



[Embedded Pico Systems]

User's Guide
USB2TCM_v1.1

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Table of Contents

1	<u>Introduction</u>	3
2	<u>Supported Devices</u>	3
3	<u>Supported Operating Systems</u>	4
4	<u>Usage</u>	4
	4.1 <u>Connection</u>	4
	4.2 <u>Uploading Image to TCM</u>	5
	4.3 <u>Image Conversion to EPD Format</u>	5
	4.4 <u>Reset Button</u>	6
5	<u>Known Issues</u>	6
6	<u>Troubleshooting</u>	7
7	<u>Revision History</u>	8
8	<u>Legal Information</u>	9
	8.1 <u>Disclaimers</u>	9
9	<u>Contact Information</u>	10

1 Introduction

USB2TCM_v1.1 interface is an easy to use USB Mass Storage device, which allows uploading images from a computer to MpicoSys Timing Controller Module for Pervasive Displays (TCM.)



Figure 2.1: UCB2TCM_v1.1

2 Supported Devices

USB2TCM_v1.1 is designed to interface a computer and the following TCM devices:

- TCM-P441_v1.1
- TCM-P441-230_v1.0
- TCM-P74-110_v1.1
- TCM-P74-220_v1.1
- TCM-P74-230_v1.0
- TCM-P102-220_v1.1



Figure 2.2: USB2TCM_v1.1 connected to a TCM-P441



Figure 2.3: USB2TCM_v1.1 interface connected to a TCM-P74

3 Supported Operating Systems

- Microsoft Windows XP and above (32-bit and 64-bit)
- Apple Mac OS (tested on OS X Mavericks)
- Linux (tested on Ubuntu 13 64-bit)

4 Usage

4.1 Connection

Use a USB A Mini-B cable to connect the USB2TCM_v1.1 to a computer USB port.

NOTE USB2TCM_v1.1 may not work properly when connected to a passive USB hub (i.e. a USB hub with no external power supply. Please make sure to use a fully-powered (100 mA) USB socket.

Connect the USB2TCM_v1.1 10-pin female header with the TCM 10-pin male header. Please mind the correct orientation i.e. the components on both the boards should be facing the same side.

4.2 Uploading Image to TCM

Connected to the computer the USB2TCM_v1.1 device acts like a flash drive. Images in EPD format¹ can be copied on that drive and will be automatically sent to TCM, where the e-paper display will be updated.

The procedure is as follows:

- 1) Check that the USB2TCM_v1.1 is properly connected to a computer and to a TCM
- 2) Check whether PWR LED on USB2TCM_v1.1 is on
- 3) Check whether USB2TCM_v1.1 is properly recognized and mounted by your operating system (it should be visible as Removable Disk with 484 KB free space)
- 4) Copy an image in EPD format suitable for TCM module used (P441, P74 or P102) to the USB2TCM Removable Disk
- 5) After copying, the USB2TCM will forward this image to the TCM, which is indicated by the COM LED being lit constantly
- 6) If the image was sent correctly, COM LED will turn off. If there was erroneous TCM operation – COM LED will blink until the device is restarted
- 7) Remove the previously sent image from USB2TCM Removable Disk before uploading a new one

NOTE If the COM LED continues blinking the transfer from the USB2TCM_v1.1 to the TCM failed. The USB2TCM_v1.1 must be reset by power cycling – disconnecting and reconnecting the USB cable.

4.3 Image Conversion to EPD Format

Image in the typical format like JPEG or PNG can be converted to EPD by using the Convert tool. The Convert tool can be downloaded from the Pervasive Displays Inc. website (www.pervasivedisplays.com.)

The Convert tool accepts any image resolution, aspect ratio and colour depth, however for the best results it is recommended to prepare an input image file already scaled-down to the target display resolution and orientation and to monochrome in a graphical program on your computer.

Run the Convert application using Java Runtime Environment.

¹ For more information please refer to *Timing Controller Solutions for Pervasive Displays 4.41", 7.4" and 10.2" Panels – Developer's Guide*; File name *TCS-P_DevelopersGuide_rF.pdf*; Document reference 0874/13-MK; Section 6.



Figure 4.1: Convert application for TCM-P74

To convert an image simply drag and drop the file from the file explorer window to the Convert window area. Application will then create output folder with output files in the same location as the original image file.

Output folder named *PDIxx_Converted* contains four output files:

- *PDIxx_ImageName_1bit.epd* – file with image converted to EPD format
- *PDIxx_ImageName_1bit.h* – C-type header file – an array with bytes corresponding to the image pixels, that can be directly included in your C project source code
- *PDIxx_ImageName_1bit.png* – PNG image file in 1-bit colour scale – for preview on a computer
- *PDIxx_ImageName_4bit.png* – PNG image file in 4-bit colour scale – for preview on a computer

where:

- *xx* – the display type for which the image is created (PDI441, PDI74 or PDI102)
- *ImageName* – original image file name

File suitable to be sent to TCM is the one with the EPD extension.

4.4 Reset Button

The reset button located next to the mini-USB socket can be used to reset the USB2TCM_v1.1 e.g. when the COM LED is blinking. The reset is automatically followed by sending the stored image to the TCM and refreshing the display.

5 Known Issues

When the USB2TCM_v1.1 is plugged in a USB port on a Mac OS computer with TCM disconnected, the COM LED will blink. In that case please connect the TCM and reset USB2TCM_v1.1 by pressing the reset button or by disconnecting the USB cable and connecting it again.

This issue is caused by the Mac OS writing proprietary hidden files to any FAT-formatted drive.

6 Troubleshooting

Issue	Possible cause	Solution
USB2TCM_v1.1 device is not found by the operating system	USB cable damage	Check whether PWR LED on USB2TCM board is on. Replace the USB cable.
COM LED is constantly blinking	Problem with TCM module connection	Check connection between USB2TCM and TCM board. Restart USB2TCM board by USB cable disconnecting and connecting again or by pressing the reset button.
Picture on TCM display is distorted	EPD file uploaded to TCM is not appropriate for the used TCM	Ensure that EPD file is according to used panel size.
EPD file can't be copied on USB2TCM drive – not enough space	USB2TCM memory is occupied	Delete previously sent EPD file from USB2TCM removable disk.

Table 6.1: Troubleshooting

7 Revision History

Document Revision	Release Date	Document Status	Supersedes
A	2014-07-30	Approved	-

Table 7.1: Revision history

Document Revision	Change Log
A	Initial version

Table 7.2: Change log

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