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TAO-3530 System on Module

TAO-3530 USER'S GUIDE 097 | 10/18/2013, TechNexion

10/18/2013, TechNexion



TAO-3530

TAO-3530 System on Module

and its Baseboards

User's Guide

Rev 0.97

1	Contents			
2	2 Revision			
3 Care and maintenance				
	3.1	General	7	
	3.2	Regulatory information	7	
4	Intr	oduction1	.0	
5	Get	started1	.1	
	5.1	First time use Tsunami baseboard XL (7" LCD)1	.1	
	5.2	First time use Tsunami baseboard (4.3" LCD)1	.4	
	5.3	First time use Thunder baseboard1	.7	
	5.4	First time use Inferno baseboard2	.1	
	5.5	Explanation of the TAO-3530W System on Module2	5	
	5.6	Explanation of the TAO-3530 System on Module2	6	
	5.7	Explanation of the Tsunami Baseboard2	7	
	5.8	Explanation of the Thunder Baseboard3	0	
	5.9	Explanation of the Inferno Baseboard3	2	
6	Me	chanical Dimensions3	4	
	6.1	Inferno Baseboard dimensions3	4	
	6.2	Thunder Baseboard dimensions3	4	
	6.3	Tsunami Baseboard dimensions3	5	
7	Har	ddisk placement (Tsunami)3	6	
8	Dov	vnloads and drivers3	7	
9 Software – Factory Default Screen		ware – Factory Default Screen3	8	
	9.1	Automatic check for updates	8	
	9.2	Installing Linux	9	
	9.3	Installing Android3	9	
	9.4	What to do if your development kit does not have the factory default screen	0	
	9.4.	1 Create the SD-card with the rescue image in a Windows environment4	0	
9.4		2 Create the SD-card with the rescue image in a Linux environment4	3	
	9.4.	3 Installing the rescue image on the baseboard with the SD-card4	5	
9.4.4		4 Factory Default Home Screen	6	

10	LO Connecting a null modem cable47				
11	11 Software – Linux53				
11.1	11.1 Introduction				
11.1	Qui	ck install guide for installing a cross-compiler.	53		
11.2 XUKR build instructions					
11	1.2.1	X-loader	54		
11	1.2.2	U-boot	55		
11	1.2.3	Kernel	55		
1	1.2.4	Root filesystem	56		
11.3	B Com	npiling for TAO-3530	56		
11	1.3.1	QT	57		
11.4	l Basi	ic components of a bootable Linux SD card:	57		
11.5	5 Mar	nual NAND Installation	58		
11.6 How to			60		
11	1.6.1	How to calibrate the touch screen in Linux	60		
11	1.6.2	How to use OPKG	61		
11	1.6.3	How to enable wireless	62		
11	1.6.4	How to do low level debugging (advanced)	63		
12	Softwa	are - Android	64		
12.1	Hov	v to install an Android application on TechNexion baseboards	64		
12.2	2 Hov	v to install an android application with an internet connection	70		
12.3	B ADE	3 - Installing applications	77		
12	2.3.1	Windows	77		
12	2.3.2	Linux	83		
12	2.3.3	ADB Functions	85		
13 Softw		are - Windows Embedded Compact 7	86		
13.1	Wai	rning	86		
13.2	2 Upd	late to the latest Windows Embedded Compact 7	86		
13.3	6 Get	the BSP	86		
13	3.3.1	Download the BSP from the web-Site	86		
13.3.2		Install BSP to "Platform Builder"	87		

13.4	Crea	ate the files for a SD card	87
13.5	Crea	ating the SD card	90
13.6 Sta		ting HyperTerminal	95
13.6.1		Checking if the NAND of the Development kit is empty	97
13.7 Esta		ablish a serial connection	99
13.7	7.1	Transfer a file to the development kit	100
13.8	Boo	t from SD-card	104
13.9	Enal	ble the development kit to boot from NAND	105
14 S	oftwa	are - Windows CE6	106
14.1	14.1 Warning		
14.2	Upd	late to Windows Embedded CE6.0 R3	106
14.3	Get	the BSP	106
14.3	3.1	Download the BSP from the web-Site	106
14.3	3.2	Install BSP to "Platform Builder for CE 6.0".	106
14.4	Crea	ate a SD card	112
14.5	How	v to put the WinCE image in the NAND Flash	124
14.5	5.1	Create file "NK.nb0"	124
14.5	5.2	Write the Bootloader and OS image to the NAND Flash.	128
14.5	5.3	Boot from NAND flash	141
14.6	Crea	ate a new project using TN_TAO_3530 BSP	146
14.6	5.1	Compile project	158
14.7	How	v to change the logo that you see during boot up	164
14.7	7.1	Preparing the BMP	164
14.7	7.2	Change the makefile.inc	164
14.7	7.3	Calculate the needed blocks	164
14.7	7.4	Change image-cfg.h	166
14.7	7.5	Compile	166
14.7	7.6	Put in NAND	166
15 A	ppen	dix – Module	167
15.1	ΤΑΟ	0-3530 System on Module Dimensions	167
15.2	Мос	dule Connectors	168

10/18/2013, TechNexion

15.3	Nut to Fix TAO-3530 Module to the Baseboard169
15.4	TAO-3530 JTAG Solder points
16 A	Appendix - Schematics
16.1	Inferno baseboard schematics172
16.2	Thunder baseboard schematics
16.3	Tsunami baseboard schematics
17 A	Appendix - Pin outs
17.1	Module connector B1194
17.2	Module connector B2196
17.3	SPI1199
17.4	UART 3
17.5	Pin header for VGA connector
17.6	LVDS connector
17.7	Thunder expansion pin header
17.8	Battery connector
17.9	Inferno Expansion Pin Header207
17.10	RS-232 cable

2 Revision

Revision	Date	Description	Created by
0.97	18/10/2013	Add revision table,	TechNexion
		Add Chapter Software - Windows Embedded Compact 7	
		Change manual NAND installation instructions	

3 Care and maintenance

3.1 General

Your device is a product of superior design and craftsmanship and should be treated with care. The following suggestions will help you.

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty, dirty areas. Its moving parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not attempt to open the device.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Do not paint the device. Paint can clog the moving parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

These suggestions apply equally to your device, battery, charger, or any enhancement. If any device is not working properly, take it to the nearest authorized service facility for service.

3.2 Regulatory information

Disposal of Waste Equipment by Users in Private Household in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is

recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

TechNexion Ltd.

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The Compliance of RoHS New Requirement

According to the new requirements in directive 2002/95/EC, DecaBDE is added with specification starting by July 1, 2008 as follows:

Cadmium (Cd)	: Under 100ppm
Lead (Pb)	: Under 1000ppm
Mercury (Hg)	: Under 1000ppm
Hexavalent Chromium (Cr6)	: Under 1000ppm
PBB	: Under 1000ppm
PBDE (include DecaBDE)	: Under 1000ppm

Please confirm and send back, thanks.

RoHS Compliance Statement

We aware the change in this directive and our product can meet this new specification as above.



Company Stamp

Page . .



Federal Communications Commission (FCC) Unintentional emitter per FCC Part 15

requirements and other relevant provisions of European Directive 1999/5/EC (radio equipment and telecommunications terminal equipment Directive).

We hereby declare that the product is in compliance with the essential

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential

installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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



WARNING! To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC

adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

4 Introduction

The TAO-3530 System on Module (SOM) is a small computer that can be clicked in a baseboard with several IO's to form a full computer. Each base board can be developed with IO's in different places and with different functions. The Idea behind the product is that anyone can develop a base board suitable for their needs and just plug in the SOM. This will make the system very flexible and faster to develop and cheaper than developing a single board solution, because all the hard work is already completed within the SOM module.

Anybody can buy a TAO-3530 and a Baseboard from our website.

The development kits are meant to test your software on the platform. In the same time you can develop your own baseboard with the IO's on the place you need. When your own baseboard is ready, the module can be plugged into your own baseboard to complete the project.

The TAO-3530 system and its baseboards come in different versions, the user's guide is meant as a general guide for all these versions. Pictures and details of the device can differ from the actual purchased product. All specifications are subject to change without notice.

One can always check our website (<u>www.technexion.com</u>) for more details, to download this user guide or to see other information.

5 Get started

5.1 First time use Tsunami baseboard XL (7" LCD)

This guide describes how to put the TAO-3530W module and the Tsunami interface board together, how to connect the LCD and power up the board.



Figure 1: Step 1 -After clicking the module onto the board. Use a small Philips screwdriver and fix the module on the interface board. By doing so you guarantee the connection is firm and solid.

Connecting the 7" LCD touch panel (XL version) to the Tsunami interface board should be done by following the following steps.

Please make sure to gently open/close the connector and handle the FPC connector at the LCD and the LCD panel itself with care.

(Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)



Figure 2: Step 2a - Pull the connector, on the topside of the PCB, sideward open with your nail.



Figure 3: Step 2b - Insert the LCD panel FPC. And push the connector sideways to close



Figure 4: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

Step 3b - Use the USB cable and connect to a USB or computer system. The cable should only be inserted into the USB port shown above. Connect the adapter to power the Tsunami interface board and the LCD. (The power cord is not included in the pack; please get one with a plug that fits your local power outlet)

Step 4 - Use the spacers (stand offs) for a stable placement, to prevent shorts on conducting surfaces and to allow free airflow for cooling.

Step 5 - for better WIFI reception connect the antenna to the U.FL (IPEX) connector on the TAO-3530W module.

5.2 First time use Tsunami baseboard (4.3" LCD)

Connecting the 4.3" LCD touch panel (Standard version) to the Tsunami interface board should be done by following the following steps.

Please make sure to gently open/close the connector and handle the FPC connector at the LCD and the LCD panel itself with care.



Figure 5: Step 2a - Pull the connector at the bottom side of the Tsunami baseboard sideward open with your nail.

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Figure 6: Step 2b - Insert the LCD panel FPC. And push the connector sideways to close



Figure 7: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

Step 3b - Use the USB cable and connect to a USB or computer system. The cable should only be inserted into the USB port shown above. Connect the adapter to power the Tsunami interface board and the LCD. (The power cord is not included in the pack; please get one with a plug that fits your local power outlet)

Step 4 - Use the spacers (stand offs) for a stable placement, to prevent shorts on conducting surfaces and to allow free airflow for cooling.

Step 5 - for better WIFI reception connect the antenna to the U.FL (IPEX) connector on the TAO-3530W module.

5.3 First time use Thunder baseboard

This guide describes how to put the TAO-3530W module and the Thunder interface board together, how to connect the LCD and power up the board.

Mount screws for correct and solid connection



Figure 8: Step 1 - After clicking the module onto the board. Use a small Philips screwdriver and fix the module on the interface board. By doing so you guarantee the connection is firm and solid.

Connecting the LCD touch panel to the thunder interface board should be done by following the following steps.

Please make sure to gently open/close the connector and handle the FPC connector at the LCD and the LCD panel itself with care.

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Figure 9: Step 2a - Open the connector with your nail. The black flip-type will stand up in an angle of about 90 degrees. The brown slide-type will open a little more than a millimeter



Figure 10: Step 2b - Insert the LCD panel FPC. There are 2 white horizontal lines on the end of the connector. The first line will nearly go into the connector but still remain visible. The line should be parallel to the connector itself.

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Figure 11: Step 2c - Close the connector to firmly lock the connection and avoid the panel to come loose.



Figure 12: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Outer row of pin header last 3 pins of the connector header). (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

Step 3b - Use the USB cable and connect to a powered USB hub or computer system to power the thunder interface board and the LCD. The cable should only be inserted into the USB port shown above.

Step 4 - Use the spacers (stand offs) for a stable placement, to prevent shorts on conducting surfaces and to allow free airflow for cooling.

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Figure 13: Step 5 - for better WIFI reception, connect the antenna to the U.FL (IPEX) connector on the TAO-3530W module.

5.4 First time use Inferno baseboard

This guide describes how to put the TAO-3530 module and the Inferno interface board together and how to connect cables to your development system.

Step 1 - After clicking the module onto the board. Use a small Philips screwdriver and fix the module on the interface board. By doing so you guarantee the connection is firm and solid.

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Mount screws for correct and solid connection



Figure 14: Step 2a - Connect the RS-232 serial console cable as on the picture below. (Outer pin header row last 3 pins of the connector header). (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)



Figure 15: Step 2b - Use the USB cable and connect to a powered USB hub or computer system to power the thunder interface board and the LCD. The cable should only be inserted into the USB port as shown in the photo.

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Figure 16: Step 3 - Use the spacers for a stable placement, to prevent shorts on conducting surfaces and to allow free airflow for cooling.

5.5 Explanation of the TAO-3530W System on Module





Figure 17: top and bottom view of TAO-3530W with wireless module

Top view

1 Wireless LAN 802.11b/g by SDIO MMC1 interface with IPEX U.FL connector (TAO-3530W = Wireless)

Bottom view

B1 <u>100 pin NAIS connector</u> (Panasonic AXK5S00247YG) (<u>http://www.panasonic-electric-</u>works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf)

B2 <u>100 pin NAIS connector</u> (Panasonic AXK5S00247YG) (<u>http://www.panasonic-electric-</u>works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf)

2 JTAG header

5.6 Explanation of the TAO-3530 System on Module





Figure 18: top and bottom view of TAO-3530

Top view

1

Bottom view

B1 <u>100 pin NAIS connector</u> (Panasonic AXK5S00247YG) (<u>http://www.panasonic-electric-works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf</u>)

B2 <u>100 pin NAIS connector</u> (Panasonic AXK5S00247YG) (<u>http://www.panasonic-electric-</u>works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf)

2 JTAG header



5.7 Explanation of the Tsunami Baseboard

Figure 19: top view Tsunami Baseboard



Figure 20: bottom view Tsunami Baseboard

- B1 Connector to the TAO-3530 CPU module
- B2 Connector to the TAO-3530 CPU module
- 1 connector for 7" LCD panel
- 2 Connector for 4 wire touch panel of LCD panel
- 3 Pin header for front connector
- 4 Power button
- 5 User definable button (in <u>Android</u> this can be used as the <u>BACK</u> button)
- 6 Pin header for RS-232
- 7 RTC Battery (CR-1220)
- 8 Mini SD card slot

- 9 S-video out
- 10 USG OTG
- 11 Speaker left
- 12 Speaker right
- 13 Microphone
- 14 Line in
- 15 Line out
- 16 S-video in
- 17 USB HOST (2x)
- 18 USB HOST (1x)
- 19 LAN
- 20 DVI-D by HDMI connector
- 21 12 V DC Power connector
- 22 Pin header for VGA connector
- 23 LVDS connector for LCD panel
- 24 LVDS Power Select switch
- 25 SATA connector for a 2.5" hard disk
- 26 LCD TTL Flat panel connector with touch screen to connect to 4.3 inch LCD panel



5.8 Explanation of the Thunder Baseboard

Figure 21: views of the Thunder Baseboard

- B1 Connector to the TAO-3530 CPU module
- B2 Connector to the TAO-3530 CPU module
- 1 Expansion header
- 2 Reset Button
- 3 User Definable Button
- 4 Power Button
- 5 Stereo audio out
- 6 Audio in
- 7 Speaker Left
- 8 Speaker Right
- 9 Battery interface
- 10 DC 5V input
- 11 DVI-D by HDMI connector
- 12 USG OTG + power functions
- 13 USB Host
- 14 RJ-45 LAN
- 15 3 axis G-Sensor
- 16 DC / Battery power switch
- 17 SD Card slot
- 18 LCD TTL Flat panel connector with touch screen to connect to 4.3 inch LCD panel

5.9 Explanation of the Inferno Baseboard









Figure 22: views of the Inferno Baseboard

- B1 Connector to the TAO-3530 CPU module
- B2 Connector to the TAO-3530 CPU module
- 1 <u>Expansion header</u>
- 2 Audio in
- 3 Stereo audio out
- 4 DVI-D by HDMI connector
- 5 USB OTG + power functions
- 6 DC 5V input
- 7 S-Video
- 8 USB Host
- 9 User Definable button
- 10 Reset button
- 11 Pin header for RS-232
- 12 SD Card slot

6 Mechanical Dimensions

6.1 Inferno Baseboard dimensions



Figure 23: Inferno Baseboard dimensions (Dimensions in mm)

6.2 Thunder Baseboard dimensions

Figure 24: Thunder Baseboard dimensions (Dimensions in mm)



Figure 25: Tsunami Baseboard dimensions (Dimensions in mm)



Figure 26: Step1 – Place the 2.5" hard disk in the connector as shown above.

Be careful not to break the connector, for example, when placing the PCB at the table or when taking it of the table. To relief the stress on the connector one can also buy an extension cable at a local electronics store.


8 Downloads and drivers

Downloads and other information can be found at the TechNexion website (<u>www.technexion.com</u> > support > download center)



Figure 27: The Download Center at the TechNexion website

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9 Software – Factory Default Screen



Figure 28: Factory Default Home Screen

All new development kits will show the Factory default Home Screen. We advise to make a

Rescue-SD card by pressing the icon. Please store this in a safe place, so restoring to the factory default is always possible.

In case the development kit does not have the factory default screen or the rescue-SD, is lost, then the rescue SD-card can always be created by downloading the rescue-SD image from the download center (see paragraph 9.4)

9.1 Automatic check for updates

The software is downloaded from the TechNexion servers to ensure you always have the most recent software.

The factory default screen will check automatically if it needs to be updated. The version number is shown in the bottom right corner. If the square is red it needs to check the server. When an update to the default screen is available it will prompt "new version available", please press the "Update" button.

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Figure 29 : the location of the factory default screen update button

9.2 Installing Linux

To install for example Linux; just press the Linux icon (make sure you are connected to the internet (with a LAN cable and DHCP) and insert an empty SD-card).

- "Linux (SD)" will make a SD-bootable card.
- "Linux (NAND)" will install in NAND Flash via the SD-card.

9.3 Installing Android

To install for example Android; just press the Android icon (make sure you are connected to the internet (with a LAN cable and DHCP) and insert an empty SD-card).

- "Android (SD)" will make a SD-bootable card.
- "Android (NAND)" will install in NAND Flash via the SD-card.

9.4 What to do if your development kit does not have the factory default screen

In case the development kit does not have the factory default screen or the rescue-SD, is lost, then the rescue SD-card can always be created by downloading the rescue-SD image from the download center at the TechNexion website (see below). Make sure you choose the correct image depending on the size of the LCD that comes with your development kit.

TAO-3530 Rescue SD Image for Thunderpack (with 4.3 inch screen)



		-
Description	TAO-3530 Factory default for Thunderpack	with 4.3 inch touchscreen
Revision	REV 0.53	
Date	11 November 2011	

TAO-3530 Rescue SD Image for Tsunamipack (with 4.3 inch screen)



			•		,
Description	TAO-3530 Factory defaul	t for Ts	unamipack [.]	with 4.3 inch t	puchscreen
Revision	REV 0.53				
Date	11 November 2011				

TAO-3530 Rescue SD Image for Tsunamipack-XL (with 7 inch screen)



Description	TAM-3517 Factory default for Tsunamipack-XL with 7 inch touchscreen
Revision	REV 0.53
Date	11 November 2011

Figure 30 : the rescue images on the download center. Make sure you choose the correct image.

9.4.1 Create the SD-card with the rescue image in a Windows environment

After downloading the rescue-image for your baseboard; extract it on your Windows computer



Figure 31: Extracted files

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Content of the zip-file:	Explanation
Making-a rescue-sd.pdf	This PDF document
Win32diskimager-release-0.3	Utility to write the image on a SD-card
Rescue-tsunami-070.img	Rescue image for Baseboard with 7" LCD



Figure 32: Extract and execute the win32-disk-imager to prepare the rescue image creation



Figure 33: example of converters to plug the Micro-SD in your computer

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👒 Win32 Disk Imager		
∼Image File		After inserting the SD-card click
Progress		the Refresh icon
Cancel Read Write Refresh the list of available devices	Exit	

Figure 34: Select the SD-card (in your computer) as device

Select a disk in	iage				? 🔀	
Save in:	🛅 rescue image		•	🗢 🗈 💣 🛽		
My Recent	rescue-blizzard	-070.img				
Documents						
Mu Documents						
My Computer						
My Network Places	File name: Save as type:	rescue-blizzard-070.img *.img;*.IMG		•	Save Cancel	
👒 Win32 Disk	mager					11.0
←Image File					1000	
Progress				100		
Cancel	Read	Write Exit		🔞 Folder Sync		
Address 🛅 C:\re	scue image					💌 🔁 Go
File and Fold	e r Tasks 🔕 w folder	Adobe Acro	scue-sd.pc bat Docum	lf ent	IMG File 64,512 KB	d-070.img

Figure 35: Select, browse and locate the rescue- image file

👒 Win32 Disk Imager	
- Image File	Device
C:/rescue image/rescue-blizzard-070.img	🖻 FI 🗸 🔊
Progress	
Cancel Read Write	Exit

Figure 36: Click the write button to create the rescue-image SD-card

After creating the SD-card on your Windows based Computer, take out the SD-card and proceed to chapter 2 of this guide, to install it on your development kit.

9.4.2 Create the SD-card with the rescue image in a Linux environment

After downloading the rescue-image for your baseboard; extract it on your Linux computer



Figure 37: Install the image writer on your Linux computer

Install the image writer:

apt-get install usb-imagewriter

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Figure 38: Start image writer (Applications>accessories>imagewriter)

🔞 ImageWriter					
ubuntu ImageWriter		LL.			
Write Image: 🛐 rescue-xxx.img	to 📔	Generic- I	Aulti-Card (/d	ev/sdb)	•
+ Details		Close	a Wri	ite to dev	ice
	0			2	

Figure 39: Select the downloaded image and destination (SD-card in your computer), click write to device



Figure 40: Press the "OK" button to confirm

9.4.3 Installing the rescue image on the baseboard with the SD-card



Notice! The following procedure can take up to **5 minutes** to complete.

Insert the newly created SD-card in your development kit and connect the power. The following screens will appear and complete the installation of the rescue-software automatically (See Figure 41 to Figure 44).



Notice! If your image does not run automatically, please do the following:

- 1. Disconnect the power to the board
- 2. Press the "User1" button and keep it pressed
- 3. Reapply the power to the board
- 4. Keep "User1' button pressed for 10 seconds



Figure 41: Installing the rescue image (factory default)



Figure 42: Installing the rescue image – Copying files



Figure 43: Installing the rescue image – Synchronizing File System



Figure 44: Installation complete - Take out the SD card and reboot.

9.4.4 Factory Default Home Screen



Figure 45: Factory Default Home Screen

The installation of the rescue-image is finished and the development kit will show the Factory default Home Screen.

10 Connecting a null modem cable



Warning! Installing software is not easy. Finish the procedure completely and be patient to let the compilation and installation finish.



Important! To install Windows CE or Linux, you need a null modem to <u>see</u> what is going on.

Connecting a null-modem cable



Figure 46: The cable (RS-232 to USB) with yellow mini-gender-changer-block connected to the Debug connector (see orange arrow for position of the white dot)



Figure 47: The cable (RS-232 to USB) with null-modem-block connected to the debug connector (see orange arrow for position of the white dot (note: turned 180 degrees))

Start PuTTY on your computer and make sure the "Options controlling local serial lines" are as Figure 48:

🕵 PuTTY Configuration	1	
Category:		
 Session Logging Terminal Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Serial 	Options controlling Select a serial line Serial line to connect to Configure the serial line Speed (baud) Data bits Stop bits Parity Elow control	g local serial lines
About		Open <u>C</u> ancel

Figure 48: Settings

For computers running a Windows Operating System more steps (see Figure 49 to Figure 51) might be required in order to check which serial line is used (see orange circle in Figure 48):



Figure 49: Right click on "My Computer" and select Properties

System Pro	perties			? 🔀
System	n Restore	Automatic	c Updates	Remote
General	Compu	uter Name	Hardware	Advanced
	Device Manager The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the			
		iy donico.	Device Ma	anager
Hardware	Drivers Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers. Driver Signing Windows Update Driver Signing Windows Update Hardware Profiles Hardware profiles provide a way for you to set up and store different hardware configurations.			
	Hardware <u>P</u> rofiles			
		OK	Cancel	Apply

Figure 50: Go to the hardware tab and select "Device manager"

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Figure 51: Under Ports (COM & LPT) you will see the baseboard connected with the null modem cable (in this picture COM3), this means in Putty the serial line should be changed into COM3.

- Go to Session and check if "specify the destination you want to connect to " is on Serial (See Figure 52)
- Push open and a window will pop up (see Figure 53)

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Reputity Configuration	n 🛛 🔀
Category: Session Logging Terminal Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Serial	Basic options for your PuTTY session Specify the destination you want to connect to Serial fige Speed COM3 115200 Connection type: Image: Speed Raw Image: Image: Image: Speed Load, save or delete a stored session Serial Saved Sessions Image: Image: Image: Speed 123 Image:
About	<u>Open</u> <u>Cancel</u>

Figure 52: check if serial is selected and then select open



Figure 53: PuTTY terminal window

• You will now be able to see what is going on during the installation.

• If nothing happens then please check the settings and check if the cable is correctly connected to the debug pin header. Sometimes cables are not inverted, which can be solved by turning around the connector to the debug pin header (white dot turns 180 degrees: pin 1 becomes pin 3, pin 3 becomes pin 1).

11 Software – Linux

11.1 Introduction

This Chapter explains how to use Linux and will mostly use a null modem and terminal to issue commands to the board. Technical Software knowledge is required.

For much easier installation of Linux please read the "factory default screen" chapter

Things to know in advance:

• We use Code Sourcery G++ 2010.09-50 (gcc 4.5.1)

Remember to use cross compile versions of all bintools:

export CC=arm-none-linux-gnueabi-gcc export AS=arm-none-linux-gnueabi-as export CPP=arm-none-linux-gnueabi-cpp etc.

- It is recommended to use a PC with a Linux environment (for example: Ubuntu, Fedora)
- U-boot#: Refers to commands executed under U-boot
- *devkit#*: Refers to commands executed under TAO-3530 Linux
- *Host#*: Refers to commands executed at PC

11.1 Quick install guide for installing a cross-compiler.

1. Choose your cross compiler.

TechNexion engineering uses CodeSourcery C++ Lite 2010.09-50:

https://sourcery.mentor.com/sgpp/lite/arm/portal/release1600

Other versions can work too: CodeSourcery C++ Lite 2009q1 is a popular version in the community.

2. Once installed, add the bin folder of the toolchain to your PATH

If your toolchain is installed in /opt/arm-2010.09, you should add /opt/arm-2010.09/bin/ to PATH

i.e:

PATH=/usr/bin:/opt/arm-2010.09/bin:.

Note: check that you added the right bin folder: do not add '/opt/arm-2010.09/arm-none-linux-gnueabi/bin/' !

3. Set your CROSS_COMPILE variable to the ABI prefix:

CROSS_COMPILE=arm-none-linux-gnueabi-

(or 'CROSS_COMPILE=ccache arm-none-linux-gnueabi' if ccache is used)

4. Set the architecture variable to arm: ARCH=arm

Both ARCH and CROSS_COMPILE can be set compile time, but it is often easier to set them once in the working shell.

11.2 XUKR build instructions

(From the XUKR-20120103 for TDM3730, TAO3530 and TAM3517 Release candidate)

This file contains build reference for x-loader, u-boot and kernel, and a sample Angstrom Linux root file system / userland.

It is assumed a cross-compiling environment is already set up.

Prebuilt binaries can be found in the prebuilt/ folder.

11.2.1 X-loader

For TAO-3530 based boards, compile using:

% make distclean && make tao3530_config && make -j 2

Similarly, for TDM-3730 based boards, the command is:

% make distclean && make tdm3730_config && make -j 2

And for TAM-3517 based boards, the command is:

% make distclean && make tam3517_config && make -j 2

The resulting binary is named MLO.

11.2.2 U-boot

To set display size, you need to (unfortunately) edit the relevant configuration file. For 4.3" panel, set the define

#define TN_PANEL 043

in include/configs/tao3530.h

(For tao3530 - for tdm3730 the file is named tdm3730.h etc)

Similarly, for 7" LCD the variable is to be set to

#define TN_PANEL 070

instead.

For TAO-3530 based boards:

% make distclean && make tao3530_config && make -j 2 tao3530

For TDM-3730 based boards:

% make distclean && make tdm3730_config && make -j 2 tdm3730

For TAM-3517 based boards:

% make distclean && make tam3517_config && make -j 2 tam3517

The resulting binary is named u-boot.bin

For THB based boards the SW3 switch define must be enabled for LCD "detection" to work.

11.2.3 Kernel

The kernel configuration depends on both CPU module, baseboard and display.

For TAO-3530 on a Tsunami baseboard:

% make distclean && make tao3530_tsunami_defconfig && make -j 2 ulmage && make modules

For TAO-3530 on a Thunder baseboard:

% make distclean && make tao3530_thunder_defconfig && make -j 2 ulmage && make modules

For TDM-3730 on a Blizzard baseboard:

% make distclean && make tdm3730_blizzard_defconfig && make -j 2 ulmage && make modules

For TAM-3517 on a Twister baseboard:

% make distclean && make tam3517_twister_defconfig && make -j 2 ulmage && make modules

For TAM-3517 on a THB baseboard:

% make distclean && make tam3517_thb_defconfig && make -j 2 ulmage && make modules

The resulting kernel binary is arch/arm/boot/ulmage

11.2.4 Root filesystem

The root filesystem is based on the Angstrom-distribution. There are two things to keep in mind before booting with this:

1. For TAO-3530 the default console is ttyO2 and not ttyO0 - change this in /etc/inittab

2. The wireless kernel module, and the PowerVR modules need to be placed in the /boot folder of the root filesystem.

11.3 Compiling for TAO-3530

While strictly not necessary; the following steps are for getting the most out of your DM3730

Enable floating point using the Neon SIMD DPS by:

-mfpu=neon -funsafe-math-optimizations -mfloat-abi=softfp

The switch enabling unsafe floating point should be used with care, however it is necessary for gcc to generate Neon instructions (Neon is not 100% compatible with IEEE standards)

Soft-fp ABI switch is to enable FP instructions, but use software emulated fp calling conventions.

The TAO-3530 contains an ARM Cortex A8 core, which supports ARMv7-A instructions

-marm -mcpu=cortex-a8 -march=armv7-a

Misc flags:

-ftree-vectorize

is not included in -O2, and allows gcc to auto-generate SIMD code for Neon

All-in-all:

arm-none-linux-gnueabi-gcc -marm -mcpu=cortex-a8 -march=armv7-a -mfpu=neon -funsafe-mathoptimizations -ftree-vectorize -mfloat-abi=softfp

or:

setenv ARMROOT /usr/src/tmp/tam3517-default/rootfs/usr

setenv CC arm-none-linux-gnueabi-gcc

setenv AS arm-none-linux-gnueabi-as

setenv CPP arm-none-linux-gnueabi-cpp

setenv CFLAGS "-O2 -fwhole-program -marm -mcpu=cortex-a8 -march=armv7-a -mfpu=neon -funsafemath-optimizations -ftree-vectorize -mfloat-abi=softfp -l\${ARMROOT}/include -L\${ARMROOT}/lib"

configure --prefix=\$ARMROOT --host=i686 --target=arm

11.3.1 QT

QT libraries come precompiled in the Ångström root file system provided.

11.4 Basic components of a bootable Linux SD card:

- Boot partition (a FAT 32 LBA partition) containing

X-loader, binary (MLO)

u-boot, boot loader

ulmage, Linux kernel

- A root file system (a Linux file system, like ext3).

To prepare a bootable SD card, one needs to:

1. Partition the SD card into two partitions (FAT and, say EXT3)

- 2. Format the partitions
- 3. Copy the boot files to the FAT partition
- 4. Copy the rootfs files to the EXT3 partition

Note1: copying the rootfs must often be done as root, to preserve ownership and permissions of files.

Note2: if you want your SD card to be bootable no matter what, it must contain a special boot/partition signature. In this case we recommend you to reuse the partition table from one of TechNexion's Angstrom SD card images, and if needed resize the EXT3 partition.

(Do NOT use the rescue card image bootsector, it is special and not for general purpose)

11.5 Manual NAND Installation

This paragraph explains how to install Linux to NAND from a bootable SD-card. Stop at the u-boot prompt, and issue the following commands:

```
# nand erase.chip clean
# setenv bootdelay 1
# mmc rescan 0
# fatload mmc 0:1 $loadaddr MLO
# nandecc hw 2; nand erase 0 80000
# nand write $loadaddr 0 80000
# fatload mmc 0:1 $loadaddr u-boot.bin
# nandecc sw; nand erase 80000 160000
# nand write $loadaddr 80000 160000
# fatload mmc 0:1 $loadaddr uImage
# nandecc hw; nand erase 280000 400000
```

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nand write \$loadaddr 280000 400000
fatload mmc 0:1 \$loadaddr uImage
run mmcboot

After booting to linux shell:

mkdir -p /mnt/ubi
flash_eraseall /dev/mtd4
ubiattach /dev/ubi_ctrl -p /dev/mtd4
ubimkvol -N rootfs -m /dev/ubi0
mount ubi0:rootfs /mnt/ubi -t ubifs
cp -a \$rootfolder/* /mnt/ubi/
umount /mnt/ubi
sync

Reboot and take out SD card.

11.6 How to

11.6.1 How to calibrate the touch screen in Linux



Figure 54 : settings > Touchscreen Calibration



Figure 55 : touch the crosshairs on the screen. After Calibration it will reboot to store the settings

In case the calibration is incorrect, you have two options to initiate the calibration process

11.6.1.1 Recover the touch calibration with a USB keyboard.

- 1. Plug in the USB keyboard
- 2. Press Ctrl+Alt+F1 (the terminal-screen will open)
- 3. Type "root" and press return
- 4. Type "ts_calibrate" and press return
- 5. Calibrate the screen
- 6. Type "reboot" and press return
- 11.6.1.2 Recover the touch calibration with a USB mouse
- 1. Power off the unit
- 2. Insert a USB mouse
- 3. Click on "settings" and then "tocuhscreen calibration"
- 4. Calibrate by using the mouse to click on the crosshairs
- 5. The unit will reboot

11.6.2 How to use OPKG

First connect your development kit to the internet. Then, use

opkg update

(to update the repository locations etc.)

Then use

opkg list-installed	(to list the installed packages)
opkg list	(to list the available packages (use grep! the list is long))
opkg install <package></package>	(to install <package>)</package>
opkg remove <package></package>	(to uninstall a package.)

A few more useful commands:

opkg search <full/path/filename> (te

> (tells you which package provides the named file)

11.6.3 How to enable wireless

Wireless can be enabled using a terminal in the following two ways.

11.6.3.1 The easy way

1. Open a terminal

2. # wireless.sh

3. You will be shown a list of networks in range, and asked to type in the name of the network

4. Once an existing network has been typed in, you will be asked for a passphrase (if you are prompted for the net name again, it means you mistyped something)

Note: it can be enough to type in a part of the network name -- if that part is not a part in any other nearby network SSID

5. After these steps, the system tries to connect to the network

11.6.3.2 If the easy way does not work

In case the above does not work (due to different network settings etc), you can use the command line tools to connect manually:

- 1. Use 'insmod /boot/libertas_sdio.ko' to load the wireless driver
- 2. Use 'ifconfig wlan0 up' to enable the wireless interface
- 3. Use 'iwlist wlan0 scan', to scan the networks
- 4. Use 'wpa_passphrase' to generate the WPA psk for an SSID
- 5. Edit a wpa_supplicant configuration file containing your network settings
- 6. Use 'wpa_supplicant -Dnl80211 -iwlan0 -c file' to connect to the SSID in file
- 7. Use 'udhcpc -i wlan0' to request and IP adress, gateway and DNS server

11.6.3.3 Common errors

Problem: you see the error message "assoc: bss (null) not in scan results"

Reason: Wireless chip sees no networks

Solution1: Attach an antenna :-)

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Solution2: Did you forget 'ifconfig wlan0 up' before scanning?

11.6.4 How to do low level debugging (advanced) To write to OMAP/Sitara UART:

Send character to physical adress

0x4806A000 == UART1

0x4806C000 == UART2

0x49020000 == UART3

Hope somebody else has set up baud rate etc ;-)

Instructions to write a 'T' to UART3

ldr	r8, =0x49020000
mov	r7, #'T'
strb	r7, [r8, #0]

12 Software - Android

12.1 How to install an Android application on TechNexion baseboards

Things to know in advance:

- Plug a USB-keyboard in the baseboard, the "backspace" is the "back" button and the "home" button goes to the first page.
- On the HMI the back button is the top button on the right backside of the HMI
- The application (*.apk) should be placed on a micro-SD card.
- If you do not have a file-manager, Astro, etc. please read paragraph 12.2)



Figure 56: press (tap it with your finger) on the Settings icon

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Figure 57: Scroll to the Applications and press on it



Figure 58: press on "Unknown sources"

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Figure 59: Confirm OK



Figure 60: The "Unknown sources" will now show a green icon. It will now install application even if the sources are unknown.

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Figure 61: Use the "left arrow" button on the USB-keyboard to go BACK to the main menu. Insert a micro-SD card with the application on it in the baseboard. In the top left it will show "preparing SD card" which will disappear after the SD-card is detected. Press on the "File manager". (If you do not have FileManager or Astro then go to the next paragraph 12.2)



Figure 62: The "File manager" will show the contents of the SD-card. Press on the application that you want to install (for example: Rockplayer)

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RockPlayer	
Do you want to install this application?	
Allow this application to:	
Storage modify/delete SD card contents	
Network communication full Internet access	
Phone calls read phone state and identity	
System tools prevent phone from sleeping	
Install	Cancel

Figure 63: Press install

RockPlayer	× 07:16
Installing	

Figure 64: The application will install

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Figure 65: after installation you have the choice to open the application or to go back.



Figure 66: The main menu will now show the Rockplayer application icon. To start the application, just press the icon.

12.2 How to install an android application with an internet connection

In case you have no file manager, you can install this (or any other application) via an internet connection. In this example we use the wireless internet, but you can also use a LAN connection.

	📶 📟 14
Wireless & network settings	
Airplane mode Disable all wireless connections	
Wi-Fi Turn on WI-Fi	
Wi-Fi settings Set up & manage wireless access points	
Bluetooth Turn on Bluetooth	
Bluetooth settings Manage connections, set device name & discoverability	
VPN settings Set up & manage Virtual Private Networks (VPNs)	
Mobile networks	

Figure 67: in "Settings", switch on Wi-Fi:

	📶 🔲 14:09
Wireless & network settings	
Airplane mode Disable all wireless connections	
Wi-Fi Connecting	
WI-Fi settings Set up & manage wireless access points	
Bluetooth Turn on Bluetooth	
Bluetooth settings Manage connections, set device name & discoverability	
VPN settings Set up & manage Virtual Private Networks (VPNs)	
Mobile networks	

Figure 68: Go to Wi-Fi settings:

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	14:09
Wi-Fi settings	
Wi-Fi Scanning	
Network notification Notify me when an open network is available	
Wi-Fi networks	
TECHNEXION Remembered, secured with WPA/WPA2 PSK	A
planexuser Secured with WPA/WPA2 PSK	
Add Wi-Fi network	

Figure 69: Select a network

Resultion of the second		A 🖉 🗨	14:09
Wi-Fi settings			
Wi-Fi Disconnected			
Network notifi	cation		
Wi-Fi networks			
TECHNEXION Remembered, secure	Security WPA/WPA2 PSK Signal strength Poor		
planexuser Secured with WPA/WP	Connect Forget Cancel		-
Add Wi-Fi netv	vork		

Figure 70 : Choose connect and, if necessary, enter a password.

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Figure 71 : Open the browser in the main menu

		07:17
http://code.goo	ogle.com/p/rowboat/	O X
Android for Texas Instrum	nents Devices (Sitara, Davinci and Integra)	Search projects
Project Home Downloads W	riki <u>Issues</u> Source	
Summary Updates People		
Project Information	arowboat.org	
Activity I High Project feeds	Enables Android for Texas Instruments devices	
Code license Apache License 2.0	Currently supported devices are OMAP35x, AM35x, AM37x, DM37x, AM389x, AM1808.	
Labels android, omap3, omap, beagle, beagleboard, ti, linux, dsp, 3530, omap3530, am3517, omap3730, 3730, am350	The goal of arowboat.org project is to : Provide a stable Google Android base port for AM1808, OMAP35x, AM35x, AM37x, AM389x and DM37x platf Enable key hardware features (ARM plus NEON, <u>DSP</u> , 2D/3D Accelerated Graphics and others) on Sitara(T Integra(TM) devices.	orms M), Davinci(TM) and
Members sm.kha@gmail.com 9 committers	Who should get involved • Everyone considering Android beyond handsets with TI devices like AM/DM37x, AM35x, AM38xx, AM18xx • Android OS and Android application developers	
Featured	Why to use arowhoat project	
Downloads LiphtingTalks.mov RowhoatBench-v1.0-for-2+ apk rowhoat-walipapers.zip Show all -	 Active and open development of a quality Android port Focused on a stable, well tested and bench marked Android port for non-phone segment Consistent performance improvement for Graphics and Multimedia Software and Hardware support for all arowboat enabled devices 	

Figure 72 : Press the internet address bar and the onscreen keyboard will appear, or Insert an USB-keyboard.
TAO-3530 USER'S GUIDE 097

10/18/2013, TechNexion

							E	07:19
http://openir	ntents.goo	glecode.c	om/					Go
http://openin	ntents.goo	glecode	.com			http	://openin	tents.goo 🕨
q V	N e	•	r	t	у	u i	C	р
а	S	d	f	g	h	j	k	I
ê	Z	x	С	v	b	n	m	X
7123	/			-				Go

Figure 73 : Type: <u>http://openintents.googlecode.com</u> press "GO" and you will find the File Manager under the downloads

			6 🚮 🛑 07:19
http://code.google.com/p/op	enintents/		
		M	Ay favorites • Sign in
Openintents Make Android applications work to	gether.		Search projects
Project Home Downloads Wiki Is	sues <u>Source</u>		
Summary Updates People			
Project Information Activity ••I High Project feeds Code license Apache License 2.0 Labels android, openintents, java, boltable, sensors, intents, contentprovider	OpenIntents participa Google SUMMER OF COOGLE SUMMER OF COOGLE OF COOGLE SUMMER OF COOGLE SUMMER OF COOGLE SUMER	openIntents	
Members peli0@googlemail.com, friedger,	-		
zeroo@googlemail.com	Aut		

Figure 74 : Another option is:: <u>http://www.openintents.org</u> and you will also find the File Manager

	🗟 📶 🥌 07:20
Project Information	OpenIntents participates in GSoC2011!
Activity II High Project feeds	Coogle:
Code license	SUMMER OF
Apache License 2.0	CODE
Labels	
sensors, intents, contentprovider	Welcome to OpenIntents
Members	
pelio@googlemail.com, friedger,	
12 committers	
	Download our free and open source applications at <u>www.openintents.org</u>
Featured	What is <u>OpenIntents</u> about?
Downloads AboutApp-1.0.3.apk	We design and implement open intents and interfaces to make Android mobile
CalendarPicker-1.0.0.apk	applications work more closely together. We provide samples and free applications to demonstrate their usage.
ConvertCSV-1.1.0.apk	If you are interested as a developer or designer feel free to join us in our discussion
Distances 116 and	group.
Para and a second second	Now, jump directly to
	🗟 🚻 💭 07:20
http://code.google.com/p/	openintents/downloads/detail?name=FileManager-1.1.6
	My favorites + Sign in
a openintent	c
P Make Android applications work	together Search projects
Project Home Downloads Wiki	Issues Source
Search Current downloads 💽 for	Search
Download: OI File Manager 1.1 4 people starred this down	I.6 Noad
Uploaded by: peli0@googlemail.com	
Released: , 2011 Fi	le: FileManager-1.1.6.apk 172 KB
Downloads: 23235 D	escription:
Type-Package SI	tA1 Checksum: c4c1e22effa73881e1fcc88739d7dbbf9c338f69 What's this?
Featured	
Featured	

Figure 75 : Click the file manager link; it might appear like nothing happens, but just go to the main screen and pull the bar on top down.

TAO-3530 USER'S GUIDE 097

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2011 8 25	and the second		(SHORE SHORE)	07:20
	(No service)		Clear	
	Notifications			
<	EileManager-1.1.6.apl	<	07:20	
Line and the second second		IIIII AND		and the second se

Figure 76: You will see the download when it has finished downloading



Figure 77 : Press the download and it will ask to install or cancel, Install will install the application, and Cancel will delete the file

OI File Manager		a 🚮 🥌 07:21
Application installed		
Open	Done	

Figure 78 : You now have a file manager and it will make it easier to install apk's that are placed on a SD card

12.3 ADB - Installing applications

12.3.1 Windows

Source of information (in this paragraph): [1]

When it comes to Android modding, most novice users are confused or left wondering by reference over reference to a certain "ADB". This is especially true when you are looking up something on modding your device, or root it in particular. ADB is the wonder toy of Android and everyone seems to love it, so let's have a look at understanding what it is and why you need it, and how you can get it.

12.3.1.1 What is ADB

ADB stands for Android Debug Bridge. It comes as a part of the standard Android SDK, which you can grab <u>here</u>. Basically, it provides a terminal-based interface for interacting with your phone's file system. Since Android platform is based on Linux, command-line is the only way to obtain and manipulate root access often required to perform certain advanced operations on your device using root access.

While these things can be done directly on the device itself using some terminal emulator, it will be rather difficult to execute complex commands on such a small screen. ADB provides the bridge between your machine and your computer.

12.3.1.2 How to Install ADB

Step 1: Installing the Android SDK

Note: At the time of updating this guide, the latest version of the Android SDK available is r8 and we shall be using it throughout the rest of the guide. The tools will work the same way however, even if you get a later version. In case of earlier versions though, the location of some of the tools was different and it is recommended that you get the latest available version.

The first step is to download the SDK. Use the link given at the end of this post and download the latest version of the Android SDK from there. There are versions available for Microsoft Windows, Linux and Mac OS X. In case of Windows, both an installer and a zip file are available but there isn't any need to use the installer as a formal installation is not required.

Once you have downloaded the SDK, simply extract the compressed file to a location on your computer. In our case, we have extracted it to the root of our C drive and that makes *C:\android-sdk-windows* the installation location of the SDK. From here onwards, we shall be referring to this location as the 'SDK folder'.

Step 2: Downloading the SDK Platform Tools

Previously, ADB used to be included in the SDK by default in the 'tools' sub-folder but now, it has been relocated to the 'platform-tools' sub-folder which needs to be downloaded as an SDK package. Fortunately, this is quite easy:

Just browse to the SDK folder and launch SDK Manager. When launching it for the first time, it will present you with a window to choose packages to install. The first option begins with 'Android SDK Platform-tools'. Make sure it is checked, and uncheck all the other packages for now. You can check/uncheck a package by clicking on its name and then selecting the Accept/Reject radio button. Your window should look like this:

Choose Packages to Install Packages Android SDK Platform-tools, revision 1 [*] Documentation for Android SDK, API9, re SDK Platform Android 2.3, API9, revision 1 SDK Platform Android 2.2, API8, revision 2 SDK Platform Android 1.6, API4, revision 2 SDK Platform Android 1.5, API3, revision 4 Samples for SDK API9, revision 1	Package Description & License <u>Package Description</u> Android SDK Samples for Android API 7, revision 1 <u>Archive Description</u> Archive for any OS Size: 7 MiB SHA1: 51e4907f60f248ede5c58b54ce7b6ae0b473e0ca <u>Site</u> Android Repository (dl-ssl.google.com)	
Samples for SDK AP10, revision 1 Samples for SDK AP17, revision 1	O Accept I Reject	Cancel

Figure 79

Now simply click 'Install' and wait till the platform tools are installed. Once the process is done, you will have a 'platform-tools' folder inside your SDK folder. That folder will include ADB and all its dependencies.

Step 3: Setting the Path variable

Now you have ADB installed but using it this way will require you to either use the complete path of the ADB command (*C:\android-sdk-windows\platform-tools\adb*) or to first change directory to the platform-tools subfolder of the SDK folder each time, and this can become quite a hassle. To make ADB along with other Android SDK tools and platform tools easily accessible from anywhere at the command line, we shall add their paths to the PATH environment variable. This method will apply to Windows users only. If you are a Linux or Mac user, add the 'tools' and 'platform-tools' sub-folders of the Android SDK to your system's PATH variable using the standard method for your operating system.

• If you have no experience with editing system environment variables, make a System Restore point now so that you can revert back to it in case something goes wrong.

- If you are using Windows 7, right-click the 'Computer' icon and click 'Properties'. Now click 'Advanced System Settings' from the options in the left pane to bring up the 'System Properties' window. Windows XP users will directly get this window when they right-click 'My Computer' and click 'Properties'.
- In the 'System Properties' window, click the 'Environment Variables' button on the 'Advanced' tab.

ser variables for	Aatoo
Variable	Value
path	%CommonProgramFiles%∖Microsoft Sh
TEMP	%USERPROFILE%\AppData\Local\Temp
TMP	%USERPROFILE%\AppData\Local\Temp
	New Edit Delete
ystem variables	Value
ystem variables Variable	Value
ystem variables – Variable OS Path	Value Vindows_NT C:\Program Files\PC Connectivity Soluti
ystem variables – Variable OS Path PATHEXT	Value Windows_NT C:\Program Files\PC Connectivity Soluti COM: EXE: BAT: CMD: VBS: VBE: 15:
ystem variables Variable OS Path PATHEXT PROCESSOR_A	Value Windows_NT C:\Program Files\PC Connectivity Soluti .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS; x86
ystem variables Variable OS Path PATHEXT PROCESSOR_A	Value Windows_NT C:\Program Files\PC Connectivity Soluti .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS; x86 New Edit Delete

Figure 80

- Find 'Path' in the 'System variables' section and double-click it to edit it.
- Make sure NOT to delete the existing entry in 'Variable value' or it will mess up things on your computer. Just add the following string to the end of it, including both the semicolons:

```
;c:\android-sdk-windows\tools;c:\android-sdk-windows\platform-tools
```

If you have extracted the SDK's contents to another directory, make sure to use that one for your PATH variable.

After adding the string, this is what my Path variable looks like:

```
C:\Program Files\Common Files\Microsoft Shared\Windows Live;C:\Program Files
(x86)\Common Files\Microsoft Shared\Windows
Live;%SystemRoot%\system32;%SystemRoot%;%SystemRoot%\System32\Wbem;%SYSTEMROO
T%\System32\WindowsPowerShell\v1.0\;C:\Program Files (x86)\ATI
Technologies\ATI.ACE\Core-Static;C:\Program Files (x86)\Windows
Live\Shared;C:\Program Files\Java\jdk1.6.0_23\bin;C:\Program Files
(x86)\Java\jdk1.6.0_23\bin;C:\android-sdk-windows\tools;C:\android-sdk-
windows\platform-tools
```

Don't worry if yours does not include some of the other text – what is important is the way the new entry should be added to the existign one, and the way the previous entries MUST be left unchanged. Notice that the semi-colons are necessary to separate each path variable entry from the next and previous ones. Once you have added the path, your machine may require a reboot.

In case you messed up while editing the Path variable and ended up deleting the previously existing entries, just restore the System Restore point you made and retry, being more careful this time.

Step 4: Installing the USB drivers

Finally, you need to install the <u>USB</u> drivers. You may or may not need to perform this step, depending on your device. If you are using a device that ships with stock Android operating system such as the Nexus One, this will be necessary. In case of other devices that ship with their custom version of Android and some tools to sync the device with the PC, such as devices from HTC that ship with HTC Sync or devices by Samsung that ship with Samsung's own software, the suitable driver for your device will be automatically installed with that software package.

- The first step will be to download the USB drivers. To do this, launch SDK Manager from the SDK folder and click on 'Available packages' in the left pane.
- Expand 'Third party Add-ons' followed by 'Google Inc. add-ons' and check 'Google Usb Driver package', as shown in this image:

Virtual devices	SDK Location: C:\Users\Haroon\Downloads\Software\Android\android-sdk-windows	
Available packages Settings About	Packages available for download Image: Samples for SDK API9, revision 1 Image: Samples for SDK API8, revision 1 Image: Samples for SDK API7, revision 1 Image: Samples for SDK API5 by Google Inc., Android API8, revision 2 Image: Sample for SDK BPI Solution (Inc., Android API 4, revision 2 Image: Sample for SDK BPI Solution (Inc., Android API 3, revision 3 Image: Sample Solution (Inc., Android API 3, revision 3 Image: Sample Solution (Inc., Android API 3, revision 3 Image: Sample Solution (Inc., Sample Solution (Inc., Sample Solution 1) Image: Sample Solution (Inc., Sample Solutio	E
	Description Android SDK Platform-tools, revision 1	

Figure 81

- Click 'Install Selected' and in the window that pops up, click the 'Accept all' radio button followed by the 'Install' button. Wait patiently while the USB drivers are downloaded and installed in the Android SDK.
- The drivers for both <u>32 bit</u> and 64 bit systems will now be present in the SDK folder under 'usb_driver\x86' and 'usb_driver\x64' sub-folders respectively.

Now that the USB drivers have been downloaded, you can install them to your computer as follows:

- On the device, go to home screen, press Menu, select Applications > Development, and enable USB Debugging.
- Now connect your phone to the PC via USB. New hardware installation should kick in, and it will start looking for the drivers.
- Manually point the drivers to the folder suitable for your operating system and let them install.
- Once drivers have installed, you can verify successful installation by going to Device Manager. Your phone should be showing under 'ADB Interface', like in this example:



Figure 82

12.3.1.3 How to Use ADB

At this point, the setting is done. Here on you can simply use adb to manipulate your phone in whatever way you like. On Windows, the best way to do so is using command prompt. To ensure that adb has been set up properly, run <u>command prompt</u> and type 'adb devices' and hit enter. Your connected device should show up with a serial number.



Figure 83

This is it for this guide. We would like to emphasize that playing with your phone at this level can be dangerous if you don't know what you are doing, and can even render the phone completely useless. Please do it at your own risk.

For a complete list of adb commands, check out the official adb guide here.

Editor's Note: ADB is for advanced users only. If you need ADB with a Graphical User Interface, check out <u>QtADB</u>.

12.3.1.4 Summary

Download

Download JRE/JDK

Above two will install the Android SDK.

When plug in our device, Windows will prompt that a new device is found, and asks for driver. Please install with the drivers we provide.

12.3.2 Linux

Download

tar zxvf ~/android-sdk_r08-linux_86.tgz cd android-sdk-linux_86

The folder structure should be

Add-ons Platforms SDK Readme.txt Tools

Most of the utilities are basic, so you need to update:

./tools/android update SDK

It will launch a GUI interface. Install all the packages you need.

Now the "ADB" is in the folder "platform-tools", you can add it to your path.

12.3.2.1 Connect by USB

Connect USB-otg on TAO to host machine

Turn on USB Debug

MENU->Settings->Applications->Development and then enable the "USB debugging" option.

Setup Host Machine

Log in as root and create this file: /etc/udev/rules.d/51-android.rules

For Gusty/Hardy, edit the file to read: SUBSYSTEM=="usb", SYSFS{idVendor}=="18d1", MODE="0666" For Dapper, edit the file to read: SUBSYSTEM=="usb_device", SYSFS{idVendor}=="18d1", MODE="0666"

Execute the following to change the user mode for the rules file:

host#> chmod a+r /etc/udev/rules.d/51-android.rules

Verify the adb connectivity between host and target board:

host#> adb devices

If device is connected, then output on screen should list the device, example:

List of devices attached 20100720 device

Login use ADB

host#> adb shell

12.3.2.2 Connect by Ethernet

Please make sure Ethernet on both TAO and the host machine are connected to same network Check Ethernet configuration for the board

tao #> netcfg lo UP 127.0.0.1 255.0.0.0 0x00000049 eth0 UP 192.168.70.135 255.255.255.0 0x00001043

If Ethernet was not configured, configure Ethernet of the board using ifconfig/netcfg as shown below.

tao #> netcfg eth0 dhcp

Configure the ADB Daemon to use an Ethernet connection using setprop as shown below.

tao #> setprop service.adb.tcp.port 5555

If network is configured successfully (above steps) then restart service adbd on the target,

tao #> stop adbd tao #> start adbd

On the host machine use following commands to establish the ADB connection

host#> export ADBHOST=<target's ip address>
host#> adb kill-server
host#> adb start-server

Verify for device connectivity, by executing the following commands

host#> adb devices

If connected, find the device name listed as an "emulator"

List of devices attached emulator-5554 device

Login use ADB

host#> adb shell

For more information about adb commands, see Android Debug Bridge page at http://developer.android.com/guide/developing/tools/adb.html

12.3.3 ADB Functions

12.3.3.1 Application Install/Remove

Install

\$> adb install <package>.apk

Remove

\$> adb uninstall <package>.apk

12.3.3.2 File Operation

To Device

\$> adb push <local file path> <remote path>

From Device

\$> adb pull <remote file path> <local path>

12.3.3.3 Shell Operation

\$> adb shell

12.3.3.4 Show Devices

\$> adb devices

13 Software - Windows Embedded Compact 7

13.1 Warning



Important! To install Windows CE, you need a null modem to follow process.

13.2 Update to the latest Windows Embedded Compact 7

Make sure you have <u>downloaded all patches</u> for Windows Embedded Compact 7. The Patches can be found at the Microsoft website

13.3 Get the BSP

13.3.1 Download the BSP from the web-Site

Go to www.technexion.com > Support > download Center > ARM_CPU_Modules> TAO-3530; and download the TAO-3530 Windows Embedded Compact 7 BSP".



Figure 84: Decompress the downloaded file.

13.3.2 Install BSP to "Platform Builder"

CTN_TDM_3730			
<u>E</u> ile <u>E</u> dit ⊻iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp		1
Ġ Back 🝷 🕥 🕤 🏂 🔒	🔎 Search 🄀 Folders 🛛	Ⅲ▼ 🔞 Folder Sync	
Address 🛅 C:\temp\TN_TDM	_3730		💌 🋃 Go
File and Folder Tasks 🛞	3rdParty	OSDesigns	
Publish this folder to the Web Share this folder	↓ platform	public	

Figure 85: After entering the "TN_TAO_3530" folder, copy all folders, and paste the folders into c:\WINCE700\ (overwrite is OK)

😂 CAWINCE700				M. Same M	
檔案(E) 編輯(E) 檢視(V) 我的最愛(A) 工具	↓(<u>1</u>) 説明(<u>H</u>)	121877			
🌀 上一頁 🔹 🕥 · 🏂 🔎 搜尋 陵	資料夾 🛄 🗙 🌛	X 🖻 🚺 🖻			
網址① 🗀 C:\WINCE700					▼ 🌖 移至
資料夾	×	名稱 🔺	大小	類型	修改日期
 ● ● technexion ● ● TI ● ● Tools ● ● 3rdParty ● ● SoRup ● ● SoRup ● ● StDesigns ● ● others ● ● public ● ● public ● ● public ● ● willNOOWS ● ● Xeritig (C:) ● ● Mchinistrator fibyth ● ● Administrator fibyth ● ● Mchinistrator fibyth ● ● WIEC700-DM3730 		 3rdParty Backup OSDesigns others platform private gass1.txt pass2.txt perstime bat build lkg.log build lkg.log build lkg.log build lwg. build lwg. timelog.txt 	7 KB 7 KB 1 KB 1 KB 1 KB <u>1 KB 2012/315 上</u> 4 大小:19 個位元組 12 KB 5 KB	檔案文字資料來 檔檔案文字資料表來 檔檔案文字資料表來 檔檔案文字資料表示 檔檔案文字文件 MS-DOS 批次 MS-DOS 批 MS-DOS 批 MS-DOS 批 MS-DOS 批 MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS-DOS MS- MS- MS-DOS MS- MS- MS- MS- MS- MS- MS- MS- MS- MS-	2012/2/29 上午 02: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/2/24 上午 06: 2012/3/15 丁午 06: 2012/3/15 丁午 06: 2012/3/15 丁午 06: 2012/3/15 丁午 06: 2012/3/15 丁午 12: 2012/3/15 丁午 12:
18 個物件 (磁碟可用空間: 195 GB)			4	.41 MB 🛛 💡 我的	的電腦

Figure 86: the folders in c:\WINCE700\

13.4 Create the files for a SD card

The following chapter describes how to create the files that will be placed on a SD card.

• Open "Microsoft Visual Studio 2008".

📽 Start Page - Microsoft Visual	Studio					
File Edit View Project Tag	get Iools Test <u>M</u> indow <u>H</u> elp					
<u>N</u> ew)	国ち・マ・知・早・		- 🗃 zHexBuf	• 💀 🐨 🕸 🋠 🖬 🖬 • 🖕		
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Save Selected Items Ctrl+S	Microsoft*	lieveene				
Save Selected Items <u>A</u> s	Visual Stuc	110 2008				
🗿 Save All Ctrl+Shift+S						
Export Template	Recent Projects	Get News from Microsoft				
Page Setup	Technexion_LCD_480x272_LB043	Download the latest inform	ation for developers to the Sta	t Page		
🗳 Innt Ctrl+P	Tsumami_DVI_1280x720	Click here to enable an RSS feed packs, community technology pr	that provides regularly updated artic eviews, and Beta releases of Microso	es about new technologies, product tips and tricks, and upcomin t products and technologies. To view the Microsoft Privacy Poli	ng events. This live feed also includes information about serv cy, go to Tools/Options/Environment/Help/Online and then	vice click
Recent Files	Tsumami_LCD_800x480_AT070TN	Read the privacy statement.				
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	Platform Builder Release Notes					
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Figure 87: Click "File \rightarrow Open \rightarrow Project Solution"

🗁 Technexion_	LCD_480x272_L	B043WQ2	~	G	00	•	
C Technexion_I	.CD_480x272_LE .CD_480x272_LE	3043 WQ2 3043 WQ2.sbn			2		
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Figure 88: Go into the folder and open the SLN-file of your board (As example in this manual we use "Technexion_LCD_480x272_LB043WQ2")

🐐 Technexion_LCD_480x272_LB043WQ2 - Microsoft Virnal Stadio
Eile Edit Yiew Project Build Debug Target Icols Tert Window Help
🛐 • 💷 • 🎯 📓 🐇 🔄 🐮 ヴ • 🕲 - 🔍 - 🔍 - 📜 🕨 TDM_3730 AF- Platform Builder (TGTCPU) • 👩 cmdDownload 💿 💀 😰 🐨 🌪 📰 📯 🗑 🗩 • 👼
Solution Explorer - Technesion_LCD_480x272_E043WQ2 + 4 Conference And A Co
Jointon Techneckin, LCD_4803/C72_LE8043WQ2 (1 project) ● Techneckin, LCD_4803/C72_LE8043WQ2 ● Techne
ABM ABM Common Como
Output 🔹 🎙
Show output from: Platform Builder Debug 🔹 💿 🛼 🔁
California Wedges - Output (2) Ever Liel

Figure 89: Before building, choose the TAO-3530 ARMV7 Release mode



Figure 90: before building, choose the correct display (default might be set to a multi-touch Prism)

In the menu click "build/advanced build command/Clean Sysgen" (Figure 91) this will take approximately 30 minutes, after which you will see "build complete" (Figure 92)



Warning! Be patient: let "clean sysgen" finish, this can take up to 30 minutes



Figure 91: build/advanced build command/Clean Sysgen

Technexion_LCD_480x272_LB043WQ2 - Microsoft Visual Studio		
File Edit Yiew Project Build Debug Target Jools Test Window Help	Platform Puilder (7GTCPID - Other HavBut	- AAAAAAAAAAAAA
olution Explorer - Technexion_LCD_480x272_LB043WQ2	• 4 × Start Page	-
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Solution Boplore Cabby I have for or cabations Found Central (1992) 2002 (1992) (199		
Anita: I succeeded or up-to-date, U failed, U asyped		
Cole Definition Window (m Output (2) Error List		
uild succeeded		Ln 102 Col 1 Ch 1 F
🖌 55552 🐂 2. Window 🔹 🤗 Technesona 👘 2. Notened 🔹 🤗 T	IltraEdit-3 5 Adobe - 🖉 SDIO	W 🔞 2 Minuter - 🕭 HART-48 🗰 Technomics 🐘 Z 🖬 🖉 😓 🔕 🛵 🛦 🖚 🕇

Figure 92: build complete

13.5 Creating the SD card

• Plug an microSD in your computer (with for instance a USB card reader)



Figure 93: An example of an USB card reader

Go to:

C:\WINCE700\OSDesigns\Technexion_LCD_480x272_LB043WQ2\Technexion_LCD_480x272 _LB043WQ2\RelDir\TN_TAO_3530_ARMV7_Release

Open the folder. The folder contains files named: MLO, EBOOTSD.nb0, NK.bin (These files are needed for a bootable SD-card)



Step 1 - TAO-3530.zip contains these files (in this example extracted on "c :")

🏘 TI SDCard Utility	\mathbf{X}
First Step - SD Card drive	
Select SD Card drive D:	
Second Step - MLQ file	
C:\tdm-3720\MLO	
Third Step - OS files	
C:\tdm-3730\EBOOTSD.nb0 C:\tdm-3730\NK.bin	
Debug Output]
Found removable media on drive "D:"	
MLO file selected. MLO path = C:\tdm-3730\MLO.	
	Proceed Quit

Figure 95: Step 2 -Use the "TI_SDCard_boot_utility_v1_0.exe" tool to format the SD card and copy the files (MLO, EBOOTSD.nb0, and NK.bin). Press the "Proceed" Button

Format Removable	? 🔀
Capacity:	
3.69 GB	~
<u>F</u> ile system	
FAT32	~
Allocation unit size	
Default allocation size	~
Volume <u>l</u> abel	
Create an MS-DOS startup o	isk ⊆lose
Format Removable	Disk (D:)
WARNING: Forma To format the disk	tting will erase ALL data on this dis , click OK. To quit, click CANCEL.

Figure 96: Step 3 - Press "Start" Button and then press the "OK" button



Format Removable ? 🔀
Cagacity:
3.69 GB 💌
<u>F</u> ile system
FAT32
Allocation unit size
Default allocation size 🛛 🗸
Volume label
- Format options
Quick Format
Enable Compression
Create an MS-DOS startup disk
<u>Start</u>

Figure 97: Step 4 - After format is complete press "OK" button" and then press "close"

🏘 TI SDCard Utility	
First Step - SD Card drive	
Select SD Card drive	
Second Step - MLO file	
C:\tdm-3730\MLO	
Third Step - OS files	
C:\tdm-3730\EBOOTSD.nb0	
C:\tdm-373U\NK.bin	
C Debug Output	
MLO path = C:\tdm-3730\MLO. Formatting "D:" drive	
Copying files to SD	
D:\MLO	
D:\NK.bin	
Capying files done.	~
	Proceed Quit

Figure 98: Step 5 - Wait until the copying of the files to the SD is done, then Press Quit

13.6 Starting HyperTerminal

All Programs 🕨 🖮 Accessories 🔹 🕨 📾 Communications 🔹 🔸 🦃 HyperTerminal

Figure 99: Step 6 - Execute HyperTerminal

(This requires the use of a null-modem, if you are not sure how this works then please read the chapter about connecting the null-modem)

TAO-3530 USER'S GUIDE 097 10/18/2013, TechNexion

Connect To 🛛 🛛 🛛 🛛 🤶 🔀
🧞 to-devkit
Enter details for the phone number that you want to dial:
Country/region: United States (1)
Area code: 000
Phone number:
Connect using: COM1
OK Cancel

COM1 Properties ? 🔀
Port Settings
<u>B</u> its per second. 115200
Data bits: 8
Parity: None
Stop bits: 1
Elow control: None
<u>R</u> estore Defaults
OK Cancel Apply

Figure 100: And configure the same port settings.

13.6.1 Checking if the NAND of the Development kit is empty

Power ON the development kit, then Press any key, you can see one of the following messages on the hyper terminal:

13.6.1.1 The development kit runs Linux or the Default Screen

Ease the NAND in u-boot:



Figure 101: press any key to enter u-boot and do a nand erase.chip

13.6.1.2 The development kit runs a version of windows

Figure 102: Step 7b - Output on the terminal when the TAO-3530 has an image in NAND

Step 8 - To clean the NAND, key in the following:

- Key in "5"
- Key in "4"
- Key in "0" and press Enter
- Key in "3999" and press Enter
- Key in "y"

(Flash management) (Erase Block Range) (First Block) (Last Block) (continue)

Selection: 5
Flash Management
 [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [8] Enable flashing NK.bin [9] Set ECC mode [0] Exit and Continue
Selection: 4
First Block Number: 0
Last Block Number: 3999

Figure 103: erasing the blocks

	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
	Done
Flash Management	
/	
[1] Chan flack manutum	
[2] Dump flash geometry	
[3] Eraco flach	
[6] Erasa block range	
[5] Pasarua black range	
[6] Sot bad block	
[7] Format flash	
[8] Enable flashing NK bin	
[9] Sot Eff modo	
[0] Evit and Continuo	
Selection	
Verection.	

Figure 104: erasing of the blocks finished

Remove the power cable and reinsert the powr cable again



Figure 105: Step 7a - Output on the terminal when the TAO-3530 has no image in NAND.

13.7 Establish a serial connection

Step 9 - Execute the "All Programs>Accessories>Command Prompt" (console), and enter the Path: cd c:/tdm3730 (It means changing to the directory of TAO-3530).



Step 10 - Terminate the hyper terminal

Step 11 - Execute this command:

pserial.exe -p COM1 -f XLDRUART.nb0 (enter)



Then remove the power cable from the development kit, and reinsert it, to reboot.



13.7.1 Transfer a file to the development kit

Step 12 - Execute the Hyper terminal, you can see these characters every 10 seconds



TAO-3530 USER'S GUIDE 097

10/18/2013, TechNexion

Figure 106: Start HyperTerminal and transfer files by using "send file".

Send File
Folder: C:\tao-3530 <u>F</u> ilename: C:\tao-3530\fldrlogo.raw <u>B</u> rowse <u>Protocol:</u>
<u>S</u> end <u>C</u> lose Cancel

Figure 107: Select Xmodem and select the file (TAO-3530-nand-logo.raw),

Xmodem file send for to-devkit							
Sending:	C:\tdm-3730\tdm-3730-nand-logo.raw						
Packet:	Error checking: CRC						
Retries:	0 Total retries: 0						
Last error:							
File:	0K of 1894K						
Elapsed:	Remaining: Throughput:						
	Cancel <u>c</u> ps/bps						

Figure 108: Wait for the transfer to finish

SSSSSSSSSSSSSSSSSSSSSSSSSSS Beceive return code 0x01 blocks written 0x0F bytes rx 0x001D9480 pkts rx 0x00003B29 acks sent 0x00003B2A naks sent 0x0000002B can sent 0x00000000 others sent 0x00000000 chksum errs 0x0000000	
Aun nkts AxAAAAAAA	
and but our	

Figure 109: When the download finishes, you can see this message.

Step 13 - Power OFF, and again Power ON the TAO-3530 board. You will see the following.

EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block (0×2) (0×3) (0×4) EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block 0×5 (0×6) EraseBlocks: preserving reserved block (0x7 EraseBlocks: preserving reserved block (Ø×8) (0x9) (0xa) EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block (0xb) (Øxc EraseBlocks: preserving reserved block EraseBlocks: preserving reserved block (Øxd) (0xe) Done. WriteMBR: MBR block = 0xf. Done. 1 IsValidMBR: MBR sector = 0x3c0 (valid MBR) OpenPartition: Partition Exists=0x0 for part 0xb. CreatePartition: Enter CreatePartition for 0xb. LastLogSector: Last log sector is: 0x3fc3f. CreatePartition: Start = 0x40, Num = 0x34148. WriteMBR: MBR block = 0xf. IsValidMBR: MBR sector = 0x3c0 (valid MBR) OpenPartition: Partition Exists=0x0 for part 0x21. CreatePartition: Enter CreatePartition for 0x21. FindFreeSector: FreeSector is: 0x34188 after processing part 0xb. CreatePartition: Start = 0x341c0, Num = 0x9fff.

Figure 110 : partitioning

INFO: Boot config wash tround, using defaults INFO: SW4 boot setting: 0x0f IsValidMBR: MBR sector = 0x3c0 (valid MBR) OpenPartition: Partition Exists=0x1 for part 0x21. >>> Forcing cold boot (non-persistent registry and other data will be wiped) <<< Hit space to enter configuration menu 5... Hit space to enter configuration menu 4... Hit space to enter configuration menu 2... Hit space to enter configuration menu 2... Hit space to enter configuration menu 2... Hit space to enter configuration menu 1... OALFlashStoreOpen: 4096 blocks, 64 sectors/block OALFlashStoreOpen: 2048 bytes/sector, 15 reserved blocks INFO: Boot device uses MAC 00:1f:7b:20:01:21 INFO: *** Device Name EVM3730-289 *** InitDHCP():: Calling ProcessDHCP() ProcessDHCP()::DHCP_INIT

Figure 111: partitioning finished

13.8 Boot from SD-card

Step 14 - Insert SD card (the one created in step 2 to step 5), then keep TAO-3530 board's user1 button pressed, and power ON again (with USER1 button is still pressed), and after this press any key

Hit space to enter configuration menu 5 Hit space to enter configuration menu 4 Hit space to enter configuration menu 3
Main Menu
<pre>[1] Show Current Settings [2] Select Boot Device [3] Select KITL (Debug) Device [4] Network Settings [5] SDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Management [9] Enable/Disable OAL Retail Messages [a] Select Display Resolution [b] Select OPP Mode [0] Exit and Continue</pre>
Selection: _

Figure 112: pressing any key on your PC's keyboard will show the menu

(to confirm)

(hamming bit)

- Key in "2" (select boot device)
- Key in "3" (NK from SD card file)
- Key in "8" (Flash management)
- Key in "8"
- then key in "y"
- Key in "9"
- then key in "0"
- Key in "0"
- Key in "a"
- then key in"9"
- Key in "7"
- (save settings) (to confirm)
- then key in "y" key in "0"
- (Exit and continue)

(set ecc mode)

(Exit and continue)

(enable flashing nk.bin)

(select display resolution)

(LCD 800x480 60Hz) (this is the 7" LCD)

	_
<pre>[8] Flash Management [9] Enable/Disable OAL Retail Messages [a] Select Display Resolution [b] Select OPP Mode [0] Exit and Continue</pre>	
Selection: 0 Init HW: controller RST SDCARD: regested speed 1000000, actual speed 1000000 SDHC: command response timeout CTO! MMC::MMCCommandResponse: MMCSendCommand error, command = 8 MMC::MMCCommandResponse: Command Response Error SDCARD: regested speed 25000000, actual speed 19200000 BL IMAGE TYPE BIN	
Download file information:	
[0]: Address=0x88000000 Length=0x04120134 Save=0x88000000	
Download file type: 1	

Figure 113: After this you can see the Windows Embedded Compact 7's desktop. (This is still booting from the SD-card).

13.9 Enable the development kit to boot from NAND

Step 15 - Reboot TAO-3530, and then press any key.

- Key in "2" (select boot device)
 - key in "3" (NK from NAND)
- Key in "7" (save settings)
- Then key in "y" (to confirm)

•

- key in "0" (Exit and continue)
- The development kit can now reboot from NAND.

14 Software - Windows CE6

14.1 Warning



Warning! Installing software is not easy. Finish the procedure completely and be patient to let the compilation and installation finish.



Important! To install Windows CE, you need a null modem to <u>see</u> what is going on.

14.2 Update to Windows Embedded CE6.0 R3

Make sure you have <u>downloaded all R3 patches</u> for Windows Embedded 6.0. The Patches can be found at Windows Embedded CE6.0 R3 on the Microsoft website.

14.3 Get the BSP

14.3.1 Download the BSP from the web-Site Go to www.technexion.com > Support > Download Center and download TAO-3530_WinCE 6_versionnumber.

14.3.2 Install BSP to "Platform Builder for CE 6.0". Decompress the downloaded file. (See Figure 114)

TAO-3530 USER'S GUIDE 097

10/18/2013, TechNexion

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🦡 網路				
2個項目				

Figure 114

After entering the "TN-TAO-3530_CE6.0_1.00.04 / 1.0014 / TN-TAO-3530_BSP" folder, copy the "TN_TAO_3530" folder to "C:\ WINCE600 \ PLATFORM \". (See Figure 115 and Figure 116)

IN-TAO-3530_BSP		(200) Luis-		
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🕠 下載	IN_TAO_3530	2010/10/11 上午 11	檔案資料夾	
■ 点面	Installation.txt	2010/9/8 上午 11:16	文字文件	1 KB
遭 嵌近的位置	📄 ReadMe.txt	2010/9/8 上午 11:18	文字文件	4 KB
 編 媒體櫃 ① 文件 ⑦ 音樂 酬 視訊 圖 月 ○ 個月 ○ 本機磁碟 (C:) ○ 本機磁碟 (E:) ○ 本機磁碟 (E:) 	Tersion.txt	2010/10/11 下午 01	文字文件	1 KB
 ● 網路 ■ TN_TAO_3530 ■ 檔案資料夾 	9 修改日期: 2010/10/11 上午 11:54			

Figure 115
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■ 点面	\mu ARUBABOARD	2010/4/6 下午 02:42	檔案資料夾
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Go back to the decompressed folder "TN-TAO-3530_CE6.0_1.00.04 / 1.0014 / " folder, and copy the "OSDesigns" folder to "C:\ WINCE600 \". (See Figure 117 and Figure 118)

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Figure 117

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14.4 Create a SD card

This chapter describes making a SD card with the standard panel solutions. If you want to make a SD card for your own custom panel (a new project), then please read chapter 14.6.

- Open "Microsoft Visual Studio 2005". If that already open, Please reopen it.
- Click "File \rightarrow Open \rightarrow Project Solution" (See Figure 119)

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- Figure 119
 - Go into the folder and open the SLN-file (As example in this manual we use "Tsunami_LCD_AT070TN94") (See Figure 120)

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Figure 120

In the menu click "build/advanced build command/sysgen" (See Figure 121); this will take approximately 20 minutes, after which you will see "build complete" (see Figure 122)

[The older version of the BSP has a naming mistake, so even though we install a 7 inch panel you will sometimes see "LB043WQ2" mentioned in the log]



Figure 121

TAO-3530 USER'S GUIDE 097

10/18/2013, TechNexion

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• Plug an microSD in your computer (with for instance a USB card reader)



- Open "active@partition manager" (freeware at <u>www.pcdisk.com</u>)
- Right click on removable disk and choose "new partition" (see Figure 123)

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Be	组合管	Data Storage Devic	es and Partitions		L PLOT						P: 1 P	B - 141						
E	* 1	Hame	P7250250LA380 (80h)	Hard Disk	Ready	File System	Segment	Oliset in sectors	488395055	4.03 MB	Disk Usage	232 GB						-
E		🖲 🧼 Hitschi HI	P725025GLA380 (81h)	Hard Disk	Ready				488397168	2.49 MB		232 GB						
E	9.0	Unallo	cated.	Primary	Unallocated	Unallocated	0	63	499712	245 MB		244 MD 243 MB						
	24	PIONEER	DVD-ROM DVD-130P (7Fh)	CDRom Drive	Not Ready Not Ready				0									
	調 葬	E S HACI 41	Exert (ring	CDR011 DIWE	AULKeally				0									
	1																	
	Mark																	
	(1) 1																	
	Reality	Device: 80h Hard Dick	L Local Disk (C:)					ocal Disk (E:)										
		[232 GB]	1. 79.9 GB Primary NTFS				8	0.0 GB Primary NT.	FS				38.1 GB Logical Un	nknown	30.9 GB Logics	l Unknown	3.81 GB Logica	
	-	Device: 81h	Local Dick (Dr)															
	em a	[232 GB]	232 GB Primary NTFS															
		Device: 82h	-							_								
		Removable Disk [244 MB]	243 MB Unallocated	🛞 New Partitic	on													
		Device: 7Fh		📄 🕨 Scan for De	eleted Partitions													
11	1000	CDRom Drive		Properties					DEVICE I	S NOT R	EADY							
		[Inversion(3.]		-														-
1		CDRom Drive							DEVICE I	S NOT R	EADY							
		[Not Ready]								en concerna con								
-																		
Cata	alog Items																	
Output																		• 4 ×
STUDY C	мрано. Macф																	
61269	(區序號:																	
C:\1	VINCE600																	
2010/	/10/27																	
BLDDE	EMO: Tsu																	
Tsuna	ani_LCD_							_							_			
																	1	
•		and the																•
Dull Dull	pol _ Er	TOT DIST													I = 2202	Call	Chi	Die
CTRR-	* 6														LH 3303		0 2 m 0	TH 02-23
11/24	- · ·															1000 U		1 00 m

Figure 123

 In the menu mark "partition as active", press OK, it will then show "successful" (see Figure 124)

reate Partition			×
Select the partition you (vant to create and other :	settings:	
Primary Partition	C Extended Partition	C Logical Drive	
Partition geometry			
• Default partition ge	eometry		
Size, MB:	243 Maximum: 24	3 MB	
C Exact partition geo	metry		
Offset:	63 with size:	499649	
Min offset:	63 space available:	499649	
	measured in: $oldsymbol{C}$ m	egabytes 🙃 sectors	
	10101010-010		
Drive Attributes			
Assign the followin	g drive letter: H: 💌		
Mark Partition as A	ctive		
Format Partition -			
and the second			
Volume Label:	-		
File System:	FA132		
Allocation unit size	Default	7	
Perform a quic	k format		
	ОК	Cancel	
	1994	1000000	
ocessing completed			
New partition h	as been created successfu	lly	
~~			
242 C 243			2 Contraction (1997)



• Right click again and choose format, Click OK, finished (see Figure 125)

Format		×	
Volume Label:			
File System:	FAT	•	
Allocation unit size	Default	_	
🔽 Perform a quic	k format		
	ОК	Cancel	
D			
Processing completed			<u>^</u>
Partition has b	een formatted successfu	lly	
1			

Figure 125

 Go to C:\WINCE600\OSDesigns\Tsunami_LCD_AT070TN94\RelDir" and open the folder "TN_TAO_3530_ARMV41_release" (See Figure 126). The folder contains files named: MLO, EBOOTSD.nb0, NK.bin (These files are needed for a <u>bootable</u> SD-card)

RelDir				
🌀 🔵 🗢 🕌 🗕 OSDesign	s 🗕 Tsunami_LCD_AT070TN94 🚽 RelDir 🚽	▼ 🛂 捜尋	t RelDir	
檔案④ 編輯④ 検視♥ 組合管理 ▼ 🍃 開啟	工具(I) 說明(H) 加入至媒體櫃 ▼ 共用對象 ▼ 新增資料來	:		:= • 🔟 😢
🚖 我的最愛	名稱 🔺	修改日期	類型	大小
🕠 下載	\mu TN_TAO_3530_ARMV4I_Debug	2010/10/27 下午 01	檔案資料夾	
🜉 桌面 🗐 晶新的位署	腸 TN_TAO_3530_ARMV4I_Release	2010/10/27 下午 02	檔案資料夾	
 課體櫃 文件 〕 育樂 親訊 圖月 ■ 圖月 ● 電腦 ▲機磁碟 (C:) → 本機磁碟 (D:) → 本機磁碟 (E:) ● 和機磁碟 (E:) 				

Figure 126

- First copy "MLO" to the microSD card (the order is important)
- Then copy "EBOOTSD.nb0" and "NK.bin" in the microSD card (See Figure 127)
- Remove the MicroSD card



Figure 127

- Open a terminal (Hyperterminal or PuTTY). In this manual we use PuTTY.
- Make sure the terminal cable is connected
- Select a com port (for example COM1) and check that the settings are OK:

Baud rate	115200
Data bit	8
Stop bits	1
Parity	none
Flow control	none

- Press "Load"
- Now insert the microSD in your Baseboard
- Keep the user button on the baseboard pressed and insert the power cable
- It will boot from SD
- You'll see "Hit space to enter configuration menu 5..." in PuTTY. Please push space key on the keyboard of PC. You'll see "Main Menu" in PuTTY.
- In the terminal choose option Select Boot Device (See Figure 128)

B COM1 - PuTTY	
Init HW: controller RST	
SDHC: command response timeout CTO!	
MMC::MMCCommandResponse: MMCSendCommand error, command = 8	
MMC::MMCCommandResponse: Command Response Error	
read ebootsd.nb0 file	
jumping to ebootsd image	
Microsoft Windows CE Bootloader Common Library Version 1.4 Built Oct 27 2010 14:04:53	
Texas Instruments Windows CE EBOOT for Mistral OMAP EVM, Built Oct 27 2010 at 14:08:23	
TI OMAP3530 Version 0x4b7ae02f (ES3.1)	
TPS659XX Version 0x10 (ES2.x)	
System ready!	
Preparing for download	
INFO: Predownload	
WARN: Boot config wasn't found, using defaults	
INFO: SW4 boot setting: 0x2f	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Hit space to enter configuration menu 3	
Hit space to enter configuration menu 2	
Hit space to enter configuration menu 1	
MAC address not found !! Aborting	
ERROR: Boot device driver Init call failed	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[7] Save Settings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 2	
Select Boot Device	
[1] LAN9220 MAC	
[2] USBFN RNDIS	
[3] NK from SDCard FILE	
[0] Exit and Continue	
Selection (actual LAN9220 MAC):	



• Select NK from SD Card FILE (See figure 16)

de COM1 - PuTTY
WARN: Boot config wasn't found, using defaults INFO: SW4 boot setting: Ox2f
<pre>>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<< Hit space to enter configuration menu 5 Hit space to enter configuration menu 3 Hit space to enter configuration menu 2 Hit space to enter configuration menu 2 Hit space to enter configuration menu 1 MAC address not found!! Aborting ERROR: Boot device driver Init call failed</pre>
Main Menu
[1] Show Current Settings [2] Select Boot Device [3] Select KITL (Debug) Device [4] Network Settings [5] SDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Management [9] Enable/Disable OAL Retail Messages [0] Exit and Continue Selection: 2
Select Boot Device
<pre>[1] LAN9220 MAC [2] USBFn RNDIS [3] NK from SDCard FILE [0] Exit and Continue Selection (actual LAN9220 MAC): 3 Boot device set to NK from SDCard FILE</pre>
Nain Menu
<pre>[1] Show Current Settings [2] Select Boot Device [3] Select KITL (Debug) Device [4] Network Settings [5] SDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Management [9] Enable/Disable OAL Retail Messages [0] Exit and Continue Selection:</pre>



- Select Exit and Continue
- It will start to load the image into the memory (see Figure 130) and the base board will show Windows CE.
- FINISHED

R COMI - PuTTY	<u>-0×</u>
Selection: 2	_
Select Boot Device	
[1] LAN9220 MAC	
[2] USBFn RNDIS	
[3] NK from SDCard File	
[0] Exit and continue	
Selection (actual LAN9220 MAC): 3	
Boot device set to NK from SDCard FILE	
малл лели	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select Kill (Depug) Device	
[5] SDCard Settings	
[6] Set Device ID	
[7] Save Settings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 0	
Jetector, o	
SHC: command response timeout CTO'	
MMC::MMCCommandResponse: MMCSendCommand error, command = 8	
MMC::MMCCommandResponse: Command Response Error	
BL_IMAGE_TYPE_BIN	
Download file information:	
[0]: Address=0x84001000	
Download file type: 1	
rom_offset=0x0.	
ImageStart = 0x84001000, ImageLength = 0x1D1E680, Launchlddr = 0x8400B294	
Completed file(s):	
[0]: Address=0x84001000 Length=0x1D1E680 Name="" Target=RAM	
ROMHDR at Address 84001044h	
Launch Windows CE image by jumping to 0x8000b294	
Windows CE Kernel for ARM (Thumb Enabled) Built on Oct 20 2009 at 18:39:19	
High Performance Frequecy is 32768 khz	
OEMInit(Deinitialize serial debug)	
	•

14.5 How to put the WinCE image in the NAND Flash

In the previous section we showed how to boot from a SD card. Now we explain how to put the image in the NAND Flash so you can boot without the SD card.

14.5.1 Create file "NK.nb0".

- Click "Build \rightarrow Open Release Directory in Build Window". (See Figure 131)
- It will open a console window. (See figure 19)





- Type "viewbin nk.bin". (See Figure 132)
- It will show "Image Start = address, length = size".
 (Example "Image Start = 0x84001000, length = 0x01D1E680")
- Type "cvrtbin -r -w 32 -a Image Start -l length nk.bin".
 (Example "cvrtbin -w 32 -r -a 0x84001000 -l 0x01d1e680 nk.bin"). (See Figure 133)





26 条统省	辞理員: Isu	nami_LCE	_LB043WQ2 -	TN_TAO_	.3530_ARI	M¥4I Rele	ase				
start 8	35690000	length	00007588								*
start 8	85698000	length	00000020								
start 8	85699000	length	0003c210								
start 8	856d6000	length	00003194								
start 8	856da000	length	0000141c								
start 8	856dc000	length	00000080								
start 8	856dd000	length	000030d0								
start 8	856e1000	length	00023594								
start 8	35705000	length	00009360								
start 8	3570£000	length	00009380								
start 8	85719000	length	0003fa94								
start 8	85758a94	length	00027104								
start 8	3577fb98	length	000574bc								
start 8	357d7054	length	00032d48								
start 8	85809d9c	length	0001998c								
start 8	85823728	length	00035cdc								
start 8	85859404	length	0003f28c								
start 8	35898690	length	00035ee0								
start 8	858ce570	length	0003f924								
start 8	3590de94	length	0003c57c								
start 8	8594a410	length	00056614								
start 8	359a0a24	length	00047e84								
start 8	359e88a8	length	00039504								
start 8	35a21dac	length	00033564								
start 8	35a55910	length	00067794								
start 8	35abd0a4	length	0025e624								
start 8	35d1b6c8	length	00001650								
start 8	35d1cd78	length	00000054								100
start 8	35d1cdcc	length	00002854								
Progres	ss										
Ø%Done.											
C-SULNO	PE600\001	lasigna	Toupani ICI) от юрот	N04\P-1	Dinth	T00 2	520		Palazoa	-1
C- WINC	2000/021	resigns	asunaniLG		1974 / ne 1	DTP NIM_	1HU_3	<u>ววย_</u>	HNN041.	_nerease>	

- FINISHED. (See Figure 134)
- You will now be able to find the file"NK.nb0" in the directory: RelDir/TN_TAO_3530_AMV41_Release

14.5.2 Write the Bootloader and OS image to the NAND Flash.

- Format the SD Card with the USB Card Reader in the computer, using "Active@ Partition Manager" or another utility.
- Mark "partition as active"
- This needs "MLO", "EBOOTSD.nb0", "fldr.raw" or "fldrlogo.raw" and "nk.nb0". These are in "C:\WINCE60\OSDesigns\Project Name\ RelDir\TN_TAO_3530_ARMV4I_Release\".

(Note: for installing into NAND we need the **nk.nb0**, <u>this is different</u> from the nk.bin we used for the bootable SD-card)

- You can choose between "fldr.raw" or "fldrlogo.raw" (the end result will be the same). Fldr.raw will, during boot up, show a screen divided in four different colors. Fldrlogo.raw will, during boot up, show a dark screen with a TechNexion logo. If you want your own logo to appear then please read chapter 14.7.
- First copy only the "MLO" file to the SD card. (the order is important) See Figure 135)
- Then copy "EBOOTSD.nb0", "fldr.raw" or "fldrlogo.raw" and "nk.nb0" files to the SD card. (see Figure 136)
- Connect the UART cable. Open terminal setting: Chose Serial port: COM1 or other

Speed:	115200
Data bits:	8
Stop bits:	1
Parity:	None
Flow Control:	None

- Insert SD Card into the target board. Keep USER1 bottom pushed in. Then connect the power cable.
- When it shows "Hit space to enter configuration menu". Please push space button on the keyboard.
- It will show "Main Menu" in the terminal. (See Figure 137)

mo name (H:)				
	IO NAME (H:)	▼ [😚 搜尋 NO NAME (H:)	<u> 1</u>
檔案(E) 編輯(E) 檢視(V) 組合管理 ▼ _ 開啟) 工具(I) 說明(H) 新增資料夾			:= • 🔝 🔞
술 我的最愛	名稱 🔺	修改日期	大小類型	
下載	MLO	2010/10/27 下午 02	49 KB 檔案	
🜉 景画 🗐 最近的位置				
□ 保證値 ○ 文件				
→ 音樂				
■ 倪訊				
ा == 电脑 ▲ 本機磁碟 (C:)				
本機磁碟(D:) ★機磁碟(D:)				
6 900 900 900 900 900 900 900 900 900 90				
	•			<u>•</u>
MLO 修改日期]: 2010/10/27 下午 02:09 建	建立日期: 2010/10/27 下午 02:31		
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	N: 48.0 KB			

Figure 135

NO NAME (H:)					
○○ - • 電腦 •	NO NAME (H:)	+	🧑 搜尋 NO 1	IAME (H:)	\$
檔案(F) 編輯(E) 檢視(④ 組合管理 ▼ _ 開啟) 工具(I) 說明(H) 新增資料夾				
👉 我的最愛	名稱 ▲	修改日期	大小	類型	
🚺 下載	MLO	2010/10/27 下午 02	49 KB	檔案	
■ 点面	EBOO TSD.nb0	2010/10/27 下午 02	256 KB	NBO 檔案	
📓 最近的业室	📄 fldrlogo.raw	2010/10/27 下午 02	418 KB	RA₩ 檔案	
📄 媒體櫃	📄 nk.nb0	2010/10/27 下午 03	29,818 KB	NBO 檔案	
■ 0.4 M ■ 個月 ● 電腦 ● 本機磁碟 (C:) ■ 本機磁碟 (D:) ■ 本機磁碟 (E:) ■ NO NAME (H:)					
選取了3個項	▲ 夏目 修改日期: 2010/10/27 下午 0. 大小: 29.7 MB	3:08 建立日期: 2010/10/27 下4	F 03:13		

Figure 136

La COMI - PUTTY	
400	A
Texas Instruments Windows CE SD X-Loader for EVM 3530	
Built Oct 27 2010 at 14:08:29	
Version 6.12.04	
open ebootsd.nb0 file	
Init HW: controller RST	
SDHC: command response timeout CTO!	
MMC::MMCCommandResponse: MMCSendCommand error, command = 8	
MMC::MMCCommandResponse: Command Response Error	
read ebootsd.nb0 file	
Jumping to epootsa image	
Microsoft Windows CE Bootloader Common Library Version 1.4 Built Oct 27 2010 14:04:53	
Texas Instruments Windows CE EBOOT for Mistral OMAP EVM, Built Oct 27 2010 at 14:08:23	
EBOOT Version 1.1, BSP 6.12.04	
TI OMAP3530 Version 0x4b7ae02f (ES3.1)	
TPS659XX Version 0x10 (ES2.x)	
System ready!	
Preparing for download	
INFO: Predownload	
WARN: Boot config wasn't found, using defaults	
INFO: SW4 boot setting: 0x2f	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Hit space to enter configuration menu 3	
Hit space to enter configuration menu 2	
Hit space to enter configuration menu 1	
MAC address not found !! Aborting	
ERROR: Boot device driver Init call failed	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[/] Save Settings	
[0] Flash management	
[0] Future and Continue	
fol type and concerne	
Selection:	
	-

• Chose "Flash Management". (See Figure 138)

g ² COM1 - Pulty	
Texas Instruments Windows CE EBOOT for Mistral OMAP EVM, Built Oct 27 2010 at 14:08:23	<u> </u>
EBOOT Version 1.1, BSP 6.12.04	
TI OMAP3530 Version 0x4b7ae02f (ES3.1)	
TPS659XX Version 0x10 (ES2.x)	
System ready!	
Preparing for download	
INFO: Predownload	
WARN: Boot config wash't found, using defaults	
INFO: SW4 boot setting: UX21	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Hit space to enter configuration menu 3	
Hit space to enter configuration menu 2	
Hit space to enter configuration menu 1	
MAC address not found !! Aborting	
ERROR: Boot device driver init call failed	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device 1D	
[/] Save settings	
[0] Flash - Manlenienc	
In Frist and Continue	
to the and continue	
Selection: 8	
Flash Management	
[1] Dive lists geometry	
[2] Fund Linksh Sector	
[4] Frace block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection:	



- Chose "Show flash geometry". (See Figure 139)
- It will show:
 Flash Type: NAND
 Blocks: 2048
- Chose "Erase block range". (See Figure 140)
- It will show "First Block Number:" Input "0". Then enter.
- It will show "Last Block Number:" Input "(Blocks 1)". For example "2048-1=2047", so type 2047 then enter.
- It will show "Do you want erase block 0-2047 [-/y]?" Input "y" (See Figure 141)

R COM1 - PuTTY	
[1] Show Called Sectings	
[2] Select Boot Device	
(3) Select Kill (Debug) Device	
[4] Network Settings	
[5] SUCARA Settings	
[6] Set Device ID	
[7] Save Settings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 8	
Flash Management	
[1] Show flash geometry	
[2] Dues Linda generation	
[3] Fraze flach	
[4] Litase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format Ilash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] fxit and Continue	
Selection: 1	
Flash Type: NAND	
Blocks: 2048	
Bytes/block: 131072	
Sectors/block: 64	
Bytes/sector: 2048	
Treserved1 0 1 2 3	
[had] 45 128 424 701 1196 Dane	
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Frase block range	
[5] Beserve block range	
[6] Set had block	
[7] For but stock	
[7] FULMAL LIASH	
[o] white bootboader from speard to flash	
[9] WRITE NK Image from Sucard to flash	
[0] Exit and Continue	
Selection:	



COM1 - PuTTY	<u>_0×</u>
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[/] Save Settings	
[0] Flash Management	
[9] Enable/Disable OAL Ketall Messages	
[0] EXIC and Concinue	
Selection: 8	
Flash Management	
(11 Show flash geometry	
[2] Dumn flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 1	
Flash Tune - NIND	
Blocks: 2048	
Bytes/block: 131072	
Sectors/block: 64	
Bytes/sector: 2048	
reserved 0.1.2.3	
bad] 45 128 424 791 1196 Done	
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
· 같같은 말씀 안정 200 가 동안에 전성 200 가 동안에 가지 않는 것이다. 이 가 이 가지 않는 것이다. 이 가지 않는 것이 이 가 있다. 이 가 있다 이 가 있다. 이 하 이 가 있다. 이 가 있다.	
[4] Lrase block range	
[4] trase block range	
[4] trade block range [5] Reserve block range [6] Set bad block	
 [4] Frace block range [5] Reserve block range [6] Set bad block [7] Format flash 	
<pre>[4] frame Dicock Fange [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash</pre>	
<pre>[4] Frase Dicock Fange [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash [9] Unite NK image from SDCard to flash</pre>	
 [4] Frase Dicok Fange [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash [9] Dicte TNK image from SDCard to flash [4] Exit and Continue 	
[4] Frase Dicok Fange [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash [9] Unite NK image from SDCard to flash [6] Exit and Continue Selection: 4	
<pre>[4] Frase Diook Fange [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash [9] Elete NK image from SDCard to flash [40] Exit and Continue Selection: 4 First Block Number: 0</pre>	

TAO-3530 USER'S GUIDE 097

COM1 - PuTTY	
[6] Set Device ID	
[7] Save Settings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 8	
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 1	
Flash Type: NAND	
Blocks: 2048	
Bytes/block: 131072	
Sectors/block: 64	
Bytes/sector: 2048	
[reserved] U 1 2 3	
[bad] 13 160 124 (SI 1190 Dule	
Flash Management	
[1] Show flash geometry	
[2] Jump Hash Sector	
[3] Frase Flash	
[1] Liase block range	
[5] Active block large	
[0] Servert flock	
[/] FOLMAC IIADH [9] Write boorloader from Shfard to flack	
[0] write booldader from SDCard to flash	
[5] WILLE WA IMAGE ITOM SPEARE CO ITASH	
[0] File and contribut	
Selection: 4	
First Block Number: 0	
Last Block Number: 2047	
Do you want erase block 0-2047 [-/y] y	
Do you want to erase reserved block 0 [-/y]?	
Figure 141	

- Chose "Write Bootloader from SD-Card to flash". (See Figure 142)
- It will show "Do you want to write Bootloader to flash [-/y]?" Input "y"
- Then it will show "Bootloader Image written". (See Figure 143)

B COMI - Putty	
Less Direct Nectors 2017	
Last Block Number: 204/	
bo you want erase block U-2U47 [-/y] y	
Do you want to erase reserved block O [-/y]? y	
Do you want to erase reserved block 1 [-/y]? y	
Do you want to erase reserved block 2 [-/y]? y	
Do you want to erase reserved block 3 [-/y]? y	
Do you want to erase reserved block 45 [-/y]? y	
Do you want to erase bad block 45 [-/y]? y	
Oops, can't erase block 45 - mark as bad	
Do you want to erase reserved b	lock 128 [-/y]? y
Do you want to erase bad block 128 [-/y]? y	
Oops, can't erase block 128 - mark as bad	
	• • • • • • • • • • • • • • • • • • • •
Do you want to erase reserved block 424 [-/y]? y	
Do you want to erase bad block 424 [-/y]? y	
Oops, can't erase block 424 - mark as bad	
	· · · · · · · · · · · · · · · · · · ·
	•••••••••••••••••••••••••••••••••••••••
Do you want to erase	reserved block 791
1] ? ¥	
Do you want to erase bad block 791 [-/y]? y	
Oops, can't erase block 791 - mark as bad	
	De
want to erase reserved block 1196 [-/y]? y	
Do you want to erase bad block 1196 [-/y]? y	
Oops, can't erase block 1196 - mark as bad	
Done	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Fyit and Continue	
Selection: 8	

🛃 COM1 - PuTTY		
Init HW: controller	RST	
SDHC: command respo	hse timeout CTO!	
MMC::MMCCommandResp	onse: MMCSendCommand error, command = 8	
MMC::MMCCommandResp	onse: Command Response Error	
file size = 427434		
Read BootLoader Fro	n SD Card.	
••		
Read data successfu	11y!	
Write BootLoader to	Flash.	
OALFlashStoreOpen:	2048 blocks, 64 sectors/block	
OALFlashStoreOpen:	2048 bytes/sector, O reserved blocks	
ROMHDR (nTOC = 0x80	006458)	
DLL First	: Dx4001c001	
DLL Last	: 0x4001c001	
Physical First	. Dx40206000	
Physical Last	: 0x4020c1a0	
Num Modules	- 1	
DAM Stort	· 0x4020~000	
RAM Free	• 0x4020e000	
RAM Fred	• 0x4020f000	
Num Conv Entries		
Conv Entries Offs	- 0x4020b4c4	
Prof Sumbol Lengt	- 0x0000000	
Prof Symbol Offee	· · 0x00000000	
Num Files		
Vernel Flage		
FiloSue DAM Derce		
Driver Glob Stert	• 0×00000000	
Driver Glob Lengt		
CDU CDU	· 0x01c2	
WiggFlows	· 0x0102	
hiseriags	- 0x0002	
Excensions	: 0x0000000	
Tracking Mem Star		
Ifacking new being	.n : 0x0000000	
BootLoader Image wr	itten	
Flash Nonagement		
[1] Show flash geo	met.rv	
[2] Dumn flash sec	tor	
[3] Erase flash		
[4] Frase block ra	nge	
[5] Beserve block	range	
[6] Set had block		
[7] Format fleeh		
[8] Write bootload	er from SDCard to flagh	
[9] Write NK image	from SDCard to flash	
[0] Evit and Conti	nie	
[0] EXTE and COLCI	- ****	
Calana (

Figure 143

- Take the microSD card out of the Baseboard.
- Reboot from NAND Flash by pushing the reset button on the baseboard (See Figure 144).
- It will make a partition and format and then show "Flash format complete!"

```
🚰 COM1 - PuTTY
                                                                                                                                                                                                    Formatting flash..
                                                                                                                                                                                                           .
 Enter LowLevelFormat [OxO, Ox7ff]
Erasing flash block(s) [0x0, 0x7ff] (please wait): EraseBlocks: preserving reserved block (0x0) 
EraseBlocks: preserving reserved block (0x1)
EraseBlocks: preserving reserved block (0x2)
EraseBlocks: preserving reserved block (0x3)
IraseBlocks: found a bad block (0x2d) - skipping...
FraseBlocks: found a bad block (0x80) - skipping...
FraseBlocks: found a bad block (0x1a8) - skipping...
FraseBlocks: found a bad block (0x17) - skipping...
EraseBlocks: found a bad block (0x4ac) - skipping...
Done.
WriteMBR: MBR block = 0x4.
Done.
IsValidMBR: MBR sector = 0x100 (valid MBR)
 OpenPartition: Partition Exists=0x0 for part 0x20.
CreatePartition: Enter CreatePartition for 0x20.
LastLogSector: Last log sector is: 0x1fdbf.
CreatePartition: Start = 0X, Num = 0x5fff.
Log2Phys: Logical 0x1 -> Physical 0x101
WriteMBR: MBR block = 0x4.
IsValidMBR: MBR sector = 0x100 (valid MBR)
OpenPartition: Partition Exists=0x0 for part 0xb.
CreatePartition: Enter CreatePartition for Oxb.
FindFreeSector: FreeSector is: 0x6000 after processing part 0x20.
CreatePartition: Num sectors set to 0x19c80 to allow for compaction blocks.
CreatePartition: Start = 0x6000, Num = 0x19c80.
NotembR: MBR block = 9x4.
Flash format complete!
      Forcing cold boot (non-persistent registry and other data will be wiped) <<<
Hit space to enter configuration menu 5...
Hit space to enter configuration menu 4...
Hit space to enter configuration menu 3...
Hit space to enter configuration menu 2...
Hit space to enter configuration menu 1...
  Main Menu
  [1] Show Current Settings
  [2] Select Boot Device[3] Select KITL (Debug) Device
  [4] Network Settings[5] Flash Management
  [6] Set Device ID
[7] Save Settings
  [8] Enable/Disable OAL Retail Messages[0] Exit and Continue
  Selection:
```



- Put the microSD card back into the baseboard. Unplug the power, push the User button while inserting the power again (=reboot from SD Card) (See Figure 145)
- When it shows "Hit space to enter configuration menu". Please push space button on the keyboard.



Figure 145

- Chose "Flash Management". (See Figure 146)
- Chose "Write NK image from SD-Card to flash". (See Figure 146)
- It will show "Do you want to write NK image to flash [-/y]?" Input "y".
- It will show "NK image written". (See Figure 147)

Party	
Microsoft Windows CE Bootloader Common Library Version 1.4 Built Oct 27 2010 14:04:53	
Texas Instruments Windows CE EBOOT for Mistral OMAP EVM. Built Oct 27 2010 at 14:08:23	
EBOOT Version 1.1, BSP 6.12.04	
TI OMAP3530 Version 0x4b7ae02f (ES3.1)	
PS659XX Version 0x10 (ES2.x)	
System ready!	
Preparing for download	
INFO: Predownload	
MARN: BOOT CONFIG WASN'T FOUNDA, USING GETAULTS INFO: SVA boot setting: 0/2f	
INFO: SWY BOOC SECCING: OX21	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
it space to enter configuration menu 3	
it space to enter configuration menu 2	
it space to enter configuration menu 1	
TAC address not found:: Aborting TDDDD: Root derive driver Init cell feiled	
Adda bos device driver inte cari funca	
Main Menu	
[1] Show Current Settings	
[2] Select KITI (Abbud) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
17 Save Settings	
[8] Flash Management	
19] Enable/Disable AL Retail Messages	
[U] Exit and continue	
Selection: 8	
Flash Management	
[2] Dumo flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format Fleek	
Toj witte bootboader irom bloard to Ilash 191 write NV imega from Shoard to flash	
[2] witce we image from speard to flash	
Top-man and concerned	
Selection: 9	
Do you want to write NK image to flash [-/v]?	

Figure 146

			-
ad data success	· · · · · · · · · · · · · · · · · · ·		
ite NK image to	Flach		
TOE WK IMage CO	Tabii.		
iting NK image t	o OS partition		
MHDR (pTOC = Ox8	1d1cd78)		
DLL First	: 0x4001c001		
DLL Last	: 0x416dcOcd		
Physical First	: 0x84001000		
Physical Last	: 0x85d1f680		
Num Modules	: 253		
RAM Start	: 0x85d20000		
RAM Free	: 0x85d35000		
RAM End	: 0x88800000		
Num Copy Entries	: 2		
Copy Entries Of!	set : 0x851afdc0		
Prof Symbol Lend	th : 0x0000000		
Prof Symbol Off:	et : 0x0000000		
Num Files	: 83		
Kernel Flags	: 0x0000002		
FileSys RAM Perc	ent : 0x40404040		
river Glob Star	t : 0x0000000		
river Glob Leng	th : 0x0000000		
CPU	: 0x01c2		
MiscFlags	: 0x0002		
Extensions	: 0x84002020		
Tracking Mem Sta	rt : 0x00000000		
Tracking Mem Le:	gth : 0x00000000		
ValidMBR: MBR se	ctor = 0x100 (valid)	MBR)	
enPartition: Par	at 0x1d1e680	. pare enter	
enPartition: Par SetDataPointer			
enPartition: Pai _SetDataPointer _SetDataPointer	at OxO		
enPartition: Pa _SetDataPointer _SetDataPointer iteData: Start =	at OxO OxO, Length = Oxidia	÷680.	
enPartition: Pa _SetDataPointer _SetDataPointer iteData: Start = ZPhys: Logica	at OxO OxO, Length = Oxidie Dx1 -> Physical Ox10:	e680.	
enPartition: Pa SetDataPointer SetDataPointer iteData: Start = g2Phys: Logical image written	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10:	e680. L	
enPartition: Pa SetDataPointer SetDataPointer iteData: Start : g2Phys: Logical image written	at OxO OxO, Length = Ox1d14 Ox1 -> Physical Ox10:	≥680. L	
enPartition: Pai SetDataPointer SetDataPointer iteData: Start = g2Phys: Logical image written	at 0x0 0x0, Length = 0x1d1(0x1 -> Physical 0x10	2680. L	
enPartition: Pai SetDataPointer SetDataPointer iteData: Start g2Phys: Logical image written lash Management	at OxO OxO, Length = Oxidi OxI -> Physical OxIO	=680. L	
enPartition: Pai SetDataPointer SetDataPointer IteData: Start - g2Phys: LogIca image written lash Management	at 0x0 0x0, Length = 0x1di 0x1 -> Physical 0x10: 	≥680. 1	
enPartition: Pai SetDataPointer SetDataPointer iteData: Start : g2Phys: Logical image written lash Management 1] Show flash ge 2] Dump flash se	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10: 	=680. 1	
enPartition: Pai _SetDataPointer SetDataPointer iteData: Start = g2Phys: Logical image written lash Management 1] Show flash ge 2] Dump flash se 3] Errase flash	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10:	≥680. 1	
enPartition: Pai SetDataPointer SetDataPointer IteData: Start = g2Phys: LogIca: image written lash Management 1] Show flash ge 2] Dump flash se 3] Drase flash 4] Erase block r	at 0x0 0x0, Length = 0x1di 0x1 -> Physical 0x10 ometry toor inge	≥680. 1	
enFartition: Pai SetDataPointer SetDataPointer iteData: Start • g2Phys: LogIcal image written lash Management 1] Show flash ge 2] Dump flash se 3] Erase flash 4] Erase block r 5] Reserve block	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10. 	≥680. 1	
enFartition: Pai SetDataPointer SetDataPointer iteData: Start - g2Phys: LogIcal : image written lash Management] Show flash ge 2] Dump flash se 3] Erase flash 4] Erase block r 5] Reserve block 6] Set bad block	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10. 	≥680. 1	
enPartition: Pai SetDataPointer SetDataPointer IteData: Start = g2Phys: LogItal image written lash Management] Show flash ge 2] Dump flash se 3] Erase flash 4] Erase block r 5] Reserve block 6] Set bad block	at 0x0 0x0, Length = 0x1di 0x1 -> Physical 0x10 ometry stor ange range	≥680. 1	
enPartition: Par SetDataPointer SetDataPointer iteData: Start : g2Phys: Logical image written lash Management] Show flash ge 2] Dump flash se 3] Erase flash 4] Erase block r 5] Reserve block 6] Set bad block 7] Format flash 8] Write bootLoc	at 0x0 0x0, Length = 0x1d1 0x1 -> Physical 0x10 metry stor ange range ler from SDCard to fi	=680. 1 	
enPartition: Pai SetDataPointer SetDataPointer iteData: Start = g2Phys: Logical image written lash Management] Show flash ge 2] Dump flash ge 3] Erase flash 4] Erase block r 5] Reserve block 6] Set bad block 7] Format flash 8] Write botLos 9] Write NK imag	at CNO OXO, Length = Oxidi Oxi -> Physical Oxio ometry stor ange range ler from SDCard to flas	≘680. 1 	
enPartition: Pai SetDataPointer SetDataPointer iteData: Start OfPhys: Logical image written lash Management] Show flash ge 2] Dump flash se 3] Erase flash 4] Erase block r 5] Reserve block 6] Set bad bloch 7] Format flash 8] Write bootLos 9] Write NK imag 0] Exit and Cont	at CNO OXO, Length = Oxidi OXI -> Physical Oxio ometry toor ange range ier from SDCard to flag inue	=680. 1 	

Figure 147

14.5.3 Boot from NAND flash.

- Take out the MicroSD Card from the Baseboard
- Press the reset button on the baseboard
- When it shows "Hit space to enter configuration menu". Please push space button on the keyboard. (See Figure 148)





- Chose "Select Boot Device". (See Figure 149)
- It will show "Selection (actual (NULL)):" Then chose "NK from NAND" (see Figure 150)

COMI - PuTTY	
xas Instruments Windows CE NAND X-Loader for EVM 3530	
ilt Oct 27 2010 at 14:08:27	
rsion 6.12.04	
mping to bootloader	
crosoft Windows CE Bootloader Common Library Version 1.4 Built Oct 27 2010 14:04:53	
xas Instruments Windows CE EBOOT for Mistral OMAP EVM, Built Oct 27 2010 at 14:08:16	
OOT Version 1.1, BSP 6.12.04	
OMAP3530 Version 0x4b7ae02f (ES3.1)	
S659XX Version 0x10 (ES2.x)	
stem ready!	
eparing for download	
FO: Predownload	
ecking bootloader blocks are marked as reserved (Num = 4)	
RN: Boot config wasn't found, using defaults	
FO: SW4 boot setting: 0x0f	
LFlashStoreOpen: 2048 blocks, 64 sectors/block	
LFlashStoreOpen: 2048 bytes/sector, 4 reserved blocks	
ValidMBR: MBR sector = 0x100 (valid MBR)	
enPartition: Partition Exists=0x1 for part 0x20.	
> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
t space to enter configuration menu 5	
t space to enter configuration menu 5 t space to enter configuration menu 4 - space to enter configuration menu 3	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KJTL (Debug) Device	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 9] Fact and contings	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 9] First and Continue election: 2	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 0] Enter and Continue election: 2	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 0] Ewie and continent election: 2 elect Boot Device	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 0] We'r and contingent election: 2 elect Boot Device	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Filash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 6] Ever and Continue election: 2 elect Boot Device 1] LAN9220 MAC	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 6] Sert and Continue election: 2 elect Boot Device 1] LAN9220 MAC 2] USBFn RNDIS	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 0] Ewit and continue elect Boot Device 1] LAN9220 MAC 2] USBFn RNDIS 3] NK from NAND 0] Evit end Continue	
t space to enter configuration menu 5 t space to enter configuration menu 4 t space to enter configuration menu 3 ain Menu 1] Show Current Settings 2] Select Boot Device 3] Select KITL (Debug) Device 4] Network Settings 5] Flash Management 6] Set Device ID 7] Save Settings 8] Enable/Disable OAL Retail Messages 9] Fact and continue election: 2 elect Boot Device 1] LAN9220 MAC 2] USBFR MDIS 3] NK from NAND 0] Exit and Continue	

Figure 149



Figure 150

🛃 COM1 - PuITY	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Hit space to enter configuration menu 3	
Main Menu	
[1] Show Current Settings	
[2] Select Boot pevice	
[3] Select Kill (Debug) Device	
[7] Network Settings	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 2	
Select Boot Device	
[1] LAN9220 MAC	
[2] USBFn RNDIS	
[3] NK from NAND	
[0] Exit and Continue	
Selection (actual LiN9220 MiC): 3	
Boot device set to NK from NAND	
Nain Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[U] Exit and Continue	
Selection: 0	
Load NV image from flagh memory	
IsvalidMBR: MBR sector = 0x100 (valid MBR)	
OpenPartition: Partition Exists=0x1 for part 0x20.	
BP SetDataPointer at OxO	
ReadData: Start = 0x0, Length = 0x1000.	
Log2Phys: Logical Ox1 -> Physical Ox101	
ReadData: Start = 0x1000, Length = 0x1d1adcc.	
Log2Phys: Logical 0x3 -> Physical 0x103	
	· · · · · · · · · · · · · · · · · · ·

Figure 151: Chose "Exit and Continue".
g ² COM1 - PuTTY	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection: 0	
Load NK image from flash memory	
IsValidMBR: MBR sector = 0x100 (valid MBR)	
OpenPartition: Partition Exists=0x1 for part 0x20.	
BP_SetDataPointer at 0x0	
ReadData: Start = 0x0, Length = 0x1000.	
Log2Phys: Logical 0x1 -> Physical 0x101	
ReadData: Start = 0x1000, Length = 0x1d1adcc.	
Log2Phys: Logical UX3 -> Physical UX103	
ROMMER (NTOC = 0x8141c478)	
DLL First : 0x4001c001	
DLL Last : 0x416dc0cd	
Physical First : 0x84001000	
Physical Last : 0x85d1f680	
Num Modules : 253	
RAM Start : 0x85d20000	
RAM Free : 0x85d35000	
RAM End : 0x88800000	
Num Copy Entries : 2	
Copy Entries Offset : 0x851afdc0	
Prof Symbol Length : 0x00000000	
Prof Symbol Offset : 0x00000000	
Num Files : 83	
Kernel Flags : 0x00000002	
FileSys RAM Percent : 0x40404040	
Driver Glob Start : 0x00000000	
Driver Glob Length : 0x00000000	
CPU : 0x01c2	
MiscFlags : 0x0002	
Extensions : 0x84002020	
Tracking Mem Start : UXUUUUUUUU	
Tracking Mem Length : UXUUUUUUUU	
ReadData: Start = 0x1d1bdcc, Length = 0x28b4.	
Log2Phys: Logical 0x3a38 -> Physical 0x3bb8	
NK Image Loaded	
Launch Windows CE image by jumping to 0x80001000	
Windows CE Kernel for ARM (Thumb Enabled) Built on Oct 20 2009 at 18:39:19	
high Performance Frequecy 13 32768 khz	
opminit(peinitialize serial depug)	

Figure 152 :	Now it v	will start	booting	WinCE

• FINISHED.

14.6 Create a new project using TN_TAO_3530 BSP

This chapter describes how to create a new project, for example when you have your own custom LCD panel.

- Open "Microsoft Visual Studio 2005". If that already open, Please reopen it.
- Click "File \rightarrow New \rightarrow Project..." (See Figure 153)

💔 St	art Page - Microsoft Visual	l Studio									×
File	Edit View Project Ta	aget Tools Wind	low Community Help								
	New 🕨	Project	Ctrl+Shift+N	*	- 🖄 usb_h	ost	• 🔍 🕾 🖄 🏷 💽 🗆	• =			
	Open 🕨	• 婱 Web Site		Start Page							• ×
	Close	File	Cul+N	Microsof							
6	Close Solution	Project From	Existing Code		ial Studic	2005					
	Save Selected Items Ctrl+S				au stuart	2005					
	Save Selected Items As										
2	Save All Ctrl+Shift+S			Recent Projects		MSDN: VISUAL ST	ud10				
	Export Template					Microsoft SDL T Wed, 10 May 2010	eam Releases the MSF-Agile+SDL 15:21:40 -0200 - Download the MSE-A	L Process Template for Vis sile+SDL Process Template to e	ual Studio 2008 asily integrate recurity and prive	ov into your & sile development	miert
	Page Setup										holor
9	Print Ctrl+P	-									
	Recent Files	·									
L.,	Exit			Open: Project	Web Site						
				Create: Project	Web Site						
				Getting Started							
				What's new in Visual	Studio 2005?						
				Samples and Walkth Use a Starter Kit	oughs						
				New Project From E:	isting Code						
				How Do 1? Developer Center							
				Visual Studio Hea	lines						
				[해방습] 해방습입	R - Visual						
				Studio 2010 整合 ASP NET 4.0 入門	UML 简介與						
				[研討會] 研討會清	R - Visual						
				Silverlight 4 實務	加定間219代						
				[最新優惠活動及] Studio 2010 宮機	程] Yisual N決課程						
				[研討會] 深入浅出	Silverlight 與						
				[研討會] SharePoi	at 2010 軟體間						
					没自己敬起。						
				¥ Visual Studio 2	010 內建的						
				[最新優惠活動及]	E I VSTS _						
				日雪 - Yisual Stud System 軟體開發及	io Ieam 管理資作						
				[最新優惠活動及] Flash 電子報訂戶	程]MSDN 第字/度用						
				Visual Studio Teau Connection Newsl	n System etter 試閱大會						
				[是新儀車浮動攻)	121112末18						
				重接國專案	NE 12.44/57						
				[最新倫選活動及] Embedded 上手專	REELIMSDN #						
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- Chose "Platform Builder for CE 6.0". Then input project name in the "Name:" box. For example "Thunder". (See Figure 154)
- Click the "OK" button.

New Project					? ×
Project types:		Templates:		00	5-5- 5-5- 5-5-
 → Visual Basic → Windows → Smart Dev → Database → Starter Ki → Web → Visual C# → Visual J# → Visual C++ → Other Project → Platform Built 	vice ts Types der for CE 6.0	▼isual Studio installed tem ● OS Design My Templates Image: Search Online Templates	plates		
A project for creat	ing a Windows Embedd	ed CE 6.0 operating system			
<u>N</u> ame:	Thunder				
Location:	C:\WINCE600\OSD	esigns		Browse	
Solution Na <u>m</u> e:	Thunder		Create directory for solution		
			OK	Cance	1

Figure 154

Windows Embedded CE 6.0 OS Design Wizard	? ×
Welcome to the Windows Embedded CE 6.0 OS Design Wizard	
This wizard guides you through the process of creating an OS design for a CE 6.0 based platform. An OS design defines the characteristics of a CE 6.0 OS.	
You can create an OS design by choosing a design template and one or more board support packages (BSPs). A BSP includes an OEM adaptation layer (OAL) and device drivers.	
This wizard helps you:	
Choose a BSP. Choose a design template. Add items to your OS design or remove items from it.	
To continue, click Next.	
< <u>Previous</u> <u>N</u> ext > <u>F</u> inish Canc	el

Figure 155: Click the "<u>N</u>ext >" button.



Figure 156: Chose "TN_TAO_3530:ARMV4I". Then click "Next >" button.



Figure 157 : Chose "Industrial Device". Then click "<u>Next</u> >" button.

Windows Er	nbedded CE 6.0 OS Design Wizard	?)	۱
A	Design Template Yariants		
<u>V</u> ariants: Industrial Internet A Gateway	Contreller Appliance	Internet Appliance	
	< Previous	<u>N</u> ext > <u>F</u> inish Cancel	

Figure 158 : Chose "Internet Appliance". Then click the "<u>N</u>ext >" button.



Figure 159 : Click the "<u>Next</u> >" button.



Figure 160 : Click the "<u>Next</u> >" button.

Windows Embedded CE 6.0 OS Design Wizard	? ×
OS Design Project Wizard Complete	
You have completed the wizard. Press Finish to create your OS Design project.	
< Previous Next > Finish	Cancel

Figure 161 : Click the "Finish" button.



Figure 162 : Click the "Acknowledge" button.

• Chose function for "Thunder" board in the "Catalog Items View". (See Figure 163 and Figure 164)

🗱 Thunder - Microsoft Visual Studio				_ @ ×
File Edit View Project Build Debug Target Tools Window Comm	unity <u>H</u> elp			
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Catalog Items View - 4 ×	Start Page	• X	Properties	~ # X
😴 🔚 Filter + 👩 «Search» - 🛃			TN_TAO_3530:ARMV4I Board Suppo	ort Package 👻
a 🕞 🔞 Thunder	Microsoft			
🖉 🗇 📴 BSP	Visual Studio	2005	T Mim	
Core OS			Description	A BSP for the TechNexion TAO 3530 reference platform
Third Party			Name	TN_TAO_3530:ARMV4I
🗟 😑 📴 BSP	Recent Projects	MSDR: Visual Studio	Platform Directory	TN_TAO_3530
G TN_TAO_3530.ARMV41	Thunder	Microsoft SDL Team Releases the MSF-Agile+SDL Process Template	Supported CPU	ARMV4I CPU
Device Drivers		Wed, 10 Mar 2010 15:21:40 -0700 - Download the MSF-Agile+SDL Process Template to easily integrate security and privacy into your Agile development project.	Vendor	TechNexion
Headset Driver			Version	1.00.00
OMAP3530 Wave Drive				
Bus				
- TRO_5550 Root Bas Drive	Onen: Project Web Site			
Backlight Driver	Create: Project Web Site			
- DVI Driver				
OMAP3530 DDI Driver	Getting Started			
E- DMA				
- OMAP3530 DMA Driver	Samples and Walkthroughs			
E- Flash	Use a Starter Kit			
- GPIO	New Project From Existing Code			
GPIO Driver	How Do L? Developer Center			
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- Local Area Networking (LAN) devices				
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Touch Driver	[最新優惠活動及課程] Visual			
😑 TPS659XX	Studio 2010 資機調練課程			
RTC Driver	Expression Blend 開發資務			
TPS659XX Root Driver	[研討會] SharePoint 2010 軟體開			
😑 USB Function				
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B B Host Controllers	日替 - Visual Studio Team System 軟體語及移理審性			
OMAP3530 USB H_ST Driver	[最新優惠活動及課程] MSDN			
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Figure 163



Figure 164

14.6.1 Compile project.

• Chose "TN_TAO_3530_ARMV4I Release". (See Figure 165)



Figure 165

🐲 Thunder - Microsof	ft Visual Studio				X			
File Edit View P	weet Build Debug weet Tools Window Comm	anity Help						
i 🛐 🔹 💷 😼 🚺	Add New Subproject N_ TAO_	35% + Platform Builder (_TGTCPU) + 🎒 usb_ho	a - 🔩 🕾 🖄 🏷 💽 🗆 - 🖕					
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Filter - C	Set Subminisct Build Order			SMSC9500 Driver Catalog Item				
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🎽 📋 Third	WALLE	Recent Projects	MSDW Visnal Studio	Description				
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	Thunder Properties		Wed, 10 Mar 2010 15:21:40 -0700 - Download the MSP-Agile+SDL Process Template to easily integrate security and privacy into your Agile development project	Sysgen Variable				
	Headset Driver			Vendor	TechNexion			
	OMAP3530 Wave Drive			Version	1.00.00			
	Bus							
	IRO_3530 Root Bus Driver							
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	OMAP3530 UART Driver (COM2)	ASP.NET 4.0 AP9						
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		[最新優惠活動及課程] MSDN		Name				
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🔵 Catalog Items View	🗴 🟹 Solution Explorer 🔀 Class View							
Ready								
	S 1							

Figure 166 : Click "Project \rightarrow Thunder Properties..."

- Click "Configuration Properties \rightarrow Build Options". (See Figure 167)
- Cancel "Enable KITL (no IMGNOKITL=1)" option.
- Chose "Run-time image can be larger than 32 MB (IMGRAM64=1)" option.
- Click "Apply (<u>A</u>)". Then click "OK" option.

Thunder Property Pages
Configuration: Active(TN_TAO_3530_ARMV4I R • Platform: M/A Configuration Manager Common Properties General Build options: Build options Locale Build Options Enable eboot space in memory (IMGEBOOT=1) Enable eboot space in memory (IMGEBOOT=1) Custom Build Actions Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Build Options Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Enable hardware-assisted debugger (see IMGNOEEDUGEER=1) Build Dit to to to t
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Figure 167

it View Project Build Debug Target Tools Window Con	nmunity Heln			
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Build All SDKs	Rebuild and Clean Syzgen		Version	1.00.00
Copy Files to Release Directory	Build Current BSP and Subprojects			
Make Run-Time Image	Rebuild Current BSP and Subprojects			
😑 🧰 🛛 Open Release Directory in Build Window	Open: Project Web Site			
and the state bleedely in build whitely	Create: Project Web Site			
Giobal Build Settings				
Targeted Build Settings	Getting Started			
Batch Build	What's new in Visual States 20052			
and isuration Manager	Samples and walkthroughs			
NAND Flash Driver	ose a Starter Kit			
🖶 🦢 GPIO	New Project From Existing Code			
- GPIO Driver	Developer Center			
Networking				
Local Area Networking (LAIN) devices				
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OMAP3530 UART Driver (COM3)	[時封管] 時封管資訊 - ¥15041 Studio 2010 筆充功能簡介與			
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Touch Driver	[最新優選活動及課程] Yisual Studio 2010 資標譜經課程			
RTC Driver	[研討會] 深入浅出 Silverlight 與			
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OMAP3530 Hardware Watchdog	visual Studio leam System Connection Newsletter 試圖大會			
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	[最新優惠活動及課程] MSDW		Name	
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dog Items View 🯹 Solution Explorer 🐼 Class View				

Figure 168 : Click "Build \rightarrow Advanced Build Commands \rightarrow Sysgen".

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Figure 169 : When the compilation is successful the following screen will appear.



Figure 170 : Project folder in the %_WINCEROOT%\OSDesigns\.

14.7 How to change the logo that you see during boot up

During boot up you will see a TechNexion logo or a screen with four colored squares. As shown in 14.5.2 you can choose between "fldr.raw" and "fldr-logo.raw". Fldr.raw will, during boot up, show a screen divided in four squares with different colors. Fldrlogo.raw will, during boot up, show a dark screen with a TechNexion logo. This section will describe how to make your own logo to appear.

14.7.1 Preparing the BMP

• You will need to prepare a BMP with your logo. However the logo needs to be flipped vertical (see Figure 171)



Figure 171

- This can be done with for instance Photoshop (Use: edit \ transform \ flip vertical)
- Place the flipped BMP at the following directory: C:\WINCE600\PLATFORM\TN_TAO_3530\FILES
- The final result on your display will be as below (see Figure 172)



Figure 172

14.7.2 Change the makefile.inc

- Open a text editor (for instance Notepad)
- Open makefile.inc, which is in the directory:
 C:\WINCE600\PLATFORM\TN_TAO_3530\SRC\BOOT\XLDR\NAND
- Change the orange part in the following line with the name of your BMP: Copy /b \$(_TGT)\TIEVM3530-nand.raw + \$(_FILES)\TechNexion.bmp \$(_TGT)\TIEVM3530-nand-logo.raw
- Save makefile.inc in the same directory

14.7.3 Calculate the needed blocks

- You need to calculate the needed blocks in your NAND Flash to store the logo.
- For instance the TechNexion logo is 292x39 pixels and in RGB color(x3), that means it is using: 292x39x3=34164 bytes.
- This is 34164/1024= 33.36kB
- The NAND Flash blocks are 128kB in size so it will fit in 1 block

- If you want to make a logo that fits the whole 7" screen it is 800x480 pixels and in RGB color(x3).
- That means it is using: 800x480x3= 1152000 bytes.
- 1152000/1024=1025kb
- This will use 1125kB/128kB=8.789 blocks, so it will fit in 9 blocks
- 9 full blocks x 128kB is 1152kB
- 1152kb x 1024=1179648 bytes
- This we need to convert from decimal to hexadecimal
- Open your calculator (View Scientific) and type the number and then select Hex(See Figure 173)

Calculator										
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1179648.										
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🔲 Inv	H	lyp				Backsp	oace	CE		С
Sta	F-E			MC	7	8	9		Mod	And
Ave	dms	Ехр	In	MR	4	5	6	*	Or	Xor
Sum	sin	х^у	log	MS	1	2	3	ŀ	Lsh	Not
s	COS	x^3	nl	M+	0	+/-) [.	+	=	Int
Dat	tan	x^2	1/x	pi	Α	B) [C	D	E	F

Figure 173

• The outcome in Hexadecimal will be 120000 (See Figure 174)

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										120000	
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Sta	F-E			MC	7	8	9	/	Mod	And	
Ave	dms	Exp	In	MR	4	5	6	*	Or	Xor	
Sum	sin	x^y	log	MS	1	2	3	·	Lsh	Not	
s	COS	x^3	n!	M+	0	+/-		+	=	Int	
Dat	tan	x^2	1/x	pi	A	В	С	D	E	F	

Figure 174

14.7.4 Change image-cfg.h

- Open a text editor (for instance Notepad)
- Open image-cfg.h which is in the following directory:

C:\WINCE600\PLATFORM\TN_TAO_3530\SRC\INC

• Change the green number, with the number calculated in 14.7.3, in the following line:

#define IMAGE_BOOTLOADER_BITMAP_SIZE 0x00120000

• (please keep beginning and length (10 characters) the same)

14.7.5 Compile

- Open Microsoft Visual Studio 2005
- Open your project (For example: tsunami_LCD_AT070TN94)
- Use the menu: Build\advanced build commands\clean sysgen
- You will now find a fldr-log.raw in the following directory:

C:\EINCE600\OSdesigns\tsunami_LCD_AT070TN94\RelDir\TN_TAO_3530_AR MV41_RELEASE

14.7.6 Put in NAND

- Follow all the instructions in 14.5.2
- Finished.

15 Appendix – Module

15.1 TAO-3530 System on Module Dimensions



Dimensions in mm, tolerance +/- 0.2 mm

Note: 2D (DXF) and 3D(STEP) files are available for download at the Technexion website. (Service and support/ Downloads/ ARM CPU Modules/ TAO-3530)

15.2 Module Connectors

To mount the TAO-3530 module on the baseboard it is recommended to use a connector with the following specifications:

- 100 pin NAIS connector
- Mated height 4.5 mm

For example Panasonic AXK5S00247YG

P5KS: Mated height 4.5mm type

Socket



If you have difficulty purchasing these parts please contact <u>sales@technexion.com</u>, for assistance.



15.3 Nut to Fix TAO-3530 Module to the Baseboard

Note 1: Always design the above mounting nut/pose on your custom baseboard and fasten the TAO-3530 to ensure a solid connection and counter vibration prone applications.

Note 2: On a custom baseboard always connect the mounting nut/pose to the baseboard general system GND section.

If you have difficulty purchasing these parts please contact <u>sales@technexion.com</u>, for assistance.

15.4 TAO-3530 JTAG Solder points

Need to connect a JTAG debugger to our module (revision A & B)?



There are solder points as indicated in above picture. There are 7 pairs; their function is described in the table below.

JTAG TMS	JTAG TDI	1.8V	JTAG TDO	JTAG RTCK	JTAG TCK	JTAG EMU0
(R310)	(R311)	(R312)	(R313)	(R314)	(R315)	(R316)
JTAG nTRST	GND	NC	GND	GND	GND	JTAG EMU1

Table: Description of JTAG solder points (same direction as photo)

JTAG header in TAO-3530-rev-C1





Solder at the orange pads

16 Appendix - Schematics

16.1 Inferno baseboard schematics









If you are designing your own baseboard then please contact <u>sales@technexion.com</u> for clear design files

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16.2 Thunder baseboard schematics








181



182

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If you are designing your own baseboard then please contact sales@technexion.com for clear design files



16.3 Tsunami baseboard schematics



185





187

TAO-3530 USER'S GUIDE 097

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If you are designing your own baseboard then please contact sales@technexion.com for clear design files



189

If you are designing your own baseboard then please contact sales@technexion.com for clear design files



190



If you are designing your own baseboard then please contact sales@technexion.com for clear design files



If you are designing your own baseboard then please contact sales@technexion.com for clear design files

192

CSV



193

17 Appendix - Pin outs

17.1 Module connector B1



A1	MCBSP3_FSX
A2	MCBSP3_DR
A3	MCBSP3_DX
A4	MCBSP3_CLKX
A5	HSUSB2_D7
A6	HSUSB2_D5
A7	HSUSB2_D4
A8	HSUSB2_D3
A9	HSUSB2_D6

	3.3V
	3.3V
1	MCSPI1_SIMO
1	MCSPI1_SOM
1	MCSPI1_CLK
1	MCSPI1_CS0
ł	ISUSB2_D2
٦	S_nPEN_IRQ
ł	IDQ_SIO

B5 B6 B7 B8 B9

A10	UART3_RTS	B10	USERBOOT
A11	UART3_CTS	B11	I2C3_SDA
A12	UART3_RX	B12	I2C3_SCL
A13	UART3_TX	B13	I2C2_SDA
A14	MCSPI4_CLK	B14	I2C2_SCL
A15	MCSPI4_SIMO	B15	GPIO_12
A16	MCSPI4_SOMI	B16	GPIO_13
A17	MCSPI4_CS0	B17	MCSPI3_SIMO
A18	MICBIAS	B18	MCSPI3_SOMI
A19	MIC_MAIN_M	B19	MCSPI3_CS0
A20	GND	B20	MCSPI3_CLK
A21	MIC_G	B21	GPIO_18
A22	GND	B22	GPIO_19
A23	ВКВАТ	B23	GPIO_20
A24	GND	B24	MCSPI3_CS1
A25	GND	B25	MMC1_WP
A26	GND	B26	GPIO_22
A27	GND	B27	HSUSB2_CLK
A28	GND	B28	HSUSB2_STP
A29	GND	B29	HSUSB2_DIR
A30	GND	B30	HSUSB2_NXT
A31	GND	B31	HSUSB2_D0
A32	GND	B32	GPIO_162
A33	GND	B33	SYS_CLKOUT1
A34	UART1_TX	B34	ADCIN2
A35	UART1_RX	B35	SYS_nRESPWRON
A36	UART1_RTS	B36	PWR_ON
A37	UART1_CTS	B37	MIC_MAIN_P
A38	LCD_INI	B38	T2_AUXR
A39	LCD_ENVDD	B39	T2_HSUSB_ID
A40	VBUS 5V0M	B10	
A41	—	D40	LCD_ENBKL
A42	DC_5VM	B40 B41	HOST_NOC
	DC_5VM T2_HSUSB_DN	B40 B41 B42	HOST_nOC LEDA
A43	DC_5VM T2_HSUSB_DN T2_HSUSB_DP	B40 B41 B42 B43	HOST_nOC LEDA SYSEN
A43 A44	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL	B40 B41 B42 B43 B44	HOST_nOC LEDA SYSEN CHRG_STATE
A43 A44 A45	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR	B40 B41 B42 B43 B44 B45	HOST_nOC LEDA SYSEN CHRG_STATE VIO_1V8
A43 A44 A45 A46	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR VBATM	B40 B41 B42 B43 B44 B45 B46	HOST_nOC LEDA SYSEN CHRG_STATE VIO_1V8 VIO_1V8
A43 A44 A45 A46 A47	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR VBATM VBATM	B40 B41 B42 B43 B44 B45 B46 B47	HOST_nOC LEDA SYSEN CHRG_STATE VIO_1V8 VIO_1V8 VIO_1V8
A43 A44 A45 A46 A47 A48	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR VBATM VBATM VBATM	B40 B41 B42 B43 B44 B45 B46 B47 B48	HOST_nOC LEDA SYSEN CHRG_STATE VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8
A43 A44 A45 A46 A47 A48 A49	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR VBATM VBATM VBATM VBATM	B40 B41 B42 B43 B44 B45 B46 B46 B47 B48 B49	HOST_NOC LEDA SYSEN CHRG_STATE VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8 TV_SVIDEO_Y
A43 A44 A45 A46 A47 A48	DC_5VM T2_HSUSB_DN T2_HSUSB_DP T2_HSOL T2_HSOR VBATM VBATM VBATM	B40 B41 B42 B43 B44 B45 B46 B47 B48 B40	HOST_NOC LEDA SYSEN CHRG_STAT VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8 VIO_1V8

17.2 Module connector B2



B1 B2 B3 B4 B5 B6 B7 B8 B9

B10 B11 B12 B13

B13 B14 B15 B16 B17 B18 B19

B49 B50

A1	CAM_D0
A2	CAM_D1
A3	CAM_D2
A4	CAM_D3
A5	CAM_D4
A6	CAM_D5
A7	CAM_D6
A8	CAM_D7
A9	CAM_HS
A10	CAM_VS

B1	CAM_XCLKA
B2	CAM_XCLKB
B3	CAM_D8
B4	CAM_D9
B5	CAM_D10
B6	CAM_D11
B7	CAM_STROBE
B8	CAM_FLD
B9	CAM_WEN
B10	CAM_PCLK

A11	DVI_nDISABLE	B11	DSS_D0
A12	LCD_PON	B12	DSS_D1
A13	GPMC_A1	B13	DSS_D2
A14	GPMC_A2	B14	DSS_D3
A15	GPMC_A3	B15	DSS_D4
A16	GPMC_A4	B16	DSS_D5
A17	GPMC_A5	B17	DSS_D6
A18	GPMC_A6	B18	DSS_D7
A19	GPMC_A7	B19	DSS_D8
A20	GPMC_A8	B20	DSS_D9
A21	GPMC_A9	B21	DSS_D10
A22	GPMC_A10	B22	DSS_D11
A23	B_GPMC_D0	B23	DSS_D12
A24	B_GPMC_D1	B24	DSS_D13
A25	B_GPMC_D2	B25	DSS_D14
A26	B_GPMC_D3	B26	DSS_D15
A27	B_GPMC_D4	B27	DSS_D16
A28	B_GPMC_D5	B28	DSS_D17
A29	B_GPMC_D6	B29	DSS_D18
A30	B_GPMC_D7	B30	DSS_D19
A31	B_GPMC_D8	B31	DSS_D20
A32	B_GPMC_D9	B32	DSS_D21
A33	B_GPMC_D10	B33	DSS_D22
A34	B_GPMC_D11	B34	DSS_D23
A35	B_GPMC_D12	B35	DSS_PCLK
A36	B_GPMC_D13	B36	DSS_HSYNC
A37	B_GPMC_D14	B37	DSS_VSYNC
A38	B_GPMC_D15	B38	DSS_ACBIAS
A39	B_GPMC_nWE	B39	MMC1_CD
A40	B_GPMC_nOE	B40	HSUSB2_D1
A41	GPMC_nBE1	B41	MMC1_CMD
A42	GPMC_WAIT3	B42	MMC1_CLK0
A43	GPMC_CLK	B43	MMC1_DAT0
A44	GPMC_nCS3	B44	MMC1_DAT1
A45	GPMC_nCS4	B45	MMC1_DAT2
A46	GPMC_nCS5	B46	MMC1_DAT3
A47	GPMC_nCS6	B47	MMC1_DAT4
A48	GPMC_nCS7	B48	MMC1_DAT5
A49	VIO_1V8	B49	MMC1_DAT6
A50	VMMC1M	B50	MMC1_DAT7

Above schematic block are the 2 connectors from the module towards your interface base board. Keep note of the following requirements.

1. Provide 5VDC on the signals requesting them.

2. Provide 4.2VDC on the VBAT pins towards the module. (you need provide this from your baseboard)

3. When using TAO-3530W (with wireless) you also need to provide 3.3VDC. If you don't have wireless. You can ignore this requirement.

4. Connect all GND pins to GROUND.

5. If you don't have a BKBAT please connect A23 on connector B1 to GND. Don't let it floating.

6. If you don't implement microphone function. Please connect pin A19 and A21 on connector B1 to GND

All 1.8V signals are generated on the module and are OUTPUTS from the module towards the interface base boards. They will be used towards the GPIO's for example.

For the Pin out and for changing the signals on the pins, it is recommended to read the TAO-3530-hardware-manual, which describes how signals can be multiplexed.

17.3 SPI1



Marking on main board: SPI1

1	+3.3V	2	+3.3V
3	MCSPI3_CLK_3V	4	MCSPI4_CLK_3V
5	MCSPI3_SIMO_3V	6	MCSPI4_SIMO_3V
7	MCSPI3_SOMI_3V	8	MCSPI4_SOMI_3V
9	MCSPI3_CS0_3V	10	MCSPI4_CS0_3V
11	GND	12	GND
13	I2C2_SCL_3V	14	GND
15	I2C2_SDA_3V	16	+3.3V
17	UART1_RTS_3V	18	UART1_RX_3V
19	UART1_CTS_3V	20	UART1_TX_3V

17.4 UART 3

1 ■ 2 ● 3 ●

1	RS232_RX3
2	GND
3	RS232_TX3

Note: RS-232 serial console cable might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable (pin 1 becomes 3 and pin 3 becomes 1)

	1 3 5 7 9 11 13 15	 2 4 6 8 10 12 14 16 	
1	CRT_R	2	CRT_G
3	CRT_B	4	Х
5	GND	6	GND
7	GND	8	GND
9	Х	10	GND
11	Х	12	VGA_I2C3_SDA
13	VGA_HSYNC	14	VGA_VSYNC
15	VGA_I2C3_SCL	16	х

17.5 Pin header for VGA connector

17.6 LVDS connector



Data connector is 40 pin

Marking on main board: LVDS1

1	GND	2	GND
3	+3.3V	4	+3.3V
5	+12V	6	+3.3V
7	x	8	x
9	GND	10	x
11	LCD_ENBKL	12	GND
13	TXD0-	14	XL (Touch screen)

- 17 GND
- 19 TXD1-
- 21 TXD1+
- 23 GND
- 25 TXD2-
- 27 TXD2+
- 29 GND
- 31 TXC-
- 33 TXC+
- 35 GND
- 37 LVDS_I2C_SCL
- 39 LVDS_I2C_SDA

- 16 XR (Touch screen)
- 18 GND
- 20 YU (Touch screen)
- 22 YD (Touch screen)
- 24 GND
- 26 Backlight Control Enable
- 28 LVDS_LED+ (Backlight Power +)
- 30 LVDS_LED+ (Backlight Power +)
- 32 LVDS_LED+ (Backlight Power +)
- 34 Backlight Power Control
- 36 LVDS_LED- (Backlight Power -)
- 38 LVDS_LED- (Backlight Power -)
- 40 LVDS_LED- (Backlight Power -)



LVDS Power Select Switch

1 on 2 off	5V
2 on 1 off	3.3V

17.7 Thunder expansion pin header



Pitch of connector is 2.00 mm

1	MSCPI3_CLK	2	CAM_D0
3	MCSPI3_SIMO	4	CAM_D1
5	MCSPI3_SOMI	6	CAM_D2
7	MCSPI3_CS0	8	CAM_D3
9	MCSPI3_CS1	10	CAM_D4
11	MCBSP3_DX	12	CAM_D5

13	MCBSP3_DR	14	CAM_D6
15	MCBSP3_CLKX	16	CAM_D7
17	MCBSP3_FSX	18	CAM_D8
19	UART1_CTS	20	CAM_D9
21	UART1_RTS	22	CAM_D10
23	UART1_RX	24	CAM_D11
25	UART1_TX	26	CAM_XCLKA
27	VIO_1V8	28	CAM_XCLKB
29	VIO_1V8	30	CAM_PCLK
31	I2C3_SCL	32	CAM_VS
33	I2C3_SDA	34	CAM_HS
35	DC_5V	36	CAM_FLD
37	DC_5V	38	CAM_WEN
39	DC_5V	40	CAM_STROBE
41	GND	42	PWR_ON
43	GND	44	SYS_nRESPWRON
45	RS232_RX3	46	VIO_3V3
47	GND	48	VIO_3V3
49	RS232_TX3	50	VIO_3V3



To operate on battery power and to enable the charging circuit you need to put the switches located next to the user buttons as follows:



Battery powered & charging enabled: switch 1 off switch 2 on

Only DC power enabled: switch 1 on switch 2 off

17.9 Inferno Expans	sion Pin Header		
	1 🔳	• 2	
	3 🔵	• 4	
	5 🔸	• 6	
	7 🔵	• 8	
	9 \bullet	• 10	
	11 🗨	• 12	
	13 •	• 14	
	15 ●	• 16	
	17 🔵	• 18	
	19 🔵	• 20	
	21 🗨	• 22	
	23 🗨	• 24	
	25 🗨	• 26	
	27 🔵	• 28	
	29 🗨	• 30	
	31 🔵	• 32	
	33 🔵	• 34	
	35 🔵	• 36	
	37 •	• 38	
	39 🕒	• 40	
1	RS232_RX3	2	CAM_D0
3	GND	4	CAM_D1
5	RS232_TX3	6	CAM_D2
7	UART1_RTS	8	CAM_D3
9	UART1_CTS	10	CAM_D4
11	UART1_RX	12	CAM_D5
13	UART1_TX	14	CAM_D6
15	GND	16	CAM_D7
17	MCSPI1_CLK	18	CAM_D8
19	MCSPI1_SIMO	20	CAM_D9
21	MCSPI1_SOMI	22	CAM_D10
23	MCSPI1_CS0	24	CAM_D11
25	GND	26	CAM_XCLKA
27	I2C3_SCL	28	CAM_PCLK
29	I2C3_SDA	30	CAM_VS
31	HDQ_SIO	32	CAM_HS
33	SYS_nRESPWRON	34	CAM_FLD
35	DC_5V	36	CAM_WEN
37	DC_5V	38	CAM_STROBE
39	VIO_1V8	40	GND

17.10 RS-232 cable

Accessory



1	(white dot)

2	

3

$\left(\left(\left(1_{0} \circ \circ \circ \circ \circ \right) \right) \right)$
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