

## **EPC-R3430**

**NXP ARM® Cortex®-A9 i.MX6  
Dual 1GHz Fanless Box**

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## 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

## FCC Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

## Ordering Information

Part No.	Description
EPC-R3430ID-PLA100	NXP i.MX6 Dual computer box with RS-485
EPC-R3430ID-PLA120	NXP i.MX6 Dual computer box with 2nd LAN
EPC-R3430ID-PLA140	NXP i.MX6 Dual computer box with CAN bus

## Packing List

Before installation, please ensure the following items have been shipped.

- 1 x EPC-R3430 BOX PC
- 2 x Wall Mount
- 1 x China RoHS

## Optional Accessories

Part No.	Description
96PSA-A36W12R1	ADP A/D 100-240V 36W 12V C6 DC PLUG 90°
1700001524	Power Cord 3P UL 10A 125 V 180 cm
170203180A	Power Code 3P UK 2.5A/3A 250V 1.83cm
170203183C	Power Code 3P Europe 183cm
1700019146	Power Cord CCC 3P 10A 250V 183cm
SQF-MSDM1-8G-21C	SQF MICRO SD C10 MLC 8G (-25 ~ 85 °C)
EWM-W162M201E	802.11 ac/a/b/g/n Wi-Fi and BT4.2 M.2 card
1750007965-01	Wi-Fi cable, SMA (M) to MHF4, 50 cm
1750000318	2DBI 2.4 GHz SMA CONN
EWM-C106FT02E	HSPA/WCDMA/GPRS cellular module
1750006264	Antenna SMA(F)/MHF 15cm SMALFN8-3150A-00X00R for a cellular module
	Antenna L 10.9cm 50Ohm AN8921F-5701SM for 3G

## 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

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.



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# Chapter 1

## General Introduction

This chapter gives background information on the EPC-R3430

Sections include:

- Introduction
- Specifications

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## 1.1 Introduction

EPC-R3430 is an ARM-based Box Computer powered by Rockchip ARM Cortex A9 i.MX6 dual high performance processors, which supports 2K displays and multi-format video decoding via HDMI. It features M.2, Mini-PCle and SIM card slots for WIFI, BT and 4G connectivity. EPC-R3430 also offers multiple interfaces such as 6 USB2.0, 6 UART, 1 GbE and 8 GPIO. It is an ideal solution for kiosks, vending machines, and digital signage applications.

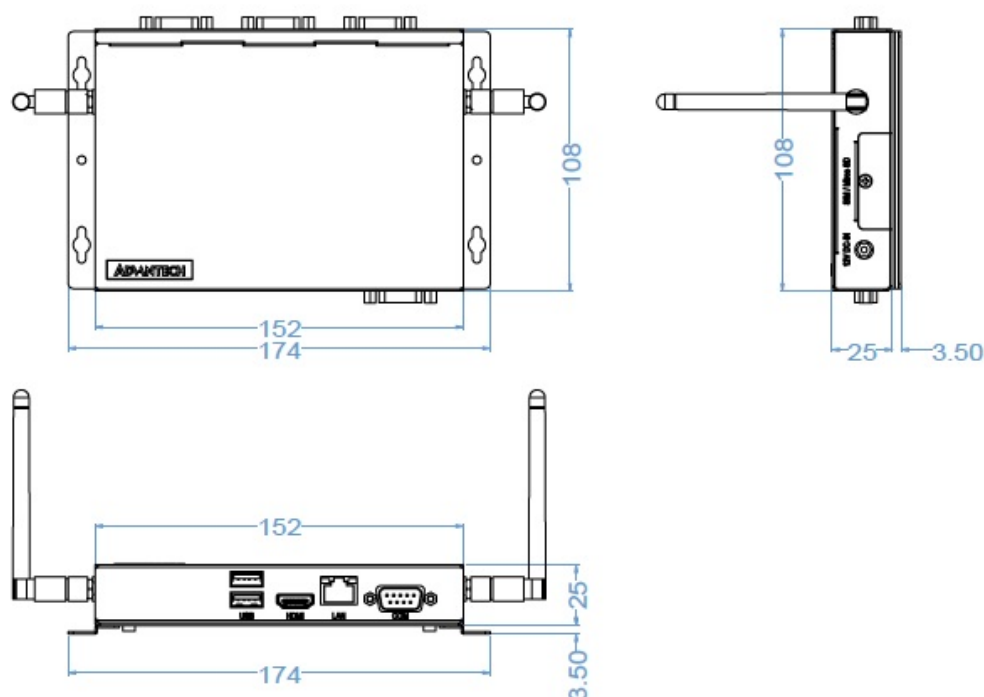
## 1.2 Specifications

### 1.2.1 Functional Specifications

- **Processor:**
  - ARM Cortex™-A9 high performance processor, Dual core 1 GHz
  - Supports 2 IPU, OpenGL ES 2.0 for 3D BitBLT for 2D and OpenVG™ 1.1
  - Video decoder: MPEG-4 ASP, H.264 HP, H.263, MPEG-2 MP, MJPEG BP
  - Video encoder: MPEG-4 SP, H.264 BP, H.263, MJPEG BP
- **System Memory Support:**
  - DDR3 1066 MHz
  - Capacity: on board DDR3 1 GB
- **Gigabit Ethernet:**
  - Chipset: NXP i.MX6 integrated RGMII
  - 1 x 10/100/1000 Mbps
- **Peripheral Interface:**
  - 1 x HDMI, 1920 x 1080
  - 2 x USB Type A
  - 1 x Micro SD slot
  - 1 x 4-wire RS-232/485, 4 x 4-wire RS-232/422/485
  - 1 x mini PCIe Slot
  - 1 x M.2 Slot
  - 1 x Nano SIM Slot
  - 8 x GPIO, 1 x RS-485, 1 x RS-232
  - 1 x GbE, 2 x USB, 2 RS-232
- **OS Support:** EPC-R3430 supports Android and Linux

## 1.2.2 Mechanical Specifications

- **Dimension:** 174 x 108 x 25 mm
- **Reference Weight:** 1.3kg (including whole package)



## 1.2.3 Electrical Specifications

- **Power Supply Type:** DC-in 12V
- **RTC Battery:**
  - Typical voltage: 3V
  - Normal discharge capacity: 210 mAh

## 1.3 Environmental Specifications

- **Operating Temperature:** -20~60°C (-4~140°F)
- **Operating Humidity:** 0% ~ 90% relative humidity, non-condensing
- **Storage Temperature:** -40~85°C (-40~185°F)
- **Storage Humidity:** 60°C @ 95% RH non-condensing



# Chapter 2

## H/W Installation

This chapter gives mechanical and connector information on the EPC-R3430

Sections include:

- Jumper Information
- Connector Information
- Mechanical Drawing
- Quick Start Guide

## 2.1 Introduction

The following sections show the external connectors and pin assignments for applications.

## 2.2 EPC-R3430 I/O Overview



## 2.3 Connectors

### 2.3.1 COM RS-232/422/485

EPC-R3430 supports 1 x RS-232/RS-422/RS-485. Pins are defined below:



#### COM Pin Define

Pin	Description
1	N/C RS-422 TX- RS-485-
2	COM 2_RXD RS-422 TX+ RS-485+
3	COM2_TXD RS-422 RX+
4	N/C RS-422 RX-
5	GND
6	NC
7	COM2_RTS
8	COM2_CTS
9	NC

### 2.3.2 USB

EPC-R3430 supports 2 x USB2.0 type A connectors



#### USB 1/2

Pin	Description
1	USB1 PWR
2	USB1 D-
3	USB1 D+
4	USB1 GND
5	USB2 PWR
6	USB2 D-
7	USB2 D+
8	USB2 GND

### 2.3.3 DC-IN

EPC-R3430 supports 12V DC in by DC-Jack



### 2.3.4 LAN



Pin	Description
R1	100nF Capacitor to GND
R2	MDI0+
R3	MDI0-
R4	MDI1+
R5	MDI1-
R6	MDI2+
R7	MDI2-
R8	MDI3+
R9	MDI3-
R10	GND
L1	LAN1_100_LINK#
L2	LAN1_1000_LINK#
L3	Pull up to +3.3V
L4	LAN1_ACT

### 2.3.5 HDMI



Pin	Description	Pin	Description
1	HDMI _D2+	11	GND
2	GND	12	HDMI _CLK-
3	HDMI _D2-	13	HDMI _CEC
4	HDMI _D1+	14	NC
5	GND	15	HDMI _CTRL_CLK
6	HDMI _D1-	16	HDMI _CTRL_DAT
7	HDMI _D0+	17	GND
8	GND	18	+5V
9	HDMI _D0-	19	HDMI _HPD
10	HDMI _CLK+		



### 2.3.6 Micro SD and Nano SIM Slot



### 2.3.7 Antenna

There are a total of five reserved openings for antenna to support WiFi/3G/4G/GPS modules



## 2.4 Quick Starting EPC-R3430

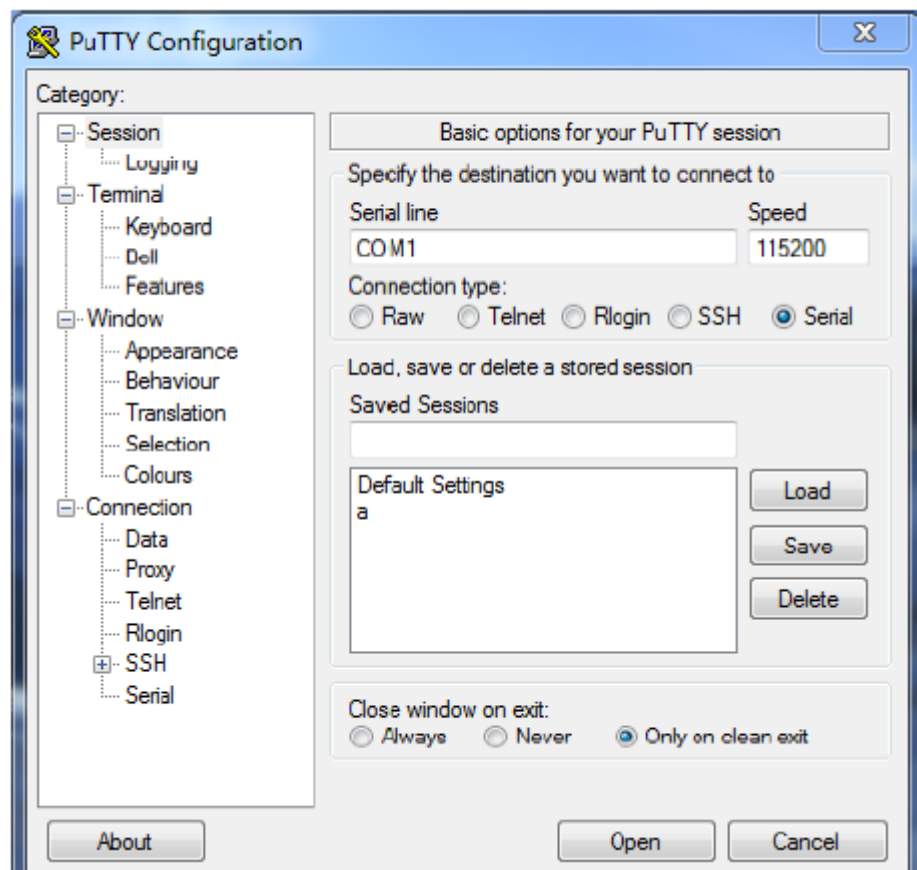
### 2.4.1 Debug Port Connection

1. Connect debug cable to EPC-R3430 debug port
2. Connect the other side of debug cable to USB-to-RS232 cable then connect to your PC

### 2.4.2 Debug Port Settings

EPC-R3430 can communicate with a host server by using serial cables. Common serial communication programs such as HyperTerminal, Tera Term or Putty can be used in this case. The example below describes the serial terminal setup using HyperTerminal on a Windows host:

1. Connect EPC-R3430 with your PC by using a serial cable
2. Open HyperTerminal on your Windows PC and select the settings as shown below
3. After the boot loader is programmed on Micro SD card, insert power adapter connector to DC jack on EPC-R3430 to power up the board. The boot loader prompt is displayed on the terminal screen.



HyperTerminal Settings for Terminal Setup

# Chapter 3

## Software Functionality

This chapter details the software programs on the EPC-R3430 platform

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## 3.1 Test Tools

All test tools must be verified on the RSB-3430. Please prepare the required test fixtures before verifying each specified I/O. If you have any problems with testing, please contact your Advantech contact window for help.

### 3.1.1 USB Test

Insert a USB disk

```
usb 1-1.2: new high-speed USB device number 4 using ci_hdrc
usb-storage 1-1.2:1.0: USB Mass Storage device detected
scsi2 : usb-storage 1-1.2:1.0
scsi 2:0:0:0: Direct-Access    Generic- SD/MMC          1.00 PQ: 0 ANSI: 0 CCS
sd 2:0:0:0: [sda] 3862528 512-byte logical blocks: (1.97 GB/1.84 GiB)
sd 2:0:0:0: [sda] Write Protect is off
sd 2:0:0:0: [sda] No Caching mode page found
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:0:0: [sda] No Caching mode page found
sd 2:0:0:0: [sda] Assuming drive cache: write through
sda: sda1
sd 2:0:0:0: [sda] No Caching mode page found
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:0:0: [sda] Attached SCSI removable disk
```

### 3.1.2 LAN

\*Use Different Domain

LAN - **Front IO -eth0**

```
ifconfig eth0 8.8.8.8
```

LAN - **Rear IO -eth1**

```
ifconfig eth1 8.8.8.8
```

### 3.1.3 3G Test (Telit HE910D)

```
pppd connect 'chat -v -s -t 10 "" "AT" "" "ATDT*99#" "CONNECT" "" user username
password password /dev/ttyACM3 460800 nodetach crtscts debug usepeerdns
defaultroute &
```

### 3.1.4 M.2 Module Test (EWM-W162M201E) - WIFI / BT Function WIFI

```
$ ifconfig wlan0 up
$ wpa_passphrase ${SSID} ${WPA_KEY} > /tmp/wpa.conf
$ wpa_supplicant -BDwext -imlan0 -c/tmp/wpa.conf
$ udhcpc -b -i wlan0
```

**BlueTooth**

```

$ /usr/libexec/bluetooth/bluetoothd -C &
$ hciconfig hci0 up
$ bluetoothctl
$ discoverable on
$ pairable on
$ scan on
[NEW] FC:18:3C:8D:75:F4 Device ID
$ scan off
$ pair FC:18:3C:8D:75:F4
$ connect FC:18:3C:8D:75:F4

```

**3.1.5 LVDS Test**

U-boot command :

```

setenv mmcargs setenv bootargs console=${console},${baudrate} ${smp}
root=${mmccroot} ${bootargs} video=mxcb0:dev=ldb,800x480M@60,if=RGB24

```

**3.1.6 Audio Test**

**Line out :**

```
$ aplay -D plughw:0,0 Advantech.wav
```

**MIC in :**

```
$ arecord -t wav -c 1 -r 44100 -d 10 test.wav
```

**3.1.7 RTC :**

```
$ date MMDDhhmm[[CC]YY][.ss]
```

```
$ hwclock -w
```

```
$ ntpdate tw.pool.ntp.org
```

**3.1.8 RS-232/ RS-422/ RS-485 Port Test (For RSB-3430 COM Port)**

**Uboot command :**

```
setenv console ttymxc2 <--(Change to other RS-232 port) , then do the Front IO - RS
232 test
```

```
saveenv
```

```
reset
```

**<RS-232 Test>**

```
stty -F /dev/ttymxc1 115200
```

```
echo Serial Port Test > /dev/ttymxc1
```

if want to change debug port back, need to set the uboot command again .

```
setenv console ttymxc1
```

```
saveenv
```

```
reset
```

---

### < RS-422 Test>

RS-422 setting

```
echo 134 > /sys/class/gpio/export
echo 135 > /sys/class/gpio/export
echo out > /sys/class/gpio/gpio1/direction
echo out > /sys/class/gpio/gpio2/direction
echo 1 > /sys/class/gpio/gpio1/value
echo 1 > /sys/class/gpio/gpio2/value
```

RS-422 test

```
stty -F /dev/ttymx1 115200
echo Serial Port Test > /dev/ttymx1
```

### < RS-485 Test>

RS-485 setting

```
echo 134 > /sys/class/gpio/export
echo 135 > /sys/class/gpio/export
echo out > /sys/class/gpio/gpio1/direction
echo out > /sys/class/gpio/gpio2/direction
echo 0 > /sys/class/gpio/gpio1/value
echo 1 > /sys/class/gpio/gpio2/value
```

RS-485 test

```
stty -F /dev/ttymx1 115200
echo Serial Port Test > /dev/ttymx1
```

## 3.1.9 RS-485 Port Test (For UIO-4030 COM Port)

Note: RS-232: /dev/ttymx2

GPIO : need to connect loopback.

RS-485: pin1 data- & pin2 data+ (ttyUSB0)

Test command

```
$ stty -F /dev/ttymx2 -echo -onlcr 115200 crtscts
$ cat /dev/ttymx2 &
$ echo "Serial Port Test" > /dev/ttymx2
```

### RS-485 Test with Adam-4520

```
stty -F /dev/ttyUSB0 115200
echo "Serial Test" > /dev/ttyUSB0
```

### 3.1.10 GPIO Port Define

```
GPIO
[EXTENSION I/O B]
pin#5: gpio 121, pin#6: gpio 122
pin#7: gpio 123, pin#8: gpio 124
pin#9: gpio 125, pin#10: gpio 126
pin#11: gpio 127, pin#12: 133
```

if want to test need to connect with GPIO device.

### 3.1.11 RS-232 Port Test (For UIO-4032 COM Port)

```
Note: RS-232: /dev/ttymx2
$ stty -F /dev/ttymx2 -echo -onlcr 115200 crtscts
$ cat /dev/ttymx2 &
$ echo "Serial Port Test" > /dev/ttymx2
```

### 3.1.12 RS-232 Port Test (For UIO-4034 COM Port)

```
$ stty -F /dev/ttymx2 -echo -onlcr 115200 crtscts
$ cat /dev/ttymx2 &
$ echo "Serial Port Test" > /dev/ttymx2
```

### 3.1.13 CAN Bus Port Test (For UIO-4034 CAN Port)

```
$ ip link set can0 up type can bitrate 125000
$ ifconfig can0 up
$ ip link set can1 up type can bitrate 125000
$ ifconfig can1 up

$ candump can0 &
$ cansend can1 1F334455#1122334455667788
```

### 3.1.14 Watch Dog Test

```
$ echo 1 > /dev/watchdog
```

All of the related S/W description, please refer the below link.

[http://ess-wiki.advantech.com.tw/view/IoTGateway/BSP/Linux/iMX6/Yocto\\_L-BV8\\_User\\_Guide](http://ess-wiki.advantech.com.tw/view/IoTGateway/BSP/Linux/iMX6/Yocto_L-BV8_User_Guide)

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## 3.2 System Recovery

This section provides detailed procedures for restoring the eMMC image. If you destroy the onboard flash image by accident, you can recover a system by following these steps:

1. Copy "3430A1LIVxxxx.img.gz" package to your desktop.
2. Open "Terminal" on Ubuntu 12.04 LTS.
3. `$sudo su` (Change to "root" authority)
4. Input your password.
5. `#cd Desktop/`
6. `#gunzip 3430A1LIVxxxx.img.gz` (Unzip files)
7. Insert one SD card to your developing computer
8. `# sudo fdisk -l`
9. `#` Check the SD card location, like `/dev/sdf`
10. `#dd if=3430A1LIVxxxx.img of=/dev/sdf bs=1M conv=fsync`
11. Please wait until dump disk is done
12. Connect console cable to debug port (CONSOLE) and open serial console program on Ubuntu 12.04 LTS, set baudrate to 115200. For detailed console settings, please refer to section 3.6.
13. On RSB-3430 platform, type `#root` (Login)
14. On RSB-3430 platform, type `#cd /mk_inand`
15. On RSB-3430 platform, type `#./mkinand?linux.sh /dev/mmcblk0`
16. On RSB-3430 platform, type "y "  
(Start to copy files, wait until it shows [Done])

Power off and remove this SD card.



# Chapter 4

## Advantech Services

This chapter introduces Advantech design-in serviceability, technical support, and warranty policy for the EPC-R3430 evaluation kit

## 4.1 Contact Information

Below is the contact information for Advantech customer service.

Region/Country	Contact Information
America	1-888-576-9688
Brazil	0800-770-5355
Mexico	01-800-467-2415
Europe (Toll Free)	00800-2426-8080
Singapore & SAP	65-64421000
Malaysia	1800-88-1809
Australia (Toll Free)	1300-308-531
China (Toll Free)	800-810-0345 800-810-8389 Sales@advantech.com.cn
India (Toll Free)	1-800-425-5071
Japan (Toll Free)	0800-500-1055
Korea (Toll Free)	080-363-9494 080-363-9495
Taiwan (Toll Free)	0800-777-111
Russia (Toll Free)	8-800-555-01-50

You can reach our service team through the website below. Our technical support engineers will provide quick responses once the form is filled out: [http://www.advantech.com.tw/contact/default.aspx?page=contact\\_form2&subject=Technical+Support](http://www.advantech.com.tw/contact/default.aspx?page=contact_form2&subject=Technical+Support)

## 4.2 Global Service Policy

### 4.2.1 Warranty Policy

Below is the warranty policy for Advantech products:

#### 4.2.1.1 Warranty Period

Advantech branded off-the-shelf products and third party off-the-shelf products used to assemble Advantech Configure to Order products are entitled to a two year complete and prompt global warranty service. Product defects in design, materials, and workmanship, are covered from the date of shipment.

All customized products will by default carry a 15 month regional warranty service. The actual product warranty terms and conditions may vary based on sales contract.

All third party products purchased separately will be covered by the original manufacturer's warranty and time period, and shall not exceed one year of coverage through Advantech.

#### 4.2.1.2 Repairs Under Warranty

It is possible to obtain a replacement (Cross-Shipment) during the first 30 days of the purchase, thru your original ADVANTECH supplier to arrange DOA replacement if the products were purchased directly from ADVANTECH and the product is DOA (Dead-on-Arrival). The DOA Cross-Shipment excludes any shipping damage, customized and/or build-to-order products.

For those products which are not DOA, the return fee to an authorized ADVANTECH repair facility will be at the customers' expense. The shipping fee for reconstructive products from ADVANTECH back to customers' sites will be at ADVANTECH's expense.

#### 4.2.1.3 Exclusions from Warranty

The product is excluded from warranty if

- The product has been found to be defective after expiry of the warranty period.
- Warranty has been voided by removal or alternation of product or part identification labels.
- The product has been misused, abused, or subjected to unauthorized disassembly/modification; placed in an unsuitable physical or operating environment; improperly maintained by the customer; or failure caused which ADVANTECH is not responsible whether by accident or other cause. Such conditions will be determined by ADVANTECH at its sole unfettered discretion.
- The product is damaged beyond repair due to a natural disaster such as a lightning strike, flood, earthquake, etc.
- Product updates/upgrades and tests upon the request of customers who are without warranty.

### 4.2.2 Repair Process

#### 4.2.2.1 Obtaining an RMA Number

All returns from customers must be authorized with an ADVANTECH RMA (Return Merchandise Authorization) number. Any returns of defective units or parts without valid RMA numbers will not be accepted; they will be returned to the customer at the customer's cost without prior notice.

An RMA number is only an authorization for returning a product; it is not an approval for repair or replacement. When requesting an RMA number, please access ADVANTECH's RMA web site: <http://erma.ADVANTECH.com.tw> with an authorized user ID and password.

You must fill out basic product and customer information and describe the problems encountered in detail in "Problem Description". Vague entries such as "does not work" and "failure" are not acceptable.

If you are uncertain about the cause of the problem, please contact ADVANTECH's Application Engineers (AE). They may be able to find a solution that does not require sending the product for repair.

The serial number of the whole set is required if only a key defective part is returned for repair. Otherwise, the case will be regarded as out-of-warranty.

#### 4.2.2.2 Returning the Product for Repair

It's possible customers can save time and meet end-user requirements by returning defective products to any authorized ADVANTECH repair facility without an extra cross-region charge. It is required that you contact the local repair center before offering global repair service.

It is recommended to send cards without accessories (manuals, cables, etc.). Remove any unnecessary components from the card, such as CPU, DRAM, and CF Card. If you send all these parts back (because you believe they may be part of the problem), please note clearly that they are included. Otherwise, ADVANTECH is not responsible for any items not listed. Make sure the " Problem Description " is enclosed.

European Customers that are located outside European Community are requested to use UPS as the forwarding company. We strongly recommend adding a packing list to all shipments. Please prepare a shipment invoice according to the following guidelines to decrease goods clearance time:

1. Give a low value to the product on the invoice, or additional charges will be levied by customs that will be borne by the sender.

2. Add information "Invoice for customs purposes only with no commercial value" on the shipment invoice.
3. Show RMA numbers, product serial numbers and warranty status on the shipment invoice.
4. Add information about Country of origin of goods

In addition, please attach an invoice with RMA number to the carton, then write the RMA number on the outside of the carton and attach the packing slip to save handling time. Please also address the parts directly to the Service Department and mark the package "Attn. RMA Service Department".

All products must be returned in properly packed ESD material or anti-static bags. ADVANTECH reserves the right to return unrepaired items at the customer's cost if inappropriately packed.

Besides that, "Door-to-Door" transportation such as speed post is recommended for delivery, otherwise, the sender should bear additional charges such as clearance fees if Air-Cargo is adopted.

Should DOA cases fail, ADVANTECH will take full responsibility for the product and transportation charges. If the items are not DOA, but fail within warranty, the sender will bear the freight charges. For out-of-warranty cases, customers must cover the cost and take care of both outward and inward transportation.

#### 4.2.2.3 Service Charges

The product is excluded from warranty if:

- The product is repaired after expiry of the warranty period.
- The product is tested or calibrated after expiry of the warranty period, and a No Problem Found (NPF) result is obtained.
- The product, though repaired within the warranty period, has been misused, abused, or subjected to unauthorized disassembly/modification; placed in an unsuitable physical or operating environment; improperly maintained by the customer; or failure caused which ADVANTECH is not responsible whether by accident or other cause. Such conditions will be determined by ADVANTECH at its sole unfettered discretion.
- The product is damaged beyond repair due to a natural disaster such as a lightning strike, flood, earthquake, etc.
- Product updates and tests upon the request of customers who are without warranty.

If a product has been repaired by ADVANTECH, and within three months after such a repair the product requires another repair for the same problem, ADVANTECH will do this repair free of charge. However, such free repairs do not apply to products which have been misused, abused, or subjected to unauthorized disassembly/modification; placed in an unsuitable physical or operating environment; improperly maintained by the customer; or failure caused which ADVANTECH is not responsible whether by accident or other cause.

Please contact your nearest regional service center for detail service quotation.

Before we start out-of-warranty repairs, we will send you a pro forma invoice (P/I) with the repair charges. When you remit the funds, please reference the P/I number listed under "Our Ref". ADVANTECH reserves the right to deny repair services to customers that do not return the DOA unit or sign the P/I. Meanwhile, ADVANTECH will scrap defective products without prior notice if customers do not return the signed P/I within 3 months.

#### 4.2.2.4 Repair Report

ADVANTECH returns each product with a "Repair Report" which shows the result of the repair. A "Repair Analysis Report" is also provided to customers upon request. If the defect is not caused by ADVANTECH design or manufacturing, customers will be charged US\$60 or US\$120 for in-warranty or out-of-warranty repair analysis reports respectively.

#### 4.2.2.5 Custody of Products Submitted for Repair

ADVANTECH will retain custody of a product submitted for repair for one month while it is waiting for return of a signed P/I or payment (A/R). If the customer fails to respond within such period, ADVANTECH will close the case automatically. ADVANTECH will take reasonable measures to stay in proper contact with the customer during this one month period.

#### 4.2.2.6 Shipping Back to Customer

The forwarding company for RMA returns from ADVANTECH to customers is selected by ADVANTECH. Per customer requirement, other express services can be adopted, such as UPS, FedEx and etc. The customer must bear the extra costs of such alternative shipment. If you require any special arrangements, please indicate this when shipping the product to us.



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