

User Manual

ECU-4574 Series

**Intel® Atom™ N2600 1.6GHz
Power & Energy Computers with
8 x LAN and 10 x COM**

ADVANTECH

Enabling an Intelligent Planet

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For technical support and service, please visit our support website at: <http://www.advantech.com.cn/support/>

This manual is for ECU-4574 Series.

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user is required to correct interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -25° C (-13° F) OR ABOVE 70° C (158° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**
17. Due to the sensitive nature of the equipment it must be stored in a restricted access location, only accessible by qualified engineers.
18. When installing this equipment, ensure that the Earth cable is securely attached using a 3.5 mm screw.
19. The equipment does not include a power cord and plug.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Chapter 1	Overview	1
1.1	Introduction	2
1.2	Hardware Specifications	3
1.2.1	General	3
1.2.2	System Hardware	3
1.2.3	I/O Interface	3
1.2.4	Environment	4
1.3	Safety Precautions	4
1.4	Chassis Dimensions	5
	Figure 1.1 ECU-4574 Chassis Dimensions	5
1.5	Packing List	6
Chapter 2	Hardware Function	7
2.1	Overview	8
	Figure 2.1 ECU-4574-A53SAE Front Panel	8
	Figure 2.2 ECU-4574-A53SAE Rear Panel	8
2.2	LED Indicators	8
2.2.1	System Status Indicators	8
	Table 2.1: Definition of System Status Indicators	8
2.2.2	LAN Status Indicators	9
	Table 2.2: Definition of LAN Status Indicators	9
2.2.3	Serial Communication Status Indicators	9
	Table 2.3: Definition of Serial COM Status Indicators	9
2.3	Power Input	10
	Table 2.4: AC/DC power input	10
	Table 2.5: AC/DC Power Input PIN Definition	10
Chapter 3	Initial Setup	11
3.1	Configuration	12
3.2	Installing a CF card	12
3.3	Installing a Hard Disk	13
3.4	BIOS Setup	13
Appendix A	Pin Assignments	15
A.1	RS-232 Serial Ports (COM1 ~ COM2)	16
	Table A.1: RS-232 Port Pin Definitions (COM1~COM2)	16
A.2	RS-232/485 Serial Ports (COM3 ~ COM10)	16
	Table A.2: RS-232/485 Serial Ports (COM3 ~ COM10)	16
A.3	VGA	17
	Table A.3: VGA	17
A.4	USB	17
	Table A.4: USB 2.0	17

Chapter 1

Overview

This chapter provides an overview of ECU-4574 Series' specifications.

Sections include:

- Introduction
- Hardware Specifications
- Safety Precautions
- Chassis Dimensions
- Packing List

1.1 Introduction

For Power and Energy Automation, Advantech has developed ECU-4000 series products for Embedded Automation Computers to meet the most demanding computing requirement in Smart Substation's Bay level application, which are certified by IEC 61850-3 and IEEE 1613 to meet the harsh and critical requirements of smart grid automation; It is easy to use for Smart substation communication Platform & Gateway & Protocol Conversion; Provide high Performance and reliable functionality to meet the most critical computing applications; Support Remote monitoring and diagnosis for the remote device connectivity to enhance maintenance efficiency.

The ECU-4574 is targeted at Data Server and Communication Gateway in Substations Bay level, for Data Gateway for IEC 61850. Within a substation, there are lots of devices using a wide variety of protocols. Status and information of devices need to be monitored and controlled reliably; hence, a reliable automation controller plays such an important data protocol gateway, communication server and intelligent Device (IED) analyzer at a substation.

ECU-4574 is Intel Atom N2600 1.6 GHz Power & Energy Automation Computer with 8 x LAN and 10 x COM. ECU-4574 series products is compliant with Electricity Certificate IV level (especially for China) and IEC 61850-3 and IEEE 1613 certification, which provide higher reliability and stability, suitable for any Global Power & Energy automation market and harsh environment; with versatile communication interface to use for Smart substation Communication server and IED Analyzer to fulfill the Data Gateway & Protocol Conversion requirement easily; Featuring a fanless design with high performance Intel Atom N2600 processor.

Certification for Reliable: Reliable IEC 61850-3 platform

- IEC 61850-3 and IEEE 1613 certification, ECU-4574 has higher standard than other embedded automation controller and contributes to higher reliability and stability, suitable for any Global P&E automation market and harsh environment.
- China Electricity Certificate IV Test level to provide the high reliability and competence in China Power & Energy automation market.

Isolation & High Speed Communication Interface

- Comprehensive communication interface to use for Smart substation Communication server and IED Analyzer to implement Data Gateway & Protocol Conversion easily, support for variety of protocol (IEC-60870-101/103/104, DNP3.0 etc.).
- Network interface are required to respond to real-time data and collect high-density network packets, handle accurately to facilitate data analysis.
- Flexible With versatile communication interface: IED Analyzer to fulfill the Data Gateway & Protocol Conversion requirement easily.

Easy to Diagnose System & Communication and Enhance Efficiency Maintenance

- iCDManager Design to provide the remote monitoring(instant alert & event Log) and diagnosis for the remote device connectivity to enhance Network communication maintenance efficiency.
- Remote Diagnose and manage System to provide the high system maintenance efficiency.
- The rear IO connection and LEDs on front panel for all ports and modes, simplify the monitoring status for operation.

Fast and Easy for ODM Customization

- Structured and functional module Internal design for easy customization and Fast assembly to fulfill the different kind of application by T-Parts manufacture process
- Customer Focused Service provide Fast response for customization development request based on this product's main hardware structure

1.2 Hardware Specifications

1.2.1 General

- **Certification:** CE, FCC Class A, CCC, Electricity IV level for China (Compatible IEC61850-3, IEEE 1613)
- **Dimensions (W x D x H):** 480 x 308.9 x 44.5 mm
- **Enclosure:** SECC & Aluminum
- **Mounting:** 1U 19" Rackmount
- **Power Requirements:** Supports dual power input (Optional)
 - Power 1: 100 ~ 240 VAC (47 ~ 63 Hz) or 100 ~ 240 VDC
 - Power 2: 100 ~ 240 VAC (47 ~ 63 Hz) or 100 ~ 240 VDC
- **Power Consumption:** 30 W @ 220 VAC (Typical)
- **Weight:** < 4.5 kg
- **OS Support:** Windows 7, WES 7, Linux
- **iCDManager:** Intelligent Connectivity Diagnose and Manager Software

1.2.2 System Hardware

- **CPU:** Intel Atom N2600 1.6GHz
- **Memory:** 2G DDR3 SDRAM built-in
- **Indicators:** LEDs for Power, LAN (Active, LINK), Serial (Tx/Rx)
- **WatchDog Timer:** Programmable 256 levels time interval, from 1 to 255 seconds for each tier
- **Storage:** 1 x internal CF slot, Built-in one 2.5" SATA HDD bracket
- **Display:** DB15 VGA

1.2.3 I/O Interface

- **Serial Ports:** 2 x RS-232, 8 x RS-232/485
- **Serial Port Speed:**
 - RS-232: 50 ~ 115.2 kbps
 - RS-485: 50 ~ 921.6 kbps
- **Ethernet:**
 - 2 x 10/100/1000M Base-T RJ-45 ports
 - 6 x 10/100M Base-T RJ-45
- **USB Ports:** 4 x USB 2.0, Rev. 2.0 compliant

1.2.4 Environment

- **Humidity:** 95% @ 40° C (non-condensing)
- **Operating Temperature:** -20~70° C (-4 ~ 140° F), 48hrs
- **Operating Humidity:** -25~95% (non-condensing)
- **Shock Protection:** IEC 682-27
 - CompactFlash: 30 G, half sine, 11 ms
 - HDD: 20G, half sine, 11ms
- **Vibration Protection:** IEC 682-64, Random 1 Oct./min, 1 h/axis
 - CompactFlash: 2 Grms @ 5 ~ 500 Hz
 - HDD: 1 Grms @ 5 ~ 500 Hz

1.3 Safety Precautions

The following messages inform how to make each connection. In most cases, you will simply need to connect a standard cable.

Warning! *Always disconnect the power cord from your chassis whenever you are working on it. Do not connect while the power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis.*



Caution! *Always ground yourself to remove any static electric charge before touching ECU-4574 Series Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag.*



Note! *If DC voltage is supplied by an external circuit, please put a protection device in the power supply input port.*



1.4 Chassis Dimensions

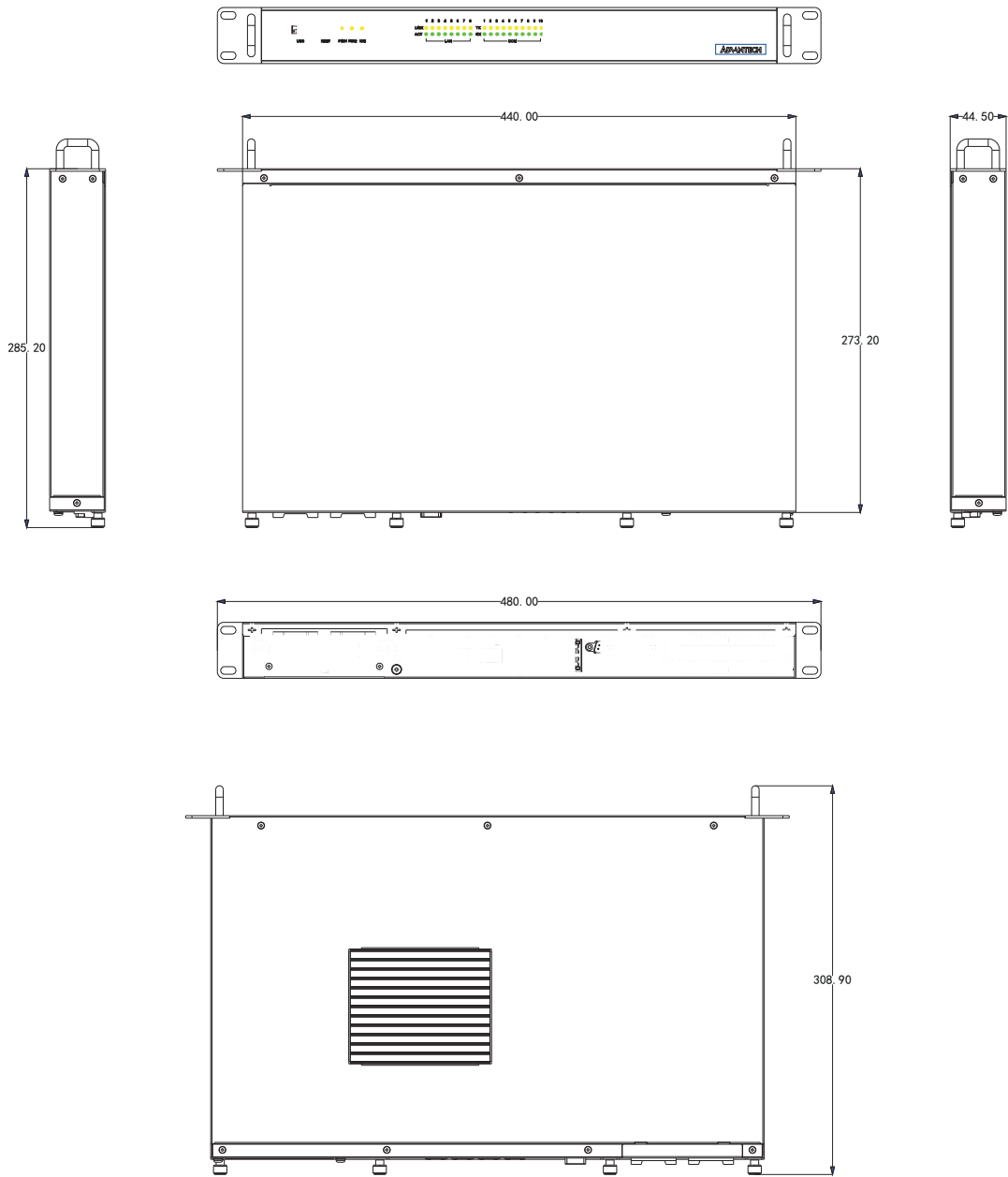


Figure 1.1 ECU-4574 Chassis Dimensions

1.5 Packing List

The accessory package of ECU-4574 Series contains the following items

ECU-4574-A53SAE accessory:

- (A) ECU-4574-A53SAE Product
- (B) 2 x 20PIN green screw terminals
- (C) 16 x 2P 2.0mm jumper shorter
- (D) 1 x 3PIN green screw terminals
- (E) 1 x cable for dual power module
- (F) 4 x M3*5 screws for HDD installation
- (G) 2 x M3*6L screws for power input terminal
- (H) 4 x M3*6L screws for dual power module
- (I) 1 x HDD hold BRK (with black HDD Mylar)
- (J) 1 x DVD
- (K) 1 x warranty card
- (L) 1 x Start up manual
- (M) 1 x ROHS LIST

Chapter 2

Hardware Function

This chapter shows how to setup the ECU-4574 hardware functions, including connecting peripherals, setting jumpers and indicators.

Sections include:

- Overview
- LED Indicators
- Interface Definitions
- Power Input

2.1 Overview

The following figures show the indicators and connectors on ECU-4574 Series. The following sections give you detailed information about function of each peripheral.

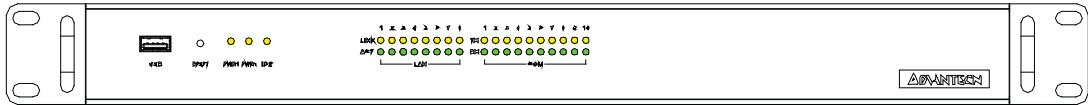


Figure 2.1 ECU-4574-A53SAE Front Panel

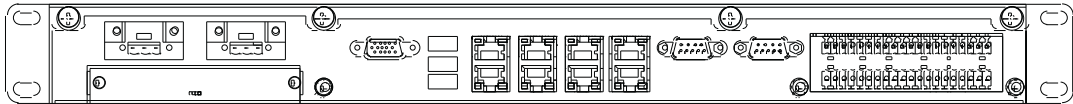
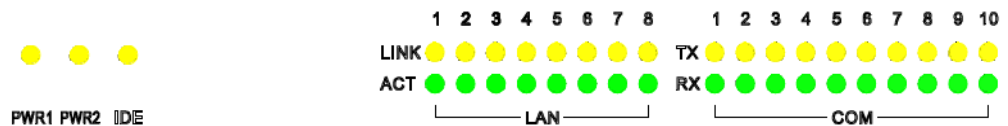


Figure 2.2 ECU-4574-A53SAE Rear Panel

2.2 LED Indicators

The LEDs in the front panel can be divided into 3 groups.



2.2.1 System Status Indicators



Table 2.1: Definition of System Status Indicators

Item	LED	Status	Description
1	PWR1	Green	System power1 is on
		Off	System power1 is off
2	PWR2	Green	System power2 is on
		Off	System power2 is off
3	IDE	Green	Data being received/ transmitted between storage devices
		Off	No data being received/ transmitted between storage devices

2.2.2 LAN Status Indicators

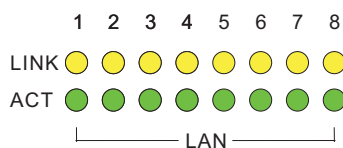


Table 2.2: Definition of LAN Status Indicators

Item	LED	Status	Description
1	LAN/LINK (Port 1~2)	Green	1Gbps network link
		Orange	100Mbps network link
		Off	10Mbps network link or invalid network link
2	LAN/ACT (Port 1~2)	Green	Ethernet data being received/ transmitted
		Off	No Ethernet data being received/ transmitted
1	LAN/LINK (Port 3~8)	Orange	100Mbps network link
		Off	10Mbps network link or invalid network link
2	LAN/ACT (Port 3~8)	Green	Ethernet data being received/ transmitted
		Off	No Ethernet data being received/ transmitted

2.2.3 Serial Communication Status Indicators

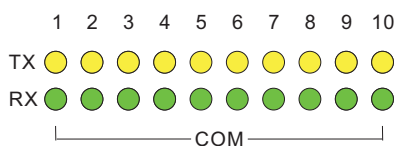


Table 2.3: Definition of Serial COM Status Indicators

Item	LED	Status	Description
1	COM/Rx (Port 1~10)	Orange	Serial port data being received
		Off	No data being received
2	COM/Tx (Port 1~10)	Green	Serial port data being transmitted
		Off	No data being transmitted

2.3 Power Input

ECU-4574 Series product support single power input AC or DC, It is reserved for dual power supply input interface, to facilitate customer to extend using dual power specifications.

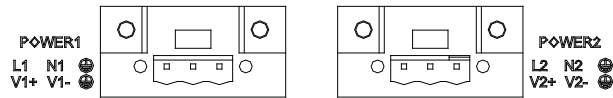


Table 2.4: AC/DC power input

Item	AC/DC	Volt. Range	Power Rating	Connector Type
PWR1	AC	100~240V	0.35A~0.15A, 47~63Hz	3Pin Screw Terminal
	DC	100~240V	0.35A~0.15A	3Pin Screw Terminal
PWR2	AC	100~240V	0.35A~0.15A, 47~63Hz	3Pin Screw Terminal
	DC	100~240V	0.35A~0.15A	3Pin Screw Terminal

Table 2.5: AC/DC Power Input PIN Definition

PIN	Screen printing	Function Description
1	L/V+	PWR1 L/PWR2 V+ AC/DC power input pin
2	N/V-	PWR1 N/PWR2 V- AC/DC power input pin
3	GND	GND

Chapter 3

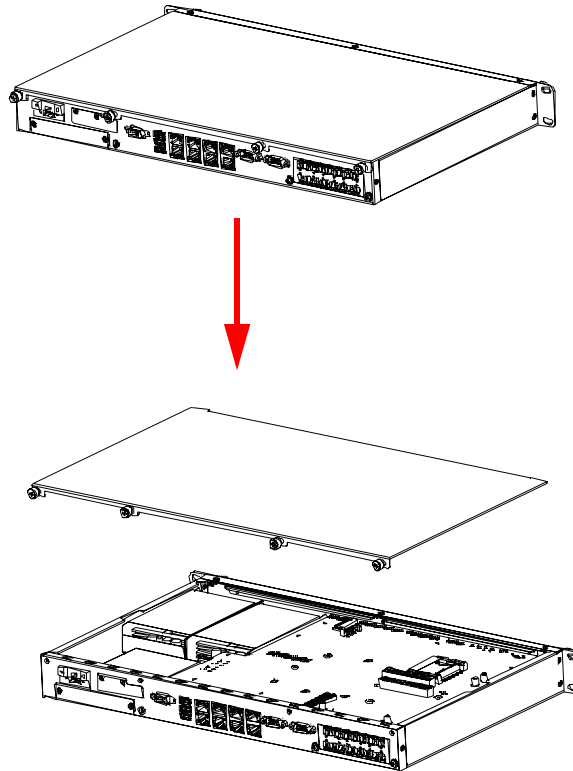
Initial Setup

Sections include:

- Configuration
- Installing a CF card
- Installing Hard Disk

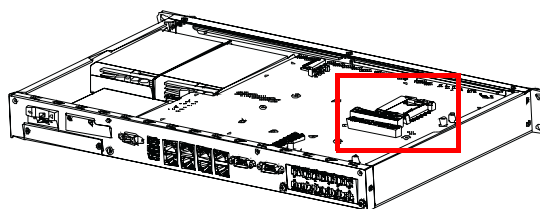
3.1 Configuration

To open the ECU-4574 product chassis, remove all power and signal connections. And unscrew screws on the chassis's top cover.



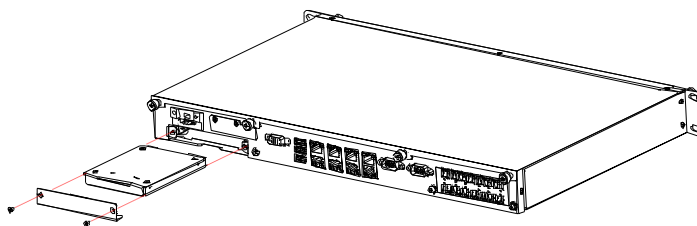
3.2 Installing a CF card

The ECU-4574 provides 1 CF Card slot. To install the cards, open the product chassis and insert the card at location shown below



3.3 Installing a Hard Disk

To install a HDD and HDD bracket (in the accessory), unscrew the 2 screws and remove the HDD back plate.



3.4 BIOS Setup

The ECU-4574 adopts Advantech's SOM-6765 CPU module. Further information about the SOM module can be found in SOM's user's manual. You can find this manual on the ECU-4574's companion disc.

Appendix **A**

Pin Assignments

A.1 RS-232 Serial Ports (COM1 ~ COM2)

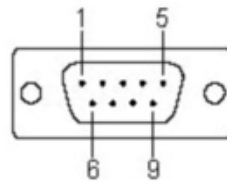


Table A.1: RS-232 Port Pin Definitions (COM1~COM2)

Pins	RS-232
1	
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.2 RS-232/485 Serial Ports (COM3 ~ COM10)

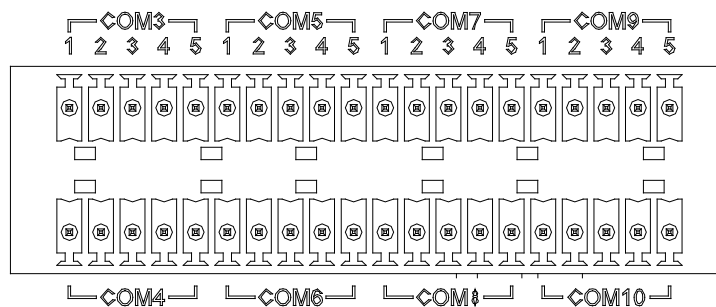


Table A.2: RS-232/485 Serial Ports (COM3 ~ COM10)

RS-232		RS-485	
Pins	Name	Pins	Name
1	Rx	1	—
2	Tx	2	—
3	—	3	Data+
4	—	4	Data-
5	GND	5	

A.3 VGA

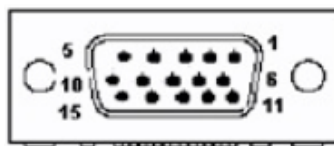


Table A.3: VGA

Pins	Signal	Pins	Signal
1	Red	9	+ 5V
2	Green	10	GND
3	Blue	11	NC
4	NC	12	DDC-DATA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	DDC-CLK
8	GND		

A.4 USB



Table A.4: USB 2.0

Pins	Signal
1	+V5 (VCC)
2	USB DATA-
3	USB DATA+
4	GND

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

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