TechNexion

1/16/2012



SOM

TAM-3517 System on Module

TAM-3517 USER'S GUIDE 097 | 1/16/2012, TechNexion

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TAM-3517

TAM-3517 System on Module and its Baseboards

User's Guide

Rev 0.97

1	l Contents				
2		Car	e and maintenance	6	
	2.	.1	General	6	
	2.	.2	Regulatory information	6	
3		Intr	oduction	9	
4		Get	started1	0	
	4.	.1	First time use Twister baseboard XL (7" LCD)	0	
	4.	.2	First time use Twister baseboard (4.3" LCD)	4	
	4.	.3	Explanation of the TAM-3517W System on Module1	8	
	4.	.5	Explanation of the Twister Baseboard24	0	
5		Me	chanical Dimensions	3	
	5.	.1	TAM-3517 dimensions2	3	
	5.	.2	Twister baseboard dimensions	3	
6		Har	ddisk placement (Twister)	4	
7		Dov	vnloads and drivers	5	
8		Sof	tware – Factory Default Screen	6	
	8.	.1	Automatic check for updates2	6	
	8.	.2	Installing Linux	7	
	8.	.3	Installing Android2	7	
		8.3	1 Special instructions for installing "Android(NAND)" on TAM-3517	7	
	8.	.4	What to do if your development kit does not have the factory default screen	8	
		8.4	1 Create the SD-card with the rescue image in a Windows environment	8	
		8.4	2 Create the SD-card with the rescue image in a Linux environment	2	
		8.4	.3 Installing the rescue image on the baseboard with the SD-card	4	
		8.4	4 Factory Default Home Screen	5	
9		Sof	tware – Connecting a Null Modem	6	
	9.	.1	Connecting a null-modem cable	6	
1	0	S	oftware – Angstrom (Linux)	2	
	1(0.1	Introduction	2	
	1(0.1	Quick install guide for installing a cross-compiler	2	
	10.2		XUKR build instructions	3	

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	10.2	2.1	X-loader	43
	10.2.2		u-boot	44
	10.2	2.3	Kernel	44
	10.2	2.4	root filesystem	45
1	0.3	Com	npiling for TAM-3517	45
	10.3	3.1	QT	46
1	0.4	Basi	c components of a bootable Linux SD card:	46
1	0.5	Mar	nual NAND Installation	47
1	0.6	How	v to	49
	10.6	5.1	How to calibrate the touch screen in Linux	49
	10.6	5.2	How to use OPKG	50
	10.6	5.3	How to enable wireless	51
	10.6	5.4	How to do low level debugging (advanced)	52
11	S	oftwa	are - Android	53
1	1.1	How	v to install an Android application on TechNexion baseboards	53
1	1.2	How	v to install an android application with an internet connection	59
12	S	oftwa	are - Windows CE	66
1	2.1	War	ning	66
1	2.2	Upd	late to Windows Embedded CE6.0 R3	66
1	2.3	Get	the BSP	66
	12.3	3.1	Download the BSP from the web-Site	66
	12.3	3.2	Install BSP to "Platform Builder for CE 6.0".	66
1	2.4	Crea	ate a SD card	70
1	2.5	How	v to put the WinCE image in the NAND Flash	81
	12.5	5.1	Write the Bootloader and OS image to the NAND Flash.	81
	12.5	5.2	Boot from NAND flash.	93
1	2.6	How	v to - change the logo that you see during boot up	100
	12.6	5.1	Preparing the BMP	100
	12.6	5.2	Change the makefile.inc	100
	12.6	5.3	Calculate the needed blocks	100
	12.6	5.4	Change image-cfg.h	102

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12	2.6.5	5 Compile	
12	2.6.6	5 Put in NAND	
12.7	' H	low to - Install applications in windows CE	
12	2.7.1	L What to do with CAB-files?	
12	2.7.2	2 Installing with an SD card	
12	2.7.3	3 Installing with Active sync	
12.8	н	low to - use the LAN cable instead of Wi-Fi	
12.9	н	low to - turn backlight on/off	
12.1	.0	How to - calibrate the touch screen in Windows CE	
13	Арр	pendix – Module	
13.1	. M	Nodule Connector DDR2 SO-DIMM	
13.2	N	Nut to fix TAM-3517 to the baseboard	
14	Арр	pendix – Block Diagram	
15	Арр	pendix - Schematics	
15.1	. Tv	wister baseboard schematics	
16	Арр	pendix - Pin outs	
16.1	. M	Nodule connector	
16.2	SF	SPI1	
16.3	U.	JART 1/UART 3	
16.4	- Pi	Pin header for VGA connector	
16.5	5 L\	VDS connector	
16.6	R	RS-422/485 connector	
16.7	G	GPIO Switch (SW3)	
16	5.7.1	L Auto Update Procedure	
16.8	U:	JSB client/host Switch (SW4)	
16.9	C/	CANBUS	
16.1	.0	RS-232 Cable	
16.1	.1	JTAG Solder Points	

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.



We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of European Directive 1999/5/EC (radio equipment and telecommunications terminal equipment Directive).

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 100ppmLead (Pb): Under 1000ppmMercury (Hg): Under 1000ppmHexavalent Chromium (Cr6): Under 1000ppmPBB: Under 1000ppmPBDE (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

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



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 TAM-3517 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, 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 TAM-3517 and a Baseboard from our website. There are 2 versions: the TAM-3517W with Wi-Fi (used for example in the development kits) and the TAM-3517 without Wi-Fi (used for example in the HMI). Other configurations can be discussed with our sales.

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 TAM-3517 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 Twister baseboard XL (7" LCD)

This guide describes how to put the TAM-3517W module and the Twister interface board together, how to connect the LCD and power up the board.

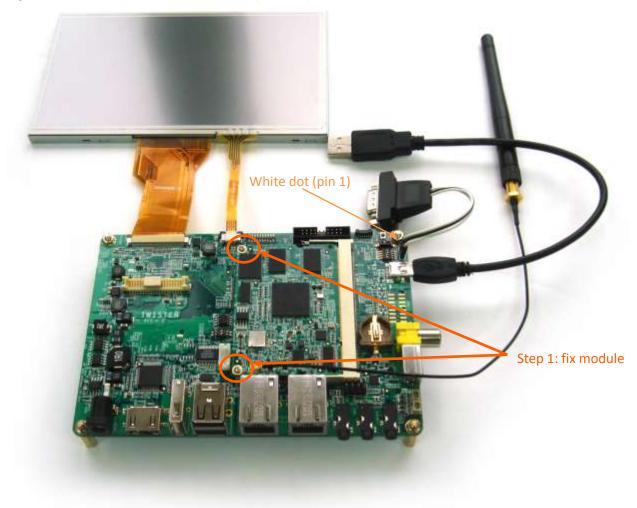


Figure 1: Step 1 - After clicking the module onto the board. Use a small Philips screwdriver and fix the module on the interface board. By doing so you guarantee the connection is firm and solid.

Connecting the 7" LCD touch panel (XL version) to the Twister 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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(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 carefully open with your nail. (NOTE: the board has different connector options; please check if it is a "slide" or "turn" connector before opening. Handling the connector wrong will lead to damage)

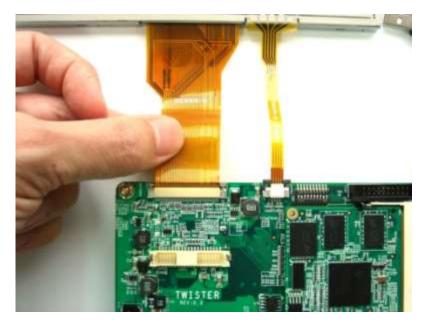


Figure 3: Step 2b - Insert the LCD panel FPC. And push the connector sideways to close

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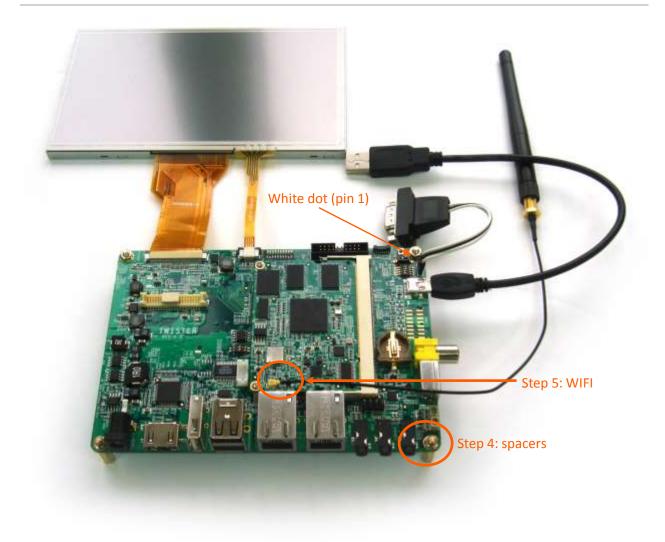


Figure 4: Step 3a - Connect the RS-232 serial console cable as on the picture above. (Note: <u>RS-232</u> <u>serial console cable</u> might need a gender changer when connected to, for example, a null-modem. One can also reverse the connected cable)

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 Twister 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, protect the components on the bottom and to allow free airflow for cooling.

Step 5: for better WIFI reception connect the antenna to the U.FL (IPEX) connector on the TAM-3517W module.



Warning! Without the below setting the screen might show unexpected results.

Check if your dip switch (SW3) is set as follows:

3	2	1	
OFF	OFF	ON	7" panel

4.2 First time use Twister baseboard (4.3" LCD)

Connecting the 4.3" LCD touch panel (Standard version) to the Twister 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.

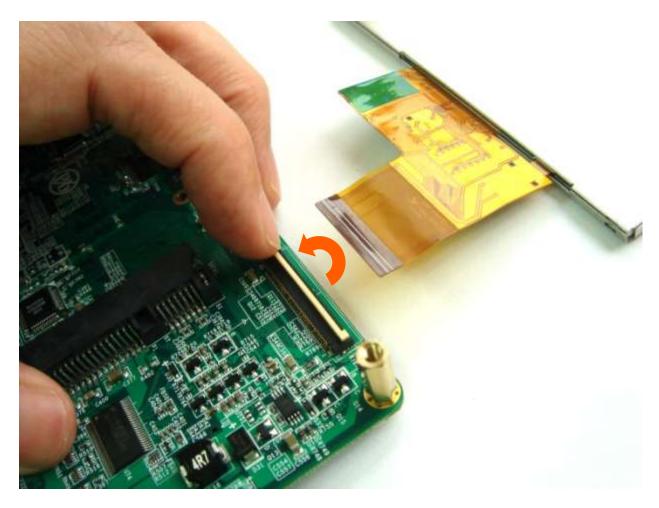


Figure 5: Step 2a - Turn the connector at the bottom side of the Twister baseboard about 90 degrees open with your nail. (NOTE: the board has different connector options; please check if it is a "slide" or "turn" connector before opening. Handling the connector wrong will lead to damage)

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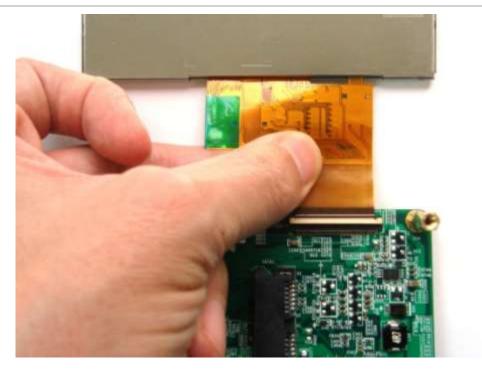


Figure 6: Step 2b - Insert the LCD panel FPC.

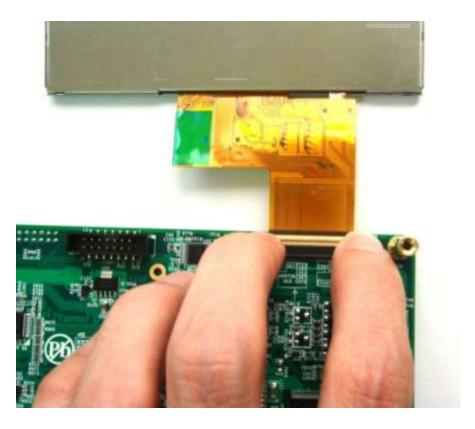


Figure 7: And turn the connector down to close

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Figure 8 : 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 Twister 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, protect the components on the bottom and to allow free airflow for cooling.

Step 5: for better WIFI reception connect the antenna to the U.FL (IPEX) connector on the TAM-3517W module.

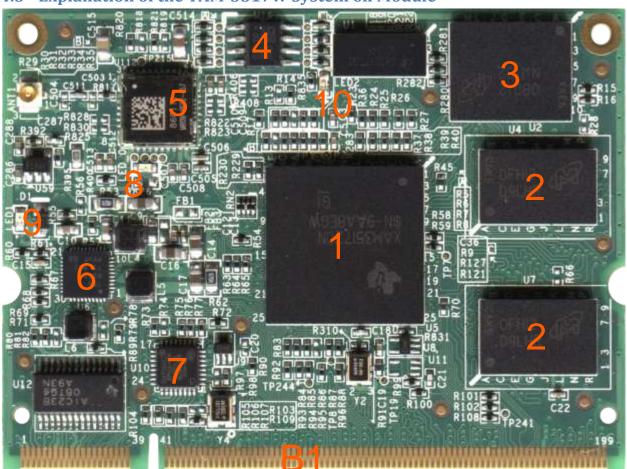


Warning! Without the below setting the screen might show unexpected results.

Check if your dip switch (SW3) is set as follows:

3	2	1	
OFF	OFF	OFF	4.3" panel

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4.3 Explanation of the TAM-3517W System on Module

Figure 9: TAM-3517W top view

Top view

- 1 CPU
- 2 Memory
- 3 NAND Flash
- 4 EEPROM

5 Wireless LAN 802.11b/g by SDIO MMC1 interface with IPEX U.FL connector (TAM-3517W = Wireless)

- 6 PMIC
- 7 LAN PHY
- 8 LED 0: Wireless

9 LED 1: Power

- 10 LED2: Will flash during software updates
- B1 200 pin SO-DIMM connector

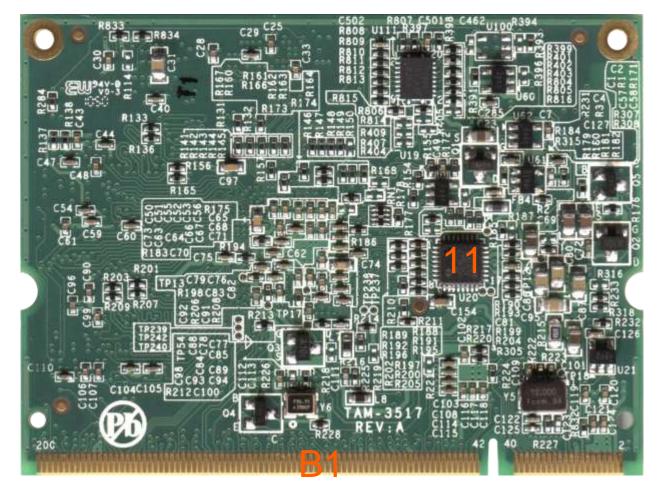


Figure 10: TAM-3517W bottom view

Bottom view

- B1 200 pin SO-DIMM connector
- 11 USB PHY

4.5 Explanation of the Twister Baseboard

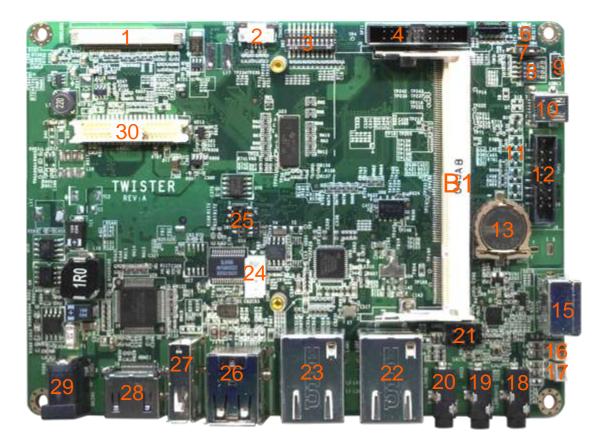


Figure 11: Twister Baseboard top view

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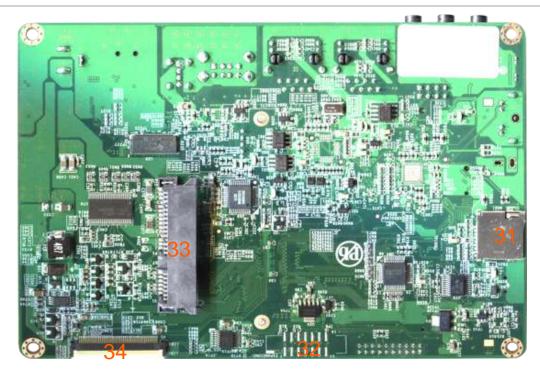


Figure 12: Twister baseboard bottom view

- B1 Connector to the TAM-3517 CPU module (DDR2 SO-DIMM 200 pin SMT, standard, H:6.5 mm, e.g. Foxconn AS0A426-N6SN-4F or Tyco 5-1746530-4)
- 1 connector for 7" LCD panel
- 2 Connector for 4 wire touch panel of LCD panel
- 3 <u>GPIO Switch</u> (marked with SW3)
- 4 Front panel connector
- 6 Power / reset button
- 7 USB (10) Switch between host and client
- 8 RS-232 Switch between UART1 and UART3
- 9 Pin header for RS-232
- 10 USB OTG
- 11 LEDs

- 12 Pin header for VGA connector
- 13 RTC Battery (CR-1220)
- 15 S-video Out
- 16 Speaker left
- 17 Speaker right
- 18 Microphone
- 19 Line in
- 20 Line out
- 21 CAN Bus
- 22 Integrated LAN
- 23 SMMC 9220 LAN
- 24 RS-422, RS-485 Connector
- 25 <u>RS-422/485 switch</u>
- 26 USB HOST (2x)
- 27 USB HOST (1x)
- 28 DVI-D by HDMI connector
- 29 12 V DC Power connector
- 30 LVDS connector for LCD panel
- 31 Micro SD card slot
- 32 No function
- 33 SATA connector for a 2.5" hard disk
- 34 LCD TTL Flat panel connector with touch screen to connect to 4.3 inch LCD panel

5 Mechanical Dimensions

5.1 TAM-3517 dimensions

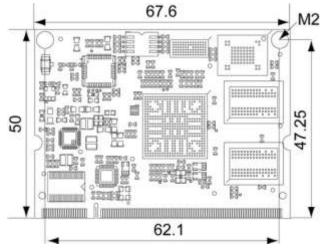


Figure 13: tam-3517 dimensions (Dimensions in mm)

5.2 Twister baseboard dimensions

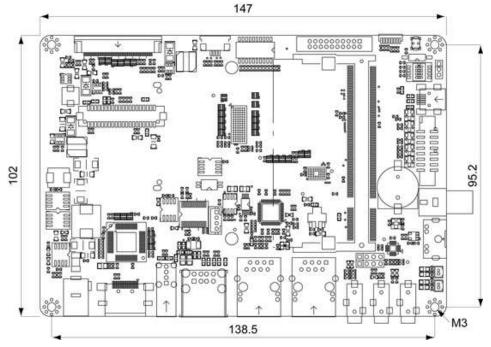


Figure 14: Twister baseboard dimensions (Dimensions in mm)

Note: 2D (DXF) and 3D(STEP) files are available for download at the Technexion website. (Support/ Download Center/)

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6 Harddisk placement (Twister)



Figure 15: Step1 – Place the 2.5" hard disk in the connector as shown above (you will need to remove one spacer in the bottom right corner).

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

Drivers and other download can be found at the TechNexion webpage (<u>www.technexion.com</u> > Support > download center)



Figure 16: Download Center at the TechNexion website

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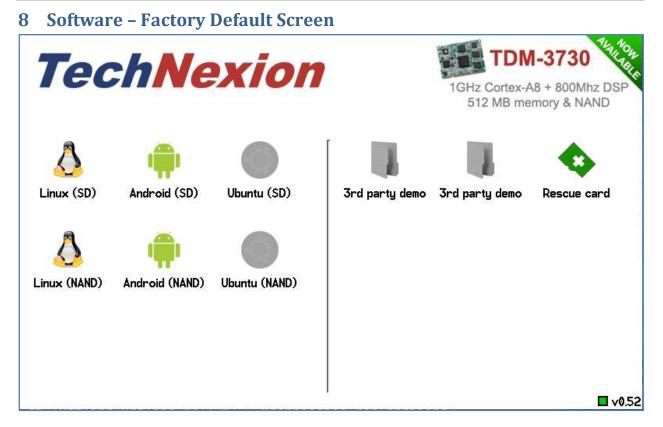


Figure 17: Factory Default Home Screen

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

Rescue-SD card by pressing the the factory default is always possible.

icon. Please store this in a safe place, so restoring to

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	chNe	exion			TAM-3517 uch Systems
Linux (SD)	Android (SD)	Ubuntu (SD) Ubuntu (NAND)	Jun 3rd party demo	Jun 3rd party demo	Rescue card
				New version a	a∨ailable: Update ■ v0.56

Figure 18 : 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.

8.3.1 Special instructions for installing "Android(NAND)" on TAM-3517

Make sure your development kit is connected to the internet

Put the switch8 (on SW3) to "ON"

Press the android (NAND) on the factory default screen

The files will download to SD (this will take a long time), and it will then ask to reboot

It will now install into NAND, when finished it will say: take out SD-card and put switch 8 back to "OFF"

The development kit will now show Android

(This is a special version of the Android software that will clean the NAND, so if you want to go back to the rescue-SD you now also need to use the switch 8 (SW3))

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.

TAM-3517 Rescue SD Image for Twisterpack (with 4.3 inch screen)



Description	TAM-3517 Factory default for Twisterpack with 4.3 inch touchscreen
Revision	REV 0.53
Date	11 November 2011

TAM-3517 Rescue SD Image for Twisterpack-XL (with 7 inch screen)



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

Figure 19 : 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

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le <u>E</u> dit <u>V</u> iew F <u>a</u> vorites	ools Help	
🌖 Back 🔹 🌍 🕤 🏂 🍃	🔎 Search 💫 Folders 🔟 🛛 🔞 Folder Sync	
dress 🛅 C:\rescue image		💌 🄁 Go
File and Folder Tasks 🙁		g-a-rescue-sd.pdf e Acrobat Document B
 Make a new folder Publish this folder to the Web Share this folder 	rescue-blizzerd-070 img	diskimager-RELEASE-0.3.

Figure 20: Extracted files

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-twister-070.img	Rescue image for Baseboard with 7" LCD

🚔 win32-image-writer at Launchpad_net	
File Edit View Favorites Tools Help	.
🚱 Back 🝷 🕥 - 🏂 🔎 Search 🍋 Folders 🔟 - 🔞 Folder Sync	
Address 🛅 E: \win32-image-writer at Launchpad_net	Go
File and Folder Tasks Image: Split and S	
Image: Copy this file Image: Copy this file Image: Copy this file Image: Copy this file	
Publish this file to the web Publish this file to the web Publish this file Publish this	
Other Places Constant of the second	

Figure 21: Extract and execute the win32-disk-imager to prepare the rescue image creation

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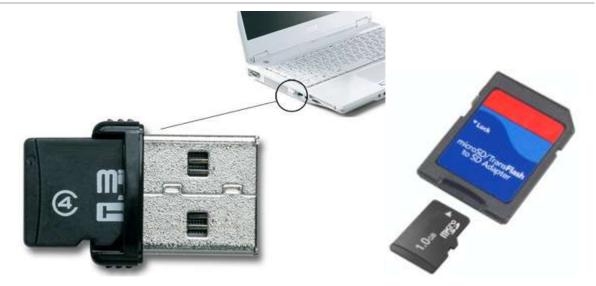


Figure 22: example of converters to plug the Micro-SD in your computer

👒 Win32 Disk I	mager				
Image File			Device	After inserting the SD-card click	
Progress			the Refresh icon		
Cancel	Read	Write	Exit		
Refresh the list of a	vailable devices	5			

Figure 23: Select the SD-card (in your computer) as device

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Select a disk in	nage				? 🔀	1
Save in:	🛅 rescue image		• • •) 💣 📰 -		
My Recent Documents	rescue-blizzard	070.img			T.	
Desktop						
My Documents						
My Computer						
N		-				
My Network Places	File name:	rescue-blizzard-070.img		<u> </u>	Save	
	Save as type:	.img;*.IMG		<u> </u>	Cancel	
Win32 Disk Image File	lmager	Device			1 de	
Progress						
Cancel	Read	Write Exit	👖 🛛 🔞 Fol	lder Sync		
Address 🛅 C:\re	scue image					🔽 🛃 Go
File and Fold		Adobe Acroba	cue-sd.pdf at Document		rescue-blizzard- IMG File 64,512 KB	070.img

Figure 24: 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 25: 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

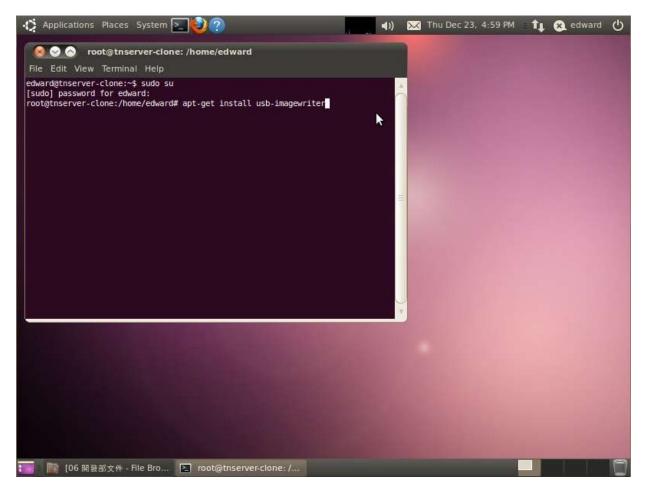


Figure 26: Install the image writer on your Linux computer

Install the image writer:

apt-get install usb-imagewriter

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Figure 27: Start image writer (Applications>accessories>imagewriter)

🔞 ImageWriter						
ubuntu ImageWriter		LL.	1		5	
Write Image: rescue-xxx.img	to	Generic-	Multi-0	Card (/dev/s	db)	•
+ Details		Close		Write to	o devia	ce
+ Details		Close		Se Write to	devic	ce

Figure 28: Select the downloaded image and destination (SD-card in your computer), click write to device



Figure 29: 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 30 to Figure 33).



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 30: Installing the rescue image (factory default)



Figure 31: Installing the rescue image – Copying files



Figure 32: Installing the rescue image – Synchronizing File System

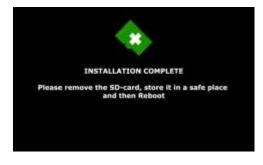


Figure 33: Installation complete - Take out the SD card and reboot.

8.4.4 Factory Default Home Screen



Figure 34: Factory Default Home Screen

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

9 Software - Connecting a Null Modem

9.1 Connecting a null-modem cable



Figure 35 : The Null-modem connected to the UART1 connector Twister baseboard (For debugging the dipswitch (SW2) pin 1 and 2 should be "ON")

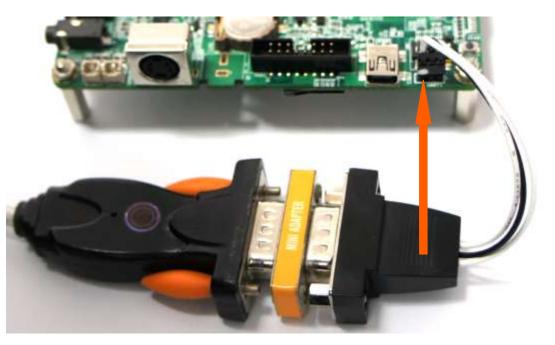


Figure 36 : White dot for the cable (RS-232 to USB) with null-modem-block connected to the UART1 of the Twister baseboard. For a gender-changer-block (yellow) you might need to turn around the connection so the dot is on the other side.

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Figure 37: The cable (RS-232 to USB) with yellow mini-gender-changer-block connected to the UART1 connector of the THB-3517 HMI baseboard (see arrow for position of the white dot)

• Start PuTTY on your computer and make sure the "Options controlling local serial lines" are as in Figure 38: Settings in PuTTY:

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

Figure 38: Settings in PuTTY

For computers running a Windows Operating System more steps (see Figure 39 till) might be required in order to check which serial line is used (see orange circles in figures)



Figure 39: Right click on "My Computer" and select Properties

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System Properties		
System Restore Automatic Updates Remote		
General Computer Name Hardware Advanced		
C 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 <u>S</u> igning <u>W</u> indows 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 40: Go to the hardware tab and select "Device manager"

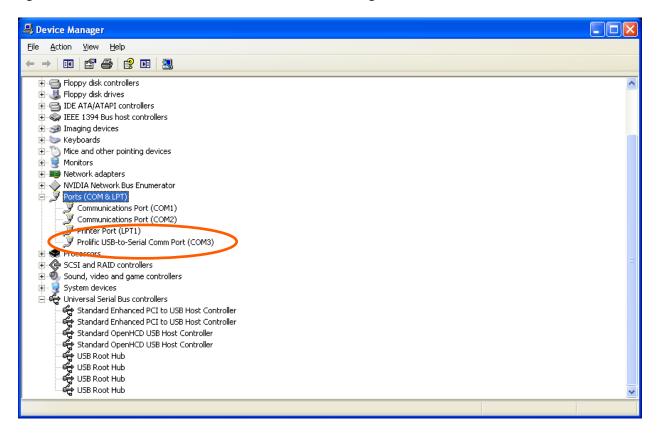


Figure 41: Under Ports (COM & LPT) you will see the baseboard connected with the null modem cable (in this picture COM3), this means in Putty the serial line should be changed into COM3.

- Go to Session and check if "specify the destination you want to connect to " is on Serial (See figure 49)
- Push open and a window will pop up (see figure 50)

🕵 PuTTY Configuration		
Category:	Basic options for your PuTTY	
E Ferninda Keyboard Bell Features	COM3 Connection type:	Sgeed 115200
 Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet 	Connection type. O Raw O Ielnet O Rlogin O St Load, save or delete a stored session Saved Sessions 123 Default Settings 123	SH Serial
⊡ Rlogin ⊕ SSH ⊡ Serial	Close window on e <u>x</u> it: Always Never Only on <u>Open</u>	clean exit

Figure 42: check if serial is selected and then select open

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Figure 43: 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 UART1 pin header, and check if the dipswitch is on UART1. Sometimes cables are not inverted, which can be solved by turning around the connector to the UART1 pin header (white dot turns 180 degrees).

10 Software – Angstrom (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 TAM-3517 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:/bin:/opt/arm-2010.09/bin:.

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

3. Set your CROSS_COMPILE variable to the ABI prefix:

CROSS_COMPILE=arm-none-linux-gnueabi-

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

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

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

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 TAM-3517

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 TAM-3517 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 bit he stellate time.		

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 44 : settings > Touchscreen Calibration



Figure 45 : 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> (tel

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

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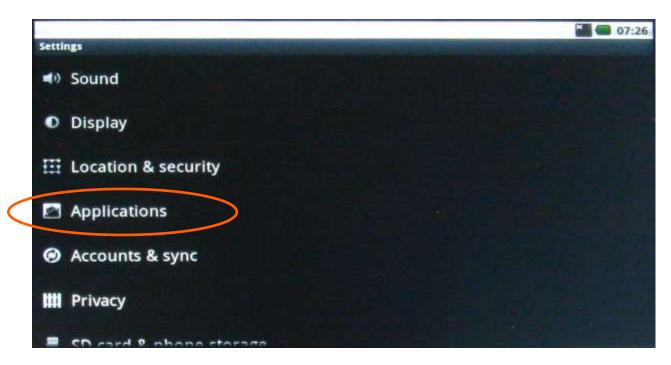


Figure 47: Scroll to the Applications and press on it

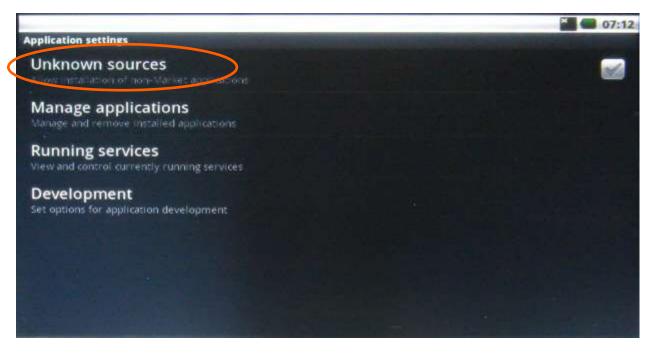


Figure 48: press on "Unknown sources"

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Figure 49: Confirm OK

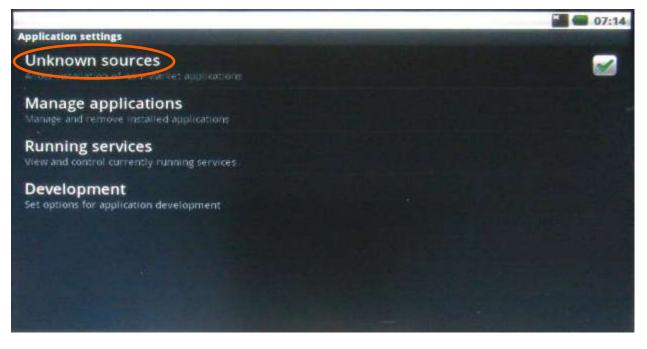


Figure 50: The "Unknown sources" will now show a green icon. It will now install application even if the sources are unknown.

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Figure 51: 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 52: 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 ly/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 53: Press install

	2 60 07:16
RockPlayer	
이 아이들은 이 방법에 가지 않는 것은 것은 것은 것이 같아.	
Installing	

Figure 54: The application will install

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Figure 55: after installation you have the choice to open the application or to go back.



Figure 56: 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.

	an 🗐 👄
Wireless & network settings	a designed and the local division of the loc
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 57: 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 & manage whreless 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	$\lambda_{1} = \lambda_{2}$

Figure 58: Go to Wi-Fi settings:

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

Figure 59: Select a network

Wi-Tisettings				14:09
WI-FI Disconversed				
Network notifi				
Notify me when an op Wi-Fi metworks		N		
TECHNEXION Remembered, secure	Security WPA/WPA2 PSK Signal strength Poor	C.		î.
planexuser Secured with WPA/W	Connect	Forget	Cancel	10
Add Wi-Fi netw	work			
				21

Figure 60 : Choose connect and, if necessary, enter a password.

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Figure 61 : Open the browser in the main menu

and the second		07:17
@http://code.go	ogle.com/p/rowboat/	CX
Antroit for Texas Intro	nems Devices (Snata, Davner and Integrat	Search projects
Project Home Doublings 1	In linies Source	
Summary Unitative People		
Project Information	arowboat.org	
Artisty califigh Driver toots	Enables Android for Texas Instruments devices	
Code Reense Austitus Colonies 2.0	Currently supported devices are OMAP25a, AM35a, AM37a, DM37a, AM380a, AM1808.	
Labole andmitt, omap3, omap, beage, beagleboard, tu linux, day 15.91, ansag1550, anv1517, omap.1780, 3730, anv150	The goal of anowboat and project is to 1 • Previous a statute Google Android Soose port for AM1805, OMAPSI's, AM254, AM254, AM289, and DM374 platform • Evable key fundmain features (ARM plus NEON, <u>D14</u> , 20/3D Accelerated Graphics and others) on StatisTM, D DistignaTM) devices	
Ale Members om blue. Ogenali tom Etementings	Whit should get involved • Everyonic considering Android Report Nandhata with TL devices like AM/DMITY, AMUSA, AMUBAS, AMUBAS, • Aminist OL and Android optication developers • Aminist OL and Android optication developers • Aminist OL and Android optication developers	
Featured	Why to use anowhoat project	
Description Special Contents Restaudional of the Array product model and the Array product model and the Array Provide Contents of the	Artise and exercises devicement of a quality Authinid point Action and exercises devicement of a quality Authinid point Consoling on a statistic world testind and hereich warkent Authority point for non-phase suggrang Consoling performance expressions for Graphics and Multiministia Software and Hereinere support for all armother resident devices	

Figure 62 : Press the internet address bar and the onscreen keyboard will appear, or Insert an USB-keyboard.

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										8	07:19
http://openin	iterits.g	oogleci	ode.co),mc							60
http://openir	ntents.	google	code.	com				h	ttp://o	openint	ents.goc 🕨
q v	v	е		r	t	у		u	i	0	р
а	s		d	f	g		h	j		k	1
4	-		x	-	100		b	n		m	(33)
Statement of the local division in which the local division in the	Z		^	C	v		D	C.C.			

Figure 63 : Type: <u>http://openintents.googlecode.com</u> press "GO" and you will find the File Manager under the downloads

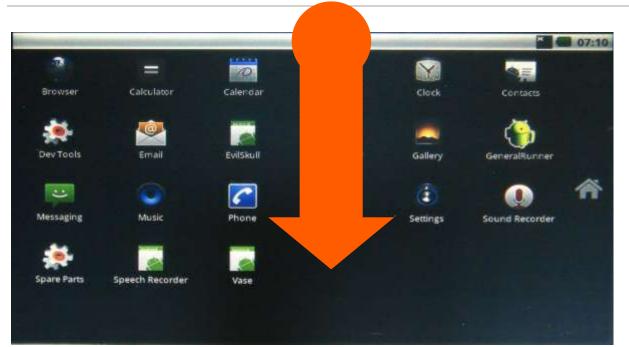


Figure 64 : Another option is:: <u>http://www.openintents.org</u> and you will also find the File Manager

Name and Address of the Owner, or other	🗐 🔠 🥌 07:20
Project Information	OpenIntents participates in GSoC2011!
Activity +1 High Project feeds	Google
Code license	SUMMER OF
Apache License 2.0	CODE
Labels android, openintents, java, boltable,	
sensors, intents, contentprovider	Welcome to OpenIntents
Es Members	
petit), throoglemail.com, friedger, seroo, drooglemail.com	
12 controlliters 4 contributors	
Featured	Download our free and open source applications at <u>www.openintents.org</u>
Downloads	What is <u>OpenIntents</u> about?
AlcostApp-1.0.3.apk CalendarPicker-1.0.0.apk CalentPicker-1.1.0.apk	We design and implement open intents and interfaces to make Android mobile applications work more closely together. We provide samples and free applications to demonstrate their usage.
Convertility - 1.1.0.498 Constitution - 1.1.1.494 Wanting age: 1.1.6.494	If you are interested as a developer or designer, feel free to join us in our <u>discutance</u> group.
Constant and a constant	Now, jump directly to
Concession in the local division in the loca	🖬 📶 👄 07:20
http://code.google.com/p/c	ppenintents/downloads/detail?name=FileManager-1.1.6
	My favorites + Sign in
🚓 openintent	c
Make Android applications work	
Project Home Downloads Wild	Issues Source
Search Current downloads 💽 for	Search
Download: OI File Manager 1.1 4 people starred this down	
Uploaded by: prid. Orgongiemal.com	
Released: , 2011 File Optimated: Jun 2, 2011	FileManager-1.1.6.apk 172 x8
Statistics and a statistics (35)	scription:
Type-Fackage SH Instanted	A1 Checksum: c4c1e22effa73881e1fcc88739d7dbhf9c338f69 <u>Whars this?</u>
[
3	1

Figure 65 : 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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2011 8 25			07:20
	(No service)	Clear	
	Notifications		
	EileManager-1.1.6.apk	07:20	
			and the second second
all and an			
All Property lies and			STREET, SQUARE, SQUARE

Figure 66: You will see the download when it has finished downloading

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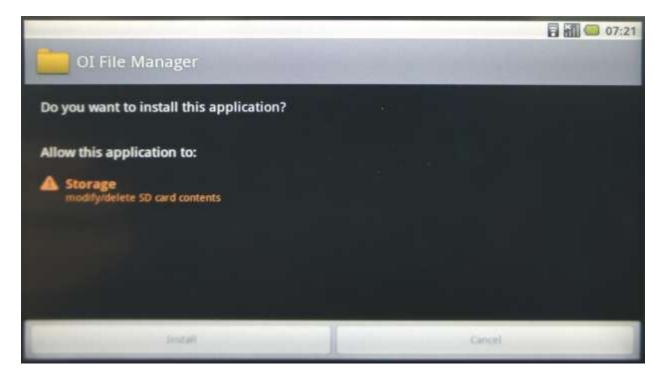


Figure 67 : Press the download and it will ask to install or cancel, Install will install the application, and Cancel will delete the file

OI File Manager	07:21
Application installed	
Open	Darie

Figure 68 : You now have a file manager and it will make it easier to install apk's that are placed on a SD card

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 > "HMI"; and download "TAM3517_CE6.0_versionnumber"".

12.3.2 Install BSP to "Platform Builder for CE 6.0". Decompress the downloaded file. (See Figure 69)

2012-01-16, TechNexion

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💮 🔂 🕨 - Temp -		▼ 🛂 捜索	t Temp	2
組合管理 ▼ 加入至媒體	題櫃 ▼ 共用對象 ▼ 新增資料夾			= 🕶 🗔 🔞
🔶 我的最愛	名稱 🔺	修改日期	類型	大小
 ▶ 下載 ■ 点面 ⑨ 最近的位置 ◎ 架體櫃 ◎ 文件 ● 音樂 ● 副片 ● 電腦 ▲ 本機磁碟 (C:) □ 本機磁碟 (D:) □ 本機磁碟 (E:) ● 網路 	01.00.00 TAM3517_CE6.0_01.00.00.zip	2011 <i>/7/2</i> 0	檔案資料夾 WinRAR ZIP 壓縮檔	36,793 KB
2個項目				

Figure 69

After entering the "01.00.00\BSP" (version number) folder, copy the "TAM3517" folder to "C:\ WINCE600 \ PLATFORM \". (See Figure 71 and Figure 71)

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組合管理 👻 演 開啟	加入至媒體櫃 🔻 共用對象 🔻 新增資料夾			III 🕶 🗔 🔞
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	🚺 TAM3517	2011/7/7 下午 04:41	檔案資料夾	
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	📄 ReadMe.txt	2011/7/7 下午 04:43	文字文件	4 KB
 □ 媒體櫃 □ 文件 □ 音樂 ■ 視訊 □ 圖片 	Version.txt	2011 <i>/7/7</i>	文字文件	3 KB
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TAM3517 修 檔案資料夾	改日期: 2011/7/7 下午 04:41			

Figure 70

PLATFORM						
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▶ 文件	🍑 H4SAMPLE	2011/5/11 下午 04:03	檔案資料夾		SYSTEM	
	🍑 MAINSTONEIII	2011/5/11 下午 04:03	檔案資料夾		SYSTEM	
■ 17.11	15530	2011/5/11 下午 04:33	檔案資料夾		SYSTEM	
	Lam3517	2011/7/20 下午 02:03	檔案資料夾		Libra-Desktop\Libra	
■ 電腦	VOIT_FXA276	2011/5/11 下午 04:33	檔案資料夾		SYSTEM	
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🗣 網路						
TAM3517 修 檔案資料夾	改日期: 2011/7/20 下午 02:03					



Go back to the decompressed folder "01.00.00" folder, and copy the "OSDesigns" folder to "C:\WINCE600 \". (See Figure 72 and Figure 73)

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組合管理 🔻 📜 開啟	加入至媒體櫃 🔻 共用對象 🔻 新增資料夾			:= - 🔟 🔞
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▶ 下載	\mu BSP	2011/7/7 下午 04:41	檔案資料夾	
■ 桌面 最近的位置	퉬 OSDesigns	2011/7/7 下午 04:48	檔案資料夾	
 □ 媒體櫃 □ 文件 〕 文件 〕 音樂 □ 視 □ 圖片 ○ 圖片 ○ 本機磁碟 (D:) □ 本機磁碟 (E:) ○ 本機磁碟 (E:) 				
OSDesigns 修 檔案資料夾	改日期: 2011/7/7 下午 04:48			

Figure 72

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🗎 媒體櫃	OTHERS	2011/5/11 下午 04:36 檔案資料	夾	
📑 文件	📙 PLATFORM	2011/7/20 下午 02:03 檔案資料	夾	
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▙▋▕▋/Ŧ	\mu SDK	2011/5/11 下午 04:01 檔案資料	夾	
🖳 電腦	🌗 Updates	2011/5/11 下午 05:37 檔案資料	夾	
🏭 本機磁碟 (C:)	pass1.txt	2011/7/20 下午 01:19 文字文件	4 KB	
本機磁碟(D:)	pass2.txt	2011/7/20 下午 01:19 文字文件	4 KB	
👝 本機磁碟 (E:)	📄 build.log	2011/7/20 下午 01:18 文字文件	9,478 KB	
📬 網路	📄 build.wm	2011/7/20 下午 01:18 WRN 檔到	₹ 19 KB	



12.4 Create a SD card

This chapter describes how to create a SD card.

- Open "Microsoft Visual Studio 2005". If that already open, Please reopen it.
- Click "File \rightarrow Open \rightarrow Project Solution" (See Figure 74)

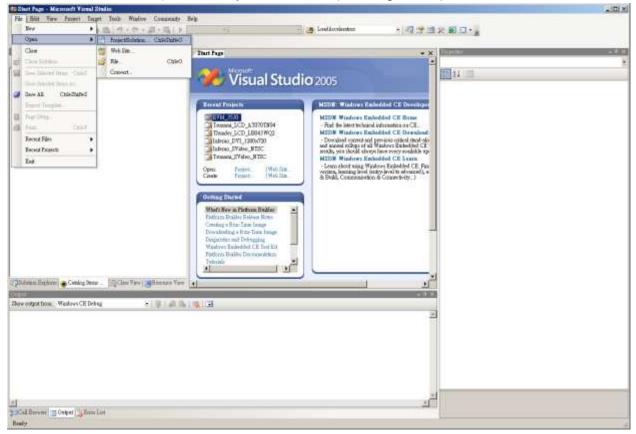


Figure 74

• Go into the folder and open the SLN-file of your HMI (As example in this manual we use "Twister_LCD_7inch") (See Figure 75)

2012-01-16, TechNexion

)pen Project		?
Look in:	🔄 🕒 OSDesigns 🔄 💽 🛞 - 🖄 🔍 🗙 📸 🖬 - Tools -	
Desktop My Projects My Computer	名稱 • 修改日期 • 操型 • 大小 • EVM_3530 Thunder_DVI_1280x720 Thunder_LCD_LB043WQ2 Inferno_DVI_1280x720 Tsunami_DVI_1280x720 Inferno_SVideo_NTSC Tsunami_DVI_1280x720 Picard_LCD_5.5inch Tsunami_LCD_AT070TN94 Picard_LCD_6.4inch Tsunami_LCD_LB043WQ2 temp Workspace Tsunami_SVideo_NTSC TH0635 Twister_DVI_1280x720 TH0635 Twister_LCD_4.3inch TH0835 Twister_LCD_7inch TH1235 TH1535	
pen Project Look in:	File name: Image: Constraint of type: Files of type: All Project Files (*.sln;*.dsw;*.vcw;*.csproj;*.vbproj;*.vbp;*.vjsproj Image: Constraint of type: Image: Constraint of type: Image: Constraint of type: Constraint of type: Image: Constraint of type: Image: Constraint of type: Constraint of type: Image: Constraint of type: Image: Constraint of type: Constraint of type: Image: Constraint of type: Image: Constraint of type: Constraint of type: Constraint of type: Image: Constraint of type: <	Open Cancel
Desktop	Twister_LCD_7inch.sln	
My Projects		

Figure 75

 In the menu click "build/advanced build command/Clean Sysgen" (See Figure 76) This will take approximately 20 minutes, after which you will see "build complete" (see Figure 77)



Warning! Be patient: let "clean sysgen" finish, this will take 20 minutes

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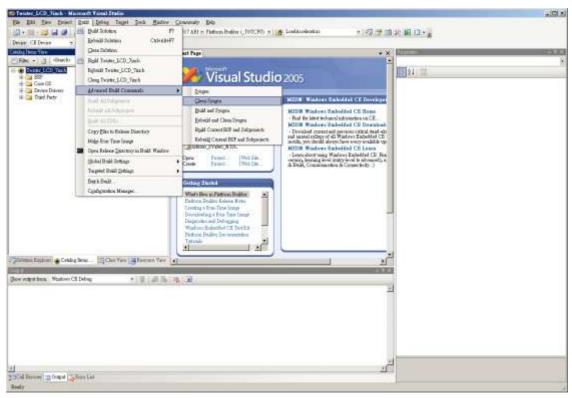
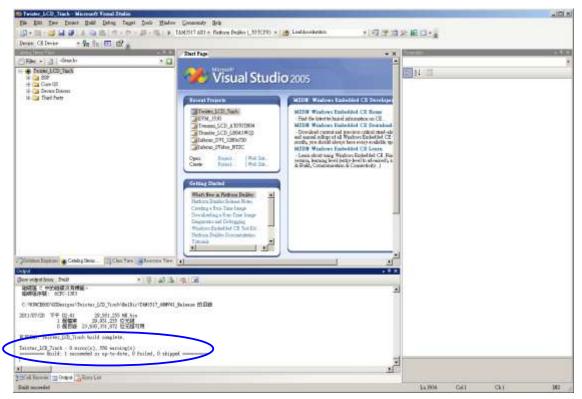


Figure 76





• 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 78)

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					10718-5			-0.5
a in Grant Market	OPTURILITILA MERICAN OPTURILITILA MERICAN ONI	Southand South Southand South Response South		704644580 Ppe Save Save Save Save 4405/0000 4-21148 400291188 2-41148 400291188 2-41148	0016 10178 244 MS			
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and the second		Incode		10000 (0.001.0000) [
Strate-				ranna si sur sastr				

Figure 78

• In the menu mark "partition as active", press OK, it will then show "successful" (see Figure 79)

Default partition geometry Size, MB: 243 Maximum: 243 MB Offset: 63 with size: 499649 Min offset: 63 space available: 499649 measured in: me	eate Partition		×	
Partition geometry Default partition geometry Size, MB:243 Maximum: 243 MB Exact partition geometry Offset:63 space available:499649 Min offset:63 space available:499649 measured in: C megabytes C sectors Drive Attributes Assign the following drive letter: H: Mark Partition as Active Format Partition Volume Label: File System:FAT32 Allocation unit size: Default Perform a quick format C Cancel Secssing completed Mew partition has been created successfully	elect the partition you want	to create and other settings:		
Default partition geometry Size, MB: 243 Maximum: 243 MB Offset: 63 with size: 499649 Min offset: 63 space available: 499649 measured in: me	Primary Partition	Extended Partition 💦 C Logical	Drive	
Size, MB: 243 Maximum: 243 MB Exact partition geometry 99649 Offset: 63 space available: 499649 measured in: 199649 Min offset: 63 space available: 10// exttributes measured in: 199649 Image by the following drive letter: Image by the size: sectors Drive Attributes Image by the following drive letter: Image by the size: Image by the following drive letter: Image by the size: sectors Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: Image by the size: Image by the following drive letter: Image by the size: <td< th=""><th>Partition geometry</th><th></th><th>22</th><th></th></td<>	Partition geometry		22	
Exact partition geometry Offset: G3 with size: 499649 Min offset: G3 space available: 499649 measured in: Mark Partition as Active Mark Partition as Active Volume Label: Far32 Allocation unit size Default OK Cancel Volume Label: Far32 Min off endet OK Cancel Ok Cancel Ok Nutre State Stat	Default partition geometry	etry		
Offset: 63 with size: 499649 Min offset: 63 63 space available: 499649 measured in: megabytes sectors: Mark Partition as Active Volume Label: File System: FAT32 OK Cancel cessing completed	Size, MB: 2	43 Maximum: 243 MB		
Min offset: 63 space available: 499649 measured in: C megabytes S sectors Drive Attributes Assign the following drive letter: H: Mark Partition as Active Format Partition Volume Label: File System: FAT32 Allocation unit size Default Perform a quick format OK Cancel Cessing completed S New partition has been created successfully	C Exact partition geomet	'y		
Min offset: 63 space available: 499649 measured in: C megabytes S sectors Drive Attributes Assign the following drive letter: H: Mark Partition as Active Format Partition Volume Label: File System: FAT32 Allocation unit size Default Perform a quick format OK Cancel Cessing completed S New partition has been created successfully		and a second provide a second se		
measured in: C megabytes S sectors Drive Attributes Assign the following drive letter: H: T Mark Partition as Active Format Partition Volume Label: File System: FAT32 Allocation unit size Default Perform a quick format OK Cancel Cancel Mark Partition has been created successfully	10 N	10 Miles		
Drive Attributes Assign the following drive letter: H: Mark Partition as Active Format Partition Volume Label: File System: Allocation unit size: Default Default Default OK Cancel Cessing completed Cessing comp			sectors	
Assign the following drive letter: H: Mark Partition as Active Format Partition Volume Label: File System: FAT32 Allocation unit size Default OK Cancel Cessing completed Wew partition has been created successfully			100000000000000000000000000000000000000	
Mark Partition as Active Format Partition Volume Label: File System: FAT32 Allocation unit size Default OK Cancel Cessing completed New partition has been created successfully	Drive Attributes			
Format Partition Volume Label: File System: FAT32 Allocation unit size Default Image: Completed Solution has been created successfully				
Volume Label: File System: Allocation unit size Default Image: Perform a quick format OK Cancel cessing completed Wew partition has been created successfully	Mark Partition as Active	j		
OK Cancel	Volume Label: File System: Allocation unit size	Default	N N	
cessing completed Image: Second structure Image: Second structure		mac.		
New partition has been created successfully		ОК	Cancel	
New partition has been created successfully	cessing completed			
₩ ₩	in the second se	16 18 16-18		
	New partition has be	en created successfully		
	3 (1)			
Details >> Close this dialog when execution completes Close	Details >>	C class this distant to a second	an annalaban	Close



• Right click again and choose format, Click OK, finished (see Figure 80)

Format		×	
Volume Label:	<u></u>		
File System:	FAT	•	
Allocation unit size	Default	•	
🔽 Perform a quic	k format		
	ОК	Cancel	
Processing completed		_	×
Partition has b	een formatted successful	lly	
12. A			Close

Figure 80

 Go to C:\WINCE600\OSDesigns\Twister_LCD_7inch" and open the folder "TAM_3517_ARMV4I_release" (See Figure 81). The folder contains files named: MLO, EBOOTSD.nb0, NK.bin

(These files	are needed	for a	bootable	SD-card)
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📑 文件						
● 音樂						
📑 視訊 📄 圖片						
🌉 電腦						
🏭 本機磁碟 (C:)						
🦲 本機磁碟 (D:) 👝 本機磁碟 (E:)						
📬 網路						



- <u>First</u> copy "MLO" to the microSD card (the order is important)
- Then copy "EBOOTSD.nb0" and "NK.bin" in the microSD card (See Figure 82)
- Remove the MicroSD card

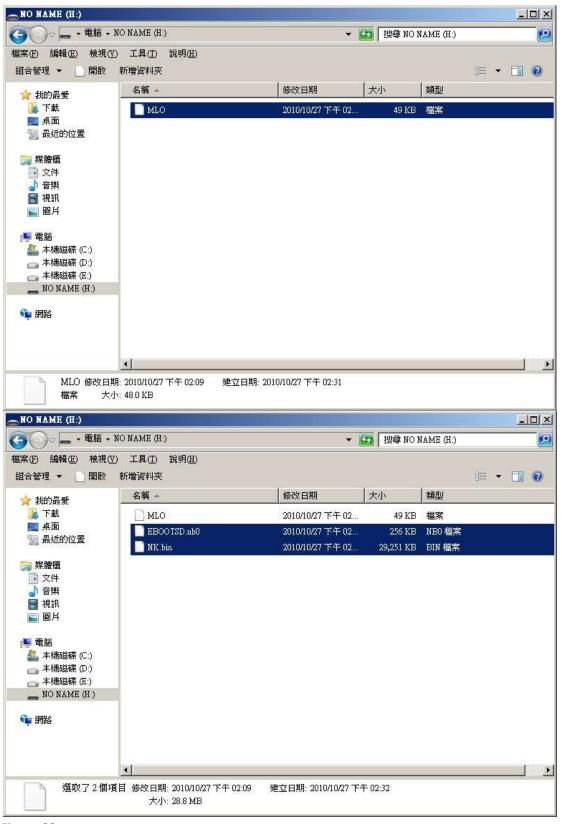


Figure 82

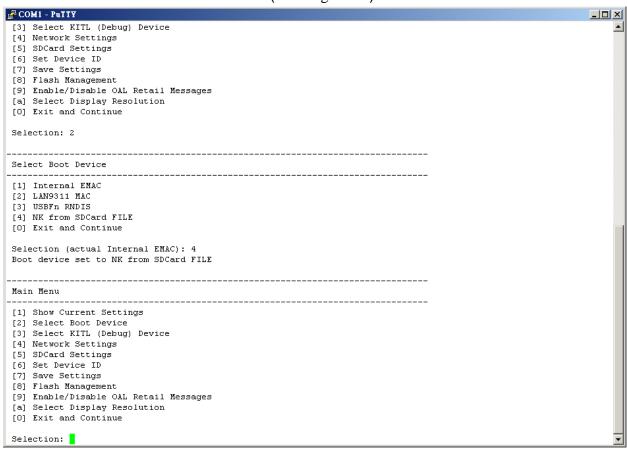
- Open a terminal (Hyperterminal or PuTTY). In this manual we use PuTTY.
- Make sure the terminal cable is connected
- Select a com port (for example COM1) and check that the settings are OK:

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

- Press "Load"
- Now insert the microSD in your Baseboard
- Insert the power cable
- The baseboard 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 83) •

Recomi - Putty	
TI AM3517 Version 0x0 (Hawkeye 0xb868 / manufacturer ID 0x17) System ready! Preparing for download INF0: Predownload	
WARN: Boot config wasn't found, using defaults INFO: SW4 boot setting: Ox2f	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<< Hit space to enter configuration menu 5 Hit space to enter configuration menu 4 Hit space to enter configuration menu 3	
Main Menu	
<pre>[1] Show Current Settings [2] Select Boot Device [3] Select KITL (Debug) Device [4] Network Settings [5] SDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Management [9] Enable/Disable OAL Retail Messages [a] Select Display Resolution [0] Exit and Continue Selection: 2</pre>	
Select Boot Device	
 [1] Internal EMAC [2] LAN9311 MAC [3] USBFn RNDIS [4] NK from SDCard FILE [0] Exit and Continue 	
Selection (actual Internal EMAC):	





• Select NK from SD Card FILE (See Figure 84)



- Select Exit and Continue
- It will start to load the image into the memory (see Figure 85) and the base board will show Windows CE.
- FINISHED

RCOM1 - PuITY	<u>- 0 ×</u>
[6] Set Device ID	
[7] Save Settings [8] Flash Management	
[0] Flash Hanagement [9] Enable/Disable OAL Retail Messages	
[a] Select Display Resolution	
[0] Exit and Continue	
Selection: D	
Selection: 0 Init HW: controller RST	
SDCARD: regested speed 1000000, actual speed 1000000	
SDHC: command response timeout CTO!	
MMC::MMCCommandResponse: MMCSendCommand error, command = 8	
MMC::MMCCommandResponse: Command Response Error	
Card size is = 499712 512 byte sectors	
SDCARD: reqested speed 25000000, actual speed 19200000 BLSDCardReadLogo: cannot open Logo.bmp	
Turning on the LCD.	
Turning on the LCD.	
BL_IMAGE_TYPE_BIN	
Download file information:	
[0]: Address=0x80002000 Length=0x01d05a2c Save=0x80002000	
Download file type: 1	
ImageStart = 0x80002000, ImageLength = 0x1D05A2C, LaunchAddr = 0x80010E70	=0x0.
Completed file(s):	
[0]: Address=0x80002000	
ROMHDR at Address 80002044h	
Launch Windows CE image by jumping to 0x80010e70	
Windows CE Kernel for ARM (Thumb Enabled) Built on Nov 3 2010 at 07:30:04	
****Profiler Build****	
High Performance Frequency is 12999914 hz	
	-



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 make a SD-card that will put the image in the NAND Flash so you can boot without the SD card.

12.5.1 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\TAM3517_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).
- First copy only the "MLO" file to the SD card. (the order is important) See Figure 86)
- Then copy "EBOOTSD.nb0", "fldr.raw" or "fldrlogo.raw" and "nk.nb0" files to the SD card. (see Figure 87)
- 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. 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 88)

NO NAME (H:)					_1012
	IO NAME (H:)	÷.	🕢 搜尋 NO N	IAME (H:)	<u></u>
當案(E) 編輯(E) 檢視(V) 組合管理 ▼ _ 開取) 工具(I) 說明(H) 新增資料夾				H · 🔟 📀
🙀 我的最愛	名稱一	修改日期	大小	類型	
🚺 下載	MLO	2010/10/27 下午 02	49 KB	檔案	
📰 点面 🗐 最近的位置					
□ 媒體櫃 □ 文件					
III → 音樂					
▋ 視訊					
▶ 圖片					
🌉 電腦					
🏭 本機磁碟 (C:) 👝 本機磁碟 (D:)					
📑 本機磁碟 (E:)					
NO NAME (H:)					
📬 網路					
	•				
MLO 修改日期	: 2010/10/27 下午 02:09 🛛 🕅	建立日期: 2010/10/27 下午 02:31			

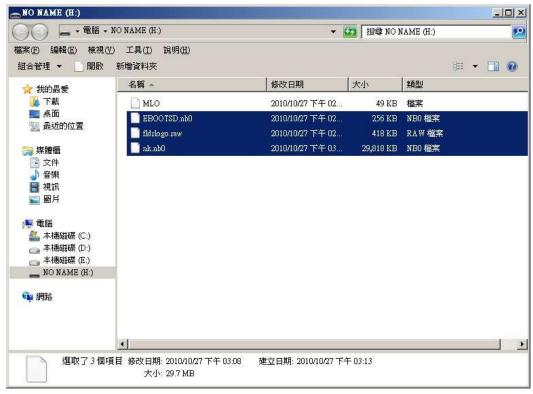


Figure 87

COMI - PATTY	
SDHC: command response timeout CTO!	
MBC::MBCCommandResponse: MBCSendCommand error, command = 8	
NHC:: NNCCommandResponse: Command Response Error	
Card size is = 499712 512 byte sectors	
SDCARD: regested speed 25000000, actual speed 19200000	
read ebootsd.nb0 file	
jumping to ebooted image	
Microsoft Windows CE Bootloader Common Library Version 1.4 Built Jul 20 2011 14:32:59	
Texas Instruments Windows CE EBOOT for AM35x, Built Jul 20 2011 at 14:38:58	
EB007 Version 1.2, BSP 1.00.00.14	
TI AND517 Version 0x0 (Nawkeye 0xb868 / manufacturer ID 0x17)	
System ready:	
Preparing for download	
INFO: Predownload,	
VARN: Boot config wasn't found, using defaults	
IMFO: SW4 boot setting: Dx2f	
>>> Forcing cold hoot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Kain Benu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings	
[6] Set Device ID	
[7] Save Settings	
[8] Flash Hanagement	
[9] Enable/Disable OAL Retail Messages	
[4] Select Display Resolution	
[0] Exit and Continue	
Belection:	-

• Chose "Flash Management". (See Figure 89)

PCOM1 - PuTTY	
INFO: Predownload WARN: Boot config wasn't found, using defaults INFO: SW4 boot setting: Ox2f	<u> </u>
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<< Hit space to enter configuration menu 5 Hit space to enter configuration menu 4	
Main Menu	
 [1] Show Current Settings [2] Select Boot Device [3] Select KITL (Debug) Device [4] Network Settings [5] SDCard Settings [6] Set Device ID [7] Save Settings [8] Flash Management [9] Enable/Disable OAL Retail Messages [a] Select Display Resolution [0] Exit and Continue Selection: 8 	
Flash Management [1] Show flash geometry	
[2] Dump flash sector [3] Erase flash	
 [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from SDCard to flash 	
[9] Write NK image from SDCard to flash [0] Exit and Continue	
Selection:	



- Chose "Show flash geometry". (See Figure 90)
- It will show:

Flash Type:	NAND
Blocks:	4096
Bytes/block:	131072
Sectors/block:	64
Bytes/sector:	2048

- Chose "Erase block range". (See Figure 91)
- It will show "First Block Number:" Input "0". Then enter.
- It will show "Last Block Number:" Input "(Blocks 1)". For example "4096-1=4095", so type 4095 then enter.
- It will show "Do you want erase block 0-4095 [-/y]?" Input "y" (See Figure 92) (You might need to repeat this step, until all blocks are erased)

🚰 COM1 - PuTTY	- D ×
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector [3] Erase flash	
[4] Erase block range [5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[7] Format Flash [8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[9] Write WK Image from Socard to Flash [0] Exit and Continue	
[0] Exit and continue	
Selection: 1	
Flash Type: NAND	
Blocks: 4096	
Bytes/block: 131072	
Sectors/block: 64	
Bytes/sector: 2048	
reserved] 0 1 2 3 4 5 pone	
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
_	
Selection:	-



CON1 - PATTY	.10
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erape flash	
4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 1	
Flash Type: NAND	
Blocks: 4096	
Bytes/block: 131072	
Sectors/block: 64	
Sytes/sector: 2048	
Tan Kasa Anto Isu Inda Kasimata Angeria	
[reserved] D 1 2 3 4 5 Done Flash Management	
Flash Management	
Flash Management	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Remerve block range	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set End block	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Remerve block range [6] Set had block [7] Formar fleeb	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set had block [7] Yornar flash [6] Write bootboader from Weigrd to flash	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [9] Write bootloader from Steard to flash [9] Write NK image from Steard to flash	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set had block [7] Yornar flash [6] Write bootboader from Weigrd to flash	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set End block [7] Format flash [9] Write bootloader from Steard to flash [9] Write NK image from Steard to flash	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Remerve block range [6] Set had block [7] Format flash [8] Write bootloader from SECard to flash [9] Write NK image from SECard to flash [9] Write NK image from SECard to flash [0] Exit and Continue	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Remerve block range [6] Set had block [7] Fornat flash [8] Write bootLoader from SECard to flash [9] Write bootLoader from SECard to flash [9] Write NK image from SECard to flash [0] Exit and Continue	
Flash Management [1] Show flash geometry [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [9] Write bootLoader from Stard to flash [9] Write NN image from SDCard to flash [9] Write NN image from SDCard to flash [9] Exit and Costinue Selection: 4	

🖉 СОНІ - ТАТТУ	
[3] Krase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 1	
Flash Type: MAND	
Blocks: 4096	
Bytes/block: 131072	
Sectors/block: 64	
Bytes/sector: 2048	
[reserved] 0 1 2 3 4 5 6 7 8 9 10 11 Done	
Flash Management	
[1] Show flash prometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range	
[6] Set bad block	
[7] Format flash	
[8] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 4	
First Block Number: 0	
Last Block Number: 4095	
Do you want erase block 0-4095 [-/y]? y	
Do you want to erase reserved block D [-/y] 7	-

- Chose "Write Bootloader from SD-Card to flash". (See Figure 93)
- It will show "Do you want to write Bootloader to flash [-/y]?" Input "y"
- Then it will show "Bootloader Image written". (See Figure 94)

<u>a</u> cor	41 - PuTTY
	Done
Flas	h Management
	Show flash geometry
	Dump flash sector
	Erase flash
	Erase block range
	Reserve block range
	Set bad block
	Format flash
	Write bootLoader from SDCard to flash
	Write NK image from SDCard to flash
[0]	Exit and Continue
	ction: 8
CH 1	

TAM-3517 USER'S GUIDE 097

Bassa		
🚰 COM1 - PuTTY		
	: 0x4001c001	<u>-</u>
Physical First		
-	: 0x40206158	
Num Modules	: 1	
RAM Start	. 0x40209000	
RAM Free	: UX4UZUBUUU	
RAM End		
Num Copy Entries		
Copy Entries Offset	: 0x40205a68	
Prof Symbol Length	: 0x0000000	
Prof Symbol Offset	: 0x0000000	
	: 0	
Kernel Flags	: 0x0000000	
FileSys RAM Percent	: 0x80808080	
Driver Glob Start	: 0x0000000	
Driver Glob Length	: 0x0000000	
	: 0x01c2	
MiscFlags	: 0x0002	
Extensions	: 0x0000000	
Tracking Mem Start	: 0x0000000	
Tracking Mem Length	: 0x0000000	
BootLoader Image writt	en	
Flash Management		
[1] Show flash geomet		
[2] Dump flash sector		
[3] Erase flash		
[4] Erase block range		
[5] Reserve block ran	ge	
[6] Set bad block		
[7] Format flash		
[8] Write bootLoader	from SDCard to flash	
[9] Write NK image fr	om SDCard to flash	
[0] Exit and Continue		
Selection:		



- Take the microSD card out of the Baseboard.
- Reboot from NAND Flash by pushing the reset button on the baseboard (See Figure 95)
- It will make a partition and format and then show "Flash format complete!"

R COMI - PUTTY	
CreatePartition: Start = 0x1, Num = 0x5fff.	
Log2Phys: Logical 0x1 -> Physical 0x301	
WriteMBR: MBR block = Oxc.	
IsValidMBR: MBR sector = 0x300 (valid MBR)	
OpenPartition: Partition Exists=0x0 for part 0xb.	
CreatePartition: Enter CreatePartition for Oxb.	
FindFreeSector: FreeSector is: 0x6000 after processing part 0x20.	
CreatePartition: Num sectors set to 0x39a80 to allow for compaction blocks.	
CreatePartition: Start = 0x6000, Num = 0x39a80.	
Writemer: Mer block Oxc.	
Flash format complete!	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Hit space to enter configuration menu 3	
Hit space to enter configuration menu 2 Hit space to enter configuration menu 1	
OALFlashStoreOpen: 4096 blocks, 64 sectors/block	
OALFlashStoreOpen: 2056 bitocks, 64 Sectors, 12 reserved blocks	
Turning on the LCD.	
Turning on the LCD.	
Automagociation failed. Check the ethernet cable	
ERROR: Boot device driver Init call failed	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	_
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[9] Select Display Resolution	
[0] Exit and Continue	
Selection:	•

- Put the microSD card back into the baseboard. Unplug the power and insert the power again (=reboot from SD Card) (See Figure 96), or push the reset button.
- When it shows "Hit space to enter configuration menu". Please push space button on the keyboard.

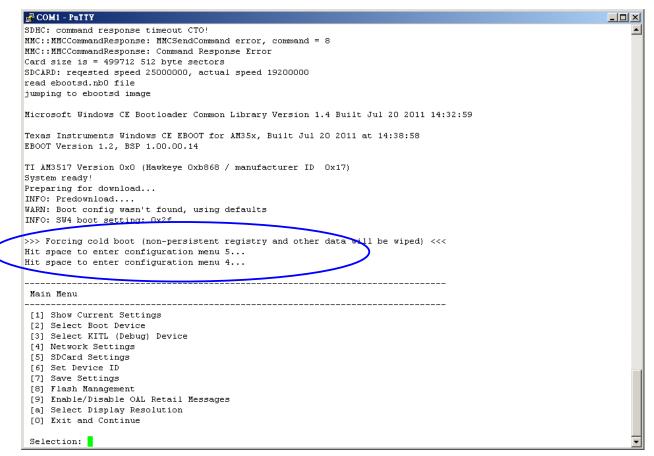


Figure 96

- Chose "Flash Management". (See Figure 97)
- Chose "Write NK image from SD-Card to flash". (See Figure 97)
- It will show "Do you want to write NK image to flash [-/y]?" Input "y".
- Wait until it will show "NK image written". (See Figure 98)

de COM1 - PuTTY	
WARN: Boot config wasn't found, using defaults	
INFO: SW4 boot setting: 0x2f	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Hit space to enter configuration menu 4	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] SDCard Settings [6] Set Device ID	
[7] Save Settings	
[8] Flash Management	
[9] Enable/Disable OAL Retail Messages	
[a] Select Display Resolution	
[0] Exit and Continue	
Selection: 8	
Flash Management	
[1] Show flash geometry	
[2] Dump flash sector	
[3] Erase flash	
[4] Erase block range	
[5] Reserve block range [6] Set bad block	
[7] Format flash	
[0] Write bootLoader from SDCard to flash	
[9] Write NK image from SDCard to flash	
[0] Exit and Continue	
Selection: 9	
Do you want to write NK image to flash [-/y]?	-

🛃 COM1 - PuTTY		
RAM End : 0	×8f800000	
Num Copy Entries :		-
Copy Entries Offset : 0		
Prof Symbol Length : 0		
Prof Symbol Offset : 0		
Num Files :		
Kernel Flags : 0		
FileSys RAM Percent : 0		
Driver Glob Start : C	x0000000	
Driver Glob Length : 0	x0000000	
CPU :	0x01c2	
MiscFlags :		
Extensions : 0		
Tracking Mem Start : 0		
Tracking Mem Length : 0	x0000000	
og2Phys: Logical Ox1 -> NK image written	raysical basis	
Flash Management		_
		-
[1] Show flash geometry.		
[2] Dump flash sector		
[2] Dump flash sector [3] Erase flash		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range 		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block 		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash 		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from 		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from [9] Write NK image from 		
 Show flash geometry Dump flash sector Erase flash Frase block range Reserve block range Set bad block Format flash Write bootLoader from Write NK image from Exit and Continue 		
 [2] Dump flash sector [3] Erase flash [4] Erase block range [5] Reserve block range [6] Set bad block [7] Format flash [8] Write bootLoader from [9] Write NK image from 		

12.5.2 Boot from NAND flash.

- Take the MicroSD Card out of 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 99)

ظ ^R COM1 - PuTTY	
Texas Instruments Windows CE NAND X-Loader for AM35x	L
Built Jul 20 2011 at 14:39:05	
Version BSP_WINCE_ARM_A8 1.00.00.14	
 Jumping to bootloader	
Microsoft Windows CE Bootloader Common Library Version 1.4 Built Jul 20 2011 14:32:59	
Texas Instruments Windows CE EBOOT for AM35x, Built Jul 20 2011 at 14:38:41 EBOOT Version 1.2, BSP 1.00.00.14	
TI AM3517 Version OxO (Hawkeye Oxb868 / manufacturer ID Ox17) System ready!	
Preparing for download	
INFO: Predownload	
Checking bootloader blocks are marked as reserved (Num = 12)	
WARN: Boot config wasn't found, using defaults	
INFO: SW4 boot setting: 0x2f	
IsValidMBR: MBR sector = 0x300 (valid MBR)	
OpenPartition: Partition Exists=0x1 for part 0x20.	
>>> Forcing cold boot (non-persistent registry and other data will be wiped) <<<	
Hit space to enter configuration menu 5	
Main Menu	
[1] Show Current Settings [2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[9] Select Display Resolution	
[0] Exit and Continue	
Selection:	

PuTTY		
Network:		
KITL state:		_
	enabled	
KITL type:	active	
KITL mode:	interrupt	
DHCP:	enabled	
IP address:		
IP mask:	0.0.0.0	
IP router:		
	MAC Addr: 00:1f:7b:15:06:90	
	MAC Addr: 00:1f:7b:15:06:91	
VMINI:		
Note: USBFN R	NDIS MAC Addr cannot be changed.	
Main Menu		
[1] Show Curre		
[2] Select Boo		
	L (Debug) Bevice	
[4] Network Se	ccings	
[5] Flash Mana	gement	
[6] Set Device	ID	
[7] Save Setti	ngs	
[8] Enable/Dis	able OAL Retail Messages	
[9] Select Dis	play Resolution	
[0] Exit and C	ontinue	
Selection: 2		
Select Boot De	vice	
[1] Internal E	MAC	
[2] LAN9311 MA		
[3] USBFn RNDI		
[4] SDCard FIL		
[5] NK from NA		
[0] Exit and C		
[0] ENTO dild o		
Selection (act	ual Internal EMAC):	_
Serection (acc	uar Incelhar Enacy.	

Figure 100: Chose "Select Boot Device".

COMI - PuTTY	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages [9] Select Display Resolution	
[0] Exit and Continue	
Selection: 2	
Select Boot Device	
[1] Internal EMAC	
[1] INCELNAI EMAC [2] LAN9311 MAC	
[3] USBFn RNDIS	
[4] SDCard FILE	
5] NK from NAND	
[0] Exit and Continue	
Selection (actual Internal EMAC): 5	
Boot device set to NK from NAND	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device[4] Network Settings	
[4] Network Settings [5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[9] Select Display Resolution	
[0] Exit and Continue	
Selection:	

Figure 101: Then chose "NK from NAND"

COM1 - PuTTY	<u>_ D</u>
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable OAL Retail Messages	
[9] Select Display Resolution	
[0] Exit and Continue	
Selection: 2	
Select Boot Device	
[1] Internal EMAC	
[2] LAN9311 MAC	
[3] USBFR RNDIS	
[4] SDCard FILE	
[5] NK from NAND [0] Exit and Continue	
of Exit and continue	
Selection (actual Internal EMAC): 5	
Boot device set to NK from NAND	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
6] Set Device ID	
6] Set Devise ID [7] Save Settings	
[6] Set Devise ID [7] Save Settings [8] Enchle/Dischle Off Retail Messages	
[6] Set Devise ID [7] Save Settings [6] Enable/Disable Oxf. Retail Messages [9] Select Display Resolution	
6] Set Devise ID [7] Save Settings [8] Enchle/Dischle OML Retail Messages [9] Select Display Resolution	
[3] radio management [6] Sat Braisge ID [7] Save Settings [8] Enchle/Disable Oan Retail Messages [9] Select Display Resolution [0] Exit and Continue Selection: 7 Do you want save current settings [-/y]?	

Figure 102 : Select save settings

PCOM1 - PuTTY	
[4] SDCard FILE	_
[5] NK from NAND	
[0] Exit and Continue	
Selection (actual Internal EMAC): 5	
Boot device set to NK from NAND	
Main Menu	
[1] Show Current Settings	
[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	
[7] Save Sectings [8] Enable/Disable OAL Retail Messages	
[9] Select Display Resolution	
[9] Exit and Continue	
[0] Exit and continue	
Selection: 7	
Do you want save current settings [-/y]? y	
Current settings has been saved	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
[3] Select KITL (Debug) Device	
[4] Network Settings	
[5] Flash Management	
[6] Set Device ID	
[7] Save Settings	
[8] Enable/Disable O&L Retail Messages	
[9] Select Display Resolution	
[0] Exit and Continue	
Selection:	

Figure 103 : Confirm selection "y"

g ^g COM1 - PuIIY	
[1] Internal EMAC	
[2] LAN9311 MAC [3] USBFn RNDIS	
[4] SDCard FILE [5] NK from NAND	
[5] NK From WAND [0] Exit and Continue	
[0] Exit and continue	
Selection (actual Internal EMAC): 5	
ot device set to NK from NAND in Menu Show Current Settings Select Boot Device Select KITL (Debug) Device Network Settings Flash Management	
Main Menu	
[1] Show Current Settings	
[2] Select Boot Device	
3] Select KITL (Debug) Device	
[4] Network Settings	
5] Flash Management	
[6] Set Device ID	
77 Save Settings	
[6] Enable/Disable OAL Retail Messages	
91 Select Display Resolution	
0] Exit and Continue	
Selection: O	
LFlashStoreOpen: 4096 blocks, 64 sectors/block	
MLFlashStoreOpen: 4096 blocks, 64 Sectors/block MLFlashStoreOpen: 2048 bytes/sector, 12 reserved blocks	
Ining on the LCD.	
urning on the LCD.	
fining on the Leb.	
oad NK image from flash memory	
sValidMBR: MBR sector = 0x300 (valid MBR)	
penPartition: Partition Exists=0x1 for part 0x20.	
P_SetDataPointer at 0x0	
adData: Start = 0x0, Length = 0x1000.	
pg2Phys: Logical 0x1 -> Physical 0x301	
adData: Start = 0x1000, Length = 0x1d02388.	
og2Phys: Logical 0x3 -> Physical 0x303	

Figure 104: Chose "Exit and Continue".

2

Figure 105: Now it will start booting WinCE.

• FINISHED.

12.6 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 the "write bootloader and OS in NAND <u>paragraph</u>" 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.

12.6.1 Preparing the BMP

• You will need to prepare a BMP with your logo. However the logo needs to be flipped vertical (see Figure 106)



Figure 106

- This can be done with for instance Photoshop (Use: edit \ transform \ flip vertical)
- Place the flipped BMP at the following directory: C:\WINCE600\PLATFORM\TAM3517\FILES
- The final result on your display will be as below (see Figure 107)



Figure 107

12.6.2 Change the makefile.inc

- Open a text editor (for instance Notepad)
- Open makefile.inc, which is in the directory: C:\WINCE600\PLATFORM\ TAM3517\SRC\BOOT\XLDR\NAND
- Change the orange part in the following line with the name of your BMP: Copy /b \$(_TGT)\TIEVM3517-nand.raw + \$(_FILES)\TechNexion.bmp \$(_TGT)\TIEVM3517-nand-logo.raw
- Save makefile.inc in the same directory

12.6.3 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 is800x480 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 108)

📓 Calc	ulator					
<u>E</u> dit ⊻ie	w <u>H</u> elp					
					11	79648.
OHex	O Dec O Oc	st 🔘 Bin	 Degrees 	🔘 Radians	🔘 Grad	s
🗖 Inv	Нур		Back	space (æ	С
Sta	F-E () MC	78	9	/ Mod	And
Ave	dms Exp	In MR	4 5	6	* Or	Xor
Sum	sin x^y	log MS	1 2	3	· Lsh	Not
s	cos x^3	n! M+	0 +/-		+ =	Int
Dat	tan x^2	1/x pi	AB		DE	F

Figure 108

• The outcome in Hexadecimal will be 120000 (See Figure 109)

Calculator	
<u>E</u> dit <u>V</u> iew <u>H</u> elp	
	120000
Olec Oct OBin	Qword O Dword O Word O Byte
Inv Hyp	Backspace CE C
Sta F-E ()	1C 7 8 9 / Mod And
Ave dms Exp In M	IR 4 5 6 * Or Xor
Sum sin x^y log 🕨	15 1 2 3 · Lsh Not
s cos x^3 n!	1+ 0 +/ + = Int
Dat tan x^2 1/x	pi A B C D E F

Figure 109

12.6.4 Change image-cfg.h

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

C:\WINCE600\PLATFORM\TAM3517\SRC\INC

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

#define IMAGE_BOOTLOADER_BITMAP_SIZE 0x00120000

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

12.6.5 Compile

- Open Microsoft Visual Studio 2005
- Open your project (For example: Twister_LCD_7inch)
- Use the menu: Build\advanced build commands\clean sysgen
- You will now find a fldrlogo.raw in the following directory:

C:\WINCE600\OSdesigns\Twister_LCD_7inch\RelDir\TAm3517_ARMV4I_Relea se

12.6.6 Put in NAND

- Follow all the instructions in the "write bootloader and OS in NAND paragraph"
- Finished.

12.7 How to - Install applications in windows CE

12.7.1 What to do with CAB-files?

EABp.CAB - WinRAR (evaluation copy)					
<u> Eile C</u> ommands Tool <u>s</u> Fav <u>o</u> rites Optio <u>n</u> s <u>H</u> elp					
Add Extract To Test View Delete	Find Wizard	Info VirusScan			
💽 🚺 🔁 CABp.CAB - CAB archive, unpacked size 7,655	bytes				*
Name 🏠	Size	Packed Type	Modified	CRC32	
a		Folder			
SD2FD0.OSD	487	? File OSD	06-Oct-11 9:47		
SDRealS.exe	7,168	? Application	06-Oct-11 9:47		
		Total 7,655 byt	es in 2 files		.::

Figure 110: First extract a CAB-file on your PC (with for example WinRAR), then place them on a SD card or copy the files via Active Sync.

12.7.2 Installing with an SD card

Copy your files on a SD-card, then put the SD card in your board or HMI.



Figure 111: Open "my device"

TAM-3517 USER'S GUIDE 097

Eller Edit	XHLM - EO	Payoritins	0.00		11-					ж
Jadress To										*
D	D	0	0	2	D	9	D	D	₽	
Outa	Doclaterits and Settings	Mounties5 Volume	My Documents	Network	Program Files	Storage Card	Terro	Windows	Control Parad	
1.2.2.1										
									_	
# Start	IN Divis								3,2:31 FM	33

Figure 112 : Open "Storage card"

Elle Edit Yow Go Favoritos		
Address Storage Card		*
DECIFCO SCRews		
IOSECIFEO SERiouts	De .	
Stat Stange Cert		A 225 PM

Figure 113: Double click the executable file to start/ install

12.7.3 Installing with Active sync

Connect The USB-OTG on the board to a USB on the PC with a cable

😔 Microsoft Active	Sync	
<u>File View T</u> ools <u>H</u> el <mark>r</mark>	·	
Sync Stop Details	Explore Options	
WindowsCE		
Connected Synchronized		
Information Type	Status	
🔁 Files 🔅	Synchronized	

Figure 114: Microsoft Active Sync will detect the board, click on the explore button.

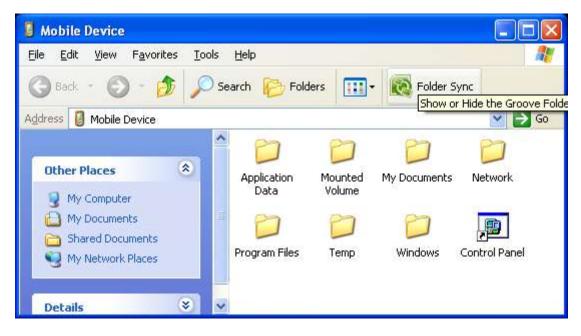


Figure 115: The explore window will pop up

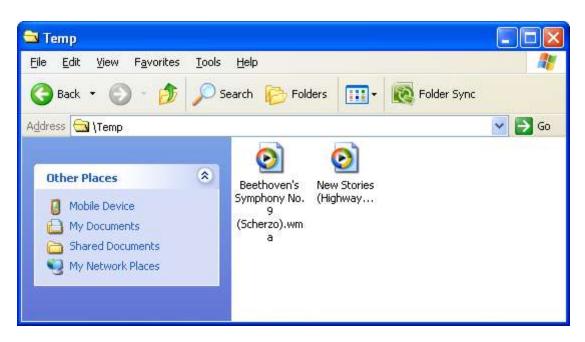


Figure 116: Copy your files into this explore window (in this example they are placed in the TEMP folder)

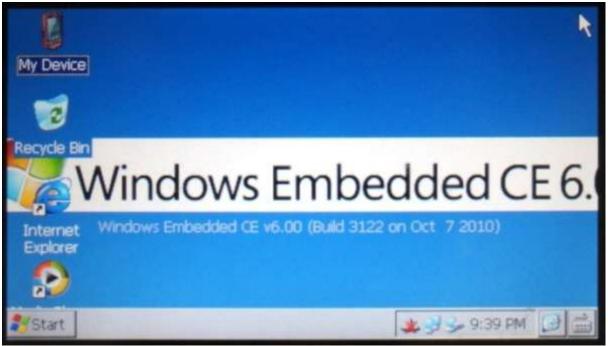


Figure 117 : Open "my device" on your board

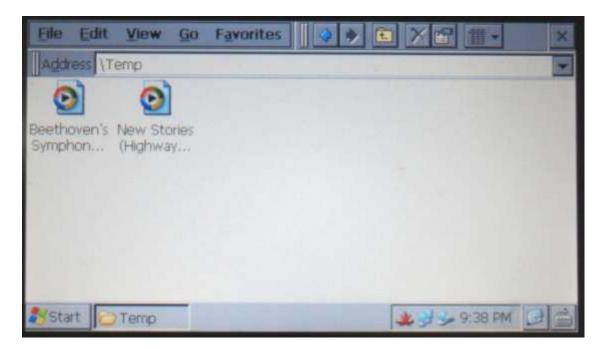


Figure 118: You will find the copied files. Executable files can be installed/ started with a double click

My Device 2 OK × SDI086861 cucie Be IP Information IPv6 Information Wireless Information Select a network and press connect or right-click for more options. To add a new network, double-click "Add New". I NAKAMA-02 . I NAKAMA-03 1 planexuser 6.0 TECHNEXION (preferred) . Connected to TECHNEKICN Status; Signal Strength: Excellent Notify me when new wireless networks are available Connect Advanced... View Log H 1 121 FM ANT BOODDANNES

12.8 How to - use the LAN cable instead of Wi-Fi

Figure 119: In the default setting the Wi-Fi is on.

	SDI086861	OK ×		
ecycle Bin	IP Information IPv6 Information Wireless Information			
Internet	Select a network and press connect or right-click for more options. To add a new network, double-click 'Add New'.			
Explorer	EWI-TAIPEI-DUNK EWI-TAIPEI-OFFICE			
ada Player 📃	i pames01		6.0	
	Status: Connected to TECHNEXION Signal Strength: Excellent	2.1		
	Notify me when new wireless networks are available			
Brograms	Connect Advanced View Log			
Fgrorites	No. 1998 The States of the States of			

Figure 120: To use the LAN cable, go to Start/settings/Control panel (or go direct to "Network and dial up Connections", see figure 4)

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Eile Viev	N	(17135	30 74 72	-	in the second		-		? ×
O Certificates	Date/Time	Dialog	Steplay Display	👮 Input Panel	9 Internet	Seyboard Keyboard	Mouse	Network and	Sale of the second seco	
29			0	0	Options	30		Dial-up Co		
Patrword	PC Connection	Regional Settings	Storage Manager	Stylus	System	Volume & Sounds				
		Re								19
#Start St	1066961		Cor	trol Panel		The second		3.	1. 1:22 PM	13

Figure 121: In the control panel chose the "Network and dial up Connections"

Eile Edit View Advanced	×町 ^a a と借	A REAL PROPERTY OF	? X
Make New S01086861 EMACI			1g
Start SD00e6e61	D-Control Panel	Network Connections	9 - 1:22 PM 0 =

Figure 122: The folder contains Wi-Fi (SDIO86861) and the LAN (EMAC1)

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Eile Edit View	w Advanced 🔀			? ×
3	1 91			
Make New 5010	Disable	>		
Connection	Set as Default			
	Desktop Shortbut Delete Rename			
The second	Properties			
1 11				
100				
Start Scecese	161	Control Panel	Network Connections	9 1 1 23 PM 3

Figure 123: To use the cable connection, disable the Wi-Fi (SDIO86861)

Eile Edi			7 ×
3	24 21		
Make New Connection	SDI006661		
Start	Control Panel	Network Connections	1.123 PM

Figure 124: Your HMI will now only use the LAN cable connection

To use the Wi-Fi again you will need to enable and reboot the HMI

Operation Operation	3	-										Eile View
Password PC Regional Storage Stylus System Volume &			1.000		Mouse	-		input Panel	Display		D	O Certificates
Password PC Regional Storage Stylus System Volume &				Pup co		30			0	-9	3	29
							System	1 Martin	Storage Manager			Password

Figure 125: open the control panel and click on "Display"

Eile Vo	ew.			112				15.121		? ×
O Certificate	o Date/Time	Dialog	Ceckely	input Panel	() Internet	Seyboard	Mouse	Network and	States Courses	
- Certificate	s Dates title	1106 14	CODAD)	angeot Plantes	Options	(a poor a c	(***)A	Dial-up Co	Series .	
B	323	2	3		123	30				
Password	PC. Connection	Display P	operties					ок ×		
	244 6 M22 004 1	Backgroun	d Appeara	ance Backlight						
		1								
			-	Window	Ember	Ichest CT 6	0			
100		120								
		1			-	1.5.				
		Image:	VindowsCE	<u> </u>	Browse		je on backg	round		

Figure 126: Display properties, go to the backlight tab

2012-01-16, TechNexion

Eile View	1	11.02	-	a labor		-		1111	-	? ×
0	-2	-	3	9	9	1	C	2	<u>8</u>	
Certificates	Date/Time	Cialing	Cisplay	Input Panel	Internet Options	Keyboard	Mouse	Network and Dial-up Co	Owner	
2	ging a	2	0	A	R.B	SO		ALCONTRACTORY A		
Password	PC Connection	Display Pr	operties					OK ×		
	544 C 104 S 101 T	Backgroun	d Appeara	nce Backlight						
		B		attery life, you ally shuts off.	can adjust v	when the backi	ght	13		
		[Daut		m off backlight	while on ha	ttery nower				
				15 i = and		nuous idle time				
1884				m off backlight	while on ex	ternal power				
		Tun	n off after [t minute	- of conti	nuous idle time	-			18.005
1		-								- 10
1.1										11021
1.										12
				-		11	12		12TAL	1000
#start	Control Panel		3.0	play Properties	1			-	1:28 PM	3

Figure 127: In the Standard Setting the backlight is always on,

Elle ⊻ie	w									?	×
Certificates	s Date/Time	Dialing	Skale Street	input Panel	Internet	Seyboard	Mouse	Network and	See		
2	3 ² 3	-9	3		Options	30		Dial-up Co			
Password	PC Connection	200	nd Appeara	ance Backlight	100 million (1997)			OK ×			
		and the second second	automatic tomatically tu	battery life, you ically shuts off. um off backlight	nt while on ba	attery power					
		Aut		urn off backlight	nt while on ex						
Start	Control Panel			Asplay Propertie	5			[1:28 PM		10

Figure 128: select the backlight

2012-01-16, TechNexion

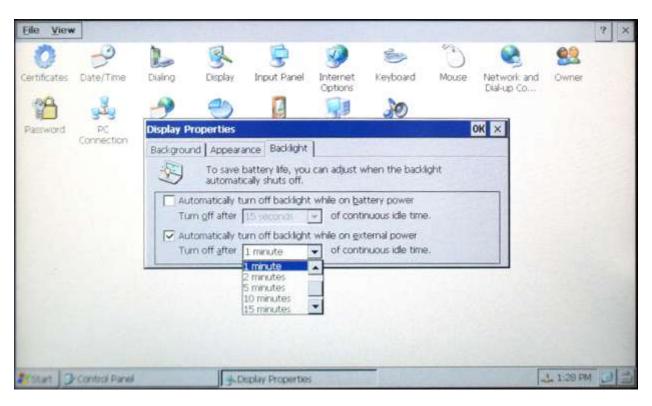
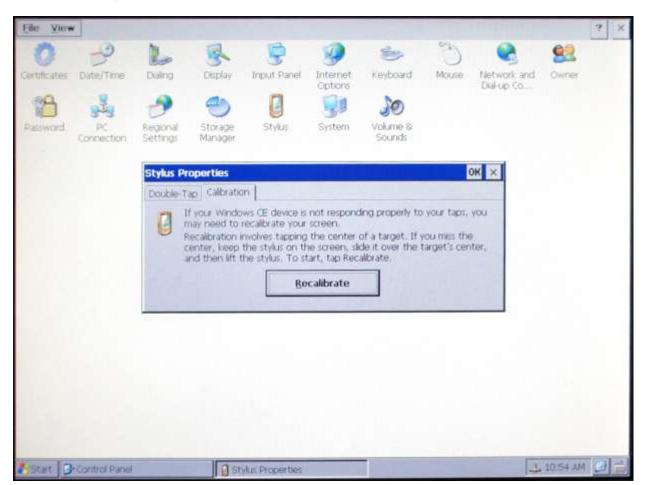


Figure 129: choose the time after which the display will turn off

Eile Vier	*	1000		122				Stor I and		? ×
0	-9	2	8	9	9	1	Ċ		22	
Certificates	s Date/Time	Dialing	Display	Input Panel	Internet Options	Keyboard	Mouse	Network and Dial-up Co	Owner	
28	uly se	-9	3		128	30		SHEED AND		
Password	PC Connection		Properties					ок ×		
		Backgrou		ance Backlight	10	A second second				
		S.		battery life, you ically shuts off.	i can adjust v	when the back	aght			
		and the second se		um off backlight	the second s					
			N	um off backlight	-		e.			
		and the second se		15 minutes			e.			
		L								
#rstart	Control Panis		140	Jisplay Propertie	6				1:28 PM	

Figure 130: select OK

12.10 How to - calibrate the touch screen in Windows CE



Insert a USB keyboard.

Figure 131: Open the Control Panel and double click Stylus

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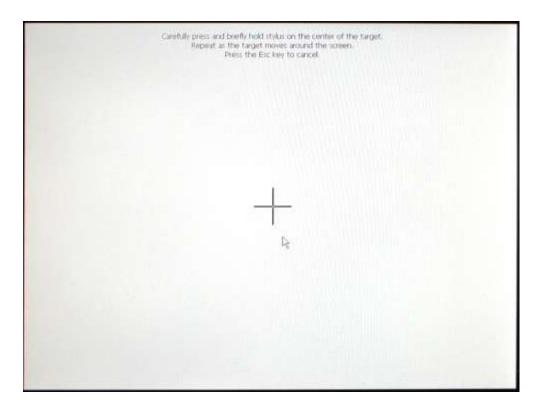


Figure 132: Touch the crosses that appear on the screen

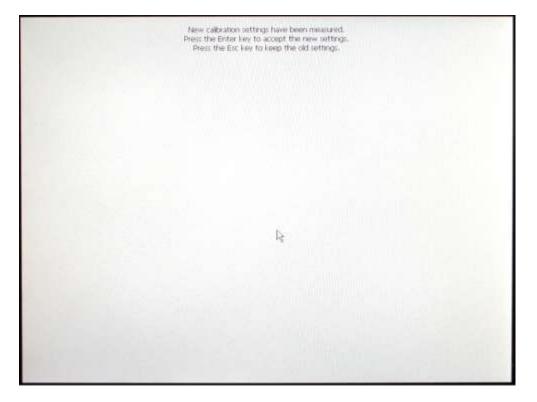


Figure 133: Press enter on the Keyboard.

13 Appendix – Module

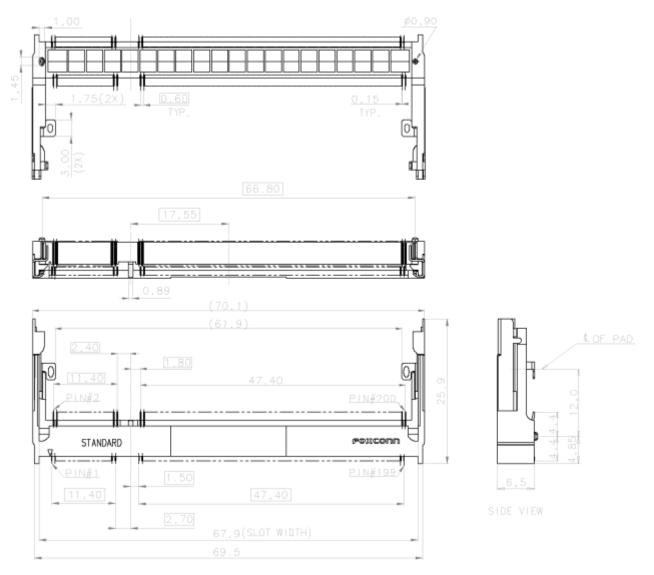
13.1 Module Connector DDR2 SO-DIMM

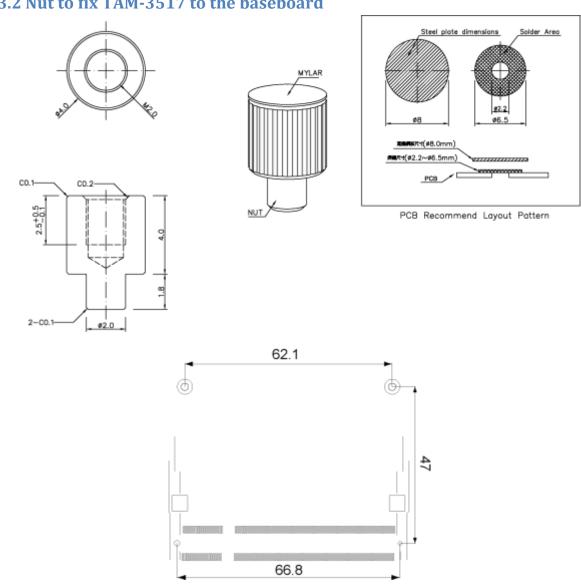
To mount the TAM-3517 module on the baseboard it is recommended to use a connector with the following specifications:

- DDR II SO-DIMM 200pin SMT
- Standard
- height 6.5 mm

For example Foxconn AS0A426-N6SN-4F or Tyco 5-1746530-4

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





13.2 Nut to fix TAM-3517 to the baseboard

Figure 134 : Placement of nuts and connector

Note 1: Always design the above mounting nut/pose on your custom baseboard and fasten the TAM-3517 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 sales@technexion.com, for assistance.

14 Appendix – Block Diagram

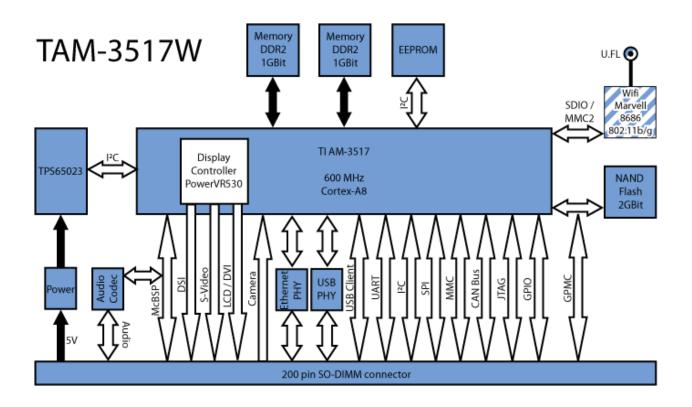
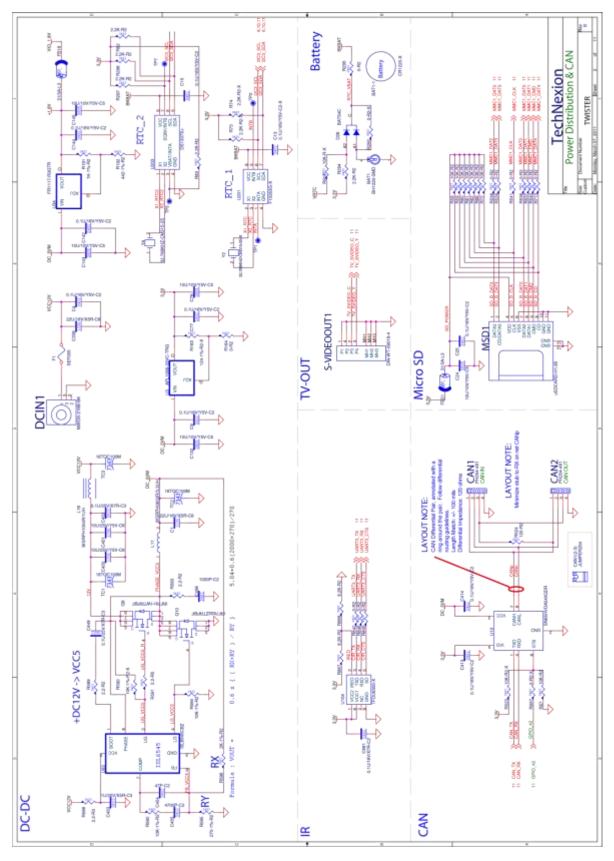


Figure 135 : TAM-3517 Block Diagram

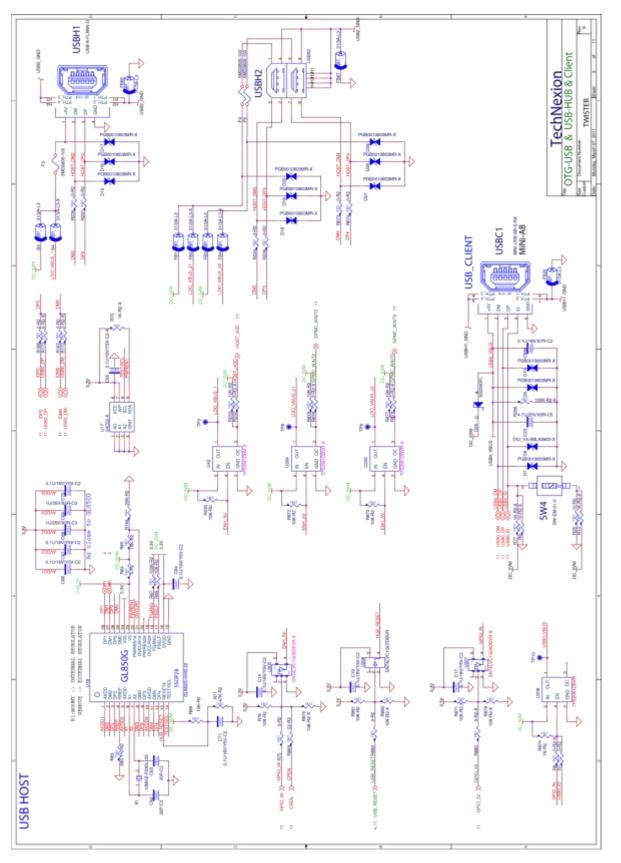
15 Appendix - Schematics

15.1 Twister baseboard schematics



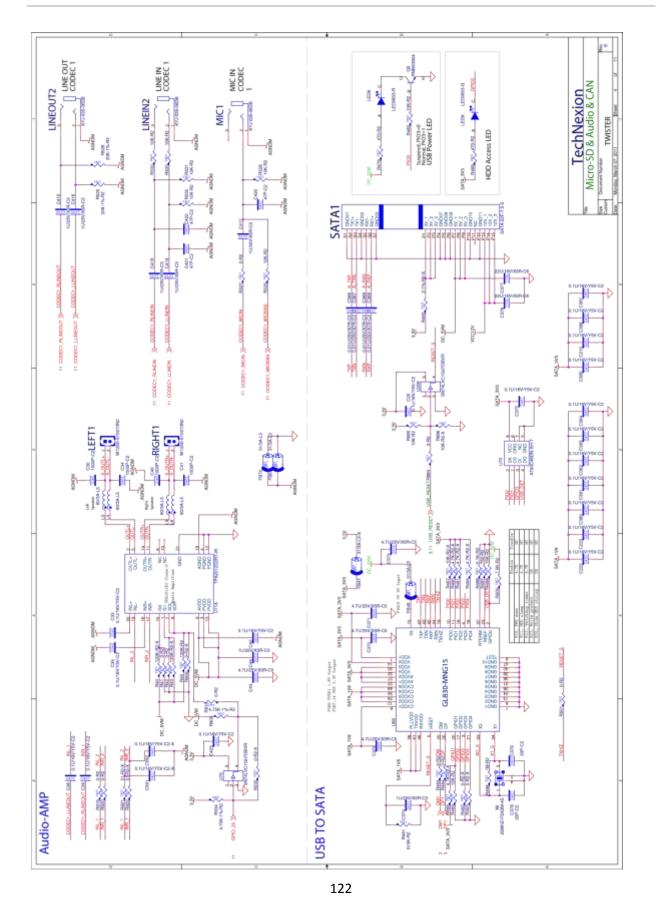


120

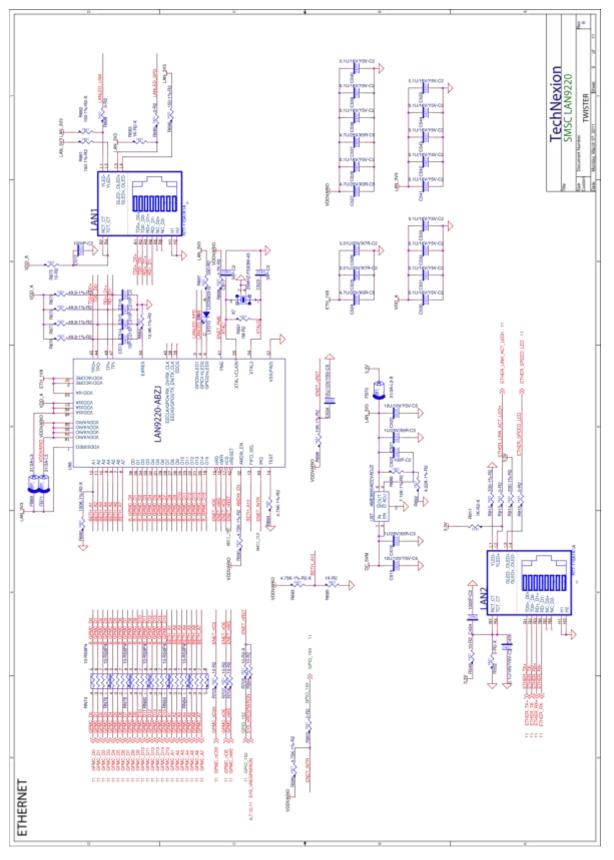


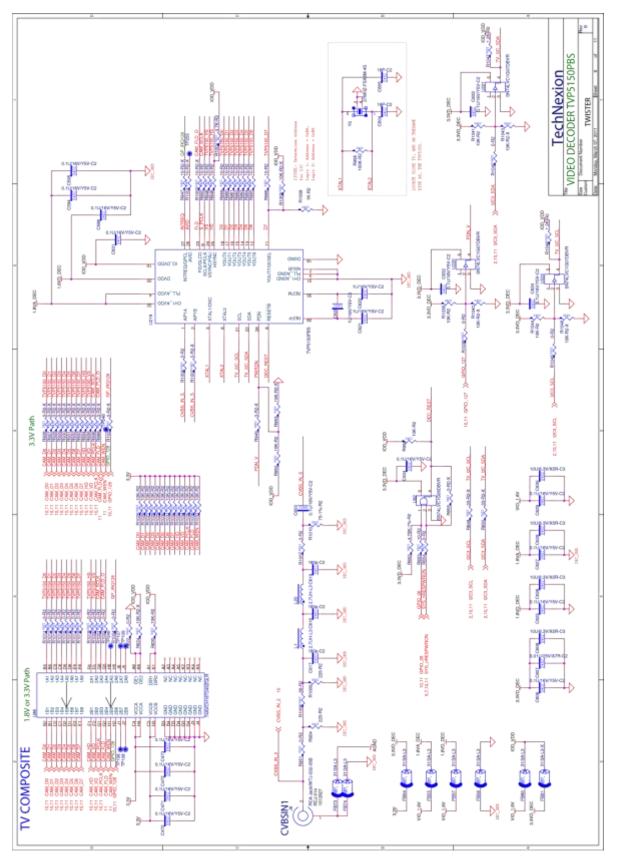
If you are designing your own baseboard then please contact sales@technexion.com for clear design files

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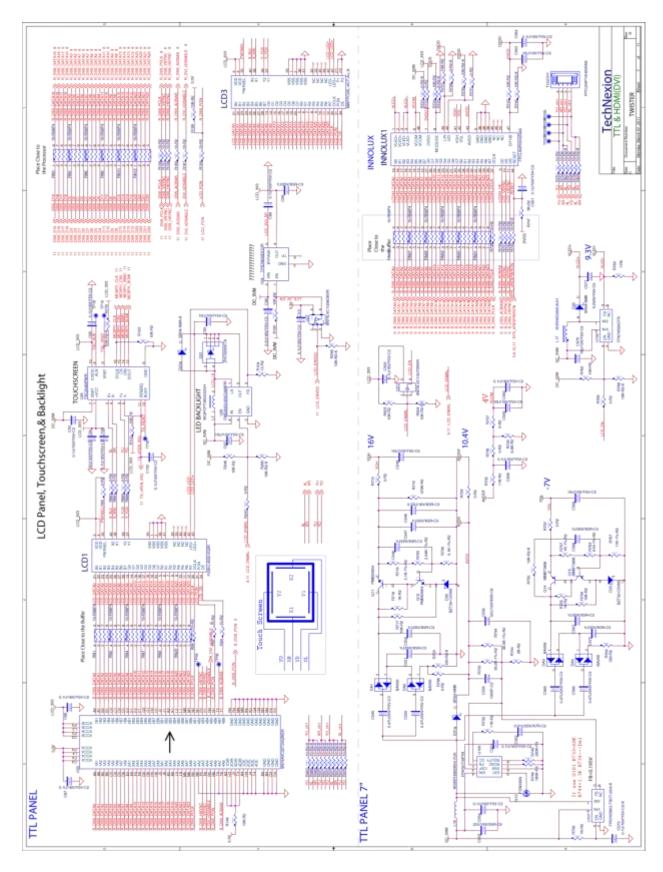
If you are designing your own baseboard then please contact <u>sales@technexion.com</u> for clear design files

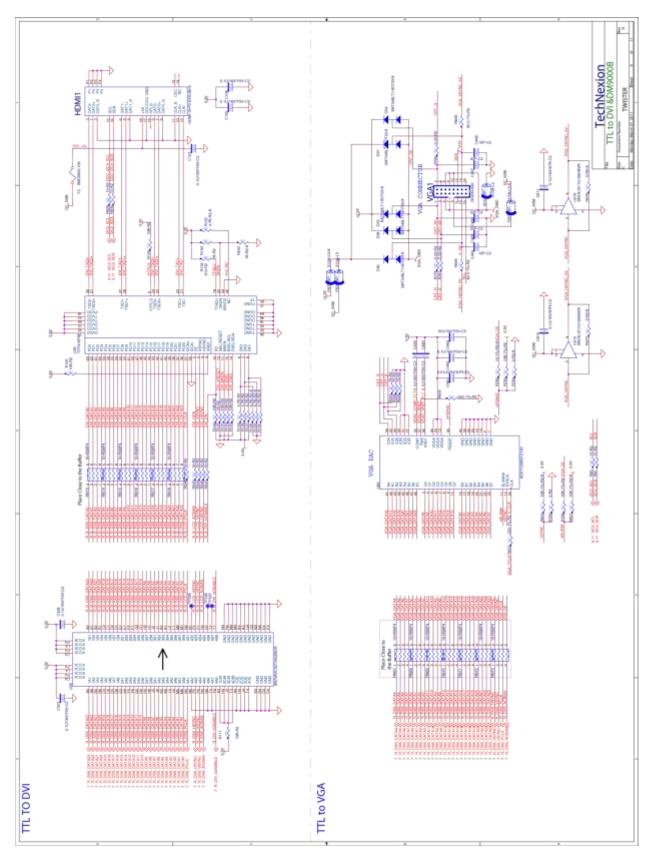




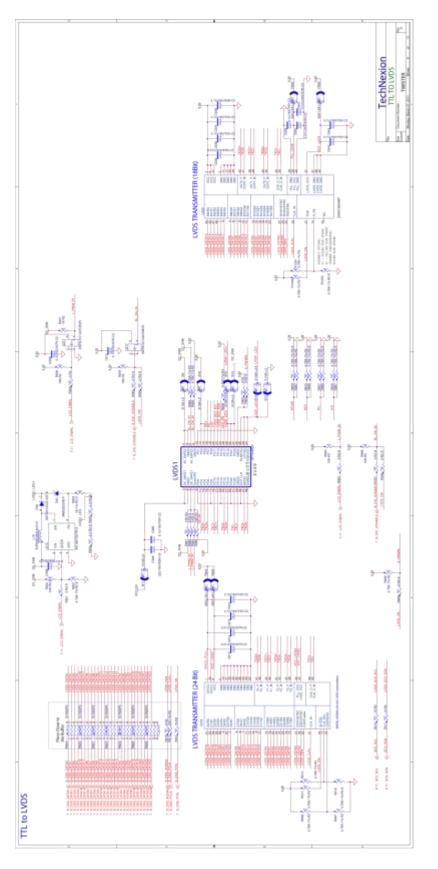
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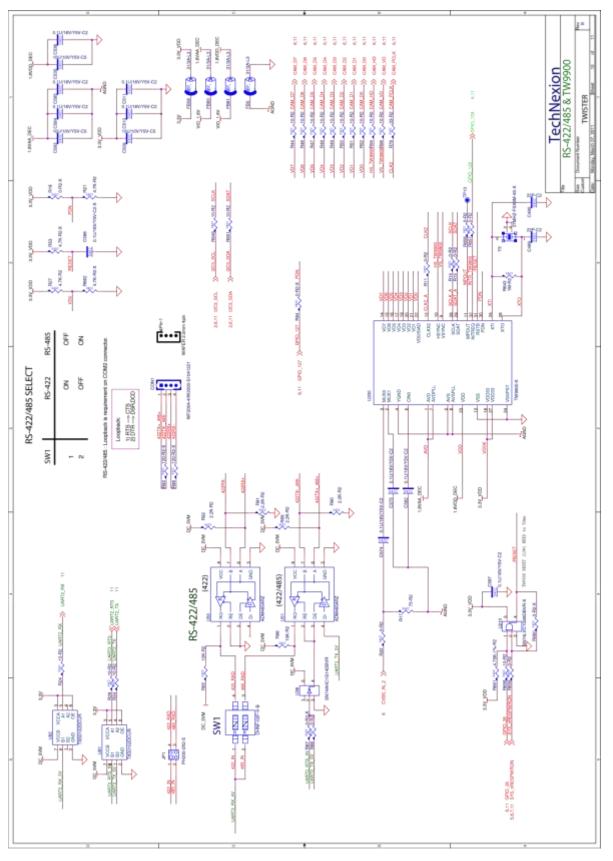


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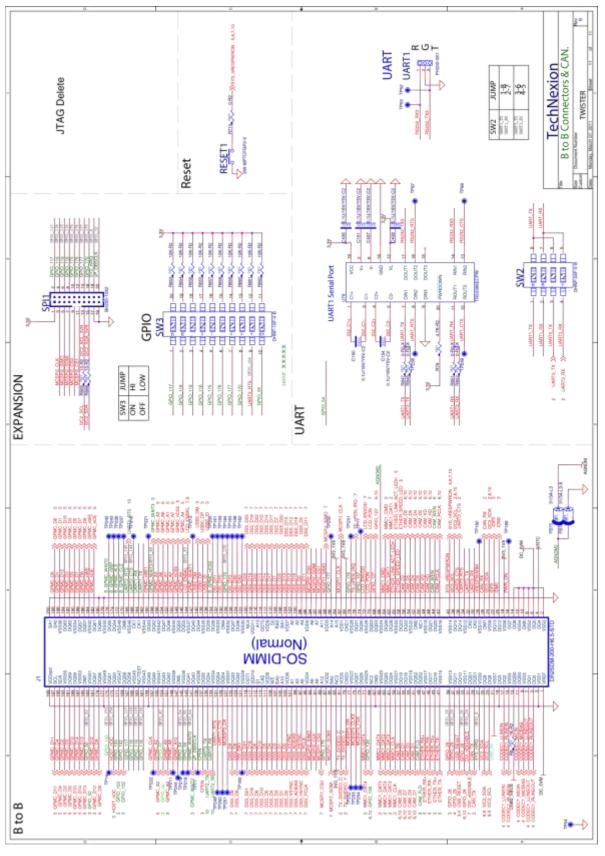


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127



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16 Appendix - Pin outs

16.1 Module connector

Pin 001	Pin 003		- 2	5		Pin 004	- Pin 002
Pin 005	Pin 007		1	- 8		- Pin 008	Pin 006
Pin 009	Pin 011		- 1	- S.		- Pin 012	Pin 010
Pin 013 -	Pin 015		-)	0		- Pin 016	Pin 014
Pin 017	Pin 019		(- Pin 020	Pin 018
Pin 021	Pin 023		2	0		- Pin 024	- Pin 022
Pin 025	Pin 027		- A.	- 2		- Pin 028	Pin 026
Pin 029	Pin 031		1		-	- Pin 032	- Pin 030
Pin 033	Pin 035		- N	1		- Pin 036	Pin 034
Pin 037	Pin 039	: 8	1	1		Pin 040	Pin 038
	1997			(843335	
Pin 041	0.010		F	2	-	Di- 044	- Pin 042
Pin 045	Pin 043	-	R	1	в	Pin 044	- Pin 046
Pin 049	Pin 047	-	ô)	6.0	A	Pin 048	- Pin 050
Pin 053	Pin 051	-	Ň (1	C	- Pin 052	Pin 054
Pin 057	Pin 055		T)	- (0)	ĸ	Pin 056	- Pin 058
Pin 061	Pin 059		S	20	s	Pin 060	- Pin 062
Pin 065	Pin 063		1)	- Q.,		Pin 064	- Pin 066
Pin 069	Pin 067	-	D	2.1	D E	Pin 068	- Pin 070
Pin 073	Pin 071		E)	- Q.		Pin 072	- Pin 074
Pin 077	Pin 075	-	1	- 1		Pin 076	- Pin 078
Pin 081	Pin 079	-	- 7	- V	and the second	- Pin 080	- Pin 082
Pin 085	Pin 083			6		Pin 084	- Pin 086
Pin 089	Pin 087	-	()		- Pin 088	Pin 090
Pin 093	Pin 091		- 0	0		- Pin 092	- Pin 094
Pin 097	Pin 095		- (2		- Pin 096	Pin 098
Pin 101	Pin 099		2	- Q		- Pin 100	- Pin 102
Pin 105	Pin 103		1	- 2		Pin 104	- Pin 106
Pin 109	Pin 107	-	1	- V		- Pin 108	- Pin 110
Pin 113	Pin 111			6	-	- Pin 112	- Pin 114
Pin 117	Pin 115		- 7	- Y		- Pin 116	- Pin 118
Pin 121	Pin 119			6		- Pin 120	- Pin 122
Pin 125	Pin 123	-	0)		- Pin 124	- Pin 126
Pin 129 -	Pin 127	- 8		(- Pin 128	- Pin 130
Pin 133	Pin 131	- 8	0	2		- Pin 132	- Pin 134
Pin 137 -	Pin 135		- 7	0		- Pin 136	- Pin 138
Pin 141	Pin 139	-	N	- 1		- Pin 140	- Pin 142
Pin 145	Pin 143	-	1	S		- Pin 144	- Pin 146
Pin 149	Pin 147			6		- Pin 148	- Pin 150
Pin 153	Pin 151		- 6			Pin 152	- Pin 154
Pin 157 -	Pin 155		0	0		Pin 156	- Pin 158
Pin 161	Pin 159		8)		- Pin 160	- Pin 162
Pin 165	Pin 163		-)	0		- Pin 164	- Pin 166
Pin 169	Pin 167			- 2		- Pin 168	Pin 170
Pin 173 -	Pin 171		1	- 2		- Pin 172	- Pin 174
Pin 177 -	Pin 175	-	- N	6		Pin 176	- Pin 178
Pin 181 -	Pin 179	-	0	1		Pin 180	- Pin 182
Pin 185 -	Pin 183			0		Pin 184	- Pin 186
Pin 189	Pin 187		()		Pin 188	- Pin 190
Pin 193 -	Pin 191	-	- 2	0		Pin 192	- Pin 194
Pin 197	Pin 195		1	1		Pin 196	- Pin 198
- 111 1 BY	Pin 199)		- Pin 200	Pin 199
DC 5V				2		DC 5V	
GND				4		VRTC	
CODEC1 RLIN	IFOUT			4 6		DC 5V	
CODLCT NLIN	1001			0			

1 3

_

5

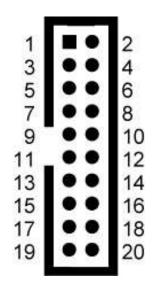
7	CODEC1 LLINEOUT	8	DC 5V
9	CODEC1 LLINEOUT	8 10	DC 5V
9 11	CODEC1 MICIN	10	DC 5V
13	USB0 VBUS	12	DC 5V
15	CODEC1_RLINEIN	14	PWR_ON
13	CODEC1_LLINEIN	10	3V3
19	GND	20	IDMO
21	USB_5V	20	IDPO
23	12C2_SCL	24	I2C3_SDA
25	12C2_SDA	24	CAN_RX
25	SYS_nIRQ	28	nRESPWARM
29	CAN_TX	30	UART3_RX
31	DVI_nDISABLE	32	UART3_TX
33	GPIO_26	34	UART3_RTS
35	USB_RESET	36	UART3_CTS
37	GPIO_29	38	I2C3_SCL
39	GPIO_28	40	SYS nRESPWRON
41	ETHER_TX-	42	CAM_PCLK
43	ETHER_TX+	44	CAM_WEN
45	ETHER_RX-	46	CAM_HD
47	ETHER_RX+	48	CAM_VD
49	CAM_FLD	50	CAM_D0
51	CAM_D1	52	CAM_D4
53	CAM_D3	54	CAM_D5
55	CAM_D7	56	CAM_D2
57	CAM_D6	58	ETHER_SPEED_LED
59	_ MMC1_CLK	60	ETHER_LINK_ACT_LEDn
61	 MMC1_DAT2	62	MMC1 DAT1
63	MMC1_DAT0	64	MMC1_CMD
65	MMC1_DAT3	66	AGND
67	GND	68	GPIO_127
69	GPIO_128	70	LCD_PON
71	MMC1_DAT4	72	LCD_ENVDD
73	MCBSP3_FSX	74	GPIO_137
75	MCBSP3_CLKX	76	TS_nPEN_IRQ
77	MCBSP3_DR	78	GPIO_176
79	TV_SVIDEO_Y	80	3V3
81	TV_SVIDEO_C	82	MCSPI1_CLK
83	3V3	84	3V3
85	MCSPI1_SOMI	86	GPIO_177
87	GPIO_175	88	MCSPI1_SIMO

89	MCSPI1_CSO	90	MCSPI2_CS1
91	MCSPI2_CLK	92	MCSPI2_SOMI
93	MCSPI2_SIMO	94	MCSPI2_CS0
95	DSS_PCLK	96	DSS_D11
97	DSS_HSYNC	98	DSS_D2
99	DSS_ACBIAS	100	DSS_D18
101	DSS_VSYNC	102	DSS_D12
103	DSS_D0	104	DSS_D13
105	DSS_D1	106	DSS_D20
107	DSS_D3	108	DSS_D7
109	DSS_D4	110	DSS_D17
111	DSS_D5	112	DSS_D14
113	DSS_D10	114	DSS_D15
115	DSS_D6	116	DSS_D22
117	DSS_D16	118	DSS_D19
119	DSS_D21	120	DSS_D23
121	DSI_DX1	122	DSI_DX2
123	DSS_D8	124	DSI_DX0
125	DSS_D9	126	DSI_DY2
127	MCBSP3_DX	128	GPIO_170
129	UART1_CTS	130	DSI_DY0
131	UART1_RTS	132	DSI_DY1
133	UART2_RX	134	B_GPMC_nCS0
135	UART2_TX	136	USB0_ID
137	CPEN	138	USB0_DP
139	uP_OBSCLK	140	USB0_DM
141	GPMC_WAIT2	142	GPMC_WAIT1
143	GPIO_55	144	LDC_ENBKL
145	GPIO_54	146	GPMC_A4
147	GPMC_A10	148	GPMC_nCS5
149	GPMC_A8	150	GPMC_A7
151	GPMC_A5	152	GPMC_A1
153	GPIO_42	154	GPMC_A6
155	GPMC_A2	156	GPMC_A3
157	GPMC_CLK	158	GPMC_WAIT3
159	GND	160	GPMC_nBE1
161	GPIO_116	162	UART1_TX
163	GPIO_119	164	UART1_RX
165	GPIO_118	166	UART2_CTS
167	GPIO_117	168	UART2_RTS
169	GPIO_152	170	B_GPMC_CLE

171	GPIO_153	172	B_GPMC_ALE
173	HOST_nOC	174	B_GPMC_nWP
175	GPIO_155	176	B_GPMC_WAIT0
177	GND	178	GND
179	GPMC_D9	180	GND
181	GPMC_D12	182	GPMC_nOE
183	GPIO_52	184	GPMC_nWE
185	GPMC_D13	186	GPMC_D8
187	GPMC_D14	188	GPMC_D7
189	GPMC_D10	190	GPMC_D5
191	GPMC_D0	192	GPMC_D3
193	GPMC_D2	194	GPMC_D15
195	GPMC_D4	196	GPMC_D1
197	GPMC_D11	198	GPMC_D6
199	GND	200	GND

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16.2 SPI1

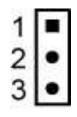


Marking on main board: SPI1

1	+3.3V	2	GPIO_117
3	MCSPI2_CLK	4	GPIO_118
5	MCSPI2_SIMO	6	GPIO_119
7	MCSPI2_SOMI	8	GPIO_116
9	MCSPI2_CS0	10	GPIO_175
11	MCSPI2_CS1	12	GPIO_176
13	I2C2_SCL_3V	14	GPIO_177
15	I2C2_SDA_3V	16	GPIO_170
17	GND	18	SYS_nIRQ
19	GND	20	uP_OBSCLK

NOTE: SPI1 @3.3V

16.3 UART 1/UART 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)

Switch between UART1 and UART3

1 🔲	⊢╓┲╖	118
2 🔲	~[Π7
з 🔲	ω [[]]	Ш 6
4 🔲		5

Marking on main board: SW2

1&2 on, 3&4 off

UART1 (debug port)

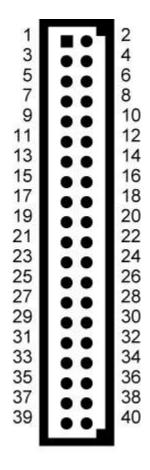
1&2 off, 3&4 on

UART3

16.4 Pin header for	VGA connector	 2 4 6 8 	
	9 11 13 15	 10 12 14 16 	
1	CRT_R	2	CRT_G X
3 5	CRT_B GND	4 6	GND
7	GND	8	GND
9	X	10	GND
11	Х	12	VGA_I2C3_SDA
13	VGA_HSYNC	14	VGA_VSYNC
15	VGA_I2C3_SCL	16	x

2012-01-16, TechNexion

16.5 LVDS connector



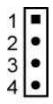
Data connector is 40 pin

Marking on main board: LVDS1

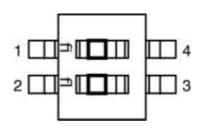
1	Vcc12V	2	DC_5VM
3	Vcc12V	4	DC_5VM
5	LCD Enable @5V	6	Backlight on @5V
7	LCD Enable @3.3V	8	Backlight on @3.3V
9	GND	10	GND
11	SEL68	12	3.3V
13	TXD0-	14	3.3V

15	TXD0+	16	REV
17	GND	18	R/L
19	TXD1-	20	U/D
21	TXD1+	22	LVDS_I2C_SCL
23	GND	24	LVDS_I2C_SDA
25	TXD2-	26	LED Enable @3.3V
27	TXD2+	28	LVDS_LED+ (Backlight Power +)
29	GND	30	LVDS_LED+ (Backlight Power +)
31	TXC-	32	LVDS_LED+ (Backlight Power +)
33	TXC+	34	LVDS Enable @3.3V
35	GND	36	LVDS_LED- (Backlight Power -)
37	TXD 3-	38	LVDS_LED- (Backlight Power -)
39	TXD 3+	40	LVDS_LED- (Backlight Power -)

16.6 RS-422/485 connector



- 1 422TX+ 485+
- 2 422TX- 485-
- 3 422RX+
- 3 422RX-

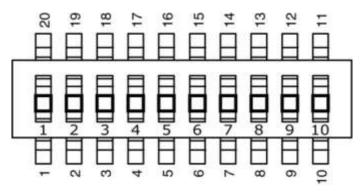


Marking on main board: SW1

1 on 2 off RS-422

2 on 1 off RS-485

16.7 GPIO Switch (SW3)



Marking on main board: SW3

4	3	2	1	Function: Display settings
Off	Off	Off	Off	Panel LG LB043WQ2 (4.3")
Off	Off	Off	ON	Panel Innolux AT070TN93 (7")
Off	Off	ON	Off	LVDS AUO-B089
Off	Off	ON	ON	DVI/ HDMI/ VGA 1280x720@60
Off	ON	Off	Off	TV out NTSC
Off	ON	Off	ON	TV out PAL
Off	ON	ON	Off	LVDS auo-g065vn01 with touch
Off	ON	ON	ON	LVDS auo-g121sn01 with touch
ON	Off	Off	Off	LVDS auo-g150xg01 with touch
ON	Off	Off	ON	LVDS auo-g070vw01 with touch
ON	Off	ON	Off	LVDS auo-g084sn05 with touch
ON	Off	ON	ON	LVDS auo-g104sn02 with touch
7	6	5		Function: System settings
Off	Off	Off		Linux Angstrom
Off	Off	ON		Android

2012-01-16, TechNexion

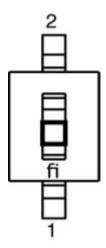
10	9	Function: Root file system path
Off	Off	NAND
Off	ON	MMC
ON	Off	NFS (remote server, default host IP 192.168.1.5, default server IP 192.168.1.4)(can change in u-boot)

16.7.1 Auto Update Procedure

It is possible to automatically update the system that is in the NAND Flash. Chapter 8 to 9 describes how to update.

8		Function: Auto update mode
Off		Normal operation
ON		Auto update from MMC

16.8 USB client/host Switch (SW4)



Marking on main board: SW4

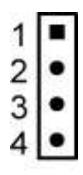
1 on

Host

1 off

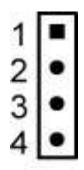
Client

16.9 CANBUS



CAN1 (CAN IN)

- 3 Read Back
- 4 GND



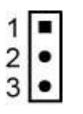
CAN2 (CAN OUT)

- 2 CAN Low
- 3 Read Back
- 4 GND

16.10 RS-232 Cable

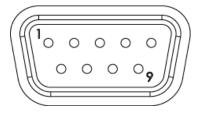


Accessory





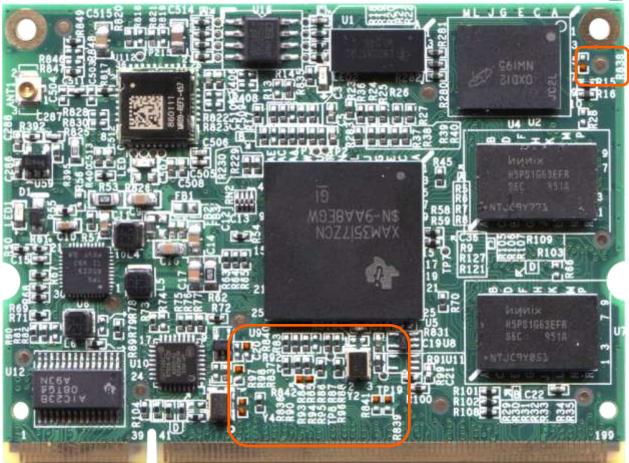
3





16.11 JTAG Solder Points





(Figure: tam-3517_revB) Solder at the orange pads

