# Advantech Power & Energy Automation Computers

## Robust Products for a Variety of Power and Energy Applications

IEC61850-3

TÜV SÜD
ISO 9001

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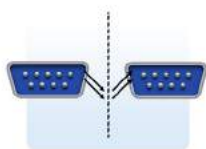# Product Features

### IEC 61850-3 Certification

IEC-61850-3 & IEEE 1613 certified

Products with IEC 61850-3 Certification meet the smart substation's station and bay level.

### Flexible Module Expansion with Robust XPCIe Familiy

I/O expansion modules are specifically designed for the ECU-4784 rack-mount automation computer. There are multiple I/O cards such as - serial cards, fiber cards, IRIG-B cards and Gigabyte Ethernet cards -for different data applications.

### Ethernet Redundancy

Ethernet redundancy ensures communication is maintained if one Ethernet port fails thereby avoiding loss of data.

### $2500V_{AC}$ Isolation with Serial Port

Isolation separates ports so there is no need to be concerned about differences in voltage.

### Easy Diagnosis and Software Security Protection

iCDManager

iCDManager provides realtime communication status monitoring functions to get diagnosis information when connectivity exceptions occur to enhance maintenance efficiency and ensure the system operates smoothly.

# Robust Products for a Variety of Power and Energy Applications

Advantech's powerful TUV certified ECU-4784 Embedded PC has been specifically designed to meet the critical requirements of power automation. IEC-61850-3 and IEEE1613 certification demonstrates the ECU-4784 suitability for electrical power communication protocol conversion, intelligent remote data analysis, network communications security and comprehensive monitoring applications, which provides higher reliability and stability, specially suitable for global power automation, energy automation and harsh environments.

## Time Synchronization Functionality with IRIG-B

IRIG-B is an important time synchronization mode that ensures efficient and reliable communication between power automation systems.
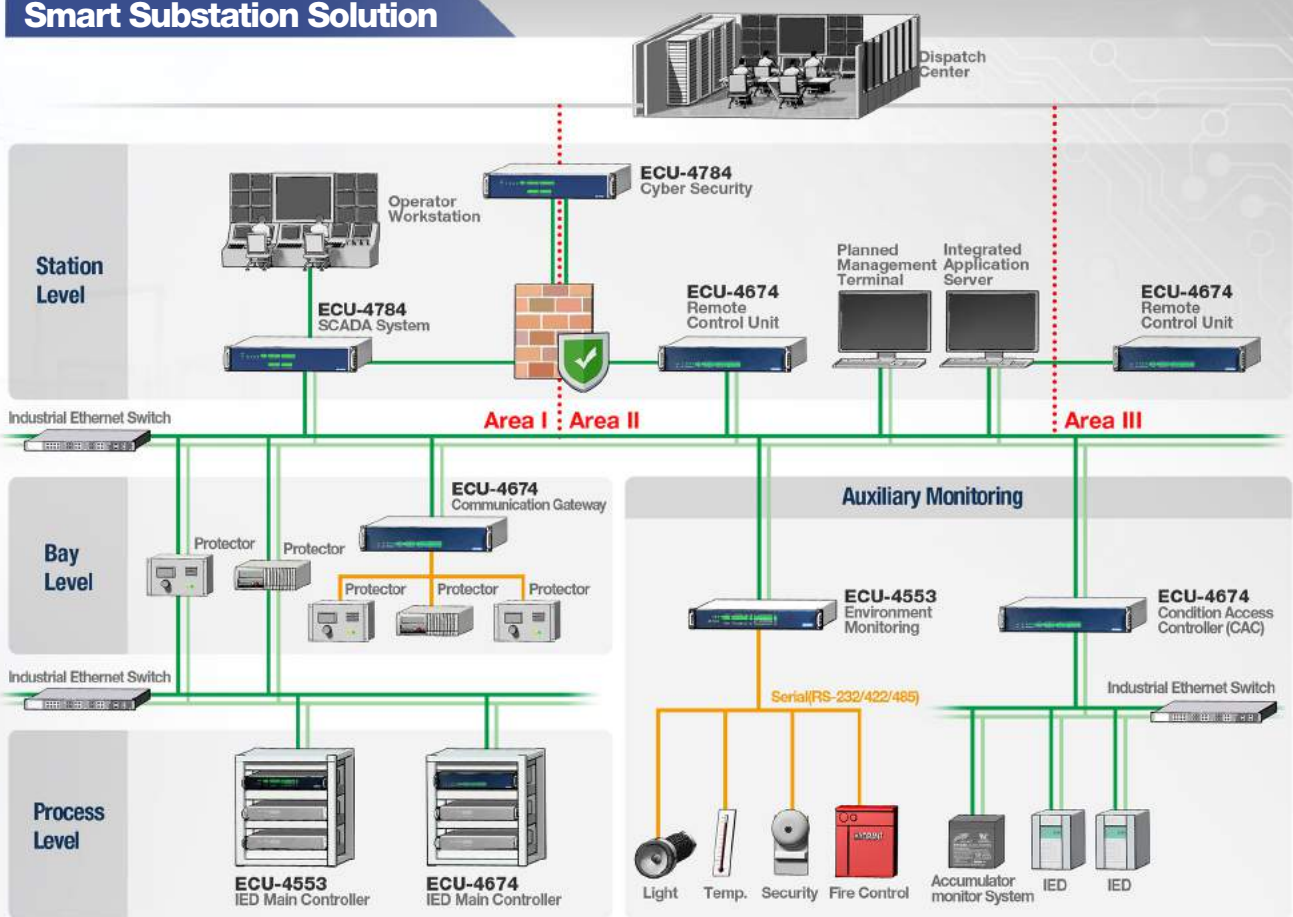
## Robust Design- Fanless and Dual Power Design

The fanless dual power design ensures that dust particles aren't drawn into the system and that if one power source fails the devices will continue working.

# Application

## Smart Substation Solution



## SCADA Application

In the Smart Substation field, it's very important to be able to remotely monitor substation devices from a supervisory center. High performance computing platforms can easily integrate the HMI/DATA collection, data monitoring, environmental status, which helps operators accurately evaluate their devices' status and take action.

### Application Requirements

• Reliable IEC 61850-3 certification

• High-performance computing platform

• AMT/TPM

## Cyber Security for Smart Grids

There are different grades of network protection priorities in a substation, and use in these environments need reliable cyber security. This requires a software firewall or comparable hardware firewall devices to prevent illegal or unauthorized user access.

### Application Requirements

• Reliable IEC 61850-3 certification

• High-performance Ethernet

• Virtual Machine/TPM

## Communication & Data Gateway for IEC-60870/IEC-61850

Numerous intelligent electronic devices have their own isolated protocols such as IEC-60870-5(101,103,104) in the substation. Customers have to transform these isolated protocols into the unified 61850-3 standard protocol to achieve interconnected communications.

### Application Requirements

• Reliable IEC 61850-3 gateway platform

• Multi-functional communication interfaces including isolated seriel port, IRIG-B, serial port, Ethernet, etc.

| Model Name | ECU-4784 | ECU-4784-Xeon | ECU-4574 / ECU-4674 | ECU-4553 | ECU-1152 / ECU-1251 | ECU-1050 / ECU-1051 |
|---|---|---|---|---|---|---|
| Certification | 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 Compliant China Electricity Certificate IV | China Electricity Certificate IV level | China Electricity Certificate IV level | - |
| CPU | Intel Haswell Core i7 4650U 1.7GHz dual-core, i3 4010U 1.7GHz, Celeron 2980U 1.6GHz | Intel SkyLake Xeon E3-1505L Quad-core 2.0GHz | Intel Atom N2600 1.66GHz | TI Cortex A8, 800MHz | TI Cortex A8, 800MHz | TI Cortex A8, 600MHz |
| Onboard RAM | 8G DDR3L SDRAM 16G DDR3L SDRAM | 16G DDR4 SDRAM with ECC 32G DDR4 SDRAM with ECC | 2G DDR3 SDRAM | 1G DDR3L SDRAM | 512MB DDR3L(ECU-1152) 256MB DDR3L(ECU-1251) | 256MB DDR3L |
| Display | VGA;DVI | VGA;DVI | VGA | VGA | – | - |
| Serial Ports | 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) | 2 x isolated RS-232 ECU-4574: 8 x isolated RS-232/485 ECU-4674 : 1 x IRIG-B 16 x Isolated RS-232/485 | 16 x Isolated RS-232/485 1 x IRIG-B (COM1) 2 x Isolated CAN2.0B | 6 x Isolation RS-232/485(ECU-1152) 4 x Isolation RS-232/485(ECU-1251) | 2 x Optional Isolated RS232/RS485 (ECU-1051) |
| Ethernet Ports | 8 x 10/100/1000Base-T | 8 x 10/100/1000Base-T | 2 x 10/100/1000Base-T 6 x 10/100Base-T | 4 x 10/100Base-T | 2 x 10/100Base-T | 1 x 10/100 Base-T (ECU-1050) 2 x 10/100 Base-T (ECU-1051) |
| USB Ports | Six (One internal) | Six (One internal) | Five (One internal) | One | One | - |
| Expansion | 2 x PCI/PCIE | 2 x PCI/PCIE | 1 x PCI 104 | - | - | - |
| Onboard I/O | - | - | ECU-4674-A53SAE: 8 x isolated DI, 8 x isolated DO | - | - | - |
| Watchdog Timer | Yes | Yes | Yes | Yes | Yes | Yes |
| Storage Slots | One Internal(CFast) | One Internal(CFast) | One Internal (CF) | Two Internal (mico-SD) | Two Internal (mico-SD) | Two Internal (mico-SD) |
| 2.5" HDD Expansion | 2 x SATA | 2 x SATA | 2 x SATA | - | - | - |
| Operating Systems | WES7, Windows7, Windows 8, Windows Server 2012R2, Windows Server 2008R2(64bits), Windows Windows Embedded 8 64-bit | WES7, Windows7, Windows 8, Windows Server 2012R2, Windows Server 2008R2(64bits), Windows Windows Embedded 8 64-bit | WES7, Windows7,Linux | RT Linux | RT Linux | RT Linux |
| Mounting | 2U Rack Mount | 2U Rack Mount | 2U Rack Mount | 1U Rack-Mount | Wall-Mount, DIN Rail | Wall-Mount, DIN Rail |
| Anti-Vibration | 2 G w/CFast, 1 G w/HDD | 2 G w/CFast, 1 G w/HDD | 2 G w/CF, 1 G w/HDD | 2 G | 2 G | - |
| Anti-Shock | 30 G w/CFast, 20 G w/HDD | 30 G w/CFast, 20 G w/HDD | 30 G w/CF, 20 G w/HDD | 30 G | 30 G | - |
| Power Input Range | AC: 100 ~ 240 VAC DC: 100~240 VDC | AC: 100 ~ 240 VAC DC: 100~240 VDC | AC: 100 ~ 240 VAC DC: 100~240 VDC | AC: 100 ~ 240 VAC | DC: 10~30VDC | DC: 10~30VDC |
| Operating Temperature | -25 ~ 70°C (-13 ~ 158°F) | -25 ~ 60°C with 50% CPU/ I/O loading, without 2D/3D -25 ~ 45°C with 100% CPU/ I/O loading | -25 ~ 70°C (-13 ~ 158°F) | -40 ~ 70°C (-40 ~ 158°F) | -40 ~ 70°C (-40 ~ 158°F) | -40 ~ 70°C (-40 ~ 158°F) |
| Power Consumption (Typical) | 22W (i7 dual-core) 24.2W (Celeron) | 35W | 24W | 10W | 7W | 2.4W @ 24V DC |
| Power Requirements | Supports Redundant Power Input Power 1: 100 ~ 240 VAC or 100 ~ 240 VDC Power 2: 100 ~ 240 VAC or 100 ~ 240 VDC | Supports Redundant Power Input Power 1: 100 ~ 240 VAC or 100 ~ 240 VDC Power 2: 100 ~ 240 VAC or 100 ~ 240 VDC | Supports Redundant Power Input Power 1: 100 ~ 240 VAC or 100 ~ 240 VDC Power 2: 100 ~ 240 VAC or 100 ~ 240 VDC | Power : 100 ~ 240 VAC or 100 ~ 240 VDC | Power : 24VDC (10~30VDC) | Power : 24VDC (10~30VDC) |
| Dimensions (W x H x D) | 440 x 280 x 88 mm | 440 x 280 x 88 mm | 440 x 272 x 44 mm (ECU-4574) 440 x 220 x 88mm (ECU-4674) | 440 x 220 x 44 mm | 170 x 110 x 32.2 mm (ECU-1152) 140 x 96.5 x 30 mm (ECU-1251) | 92 x 93.7 x 30 mm (ECU-1050) 92 x 93.7 x 30 mm (ECU-1051) |
| Weight | 6.0 kg | 6.0 kg | 5.5 kg | 4.5 kg | 1 kg | 1 kg |
| Ordering Information | ECU-4784-D55SBE ECU-4784-D56SBE ECU-4784-E15SAE ECU-4784-C25SBE | ECU-4784-E56SAE ECU-4784-E57SAE | ECU-4574-A53SAE ECU-4674-A53SAE ECU-4674-LBA53SAE | ECU-4553-R12SAE | ECU-1152-R11ABE ECU-1251-R10AAE | ECU-1050-R10AAE ECU-1051-R10AAE |

## XPCIe
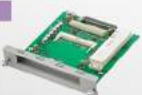
| Serial Port | Digitial I/O & Time Sync. | Time Sync. | Ethernet | Interface card |
|---|---|---|---|---|

| | | |
|---|---|---|
| **UNOP-1628D / 1618D** 8-port Isolated/ Non Isolated/ RS-232/422/485 | **ECU-P1761** 4-ch Isolated DI, 4-ch Isolated RO Card with IRIG-B | **UNOP-1624D** 4-port Isolated RS-232/422/485 with IRIG B |
| **UNOP-1514RE / 1514PE** 4-port RJ45 / SFP Gigabit Base Ethernet Card | **UNOP-1514C** 4-port Fiber Optic LAN Card | **ECU-P1524PE** 2-port SFP Gigabit Base Ethernet Card with HSR/PRP |
| **UNOP-1000I** PCI & Mini-PCI Expansion Card | **UNOP-1000J** PCI-104 & Mini-PCIe Expansion Card | **UNOP-1000K** PCIe Expansion Card |

# Regional Service and Customization Centers

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

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| Toll-Free | 800-810-0345 |
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| Shenzhen | 86-755-8212-4222 |
| Chengdu | 86-28-8545-0198 |
| Hong Kong | 852-2720-5118 |

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| Taipei & IoT Campus | 886-2-2792-7818 |
| Taichung | 886-4-2329-0371 |
| Kaohsiung | 886-7-229-3600 |

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## Asia

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| Nagoya | 81-52-856-9657 |

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| Penang | 60-4-537-9188 |

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| Düsseldorf | 49-2103-97-855-0 |

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| Irvine | 1-949-420-2500 |
| Ottawa | 1-815-434-8731 |

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