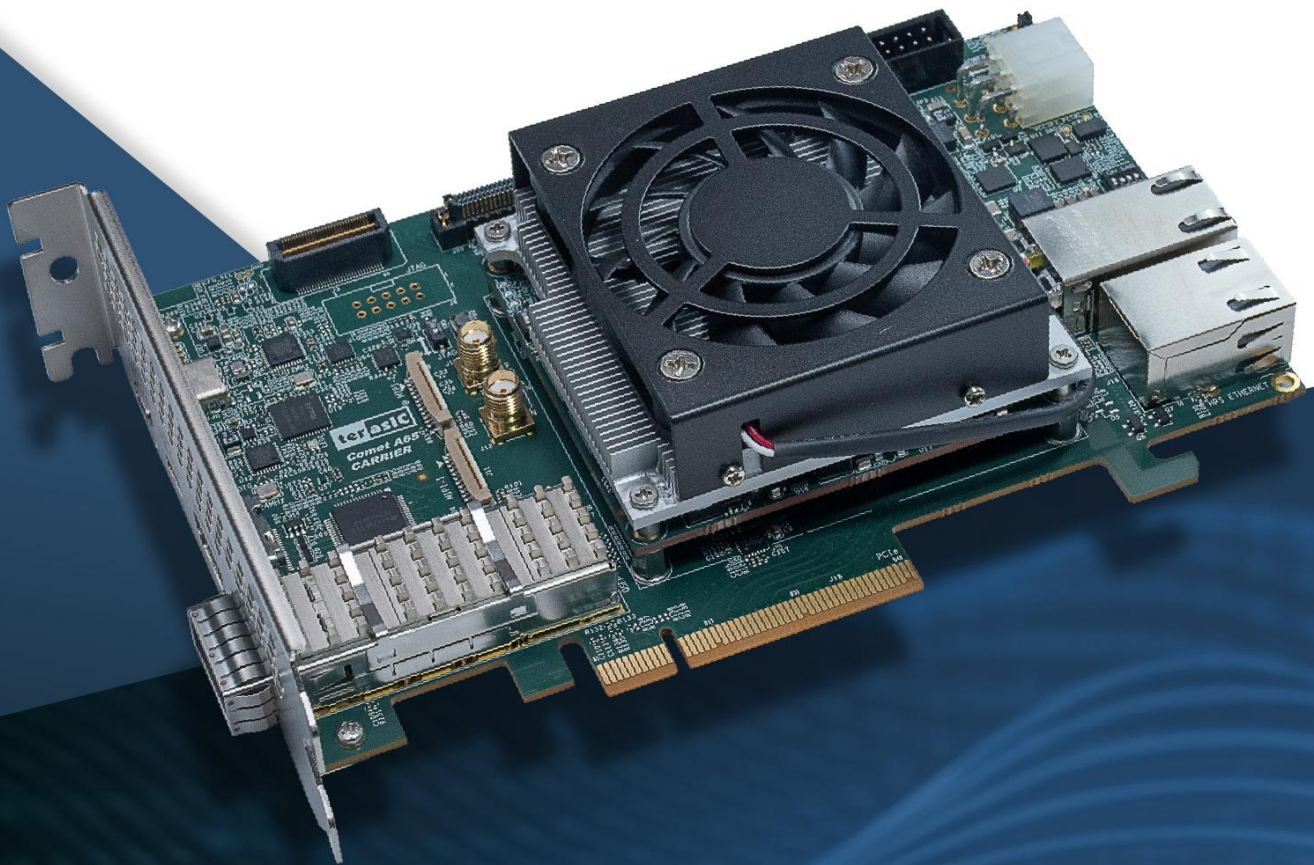


# Comet-A65 Evaluation Kit



## Getting Started Guide

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## Chapter 1

# *About this Guide*

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This getting started guide contains a quick overview of the hardware and software setup for Terasic Comet A65 evaluation kit (Comet A65 EVK), including step-by-step procedures from installing the necessary software tools to use the board. The main topics that this guide covers are listed below:

- Software Installation: Installing Quartus Pro v25.3 and Ashling RiscFree IDE
- Development Board Setup: Powering on the Comet A65 evaluation kit
- Perform FPGA System Test: Downloading a FPGA SRAM Object File (.sof)

## Chapter 2

# *Software Installation*

## 2.1 Introduction

The Comet A65 evaluation kit is equipped with an integrated Altera USB Blaster III circuit. To ensure proper operation, you must install the correct driver. The necessary driver is included with Quartus Prime 25.3.1 Pro and later versions. We recommend installing Quartus Prime 25.3.1 or a newer version to ensure the on-board USB Blaster III is recognized and functions correctly for programming and debugging.

This section explains how to install the following software:

- Quartus Prime Pro v25.3.1 software
- Ashling\* RiscFree\* IDE for Altera

Note: 64-bit OS required

## 2.2 Installing Quartus Prime software

For a more efficient and customized installation experience, we strongly recommend using the Quartus Prime Installer (online installer) to install the Quartus Prime Design Suite.

Unlike downloading a single, large file containing all components, the online installer is a lightweight tool that allows you to precisely select only the components you need during the installation process.

You can download the Quartus Prime Installer from the following URL:

[Quartus Prime Pro Edition Design Software Version 25.3.1 for Windows](#)

**Figure 2-1** shows the Quartus Prime Installer. Please make sure to check the following options:

- Quartus Prime Pro Edition Software
- Agilex 5 device support

- Ashling RiscFree IDE for Altera (This is for Nios V software development and debugging.)

Also, confirm the installation directory.

In the "After-install actions" section, check the following:

- Install UART FTDI driver: This installs the HPS UART interface driver for the Comet A65 evaluation kit.
- Install USB Blaster III driver: This enables proper use of the JTAG interface on the Comet A65 evaluation kit.

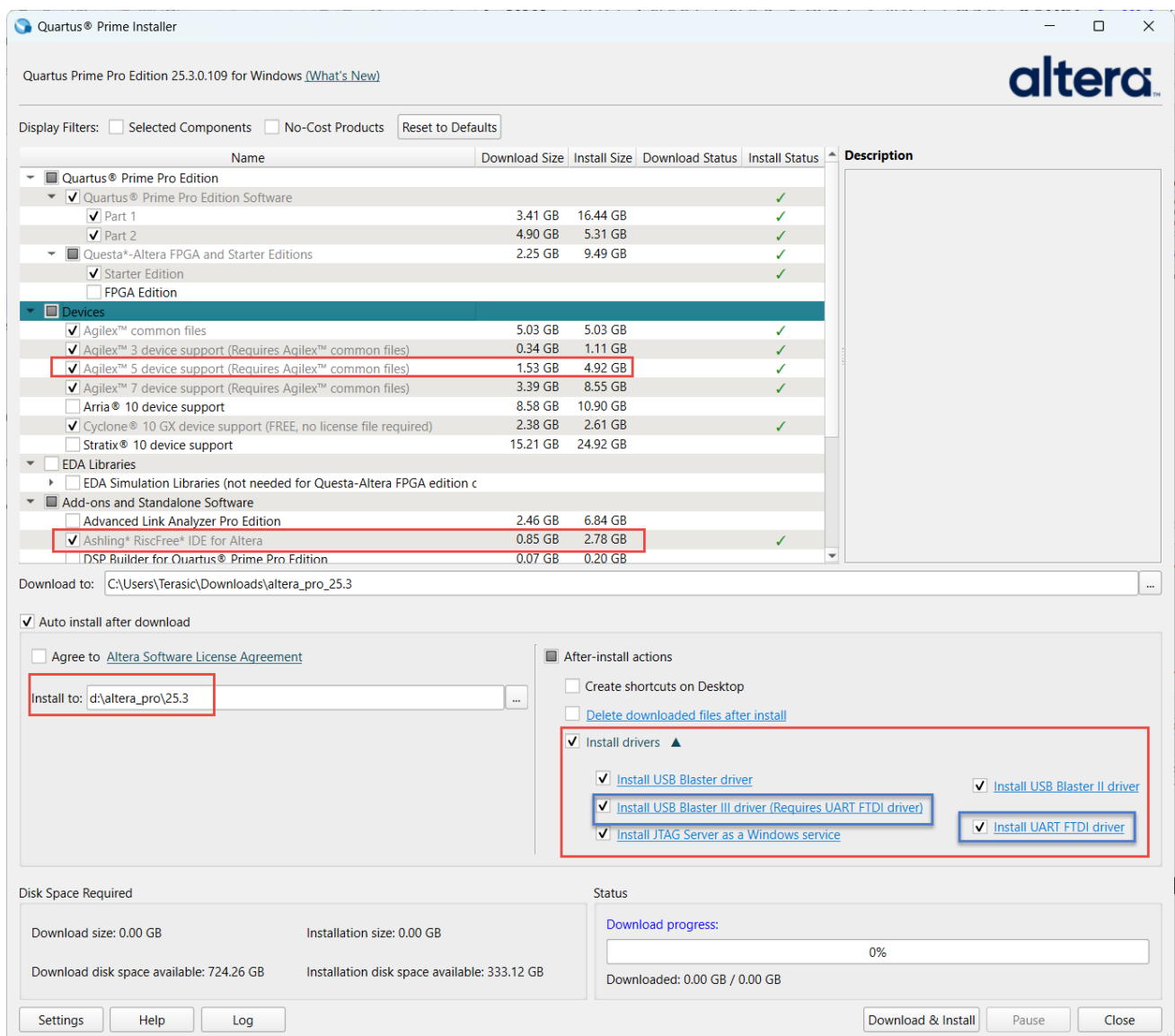
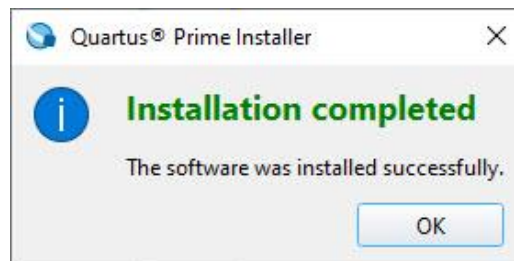


Figure 2-1 Quartus Installer

After Quartus has been downloaded and installed, an installation completion window, as shown in **Figure 2-2**, will appear.



**Figure 2-2** Quartus install completed

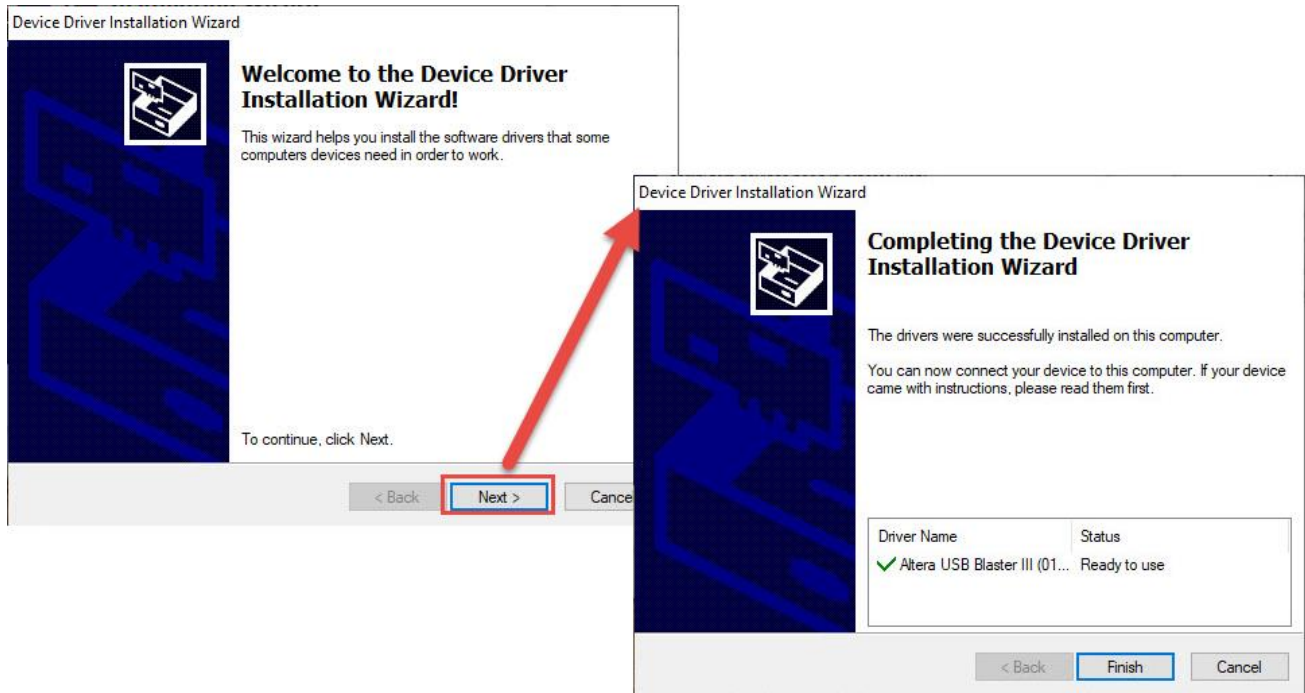
Next, the Quartus installer will then prompt you to install several necessary drivers.

Please pay special attention to the UART FTDI driver (see **Figure 2-3**) and the Altera USB Blaster III driver (see **Figure 2-4**).



**Figure 2-3** Install UART FTDI driver





**Figure 2-4** Install Altera USB Blaster III driver

## 2.3 Free No-Cost Licenses for Altera Agilex™ 5 Devices

The Comet A65 evaluation kit, powered by Altera Agilex 5 FPGA, enables developers to access Quartus Pro Edition software at no cost — no additional license purchase required. Developers can leverage full design and compilation capabilities of Quartus Pro without incurring licensing fees.

For details on how to acquire the free license, please refer to Altera's official guide: [Acquiring Free No-Cost Licenses for Agilex™ 5 Devices](#)

# Development Board Setup

## 3.1 Introduction

The instructions in this section explain how to set up the Comet A65 evaluation kit. The following pictures show the board overview of the board.

## 3.2 Configuration Modes

The Comet A65 evaluation kit supports two configuration modes selected via the SW1 switch (See Figure 3-1) :

### ■ AS-Fast Mode (Active Serial Fast) – Default

- Setting: Set SW1[0] to "ON"
- Description: The FPGA loads configuration from the non-volatile QSPI flash automatically when powered on.
- Note: AS Mode is recommended for general testing and standard operation.

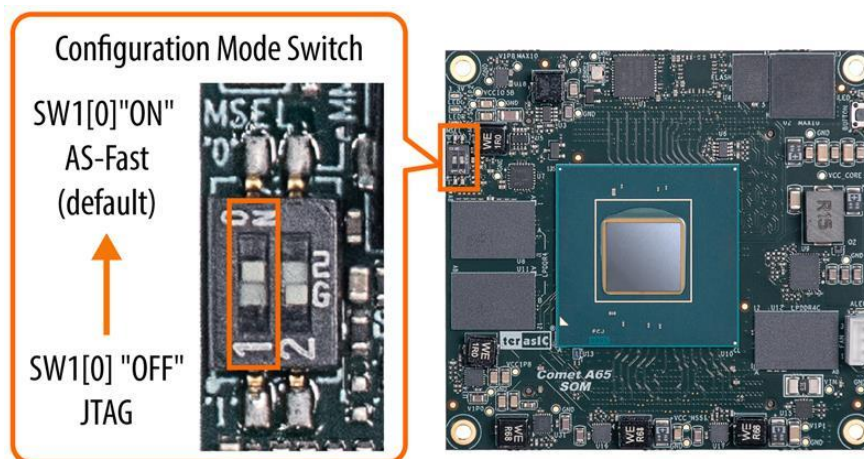


Figure 3-1 FPGA Configuration Mode Switch in AS Mode

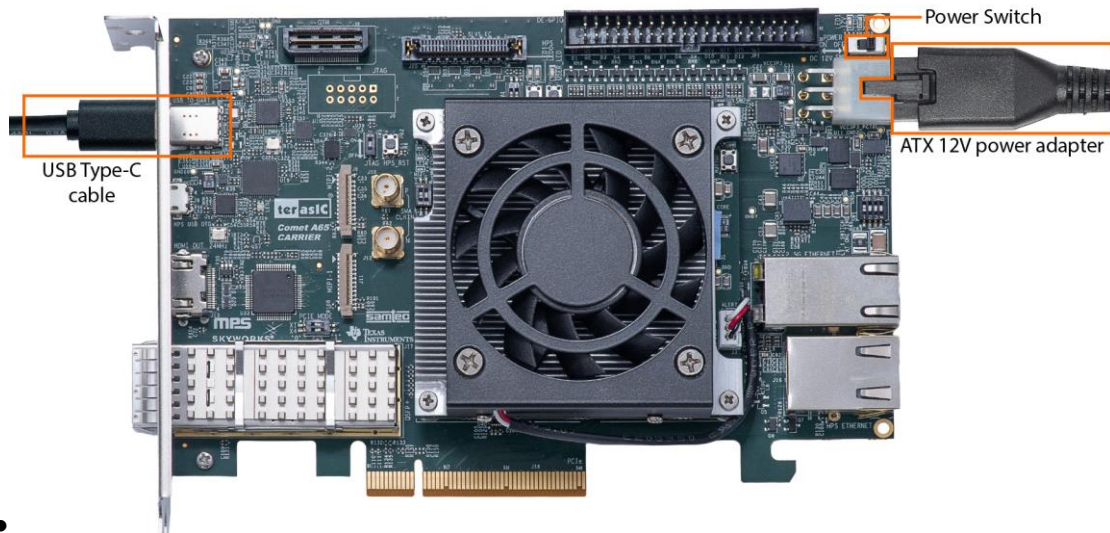
### ■ JTAG Mode

- Setting: Set SW1[0] to "OFF"
- Description: Configuration is downloaded directly to the FPGA. The configuration is volatile and will be lost when the power is turned off.



### 3.3 Hardware Setup and Connection

Please follow the steps below to power up the board and establish a connection with the Host PC (as shown in **Figure 3-2**):



**Figure 3-2 USB Blaster III and Power Connector on Comet A65 evaluation kit**

1. Connect Power Supply: Connect the 12V DC power adapter to the 2x3 power connector on the board. This provides the necessary power for the system to operate.
  - Power on the board by turning the power switch (SW0).
2. Connect USB Cable: Connect a USB Type-C cable from the USB port (JTAG) on the board to a USB port on your Host PC.
  - This connection activates the onboard USB-Blaster III circuit.
  - The USB-Blaster III allows the Host PC to communicate with the board for FPGA configuration and debugging purposes.

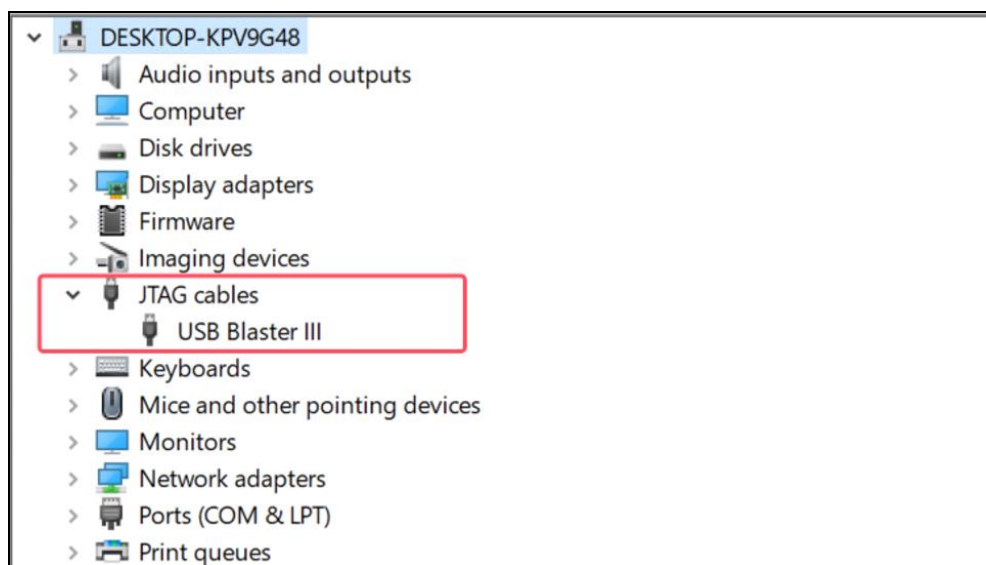
# Performing a FPGA System Test

## 4.1 Introduction

This chapter shows how to download a FPGA SRAM Object File(.sof) to Comet A65 evaluation kit.

## 4.2 Downloading a FPGA SRAM Object File

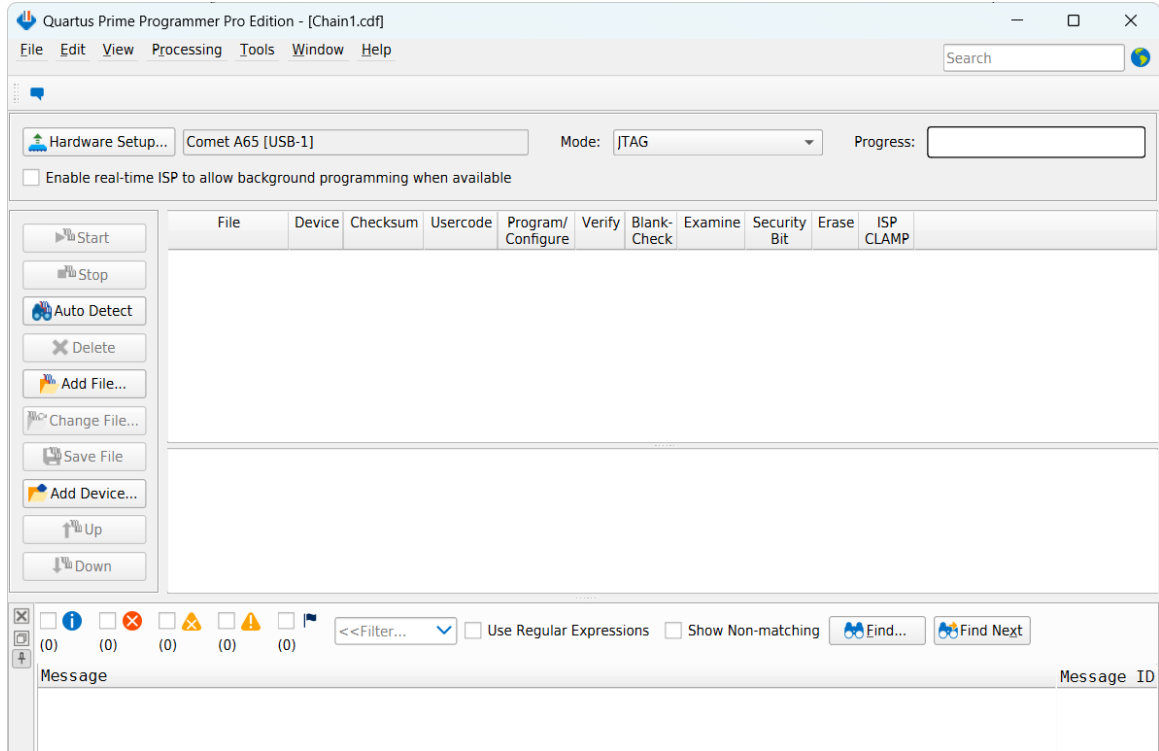
The Quartus Prime Programmer is used to configure the FPGA with a specific .sof file. Before configuring the FPGA, ensure that the Quartus Prime Pro v25.3.1 software and the USB-Blaster III driver are installed on the host computer. Normally you should see USB Blaster III in PC Device Manager, as shown in **Figure 4-1**.



**Figure 4-1 USB Blaster III shown in PC Device Manager**

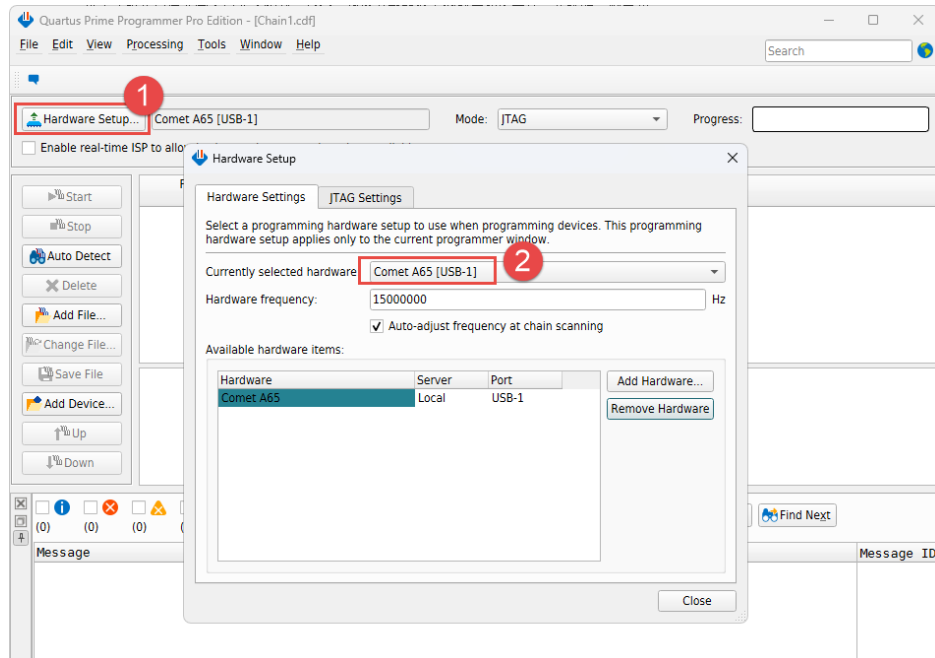
There is only one device (FPGA) on the JTAG Chain of Comet A65 evaluation kit, the following shows the programming flow with JTAG mode step by step.

1. Connect your computer to the Comet A65 evaluation kit by plugging the Type-C USB cable into the USB Blaster III connector of the board and power up it (details shown in section 3.3)
2. Open the Quartus Prime software and select Tools > Programmer. The Programmer window will appear as shown in **Figure 4-2**.



**Figure 4-2 Quartus Programmer window**

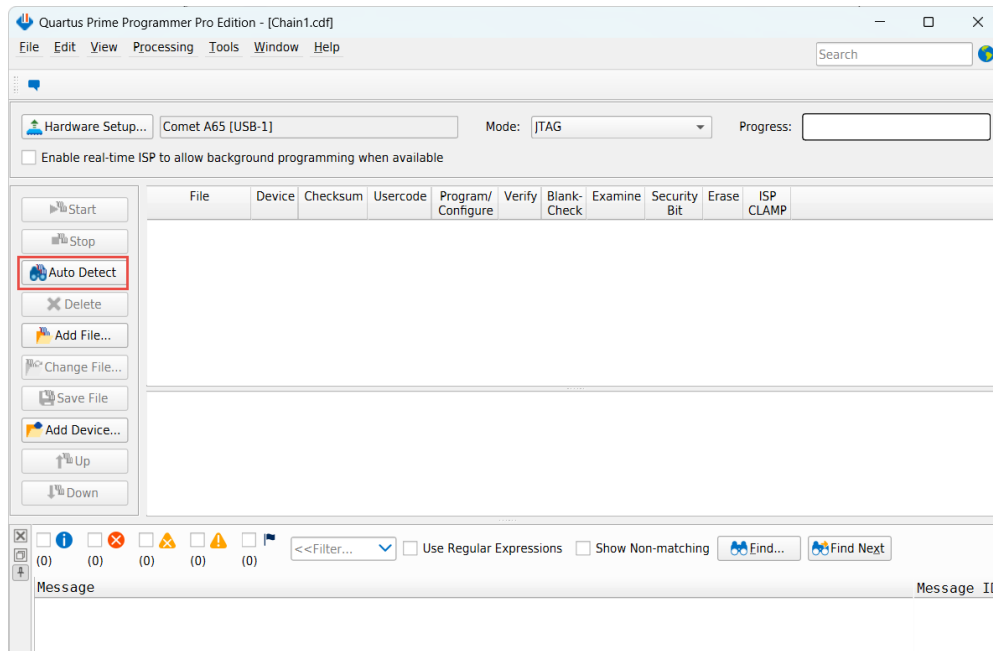
3. Click **Hardware Setup**.
4. Select **Comet A65 [USB-1]** under **Currently selected hardware**, and click **Close** as shown in **Figure 4-3**.



**Figure 4-3 Hardware Setup**

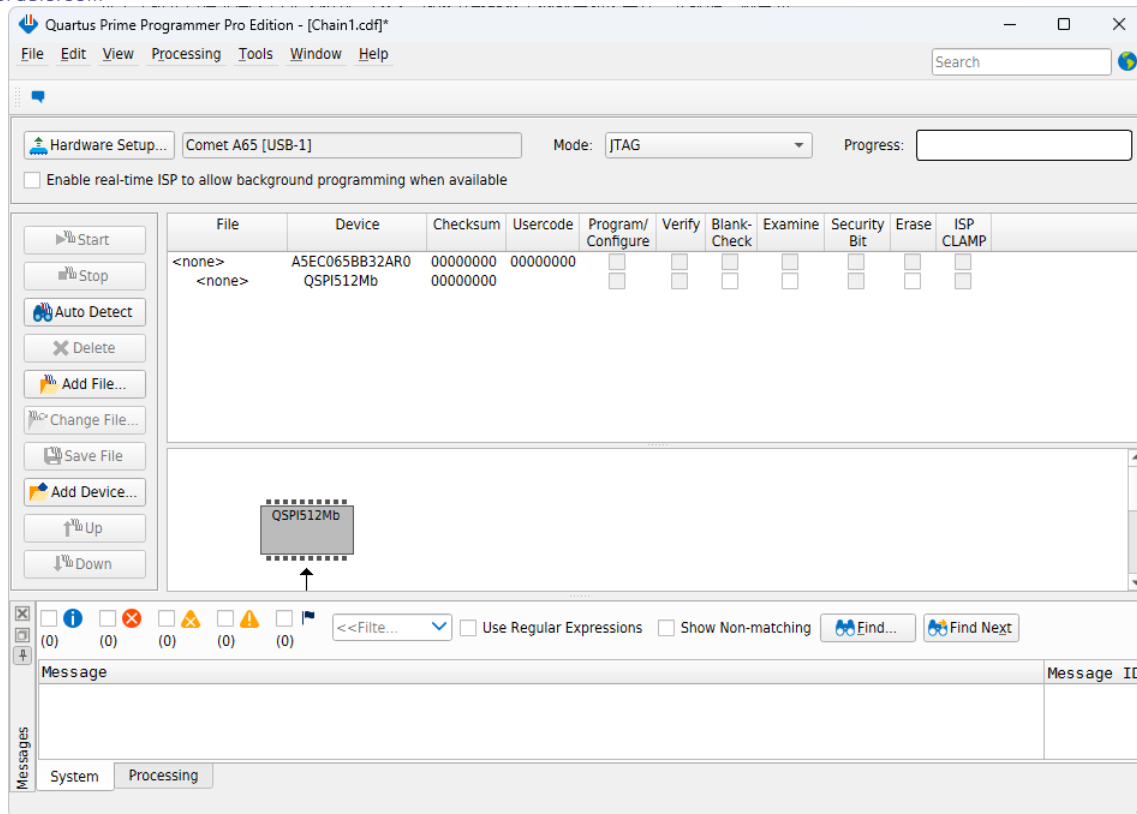
If the USB-Blaster III does not appear under hardware options list, please confirm if the USB-Blaster III driver has been correctly installed, and the Type-C USB cable has been properly connected between the Comet A65 evaluation kit and host computer.

5. Click “Auto Detect”, as shown in **Figure 4-4**.



**Figure 4-4 Auto detect FPGA device**

6. The FPGA device and QSPI flash of Comet A65 evaluation kit are detected under Programmer, as shown in **Figure 4-5**. Note: The user will see the **QSPI flash** on the JTAG chain because the FPGA configuration mode is set to **AS** mode.

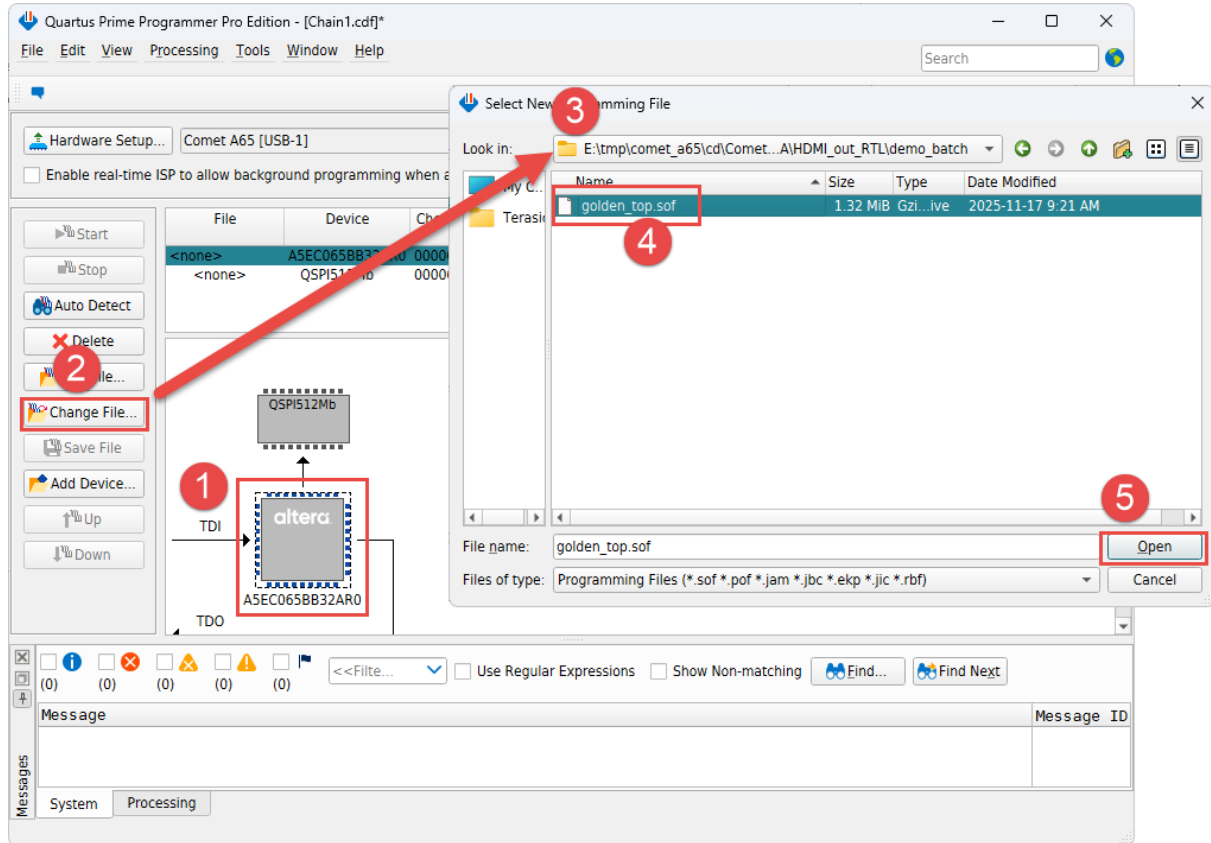


**Figure 4-5 JTAG Chain on Comet A65 evaluation kit**

- Click the FPGA device, then click **Change File** button to open the **Select New Programming File** window. Browse to select golden\_top.sof in the **Select New Programming File** window as shown in **Figure 4-6**.

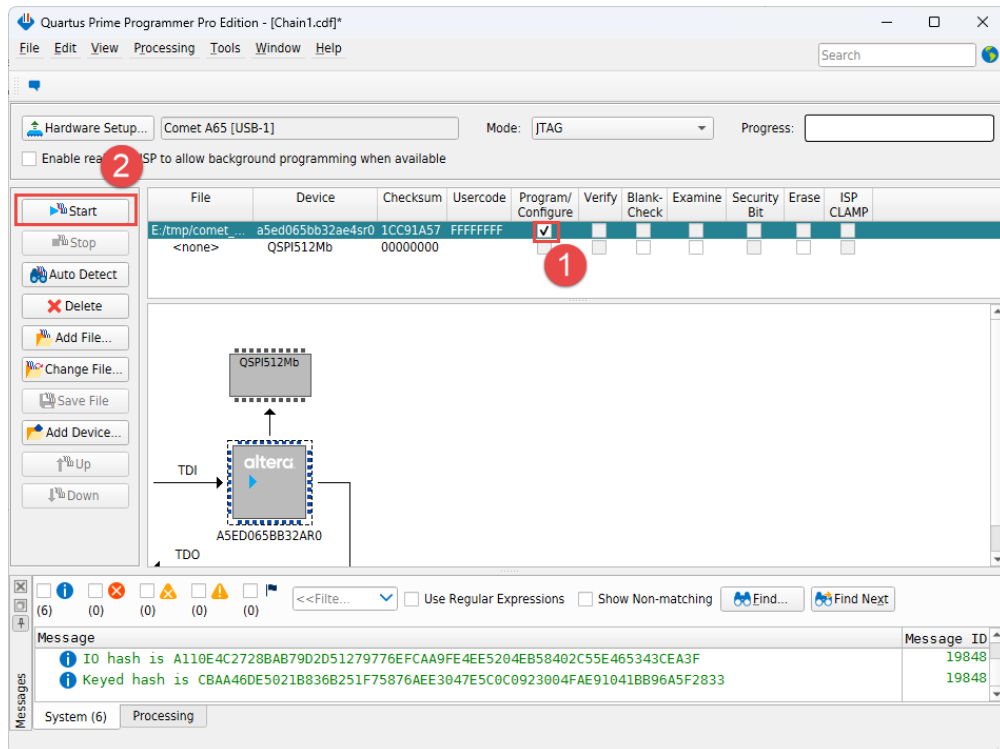
**Note :** You can find a downloadable .sof file in the **Demonstration** folder within the Comet A65 resource package.



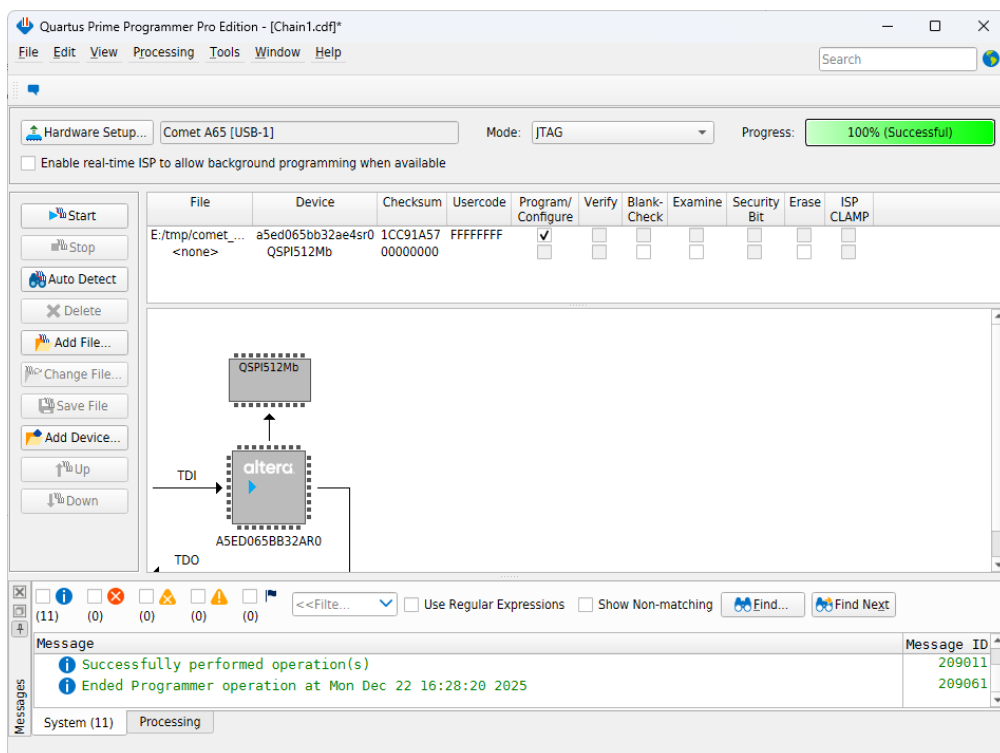


**Figure 4-6 Select golden\_top.sof file**

8. Click “Program/Configure” check box, and then click “Start” button to download .sof file into FPGA, as shown in **Figure 4-7**.



**Figure 4-7 Download .sof file**



**Figure 4-8 Download .sof successfully**

## ***Additional Information***

### **Revision History**

| Date    | Version | Changes  |
|---------|---------|--|
| 2025.12 | V1.0    | First Version  |
| 2026.04 | V2.0    | Change Quartus version, 12V DC jack to 12V 2x3 power connector |
|         |         |  |
|         |         |  |
|         |         |  |
|         |         |  |
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