**Feature Highlights**

**Predictive Data Analysis**
Precisely collect parameter data and perform wind farm monitoring in real time to enhance wind power generation efficiency.

**Accurate and Reliable Failure Diagnosis**
Optimize security and reduce unanticipated failures to extend the life of wind turbine subsystems and components.

**Intelligent Prevention and Maintenance**
Intelligent prognostics and health management extend operating lifetime and the wind turbine life cycle while minimizing unplanned maintenance, thus reducing total operating costs.

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**Application Stories**

**Smart Wind Farm Platform for O&M Management and Wind Power Prediction**
• Wind turbine health management and predictive diagnosis to prevent wind turbine failure and minimize downtime
• Wind energy prediction to optimize production with more than 85% accuracy and compliance with grid regulations
• Maintenance scheduling and resource planning optimization to reduce production loss and costs while improving turbine yield rate

**Wind Turbine Remote and Vibration Monitoring Management**
• Monitor vibration information for each key component in real time
• Identify failure modes at turbine substations with the exact damage location
• Perform prognostics and health management on wind turbines in various remote locations
• Improve the accuracy and reliability of diagnostics to aid strategic operational decision-making

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**Ordering Information**
[www.advantech.com/srp/WPM](http://www.advantech.com/srp/WPM)

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**Solution Ready Package**

**SRP-PHM400**

- Failure analysis for efficient prognostics and health management
- Prediction of potential failures and alerts to lower maintenance costs
- Maximum power generation and operational efficiency

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**WISE-PaaS Situation Room**

**WISE-PaaS VIP Membership**

**SRP-SR-100-BTO**

- LCD Wall: 1 x 86" + 2 x 55"
- Server and Display: 1 x DS-980
- Control Panel: 1 x UTC-520

**WISE-PaaS/Signage CMS**

**SRP-PHM010**

- Wind Turbine PHM and CMS Solution

**SRP-PHM410**

- Modularized Condition Monitoring Solution

**SRP-PHM420**

- Compact Condition Monitoring Solution

**MIC-7500B-U4A1E**

**MIC-75M20-00A1E**

**PCIE-1802**

**Windows 7 Pro**

**WebAccess/MCM**

**1 x MIC-1810**

**Windows 7 Pro**

**WebAccess/MCM**

**IoT.SENSE Training**

**IoT.SENSE Consulting**

- Basic training
- Advanced training

- 2 days
- 1 day
- 3 days

**Optiona Purchase**

- Performance management software
- Wind turbine condition monitoring system software
- Prognostics and health management of wind turbine software

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**Solution Package**

**SRP-PHM400**

- Failure analysis for efficient prognostics and health management
- Prediction of potential failures and alerts to lower maintenance costs
- Maximum power generation and operational efficiency

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**Optimized Operational Efficiency with IoT Edge Computing**

**Wind Power Monitoring & PHM Solution**

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**Contact Information**

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[www.advantech.com](http://www.advantech.com)

[www.advantech.com.tw/contact](http://www.advantech.com.tw/contact)
With predictive analysis and intelligent diagnostic software for equipment operation and system management, Advantech’s Wind Turbine Monitoring and PHM Solution provides precise data acquisition, real-time monitoring, and intelligent operation management, thus achieving intelligent preventative maintenance to maximize the operational efficiency of wind turbines.

1. Focal Point for Wind Turbine System Status Monitoring
   - Production efficiency failure diagnosis
   - Failure diagnosis and alert management

2. Interactive Dashboard for Wind Turbine Monitoring and PHM Solution
   - Main menu for quick selection

3. Management Scorecard
   - Daily wind turbine usage rate
   - Accumulated power generation output/loss ratio and grid dispatch compliance
   - Cost information with power factor efficiency

4. Status Overview of Individual Wind Turbine
   - Health status analysis of bearing unit, gearbox, and generator
   - Real-time condition monitoring and anomaly detection with SCADA time-series data
   - Diagnostic information and alert management

Wind Turbine Monitoring and PHM Solution
- Home Page
- Wind farm geographical distribution map and operation status by color
- Current status overview of individual wind turbines

Wind Farm Status Overview
- Real-time analysis of key factors of overall wind farms
- Identify risk and low-efficiency wind turbines

Optimized Efficiency
- Improving wind turbine capacity maximizes power generation

Remote Management
- Remote monitoring and centralized management optimizes wind turbine performance

Condition Monitoring
- Vibration analysis of wind turbines facilitates predictive maintenance

Performance Management
- Fault prediction and diagnosis of wind turbines lowers maintenance costs

Datapretreatment
- Feature extraction algorithms
- Real-time monitoring and alarm notification
- Dynamic signal acquisition and analysis
- Data pretreatment
With predictive analysis and intelligent diagnosis software for equipment operation and system management, Advantech's Wind Turbine Monitoring and PHM Solution provides precise data acquisition, real-time monitoring, and intelligent operation management, thus achieving intelligent preventative maintenance to maximize the operational efficiency of wind turbines.

System Introduction

1. Focal Point for Wind Turbine System Status Monitoring
   • Production efficiency failure diagnosis for individual wind turbines
   • Failure diagnosis and alert management

2. Interactive Dashboard for Wind Turbine Monitoring and PHM Solution
   • Main menu for quick selection

3. Management Scorecard
   • Daily wind turbine usage rate
   • Accumulated power generation output loss rate and grid dispatch compliance
   • Cost information with power factor efficiency

4. Status Overview of Individual Wind Turbine
   • Health status analysis of bearing unit, gearbox, and generator
   • Real-time condition monitoring and anomaly detection with SCADA time-series data
   • Diagnostic information and alert management

Wind Turbine Monitoring and PHM Solution Home Page

• Wind farm geographical distribution map and operation status by color
• Current status overview of individual wind turbines

Production Management

• 72-hour wind power prediction
• Productivity and cause of power loss for individual wind turbines

Maintenance Management

• Maintenance task scheduling with total cost optimization
• Intuitive visualization of maintenance task planning and routes for mechanical maintenance

Performance Management

Fault prediction and diagnosis of wind turbines lowers maintenance costs

Optimized Efficiency

Improving wind turbine capacity maximizes power generation

Remote Management

Remote monitoring and centralized management optimizes wind turbine performance

Condition Monitoring

Vibration analysis of wind turbines facilitates predictive maintenance

Data pretreatment
Real-time alarm notification
Feature extraction algorithms
Dynamic signal acquisition and analysis
Real-time monitoring

Bearing unit Gear box Generator

Data Server
Edge Computing
Condition Monitoring
Performance Management
Wind Turbine Condition Monitoring System
Wind Turbine Prognostics and Health Management
With predictive analysis and intelligent diagnosis software for equipment operation and system management, Advantech’s Wind Turbine Monitoring and PHM Solution provides precise data acquisition, real-time monitoring, and intelligent operation management, thus achieving intelligent preventative maintenance to maximize the operational efficiency of wind turbines.

**System Diagram**

**Software Diagram**

**Edge Intelligence**

**Visualization - Dashboard**

**Data Infrastructure**

**Software Diagram**

**Edge Intelligence**

**Visualization - Dashboard**

**Data Infrastructure**

**Software Diagram**

**Edge Intelligence**

**Visualization - Dashboard**

**Data Infrastructure**
Feature Highlights

Predictive Data Analysis
Precisely collect parameter data and perform data mining in real time to enhance wind power generation efficiency.

Accurate and Reliable Failure Diagnosis
Optimise security and reduce unplanned shutdowns to extend the life of wind turbine subsystems and components.

Intelligent Prevention and Maintenance
Intelligent prognostics and health management extend the life cycle and reduce unplanned maintenance, thus reducing total operating costs.

Application Stories

Smart Wind Farm Platform for O&M Management and Wind Power Prediction
- Wind turbine health management and predictive diagnosis to prevent wind turbine failure and maintain efficiency.
- Wind energy precision to optimise production, improve the wind farm's accuracy and compliance with grid regulations.
- Monitor the scheduling and resource planning optimisation to reduce production loss and costs while improving turbine yield rate.

Wind Turbine Remote and Vibration Monitoring Management
- Monitor vibration information for each key component in real-time.
- Wind turbine diagnostics with the exact damage locations.
- Perform prognostics and health management on wind turbines in various remote locations.
- Improve the accuracy and reliability of diagnosis to aid strategic operational decision-making.
# Feature Highlights

**Predictive Data Analysis**
Precisely collect parameter data and perform wind farm monitoring in real time to enhance wind power generation efficiency.

**Accurate and Reliable Failure Diagnosis**
Optimize security and reduce unanticipated failures to extend the life of wind turbine subsystems and components.

**Intelligent Prevention and Maintenance**
Intelligent prognostics and health management extend operating lifetime and the wind turbine life cycle while minimizing unplanned maintenance, thus reducing total operating costs.

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## Ordering Information

### Solution Package

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</tbody>
</table>

### SRP-PHMS010 (Wind Turbine PHM and CMS Solution)

- Performance management software
- Wind turbine condition monitoring system software
- Prognostics and health management of wind turbine software

### SRP-PHMS410 (Modularized Condition Monitoring Solution)

- MEC-79331-U4A1E x1
- MEC-79333-04A1E x1
- PCE-1602 x2
- Windows 7 Pro
- WebAccess/MCM

### SRP-PHMS420 (Compact Condition Monitoring Solution)

- 1 x MEC-1810
- Windows 7 Pro
- WebAccess/MCM

### Optional Purchase

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**Solution Package**

- **Micro/FAN/V1K**
  - MIonic-7500B-U4A1E x1
  - MIonic-75M20-00A1E x1
  - PCIE-1802 x2
  - Windows 7 Pro
  - WebAccess/MCM

- **IoT.SENSE Training**
  - Basic training
  - Advanced training
  - 2 days
  - 1 day

- **IoT.SENSE Consulting**
  - IoT solution and on-site technical support
  - 3 days