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Software and Industry Solutions

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ADVANTECH 
WISE-PaaS
AIoT Solutions & Marketplace



WebAccess Software

Introduction

The emergence of IoT technology and its related eco-system promises significant future business opportunities until the year 2025. With more and more investment going into developing integrated IoT applications and cloud services, software has become the crucial factor for success. As one of its core IoT solutions, Advantech's WebAccess/SCADA offers more than just a human-machine interface (HMI), supervisory control, and data acquisition (SCADA) solution, it is also a platform for IoT and cloud applications and services.

With Advantech WebAccess/SCADA browser-based IoT application software, users can easily monitor and remotely manage projects via their browser. For the IoT device layer, Advantech WebAccess/SCADA supports multiple protocols and drivers for connecting up to 450 controllers and devices, making WebAccess/SCADA a flexible and powerful software platform for all Industrial IoT (IIoT) applications and projects. Additionally, WebAccess/SCADA provides a foundation for IoT data collection and management with its open architecture and open interfaces, which facilitate the speedy development of numerous vertical applications.

To satisfy demands for IIoT and Industry 4.0 services, a variety of cloud-specific features, such as plug-and-play device configuration, cloud-based dashboards, and multi-protocol data connectivity are included in the WebAccess/SCADA Cloud software package in an effort to provide easy tools for connecting IoT devices and performing big data analysis and predictive maintenance.

Industrial IoT Application Software Platform



DrawDAQ



WISE-IoTSuite/Dashboard



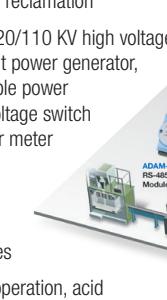
WISE-IoTSuite/SaaS Composer

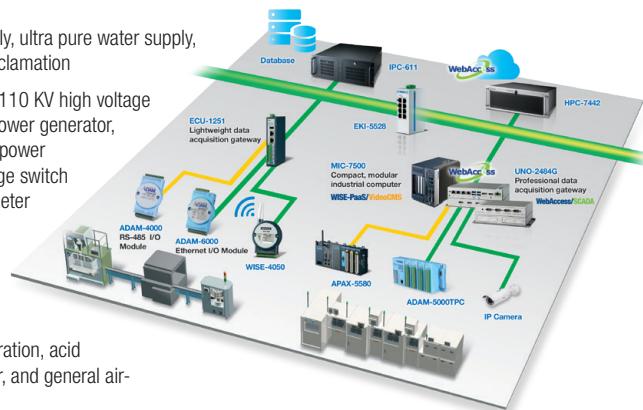
WebAccess/SCADA Focused Solutions

Factory automation solution



- Water system: raw water supply, ultra pure water supply, waste water treatment, and reclamation
- Electricity power system: 220/110 KV high voltage power monitoring, emergent power generator, dynamic/static uninterruptible power supply, electric bus, high voltage switch gear, and low voltage power meter
- Gas system: toxic gases detection, gas cabinet operation, valve box operation, and general gases
- HVAC system: clean room operation, acid exhaust, process cooling water, and general air-conditioning

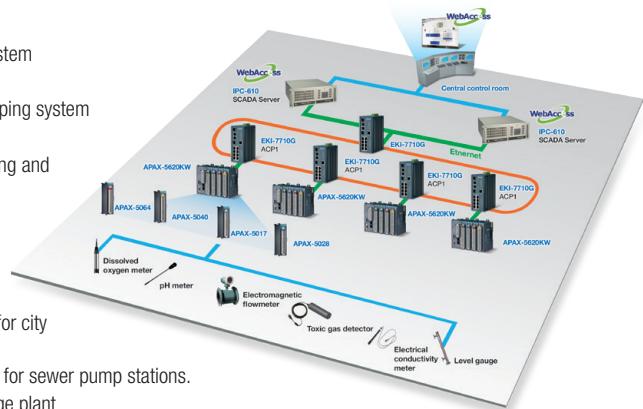




Water treatment solution



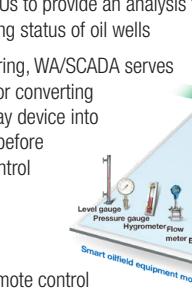
- Water resource distribution system
- Raw water distribution system
- Large-scale water supply pumping system
- SCADA system for tap water
- Booster pump station monitoring and control system
- Urban tap water pipeline monitoring control system
- City pipeline distribution optimization system
- Remote management system for city sewage pipelines
- Monitoring and control system for sewer pump stations
- SCADA system for large sewage plant
- Performance management for large sewage plant

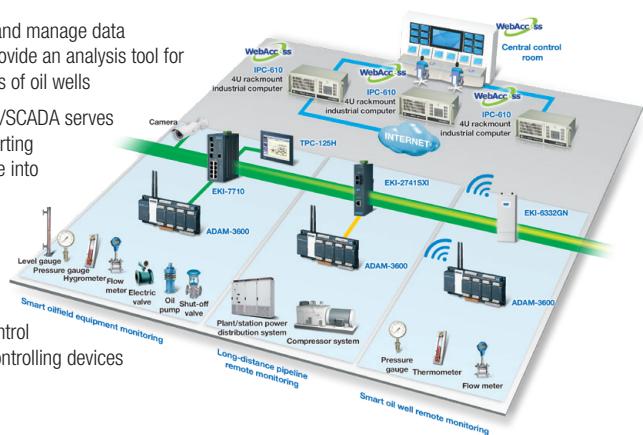


Oil & gas solution



- WA/SCADA is used to collect and manage data transmissions from RTUs to provide an analysis tool for monitoring the operating status of oil wells
- For oil pipeline monitoring, WA/SCADA serves as gateway software for converting data from each gateway device into the standard protocol before transmission to the control center
- Communicating with intelligent devices, WA/SCADA acts as remote control software for monitoring and controlling devices in the field

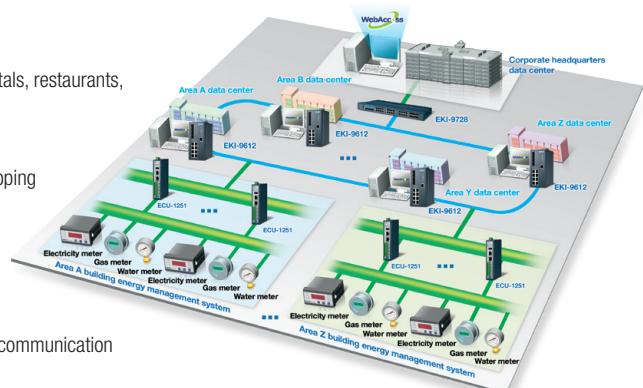




Building energy management solution



- Stand-alone buildings
 - Commercial buildings, hospitals, restaurants and office buildings
- Building complexes
 - Franchised restaurants, shopping malls, furniture stores, shoe stores, supermarkets, book stores, and convenience stores
 - Financial groups, shopping centers, campuses, and telecommunication stations

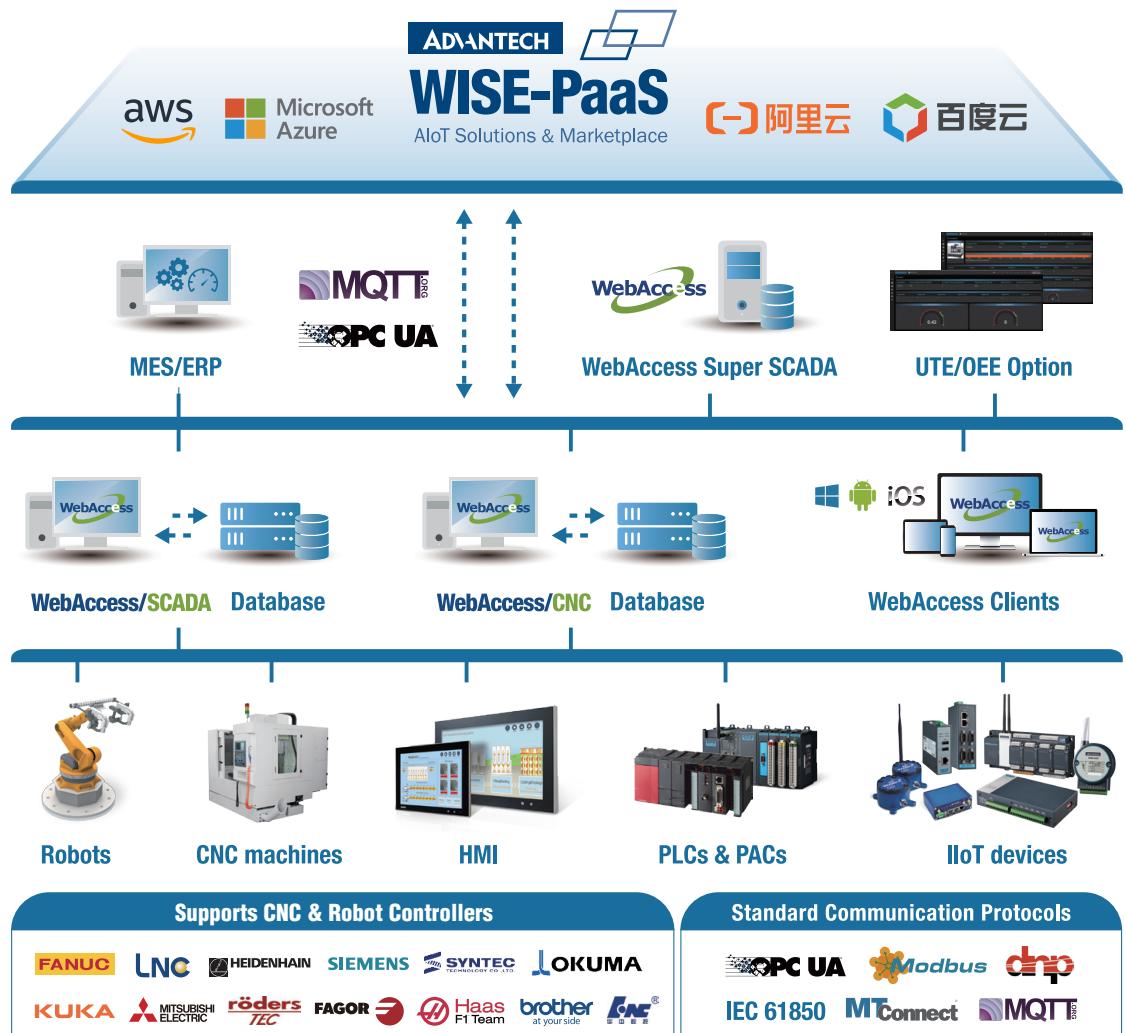


WebAccess/CNC for Metal Processing

Advantech WebAccess/CNC is a core solution for network CNC devices. WebAccess/CNC provides major CNC, PLC and robot networking functions in addition to bringing the advantages of SCADA software to the metal processing market. Auto-build CNC project provides users with quick access to device information.

WebAccess UTE/OEE Option for Device Usage Analysis

Through the flexible configuration interface, the WebAccess UTE/OEE option provides UTE (utilization rates) and OEE analysis per second. Preset event records and visualization templates are included to effectively reduce the development time and cost of integration - coding not required.



WebAccess P/N	Description
32WAMP000001A0	WebAccess 150 base (Rebindable License from Marketplace)
32WAMP020001A0	WebAccess Unlimited Tags (Rebindable License from Marketplace)
WA-P84-U075E	WebAccess Professional, 75 I/O, 75 internal tags, with USB Key
WA-P84-U150E	WebAccess Professional, 150 I/O, 150 internal tags, with USB Key
WA-P84-U300E	WebAccess Professional, 300 I/O, 300 internal tags with USB Key
WA-P84-U600E	WebAccess Professional, 600 I/O, 600 internal tags, with USB Key
WA-P84-U15HE	WebAccess Professional, 1500 I/O, 1500 internal tags, with USB Key
WA-P84-U50HE	WebAccess Professional, 5,000 I/O, 5000 internal tags, with USB Key
WA-P84-U20KE	WebAccess Professional, 20,000 I/O, 20000 internal tags, with USB Key
WA-P84-U64KE	WebAccess Professional, Unlimited I/O, Unlimited internal tags, with USB Key

WebAccess P/N	Description
32WAMP10000100	Additional Items: SaaS composer
32WSDASHWA0P01	Additional Items: Dashboard (Professional)
WA-CNC-U001E	75 I/O tags, 1 CNC connection for CNC runtime
WA-CNC-U005E	75 I/O tags, 5 CNC connection for CNC runtime
WA-CNC-U010E	75 I/O tags, 10 CNC connection for CNC runtime
WA-CNC-X005E	No I/O tags, 5 CNC connection (upgrade) for CNC runtime
WA-BRO-U001E	75 I/O tags, 1 CNC or robot connection for CNC driver
WA-BRO-U005E	75 I/O tags, 5 CNC or robot connection for CNC driver
WA-BRO-U025E	75 I/O tags, 25 CNC or robot connection for CNC driver
WA-BRO-U050E	75 I/O tags, 50 CNC or robot connection for CNC driver
WA-BRO-X001E	No I/O tags, 1 CNC or robot connection (upgrade) for CNC driver
WA-BRO-X005E	No I/O tags, 5 CNC or robot connection (upgrade) for CNC driver
WA-BRO-X025E	No I/O tags, 25 CNC or robot connection (upgrade) for CNC driver
WA-UTEOEE	WebAccess UTE/OEE upgrade option

WISE-EdgeLink

Transmit Data to the Cloud with WISE-EdgeLink

With the emergence of industrial IoT, companies are seeking solutions that facilitate the use of data analytics to improve service levels, create superior products, and reduce operating costs. The first step in this process is the digitalization of all assets, which means data collected from different equipment must first be analyzed. Equipment operators therefore require an easy and reliable method for collecting data from field-based equipment. Advantech's WISE-EdgeLink provides a data acquisition solution that does not require frequent on-site maintenance and service trips. With this solution, users can monitor critical assets, track equipment performance, receive alarm notifications, and perform system management and configuration using handheld devices. This will substantially reduce costs and ensure field equipment and facilities are better monitored and controlled.



Optimizing efficiency with connected equipment

For industrial boilers, air compressors, chillers, power distribution cabinets, and other equipment, WISE-EdgeLink serves as a hub for data acquisition, storage, and reports, as well as alarm notifications, maximizing equipment efficiency with the provision of accurate data.



Plug-and-play cloud access for rapid deployment

Plug-and-play functionality for data transmissions to the cloud eliminates complex programming and configuration. This ensures data can be easily uploaded for analysis and visualization to provide a useful reference for operational optimization.



Secure data conversion for integrating data with third-party systems

WISE-EdgeLink supports data conversion, enabling equipment used for mass production, such as PLCs, sensors, and inverters, to be directly integrated with SCADA, MESs, and ERP systems for convenient operation and maintenance.



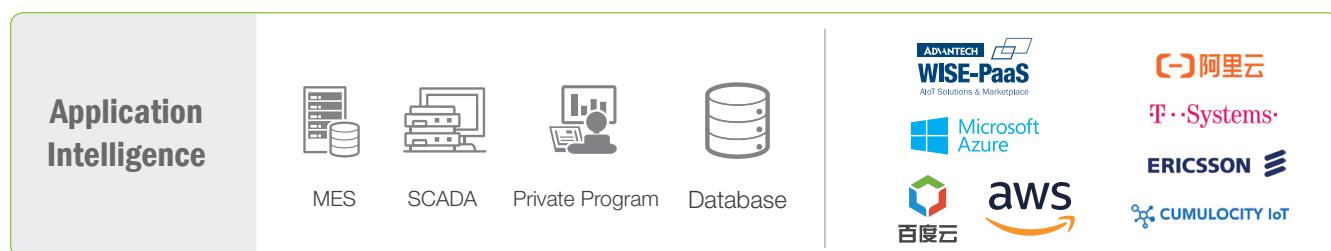
- 1** IIoT Software Solutions
- 2** Intelligent Systems
- 3** SKY Servers
- 4** AI & Advanced Computer Vision
- 5** Intelligent HMI and Monitors
- 6** Automation Computers
- 7** Intelligent Transportation Platforms
- 8** Mission Critical CompactPCI Platforms
- 9** Utility and Energy Solutions
- 10** EtherCAT Solutions and Automation Controllers
- 11** Intelligent Motion Control Solutions
- 12** High Speed DAO Solutions
- 13** Industrial Communication
- 14** Intelligent Edge DAQ Devices
- 15** Remote I/O, Wireless I/O & Sensors
- 16** Serial Communication

Advantech's WISE-EdgeLink is equipped with key functionalities aimed at edge applications. With downlink data acquisition capabilities integrated with uplink connectivity, security, and intelligence functions, transmitting field data to the cloud becomes an easy task.

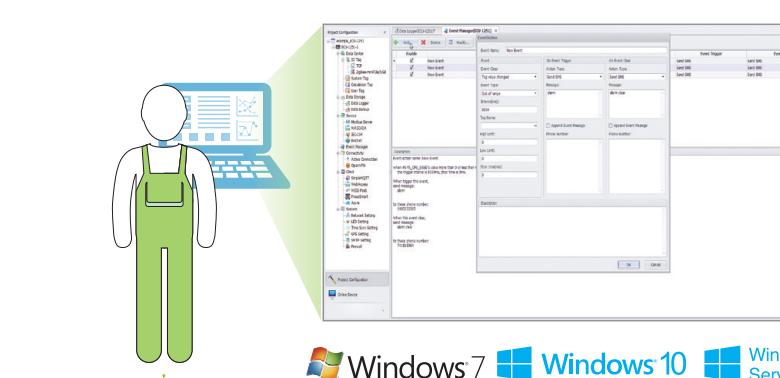
WISE-EdgeLink Kernel



WISE-EdgeLink Kernel Architecture



WISE-EdgeLink Components



EdgeLink studio
(for Windows)

- Project configuration
- Online device monitoring
- Device communication setup
- Data forwarding settings
- System settings

Download projects to the platform via a network

Configuration files



EdgeLink runtime
(for Linux)

- Connects end devices to a network
- Data acquisition and transmission
- Supports 200+ device drivers
- Real-time/historical data log
- Connectivity to the cloud and third-party systems

WISE-EdgeLink Target Applications



Machine-to-Intelligence

- Leasing equipment management
- Overall equipment efficiency
- Pump status monitoring
- Flow pressure monitoring
- HVAC system operating status analysis



Factory Environment

- Facility energy management
- Wastewater discharge
- Continuous emission monitoring systems
- Volatile organic compounds monitoring
- Industrial park energy management



Urban Construction

- Air quality monitoring
- Flood control systems
- Levee monitoring
- Wastewater systems
- Hazardous materials control



Distributed Energy Resources

- Solar power management
- Wind power management
- Geothermal energy management
- Weather station monitoring
- Power generation efficiency monitoring
- Energy storage solution monitoring

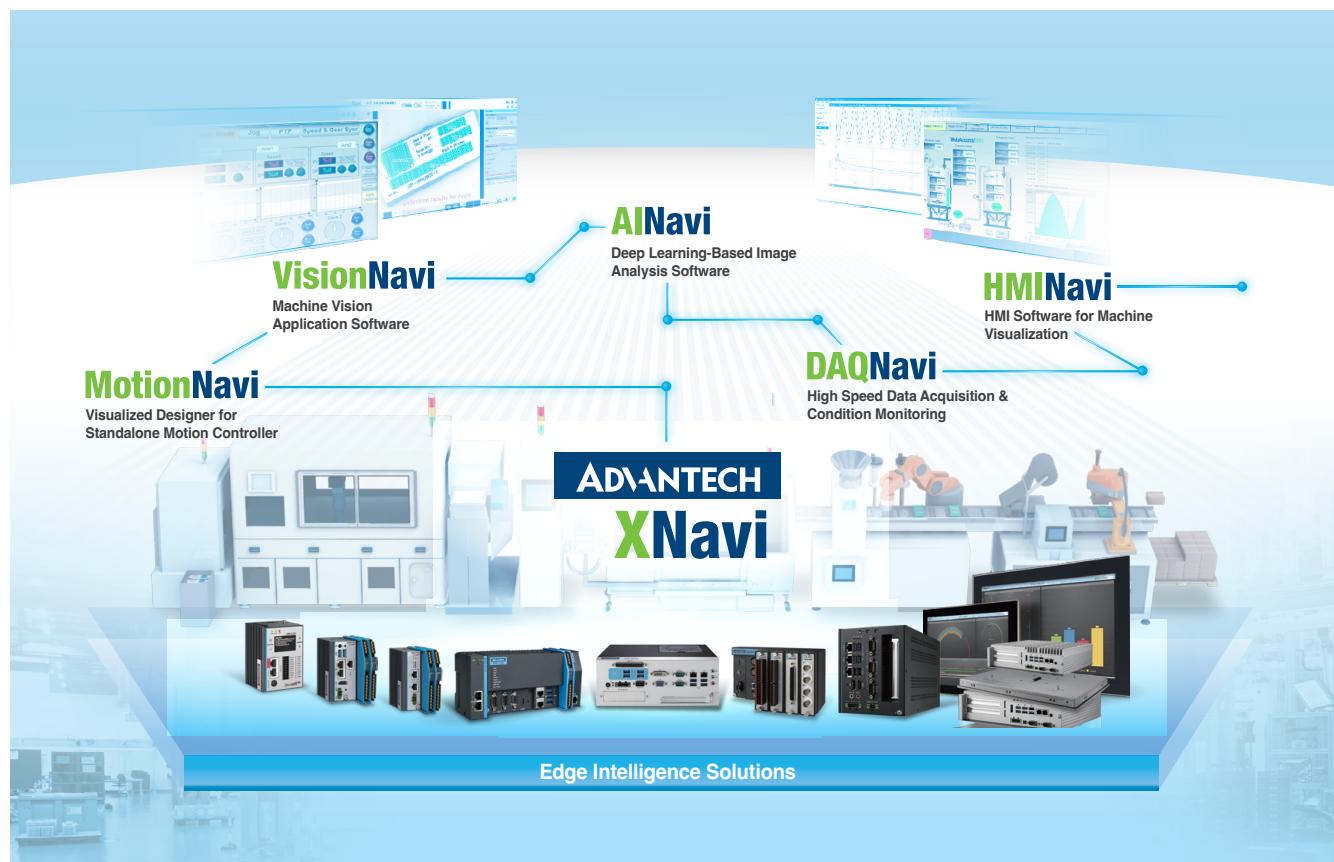


XNavi Software Series

Introduction

In the future, intelligent industrial automation will need to be real-time adaptable and agile, and edge solution ready packages are designed to meet this trend. Edge Solutions are software-hardware bundled products developed for use on the network edge, and are thus situated much closer to where the processing takes place. This helps manufacturers deal with issues cropping up in their systems as and when they occur without any lag in the time taken to act upon them. Edge solutions bridge the gap between the cloud and connected devices in the factory. These include specially written application-focused software such as DAQNavi, MotionNavi, VisionNavi, HMINavi, and AI-navi, for use on the edge for data collection, motion control, vision inspection, process visualization and AI analysis. This brings processing, communication, and decision making, much closer to edge devices.

Integrated Software Development Suite



Connecting Data, Motion, Vision and HMI from Edge-to-Cloud

DAQNavi

DAQNavi is software package used to enable edge intelligence for your DAQ device. It includes an SDK (Software Development Kit) used to get data from Advantech DAQ cards and modules, but also adds further data processing algorithms in order to gain a better insight from acquired data. The software has 6 parts: 1. Data Acquisition 2. Data Processing 3. Feature Extraction 4. Interpretation and Output 5. External Device/Cloud Connectivity 6. Data Visualization.

Featuring easy configuration and development support tools, the software can easily be deployed in Machine Condition Monitoring, Automated Testing Equipment and Machine Control scenarios. This makes it easier to realize an edge automated monitoring and control system.

MotionNavi

Advantech MotionNavi is a brand new comprehensive and universal software suite for PC-based motion control boards and standalone motion controllers. MotionNavi Designer is an integrated development environment for programming motion control applications. Designer offers BASIC-like commands for multi-process programming inside a controller; Simulation offers tools for off-line programming and preview; 3D path offers display for visualization of XYZ position via time interval; Oscilloscope is for capturing and recording motion velocity data in time intervals for analysis. MotionNavi; and Utility is a universal user interface. For PC-based motion control, Advantech provides several APIs for programming in C/C++, Visual Studio/Net, Python and others.

VisionNavi

Advantech VisionNavi is a programmable machine vision software that facilitates development of menu-driven user interface and helps deploy multiple tasks. It supports a wide range of Advantech industrial PCs and cameras, provides easy system installation and project development while reducing maintenance costs. It is suitable for automated applications aimed at defect inspection and quality assurance which need different conditional branches, steps or loops to complete each task. Any programmer can easily configure each process and determine the next action depending on the results, while the results can be inherited to the next step and become the reference or parameters for that process.

HMINavi

HMINavi is a powerful and intuitive software program for creating comprehensive human machine interface solutions. HMINavi is an easily integrated development tool with proven value in many application fields. Features include solution-oriented screen objects with built-in functionality, high-end vector symbols, graphics, and support for 450 PLC communication protocols. HMINavi also supports online/offline simulation and utility programs such as Data Transfer Helper (DTH), recipe editor, and text editor, ensuring easy development of all HMI applications.

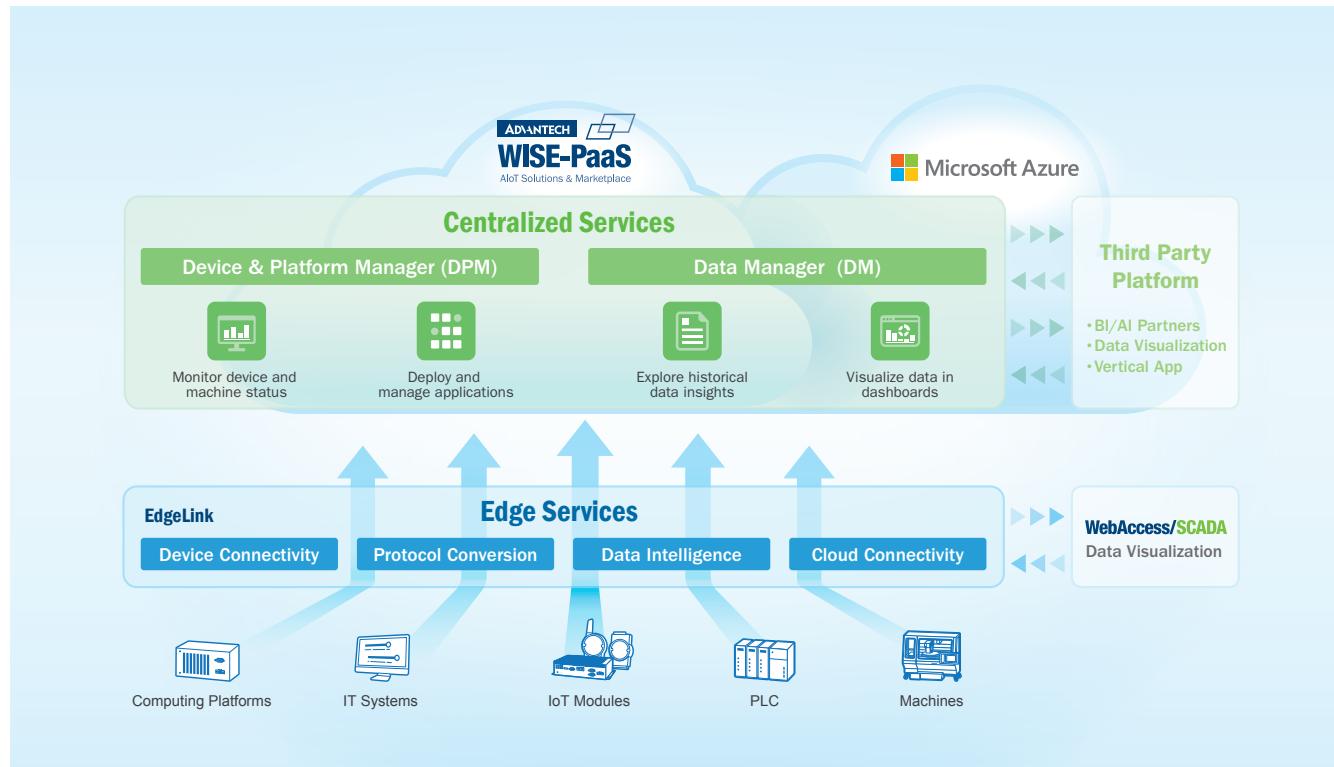
AI Navi

AI Navi is deep-learning-based image analysis software that includes AI defect inspection tools and independent AI training software. It is designed for inspection in multi-product lines and multi-defect applications. AI defect inspection tool can be easily used in any defect inspection application. It reduces software development times and provides high-tolerance to environmental factors. It can also be implemented to replace manual inspection. The AI trainer software uses the latest neural network recognition judgment and it can train models with only a few images. AI Navi lowers the threshold difficulty of applying AI algorithms in automation production lines. It provides a faster and more efficient way to deploy defect inspection tools.



WISE-DataConnect

WISE-DataConnect is the fundamental core for device and Internet of Things management. In addition to edge device gateways or platform remote management, various data from IT database sources as well as data from OT sensors can be constructed to virtual things or virtual objects in order to make sufficient management in a centralized platform. WISE-DataConnect provides a device and platform management portal and allows customers to establish their own connected "things" to make real time monitoring dashboards as well as providing object based inquiry APIs for vertical application extensions, enabling seamless business and manufacturing digital transformation.



Industrial IoT Device, Platform, and Data Management

WISE-DataConnect is designed for managers to monitor connected equipment or devices easily. Engineers can also spend less time sifting through raw data and focus more on improving the reliability and performance of equipment or devices operation.



Hierarchical KPI management

The clear roles and responsibility (R&R) defined in terms of organization structure over equipment management enhances risk assessment control with aid of stacked indexes via dashboard visualization. This provides straightforward KPI monitoring and comparison.



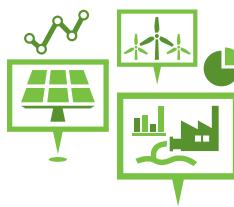
Comprehensive equipment management

Concise equipment effectiveness monitoring together with visualized operation status demonstrates prompt assignment monitoring where proactive decision can be made precisely.



Equipment profile management

Profile templates for equipment in terms of customer defined objects can be stored and used over and over upon site setup once equipment is connected.



Easy visualization setup

In practice, visualization of domain focused scenarios become true plug and play. When transmitting data, the domain scenario dashboards obtain data automatically from equipment and objects will be displayed without any extra work.

Energy & Environment Solutions

Advantech has developed many solutions for energy and the environment using industrial IoT technologies that focus on the process of sensing, control monitoring, remote communication, and smart data management. By combining these technologies, Advantech can offer cloud-based monitoring and management solutions that perform data integration and analysis used in a wide variety of energy and environment industries.

Data acquisition using multiple communication protocols

There are many types of electrical equipment in energy applications, such as inverters, combiner boxes, and intelligent or non-intelligent power meters, which need the support of a diverse range of communication protocols. With WISE-EdgeLink to realize device data acquisition, Advantech provides communication platforms compatible with these protocols.

WebAccess/SCADA based application solution

For energy monitoring, Advantech WebAccess/SCADA software is able to implement remote management, energy consumption status overview, energy saving potential assessment, and recommend practical measures, energy monitoring and reporting analysis, etc. to effectively achieve energy savings and cost control.

Visualized and integrated cloud platform

Integrated data is gathered from a wide area and big data analysis and information visualization provides management level intelligence for decision-making to optimize operational efficiency.

Remote equipment monitoring and efficiency optimization

Each energy and environment solution is integrated with intelligent sensing, communication, and real-time analysis capabilities that allow users to obtain the operating status of any machine at any time to ensure efficient resource usage.

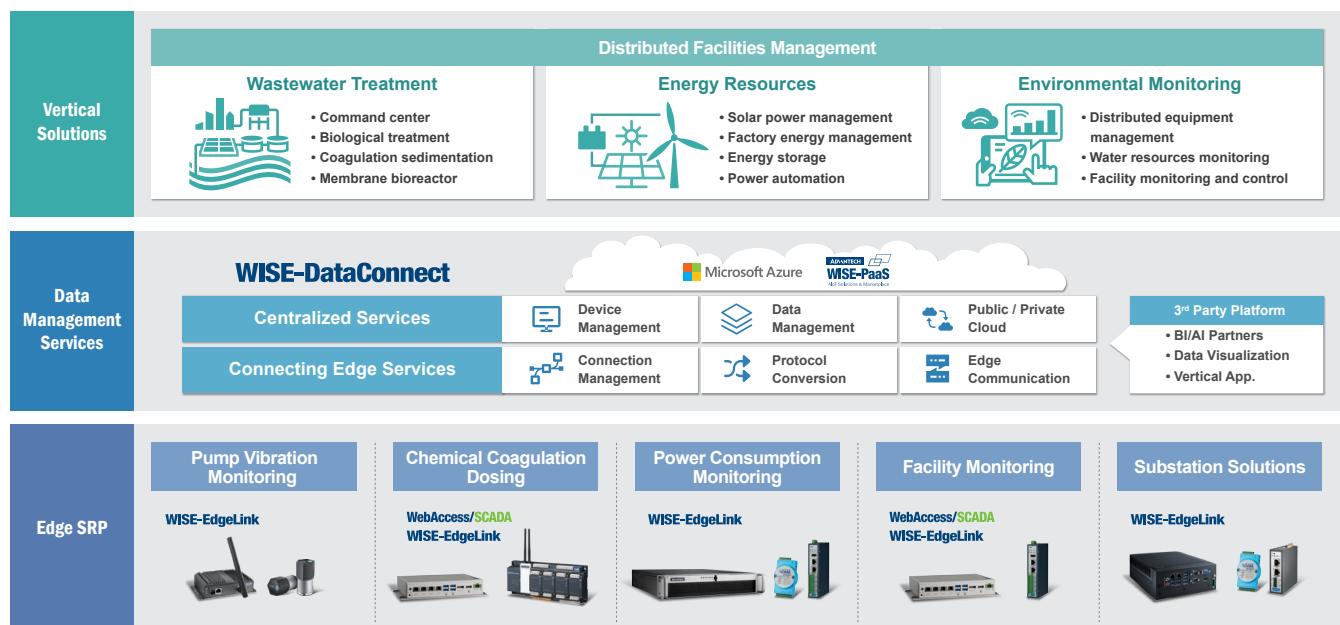
Event monitoring for real-time alarms

With wireless communication technology, event alerts can be transmitted in real-time from remote sites to the control center, allowing field personnel to respond promptly to minimize accidents and losses.

Remote equipment diagnostics and predictive maintenance

Collates operating status data from key components, thereby increasing equipment life, while reducing maintenance costs.

System Architecture



Solar Power Management Solution (SPMS)

Transforming distributed energy resources to drive the growth of the renewable energy market

E&E
SPMS

Distributed solar power operation and maintenance management system

- Decentralized control and centralized management
- Qualified for local regulations for seamless real-time process monitoring of station equipment



Energy Management Solution (EMS)

Highly stable and reliable centralized monitoring and management system for key energy consumption equipment

Energy
EMS

Energy management system

- Displays electricity usage for analysis
- Graphical dashboard for clear energy indicators
- Data diagnosis to save energy



Water and Wastewater Treatment

Cloud-enabled remote equipment management for water and wastewater

Water

Water management solution

- Real-time equipment monitoring scenario and dashboard setup
- Data visualization and analysis for water and wastewater treatment management



Water
Waste
Dosing

Wastewater chemical coagulation dosing solution

- Precise dosing
- Stable discharge water quality



Environmental Facility Monitoring

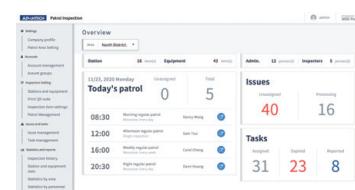
True plug and play standalone application suite for flexible and efficient facility management

E&E
Patrol
Inspection

Patrol inspection

Patrol inspection system is a true plug and play standalone application suite including an Advantech industrial PC and patrol inspection software system.

- Inspection user group management
- Hierarchical inspection site setup and survey configuration
- Dynamic patrol route scheduling

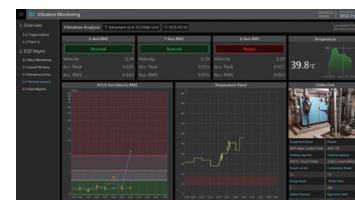


Env.
Vibration

Vibration monitoring

Vibration monitoring system is a true plug and play standalone application suite including an Advantech industrial PC and vibration monitoring panel.

- ISO 10816-3 monitoring panel
- WebAccess/SCADA 1500 tags included



WISE-Factory Solutions

To confront the challenges of the future through digital transformation in Industry 4.0, Advantech developed an Industrial app platform to meet these challenges. Advantech provides WISE-Factory I.Apps that allow DFSI (Domain-Focused Solution Integrator) partners to have easy access to multiple I.App modules so they can collaborate with Advantech and develop complete industrial solutions. All WISE-Factory Apps are available on WISE-Marketplace and can be easily subscribed to via Advantech WISE points.

WISE-PaaS IoT Cloud Platform

Advantech's WISE-PaaS IoT cloud platform provides edge-to-cloud software and services to help system integrators, manufacturers, solution developers, and industrial end customers; enabling real IoT-powered cloud business models in various vertical markets. Leveraging Advantech's extensive hardware portfolio, WISE-PaaS integrates diverse software services for edge connectivity. Data collected on hardware can be sent to the WISE-PaaS/EnSaaS industrial IoT cloud PaaS to help its ecosystem partners quickly develop SaaS and domain-specific IoT solutions based on our data-driven IoT cloud platform, WISE-PaaS.

WISE-Marketplace

WISE-Marketplace is a trading platform for IIoT solutions that provide customers with subscription services for Industrial apps (I.Apps). The platform invites its ecosystem partners to launch their solutions via the platform. Users are able to subscribe to Edge, SRP, General I.App, Domain I.App, AI modules, as well as consulting services, and training services provided by Advantech and partners on WISE-Marketplace.

WISE-Factory I.Apps for Industry 4.0 Applications

Based on the WISE-PaaS platform, Advantech has developed some significant industrial apps that can be easily integrated and customized for various industries. Moreover, Advantech invites DFSI partners to connect with WISE-PaaS platform and co-create WISE-Factory I.Apps for Industry 4.0 applications, to help vertical industry customers implement rapid digital transformation.

	Food & Beverage	Packaging	Metal Processing	PCB	Electronics	Footwear	Textiles
WISE-Factory Solution	WISE-FactoryOEE&M Machinery Management & Maintenance for Production Excellence						
I.App	FEMS Factory Energy Management System	OEE Overall Equipment Effectiveness	Predict Predict	SPC Statistical Process Control	eManual eManual	Maintenance Maintenance	Shop Floor Shop Floor
WISE-PaaS Data Platform	WISE-DatalnSight One-stop service for data storage, governance, and exploration			WISE-EnSaaS K8S-based hosting environment for publishing, subscription, and hosting of I.Apps microservices		WISE-AIFS MLOps platform for data analytics, computing resource management and model retraining	
Edge SRP (Solution Ready Package)	Edge Computing & Visualization WebAccess/SCADA HMI Navi		RTM Gateway WISE-EdgeLink WISE-DeviceOn WebAccess/CNC		Data Acquisition Module		Edge To Cloud Microsoft Azure  AWS IoT  / IOT CONNECT
Edge Equipment	Lathe	Milling	Drilling	Grinder	Sawing	Plane Machine	Robot
	SMT	Stamping	AGV				



Overall Equipment Effectiveness & Maintenance (OEE&M)

Real-time machine performance and maintenance support for operational excellence



WISE-FactoryOEE&M

Many manufacturers have adopted automated production machinery to improve production throughput and quality. Powerful production machinery can be incredibly complex making it difficult for users to identify and prevent machine problems during production. While machine suppliers have provided support to handle known common issues, trained mechanical professionals are still needed to service the machines and ensure optimal operations.

OEE&M is WISE-Factory's solution suite to enable better machine services and smoother operations. Machine data is aggregated to allow factory management to easily check machine performance and any anomalies. Maintenance and repairs are scheduled and recorded, this helps to ensure all service requests are handled properly with clear health records for production equipment.

Key Features

- Real-time data acquisition from production machinery, with support for multiple industrial protocols.
- Configurable machine performance metrics, including OEE, APQ etc.
- Track and record machine repair and maintenance requests, manage spare part stocks.
- Supports AI analytics methods to predict machine anomalies and remaining useful life for early intervention.
- Easy to use dashboard for composing data visualizations and reports.

Environment, Health & Safety (EHS)

Enabling smart manufacturing facilities for carbon neutral operations and a safer work place



WISE-FactoryEHS

Consumption of energy and water are a daily necessities for manufacturing. They contribute to a significant portion of production costs, as do the personnel needed to operate machines and perform various production work. Providing safeguards for your workforce helps keep them focused on the task at hand and also increases productivity.

EHS is WISE-Factory's solution suite for enabling smart facilities and safeguarding your workforce. Usage of energy and utilities can be monitored and attributed to specific production. Target usage levels can be set to help control resource consumption, with alerts to request intervention. Video analytics help identify personnel entering restricted areas and confirm if they are wearing the correct protective attire. Other analytics assist in forecasting energy needs, further helping to control costs and lowering the carbon footprint.

Key Features

- Whole facility monitoring for energy, utilities & safety.
- Configurable KPI targets to meet carbon targets and reduce waste.
- Calculate and analyze carbon footprint of your manufacturing operations.
- Integrate AI analytics methods to predict usage trends, video-based geofencing and motion analysis.
- Easy to use dashboard for composing data visualizations and reports.

Manufacturing Operations Management (MOM)

Digital transformation of manufacturing operations for flexible capacity



WISE-FactoryMOM

In order to produce a complete product, each piece must go through a series of manufacturing steps. With the impact of COVID on the global supply chain, as well as the increasingly high mix low volume operational model, tracking production progress and adapting production capabilities has never been more complex.

MOM is WISE-Factory's solution suite to support manufacturers along their digital transformation journey. Work plans can be arranged in our solution suite or received from ERP systems. Based on available resources and routing, work can easily be allocated to corresponding areas for execution. Live production data is collected from the shop floor and updated on real-time dashboards. Digital work instructions complement guidance for operators and technicians during work tasks, reducing errors and time needed for training.

Key Features

- Schedule and dispatch production work.
- Guide assembly and machine setup for production.
- Track and record production outcomes, QC results.
- Real-time updates & transparency to support upper management business decisions.
- Easy integration with ERP, PLM and existing IT systems.

