# Test Plan and Procedure – P1.3

ECE 3740 – Ken Ferens – Fall 2017
Assignment 1.3
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# 1. INTRODUCTION

## 1.1 Purpose of the Test Plan Document

This document tests whether the program to toggle LEDs and monitor push buttons on the MX7CK board works by connecting to a TCP server on the board, and issuing commands through a Telnet client to interface with the board.

# 2. TESTING

## 2.1 Test Plan and Cases

| Item to Test | Test Description | Test Date | Responsibility |
|---|---|---|---|
| TCP/IP LED and PB monitor functionality. | Load the MX7CK board with a TCP/IP server program, and issue requests to the server to toggle LEDs and monitor push buttons. | | Daniel Lovegrove |
| Disconnect functionality. | Start up the TCP/IP server, connect to it, disconnect from it, and connect to it. | | Daniel Lovegrove |
| Error Handling | Issue dummy commands to server and ensure the server stays connected if a bad command is entered. | | Daniel Lovegrove |

## 2.2 Test Procedures

### 2.2.1 TCP/IP LED and PB Monitor Functionality

Prerequisites: Be using a Windows machine with MPLAB X installed, as well as the XC32 compiler and the PIC32 peripheral libraries. The Telnet client must be enabled prior to testing. You must have the project files downloaded, and a MX7CK board with a micro USB cable and Ethernet cable.

| Instruction | P/F |
|---|---|
| 1. Using the file explorer GUI, copy the folder P1.3 to C:\tmp\P1.3 | |
| 2. Connect the MX7CK board to your computer with a micro USB cable and Ethernet cable. The small end of the USB should be plugged into the DEBUG port. The Ethernet cable should be connected between the board and the computer. Turn the board ON | |
| 3. Open MPLAB X IDE by clicking its icon. | |

| | |
|---|---|
| 4. In MPLAB X, click File->Open Project. Using the file explorer that was opened, open the project C:\tmp\P1.3\TCPIP\"Demo App"\XC32-PIC32_ETH_SK_ETH795.X | |
| 5. Once the project is open, in MPLAB X click Debug->Debug Project. This will load the project onto the board. If a dialogue pops up for "Licensed Debugger not Found," click CerebotMX7CK under Licensed Debugger and click OK. Wait for the project to start running (LEDs will start rotating). | |
| 6. Open a command prompt by pressing the Windows button and R at the same time, then type cmd.exe and press Enter. | |
| 7. Connect to the board via a Telnet client. From the command prompt, type in the following command (without quotes) and hit enter: "telnet 192.168.1.214 7777". | |
| 8. There should be a menu displayed by the board giving instructions on how to use the program, starting with "Enter a command to interact ...". | |
| 9. Verify that the command line's cursor is displayed after a yellow dollar sign, signalling that the program is ready to receive commands. | |
| 10. Turn LED2 on and off. First type (without quotes) "LED2" and hit enter. Verify that LED2 is now on, and that the server sent a message saying LED2 is on. Type "~LED2" and hit enter. Verify that LED2 is now off, and that the server sent a message saying LED2 is off. | |
| 11. Turn LED3 on and off. First type (without quotes) "LED3" and hit enter. Verify that LED3 is now on, and that the server sent a message saying LED3 is on. Type "~LED3" and hit enter. Verify that LED3 is now off, and that the server sent a message saying LED3 is off. | |
| 12. Turn LED4 on and off. First type (without quotes) "LED4" and hit enter. Verify that LED4 is now on, and that the server sent a message saying LED4 is on. Type "~LED4" and hit enter. Verify that LED4 is now off, and that the server sent a message saying LED3 is off. | |
| 13. Monitor BTN1. Without pressing any buttons, type "BTN1" and hit enter. The server should send a response to the console that BTN1 is NOT pressed. Now, type in the command "BTN1" again, and while holding BTN1 down, press enter. BTN1 is the button furthest from the USB cable. The server should send a response to the console that BTN1 is pressed. | |
| 14. Monitor BTN2. Without pressing any buttons, type "BTN2" and hit enter. The server should send a response to the console that BTN2 is NOT pressed. Now, type in the command "BTN2" again, and while holding BTN2 down, press enter. BTN2 is the middle button. The server should send a response to the console that BTN2 is pressed. | |
| 15. Monitor BTN3. Without pressing any buttons, type "BTN3" and hit enter. The server should send a response to the console that BTN3 is NOT pressed. Now, type in the command "BTN3" again, and while holding BTN3 down, press enter. BTN3 is the button closest to the USB cable. The server should send a response to the console that BTN3 is pressed. | |

## 2.2.2 Server Disconnect Functionality

Prerequisites: Have completed up to step 15 of 2.2.1, and have the server still running on the Windows command line.

| Instruction | P/F |
|---|---|
| 1. The server should still be running from test 2.2.1. If not, complete Step 1-9 of test 2.2.1. | |
| 2. The server should quit by entering Q. Type Q and hit enter. The server should disconnect. | |
| 3. Verify that you can reconnect. Reconnect by following step 7 of 2.2.1. The server should have sent the same help menu from before and should be accepting input after the dollar sign. | |
| 4. Redo step 10 of 2.2.1 and verify that the LEDs are still working after reconnecting. | |
| 5. The server should quit by entering q as well. Type q and hit enter. The server should disconnect. | |
| 6. Verify that you can reconnect. Reconnect by following step 7 of 2.2.1. The server should have sent the same help menu from before and should be accepting input after the dollar sign. | |
| 7. Redo step 11 of 2.2.1 and verify that the LEDs are still working after reconnecting. | |

## 2.2.3 Error Handling

Prerequisites: Have completed up to step 7 of 2.2.2, and have the server still running on the Windows command line.

| Instruction | P/F |
|---|---|
| 1. The server should still be running from test 2.2.2. If not, complete Step 1-9 of test 2.2.1. | |
| 2. Verify that the server does not disconnect after issuing a bad command. Type "LED5" in and press enter. The server should have responded with "Invalid Command". | |
| 3. Redo step 10 of 2.2.1 and verify that the LEDs still work after issuing a bad command. | |
| 4. Enter another bogus command of your choice which must be less than 19 characters. The server should still respond with "Invalid Command". | |
| 5. Quit the server by typing "q" and hitting enter. Quit the Windows command line, and optionally, delete the folder C:\tmp\P1.3. | |

## 3. TEST PLAN TEMPLATE APPROVAL

The undersigned acknowledge they have reviewed the P1.3 Test Plan and Procedure document and agree with the approach it presents. Any changes to this Requirements Definition will be coordinated with and approved by the undersigned or their designated representatives.

Signature (TA) _____ Date: _____

Print Name:      _____

Title:               _____

Role:               _____

## 4. REFERENCES

K. Ferens, "ECE 3740 Systems Engineering Principles 1," 15 September 2001. [Online]. Available: http://ece.eng.umanitoba.ca/undergradutate/ECE3740/. [Accessed 17 September 2017].