INDUSTRY

4.0

Global Success Stories

Co-Creating the Future of Industry 4.0

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

Contents

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 iFactory SRP (Solution Ready Package) that combines hardware and software into integrated industrial application is a step-wise approach to realizing intelligent factory. Accordingly, we actively seek co-creation partnerships to construct the Industry 4.0 ecosystem and strengthen the influence of domain focused applications.

Advantech enters the next IoT era by adopting the co-creation model and global deployment. Advantech is working with partners to co-create Industrial IoT ecosystems that accelerate the development of Industry 4.0. By working together we are committed to the performance and success of your business in the future of Industry 4.0.
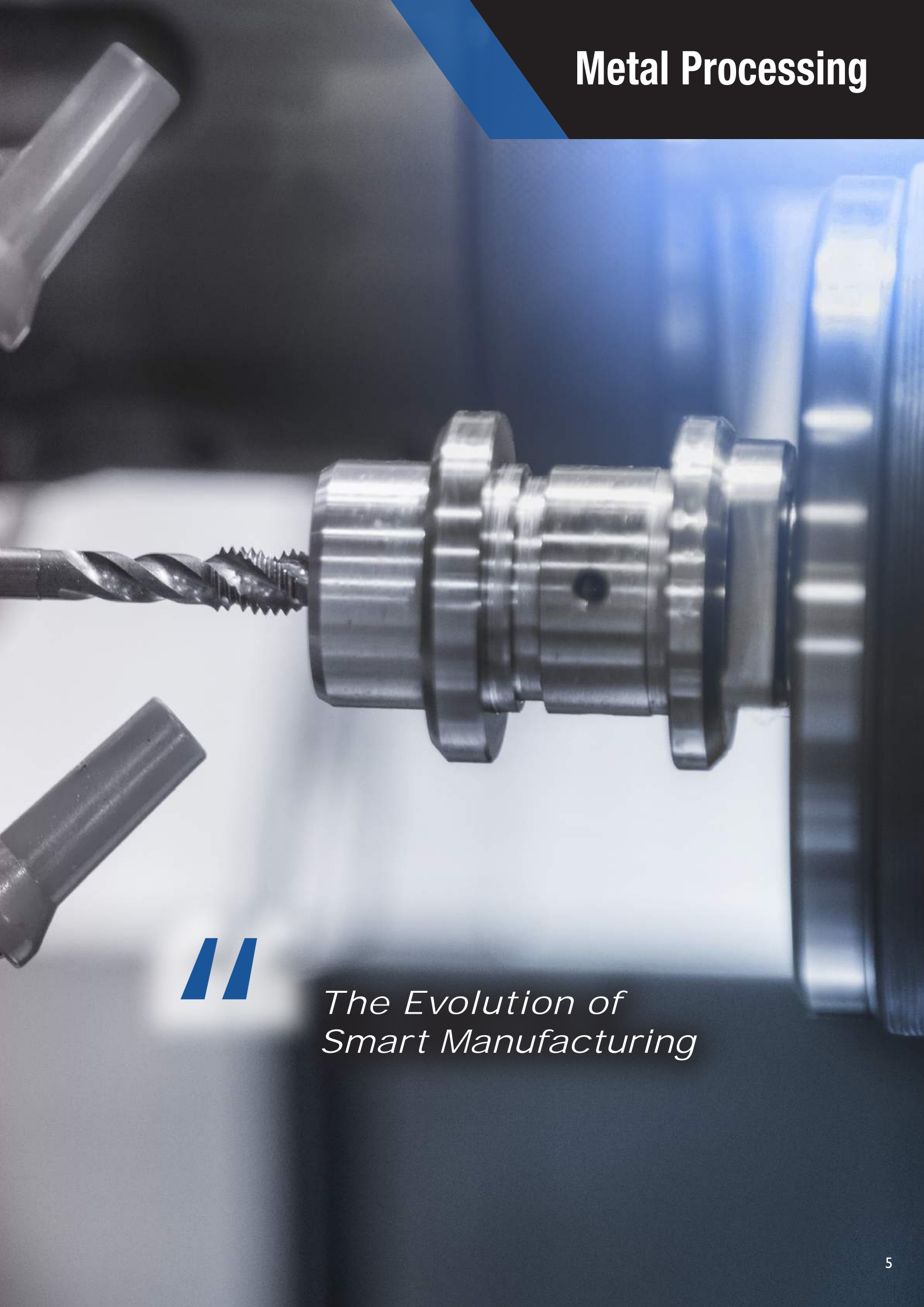
Smart Manufacturing

Today's science is building the sustainable, digital, and smart road map for tomorrow's metal processing industry.

The Evolution of
Smart Manufacturing

THE POWER OF CO-CREATION

YCM Turns to Advantech to Co-Create a CNC Management Solution for Intelligent Metal Manufacturing

Overview
- Machine tool manufacturer in greater China

Challenge
- Company needed ready-to-use CNC management solution

Solutions
- Intelligent CNC machine management solution

Benefits
- Identifies production bottlenecks and improves productivity
- Significantly reduces development time and costs
- Stays ahead of the competition

Metal manufacturing industries have faced countless challenges in recent years. China is no exception to the challenge. Common problems that face China's metal fabrication industry include a lack of standardized communication interfaces, low-level intelligence in existing equipment, and low level of informatization in existing systems.

With more than six decades of experience in machine tool manufacturing, YCM (Yeong Chin Machinery Industries Co. Ltd.®) has deep trade experience in China's metal manufacturing industry. However, with the advent of Industry 4.0 and new trends in IoT, even leaders such as YCM face huge challenges in making their manufacturing smarter using digitized information and visualized data intelligence. Challenges such as rapid changes in the marketplace, emerging market competition, limited resources and sustainability, slow growth, labor shortages and transitioning business integration are common problems in China's metal manufacturing industry.

So how can China's metal manufacturers turn today's problems into tomorrow's success? The key is to focus on process management that yields decreased

time-to-market while delivering high-quality and competitive product pricing. To meet this challenge YCM looked to Advantech and its CNC Machine Management Solution, a Machine-to-Intelligence Solution Ready Package that implements CNC machine management (M2I/CNC SRP), to meet their demands and simplify manufacturing by rapidly upgrading legacy systems for a successful transition into the Industry 4.0 era.

Advantech also has a wealth of industry experience in industrial automation, including metals processing. With more than 35 years in providing manufacturing customers across the globe with IoT hardware and software solutions such as the WISE-PaaS IoT Edge Intelligence Platform and AIoT SRP, Advantech delivers custom IoT solutions in an increasingly competitive global market.

By employing Advantech's M2I/CNC SRP, YCM has been able to directly integrate IoT cloud features into its CNC controllers to facilitate machine data acquisition through the WISE-PaaS industrial cloud platform. In subscribing to the M2I/CNC cloud service on Advantech's WISE-PaaS Marketplace, YCM was able to easily examine overall equipment effectiveness (OEE), performance, and event history for individual CNC devices by viewing web-based dashboards. Cloud-based solutions allowed for the collection of data for instant machine-to-cloud management without having to install a server room infrastructure. The OEE dashboard, in combination with historical performance data and real-time trends, provided a comprehensive operational overview. Through additional optimization, critical and non-critical issues alike are easily identified — minimizing system downtime and providing insight into proactive maintenance forecasting.

By utilizing Advantech's M2I/CNC SRP, YCM has been able to realize reductions in operational costs. In a recent metal processing order, YCM saw operational cost reductions through the rapid deployment of Advantech's SRP solution. By eliminating unnecessary costs and loss-of-business opportunities, YCM was able to rapidly deploy smarter manufacturing processes, and deliver customer products to market faster than otherwise possible.

As a new service business dedicated to further meeting China's growing CNC and metals production and fabrication market demands, YCM has teamed with Advantech to co-create Dot Zero®. By offering a broad range of smart manufacturing solutions, Dot Zero has been able to deliver significant savings across industries. With solutions such as CNC Machine Management, Equipment Management System (EMS), Work In Process (WIP), and Statistical Process Control (SPC), Dot Zero can assist in combining smart management with smart machines to realize the ultimate in smart automation – your Smart Factory Dream.

Product Solutions

CNC Machine Management Solution

M2I/CNC
Generic Cloud Service
on WISE-PaaS

CNC Edge
ESRP-CNC-UNO1372

DIGITAL TRANSFORMATION

Impelex and Advantech Transform the Metal Processing Ecosystem with iFactory SRP

Overview

- Innovative system integrator in Taiwan

Challenge

- Data collection from different machines
- Dashboard visualization management

Solutions

- OEE solution
- Equipment utilization system

Benefits

- Real-time monitoring of equipment utilization
- Mobile dashboard monitoring

In the competitive business of manufacturing, is it better to be reactive or proactive when managing a production facility? Advantech's WISE-PaaS VIP, Impelex, tells its success story–transforming traditional reactive industrial environments to much smarter (and profitable) pro-active manufacturing systems.

Since 2013, Impelex Data Transfer has been providing innovative system integration solutions for smart factory implementation. Utilizing Advantech's Overall Equipment Effectiveness (OEE) solution, Impelex built and implemented an Enterprise Resource Planning (ERP) management system to collect data for precise production, materials checking, and quality assurance, helping to accelerate the information and manufacturing workflows of their customer.

One of Taiwan's leading hand tool manufacturers, RE-DAI Precision Tools (RE-DAI), founded in 1984, has enjoyed decades of success in the tools fabrication market. As an established leader, RE-DAI have continued to follow a traditional industrial manufacturing and management model, even during recent times that have presented significant challenges. And further strains to the operation were apparent from the competition and the ever-changing market place.

The challenge for Impelex was to implement a real-time system that monitored machine operations and that incorporated a mobile dashboard, which prevents power outages and improves overall production efficiency.

As its first task, Impelex needed to unify RE-DAI's communication platform for the many systems that controlled its machinery. With different production machinery acquired over the years since its founding, RE-DAI were able to "get by" on the various machines and equipment their in-house IT departments were able to craft. While in-house solutions sufficed for small-run companies, this haphazard approach became a hindrance to RE-DAI's growing portfolio.

With its expanding portfolio of production machinery acquired over the years, RE-DAI were burdened with developing software tools to keep their entire machinery running. RE-DAI needed a fully mature communication solution to unify and control all the disparate systems on one platform, so they turned to IMPELEX to deploy a solution to integrate and streamline all the machines.
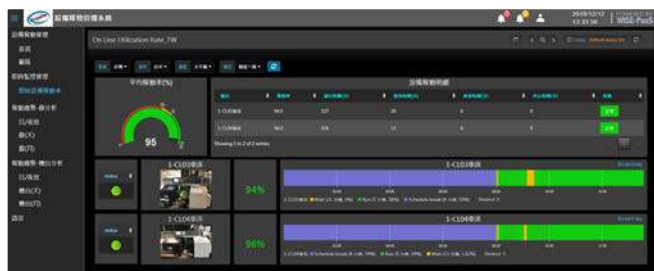
To meet the challenge, Impelex leveraged a ready-made OEE solution, one of Advantech's iFactory Solution Ready Packages (SRP). By utilizing Advantech's rich industry experience in smart factories, Impelex quickly developed an OEE SRP that was easily deployed on the factory floor – avoiding costly and time consuming in-house development and integration.

With all of RE-DAI's production machinery now communicating and functioning at maximum efficiency, Impelex was able to explore the many advantages Advantech's SRP offered. Impelex trained RE-DAI technicians how to command an eagle-eye view of all RE-DAI resources using the OEE system from the main dashboard.

The digital transformation led RE-DAI to retrieve 100% of the data collected from its diverse infrastructure. The solution further allowed Impelex to expand on its offering and provide services such as a Warehouse Management System (WMS) and a Quality Control System (QCS).

With the initial task clearly outlined, Impelex turned its focus on RE-DAI's Chiayi factory. By leveraging its technical advantages, the new factory received the full benefit of Impelex services. The customized integration served as the catalyst for pro-active control and oversight of the digitalized management ecosystem. With its new OEE dashboard in place, RE-DAI further extended its capabilities by spanning its data across a cloud platform optimized for growth and extensibility. The new OEE dashboard is configurable in order to reduce customization effort. To bring its management together onto the same page, RE-DAI also installed an oversized OEE dashboard in an "Industry 4.0 Situation Room" so that managers could meet and view the company's real-time disposition and thus synchronize critical decisions without delay. In this manner, RE-DAI has changed its production management style from reactive to proactive.

By implementing Advantech's OEE SRP, manufacturers like RE-DAI can potentially enjoy benefits of up to 20% improvement in machine availability. By transforming the workspace, the smart real-time equipment utilization system bridged the gap between the demands for progress and the practicality of cost reduction.

Ann Huang, VP of IMPELEX said, "With Advantech's OEE SRP, we successfully helped RE-DAI implement an equipment utilization system and customized features they desired. By the time RE-DAI's new Chiayi factory was ready to come online, they weren't held back by the usual production delays. Many new facilities at RE-DAI's new Chiayi site were ready to hit the ground running and start producing from day one. We are glad to help enable digital transformation for RE-DAI in order to grow and meet future market and production demands."

Product Solutions

iFactory/OEE

WISE-PaaS/EdgeLink

WISE-PaaS/EnSaaS

Overall Equipment Effectiveness Solution

OEE Edge	OEE Cloud Service
SRP-IFS210-D36TAE	9803WPOE01

Industry 4.0 Situation Room

Situation Room
SRP-SR-100-BTO

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.

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

UNLEASHING
the VALUE of
CO-CREATION

Nippon RAD and Advantech Transform Japan's Industry 4.0 Centric Solutions

Overview

- IT system integrator in Japan

Challenge

- Difficult data collection from different machines

Solutions

- Data visualization
- End-to-End IoT platform

Benefits

- Easy configuration and quick implementation
- Rapid data collection and visualization
- Improves equipment uptime, performance, and saftey

Nippon RAD is a long-established IT system integrator with a pedigree in hardware and software integration and enterprise software development. In contrast to many of its competitors, Nippon RAD is independent and has continued to position itself to meet the needs of customers through expert resource management and flexibility. With the benefit of foresight, Nippon RAD turned its attention to the development of IoT platforms for the smart manufacturing sector and in a significant move, joined forces with Advantech to strengthen its footprint in the Japanese Industrial IoT market.

Transforming Japan's IIoT-Centric Solutions

In order to accurately define solutions in the context of sustainability, Nippon RAD closely examined the underlying opportunities and challenges as drivers for Industry 4.0 implementation. At first glance, it found that many of its own customers, as well as their competitors, saw significant success over the years. However, the same infrastructure that facilitated the success was quickly becoming growing pains and turning production management systems into difficult, inefficient, and unprofitable equipment. Upon closer

examination, analysis showed a lack of real-time connectivity between people, machines, and devices, as well as information and communication technologies for the dynamic management of the ever-increasing complexity of the business process.

The automotive industry is one of the most important sectors in Japan. Japan's auto parts manufacturing market is said to be already mature, however, lots of auto component manufacturers still face challenges to effectively collect and visualize machine data from production lines, especially from different machines, purchased from different suppliers, each with multiple protocols. With an expanding portfolio of multi-branded production machinery acquired over a plogonged period of time, manufacturers felt unable to properly meet the challenges of increased competition and change management. With such daunting variables to consider, manufacturers viewed integration predominantly from a technical perspective, whereas the true solution required consideration for all dimensions including long-term sustainability.

One of Japan's auto parts manufacturers recently came to Nippon RAD for an easy-to-use solution. Nippon RAD quickly solved the data collection problem by using Advantech products and solutions. From Advantech's Ethernet I/O module ADAM-6000 series with its Peer-to-Peer (P2P) and Graphic Condition Logic (GCL) technology used for remotely monitoring device status, to UNO-2484G edge platform that has pre-installed WebAccess/SCADA and WebAccess/CNC software used as a key to interlinking an end-to-end RAD-style IoT solution, a solution was needed where equipment performance, tools for rapid data collection, and visualization all come together. To further implement predictive maintenance, the MIC-1816 DAQ platform with WebAccess/MCM machine condition monitoring software was installed, providing easy sensor signal acquisition, signal analysis, data management, and warning alerts.

Konekti™, Nippon RAD's End-to-End IoT platform
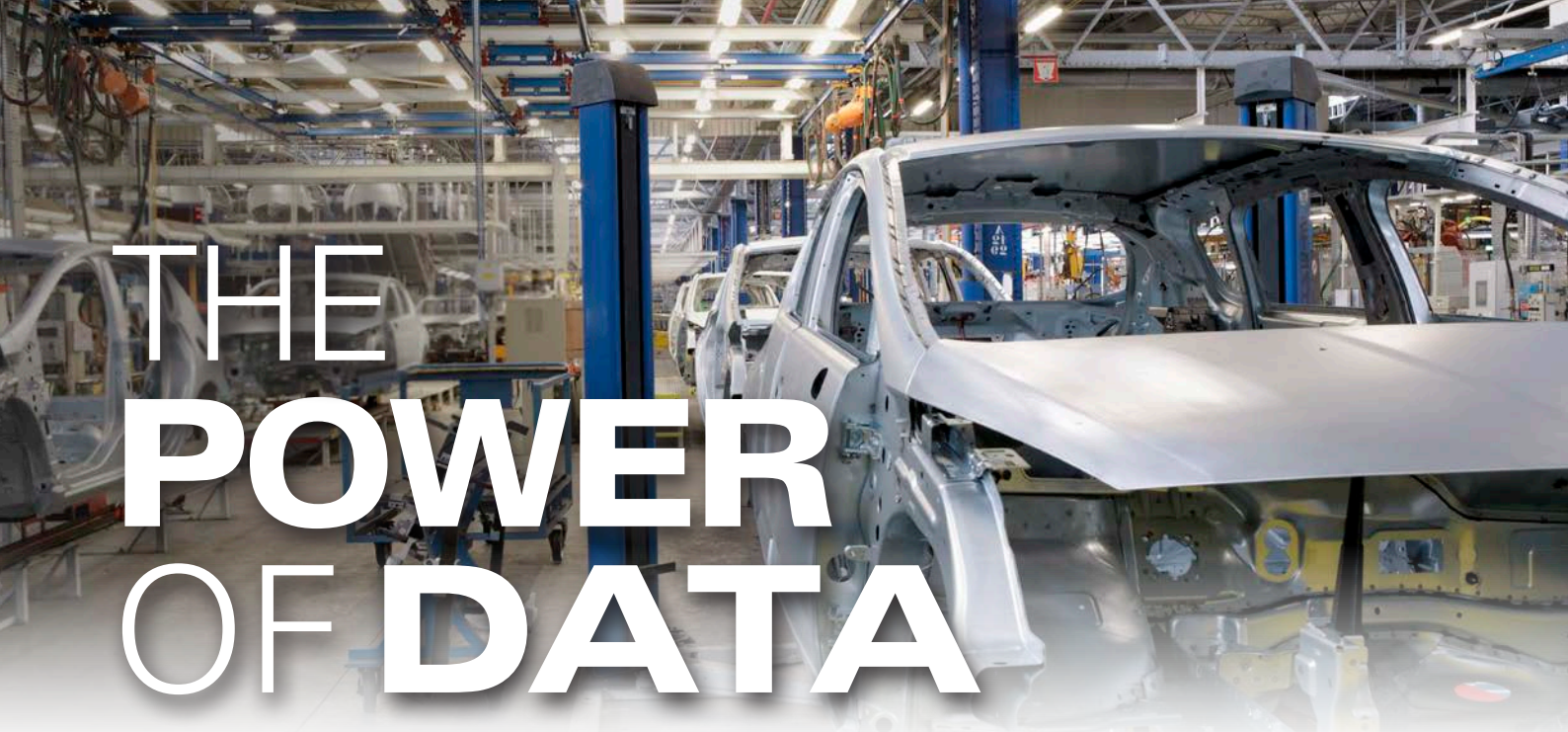
This application used Advantech's solutions and products to connect with Konekti™— Nippon RAD's end-to-end IoT platform. This platform effectively processes and analyzes big data obtained from the plant, displays real-time information, and visualizes the results, as well as performing predictive maintenance and optimization. This helped improve equipment uptime, performance, and safety, while greatly reducing maintenance costs. The data-backed products and services revolutionizing Japan's auto parts industry have given existing manufacturers the template to equip current production equipment for retrofitting. The strategic alliance between Advantech and Nippon RAD, the WISE-PaaS Premier VIP partner, alleviates the risks and challenges faced by the transformation towards IoT platforms.

As one of the few industrial system integrators with the commitment to transform traditional business models to new IoT-centric solutions, Nippon RAD has officially become a co-creation partner of Advantech's IIoT sector in Japan through an equity investment in 2018. This creates a Nippon RAD style smart factory solution that fully leverages the hardware, software, and integration expertise of the two companies.The solution has allowed them to help manufacturers upgrade to Industry 4.0 and fully leverage production efficiency.

Product Solutions

WebAccess/SCADA	WebAccess/CNC	UNO-2484G	MIC-1816 with WebAccess/MCM	ADAM-6000 Series
Industrial IoT Application Software Platform	CNC Machine Monitoring Solution	Intel® Core™ i7/i5/i3 Regular-Size Modular Box Platform	DAQ Platform with Machine Condition Monitoring Software	Ethernet 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.

Maximized Efficiency Seamless Data Acquisition Fully Integrated Solutions

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

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

IBCON

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 a 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**

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.

Complex needs Simplified solutions Enhanced productivity

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.

Product Solutions

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

Scaling and Adoption Trends

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

ADVANTECH
WISE-PaaS
IoT Edge Intelligence

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

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

WISE-PaaS
IoT Edge Intelligence
ADVANTECH

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 package 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 Package for Seamless Data Integration

Featuring Advantech's WebAccess/SCADA software, along with a suite of other functionalities, the SRP-FPV220 package 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

**Process Visualization Solution
SRP-FPV220**
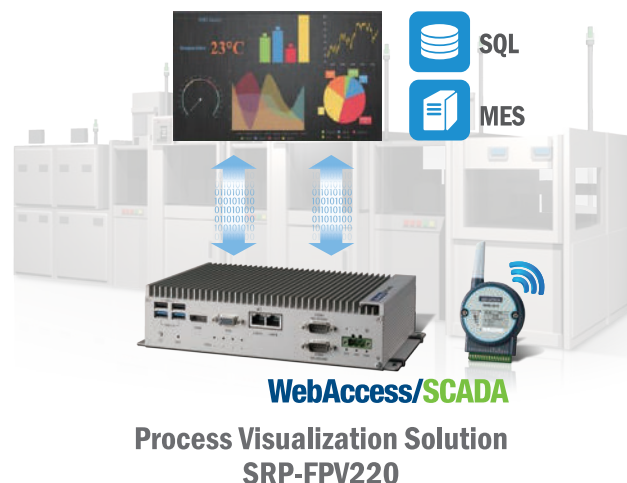
can be resolved with comparatively simple solutions. Leading technology services providers can recognize exceptional innovations when they see them, and they know that Advantech's industrial automation solutions offer substantial development convenience and efficiency by integrating key software and 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

WISE-4000 Series

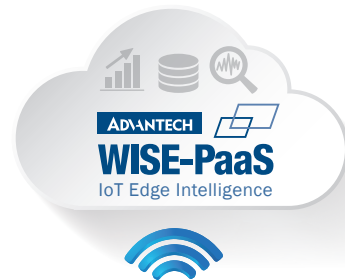| Preinstalled WebAccess/SCADA Pro. Runtime 1500 tags | Intel® Core™ i3 Regular-Size Automation Computer | 4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module | 2.4 GHz IEEE 802.11b/g/n WLAN I/O Module |

LEADING
THE PACK

ADVANTECH
WISE-PaaS
IoT Edge Intelligence

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.

Streamlined Installation Efficient Integration All-in-one Solutions

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

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.
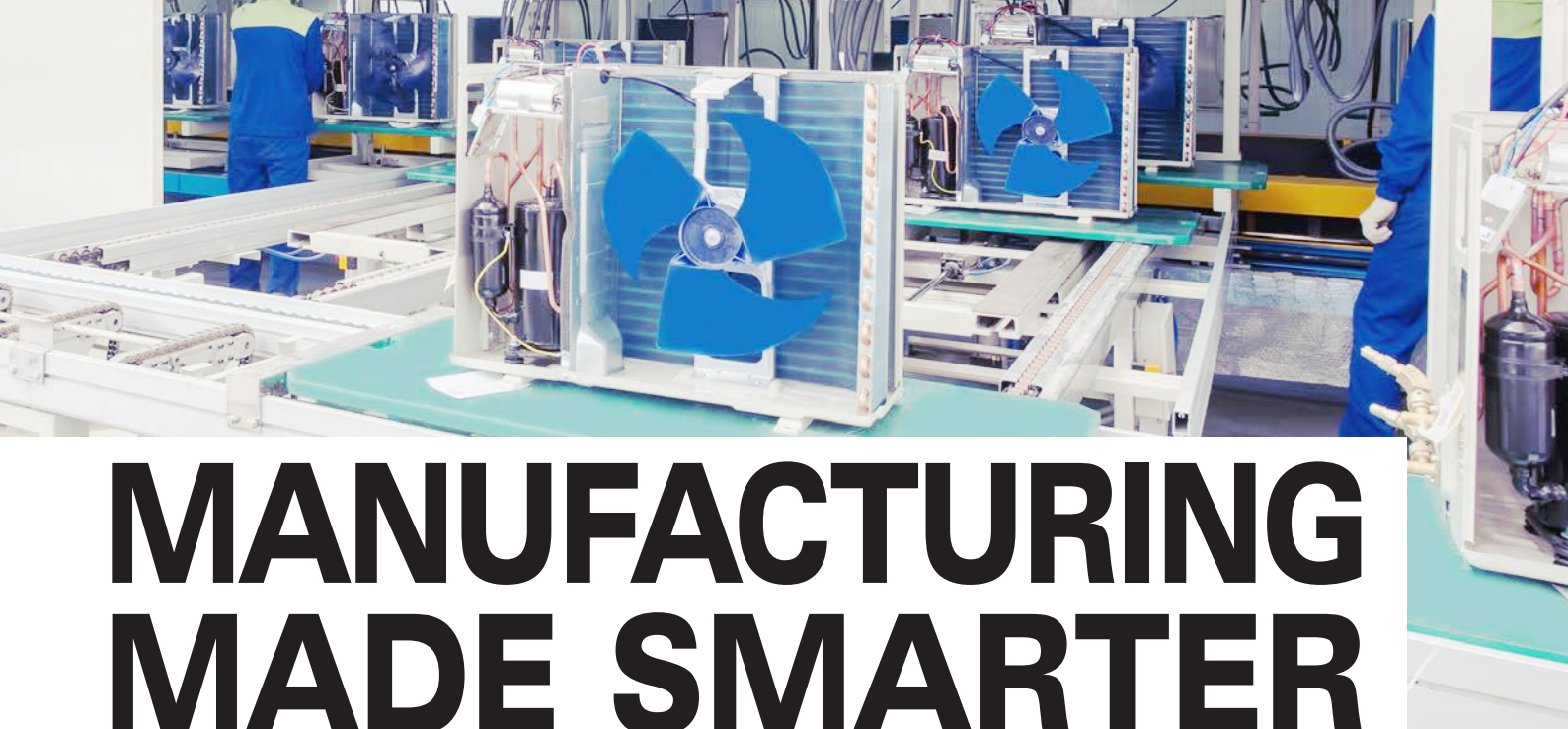
Efficiency
Competitiveness
Profitability

MANUFACTURING MADE SMARTER

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

Advantech's equipment connectivity and process visualization 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 packages 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 Equipment Connectivity 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 ESRP-PCS-UNO2271 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, ESRP-PCS-UNO2271 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 equipment connectivity and process visualization solutions, global leaders can increase their productivity, maximize their profitability, and stay on top in the global marketplace.

Product Solutions

Equipment Connectivity Solution / ESRP-PCS-UNO2271

Pre-installed WebAccess/HMI Runtime 1500 Tags

Intel® Atom™ Pocket-Size Automation Computer

ADAM-6060

6-ch Digital Input 6-ch Power Relay Modbus TCP Module

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

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 ESRP-SCS-UNO1372 CODESYS solution-ready package, 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.

Remote Control Cost-Effective Data Accessibility

Flexible Functionality for the Future

Advantech's ESRP-SCS-UNO1372 is a complete edge solution ready package 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 ESRP-SCS-UNO1372 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

Equipment Connectivity Solution / ESRP-SCS-UNO1372

Preinstalled CODESYS SoftMotion & Visualization (Target & Web) Runtime

Intel® Celeron® 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

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

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 IoT Edge Intelligence   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 AI 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

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

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 process visualization 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
- Process visualization 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

清 祿
Ching Luh

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 process visualization 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 Package (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 process visualization 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

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** |

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

Intelligent Evolution

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.

Enhanced productivity with Advantech's smart machinery solutions

WHEN TRADITIONAL MAKES SENSE

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

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%)

yeefung

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, 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	PCM-24S2WF / PCM-26D2CA	EKI-7710E-2C	WISE-5121	FPM-7061T
Intel® Atom™ Palm-Size Automation Computer 1 x GbE, 2 x mPCIe, VGA/HDMI	WiFi (802.11 a/b/g/n/ac) Bluetooth (4.1) 2-port SMA / 2-Ports Isolated CANBus, CANOpen, 2 x DB9	8FE+2G Combo Managed Ethernet Switch	Industrial-grade IEEE 802.11 b/g/n Wi-Fi AP/Client	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

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®

Global Service Center

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.

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

C L R3 S Milpitas
D Irvine
Cincinnati D
Monterrey **R2**
Itajubá

USA
Milpitas

Mexico
Monterrey

USA
Cincinnati

Netherla
Eindh

USA
Irvine

Russia
Moscow

Brazil
Itajubá

Poland
Warsa

Eindhoven C L

Munich L R2 S

Amberg D

C L O R3

Moscow R3

Warsaw C L O R3

D C L O R3 **Beijing**

D M C L R3 S **Kunshan**

C L R3 **Bangalore**

Bangkok C

Penang C

Singapore C L R2

Seoul C L R3

Tokyo C L R3

Taipei D M C L O R3 S

Melbourne C L R2

Netherlands
Eindhoven

Germany
Munich

India
Bangalore

China
Beijing

Japan
Tokyo

Headquarters

Taiwan
Taipei

China
Kunshan

Singapore
Singapore

Australia
Melbourne

Korea
Seoul

Warsaw

ADVANTECH

Enabling an Intelligent Planet