User Guide Standards

31.2″ monochrome ePaper Display (ED312TT2)

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ePaper Display Update SOP

1 Introduction

ED312TT2 is a reflective electrophoretic E Ink® technology display module based on active matrix TFT substrate. It has 31.2" active area with 2560 x 1440 pixels, the display is capable to display images at 2-16 gray levels (1-4 bits) depending on the display controller and the associated waveform file it used.

31.2" display panel is suitable for various applications, e.g. bus stop, museum etc…

(1) PACKAGE CONTENTS

This demo kit contains the following:

- V5 System Board
- 31.2” E Ink ePaper display (EPD)
- FFC cable *4
- Adapter 12V 5A

Demo Kit Contents

Specification

CPU	NXP i.MX7 Dual Core ARM Cortex A7@1GHz + M4 MCIMX7DVM10SD
RAM	Two Micron LPDDR3 (256Mbx16)
eMMC Flash	8GB Flash on SD3
Display Interface	4xEPDC Connector
Debug Interface	Micro USB UART
Network Interface	Wi-Fi
	Ethernet 1000M
OS supported	Linux Kernel 3.14.52
Storage	1 x microSD Card on SD1
I/O Interfaces	USB Port 1 (Micro USB)
	USB Port 2 (Type A)
Power Adapter	DC +12V / 5A
Dimension	185mm x185mm
Operating Temperature	0~40 degree

* Note: All hardware specifications are for the demonstration of this evaluation kit only.

2 Hardware Guide

This section describes the hardware setup of the 42” EPD display demo kit.

(1) Hardware Requirements

EVK – V5 system Board

ED312TT2 EPD

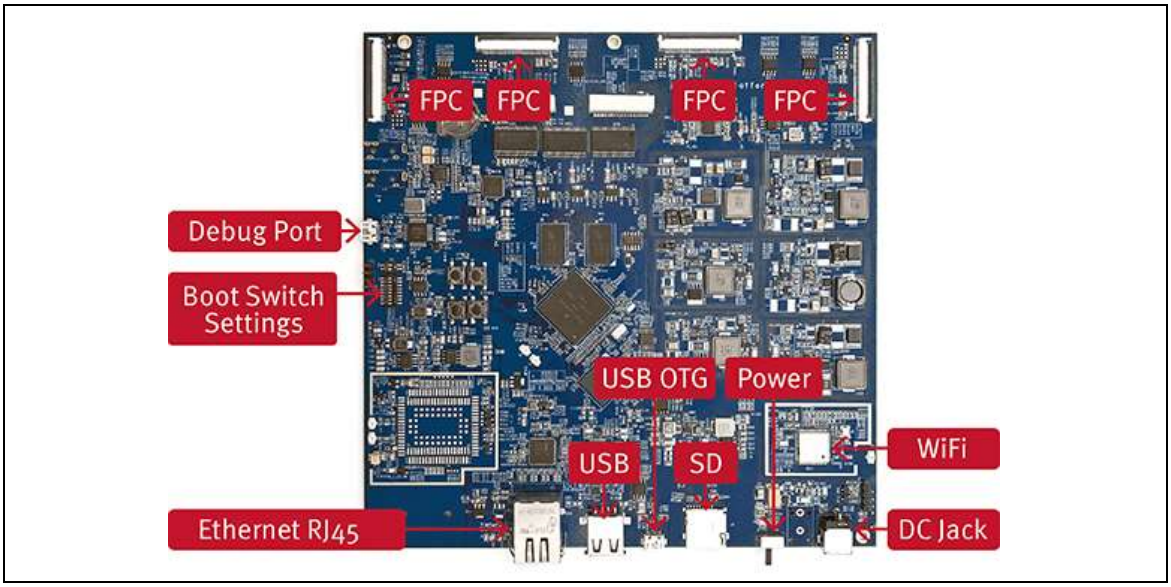
FFC

Adapter

(2) Demo Kit Hardware Description

31.2 EPD display (ED312TT2) demo kit includes an SoC driving board and an E Ink display adapter board. The SoC driving board and E Ink display adapter board are connected via a 50 pin FFC.

The micro USB OTG port on the EVK work as USB Ethernet interface can be used for change the image of the E Ink panel.



Demo Kit

Module Name	Description
FPC	Connector for 31.2” and 42” panels
Debug Port	micro USB UART
Ethernet RJ45	Support MII, GMII and RGMII for different types of 10/100/1000Mb Media Access Controller (MAC).
USB	A-Type
USB OTG	Micro USB
SD Card	Micro SD Card
Power SW	Switch for powering on/off V5 Board
DC Jack	DC 12V, 5A
WiFi	Modules which has WIFI, Bluetooth and FM functionalities. It complies with IEEE 802.11 b/g/n standard and can achieve the speed up to 72.2 Mbps/802.11n, 54Mbps/802.11g and 11Mbps/802.11b.
Boot switch setting	switch settings

FFC connect pin assignment

	FPC_J34	FPC_J35	FPC_J36	FPC_J37
PIN NUMBER	SIGNAL		SIGNAL	
1	VEE	VEE	VEE	VEE
2	NC	NC	NC	NC
3	VGG	VGG	VGG	VGG
4	Mode2	Mode2	Mode2	Mode2
5	VDD	VDD	VDD	VDD
6	Mode1	Mode1	Mode1	Mode1
7	CKV	CKV	CKV	CKV
8	STV	STV	STV	STV
9	VSS	VSS	VSS	VSS
10	VCOM_TFT	VCOM_TFT	VCOM_TFT	VCOM_TFT
11	VDD	VDD	VDD	VDD
12	VSS	VSS	VSS	VSS
13	CKH	CKH	CKH	CKH
14	D0	D0	D0	D0
15	D1	D1	D1	D1
16	D2	D2	D2	D2
17	D3	D3	D3	D3
18	D4	D4	D4	D4
19	D5	D5	D5	D5
20	D6	D6	D6	D6
21	D7	D7	D7	D7
22	VSS	VSS	VSS	VSS
23	D8	D8	D8	D8
24	D9	D9	D9	D9
25	D10	D10	D10	D10
26	D11	D11	D11	D11
27	D12	D12	D12	D12
28	D13	D13	D13	D13
29	D14	D14	D14	D14
30	D15	D15	D15	D15
31	STH	STH	STH	STH
32	LEH	LEH	LEH	LEH
33	OEH	OEH	OEH	OEH
34	ISEL	ISEL	ISEL	ISEL
35	NC	NC	NC	NC
36	VPOS	VPOS	VPOS	VPOS
37	NC	NC	NC	NC
38	VENG	VENG	VENG	VENG
39	VCOM_FPL	VCOM_FPL	VCOM_FPL	VCOM_FPL

40	Border	Border	Border	Border
41	STV2	STV2	STV2	STV2
42	NC	NC	NC	NC
43	NC	NC	NC	NC
44	NC	NC	NC	NC
45	NC	NC	NC	NC
46	NC	NC	NC	NC
47	NC	NC	NC	NC
48	NC	NC	NC	NC
49	NC	NC	NC	NC
50	STL2	STL2	STL2	STL2

3 31.2” EPD V5 board operation manual

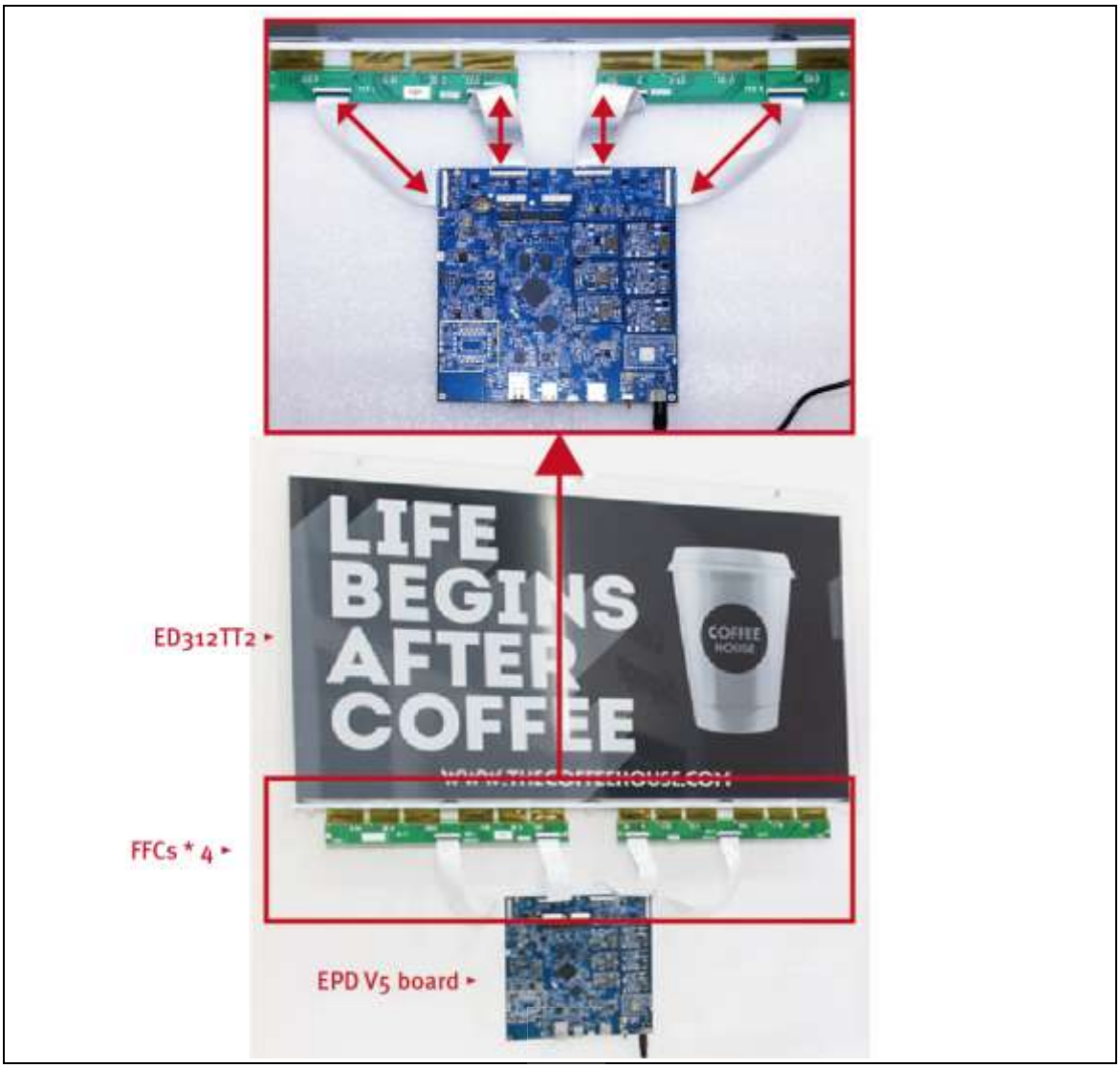
(1) How to connect FFC to ED312TT2

● Connect FFC to ED312TT2

EPD V5 Board

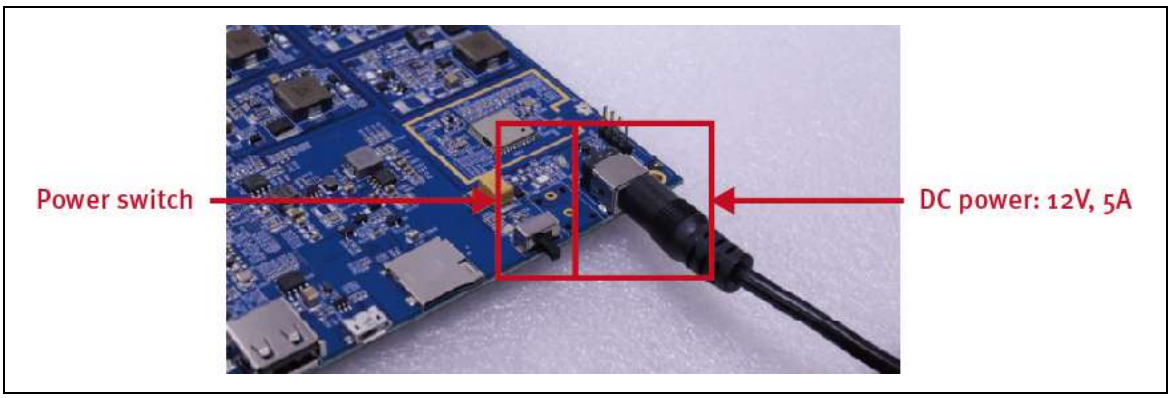
FFC X 4

- Connect FFC to ED312TT2



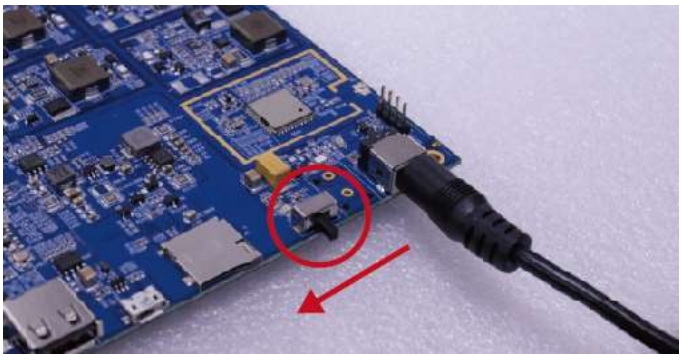
(2) How to power on/off

- Power switch
- DC power: 12V, 5A

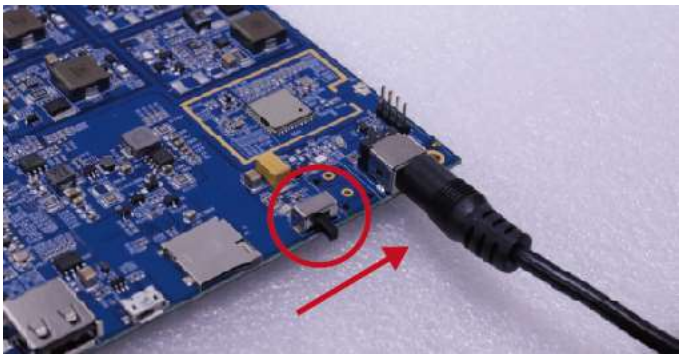


Power switch on/off

Power off



Power on



Needed waiting about 10s, the system will start running the auto slideshow

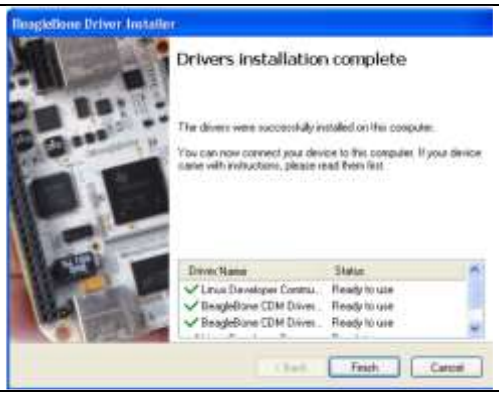
(3) Connecting the V5 Board from PC

This section provides instruction on how to set up the system

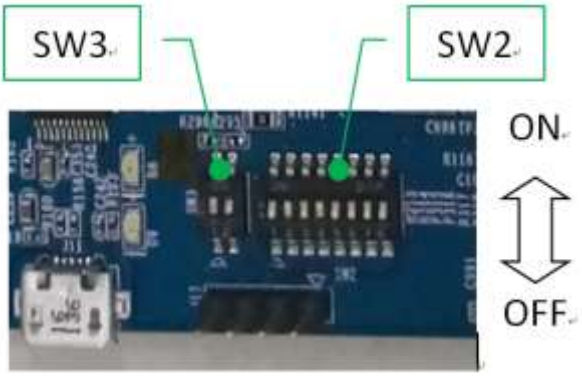
Step 1: Download driver from website http://beagleboard.org/getting-started

Step 2: Install the Windows Driver

If you use Windows 7 64 bits version, please execute BONE_D64.exe. If you use Windows XP 32 bits version, please execute BONE_DRV.exe.



Step 3: Setup the Booting from eMMC



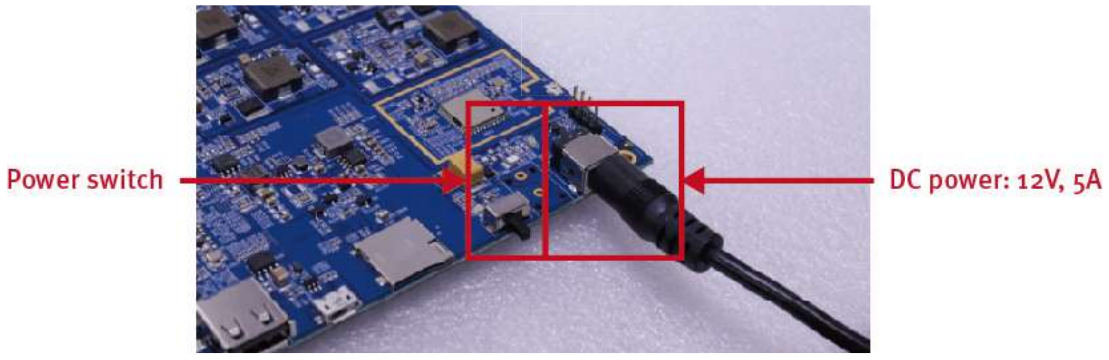
Switch	D1	D2	D3	D4	D5	D6	D7	D8
SW2	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
SW3	ON	OFF	-	-	-	-	-	-

Step 4: Power on the DC Supply

Before turning the power on, please ensure that the power has been connected correctly.

Boot from the System

1. DC 12V
2. Power switch turn on

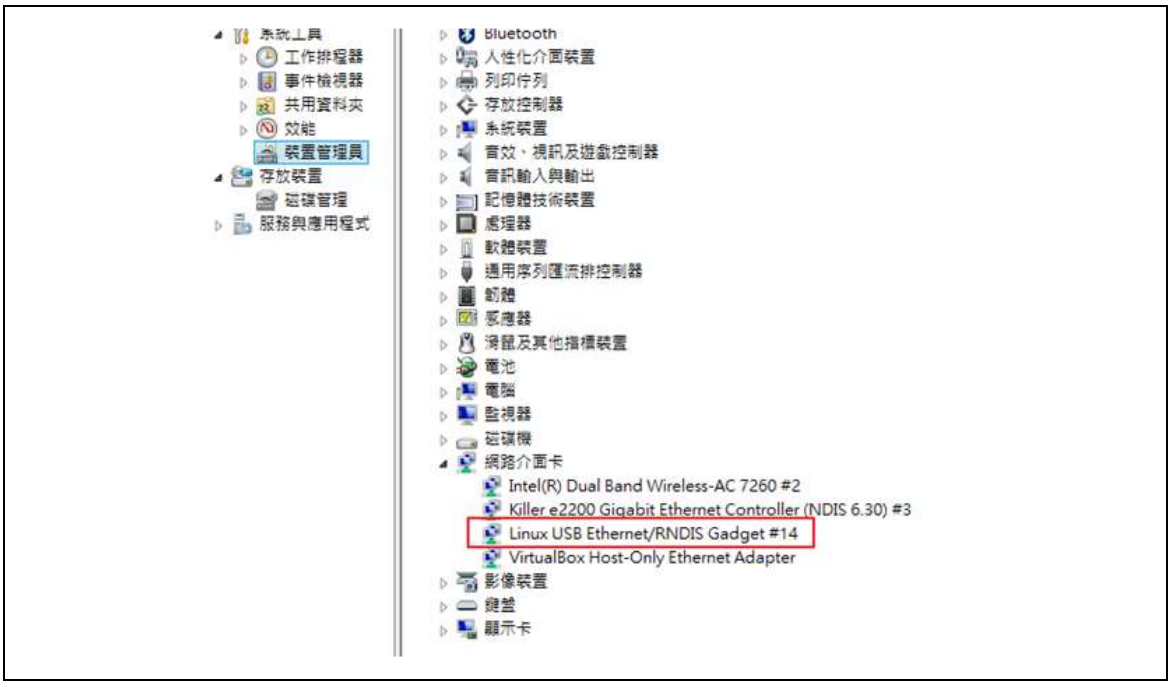


Step 5: Connect USB-OTG cable to the System

After turning the power on, wait for about 2 seconds to plug USB-OTG cable to V5 board

Step 6: drivers successfully installed

If these drivers are successfully installed, we can see Linux USB Ethernet/RNDIS Gadget on Windows.



Please make sure above drivers have been installed successfully, otherwise we cannot connect to Demo Kit correctly.

(4) How to Send Files to System?

We may need to replace demo files for some situation.

- New display pattern.
- New Waveform

USE SAMBA TO CONNECT TO V5 KIT

Step 1: Type \\192.168.7.2 on Windows File Manager

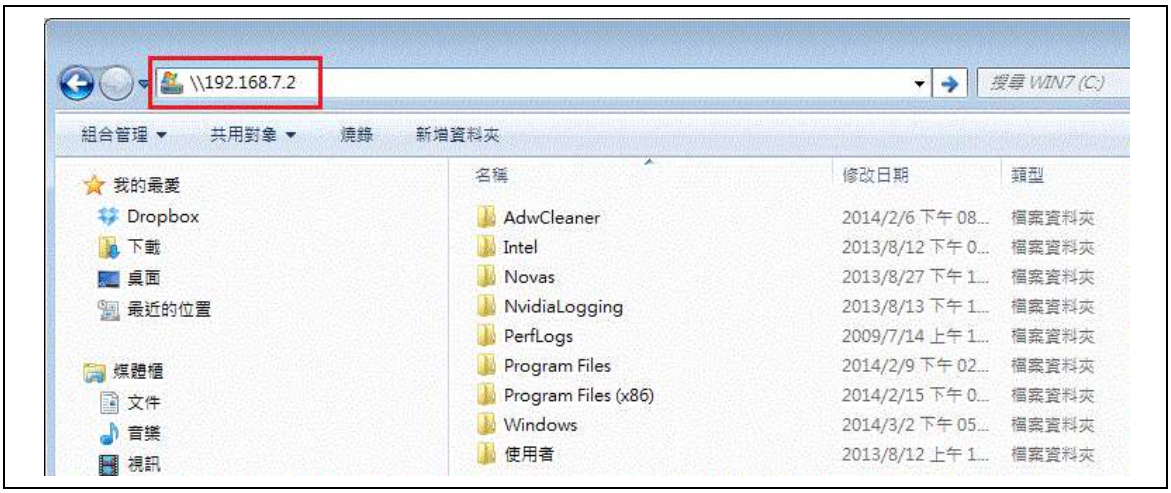
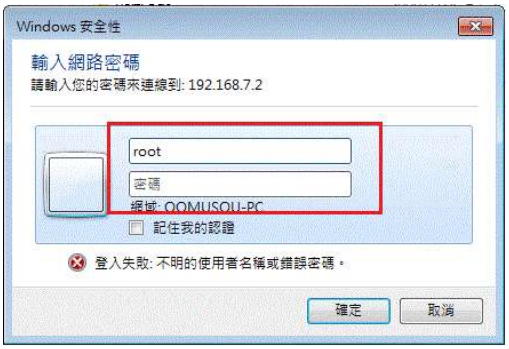


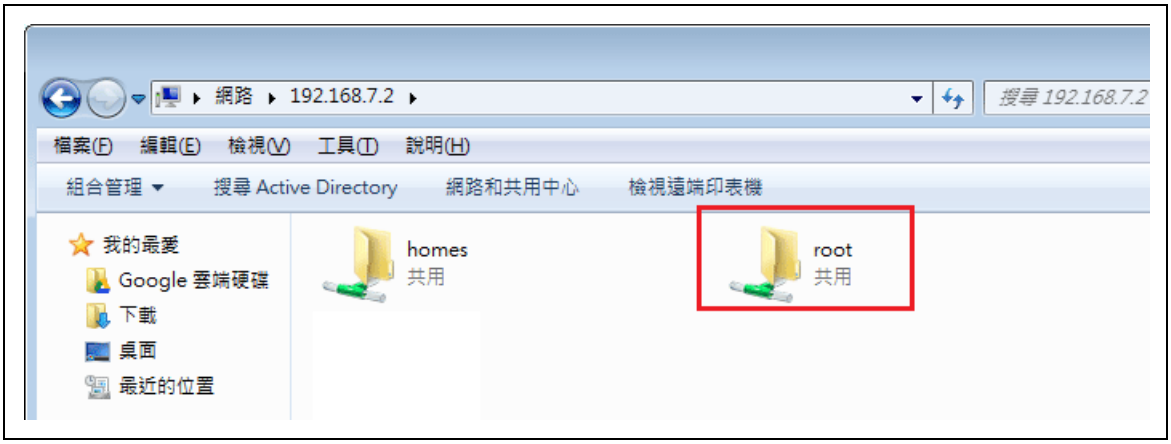
Figure A.1 Type \\192.168.7.2 on Windows File Manager

Step 2: Login to V5

Login: root Password: (none)



Step 3: Explorer the Home Directory



Step 4 : Copy image file to image folder

\homes\pattern\grayscale\1440x2560\slideshow

(5) HOW TO MODIFY SLIDESHOW SCRIPTS OF SYSTEM?

User can edit slideshow.txt script to control the behavior of slideshow.

31.2” mono: slideshow.txt must be placed in the directory

“/root/pattern/grayscale/1440x2560/slideshow/slideshow.txt”

Example slideshow.txt as follows

```
3,3,4,101.bmp
3,1,4,white.bmp
3,3,4,audi.bmp
3,1,4,white.bmp
3,3,4,cat.bmp
3,1,4,white.bmp
3,3,4,girl.bmp
3,1,4,white.bmp
```

First column is Waveform Mode.

Second column is Dwell Time(s).

Third column is fix number 4.

Fourth column is file name of pattern.

Each column is separated by comma.

(6) HOW TO CHANGE PICTURES

Please open “slideshow” folder on V5 board:

- 31.2” Grayscale: slideshow.txt must be placed in the directory “/root/pattern/grayscale/1440x2560/slideshow/”
- Please use Windows BMP instead of Adobe BMP to avoid display issue
- Image Format Checking

(7) 31.2” Grayscale

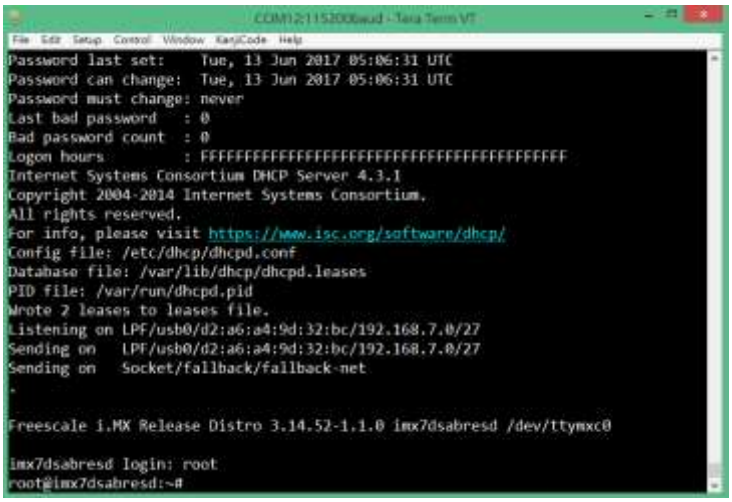
- Resolution: 1440x2560
- File Format: BMP
- Bit: 4
- Size: 1.75MB

4 Appendix

(1) How to use WiFi

WIFI SSID AND PASSWORD SETTINGS

Step 1: Run Tera Term and Login as Root



● Step 2: Settings WIFI SSID, Password command

```
root@imx7dsabresd:~# wpa_passphrase "yourSSID" "yourPassPhrase" > /etc/wpa_supplicant.conf
```

RUN WI-FI COMMAND

```
root@imx7dsabresd:~# sh /etc/wifi.sh
```

5 How to update waveform of system?

UPLOAD NEW WAVEFORM

In our latest version of Firmware, we have provided latest Waveform

(e.g. 220_C251_32_WN6F41_PENG312D01_BTC.fw named to epdc_ED312TT2.fw).

If you want to update Waveform in the future, please also upload them to directory “/lib/firmware/imx/epdc”.

Please fix the filename:

● 31.2” Grayscale: epdc_ED312TT2.fw

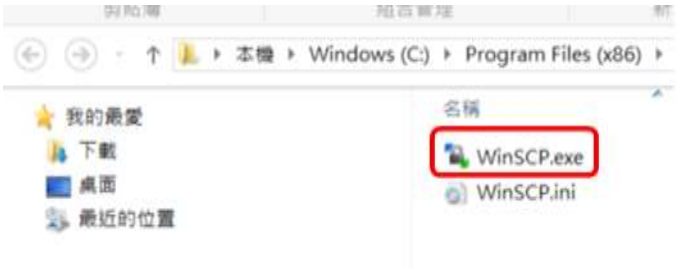
USE ” WINSCP” TO CONNECT TO V5 KIT AND UPDATE NEW WAVEFORM:

Step 1: Download “WinSCP” from website https://winscp.net/eng/download.php

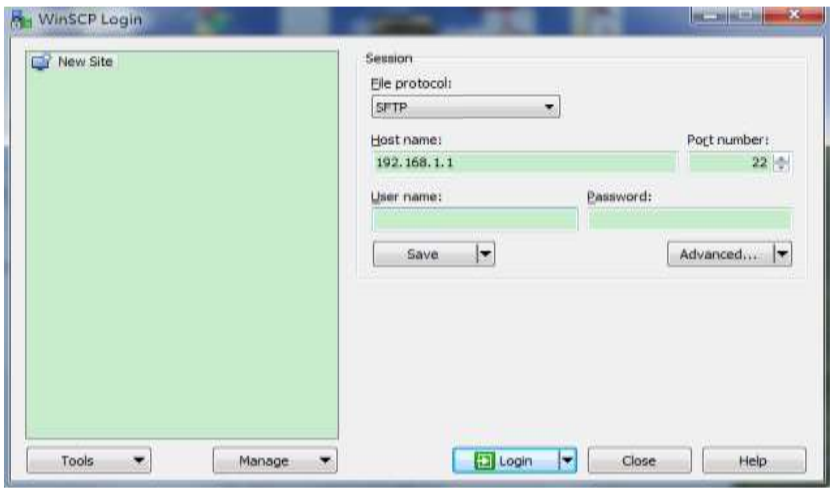
Step 2: Install WinSCP

Step 3: Connect USB-OTG cable to the System

Step 4: Run WinSCP



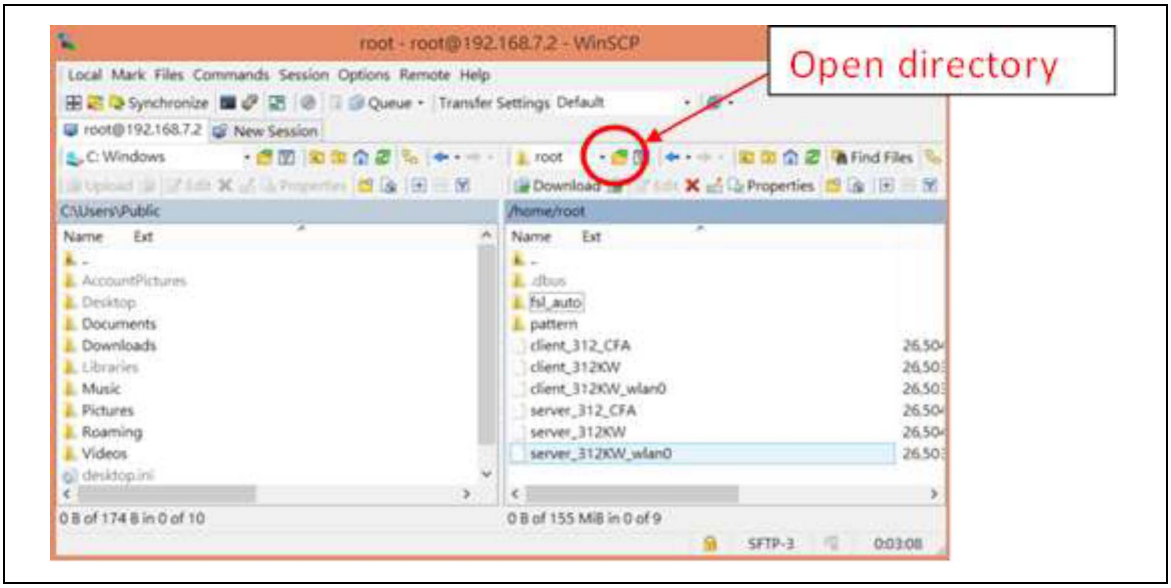
Step 5: Login to V5 kit



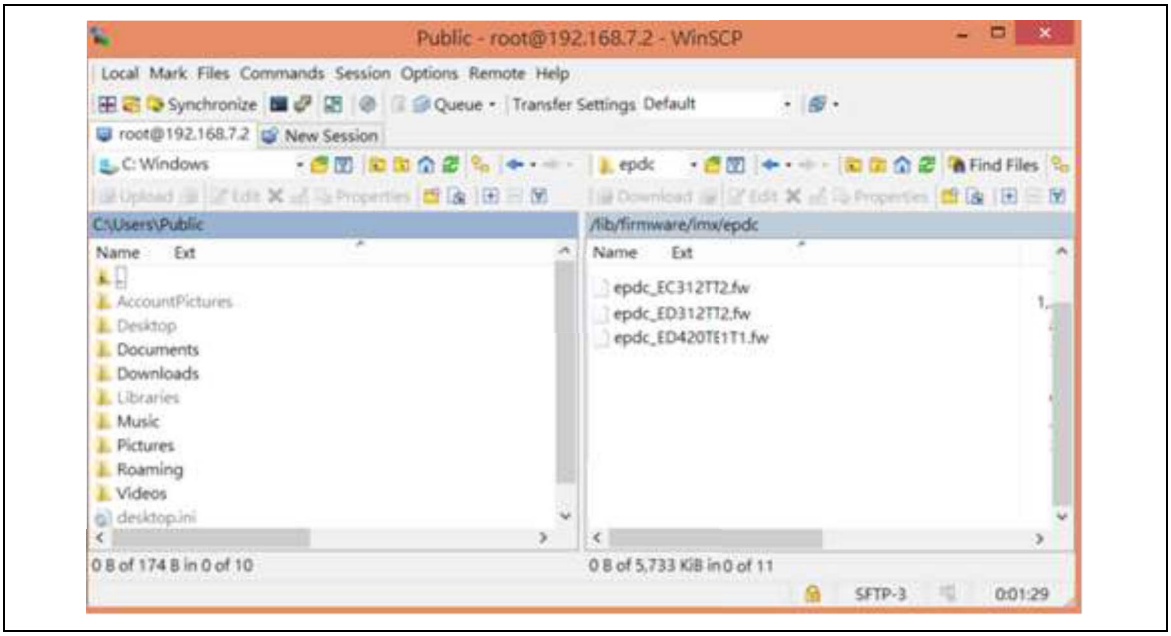
Host name: 192.168.7.2
Login: root
Password: (none)

Step 6: Upload new waveform

Open directory “/lib/firmware/imx/epdc/”



Step 7: Upload new waveform to directory “/lib/firmware/imx/epdc/”



6 Contact Information

For more information, please visit

http://www.eink.com

For sales office addresses, please visit

http://www.eink.com/contact_sales.html

7 Legal Information

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● Revision History

Version	Date	Pag	Description	Author
0.1	2017/08/11		Initial	Tommy
0.2	2017/08/17		Wording and re-arrangement	Patrick