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Jane-TCON EPD Demo Unit
User Manual

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Table of Contents

Chapter 1 Introduction

This manual describes the setup and operation of the Jane-TCON EPD Demo Unit.

The Jane_TCON EPD Demo is a self contained demo unit intended for evaluation and demonstration of Pervasive Displays (PDI) EPD panels and Epson timing controller chips for these panels.

The unit is made of:

• Jane board

• PDI EPD panel

• Plastic enclosure

The unit is powered by an internal Li-Ion rechargeable battery or from a USB connection. The battery is charged by power from the USB connection. The unit has an Epson TCON, S1D13T03, and typically has mounted a 2.7" panel from PDI. The board can also use a 1.44" or 2" EPD panel from PDI. The main processor on the board is an Epson MCU, S1C17801, which has embedded an USB controller. The demos software, including the images are stored on a microSD card.

Figure 1-1: Jane-TCON EPD Demo Unit (Top View)

This user manual is updated as appropriate. Please check the Epson Research and Development Website at www.erd.epson.com for the latest revision of this document before beginning any development.

We appreciate your comments on our documentation. Please contact us via email at documentation@erd.epson.com.

Chapter 2 Jane-TCON EPD Demo Unit Overview

2.1 Power

The demo unit has a Li-Ion rechargeable battery, coin cell, LIR2450, 3.6V, 100mAh. When fully charged it will provide power for aproximately 1000 updates of the display. The battery is recharged when the USB cable is plugged in. In this case, the power from the USB connection will power the unit and the remaining available paower will be used to charge the battery. It will take aproximately 4 hours to fully recharge the battery. When the battery is charging, an orange LED is on. If the USB cable is connected and it provides power to the unit and the orange LED is off, it means that the battery is fully charged. The LED is mounted on the back of the board, close to the USB connector, so it is visible only by looking from the side at the unit.

The unit has an ON/OFF button, which is used to turn the power on and off. Pressing the button will toggle the power. If the power is off and the button is pressed, the power will turn on, if the power is on and the button is pressed, the power will turn off. When the power is on, a green LED will be on to indicate that the power is off. The LED is mounted on the back of the board, close to the USB connector, so it is visible only by looking from the side at the unit.

When the power is off and the battery is charged or the USB cable is connected, pressing the ON/OFF button will always turn on power.

When the display is in the process of being updated, in order to prevent power being turned off in the middle of an update, the main processor will disable the ON/OFF button. If the button is pressed during a display update, nothing will happen, the power will stay on. In order to turn the power off the ON/OFF button will have to be pressed again when there is no current display update (there is no memory of the button being pressed during the dispay update).

The demo unit has a battery voltage detection, that will automatically shut down the power when the battery voltage gets below 3.4V.

2.2 Jane board description
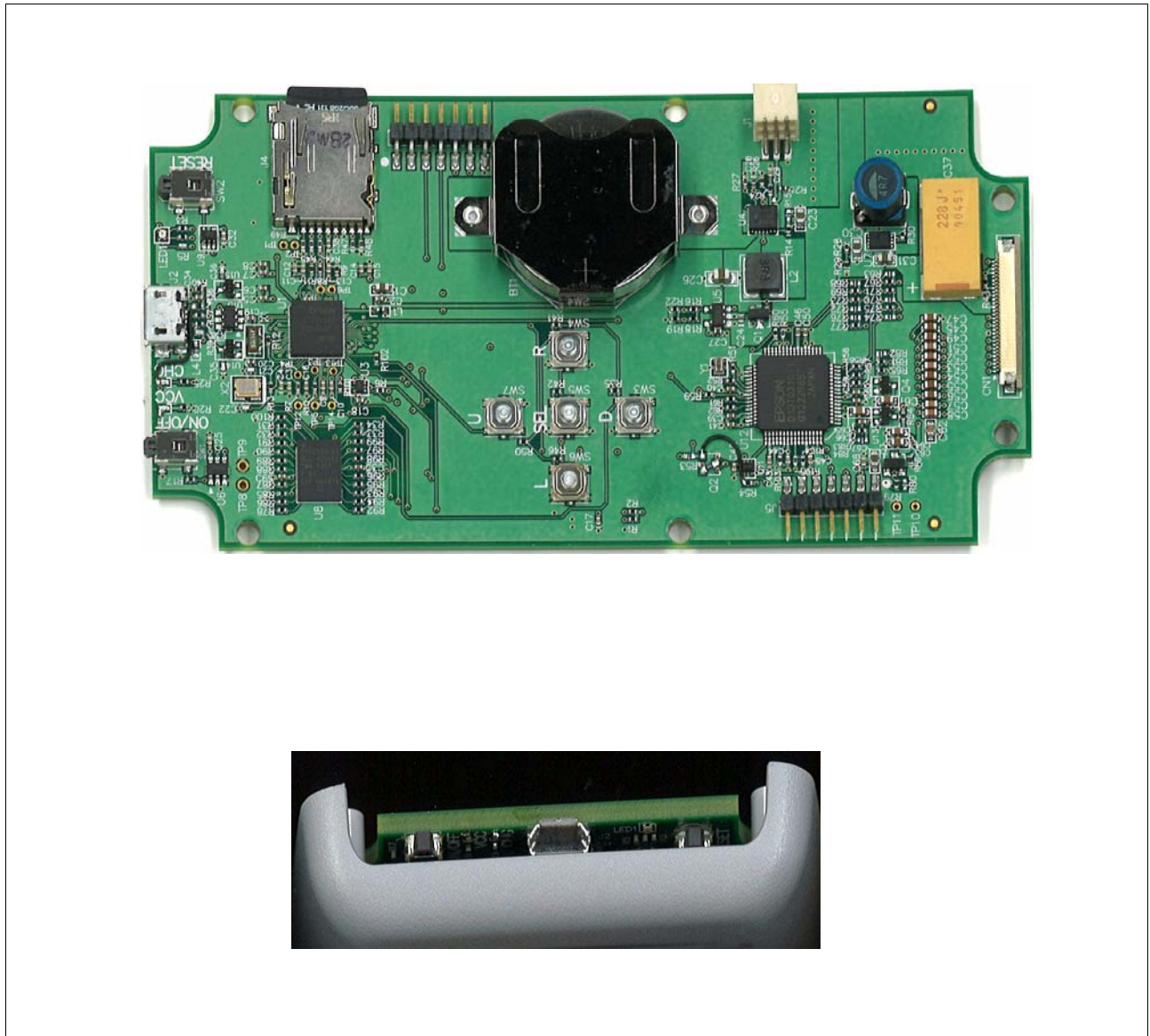
The main processor is an Epson 16-bit MCU, S1C17801, which has an embedded USB controller, full-speed (12Mbps). The USB connector on the board is a Micro-B receptacle and it will require a USB cable with Micro-B plug.

The board has a microSD card which is used by the main processor as permanent storage. All the demo files, including the images are stored on the microSD card. When connected to a computer by USB, the unit will be seen as a flash memory drive, and all the files on the microSD card will be accessible from the computer. The files can edited, deleted, new files can be added, the same as on any flash memory drive.

The board has an Epson EPD controller, S1D13T03. The EPD controller will drive a PDI EPD display.

The board has a reset button. The button is a side-actuation button (same as ON/OFF button), mounted on the back of the board, in recess from the edge of the board, so that it can not be accidentally pushed. In order to reset the board, a pointed object (like a pen) should be used to push the reset button.

The board has 4 user input button, named '1', '2', '3', and '4'. Button '4' function is fixed and is used to put the demo unit in USB mass storage mode. The other 3 buttons are for user control of the demo software. Their function is flexible and can be changed by the user.
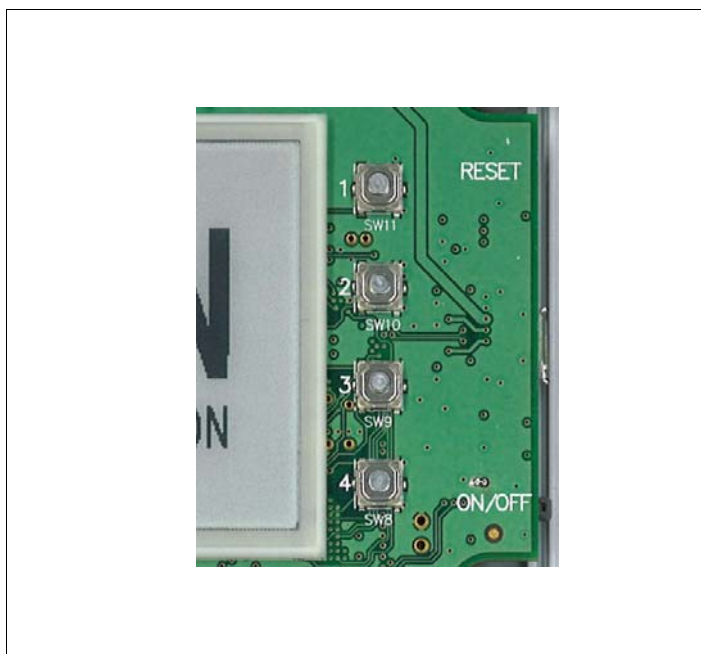
2.3 EPD Panel

The demo unit is usually configured with a PDI 2.7" EPD display. The unit can be configured with a different panel, like PDI 1.44" EPD display or PDI 2.0" EPD display. To In order to replace a display with another, you must inser a fine blade between the PCB and the display and work the blade toward the right edge of the board so that it will be unstuck from the PCB (the double-sided may remain on the PCB. After then just open the flap on CN2 connector on the board and remove the panel. Insert the new panel into CN2 connector and close the flap. If the double sided tape is still on the PCB, gently press the display against it so that will be fixed to the PCB. If there is no double sided tape on the PCB, place new double sided tape on the PCB and then gently press the display against it.

Chapter 3 SD Card File Structure

When the unit is connected to a computer by USB, it will be seen as a mass storage device and all the content of the SD card will be accesible from the computer.

The SD Card contains the documentation, the demo images and script files use by Jane-TCON Demo unit.

In the root directory of the SD Card there is a script file 'Config.txt' and several folders. Each folder contains the demo sofware, the images and the script file used for a particular panel. For example, the folder called '2.7' will hold all the files for the demo using PDI 2.7" EPD panel.

3.1 'Config.txt' file

'Config.txt' is used to configure the demo unit for the panel mounted on the unit. To configure the unit for a panel:

• Connect to a PC via USB.

• Press button '4' and turn the power on (the demo unit will power up in USB mode).

• The demo will appear as mass storage device and open with a text editor the file 'config.txt' in the root directory.

• The first line in the file conatin the PANEL_SELECT command, followed by a parameter with the name of the folder coresponding to a panel. For example the the PDI 2.7" display, the folder is named '2.7'.

• Change the parameter to the name of the folder corresponding to the panel used and save the change.

• Reset the unit or turn the power off and then on again and the unit will run the demo for the configured display.

3.2 Panel folders

In each folder there are the images and script files used by the demo software.

3.2.1 Script files

• Panel.txt file

  • This file contains the parameters related to the panel used:

    • the resolution of the panel

    • the rotation of the image

• Startup.txt

  • This file specifies the image displayed when the demo unit is turned on

• Buttons.txt

  • This file specifies the script file which will run when the respective button will be pressed by the user. Button '4' has a fixed function (to putthe demo unit in USB mode) and buttons'1', '2', and '3' will have the operation defines in the script file associated with each button.

- Button1.txt

  - This file defines the opeartion of the demo unit when button 1 is pressed. The commands used in the script files are explained in next chapter.

- Button2.txt

  - This file defines the opeartion of the demo unit when button 1 is pressed. The commands used in the script files are explained in next chapter.

- Button3.txt

  - This file defines the opeartion of the demo unit when button 1 is pressed. The commands used in the script files are explained in next chapter.

3.2.2 Images

The images use by the demo are in Window bitmap format (bmp), grayscale, 2 shades (black and white) . In order to use a custom image, it must be converted to bmp, black and white format.

In order to evaluate the display with its different images than the one provided with the demo unit, the new images must be saved in the folder corresponding to the panel used on the demo unit, and then change the name of the image file in the script file defining the buttons operation.

An alternative way of using new images on the demo unit is to overwrite an exiting image with a new images, but in this case, the new image must have the same resolution like the old image and be in bmp format, black and white.

Chapter 4 Demo Software

4.1 Scripts and Commands

' Comment start

// Alternative comment start

Command arguments are in HEX unless modified by a suffix:

2000 default radix value

2000h HEX value

2000H HEX value

2000t Decimal

2000T Decimal

Commands and parameters shall be divided by one or a few spaces or tab. Commands are not case sensitive (unless it is specified!).

4.1.1 RADIX DECIMAL/HEX

This command changes an implicit radix. The explicit radix is always controlled by one of the suffixes either 't' or 'H'

The implicit radix can be controlled with the command.

4.1.2 SHOW

Description:

Command displays 1 bit per pixel (two colors) BMP file or proprietary binary file to the panel at offset 0, 0. Bitmap must correspond the selected panel width and height. A subset of SHOW commands can display an area with width and height and offset of top left corner

SUBSET OF SHOW COMMANDS:

CMD_SHOW FILENAME issues a target command full update panel

CMD_SHOW_AREA FILENAME XSTART YSTART WIDTH HEIGHT issues a target command full update area

CMD_SHOW_P FILENAME issue a target command partial update

CMD_SHOW_P_AREA FILENAME XSTART YSTART WIDTH HEIGHT issue a target command partial update area

If the file with the name is not found – Two 200 MSEC Red flashes issued

4.1.3 DELAY MSECONDS

Description:

Command delays console for a number of milliseconds

4.1.4 PANEL_SELECT STRING

Description:

Command selects a panel type. If directory is not found – Solid RED light is lit

4.1.5 CMD INIT_DSPE_CFG

4.1.6 CMD INIT_DSPE_ROT

4.1.7 CMD LD_IMG_AREA XSTART YSTART AREAW AREAH FILENAME

Command loads file from the media storage to the target. If there is no file name then the current image is kept.

4.1.8 CMD UPD_FULL

4.1.9 CMD UPD_FULL_AREA

4.1.10 CMD UPD_FULL

4.1.11 CMD UPD_FULL_AREA

Chapter 5 References

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Change Record

X93A-G-004-01 Revision 1.0 - Issued: June 18, 2012

• initial release

EPSON S5U13522C100S00 E Paper Display PICtail™ Plus Board