Machine-as-a-Service: Intelligent Industrial Equipment Management

Intelligent Equipment Management Upgrade Improves Overall Competitiveness

M2I-31A

- Real-time Monitoring
- Alarm Notifications
- Predictive Diagnosis
- Operation and Maintenance

Electric Motor
Injection Molding Machine
Air Compressors
Pump
Vulcanizing Machine
Steam Turbine

iMachine Solution Suite

Introduction Video
Solution Introduction

Digital transformation in the manufacturing industry has increased willingness to modify equipment. Advantech’s MachineAPM/M2I-31A is a one-stop, end-to-cloud intelligent equipment management solution aimed at industrial infrastructure equipment. This solution is adaptable to air compressors, electric motors, pumps, injection molding machines, vulcanizing machines, and steam turbines. It delivers equipment management and configuration templates to diverse industries; and empowers edge equipment connectivity, data collection, and equipment monitoring. It further accommodates fault alarms, operation, and maintenance/preventive maintenance. InsightAPM/M2I also supports multiple deployment options for WISE-STACK Edge and public/private clouds enabling users to complete equipment management deployment quickly.

One-stop integration with comprehensive services

One-click subscription, fast delivery of IaaS, PaaS, and SaaS; and automatic deployment of dependent services.

Ready-to-use Low-code configuration solutions

Configure the interface of end-to-cloud equipment to access and upload data to the cloud. Avoid developing templates by directly applying pre-made equipment templates.

Flexible framework and service expansion

Provide an open-source microservice framework that supports tens of millions of point access and third-party service expansion.

Focused Applications

Electric Motor
Injection Molding Machine
Air Compressors
Pump
Vulcanizing Machine
Steam Turbine

Solution Benefits

1. Economic benefits
   - Improve equipment energy efficiency and maximize equipment value
   - Unify equipment and parts management to increase asset value
   - Regular operation, maintenance, tracking, and management extends equipment lifespan

2. Management benefits
   - Unified management saves management time by 50%
   - Comprehensive end-to-cloud solution reduces solution configuration complexity by 70%
   - Replicated plan templates reduce integration cycle from 1 month to 2 hours

3. Cost-effectiveness
   - Remote operation and maintenance interfaces save travel expenses by 66%
   - Reasonable equipment resource arrangements optimize investment costs
Solution Architecture Overview

Software Diagram

Command Center and Edge Cloud

Industrial Apps

Edge Devices and Gateways

Equipment Monitoring
- Comprehensive equipment monitoring
- Key data monitoring
- Equipment performance monitoring
- Remote parameter configuration
- Group authority management

Alarm Push Notification
- Various alarm rules
- Alarm push notification
- Automatic workforce dispatching
- Abnormality statistics

Operation and Maintenance
- Schedule regular maintenance services
- Notify alarm events in advance
- Maintenance execution tracking
- Monitor maintenance analysis

Equipment Reports
- Equipment status reports
- Predictive maintenance reports
- Spare parts management reports
- Equipment performance reports

Intelligent Industrial Equipment Management

Central Cloud (Azure, AWS, Ali)

WISE-PaaS/IoTSuite

WISE-STACK Edge100

Machine-to-Intelligence

MachineAPM

M2I-31A Apps

WISE-PaaS/insightAPM

Integrated Service
- IoT data accelerator
- 3D and 3D visualization
- Alarms and notifications

WISE-PaaS/insightAPM

Visualization Templates
- Trigger and alarm
- Workflow/IT integration API

Patrol
- Trigger
- Asset management

Edge Connectivity/OT Control API

Device and Storage Service
- Virtual gateway
- Patrol inspection

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MachineAPM

Innovative Industrial Equipment Management

Central Cloud

(Oracle, AWS, Ali)

WISE-PaaS/IoTSuite

WISE-STACK Edge100

Management Center

Intelligent Industrial Equipment Management

M2I-31A

Machine-to-Intelligence

MachineAPM

M2I-31A

Software Diagram

Industrial Apps

Edge Devices and Gateways

WISE-EdgeLink

ESRP-AWS-UNO2271

Air compressors

WebAccess/SCADA

ESRP-SCS-W5580-7C0

Vulcanizing machine

PIECE-EdgeLink

ESRP-PCS-WISE710

Electric motor

PIECE-EdgeLink

ESRP-PCS-ECU1251

Injection molding machine

PIECE-EdgeLink

ESRP-PCS-ECU1051

Steam turbine
Application Story

InsightAPM/M2I Enables Air Compressor Equipment Manufacturers to Create Service Value During Operation and Maintenance

Overview
Tong Cheng Iron Works Co., Ltd., an established air compressor manufacturer in Taiwan has been selling products worldwide for 60 years. With a view toward the Internet of Things (IoT), Industry 4.0, factory automation, and growing customer demand, Tong Cheng recognized the urgency of industrial transformation. Tong Cheng cooperated with Advantech to develop a cutting-edge, intelligent solution aimed at maintaining their leading role in the industry.

Challenges
• Traditional air compressors cannot effectively manage operating times and prevent business owners from saving production costs
• High machine loads prevent the early detection of data abnormalities
• Difficulties calculating the maintenance cycle of air compressor parts results in air compressor component failures which affect factory supply

Solution
Advantech's InsightAPM/M2I helps Tong Cheng manage cloud data to create new business opportunities and services.
• Visualized management enables customers and distributors to view air compressor operation in real-time, and accurately track machine statuses
• Alarms are triggered instantly following the detection of machine abnormalities; replacement parts are prepared according to equipment status and service lifespan
• Template-based configuration empowers IT personnel to deploy solutions quickly
• Comprehensive management of equipment used in various branches and offices helps manage equipment maintenance statuses and predict the quantity of spare parts needed

Benefits
InsightAPM/M2I allows users to survey the trends and changes of energy use efficiency at any time. This feature empowers the recording of power consumption information and efficiency optimization configuration — saving 30% more energy.

Co-Creating an Intelligent Connectivity Ecosystem
## Ordering Information

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<th>Industrial Equipment Management Solution</th>
<th>M2I-31A</th>
<th>License for 1000 tags</th>
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## Optional Services

### Additional Licenses
- **9803M2I0100** Additional license for 1000 tags

### InsightAPM/Patrol Inspection
- **9806DISPB00** Asset inspection, task dispatch and tracking system

### WISE-PaaS/VPN
- **9806WPVPN01** 50 Client, 10Mbps Bandwidth, 100GB Traffic
- **9806WPVPN02** 100 Client, 20Mbps Bandwidth, 200GB Traffic
- **9806WPVPN03** 200 Client, 50Mbps Bandwidth, 400GB Traffic
- **9806WPVPN04** 500 Client, 100Mbps Bandwidth, 800GB Traffic

## Optional Purchases

### Edge Data Collector
- **ESRP-PCS-WISE710** WISE-710, Yocto 2.1, WISE-Edgelink
- **ESRP-AWS-UNO2271** UNO-2271-E23AE, Linux Ubuntu, WISE-Edgelink
- **ESRP-PCS-ECU1251** ECU1251, Real-time Embedded Linux, WISE-Edgelink
- **ESRP-PCS-ECU1051** ECU1051, Real-time Embedded Linux, WISE-Edgelink
- **ESRP-SCS-W5580-7C0** WEST, CODESYS Softlogic RTE with Softmotion CNC, WebAccess/SCADA

## Edge to Cloud Solutions

### Edge-Cloud Solution Suite
- **WISE-STACK Edge100** Hardware: SKY7221/10 cores/64GB Memory/16TB HDD/1TB SSD
  Software: WISE-PaaS/IoTSuite E100