to say nothing of severely damaging the image of the company at fault. As such, the industry is typically a relatively late adopter of any innovative technology unless the said technology is directly aimed at ensuring regulatory compliance. However, the power of IIoT-based asset management solutions to improve production line efficiency and reduce costs cannot be denied. Therefore, firms that fail to innovate put their competitiveness at a substantial risk.

One producer of pharmaceutical packaging was experiencing the costs of outdated production processes firsthand. With four manufacturing sites to manage, corporate headquarters found the remote process increasingly unsustainable. To resolve the issue, the manufacturer required a means of centralizing the management of all process visualization applications so that key adjustments could be performed remotely at its headquarters, thus saving on the firm's limited IT resources while still ensuring the required traceability and regulatory compliance.

## IIoT Innovation for the Modern Pharmaceutical Product Manufacturer

Among the various types of manufacturers, pharmaceutical manufacturers may face the greatest requirements of all in terms of product quality and attention to detail. The drug packaging maker, for example, must adhere to strict FDA regulations aimed at ensuring consumer safety. Such regulations are critical, of course, but they have also made manufacturers in the pharmaceutical sector slow to realize the potential of IIoT technologies for making process improvements to production line efficiency.

Fortunately, with smart production lines featuring IIoT-enabled solutions, manufacturers can store and access critical data in real time to better monitor production processes, ensuring both increased visibility and integration of information, which in turn leads to increased productivity while still ensuring product quality. In light of these advantages, the manufacturer turned to Advantech's expertise in the field to solve their critical asset management needs.

### Centralized Asset Management with Advantech's SRP-FPV240 ThinManager-Ready Solution

In this case, the manufacturer needed a technology solution that could centralize the management of its assets while streamlining data visualization. To this end, Advantech's SRP-FPV240 was developed based on thin client options that are fully compatible with Rockwell Automation's innovative ThinManager® software. Through seamless integration with an existing MES and ERP, ThinManager allows users to manage all server applications and monitoring sessions from a single interface. With multi-monitor support, virtual screens, shadowing, session scaling, and screen tiling support, the software provides all the functions required to customize the presentation and visualization of data from multiple sources. ThinManager's capabilities make Advantech's SRP-FPV240 an optimal platform

for the building of scalable data management systems within smart factories. It streamlines thin client workflows and reduces hardware operations. SRP-FPV240 extends thin-client functionality and facilitates greater vertical integration through centralized management and plug-and-play support that improves reliability, security, and maintenance effectiveness.

In short, Advantech's ThinManager-Ready SRP-FPV240 provided the manufacturer with a range of important benefits. First, with centralized application management and deployment made possible at the company headquarters, the firm's limited IT resources are now better utilized. Second, this newly realized management capability also allows for the improved maintenance and validation of production processes while still ensuring the required traceability. Third, the thin client architecture of the SRP-FPV240 has greatly reduced the number of resources the firm must dedicate to the maintenance of its dashboard displays while still allowing these displays to show key production information throughout each plant and at the company headquarters.

### Simple Solutions for Complex Problems

Given its critical role in the lives and health of consumers, the pharmaceutical industry faces greater scrutiny and stricter regulatory oversight than manufacturers in almost any other sector. These strict product quality requirements make the modern production lines of pharmaceutical manufacturers even more complex with their wide range of sophisticated hardware and software components. However, while such systems are necessarily complex, the solutions to production line problems don't have to be. With Advantech's state-of-the-art asset management solution, pharmaceutical industry manufacturers of all sorts can keep pace with the technological challenges of the present, and ensure their competitiveness for the future.

## Product Solutions



**SRP-FPV240-AE**

AMD® Dual-Core T40E  
Small-size ThinClient  
HDMI\*1, DP\*1



**SRP-FPV240-01**

Intel® Atom E3815  
Pocket-size ThinClient  
HDMI\*1, USB\*4



**SRP-FPV240-02**

Intel® Celeron® J1900  
Dual Monitor ThinClient  
VGA\*1, HDMI\*1



**SRP-FPV240-03**

Intel® Celeron® J1900  
21.5" Stainless IP69K  
Panel ThinClient



**SRP-FPV240-04/05/06**

Intel® Atom E3827  
12.1"/15"/17" Panel  
ThinClient



# FROM FACTORY TO HOME

**With Advantech's PPC-3120S and EKI Solutions,  
Production Line Efficiency is Reaching New Heights**

## Overview

- Brazilian consumer chemical goods manufacturer

## Challenge

- Integration with MES and ERP systems to improve production and reduce maintenance cost

## Solutions

- HMI solutions
- Industrial communication solutions

## Benefits

- MES/ERP integration for production optimization
- Network performance and stability improvement
- Decrease in machine downtime

With a dizzying array of family, personal, and household care products, consumer goods manufacturers must maintain some of the most complex and high volume production facilities of any industry. Consumers worldwide spend millions of dollars annually on everyday consumer goods of all types, from soap bars and laundry detergents to fabric softeners, toothpaste, and disinfectants. Given such volumes, for one of Brazil's leading manufacturers of consumer goods, maintaining an edge over the competition means working smarter, not just harder.

For this particular Brazilian manufacturer, it was clear that they prided themselves on the presence of their products in the homes of all types of people, from consumers in big urban centers to the smallest Amazonian villages. In offering so many household goods, from multi-purpose cleaners to personal hygiene products, the firm must effectively monitor an extraordinary range of production lines while also maintaining rigorous standards of quality and efficiency. But thanks to the technical advances of modern manufacturing, the production lines for even very different products share

certain key similarities. As such, by actively managing production line assets, whether through adjustments to coordination or the avoidance of costly downtime through preventive maintenance, manufacturing can be sustained at optimal efficiency.

## Working Smarter, Not Just Harder

One key aspect of consumer goods manufacturing is the need to maintain the strictest standards for product quality. After all, these are products used to clean people's homes and even their bodies. As such, the sale of any low-quality products could adversely impact consumer health and spark a marketplace backlash. With these concerns in mind, manufacturers take great care to document each step of their production processes to ensure the very best product for their customers.

Fortunately, with smart production lines featuring IIoT-enabled solutions, manufacturers can store and access critical data in real time, in order to better monitor production processes, ensuring both the increased visibility and integration of information while still ensuring product quality. Of course, making the most of such technological advances is far from automatic, which is exactly where Advantech's HMI solutions and communication solutions come in. EKI and PPC-3120S solutions are the exact tools required to reduce machine setup times and limit maintenance requirements while still ensuring the highest levels of quality control.

## Seamless MES Integration with Advantech's PPC-3120S and EKI Solutions

Above all, manufacturers need to find an effective means of ensuring the integration of their MES, enterprise resource planning, and maintenance systems. Such integration can ensure improved machine availability, equipment homologation, and

production line management. Given the sometimes harsh and space-limited conditions of factory floors, the necessary solution would also need to feature a slim but robust design.

Advantech's EKI-2525 unmanaged Ethernet switch and EKI5626CI-MB protocol managed Ethernet switch offer X-Ring fast recovery (<20 ms) technology for improved network performance and stability. With features such as overload current protection and redundant input power supply design, the switches are ideal for harsh industrial environments. PPC-3120S, it is an ultra slim, fanless panel PC with a low power consumption Intel® Celeron N2930 1.86 GHz processor providing high computing performance. With a high durability design, including a true-flat touch screen with IP65 front panel protection and a die-cast Al Alloy enclosure, it supports two serial ports, three USB ports, and two GbE LAN ports to satisfy a wide variety of industrial applications.

## Simple Solutions for Complex Problems

While churning out an almost bewildering range of products at massive volumes, consumer goods manufacturers have fully recognized the need to work smarter, not just harder. While their production lines are necessarily dizzying in their complexity, the solutions to any production line problems don't have to be. With smart factory solutions from Advantech, this consumer goods manufacturer in Brazil has kept their production lines buzzing, even while maintaining the strictest quality control standards. Thanks to Advantech's HMI solutions and industrial communication expertise, manufacturing is keeping pace with the technological solutions of the present and continues the progress towards a sustainable competitive advantage and visualization obstacles, taking its productivity to the next level.

## Product Solutions

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**PPC-3120S**

12.1" Fanless Panel PC with  
Intel® Celeron® N2930 Processor



**EKI-2525**

5FE Unmanaged  
Ethernet Switch



**EKI-5626CI-MB**

16FE+2G Combo Managed Ethernet  
Switch Supports Modbus/TCP



# Optimizing Efficiency

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The advent of Industry 4.0 is spurring the evolution of shoe manufacturing. With Advantech solutions, traditional factories can rapidly transform into streamlined, high-output smart factories.

# Footwear & Textiles



***Enhanced productivity and  
profitability with Advantech's  
Industry 4.0 solutions***



# TRANSFORMING the TRADITIONAL

## Upgrading from Manual Transcription to Real-time Monitoring with Advantech's Industry 4.0 Capabilities

**Advantech's OEE solution helps Ching Luh Group deploy a real-time manufacturing visibility system**

### Overview

- One of the world's leading sports footwear manufacturers with manufacturing locations in China, Vietnam & Indonesia

### Challenge

- Automate collection of real-time production information from manual transcription

### Solutions

- OEE solution
- Manufacturing visibility system

### Benefits

- Saving time and money by replacing manual data recording method
- Process visualization for production optimization & quality control
- Real-time decision-making for cross-plant management



Almost everyone has at least one pair of sneakers, but most don't know that their shoes are produced through a manufacturing process nearly as complicated as that used to make smartphones. Following the approval of a new design, a variety of machines and technicians take part in a complex ballet comprising numerous processing stages, including cutting, sewing, molding, detailing, and more, such that a single pair passes through hundreds of steps before finally being delivered to a store for sale. Given all of these steps, shoemaking is a highly cost-sensitive industry, such that shoe factory managers have traditionally required working group leaders to keep close watch over their subordinates and equipment in order to reduce waste, product defects, and equipment downtime. In doing so, these managers would typically note abnormal conditions by hand and then enter that data into a computer system to serve as references for improving the process in question and preventing the recurrence of any problems.

Of course, this old-fashioned approach is extremely cumbersome and slow, preventing managers from having a firm grasp of the real-time production status, even as their handwritten records and manually entered data yield errors and inconsistencies regarding said status, hindering the ability to make meaningful improvements. Simply put, in today's fiercely competitive market with its rapidly changing customer demands, a shoemaker that

persists with this outdated approach risks devastation at the hands of competitors. With the advent of Industry 4.0 and associated smart factory technologies, shoemakers and other textile manufacturers must adapt or die, sink or swim.

## Think Outside the Shoe Box

In spite of the dire consequences for late adopters, many footwear manufacturers are traditionalists. Unlike the makers of high-tech products such as smartphones, they do not change their stripes so readily.

Some footwear manufacturers, however, are different, advancing with the times with the sure-footed speed of the athletes who wear their products. The Ching Luh Group is one such manufacturer. Guided by their core philosophy of “Make It Right”, the firm has won the favor of some of the world’s leading sports brands, producing major sneaker lines for them. Moreover, to maintain its cutting-edge reputation, the firm has been quick to optimize its traditional manufacturing processes with the help of Industry 4.0 solutions from Advantech.

Because of the limited adoption of computerization, automated systems more recently used in traditional shoemaking have typically been designed to serve specific applications and factories are effectively forced to coordinate an assortment of non-seamlessly integrated information systems. In view of this, the Ching Luh Group understood that it was imperative to build a mature ICT infrastructure with a practical management platform to rapidly and efficiently integrate machines and their data. Such comprehensive, real-time integration makes key manufacturing information highly transparent, enormously increasing opportunities for optimization and improvement.

## Practical Integration Platform Inspires Innovative Monitoring Practice

In early 2017, the Ching Luh Group introduced Advantech’s Overall Equipment Effectiveness (OEE)

solution at its factory in Vietnam in order to build a real-time manufacturing visibility system for the factory floor. Based on Advantech’s iFactory Solution Ready Platforms (SRP), this solution allowed the firm to develop its own specifically developed application functions. In fact, the iFactory SRP drastically reduced system development time, allowing intelligent applications to be implemented with ease and simplicity. Moreover, it also efficiently integrated Advantech’s embedded automation platform, WebAccess/SCADA software, and wireless data acquisition WISE modules, shortening the implementation schedules for real-time equipment monitoring, manufacturing processes, and energy consumption systems.

In operation for less than a year, the factory’s real-time manufacturing visibility system has increased factory production and management efficiencies substantially. Now, instead of using the old-fashioned approach of managers walking the floor, with its heavy manpower requirements, cumbersome data entry and reports, and all the associated costs and delays, the firm’s managers are provided with clearly visualized real-time data regarding machine operating statuses, allowing them to engage in productivity analysis with unprecedented efficiency, and helping them to foresee problems before they result in unnecessary equipment downtimes and product defects.

## Simple Solutions for Complex Problems

With the ongoing trend toward Industry 4.0 capabilities, footwear and other textile manufacturers that fail to get on board risk increasing competitive weakness in the years to come, as automated smart factories allow their competitors to work smarter, not just harder. Although the emergence of Industry 4.0 carries risks for the sluggish, fleet-footed firms like the Ching Lung Group are already benefitting from the transformation of their traditional factories into smart factories. With Advantech’s OEE solution, the firm is enjoying enhanced efficiency and reduced costs, while still ensuring that they always “Make It Right”, which should, in turn, help them to enjoy even stronger growth than ever before.

## Product Solutions



### OEE Solution / SRP-OEE200

Preinstalled  
WebAccess/SCADA  
Pro Runtime  
1500 tags

Intel® Core™ i3  
Regular-Size Modular Box  
Platform (MBP)  
with 4 x GbE,  
1 x mPCIe, HDMI, DP

8-ch Digital Input IoT  
Wireless I/O Module  
with RS-485 Port

### EKI-6332GN

IEEE 802.11 b/g/n  
Wi-Fi AP/Client

### EKI-5525I

5FE Unmanaged  
Ethernet Switch,  
ATEX/C1D2/IECEx



# THE EARLY BIRD GETS THE WORM

## Advantech's Edge Gateway Platforms Show How "Industry 4.0" is More Than Just a Catchphrase for an Industrial Laundry Business

### Overview

- A large-scale industrial laundry firm in the USA

### Challenge

- Productivity automatically collected and visualized for real-time management

### Solutions

- Edge gateway platform
- Wireless I/O module

### Benefits

- Productivity monitoring and improvement
- Cloud-based real-time management

In spite of the dire consequences faced by slow-moving firms in today's highly competitive global marketplace, many textile manufacturers are traditionalists. Unlike the makers of high-tech products such as smartphones, they are not inclined to adopt key Industry 4.0 solutions so readily, some preferring instead to persist in their old ways and risk being left in the past by the competition.

Industrial laundries, key players in the textile industry and service industry, have yet to make the transition to Industry 4.0 to avoid getting left behind. Industrial laundries require highly productive and programmable laundry products to quickly process a variety of goods. Simultaneously, they need to embrace a stepped approach to laundry automation and intelligence.

Industry 4.0 is bringing about the realization of smart factories – that is, factories in which Internet-based capabilities allow physical elements such as robotics and sensors to be remotely connected to computer systems that can then learn from the data produced by those physical elements and adjust them as necessary to yield optimal efficiency, allowing manufacturers to improve productivity while enhancing product quality, to maximize profits while reducing costs.

## Risks for the Slow, Rewards for the Fleet

Large-scale industrial laundry facilities in the service industry tend to be traditional businesses, but innovative firms effectively use their machines as an interconnected part of a smart factory. A once traditional industrial laundry firm in the USA, with the foresight to embrace innovation wherever possible, has actively transformed itself from a labor-intensive manufacturer into a knowledge-intensive company, converting several traditional factories into smart factories. Factory management needed to monitor the efficiency of both machines and workers in their large facilities, and make use of visualization and data analytics to help them deploy efficiency initiatives. Most importantly, traditional PLC/HMI solutions were too expensive and not easily integrated into cloud-based solutions. Therefore, they needed a dedicated cloud-based application that would allow management to easily view their production efficiency across multiple locations throughout the country.

## Evolving to Industry 4.0 with Advantech's Edge Gateway Platforms

For this industrial laundry firm, Advantech was able to leverage its expertise in helping transform traditional factories into Industry 4.0-enabled smart factories. However, the company initially faced some challenges in pursuing this goal. For example, many of the industrial laundry tasks were being performed by personnel who were only being supervised by other personnel. Also, as most machines used in traditional laundries are old, attempts to implement automation are often met with problems because old equipment typically lacks open communication interfaces. At the same time, replacing old but reliable equipment is unrealistic from a cost perspective.

Fortunately, the Advantech WISE-4051, 8-ch digital input IoT wireless I/O module with RS-485 port works as

a wireless counter to monitor a number of laundry items handled by each worker. The palm-size automation computer UNO-2272G functions as a data gateway for local data aggregation before pushing the data to the AWS cloud-based app. And an EKI-6332GN IEEE 802.11 b/g/n Wi-Fi app/client was used for the onsite wireless infrastructure and the collection of data from end devices throughout their plants, including very old equipment retro fitted with sensors. The powerful smart WISE IoT modules, UNO edge gateway platforms, and EKI wireless routers, met all the firm's needs for easy, trouble-free installation with cost-effective results.

Now employee productivity is collected automatically and presented to management in real-time. Data analytics and equipment optimization enabled by these upgrades have in turn allowed this firm to improve their output in countless ways, and the AWS cloud app allows management to easily view their production metrics across multiple locations throughout the country. Substantial benefits are now available to this industrial laundry firm that chose to embrace the power and capabilities of Industry 4.0.

## Simple Solutions for Complex Problems

As more and more industry leaders incorporate Industry 4.0 capabilities, the traditional businesses that continue to rely on outdated methods and technologies risk increasing competitive disadvantages in the years ahead, as automated smart factory solutions allow their competitors to be both faster and more efficient. By the same token, while the emergence of Industry 4.0 carries risks for sluggish businesses; innovative firms are already enjoying the substantial benefits of converting their traditional factories into smart factories. With Advantech's edge gateway platforms, even the most traditional factories can solve the complicated problem of integrating legacy equipment into Industry 4.0 smart factories, ensuring that they are victors, not victims, of ongoing industry advancements.

## Product Solutions



**UNO-2272G**

Palm-size Automation Computer  
with Intel® Atom™ J1900 processor



**WISE-4051**

8-ch Digital Input IoT Wireless I/O Module  
with RS-485 Port

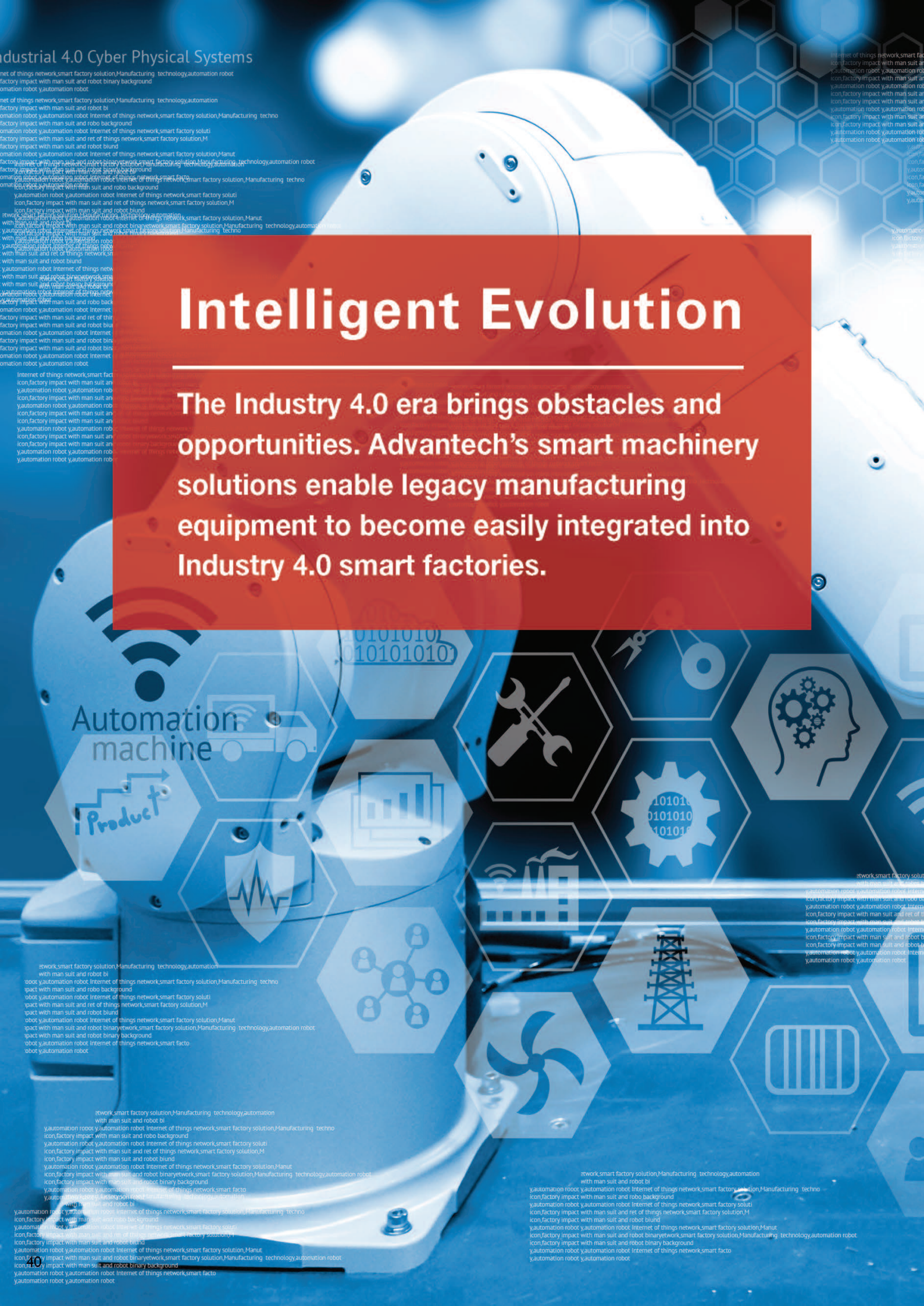


**EKI-6332GN**

IEEE 802.11 b/g/n Wi-Fi AP/Client

**The Industry 4.0 era brings obstacles and opportunities. Advantech's smart machinery solutions enable legacy manufacturing equipment to become easily integrated into Industry 4.0 smart factories.**

## Automation machine



# Smart Machinery

**Enhanced productivity with  
Advantech's smart machinery  
solutions**



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# WHEN TRADITIONAL MAKES SENSE

## How Advantech's Solutions for Yeefung's Automated Guided Vehicles Help Turn Traditional Factories into Smart Factories



Industry 4.0 is already bringing a wide range of benefits to the most forward-looking

firms. With the capability to easily automate and systematically collect and analyze data, a smart factory can ensure that robotics and Automated Guided Vehicles (AGVs) work at maximum efficiency with virtually no downtime, leading to reduced costs and increased profits.

Widely used across many industries, AGVs have been dashing around factory floors for decades. Thanks to evolving technologies like automated controls, sensors and wireless technology, their guidance systems and architecture continue to evolve and now, compact trackless AGV are being rolled out.

### Increasing Efficiency at Every Opportunity

In fairness though, the above description of Industry 4.0 is fairly abstract. Fortunately, a wide variety of concrete examples amply demonstrate how Industry 4.0 is already bringing massive benefits to some firms. Simply imagine, for a moment, the factory floors of yesteryear. Long lines of workers stand alongside rows of conveyor belts, repeating the same monotonous motions – tightening screws,

### Overview

- Leading provider of comprehensive AGV and revolutionary parking solutions in China

### Challenge

- Comprehensive hardware and AGV controller solutions

### Solutions

- Wireless AGV solutions
- iDoor module solutions

### Benefits

- Improved requisition management
- Reduction of labor force (50-90%)

soldering joints, fitting frames – over and over again. At the end of the line, the resulting products are boxed up and passed on to still other workers who stack them on shelves and palettes to be loaded into delivery trucks just outside the factory doors.

With Industry 4.0, such images are largely a thing of the past. For example, in modern manufacturing, robotic arms perform many of the fabrication actions once performed by humans, doing so with a speed, precision, and indifference to repetition that no human could possibly match. Meanwhile, Advantech's wireless AGV solutions are easy to integrate and enable reliable high-performance computing, and system integrators can rapidly develop and deploy AGV systems for intelligent factory applications. With AGV systems, factory operators benefit from increased productivity and labor savings.

## On Factory Floors, Computers Make the Best Drivers

Founded in 2014, Shenzhen Yeefung Robotics Technology develops cutting-edge AGV systems featuring Advantech's wireless AGV solutions. In combination with evolving technologies, such as sensors, wireless networks, and laser-based navigation, Yeefung has expanded the versatility of its AGV systems for use both in smart factories and smart parking—solutions that have proven to be more than just basic automation tools.

In the past, AGVs were typically controlled with programmable logic controllers (PLCs). However, to ensure comprehensive monitoring and flexibility, smart factory AGVs must perform multiple arithmetic operations at speeds that PLCs simply cannot handle. Fortunately, the Advantech PC-based UNO-2272G embedded automation computer used in Yeefung AGVs not only fulfills the performance requirements of smart factory AGVs, but also supports componentized real-time operating systems (Windows® Embedded Compact 7), customized

drivers, and remote management and monitoring software. Moreover, with its Intel® Atom™ J1900 processor, wireless communication module (PCM-24S2WF), and CANbus module (PCM-26D2CA), the palm-sized UNO-2272G can not only receive commands from a central dispatch system, but can also quickly process the data collected from an AGV's anti-collision sensors, 360-degree laser transmitter, and magnetic nail scanner to rapidly calculate the AGV's parking location and travel path. Used in conjunction with other Advantech wireless AGV solutions such as the EKI-7710E-2C managed Ethernet switch, WISE-5121 Wi-Fi AP/Client, and FPM-7061T VGA industrial monitor, the UNO-2272G allows Yeefung to produce state-of-the-art AGV systems featuring a wide range of smart factory capabilities, such as instruction issuing, travel track and position monitoring, system health diagnosis, and automatic scheduling. In short, the combination of industrial-grade hardware with innovative software eliminates the need for compatibility testing and ensures immediate applicability for diverse applications, resulting in incredibly efficient and robust AGV systems that quickly provide factory operators with increased productivity and labor savings.

## Simple Solutions for Complex Problems

With the ongoing trend toward Industry 4.0 capabilities, manufacturers that fail to quickly get on board risk increasing competitive weakness in years to come, as automated smart factory solutions such as Yeefung's AGV systems allow manufacturers to work smarter, not just harder. However, while the emergence of Industry 4.0 carries risk, the benefits of transforming a traditional factory into a smart factory are undeniable. Wireless AGV solutions and related technologies from Advantech help the factories of yesterday quickly transform into the factories of the future, bringing enhanced efficiency, reduced costs, and stronger growth than ever before.

## Product Solutions



**UNO-2272G**

Intel® Atom™ Palm-Size  
Automation Computer  
1 x GbE, 2 x mPCIe,  
VGA/HDMI



**PCM-24S2WF /  
PCM-26D2CA**

WiFi (802.11 a/b/g/n/ac)  
Bluetooth (4.1) 2-port SMA/  
2-Ports Isolated CANBus,  
CANOpen, 2 x DB9



**EKI-7710E-2C**

8FE+2G Combo  
Managed  
Ethernet Switch



**WISE-5121**

Industrial-grade  
IEEE 802.11 b/g/n  
Wi-Fi AP/Client



**FPM-7061T**

6.5" VGA Industrial Monitor  
Resistive Touchscreen  
Direct-VGA/DP  
Wide Operating Temp. Range



# The **FUTURE** is **NOW**

## **How Advantech Edge Gateway Platforms Are Helping to Make Machines Intelligent**

### **Overview**

- An US machine builder focused on providing exceptional quality & value for all of their custom machine building and repair service customers

### **Challenge**

- Powerful, customizable & cost-effective edge gateway platform for running multiple software applications seamlessly

### **Solutions**

- Edge gateway platform
- HMI solution

### **Benefits**

- Machine performance improvement
- Signal quality improvement

Industry 4.0 is the past, current and next big thing. The idea relies on sophisticated software and machines that communicate with each other to optimize production. Most machine builders are facing strong demands for providing their customers with the machines that deliver productivity, flexibility, efficiency, and availability. The more innovative the machine manufacturer is, the better its position in the market. The advent of intelligent machines is enabling machine builders to innovate in ways that have never been possible before, for example, to ensure that machines and other automated equipment work at maximum efficiency with virtually no downtime.

### **Make Machines Ever Smarter**

Industry 4.0-enabled smart machine capabilities continue evolving greater autonomy, flexibility, and adaptability. A US machine builder focused on providing exceptional quality and value for all of their custom machine building and repair service customers was looking for powerful and customizable industrial computers to make their

machines more intelligent, more reliable, and more powerful.

As a leading promoter of Industry 4.0, Advantech has developed its UNO series of powerful yet flexible embedded box PCs to serve as intelligent machine coordinate solutions that facilitate digitization. With their innovative yet reliable design and intelligent software, UNO systems enable smarter interconnected machines capable of communicating and learning.

### **Making the Most of Machine Communication with Advantech's UNO System**

In the most basic terms, Advantech's UNO platforms are a series of powerful yet flexible embedded box PCs that serve as data gateways that enable legacy equipment to become easily integrated into Industry 4.0 smart factories. At present, the majority of manufacturing devices still currently in use consist of legacy systems, many of which run stand-alone, isolated applications.

The machine builder cooperated with Advantech to slash development time and maintenance costs and improved gross margins substantially within months. They deployed the Industry 4.0 edge gateway UNO-2473G to provide superior processing power as well as signal strength for them to run their software and HMI with unparalleled performance and reliability. Equipped with an Intel® ATOM™ processor, UNO-2473G is designed to deliver adequate computing and is capable of running multiple software applications seamlessly.

In fact, Advantech's UNO-2000 series takes the value of IIoT edge gateway platforms that extra mile. The UNO gateways feature state-of-the-art Intel processors capable of running multiple software applications simultaneously, while their strong and reliable signals ensure that data transmissions to HMIs

are achieved without distortion or ghosting issues. Equipped with a rugged metal enclosure, wide power input range, and wide operating temperature range, the UNO-2000 series of embedded automation computers are suitable for application in even the harshest industrial environments.

With front-accessible hot-swappable HDD/SSD bays, iDoor modularity, and versatile mounting options, the design of each UNO system are easy to upgrade and apply to different applications with single module, reducing maintenance time and costs. Most importantly, Advantech's Edge Intelligence Service (EIS) allows UNO systems to communicate and conduct automated processing for real-time monitoring and control, in addition to supporting cloud-based data analysis to facilitate intelligent factory operations. This remarkable suite of features and strengths means that Advantech's UNO gateways can handle larger workloads and produce higher quality signals than similarly priced competing products, making them extremely cost-effective and efficient.

### **Simple Solutions for Complex Problems**

With Industry 4.0, the smallest of differences can add up to massive competitive advantages and profits, as intelligent industrial automation solutions allow manufacturers to work smarter, not just harder. And, while the concepts underlying Industry 4.0 can seem complicated, transforming a traditional machine into a smart machine doesn't have to be. With Advantech's UNO systems, the machines of yesteryear become the smart machines of the future, bringing enhanced productivity, improved product quality, and maximized profitability and customer satisfaction.

## **Product Solutions**

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**UNO-2473G**

Intel® ATOM™ E3845/Celeron®  
J1900 Processor Regular-Size  
Automation Computer



**TPC-2151T**

Modular Industrial Thin Client  
Multi-Touch Panel Computer with  
15" XGA LED LCD and Intel® Celeron®

## About Advantech

Advantech's corporate vision continues to this day: to "Enable an Intelligent Planet". The company is a global leader in the fields of IoT intelligent systems and embedded platforms. To fully embrace the trends of IoT, big data, and artificial intelligence, Advantech promotes IoT hardware and software solutions with the Edge Intelligence WISE-PaaS core to empower business partners and clients alike in connecting their industrial chains. Advantech is also working with business partners to co-create business ecosystems that accelerate the goal of industrial intelligence.

## Global Service Center

- D** Design Centers
- M** Manufacturing Centers
- C** Configure To Order Service Centers
- L** Logistics Centers
- O** Onsite Service
- R2** System Repair Centers
- R3** System & Board Repair Centers
- S** Show Rooms



# & Show Room





*Enabling an Intelligent Planet*