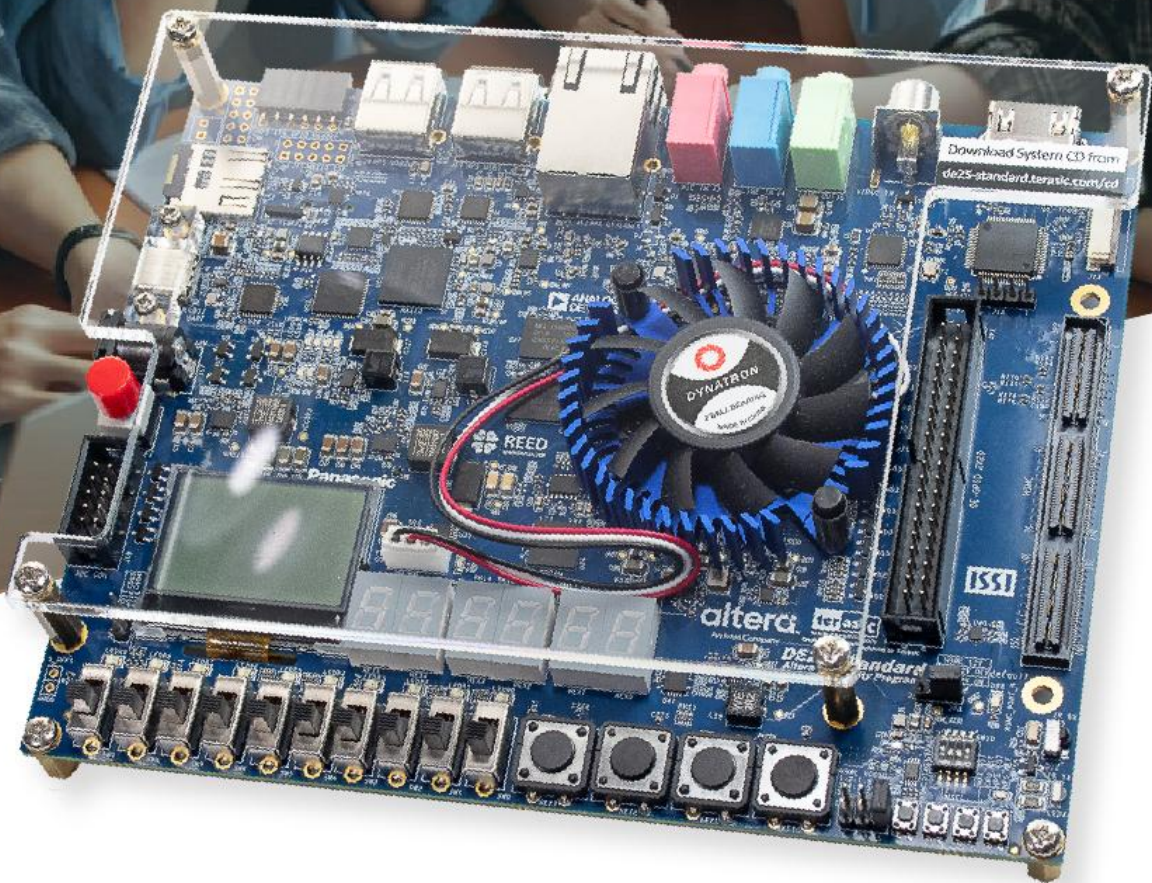


DE25-Standard Development Kit



**Powering next-level performance for
digital logic and embedded applications !**

Linux Booting Started Guide

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Chapter 1

Linux Booting on the board

1.1 Introduction

This guide describes how to boot the HPS on the board using the Micro SD Card with Linux image, and use the UART interface to allow the Host PC to communicate with the HPS of the board.

1.2 Required Hardware

To boot Linux on the board, the following hardware is required:

- DE25-Standard board
- USB Type A to Type-C Cable
- Micro SD Card (At least 4GB capacity)

1.3 Install the MicroSD Card

This section will show you how to install the MicroSD card into the board. In addition, if user want to recover the factory image file to the MicroSD Card. It will show how to download the Linux image file for the board and how to write it into the MicroSD Card.

■ Install the MicroSD Card to the Board

The Board will be shipped with a MicroSD card that has been written with Linux image. Users can install the Micro SD Card on the board by referring to **Figure 1-1**.

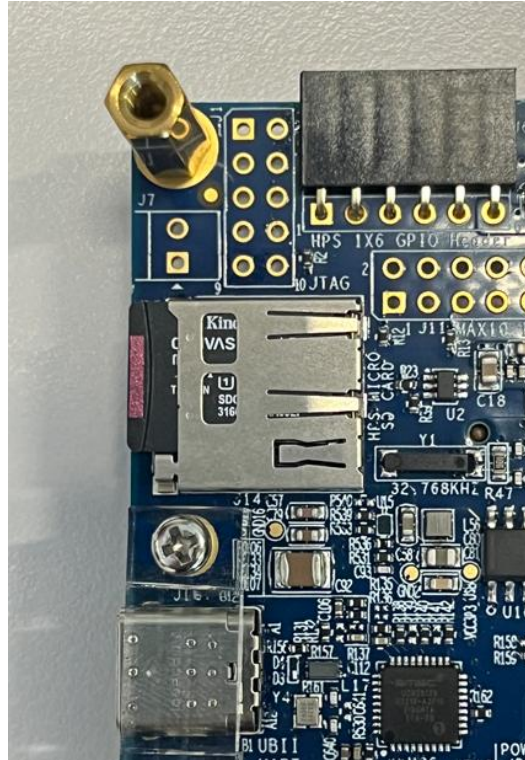


Figure 1-1 Installing MicroSD card

■ Download Linux image file

If the user wants to copy or re-program the MicroSD card, you can download the Linux image file (Find “*Linux BSP (Board Support Package): MicroSD Card Image*”) by referring to the link below:

<http://de25-standard.terasic.com/cd>

Linux BSP (Board Support Package): MicroSD Card Image

Title	Version	Size	Date	Download
Linux Console (Kernel 6.1.68-lts; rev. A Hardware)	1.0.0		2024-06-12	

Figure 1-2 BSP Download site

■ Download the programming tool

To program a MicroSD card Linux image you can use a free tool such as [Rufus](#).

■ Program the MicroSD Card

The SD card image file needs to be programmed to a MicroSD card before it can be used.

The steps below present how to create MicroSD card on a windows machine using Rufus.

1. Connect the MicroSD card to a Windows PC
2. Execute **Rufus**
3. Select the image file for MicroSD card
4. Select the MicroSD card device
5. Click “**START**” to start writing the image file to the MicroSD card. Wait until the image is successfully written.

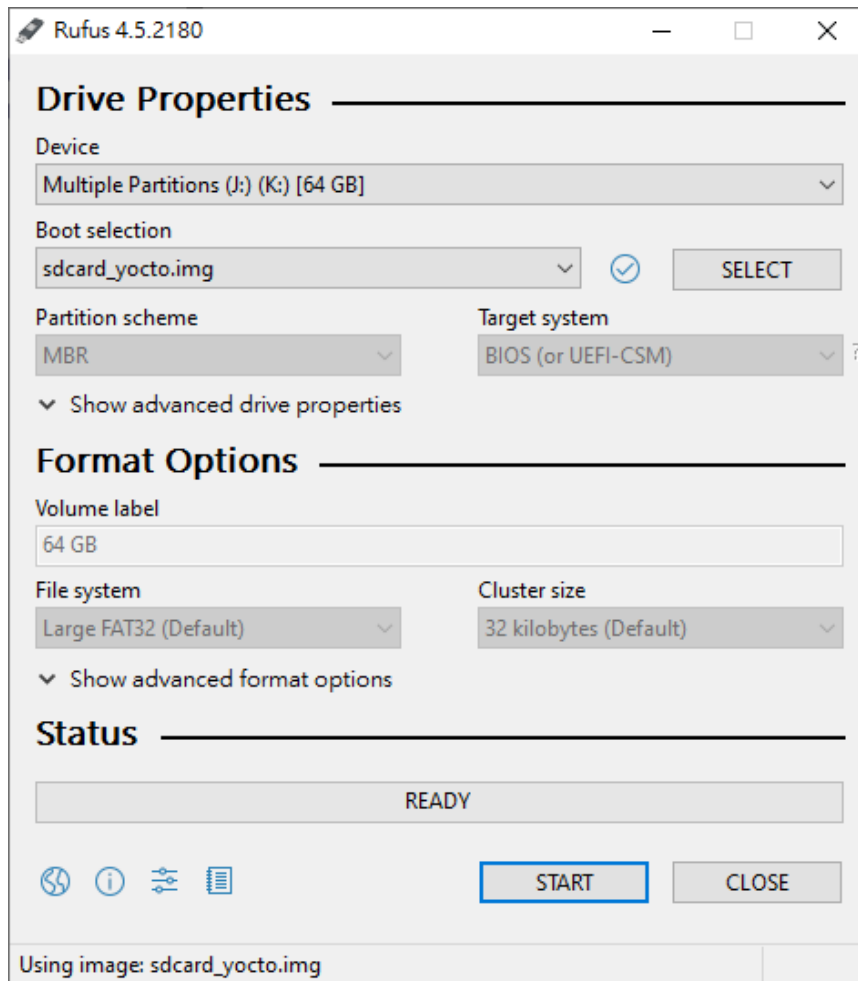


Figure 1-3 Rufus tool

1.4 Set the MSEL

Make sure the Configure mode switch is set to AS Fast mode. please set MSEL[2:0] to “001”.

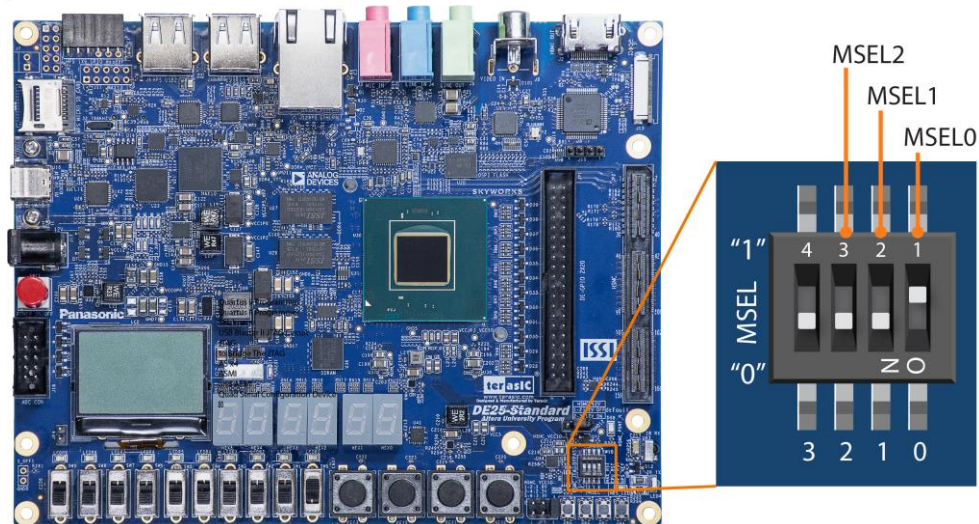


Figure 1-4 Position of slide switches SW10 for Configuration Mode

1.5 Power On the Board

To power up the board, user need to connect a 12V DC power supply to the board, then turn on the power switch SW5 on the board to power on the board (See **Figure 1-5**).

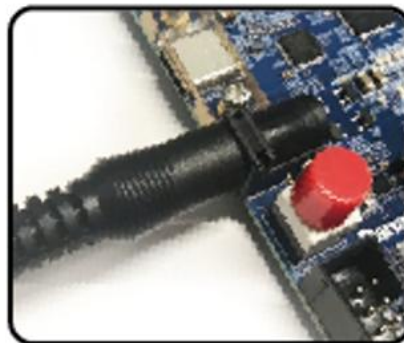


Figure 1-5 Power on the board form external Power

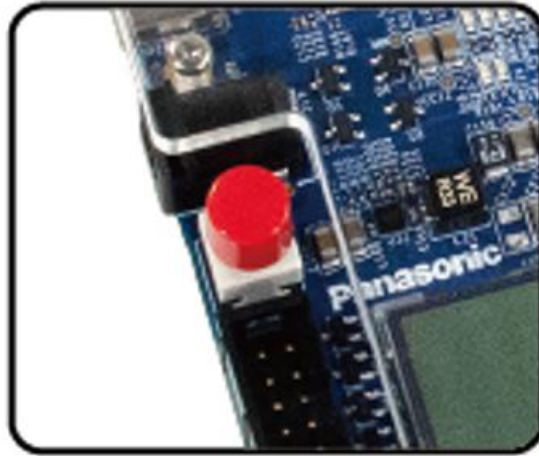


Figure 1-6 Power on the board form external Power

1.6 Setting Up HPS UART Terminal

This section presents how to setup the HPS UART interface on your Host PC. The HPS UART on the DE25-Standard development board is implemented through the FTDI FT2232H chip, which is part of the onboard USB Blaster III circuit. This means the onboard USB Blaster III and the HPS UART interface share the same USB Type-C connector for their connection to the host.

■ Installing the Driver

The driver for this UART interface is installed automatically by simply checking the '**Install UART FTDI driver**' option during the Quartus 25.1 Pro setup.

If you missed this option during the Quartus installation or need to reinstall, you can manually install the driver from the source files located in the Quartus installation directory. The typical path is:

<Quartus 25.1 pro install path>\25.1\quartus\drivers\uart-ftdi

■ Hardware Setting

Connect your computer to the development board by plugging the USB cable into the USB Type-C connector of the board. (Connection setup is shown in **Figure 1-7**)

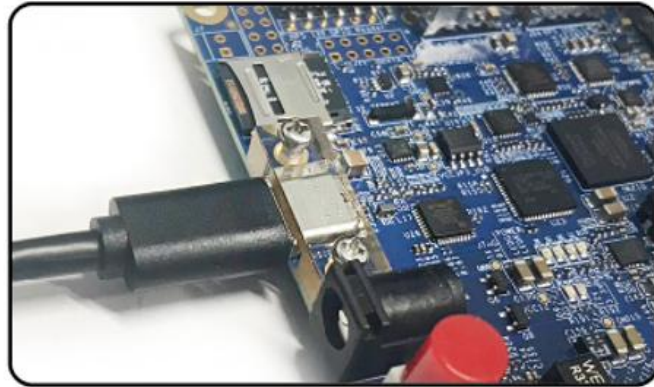


Figure 1-7 Connect the Micro USB cable to the board

The following steps show how to configure a PuTTY terminal window (can be downloaded from the link: <http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>)

1. Open the **Device Manager** on your windows and check the **Port(COM&LPT)** tab. User may find the **USB Serial Port(COM X)** on the list. See **Figure 1-8**, the COM number of this Host is COM13. *Note that the “COM13” on the Serial Line column needs to be modified according to the actual com port on the user's computer.*

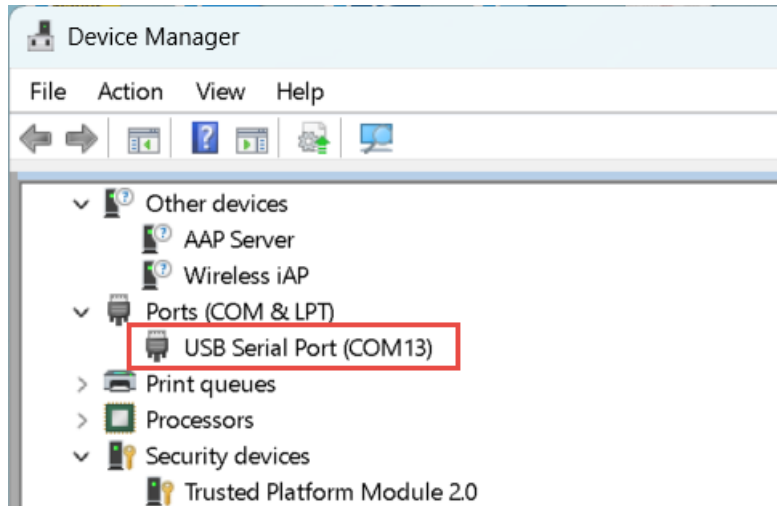


Figure 1-8 Device Manager

2. Open putty.exe, click Serial go to a serial configure interface.
3. Configure the window like the following picture and click “save” button to save the setting and click “Open” to open the terminal window. *Note that the “COM13” on the Serial Line column needs to be modified according to the actual com port on the user's computer.*

The main settings in PuTTY are as follows:

- Connection type : Serial
- Serial line : COMX
- Speed : 115200

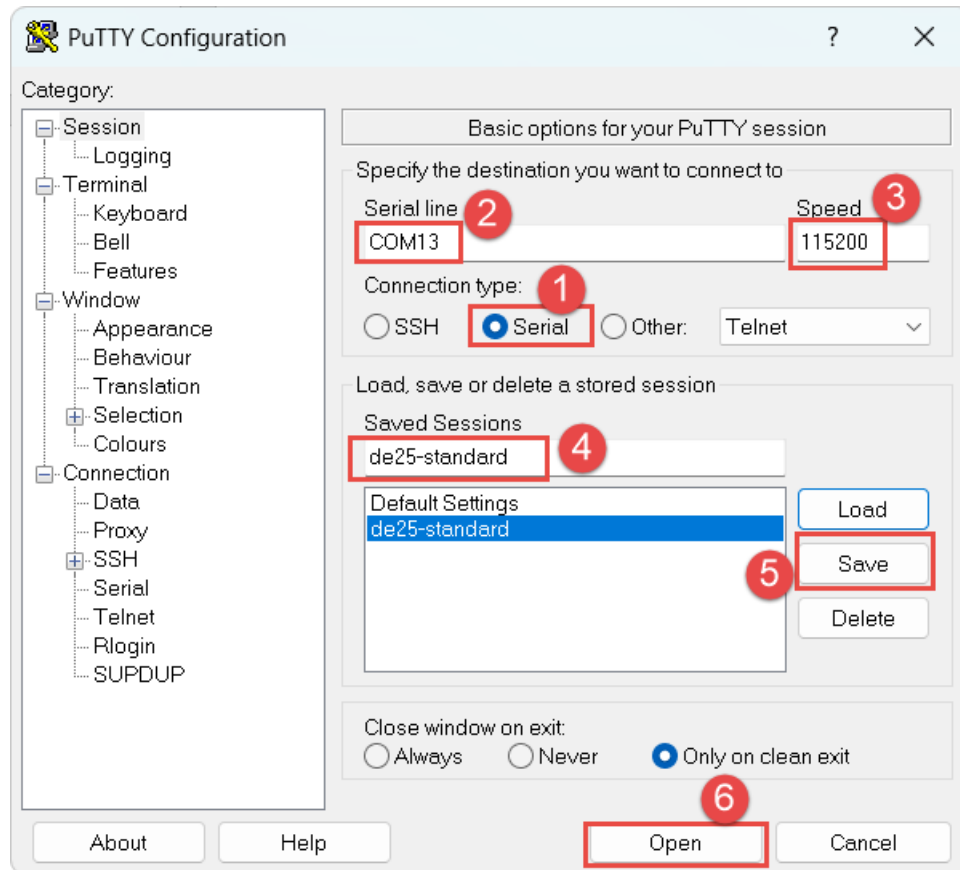


Figure 1-9 Putty Window

4. Please type **terasic** for account name and **123** for the password to login Ubuntu(See **Figure 1-10**).

Note : If the UART terminal does not respond, please refer to Appendix 1.7 to troubleshoot the issue.

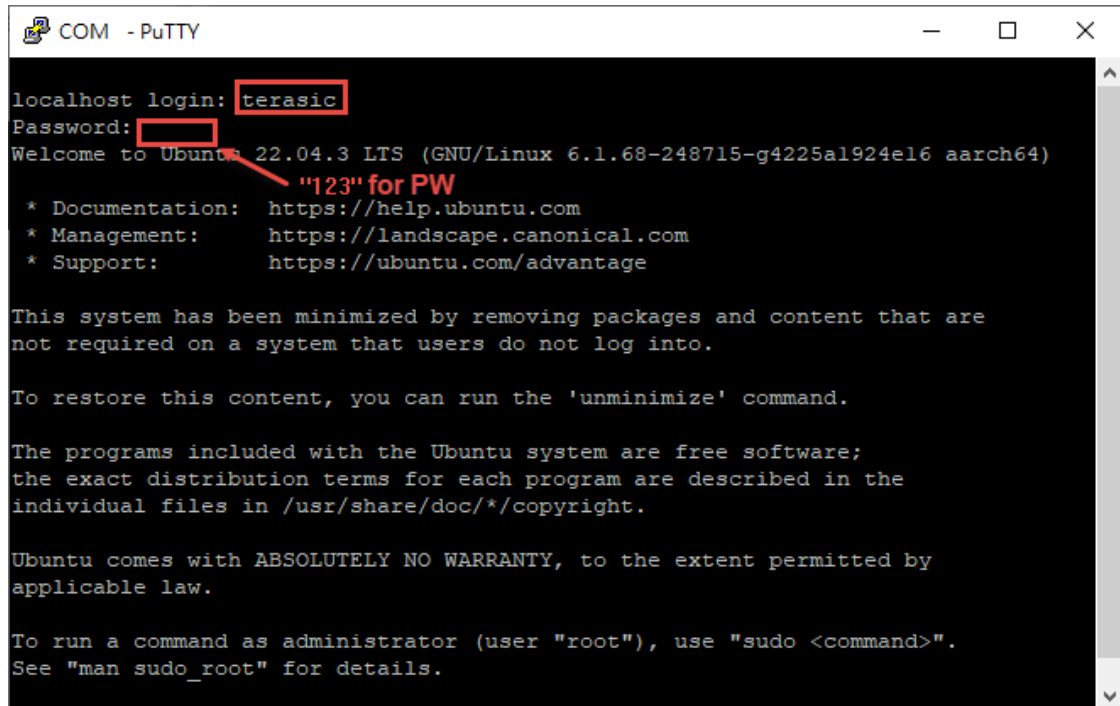


Figure 1-10 Putty Window

1.7 Appendix

This section describes troubleshooting steps to take if Linux fails to boot or if the PuTTY window is unresponsive.

1. Check if the USB Serial Port shows on the device manager on the computer.

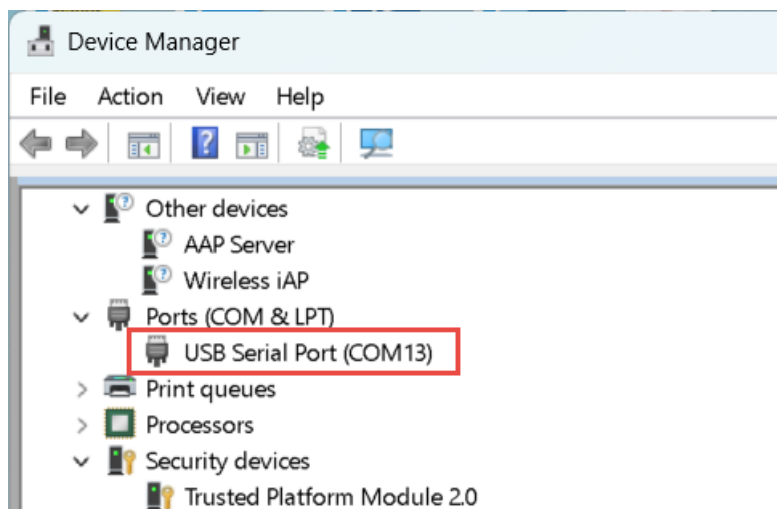


Figure 1-11 Hardware Setup for UART Terminal

2. Make sure the Configure mode switch is set to AS mode.

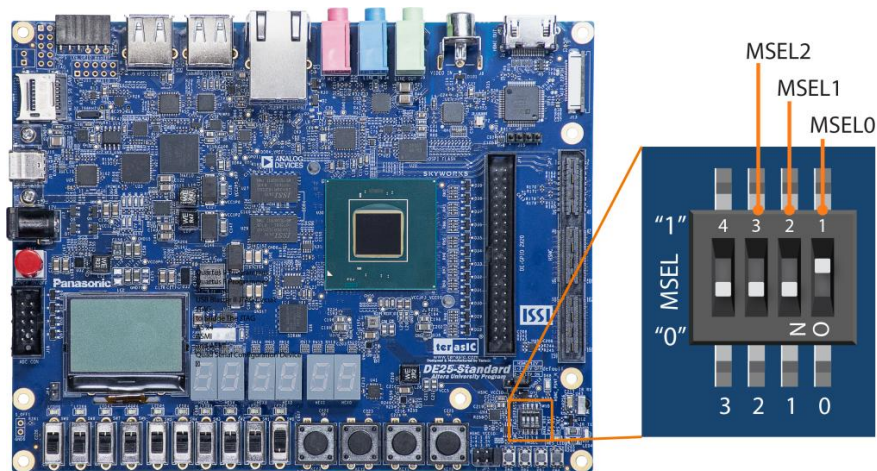


Figure 1-12 Position of slide switches SW10 for Configuration Mode

3. The QSPI flash on the Board had programmed the boot file when shipped. After power on, user can check if the user LEDR[9] is flashing, and after 10 seconds of booting. If not, please refer to following steps to re-program the QSPI flash with the factory code.
 - Connect the USB cable to USB blaster III connector of the Board.
 - Copy the factory code from the path :
System CD\ Demonstration\SoC_FPGA\GHRD\output_files\program_qspi_flash\
 - Execute “flash_program.bat” to erase and program the QSPI flash.

Additional Information

Contact Terasic

Here are the addresses where you can get help if you encounter problems:

■ Terasic Technologies

No.80, Fenggong Rd., Hukou Township, Hsinchu County 303035. Taiwan

Email: support@terasic.com

Web: www.terasic.com

Agilex 7 FPGA Starter Kit Web: DE25-STANDARD.terasic.com

■ Revision History

Date	Version	Changes
2025.07	First publication	