EM3568 Debian10 User Manual

V1.0





www.boardcon.com



1. Introduction

1.1. About this Manual

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

1.2. Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website (<u>www.boardcon.com</u>, <u>www.armdesigner.com</u>). These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

1.3. Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.



Revision History

Ver	Description	Author	Date
V1.0	Initial version	Zhou Lijun	2022-04-11



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1 EM3568 Introduction



	Specifications
CPU	Rockchip RK3568 Quad-core Cortex-A55 @ up to 2.0 GHz
GPU	ARM Mali-G52 GPU with support for OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1
NPU	0.8 TOPS
Storage	8GB eMMC flash (up to 128GB) MicroSD card slot 2x SATA3.0 (SATA2 shared with PCIe2.0)
Power Supply	12V/3A DC input jack
USB	1x USB OTG 2.0 3x USB Host 2.0 (USB-AF or 4-pin connector) 1x USB 3.0
Connectivity	2x Gigabit Ethernet RJ45 ports via Realtek RTL8211F-CG controller 2.4G WiFi (802.11b/g/n) with Bluetooth 4.0 PCIe socket with Nano SIM card port to support 4G modules (PCIe socket integrated PCIe2.0 for WiFi Card)



	1x Serial port for debug, 3-pin connector
Serial	3x UART, 4-pin connectors
	1x RS485, 3-pin connector
	HDMI 2.0, 4Kp60
Video	MIPI DSI/LVDS, 1080p60 (40-pin header)
Video	EDP 1.3, 2560x1600@60Hz (30-pin header)
	RGB, up to 1920x1080@60Hz (40-pin FPC connector)
	3.5mm audio I/O jack
	8-channel audio via HDMI
Audio	SPDIF out
	Speaker (2-pin connector)
	MIC
Camera(optional)	2x MIPI Cameras, 24-pin FPC connector.
Keve	Recover Reset Power
iteys	
Other features	RTC with battery connector; GPIO&I2C CAN; Key connector(PWM3_IR/Reset /
Other leatures	Recover /Power)
Dimension	Based board - 135mm x 100mm; CPU module - 45mm x 60mm

2 Compiler Environment

2.1 Vmware10.0+ubuntu18.04

Install Vmware10.0 in windows OS, and then install ubuntu18.04 in VMware to compile. Please visit the official website <u>http://www.ubuntu.com/</u> to download and install ubuntu operating system. Note: Debian should be complied by ubuntu 64bit OS.

2.2 Install Tools

PC OS: ubuntu system

Network: online

Permission: root

\$ sudo apt-get install build-essential zlib1g-dev flex libx11-dev gperf libncurses5-dev bison lsb-core lib32z1-dev g++-multilib lib32ncurses5-dev uboot-mkimage g++-4.4-multilib repo git ssh make gcc libssl-dev liblz4-tool expect g++ patchelf chrpath gawk texinfo chrpath diffstat binfmt-support qemu-user-static live-build bison flex fakeroot cmake gcc-multilib g++-multilibdevice-tree-compiler python-pip ncurses-dev pyelftools unzip



3 Compile Source

Step 1, unzip the source and set the compile board

\$ tar xvf sdk-1.1.tar.gz
\$ cd sdk-1.1

Step 2, compile uboot

\$./build.sh uboot

Step 3, compile kernel

\$ /build.sh kernel

Debian10 kernel.img and resource.img are included in boot.img

Step 4, compile recovery

\$./build.sh recovery

Step 5, compile Debian

\$ sudo apt-get install binfmt-support qemu-user-static live-build

\$ sudo dpkg -i ubuntu-build-service/packages/*

\$ sudo apt-get install -f

\$ RELEASE=buster TARGET=desktop ARCH=arm64 ./mk-base-debian.sh

- \$ VERSION=debug ARCH=arm64 ./mk-rootfs-buster.sh
- \$./mk-image.sh

After compile, you will get the linaro-rootfs.img image in the debian directory.

Step 6, Generated image file

\$./mkfirmware.sh

\$./build.sh updateimg (packaged in the update.img)

\$ cd rockdev

\$ Is

The update.img are generated in current directory.

4 Images Operation

4.1 Pack Image

Step 1, copy all the files in debian directory rockdev to the windows RKDevTool/rockdev/Image

Step 2, enter RKDevTool/rockdev/, double-click to run mkupdate.bat.

Step 3, the update.img will be generated in rockdev directory.



CD ► EM3568 ► debian ► To	ols 🕨 RKDevTool 🕨 rockd	ev 🕨 Image	- 4
工具(T) 帮助(H)			
共享 ▼ 新建文件夹			
名称	修改日期	类型	大小
🕑 boot.img	2022/4/22 12:15	光盘映像文件	22,378 KB
MiniLoaderAll.bin	2022/4/22 12:15	KuaiZipMount.bin	455 KB
💽 misc.img	2022/4/22 12:15	光盘映像文件	48 KB
🙆 oem.img	2022/4/22 12:18	光盘映像文件	17,408 KB
📋 parameter.txt	2022/4/22 12:15	文本文档	1 KB
🛃 recovery.img	2022/4/22 12:15	光盘映像文件	29,125 KB
📑 rootfs.img	2022/4/22 12:18	光盘映像文件	3,668,956
🕑 uboot.img	2022/4/22 12:15	光盘映像文件	4,096 KB
🕑 userdata.img	2022/4/22 12:18	光盘映像文件	5,120 KB

EM3568 + debian + Tools + RKDevTool + rockdev +

▼ 4 搜索 rockdev

i(V) 工具(T) 帮助(H)

包含到库中 ▼ 共享 ▼ 新建文件夹

名称	修改日期	类型	大小
🌗 Image	2022/4/22 14:44	文件夹	Ĩ
AFPTool.exe	2021/8/25 20:23	应用程序	229 KB
🚳 mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
package-file	2021/8/25 20:23	文件	1 KB
🚳 px3se-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
px3se-package-file	2021/8/25 20:23	文件	1 KB
🚳 px30-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
px30-package-file	2021/8/25 20:23	文件	1 KB
recover-script	2021/8/25 20:23	文件	1 KB
🚳 rk312x-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
rk312x-package-file	2021/8/25 20:23	文件	1 KB
🚳 rk356x-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
rk356x-package-file	2021/8/25 20:23	文件	1 KB
🚳 rk1808-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
rk1808-package-file	2021/8/25 20:23	文件	1 KB
🚳 rk3036-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
rk3036-package-file	2021/8/25 20:23	文件	1 KB
🚳 rk3128h-mkupdate.bat	2021/8/25 20:23	Windows 批处理	1 KB
rk3128h-package-file	2021/8/25 20:23	文件	1 KB



📾 Android Firmware Package Tool v1.65
当文件已存在时,无法创建该文件。
E:\CD\EM3568\debian\Tools\RKDevTool\rockdev>Afptool -pack ./ Image\update.img Android Firmware Package Tool v1.65 PACKAGE
Add file: .\package-file done.offset=0x800.size=0x332.userspace=0x1 Add file: .\Image/MiniLoaderAll.bin Odd file: .\Image/MiniLoader011 bin done.offset=0x1000 size=0x219s0 userspace=0x1
e4 Add file: .\Image/parameter.txt Add file: .\Image/parameter.txt
Add file: .\Image/uboot.img Add file: .\Image/uboot.img Add file: .\Image/uboot.img done,offset=0x73800,size=0x400000,userspace=0x801
Add file: .\Image/boot.img Add file: .\Image/boot.img done,offset=0x474000,size=0x15da600,userspace=0x2bb5 Add file: .\Image/rootfs.img Add file: .\Image/rootfs.img
bfdef Add file: .\Image/recovery.img Add file: .\Image/recovery.img
Add file: .\Image/oem.img 0dd file: .\Image/oem.img 0dd file: .\Image/oem.img
Add file: .\Image/userdata.img
adi Add CRC
OK
c: <pre>CD <ensses (1001s="" <cockdev="" <kkbe01001="" <uebian="">kk1magenaker.exe =kk3568 1mage <inii ************************************<="" -os_type:androidos="" <update.img="" image="" l="" oaderall.bin="" td="" update.img=""></inii></ensses></pre>
Generating new image, please wait Writing head info Writing boot file
Writing firmware Generating MD5 data MD5 data generated successfully!
New image generated successfully! E:\CD\EM3568\debian\Tools\RKDevTool\rockdev>rem update.img is new format. Image\
update.img is old format, so delete older format
E: \CD\EM3568\debian\Tools\RKDevTool\rockdev>pause
请按任意键继续

EM3568 🔸 debian 🔸 Tools 🔸 RKDevToo	I ▶ rockdev ▶	- - f 	搜索 rockdev
(V) 工具(T) 帮助(H)			
▼ 共享 ▼ 新建文件夹			
名称	修改日期	类型	大小
rv1126_rv1109-package-file-tb	2021/8/25 20:23	文件	1 KB
rv1126 rv1109-package-file-uvc	2021/8/25 20:23	文件	1 KB
🕑 update.img	2022/4/22 14:53	光盘映像文件	3,748,009



4.2 Unzip Firmware

Unzip Firmware in windows.

Step1, open RKDevTool.exe (Path:RKDevTool_Release\RKDevTool.exe)

RKDevTool v2.91 Download Image Upgrade Firmware Advanced Function	
Boot Firmware ReadFlashID ReadFlashInfo TestDevice ResetDevice Go Maskrom ClearSn DetectSecure ExportImage EraseLBA Start Count:	Download Unpack ReadCapability 1. FLASH 2. FMMC 3. SD 3. SD 4. SDI 5. SPTNOR 6. SPTNATD 7. FAM 7. FAM 9. SATA 10. PCIE
No Devices Found	

Step 2, click Advanced Function -> Firmware, select update.img. Click Unpack to Unzip.

RKDevTool v2.91	pgrade Firmware 🛛	dvanced Function]1		
Boot: Firmware E: \0	CD\EM3568\debian\I	mage\4.6\update.		Download	
ReadFlashID TestDevice	ReadFlashInfo	ReadChipInfo Go Maskrom	ReadCapability Switch Storage	1. FIAST 2. EMMC 3. SD 4. SD1 5. SPINOR 6. SFINAND 7. BAM	
ClearSn Exportimage	DetectSecure EraseLBA	ExportComLog EraseAll	t Selected Stora	8. USB 9. SATA 10. PCIE	
Start: Count:					
No	Devices Fo	ound			



wnload Image Upgrade Firmware Advanced Function	Start to unpack union firmware
Boot Download	
Firmware E:\CD\EM3568\debian\Image\4.6\update.img Unpack	
ReadFlashID ReadFlashInfo ReadChipInfo ReadCapability 1. FIASH 2. EMMC 3. Sh	
TestDevice ResetDevice Go Maskrom Switch Storage 6. STRAND 7 RAM	
ClearSn DetectSecure ExportComLog t Selected Stora SATA	
Exportimage EraseLBA EraseAll	
Start	
Count:	

Step 3, Unpack finish as follow:

KKDevTool v2.91	
Download Image Upgrade Firmware Advanced Function Boot: Download Firmware E: \CD\EM3568\debian\Image\4.6\update.img Unpack ReadFlashID ReadFlashInfo ReadChipInfo ReadCapability 1. FLASH TestDevice ResetDevice Go Maskrom Switch Storage 5. SPINOR ClearSn DetectSecure ExportComLog t Selected Stora 9. SATA 10. PCLE Start: Count: No Devices	Start to unpack union firmware Unpack union firmware ok Start to unpack android firmware Unpack android firmware ok, store in the output dir of tool

The unzip files will be generated in **\RKDevTool\RKDevTool_Release\Output\Android\Image** directory.

Tools + RKDevTool + RKDevToo	l_Release ► Output ► An	droid 🕨 Image	- 49
) 工具(T) 帮助(H)			
共享 ▼ 新建文件夹			
名称	修改日期	类型	大小
🙆 boot.img	2022/4/22 12:15	光盘映像文件	22,378 KB
MiniLoaderAll.bin	2022/4/22 12:15	KuaiZipMount.bin	455 KB
🕑 misc.img	2022/4/22 12:15	光盘映像文件	48 KB
🙆 oem.img	2022/4/22 12:18	光盘映像文件	17,408 KB
parameter.txt	2022/4/22 12:15	文本文档	1 KB
🛃 recovery.img	2022/4/22 12:15	光盘映像文件	29,125 KB
i rootfs.img	2022/4/22 12:18	光盘映像文件	3,668,956
📑 uboot.img	2022/4/22 12:15	光盘映像文件	4,096 KB
🕑 userdata.img	2022/4/22 12:18	光盘映像文件	5,120 KB



5 Install Tools

5.1 Install CP2102 Driver

Plug the USB-to-UART cable CP2102 to the PC, unzip CP2102WIN7.rar on Windows, then click preInstaller.exe to install



🗄 Install Drive	r				X
CP210x USB to	VART Bridg	ge Controller	Driver Se	t me500	
C:\Program Fi	les\SiLabs\	MCV\CP210x			Browse
	PreInstall	er Installation	Successfu		<u> </u>
			确定		

Now the device will be listed under Device Manager -> PORTS with unique serial port assigned



5.2 Install Rockchip Driver Assistant

Path: DriverAssitant_v5.1.1/DriverInstall.exe

RK Driver Assitant	X
Install Driver	hinstall Drive

RK Dri	ver Assitant	
	Install Driver	uinstall Drive

After the installation is complete, connect the board and PC with Micro USB cable and press the "Recover" key and hold then power the board, in *Computer Management* can see the following information:



The WINDOW will pop up found New Hardware Wizard dialog box, choose to install from the specified location, and then select \DriverAssitant_v5.11\DriverAssitant_v5.1.1\ADBDriver.

After the installation is complete in *Computer Management* can see the following information:





5.3 Install Serial Terminal Tool

The serial terminal SecureCRT is used for debugging. It can be used directly after decompression.

Open SecureCRT.exe after copy to PC (path: tools\windows\SecureCRT.exe), then click the icon **Quick Connect** to config



Set the parameters as follow: **Protocol**: Serial **Port**: To be specified by user PC **Baud rate**: 1500000 Please check XON/XOFF not selected

Check Save session is selected



Quick Conr	nect	\mathbf{X}
Protocol: Port: Baud rate: Data bits: Parity: Stop bits:	Serial COM2 ✓ 1500000 ✓ 8 ✓ None ✓ 1 ✓	User com port
Show quick	connect on startup	Save session

After all, click connect



Illusion: If open more than one serial terminal tools, and they use the same serial port, there will be reported **the port is busy**.

Solution: Turn off the serial tool that unnecessary.



6 Burn Images

Step 1, unzip **RKDevTool.zip** on Windows.

Sten 2	open RKDevTool exe	(Path RKDevTool	Release RKDevTool ever
Siep Z	, open RRDevidonese	Falli.NNDEVI001	NEIEASE INNUEVIUUI.EKE

¥		Storage	Address	Name	Path				
L I			0x00000000	Loader	\rockdev\Image\MiniLoaderAll.bin				
2	V		0x00000000	Parameter	\rockdev\Image\parameter.txt				
3	~		0x00004000	Uboot	\rockdev\Image\uboot.img				
ŧ	~		0x00006000	Misc	\rockdev\Image\misc.img				
5	~		0x00008000	Boot	\rockdev\Image\boot.img				
3	~		0x00018000	Recovery	\rockdev\Image\recovery. img				
7			0x00028000	Backup					
3	~		0x00038000	rootfs	\rockdev\Image\linaro-rootfs.img				
9	~		0x00C38000	oem	\rockdev\Image\oem. img				
10	~		0x00C78000	userdata	\rockdev\Image\userdata.img				
10			0x00C78000	userdata	\rockdev\Image\userdata.ing				
oad	ler Ve	r:1.01	Run	Switch	Dev Partition Clear				

Step 3, connect PC and development board with Micro USB cable, keep pressing the **Recover Key** and power the board until the windows PC shows **Found one LOADER Device**.





ŧ		Storage	Address	Name	Path	
			0x00000000	Loader	\rockdev\Image\MiniLoaderAll.bin	
	1		0x00000000	Parameter	\rockdev\Image\parameter.txt	
_	1	11	0x00004000	Vboot	\rockdev\Image\uboot.img	
_	~	31	0x00006000	Misc	\rockdev\Image\misc.img	
	~		0x00008000	Boot	\rockdev\Image\boot.img	
	V		0x00018000	Recovery	\rockdev\Image\recovery.img	
			0x00028000	Backup		
			0x00038000	rootfs	\rockdev\Image\linaro-rootfs.img	
Ε.)	V		0x00C38000	oem	\rockdev\Image\oem.img	
0	V		0x00C78000	userdata	\rockdev\Image\userdata.img	
oa	der Vi	er:1.01 [Run	Switch	Dev Partition Clear	

Step 4, click Upgrade Firmware -> Firmware, select update.img. Click Upgrade to flash.

Firmware	Upgrade	Switch						
2	3							
Fw Ver:	1.0.00	Loader Ver:	1.01	Chip Info:	RK3568			
Firmware:	E:\CD\EM3	568\debian\Image	e\4.6\update	e.img				

wnload Image Firmware	Upgrade Firmware Advanced Function	Test Device Start Test Device Success Check Chip Start Check Chip Success Get FlashInfo Start
Fw Ver: Firmware:	1.0.00 Loader Ver: 1.01 Chip Info: RK3568 E:\CD\EM3568\debian\Image\4.6\update.img	Get FlashInfo Success Prepare IDB Success Download IDB Start Download IDB Start Download Firmware Start Download Firmware (100%) Download Firmware Success



User can also update the firmware separately.

Step 1, Click the column on the right side for the path of the file want to flash.

Step 2, Select the checkbox on the left.

Step 3, Click "run" to flash the image.

DevTool v2.91			and the second	
nload Image Upgra	de Firmware Ad	vanced Functio	m	
				-
# 🗹 Storage	Address	Name	Path .1	
	0x00000000	Loader	\rockdev\Image\MiniLoaderAll.bin	
2	0x00000000	Parameter	\rockdev\Image\parameter.txt	
3 14	0x00004000	Uboot	\rockdev\Image\uboot. img	
	0x00006000	Misc	\rockdev\Image\misc.img	
	0x00008000	Boot	\rockdev\Image\boot.img	
	0x00018000	Kecovery	\rockdev\1mage\recovery.1mg	
	0x00028000	Dackup	Succession of the second second second	
	0+00038000	TOOLIS	wookder/Trage/com ing	
10 🔽	0x00C78000	userdata	\rockdev\Image\userdata.img	
.oader Ver:1.01	3 Run Write by Addre LOADER	Switch Ss	Dev Partition Clear	
KDevTool v2.91				
wnload Image Upgre	de Firmware Ad	dvanced Functi	on	lest Device Start Test Device Success
		N		Check Chip Start
# 🔟 Storage	Address	Name		Get FlashInfo Start
	0000000000	Loader	L. VCD VEM35555 (debian (Tools \KKDev	Get PlashInfo Success
2 1	0x00000000	l'arameter	E:\UU\EM3568\debian\Tools\RKDev	Prepare IDB Start
3 1	Ux00004000	Uboot	E: \UU\EM3566\debian\Tools\RKDev	Prepare IDB Success
4 / V	UxU0006000	Misc	E:\UU\EM3568\debian\Tools\RKDev	Download IDB Start
	0x00008000	Boot	E:\UU\EM3568\debian\Tools\RKDev	Download IDB Success
	0x00018000	Kecovery	E: \UU\EM3568\deb1an\Tools\RKDev	Wait For Loader Start
	UxUUU28000	Backup		Wait For Loader Success
8 14	UxU0038000	rootfs	E:\UJ\EM3568\debian\Tools\RKDev	Test Device Start
9 10	UxUUC38000	oem	E:\UJ\EM35568\deb1an\Tools\RKDev	Test Device Success
Loader Ver:1.01	Run [Switch	Dev Partition Clear	Start to download uboot Download uboot Download misc Download misc Start to download boot Download boot Start to download recovery Download recovery Download recovery
Found One	e LOADER	Device	3-2 :LOADER	Start to download rootfs Download rootfs (2%)
KDevTool v2.91				
wnload Image Upgra	de Firmware Ad	dvanced Functi	on	Get FlashInfo Success Prepare IDB Start
* 🗖 84		Ner	Peth	Prepare IDB Success Download TDB Start
+ L Storage	Address	Name London	R \CD\RM3568\debies\Tesle\RPDess	Download IDB Success
2 🔽	0x0000000	Paramater	E:\CD\EM3568\debian\Tools\RKDev	Wait For Loader Start
3 🔽	0x0000000	Uhoot	E:\CD\EM3568\debian\Tools\RKDev	Wait For Loader Success
4 🔽	0x00006000	Misc	E:\CD\EM3568\debian\Tools\RKDev	Test Device Start
5 🔽	0x00008000	Boot	E:\CD\EM3568\debian\Tools\RKDev	Test Device Success
6 🔽	0x00018000	Recoverv	E:\CD\EM3568\debian\Tools\RKDev	Download Gpt (100%)
7	0x00028000	Backup		Start to download uboot
8 🔽	0x00038000	rootfs	E:\CD\EM3568\debian\Tools\RKDev	Download ubcot (100%)
9 🔽	0x00C38000	oem	E:\CD\EM3568\debian\Tools\RKDev	Demolard mise (100%)
10 🔽	0x00C78000	userdata	E:\CD\EM3568\debian\Tools\RKDev	Start to download boot
				Download boot(100%) Start to download recovery Download recovery(100%) Start to download rootfs Download rootfs
oader Ver:1.01	Run	Switch	Dev Partition Clear	Jownload roots Start to download oem Download oem (100%)
	Write by Addre	ess		Start to download userdata
N- D	Write by Addre	ess und		Start to download userdata Download userdata (100%)



7 Debian Application

7.1 Display

Connect the board and monitor with a HDMI cable and connect a 10.1 inch LVDS LCD , then start up.



Note: The system default support HDMI and LVDS asynchronous display.

7.2 SD Card

EM3568 supports SD Hot-plug.

🕞 Serial-COM	5 - SecureCRT						x
File Edit V	ew Options Transfer	Script	Tools Help				
13 2 C 2 3	3 🔊 Þi 🖻 🥰 7	3 § 6	8 2 1 9				
Serial-COM5		o					X
root@linar root@linar 16b8dcd0-9 7B8F-4E9B root@linar '4K 60甯?抱 Alarms	o-alip:/# cd /medi o-alip:/media/lina 9e7-44f5-b9d9-a7b1 o-alip:/media/lina 京室櫨瑙嗛 鏃犱汉	ia/linar aro# ls L9d9ffd0 aro# ls 、鏈烘媿錄	o/ b 8dd906f3-1 7B8F-4E9B/ 峯? 4kmee銆修c	c7a-4936-842 m.mp4'	2a-20317ab5	52423	•
Ready	Serial: COM3	7, 33	7 Rows, 76 Col	s VT100		NU	M



Trash		
	Removable medium is inserted a x Removable medium is inserted Type of medium: digital photos Please select the action you want to perform: Open in File Manager	
	☐ Always perform this action on this media type	
🔨 🔹 🕒 🗉 🚺 [Accessorie	s] Removable medi	

T rash								_				
	4		31 GB Volu	me			<u> </u>					
	<u>File Edit View Bo</u>	ookmarks <u>G</u> o	Too <u>l</u> s <u>H</u> elp									
_	0 - 0 0	/media/lin	naro/7B8F-4E9	ЭВ		3	»					
	Places Home Folder Desktop	Alarms	Android	Audiobooks	DCIM	-						
	 Trash Can Applications 1.1 GB Volu 	Documents	Download	LOST.DIR	Movies							
	134 MB Vol 🛆	Music	Notifications	Pictures	Podcasts							
	Documents Music Pictures Videos	Ringtones	System Volume Information	4K 60 ⁵¹ / ₂₇ 00 60 89 90 67 6691 60	GUGUDAN- Wonderland. 2160p.UH							
	J Downloads		*		53							
	26 items	1.0.1-	pico3399	Dico3399.ba	z 23.8 GiB (Tota	: 29 1 GiB)						
				precipace			2					
1 - 4		Accessories]	31 GB V	olume	_	_	_	_	_	_	 atil 🛞 09	9:52 🚊 👩

7.3 USB Host

The USB Host can be used to connect USB mouse, USB keyboard, U-Disk or other USB devices. EM3568 also supports SD Hot-plug.





1	-						
Trash	1		TEST			- • ×	
A CONTRACTOR OF	<u>File Edit View Bo</u>	okmarks <u>G</u> o	Too <u>l</u> s <u>H</u> elp				
	0 - 0 0	/media/lin	naro/TEST			°&	
	Places 👻					<u>^</u>	
	🕂 Home Folder			1	1		
	🔚 Desktop	3566	Alarms	Android	AnTuTu		
	Trash Can						
	Applications	Audiobooks	DCIM	Decuments	Download		
	📃 31 GB Volu 🛆	AUGIODOOKS	DCIM	Documents	Download		
	📃 1.1 GB Volu 🛆						
	📃 134 MB Vol 🛆	EM3399_And	FOUND.000	FOUND.001	LOST.DIR		X
	📃 TEST 🛛 🔺	roid11	-				
	📕 Documents						
	📕 Music	Movies	Music	Notifications	Pictures		
	📕 Pictures						
	📕 Videos	1	1	1			
	縜 Downloads	Podcasts	Ringtones	Schematic	System	-	
	75 items			Free space:	625.6 MiB (To	otal: 7.5 GiB)	
1 - 🖗 🖬 🗖	TEST	[Acces	sories]				

Note: The USB2.0 and USB3.0 interfaces are separate.

7.4 Audio Player

Copy Audio file to sdcard/udisk then insert it to the board. After system boot execute follow command to play.

aplay -I

(View audio hardware devices)



🕞 Serial-COM5 - SecureCRT
File Edit View Options Transfer Script Tools Help
19 19 G 49 10 10 10 10 10 10 10 10 10 10 10 10 10
Serial-COM5
<pre>root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# aplay -1 **** List of PLAYBACK Hardware Devices **** card 0: rockchiprk809co [rockchip,rk809-codec], device 0: fe410000.i2s-rk817-hifi rk817-hifi-0] subdevices: 1/1 subdevice #0: subdevice #0 card 1: ROCKCHIPSPDIF [ROCKCHIP,SPDIF], device 0: fe460000.spdif-dit-hifi dit-hifi-0 [fe46000 0.spdif-dit-hifi dit-hifi-0] subdevices: 1/1 subdevices: 1/1 subdevice #0: subdevice #0 card 2: rockchiphdmi [rockchip,hdmi], device 0: rockchip,hdmi i2s-hifi-0 [rockchip,hdmi i2s-hifi-0 subdevice: 1/1 subdevice #0: subdevice #0 card 2: rockchiphdmi [rockchip,hdmi], device 0: rockchip,hdmi i2s-hifi-0 [rockchip,hdmi i2s-hifi-0 [rockchip,hdmi i2s-hifi-0 [rockchip,hdmi i2s-hifi-0 [rockchip,hdmi i2s-hifi-0] subdevice: 1/1 subdevi</pre>
Ready Serial: COM3 17, 21 17 Rows, 93 Cols VT100 NUM

Execute follow command to play in earphone and speaker:

aplay test.wav

Execute follow command to play in HDMI:

aplay -Dhw:2,0 test.wav

🕞 Serial-COM5 - SecureCRT
File Edit View Options Transfer Script Tools Help
19 79 G 49 70 m m 2 G 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Serial-COM5
root@linaro-alip:/media/linaro/7B8F-4E9B# 1s '4K 60甯?椋庢櫙瑙嗛 鏃犱汉鏈烘媿鐩? 4kmee銆修om.mp4' Alarms Android Audiobacks
DCIM Documents Documents Download GUGUDAN-wonderland, 2160p, UHDTV, H265, ts
Go-home.mp3 I.O.I-Dream.Girl.2160p.UHDTV.H265.ts LOST.DIR Movies Music
Notifications Pictures Podcasts Ringtones
'screenshot from 2022-04-22 09-51-27.png' 'screenshot from 2022-04-22 09-52-35.png' 'screenshot from 2022-04-22 10-01-56.png' 'screenshot from 2022-04-22 10-02-37.png' 'svstem volume Information'
pico3399 pico3399.bak pingfanzhilu.mp3 test.mo4
test.wav Testi test2 test3
rode0_Inre_oc0aa0.mp4 rode0iaro-alip:/media/linaro/7B8F-4E9B# [1176.688724] dwc3 fcc00000.dwc3: device reset [1176.689003] android_work: sent uevent USB_STATE=DISCONNECTED
Ready Serial: COM3 34, 1 34 Rows, 93 Cols VT100 NUM



G Serial-COM5 - SecureCRT	
File Edit View Options Transfer Script Tools Help	
17 7 7 7 8 7 8 6 9 6 9 6 9 6 7 8 1 8	
Serial-COM5	X
<pre>root@linaro-alip:/media/linaro/788F-4E9B# root@linaro-alip:/media/linaro/788F-4E9B# aplay test.wav Playing wAVE 'test.wav' : signed 16 bit Little Endian, Rate 44100 Hz, Stereo [1261.4447971] rk817_digital_mute 0 4 ^CAborted by signal Interrupt [1269.955074] rk817_digital_mute 1 [1269.955150] rk817_digital_mute 1 [1269.955150] rk817_digital_mute 1 [root@linaro-alip:/media/linaro/788F-4E9B# aplay -Dhw:2,0 test.wav Playing WAVE 'test.wav' : signed 16 bit Little Endian, Rate 44100 Hz, Stereo [] </pre>	• •
Ready Serial: COM3 17, 1 17 Rows, 93 Cols VT100	NUM

7.5 Record

Execute follow command to record in MIC, speech in front of the microphone then can record.

arecord -f cd record.wav

aplay record.wav

Serial-COM5 - SecureCRT		x
File Edit View Options Transfer Script Tools Help		
19 19 17 19 18 19 10 10 1 19 19 19 19 19 19 19 19 19 19 19 19 1	😵 📰	
Serial-COM5		X
<pre>root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# root@linaro-alip:/# l848.417160] rk817_set_dai_sysclk : MCLK = [1848.417120] rk817_bw_params : sample rate ^CAborted by signal_Interrupt root@linaro-alip:/# ls bin etc lost+found mnt record.wav boot home md5sum.txt opt rootrip_test dev lib media proc_root root@linaro-alip:/# aplay record.wav Playing WAVE 'record.wav' : signed lo bit Lii [1865.77594] rk817_set_dai_sysclk : MCLK = [1865.785042] rk817_set_dai_sysclk : MCLK = [1865.780041] rk817_digital_mute 0 [1865.780042] rk817_digital_mute 0 [1865.781047] rk817_digital_mute 1 [1871.532691] rk817_digital_mute 1 [1871.532763] rk817_digital_mute 1 [1</pre>	ittle Endian, Rate 44100 Hz, Stereo 11289600Hz = 44100Hz run sys usr sbin system var srv tmp vendor ttle Endian, Rate 44100 Hz, Stereo 1128960Hz = 44100Hz	
Ready Serial: COM3	23, 21 23 Rows, 93 Cols VT100 NU	M

Note: At present, headphones cannot record, only mic recording, and the recorded audio is only single-channel output.





7.6 Ethernet

Connect the Board and router with an Ethernet cable (default DHCP=Yes). User can ping URL/IP at terminal. or open the browser to test Network.

ifconfig

ping -I eth0 www.boardcon.com

ping -I eth1 www.boardcon.com



G Serial-COM5 - SecureCRT		×
File Edit View Options Transfer Script Tools Help		
\$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$	8	
Serial-COM5		X
root@linaro-alip:/# ping -I eth0 www.boardcon PING www.boardcon.com (67.222.54.196) from 19 64 bytes from 67-222-54-196.unifiedlayer.com 64 bytes from 67-222-54-196.unifiedlayer.com 64 bytes from 67-222-54-196.unifiedlayer.com 64 bytes from 67-222-54-196.unifiedlayer.com 64 bytes from 67-222-54-196.unifiedlayer.com	.com 2.168.2.102 eth0: 56(84) bytes of data. (67.222.54.196): icmp_seq=1 ttl=47 time=192 ms (67.222.54.196): icmp_seq=2 ttl=47 time=191 ms (67.222.54.196): icmp_seq=3 ttl=47 time=185 ms (67.222.54.196): icmp_seq=4 ttl=47 time=185 ms (67.222.54.196): icmp_seq=5 ttl=47 time=193 ms	•
Ready Serial: COM3	7, 1 7 Rows, 93 Cols VT100 NUM	1





When two Ethernet interfaces are used at the same time, eth0 ping the Internet and eth1 ping the Intranet by default.

7.7 RTC

Execute the command hwclock at CRT terminal

date -s "2022-04-24 09:31:00" (set the system time)

hwclock -w

hwclock

Wait a minute then run **hwclock** again, it can be seen the time has changed.

G Serial-COM5 - SecureCRT	
File Edit View Options Transfer Script Tools Help	
49 99 G 43 80 °n °n Q G 59 69 67 92 78 50 10 10 10 10 10 10 10 10 10 10 10 10 10	
Serial-COM5	X
<pre>root@linaro-alip:/# date -s "2022-04-24 09:31:00" Sun Apr 24 09:31:00 UTC 2022 root@linaro-alip:/# hwclock -w root@linaro-alip:/# hwclock [346.202256] hym8563_rtc_set_alarm:diff_sec= 1s , use time [346.643768] hym8563_rtc_set_alarm:diff_sec= 1s , use time 2022-04-24 09:31:12.538019+00:00 root@linaro-alip:/# hwclock [350.119893] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.125198] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.13672] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.136590] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.142147] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.142147] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.643749] hym8563_rtc_set_alarm:diff_sec= 1s , use time [350.643749] hym8563_rtc_set_alarm:diff_sec= 1s , use time [3202-04-24 09:31:16.454250+00:00</pre>	
Ready Serial: COM3 16, 21 16 Rows, 76 Cols VT100	NUM



7.8 WiFi

Connect the WiFi antenna, then click **the red box below**, select the SSID from the list of available networks and enter the password.

After connected, user can ping URL/IP at terminal. or open the browser to test Network. # ping -I wlx307bc90ff478 www.boardcon.com



Trash	Ethernet Networks (eth0) disconnected		
	Ethernet Networks (eth1) disconnected		
	Wi-Fi Networks (Realtek Wi-Fi) disconnected		
	503	a d	
	609	8 a0	
	806	9 -0	
	Boardcon	6	
	Boardcon_WIFI	-	
	More networks	+	
	Wi-Fi Networks (Realtek Wi-Fi)		
	disconnected		
	Available		
	503	h	
	609	* 1	
	806	8 d	
	Boardcon	-	
	Boardcon_WIFI	-	
	More networks		
	VPN Connections	×	
	Connect to Hidden Wi-Fi Networ	k	
	Create New Wi-Fi Network		
n 🔊 🛋 🔰 📕 [Accessories]			🔰 10:12 ⋢ 🚺



īrash			
	-	Wi-Fi Network Authentication Required _ 🛛 *	
		Authentication required by Wi-Fi network Passwords or encryption keys are required to access the Wi- Fi network "Boardcon".	
	Wi-Fi adapter	Realtek Wi-Fi 👻	
	Password		
	- /	Show password	
		Cancel Connect	
	0	}	

Serial-COM5 - SecureCRT	
File Edit View Options Transfer Script Tools Help	
19 19 G 19 19 19 19 19 19 19 19 19 19 19 19 19	
Serial-COM5	X
root@linaro-alip:/# ifconfig eth0: flags=4099 <up,broadcast,multicast> mtu 1500 ether 7a:3b:8c:c3:e9:b9 txqueuelen 1000 (Ethernet) Rx packets 0 bytes 0 (0.0 B) Rx errors 0 dropped 0 overruns 0 frame 0 Tx packets 0 bytes 0 (0.0 B) Tx errors 0 dropped 0 overruns 0 carrier 0 collisions 0 device interrupt 43</up,broadcast,multicast>	*
eth1: flags=4099 <up,broadcast,multicast> mtu 1500 ether 76:3b:8c:c3:e9:b9 txqueuelen 1000 (Ethernet) RX packets 0 bytes 0 (0.0 B) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 0 bytes 0 (0.0 B) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 device interrupt 47</up,broadcast,multicast>	
lo: flags=73 <up,loopback,running> mtu 65536 inet 127.0.0.1 netmask 255.0.0.0 inet6 ::1 prefixlen 128 scopeid 0x10<host> loop txqueuelen 1000 (Local Loopback) Rx packets 32 bytes 2144 (2.0 KiB) Rx errors 0 dropped 0 overruns 0 frame 0 TX packets 32 bytes 2144 (2.0 KiB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0</host></up,loopback,running>	
p2p0: flags=4099 <up,broadcast,multicast> mtu 1500 ether 32:7b:c9:0f:f4:78 txqueuelen 1000 (Ethernet) Rx packets 0 bytes 0 (0.0 B) Rx errors 0 dropped 0 overruns 0 frame 0 Tx packets 0 bytes 0 (0.0 B) Tx errors 0 dropped 0 overruns 0 carrier 0 collisions 0</up,broadcast,multicast>	
<pre>wlx307bc90ff478: flags=4163<up,broadcast,running,multicast> mtu 1500 inet 192.168.2.163 netmask 255.255.255.0 broadcast 192.168.2.255 inet6 fe80::1bd4:38ea:ed7a:9fdf prefixlen 64 scopeid 0x20<link/> ether 30:7b:c9:0f:f4:78 txqueuelen 1000 (Ethernet) RX packets 116 bytes 14126 (13.7 KiB) RX errors 0 dropped 1 overruns 0 frame 0 TX packets 22 bytes 2706 (2.6 KiB)</up,broadcast,running,multicast></pre>	
Ready Serial: COM3 40, 21 40 Rows, 83 Cols VT100	NUM



🕞 Serial-COM5 - SecureCRT
File Edit View Options Transfer Script Tools Help
43 X3 C7 43 X8 Pa Ra Q, F8 F8 🚭 B [*] X8 T 💡 E8
Serial-COM5
<pre>root@linaro-alip:/# ping -I wlx307bc90ff478 www.boardcon.com PING www.boardcon.com (67.222.54.196) from 192.168.2.163 wlx307bc90ff478: 56(84) by tes of data. 64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=1 ttl=47 tin e=192 ms 64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 ttl=47 tin e=230 ms 64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=3 ttl=47 tin e=194 ms</pre>
Ready Serial: COM3 9, 21 9 Rows, 83 Cols VT100 NUM



7.9 Bluetooth

Click the red box below.





Click "Devices"

Trash	
	A Turn Bluetooth Off
	Make Discoverable
	Setup New Device
	Send Files to Device
	J Browse Files on Device
	(B) Recent Connections
	* Devices
	D adverter D
	Adapters
	Local Services
	Local Services
	Adapters Local Services Plugins ♦ Help

Click "Search"

Trash		
	🖇 🛛 Bluetooth Devices 💶 🗸 🕫 🗴	
	Adapter Device View Help	
	🖹 Search 🍦 🧠 🔶 📓 Setup 🗕 👻	
	V 7C:79:09:E1:DC:46	
	44-FB-DB-85-06-72	
	Mi Smart Band 6 Unknown <i>F6:34:AB:A9:60:27</i>	
	4B-30-B1-10-35-88 Unknown 4B:30:B1:10:35:88	N
	iPhone Smart phone 38:89:2C:24:FB:64	
	() 3.87 KB 1.66 B/s () 4.11 KB 2.99 B/s ↓	
🔨 🖿 🌑 🛄 💷 🚯 Bluetooth Devices		💦 🖡 👔 🚷 03:58 📮 👩



Select the available device in the list to pair.

Trash	
	Bluetooth Devices _ = ×
	Adapter Device View Help
	🔍 Search 🍦 🐵 🔶 🗟 Setup 🗕 👻
	7C:79:09:E1:DC:46 44-FB-DB-85-06-72 Unknown 44-FB-DB:85:06:72
	Mi Smart Band 6 Unknown F6:34:AB:A9:60:27
	4B-30-B1-10-35-88 Unknown B3:06:1:10:35:88
	iPhone smart phone 38:89:2C:24:Ft Connect To:
	Audio Source
	Browse Device
	-● Pair
	Create pairing with the device
	Rename device
	Remove
🔨 🖿 🏚 🔲 🗆 🕃 Bluetooth Devices 📃	[Accessories]

Trash			
	Bluetooth Devic Adapter Device View Help ☑ Search ● ● ● ● ✓ 7C:79:09:E1:DC:46 ●	setup ×	
	44-FB-DB-85-06-72 Unknown 4 0 0 0 0 0 0 0 0 0 0 0 0 0	th _ o x etooth ;24:FB:64) authentication: 12545	
	Confirm 38:89:22:24:7:8:04	Deny 2.00 B/s 🔮 4.54 KB 2.00 B/s 🕃 💽	
			6

After pairing, devices can connect with each other automatically.





7.10 CAN

Connect CAN ports of Board A and Board B with the test line.



For Board A, execute the follow commands at Serial terminal A to set CAN_A as Receiver.

- # ip link set can0 down
- # ip link set can0 type can bitrate 1000000 dbitrate 3000000 fd on
- # ip link set can0 up
 # candump can0

(set CAN0 as receive)

For Board B, execute the follow commands at Serial terminal B to set CAN_B as Transmitter.

ip link set can0 down

ip link set can0 type can bitrate 1000000 dbitrate 3000000 fd on

- # ip link set can0 up
- # cansend can0 123##1DEADBEEF (C

(CAN0 send characters 0xDE 0xAD 0xBE 0xEF)

The Transmitter and receiver can be converted by execute the command

# candump can0	(Receiver)
or	
# cansend can0 123#DEADBEEF	(Transmitter)

7.11 RS485

Connect the RS485 ports of Board A and B with the test line.

	GND	GND	
Board A	A	A	Board B
Dould	В	В	Dourd D

For Board A, execute the follow commands at Serial terminal A to set RS485 as Receiver or send. # com /dev/ttyS7 115200 8 0 1

For Board B, execute the follow commands at Serial terminal B to set RS485 as Receiver or send. # com /dev/ttyS7 115200 8 0 1



🖥 Serial-COM5 - SecureCRT	
File Edit View Options Transfer Script Tools Help	
19 79 G 49 79 == 18 Q G 59 G 18 X 1 9 28	
Serial-COM5	3
root@linaro-alip:/# com /dev/ttys7 115200 8 0 1	-
port = /dev/ttys/ baudrate = 115200	
parity = 0	
stopb = 1	
hhbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb	
RECV: h	
RECV: h	
RECV: n	
RECV: h	
RECV: h	
RECV: h	
RECV: II	
RECV: h	
RECV: N	
RECV: h	
RECV: h	
RECV: n	
RECV: II	
RECV: 览?	-
Ready Serial: COM3 32, 1 32 Rows, 93 Cols VT100 NUM	

7.12 RS232

Execute the follow commands at Serial terminal to set RS232 as Receiver or send.

# com /dev/ttyS3 115200 8 0 1	(UART3)
# com /dev/ttyS4 115200 8 0 1	(UART4)
# com /dev/ttyS5 115200 8 0 1	(UART5)

Connect TX and RX, send data can be received by itself.







7.13 SATA

Connect the sata and the sata power to the board(Sata0). Execute follow command to mount SATA after system boot.

ls /dev

mount /dev/sda1 /mnt

Is /mnt

🕞 Serial-COM5 - Secu	reCRT			
File Edit View Op	otions Transfer Script	Tools He	р	
19 29 G 29 X	h R 🍳 🛛 🖥 🖉	8%	1 🤋 📰	
Serial-COM5				X
root@linaro-alip	:/#			*
root@linaro-alip	:/# Is /dev	++++11	++1/51	Neck
bsa	mem	tty12	tty52	VC54
bus	memory bandwidth	ttv13	ttv53	VCS6
cec0	mmcb1k0	ttv14	ttv54	vcs7
char	mmcb1k0boot0	tty15	tty55	vcsa
console	mmcblk0boot1	tty16	tty56	vcsal
cpu_dma_latency	mmcblk0p1	tty17	tty57	vcsa2
disk	mmcb1k0p2	tty18	tty58	vcsa3
dr1	mmcb1k0p3	tty19	tty59	vcsa4
TDU	mmcb1k0p4	tty2	tty6	VCSaS
full	mmcblk0p5	tty21	tty61	VCSa0
fuse	mmcblk0p7	tty22	tty62	VCSU
apiochip0	mmcb1k0p8	ttv23	ttv63	vcsu1
apiochip1	mmcb1k0rpmb	tty24	tty7	vcsu2
gpiochip2	mpp_service	tty25	tty8	vcsu3
gpiochip3	network_latency	tty26	tty9	vcsu4
gpiochip4	network_throughput	tty27	ttyFIQ0	vcsu5
gpiochip5	null	tty28	ttyGS0	VCSU6
hdm1_hdcp1x	port	tty29	ttys3	VCSU/
e	ppp	LLY3	ttys4	vendor_storac
hwrng	ptmx	tty30	ttys5	vhci
120-0	ptp0	tty32	ubi ctrl	video_enc0
120-1	nts	tty33	ubid	video0
12c-3	ramO	ttv34	uinput	video1
12c-4	random	tty35	urandom	video10
12c-6	rfkill	tty36	usb-ffs	video11
iio:device0	rga	tty37	usbmon0	video12
initctl	rtc	tty38	usbmon1	video13
kmsa	rtco sda	tty39	uspmon2	video2
	sdat	tty40	usbmon/	video4
loop-control	Stim	ttv41	usbmon5	video5
100p0	snd	ttv42	usbmon6	video6
loop1	stderr	tty43	v41	video7
loop2	stdin	tty44	v41-subdev0	video8
loop3	stdout	tty45	v41-subdev1	video9
100p4	tee0	tty46	v41-subdev2	watchdog
loops	teeprivo	tty47	v41-subdev3	watchdogu
loop7	tty	tty48	VCS	2er0
malio	ttv1	ttv5	VCS2	
media0	ttv10	ttv50	VCS3	
root@linaro-alip	:/#		0.0000000000	•
Ready Seri	al: COM3 48, 21 48 R	lows, 70 C	ols VT100	NL at





Note: EM3568 not support Sata Hot-plug.

7.14 4G

Step 1, Insert 4G module to PCIe slot (4G model:EC20).

Step 2, Connect antenna and insert SIM card.

Step 3, Exexute follow command to connect 4G network after power on

pppd call quectel-ppp &

ping -I ppp0 www.boardcon.com

Serial-COM5 - SecureCRT		- x	
File Edit View Options Transfer Script Tools Help			
19 19 G 19 18 18 18 9 19 19 19 19 19 19 19 19 19 19 19 19 1			
Serial-COM5			
root@linaro-alip:/# pppd call quectel-ppp & [1] 1258			*
debug # (from /etc/ppp/peers/quectel-ppp) nodetach # (from /etc/ppp/peers/quectel-ppp) dump # (from /etc/ppp/peers/quectel-ppp) noauth # (from /etc/ppp/peers/quectel-ppp) user test # (from /etc/ppp/peers/quectel-ppp) password ????? # (from /etc/ppp/peers/quectel-ppp) remotename 3gppp # (from /etc/ppp/peers/quectel-ppp) /dev/ttyUSB3 # (from /etc/ppp/peers/quectel-ppp) 115200 # (from /etc/ppp/peers/quectel-ppp) lock # (from /etc/ppp/peers/quectel-ppp) connect chat -s -v -f /etc/ppp/peers/quectel-chat-connect	#	(fron	
<pre>/etc/ppp/peers/quectel-ppp) disconnect chat -s -v -f /etc/ppp/peers/quectel-chat-disconnect /etc/ppp/peers/quectel-ppp) nocrtscts</pre>	# ((fron	•
Ready Serial: COM3 23, 21 23 Rows, 79 Cols VT100		NUM	.d



Serial-COM5 - SecureCRT
File Edit View Options Transfer Script Tools Help
13 33 G 43 X Pa 68 Q Fa 58 A 67 X 1 9 28
Serial-COM5
221.179.38.7>] Could not determine remote IP address: defaulting to 10.64.64.64 not replacing default route to wlx307bc90ff478 [192.168.2.1] local IP address 10.2.251.146 remote IP address 10.64.64.64 primary DNS address 120.196.165.7 secondary DNS address 221.179.38.7 Script /etc/ppp/ip-up started (pid 1270) Script /etc/ppp/ip-up finished (pid 1270), status = 0x0
root@linaro-alip:/# ping -I ppp0 www.boardcon.com PING www.boardcon.com (67.222.54.196) from 10.2.251.146 ppp0: 56(84) bytes of c ata. 64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=2 ttl=46
time=831 ms 64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=3 ttl=46
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=4 ttl=46 time=1267 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=5 ttl=46 time=297 ms
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=6 ttl=46
64 bytes from 67-222-54-196.unifiedlayer.com (67.222.54.196): icmp_seq=7 ttl=46 time=475 ms ^C
www.boardcon.com ping statistics 8 packets transmitted, 6 received, 25% packet loss, time 100647005ms rtt min/avg/max/mdev = 296.783/738.542/1266.680/314.016 ms, pipe 2 root@linaro-alip:/#
Ready Serial: COM3 30, 21 30 Rows, 79 Cols VT100 NUM

```
(The Network priority : Ethernet > WIFI > 4G).
```

7.15 GPS

Plug the EC20 module and connect GPS antenna, then power on and execute the follow command:

```
# echo -e "AT+QGPS=1\r\n" > /dev/ttyUSB2
```

```
# cat /dev/ttyUSB1
```

Serial-COM5 - S	ecureCRT						X
File Edit View	Options Transfer Sc	ript Too	ls Help				
13 33 G 33 🕺	3 Þ 6 🔍 😼 ş) 6 C	1 28 1	8 🗔			
Serial-COM5							X
root@linaro-al root@linaro-al ^C root@linaro-al root@linaro-al \$GPVTG,,T,,M,, \$GPGSA,A,1,,,,	ip:/# ip:/# cat /dev/tt ip:/# echo -e "AT ip:/# cat /dev/tt N,,K,N*2C ,,,,,,,,*1E	YUSB1 +QGPS=1 YUSB1	\r\n" >	/dev/tt	yusb2		*
\$GPGGA,,,,,,0, \$GPRMC,,V,,,,,	,,,,,,*66 ,,,,,N*53						-
Ready	Serial: COM3	13, 21	13 Rows,	79 Cols	VT100	CAP	NUM



🖥 Serial-COM5 - SecureCRT
File Edit View Options Transfer Script Tools Help
13 X G 43 X == = < G 55 45 2 X 1 ? 2
Serial-COM5
\$GPRMC,074310.00,A,2234.075944,N,11353.473701,E,0.0,226.8,240422,2.3,W,A*24
\$GPGSA,A,2,03,04,14,17,19,,,,,,1.2,0.9,0.9*3C
\$GPGSV,2,1,08,01,04,046,25,03,31,049,40,04,04,101,34,09,,,26*40
\$GPGSV,2,2,08,14,69,161,30,17,48,005,36,19,40,336,30,20,02,209,32*77
\$GPGGA,074311.00,2234.075951,N,11353.473711,E,1,05,0.9,15.8,M,-2.0,M,,*49
\$GPVTG,226.8,T,229.1,M,0.0,N,0.0,K,A*25
\$GPRMC,074311.00,A,2234.075951,N,11353.473711,E,0.0,226.8,240422,2.3,W,A*20
\$GPGSA,A,2,03,04,14,17,19,,,,,,1.2,0.9,0.9*3C
\$GPG5V,2,1,08,01,04,046,23,03,31,049,40,04,04,101,34,09,,,28*48
\$GPGSV,2,2,08,14,69,161,30,17,48,005,34,19,40,336,29,20,02,209,32*7D
\$GPGGA,074312.00,2234.075959,N,11353.473720,E,1,05,0.9,15.8,M,-2.0,M,,*40
\$GPVTG,226.8,T,229.1,M,0.0,N,0.0,K,A*25
\$GPRMC,074312.00,A,2234.075959,N,11353.473720,E,0.0,226.8,240422,2.3,W,A*29
\$GPGSA,A,2,03,04,14,17,19,,,,,,1.2,0.9,0.9*3C
Ready Serial: COM3 30, 1 30 Rows, 79 Cols VT100 CAP NUM