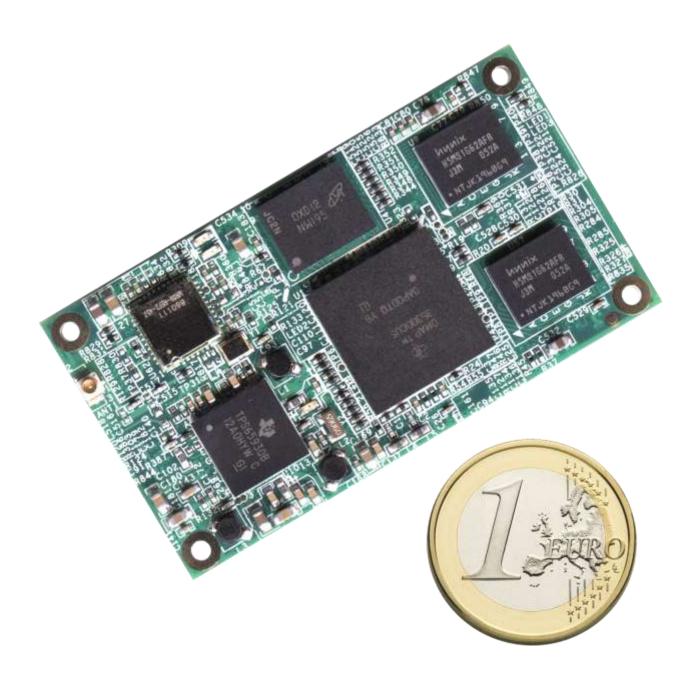


1/17/2012





TAO-3530 System on Module

TAO-3530 USER'S GUIDE 096 | 1/17/2012, TechNexion

1/17/2012, TechNexion



TAO-3530

TAO-3530 System on Module

and its Baseboards

User's Guide

Rev 0.96

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2 Care and maintenance

2.1 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.

2.2 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.

17F-1 No. 16 Jian Ba Road Chung Ho City, 23511, Taipei, Taiwan R.O.C. Phone :+886-2-8227 3585 Fax :+886-2-8227 3590

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 . .



USA

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).

3 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.

4 Get started

4.1 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.

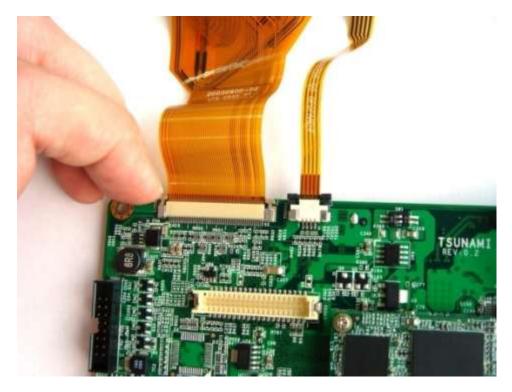


Figure 3: Step 2b - Insert the LCD panel FPC. And push the connector sideways to close

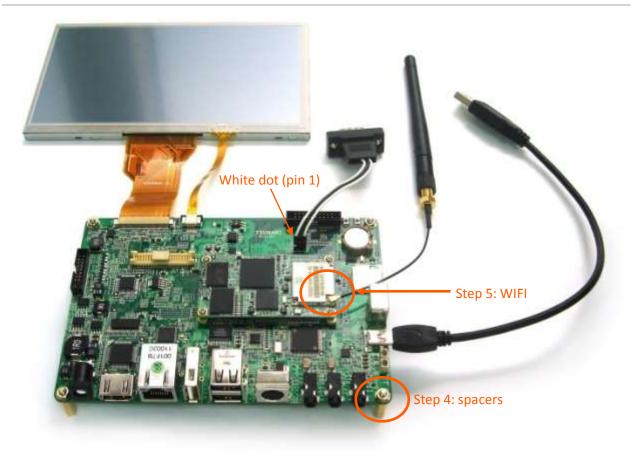


Figure 4: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Note: <u>RS-232</u> <u>serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

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.

4.2 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.

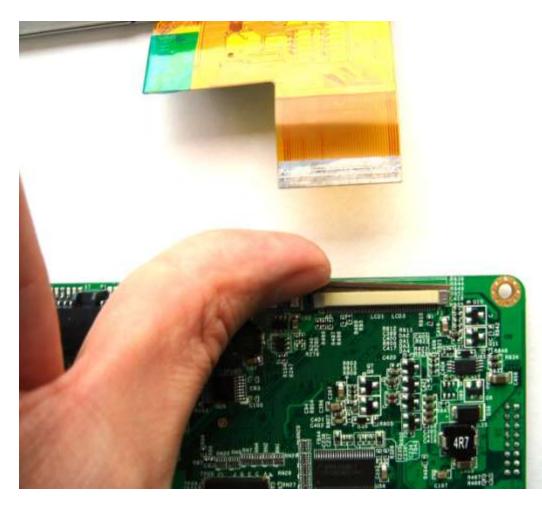


Figure 5: Step 2a - Pull the connector at the bottom side of the Tsunami baseboard sideward open with your nail.

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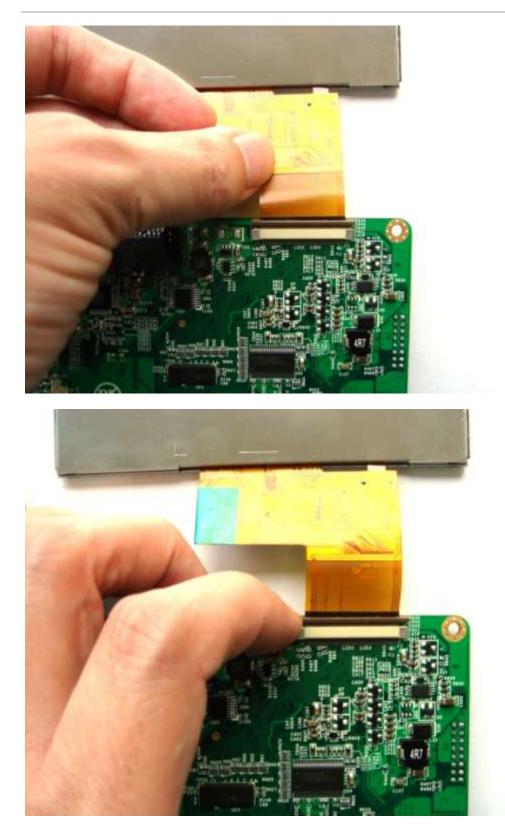


Figure 6: Step 2b - Insert the LCD panel FPC. And push the connector sideways to close

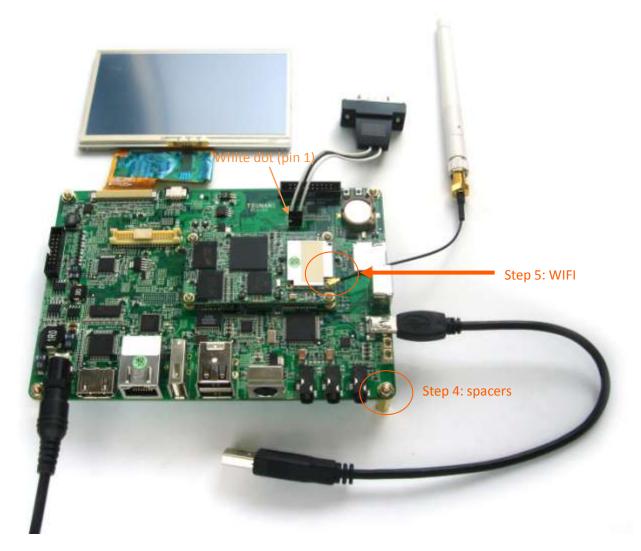


Figure 7: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Note: <u>RS-232</u> <u>serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

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.

4.3 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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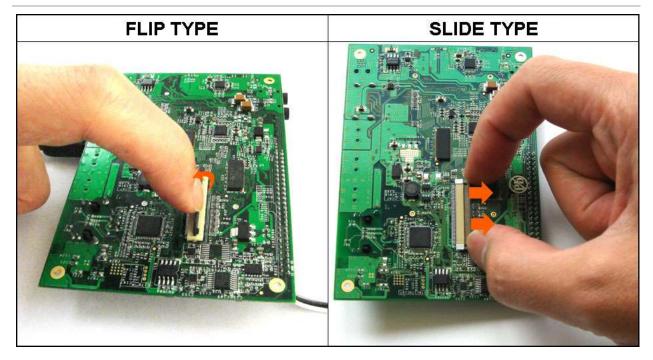


Figure 9: Step 2a - Open the connector with your nail. The black flip-type will stand up in an angle of about 90 degrees. The brown slide-type will open a little more than a millimeter

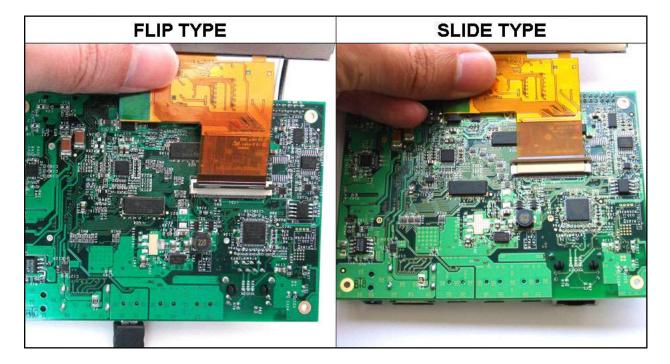


Figure 10: Step 2b - Insert the LCD panel FPC. There are 2 white horizontal lines on the end of the connector. The first line will nearly go into the connector but still remain visible. The line should be parallel to the connector itself.

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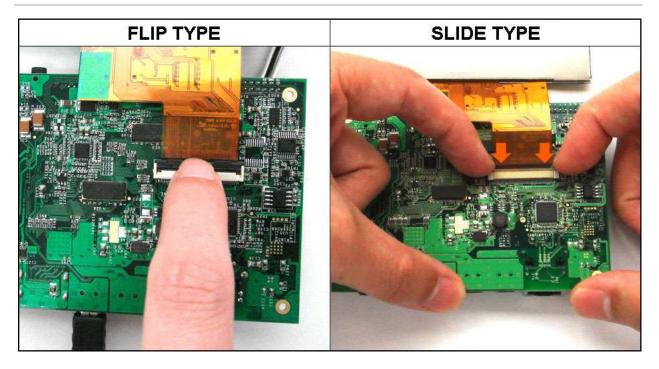


Figure 11: Step 2c - Close the connector to firmly lock the connection and avoid the panel to come loose.

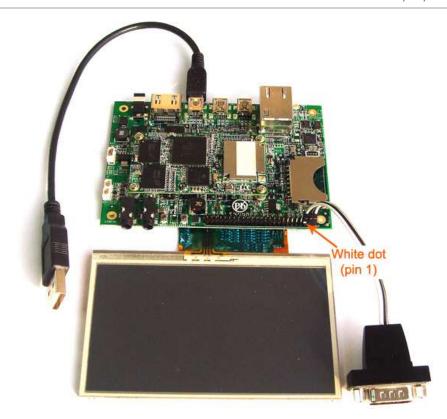


Figure 12: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Outer row of pin header last 3 pins of the connector header). (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

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.

4.4 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

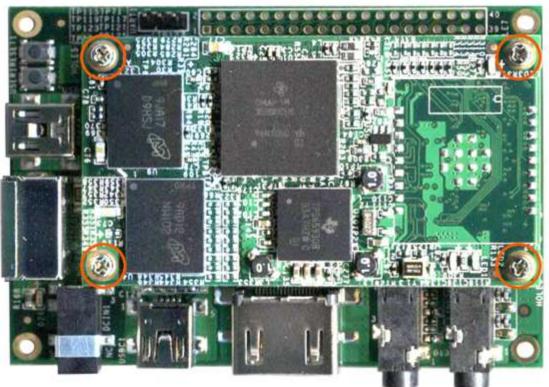


Figure 14: Step 2a - Connect the RS-232 serial console cable as on the picture below. (Outer pin header row last 3 pins of the connector header). (Note: <u>RS-232 serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

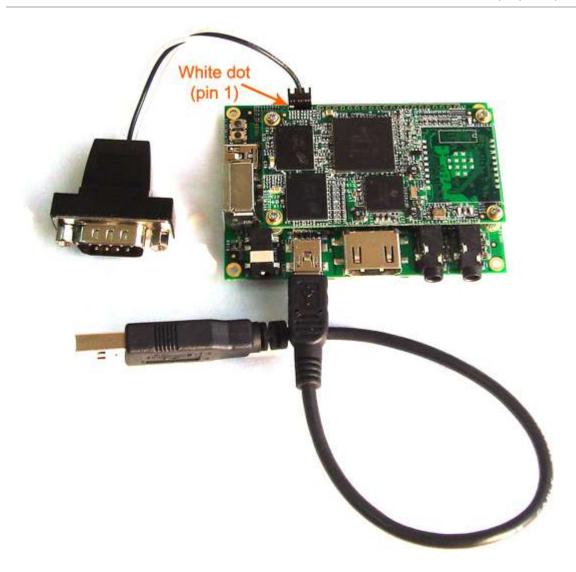


Figure 15: Step 2b - Use the USB cable and connect to a powered USB hub or computer system to power the thunder interface board and the LCD. The cable should only be inserted into the USB port as shown in the photo.

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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.

4.5 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-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-works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf</u>)

2 JTAG header

4.6 Explanation of the TAO-3530 System on Module



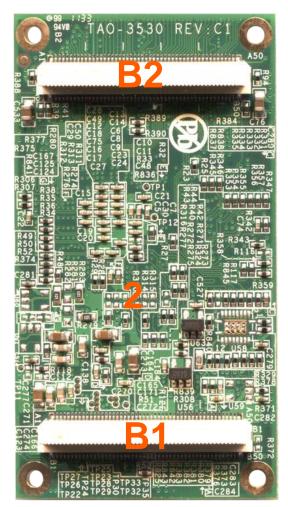


Figure 18: top and bottom view of TAO-3530

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-works.com/catalogues/downloads/connectors/en_ds_65305_0000.pdf</u>)

2 JTAG header



4.7 Explanation of the Tsunami Baseboard

Figure 19: top view Tsunami Baseboard

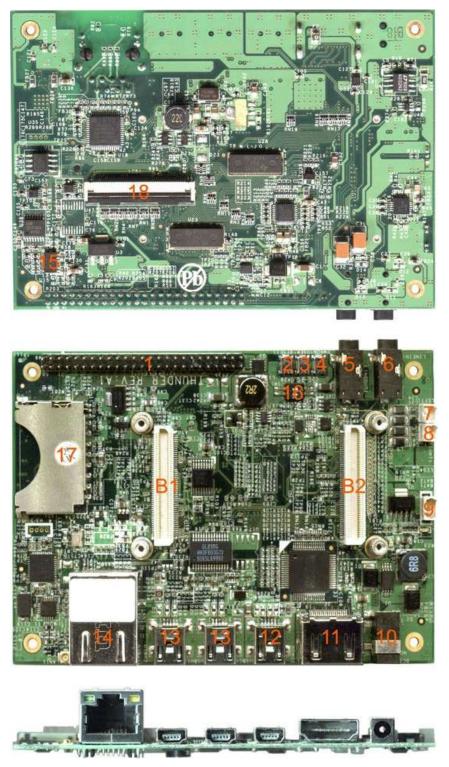
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Figure 20: bottom view Tsunami Baseboard

- 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



4.8 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

4.9 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

5 Mechanical Dimensions

5.1 Inferno Baseboard dimensions

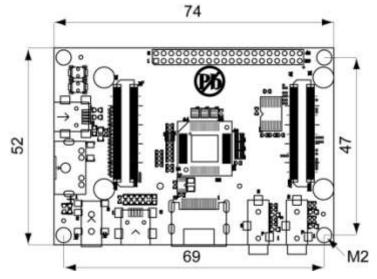
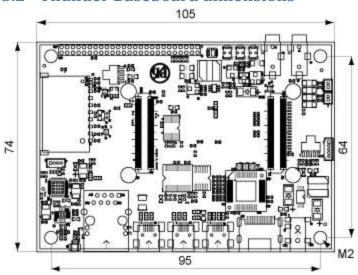
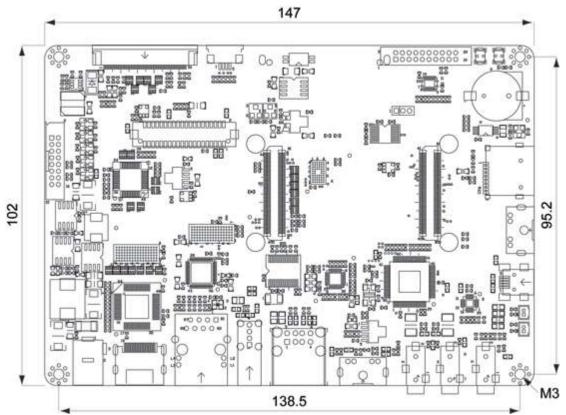


Figure 23: Inferno Baseboard dimensions (Dimensions in mm)



5.2 Thunder Baseboard dimensions

Figure 24: Thunder Baseboard dimensions (Dimensions in mm)



5.3 Tsunami Baseboard dimensions

Figure 25: Tsunami Baseboard dimensions (Dimensions in mm)

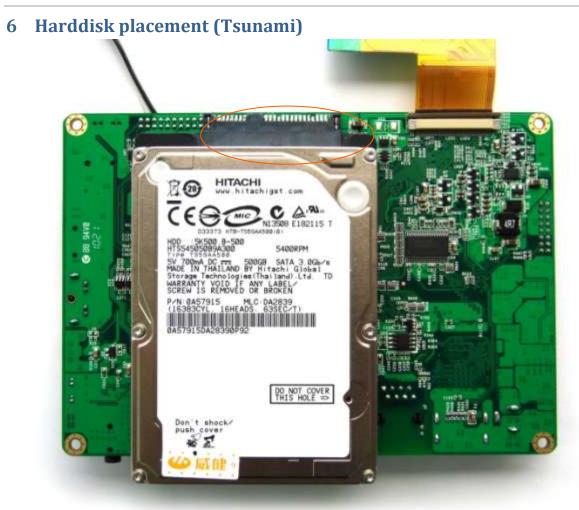


Figure 26: Step1 – Place the 2.5" hard disk in the connector as shown above.

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.



7 Downloads and drivers

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

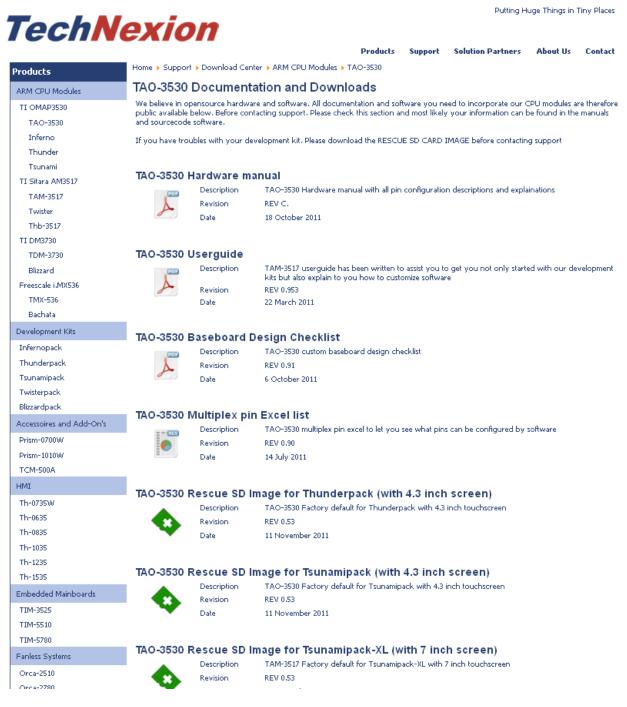


Figure 27: The Download Center at the TechNexion website

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8 Software – Factory Default Screen

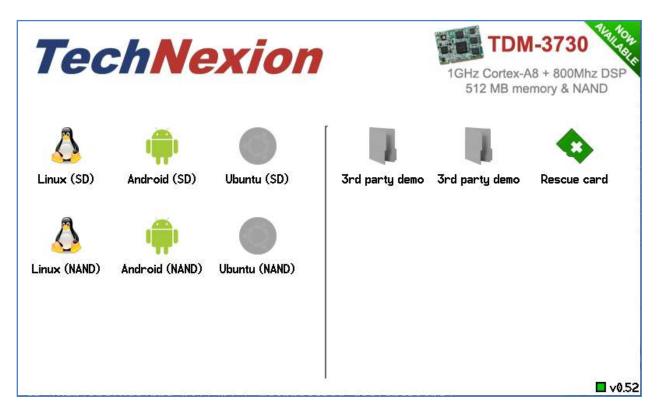


Figure 28: Factory Default Home Screen

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 8.4)

8.1 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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Tec	:hNe	xion			TAM-3517 uch Systems
Linux (SD)	Android (SD)	Ubuntu (SD) Ubuntu (NAND)	Jun 3rd party demo	Junio Santa Januari Junio Januari Janu	Rescue card
				New version a	available: Update ■ v0.56

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

8.2 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.

8.3 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.

8.4 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 defau	lt for Tl	hunderpack with 4	1.3 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 default for Tsunamipack with 4.3 inch touc	hscreen
Revision	REV 0.53	
Date	11 November 2011	

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



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

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

8.4.1 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

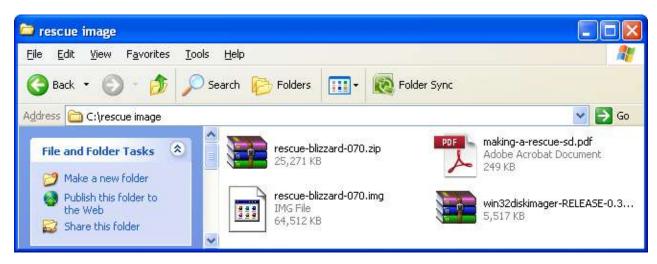


Figure 31: Extracted files

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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

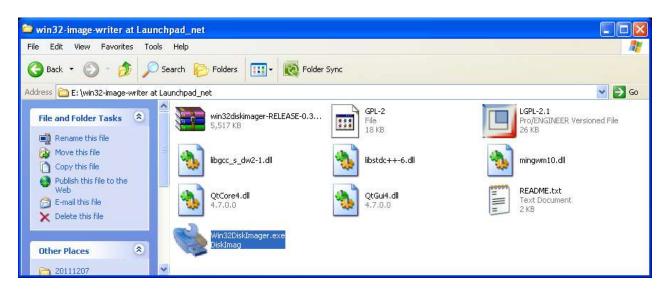


Figure 32: Extract and execute the win32-disk-imager to prepare the rescue image creation



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

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👒 Win32 Disk l	mager			
Image File Progress				After inserting the SD-card click the Refresh icon
Cancel Refresh the list of a	Read vailable devices	Write) Exit	

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

Select a disk in	lage			? 🔀	-
Save in:	🛅 rescue image		🗢 🗈 💣 📰•		
My Recent Documents Desktop My Documents My Documents	rescue-blizzard-070.img				
My Network	File name: rescue-blizz	ard-070.img		Save	
Places	Save as type: *.img;*.IMG			Cancel	- P
😒 Win32 Disk	mager			-	11.3
Image File		Device	1		
Progress			- Allin	-	
Cancel	Read Write	Exit	Rolder Sync		
Address 🛅 C:\re	scue image				👻 🄁 Go
File and Folde		Making-a-rescue-sd.p Adobe Acrobat Docur 249 KB	nent gag	r escue-blizzard- IMG File 64,512 KB	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	E F 🗸 🔊
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.

8.4.2 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

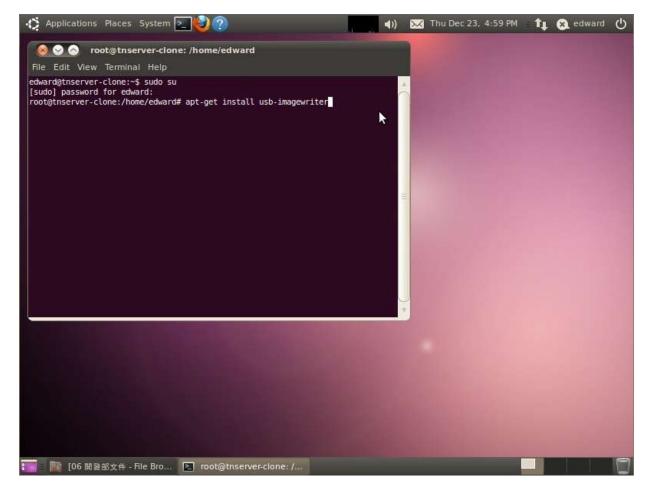


Figure 37: Install the image writer on your Linux computer

Install the image writer:

apt-get install usb-imagewriter

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

🔞 ImageWriter					
ubuntu ImageWriter		ų,	12		
Write Image: rescue-xxx.img	to	Generic-	Multi-Ca	ard (/dev/sdb)	
+ Details					
		Close		Write to dev	vice

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

8.4.3 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

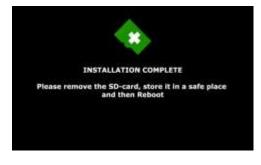


Figure 44: Installation complete - Take out the SD card and reboot.

8.4.4 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.

9 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

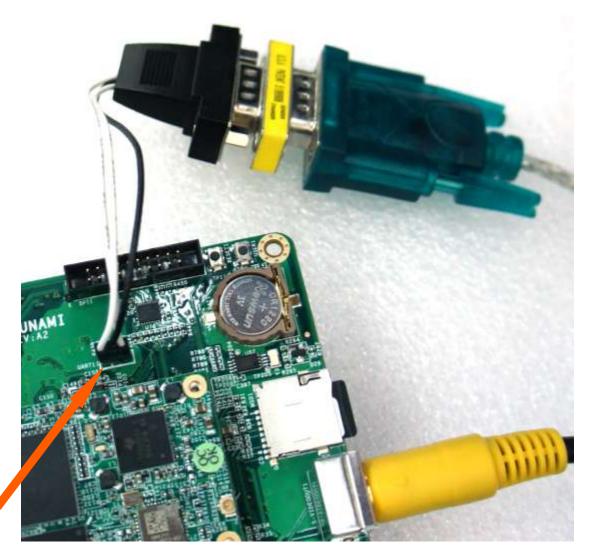


Figure 46: The cable (RS-232 to USB) with yellow mini-gender-changer-block connected to the Debug connector (see orange arrow for position of the white dot)



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 <u>b</u> its Stop bits Parity Elow control	g local serial lines
About	<u> </u>	<u>Open</u>

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 Properties ? 🛛
System Restore Automatic Updates Remote General Computer Name Hardware Advanced
Device Manager The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device. Device Manager
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
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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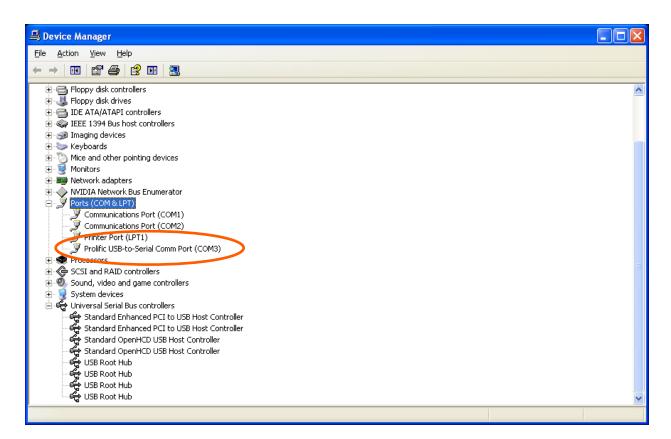


Figure 51: Under Ports (COM & LPT) you will see the baseboard connected with the null modem cable (in this picture COM3), this means in Putty the serial line should be changed into COM3.

- 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	ı 🔀
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 figs Speed COM3 115200 Connection type: Raw Ielnet Raw Ielnet Rlogin SSH Load, save or delete a stored session Saved Sessions 123 Image: Default Settings Load Save Default Settings Delete Close window on exit: Only on clean exit
About	<u>O</u> pen <u>C</u> ancel

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).

10 Software – Linux

10.1 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

10.1 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-linuxgnueabi/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.

10.2 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.

10.2.1 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.

10.2.2 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.

10.2.3 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

10.2.4 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.

10.3 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

10.3.1 QT

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

10.4 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)

10.5 Manual NAND Installation

This paragraph explains how to install Linux to NAND from a bootable SD-card. 1. Stop at the u-boot prompt, and issue the following commands:

nand erase.chip clean
env default -f
setenv bootdelay 1
saveenv
mmc rescan 0

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fatload mmc 0:1 \$loadaddr MLO				
nandecc hw ; 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				
nand erase 280000 400000				
nand write \$loadaddr 280000 400000				
run mmcboot				
The development kit boots into Linux.				

2. Once at the kernel prompt, login as root (no password required) and issue the following commands:

flash_erase /dev/mtd4 0 0
ubiattach /dev/ubi_ctrl -p /dev/mtd4
ubimkvol -N rootfs -m /dev/ubi0
mount ubi0:rootfs /mnt/ubi -t ubifs
rsync -azexclude=/mntexclude=/lost+foundexclude=/procexclude=/sys / /mnt/ubi/
mkdir -p /mnt/ubi/proc /mnt/ubi/sys /mnt/ubi/mnt/
/bin/sync
umount /mnt/ubi
ubidetach /dev/ubi_ctrl -p /dev/mtd4
poweroff

10.6 How to

10.6.1 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

10.6.1.1 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
- 10.6.1.2 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

10.6.2 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> (tells you which package provides the named file)

10.6.3 How to enable wireless

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

10.6.3.1 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

10.6.3.2 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

10.6.3.3 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 :-)

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

10.6.4 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]

11 Software - Android

11.1 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 11.2)



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

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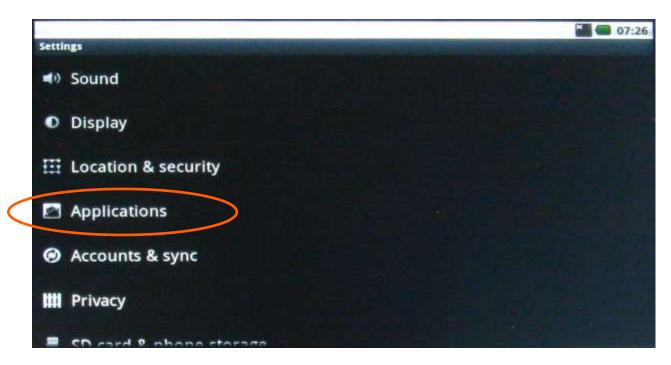


Figure 57: Scroll to the Applications and press on it

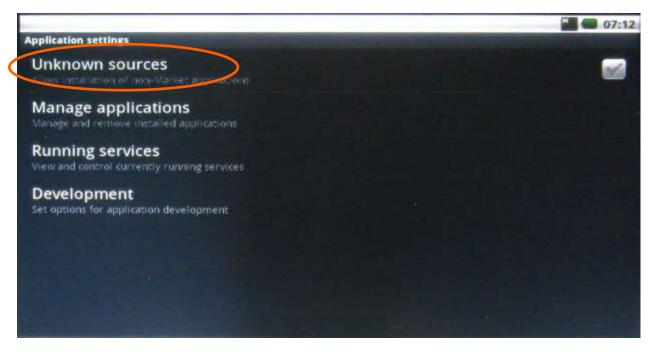


Figure 58: press on "Unknown sources"

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Figure 59: Confirm OK

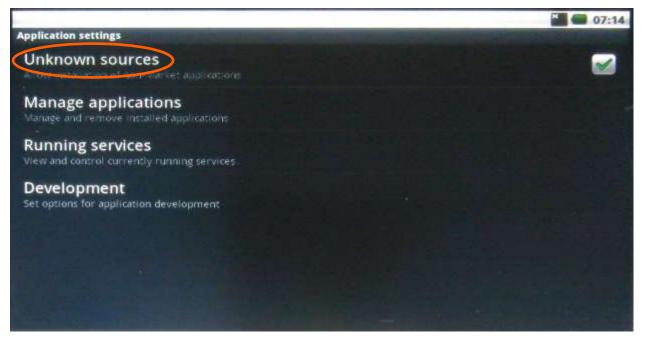


Figure 60: The "Unknown sources" will now show a green icon. It will now install application even if the sources are unknown.

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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 11.2)



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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		07:16
RockPlayer		
Do you want to install this application?		
Allow this application to:		
A Storage mod fy/delete SD card contents		
A Network communication		
A Phone calls read phone state and identity		
A System tools prevent phone from sleeping		
Install	Cancel	

Figure 63: Press install

	2 @ 07:16
RockPlayer	
Installing	
the second se	

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.

11.2 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.

	810 (
Nireless & 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:

Wireless & network settings		14:09
Airplane mode Disable all wireless connections		
Wi-Fi Connecting		
WI-FI settings Set up 6 manage wireless access	points	
Bluetooth Turn on Bluetooth		
Bluetooth settings Manage connections, set device n	ame & discoverability	
VPN settings Set up & manage Virtual Private I	Networks (VPNs)	
Mobile networks		

Figure 68: Go to Wi-Fi settings:

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

Figure 69: Select a network

	_	_		14:09
Wi-Tisettings				
WI-FI Discoverted				
Network notif	ication			
TECHNEXION Remembered, techne Sequentity Sequentity WPA/WPA2 Poor				
				18
planexuser Secured with WPA/WP	Connect	Forget	Cancel	6
Add Wi-Fi net	work			
				<u>N</u>

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.go	ogle.com/p/rowboat/	C X
Android for Treas	vents Devices (Snata, Davner and Integrat	Search projects
Project Home Downloads' N	A linies Source	
Summary Dollater People		
Project Information	arowboat.org	
Antisany call High Private Isocite	Enables Android for Texas Instruments devices	
Code Reense Austitus Colores 2.0	Currently supported devices are OMAP254, AM354, AM374, DM374, AM3896, AM1808,	
Labels ardmit, ornap3, ornap, beage, beagleboard; 11, brux, dap 15,92, ornap3550, am1517, ornap3730, 3730, am250	The goal of anowboat ang project is to 1 • Truncide a statute Google Android base pure for AM1805, OMA7355, AM255, AM255, AM389, and DM37e platform • Enable key fundham features (ARM plus NEON, <u>DEP</u> , 20/3D Accelerated Graphics and others) in StaniaTM, 1 bitigraTM/ dwaves.	
Mambers om Max. Operations Exemanismes	Who should get involved • Exerptise considering Andread Report Nandhats with TL devices like AM/DM37s, AM35s, AM38ss, AM18ss • Aminist OL and Andread approximen developers • Aminist OL and Andread approximen developers • Aminist OL and Andread approximen developers	
Featured	Why to use anowhout project	
Construction Advantation Adva	Action and seen development of a quality Authorid part Provide may active development of a quality Authorid part Provide may active development of a quality Authorid part Provide may active development and hereits and Mathematia Computer performance expressioned as Graphers and Mathematia Software and Hereiterer support for all amothers evolved devices	

Figure 72 : Press the internet address bar and the onscreen keyboard will appear, or Insert an USB-keyboard.

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										Et (III	07:19
http://openin	tents.g	ooglec	ode.co	om/							60
http://openin	and the second										
mepsropenn	itents.)	google	code	.com				hi	ttp://op	eninten	ts.goc 🕨
q v		e	1	r	t	у	u	hi	itp://op	eninten O	P P
			1		t g	-	u	j	-	0	
q v	/			r				j n	i	•	

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



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

Name and Address of the Owner, or other	🗟 📶 🥌 07:20
Project Information	OpenIntents participates in GSoC2011!
Activity at High Project feeds	Google
and the second	SUMMER OF
Code license Apache License 2.0	CODE
Labels	2011
android, openintents, java, boltable, sensors, intents, contentprovider	Websers to Onestation
	Welcome to <u>OpenIntents</u>
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CalendarPicker-10.0 apk ColorPicker-110.apk	applications work more closely together. We provide samples and free applications to demonstrate their usage.
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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.

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			19
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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	07:21
Application installed	
Open	Darie

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

11.3 ADB - Installing applications

11.3.1 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.

11.3.1.1 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.

11.3.1.2 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*:*landroid-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:

 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 2.1, API7, revision 2 	Package Description Android SDK Samples for Android API 7, revision 1 Archive Description Archive for any OS Size: 7 MiB	*
 SDK Platform Android 1.6, API 4, revision 3 SDK Platform Android 1.5, API 3, revision 4 Samples for SDK API 9, revision 1 Samples for SDK API 8, revision 1 	SHA1: 51e4907f60f248ede5c58b54ce7b6ae0b473e0ca <u>Site</u> Android Repository (dl-ssl.google.com)	
X Samples for SDK API7, revision 1	O Accept Reject	🔘 Accept Al

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.

Variable	Value	
path TEMP TMP	%CommonProgramFiles%\Microsoft Sh %USERPROFILE%\AppData\Local\Temp %USERPROFILE%\AppData\Local\Temp	
	New Edit Delete	
vstem variables Variable	Value	
	Value Windows_NT	-
Variable		-
Variable OS	Windows_NT C:\Program Files\PC Connectivity Soluti .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;	

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:

Packages available for download
Gamples for SDK API 8, revision 1 Gamples for SDK API 7, revision 1 Gamples for SDK API 7, revision 1
 Third party Add-ons Google Inc. add-ons (dl-ssl.google.com) Google APIs by Google Inc., Android API 9, revision 1
Google APIs by Google Inc., Android API 8, revision 1 Google APIs by Google Inc., Android API 8, revision 2 Google APIs by Google Inc., Android API 7, revision 1
Google APIs by Google Inc., Android API 4, revision 2 Google APIs by Google Inc., Android API 3, revision 3
Google Usb Driver package, revision 4 Google Market Licensing package, revision 1
🔲 🔡 Samsung Electronics add-ons (innovator.samsungmobile.com)
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

11.3.1.3 *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>.

11.3.1.4 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.

11.3.2 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.

11.3.2.1 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

11.3.2.2 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

11.3.3 ADB Functions

11.3.3.1 Application Install/Remove

Install

\$> adb install <package>.apk

Remove

\$> adb uninstall <package>.apk

11.3.3.2 File Operation

To Device

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

From Device

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

11.3.3.3 Shell Operation

\$> adb shell

11.3.3.4 Show Devices

\$> adb devices

12 Software - Windows CE

12.1 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.

12.2 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.

12.3 Get the BSP

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

12.3.2 Install BSP to "Platform Builder for CE 6.0". Decompress the downloaded file. (See Figure 84)

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Figure 84

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 85 and Figure 86)

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Figure 85

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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 87 and Figure 88)

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Figure 87

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12.4 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 12.6.

- Open "Microsoft Visual Studio 2005". If that already open, Please reopen it.
- Click "File \rightarrow Open \rightarrow Project Solution" (See Figure 89)

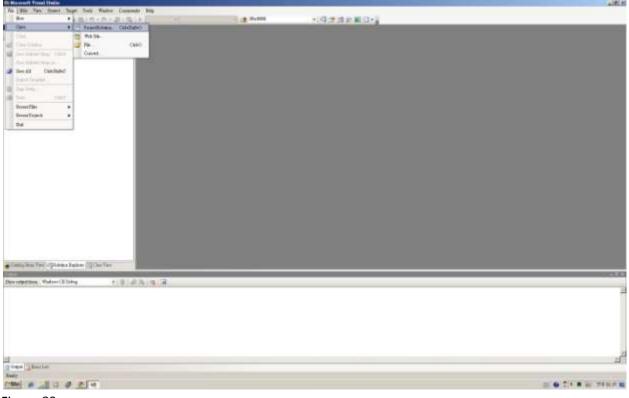


Figure 89

• Go into the folder and open the SLN-file (As example in this manual we use "Tsunami_LCD_AT070TN94") (See Figure 90)

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Figure 90

In the menu click "build/advanced build command/sysgen" (See Figure 91); this will take approximately 20 minutes, after which you will see "build complete" (see Figure 92)

[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]

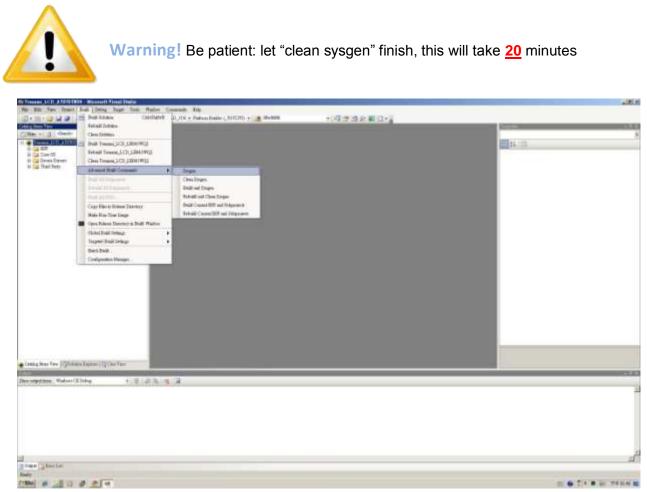


Figure 91

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Figure 92

(#(w)

• 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 93)

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Figure 93

• In the menu mark "partition as active", press OK, it will then show "successful" (see Figure 94)

eate Partition	And in case of the local division of the loc	×	
elect the partition you	want to create and other	settings:	
• Primary Partition	C Extended Partition	C Logical Drive	
Partition geometry			
• Default partition	geometry		
Size, MB:	243 Maximum: 24	3 MB	
C Exact partition ge	ometry		
Offset:	63 with size:	499649	
	63 space available:	499649	
and the second sec		egabytes 🕫 sectors	
	10-10-10-10-10-10-10-10-10-10-10-10-10-1		
Drive Attributes			
Assign the followi	ng drive letter: H: 💌		
Mark Partition as	Active		
Format Partition		i	
1151 244 P			
Volume Label:			
File System:	FAT32		
Allocation unit siz		<u> </u>	
🔽 Perform a qu	ick format		
	-		
	OK	Cancel	
cessing completed			
cessing completed		_	
New partition l	has been created successfu	ally	
~~~~			
Details >>			Close



• Right click again and choose format, Click OK, finished (see Figure 95)

Format		×	
Volume Label:			
File System:	FAT	<b>.</b>	
Allocation unit size	Default	<b>_</b>	
🔽 Perform a quid	tk format		
	ОК	Cancel	
Processing completed			×
Partition has b	een formatted successfu	lly	
Details >>	Close this dialo	g when execution completes	Close

Figure 95

 Go to C:\WINCE600\OSDesigns\Tsunami_LCD_AT070TN94\RelDir" and open the folder "TN_TAO_3530_ARMV41_release" (See Figure 96). The folder contains files named: MLO, EBOOTSD.nb0, NK.bin (These files are needed for a <u>bootable</u> SD-card)

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Figure 96

- First copy "MLO" to the microSD card (the order is important)
- Then copy "EBOOTSD.nb0" and "NK.bin" in the microSD card (See Figure 97)
- Remove the MicroSD card

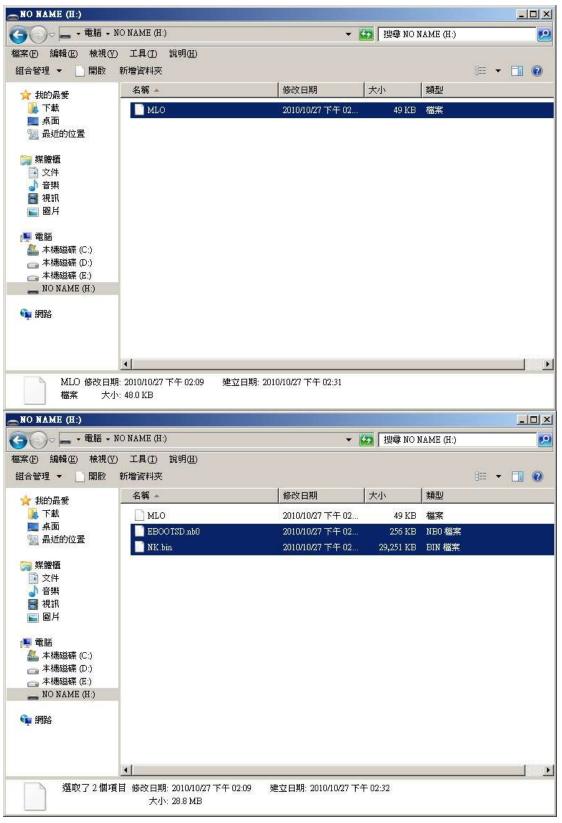


Figure 97

*

- 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 98)

CONT- 1/111	ولع ا
Init HW: constaller FST	
IVEC: energence computer timest CTD4	
HTC::ENCCommandResponse: MCCandComman error, command = 8	
HNC()HNCCasemodDesponse) Casemod Desponse Exver	
read electron, nb0 file	
Jumping is shortpd insuls	
Ricrosoft Windows CE Bustinader Common Library Version 1.4 Daris Oct 17 2010 14:04:55	
Texas Instruments Mindows IE EDONT for Ristial (MAP EVE, Sails Oct 17 2010 at 14:00:23	
EDOUT Terratom 1.1, BEP 8.12.04	
TI (MARIIIN Vergina Beacheadle (ED).1)	
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nyetaan saady	
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DUPC: 204 hour estilage Exid	
>>> Ferring sold book (non-persistant segistry and other data will be wiped) out	
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Hit space to enter configuration sens 4	
BA space to enter configuration same f	
Hit space to enter configuration menu I	
fit space to enter configuration sens 1	
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EDGE: foot device drives fait rail failed	
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[1] Heises Bans Device	
[3] Belers HTL (Bekug) Bevice	
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[7] Bave Bettings	
[1] Flash Reingenein	
<ul> <li>[4] Exable/Disable LAS, Betall Reprogec</li> <li>[8] Sect and Continue</li> </ul>	
The second	
Belettion: 2	
Swlert Boot Davite	
113 LANKED RAC	
112 UNDER UND 18	
[2] ME Stone DDCard, FILE	
[11] Exit and Continue	
Beleviins (artual LANNILD MAC):	

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

COMI - Faity	
FARM: Boot config wasn't found, using defaults	
MPO: 394 boot setting: 0x21	
>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
is precing coar boot configuration men set of the start of a start be alpha to the start of the	
it space to enter configuration menu 4	
it space to ester configuration menu 1	
lit space to enter configuration menu 2	
it space to enter configuration menu 1	
IAC address not found!! Aborting	
(REGR: Boot device driver Init call failed	
Bain Renu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[7] Bave Bettings	
[6] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[D] Exit and Continue	
Belestion: 3	
Select Bdot Device	
(1) LANSZZO MAC	
[2] USBFA BUDIS	
[3] NK from SDCard FILE	
[0] Exit and Continue	
Selection (actual LAN9220 HAC): 3 Boot device set to NK from SDCard FILE	
THE WEATHER DECK OF ALL AND ADDRESS FOR	
Nain Nenu	
[1] Show Current Settings	
(2) Belect Boot Device	
[3] Belect KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[7] Save Settings	
[0] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[0] Exit and Continue	
Selection:	-



- Select Exit and Continue
- It will start to load the image into the memory (see Figure 100) and the base board will show Windows CE.
- FINISHED

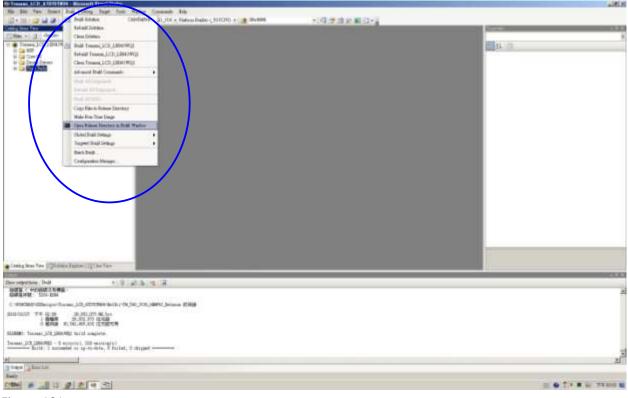
COM1 - PaTTY	
Selection: 2	-
Select Boot Device	
(1) LAND22D HAC	
(2) USSYA RADIS	
[3] WE from SDCard FILE [0] Exit and Continue	
In the continue	
Selection (actual LAN9220 MAC): 3 Boot device set to NE from SDCard FILE	
Nain Renu	
[1] Show Current Settings	
[2] Select Boot Device	
<ul> <li>[3] Select KITL (Debug) Device</li> <li>[4] Network Settings</li> </ul>	
[5] SDCard Settings	
(6) Set Device ID	
[7] Bave Settings	
<ul> <li>[0] Flash Hanagement</li> <li>[9] Enable/Disable OAL Retail Messages</li> </ul>	
[0] Exit and Continue	
Selection: 0	
Init HWI controller BST	
IDEC: command response timeout CTO'	
HBC::HRCCommundResponde: HBCBendCommand error, command = 0	
HMC1:HMCCommandPerponse: Command Response Error	
BL_INAGE_TYPE_BIN	
Download file information:	
[0]: Address=0x24001000	
Download file type: 1	
rcm_offset=0x0, ImmgeStart = 0x84001000, ImageLength = 0x101E680, LaunchAddr = 0x8400B294	
Completed file(s):	
[0]: Address=0x84001000 Length=0x1D1E680 Name="" Target=PAR	
ROMMER at Address 84001094h Launch Vindows CE Image by jumping to 0x8000b294	
Findows CE Mernel for AFM (Thumb Enabled) Built on Oct 20 2009 at 15:39:19	
High Performance Frequery is 32768 khr	
MERINIT (Deinitialize serial debug)	

# **12.5 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.

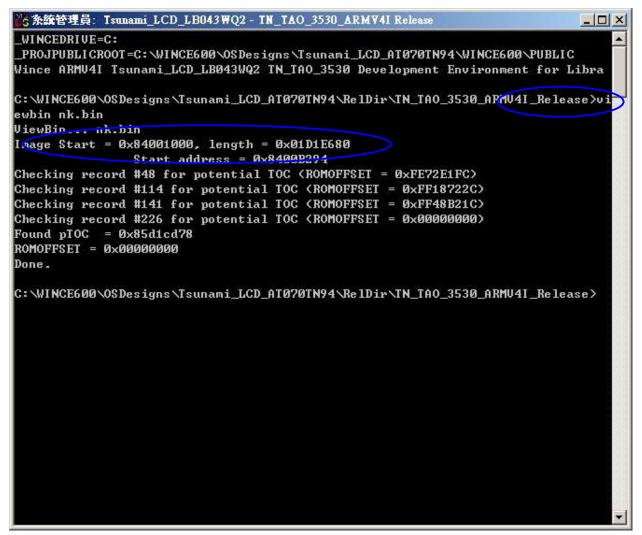
## 12.5.1 Create file "NK.nb0".

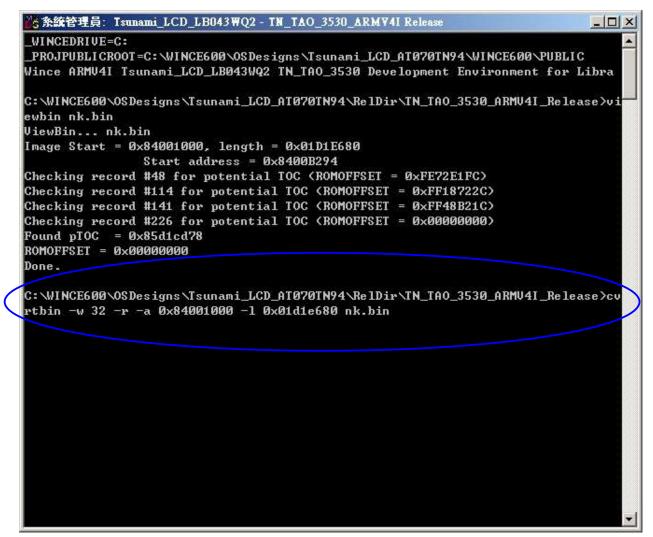
- Click "Build  $\rightarrow$  Open Release Directory in Build Window". (See Figure 101)
- It will open a console window. (See figure 19)





- Type "viewbin nk.bin". (See Figure 102)
- It will show "Image Start = address, length = size".
   (Example "Image Start = 0x84001000, length = 0x01D1E680")
- Type "cvrtbin -r -w 32 -a Image Start -I length nk.bin". (Example "cvrtbin -w 32 -r -a 0x84001000 -I 0x01d1e680 nk.bin"). (See Figure 103)





<mark>86</mark> 条纸	管理員: Isu	nami_LCI	_LB043₩Q2 -	TN_TAO	_3530_AR	MV4I Relea	ise		
start	85690000	length	00007b88						
start	85698000	length	00000020						
start	85699000	length	0003c210						
	856d6000								
start	856da000	length	0000141c						
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	85705000								
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	859a0a24								
	859e88a8								
	85a21dac								
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- FINISHED. (See Figure 104)
- You will now be able to find the file"NK.nb0" in the directory: RelDir/TN_TAO_3530_AMV41_Release

### **12.5.2** 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 12.7.
- First copy only the "MLO" file to the SD card. (the order is important) See Figure 105)
- Then copy "EBOOTSD.nb0", "fldr.raw" or "fldrlogo.raw" and "nk.nb0" files to the SD card. (see Figure 106)
- 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 107)

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Figure 105

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🔄 最近的位置	📄 fldrlogo.raw	2010/10/27 下午 02	418 KB	RAW 檔案	
📄 媒體櫃	nk.nb0	2010/10/27 下午 03	29,818 KB	NBO 檔案	
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Figure 106

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40a	-
Texas Instruments Windows CE ED X-Lowder for EVH 3530	
Built Oct 27 2010 at 14:09:29	
Version 6.12.04	
open abouted mbO film	
Init HV: controller RET	
SDBC: command septones timeout CTO!	
MMC::MMCCommandPergence: MMCBendCommand error, command = 8	
NRC:: NRCCommandResponse: Command Personse Error	
read ebooted.nb0 file	
jumping to abooted image	
Micromoft Windows CE Bootlonder Common Library Version 1.4 Built Out 27 2010 14(04:53	
Texas Instruments Windows (E EBOOT for Histral OMAF EVM, Built Oct 27 2010 at 14:08:23	
EBOOT Version 1.1, BDE 0.12.04	
TI OMARJSJO Version OwabTamOIT (EB1.1)	
TPSSIDIL Version Ox10 (EE2.x)	
System geody	
Preparing for download	
INFO: Fredowninas	
WARN: Boot config wasn't found, using defaults	
DNFC: SW4 boot setting: Dx2f	
>>> Forcing cold boot (non-pergistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration mens 4	
Hit space to enter configuration menu 3	
Hit space to makes configuration menu 2	
All space to enter configuration mens 1	
RAC mddress bot found'' Aborting	
HENOR: Sont device driver luit call falled	
Rain Henu	
[1] Show Current Settings	
[2] Select Boot Device	
(a) Salart ATT, Debug Device	
14) Bitwick Bettings	
(5) BOGard Settinge	
[2] SUGED SETLING [6] Bet Device [D]	
[7] Save Settings	
[0] Flash Rangement	
<ul> <li>[9] Enuble/Dirable CAL Retail Berrager</li> <li>[0] Evit and Continue</li> </ul>	
Sector and the sector	
Belection:	

Figure 107

# • Chose "Flash Management". (See Figure 108)

CONI-INTY	<u></u>
maas Instruments Windows CE EBOOT for Mistral OMAP EVN, Built Oct 27 2010 at 14:08:23 BOOT Version 1.1, 83F 8.12.04	
1 OMAP1530 Version 0x4b7me01f (f53.1)	
PSSSXX Version Ox10 (ES2.s)	
ystm ready: reparing for download	
NFOT Predownload	
1258: Boot config wasn't found, using defaults	
NFC: 594 boot setting: Dx2f	
>> Forcing cold boot (non-permistant negistry and other data will be wiged) <<<	
lit space to enter configuration menu 5	
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fain fiens	
[1] Show Current Bettings	
[J] Select Boot Device	
[3] Select RITL (Debug) Device	
[4] Network Settings	
<ul> <li>[5] SDCard Sattings</li> <li>[6] Set Device IJ</li> </ul>	
17) See Settinge	
[6] Jack Represent	
Insble/Disable 11 Retail Ressapes	
10] Xxit and Continue	
Selection: 8	
Time Banagement	
[1] Show flash genuetry	
[2] Dusp flash sector	
[3] Ecost flash	
[4] Erase block range	
(5) Reserve block range [6] Set bad block	
(e) Bet Dan Boork (7) Forbest flash	
[1] Write bootLoader from SDCard to flash	
[9] Write MR image from SDCard to flash	
[0] Exit and Continue	
Selection:	

Figure 108

- Chose "Show flash geometry". (See Figure 109)
- It will show:
   Flash Type: NAND
   Blocks: 2048
- Chose "Erase block range". (See Figure 110)
- 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 111)

CONI - PATTY	_101 x
[1] Show Current Settings [1] Select Hour Device [3] Select KTL (Debug) Device [4] Metwork Bettings [6] BDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Ranapement [9] Flash Ranapement [9] Enable/Dismble OAL Formil Reseages [0] Exit and Continue	
Relection: 8	
Flash Management	
<pre>[1] Show flash genemity [2] Dung flash sector [3] Erase flash [4] Erase block range [5] Beserve block tange [6] Set bad block</pre>	
<ul> <li>[7] Format flach</li> <li>[6] Write bootLoader from SDCard to flach</li> <li>[9] Write DK image from SDCard to flach</li> <li>[0] Trit and Company</li> <li>Belection: 1</li> </ul>	
Flach Type: NAND Dlocks: 2048 Bytes/block: 131072 Sectors/block: 64 Bytes/sector: 2048	
[reserved] 0 1 2 3 [hed] 45 128 414 791 1195 Done	
Flash Rabagement	
<ol> <li>Show flash geometry</li> <li>Dung flash sector</li> <li>Frame flach</li> <li>Frame flach</li> <li>Frame block range</li> <li>Sec bad block</li> <li>Sec bad block</li> <li>Frame flash</li> <li>Kit and Continue</li> </ol>	
Selection:	



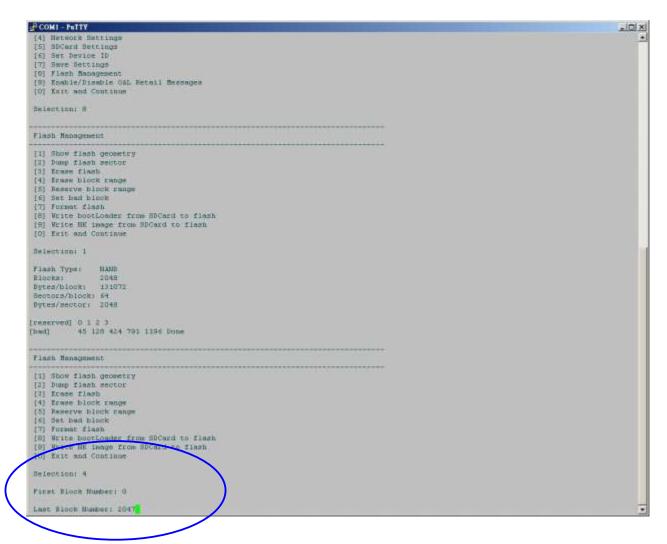


Figure 110

COMI - PATTY	
(6) Set Device ID	
7] Save Bettings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Rescages	
[0] Exit and Continue	
election: 0	
Flash Management	
[1] Show flash geometry	
[1] Dump flash sector	
0] Ecase flash	
4] Erase block range	
(5) Reserve block range	
6] Set bed block	
7] Format flash	
8] Write bootLoader from SDCard to flash	
9] Write HK image from SDCard to flash	
OJ Exit and Continue	
election: 1	
lash Type: NAND	
Locke: 2048	
lytes/block: 131072	
Jestorn/block: 64	
Sytes/medici/ 2048	
reserved] 0 I 2 3	
rad] 45 120 424 791 1196 Done	
Flash Nanagement.	
1] Show flash geometry	
2] Dump flack sector	
3] Erase flash	
1] Erase block range	
5] Reserve block cange	
6] Set had block	
7] Format flagh	
5] Write bootLoader from SDCard to flash	
9) Write NK image from SDCard to Flash	
9) Write NK image from SDCard to flash	
<ul> <li>Write NK image from SDCard to Flash</li> <li>Exit and Continue</li> <li>Relection: 4</li> </ul>	
0) Veite NK image from SDCard to flash 0) Exit and Continue election: 4	
9) Verte NK image from SDCard to Flamh 0) Exit and Continum Melection: 4 Trat Block Number: 0	
9) Veite NK image from SDCard to Flash 0) Exit and Continum election: 4 itet Block Number: 0 ast Block Number: 2047	
0) Veite NK image from SDCard to flash 0) Exit and Continue Melection: 4	

Figure 111

- Chose "Write Bootloader from SD-Card to flash". (See Figure 112)
- It will show "Do you want to write Bootloader to flash [-/y]?" Input "y"
- Then it will show "Bootloader Image written". (See Figure 113)

-	- http
Last	Numbers: 2047
	s want scame Block 0-1047 [-/917 y
	s want to erase reserved block 0 [-/y]? y
	want to grade reserved block 1 [-/y]? y
. 20 y	nu want to erase reserved block 1 [-/y]7 y
. Do y	ou want to grade reserved block 3 [-/y] 7
	Do you want to erase reserved block 45 [-/y] > y
po su	a want to stass had block 45 [-/y]? y
100000000000000000000000000000000000000	can't grass block 45 - mark as bad
	Do you want to grade reserved block 128 [=/y] > y
1205760	a want to erase bad block 138 [-/y]? y
10.000	can't crase block 128 - mark as bad
	Do you want to erase reserved block 424 [-/y] > y
	a want to stame had block 424 (-/y)7 w
COMPLET I	can't srass block 424 - mark as bad
	To may be a supervised by the second s
137 9	
- 10	a want to erase had block 751 [-/y]  y
	ton't crase block 751 - bark as bad
COLUMN	
	De
a want.	to erape reperved block 1196 (-/y)? y
Do you	a want to erase had block 1196 [-/y] 7 y
Cops,	oan't grass block 1196 - mark as bad
*****	ereneren eren Pom
Flash	Nanageisent
(1) 3	oov flash geometry
[2] D	ang flakh sector
[3] E	are flash
	man block range
	inerve block range
	t bad block
	rmat flach
	rite bootLoader from SDCard to flash
	rite NR image from SDCard to flash
[0] E	and Constant
10000095	
	tion: 8
	i want to write bootloader to flash [-/9]7

Figure 112

COMI - PaTTY	_10
Init HW: controller RBT	
SDHC: command response timeout CTO:	
NCI: MSCCommandFergonse: MSCBendCommand error, command = 8	
INCIINNCCommandSesponse: Command Sesponse Error	
11e alte = 427414	
lead BootLoader From SD Card.	
lead data successfully	
Write BootLouder to Flush.	
ALFInshStoreOpen: 2048 blocks, 64 sectors/block	
OALFinshStoreOpen: 2068 bytes/sector, 0 reserved blocks	
IONHDB (pTOC = 0x80006458)	
DLL First 1 0x4001c001	
DLL Last 1 0x4001c001	
Physical First : Dx40106000	
DLL Last : 0x4001c001 Physical First : 0x40106000 Physical Last : 0x4020c1a0	
Num Modules : 1 RAM Start : Dx402DcD00D	
RAM Start : Dx4020e000	
RAM Free r 0x4020e000	
BAN Free         I 0x4020e000           BAN End         I 0x4020f000	
Hun Copy Entries 1 1	
Copy Entries Offset : 0x4020b4c4	
Prof Symbol Length : 0x00000000	
Prof Symbol Offset : 0x00000000	
Num Files : 0	
Kernel Flage : De0000000	
FileSys RAM Percent : 0x80808080	
Driver Glob Start / 0x00000000	
Briver Glob Length I 0x00000000	
CF0 1 0x01c2	
RiscFlags : 0x0002 Extensions : 0x0000000	
Tracking Men Start : Dx00000000	
Tracking fine baset h : 0x0000000	
BootLonder Innge written	
Floon Repairment	
WORK WORKSHILL	
[1] Shoe flash geometry	
[2] Dump flash sector	
(3) Ernse flach	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[0] Write bootLoader from HDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection:	

Figure 113

- Take the microSD card out of the Baseboard.
- Reboot from NAND Flash by pushing the reset button on the baseboard (See Figure 114).
- It will make a partition and format and then show "Flash format complete!"

```
COMI - PATTY
                                                                                                                                                                                                                                        - IOI XI
          tting fin
                                                                                                                                                                                                                                                .
 Inter LowLevelFormat (0x0, 0x7ff]
Frasing flash block(s) [Gw0, Gw7ff] (please wait): FraceBlocks: preserving reserved block (Gw0)
EraseBlocks: preserving reserved block (Gw1)
EraseBlooks: preserving reserved block (0x2)
EraseBlocks: preserving reserved block (0x3)
Traselicks: found a had block (0x10) - skipping...
Done.
WriteHBB: HBB block = Dx4.
Done.
IsValidHER: MER sector = Ox100 [valid HDR]
 OpenPartition: Partition Exists=0x0 for part 0x20.
CreateFurthing: Enter CreateFurthing for 0x20.
LastLogSector: Last log sector is: 0x1005.
CreateFurthing: Stat = 0x1, Num = 0x511.
Log1Phys: Logical 0x1 \rightarrow Physical 0x101
Dependent of the sector - 0x100 (valid fER)
IsValidEBri HER sector - 0x100 (valid fER)
OpenPartition: Partition Exists-OkO for part Oxb.
CreatePartition: Enter CreatePartition for Oxb.
FindFreeBector: freeBector is: bx6000 after processing part 0x20.
CreatePactition: Num sectors set to 0x30e00 to allow for compaction blocks.
CreatePactition: Start = 0x5000, Num = Gx10e80,
Martenser BSE block
Flash format complete!
       Forcing cold boot
                                      (non-persistent registry and other data will be wiped) <---
 Hit space to enter configuration mean 5.
His 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 menn 1 ....
  Sain Senu
   [1] Show Current Settings
  [2] Select Hoot Device
[3] Select HITL (Debug) Device
  [4] Network Settings[5] Flash Hanagement
  [6] Set Device ID
[7] Save Settings
   [0] Enable/Bisable OAL Betail Bessages
  [0] Exit and Continue
  Selections
```



- 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 115)
- When it shows "Hit space to enter configuration menu". Please push space button on the keyboard.

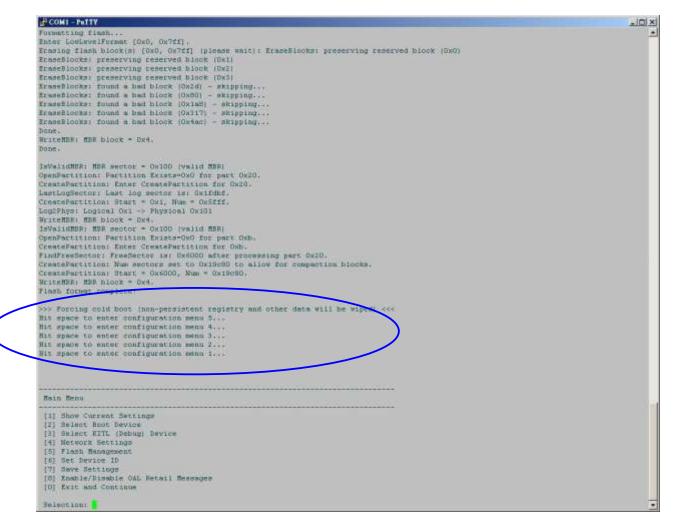


Figure 115

- Chose "Flash Management". (See Figure 116)
- Chose "Write NK image from SD-Card to flash". (See Figure 116)
- It will show "Do you want to write NK image to flash [-/y]?" Input "y".
- It will show "NK image written". (See Figure 117)

_ (C) ×
_

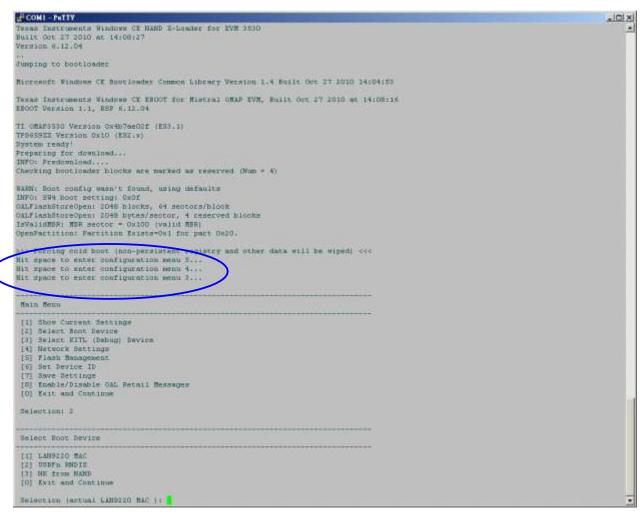


<pre>read data successfully: it to NK image to Of partitios OMDA [pToC = heftdioff] </pre>		
ric NK Image to 71mmb. rising NK Image to 00 partition OMDA (pToC = 0mt)dicating DLL Last : Device 000 Physical First : Device 000 Physical First : Device 000 Physical Leart : Device 000 Prof Symool Leargth : Device 000 Prof Symool Device 000 Prof Symool Device 000 Prof Symool Device 00	***********************	
ring W impe to 0 partition  The first i DefORING  Difference i DefORING  The first i DefORING  Track i DefORING  Tracking Bes France i DefORING  Tracking Bes Brance i DefORING  Tracking Bes		
OWDER (pTOC = 0:mildicati)         SLL Last       1 0:4001:000         Physical First       1 0:4001:000         First 0:0000000       1 0:0000000         First 0:00000000       1 0:00000000         First 0:00000000       1 0:00000000 <td< td=""><td>rite NK image to Flash.</td><td></td></td<>	rite NK image to Flash.	
bL. Last       1 De4001e001         bL. Last       1 De4001e001         Physical First       1 De4001000         Physical First       1 De4001000         Physical First       1 De501000         RAM Fract       0 0050000         RAM Fract       0 0050000         RAM Fract       0 0050000         Rum Copy Thatise       2         Copy Mattise       3         Rum Copy Thatise       2         Copy Mattise       0         Proced Sympol Length       1 De0000000         Part Sympol Length       0	riting NK image to OS partition	
bL. Last       1 De4001e001         bL. Last       1 De4001e001         Physical First       1 De4001000         Physical First       1 De4001000         Physical First       1 De501000         RAM Fract       0 0050000         RAM Fract       0 0050000         RAM Fract       0 0050000         Rum Copy Thatise       2         Copy Mattise       3         Rum Copy Thatise       2         Copy Mattise       0         Proced Sympol Length       1 De0000000         Part Sympol Length       0		
Physical Fizet : 0.04401000 Physical Least : 0.0541f600 RMB Toduice : 133 RAF Free : 0.05400000 RAF Free : 0.05400000 RAF Free : 0.054000000 Phus Copy Textuse : 2 Copy Textuse : 7 Copy Textuse : 0.00000000 Rus Fize : 0.00000000 Rus Fize : 0.00000000 FileSpe RAF Persent : 0.00000000 Priver Gich Leasth : 0.0000000 Priver Gich : 0.0000000 Priver Gich : 0.0000000 Priver Gich : 0.000000 Priver Gich : 0.0000000 Priver Gich : 0.000000 Priver : 0.00000 Priver : 0.000000 Priver : 0.00000 Priver : 0.000000 Priver : 0.000000 Priver : 0.000000 Priver : 0.000000 Priver : 0.0		
Physical Fizet : 0.04401000 Physical Least : 0.0541f600 RMB Toduice : 133 RAF Free : 0.05400000 RAF Free : 0.05400000 RAF Free : 0.054000000 Phus Copy Textuse : 2 Copy Textuse : 7 Copy Textuse : 0.00000000 Rus Fize : 0.00000000 Rus Fize : 0.00000000 FileSpe RAF Persent : 0.00000000 Priver Gich Leasth : 0.0000000 Priver Gich : 0.0000000 Priver Gich : 0.0000000 Priver Gich : 0.000000 Priver Gich : 0.0000000 Priver Gich : 0.000000 Priver : 0.00000 Priver : 0.000000 Priver : 0.00000 Priver : 0.000000 Priver : 0.000000 Priver : 0.000000 Priver : 0.000000 Priver : 0.0	DLL First : 0x4001e001	
Flysical Lest       i 0:05517600         Hum Bodius       i 253         Hum Bodius       i 253         Hum Fract       i 0:0550000         Hum Copy Entities       i 0:0510000         Hum Copy Entities       i 0:0510000         Hum Copy Entities       i 0:0000000         Prof Symbol Length       i 0:0000000         Prof Symbol Cottaet       i 0:0000000         Prof Symbol Cottaet       i 0:00000000         Priver Gich Start       i 0:00000000         GPV       i 0:00000000         Firstering III Raw Endert       i 0:00000000	DLL Least : fix416deDest	
RAM Free : 0.005435000 RAM Free : 0.0055435000 Rum Copy Tartime : 7 7 Copy Tartime : 0.0010000 Prof Symmol Lampth : 0.00000000 Rum Files : 0 Frieflys RAM Percent : 0.00000000 Friver Sido Scart : 0.00000000 Priver Sido Length : 0.00000000 Priver Sido Length : 0.00000000 CFU : 0 Raterlage : 0.00000000 Tracking Rem Length : 0.000 Tracking Rem Length : 0.0000 Tracking Rem Length : 0.0000 Tracking	Physical First : 0x84001000	
RAM Free : 0.005435000 RAM Free : 0.0055435000 Rum Copy Tartime : 7 7 Copy Tartime : 0.0010000 Prof Symmol Lampth : 0.00000000 Rum Files : 0 Frieflys RAM Percent : 0.00000000 Friver Sido Scart : 0.00000000 Priver Sido Length : 0.00000000 Priver Sido Length : 0.00000000 CFU : 0 Raterlage : 0.00000000 Tracking Rem Length : 0.000 Tracking Rem Length : 0.0000 Tracking Rem Length : 0.0000 Tracking	Physical Last / 0x05d1f600	
RAM Free : 0.005435000 RAM Free : 0.0055435000 Rum Copy Tartime : 7 7 Copy Tartime : 0.0010000 Prof Symmol Lampth : 0.00000000 Rum Files : 0 Frieflys RAM Percent : 0.00000000 Friver Sido Scart : 0.00000000 Priver Sido Length : 0.00000000 Priver Sido Length : 0.00000000 CFU : 0 Raterlage : 0.00000000 Tracking Rem Length : 0.000 Tracking Rem Length : 0.0000 Tracking Rem Length : 0.0000 Tracking	Nus Modules 1 253	
Hum Copy Entities       :       :         Copy Entities Offset :       :       :         Fred Symbol Lingth :       :       :         Fred Symbol Sett :       :       :         Fries :       :       :       :         Fries :       :       :       :         Fries :       :       :       :       :       :         Fracting :       :       :       :       :       :       :         Tracking ::       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       : <td>RAE Start / DX95420000</td> <td></td>	RAE Start / DX95420000	
Hum Copy Entities       :       :         Copy Entities Offset :       :       :         Fred Symbol Lingth :       :       :         Fred Symbol Sett :       :       :         Fries :       :       :       :         Fries :       :       :       :         Fries :       :       :       :       :       :         Fracting :       :       :       :       :       :       :         Tracking ::       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       : <td>RAE Free 1 0x05d35000</td> <td></td>	RAE Free 1 0x05d35000	
Copy farines Offset : 0x8514460 Prof Symbol Offset : 0x00000000 Bus Files : 0x00000000 FileSym Alf Percent : 0x40040400 friver Glob Beat : 0x0000000 Detver Glob Beat : 0x00000000 Detver Glob Beat : 0x0000000 Detver Glob Beat : 0x00000000 Trocking Hem Start : 0x0000000 Trocking Hem Start : 0x0000000 Trocking Hem Start : 0x00000000 Trocking Hem Start : 0x00000000 Trocking Hem Start : 0x0000000 Trocking Hem Start : 0x0000000 Trocking Hem Start : 0x00 Trocking Hem Start	RAM End : D#86000000	
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Proce Symbol offset : 0x0000000         Hum Files : 0         Price Ilag: 10x0000000         FileSys RAT Percent : 0x00000000         Driver Glob Start : 0x00000000         Striver Glob Length : Dm0000000         Striver Glob Length : 0x00000000         Stream Ilag: 10x0000000         Tracking Ham Start : 0x00000000         Tracking Ham Start : 0x0000000         Tracking Start : 0x0000000         Tracking Start : 0x00000000         Tracking Start : 0x0000000         Tracking Start : 0x00000000         Tracking Start : 0x00000000         Tracking Start : 0x00000000         Tracking Start : 0x0000000		
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<pre>Ferme1 Flags 1 0x00000000 FlisBy RM Fercent 1 0x00000000 Priver Glob Start 1 0x00000000 Priver Glob Length 1 0x00000000 Priver Glob Length 1 0x00000000 Tracking Hes Start 1 0x00000000 Tracking Hes Length 1 0x00000000 Tracking Hes Length 1 0x00000000 Tracking Hes Sector = 0x100 [valid HBS] penPartition: Partition Fristat=0x1 for part 0x20. F attracking Hes Sector = 0x100 [valid HBS] PenPartition: Partition Fristat=0x1 for part 0x20. F attracking Hes Sector = 0x100 [valid HBS] PenPartition: Partition Fristat=0x1 for part 0x20. F attracking Hes Sector = 0x100 [valid HBS] PenPartition: Partition Fristat=0x1 for part 0x20. F attracking Hes Sector = 0x100 [valid HBS] PenPartition: Partition Fristat=0x1 for part 0x20. F attracking Hes Sector = 0x100 [valid HBS] Pather Hointer at 0x0 FistbatePointer At 0x1 FistbatePointer Fistbate Fistbate FistbatePointer At 0x1 FistbatePointer Fistbate Fistbate FistbatePointer At 0x1 FistbatePointer Fistbate Fistbate Fi</pre>		
<pre>flieSps RAF fercent : 0x0000000 priver Glob Start : 0x0000000 CFG : 0x01:2 Rise/Fags : 0x000 Extermains : 0x6000000 Tracking Hem Start : 0x0000000 Tracking Hem Lengts : 0x0000000 Tracking Hem Lengts : 0x0000000  ****************************</pre>		
briver Glob Length : DR00000000 briver Glob Length : DR00000000 CFU : Skdler HardFlags : NG002 Tracking Ham Frart : DR00000000 Tracking Ham Start : DR0000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR0000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR0000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR0000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR00000000 Tracking Ham Start : DR0000000000 Tracking Ham Start : DR000000000 Tracking Ham Sta		
<pre>priver Glob Length : De0000000 CVD : Ox0000 Extensions : De0400200 Tracking Rem Start : Da00000000 Tracking Rem Length : Ox00000000 Tracking Rem Length : Ox00000000 Tracking Rem Length : Ox00000000 Tracking Rem Length : Ox00000000 Tracking Rem Length : Da1dleRE0. PostPattBointer at Ox101 [valid RBR] PerPartition: Partition TristerPost Tor part Ox20. E SetDataPointer at Ox101 [valid RBR] PatDataPointer at Ox101 [valid RBR] DataBointer at Ox101 [valid RBR] Tracking Start = Ox0. Length : Data Pointer at Ox101 [valid RBR] Tracking Start = Ox0. Tracking Start = Ox0.</pre>		
<pre>cP0 : Subject Sub</pre>		
<pre>HistFlags : 0x0001 Extensions : 0x84002020 Tracking Hem Start : 0x0000000 Tracking Hem Length : 0x00000000</pre>		
Extensions : 0x844000000 Tracking Hem Start : 0x00000000 Tracking Hem Start : 0x00000000 Tracking Hem Start : 0x00000000 SValidHERI HER sector - 0x100 [valid HER] penFarition: Fwarition Frists=Ox1 for part 0x20. F SetDataPointer at 0x00 Trachass Start = 0x0, Length = Dailess0. Trachass Start = 0x0, Length = Dailess0. Trach Haosgement Tach Haosgement Tach Haosgement Tach Start part = 0x0 Start Lang Start Lang S Set block range S Set bub block S Format flash		
Tracking Hem Start : 0x00000000 Tracking Hem Length : 0x0000000 SValidHER: HER sector - 0x10D [valid HER] perFactition: Factition Exists=Oki for part 0x20. E SetDataPointer at 0x1dleSDO P SetDataPointer at 0x0 Intelnate Start = 0x0. Length = DaidleBRO. of Physi Logins 0xi -> Physical 0x101 E Lange written Tisch Haosgement 11 Show flash geometry 12 Dump flash sector 13 Show flash geometry 14 Frase block range 15 Reserve block range 16 Set bad block 17 Format flash 18 Witter bootLosder from HDCard to flash		
Tracking New Length : 0x00000000 		
SValidNDR: NDR sector = Ox100 [valid HDR]         penPartition: Partition Exists=Ox1 for part 0x20.		
penFartition: Fartition Exists=Oki for part Ox20. 		
(1) Show flash genetry (2) Dunp flash sector (3) Erase flash (4) Erase block range (5) Reserve block range (5) Reserve block range (6) Set bad block (7) Format flash (7) Write bootboader from HDCard to flash (9) Write WK image from HDCard to flash	*******	
[2] Dump flash sector [3] Erase Flash [4] Frase block range [5] Reserve block range [6] Set bad block [7] Formst flash [6] Write bootLoader from HDCard to flash [9] Write NK issge from HDCard to flash	sValidNBR: NBR sector = 0x100 [valid NBR] penPartition: Partition Exists=0x1 for part 0x20. F SetDataPointer at Ox1d1e580 P SetDataPointer at 0x0 Intebates Start = 0x0, Length = 0x1d1e880. nd_Phys: Loging 0x1 -> Physical 0x101 F image written	
[2] Dump flash sector [3] Erase Flash [4] Frase block range [5] Reserve block range [6] Set bad block [7] Formst flash [6] Write bootLoader from HDCard to flash [9] Write NK issge from HDCard to flash	sValidHDR: HDR sector = Ox100 [valid HDR] penPartition: Partition Exists=Ox1 for part Ox20. F SetDataPointer at Ox101e580 P SetDataPointer at Ox0 riteDataS Start = GaO, Length = Ox101e580. sg.Phys: Logint Ox1 -> Physical Ox101 E image written	
[4] Frame block range [5] Reserve block range [5] Set buck [7] Format flamh [7] Write bootLoader from EDCard to flamh [9] Write Witingge from EDCard to flamh	sValidHBR: HER sector = 0x100 [valid HBR] penPartition: Partition Exists=0x1 for part 0x20. F_SetDataPointer at Oxidie580 P_SetDataPointer at 0x0 ritebata: Start = 0x0, Length = 0x1die580. supPays: Logica: 0x1 -> Physical 0x101 E image written 	
[5] Reserve block range [5] Set bad block [7] Format flach [0] Write bootLoader from HDCard to flach [9] Write NK issge from HDCard to flach	sValidHER: HER sector = 0x100 [valid HER] penPartition: Partition Exists=0x1 for part 0x20. F SetDataPointer at 0x1d1e580 P SetDataPointer at 0x0 riteData: Start = 0x0, Length = 0x1d1e580. duPhys: Logical 0x1 -> Physical 0x101 E image written Flash Hanagement [1] Show flash geometry	
[6] Set bad block [7] Format flach [0] Write bootLoader from HDCard to flach [9] Write NK image from HDCard to flach	<pre>sValidHDR: HDR sector = 0x100 [valid HBR] penPatition: Partition Exists=0x1 for part 0x20. E SetDataPointer at 0x1d1e500 P SatDataPointer at 0x0 ritebata: Start = 0x0, Length = 0x1d1e500. sourphys: Logarb 0x1 -&gt; Physical 0x101 E image written Flash Hanagement [1] Show flash geometry [2] Dump flash sector</pre>	
[7] Format flach [0] Write bootLoader from EDCard to flach [9] Write MK issge from EDCard to flach	SValidHBR: HER sector = 0x100 [valid HER] penPartition: Partition Exists=0x1 for part 0x20. F_SetDataPointer at OxidieSBO F_SetDataPointer at 0x0 ritebata: Start = 0x0, Length = 0x1dieSBO. supPays: Logics: 0x1 -> Physical 0x101 E inage written Floch Hacogenent 13 Show flash geometry 13 Eram flash sector 13 Eram flash	
[0] Write bootLoader from SDCard to flash [9] Write NK image from SDCard to flash	sValidHBR: HDR sector = Ox100 [valid HBR] penPartition: Partition Exists=Ox1 for part Ox20. F SetDataPointer at Ox1dleS00 F SetDataPointer at Ox0 FileData: Start = Gx0, Length = Dx1dleSB0. egrPhys: LogInst Ox1 => Physical Ox101	
[9] Write NK image from SDCard to flash	<pre>sValidHER: HER sector = 0x100 [valid HER] penPartition Partition Exists=0x1 for part 0x20. F_SetDataPointer at 0x1dleSBO FiteDataPointer at 0x0 FiteDataPointer at 0x0 FiteDataPointer at 0x0 FiteDataPointer at 0x1 Finab Hacogenent Fish Hacogenent 13 Show flash geometry 13 Dang flash sector 13 Erame flash [4] Erame flash [5] Reserve block range [5] Reserve block range [5] Set Dad Dlock [5] Set Dad Dloc</pre>	
	<pre>sValidHDR: HER sector = 0x100 (valid HER) penFartition: Factition Exists=0x1 for part 0x20. F SetDataPointer at 0x1d1e800 F SetDataPointer at 0x0 Length = 0x1d1e800. ourPays: Login: 0x1 -&gt; Physical 0x101 E Lange written Vloch Hapogement 13 Show flash geometry [2] Damp flash sector [3] Krame flamh [4] Erase block range [5] Reserve block range [5] Set bad block [5] Set bad block [5] Set bad block</pre>	
[0] Exit and Continue	<pre>sValidHDR: HDR sector = 0x100 (valid HDR) perFattition: Fattition Exists=0x1 for part 0x20. E SetDataPointer at OxidisE00 F SetDataPointer at 0x0 Fiebdats Start = 0x0, Length = 0x1disE00. corPhys: Lognon 0x1 -&gt; Physical 0x101 E image written Flash Hanagement 11 Show flash geometry (2) Dump flash sector (3) Frame flash [4] Ernse block range [5] Reserve block range [5] Reserve block range [5] Set Dad block [7] Friest flash [9] Write bootLooder from HDCard to flash</pre>	
	<pre>sValidHER: HER sector = 0x100 [valid HER] penPartition Partition Exists=0x1 for part 0x20. E JetDataPointer at OxidieSBO P JetDataPointer at 0x0 ritehata: Start = 0x0, Length = 0x1dieSBO. rite</pre>	
Selection:	<pre>sValidHDR: HDR sector = 0x100 (valid HDR) perFattition: Fattition Exists=0x1 for part 0x20. E SetDataPointer at OxidisE00 F SetDataPointer at 0x0 Fiebdats Start = 0x0, Length = 0x1disE00. corPhys: Lognon 0x1 -&gt; Physical 0x101 E image written Flash Hanagement 11 Show flash geometry (2) Dump flash sector (3) Frame flash [4] Ernse block range [5] Reserve block range [5] Reserve block range [5] Set Dad block [7] Friest flash [9] Write bootLooder from HDCard to flash</pre>	



#### **12.5.3 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 118)





- Chose "Select Boot Device". (See Figure 119)
- It will show "Selection (actual (NULL)):" Then chose "NK from NAND" (see Figure 120)

	_101_
Fasas Instruments Windows CE NAMD X-Londer for EVE 3530	
ullt Get 27 2010 at 14:08:27	
fersion 6.12.D4	
 Numping to bootloader	
Nerveoft Windows CE Bootlonder Common Library Version 1.4 Built Oct 27 2010 14:04:53	
Notas Instruments Windows CE EBOOT for Mistral OMAB EVM, Built Oct 27 2010 at 14:08:16 IBOOT Version 1.1, BSF 5.12.04	
II OMAP3530 Version Cx4b7osO2f (EB3:1)	
PSeSSIX Version Oxlo (EEL.x)	
ystem ready!	
reparing for download	
NPC: Fredomind	
hacking bootloader blocks are marked as reserved (Num = 4)	
139N: Boot config warn't found, using defaults	
NF0: 394 Boot setting: 0x0f	
ALFiashStoreOpen: 2068 blocks, 64 sectors/block	
ALFlashStoreOpen: 2048 bytes/sector, 4 reserved blocks	
SValidNER: NER sector = Ox100 (valid RER)	
penPartition: Partition Exists-Ox1 for part 0x20.	
it space to enter configuration menu 5 it space to enter configuration menu 4	
it space to enter configuration menu 5 it space to enter configuration menu 4	
it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter configuration menu 3	
it space to enter configuration menu 5 Il space to enter configuration menu 4 It space to enter configuration menu 3 Main Benu	
it space to enter configuration menu 5 Is space to enter configuration menu 4 It space to enter configuration menu 3 Main Senu [1] Show Current Settings	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter configuration menu 3 fain Senu [1] Show Current Settings [2] Select Boot Device</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter configuration menu 3 fain Senu 11 Show Current Settings (2) Select Ent Device (3) Select EITL (hebug) Device</pre>	
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<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter configuration menu 4 fain Senu (1) Show Current Settings (2) Select Ent Device (3) Select KITL (Debug) Device (4) Network Settings (5) Flash Ranagement</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 t space to enter configuration menu 4 fain Senu 11 Show Current Settings 23 Select Boot Device 23 Select EITL (Debug) Device 24 Mercork Settings 25 Flach Management 26 Set Device 10</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter configuration menu 3 fain Menu 11 Show Current Settings 21 Select Boot Device 31 Select Biot Device 31 Select Biot Device 31 Select Biot Device 31 Select Biot Device 31 Select Did Settings 51 Fisch Management 51 Set Device 10 71 Save Settings</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 it space to enter config</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 t space to enter configuration menu 4 t space to enter configuration menu 4 t in ferm iii Show Current Settings iii Show Current Settings iii Select finot Device iii Select KITL (Dabug) Device iii Select KITL (Dabug) Device iii Select KITL (Dabug) Device iii Select Battings iii Flach Management iii Set Perice ID iii Save Settings iii Inshle/Disable OAL Retail Bensages iii Ferr mai control</pre>	
<pre>it space to enter configuration menu 5 it space to enter configuration menu 4 t Select foot Device 13 Select Not Device 13 Select NIT (Debug Device 14 Network Sattings 15 Flash Management 15 Str Device 1D 15 Save Settings 10 Inchle/Disable OAL Betail Messages 10 Foot mod control</pre>	
it space to enter configuration menu 5 it space to enter configuration menu 4 t space to enter configuration menu 4 t space to enter configuration menu 4 Main Senu [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 [6] Enable/Disable OAL Betail Messages [0] Enable/Disable OAL Betail Messages	
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it space to enter configuration menu 5 it space to enter configuration menu 4 t space to enter configuration menu 4 t space to enter configuration menu 4 The space to enter configura	
<pre>&gt;&gt; Furcting cold boot (non-persistent registry and other data will be wiped) &lt;&lt;&lt; int space to enter configuration menu 5 int space to enter configuration menu 5 is show Current Settings is false fact front Device if Metwork Settings is franh Management is set berice 1D if Save Settings int setting int for any two facts is setting select Boot Nevice iii LAN9220 MAC is MMET me MAND in Kait and Continue Selection (actual LAN9220 MAC ): selection (actual LAN9220 MAC ): is setting (actual LAN9220 MAC ): is set</pre>	

Figure 119

P COMI - Pality	. IOI ×
Checking bootloader blocks are marked as reserved (Num = 4)	-
WARM': Bost config warn't found, using defaults	
DNFC: 894 boot setting: 0x0f	
NALFIAShStoreOpen: 2048 blocks, 64 sectors/block	
DALFIashStoreOpen: 2048 bytes/sector, 4 reserved blocks	
(sValidBBR: MBR sector = 0x100 (valid BBR)	
OpenPartition: Partition Exists=Ox1 for part Ox20.	
>>> Forcing cold bost (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
fit space to enter configuration menu 4	
Hit space to enter configuration menu J	
fain Setu	
[1] Show Current Settings	
[2] Select Root Device	
[3] Select KITL (Debug) Device	
[4] Metwork Bettings	
[5] Flash Hanagement	
[6] Set Device ID	
<ul> <li>[7] Save Settings</li> <li>[6] Enable/Dirable OAL Retail Messages</li> </ul>	
[0] Exit and continue	
the second s	
Selection: 2	
Select Boot Device	
TIT LAMPRID MAC	
11 USER SHITS	
[3] NE from RAND	
[O] Exit and Continue	
Selection (actual LAN9220 MAC ) r 3	
Sector to the form with	
Rain Benu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select HITL (Debug) Device	
[4] Network Hettings	
[5] Flash Basegement	
[6] Set Device 1D [7] Save Settings	
[0] Knable/Disable OAL Retail Bessages	
10) Analyzismole on recall messages	
Selection:	

Figure 120

COMI-Patty	ale ale
1 space to enter configuration mean 5	
t space to enter configuration menu 4	
t space to enter configuration menu 3	
sin Benu	
1] Show Current Settings	
2] Select Boot Device	
1] Select KITL (Debug) Device	
4] Network Settings	
5] Flash Management	
6] Set Device ID	
7] Save Settings	
0] Enable/Disable OAL Retail Messages	
0] Exit and Continue	
election: 2	
elect Boot Device	
1] LAN9ICO MAC	
a) uubFn subiu	
3] NE from NAND	
0] Exit and Continue	
election (actual LAN9220 MaC ): 3	
oot device set to HM from MAND	
lain Senu	
***************************************	
1) Show Current Settings	
2] Select Boot Device	
3] Select KITL (Debug) Device	
4] Network Battings	
5] Flash Management	
6] Set Device ID	
71 Save Settings	
0] Edshls/Disable OAL Retail Bessages	
0) Exit and Continue	
election: 0	
ad NE image from flash memory	
ValidHES; HER sector = Ox100 (valid HER)	
enPertition: Partition Exists-Oxi for pert 0x20.	
SetDataPointer at 0x0	
adbatai Start - 0x0, Length - 0x1000,	
gFPhys: Logical Oxi -> Physical Oxi01	
adpata; Start = 0x1000, Length = 0x101adcc.	
adData: Start = Ox1000, Length = Ox10Iadrr. gIPhys: Logical Ox3 -> Physical Ox103	

Figure 121: Chose "Exit and Continue".

<pre>[1] Shiert Hort Device [3] Shiert H. (Wough Porton [4] Metwork Bettings [5] Flack Hansgement [6] Ste Device ID [7] New Settings [6] Excelled Continue Belantian: 0. Load WE Image from flack memory [7] Stelled Continue Belantian: 10. Load WE Image from flack memory [7] Stelled Continue Belantian: 10. Device flack i Device Continue Belantian: 10. Stelled i Device Continue Belantian: 10. Stelled i Device Continue Belantian: 10. Stelled i Device Continue Belantian: 10. Belantian: 10. Stelled i Device Continue Belantian: 10. Stelled i Device Dial Device Dial</pre>	_  0  ×
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<pre>[0] Floch Hanagement [10] Set Perturns [11] Set Perturns [11] Set Perturns [12] Task - All Shamble OAL Retail Hanageme [12] Task - All Shamble OAL Retail Hanageme [13] Perfure String - Stable Hanageme [14] Perfure String - Stable Hanageme [15] Perfure String - Stable Hanageme [15] Perfure String - Stable Hanageme [15] Perfure Stable Hanagement [15] Perfure Stable Perfure Stable Perfure Stable [15] Perfure Stable Perform Stable [15] Perfure Stable Perfure Stable [15] Perfure Stable Perfure Stable [15] Perfure Stable Perfure Stable [15] Perfure Perfure Stable [15] Perfure Stable [15] Perfure Stable [15] Perfure Perform Perfure Perfure Perfure Perfure Perform Perform Perfure Perform Perf</pre>	
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<pre>[i] Sit Levice 10 [i] Save Status [i] Save Status [i] Save Status [i] Kit and Continue Relection: 0 Load NE tange from flash memory Istatus [i] Kit and Continue Relection: 0 Load NE tange from flash memory [i] Save Status - 0 Profile Status - 0 Profile Status - 0 Load NE tange from flash memory [i] Save Status - 0 Different - 0 Dif</pre>	
<pre>[7] Save Settings [0] their birdsele OAL Retail Bersages [0] their birdsele OAL Retail Bersages [1] thit and Continue Releasting [1] Kait and Continue Releasting [2] Save Setting Oal &gt; 0000 (unlif HE) [ perMartition: PostSile Dailse [2] Esterationset at 00 ReadSave: Start = 000, Length = 0x101 ReadSave: Start = 0x1000, Length = 0x101 ReadSave: Start = 0x1000000 Physical Length = 0x10000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Farme = 0x0000000 Physical</pre>	
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<pre>10) Xeit and Continue Belection: 0 Lond NE Image from Slash memory From From Slash Memory From From Slash Memory From From Slash Memory From From Slash From</pre>	
Belerium: 0 Load NF Image from flash memory IstValidENN NER sector = 0x100 (valid NEN) OpenPertition Pertition Distervix(1 for part 0x20, PetBedevise: Start = 0x00, Length = 0x101 NewDirect to 0x0, Length = 0x101 NewDirect to 0x0, Length = 0x101 NewDirect to 0x000000 NewDirect to 0x000000 Physical Col = 0x01000 NumBodules : 1 0x4000000 Physical First : 0x4000000 Physical first : 0x0000000 Physical first : 0x00000000 Physical first : 0x00000000	
<pre>Load NK Image from flash memory IsrailadEBN HEP sector = 0x100 (valid EBN) OpenPartition: Action Existent = 0x100. FactOdeAdointer at 000 WandDawa: Start = 0x0, hength = 0x1000. OpenPartition: Control Nation = 0x1000. UsedDawa: Start = 0x100, Langth = 0x1000. UsedDawa: Start = 0x100, Langth = 0x1000. UsedDawa: Start = 0x100, Langth = 0x1000. Diller : 0x40000000 Physical First : 0x40000000 Fast Free : 0x40000000 Fast Free : 0x40000000 Free Symbol Length : 0x00000000 Free Symbol Length : 0x00000000 Fre</pre>	
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JavailandBB/ HEB sector = Ox100 (valid HEF) OpenPartition: Fortific Existence() for part 0x20. Mandbata: Start = 0x00 kength = 0x1000. LogDFMys: LogDeal 0x1 - Physical 0x101 Namabata: Start = 0x1000, Length = 0x10100 NumfbM (pTOC = 0x654510d78) = 0x1000, Length = 0x1010 NumfbM (pTOC = 0x654510d78) = 0x10000000 Physical First = 0x4001000 Physical First = 0x4001000 Physical Start = 0x4001000 First = 0x0000000 First = 0x00000000 First = 0x00000000 Physical Length = 0x0000000 Num Files = 035 Att First = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Start = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Length = 0x0000000 Physical Start = 0x00000000 Physical Start = 0x00000000 Ph	
<pre>Not Start + Oxid Length + OxidOd Landbars: Start + OxidOd Landbars: Start + OxidOd Landbars: Start + OxidOd UnitEX (pTOC + OxidIadot) DOLLet i OxidOdTNI </pre>	
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<pre>hemDeta: ftart = 0x0, hempth = 0x100. logIPHys: Logical 0x1 -&gt; Physical 0x103 logIPHys: Logical 0x2 -&gt; Institute Physical First : 0x84001000 Physical First : 0x84001000 PAR End : 0x68000000 Hum Files : 23 Copy Entries : 23 Copy Entries : 2 Copy Entries : 0x85115000 Prof Symbol Length : 0x00000000 Prof Symbol Length : 0x00000000 Prof Symbol Length : 0x00000000 Deliver Olob Length : 0x00000000 Deliver Olob Length : 0x0000000 Deliver Olob Length : 0x00000000 Deliver Olob Length :</pre>	
<pre>bmglPhys: Logical 0x1 -&gt; Physical 0x101 bmadData: Start = 0x100, Lampth = 0x101ambre, LogiPhys: Logical 0x3 -&gt; Physical 0x100 comUEX (pTOC = 0x81d10d701</pre>	
NeadData: Start = 0x1000, Length = 0x141adre. Log2Phys: Log1cal 0x3 -> Physical 0x103 NONHDR (pTOC = 0x81410d78) 	
add2Phys: Logical 0x3 -> Physical 0x10 SULFIC: = 0x8idiod701 	
NONHER (pTOC * 0x6idiod78) SLL Firet : 0x401000 Physical Last : 0x4100c00 Physical Last : 0x40501000 Physical Last : 0x40501000 Physical Last : 0x40501000 PAB End : 0x6900000 PLUE For : 0x65id1000 PLUE For : 0x65id10000 PLUE For : 0x65id10000 PLUE Files : 0x60000000 PLUE : 0x62 : 0x338 : PHysIn1 0x1888 Extensions : 0x64001000	
bli Firet i 0x4003c001 bli Laet i 0x4003c001 Physical Firet 0x44001000 Physical Laet 0x8541f400 Num Bodulee i 153 RAM Btart i 0x8540000 RAM Fire i 0x85400000 Hus Copy Entries i 0x8541600 Prof Symbol Length i 0x0000000 Prof Symbol Length i 0x0000000 Filebys RAM Persons i 0x0000000 Filebys RAM Persons i 0x0000000 Driver Olob Length i 0x0000000 Driver Olob Length i 0x0000000 Driver Olob Length i 0x0000000 Trecking Mes Length i 0x0000000 Trecking Mes Length i 0x040000 Trecking Mes Length : 0x0400000 Trecking Mes Length : 0x0400000 Trecking Mes Length : 0x0884, agEPhysi Logical 0x3a8 -> Physical 0x3288	
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Num Rodulæs       :       253         PAR Start       : DusBd10000         PAR Free       : DusBd1000         PAR Free       : DusBd1000         PAR Free       : DusBd1000         PAR Free       : DusBd1000         PAR Free       : DusBd0000         Prof Symbol Length       : Du0000000         Prof Symbol Coffeet       : Du0000000         Num Files       : Du0000000         Prof Symbol Coffeet       : Du0000000         Priver Oloh Start       : Du0000000         Driver Oloh Start       : Du0000000         Driver Oloh Start       : Du0000000         Driver Oloh Start       : Du0000000         Extensions       : Du20000000         Tracking Bes Start       : Du00000000         Tracking Bes Length       : Du0000000         eadDatai Start = Oxidibdoc, Length * Ox2884, ogEPhys: Logical Ox3048 -> Physical Qu3286         E Tasge Logical       : Du3288	
Hum Rodules         :         253           FAR Start         : 0x85420000         0x85815000           FAR Free         : 0x85800000         0x85800000           Fund Copy Entries         :         2           Copy Entries Offset         : 0x0000000         0x0000000           Fred Symbol Christ         : 0x0000000           Num Files         :         03           Zeenal Flags         : 0x0000000           Driver Oloh Start         : 0x0000000           Driver Oloh Start         : 0x0000000           Extensions         : 0x0000000           Tracking Bes Length         : 0x0000000           Tracking Bes Length         : 0x0000000           eadDatai Start         : 0x0000000           Tracking Bes Logical 0x3a8(-> Physical 0x3a8(+>	
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Figure 122 : Now it will start booting WinCE

• FINISHED.

# 12.6 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 123)

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Figure 123

- Chose "Platform Builder for CE 6.0". Then input project name in the "Name:" box. For example "Thunder". (See Figure 124)
- Click the "OK" button.

New Project			? ×
Project types:	Templates:	00 0	5-5- 5-5- 5-5-
<ul> <li>□- Visual Basic</li> <li>□- Windows</li> <li>□- Smart Dev</li> <li>□- Database</li> <li>□- Starter Kit</li> <li>□- Web</li> <li>□- Visual C#</li> <li>□- Visual J#</li> <li>□- Visual C++</li> <li>□- Other Project</li> <li>□- Platform Built</li> </ul>	vice OS Design its My Templates Search Online Templates		
A project for creat	ing a Windows Embedded CE 6.0 operating system		
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Location:	C.\WINCE600\OSDesigns	Browse	
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	OK	Cancel	1

Figure 124

Windows Embedded CE 6.0 OS Design Wizard	? X
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>Previans</u> <u>Next &gt;</u> <u>Finish</u> Cance	el

Figure 125: Click the "<u>Next</u> >" button.

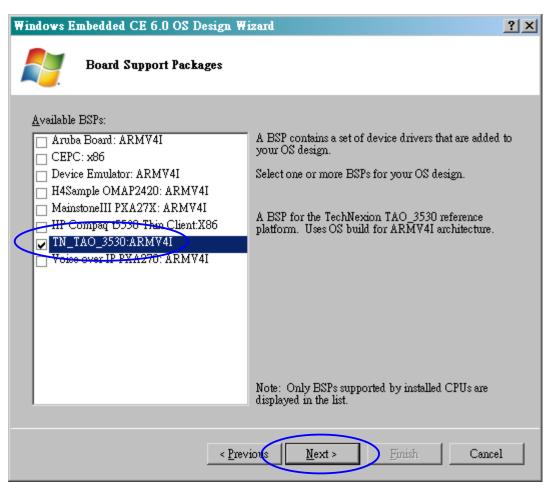


Figure 126: Chose "TN_TAO_3530:ARMV4I". Then click "Next >" button.

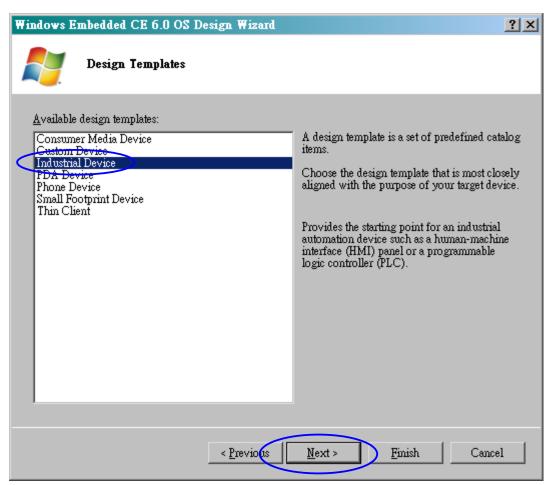


Figure 127 : Chose "Industrial Device". Then click "<u>Next</u> >" button.

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<u>V</u> ariants: Industria Unternet A <del>Unternet A</del>	Controller Appliance	Internet Appliance
	< Previous	Next > Finish Cancel

Figure 128 : Chose "Internet Appliance". Then click the "<u>N</u>ext >" button.

Windows I	Embedded CE 6.0 OS Design Wizard	<u>? ×</u>
<b>N</b>	Applications _Media	
	Windows Embedded CE Error Reporting NET Compact Framework 2.0 Internet Browser Windows Media Audio/MP3 Windows Media Player Windows Media Video/MPEG-4 Video WordPad XML MIME Viewer	Catalog items related to generating an error report and uploading the report to Microsoft when an application encounters a problem.
	< <u>P</u> reviors	<u>N</u> ext > <u>F</u> inish Cancel

Figure 129 : Click the "<u>N</u>ext >" button.

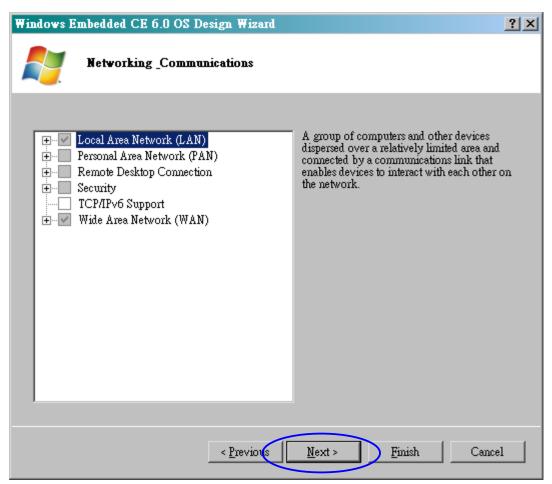


Figure 130 : Click the "<u>Next</u> >" button.

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.	
< <u>P</u> revious <u>M</u> ext > <u>Finish</u>	Cancel

Figure 131 : Click the "Finish" button.

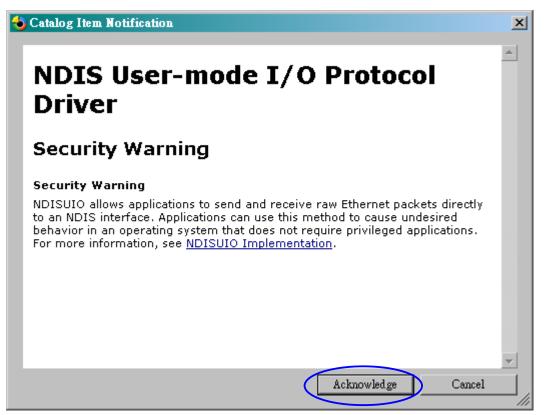


Figure 132 : Click the "Acknowledge" button.

• Chose function for "Thunder" board in the "Catalog Items View". (See Figure 133 and Figure 134)

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Figure 133

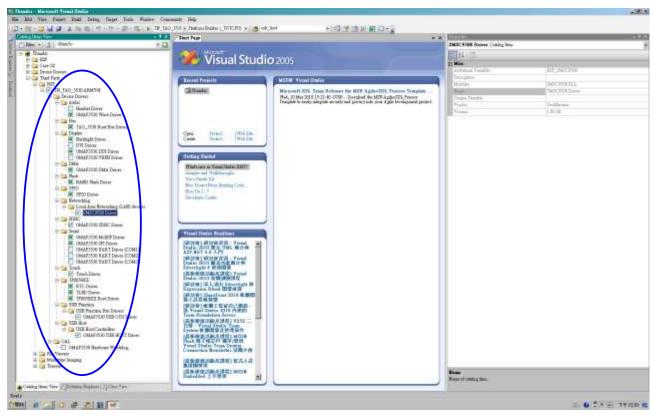


Figure 134

#### **12.6.1 Compile project.**

• Chose "TN_TAO_3530_ARMV4I Release". (See Figure 135)

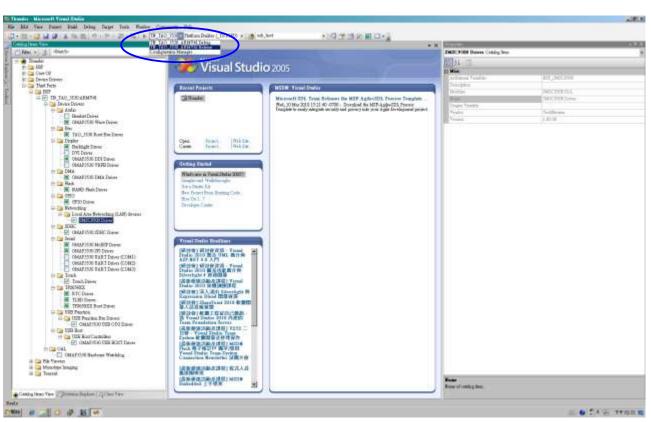


Figure 135

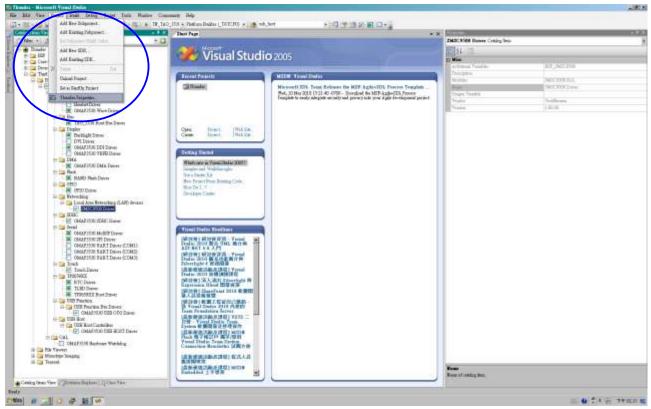


Figure 136 : Click "Project → Thunder Properties..."

- Click "Configuration Properties  $\rightarrow$  Build Options". (See Figure 137)
- 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
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Figure 137

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Figure 138 : Click "Build  $\rightarrow$  Advanced Build Commands  $\rightarrow$  Sysgen".

1/17/2012, TechNexion

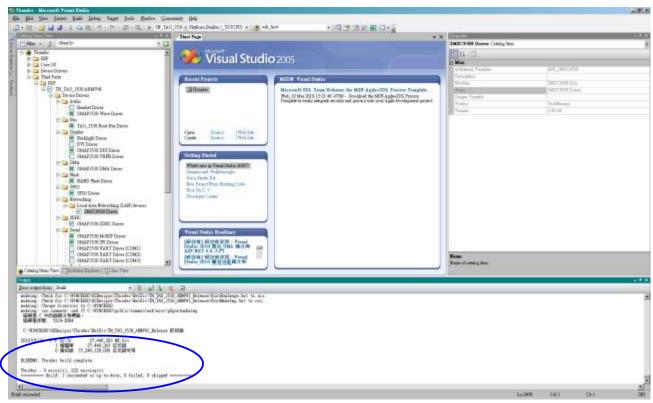


Figure 139: When the compilation is successful the following screen will appear.

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Figure 140 : Project folder in the %_WINCEROOT%\OSDesigns\.

# 12.7 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 12.5.2 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.

### **12.7.1** Preparing the BMP

• You will need to prepare a BMP with your logo. However the logo needs to be flipped vertical (see Figure 141)



Figure 141

- 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 142)



# Figure 142

# **12.7.2 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

# 12.7.3 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 143)

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Figure 143

• The outcome in Hexadecimal will be 120000 (See Figure 144)

Calculator	
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() Hex () Dec () Oct () Bin	Qword ○ Dword ○ Word ○ Byte
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s cos x^3 n! M+	· 0 +/ + = Int
Dat tan x^2 1/x pi	ABCDEF

#### Figure 144

#### 12.7.4 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 12.7.3, in the following line:

## #define IMAGE_BOOTLOADER_BITMAP_SIZE 0x00120000

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

#### **12.7.5 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:

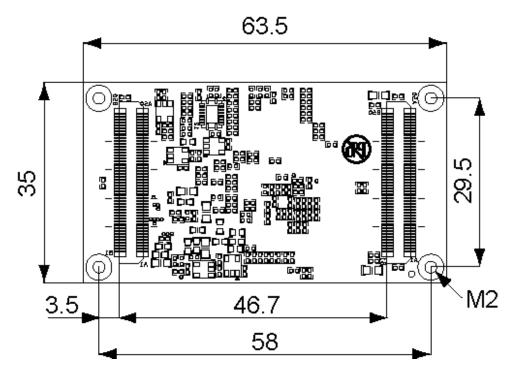
C:\EINCE600\OSdesigns\tsunami_LCD_AT070TN94\RelDir\TN_TAO_3530_AR MV41_RELEASE

#### 12.7.6 Put in NAND

- Follow all the instructions in 12.5.2
- Finished.

# **13 Appendix – Module**

# 13.1 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)

## **13.2 Module Connectors**

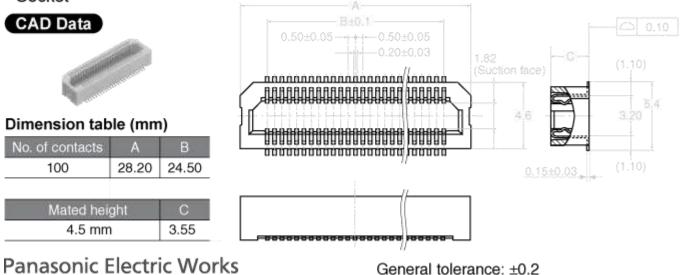
To mount the TAO-3530 module on the baseboard it is recommended to use a connector with the following specifications:

- 100 pin NAIS connector
- Mated height 4.5 mm

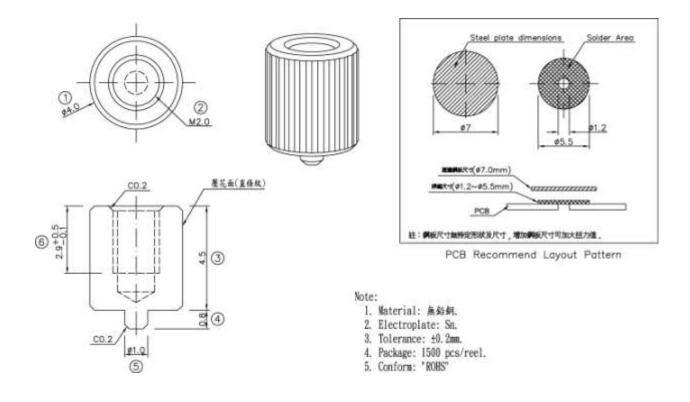
For example Panasonic AXK5S00247YG

# P5KS: Mated height 4.5mm type

Socket



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



# 13.3 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.

# 13.4 TAO-3530 JTAG Solder points

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



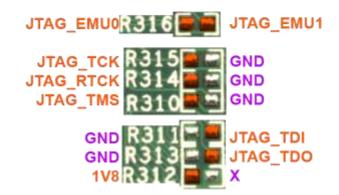
There are solder points as indicated in above picture. There are 7 pairs; their function is described in the table below.

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

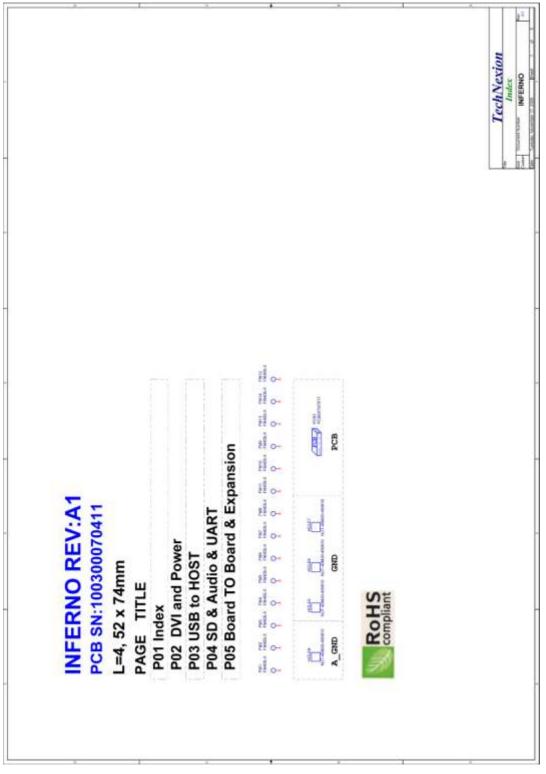


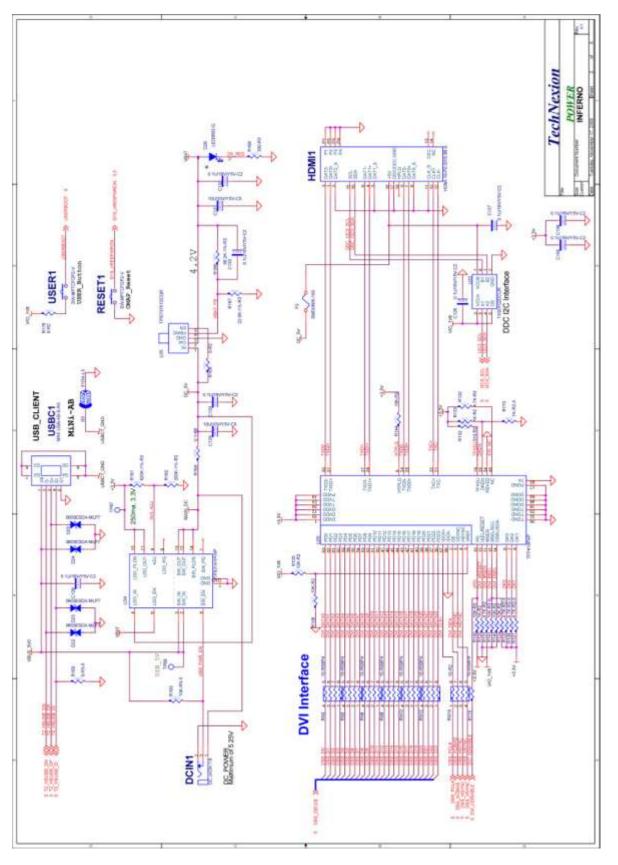


Solder at the orange pads

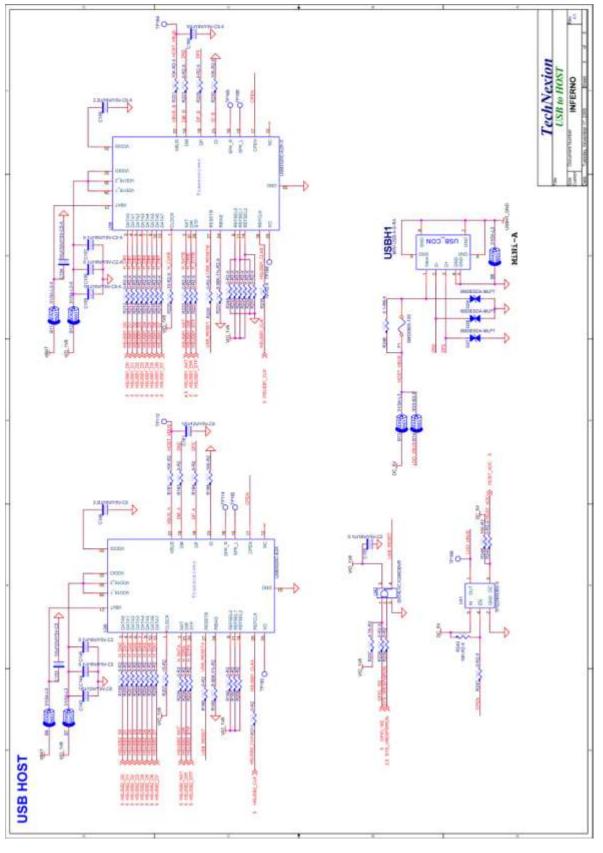
# **14 Appendix - Schematics**

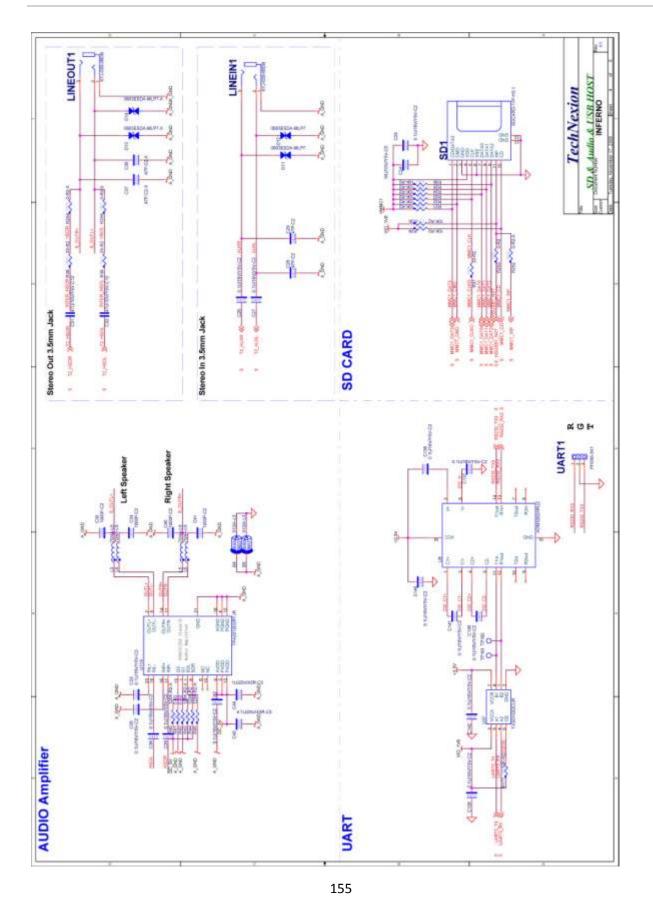
# 14.1 Inferno baseboard schematics





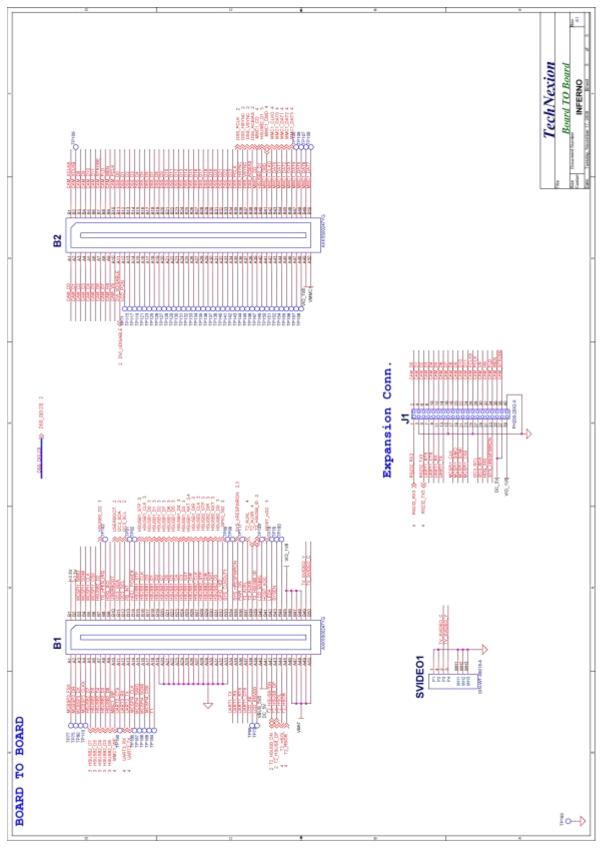
153





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

#### TAO-3530 USER'S GUIDE 096

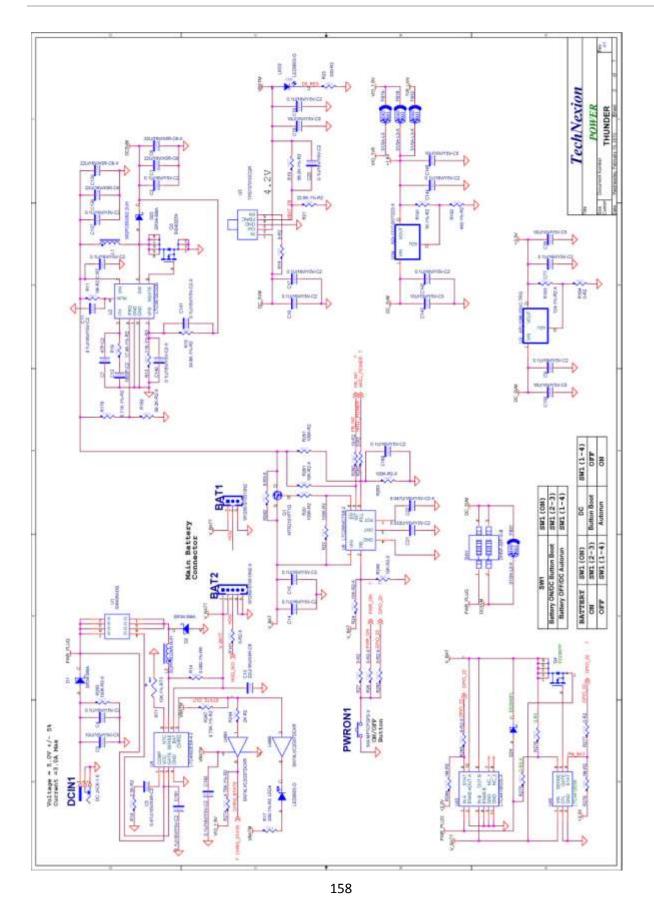


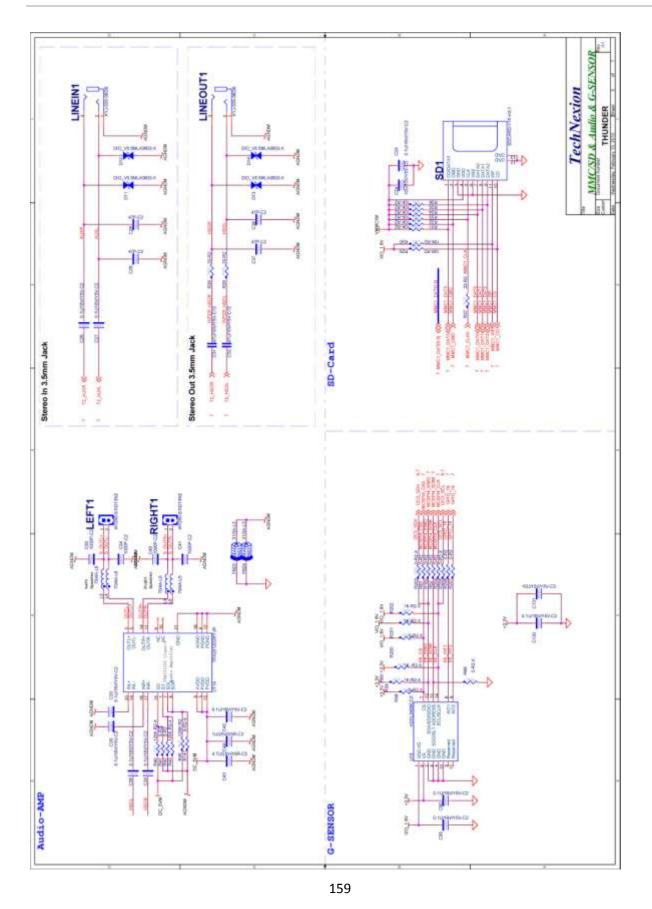
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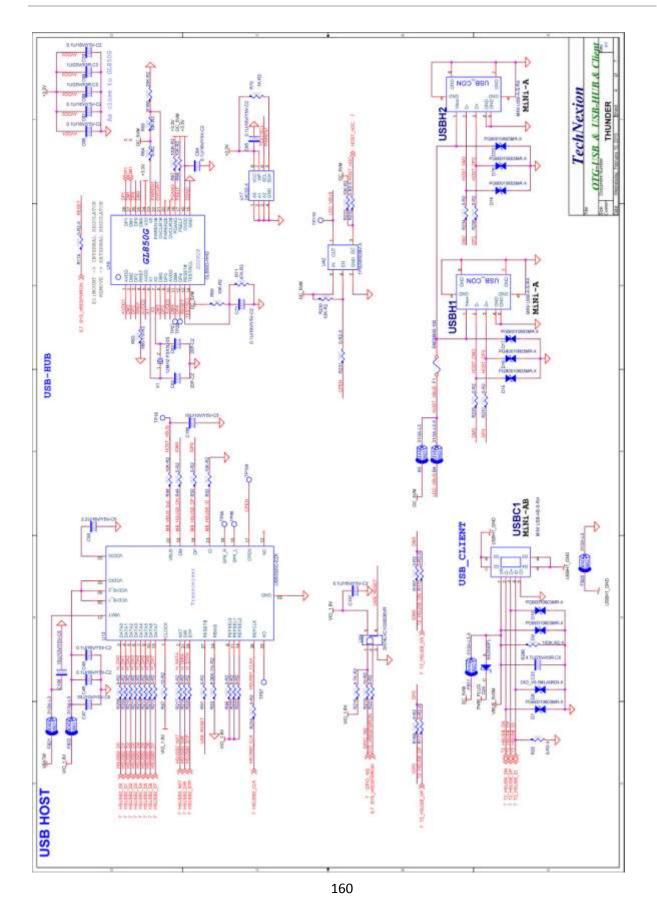


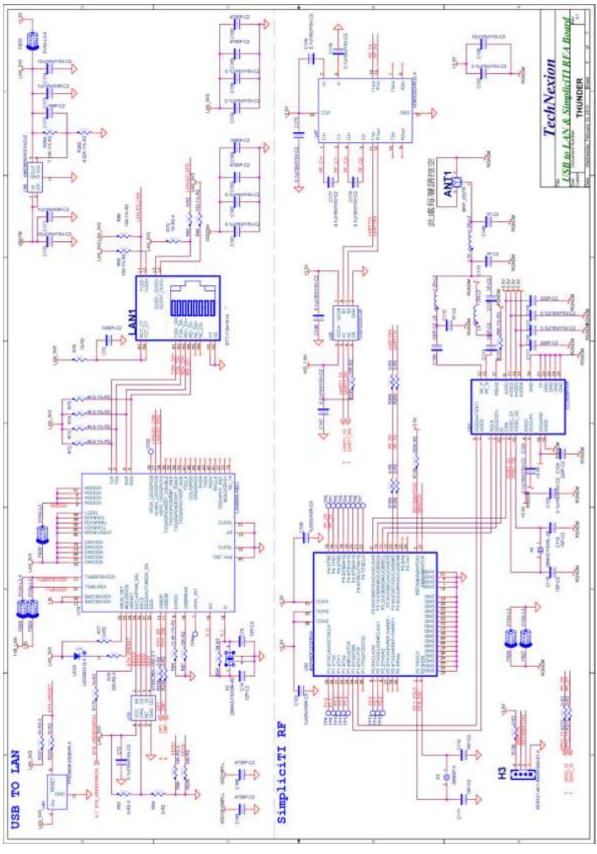
## **14.2 Thunder baseboard schematics**

1/17/2012, TechNexion

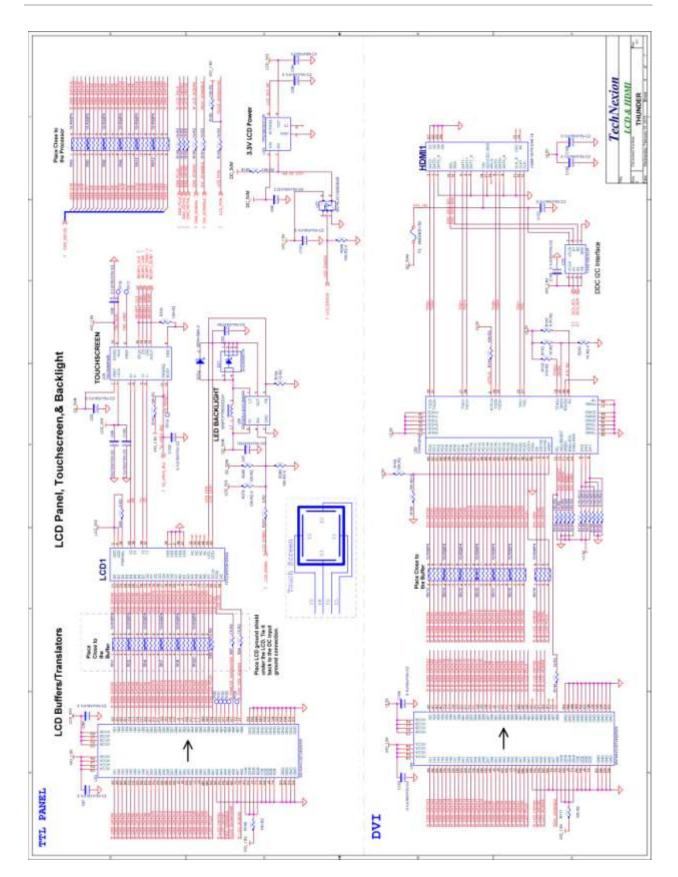


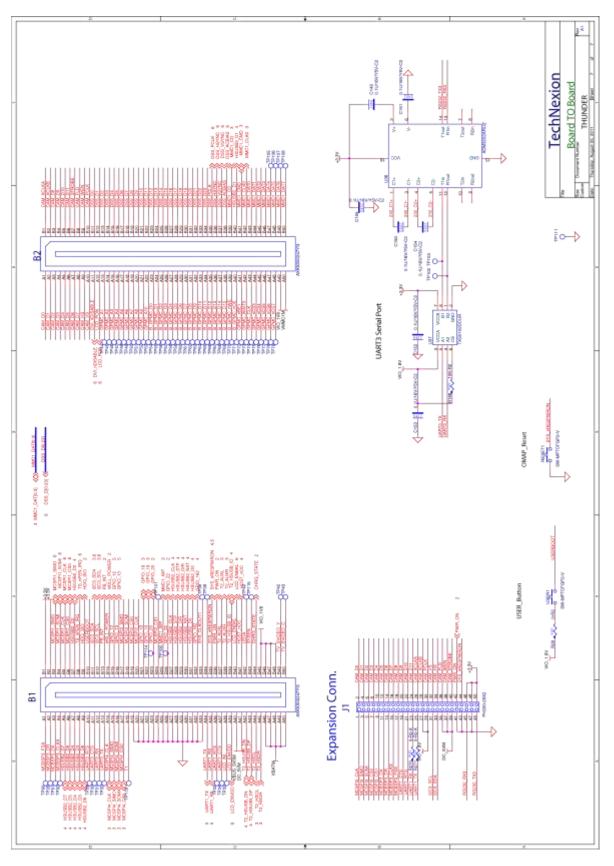






161

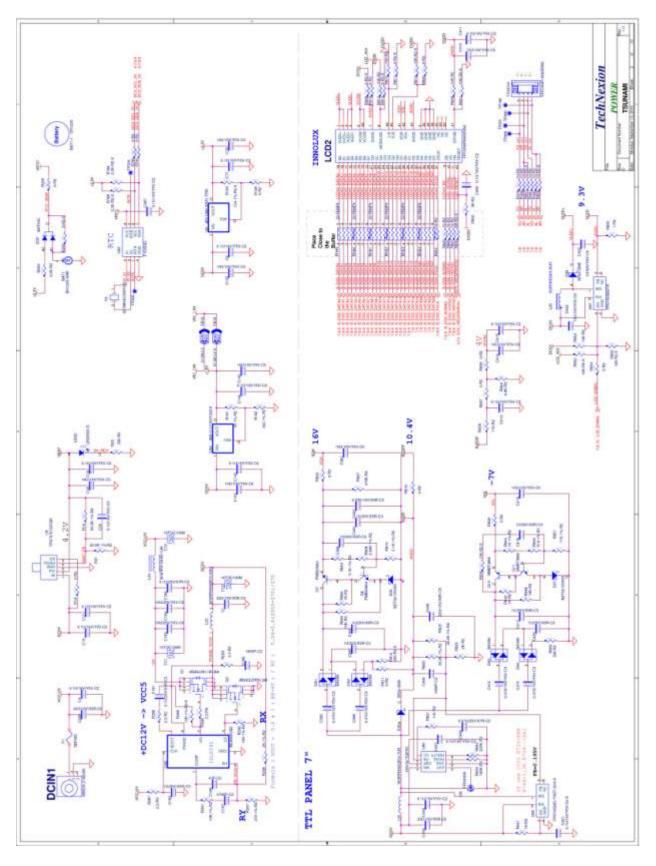


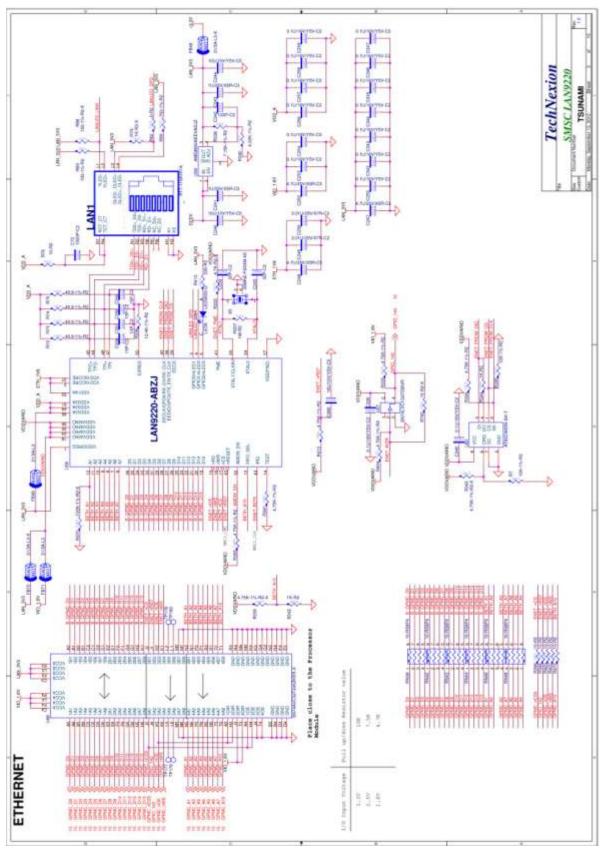


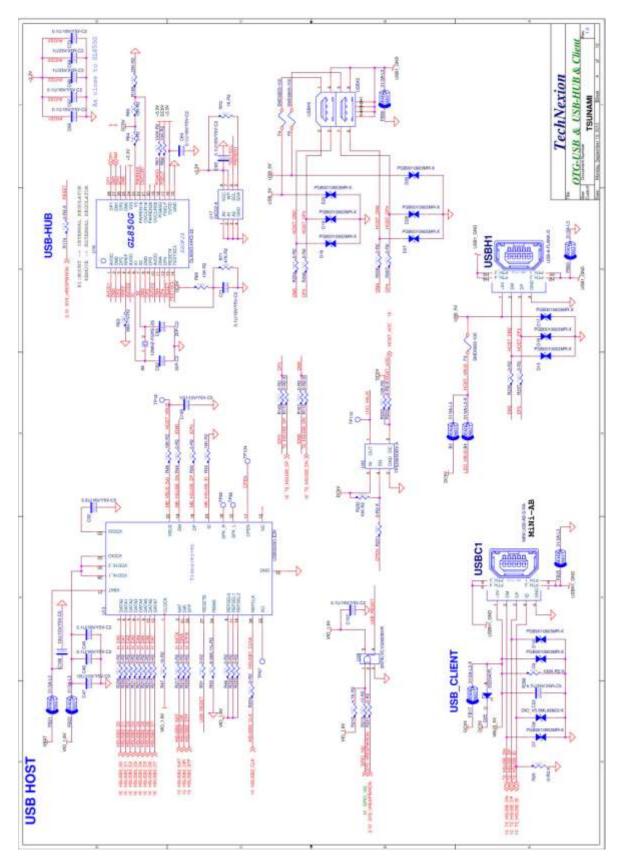


## 14.3 Tsunami baseboard schematics

1/17/2012, TechNexion



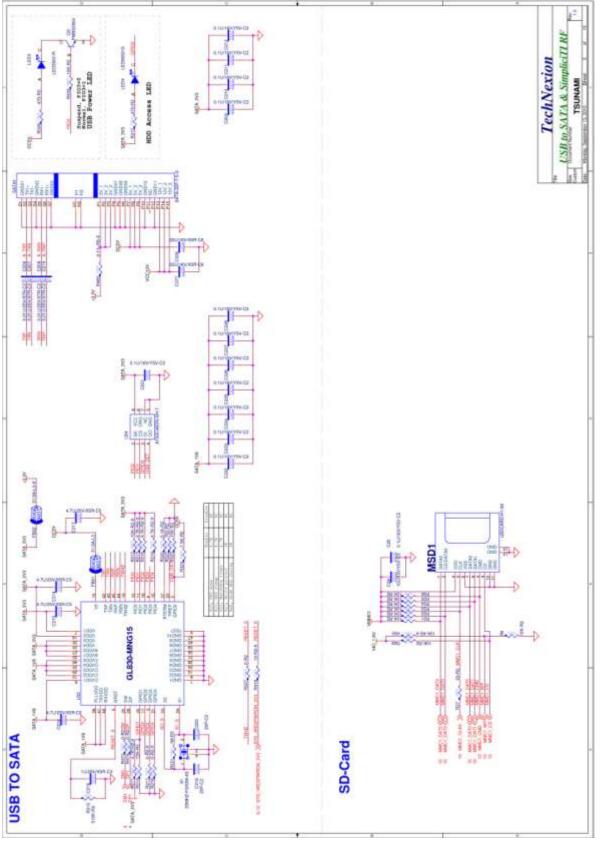




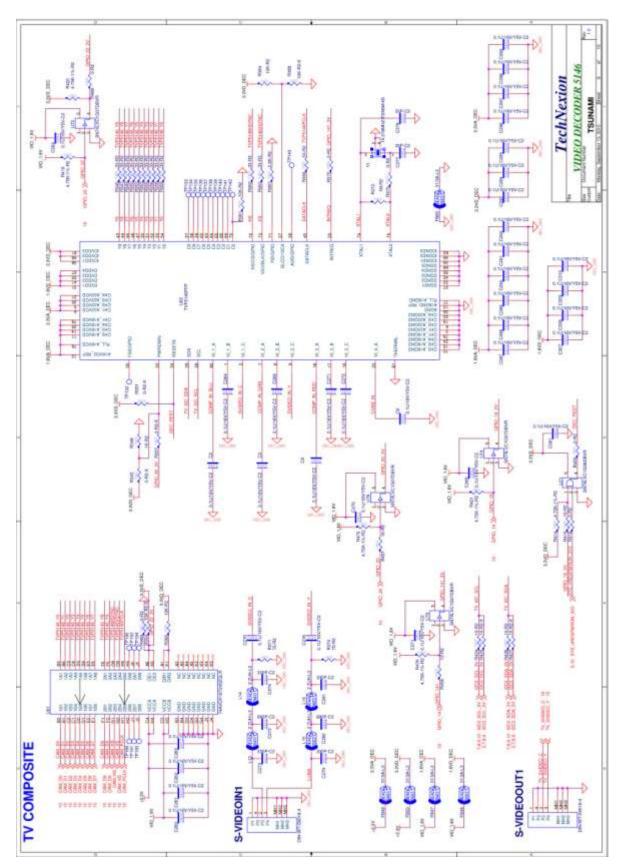
167

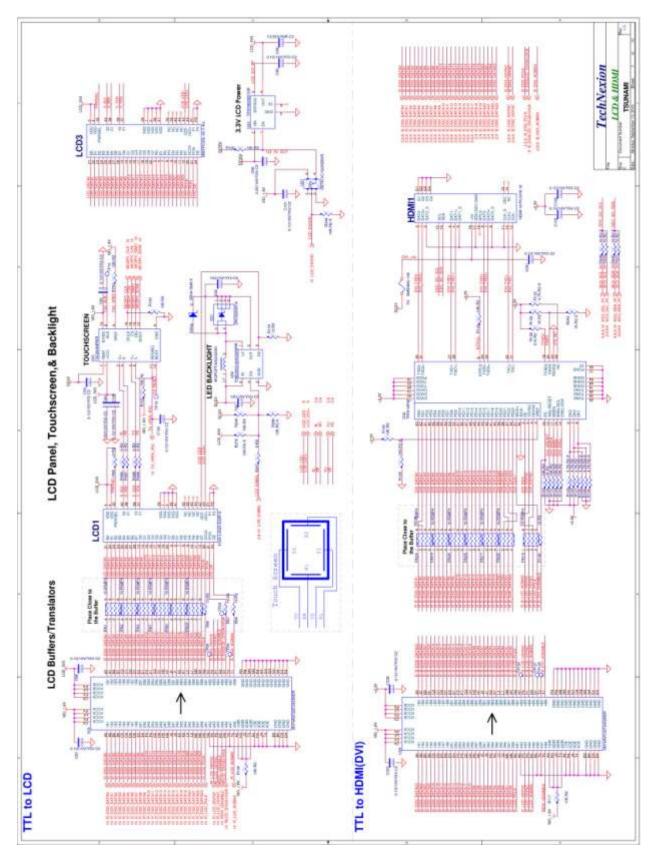
#### TAO-3530 USER'S GUIDE 096

1/17/2012, TechNexion

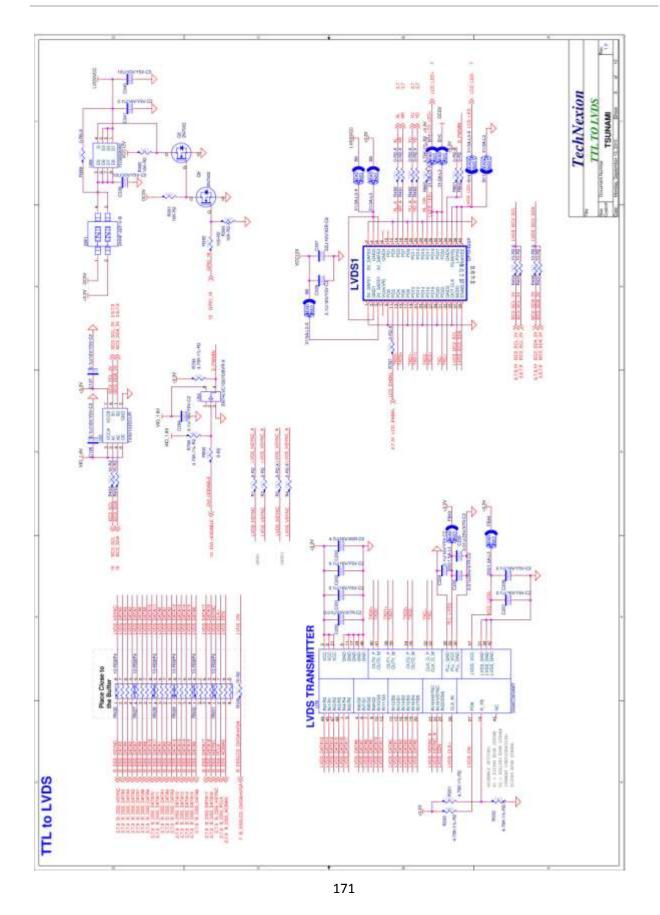


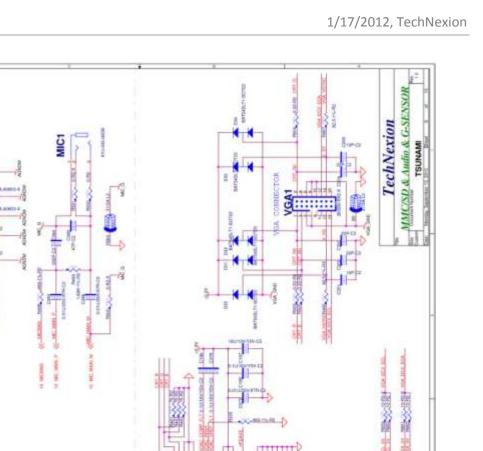
168

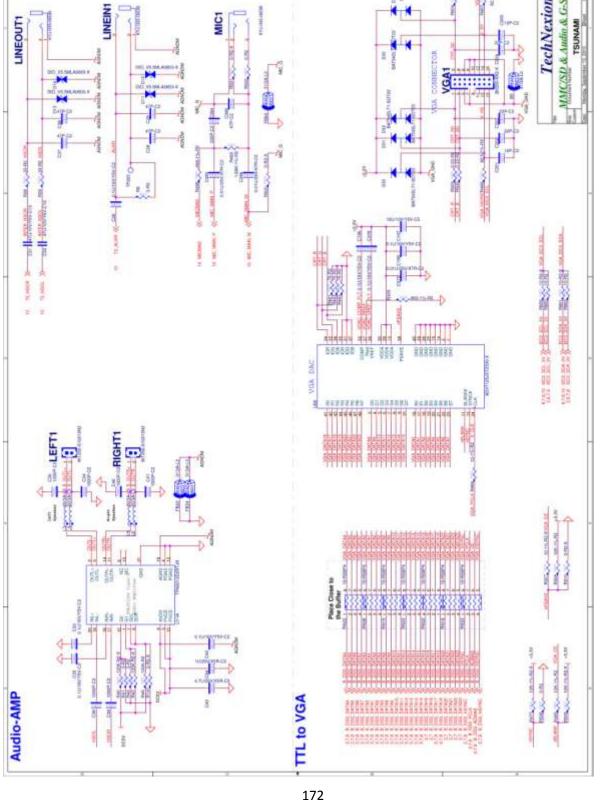


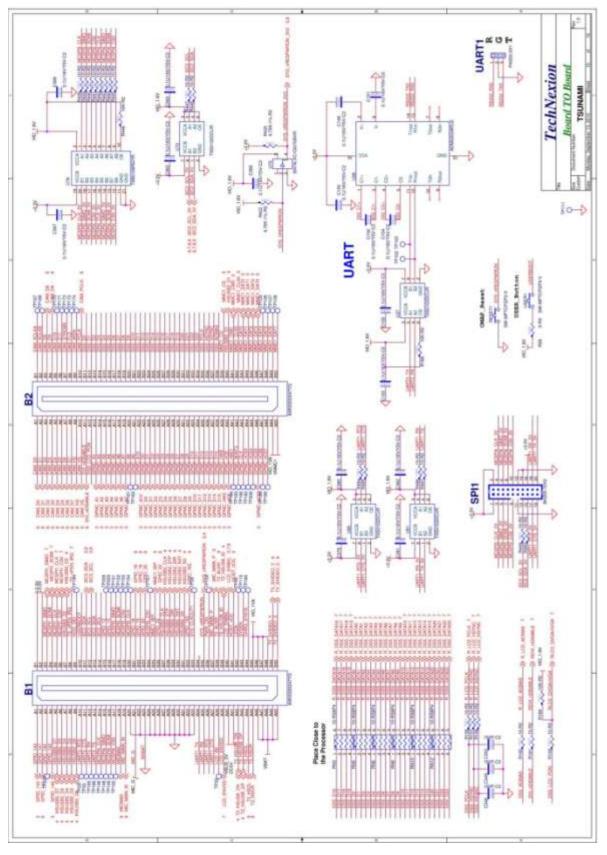


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# **15 Appendix - Pin outs**

## **15.1 Module connector B1**

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 B25 B26 B27 B28 B29 B30 B31 B32 B33 B34 B35 B36 B36 B37 **B38** B39 840 841 842 843 844 845 845 846 847 848 B49 B50 Β1 B2 Β3

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
MCSPI1_SIMO
MCSPI1_SOMI
MCSPI1_CLK
MCSPI1_CS0
HSUSB2_D2
TS_nPEN_IRQ
HDQ_SIO

B4 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	B40	LCD_ENBKL
A41	DC_5VM	B41	HOST_nOC
A42	T2_HSUSB_DN	B42	LEDA
A43	T2_HSUSB_DP	B43	SYSEN
A44	T2_HSOL	B44	CHRG_STATE
A45	T2_HSOR	B45	VIO_1V8
A46	VBATM	B46	VIO_1V8
A47	VBATM	B47	VIO_1V8
A48	VBATM	B48	VIO_1V8
A49	VBATM	B49	TV_SVIDEO_Y
A50	VBATM	B50	TV_SVIDEO_C

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# **15.2 Module connector B2**

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		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.

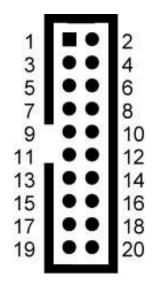
6. If you don't implement microphone function. Please connect pin A19 and A21 on connector B1 to GND

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.

# TAO-3530 USER'S GUIDE 096 1/17/2012, TechNexion

# 15.3 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

# 15.4 UART 3

1 ■ 2 ● 3 ●

1	RS232_RX3
2	GND
3	RS232_TX3

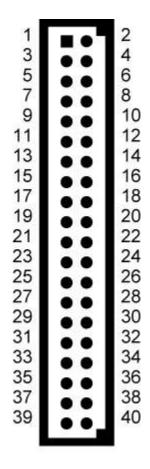
Note: RS-232 serial console cable might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable (pin 1 becomes 3 and pin 3 becomes 1)

	1 3 5 7 9 11 13 15	<ul> <li>2</li> <li>4</li> <li>6</li> <li>8</li> <li>10</li> <li>12</li> <li>14</li> <li>16</li> </ul>	
1	CRT_R	2	CRT_G
3	CRT_B	4	X
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

**15.5 Pin header for VGA connector** 

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# **15.6 LVDS connector**



Data connector is 40 pin

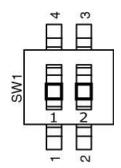
Marking on main board: LVDS1

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

15	TXD0+	

- 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

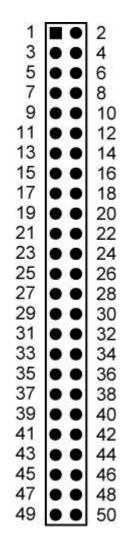
- 16 XR (Touch screen)
- 18 GND
- 20 YU (Touch screen)
- 22 YD (Touch screen)
- 24 GND
- 26 Backlight Control Enable
- 28 LVDS_LED+ (Backlight Power +)
- 30 LVDS_LED+ (Backlight Power +)
- 32 LVDS_LED+ (Backlight Power +)
- 34 Backlight Power Control
- 36 LVDS_LED- (Backlight Power -)
- 38 LVDS_LED-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



LVDS Power Select Switch

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

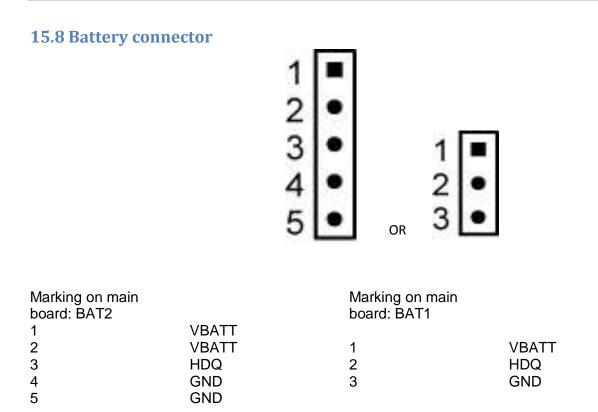
# 15.7 Thunder expansion pin header



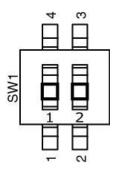
Pitch of connector is 2.00 mm

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:



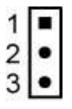
Battery powered & charging enabled: switch 1 off switch 2 on

Only DC power enabled: switch 1 on switch 2 off

15.9 Inferno Expan	sion Pin Header		
-	1 🔳	• 2	
	3 🔵	• 4	
	5 7	• 6	
		• 8	
	9 🗨	• 10	
	11 •	• 12	
	13 •	• 14	
	15	• 16	
	17	• 18	
	19	• 20	
	21	• 22 • 24	
	23 • 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 21	MCSPI1_SIMO MCSPI1_SOMI	20 22	CAM_D9
23	MCSPI1_SOM	22	CAM_D10 CAM_D11
25	GND	24	CAM_XCLKA
27	I2C3_SCL	28	CAM_PCLK
29	12C3_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

# 15.10 RS-232 cable

Accessory



1	(white dot)

			-
	2		

3

