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

Portable LCD Solution for the RIoTboard

By

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User Manual

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DISCLAIMER

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**Revision History:**

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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;

![Image of hardware connection]

**Figure 1** Hardware Connection

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**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;

![Hardware Connection 2](image)

**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 : 660000000Hz
ipg per clock : 660000000Hz
uart clock : 800000000Hz
cspi clock : 600000000Hz
ahb clock : 132000000Hz
axi clock : 1980000000Hz
emi_slow clock: 990000000Hz
ddr clock : 3960000000Hz
usdhc1 clock: 1980000000Hz
usdhc2 clock : 1980000000Hz
usdhc3 clock : 1980000000Hz
usdhc4 clock : 1980000000Hz
nfc clock : 240000000Hz

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
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
```

Execute the following instructions to install tslib;

```
root@linaro-ubuntu-desktop:~# sudo apt-get install xserver-xorg-input-tslib libts-bin
```

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
```

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
root@linaro-ubuntu-desktop:~# 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.