Co-Creating AIoT Business Success with WISE-PaaS

WISE-PaaS
AIoT Solutions & Marketplace

Sensing Devices, Cloud Services, Edge Intelligence, Servers, Machine Data Acquisition, Sensor Data Acquisition, Business Intelligence, Dashboard and Visualization, Scalable Cloud Operation, Predictive Maintenance, Remote Monitoring and Edge Analytics, Video Analysis, Cloud Services

WISE-PaaS/EnSaaS

WISE-PaaS/WISE.M+
WISE-PaaS/EdgeLink
WISE-PaaS/DeviceOn
WISE-PaaS/VideoSense

IoT.SENSE
IoT Solution Enabling Services

wise-paas.advantech.com/en-us
Advantech's WISE-PaaS Industrial IoT cloud platform provides edge-to-cloud software and services to help system integrators and manufacturers; enabling real IoT-powered cloud business models in various vertical markets. Leveraging Advantech's extensive hardware portfolio, WISE-PaaS integrates diverse software services, including WebAccess, WISE-PaaS/WISE.M+, WISE-PaaS/EdgeLink, WISE-PaaS/DeviceOn, and WISE-PaaS/VideoSense. Data collected for the WISE-PaaS/EnSaaS IoT cloud platform enables partners to quickly develop SaaS and domain-specific IoT solutions.

### WISE-PaaS 4.0 Architecture with Microservices & I.APP

<table>
<thead>
<tr>
<th>Domain IAPP's</th>
<th>Energy &amp; Environment</th>
<th>Machine to intelligence</th>
<th>iFactory/Industry 4.0</th>
<th>Smart City</th>
<th>iHealthcare</th>
<th>iRetail</th>
<th>iLogistics</th>
</tr>
</thead>
</table>

#### WISE-PaaS/EnSaaS
- Microservices Framework
  - API Gateway
  - Service Discovery
  - Broker
  - Rate-Limiting
  - Load Balancing
  - Dynamic Expansion
  - Multi Languages Support

#### Visualization Services
- WISE-PaaS/Dashboard
- WISE-PaaS/EnSaaS Composer
  - Multiple Data Sources
  - 2D & 3D Rendering

#### Asset Performance Management (APM)
- WISE-PaaS/AM
  - Asset Models
  - Asset Evaluation
  - Workflow Integration
  - Alarm/Trigger

#### AI Framework Service (AFS)
- WISE-PaaS/AFS
  - Code IDE
  - Hyper Parameter
  - Feature Extraction
  - Data Pre-Processing

#### Commercial Services
- Subscription & License
- Single Sign-On
- Consumption Mgmt.
- Metering & Billing

#### Monitoring Services
- Health Check
- Log & Metrics
- Alarm & Notification

#### Operation Services
- Auto Scaling
- Private Domain
- Code Pipeline

#### Edge Intelligence Services
- WebAccess/SCADA
- WISE-PaaS/WISE.M+
- WISE-PaaS/DeviceOn
- WISE-PaaS/VideoSense
- WISE-PaaS/iWmM2M

#### IaaS Management
- Public Clouds: Azure, AWS, Alibaba Cloud
- Private Clouds: WISE-STACK, OpenStack, VMware

### WISE-PaaS Features

#### Cross Clouds/Regional Deployment
Delivers with IaaS options to satisfy your market development preferences
- Public Cloud: Azure, AWS, Alibaba Cloud
- Private Cloud: WISE-STACK, OpenStack, VMware

#### Scalable
Cloud-native environment with high scalability offers operational benefits at any scale and makes release pace faster

#### Flexible
Provides a microservice development framework for component flexibility and improved efficiency for solution development

#### Edge-to-Cloud-Ready
Seamless edge-to-cloud integration from devices to the WISE-PaaS data platform maximizes the potential of data utilization and accelerates solution building

#### Speed-to-Market
The configuration-driven WISE-PaaS platform facilitates rapid solution development and deployment with high resource-efficiency
WISE-PaaS provides end-to-cloud connectivity, realizing data retrieval, analysis, and application. The data visualization tools, including WISE-PaaS/Dashboard and WISE-PaaS/SaaS Composer, help display your data more clearly. By configuring how and where different objects are displayed, businesses can optimize the monitoring of day-to-day operations, assess efficiency, and manage operations with a high level of precision, thereby improving their operations management and decision-making.

**WISE-PaaS/Dashboard**

*Data Analysis and Visualization Tool*

WISE-PaaS/Dashboard is commonly used for visualizing time-series data for infrastructure and application analytics. It allows access to various data sources and gives more convenient access to WISE-PaaS data. WISE-PaaS/Dashboard uses suitable graphical tools based on different data types and situations.

- **Fast and Reproducible Solutions**
- **Rapid Data Integration**
- **Plugin Development Ecology**

**WISE-PaaS/SaaS Composer**

*Cloud Configuration Tool with Visible Workflow*

WISE-PaaS/SaaS Composer supports customized component plotting for simple and intuitive 3D modeling applications and interaction. It updates views at millisecond rates, and, together with WISE-PaaS/Dashboard, presents critical management data in a visually intuitive display to help extract valuable data and improve operational efficiency.

**SRP Dashboard**

*iFactory Central Management System*

**Focal Point:**

- Real-Time Information
  - Live video streaming
  - Key production index
  - Production management information

**Interactive Dashboard:**

- Central Management System
  - Factory overview
  - Machine availability
  - Line balancing rate
  - Overall availability analysis

**Management Scorecard:**

- Operational KPIs
  - Operation management
  - Employee management
  - Supply chain management
  - Quality management
WISE-PaaS/AFS **AI Framework Service**

WISE-PaaS/AFS provides a unified platform for AI model development, training, deployment, re-training, and re-deployment. It provides a web UI interface that allows developers to quickly build up their own AI solutions. Combined with AI algorithms, the service builds an effective inference engine with automatic deployment to edge computing platforms. WISE-PaaS/AFS offers model accuracy management, model retraining, and automated redeployment. It simultaneously controls multiple AI models in the application field; offering automated model accuracy improvement and life-cycle management services.

**Artificial Intelligence Training Model and Deployment Service Framework**

**Training and Model Management**
- **Resource Schedule & Cluster Management**
  - jupyter Notebook (on line)
  - docker Upload Code (off line)
- **Workspace**
  - **SDK**
    - Data Source
    - Model Management
    - AutoML
  - **Preprocess**
    - Feature Selection
    - Time Series Data label
    - Image & Video Data Label
  - **Model Management**
    - Model Repository
    - Model Compression
  - **Training**
    - Auto Re-Training Task
    - Hyperparameter Tuning
  - **Catalog**
    - Firehose
    - Data Preprocess
    - Pre-Trained Model
    - 3rd Party Algorithm
    - Marketplace Integration

**Inference and Model Deployment**
- **Inference Engine Deployment**
  - Restful API
  - Cloud Inference and Edge Inference
- **Model Deployment**
  - Model & File Update
  - Model Update Rule

**Edge Intelligence**

**WISE-PaaS/APM **Asset Performance Management**

WISE-PaaS/APM supports remote asset management with a service framework. Built on the WISE-PaaS Platform, WISE-PaaS/APM provides a standardized way to connect diversified assets/devices, data, production lines, site infrastructure, and management staffs with a consistent interface. WISE-PaaS/APM makes asset management easier, performance better and the cross-site solution building process faster than ever.

**Asset Management Service**
- Preventative Maintenance
- Predictive Maintenance
- Performance Optimization

**Digital Twin Template**
- Connected Fixed Asset
- Connected Mobile Asset
- Connected Infrastructure
- Connected People

**Asset Performance Management Development Modules (Micro Services)**
- Fixed Asset Insights Manufacturing Execution
- Mobile Asset Insights Logistic Safety
- Building Insights Energy Grids
- Authority Management Maintenance Sys. Integration

**Edge-side Data Collection Support**

**WISE-PaaS Cloud Platform**

**APM Portal**
- Asset Models API
- Event / Alarm API

**APM Dashboard / SaaS Composer**
- Reporting API
- Workflow / MES Integration API

**APM Mobile App**
- Asset Evaluation API
- Management Configuration API
- Notification API
- OTA API

**WISE-PaaS Cloud Platform**

**Edge-side Data Collection Support**

**WebAccess/SCADA**

**WISE-PaaS/EdgeLink**

**WISE-PaaS/DeviceOn**
A globally renowned iron and steel company, facing the challenges of the low predictability of equipment fault diagnosis, reactive handling of production line halts, and difficulty passing on the skills and experience of senior equipment maintenance administrators, decided to invest in condition monitoring and cloudization.

Through technologies such as cloud data platforms, big data analysis, and artificial intelligence (machine learning for vibration analysis), the company aims to improve equipment maintenance, fault detection, and preventive diagnosis; using AI to make up for the lack of manpower to enhance production and management efficiency.

**WISE-PaaS Architecture and Benefits**

- Equipment Condition Detection
- Equipment Diagnosis
- Preventive Maintenance
- Alert Notifications

**WISE-PaaS/Dashboard**
Data Analysis and Visualization
Intuitive and easy-to-use WISE-PaaS/Dashboard suitable for field operators, system operators, and more to improve data interpretation and management efficiency.

**WISE-PaaS/APM**
Asset Performance Management
Utilize WISE-PaaS/APM asset models and configurations to quickly integrate management and alert notifications for each machine, production line, and factory zone.

**WISE-PaaS/OTA**
Over-the-Air Software Updates
Meet remote software update management requirements with centralized remote software upgrade.

**WISE-PaaS/AFS**
Enhance Equipment Prognosis with AI
Develop and train AI models online through WISE-PaaS/AFS, deploy inference engine remotely to update and integrate the asset models, and improve the correctness and scalability of equipment prognosis.

**WISE-PaaS/EnSaaS**
Industrial IoT Cloud Platform Service

**Equipment Vibration Data Collection and Computing Processing**
- Smart Machine Box (industrial computer MIC-7500 with data capture card PCIE-1802) centrally manage machine operation and capture vibration data with WebAccess/SCADA and WISE-PaaS/DeviceOn
- MIC-7500 acts as an inference engine and executes edge-side prediction models

**Advantech Smart Machine Box (SMB)**
A Chinese vessel company established over 25 years ago focusing on marine electrics and automation is currently transforming from an equipment manufacturer to a total solutions provider. This solution covers data collection, data transmission, cloud configuration, big data analysis, and data visualization for integrated remote monitoring and management.

So far, remote monitoring for all vessel data of up to 1,400 I/O points on new ships has been realized and real-time conditions for vessel operation have improved, enhancing the company’s ability to manage their own vessels and respond to emergencies.

**Project background and challenges**

A Chinese vessel company established over 25 years ago focusing on marine electrics and automation is currently transforming from an equipment manufacturer to a total solutions provider. This solution covers data collection, data transmission, cloud configuration, big data analysis, and data visualization for integrated remote monitoring and management.

So far, remote monitoring for all vessel data of up to 1,400 I/O points on new ships has been realized and real-time conditions for vessel operation have improved, enhancing the company’s ability to manage their own vessels and respond to emergencies.

**Equipment Intelligence**

**Uninterrupted Service with Remote Updates and Secure Connections**

Maintain remote software update requirements securely with WISE-PaaS/OTA and WISE-PaaS/VPN.

**2D+3D Visual Dashboard to Improve Management Efficiency**

Visualization services to access WISE-PaaS/APM data to display design drawings and circuit diagrams. Supports mobile device app to view vessels around the globe in real time.

**2D+3D Visual Dashboard to Improve Management Efficiency**

Visualization services to access WISE-PaaS/APM data to display design drawings and circuit diagrams. Supports mobile device app to view vessels around the globe in real time.

**Data Analysis and Visualization**

**WISE-PaaS/Dashboard**

**Data Analysis and Visualization**

**WISE-PaaS/SCADA**

**Communication Gateway**

**Equipment Prognosis**

**Restful APIs**

**Remote Vessel Monitoring**

**Preventive Maintenance**

**Energy Forecasts**

**Over-the-Air Software Updates**

**Virtual Private Network**

**Over-the-Air Software Updates**

**Virtual Private Network**

**Cross-site Asset Performance Management**

Data is managed by the asset model and configurable topology in WISE-PaaS/APM to perform the cross-site overall performance management for distributed devices. Alert notifications will be sent through email, SMS, and communication software when abnormalities occur.

**Simple Configuration, Data on the Cloud**

The data is simple and intuitively configured through cloud-based WISE-PaaS/SCADA to the WISE-PaaS/EnSaaS public cloud for discrete vessel systems.

**Acquisition of Key Ground Equipment Data**

Collect navigation information and key data of various equipment through the ECU-1251 communication gateway (pre-built WISE-PaaS/EdgeLink software) in the control cabin of ocean-going vessels to grasp the hull condition intuitively with detailed machine parameters.

**Edge**

- Navigation information (location, heading, speed, displacement, etc.)
- Equipment status (current, voltage, temperature, rotating speed, etc.)
- Energy consumption information
Enabling AIoT Solution Co-Creation with the WISE-PaaS VIP Program

WISE-PaaS Marketplace is the destination for all your software needs. You can find software, end-to-end solutions, industrial apps, consulting services, marketing packages, as well as microservices tools to develop your own apps or solutions.
WISE-PaaS Marketplace 2.0

Buy, Deploy, and Customize Your Industrial Software Needs to Facilitate Your Own Industrial APPs/Solutions!

- Diversified Software
- End-to-End Solutions
- Industrial Apps
- Consulting Services
- Marketing Packages
- Microservices Tools

Explore Now

Regional Service and Customization Centers

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Kunshan</td>
<td>86-512-5777-5666</td>
</tr>
<tr>
<td>Taiwan</td>
<td></td>
<td>886-2-2792-7818</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Eindhoven</td>
<td>31-40-267-7000</td>
</tr>
<tr>
<td>Poland</td>
<td>Warsaw</td>
<td>00800-2426-8080</td>
</tr>
<tr>
<td>USA</td>
<td>Milpitas, CA</td>
<td>1-408-519-3898</td>
</tr>
</tbody>
</table>

Please verify specifications before ordering. This guide is intended for reference purposes only. All product specifications are subject to change without notice. No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher. All brand and product names are trademarks or registered trademarks of their respective companies. © Advantech Co., Ltd. 2019

www.advantech.com

Explore Now

Worldwide Offices

Greater China

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>0800-810-0345</td>
</tr>
<tr>
<td></td>
<td>Beijing</td>
<td>86-10-6298-4346</td>
</tr>
<tr>
<td></td>
<td>Shanghai</td>
<td>86-21-3632-1616</td>
</tr>
<tr>
<td></td>
<td>Shenzhen</td>
<td>86-755-8212-4222</td>
</tr>
<tr>
<td></td>
<td>Chengdu</td>
<td>86-28-8545-0198</td>
</tr>
<tr>
<td></td>
<td>Hong Kong</td>
<td>852-2720-5118</td>
</tr>
<tr>
<td>Taiwan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>0800-777-111</td>
</tr>
<tr>
<td></td>
<td>Taipei &amp; IoT Campus</td>
<td>886-2-2792-7818</td>
</tr>
<tr>
<td></td>
<td>Taichung</td>
<td>886-4-2329-0371</td>
</tr>
<tr>
<td></td>
<td>Kaohsiung</td>
<td>886-7-229-3600</td>
</tr>
</tbody>
</table>

Taiwan

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taipe &amp; IoT Campus</td>
<td>886-2-2792-7818</td>
</tr>
<tr>
<td></td>
<td>Taichung</td>
<td>886-4-2329-0371</td>
</tr>
<tr>
<td></td>
<td>Kaohsiung</td>
<td>886-7-229-3600</td>
</tr>
</tbody>
</table>

Middle East and Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Israel</td>
<td>072-2410527</td>
</tr>
</tbody>
</table>

Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>0800-500-1055</td>
</tr>
<tr>
<td></td>
<td>Tokyo</td>
<td>81-3-6802-1021</td>
</tr>
<tr>
<td></td>
<td>Osaka</td>
<td>81-6-6267-1887</td>
</tr>
<tr>
<td></td>
<td>Nagoya</td>
<td>81-0800-500-1055</td>
</tr>
<tr>
<td>Korea</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>080-363-9494</td>
</tr>
<tr>
<td></td>
<td>Seoul</td>
<td>82-2-3663-9494</td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td>65-6442-1000</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Kuala Lumpur</td>
<td>60-3-7725-4188</td>
</tr>
<tr>
<td></td>
<td>Penang</td>
<td>60-4-537-9188</td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bangkok</td>
<td>66-02-2488306-9</td>
</tr>
<tr>
<td>Vietnam</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hanoi</td>
<td>84-24-3399-1155</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td>62-21-751-1939</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td>1300-308-531</td>
</tr>
<tr>
<td></td>
<td>Melbourne</td>
<td>61-3-9797-0100</td>
</tr>
<tr>
<td>India</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bangalore</td>
<td>91-80-2545-0206</td>
</tr>
<tr>
<td></td>
<td>Pune</td>
<td>91-94-2260-2349</td>
</tr>
</tbody>
</table>

Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>00800-2426-8080/81</td>
</tr>
<tr>
<td></td>
<td>Munich</td>
<td>49-89-12599-0</td>
</tr>
<tr>
<td></td>
<td>Düsseldorf</td>
<td>49-2103-97-855-0</td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paris</td>
<td>33-1-4119-4666</td>
</tr>
<tr>
<td></td>
<td>Milano</td>
<td>39-02-9544-961</td>
</tr>
<tr>
<td>Benelux &amp; Nordics</td>
<td>Breda</td>
<td>31-76-523-3100</td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newcastle</td>
<td>44-0-191-262-4844</td>
</tr>
<tr>
<td></td>
<td>London</td>
<td>44-0-870-493-1433</td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Warsaw</td>
<td>48-22-31-51-100</td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moscow</td>
<td>8-800-555-01-50</td>
</tr>
<tr>
<td></td>
<td>St. Petersburg</td>
<td>8-800-655-81-20</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Ústí nad Orlicí</td>
<td>420-465-521-020</td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oranmore</td>
<td>353-91-792444</td>
</tr>
</tbody>
</table>

Americas

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td>1-888-576-9668</td>
</tr>
<tr>
<td></td>
<td>Cincinnati</td>
<td>1-513-742-8989</td>
</tr>
<tr>
<td></td>
<td>Milpitas</td>
<td>1-408-519-3898</td>
</tr>
<tr>
<td></td>
<td>Irvine</td>
<td>1-949-420-2500</td>
</tr>
<tr>
<td></td>
<td>Ottawa</td>
<td>1-815-434-8731</td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>São Paulo</td>
<td>0800-770-5355</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Worldwide Offices

View Online

Contact

www.advantech.com

Please verify specifications before ordering. This guide is intended for reference purposes only. All product specifications are subject to change without notice. No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher. All brand and product names are trademarks or registered trademarks of their respective companies. © Advantech Co., Ltd. 2019