

14

Utility and Energy Solutions

- 🔗 14-4 Communication Central Platforms
- 🔗 14-5 Edge Intelligent IoT Gateways

Utility and Energy IoT Solutions

Introduction

The successful management of power and energy applications is becoming increasingly critical as new energy sources, distributed across a much wider area than fossil fuels, become increasingly important. The informatization, intellectualization, and energy development of these new energy sources will change the traditional model, from a single communication model without response, to an alarm-to-intercommunication unified model. Advantech, as a leading manufacturer of industrial PCs for power and energy applications, provides intelligent components, from smart meters, IEC-61850-3 certified industrial computers, intelligent wireless gateways, to SCADA software, substation automation system development, and energy management. Through a host of innovative products and solutions, Advantech has shown itself to be one of the key enablers of Industrial IoT and Industry 4.0.

Smart Substation Solutions

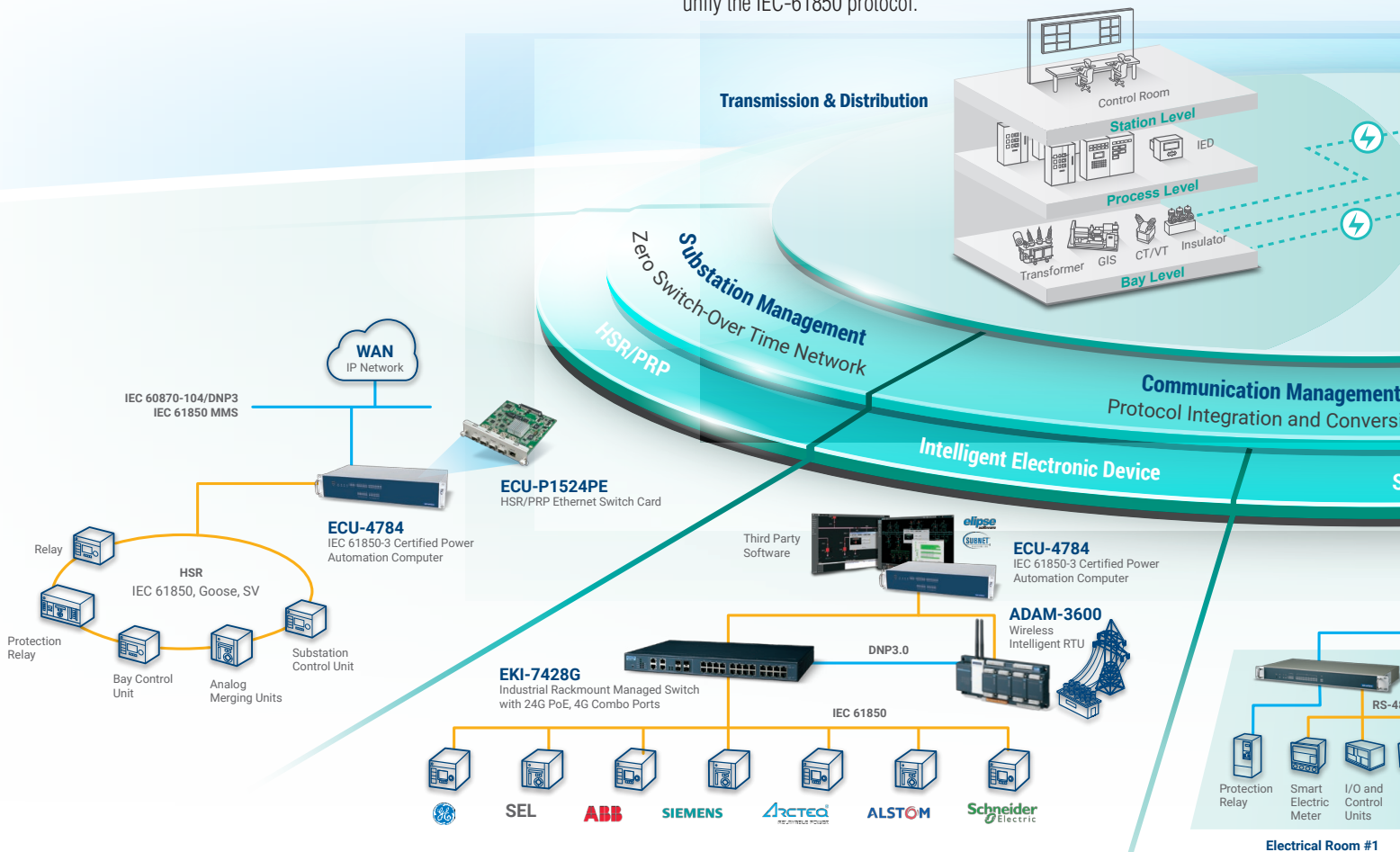
In smart substations, traditional primary devices including transforms, GIS, CT/VT, Thunder and other isolated switches, normally operate without precaution, monitoring unified communication protocols. Along with the development of modern smart substations, the IEC-61850 standard is latest trend in substation applications and primary device monitoring. To meet these requirements, Advantech provides IEC-61850 compliant computer platforms for data communication and transmission which keeps primary device operating normally.

SCADA applications

In smart substations, it's essential to be able to remotely monitor substation devices from a central management center. To achieve this, high performance computing platforms integrate HMI/DATA collection, data monitoring, environmental status, which help operators accurately evaluate their devices' status and take action.

Communication and data gateway with IEC 61850

Within a substation, various devices use a wide variety of protocols, such as IEC-60870-101/103/104, Modbus or other private rules. The status and information of these devices needs to be accurately monitored and collected through a gateway computer with a unified communication transition protocol. It's very important that transfer devices use various protocols to unify the IEC-61850 protocol.



Electrical Room #1

Distributed Energy Monitoring in Renewable Energy

With the increasing construction of solar power plants, customers are finding it difficult to handle issues of the number of communication protocol requests, unstable communication networks on distributed farms and no high-efficiency or intelligent monitoring software. This means traditional solar power monitoring solutions can not satisfy modern fast developing solar operation requirements.

Advantech provides high-performance computing platforms, total data acquisition modules, communication protocol gateways, network communications, and cloud software solutions with multiple communication protocols and stable Ethernet or wireless network support, network switchboards and remote monitoring software.

Wireless communication on distributed solar power

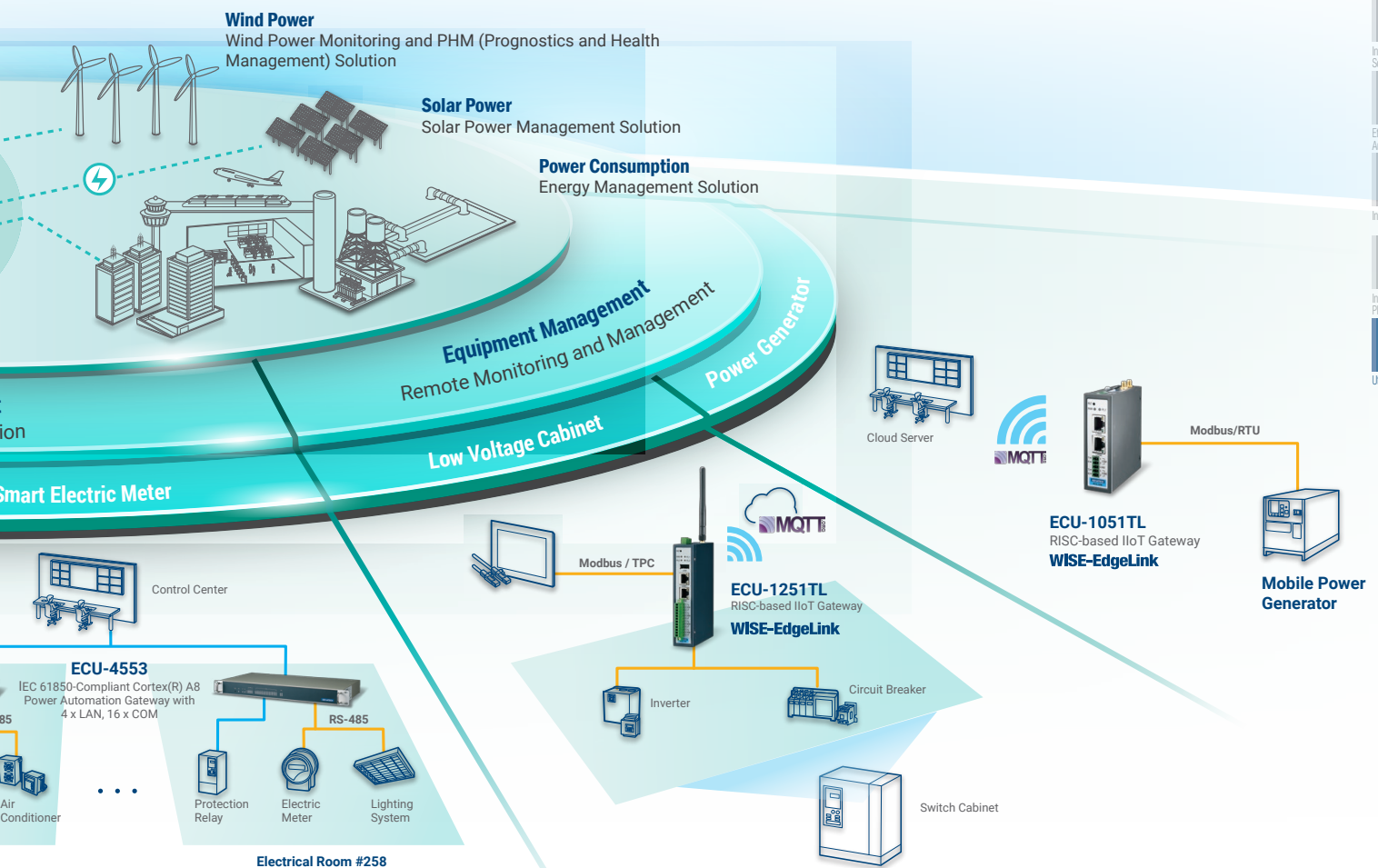
Distributed solar power farms are scattered over vast and remote areas, and establishing stable communication networks is not easy. To reduce wiring costs and maintain reliability, Advantech provides gateways capable of supporting 2G/3G/Wi-Fi/4G wireless for stable networks with data integrity.

Distributed Energy Monitoring in Energy Consumption

In order to reduce production costs and increase product profitability, manufacturing factories require integrated monitoring management and optimization measures to manage their high energy-consuming facilities. Advantech not only provides practical and easy-to-implement energy management solutions, but also has a full range of product portfolios, including smart meters, data acquisition modules, and control hosts, as well as and back-end management platforms to offer complete solutions for enterprises to achieve energy efficiency.

High energy-consuming equipment monitoring applications

Since harmonics can have a significant impact on electrical distribution systems and the critical facilities they need, Advantech's energy management solution used equipment failure diagnosis and prevention mechanisms to provide analytical information through monitoring harmonic currents generated by non-linear electronic loads, so as to improve production efficiency and reduce maintenance and energy costs.



- 1 IoT Software Solutions
- 2 Edge AI and SKY Servers
- 3 Intelligent Systems
- 4 Machine Vision Solutions
- 5 Intelligent HMI and Monitors
- 6 Automation Computers
- 7 DAO and Communication Gateways
- 8 Industrial Communication
- 9 Remote I/O, Wireless Sensing Modules and Converters
- 10 Intelligent Motion Control Solutions
- 11 EtherCAT Solutions and Automation Controllers
- 12 Industrial I/O Solutions
- 13 Intelligent Transportation Platforms
- 14 Utility and Energy Solutions

Communication Central Platforms

x86-based Industrial Automation Computers

NEW



NEW



NEW



NEW



| Model Name | ECU-4685 | ECU-4676 | ECU-4576 | ECU-4784 Xeon | ECU-4784 |
|---------------------------|--|--|--|--|--|
| Certification | IEC 61850-3/IEEE 1613 China Electricity Certificate IV level | IEC 61850-3 / IEEE 1613 Compliant China Electricity Certificate IV level | IEC 61850-3/IEEE 1613 China Electricity Certificate IV level | IEC 61850-3/IEEE 1613 China Electricity Certificate IV level | IEC 61850-3/IEEE 1613 China Electricity Certificate IV level |
| CPU | Intel Celeron 2980U 1.7GHz | Intel ATOM E3940 1.6GHz | Intel ATOM E3940 1.6GHz | Intel SkyLake Xeon E3-1505L Quad-core 2.0GHz | Intel Haswell Core i7 4650U 1.7GHz dual-core, i3 4010U 1.7GHz, Celeron 2980U 1.6GHz |
| RAM | 4G DDR3L SDRAM | 4G DDR3 SDRAM | 2G DDR3 SDRAM | 32G DDR4 SDRAM | 8G DDR3L SDRAM 16G DDR3L SDRAM |
| Display | VGA | VGA | VGA | VGA/DVI | VGA/DVI |
| Serial Ports | 8 x Isolated RS-232/422/485 (Terminal Block) | 2 x isolated RS-232 1 x IRIG-B 16 x Isolated RS-232/485 | 2 x isolated RS-232 8 x isolated RS-232/485 | 2 x Isolated RS-232 (Standard) 8 x RS-232/422/485 (Terminal Block) | 2 x Isolated RS-232 (Standard) 8 x RS-232/422/485 (Terminal Block) |
| Ethernet Ports | 6 x 10/100/1000Base-T | 8 x 10/100/1000 Base-T | 8 x 10/100/1000 Base-T | 8 x 10/100/1000Base-T | 8 x 10/100/1000Base-T |
| USB Ports | 6 (1 x internal) | 5 (1 x internal) | 5 (1 x internal) | 6 (1 x internal) | 6 (1 x internal) |
| Expansion | - | 1 x PCIE | 1 x PCIE | 2 x PCI/PCIE | 2 x PCI/PCIE |
| Onboard I/O | - | 8 x isolated DI, 8 x isolated DO | - | - | - |
| Watchdog Timer | ✓ | ✓ | ✓ | - | ✓ |
| CompactFlash Slots | 1 x Internal (mSATA) | 1 x Internal (CF) | 1 x Internal (CF) | 1 x Internal (CFast) | 1 x Internal (CFast) |
| 2.5" HDD Expansion | 2 x SATA | 2 x SATA | 2 x SATA | 2 x SATA | 2 x SATA |
| Operating Systems | WES7, Windows7, Windows 8, Windows Server 2012R2, Windows Server 2008R2(64bits), Windows Embedded 8 64-bit | WES7, Windows7, Linux | WES7, Windows7, Linux | WES7, Windows7, Windows 8, Windows Server 2012R2, Windows Server 2008R2(64bits), Windows Embedded 8 (64bits) | WES7, Windows7, Windows 8, Windows Server 2012R2, Windows Server 2008R2(64bits), Windows Embedded 8 (64bits) |
| Mounting | 2U Rackmount | 2U Rackmount | 1U Rackmount | - | 2U Rackmount |
| Anti-Vibration | 2 G w/mSATA, 1 G w/HDD | 2 G w/CF, 1 G w/HDD | 2 G w/CF, 1 G w/HDD | - | 2 G w/CF, 1 G w/HDD |
| Anti-Shock | 30 G w/mSATA, 20 G w/HDD | 30 G w/CF, 20 G w/HDD | 30 G w/CF, 20 G w/HDD | - | 30 G w/CF, 20 G w/HDD |
| Operating Temperature | -20 ~ 70°C (-4 ~ 158°F) | -25 ~ 70°C (-13 ~ 158°F) | -20 ~ 70°C (-4 ~ 158°F) | -20 ~ 60°C with 50% CPU/ I/O loading, without 2D/3D -20 ~ 45°C with 100% CPU/ I/O loading | -20 ~ 70°C (-4 ~ 158°F) |
| Power Consumption Typical | 22W | 24W | 24W | 35W | 22W (i7 dual-core) 24.2W (Celeron) |
| Power Requirements | Supports Redundant Power Input Power 1: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} Power 2: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} | Supports Redundant power input Power 1: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} Power 2: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} | Supports Redundant power input Power 1: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} Power 2: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} | Supports Redundant power input Power 1: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} Power 2: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} | Supports Redundant Power Input Power 1: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} Power 2: 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} |
| Dimensions (W x D x H) | 440 x 280 x 88 mm | 440 x 220 x 88 mm (17.3" x 8.6" x 3.4") | 440 x 272 x 44 mm (17.3" x 8.6" x 3.4") | 440 x 280 x 88 mm | 440 x 280 x 88 mm |
| Weight | 5.5 kg | ~ 6.0 kg | 4.6 kg | ~ 6.0kg | ~ 6.0 kg |
| Ordering Information | ECU-4685-LC24SAE | ECU-4676-A53SBE ECU-4676-LBA53SBE | ECU-4576-A53SAE | ECU-4784-E56SAE ECU-4784-E57SAE | ECU-4784-D55SAE ECU-4784-D56SBE ECU-4784-E15SAE ECU-4784-C25SAE |

Edge Intelligent IoT Gateways

RISC-based Industrial Communication Gateways



| Module Name | ECU-1251 | ECU-1152 | ECU-4553 |
|---------------------------|-------------------------|-------------------------|--|
| Certification | CE/FCC | CE/FCC | CE/FCC/CCC |
| CPU | TI Cortex A8 800MHz | TI Cortex A8 800MHz | TI Cortex A8 800MHz |
| RAM | DDR3L 256MB | DDR3L 512MB | DDR3L 1GB |
| Serial Ports | 4 x Isolated RS-232/485 | 6 x isolated RS-232/485 | 16 x isolation RS-232/485 |
| Ethernet Ports | 2 x 10/100 Base-T | 2 x 10/100 Base-T | 4 x 10/100 Base-T |
| CAN | - | - | 2 x CAN 2.0B |
| Display | - | - | VGA |
| USB Ports | 1 | 1 | 1 |
| IRIG-B | - | - | ✓ |
| Storage | 2 x SD (Micro-SD) | 2 x SD (Micro-SD) | 2 x SD (Micro-SD) |
| Watch Timer | ✓ | ✓ | ✓ |
| Power Requirements | 10 ~ 30 V _{DC} | 10 ~ 30 V _{DC} | 100 ~ 240 V _{AC} or 100 ~ 240 V _{DC} |
| Operating System | RT-Linux 3.12 | RT-Linux 3.12 | RT-Linux 3.12 |
| Mounting | Wall-mount/ DIN-rail | Wall-mount/ DIN-rail | 1U Rack-mount |
| Anti-vibration | 2G w/Micro-SD | 2G w/Micro-SD | 2G w/Micro-SD |
| Anti-shock | 10G w/Micro-SD | 10G w/Micro-SD | 10G w/Micro-SD |
| Operating Temperature | -40 ~ 70°C | -40 ~ 70°C | -40 ~ 70°C |
| Typical Power Consumption | 2.4W | 2.4W | 6.6W |
| Dimensions | 140 x 96.5 x 30 mm | 170 x 110 x 32.2 mm | 440 x 220 x 44 mm |
| Weight | 1.5 kg | 1.5 kg | 4.5 kg |

1

IoT Software Solutions

2

Edge AI and SKY Servers

3

Intelligent Systems

4

Machine Vision Solutions

5

Intelligent HMI and Monitors

6

Automation Computers

7

DAQ and Communication Gateways

8

Industrial Communication

9

Remote I/O, Wireless Sensing Modules and Converters

10

Intelligent Motion Control Solutions

11

EtherCAT Solutions and Automation Controllers

12

Industrial I/O Solutions

13

Intelligent Transportation Platforms

14

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