

# Cloud-Enabled Edge Gateways for Industrial IoT

Powering Edge Intelligence with  
Advantech WISE-EdgeLink

- ✓ Utilizing Edge Computing Applications
- ✓ Advantech WISE-EdgeLink Introduction
- ✓ Case Study
- ✓ WISE-EdgeLink Function List



## WISE-EdgeLink



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# Transmit Data to the Cloud and Enable Edge Intelligence 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 increasing amounts of data collected from different equipment must be analyzed. Equipment manufacturers, owners, and maintenance personnel 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.

## Advantages of WISE-EdgeLink



### 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.



### Machine-to-Intelligence

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



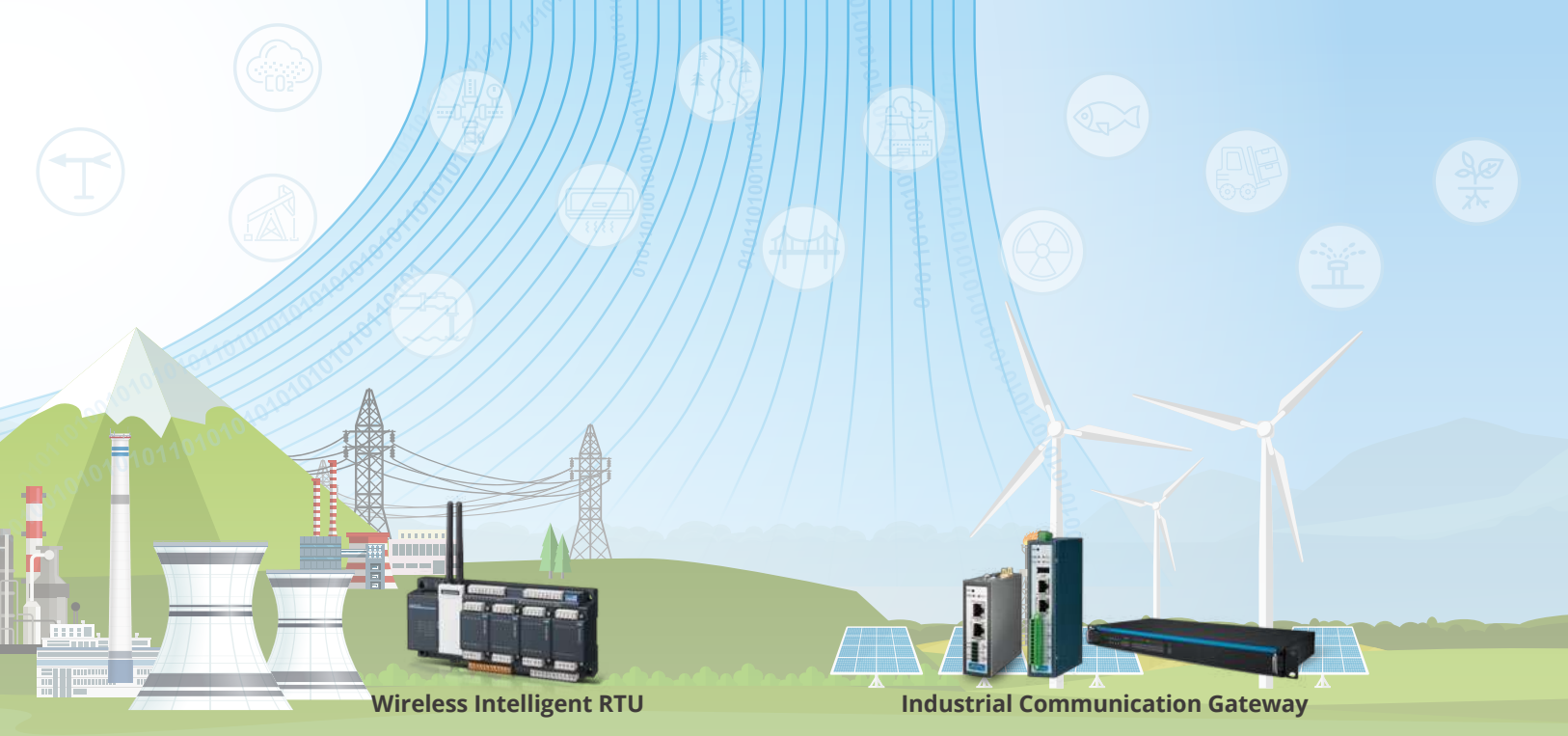
### Factory Environment

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

Public Cloud & Private Cloud

AIoT Solutions & Marketplace

# WISE-EdgeLink



Wireless Intelligent RTU

Industrial Communication Gateway



## Urban Construction

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



## Renewable Energy

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



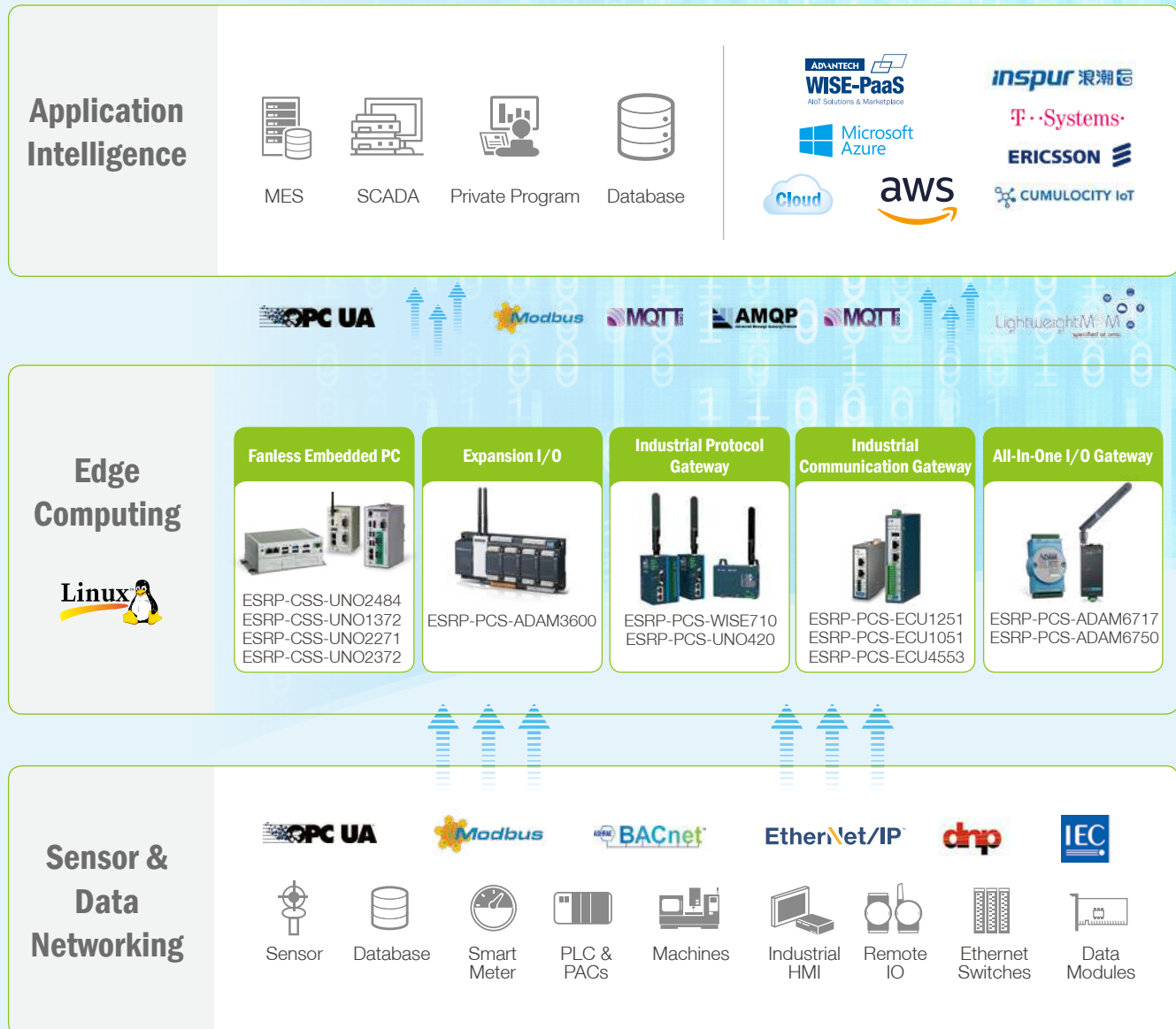
# Transmitting IoT Data from the Edge to the Cloud

Before data is ready for analysis, it must be preprocessed and transmitted to a server or the cloud using specific protocols. Advantech's WISE-EdgeLink solutions are designed to convert and process acquired data without complex and time-consuming programming.

The WISE-EdgeLink Studio software provides an efficient interface that allows users to preprocess data with just a few clicks of the mouse. After configuration, data can be downloaded to hardware equipped with WISE-EdgeLink Runtime. This software enables users to easily obtain and transmit equipment data to the cloud and third-party systems.

## WISE-EdgeLink Architecture

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 Benefits Data Management

### Data Acquisition

- I/O drivers
- WISE-EdgeLink Benefits Data Management
- User tags
- System tags

### Connectivity

- Open VPN
- Active connection to WebAccess
- Store and forward
- Protocol support
  - MQTT/FTP/ODBC/AMQP
  - Webservice/RESTful

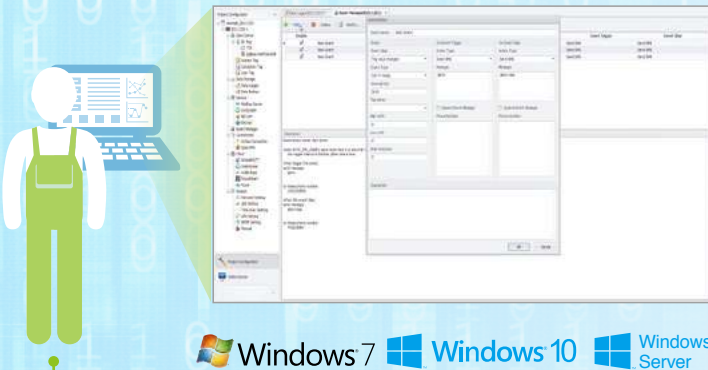
### Security

- Project encryption
- Whitelisting
- SSL encryption
- Data authority management

### Intelligence

- Event hub for SMS/email alerts
- SoftLogic runtime
- Data pretreatment
  - Event log
  - Time stamp
  - Data log
  - Tag quality

## 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



### EdgeLink Runtime (for Linux)

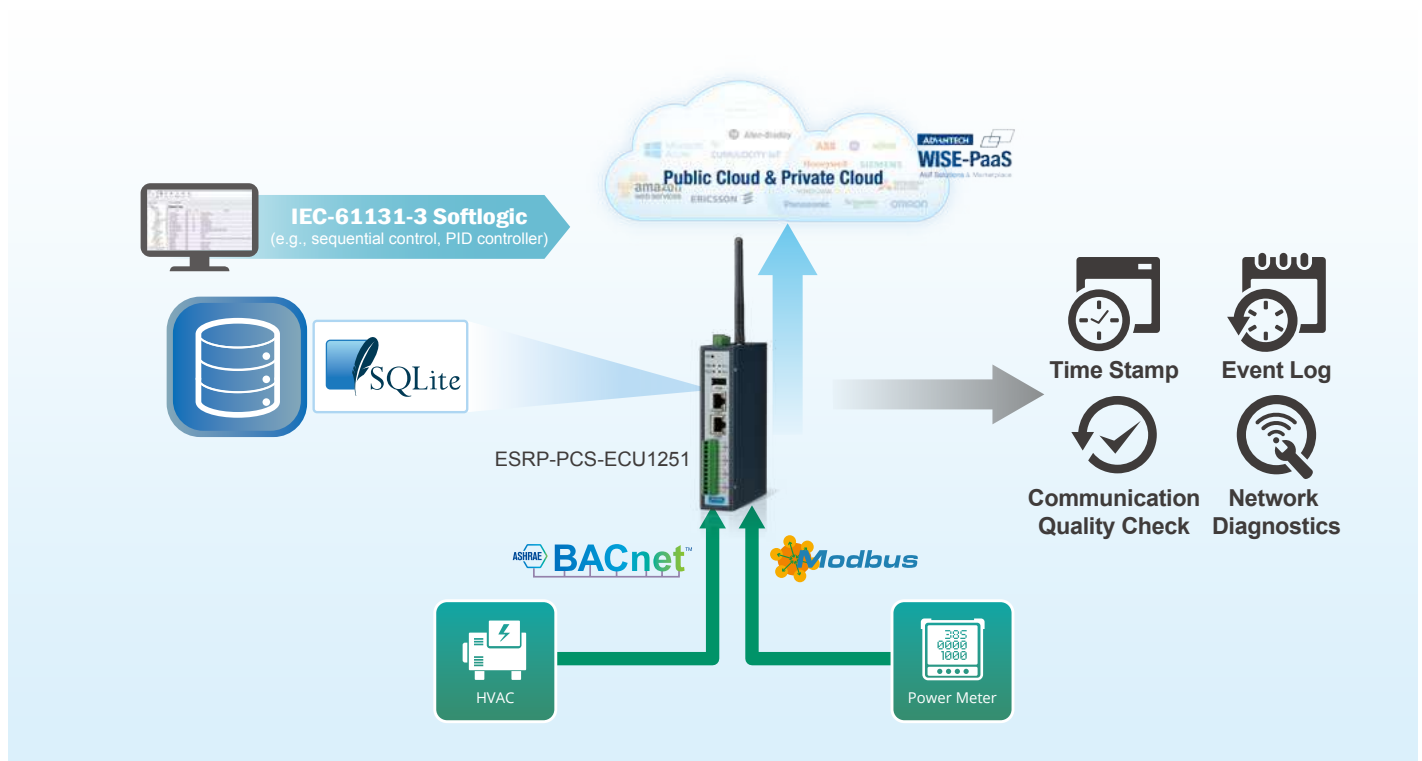
- Connect end devices to network
- Data acquisition and transmission
- Supports 200+ device drivers
- Real-time/historical data log
- Connectivity to the cloud and third-party systems

# Remote Equipment Monitoring for Equipment Builders



## Requirements

Equipment builders who thrive on improving equipment efficiency understand the importance of quality data in the analysis of component status. Given the high level of energy consumption for heating and cooling, being able to monitor and control heating, ventilation, and air conditioning (HVAC) systems can have a sizable effect on operation costs. Energy controllers can be used to monitor and control HVAC systems via a mobile or cloud system. With customizable software, they also accommodate customers who require customized functionality and input assemblies as well as cloud access.

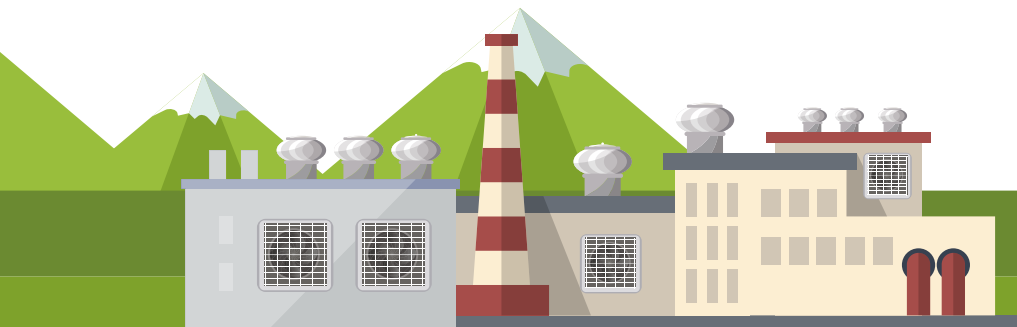


## Features

- Communication protocols: BACNet & Modbus
- Data time stamping and event logging
- Cloud solution with Microsoft Azure & MQTT
- Various I/O options

## Benefits

- Compact design and customized service
- Operational technology engineers can easily establish cloud access
- Scalable I/O & Comm. interface to different projects

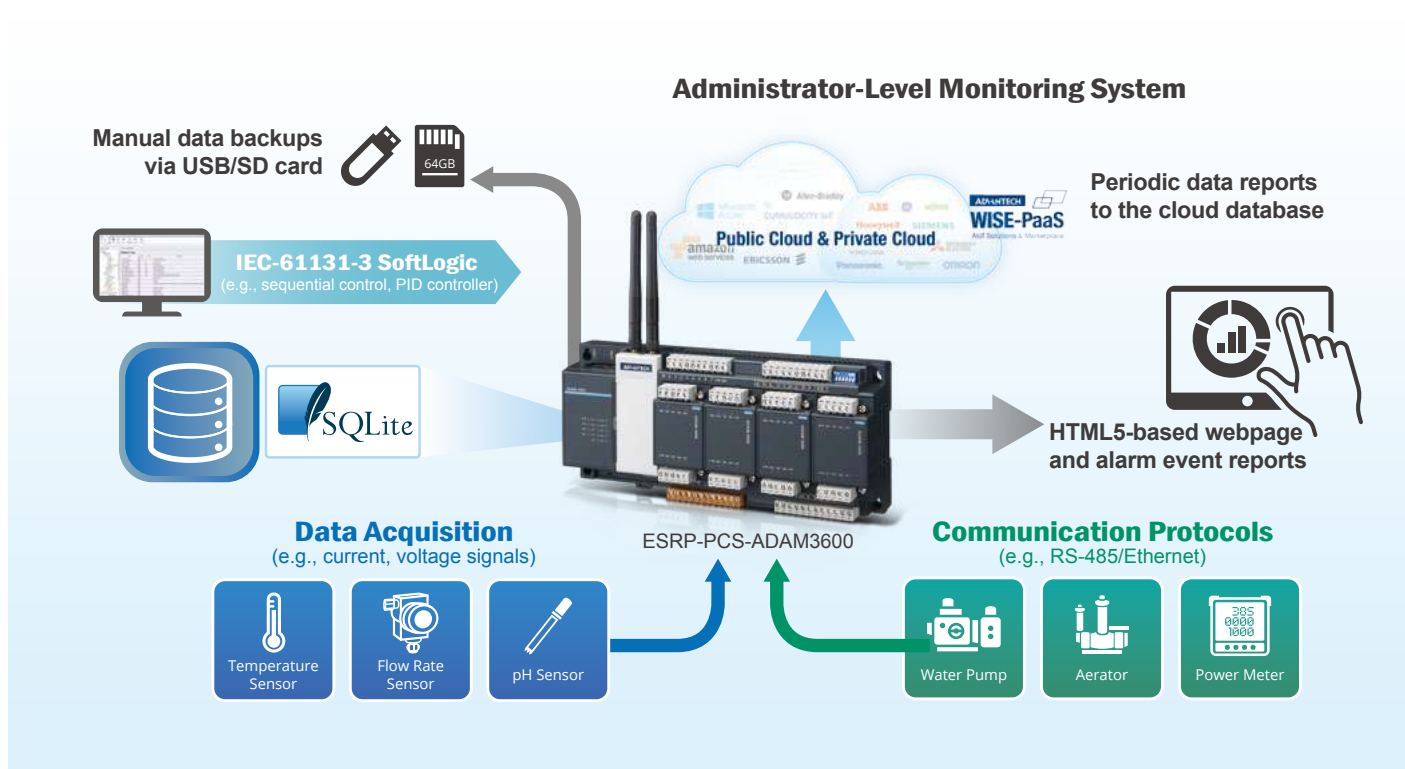


# Monitoring System for Waste Water Treatment and Reclamation Infrastructure



## Requirements

Wireless connectivity is required for monitoring a water pump station to enable reliable data transmissions to a surveillance center. The use of PLCs for monitoring and controlling pump stations is expensive and necessitates complex system integration procedures. Accordingly, many customers prefer to use all-in-one devices for data collection and transmission, as well as system monitoring and alarm reporting.



## Features

- Supports uplinking with DNP3 and Modbus protocols
- Supports downlinking to various PLC or meter protocols
- Multiple I/O interfaces
- Provides alarm notifications and reports
- Data storage and forwarding ensures completeness and accuracy
- EdgeLink data is directly mapped to SCADA (WebAccess)

## Benefits

- Eliminates programming for increased efficiency
- Cost-effective solution for site-wide monitoring
- Uses a single integrated platform for data acquisition, communication, and transmission



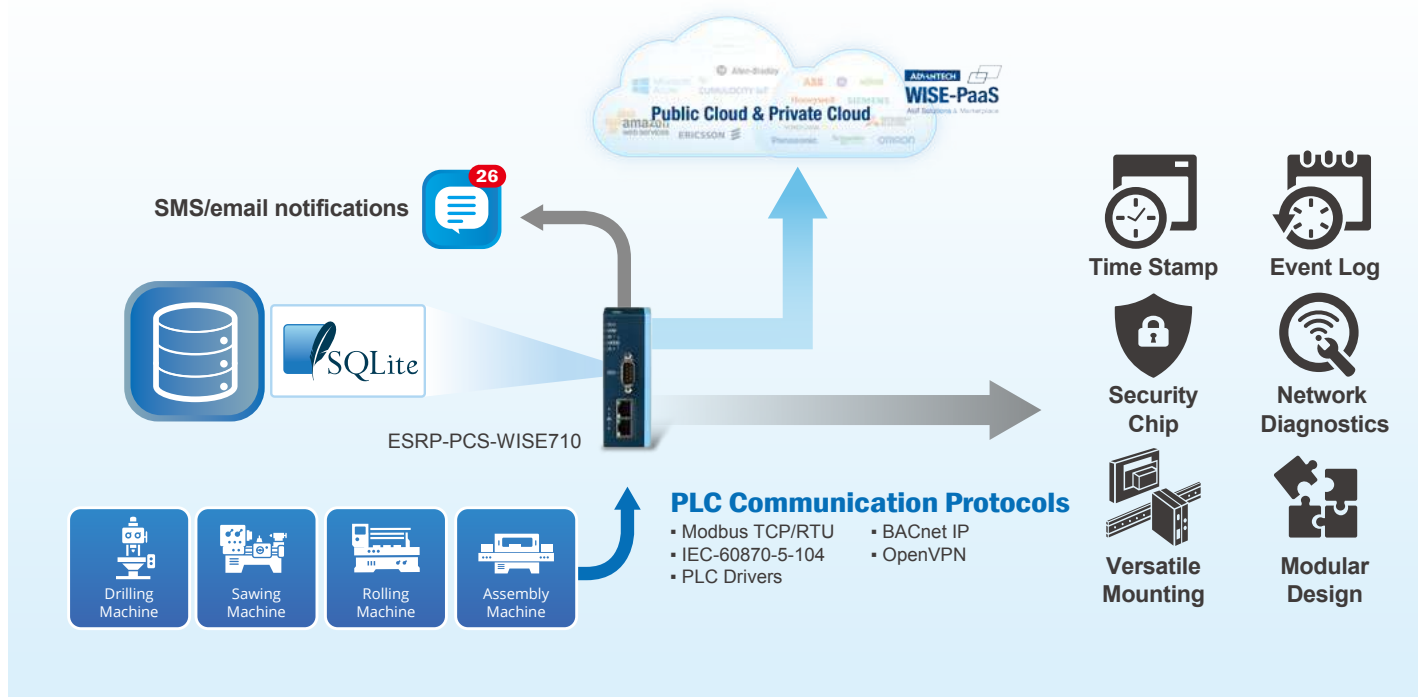


# Connecting Machines and Equipment to the Cloud



## Requirements

Digitalizing factory equipment is the first step to realizing Industry 4.0. Since this transformation affects all aspects of assembly, machining, rolling workshops, and production line processes, a wide variety of equipment and machines are involved and diverse protocols and communication ports are required. Equipment is geographically dispersed and located in environments with limited space for installation. To allow the customer to collect information from PLCs in proprietary system to information system or cloud space, a compact, distributed, multi-protocol convertor solution is required. Advantech's WISE-710 protocol converter provides the ideal solution for collecting data from PLC-controlled equipment and performing protocol conversion that enable the data to be used for machine intelligence. The modularity design of WISE-710 also provides the flexibility of functionality expansion for diverse applications.



## Features

- Supports various public clouds or private cloud connection
- Provides data time stamping and event logging
- Supports downlinking to PLCs with various protocols
- Modular design for flexible configuration and customization of functionality
- Enhanced cyber security with an embedded security chip

## Benefits

- Easy deployment to cross the barrier of OT and IT integration
- Data tagging ensures readability and comprehension
- Cost-effective system integration solutions
- Enables convenient tracking of historical data



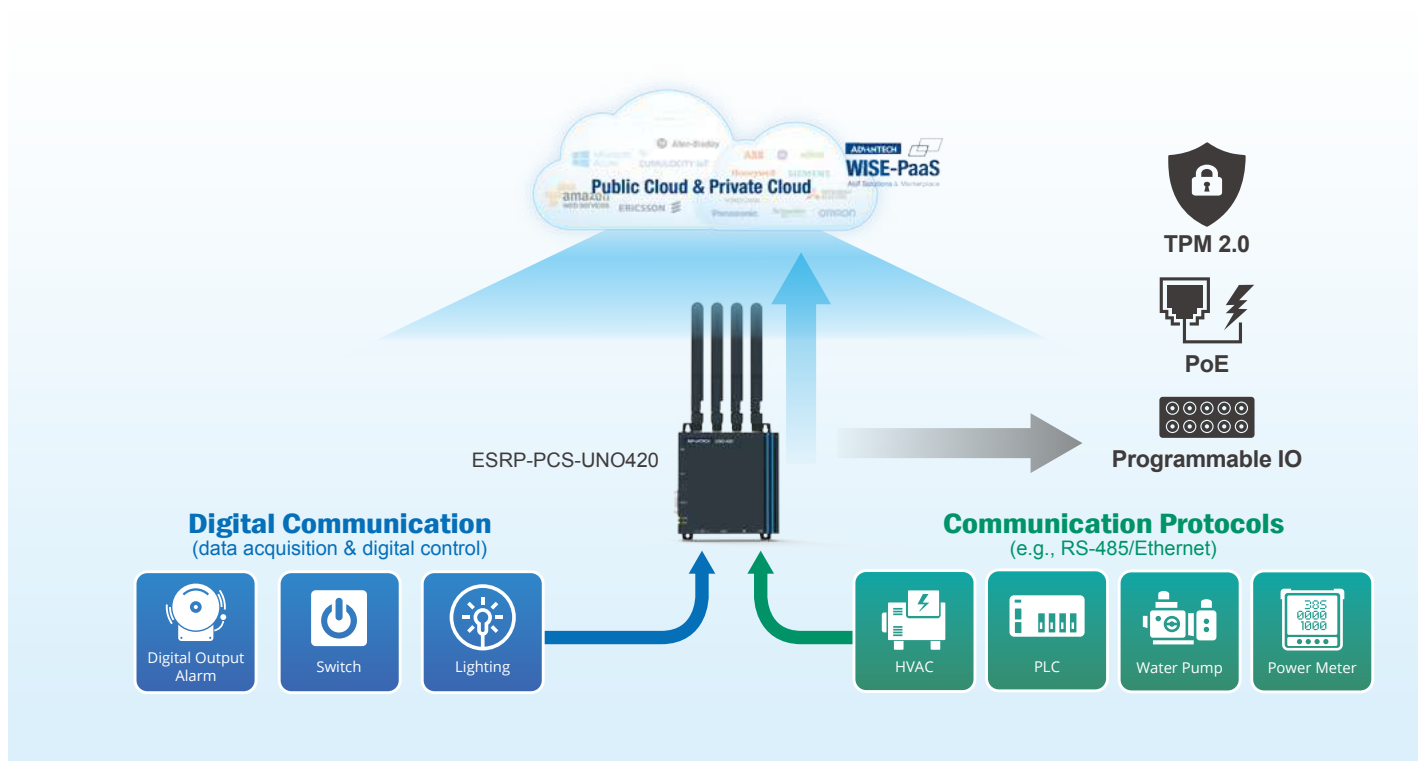


# PoE-Powered Sensing Gateway Solution



## Requirements

For enabling intelligence of industrial infrastructure and facility, sensors and controllers are widely deployed to detect operating information for remote monitoring and controlling. Advantech's rugged UNO-420 edge sensing gateway acts as a bridge between sensors/controllers and the control center or cloud. The sensing gateway supports a wide operating temperature range and power input via POE, making it suitable for installing in harsh environment and easy for power distribution.

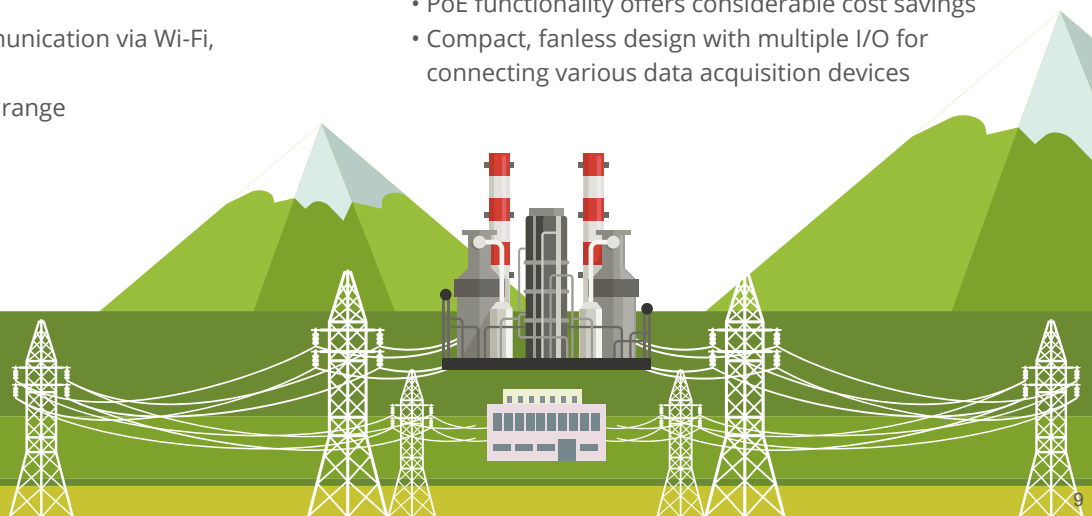


## Features

- Programmable GPIO and selectable COM for flexible functionality
- Supports dual wireless communication via Wi-Fi, 3G, 4G, and GPS
- Wide operating temperature range (-20 ~ 60 °C/-40 ~ 140 °F)

## Benefits

- Easy installation with a combined power and data cable
- PoE functionality offers considerable cost savings
- Compact, fanless design with multiple I/O for connecting various data acquisition devices

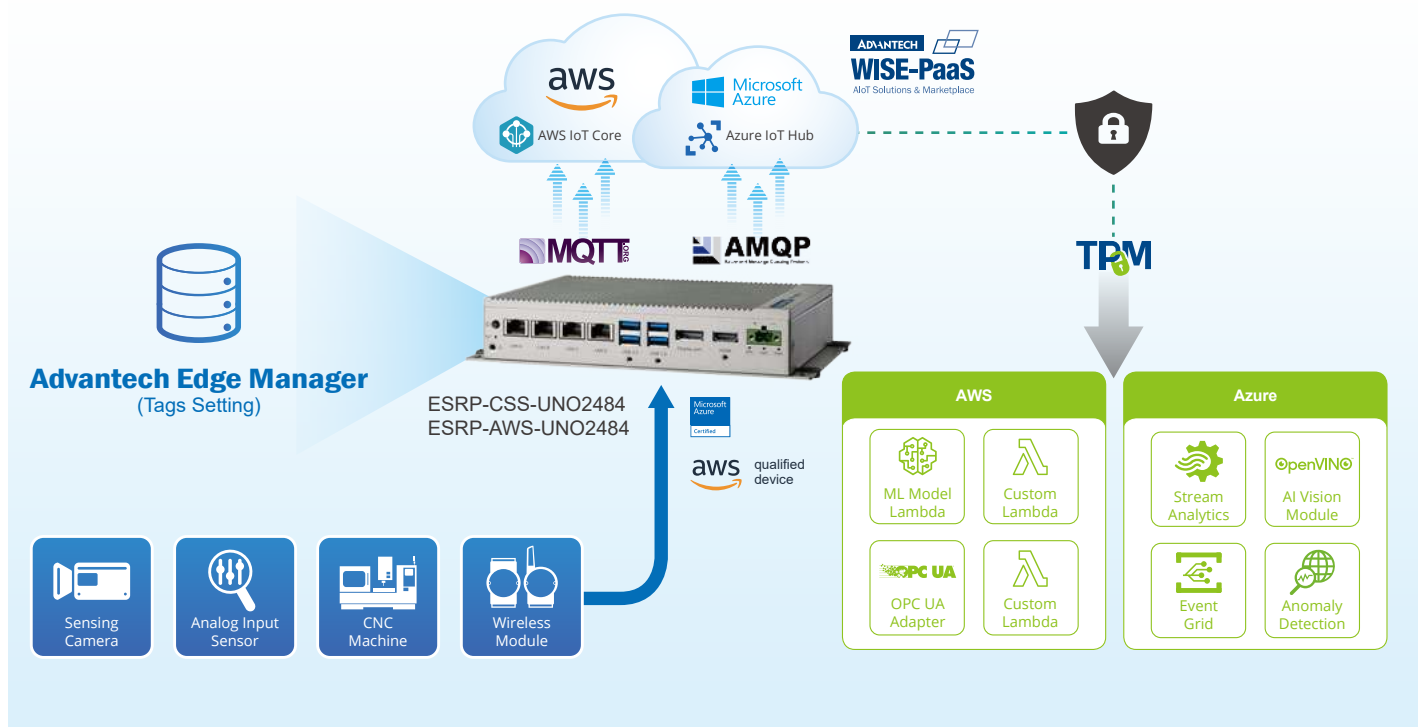


# Optimize Process Manufacturing by Edge Intelligence



## Requirements

Process manufacturing relies on sequential steps and most manufacturing systems utilize steady-state analysis which looks for uncertain conditions. However, manufacturing procedures can impact efficiency and quality as insignificant events may be exacerbated into extreme events. Advantech's AWS solution uses AI and data analysis to match production to demand when the real production model cannot be mathematically constructed. AWS IoT SageMaker is used to build an AI model at the edge via AWS IoT Greengrass in order to provide real-time analysis, notification, and control during manufacturing. The inclusion of Advantech's WISE-Edgelink software, which supports 200+ PLC drivers and communication protocols, enables device data to be collected from diverse sensors and PLCs for transmission between the AWS edge engine, third-party software, and the cloud.



## Features

- Azure IoT Edge, Azure Plug & Play and AWS IoT Greengrass certified
- The latest Docker technology

## Benefits

- Stream analytics, machine learning, image recognition, and other high-value AI deployed from the cloud to the edge with other 3rd party software
- Open and well-organized containerized software architecture

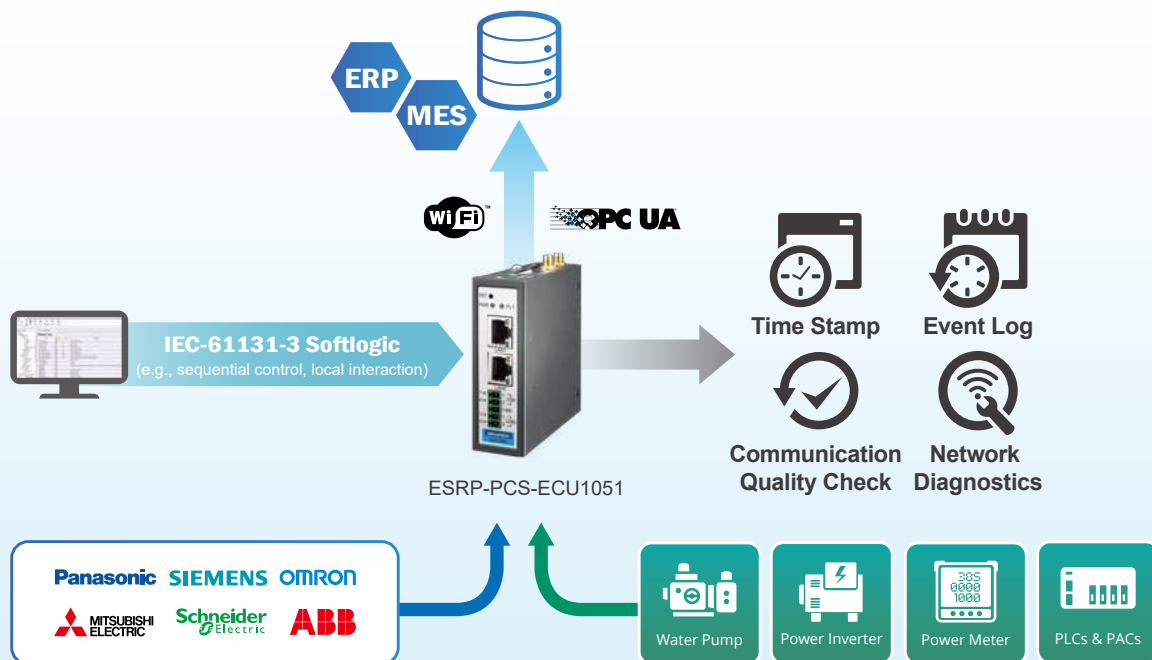


## Real-time Production Management



### Requirements

To enable smart manufacturing, real-time data from sensors and controllers are used for advanced process control and improved operations. Advantech's compact ECU-1051TL edge communication gateway acts as a bridge between field controller/machines and SCADA devices or database. The gateway supports wide-temperature operation and multiple protocol drivers via Ethernet and serial interface, making it suitable for installing in harsh environments.



### Features

- Data storage and forwarding ensures completeness and accuracy
- Supports downlinking to various PLC or meter protocols
- Direct connection to database for IT integration

### Benefits

- Cost-effective solution for site-wide monitoring
- Eliminates programming for increased efficiency
- Cost-effective solution for production monitoring

# WISE-EdgeLink Function List For Supported Platform

|                                | ESRP-PCS-ADAM6750                             | ESRP-PCS-ADAM6717                        | ESRP-PCS-ADAM3600                            |  |
|--------------------------------|---|--|--|--|
| <b>Hardware Specifications</b> |   |  |  |  |
| CPU                            | TI Cortex A8, 1GHz                            | TI Cortex A8, 1GHz                       | TI Cortex A8, 600MHz                         |  |
| RAM                            | DDR3L 512 MB                                  | DDR3L 512 MB                             | DDR3L 256 MB                                 |  |
| On-Board IO                    | 12DI/12DO                                     | 8AI/5DI/4DO                              | 8AI/8DI/4DO                                  |  |
| Slot                           | 1 x Micro SD Slot                             | 1 x Micro SD Slot                        | 4 Expansion Slots                            |  |
| Wireless Communication         | Wi-Fi/Cellular<br>(via ADAM-6700E)            | Wi-Fi/Cellular<br>(via ADAM-6700E)       | Zigbee/WiFi/Cellular/<br>NB-IOT              |  |
| Mini-PCle                      | 1 x Full-Size<br>(via ADAM-6700E)             | 1 x Full-Size<br>(via ADAM-6700E)        | 1 x Half-Size<br>1 x Full-Size               |  |
| SIM Card Slot                  | Single SIM card slot<br>(via ADAM-6700E)      | Single SIM card slot<br>(via ADAM-6700E) | Single SIM card slot / Dual<br>SIM card slot |  |
| LAN                            | 2   | 2  | 2  |  |
| COM                            | RS-485 x 2                                    | RS-485 x 2                               | 3  |  |
| USB                            | 1 Micro USB<br>1 Type A USB                   | 1 Micro USB<br>1 Type A USB              | 1  |  |
| OS Version                     | Linux 3.12.10-rt15-ti2013.12.01 #9 PREEMPT RT |  | Yocto Linux, kernel 4.9                      |  |

| <b>EdgeLink Function List</b> |                             |   |      |      |  |
|-------------------------------|-----------------------------|---|------|------|--|
| Data Center                   | Maximum number of IO Tag    | 2000  | 2000 | 3000 |  |
|                               | Device Model                | √   | √    | √    |  |
|                               | Excel Import/Export         | √   | √    | √    |  |
|                               | Data Logger                 | √   | √    | √    |  |
|                               | DataBackup                  | FTP/SQL Server                                  |      |      |  |
| Online Monitor                | iCDManager                  | -   | -    | √    |  |
|                               | Device Search               | √   | √    | √    |  |
| Data Forwarding Service       | Modbus Server               | √   | √    | √    |  |
|                               | IEC 60870-104 Server        | √   | √    | √    |  |
|                               | DNP3 Outstation             | -   | -    | √    |  |
|                               | WASCADA (WebAccess)         | √   | √    | √    |  |
|                               | BACnet Server               | √   | √    | √    |  |
|                               | OPC UA Server               | √   | √    | √    |  |
| EventManager (SMS/eMail)      |                             | √   | √    | √    |  |
| IEC-61131-3 Softlogic         |                             | √   | √    | √    |  |
| OpenVPN                       |                             | √   | √    | √    |  |
| Cloud Agent                   |                             | SimpleMQTT / WebAccess / WISE-PaaS / ProudSmart |      |      |  |
| System Setting                | Support IPv4/IPv6           | √   | √    | √    |  |
|                               | LED Setting                 | √   | √    | √    |  |
|                               | Time Sync Setting (NTP/GPS) | √   | √    | √    |  |
|                               | GPS Setting                 | √   | √    | √    |  |
| SDK                           |                             | DCTag SDK/DataLogger SDK/Board Resource SDK     |      |      |  |



|  | ESRP-PCS-ECU1051                | ESRP-PCS-ECU4553                | ESRP-PCS-ECU1251                | ESRP-PCS-WISE710                  | ESRP-PCS-UN0420                                |
|--|---------------------------------|---------------------------------|---------------------------------|-----------------------------------|--|
|  | TI Cortex A8, 600MHz            | TI Cortex A8, 800MHz            | TI Cortex A8, 800MHz            | CPU Freescale i.MX 6 Dual Lite A9 | Intel® Atom™ E3815, 1.46GHz Processor          |
|  | DDR3L 256 MB                    | DDR3L 512 MB                    | DDR3L 256 MB                    | DDR3 1GB                          | DDR3L 2GB                                      |
|  | -                               | -                               | -                               | 4DI/4DO                           | 8 GPIO   |
|  | 1x Micro SD slot                | 1x Micro SD slot                | 1x Micro SD slot                | 1x Micro SD slot                  | -  |
|  | Zigbee/WiFi/Cellular/<br>NB-IOT | Zigbee/WiFi/Cellular/<br>NB-IOT | Zigbee/WiFi/Cellular/<br>NB-IOT | WiFi/3G/4G/NB-IoT                 | -  |
|  | 1x Full-size                    | 1x Full-size                    | 1x Full-size                    | 1x Mini-PCle (Full-size)          | 1 x Full-size<br>1 x Half-size                 |
|  | Dual SIM card slot              | Single SIM card slot            | Single SIM card slot            | -                                 | -  |
|  | 2                               | 4                               | 2                               | -                                 | 2 x 10/100/1000 Mbps<br>(with 1 x PoE 802.3at) |
|  | 2                               | 16                              | 4                               | -                                 | 2 x RS232/422/485<br>1 x RS485                 |
|  | 1                               | 1                               | 1                               | 1x Micro USB2.0                   | 1 x USB 3.0                                    |
|  | Yocto Linux, kernel 4.9         |                                 |                                 | Linux imx6dl 4.1.15               | AdvLinux                                       |

|  | 2000           | 2000 | 2000 | 3000 | 3000 |
|--|----------------|------|------|------|------|
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | √    |
|  | FTP/SQL Server |      |      |      |      |
|  | -              | -    | -    | -    | -    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | √    |
|  | -              | -    | -    | -    | -    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | -    | √    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | -    | -    |
|  | √              | √    | √    | √    | √    |
| / AWS / Inspur / WLTX / T-System / OpenIoT / RootCloud / Azure / LwM2M |                |      |      |      |      |
|  | √              | √    | √    | √    | √    |
|  | √              | -    | √    | -    | -    |
|  | √              | √    | √    | √    | √    |
|  | √              | √    | √    | √    | -    |
| DCTag SDK/DataLogger SDK/Board Resource SDK                            |                |      |      |      |      |

# WISE-EdgeLink Function List For Supported Platform

|                                | ESRP-CSS-UN01372                                    | ESRP-AWS-UN01372                                    | ESRP-CSS-UN02271                                    |  |
|--------------------------------|---|---|---|--|
| <b>Hardware Specifications</b> |   |   |   |  |
| CPU                            | Intel® Celeron J1900, 2.0GHz processor              | Intel® Celeron J1900, 2.0GHz processor              | Intel® Atom™ E3825, 1.33GHz Processor               |  |
| RAM                            | DDR3L 4GB   | DDR3L 4GB   | DDR3L 4GB   |  |
| On-Board IO                    | 4DI/4DO   | 4DI/4DO   | -   |  |
| Slot                           |   |   | -   |  |
| Wireless Communication         | 3G/GPS/GPRS/Wi-Fi Communication by iDoor Technology | 3G/GPS/GPRS/Wi-Fi Communication by iDoor Technology | 3G/GPS/GPRS/Wi-Fi Communication by iDoor Technology |  |
| Mini-PCle                      | 2 x mPCle   | 2 x mPCle   | 1 x mPCle   |  |
| SIM Card Slot                  | Single SIM card slot                                | Single SIM card slot                                | Single SIM card slot                                |  |
| LAN                            | 2 x 10/100/1000 Mbps                                | 2 x 10/100/1000 Mbps                                | 2 x 10/100/1000 Mbps                                |  |
| COM                            | 1 x RS232<br>1 x RS422/485                          | 1 x RS232<br>1 x RS422/485                          | 2 x RS232/422/485                                   |  |
| USB                            | 2 x USB 2.0<br>1 x USB 3.0                          | 2 x USB 2.0<br>1 x USB 3.0                          | 1 x USB 3.0   |  |
| OS Version                     | AdvLinux  |   |   |  |

| <b>EdgeLink Function List</b> |                             |   |      |      |  |
|-------------------------------|-----------------------------|---|------|------|--|
| Data Center                   | Maximum number of IO Tag    | 5000  | 5000 | 3000 |  |
|                               | Device Model                | √   | √    | √    |  |
|                               | Excel Import/Export         | √   | √    | √    |  |
|                               | Data Logger                 | √   | √    | √    |  |
|                               | DataBackup                  | FTP/SQL Server                                  |      |      |  |
| Online Monitor                | iCDManager                  | -   | -    | -    |  |
|                               | Device Search               | √   | √    | √    |  |
| Data Forwarding Service       | Modbus Server               | √   | √    | √    |  |
|                               | IEC 60870-104 Server        | √   | √    | √    |  |
|                               | DNP3 Outstation             | -   | -    | -    |  |
|                               | WASCADA (WebAccess)         | √   | √    | √    |  |
|                               | BACnet Server               | √   | √    | √    |  |
|                               | OPC UA Server               | √   | √    | √    |  |
| EventManager (SMS/eMail)      |                             | √   | √    | √    |  |
| IEC-61131-3 Softlogic         |                             | -   | -    | -    |  |
| OpenVPN                       |                             | √   | √    | √    |  |
| Cloud Agent                   |                             | SimpleMQTT / WebAccess / WISE-PaaS / ProudSmart |      |      |  |
| System Setting                | Support IPv4/IPv6           | √   | √    | √    |  |
|                               | LED Setting                 | -   | -    | -    |  |
|                               | Time Sync Setting (NTP/GPS) | √   | √    | √    |  |
|                               | GPS Setting                 | -   | -    | -    |  |
| SDK                           |                             | DCTag SDK/DataLogger SDK/Board Resource SDK     |      |      |  |

|  | ESRP-AWS-UN02271  | ESRP-CSS-UN02372  | ESRP-AWS-UN02372  | ESRP-CSS-UN02484  | ESRP-AWS-UN02484  |
|--|---|---|---|---|---|
|  | Intel® Atom™ E3825,<br>1.33GHz Processor                  | Intel® Celeron™ J1900<br>(2.0 GHz)                        | Intel® Celeron™ J1900<br>(2.0 GHz)                        | Intel® Core™ i5-7300U,<br>2.6GHz Processor                | Intel® Core™ i5-7300U,<br>2.6GHz Processor                |
|  | DDR3L 4GB   | DDR3L 4GB   | DDR3L 4GB   | DDR4 8GB  | DDR4 8GB  |
|  | -   | -   | -   | -   | -   |
|  | -   | -   | -   | -   | -   |
|  | 3G/GPS/GPRS/Wi-Fi<br>Communication by<br>iDoor Technology | 3G/GPS/GPRS/Wi-Fi<br>Communication by<br>iDoor Technology | 3G/GPS/GPRS/Wi-Fi<br>Communication by<br>iDoor Technology | 3G/GPS/GPRS/Wi-Fi<br>Communication by<br>iDoor Technology | 3G/GPS/GPRS/Wi-Fi<br>Communication by<br>iDoor Technology |
|  | 1 x mPCle   | 2 x mPCle   | 2 x mPCle   | 1 x mPCle   | 1 x mPCle   |
|  | Single SIM card slot                                      | -   | -   | Single SIM card slot                                      | Single SIM card slot                                      |
|  | 2 x 10/100/1000 Mbps                                      | 2 x 10/100/1000 Mbps                                      | 2 x 10/100/1000 Mbps                                      | 4 x 10/100/1000 Mbps                                      | 4 x 10/100/1000 Mbps                                      |
|  | 2 x RS232/422/485   | 4 x RS232/422/485   | 4 x RS232/422/485   | 4 x RS232/422/485   | 4 x RS232/422/485   |
|  | 1 x USB 3.0   | 1 x USB 3.0<br>3 x USB 2.0                                | 1 x USB 3.0<br>3 x USB 2.0                                | 4 x USB 3.0   | 4 x USB 3.0   |
|  | AdvLinux  |   |   |   |   |

|  | 3000  | 5000 | 5000 | 8000 | 8000 |
|--|---|------|------|------|------|
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | FTP/SQL Server                              |      |      |      |      |
|  | -   | -    | -    | -    | -    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | -   | -    | -    | -    | -    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | √   | √    | √    | √    | √    |
|  | -   | -    | -    | -    | -    |
|  | √   | √    | √    | √    | √    |
| / AWS / Inspur / WLTX / T-System / OpenIoT / RootCloud / Azure / LwM2M |   |      |      |      |      |
|  | √   | √    | √    | √    | √    |
|  | -   | -    | -    | -    | -    |
|  | √   | √    | √    | √    | √    |
|  | -   | -    | -    | -    | -    |
|  | DCTag SDK/DataLogger SDK/Board Resource SDK |      |      |      |      |

## Regional Service & Customization Centers

|              |                             |               |                           |                    |                             |               |                           |            |                                |
|--------------|-----------------------------|---------------|---------------------------|--------------------|-----------------------------|---------------|---------------------------|------------|--------------------------------|
| <b>China</b> | Kunshan<br>86-512-5777-5666 | <b>Taiwan</b> | Taipei<br>886-2-2792-7818 | <b>Netherlands</b> | Eindhoven<br>31-40-267-7000 | <b>Poland</b> | Warsaw<br>00800-2426-8080 | <b>USA</b> | Milpitas, CA<br>1-408-519-3898 |
|--------------|-----------------------------|---------------|---------------------------|--------------------|-----------------------------|---------------|---------------------------|------------|--------------------------------|

## Worldwide Offices

### Asia

#### Taiwan

|                     |                 |
|---------------------|-----------------|
| Toll Free           | 0800-777-111    |
| Taipei & IoT Campus | 886-2-2792-7818 |
| Taichung            | 886-4-2372-5058 |
| Kaohsiung           | 886-7-392-3600  |

#### China

|           |                  |
|-----------|------------------|
| Toll Free | 800-810-0345     |
| Beijing   | 86-10-6298-4346  |
| Shanghai  | 86-21-3632-1616  |
| Shenzhen  | 86-755-8212-4222 |
| Chengdu   | 86-28-8545-0198  |
| Hong Kong | 852-2720-5118    |

### Asia

#### Japan

|           |                  |
|-----------|------------------|
| Toll Free | 0800-500-1055    |
| Tokyo     | 81-3-6802-1021   |
| Osaka     | 81-6-6267-1887   |
| Nagoya    | 81-0800-500-1055 |
| Nogata    | 81-949-22-2890   |

#### Korea

|           |                |
|-----------|----------------|
| Toll Free | 080-363-9494/5 |
| Seoul     | 82-2-3660-9255 |

#### Singapore

|           |              |
|-----------|--------------|
| Singapore | 65-6442-1000 |
|-----------|--------------|

#### Malaysia

|              |                |
|--------------|----------------|
| Kuala Lumpur | 60-3-7725-4188 |
| Penang       | 60-4-537-9188  |

#### Thailand

|         |                 |
|---------|-----------------|
| Bangkok | 66-02-2488306-9 |
|---------|-----------------|

#### Vietnam

|       |                 |
|-------|-----------------|
| Hanoi | 84-24-3399-1155 |
|-------|-----------------|

#### Indonesia

|         |                |
|---------|----------------|
| Jakarta | 62-21-751-1939 |
|---------|----------------|

#### Australia

|           |                |
|-----------|----------------|
| Toll Free | 1300-308-531   |
| Melbourne | 61-3-9797-0100 |

#### India

|           |                 |
|-----------|-----------------|
| Bangalore | 91-80-2545-0206 |
| Pune      | 91-94-2260-2349 |

### Europe

#### Netherlands

|           |                |
|-----------|----------------|
| Eindhoven | 31-40-267-7000 |
| Breda     | 31-76-523-3100 |

#### Germany

|            |                    |
|------------|--------------------|
| Toll Free  | 00800-2426-8080/81 |
| Munich     | 49-89-12599-0      |
| Düsseldorf | 49-2103-97-855-0   |

#### France

|       |                |
|-------|----------------|
| Paris | 33-1-4119-4666 |
|-------|----------------|

#### Italy

|       |                |
|-------|----------------|
| Milan | 39-02-9544-961 |
|-------|----------------|

#### UK

|           |                   |
|-----------|-------------------|
| Newcastle | 44-0-191-262-4844 |
| London    | 44-0-870-493-1433 |

#### Spain

|        |                 |
|--------|-----------------|
| Madrid | 34-91-668-86-76 |
|--------|-----------------|

#### Sweden

|           |                 |
|-----------|-----------------|
| Stockholm | 46-0-864-60-500 |
|-----------|-----------------|

#### Poland

|        |                 |
|--------|-----------------|
| Warsaw | 48-22-31-51-100 |
|--------|-----------------|

#### Russia

|                |                                   |
|----------------|-----------------------------------|
| Moscow         | 8-800-555-01-50                   |
| St. Petersburg | 7-812-332-5727;<br>7-921-575-1359 |

#### Czech Republic

|                 |                 |
|-----------------|-----------------|
| Ústí nad Orlicí | 420-465-524-421 |
|-----------------|-----------------|

#### Ireland

|        |               |
|--------|---------------|
| Galway | 353-91-792444 |
|--------|---------------|

### Americas

#### North America

|            |                |
|------------|----------------|
| Toll Free  | 1-888-576-9668 |
| Cincinnati | 1-513-742-8895 |
| Milpitas   | 1-408-519-3898 |
| Irvine     | 1-949-420-2500 |
| Ottawa     | 1-815-433-5100 |

#### Brazil

|           |                 |
|-----------|-----------------|
| Toll Free | 0800-770-5355   |
| São Paulo | 55-11-5592-5367 |

#### Mexico

|             |                 |
|-------------|-----------------|
| Toll Free   | 1-800-467-2415  |
| Mexico City | 52-55-6275-2727 |

### Middle East and Africa

|        |                 |
|--------|-----------------|
| Israel | 072-2410527     |
| Turkey | 90-212-222-0422 |

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