

RK3399-PPC-1xxW-Debian9

User Manual

V1.0.0



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1 About Manual

Thank you for using Advantech product and rk3399-ppc-1xxw-debian9. This manual is a user manual of rk3399-ppc-1xxw-debain9. This manual may be copied and distributed in any medium, either commercially or non-commercially.

2 Introduction

2.1 Overview

rk3399-ppc-1xxw-debian9 is developed for Advantech devices based on debian9. It

is customized to satisfy users' requirements and to add new functions and features.

2.2 Device support list

We currently support the following products:

PPC-112W PPC-115W

2.3 User and Password

The system default user is linaro, and the password of linaro is :123456.

2.3 Preview

After installation, you can see as follow:





3 Installation

It is easy to install rk3399-ppc-1xxw-debian9 on a hard disk.

3.1 Prepare an Installtion sdcard

船 Rockchip Create Upgrade Disk Tool v1.61	\times
First:Choose removable disk SDBoot:2.12 Generic MassStorageClass USB Device 14.8G	
Second:Choose function mode	
Upgrade Firmware PCBATest DD Boot	
Third:Choose firmware Restore	
D:\iso\windows\AndroidTool\rockdev\update.img Firmware	
Fourth:Choose demo(Option)	
Demo	
Create	
Restore	

You should click the "Create" button to burn the sdcard.



- 3.2 Install rk3399-ppc-1xxw-debian9
- Step 1 : Please power off in PPC1XX.

Step 2 : Insert the SD card.

Step 3 : Power on in PPC1XX.

Step 4 : Installing system update



Step 5 : Please Remove the SD Card when PPC1XX show the message "Doing Action

succeeded. please remove the sdcard.....".





Step 6 : Remove SD card.

The rk3399-ppc-1xxw-debian9 will be auto-install.

3.3 Hardware Requirements

The following information represents the requirements necessary to install

rk3399-ppc-1xxw-debian9 successfully.

Sdcard Size

- Recommended : 16 G or more
- 4 Usage

rk3399-ppc-1xxw-debian9 provides many tools based on X-Windows. Here we mainly introduce some important tools that the user may use frequently.

4.1 LXTerminal

Start-System Tools-LXTerminal, open LXTerminal as follows:





4.2 File Manager

Start-System Tools-File Manager PCManFM, open File Manager as follows:



11		linaro			- • ×
<u>File Edit View</u>	<u>B</u> ookmarks <u>G</u> o	Too <u>l</u> s <u>H</u> elp			
	🚺 🛧 /home/li	inaro			°° 8
Places Home Folder Desktop Trash Can Applications Documents Music Pictures Videos Downloads	Image: Construction of the second	Documents Documents Templates	Jownloads Videos	Music	Pictures
8 items (12 hidder	ח)		Free spa	ce: 5.3 GiB (T	otal: 7.8 GiB)

4.3 Browser

Chromium browser:

New Tab x +	_ @ ×
$\left(\leftrightarrow \mathbf{G} \right) \left(\mathbf{\sigma} \right)$	* \varTheta :
🔛 Apps 🔞 Debian.org 🔞 Latest News 🔞 Help	
You are using an unsupported command-line flag:no-sandbox. Stability and security will suffer.	×





4.4 IP configuration

🔨 👟 🗣 💵 💷 🔲 Iinaro@linaro-ali... 🔐 (Pictures) 💿 New Tab - Chrom...



rk3399-ppc-1xxw-debian9 gets IP according to DHCP default. If you want to get IP by static, you can use "Network Connections". To set static IP.

<u>i</u>	Network Connections		- • ×
Name	Last U	sed 👻	Add
▼ Ethernet			
Wired connection 1	now		📝 Edit
Wired connection 2	25 minu	utes ago	
▼ Bridge			Delete
docker0	now		
			Close

<u>G</u>	Editing Wired connection 1 _	• *
Connection name: Wired	connection 1	
General Ethernet	802.1X Security DCB Proxy IPv4 Settings IPv6 Setting	IS
Device:	C4:00:AD:62:84:DC	•
Cloned MAC address:		•
MTU:	automatic – + by	tes
Wake on LAN:	✓ Default □ Phy □ Unicast □ Multicast □ Ignore □ Broadcast □ Arp □ Magic	
Wake on LAN password:		
Link negotiation:	Ignore	•
Speed:	100 Mb/s	•
Duplex:	Full	•
	Cancel O Sav	ve



5 Test tools

5.1 eMMC Test

Test eMMc read:

root@linaro-alip:~# dd if=/dev/mmcblk1 of=/tmp/data bs=1 count=1024 1024+0 records in .1024+0 records out 1024 bytes (1.0 kB, 1.0 KiB) copied, 16.4029 s, 0.1 kB/s

Test eMMc write:

root@linaro-alip:~# dd if=/tmp/data of=/dev/mmcblk1 bs=1 count=1024 1024+0 records in 1024+0 records out 1024 bytes (1.0 kB, 1.0 KiB) copied, 0.0109707 s, 93.3 kB/s root@linaro-alip:~#

5.2 SD Test

Step 1: When booting from eMMC, you would see only below directories

root@linar@	o-a	alip: [,]	~# ls	-1 /0	lev,	/mmck	lk,	ł	
brw-rw	1	root	disk	179,	0	May	13	11:17	/dev/mmcblk1
brw-rw	1	root	disk	179,	32	May	13	11:17	/dev/mmcblk1boot0
brw-rw	1	root	disk	179,	64	May	13	11:17	/dev/mmcblk1boot1
brw-rw	1	root	disk	179,	1	May	13	11:17	/dev/mmcblk1p1
brw-rw	1	root	disk	179,	10	May	13	11:17	/dev/mmcblk1p10
brw-rw	1	root	disk	179,	2	May	13	11:17	/dev/mmcblk1p2
brw-rw	1	root	disk	179,	3	May	13	11:17	/dev/mmcblk1p3
brw-rw	1	root	disk	179,	4	May	13	11:17	/dev/mmcblk1p4
brw-rw	1	root	disk	179,	5	May	13	11:17	/dev/mmcblk1p5
brw-rw	1	root	disk	179,	6	May	13	11:17	/dev/mmcblk1p6
brw-rw	1	root	disk	179,	7	May	13	11:17	/dev/mmcblk1p7
brw-rw	1	root	disk	179,	8	May	13	11:17	/dev/mmcblk1p8
brw-rw	1	root	disk	179,	9	May	13	11:17	/dev/mmcblk1p9
brw-rw	1	root	disk	179,	96	May	13	11:17	/dev/mmcblk1rpmb

Step 2: Insert SD card to SD card slot and check your device again. You should be able to see more directories.



root@linaro-alip:~# ls -l /dev/mmcblk*	
brw-rw 1 root disk 179, 128 May 13 11:24 /dev/	mmcb1k0
brw-rw 1 root disk 179, 129 May 13 11:24 /dev/	mmcblk0p1
brw-rw 1 root disk 179, 0 May 13 11:17 /dev/	mmcblk1
brw-rw 1 root disk 179, 32 May 13 11:17 /dev/	mmcblk1boot0
brw-rw 1 root disk 179, 64 May 13 11:17 /dev/	mmcblk1boot1
brw-rw 1 root disk 179, 1 May 13 11:17 /dev/	mmcblk1p1
brw-rw 1 root disk 179, 10 May 13 11:17 /dev/	mmcblk1p10
brw-rw 1 root disk 179, 2 May 13 11:17 /dev/	mmcblk1p2
brw-rw 1 root disk 179, 3 May 13 11:17 /dev/	mmcblk1p3
brw-rw 1 root disk 179, 4 May 13 11:17 /dev/	mmcblk1p4
brw-rw 1 root disk 179, 5 May 13 11:17 /dev/	mmcblk1p5
brw-rw 1 root disk 179, 6 May 13 11:17 /dev/	mmcblk1p6
brw-rw 1 root disk 179, 7 May 13 11:17 /dev/	mmcblk1p7
brw-rw 1 root disk 179, 8 May 13 11:17 /dev/	mmcblk1p8
brw-rw 1 root disk 179, 9 May 13 11:17 /dev/	mmcblk1p9
brw-rw 1 root disk 179, 96 May 13 11:17 /dev/	mmcblk1rpmb
root@linaro-alip:~#	

Step 3: Erase and write





1. This operation **may damage the data stored** in SD card. Please make sure there is no critical data in the SD card being used for this test.

5.3 LAN Test

Setting: Check current IP config.

root@linaro-alip:~# ifconfig
docker0: flags=4099 <up,broadcast,multicast> mtu 1500</up,broadcast,multicast>
inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
ether 02:42:6e:e0:f5:1d txqueuelen 0 (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
eth0: flags=4163 <up,broadcast,running,multicast> mtu 1500</up,broadcast,running,multicast>
inet 172.21.73.59 netmask 255.255.255.0 broadcast 172.21.73.25
inet6 fe80::4c09:22d0:33b7:b6e2 prefixlen 64 scopeid 0x20 <link< td=""></link<>
ether c4:00:ad:7e:36:4b txqueuelen 1000 (Ethernet)
RX packets 455668 bytes 31841973 (30.3 MiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 615 bytes 73597 (71.8 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
device interrupt 24
lo: flags=73 <up,loopback,running> mtu 65536</up,loopback,running>
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10 <host></host>
loop txqueuelen 1 (Local Loopback)
RX packets 338 bytes 22910 (22.3 KiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 338 bytes 22910 (22.3 KiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
root@linaro-alip:~#



Setting: Enable eth0 with static IP, such as 192.168.1.84

Modify /etc/network/interfaces file as follows,



And then restart network service or reboot system, then ip address will be 192.168.1.184.

5.4 UART Test

Test COM1 rs-232,the identified node is /dev/ttyS4.

Users can use "minicom" tool to test the transceiver between two serial ports.

```
root@linaro-alip:~# minicom -s
```

and then user can see:



Select "Serial port setup", and then user can see:



+	+
· A - Serial Device	: /dev/modem
B - Lockfile Location	: /var/lock
C - Callin Program	:
D - Callout Program	:
E - Bps/Par/Bits	: 115200 8N1
F - Hardware Flow Control	: Yes
G - Software Flow Control	: No
Change which setting?	
+	

Input A, change serial device to "/dev/ttyS4", and user can also change other settings. Finished the setting then save as default.



The same settings are made for the other device which serial is tested with the PPC-1xxw device serial port. And then user can input any character with the keyboard at the ppc-1xxw,the other device's console will receive the character. And user input any character with the keyboard at the other device, the ppc-1xxw will also receive the character.

5.5 Brightness Test

Get brightness value:

root@linaro-alip:~# cat /sys/class/backlight/backlight0/brightness	
200	

Set brightness value: You can set the value from 0~255. Please notice that value 0 will let the screen be black.:

Set 0:



root@linaro-alip:~# echo 0 >/sys/class/backlight/backlight0/brightness

set 255:

root@linaro-alip:~# echo 255 >/sys/class/backlight/backlight0/brightness

5.6 USB Test

Step 1: Insert USB flash disk then assure it is in ppc-1xxW device list

Step 2: Erase and check

Step 3: Write and check





1, This operation **may damage the data stored** in USB flash disk.Please make sure there is no critical data in the USB flash disk being used for this test.

5.7 Date and time configuration

Set system time (2019/01/01 13:25:00):



root@linaro-alip:~# date -s "2019/01/01 13:25:00"

Synchronize time from the NTP server:

root@linaro-alip:~# ntpdate <NTPSERVERIP>

Reset RTC hardware clock time (use current system time):

root@linaro-alip:~# hwclock -w

Reset system time (use RTC hardware clock time):

root@linaro-alip:~# hwclock -s

Set system time zone (use Shanghai time):

root@linaro-alip:~# cp /usr/share/zoneinfo/Asia/Shanghai /etc/localtime

root@linaro-alip:~# sync

5.8 SSH service

OpenSSH is the premier connectivity tool for remote login with the SSH protocol. It encrypts all traffic to eliminate eavesdropping, connection hijacking, and other attacks. Usage:





5.9 packages install

Install packages:

sudo apt-get install packagename

Remove packages:

sudo apt-get remove packagename

6 Debug console

6.1 Prepare

Before testing PPC-1xxW, please install the putty tool on the host PC.

https://www.putty.org/

		Interspectory and AVV sees Interface in the sound's seemal to the figure of finitesis Difference on the figure of the set of the set of the set of the set of the set	Download PuTTY
	1111111	Last and a state state state from laster lines laster lines laster lines	PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers.
	12	Construction and Construction	You can download PuTT <mark>here</mark> .

Connect the PC to PPC-1xxW debug port.

Then you can use putty to connect to the PPC-1xxW in following step.

6.2 Use debug console

Step1: Check the debug COM port you connect

Desktop -> my computer -> property -> device manager -> COM&LPT

🔀 PuTTY Configuration	×	🕵 PuTTY Configuration		×
Conserver - Logging - Terminal - Reyboard - Bell - Features - Window - Appearance - Behaviour - Translation - Selection - Colours - Conours - Conours - Proxy - Teinet - Riogin - Sth - Serial	Basic options for your PuTTY session Specify the destination you want to connect to Serial lige Speed COM3 115200 Connection type: Image: Comparison of the second session Saved Sessions Second TPC-71W Load Default Settings Load TPC-71W Save Default Settings Load TPC-71W Save Older Consection of the second s	Category: - Session - Logging - Terminal - Features - Wendow - Appearance - Behaviour - Translation - Selection - Colours - Colours - Colours - Data - Proxy - Telnet - Riogin - SSH - Sensi	Options controlling le Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Flow control	COM3 COM3 115200 8 1 None ~ XON/XOFF ~
About	<u>O</u> pen <u>C</u> ancel	About	Ор	en Cancel

Step2: putty Configure



Step3: Power on PPC-1xxW and login .



7 System Update

There are two ways to update the system • One is using AndroidTool to update system, the other is using "UpdateEngin" command to update system.

7.1 AndroidTool update system

Step 1 : Use USB OTG to connect PPC-1xx device and PC

Step 2 : Open AndroidTool.exe

#		Address	Name	Path	
L I	◄	0x00000000	loader	\rockdev\Image\MiniLoaderAll.bin	
2	•	0x0000000	parameter	\rockdev\Image\parameter.txt	
3	•	0x00004000	uboot	\rockdev \Image \uboot. img	
4		0x00006000	trust	\rockdev \Image \trust. img	
5	•	0x00008000	misc	\rockdev \Image \misc. img	
6	•	0x0000A000	boot	\rockdev \Image \boot. img	
7	•	0x0001A000	recovery	\rockdev \Image \recovery. img	
3	•	0x0003A000	oem	\rockdev \Image \oem. img	
9	•	0x0005A000	board_info	\rockdev \Image \board. img	
10	•	0x0005A040	rootfs	\rockdev \Image \rootfs. img	
11		0x0105A040	userdata	\rockdev \Image \userdata. img	
<)
			Run	Switch Dev Partition C	oor
ad	ler Ve	er:1.19	Ruli	Switch Dev Partition C	ear
			P 1.0	100 0 1	_
			Found 0	ng ADR Device	

Step 3 : Reboot ppc-1xx, and enter uboot, then input "rbrom" command



CIV: (wheet arm): enter 816000 VUg init 816000 VUg kernel (N/A)
City: (uboot, armb, onter 24000 kilz, init 01000 kilz, kernel 01/a)
CLK: (LDOOT. armb) enter 24000 KHz, Init 24000 KHz, Kernel ON/A)
apii 856000 kHz
cpl1 24000 KHz
gp11 800000 KHz
npll 600000 KHz
vpll 24000 KHz
aclk_perihp 133333 KHz
hclk_perihp 66666 KHz
pclk_perihp 33333 KHz
aclk_perilp0 266666 KHz
hclk perilp0 88888 KHz
pclk perilp0 44444 KHz
hclk perilp1 100000 KHz
pclk perilp1 50000 KHz
Net: No ethernet found.
Hit key to stop autoboot('CTRL+C'): 0
=> <interrupt></interrupt>
=> <tnterrupt></tnterrupt>
=> <twterript></twterript>
=> <interrupt></interrupt>
=> <tnterript></tnterript>
Throw the second s

Step 4 : Click the execute button, In AndroidTool

KDe	vTo	ol v2.69			-	
wnlo	ad I	nage Upgrade	Firmware Adv	vanced Function	Get FlashInfo Success Prepare IDB Start Prenare IDB Success	
#		Address	Name	Path	Download IDB Start	
1	~	0x00000000	loader	\rockdev\Image\MiniLoaderAll.bin	Download IDB Success	
2	~	0x00000000	parameter	\rockdev\Image\parameter.txt	Wait For Maskrom Start	
3		0x00004000	uboot	\rockdev \Image \uboot. img	Wait For Maskrom Success	
4	~	0x00006000	trust	\rockdev\Image\trust.img	Test Device Start	
5	~	0x00008000	misc	\rockdev \Image \misc. img	Test Device Success	
6		0x0000A000	boot	\rockdev \Image \boot. img	Download Opt (100%)	
7		0x0001A000	recovery	\rockdev\Image\recovery. img	Dewpleed wheet (100%)	
8	~	0x0003A000	oem	\rockdev\Image\oem.img	Start to download trust	
9		0x0005A000	board_info	\rockdev \Image \board. img	Download trust (100%)	
10		0x0005A040	rootfs	\rockdev \Image \rootfs. img	Start to download misc	
11		0x0105A040	userdata	\rockdev\Image\userdata.img	Download misc (100%)	
					Start to download boot	
					Download boot (100%)	
C					Start to download recovery	
oad	der Ve	er:1.19	Run	Switch Dev Partition Clear	Start to download com	
					Download cem (100%)	
					Start to download board	
					Start to download rootfs	
		Fo	ound One	MASKROM Device	Download rootfs (19%)	

Step 5: Then wait for update, The system will restart automatically after the update is completed.

7.2 updateEngine update system

Step 1 : Copy the update.img to /userdata directory.



Step 2 : Execute the following command

```
1 updateEngine --image_url=/userdata/update.img --misc=update --
savepath=/userdata/update.img --reboot &
```

Step 3 :Then wait for update, The system will restart automatically after the update is completed.

8 User development

Users can use gcc to develop their own applications on the rk3399-ppc-1xxw-debian9.

For example, a simple demo as follows, Write a simple program demo.c



And then write a "Makefile" file as follow:



Then you can perform as follows:



The file "demo" is the executable file user developed.