

Nano PC User's Manual



REVISION	ORIGINATOR	SCR	REV DATE
0.1.0	Guangzhou FriendlyARM Co., Ltd		Jan 24, 2014
Guangzhou Fri	endlyARM Computer Tech Co., Ltd (Confidential:	Cuongzhou Friendly APM
This document a	nd information contained in it shall not	be reproduced	Computer Tech Co. Ltd
by, used by, or	disclosed to others except as expressly a	uthorized in	Computer Tech Co., Ltd
writi	ng by Guangzhou FriendlyARM Co., Lt	td.	Guangznou, China

Copyright@2013

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 1 - 页



Complete ARM Solutions Design, Development and Manufacturing Expertise on Embedded Linux, Android, WindowsCE

COPYRIGHT STATEMENT

The content (content being images, text, programs and scripts) of this English manual is copyright © Guangzhou FriendlyARM Computer Tech Co., Ltd. All rights expressly reserved.

Any content of the manual printed or downloaded may not be sold, licensed, transferred, copied or reproduced in whole or in part in any manner or in or on any media to any person without the prior written consent of Guangzhou FriendlyARM Computer Tech Co., Ltd including but not limited to:

- transmission by any method
- storage in any medium, system or program
- display in any form
- performance
- hire, lease, rental or loan

Requests for permission to reproduce material from this manual should be addressed to Guangzhou FriendlyARM Computer Tech Co., Ltd.



Complete ARM Solutions

Design, Development and Manufacturing

Expertise on Embedded Linux, Android, WindowsCE

Index

1 INTRODUCTION	4 -
1.1 NANO PC BOARD	5 -
1.1.1 Nano PC Hardware Feature	5 -
2 GET STARTED	8 -
2.1 BURNING SUPERBOOT TO SD CARD	8 -
2.2 FLASH MI-BOX TO NANO PC	11 -
2.2.1 Steps to Flash Mi-Box to Nano PC	- 12 -
2.2.2 HDMI Output	13 -
2.2.3 Network Connection	16 -
3 COMMUNITY AND SUPPORT	- 18 -
APPENDIX I NANO PC SCHEMATIC	19 -

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第-3-页



Complete ARM Solutions Design, Development and Manufacturing Expertise on Embedded Linux, Android, WindowsCE

1 Introduction



Nano PC Board

The Nano PC board is a Cortex-A9 embedded processing board that uses the Samsung Exynos4412 Quad-Core System On Chip (SOC).



Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 4 - 页

The Exynos4412 integrates the Mali-400 MP GPU graphic engine with hardware support for 3D and can drive video playing on screens up to 1080P. These features make it easily and widely used in MID development, Android notepads, auto electronic devices, industrial applications, GPS systems and multimedia systems.

Complete ARM Solutions

Design, Development and Manufacturing

Expertise on Embedded Linux, Android, WindowsCE

1.1 Nano PC Board

The Nano PC standard version integrates 1G DDR3 RAM and 4G eMMC flash memory.



1.1.1 Nano PC Hardware Feature

Friendly	Complete ARM Solutions Design, Development and Manufacturing Expertise on Embedded Linux, Android, WindowsCE
CPU	 Samsung Quad-Core Exynos 4412, based on Cortex-A9, 1.5GHz Integrated ARM Mali-400 Dual-Core GPU
	 Elegent 2D/3D graphic accelaration Up to 1080p@30fps hard decoded video playing, support MPEG4, H.263, H.264 etc Up to 1080p@30fps hard decoded (Mpeg-2/VC1) video input
DDR3 RAM	 IG 32bit data bus, single channels 400 M Hz
FLASH	• eMMC Flash: 4GB
LCD	 LCD interface : 40Pin, 0.5mm spacing, compatible with Mini2440/Tiny4412/Mini210S LCD, supports one wire precise touching HDMI high definition interface (Type A) LCDs supported from 3.5" to 12.1", HD
Network	• 10/100M Ethernet interface(RJ45) using DM9621
Standard Configuration	 1 x microUSB Slave-2.0 1 x 3.5mm stereotype audio output 1 x USB Host 2.0 1 x 5V power input
On Board Hardware Resource	 1 x backup battery for on board real time clock 2 x LED 2 x User button 1 x Reset button 1 x Encryption chip(AT88SC0104C-SH) 1 x Fuse(2A)

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com



Friendly	Complete ARM Solutions Design, Development and Manufacturing
	Expertise on Embedded Linux, Android, WindowsCE
External Resource	• $4 \times TTL$
	• 2 x GPIO
	• 1 x CMOS camera interface
	• 1 x MIPI camera interface
	• 1 x Digital sensor
Power	• 5V
PCB Dimension	• Eight layered board
	• Dimension: 100 x 60 (mm)
OS	• Android 4.0/4.2
	• Ubuntu-1204
	• Linux + Qt/Embedded-4.8.5

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 7 - 页



2 Get Started

We provide various OS image files. Users can flash those files to the board via an SD card. We will guide you through these steps in this chapter.

2.1 Burning Superboot to SD Card

In order to boot from an SD card, you need to burn BIOS to it. FriendlyARM offers a flashing utility: SD-Flasher.exe which can burn our Bootloader (Superboot4412.bin) to an SD card.

We tested the following steps on Windows7

Note: users complained that some notebook's integrated SD card reader cannot work properly with card burning or reading. So far we haven't encountered this issue and we suggest that you should try a common card reader in this case.

Our SD-Flasher.exe formats a 130M space for the bootloader therefore an SD card whose memory is less than 256M cannot work and we recommend using one whose memory is at least 4G

Step1: launch the SD-Flasher.exe in your shipped CD (under "\tools\"). Note: this program should be run as "administrator"

😂 SD-F	0	7:46 PM	Application	12,213 KB
📗 Activ	Deserved a la l	.0 6:27 PM	File folder	
📗 Sync	Run as administrator	.0 6:27 PM	File folder	
l dow	I roubleshoot compatibility	0.6·27 PM	File folder	

When the utility is launched a message box will pop up "Select your Machine...",

Address:	Room 1705, Block A1, Lon	gyuan Plaza, Longkouxi Road	, Guangzhou, China, 510640	Website:	http://www.arm9.net
Sales:	+86-20-85201025	Tech Support: +8	6-13719442657	Fax:	+86-20-85261505
Email for	Business and Cooperation:	capbily@163.com	Email for Tech Supp	ort: dev_f	riendlyarm@163.com

第-8-页



🔄 Select your Machine 🔋 💌
Machine Type
🔘 Mini6410/Tiny6410
Mini210/Tiny210
Mini2451/Tiny2451
Mini4412/Tiny4412
Next

Below is the dialog you will see after it is started. Note: the "ReLayout" is enabled and we will format the SD card with this function.

6	FriendlyARM SD Memory Card Fusing Tool	100.00	
	Image File to Fuse		
	D:\superboot\superboot-20110511.bin		
	SD Drive(s)		
	Name Physical Disk# Size La	oel Available Result	Scan
	Reports		
			Fuse
	Designed by FriendlyARM All rights reserved. www.arm9.net	mat! ReLayout! Quit	Ver: 1117
Step2: click on	to select your bootloade	r file	
Address: Room 1705,Block A1 Sales: +86-20-85201025 Email for Business and Cooperat	, Longyuan Plaza, Longkouxi Road, G Tech Support: +86-1 ion: <u>capbily@163.com</u>	uangzhou, China, 510640 3719442657 Email for Tech Sup	Website: <u>http://www.arm9.net</u> Fax: +86-20-85261505 port: dev_friendlyarm@163.com
ľ			笛 .9. 而

页

lenalyA	RM SD Memory	Card Fusir	ng Tool			
Image F:	ile to Fuse					
E:\work	NanoPC-4412\tv-	rom\images	Superboot4412. b	in		
SD Driv	e (s)					
Name	Physical Disk#	Size	Label	Available	Result	
H:	Disk 1	3781M	FRIENDLYARM	Yes		8
						Scan
Roports						
Scannir	15					
Found 1	Disk(s)					72
						fuse

Step3: insert a FAT32 SD card into your host's SD card socket (you can also use a USB card reader to connect to a PC), backup your data in the card and click on "Scan", all recognized SD cards will be listed.

Step4: click on "ReLayout", the following dialog will pop up prompting you that the data in your card will be lost. Just click on "Yes"



After formatting is done you will be directed back to the main menu. Click on "Scan", you will see that a "FriendlyARM" section available.



Step5: click on "Fuse", Superboot will be safely burned into the SD card. You can burn

this card in WindowsXP without worrying about its FAT32 data being lost or damaged.

	4412-20130706\im	ages\Tiny44	12-Boot.bin			
D Drive Name I:	(s) Physical Disk# Disk 3	Size 7584M Ff	Label RIENDLYARM	Available Yes	Result Succeeded	Scan
eports	 Imaga					^
rusing. u-boot						

2.2 Flash Mi-Box to Nano PC

The Mi-Box system is a customized Android system dedicated for TV or HDTV output. It can be used as a multi-media platform for TV-Box, Android advertisement machines, LCD touch machines etc.

It supports AirPlay, HDMI output, various HDMI resolutions, HDMI zoom out/in, USB WiFi, USB touch screen etc.



2.2.1 Steps to Flash Mi-Box to Nano PC

Step 1: Please download the image files from http://pan.baidu.com/s/1jGDiAAa.

After the download you will get a tiny4412-tv-images-20140103.7z file. Please uncompress it you will get a "tv-rom" directory.

Step 2: Copy the image files to SD card.

Under the "tv-rom" there is an "images" directory. Please copy the whole "images"

directory to the root directory of your SD card.

Step 3 Flash Nano PC

Insert the SD card to your Nano PC and remove the jumper indicated in the picture below. This will boot the board from the SD card. Then power on the board and it will be flashed with the Mi-Box image



Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 12 - 页



2.2.2 HDMI Output

We can connect a Nano PC to an HDMI TV. Here are the steps:

Step 1: Please connect the Nano PC to a TV via HDMI

Step 2: Please hook up a USB mouse and keyboard



Step 3: Power on the Nano PC with the boot option being "EMMC" (hook up

the boot option jumper)

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 13 - 页



Step 4: Set up HDMI Resolution

The default resolution is 1080P. You can change it in "Settings"



Click on "Display"

×				⊿ 🗎 11:42
Wi-	Fi			
	WIRELESS & NETWORKS			
	🕏 Wi-Fi Off		Brightness	
	Bluetooth OFF		Wallpaper	
	More		Sleep After 3 weeks of inactivity	
	DEVICE			
	🐠 Sound		Daydream	
	🗘 Display		Font size	
	🚍 Storage			
	Battery		Pulse notification light 🛛 🗹	
	🛃 Apps		НДМІ	
	PERSONAL			
	Occation access			
		5		

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com



Complete ARM Solutions Design, Development and Manufacturing

Expertise on Embedded Linux, Android, WindowsCE

Click on HDMI

			🛆 📋 11:43
Wi-	Fi		
	WIRELESS & NETWORKS	ADDED DISPLAY: HDMI	
	🗢 Wi-Fi Off	Width OverScan	
	Bluetooth OFF	Height OverScop	
	More		
	DEVICE	Aspect Ratio	
	∮ ิ 9 Sound	Keep Equal Proportion	
	Display	Resolution	
	🚍 Storage	ß	
	Battery		
	🖄 Apps		
	👤 Users		
	PERSONAL		
	Location access		

Click on "Resolution"

						⊿ 🖹 11:43
Wi-F						
	wireless & netwop 🛜 Wi-Fi	Resolution				
	Bluetooth	480p 59Hz			0	
	More	720p 60Hz				
		720p 50Hz				
	∮ ୬ Sound	1080p 60Hz				
	🏶 Display	1080p 50Hz				
	Storage	1080p 30Hz				
	Battery	1080i 60Hz				
	🖄 Apps	1080i 50Hz				
				Cancel		
			\hookrightarrow	\bigcirc		

Now you can select the resolution you prefer

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 15 - 页



2.2.3 Network Connection

By default after you connect the Nano PC to Ethernet you will be able to

surf the internet without any additional configurations



You can connect the Nano PC to WiFi as well following the steps below:

Step 1: Plug a USB WiFi dongle

Step 2: Go to "Settings -> WiFi"

				⊿∎	14:35
📑 Set	tings		()	+	:
	WIRELESS & NETWORKS	FriendlyARM Secured with WPA/WPA2 (WPS available)	¢.		
	🕏 Wi-Fi on	FriendlyARM-Pub Secured with WPA/WPA2	¢.		
	Bluetooth OFF	ChinaNet-jnfk Secured with WPA/WPA2 (WPS available)	<u></u>		
	DEVICE	HS Secured with WPA	÷.		
	Sound	ssk-2206-2.4 Secured with WPA/WPA2 (WPS available)	₹.		
	E Storage	ChinaNet-E5Cc Secured with WPA (WPS available)	.		
	Battery	jovo1 Secured with WPA2 (WPS available)	.		
	🛃 Apps				
	👤 Users	WirelessNet	.		
	PERSONAL				

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com



Step 3: Select a source, type the password and click on "Connect"

*							Δ	14:38
Settings						()	+	
WIRELESS & NETWO	DRKS	Friendly Secured v	/ARM-Pub vith WPA/WPA2			(Ç.		
🗢 Wi-Fi		ChinaN				¢.		
🚯 Bluetooth	FriendlyARM					0		
More	Signal strength	Excellent				Ψ.		
DEVICE	Security	WPA/WPA2 PSK				(Ça		
ଏ ୬ Sound	Password		•					
Display 🗘		Show password						
📕 Storage	Show advanced options	N			N			
Battery	Cancel	Connect K			4			
🛃 Apps								
👤 Users								
PERSONAL								
	÷							

2.2.4 Volumn Control

You can turn up or down the volumn by pressing "K1" or "K2". Pressing "K1" turns up the volumn and pressing "K2" turns it down

第 - 17 - 页



3 Community and Support

- Official site: <u>http://www.arm9.net/nanopc-t1.asp</u>
- Chinese site:<u>http://www.arm9home.net</u>
- English site:<u>http://www.friendlyarm.net</u>
- Email: tan_friendlyarm@sina.com

Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 18 - 页



Address:Room 1705,Block A1, Longyuan Plaza, Longkouxi Road, Guangzhou, China, 510640Website:http://www.arm9.netSales:+86-20-85201025Tech Support: +86-13719442657Fax:+86-20-85261505Email for Business and Cooperation:capbily@163.comEmail for Tech Support: dev_friendlyarm@163.com

第 - 19 - 页