慧智微
SMARTER MICRO

MIPI_MONITOR

C2307A Series

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C2307A MIPI Monitor Manual

CATALOG

1. Overview

This document is a guide to the use of the C2307A MIPI Monitor (bus monitoring) function.

1.1 Function Introduction

The C2307A MIPI Monitor (bus monitoring) function can monitor and decode the bus transmission content of the standard MIPI_RFFE protocol. Development of this function is based on C2307A and needs to be used with C2307A.

1.2 Hardware/software Requirements

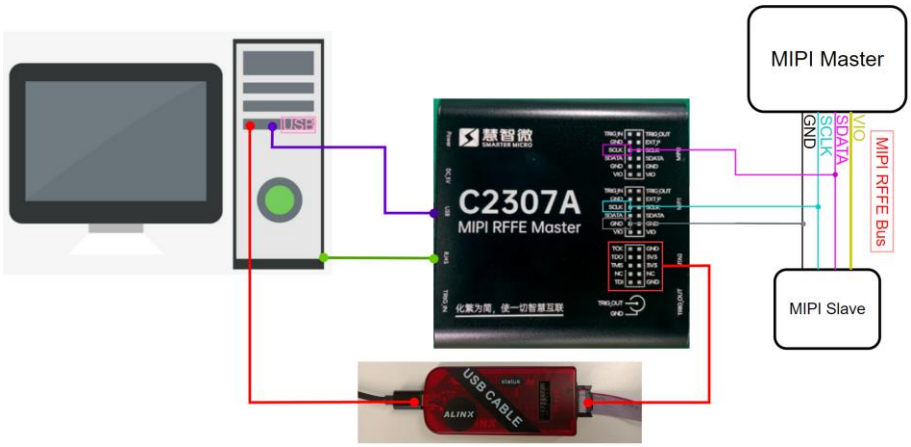
Hardware requirement		
Equipment	Quantity	Description
C2307A	1	Data monitoring
PC with wired network card	1	Receive and display analysis result
RJ45 network cable	1	Data transmission
Writer (USB CABLE)	1	Flashing firmware
USB cable(type-B) or power adapter(5V@1A)	1	Power supply
Software requirement		
Software		Description
MIPI_Monitor.exe		Software for upper computer
Vivado Lab 2022.2or Vivado 2022.2		Flashing firmware

C2307A	Writer (USB cable)	USB cable(type-B)	Power adapter(5V@1A)
			

2. Equipment Construction

This section will introduce connection and c onstruction methods when using this function.

2.1 Device connection diagram



P2.1 Device connection diagram

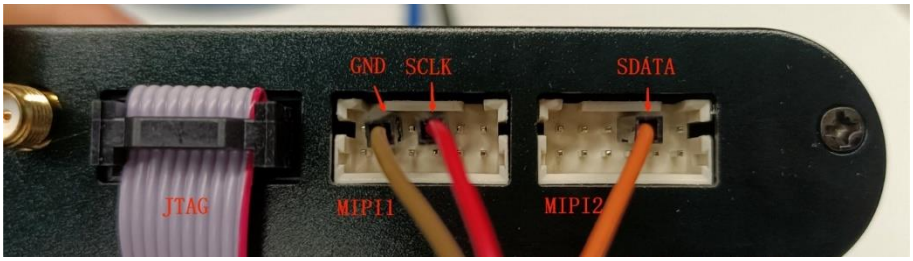
2.2 Connection between C2307A and PC

1) C2307A power supply: use USB-B type cable or power adapter (5V@1A), generally choose one of them.
2) Data transmission: a network cable with RJ45 interface, one end is connected to the RJ45 interface of the C2307A, and the other end is connected to the wired network card of the PC.
3) Flashing the firmware: one end of the programmer is connected to the JTAG interface of C2307A with a 2×5 Pin 2.54mm cable, and the other end is connected to the USB interface of the PC through a USB-Mini cable.

P2.2.1 Device connection diagram

2.3 Connection between C2307A and MIPI bus

C2307A and MIPI bus need to be connected with 3 wires, SCLK, SDATA, and GND. The SCLK to be monitored needs to be connected to the SCLK on the upper row of the MIPI1 interface; the SDATA to be monitored needs to be connected to the SCLK on the upper row of the MIPI2 interface; the GND to be monitored can be connected to any GND of the MIPI1 or MIPI2 interfaces.



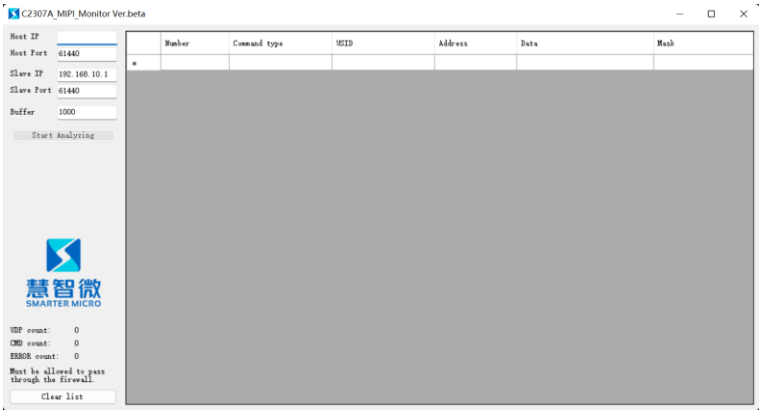
P2.3 Connection between C2307A and MIPI bus

3. Software Installation and Setup

This section will detail the software installation and setup methods. It is strongly recommended to use a computer with administrator privileges for setup.

3.1 MIPI_Monitor.exe setup

MIPI_Monitor.exe can be started by double-clicking, no need to install additional drivers. If the software cannot be started, please check whether the computer has the operating environment of Microsoft. NET Framework 4.6 or above version.



P3.1 UI of MIPI_Monitor.exe

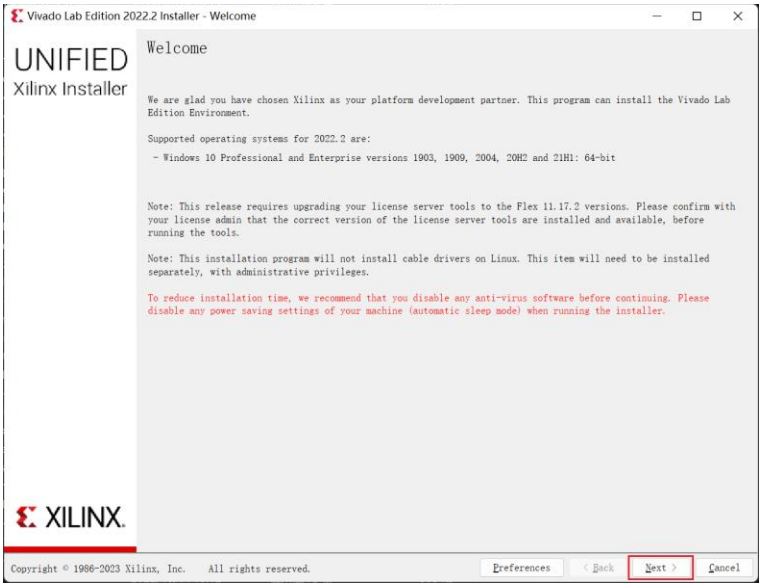
3.2 Vivado Lab 2022.2 setup

At present, the default firmware main function of C2307A is MIPI RFFE Master (MIPI box). If you want to switch to the MIPI Monitor bus monitoring function mentioned in this article, you need to use a writer, and complete firmware flashing with Vivado Lab 2022.2 to switch the main function.

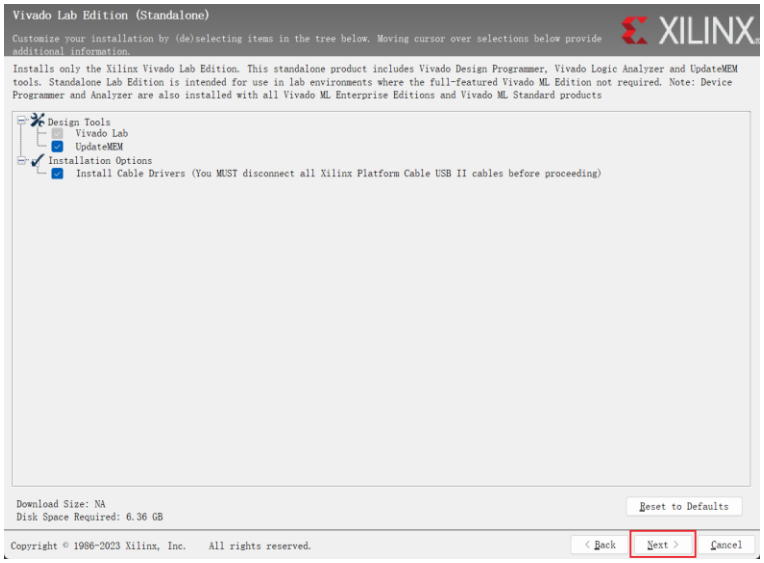
Vivado Lab 2022.2software installation steps:

Step 1：Double-click to run xsetup.exe in the installation package directory.

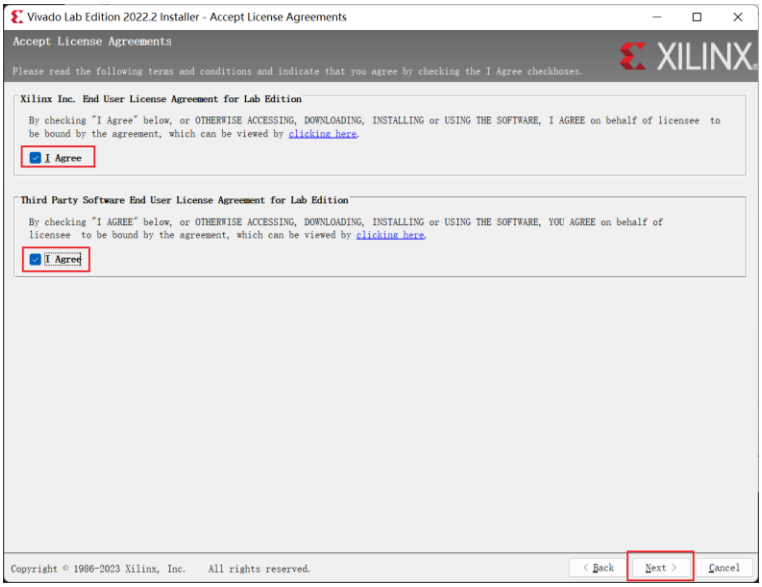
Step 2：Click “Next”



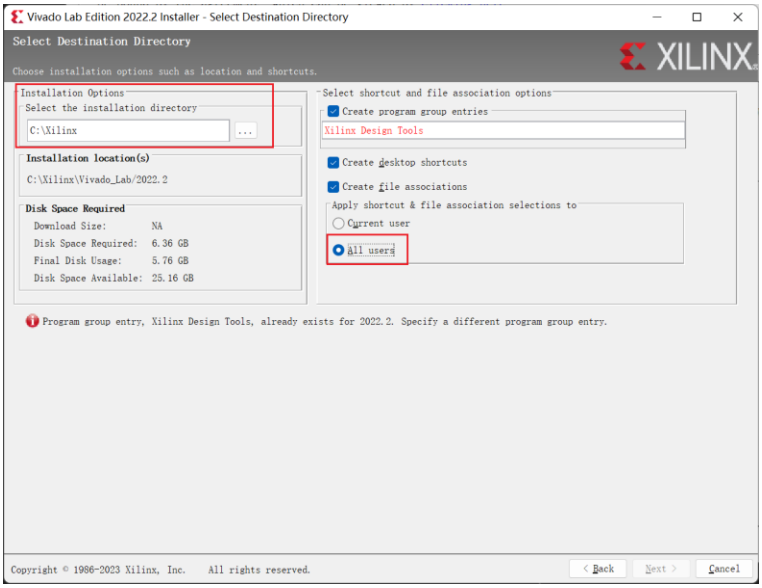
Step 3：Keep the default option，click “Next”



Step 4: Tick “I agree”, click “Next”



Step 5: Select the installation path and choose to install for all users. After clicking “Next”, wait for the progress bar to finish running to complete the installation.



4. Operating Procedures and Method

P4 Operating procedures diagram

4.1 Equipment construction

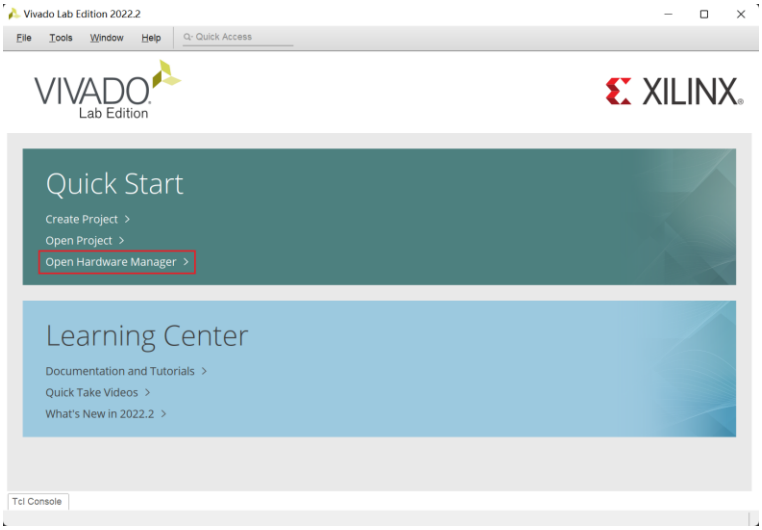
For details, please refer to Section 2 of this document.

4.2 Firmware flashing

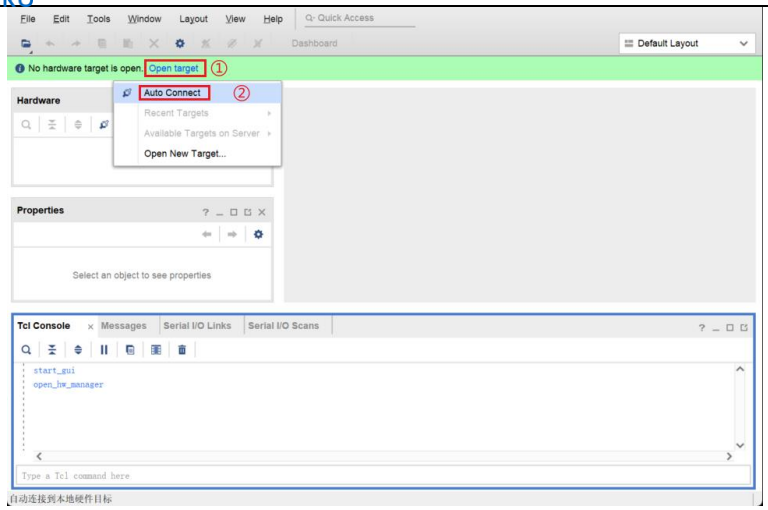
4.2.1 Temporarily effective flashing method

Note: The firmware flashed by this method will be reset after power off, and the C2307A will return to the default function MIPI RFFE Master (MIPI box) after power on again. If you want to use other functions again, you need to perform the flash operation again.

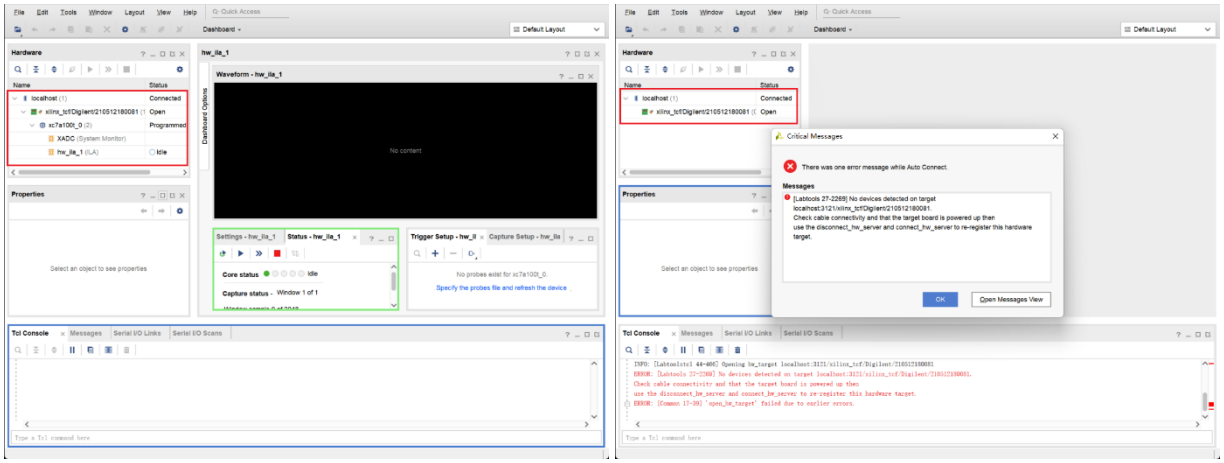
Step 1: Run Vivado Lab 2022.2, click "Open Hardware Manager"



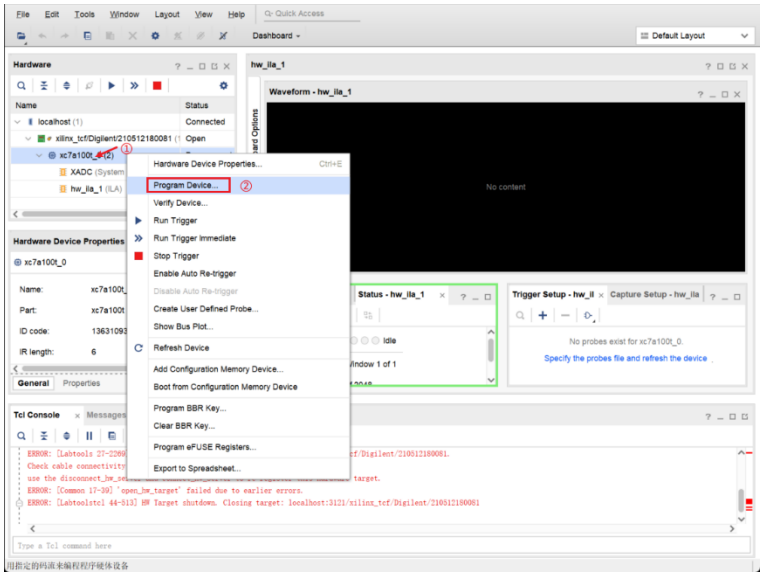
Step 2: Click "Open target", a drop-down menu appears, click "Auto Connect", the software will automatically connect to available devices.



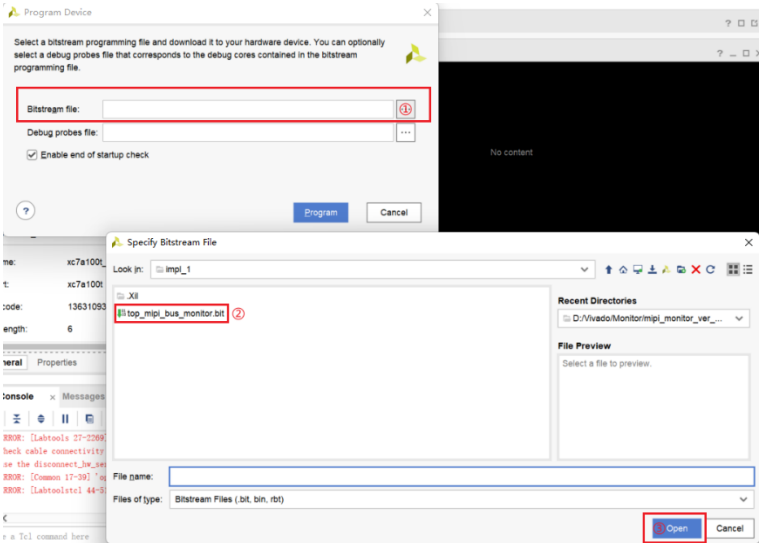
Step 3：If the device is successfully connected, the red box in the left picture below will appear; if the connection fails, please troubleshoot according to the right picture and try again.



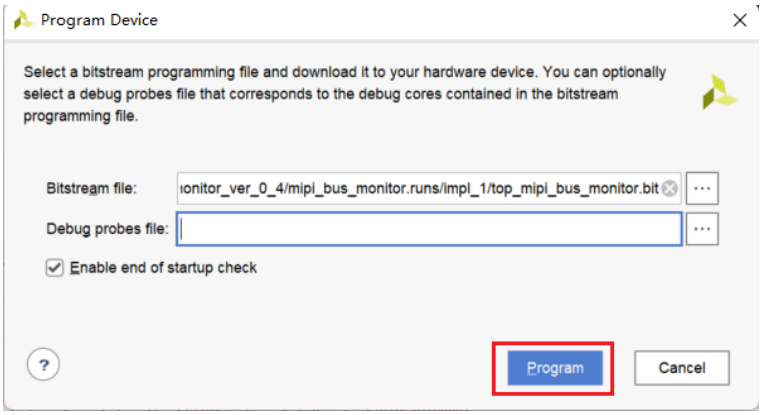
Step 4：Right-click "xc7a100t_0", and select "Program Device" after the menu appears.



Step 5: The pop-up window selects the *.Bit file to be loaded (the firmware you want to switch to).



Step 6: Finally click "Program" and wait for the progress bar to complete, then the flashing operation will be completed.

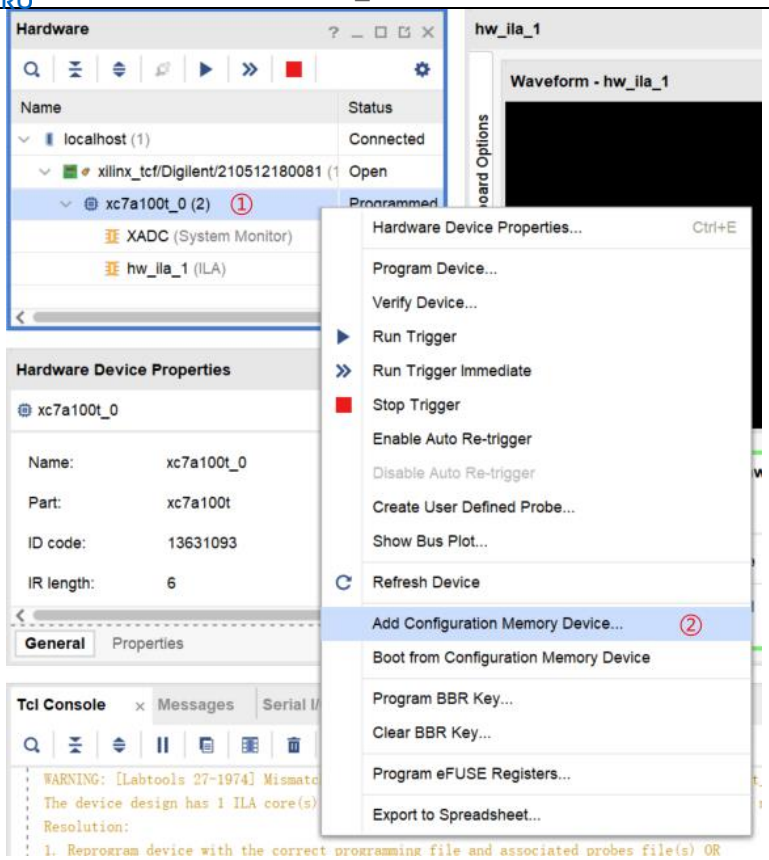


4.2.2 Permanent flashing method

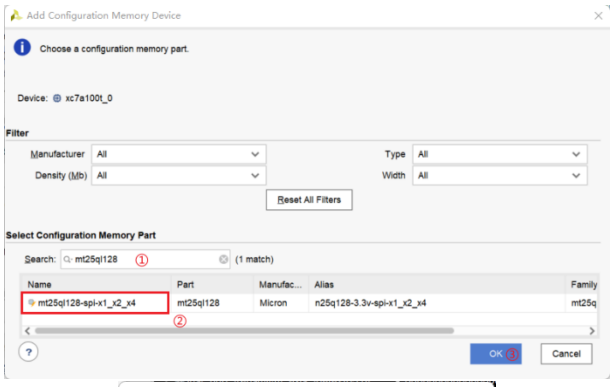
This method is to flash the content of the flash memory. After the operation, the new firmware will become the default boot function of the device.

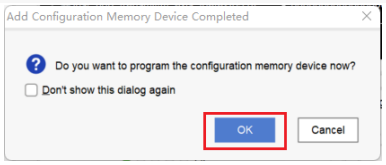
Step 1: Follow 4.2.1 to step3 to complete the device connection.

Step 2: Right-click "xc7a100t_0", and select "Add Configuration Memory Device" after the menu appears.

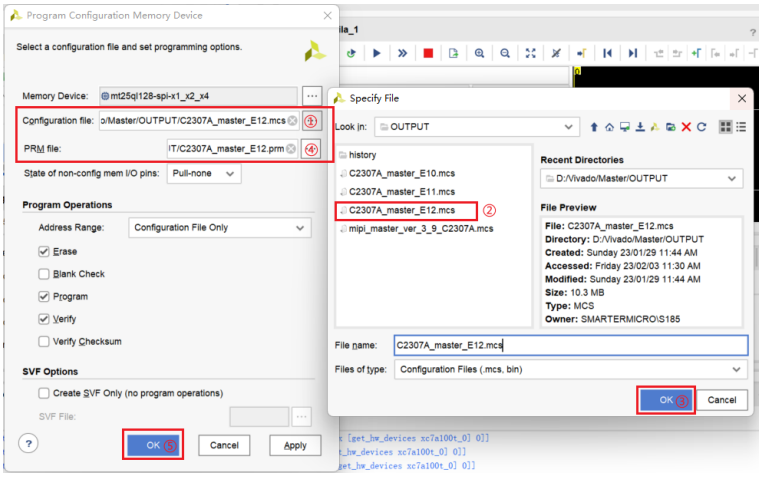

Hardware
Name
Status
localhost (1)
Connected
xilinx_tcf/Digilent/210512180081 (1
Open
xc7a100t_0 (2) ①
Programmed
XADC (System Monitor)
hw_ila_1 (ILA)
hw_ila_1
Waveform - hw_ila_1
Hardware Device Properties
xc7a100t_0
Name: xc7a100t_0
Part: xc7a100t
ID code: 13631093
IR length: 6
General
Properties
Tcl Console
Messages
Hardware Device Properties... Ctrl+E
Program Device...
Verify Device...
Run Trigger
Run Trigger Immediate
Stop Trigger
Enable Auto Re-trigger
Disable Auto Re-trigger
Create User Defined Probe...
Show Bus Plot...
Refresh Device
Add Configuration Memory Device... ②
Boot from Configuration Memory Device
Program BBR Key...
Clear BBR Key...
Program eFUSE Registers...
Export to Spreadsheet...

Step 3: Type "mt25ql128" in the Search column, select the only device that appears below, and click "OK" twice.

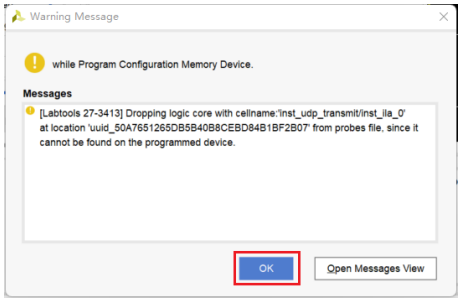




Step 4: In the pop-up interface, fill in the paths of *.mcs and *.prm files in the red box in sequence in the figure, and finally click "OK". After the progress bar is finished, the firmware flashing operation will be completed.



Step 5: After the flashing is completed, the following interface will pop up, click "OK", then unplug the writer cable, power on the C2307A again, and the new firmware will be loaded after the device restarts.



4.3 Set the IP address of the wired network card

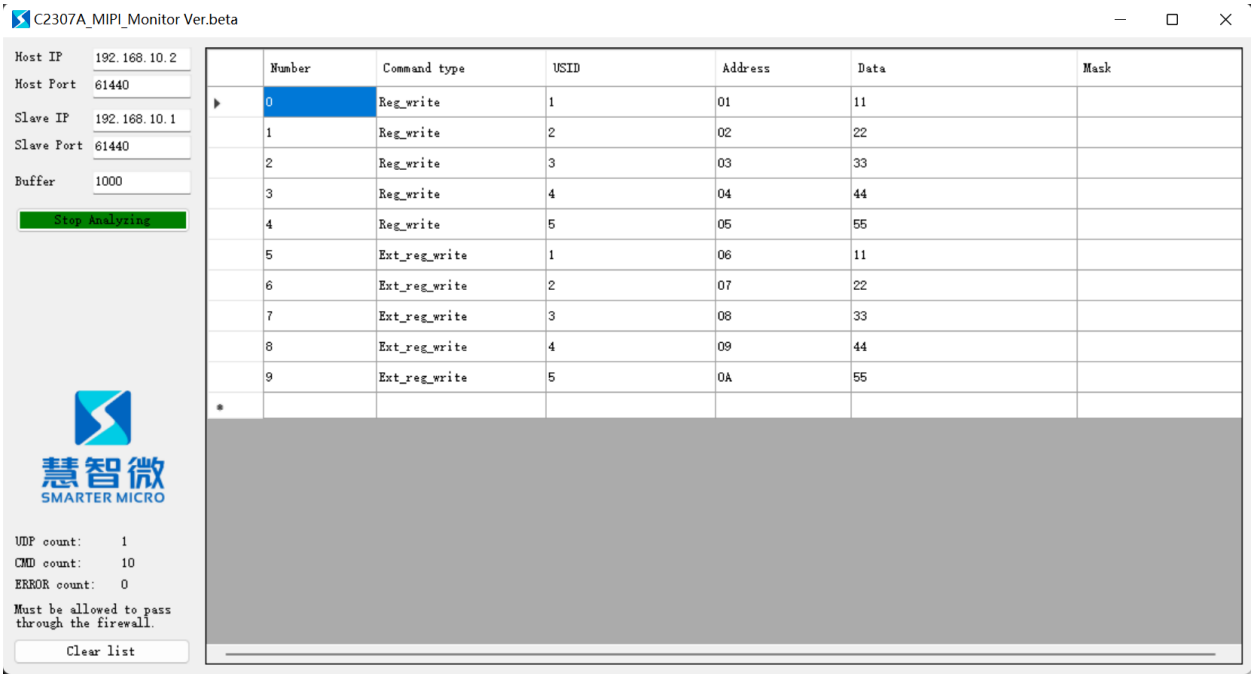
The MIPI_Monitor.exe program communicates with C2307A using the UDP protocol. The IP address of the computer must be set to 192.168.10.2 (the gateway can be empty).

4.4 MIPI_RFFE bus monitoring

Step 1: Run MIPI_Monitor.exe to enter the main interface, the program will automatically obtain the current IP address.

Step 2：Click the "Start Monitoring" button, the button turns green, and the MIPI_RFFE bus monitoring function will be started; the "Data Reservation" column is the maximum number of entries for the reserved monitoring data packets, which can be filled in according to requirements.

4.5 Preview



P4.5 Software running interface

序号	Date	Illustrate	Updated by
1	23.02.2023	Initial establishment	温兴
2	24.02.2023	Initial version in English.	刘畅
3	27.02.2023	Update	温兴