Factory Energy Management Solution
Centralized Monitoring and Data Management for Energy Efficiency Optimization

☑ Rapid configuration of FEMS solution
☑ Intelligent platform improves energy saving
☑ Easy data management to optimize energy efficiency

POWERED BY ADVANTECH WISE-PaaS
Enabling an Intelligent Planet
Factory Energy Management Solution

In today’s harsh economic climate, most manufacturers are seeking ways to save cost. Best-in-class manufacturers are already road mapping plant strategies to implement energy management in the factory for decreasing energy consumption per unit production. For this Factory Energy Management Solution (FEMS), Advantech’s iFactory Solution Ready Package (SRP) integrates hardware and software within industrial applications where typically a 7-10% energy saving can be achieved in facilities, compared to where FEMS SRP is not used. Based on real-time data obtained from smart meters, FEMS SRP allows users to monitor energy consumption information, accurately evaluate energy costs, and optimize energy efficiency, aiding business intelligence strategies for energy management.

Three Steps to Enhance Your Factory Energy Saving with FEMS SRP

Data Acquisition

With WISE-PaaS/EdgeLink edge data acquisition software, data collected from different machines and multiple facilities goes through FEMS edge into one single platform, either on-premises or in the cloud platform.

Data Computing & Visualization

With WebAccess/SCADA software, data can be aggregated in the FEMS server, or directly transmitted into the WISE-PaaS cloud platform. Data is analyzed and visualized as energy management assets with the iFactory/FEMS application.

Central Management

Using contextualized and visualized FEMS data, both real-time and historical, in the Industry 4.0 Command Center, supports managers to have continuous energy saving activities by PDCA cycle and visualization management.

Digitizing Energy Management with FEMS SRP

End Customers

Energy management combined with production management is crucial for centralized operation optimization and control.

- **Easy deployment and maintenance.** Single platform for automation and energy management allows fast implementation, easy scalability, user-friendly maintenance, and seamless integration with 3rd party software and database.

- **Data integration.** The digitally enabled convergence of information technology and operation technology provides the infrastructures to navigate the energy management landscape for operation excellence.

Reducing project lead time and providing value-added services is important for future-ready business.

- **Customizable and expandable service.** Simple, intuitive interface with easy configuration tools and tailor-made dashboards enable high reliability and flexibility to develop value-added services with reduced project time, risk and costs.

- **New business opportunities.** With rapid project implementation and value-added services, competitive advantage and new business opportunities can be earned today to comply with tomorrow.

System Integrators
Feature Highlights

Real-time Data Management
Energy consumption and cost of utilities can be measured on the basis of hour, day, month, or year, by individual, aggregated departments, or corporate level. By setting benchmarks and comparing current performance with set targets, it is easy to analyze the use of energy and utilities to support energy efficiency improvements.

Dashboard Visualization
Performance calculation, data displays and reports can be easily visualized using dashboard tools. The navigation menu and dashboard displays can be customized from the user interface, including trends, graphs, diagrams and tables. It also provides KPI and alarm management functions.

Dashboard Management

Energy Consumption Overview
An overview of past energy profiles and current energy consumption data provides a systematic approach to identify problem areas and prime targets for energy reduction.

Meter Status
When the power connection is lost, an alert notification of meter status change is sent immediately to prevent energy data loss.

Energy Consumption and Cost Analysis
Production is usually the largest energy consuming part of a factory. Energy consumption data and costs can be analyzed and compared with utility bills to help improve energy efficiency and wastage.

Machine Utilization and Energy Efficiency
Production-integrated energy management enables machine availability tracking with machine energy consumption, to enhance operational efficiency and allow preventive maintenance.
Centralized Energy Management in the Industry 4.0 Command Center

Electric Power Distribution and Utility Monitoring

Energy Consumption Monitoring on the Production Line

Benefits

- Visualize factory energy data
- Prevent low performance operation of equipment
- Improve energy cost per unit
- Enhance KPI tracking and management
- Enable transparency on energy usage
- Ascertained the cause of unusual energy consumption
- Eliminate routine waste
- Improve stand-by operation
- Reduce energy cost
- Cut down unnecessary waste
- Improve productivity and management
- Enhance awareness of energy efficiency improvement

Application Story

Keep One Step Ahead of the Competition with Factory Energy Management

Overview
Founded in 1984, Gigatek is a global, full-service Electronics Manufacturing Services (EMS) provider and Original Equipment Manufacturing (OEM) company based in Taiwan, with additional facilities in China and the United States. Over past few years, Gigatek has worked more closely with green supply chains as the environmental focus shifted.

Challenge
Gigatek found a big increase in its electricity bill, and its monthly expenditure went up continuously. Gigatek wanted to reduce energy consumption, but suffered from a lack of detailed energy usage information needed for future improvements. Additionally, the management wanted to know the energy consumption status of each department for further management, and requested to set up a management KPI and alarms if deviations led to huge bills.

Solution
Gigatek turned to Advantech for a reliable factory energy management solution, and invited Snetech, its subsidiary company that works as system integrator, to implement energy management systems in its buildings and factories.

- Customizable and scalable platform allows future upgrades and maintenance with new functionalities.
- Factory energy management dashboard for analyzing energy usage and costs resulting in data-driven actionable insights.

Benefits
With Advantech’s factory energy management solution, energy efficiency of Gigatek has been effectively improved.

- Quick project implementation that runs smoothly and reduces cost and maintenance effort.
- Reduced energy costs due to reduced energy consumption and production waste.
Software Diagram

Command Center & Visualization
- Analysis Setup
- Dashboard & Chart Editor

Data worker
- Node.js
- MongoDB (Raw Data)

MQTT Broker
- Postgres

Alert & Notification
- MQTT Sender

Default Software Function
- ERP & MES & SFC
- RESTful API

Multiple publishing
- Intelligence Enabler

Software Diagram

WebAccess/SCADA
- MQTT
- OPC UA
- Modbus Server
- OPC UA SDK / MQTT SDK
- Multiple Communication Protocol & Driver

Third Party Driver
- SDK
- Database
- Portal Conversion
- Drivers

System Diagram

Equipment & Device
- Machine Current Monitor
- Wireless Meter
- Wired Smart Meter
- Chiller Efficient Module

Production Line
- Chamber
- Robot
- Production Line

Factory Facility
- Distribution Panel
- Ultrasonic Flow Meter
- Duct Temp. Sensor
- Chiller
Solution Ready Packages

FEMS Enterprise Server
- FEMS enterprise server: SRP-IFS250-H82F01A

Spec
- HPC-8212 with Xeon Silver 4110 8 Core
- WinSvr2016 + PostgreSQL + Office
- WebAccess 8.3 unlimited
- iFactory/FEMS application with a maximum of 2000 devices supported

FEMS I.App
- Industrial cloud solution for iFactory/FEMS: 9603WP8EM01

Spec
- Cloud service in WISE-PaaS/EnSaaS cloud-based software platform
- iFactory/FEMS application with unlimited machines supported

FEMS Additional License

License
- 1 license: 32OTDISF0005A0
- 10 licenses: 32OTDISF0006A0
- 30 licenses: 32OTDISF0007A0
- 100 licenses: 32OTDISF0008A0

Additional Meter License

Industrial App
- Cloud service in WISE-PaaS/EnSaaS cloud-based software platform
- iFactory/FEMS application with unlimited machines supported

Edge FEMS Computer

ME Edge - Cell
- ME edge: SRP-IFS250-M77F01A

Spec
- MIC-7700 with i3 7101E
- Win10 + PostgreSQL
- WebAccess 8.4 300 tags
- iFactory OEE & FEMS application embedded with 1 license, maximum of 5 licenses supported

ME Edge - Line
- ME edge: SRP-IFS250-M77F02A

Spec
- MIC-7700 with i5 7500
- Win10 + PostgreSQL
- WebAccess 8.4 1500 tags
- iFactory OEE & FEMS application embedded with 10 licenses, maximum of 30 licenses supported

ME Edge - Shop
- ME edge: SRP-IFS250-M77F03A

Spec
- MIC-7700 with i7 7700T
- Win10 + PostgreSQL
- WebAccess 8.4 5000 tags
- iFactory OEE & FEMS application embedded with 100 licenses, maximum of 200 licenses supported

Field Controller

FACILITIES CONTROLLER
- FEMS edget: SRP-IFS210-D36TAE

Spec
- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- Built-in AI/DI/DO

Equipment Gateway

FEMS Gateway
- FEMS gateway: SRP-IFS240-E12TAE

Spec
- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- 2 x RS-485 isolated serial ports

Data Gateway

FEMS Gateway
- FEMS gateway: SRP-IFS240-E14TAE

Spec
- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- 4 x RS-485 isolated serial ports

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- FEMS gateway: SRP-IFS240-E16TAE

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- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- 6 x RS-485 isolated serial ports

Field Controller

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- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- 4 x RS-485 isolated serial ports

FEMS Gateway
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Spec
- IEC61131 programming language
- Built-in edgelink function
- Periodic logger for data buffering on SD card
- Linux Kernal 3.12 RT
- Zigbee/Wi-Fi/3G/4G
- 6 x RS-485 isolated serial ports

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