

Quick Guide



Building Sabrelite Linux SDK Development
Environment and System Image

Exclusively from
element14

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1 Overview

Sabrelite SDK is a software development environment for Freescale Sabrelite Development Board. This quick guide mainly contains three parts:

- 1) Downloading SDK from Internet
- 2) Compiling SDK on a local PC
- 3) Running system image on Sabrelite

The part includes two methods by which different SDK packages can be obtained. The first is downloading the existing SDK package, the second is building a custom version of SDK online and then downloading it.

2 Downloading SDK Package

2.1 Downloading Existing Package

Please follow the steps listed below to download a default Freescale SDK from <http://www.timesys.com/>.

- 1) Access the homepage of <http://www.timesys.com/> and click **User LinuxLink FREE Register now** (the button marked with a red arrow in the figure shown below) on the right;

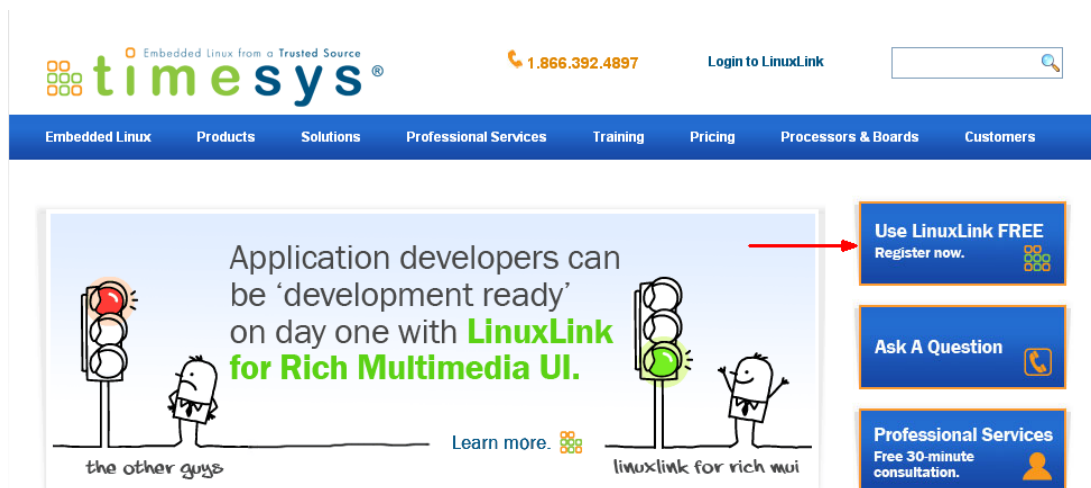


Figure 2-1 Timesys Website Homepage

2) Enter the information required on registration page;

Contact Info

First Name *


Last Name *

Title *

Phone *

Company *

Country *

Referred by 

Referring person / Company

Login Info

Email Address **Why should I provide a valid email address?**

Password *

Enter Password Again *

Agree to [Terms of Service](#) ☐

Your Board/Processor Info

Board you want to assemble Linux for *

Please contact us if you do not find the board you are looking for

Processor of Interest *

Figure 2-2 Timesys Registration Page

The items marked with “*” and the email address are required for registration. The table shown below contains brief descriptions of these items.

Table 2-1 Registration Information

Items	Descriptions
First Name	Enter your first name
Last Name	Enter your last name

Items	Descriptions
Title	Select a job title
Phone	Enter your phone number
Comany	Enter your company name
Country	Enter your county's name
Password	Enter a login password
Enter Password Again	Enter login password again
Agree to Terms of Service	Check it to agree the terms
Board you want to assemble Linux for	Select the name of your development board, which would be Freescale i.MX6Q SABRE-Lite here.
Processor of Interest	Select the name of the CPU, which would be Freescale i.MX6 here.

After all the required informtion are entered, click **Get Access Now** at the bottom of the page to finish registration, and then click **Login to LinuxLink** on the top-right of the page to login with your email address and password you previously entered.

- Click **Download BSP/SDK** (marked with a red arrow as shown below) in the navigation bar of the page;

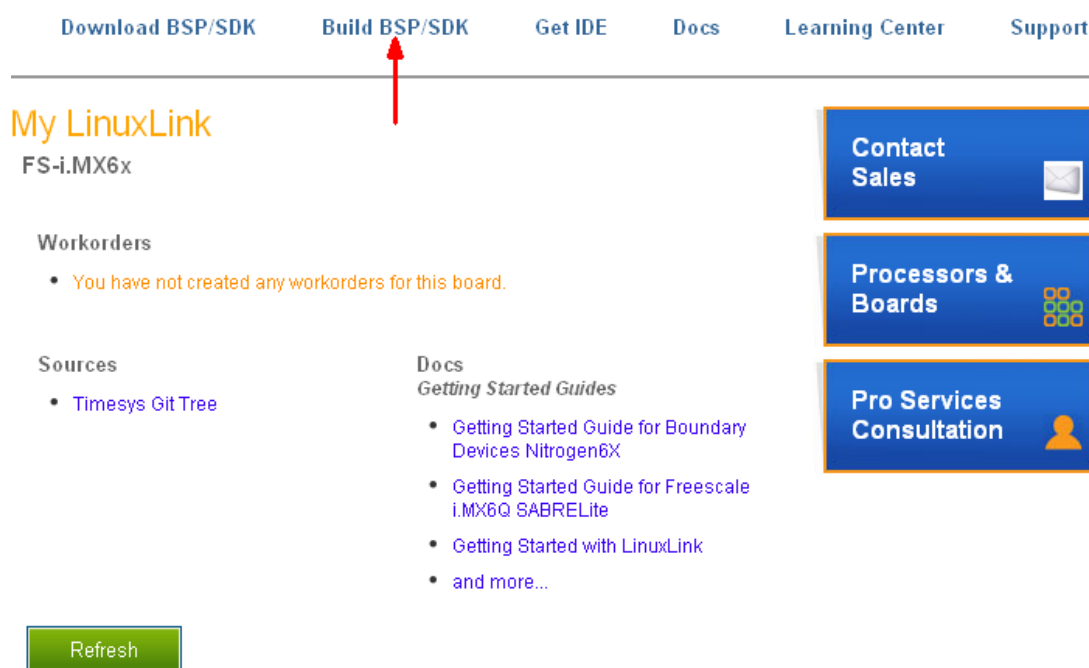


Figure 2-3 LoginTimesys

- 4) Click **i.MX6Q SABRE-Lite Small Footprint** (marked with a red arrow as shown below) in the following page;

Download BSP/SDK

FS-i.MX6x

Customized Builds

- There are no builds

Pre Built Starting Points

Freescale i.MX6 Boundary Devices Nitrogen6X

- [Nitrogen6X Video and Graphics Demo](#)

Freescale i.MX6Q SABRE-Lite

- [i.MX6Q SABRE-Lite Small Footprint](#) ←

Refresh

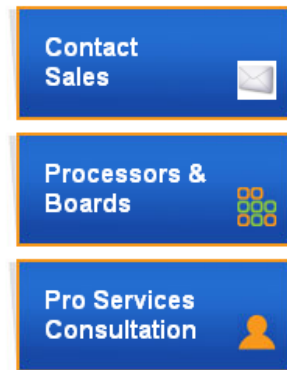


Figure 2-4 Download Page

- 5) Click the link (marked with a red arrow as shown below) next to **Download SDK installer** to download SDK package;

Downloads for Freescale i.MX6Q SABRE-Lite

This page lists the SDK installer which includes the Board Support Package (BSP) files for booting your board and setting up your host with tools for application development, and the Desktop Factory installer.

Build Summary

To view the kernel, toolchain, host tools and package versions included in the SDK, click on the build summary.

[View Build Summary](#) [Build Summary](#)

Boot your board or setup your application development host

To boot your board and/or setup your development machine, download the SDK installer that includes the custom BSP: bootloader, kernel, toolchain and root filesystem (RFS). Install the SDK by making the installer executable and then running the installer.

Download SDK installer [i.MX6QSABRELite-development-environment.sh \(md5\)](#) 213416 KB ←
Set executable permissions `chmod +x i.MX6QSABRELite-development-environment.sh`
Run the installer `./i.MX6QSABRELite-development-environment.sh`

After you have installed the SDK, refer to the Getting Started Guide, in order to setup your host and boot the board.

[Read Getting Started Guide](#) [Read Getting Started Guide for Freescale i.MX6Q SABRE-Lite](#)

Figure 2-5 Download SDK Package

Note:

The SDK package downloaded above only includes file system image, but not the tools and u-boot source code. You can display their download links by clicking **View All Files** at the bottom of the page.

2.2 Making a Custom SDK Online

Please follow the steps listed in this section to make a custom SDK on <http://www.timesys.com/>;

- 1) Access and login <http://www.timesys.com/>, and then click **Build BSP/SDK** in the navigation bar to enter project creation page as shown below;

Download BSP/SDK Build BSP/SDK Get IDE Docs Learning Center Support

Create a Project or Select an Existing Project

To get started, select Create a Project below, or click on an existing one from the project list, below.

Create a Project

Name	Description	Board	Created
------	-------------	-------	---------

Figure 2-6 Create a Project

Click **Create a Project** in the above page;

- 2) Enter information such as **Name** and **Description** in the following page and select **Freescall i.MX6Q SABRE-Lite** in the **Board** drop-down menu;

Create a Project

✚ Name

✚ Description

✚ Board

What's your Application?

☐ Networking Device

☐ Industrial Controller

☐ Multimedia

☐ Custom

☐ Other

Create Project Cancel

Figure 2-7 Enter Project information

Then click **Create Project** at the bottom of the page;

- 3) Click **Create a Workorder** in the following page;

Create a Workorder, Copy or Edit an Existing Workorder:

Project: Embest

Board: i.MX6QSABRElite


To continue, create a new workorder, edit an existing workorder by clicking on the workorder link, copy an existing workorder by clicking  below

Create a Workorder

Your workorders

Name	Description
You have not created any workorders for this project	

Timesys workorders

Name	Description
 i.MX6Q SABRE-Lite Small Footprint	Minimal Glibc and Busybox Workorder

Cancel

Figure 2-8 Create a Workorder

- 4) Enter the name of new workorder in the following page and click **Next**;

Create a Workorder for:

Project: Embest

Board: Freescale i.MX6Q SABRE-Lite

Workorder: New Workorder

≡ **Workorder Name**

Workorder Description

Next

Save

Cancel

Figure 2-9 Workorder Information

- 5) Select kernel version in the following page and click **Next**;

Select Kernel for:

Project: Embest

Board: Freescale i.MX6Q SABRE-Lite

Workorder: New Workorder

☒ 3.0-2 Kernel ↓ .config

Previous

Next

Save

Cancel

Figure 2-10 Select Kernel Version

- 6) Select a toolchain you need in the following page. The option **glibc Recommended** is recommended. Click **Next**;

Select Toolchain for:

Project: Embest

Board: Freescale i.MX6Q SABRE-Lite

Workorder: New Workorder

<input checked="" type="radio"/> glibc Recommended	glibc	2.15
	gcc	4.6.3
	binutils	2.22.52
	gdb	7.4.1
<input type="radio"/> glibc Custom	glibc	<input type="text" value=""/>
	gcc	<input type="text" value=""/>
	binutils	<input type="text" value=""/>
	gdb	<input type="text" value=""/>
<input type="radio"/> uClibc Recommended	uClibc	0.9.33.2
	gcc	4.6.3
	binutils	2.22.52
	gdb	7.4.1
<input type="radio"/> uClibc Custom	uClibc	<input type="text" value=""/>
	gcc	<input type="text" value=""/>
	binutils	<input type="text" value=""/>
	gdb	<input type="text" value=""/>

Previous

Next

Save


Cancel

Figure 2-11 Select Toolchain



7) Select software package in the table of the following page;

Which packages to select?

Just select the packages required for your application. We will select the package dependencies. If you are looking for a particular feature / package, use the search below to find the package.



☒ Deselect All

Viewing all packages

You Selected 0

Dependencies Selected 0

Total Selected 0

Packages Size (MB) 0.00

No Packages Selected

Email us if you cannot find the package or the package version you are looking for.

Select Packages for:

Project: Embest
Board: Freescale i.MX6Q SABRE-Lite
Workorder: New Workorder

Name	Version	License	Size (MB)	Build Options	Rationale
<input checked="" type="checkbox"/> Demo					
<input checked="" type="checkbox"/> Desktop					
<input checked="" type="checkbox"/> Development					
<input checked="" type="checkbox"/> Graphics					
<input checked="" type="checkbox"/> Multimedia					
<input checked="" type="checkbox"/> Networking					
<input checked="" type="checkbox"/> Runtimes					
<input checked="" type="checkbox"/> System					
<input checked="" type="checkbox"/> Utilities					

Figure 2-12 Select Package

Choosing a template in the **Select a template** drop-down menu in the left of the page can help you complete the selection of a bulk of functions with a single click, for example, you may select Busybox Init, Systemv Init and X Windows GUI for different packages;

Click **Next** at the bottom of the page;

Note: The default SDK requires **Busybox Init** to be selected. Additionally, the options fluidlauncher, qt-about-timesys, timesys-theatre-1080p and nitrogen6x-addons-tslib under **Demo** in the table and fsl-mm-aacpdec-codeclib, fsl-codec-full and libfslcodec under **Multimedia** are required as well.

- 8) Keep the default options unchanged in the following page and click **Next**;

Select Build Options for:

Project: Embest

Board: Freescale i.MX6Q SABRE-Lite

Workorder: New Workorder

Include native toolchain in the RFS?	<input type="checkbox"/>
Include Kernel in RFS?	<input type="checkbox"/>
RFS Image Format	<input checked="" type="radio"/> Tar Archive <input type="radio"/> JFFS2 <input type="radio"/> Cramfs <input type="radio"/> Squashfs <input type="radio"/> Initramfs
RFS Size Optimization	<input checked="" type="checkbox"/> Strip all libraries and binaries in the RFS <input checked="" type="checkbox"/> Remove Man Pages <input checked="" type="checkbox"/> Remove Info pages <input checked="" type="checkbox"/> Remove i18n, locale, and zoneinfo databases <input checked="" type="checkbox"/> Remove the /usr/doc and /usr/share/doc directories <input checked="" type="checkbox"/> Remove /usr/include directory <input checked="" type="checkbox"/> Remove all static files
Application Output Format	<input type="radio"/> Deb <input type="radio"/> RPM <input type="radio"/> Binary Tarball <input type="radio"/> IPKG <input checked="" type="radio"/> None

Previous

Next

Save

Cancel

Figure 2-13 Select Build Options

- 9) Click **Next** in the following page;

Advice for:

Project: Embest

Board: Freescale i.MX6Q SABRE-Lite

Workorder: New Workorder

Core Recommendations

- Busybox or the combination of bash and sysvinit are typically needed to produce a bootable platform. Timesys recommends **busybox**. Would you like to select **busybox**?

☐ Yes



Figure 2-14 Click **Next**

- 10) In the Workorder Summary page as shown below, all the contents of SDK can be modified; You can click **Save** at the bottom of the page to save the project, or click **Build** to start building custom SDK package; The building process may last for a while before it is finished and a notification email is sent to your email box by the website.

Workorder Summary for:

Project: Embest
Board: Freescale i.MX6Q SABRE-Lite
Workorder: New Workorder

General	
Name	New Workorder
Description	This is my new workorder
Edit	

Kernel Configuration	
Version	3.0-2 Kernel
Configuration	↓.config
Edit	

Toolchain	
C Library	glibc 2.15-1
Compiler	gcc 4.6.3-1
Binutils	binutils 2.22.52-1
Debugger	gdb 7.4.1-1
Native Toolchain	No
Edit	

Packages	
Updates	No updates available
Selected Packages	0 packages selected
Edit	

Build Output Options	
RFS Options	<ul style="list-style-type: none"> - Strip all libraries and binaries in the RFS - Remove Man Pages - Remove Info pages - Remove i18n, locale, and zoneinfo databases - Remove the /usr/doc and /usr/share/doc directories - Remove /usr/include directory - Remove all static files
RFS Estimated Size	0.00 MB
RFS Output Format	None
Package Output Format	Tar Archive
Edit	

Build Time	
Building this workorder will approximately take: 1 hour, 36 minutes, 29 seconds	

Looks like you have not followed all Timesys recommendations on the Advice page. We analyze your package selections and identify conflicts, incompatibilities and deficiencies. We advise you follow Timesys recommendations on the Advice page before starting a build, otherwise the build might fail or you may have runtime issues.

[Previous](#)
[Save](#)
[Build](#)
[Cancel](#)



Figure 2-15 Saving and Building SDK

- 11) After you receive the notification, please login www.timesys.com and click **Download BSP/SDK** in the navigation bar to enter the page as shown below;

Download BSP/SDK

FS-i.MX6x

Customized Builds

Name	Board	Build Date	Status	Actions
New Workorder	Freescale i.MX6Q SABRE-Lite	2013-01-23	Good	 

Pre Built Starting Points

Freescale i.MX6 Boundary Devices Nitrogen6X


- [Nitrogen6X Video and Graphics Demo](#)

Freescale i.MX6Q SABRE-Lite

- [i.MX6Q SABRE-Lite Small Footprint](#)

Refresh

Figure 2-16 Completed SDK

Click  to enter the next page;

- 12) Click the link next to **Download SDK installer** to download the custom SDK package (marked with a red arrow);

Downloads for Freescale i.MX6Q SABRE-Lite

This page lists the SDK installer which includes the Board Support Package (BSP) files for booting your board and setting up your host with tools for application development, and the Desktop Factory installer.

Build Summary

To view the kernel, toolchain, host tools and package versions included in the SDK, click on the build summary.

[View Build Summary](#) [Build Summary](#)

Boot your board or setup your application development host

To boot your board and/or setup your development machine, download the SDK installer that includes the custom BSP: bootloader, kernel, toolchain and root filesystem (RFS). Install the SDK by making the installer executable and then running the installer.

Download SDK installer [i.MX6QSABRELite-development-environment.sh \(md5\)](#) 210280 KB 
Set executable permissions `chmod +x i.MX6QSABRELite-development-environment.sh`
Run the installer `./i.MX6QSABRELite-development-environment.sh`

After you have installed the SDK, refer to the Getting Started Guide, in order to setup your host and boot the board.

[Read Getting Started Guide](#) [Read Getting Started Guide for Freescale i.MX6Q SABRE-Lite](#)

Figure 2-17 Downloading Custom SDK

3 Compiling SDK on PC

3.1 Installing SDK

- 1) Put the downloaded SDK package **i.MX6QSABRELite-development-environment.sh** under **/work** of user directory, and then install the package under Bash Shell environment of Linux system;

```
yanglsh@TIOP:~/work$ chmod a+x i.MX6QSABRELite-development-environment.sh
yanglsh@TIOP:~/work$ ./i.MX6QSABRELite-development-environment.sh
```

Note: The words in bold are the instructions need to be entered.

During the installation process, you need to press SPACE key on your PC's keyboard for many times and then type **Y** in the last stage to confirm the installation. The default installation directory is **\$HOME/timesys**;

- 2) The following instructions can be used to view the SDK files which have been installed in the system;

```
yanglsh@TIOP:~/work$ cd $HOME/timesys
yanglsh@TIOP:~/timesys$ ls -l i_MX6QSABRELite/
total 3684
drwxr-xr-x 2 yanglsh yanglsh 4096 2012-12-17 03:58 bootloader
drwxr-xr-x 3 yanglsh yanglsh 4096 2012-12-17 04:41 kernel-source
drwxr-xr-x 2 yanglsh yanglsh 4096 2013-01-10 15:34 rfs
drwxr-xr-x 12 yanglsh yanglsh 4096 2013-01-10 15:34 toolchain
-rw-r--r-- 1 yanglsh yanglsh 3750792 2013-01-10 15:34 ulmage-3.0-ts-armv7l
```

A precompiled u-boot can be found under **bootloader** directory; The recompiled Linux kernel is named **ulmage-3.0-ts-armv7l**;

- 3) Now enter the following instruction to put the path of cross compiler into the path list.

```
yanglsh@TIOP:~/timesys$ export PATH=$PATH:$HOME/timesys/i_MX6QSABRELite/toolchain/ccache:$HOME/timesys/i_MX6QSABRELite/toolchain/bin
```

3.2 Compiling SDK

3.2.1 Compiling u-boot

Please following the steps listed below to accomplish the compilation of u-boot.

- 1) Click **View All Files** at the bottom of the page as shown in the above Figure 2-17, and then click **source/** (marked with a red arrow) in the new page as shown below;

factory Embest-1 files:/output (Completed) (Good)


Name	Last Modified	Size (kb)
[parent directory]		0
BUILD-SUMMARY.txt (md5)	2013-01-23 13:10:08	3
bootloader/	2013-01-23 13:10:48	0
factory.tar.gz (md5)	2013-01-23 13:10:07	6597
i.MX6QSABRELite-development-environment.sh (md5)	2013-01-23 13:09:05	210065
i.MX6QSABRELite-factory-installer.sh (md5)	2013-01-23 13:10:32	102815
index.html (md5)	2013-01-23 13:10:33	4
packages/	2013-01-23 13:12:22	0
rootfs.tar.gz (md5)	2013-01-23 13:09:16	6939
sources/ 	2013-01-23 13:11:36	0
toolchain-final-armv7l-timesys-linux-gnueabi.tgz (md5)	2013-01-23 13:09:11	97892
toolchain-initial-armv7l-timesys-linux-gnueabi.tgz (md5)	2013-01-23 13:09:16	97884
ulmage-3.0-ts-armv7l (md5)	2013-01-23 13:09:16	3663
workorder (md5)	2013-01-23 13:09:16	78

Figure 2-18 Viewing All Files

- 2) Click **u/** (marked with a red arrow) in the following page;

factory Embest-1 files:/output/sources


Name	Last Modified	Size (kb)
[parent directory]		0
b/	2013-01-23 13:11:36	0
c/	2013-01-23 13:11:23	0
device_table	2013-01-23 13:09:19	3
e/	2013-01-23 13:11:15	0
f/	2013-01-23 13:10:53	0
g/	2013-01-23 13:11:35	0
i/	2013-01-23 13:10:53	0
k/	2013-01-23 13:11:15	0
l/	2013-01-23 13:10:52	0
m/	2013-01-23 13:10:54	0
n/	2013-01-23 13:11:14	0
p/	2013-01-23 13:10:52	0
sources.tar.gz	2013-01-23 13:10:00	236815
u/ 	2013-01-23 13:10:51	0
z/	2013-01-23 13:10:53	0

Figure 2-19 Clicking **u/**

- 3) Click **u-boot/** (marked with a red arrow) in the following page;

factory Embest-1 files:/output/sources/u


Name	Last Modified	Size (kb)
[parent directory]		0
u-boot/ 	2013-01-23 13:10:50	0
uboot-scripts-6q/	2013-01-23 13:10:51	0
util-linux/	2013-01-23 13:10:49	0

Figure 2-20 Clicking u-boot

- 4) Click **u-boot-2009.08/** (marked with a red arrow) in the following page;

factory Embest-1 files:/output/sources/u/u-boot 		
Name	Last Modified	Size (kb)
[parent directory]		0
u-boot-2009.08/ 	2013-01-23 13:10:50	0

Figure 2-21 Clicking u-boot-2009.08

- 5) Click **u-boot-2009.08.tar.bz2** and **u-boot-2009.08-imx6-12.09.01-201209111811.patch** in the following page to download them to **\$HOME/timesys/i_MX6QSABRELite**;

factory Embest-1 files:/output/sources/u/u-boot/u



Name	Last Modified	Size (kb)
[parent directory]		0
u-boot-2009.08-imx6-12.09.01-201209111811.patch	2013-01-23 13:09:18	8199
u-boot-2009.08.tar.bz2	2013-01-23 13:09:18	8533

Figure 2-22 Downloading u-boot

- 6) Execute the following instructions to uncompress u-boot and install patch;

```
yanglsh@TIOP:~/work$ cd $HOME/timesys/i_MX6QSABRELite
yanglsh@TIOP:~/timesys/i_MX6QSABRELite$ tar -xvf u-boot-2009.08.tar.bz2
yanglsh@TIOP:~/timesys/i_MX6QSABRELite$ cd u-boot-2009.08/
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ patch -p1 <../u-boot-2009.08-imx6-12.09.01-201209111811.patch
```

- 7) Execute the following instructions to start compilation;

```
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ make
CROSS_COMPILE=armv7l-timesys-linux-gnueabi- distclean

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ make
CROSS_COMPILE=armv7l-timesys-linux-gnueabi- mx6q_sabrelite_config

Configuring for mx6q_sabrelite board...
```

```

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ make
CROSS_COMPILE=armv7l-timesys-linux-gnueabi-

Generating include/autoconf.mk
Generating include/autoconf.mk.dep

```

8) Execute the following instruction to copy the software tool **mkimage** to **../toolchain/bin/**;

```

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ cp
tools/mkimage ../toolchain/bin/

```

3.2.2 Compiling Linux Kernel

Execute the following instructions to compile Linux kernel;

```

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/u-boot-2009.08$ cd $HOME/timesys/i_MX6QSA
BRELite/kernel-source/linux-3.0

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/kernel-source/linux-3.0$ make ARCH=arm distcl
ean

CLEAN .
CLEAN arch/arm/kernel
CLEAN drivers/tty/vt
CLEAN drivers/video/logo
CLEAN firmware
CLEAN kernel
CLEAN lib
CLEAN arch/arm/boot/compressed
CLEAN arch/arm/boot
CLEAN .tmp_versions
CLEAN vmlinux System.map .tmp_kallsyms1.o .tmp_kallsyms1.S .tmp_kallsyms2.o .tmp_kalls
yms2.S .tmp_vmlinux1 .tmp_vmlinux2 .tmp_System.map
CLEAN scripts/basic
CLEAN scripts/genksyms
CLEAN scripts/kconfig
CLEAN scripts/mod
CLEAN scripts

```

```

CLEAN include/config include/generated arch/arm/include/generated
CLEAN .config .config.old .version include/linux/version.h Module.symvers
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/kernel-source/linux-3.0$ make ARCH=arm imx6_
defconfig

HOSTCC scripts/basic/fixdep
HOSTCC scripts/kconfig/conf.o
SHIPPED scripts/kconfig/zconf.tab.c
SHIPPED scripts/kconfig/lex.zconf.c
SHIPPED scripts/kconfig/zconf.hash.c
HOSTCC scripts/kconfig/zconf.tab.o
HOSTLD scripts/kconfig/conf
#
# configuration written to .config
#
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/kernel-source/linux-3.0$ make ARCH=arm CROS
S_COMPILE=armv7l-timesys-linux-gnueabi- ulmage
scripts/kconfig/conf --silentoldconfig Kconfig

CHK include/linux/version.h
UPD include/linux/version.h

```

A file named **ulmage** can be found under \$HOME/timesys/i_MX6QSABRELite/kernel-source/linux-3.0/arch/arm/boot/ after the compilation is done.

3.2.3 Making Filesystem Image

- 1) Execute the following instructions to uncompress the package;

```

yanglsh@TIOP:~/timesys/i_MX6QSABRELite/kernel-source/linux-3.0$ cd $HOME/timesys/i_M
X6QSABRELite/rfs
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/rfs$ mkdir rootfs
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/rfs$ cd rootfs/
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/rfs/rootfs$ sudo tar -xvf ../rootfs.tar.gz

```

2) Execute the following instructions to make a new compressed package;

```
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/rfs/rootfs$ sudo tar -jcvf ../rootfs.tar.bz2 *
yanglsh@TIOP:~/timesys/i_MX6QSABRELite/rfs/rootfs$ ls -l ../
total 43972
drwxr-xr-x 19 root  root    4096 2012-12-17 04:40 rootfs
-rw-r--r--  1 root  root   20820205 2013-01-11 17:37 rootfs.tar.bz2
-rw-r--r--  1 yanglsh yanglsh 24145795 2013-01-10 15:34 rootfs.tar.gz
```


4 Writing and Running Images

4.1 Writing Images

Please follow the steps shown in the following sections to accomplish the writing of images.

4.1.1 Preparing Tools and Images

Table 4-1 Preparing Tools and Images

Items	Descriptions
Writing tool “Mfgtool”	It is Running under Windows and saved under \linux\tools of the CD-ROM.
Virtual Terminal	For example, the HyperTerminal of Windows
Image file “ulmage”	Please refer to 3.2.2 Compiling Linux Kernel
Image file “u-boot.bin”	Please refer to 3.2.1 Compiling u-boot
Compress Image file “rootfs.tar.bz2”	Please refer to 3.2.3 Making Filesystem Image
Sabrelite board	No description
USB OTG cable	No description
Male-to-male crossover serial cable	It is used to observe the writing process
Serial extension wire	It is used to observe the writing process
5V DC power adapter	No description
TF card	No description

4.1.2 Copying Files

Table 4-2 Copying Files

Steps	Operations
1	Copy the folder Mfgtools-Rel-12.04.01_ER_MX6Q_UPDATER from CD-ROM to C:\
2	Copy u-boot.bin to C:\Mfgtools-Rel-12.04.01_ER_MX6Q_UPDATER\Profiles\MX6Q Linux Update\OS Firmware\files\ (or replace the existing file)
3	Copy ulmage to C:\Mfgtools-Rel-12.04.01_ER_MX6Q_UPDATER\Profiles\MX6Q Linux Update\OS Firmware\files\ (or replace the existing file)
4	Copy rootfs.tar.bz2 to C:\Mfgtools-Rel-12.04.01_ER_MX6Q_UPDATER\Profiles\MX6Q Linux Update\OS Firmware\files\ (or replace the existing file)

4.1.3 Connecting Hardware

Table 4-3 Connecting Hardware

Steps	Operations
1	Connect the serial extension wire to Sabrelite, and then connect PC's serial interface to the wire with a crossover serial cable.
2	Connect Sabrelite to PC with a USB OTG cable
3	Connect the power adapter to Sabrelite
4	Insert the TF card to Sabrelite

4.1.4 Configuring USB Boot Mode

Set the switch marked as SW1 on Sabrelite to the state of "01 USB OTG" according to the following table;

Table 4-4 Configuring SW1

Switch	D1	D2
SW1	ON	OFF

4.1.5 Running Mfgtool and Detecting Sabrelite

Run MfgTool.exe and press SW4 button on Sabrelite to reset the board. The MfgTool will find the board as shown below;

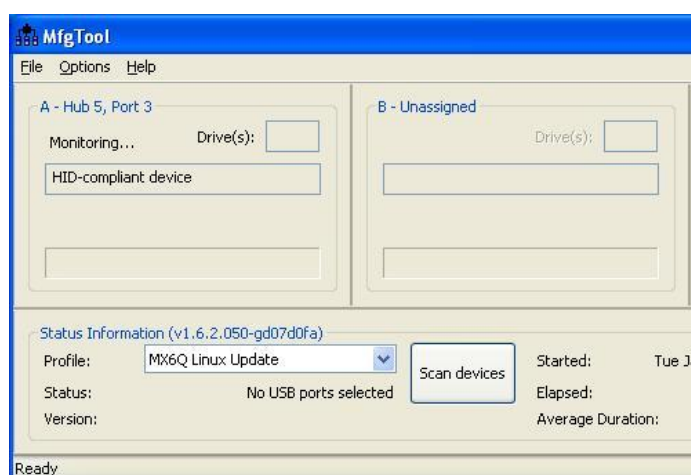


Figure 4-1 MfgTool Software Window

4.1.6 Starting Writing

Click the green button in the MfgTool window as shown below to start the writing process;

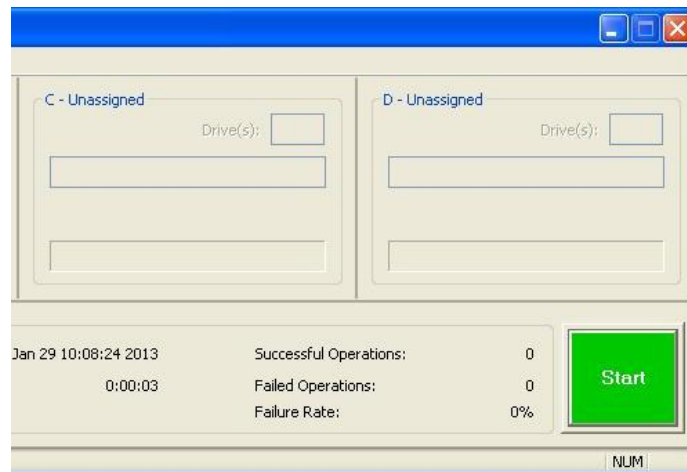


Figure 4-2 Click Green Button

Click the red button when the writing process is completed as shown below;

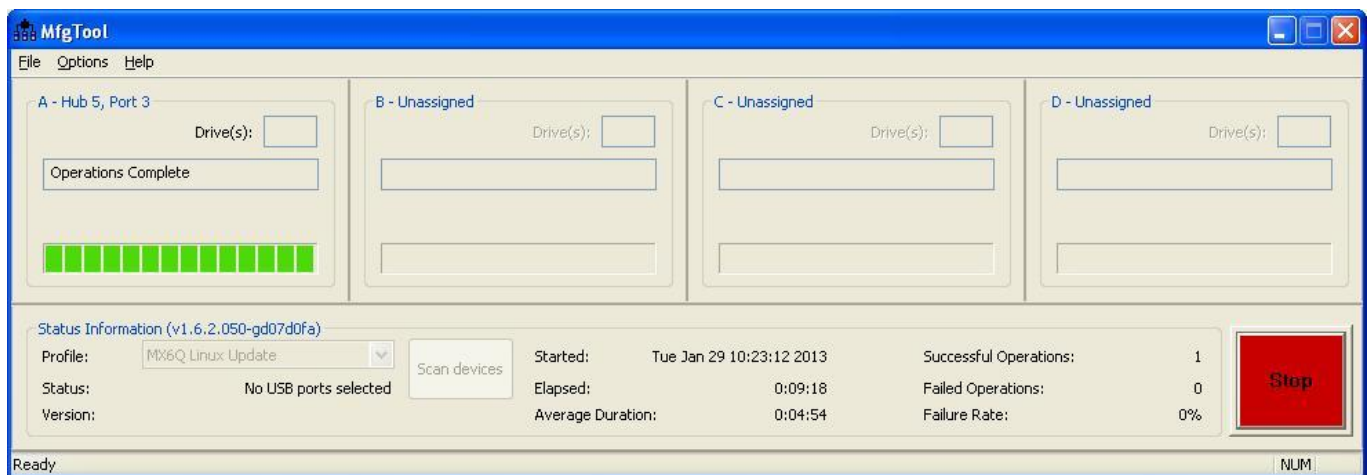


Figure 4-3 Click Red Button

4.2 Running Image Files

Please run image files according to the contents of the following sections.

4.2.1 Configuring SPI-NOR Boot Mode

Configure SW1 switch according to the table shown below;

Table 4-5 Configuring SW1

Switch	D1	D2
SW1	OFF	OFF

4.2.2 Open Terminal

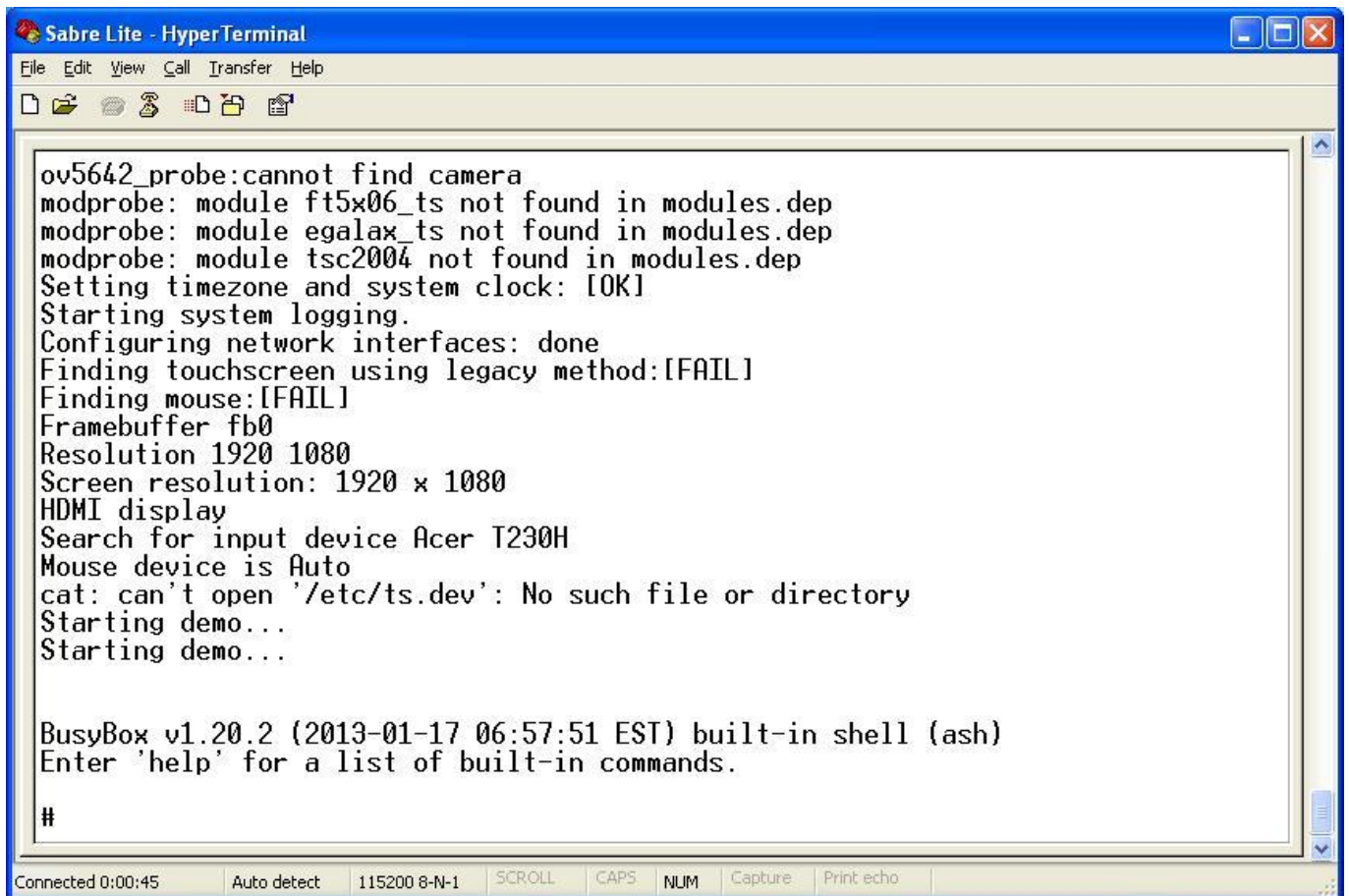
Start HyperTerminal of Windows and configure it according to the figure shown below;



Figure 4-4 Configuring HyperTerminal

4.2.3 Running System Image

Press SW4 button on Sabrelite to reset the board and run the system image; HyperTerminal will show the booting information as shown below;



The screenshot shows a HyperTerminal window titled "Sabre Lite - HyperTerminal". The window contains the following text output from a system boot process:

```
ov5642_probe:cannot find camera
modprobe: module ft5x06_ts not found in modules.dep
modprobe: module egalax_ts not found in modules.dep
modprobe: module tsc2004 not found in modules.dep
Setting timezone and system clock: [OK]
Starting system logging.
Configuring network interfaces: done
Finding touchscreen using legacy method:[FAIL]
Finding mouse:[FAIL]
Framebuffer fb0
Resolution 1920 1080
Screen resolution: 1920 x 1080
HDMI display
Search for input device Acer T230H
Mouse device is Auto
cat: can't open '/etc/ts.dev': No such file or directory
Starting demo...
Starting demo...

BusyBox v1.20.2 (2013-01-17 06:57:51 EST) built-in shell (ash)
Enter 'help' for a list of built-in commands.

#
```

At the bottom of the window, there is a status bar with the following information: "Connected 0:00:45", "Auto detect", "115200 8-N-1", "SCROLL", "CAPS", "NUM", "Capture", and "Print echo".

Figure 4-5 System Booting Information

The above information indicates that the system image is running properly.

5 Appendix

- For more information on Linux related materials, please visit <http://www.timesys.com/embedded-linux/resources/dev-center/imx6>.
- If you encounter software issues when using Linux, please send an email to support@timesys.com.
- If you encounter hardware issues when using our products, please send an email to support@timll.com, or simply call +86-0755-25503401.

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