



BE230E1

User Manual

Rev. V1.0



Revision History



Version	Note	Date
1.0	Initial Version	2017/3/7



Copyright

Copyright © 2017 BOLYMIN, INC. All rights reserved. No part of the materials may be reproduced, copied or translated into any form by any means without prior written consent from BOLYMIN, INC.

Kingston is registered trademark owned by Kingston Technology Corporation.

SanDisk is registered trademark owned by Western Digital Corporation.

Other companies or product names mentioned herein which are trademarks of their respective companies.

Disclaimer

The contents of this document are subject to change without notice.

Bolymin, Inc. reserves the right to make changes without further notice to any product herein to improve reliability, function or design.

Bolymin, Inc. does not assume any liability arising out of the application or use of any product or circuit described herein, no neither does it convey any license under its patent rights, nor the rights of others. Customers are advised to consult with Bolymin, Inc. or its commercial distributors before ordering.



WARNING: To avoid injury, please read all the following operating instructions and safety information in detail before using BE230E1 unit.

Safety Warning

1. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
2. Disconnect the power cord from the device before making every installation. Be sure both the system and the external devices are turned off. Sudden surge of power could ruin sensitive components. To make sure the device is properly grounded.
3. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -30°C or above 80°C or it may be damaged.
4. Keep the device dry, precipitation, humidity, and all types of liquids or moisture can contain minerals that corrode electronic circuits.
5. Try not to put any food, drink or cigarette around the product and keep the device in clean areas.
6. Unauthorized modifications may damage the device. Please not to drop, knock, or shake the device that the rough handling will be break it.
7. Turn off the device power before cleaning. Clean the device by a cloth only. Do not spray any liquid cleaner directly on the product.



Limited Warranty Statement

This limited warranty shall apply to the BE230E1 product. We warrant that the product is at the time of its original purchase free of defects in materials and workmanship ("Limited Warranty").

This Limited Warranty is subject to the following terms and conditions:

1. This Limited Warranty is given to the original purchaser of the BE230E1 ("Customer") only. It shall neither exclude nor limit:

- a) Any statutory rights of the Customer or
- b) Any of the Customer's rights against the seller/dealer of the BE230E1.

2. This Limited Warranty shall last for twelve (12) months from the date of original purchase for BE230E1 product and twelve (12) months for its accessories ("Warranty Period").

Customer shall present the PROOF OF PURCHASE upon claiming this Limited Warranty.

This Limited Warranty may not be given to any subsequent purchaser.

3. Throughout the Warranty Period or its authorized agent will, at their discretion, without charge and subject to Clause 7 repair or replace a defective BE230E1. Repair or replacement may involve the use of functionally equivalent reconditioned unit. We will return the repaired BE230E1 to the Customer in good working condition. All replaced faulty parts or components will become our property.

4. This Limited Warranty applies only to the hardware components of the BE230E1 as originally supplied and does not apply to any software or other equipment.



5. If we repair or replace the BE230E1, the repaired or replaced BE230E1 shall continue to be warranted for the remaining time of the original Warranty Period or for ninety (90) days from the date of repair or replacement, whichever is longer.
6. Before returning any unit for service, be sure to back up data and remove any confidential, proprietary, or personal information from the BE230E1. We are not responsible for the damage or loss of any programs, data, or removable storage media.
7. This limited warranty shall not apply if the defect was caused through any of the following:
 - a) The BE230E1 serial number, the accessory date code the IMEI number or the warranty seal has been removed, erased, defaced, altered or is illegible; or
 - b) Deterioration of the BE230E1 due to normal wear and tear; or
 - c) use other than in accordance with the user manual, rough handling, exposure to moisture, dampness or extreme thermal or environmental conditions or a rapid change in such conditions, corrosion, oxidation, unauthorized modifications or connections, unauthorized opening or repair, repair by use of unauthorized spare parts, accidents, forces of nature, or other actions beyond the reasonable control (including but not limited to deficiencies in consumable parts) unless the defect was caused directly by defects in materials or workmanship. This Limited Warranty does not cover physical damage for the surface of the BE230E1 including, but not limited to cracks or scratches on the LCD screen; or
 - d) The defects caused by the fact that the battery has been



short-circuited or by the fact that the seals of the battery enclosure or the cells are broken or show evidence of tampering or by the fact that the battery has been used in equipment other than those for which it has been specified; or

e) The defect was caused by a defective function of the cellular network or other system; or

f) The BE230E1's software needs to be upgraded due to changes in cellular network parameters; or

g) The defect was caused by the fact that the BE230E1 was used with or connected to an accessory not approved or provided by us or used in other than its intended use and where it can be shown by us that such defect is not the fault of the BE230E1 itself.

8. In the event of the BE230E1 failure, the Customer should take the following actions:

a) Refer to the user manual in order to identify and possibly correct the problem.

b) If the problem cannot be resolved by reference to the user manual the Customer should then contact the dealer where such BE230E1 was purchased or visit our website, or our sales for further information.

c) Before the Customer contacts our service agent, please ensure the following information is at hand, the model and serial number, IMEI/ESN number of the BE230E1. The Customer's full address and contact information. For example, include a copy of the Customers original invoice of the BE230E1. We will provide the Customer with instructions regarding how and when the defective BE230E1 should be returned. We will pay costs in connection with both the return of the defective



BE230E1 to us and the repaired the BE230E1 back to the Customer if the Defective BE230E1 is within the Warranty Period.

This limited warranty states the entire warranty given by us to the customer. All implied warranties of satisfactory quality or fitness for a particular purpose are limited to the relevant warranty period. In no event shall we be liable for incidental or consequential losses damages of any nature whatsoever, including but not limited to lost profits or commercial loss, to the fullest extent that those losses or damages can be disclaimed by law. In any case we and its supplier's entire liability under any provision of this limited warranty shall be limited to the amount actually paid by the customer for the hardware.

We do not exclude or limit liability for personal injury or death resulting from its own negligence. Some countries do not allow exclusions or limitation of incidental or consequential loss or damage, or limitation of the duration of implied warranties, in those circumstances the preceding limitations or exclusions may not apply to such Customers.

This warranty gives the Customer specific legal rights; the Customer may also have other rights, which may vary from country to country.

This limited warranty does not affect the Customers statutory rights in law specific to the country of purchase, such rights remain protected.

This Limited Warranty will be updated by us from time to time.



Table of Contents

1. Introduction.....	1
1.1 Package Content	1
1.2 Order Information	2
1.3 Accessories Outline	3
1.4 Main Product Outline	4
1.5 System Specification	9
1.6 Mechanical Size	11
1.7 Range of Use.....	12
2. Getting Started.....	13
2.1 Hardware Installation	13
Power On (Micro Fit Cable)	13
Power On (Multi I/O)	14
Reset Button.....	16
Audio	17
USB Interface	19
Wi-Fi External Antenna	21
LAN Port.....	23
SD Card.....	24
The BE230E1 embeds in other device.	25
2.2 Software Operations.....	26
How to connect BE230E1 Device to PC	26
How to enable/disable the Test App Launcher	27
How to setup the custom boot logo	29

	How to upgrade OS	30
	How to setup the LAN network	32
2.3	Introduce of Test program.....	33
	GPIO Test	33
	ADC Test	33
	UART Test	34
	Bluetooth Test.....	35
	WLAN Test.....	36
	LAN Test	36
	LCD Test.....	37
	Backlight Test.....	37
	Touch Panel Test	38
	Speaker Test.....	38
3.	Maintain and Contact.....	39
3.1	How to clean the product.....	39
3.2	Product and safety contact information.....	40

1. Introduction

1.1 Package Content


Please check your package content upon receiving the product parcels.

Make sure your accessories are included as well. Note that all accessories in the parcel are depended on your purchase order. If it doesn't match, please contact your dealer.



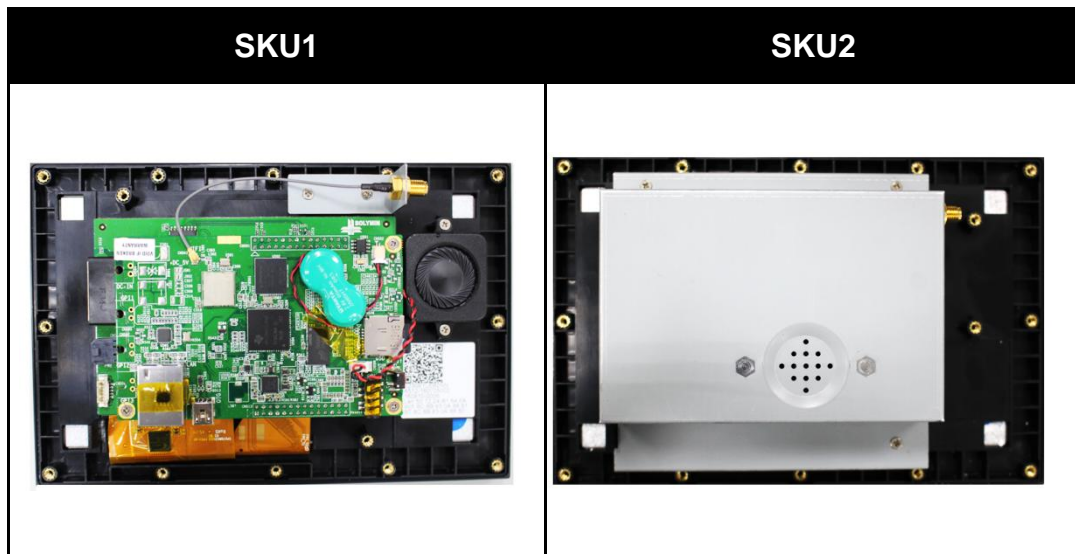
NOTICE: The term as "KIT-XX" is the serial number of all accessories. All kits could be ordered separated (optional), please contact with your dealer for further information.

Main product	S/N:KIT-02	S/N: KIT-03
		
BE230E1*1	Multi I/O	BT / Wi-Fi Antenna

S/N: KIT-04

Micro Fit Cable








1.2 Order Information

There are 2 SKUs available for your options that you can see the illustration as below.



SKU No	Product S/N	Description
SKU 1	BE230E1LEB1NN	Plastic open frame
SKU 2	BE230E1LEB2NN	Plastic open frame and Metal back cover

1.3 Accessories Outline

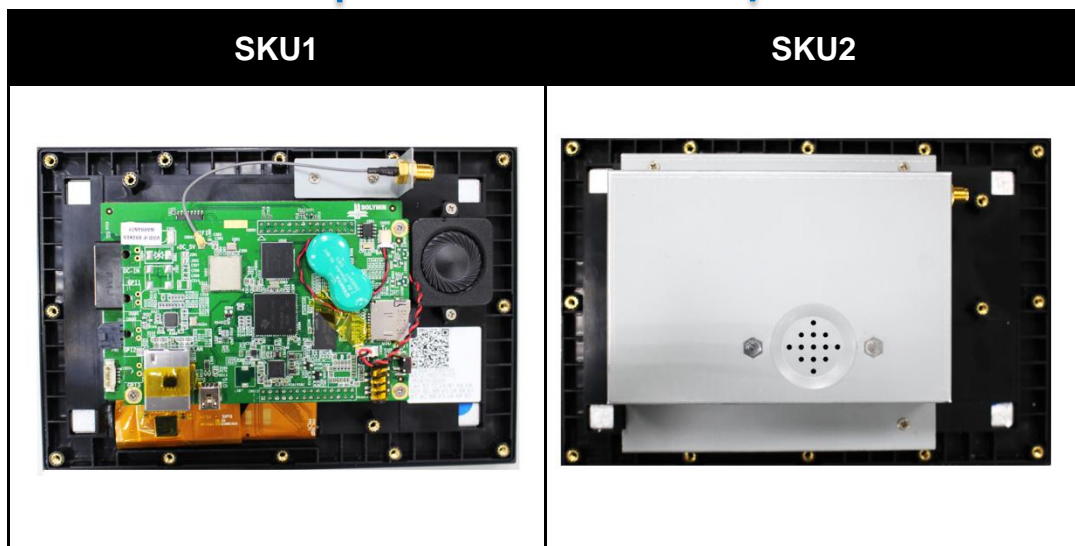
KIT NO.	Sales Order P/N	Photo	Remark
KIT-01	OPBE230E1DBA04		At first time that suggest to buy it.
			
			
			
KIT-02	OPBE230E1NNN01		Standard style by Bolymin
KIT-03	OPBE230E1NNA00		Option
KIT-04	OPBE230E1NNN03		Option

1.4 Main Product Outline

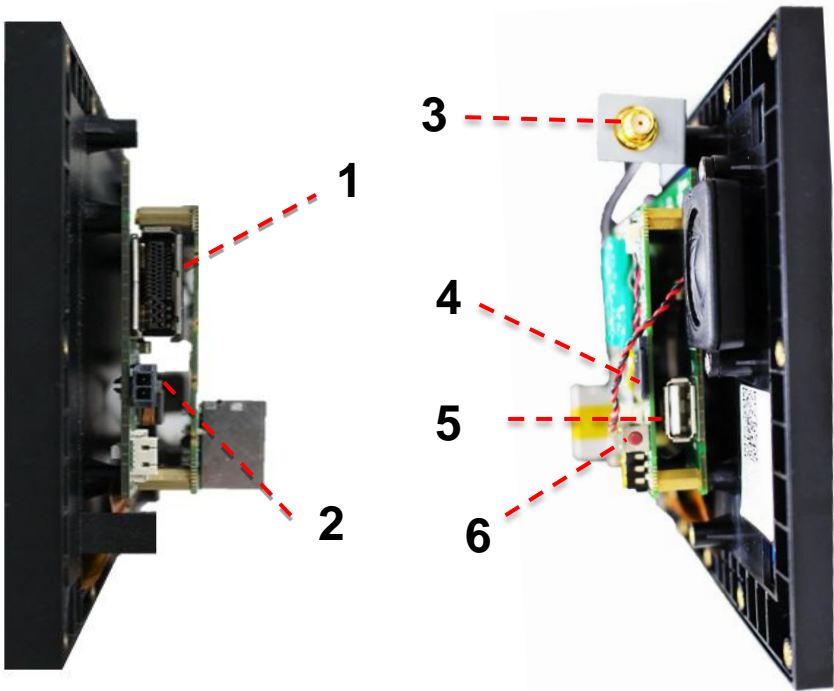
FRONT



BACK

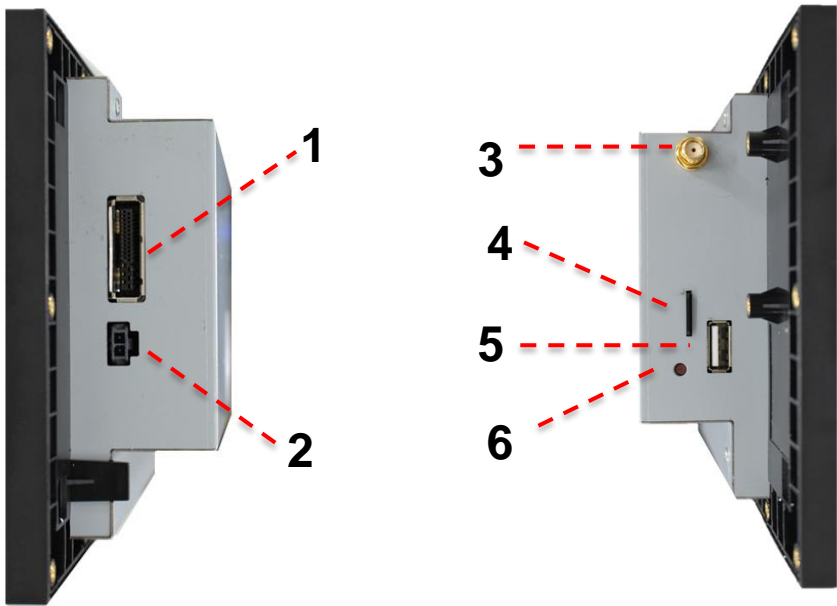


BOTH SIDES OF SKU1



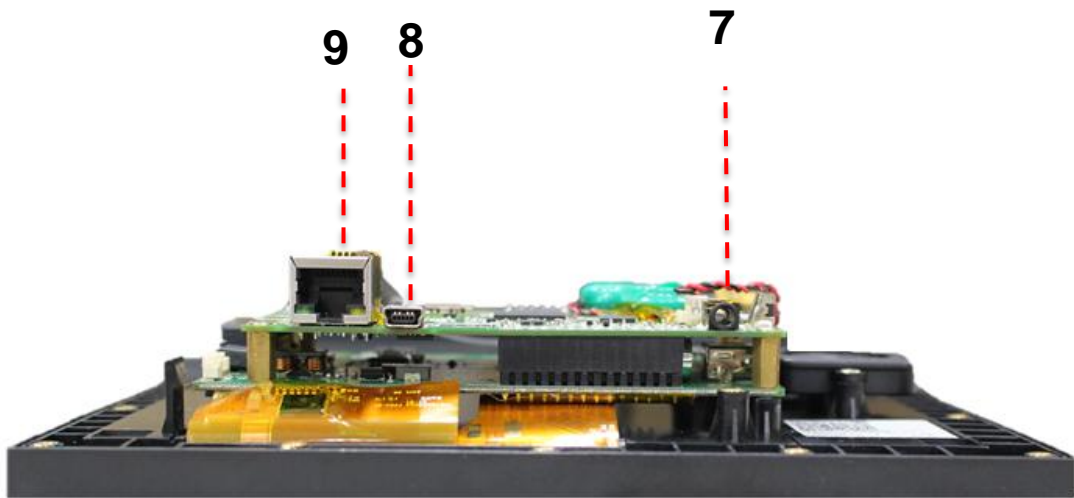
NO	Item	Usage
1	Multi-I/O	To connect power line and signal
2	Power Supply	To connect power line
3	Wi-Fi External Antenna	To strengthen the signal
4	SD Card	For Micro SD card
5	USB 2.0 Host	To support type A
6	Reset Button	A hardware button to reset the device when system hang-up or unexpected situation occurs.

BOTH SIDES OF SKU2



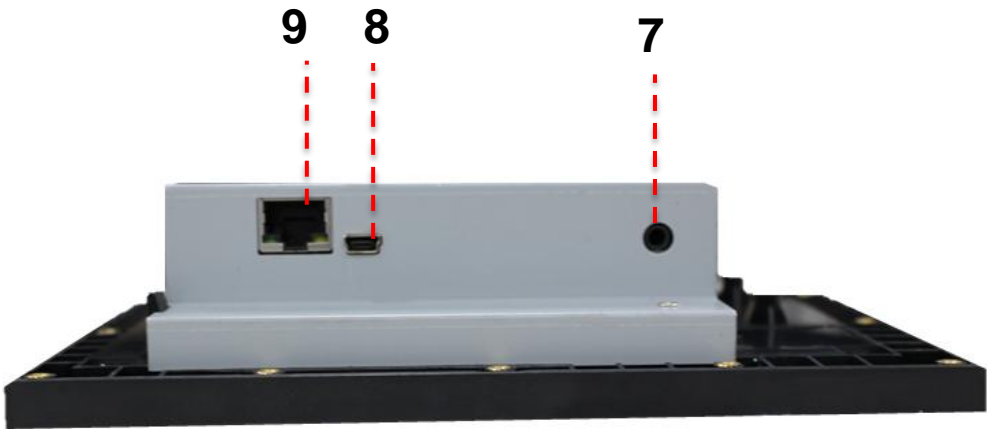
NO	Item	Usage
1	Multi-I/O	To connect power line and signal
2	Power Supply	To connect power line
3	Wi-Fi External Antenna	To strengthen the signal
4	SD Card	For Micro SD card
5	USB 2.0 Host	To support type A
6	Reset Button	A hardware button to reset the device when system hang-up or unexpected situation occurs.

BOTTOM OF SKU1



NO	Item	Usage
7	Line out	Audio signal output
8	USB 2.0 OTG	Mini-B Receptacle
9	LAN	To connect local area network

BOTTOM OF SKU2



NO	Item	Usage
7	Line out	Audio signal output
8	USB 2.0 OTG	Mini-B Receptacle
9	LAN	To connect local area network

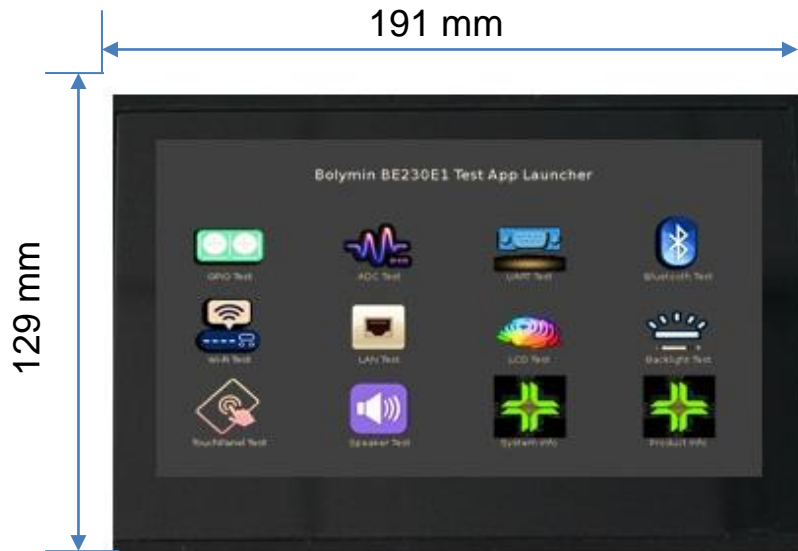
1.5 System Specification

Category	Description
Processor	TI AM3354 600MHz, 32bit RISC ARM Cortex-A8
System Memory	DDR3L512MB
Storage Memory	eMMC 5.1, 4GB
Operating System	Distribution Debian 7 (wheezy) with Linux Kernel 3.14
SD	1x Micro SD/SDHC Card Slot, up to 32GB
Display	TFT-LCD --7" 800x480
	Capacitive Touch Panel with WVGA(800*480)
Audio	1x Mono1.3W internal speaker
	1x Stereo Line out
USB	1x USB 2.0 Host (Type A)
	1x USB 2.0 OTG (Mini-B Receptacle)
UART	1x RS485 or RS422 (Cable select)
	1x 3-wired RS232
LAN	10/100 Ethernet (RJ45)
ADC	4x 12bit 3.3V-ADC
GPIO	8x 5V-GPIO
Wi-Fi	Wi-Fi 802.11 b/g/n
Bluetooth	Support Bluetooth 4.0
Power Supply	DC 9~36V Power (Micro-Fit 3.0)
Reset Button	1x Reset Button

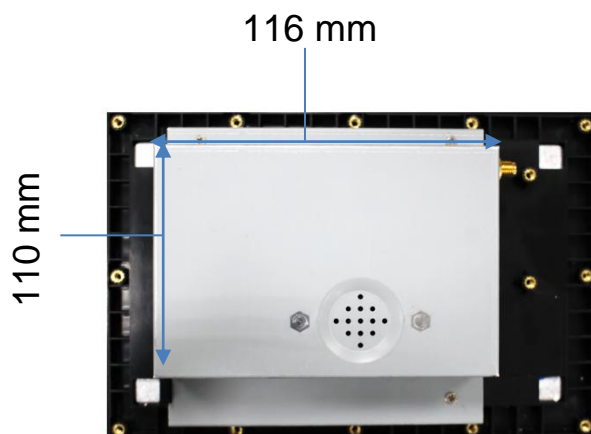
Category	Description
Real Time Clock	Yes
Watchdog	Yes
Operation Temperature	-20 °C to +70 °C
Storage Temperature	-30°C to +80°C
Humidity	90% ±5%RH, +40°C, non-condensing
Weight	SKU1: 415g
	SKU2: 536g
Dimension	191mm (W) x 129mm (H) x 44.7mm (D)

1.6 Mechanical Size

FRONT



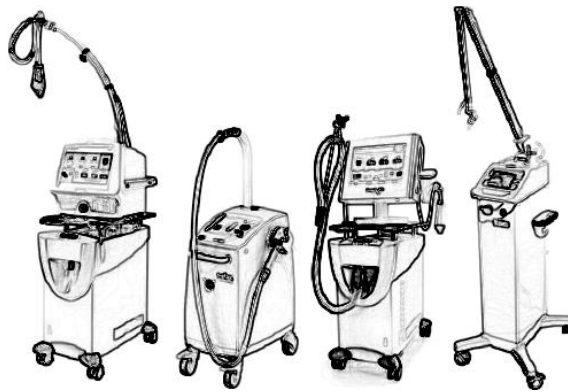
BACK



BESIDES



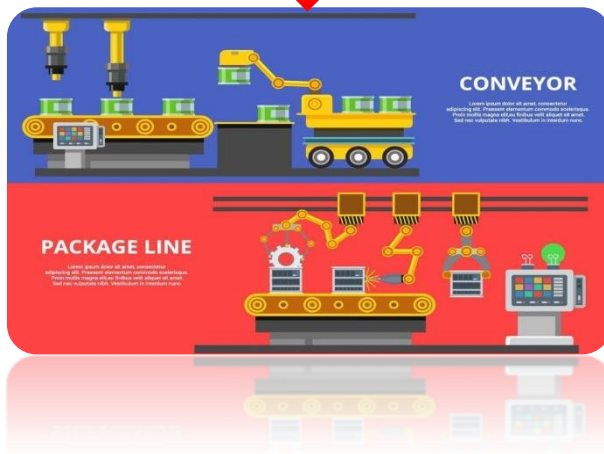
1.7 Range of Use



MEDICAL EQUIPMENT



POS SYSTEM



INDUSTRY EQUIPMENT

2. Getting Started

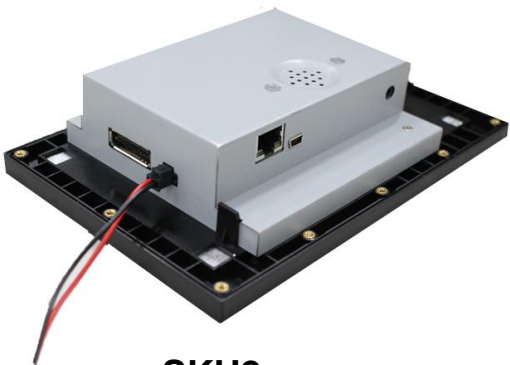
2.1 Hardware Installation

In this chapter, we'll introduce the way to turn on BE230E1, install and use accessories that are available for this device.

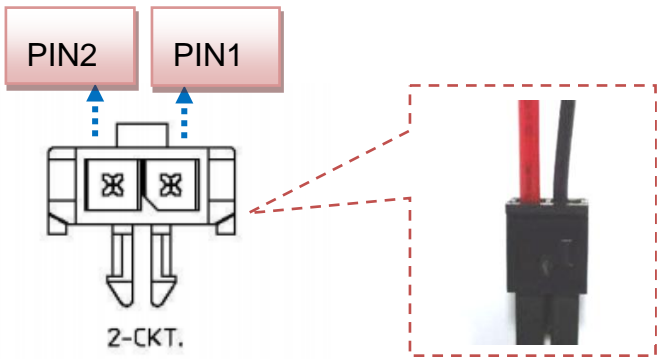
🔌 **Power On (Micro Fit Cable)**



SKU1



SKU2

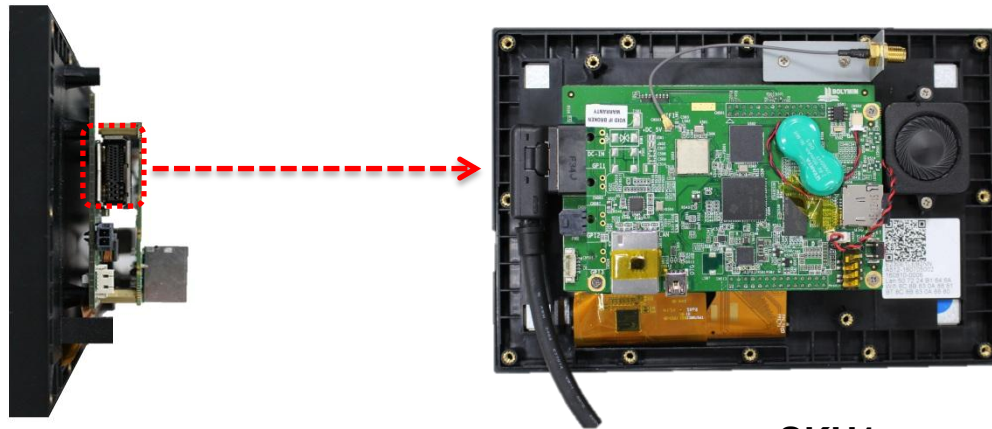


Color	Electrode	Pin No.	Signal	Description
Black	-	PIN1	VSS	+DCIN_GROUND
Red	+	PIN2	VDD	+DCIN

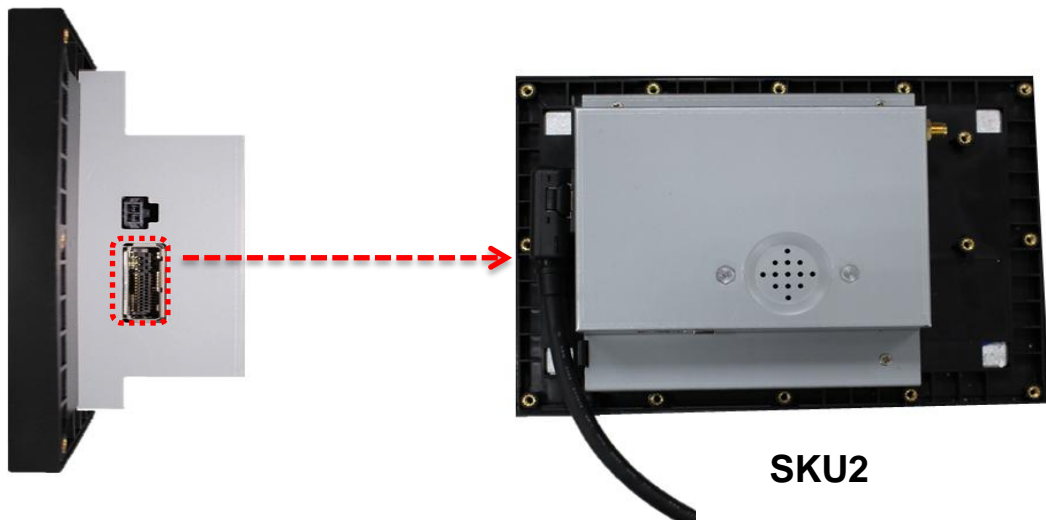


Power Pin Definitions (micro FIT 3.0) and mate with receptacle
43645-0200

✦ Power On (Multi I/O)

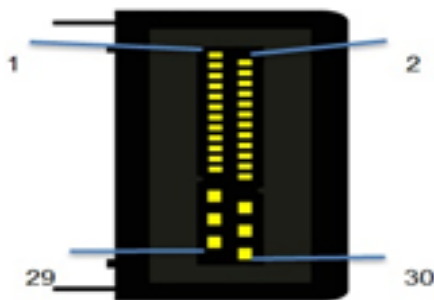


SKU1



SKU2

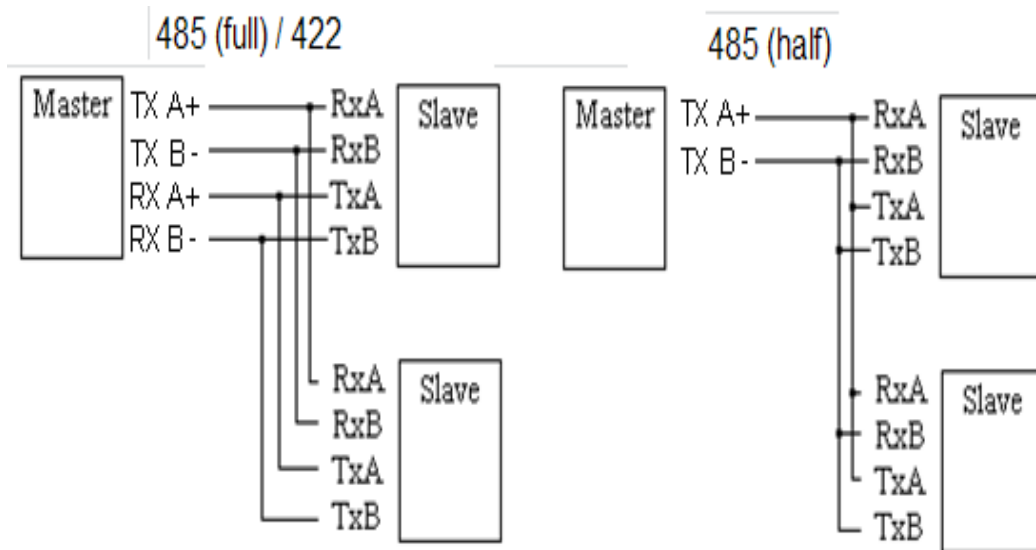
The pin assignment of Multi I/O is illustrated as below:



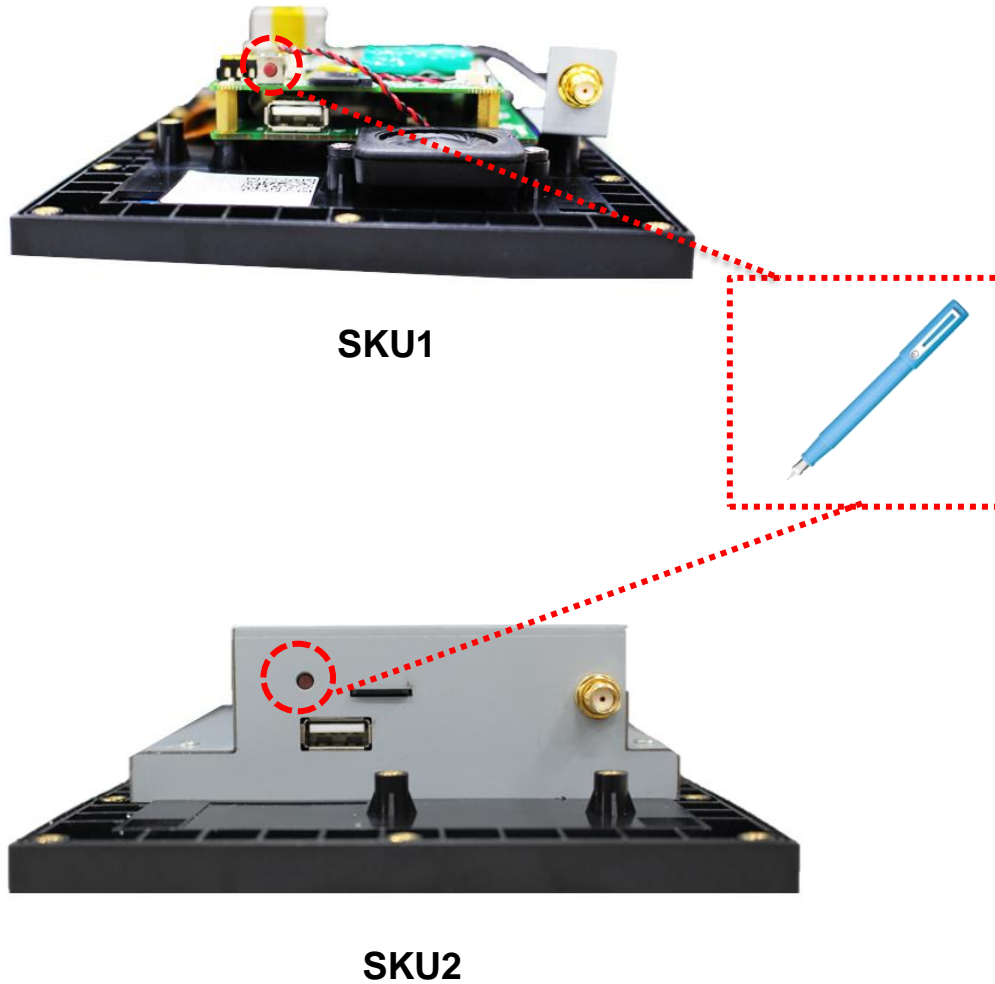
1	GPIO1	2	GPIO2
3	GPIO3	4	GPIO4
5	GROUND	6	NC
7	NC	8	RS232_TXD
9	RS232_RXD	10	GROUND
11	NC	12	NC
13	RS485_TXD+ (Full) RS485_TXD+ (Half) RS422_TXD+	14	RS485_TXD- (Full) RS485_TXD- (Half) RS422_TXD-
15	RS485_RXD+ (Full) RS422_RXD+	16	RS485_RXD- (Full) RS422_RXD-
17	GPIO5	18	GPIO6
19	GPIO7	20	GPIO8
21	ADC_IN1	22	ADC_IN2
23	ADC_IN3	24	ADC_IN4
25	GROUND	26	+DCIN_GROUND
27	+DCIN_GROUND	28	+DCIN
29	+DC_IN	30	CHASSIS GROUND

GPIO	RS485	RS422	RS232	ADC	POWER
------	-------	-------	-------	-----	-------

Wiring of RS485/RS422 illustrations:



Reset Button



The reset button is used to reset the BE230E1 when system hang-up or unexpected situation occurs.

To enable this function, please find a pin-like object or straightened paper clip, press the reset hole gently.

✦ Audio

The Audio are two channels for output of device. One is internal speaker and the other is line out. We can see illustrations as below.

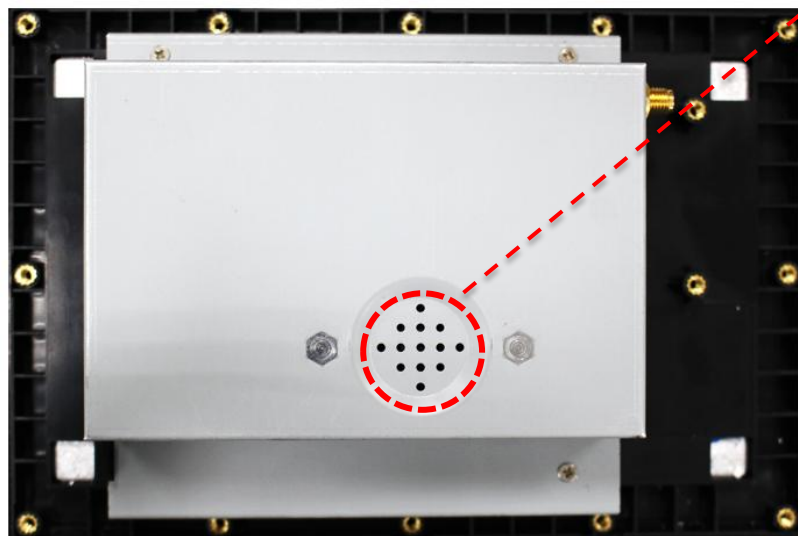
The Internal speaker of “SKU 1” and “SKU 2” is at different position.

The internal speaker:



SKU1

Speaker



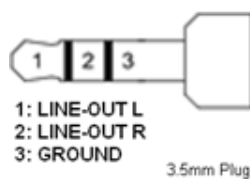
SKU2

Line out:

Position of Line out is the underside of the device and it's used for external speaker.



SKU1



Speaker Connector



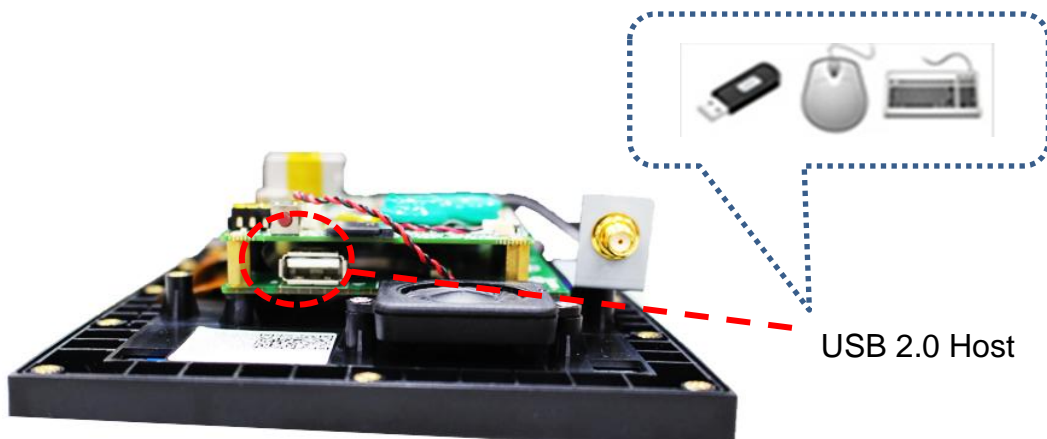
SKU2

✦ USB Interface

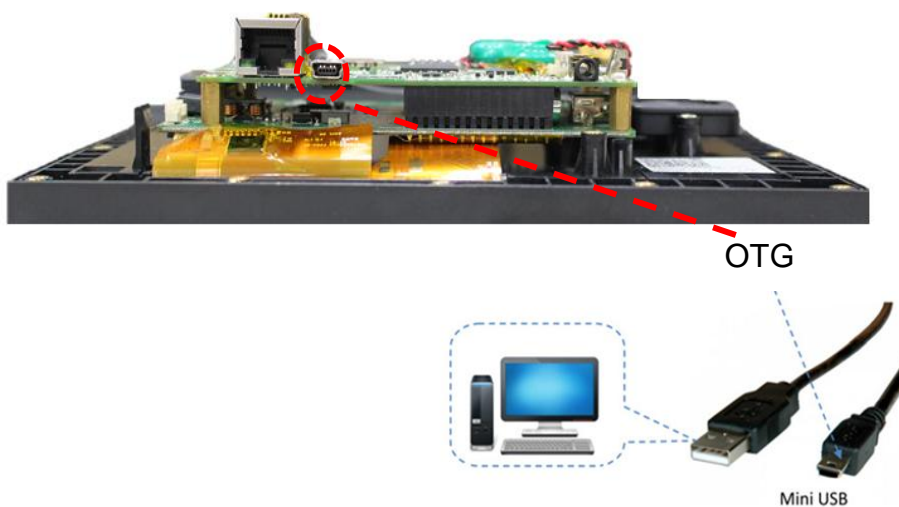
It offers two USB 2.0 interfaces - USB Host port and the OTG port.

The USB Host port by standard type A receptacle, compatible with USB 2.0/1.1 device, it can be used to connect mouse, keyboard or USB flash disk. The OTG port by type mini-B receptacle, it can be used to connect from device to PC and transfer files between each other. The OTG also can be used to connect mouse, keyboard or USB flash disk.

LEFT SIDE

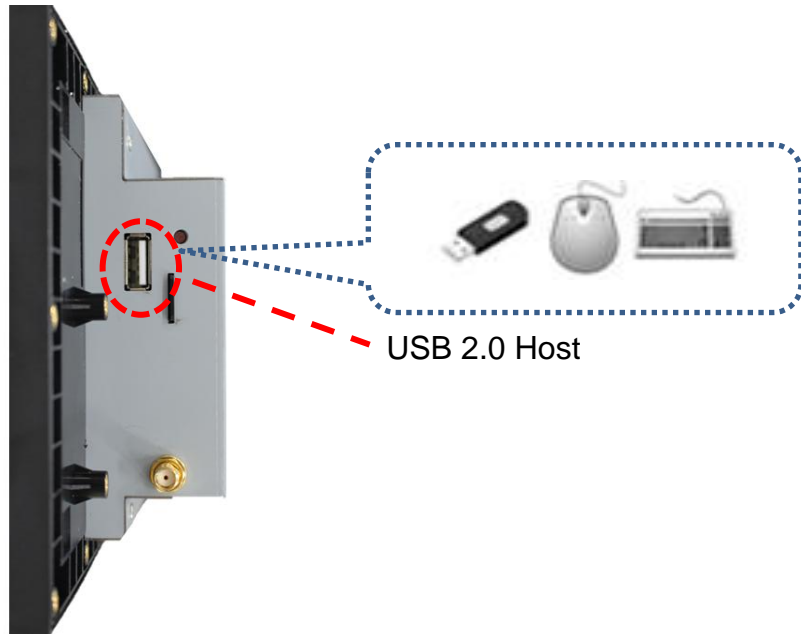


BOTTOM

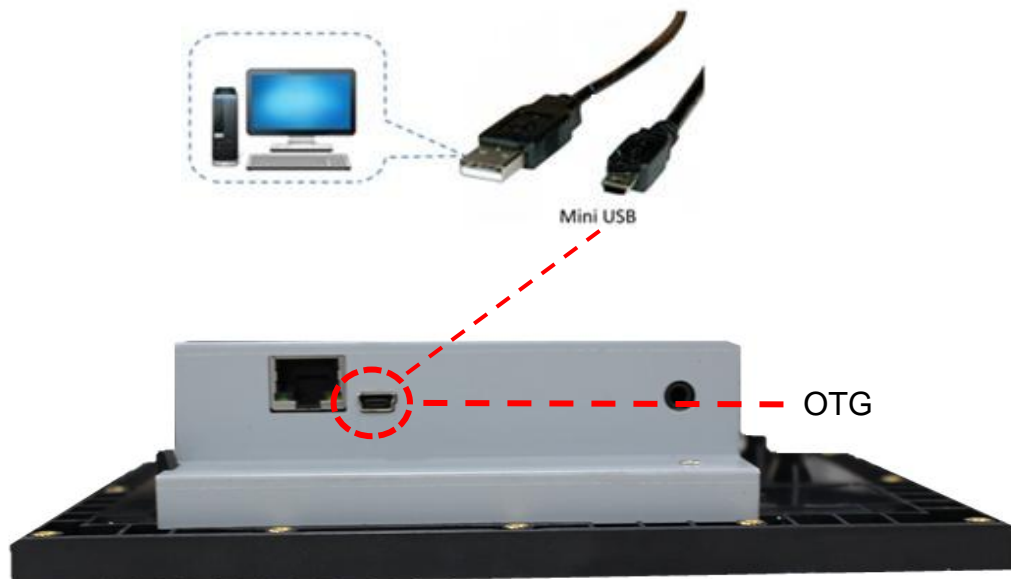


SKU1

LEFT SIDE



BOTTOM



SKU2

✦ Wi-Fi External Antenna

Install Wi-Fi External Antenna as follows:



SKU1

To connect the Wi-Fi External Antenna to the device, plug in the antenna jack to the connector on the device, and then spin the antenna clockwise gently until it is tight.



SKU1

To remove Wi-Fi External Antenna, you can spin it counterclockwise until it is loose.

Install Wi-Fi External Antenna as follows:



SKU2

To connect the Wi-Fi External Antenna to the device, plug in the antenna jack to the connector on the device, and then spin the antenna clockwise gently until it is tight.

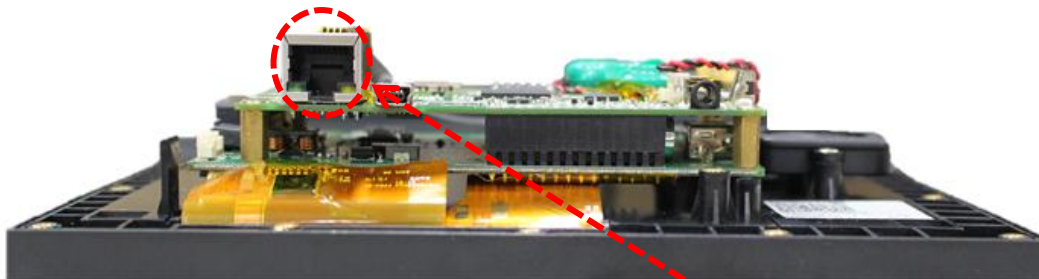


SKU2

To remove Wi-Fi External Antenna, you can spin it counterclockwise until it is loose.

✦ LAN Port

It will be connected to local area network from Ethernet cable plugging in RJ45.

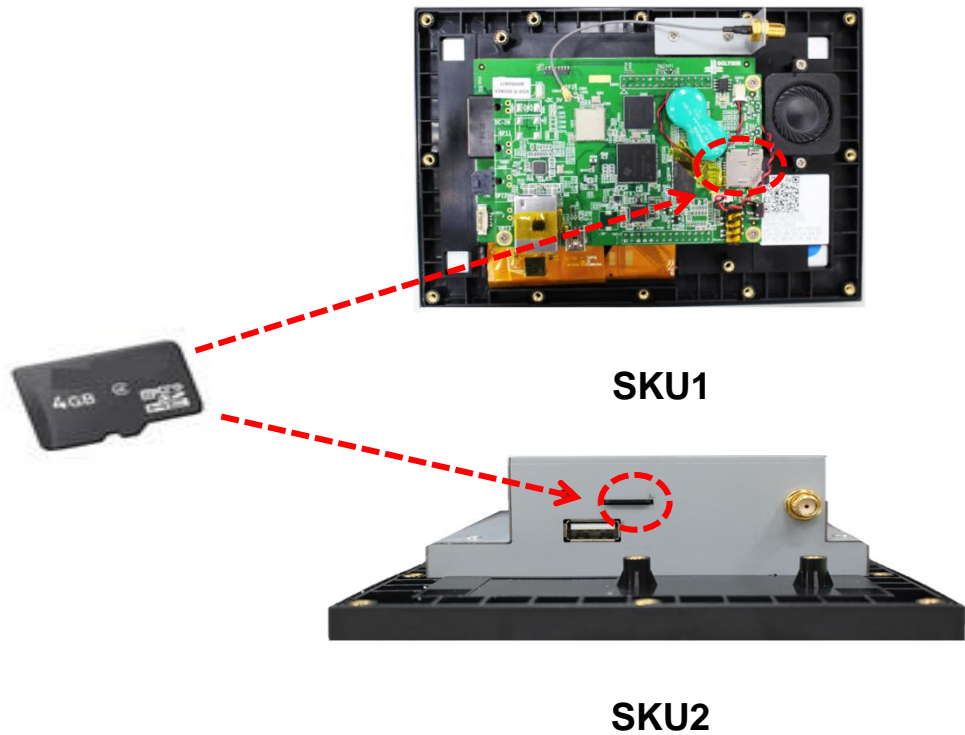


SKU1



SKU2

✦ SD Card



When you need to remove the SD card, first make sure the SD card is not in the process of reading/writing, then press a firm push on the card to pull it out.

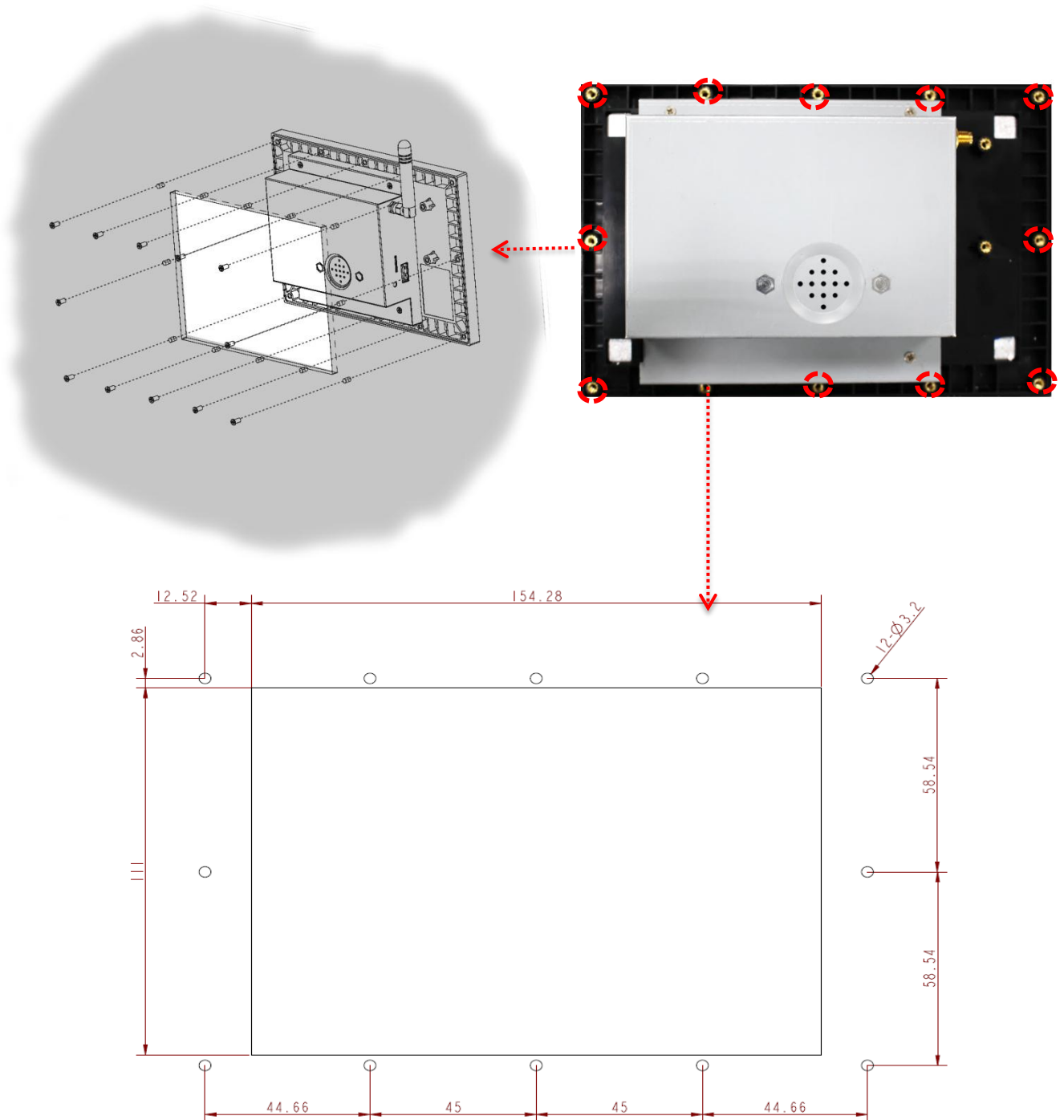
As below table lists the SD card, we recommend it is available for BE230E1.

No	Brand	Storage	Speed Class	UHS Class 1
1	SanDisk	2GB		
2	SanDisk	4GB	Class 4	
3	SanDisk	32GB	Class 4	
4	SanDisk Ultra	32GB		V
5	Transcend	4GB	Class 6	
6	Transcend	16GB	Class 4	
7	Kinston	4GB	Class 4	
8	Kinston	16GB	Class 10	
9	Panasonic	8GB	Class 10	
10	TOSHIBA	16GB	Class 4	

✦ **The BE230E1 embeds in other device.**

There are twelve screw holes on the back side of BE230E1 device and they can be used to embed the BE230E1 in other machines or devices.

User could refer to following pictures that show the installation method and the distance data between each screw hole. Please note that the screw size is M3 P0.5X6L.



Recommended Cut-out

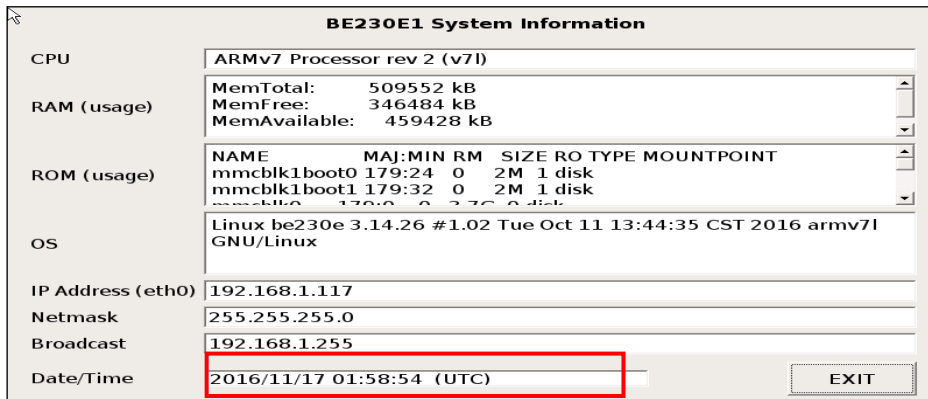
(unit : mm)

2.2 Software Operations

❏ How to connect BE230E1 Device to PC

1. Get IP address of LAN port

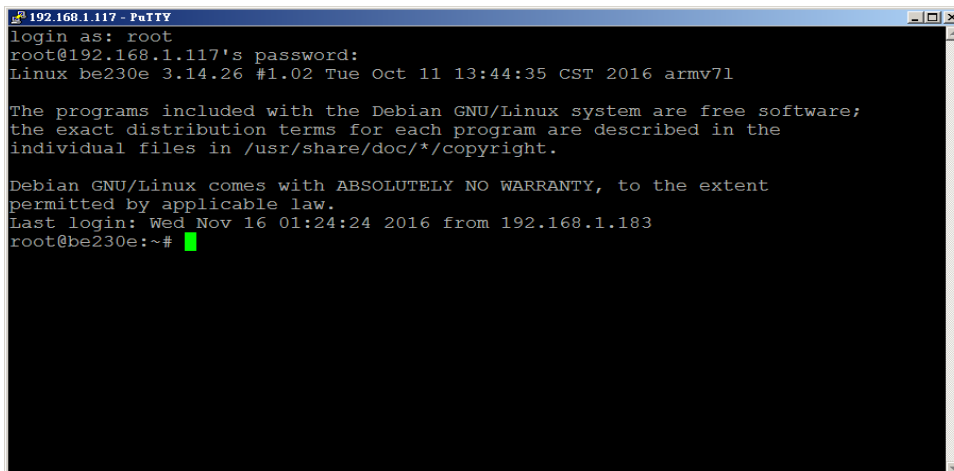
Assume there's a DHCP server in your network environment, plug an Ethernet cable into BE230E1 and then run '**System Info**' test app, you can get current IP address of LAN port.



BE230E1 System Information	
CPU	ARMv7 Processor rev 2 (v7l)
RAM (usage)	MemTotal: 509552 kB MemFree: 346484 kB MemAvailable: 459428 kB
ROM (usage)	NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT mmcblk1boot0 179:24 0 2M 1 disk mmcblk1boot1 179:32 0 2M 1 disk mmcblk0 179:0 0 2.7G 0 disk
OS	Linux be230e 3.14.26 #1.02 Tue Oct 11 13:44:35 CST 2016 armv7l GNU/Linux
IP Address (eth0)	192.168.1.117
Netmask	255.255.255.0
Broadcast	192.168.1.255
Date/Time	2016/11/17 01:58:54 (UTC)
EXIT	

2. Telnet connection (thru LAN or Wi-Fi)

The BE230E1 device has a LAN and WLAN interface so that you can do remote connection to login the device thru network via some telnet client software like [SSH](#).



```

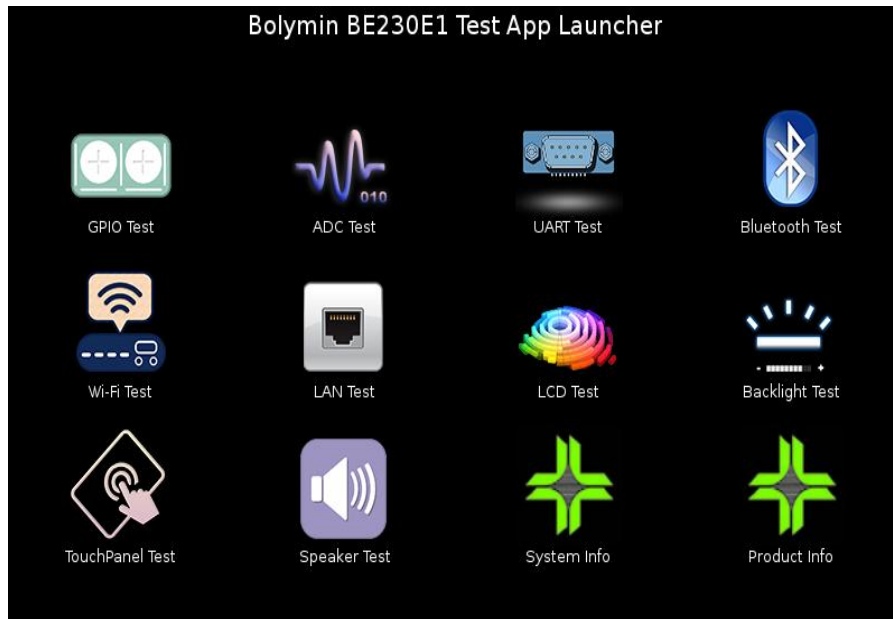
192.168.1.117 - PuTTY
login as: root
root@192.168.1.117's password:
Linux be230e 3.14.26 #1.02 Tue Oct 11 13:44:35 CST 2016 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Wed Nov 16 01:24:24 2016 from 192.168.1.183
root@be230e:~#
  
```

Default login account is "root", password is "root".

✦ How to enable/disable the Test App Launcher



The test app launcher is provided by Bolymin in order to verify the functionality of several hardware modules or I/O interfaces on BE230E1. By default, it will be launched automatically after device reboot.



If user needs to disable/enable the test app launcher, the following methods could be used respectively.

< Disable Permanently>

```
root@be230e:~# update-rc.d matrix-gui-2.0 remove
update-rc.d: using dependency based boot sequencing
insserv: warning: script 'K0luim-sysfs' missing LSB tags and overrides
insserv: warning: script 'K0lrc.pvr' missing LSB tags and overrides
insserv: warning: script 'rc.pvr' missing LSB tags and overrides
insserv: warning: script 'uim-sysfs' missing LSB tags and overrides
root@be230e:~#
```

<Enable Permanently>

```
root@be230e:~# update-rc.d matrix-gui-2.0 defaults
update-rc.d: using dependency based boot sequencing
insserv: warning: script 'K0luim-sysfs' missing LSB tags and overrides
insserv: warning: script 'K0lrc.pvr' missing LSB tags and overrides
insserv: warning: script 'rc.pvr' missing LSB tags and overrides
insserv: warning: script 'uim-sysfs' missing LSB tags and overrides
root@be230e:~#
```

<Disable Temporarily >

```
root@be230e:~# /etc/init.d/matrix-gui-2.0 stop
Initialize BT
/etc/init.d/matrix-gui-2.0: 34: /etc/init.d/matrix-gui-2.0: source: not found
Stopping Matrix GUI application1+0 records in
1+0 records out
4608000 bytes (4.6 MB) copied, 0.043798 s, 105 MB/s
.
root@be230e:~#
```

<Enable Temporarily >

```
root@be230e:~# /etc/init.d/matrix-gui-2.0 start
Initialize BT
/etc/init.d/matrix-gui-2.0: 34: /etc/init.d/matrix-gui-2.0: source: not found
/root
Removing stale PID file /var/run/matrix-gui-2.0.pid.
Starting Matrix GUI application.
root@be230e:~#
```




❏ How to setup the custom boot logo

The default boot logo file is named `bootlogo.bmp` and located at `/boot/` path. To change the boot logo, user could prepare a custom BMP file, rename as `bootlogo.bmp` and replace the old one. Note that the bitmap file must be 24-bit color depth and 800x480 resolutions.

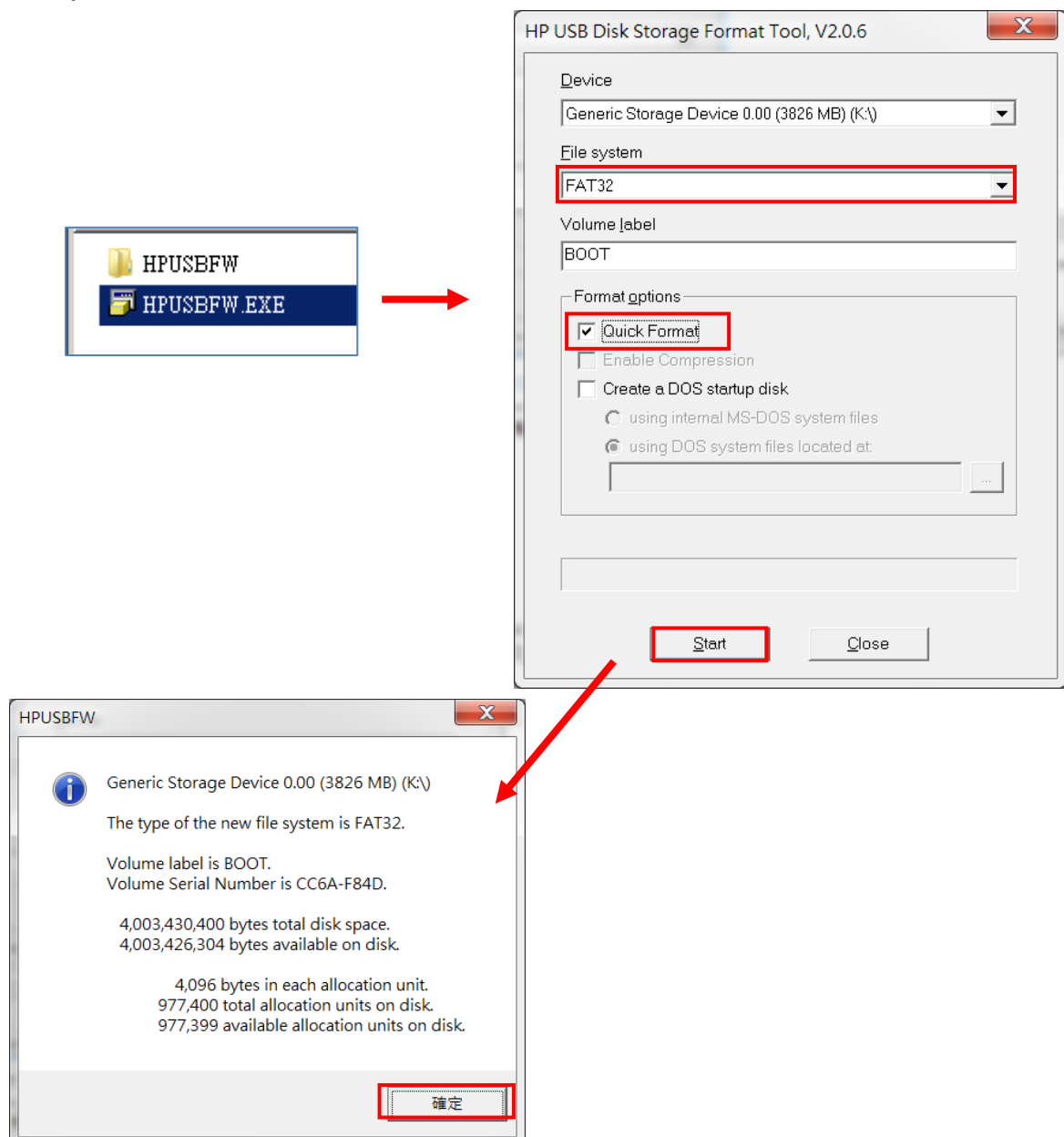
```
root@be230e:~# ls -l /boot/
total 7128
-rw-rw-r-- 1 debian debian 36662 Feb 17 2014 be230e.dtb
-rwxr--r-- 1 root root 1152056 Feb 17 2014 bootlogo.bmp
-rwxr-xr-x 1 root root 2055745 Feb 17 2014 System.map
drwxr-xr-x 2 root root 4096 Feb 17 2014 uboot
-rwxr-xr-x 1 root root 4033416 Feb 17 2014 zImage
```


✦ How to upgrade OS

To upgrade or recovery specific version of OS image to BE230E1 device, please do step-by-step procedure below.

Step 1 Create a bootable micro SD card.

Prepare a SD card and insert into your Windows PC. Download [HP USB Disk Storage Format Tool](#) to your host and run HPUSBFW.EXE via administrator privilege. Select “FAT32” file system, enable “Quick Format” option, and then start to format.

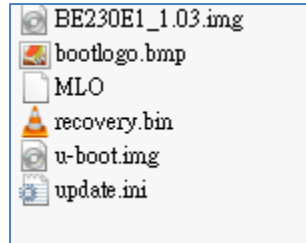




Step 2 Copy OS image files into micro SD card.

Download [BE230E1 OS image files](#) to your host and unzip it as below.

Copy those files into the formatted SD card.



Step 3 Insert micro SD card into BE230E1 device.

Step 4 Reboot BE230E1 and then press reset button.

Step 5 while a dialog is shown as below, press 'Yes' button to start OS recovery operation.



✧ How to setup the LAN network

The default network setting of LAN port on the BE230E1 is DHCP mode. If user needs to change the static mode, one of available ways is by modifying `/etc/network/interfaces` file.

Ask your Network Administrator to replace an appropriate address for the static network setting example below.

LAN Dynamic Setting

```
192.168.1.106 - PuTTY
# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo
iface lo inet loopback

allow-hotplug eth0
iface eth0 inet dhcp

auto wlan0
iface wlan0 inet loopback
    pre-up ip link set dev wlan0 up
    pre-up wpa_supplicant -d -Dnl80211 -c/etc/wpa_supplicant.conf -iwlan0 -B
    post-down ip link set dev wlan0 down

auto usb0
iface usb0 inet loopback
    pre-up /sbin/modprobe g_ether

iface bnep0 inet loopback
```

LAN Static Setting

```
192.168.1.106 - PuTTY
# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo
iface lo inet loopback

allow-hotplug eth0
#iface eth0 inet dhcp
iface eth0 inet static
address 10.0.0.100
netmask 255.255.255.0
network 10.0.0.0
broadcast 10.0.0.255
gateway 10.0.0.1
dns-nameservers 8.8.8.8

auto wlan0
iface wlan0 inet loopback
    pre-up ip link set dev wlan0 up
    pre-up wpa_supplicant -d -Dnl80211 -c/etc/wpa_supplicant.conf -iwlan0 -B
    post-down ip link set dev wlan0 down

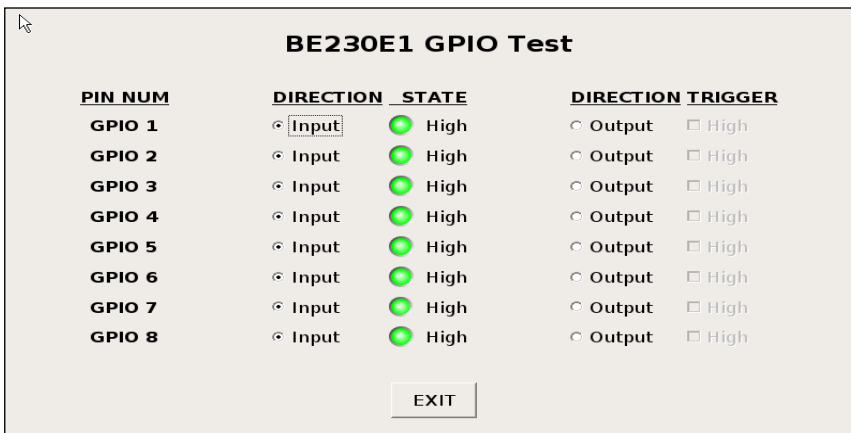
auto usb0
iface usb0 inet loopback
    pre-up /sbin/modprobe g_ether

iface bnep0 inet loopback
```


2.3 Introduce of Test program

✦ GPIO Test

This test app is used to test built-in 8 GPIO pins on BE230E1 device. Users can change both the direction (either input or output) by enabling Input or output radio buttons. As pins are configured to be output direction, enable/disable the checkbox to output High/Low signal respectively.



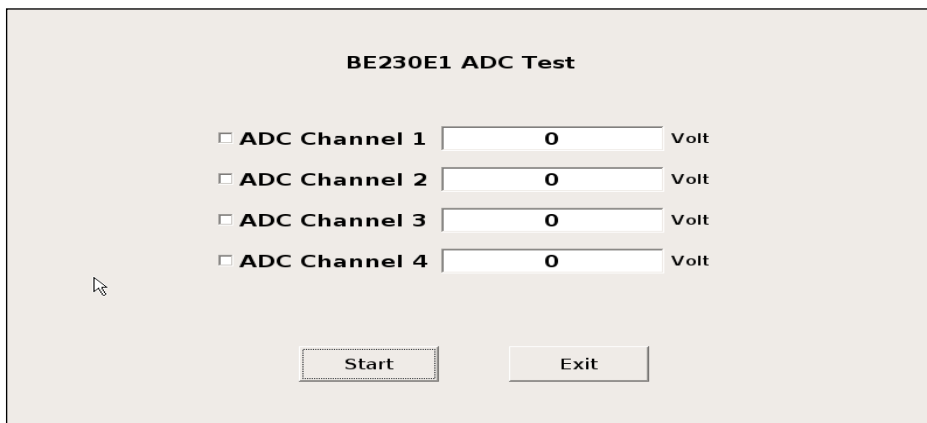
PIN NUM	DIRECTION	STATE	DIRECTION	TRIGGER
GPIO 1	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 2	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 3	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 4	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 5	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 6	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 7	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High
GPIO 8	<input checked="" type="radio"/> Input	● High	<input type="radio"/> Output	<input type="checkbox"/> High

EXIT

✦ ADC Test

This test app is used to test the four ADC channels of BE230E1. The resolution of all ADC channels is **12-bit** and each value range is from 0 to 3.3 volt.

Select the channels and begin to read by clicking the 'Start' button.



BE230E1 ADC Test

☐ ADC Channel 1 Volt

☐ ADC Channel 2 Volt

☐ ADC Channel 3 Volt

☐ ADC Channel 4 Volt

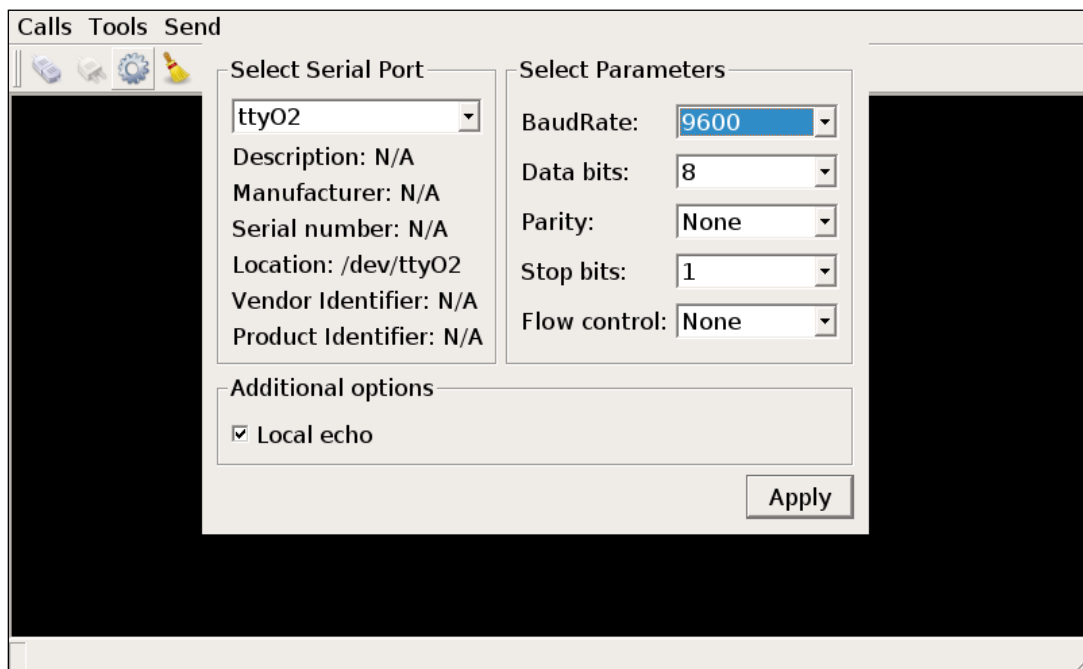
Start Exit

UART Test

This test app is used to test the UART ports of BE230E1.

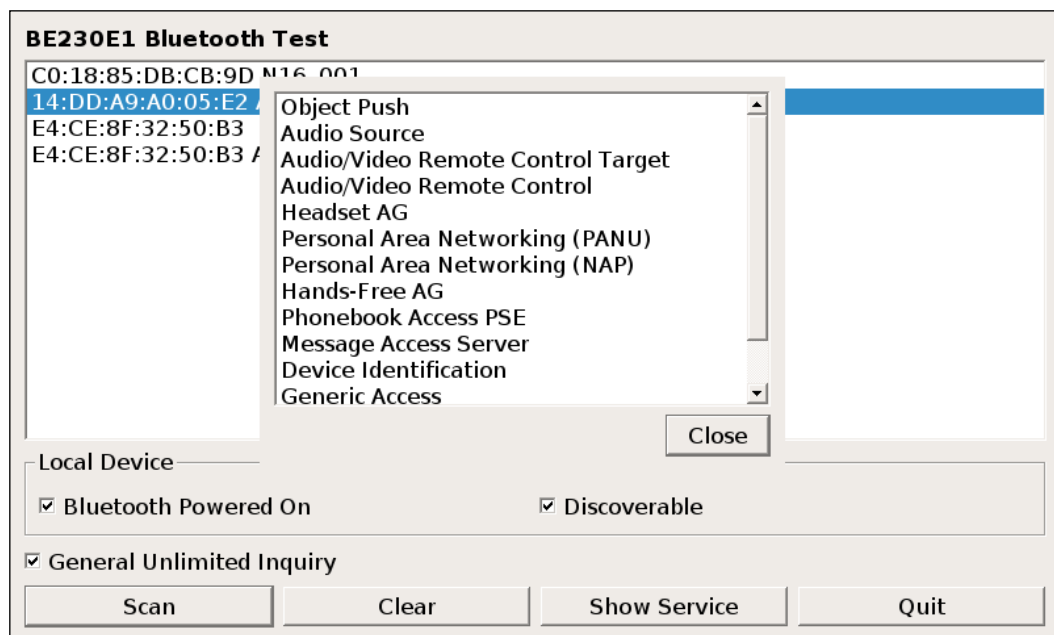
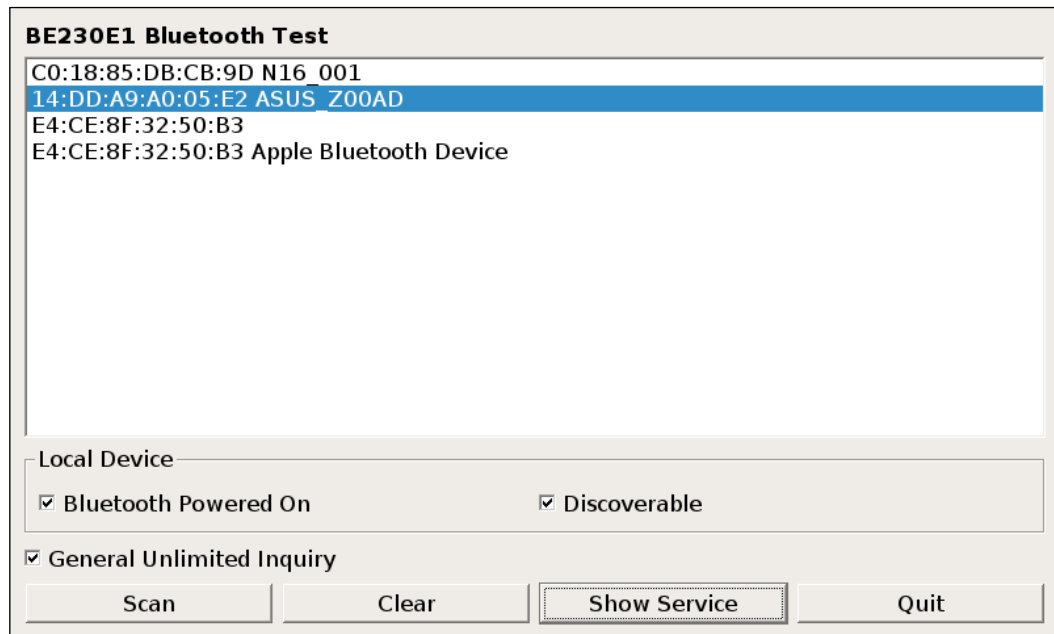
UART ports can be used for RS232 or RS422/ RS485. After selecting the desired port and its parameters (baud rate, data bits, parity, and stop bits) and users can start sending/receiving the data thru this port.

Device Name	Description
/dev/ttyO2	For RS232
/dev/ttyO4	For RS422/RS485 (selected by cable)



Bluetooth Test

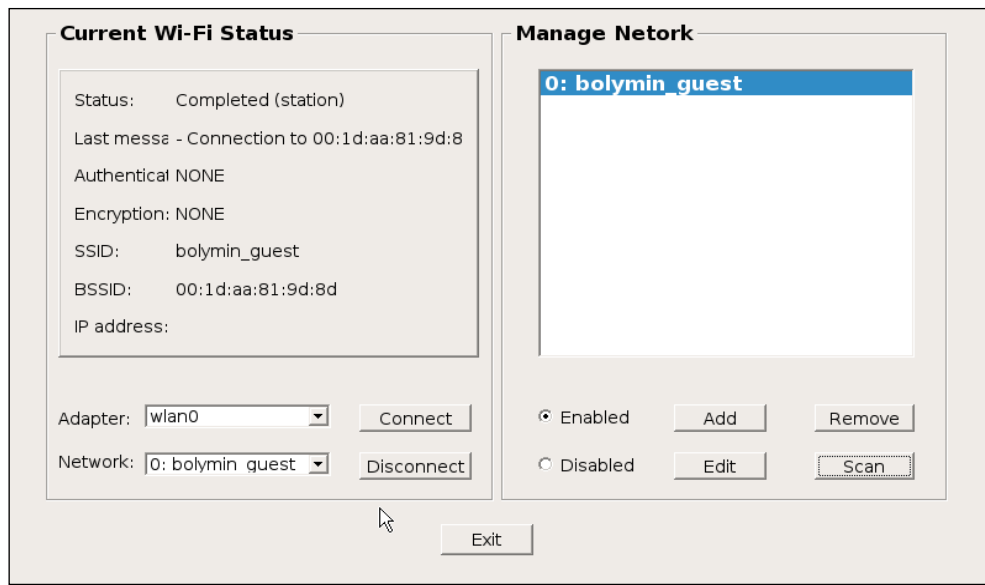
This test app is used to test the Bluetooth of BE230E1. It could be used to scan the available Bluetooth devices nearby and do pairing/un-pairing to assigned remote device.



✧ WLAN Test

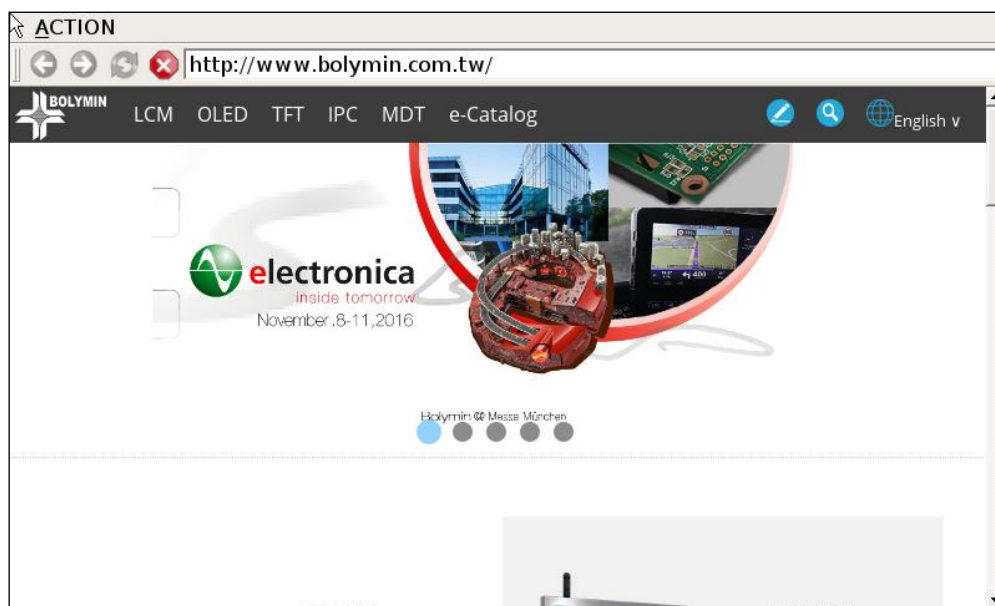
This test app is used to test the WLAN of BE230E1.

This test app is the front-end GUI part (wpa_gui-qt4) from [wpa_supplicant](#) and we've modified it only for simple testing.



✧ LAN Test

This test app is used to test networking accessing thru LAN port.





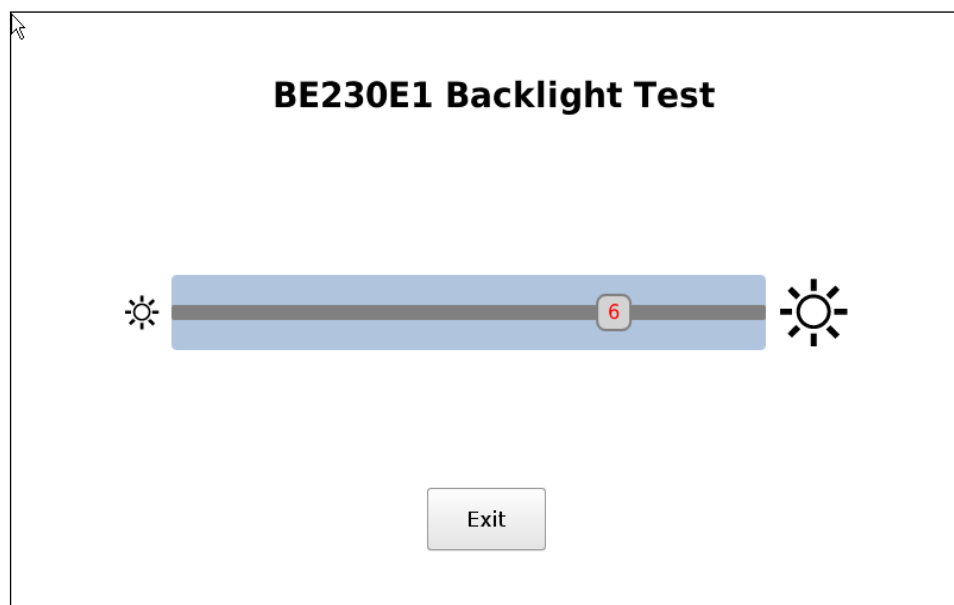
✦ LCD Test

This app is used to test the LCD screen by showing different colors (Red, Green, Blue, Black, and White) sequentially.



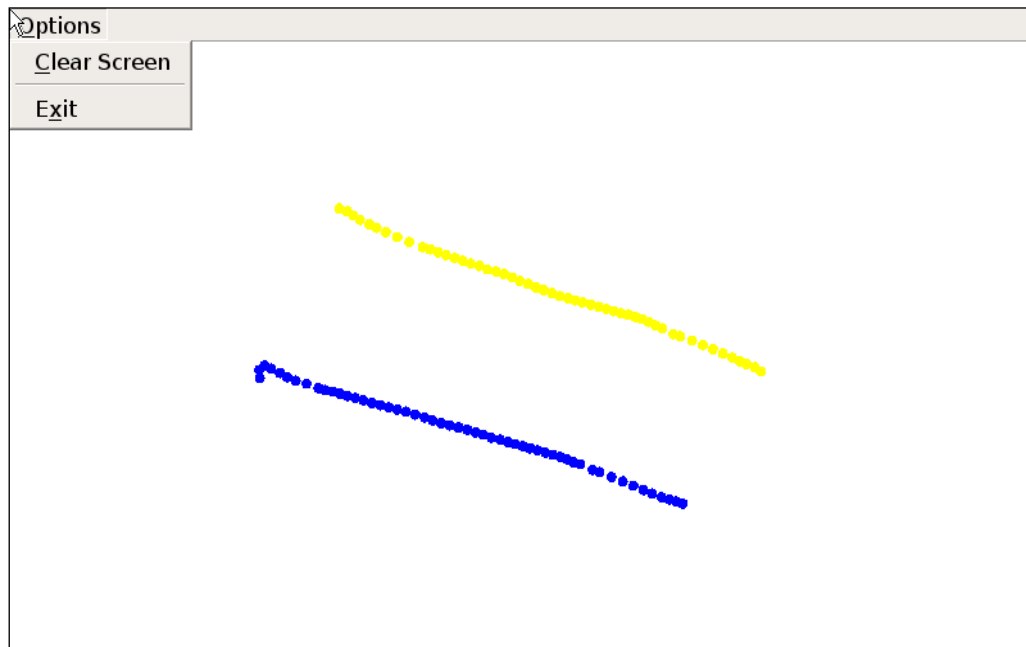
✦ Backlight Test

This app is used to control the screen backlight brightness ranged from 1 to 8.



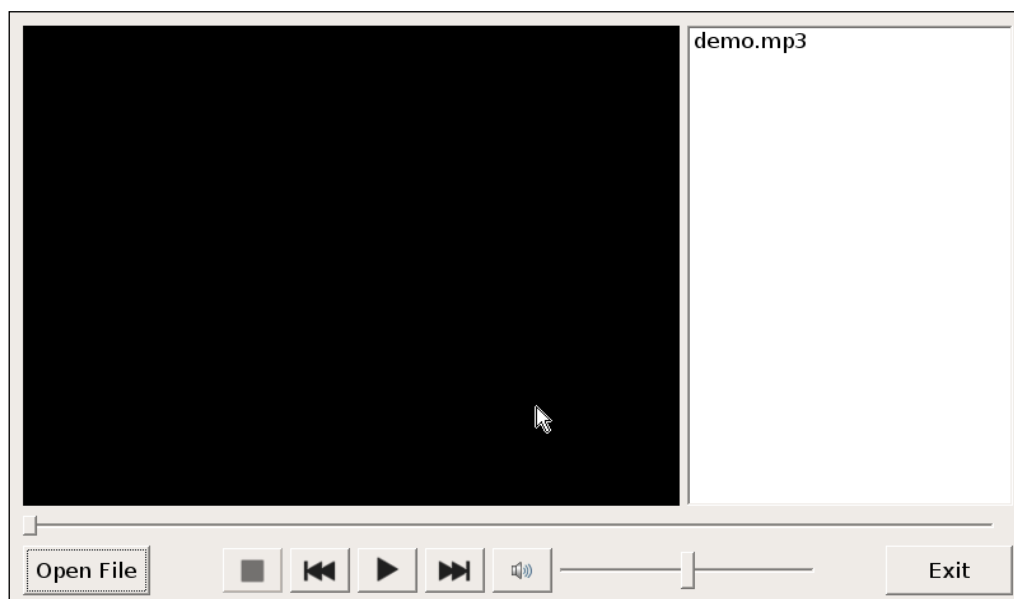
✦ Touch Panel Test

This app is used to test the capacitive touch screen by drawing lines while user's figure is pressing and moving on the screen.



✦ Speaker Test

This app is used to play the audio file (e.g. MP3) to test the built-in speaker or line out to external speaker of BE230E1. Users could select audio file to playback and adjust volume if needed.



3. Maintain and Contact

3.1 How to clean the product

1. We recommended that you should power off the system before you start to clean the product.
2. Please use clothes for cleaning product only and not to spray any liquid cleaner directly on it.
3. The methods of cleaning product, we offer good advices to you.
 - a) Clothes: The soft cloth which is the best methods not to damage directly when you clean the product.
 - b) Vacuum cleaner: To clean dust, hair or particles on the product, it is also good way. But it will have bad effect to damage circuitry in course of the years.
4. When you use solvents or chemicals to clean, please be careful with individual protection. Or some of ingredients will lead to allergic reaction.

3.2 Product and safety contact information

Company	BOLYMIN, INC.
Address	5F, 38 Keya Road, Daya Dist., Central Taiwan Science Park, 42881 Taichung City, Taiwan, R.O.C.
TEL	+886-4-2565-8689
FAX	+886-4-2565-8698
Web Site	http://www.bolymin.com.tw
Email	info@bolymin.com.tw
Service Hour	09:00 – 18:00 (UTC/GMT + 8), Mon. to Fri.



< End of BE230E1 User Manual >

