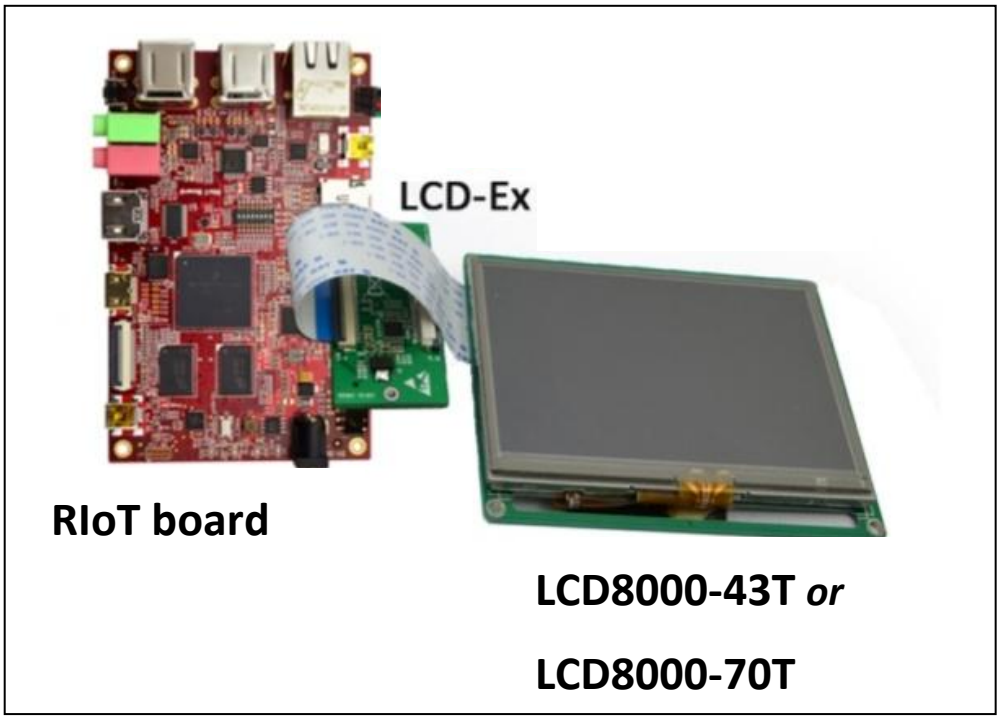
LCD8000-70T-EX1
/LCD8000-43T-EX1

Portable LCD Solution for the RIoTboard

By

element14



User Manual

Version 1

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element14

DISCLAIMER

This product is intended to be used for **ENGINEERING DEVELOPMENT, DEMONSTRATION OR EVALUATION PURPOSES ONLY** and is not considered by element14 to be a finished end product fit for general consumer use. Persons handling the product(s) must have electronics training and observe good engineering practice standards.

The goods being provided are not intended to be complete in terms of required design and/or manufacturing related protective considerations, including product safety and environmental measures typically found in end products that incorporate such semiconductor components or circuit boards.

Revision History:

Version	Date	Description
1.0	30/7/2014	Original Version

Table of Contents

1 Hardware/Software Requirements

The following preparations are required to use LCD8000-43T-EX1 or LCD8000-70T-EX1 with RIoTboard.

1.1 Hardware Requirements

- RIoTboard
- 5V Power Adapter
- LCD8000-43T-EX1 or LCD8000-70T-EX1
- UART8000-U Cable

1.2 Software Requirements

- Operating System: RIoTboard Linux or Android
- Version: Linux SVN2591 or higher; Android SVN2597 or higher
- Download Address: http://www.element14.com/RIoTboard

Note:

📖 Please refer to RIoTboard User Manual for image update.

2 Configurations under Ubuntu

1) Connecting the LCD module to RIoTboard needs the help of a LCD-Ex expansion board as shown blow;

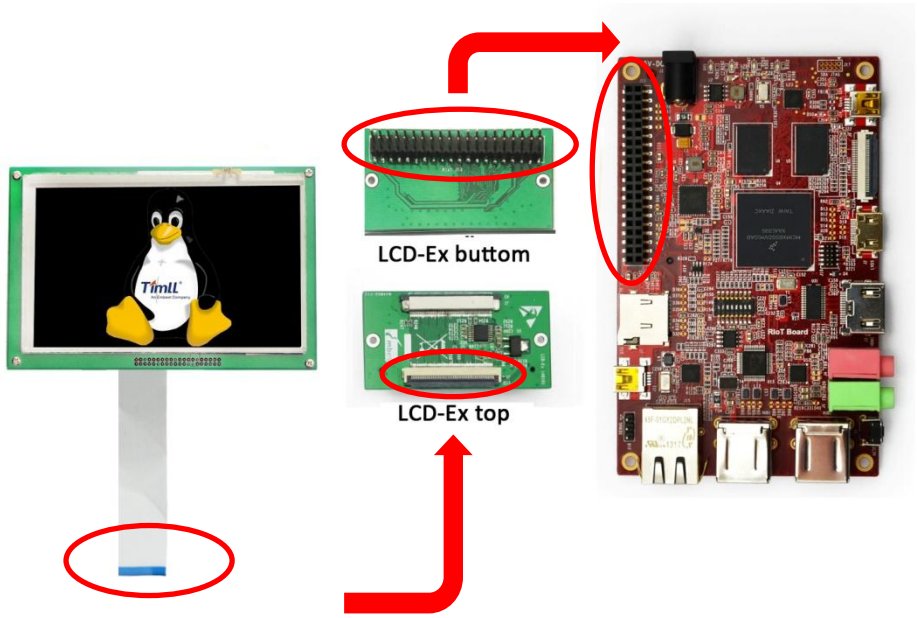

Figure 1 Hardware Connection

Note:

- The blue stripe at the end of 50-pin FPC cable should be facing upward when connecting the LCD module to LCD-Ex expansion board.
- LCD8000-43T-EX1 and LCD8000-70T-EX1 do NOT support hot plugging.

2) Use an UART8000-U cable to connect RIoTboard to a PC, and then connect a 5V power adapter to the RIoTboard (but not to mains power yet) as shown below;

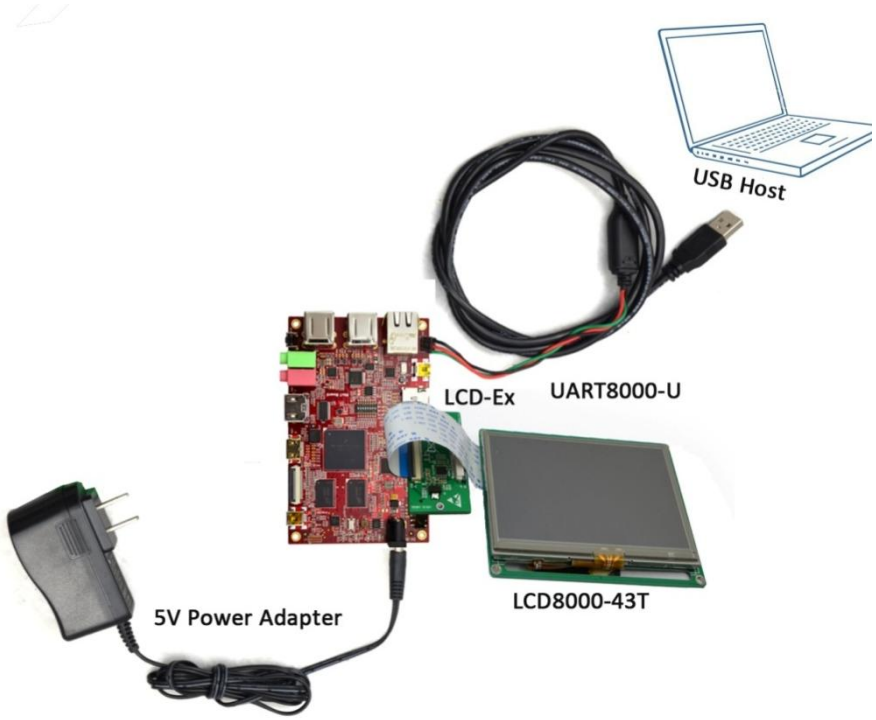

Figure 2 Hardware Connection 2

3) Power on the board to boot the system and press any key on PC's keyboard to enter u-boot when you see "**Hit any key to stop autoboot**" in your terminal window.

```
U-Boot 2009.08-dirty (Oct 17 2013 - 17:08:06)

CPU: Freescale i.MX6 family TO1.1 at 792 MHz
Thermal sensor with ratio = 201
Temperature:    42 C, calibration data 0x5f55765f
mx6q pll1: 792MHz
mx6q pll2: 528MHz
mx6q pll3: 480MHz
mx6q pll8: 50MHz
ipg clock       : 66000000Hz
ipg per clock : 66000000Hz
uart clock      : 80000000Hz
cspi clock      : 60000000Hz
ahb clock       : 132000000Hz
axi clock     : 198000000Hz
emi_slow clock: 99000000Hz
ddr clock       : 396000000Hz
usdhc1 clock   : 198000000Hz
usdhc2 clock   : 198000000Hz
usdhc3 clock   : 198000000Hz
usdhc4 clock   : 198000000Hz
nfc clock       : 24000000Hz
Board: i.MX6DL/Solo-SABRESD: unknown-board Board: 0x61011 [POR
]
Boot Device: MMC
I2C:    ready
DRAM:    1 GB
MMC:    FSL_USDHC: 0,FSL_USDHC: 1,FSL_USDHC: 2,FSL_USDHC: 3
In:      serial
Out:     serial
Err:     serial
Net:    got MAC address from IIM: 00:00:00:00:00:00
----enet_board_init: phy reset
FEC0 [PRIME]
Hit any key to stop autoboot:   0 (press any key to enter uboot)
MX6Solo RIoTboard U-Boot >
```

4) Execute the following instructions under u-boot mode to set display mode;

```
MX6Solo RIoTboard U-Boot > setenv bootargs
console=ttymxc1,115200 init=/init nosmp
```

video=mxcfb0:dev=lcd,7inch_LCD,if=RGB565 video=mxcfb1:off fbmem=10M vmalloc=400M androidboot.console=ttymxc1 androidboot.hardware=freescale calibration

MX6Solo RIoTboard U-Boot > **saveenv**

5) Execute the following instruction to remove Synaptics driver under Ubuntu system of RIoTboard;

root@linaro-ubuntu-desktop:~# **sudo apt-get remove xserver-xorg-input-synaptics**

6) Execute the following instructions to install tslilb;

root@linaro-ubuntu-desktop:~# **sudo apt-get install xserver-xorg-input-tslib libts-bin**
(Internet connection is required)

Or download **ubuntu-touchscreen.zip** from element14 website to install tslib. On unzipping, copy to U-disk and connect U-disk to RIoTboard. Then execute the following instructions:

root@linaro-ubuntu-desktop:~# **dpkg -i libts-bin_1.0-9_armel.deb**
root@linaro-ubuntu-desktop:~# **dpkg -i xserver-xorg-input-tslib_0.0.6-7_armel.deb**

7) Reboot RIoTboard and then execute the following instructions;

root@linaro-ubuntu-desktop:~# **TSLIB_TSDEVICE=/dev/input/event0**
root@linaro-ubuntu-desktop:~# **TSLIB_CONFFILE=/etc/ts.conf**
root@linaro-ubuntu-desktop:~# **export TSLIB_TSDEVICE TSLIB_CONFFILE**
root@linaro-ubuntu-desktop:~# **ts_calibrate** (finish calibration by following the instructions on the LCD)
root@linaro-ubuntu-desktop:~# **sync**

Reboot RIoTboard again; The touch screen will work properly.

3 Configurations under Android

1) Repeat the first four steps in section "Configurations under Ubuntu";

2) Follow the instructions on the LCD to calibrate the touch screen and then enter Android system.

Note:

- If a LCD8000-43T module has been used under the Android system, the following instructions need to be executed under the system before you replace it with a LCD8000-70T module;
  - root@RIoTboard_6solo:/ # **rm /data/system/calibration**
  - root@RIoTboard_6solo:/ #**sync**
- The LCD module will work properly after rebooting RIoTboard and finishing screen calibration.