

tCAM IP Search Replace Demo Instruction

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tCAM IP Search Replace Demo Instruction

Rev1.00 6-Jun-2023

This document describes the instruction to demonstrate the operation of tCAMIP on Kintex UltraScale+ (KCU116) development board. This demonstration shows search/replace text function by using tCAMIP on KCU116 board via 10 Gigabit Ethernet communication.

1 Environment Setup

To operate tCAMIP demo, please prepare following test environment.

- 1) FPGA development boards (KCU116 development board)
- 2) Test PC with 10 Gigabit Ethernet card.
- 3) Micro USB cable for JTAG connection between FPGA development board and Test PC
- 4) 10Gb Ethernet cable (SFP+ to SFP+).
- 5) Vivado Hardware Manager for programming FPGA, installed on Test PC
- 6) File “tCAMIPSearchReplacePack-KCU116.zip” that included Test Application named “tCAMIP Search Replace” and configuration file named “tCAMIPRef+.bit”.
(To download this file, please visit our web site at www.design-gateway.com)

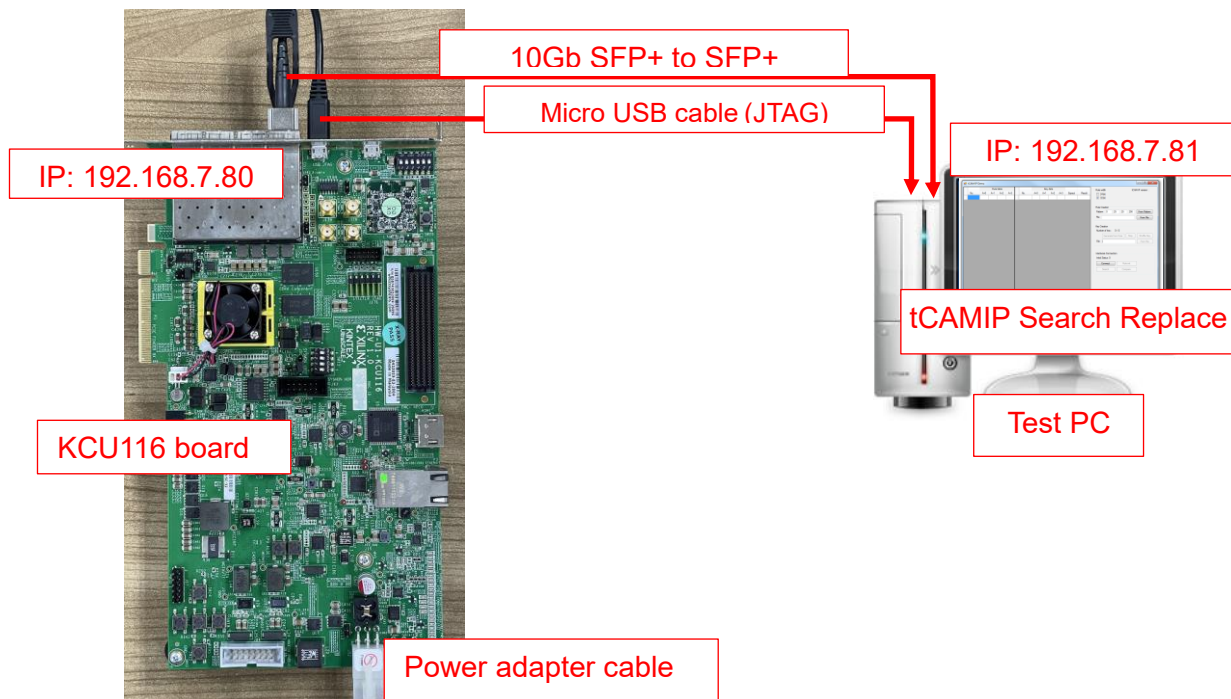


Figure 1-1 tCAMIP reference design demo on KCU116 board

2 PC Setup

Before running demo, please check the network setting on PC. Ethernet setting is shown as follows.

2.1 IP Setting

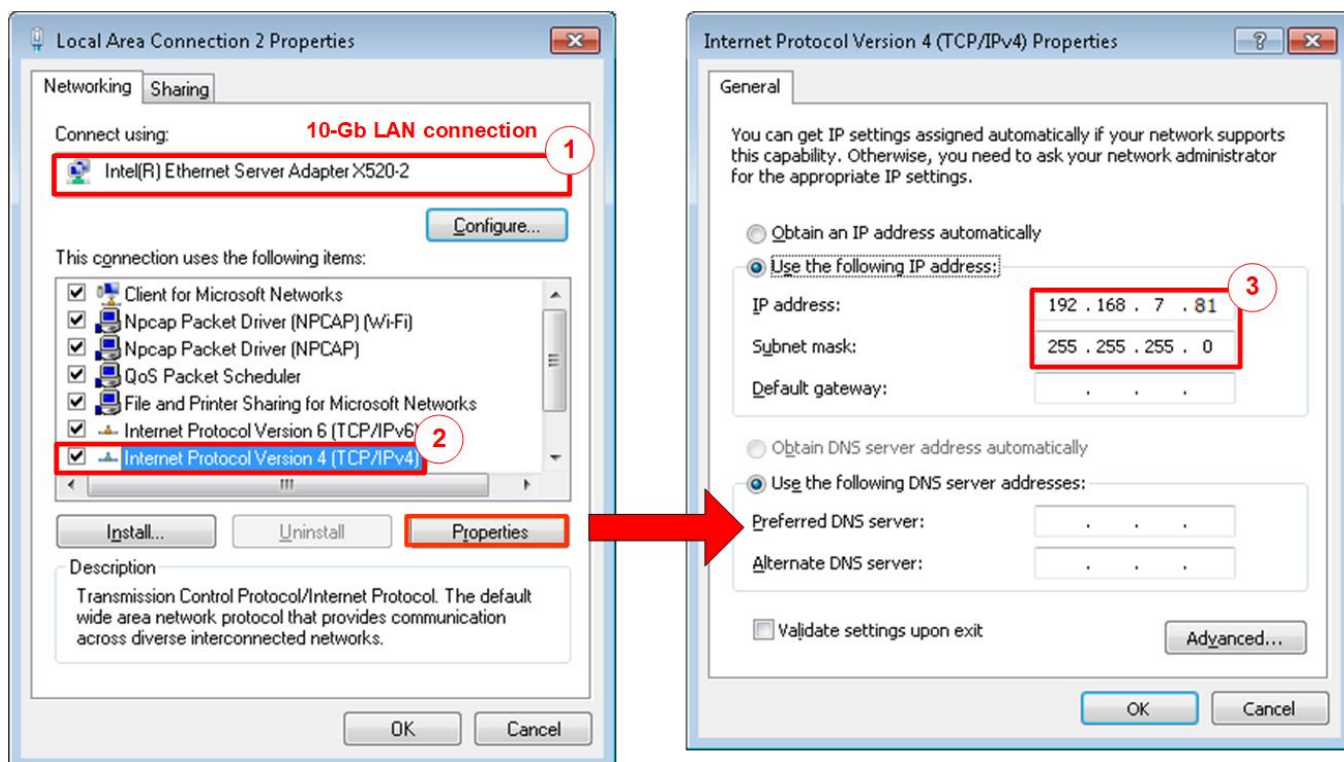


Figure 2-1 Setting IP address for PC

- 1) Open Local Area Connection Properties of 10-Gb connection, as shown in the left window of Figure 2-1.
- 2) Select “TCP/IPv4” and then click Properties.
- 3) Set IP address = 192.168.7.81 and Subnet mask = 255.255.255.0, as shown in the right window of Figure 2-1.

2.2 Speed and Frame Setting

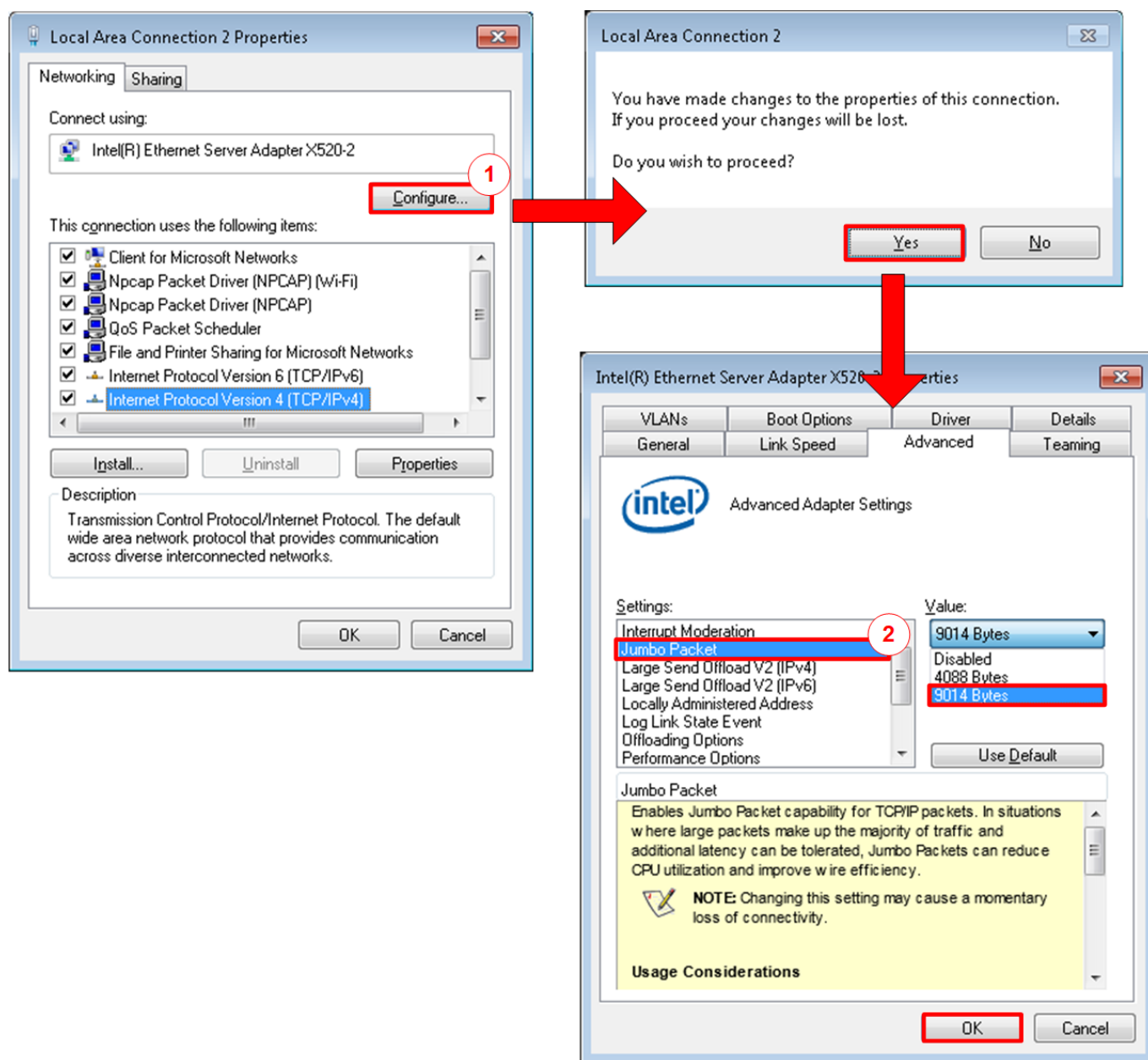


Figure 2-2 Set frame size = jumbo frame

- 1) On Local Area Connection Properties window, click “Configure” as shown in Figure 2-2.
- 2) On Advanced Tab, select “Jumbo Packet”. Set Value to “9014 Bytes” for Jumbo Frame support or set value to “Disabled” for non-Jumbo Frame support, as shown in the bottom window of Figure 2-2.

- 3) On Link Speed, select “10 Gbps Full Duplex” for running 10-Gigabit transfer test, as shown in Figure 2-3.

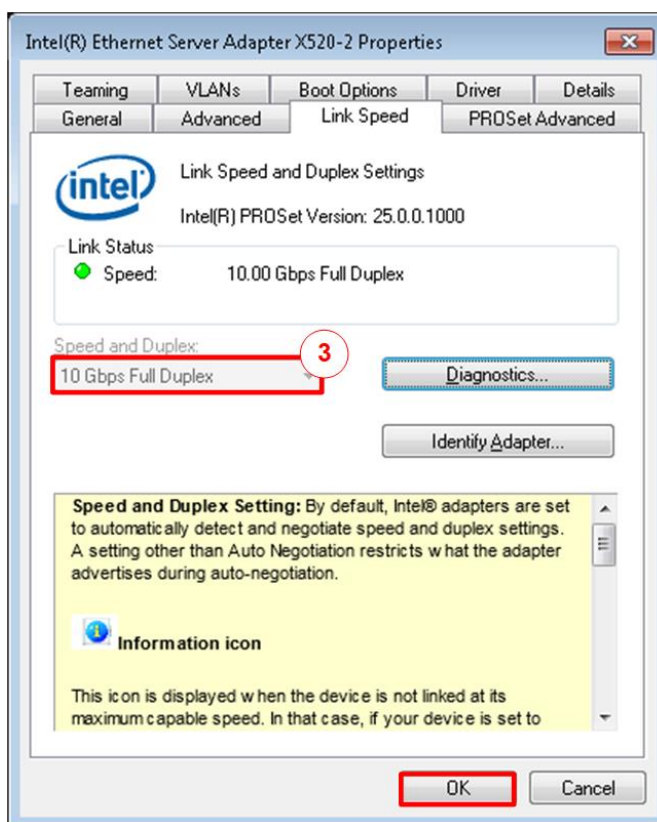


Figure 2-3 Set link speed = 10 Gbps

- 4) On PROSet Advanced Tab, select “Performance Options” and click “Properties” button.
- 5) Set “Interrupt Moderation Rate” = OFF.

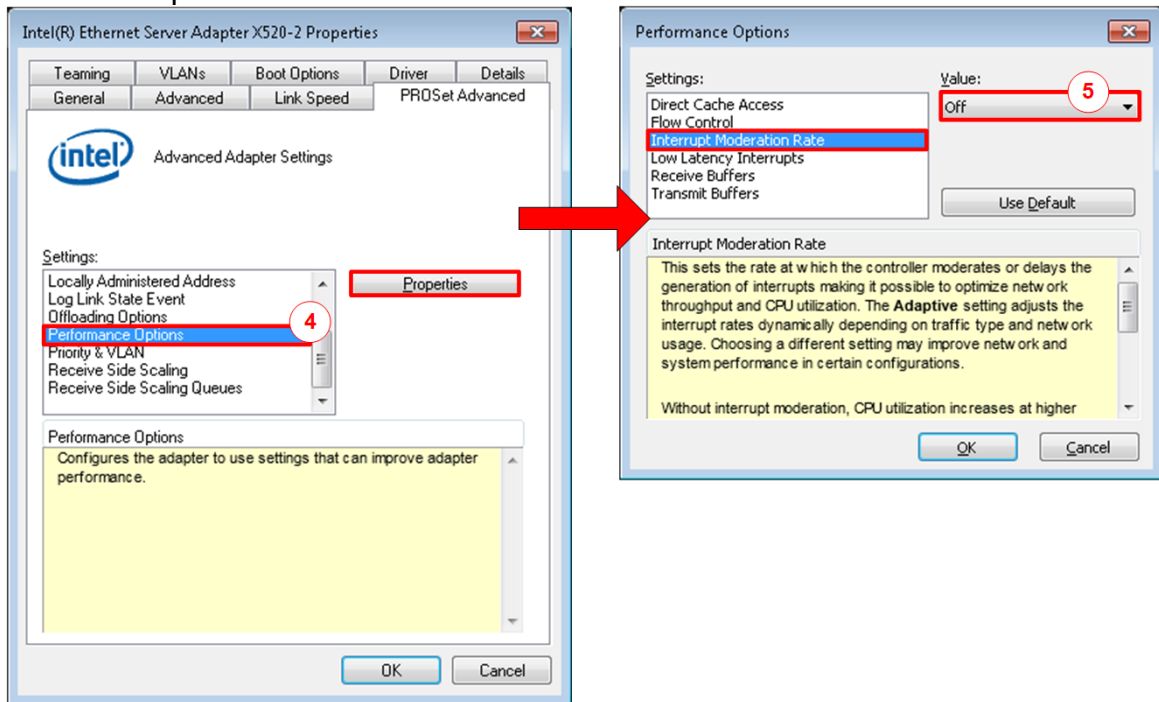


Figure 2-4 Interrupt Moderation Rate

- 6) Select “Low Latency Interrupts” and click “Properties” button.
- 7) On “Low Latency Interrupts” window, select “Use Low Latency Interrupts” and click “OK” button.
- 8) Click “OK” button to save and exit all setting windows.

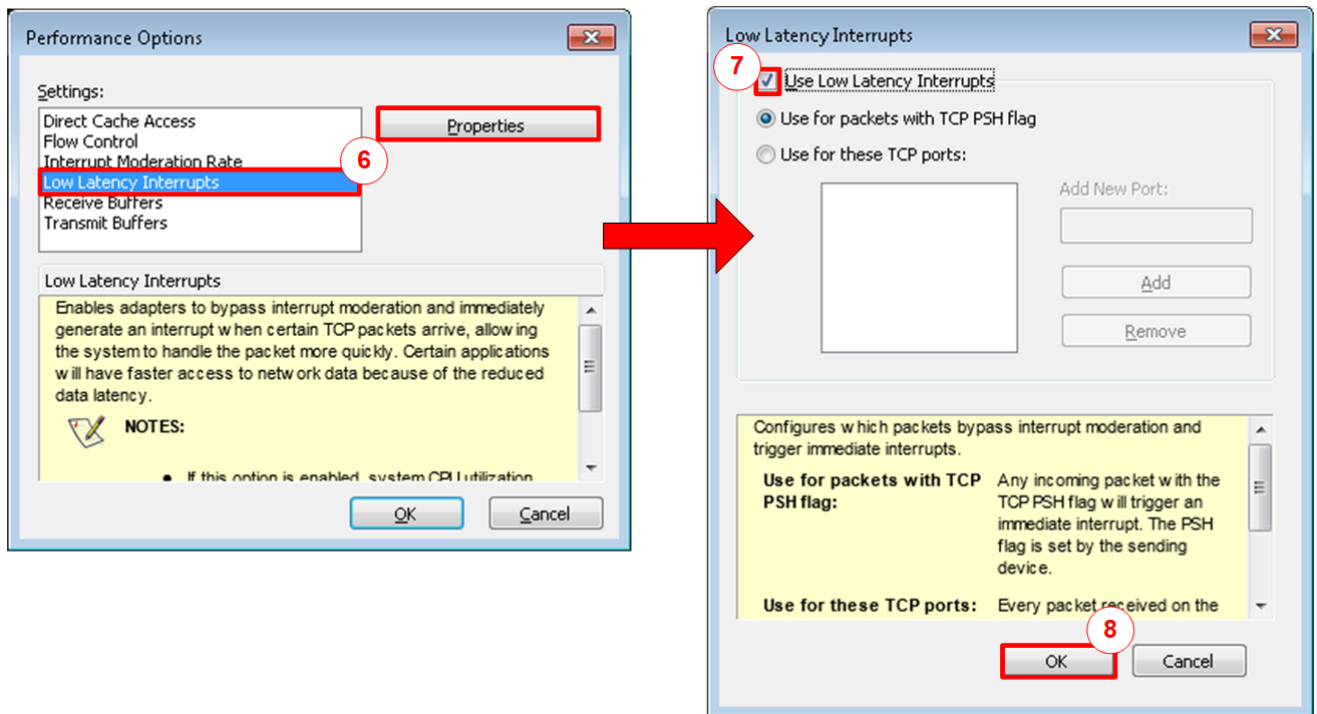


Figure 2-5 Use Low Latency Interrupts

2.3 Power Option Setting

- 1) Open Control Panel and select Power Options as shown in the left window of Figure 2-6.
- 2) Change setting to High Performance as shown in the right window of Figure 2-6.

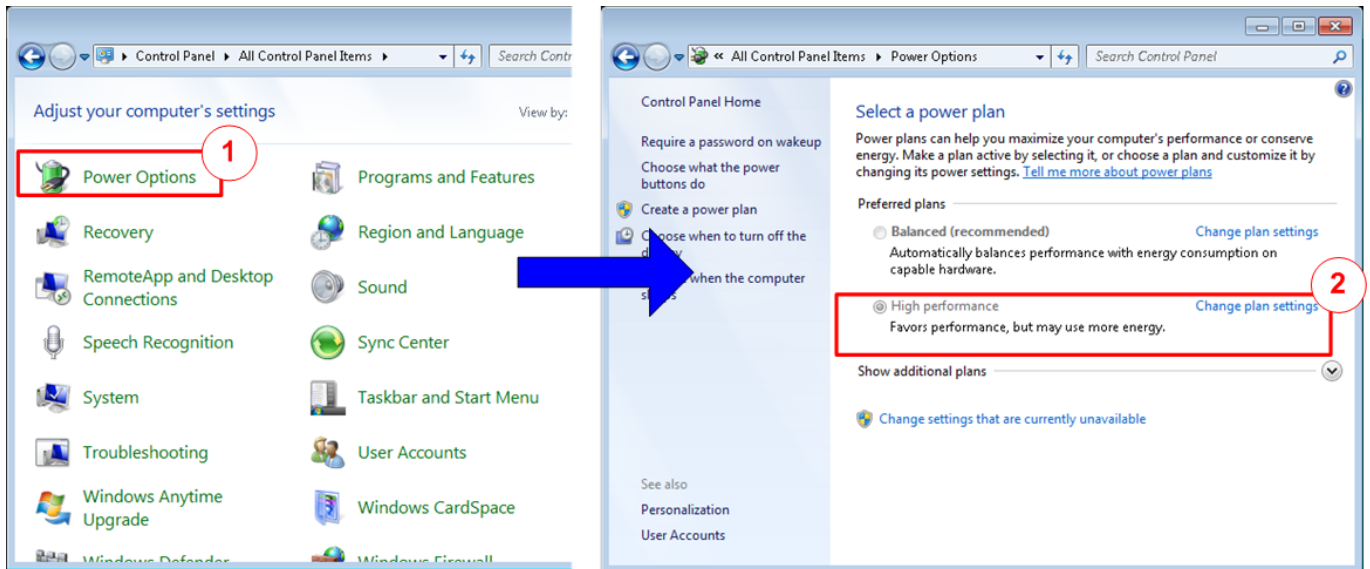


Figure 2-6 Power options

3 FPGA board setup

- 1) Make sure power switch is off and connect power supply to KCU116 development board.
- 2) Connect 10Gb SFP+ cable from KCU116 board to PC.
- 3) Connect USB cable between PC to JTAG micro USB port.

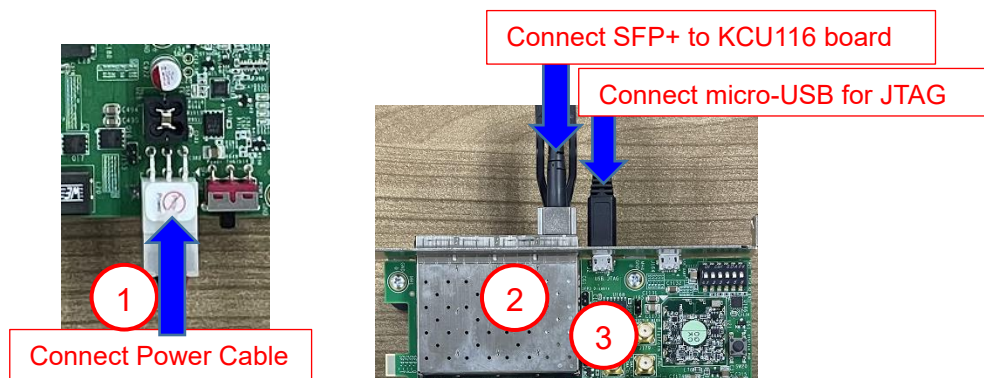


Figure 3-1 Power, Ethernet, and micro-USB cable connection for KCU116 board

- 4) Power on system.
- 5) Open Vivado Hardware Manager to program FPGA by following step.
 - a) Click “Auto Connect” to connect with board.
 - b) Right click at “xcku5p_0”, then select “Program device ...”
 - c) Select “.bit” for configuration bit file.
 - d) Select “.ltx” for debug probe file.
 - e) Press “Program” button to program device.

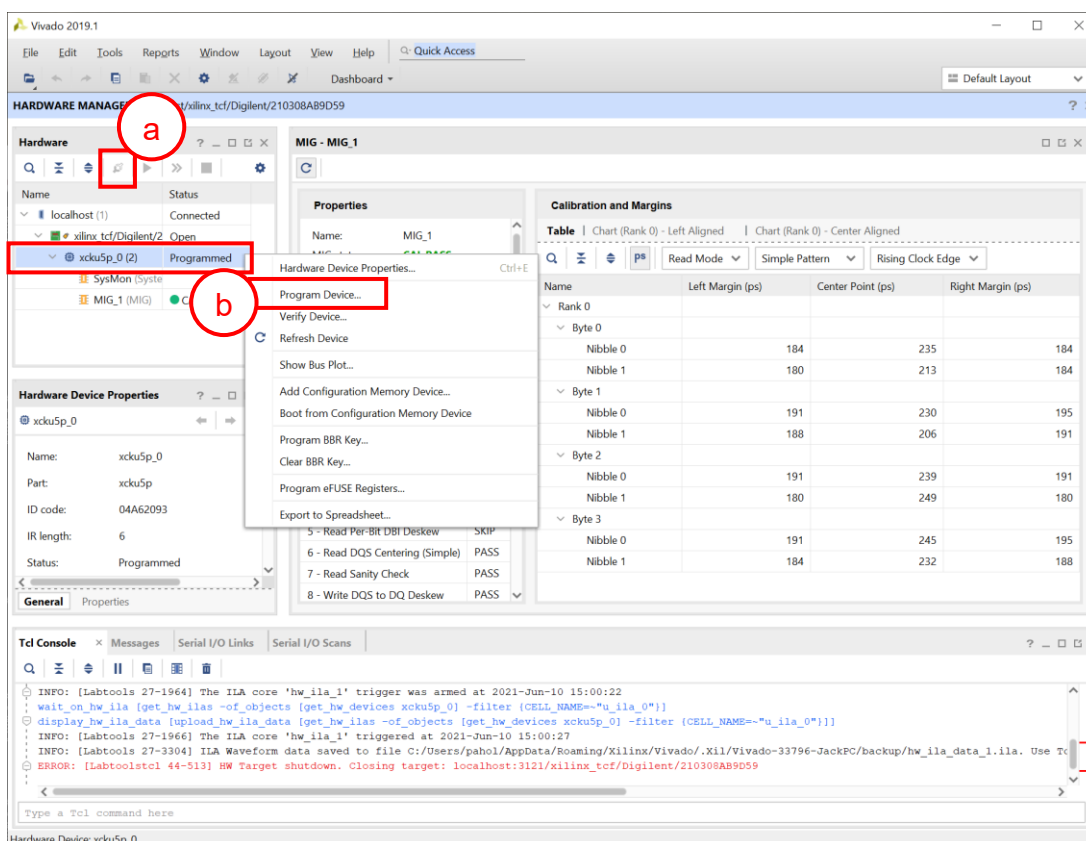


Figure 3-2 Vivado Hardware Manager

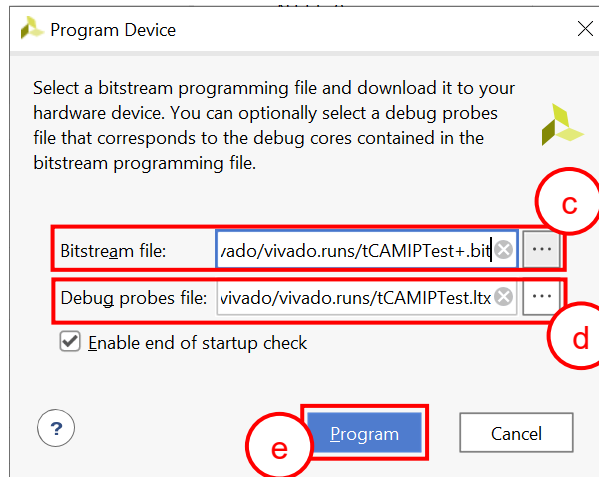


Figure 3-3 Program Device

- 6) When configuration is completed, user can check status LEDs on board as Figure 3-4.
 - LED0 is always blink to show clock is working.
 - LED1 is turned on when TOE10GIP is ready for data transfer.
 - LED2 is turned on when tCAMIP is initialized successfully.
 - LED3 is turned on when software open connection to S10MX board.

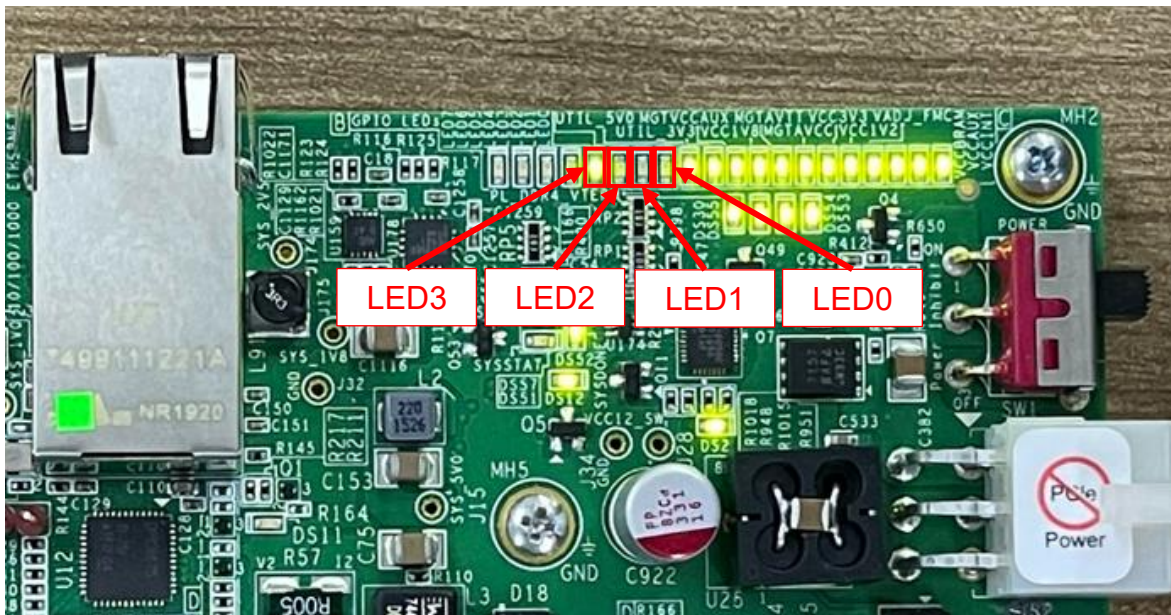


Figure 3-4 LED[3:0] status on board

4 tCAMIP Search Replace demo software

tCAMIP Search Replace demo software is designed to do search/replace text function by using space bar to be delimiter. tCAMIP Replace button is search and replace text by using tCAMIP on KCU116 board via 10 Gigabit Ethernet.

4.1 Demo software interface description

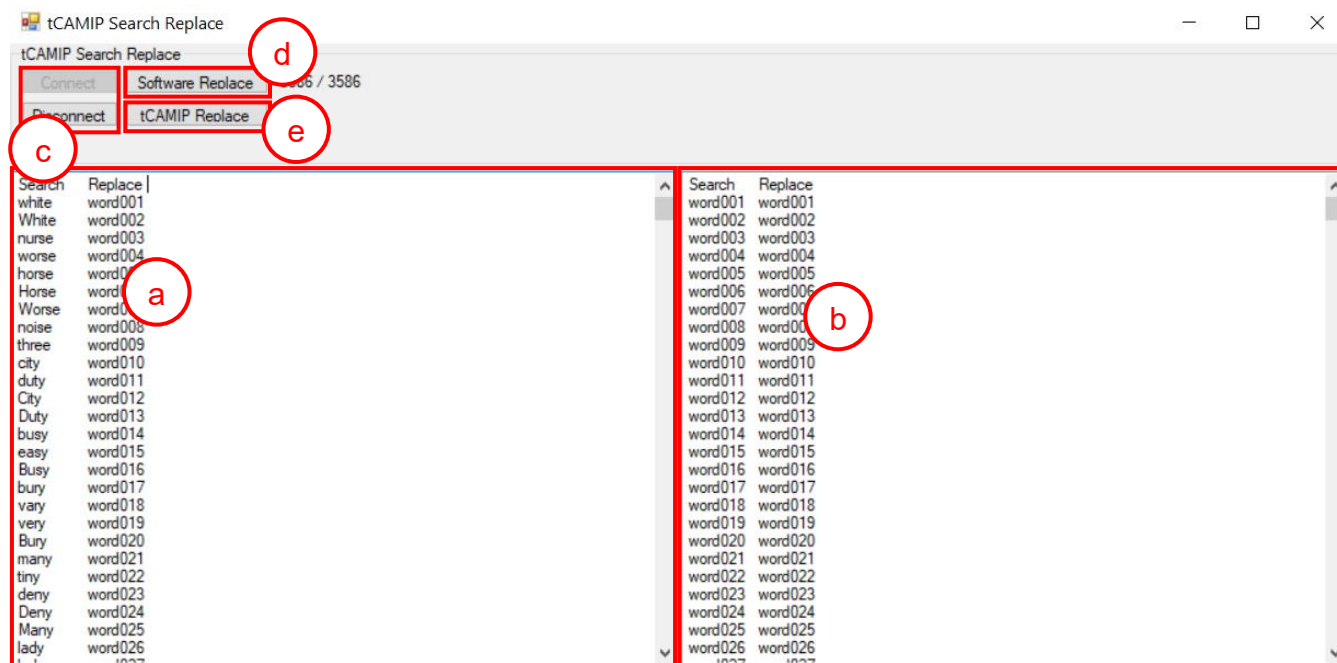


Figure 4-1 Software interface

Figure 4-1 shows tCAMIP Search Replace user interface and the description is shown as below.

- Input source text for search. ("input.txt" is sample text)
- Output result text after replace.
- Connect/Disconnect with KCU116 board via 10 Gigabit Ethernet.
- Software Replace, this button will search and replace text with software.
- tCAMIP Replace, this button will be sent source text via 10 Gigabit Ethernet to search and replace text by using tCAMIP.

4.2 Search and Replace sample table

Please refer sample table of search and replace word in file "SampleTable.txt".

4.3 Sample text

"SampleText.txt" is prepared for sample of input source text. Figure 4-2 shows sample result using "SampleText.txt"

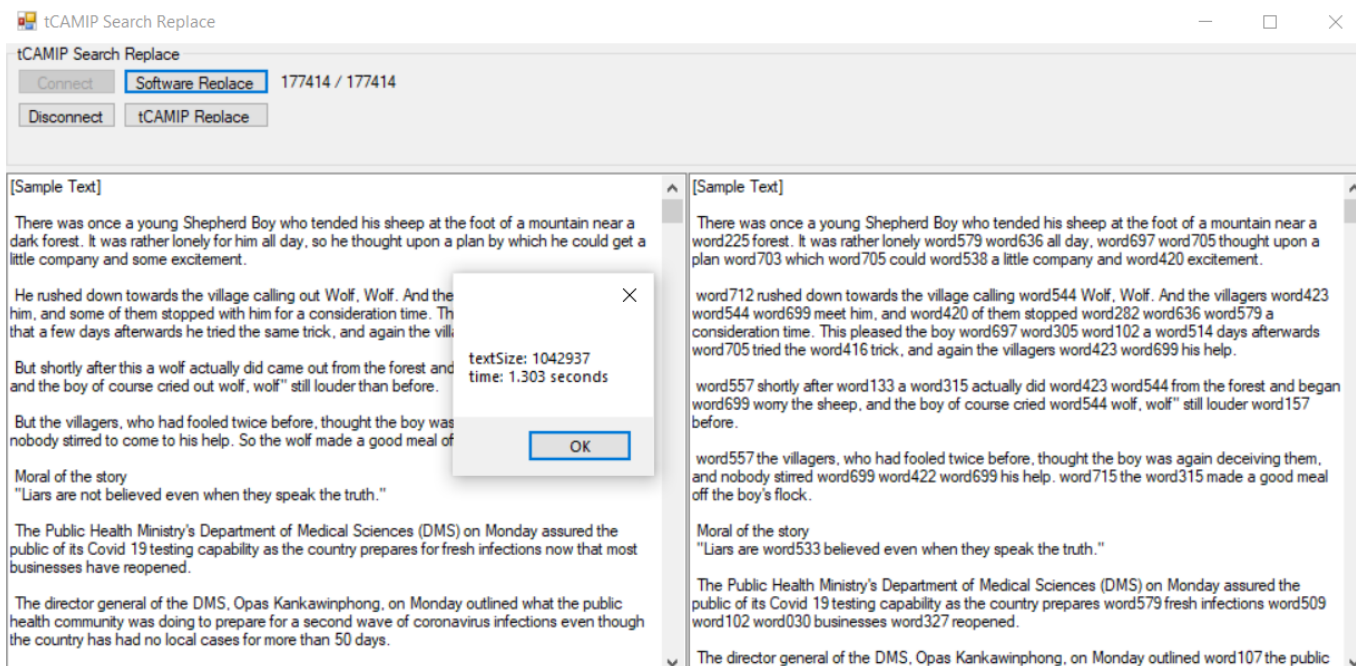


Figure 4-2 Sample result using "SampleText.txt"

5 Revision History

Revision	Date	Description
1.00	14-Jul-2021	Initial version release