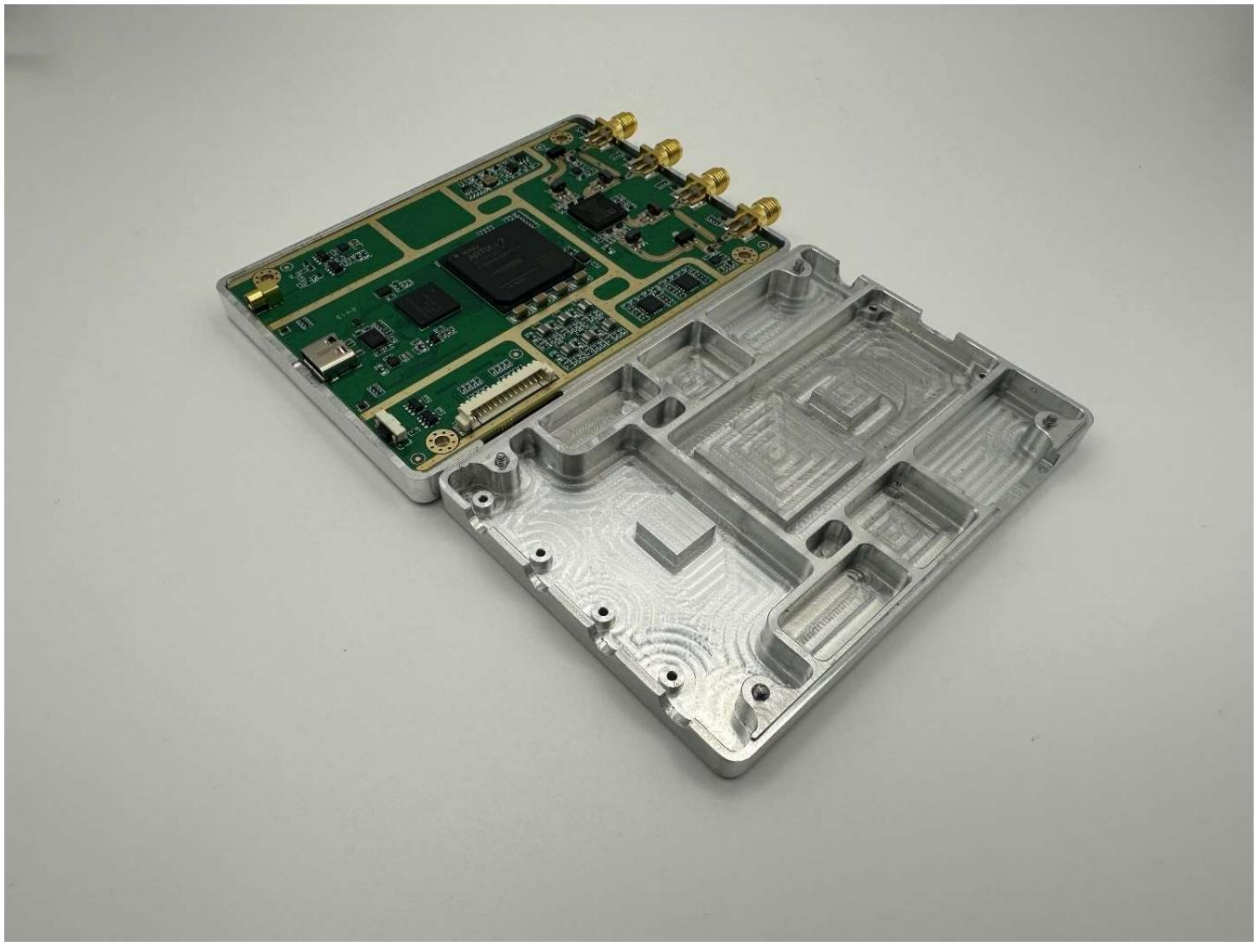
Quick Start

Thank you for choosing Professional and Quality

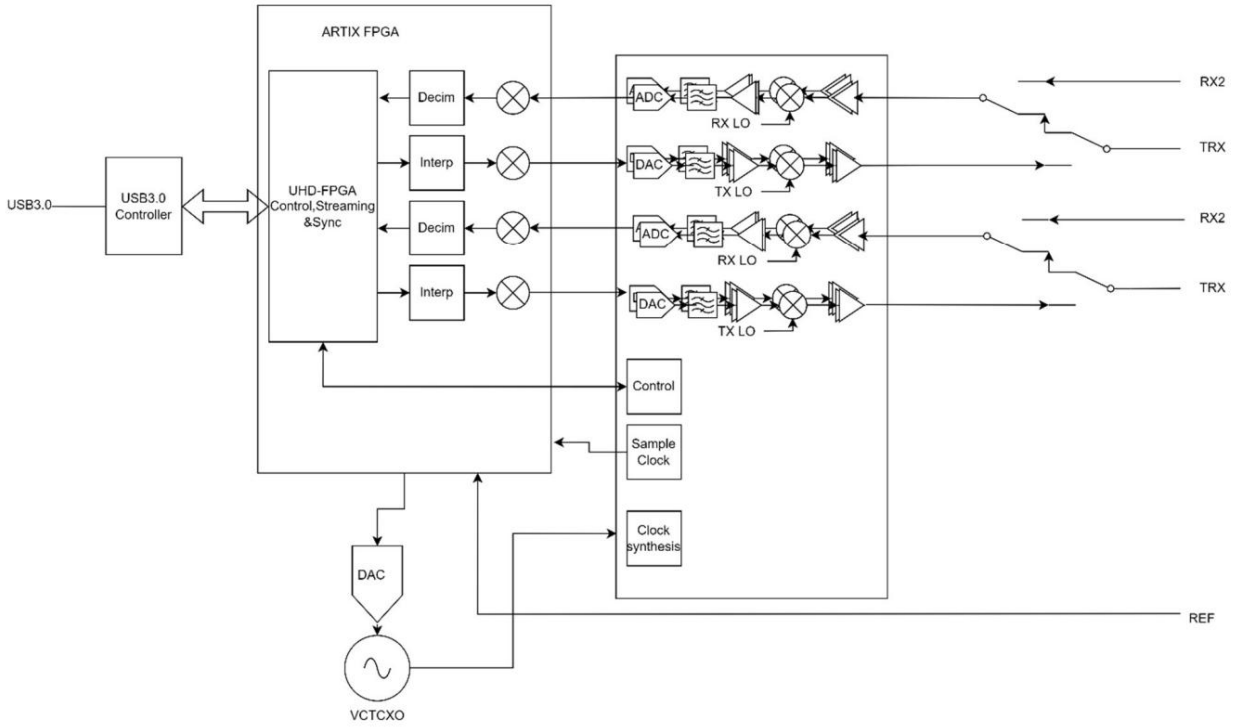
1 Overview

B210/B220mini mainly uses A7 series FPGA to replace S6 series, improves performance and reduces power consumption,

optimizes PCB design and reduces volume. It combines the advantages of B210 and B205mini, and the software interface is fully compatible with UHD1.



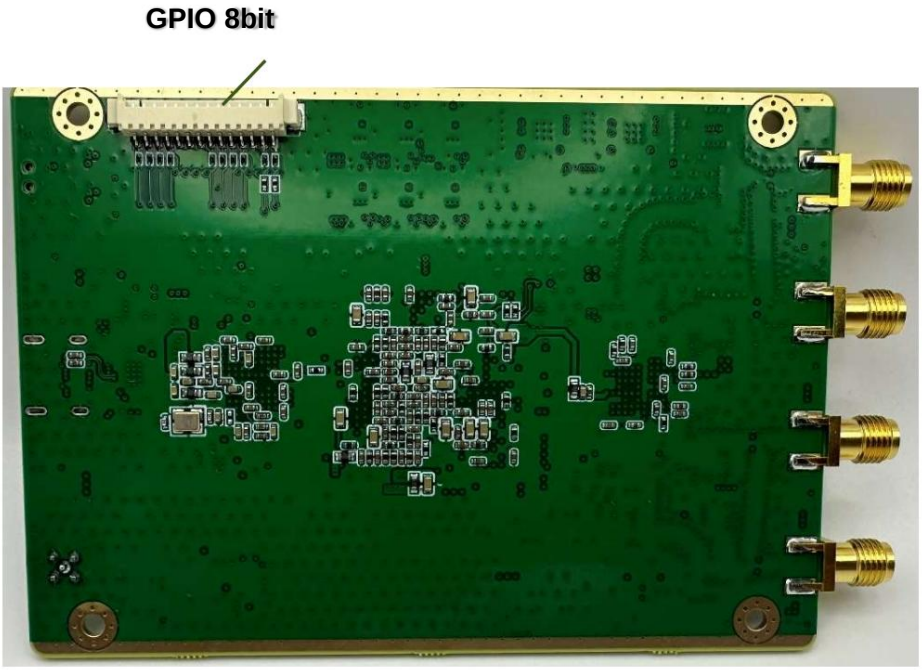
picture 1 B210min PCBA And shell display



picture[2] block diagram

1. Need to replace the fpga configuration bin file

2 Interface Definition



picture3

Interface Definition Diagram Interface Indicator, Button Function Table

type	name	Function Note	
interface	USB3.0 interface	The computer communication interface is backward compatible USB2.0, to ensure PA With sufficient current, push USB 3.0 or above is recommended interface	
	REF Interface	10M or PPS input port mouth	10M or PPS will automatically Identify, the indicator light will Indicates 10M or PPS, 10M can lock local Clock, PPS can be locked Local PPS and clock
	TRXA Port	Transceiver interface A	This port can work in Receive or send mode
	RXA port receiving port A	transceiver port B	Receiving Mode
	TRXB Port		This port can work in Receive or send mode
	RXB port receiving port B		Receiving Mode

	JTAG	FX3 and FPGA JTAG for FX3 firmware and	FPGA Debug
	GPIO	GPIO pin power,	
instruct	LED0 indicator	configuration, clock indication	Green->Power supply is normal (this indicator light indicates that all power rails in the board are powered normally and all power rails provide PG detection) Red->FPGA correctly configures the bit file Blue->Current reference 10M
	LED1 indicator	PPS, clock lock working indication	Green->Green is internal PPS pulse indication, when external PPS is input, the PPS and external sync blue -> frequency lock signal
	LED2 indicator	TRXA working indicator Red->The port is currently working in the transmitting state	Green->The port is currently working in the receiving state
	LED3 indicator	RXA Work Instructions	Green->Current port is working in receiving state
	LED4 indicator	TRXB working indicator Red->The port is currently working in the transmitting state	Green->The port is currently working in the receiving state
	LED5 indicator	RXB Work Instructions	Green->Current port is working in receiving state
Button	RST button System reset button Pressing it will reset the system		

3 Getting Started

Currently tested and supported software ecosystem:

- **ÿ UHD ÿ**
- **GNURADIO**

ÿ SDRAngel (open source SDR software)

ÿ OpenAirInterface (open source 5G protocol stack)

ÿ MATALB/Simulink ÿ

DroneSecurity (DJI DroneID detection software)

ÿ Labview ÿ

...

B210/B220mini uses UHD interface to support rich software ecology, no matter what system or software environment you are in

All you need to do is replace the original S6 FPGA configuration file with the FPGA configuration file we provide.

Can.

It should be noted that the UHD driver FX3 firmware and FPGA version numbers have a certain matching relationship.

If you receive a message that the firmware version and FPGA version do not match, please contact me to customize a lower version FPGA configuration file for you.

There is no such problem with streaming and the latest version. You can also update your UHD driver to a higher version before using it.

3.1 UHD driver installation and bin file replacement under Linux

For first-time users, it is recommended to use the package manager directly and use the PATCH script to replace the bin file.

The steps to install UHD on Ubuntu 20.04 are as follows:

1. Open Terminal.

2. Add UHD PPA (Personal Package Repository): sudo add-apt-repository -y

ppa:ettusresearch/uhd 3. Update

the package list: sudo apt update 4. Install the UHD

package: sudo apt install -y libuhd-dev uhd-host 5. Install the UHD firmware: sudo

uhd_images_downloader 6. Copy the provided patch folder to any directory 7.

Use the patch.sh script in the folder to update the local FPGA

configuration file (you need to add the run permission

And run chmod +x patch.sh sudo ./patch.sh with sudo privileges)

8. Verify that UHD is

correctly installed: uhd_find_devices

After the installation is complete, you can enter uhd_find_devices in the terminal to test whether the installation is successful.

Some versions of GNURADIO's UHD driver are provided independently, not using the system UHD driver.

python-uhd is also an independent driver. After configuring the driver and running the application, the FPGA cannot be configured.

Run the patch.sh script again.

3.2 Installation under Windows

In order to give full play to the performance of B2x0mini series, it is recommended to use native Linux system. Windows is not recommended due to Libusb performance issues.

The performance is only half of that of Linux, and the performance of the virtual machine is the same as that of the host machine.

The idea is the same as Windows. Before installing and running, use the bin file provided in the windows folder to replace

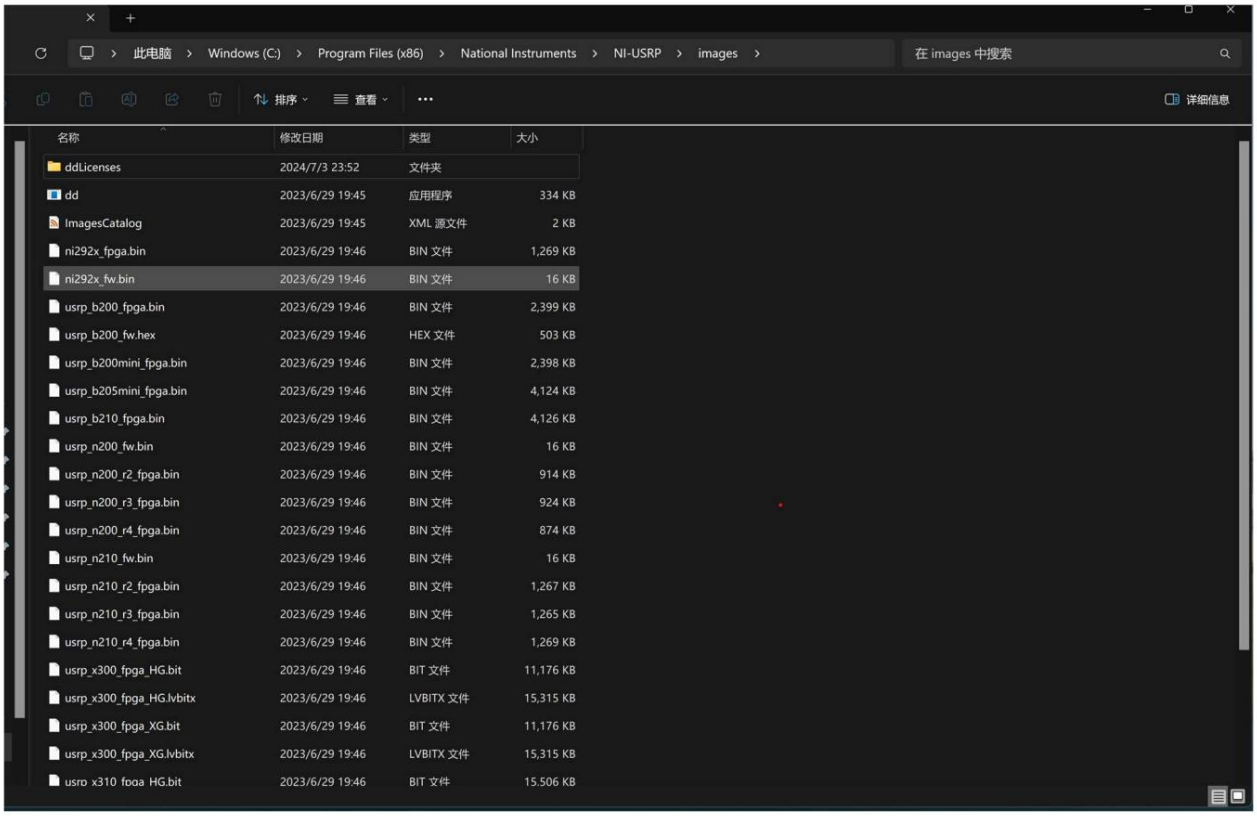
Change

Just use usrp_b210_fpga.bin in the corresponding directory.

Window also needs to replace each tool independently!!!

NI software download path

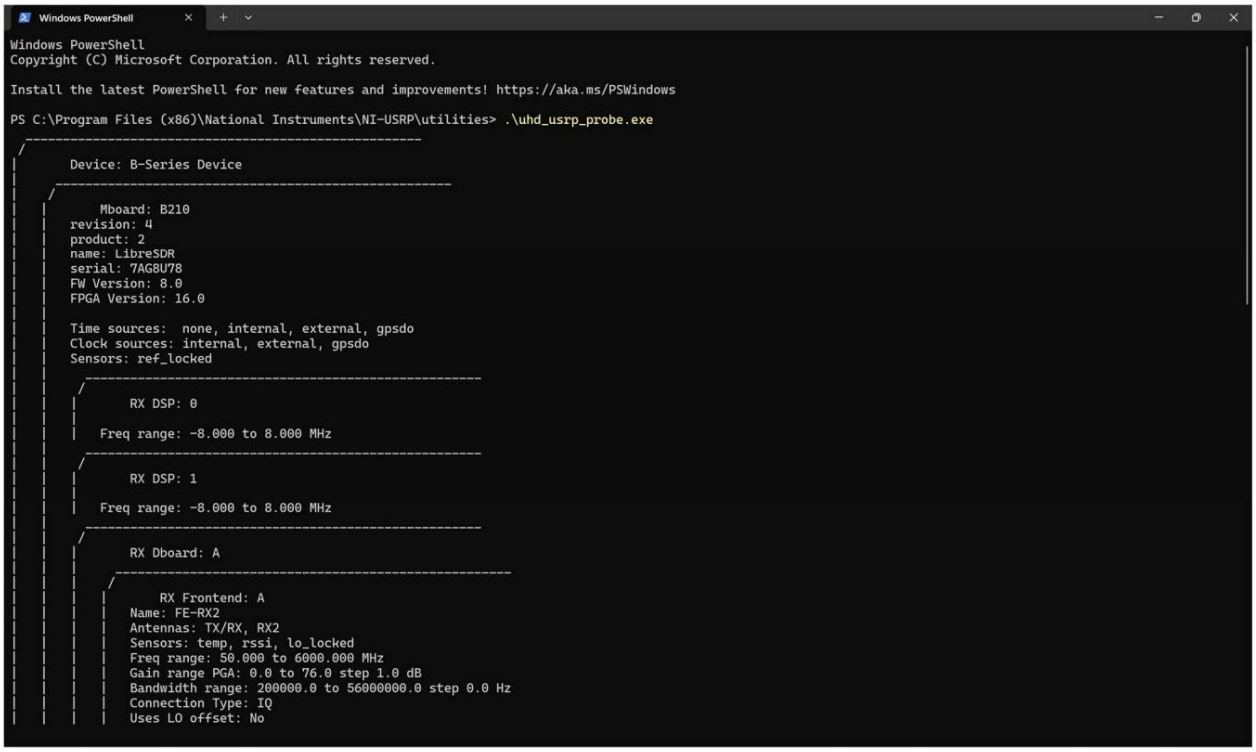
C:\Program Files (x86)\National Instruments\NI-USRP\images



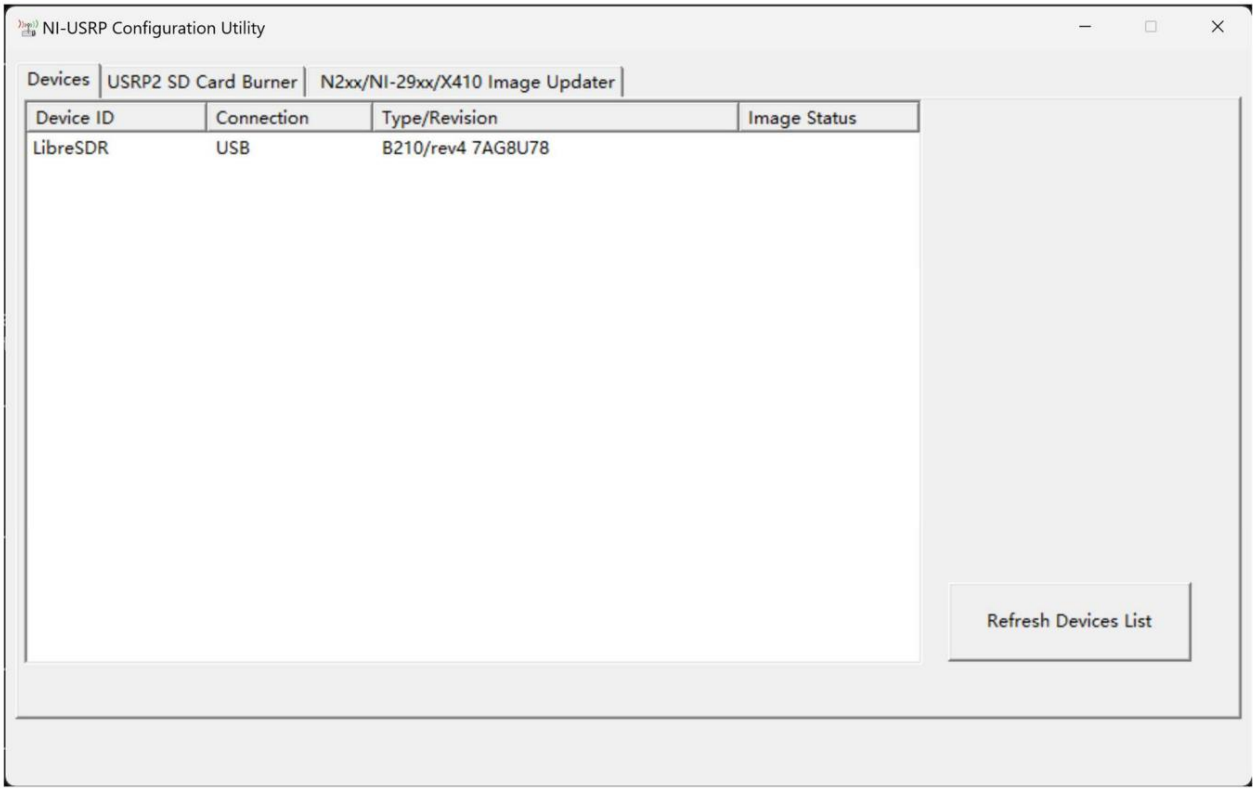
picture4 NI USRP bin File Directory

After the replacement, use the UHD tool under NI's C:\Program Files (x86)\National Instruments\NI-USRP\utilities

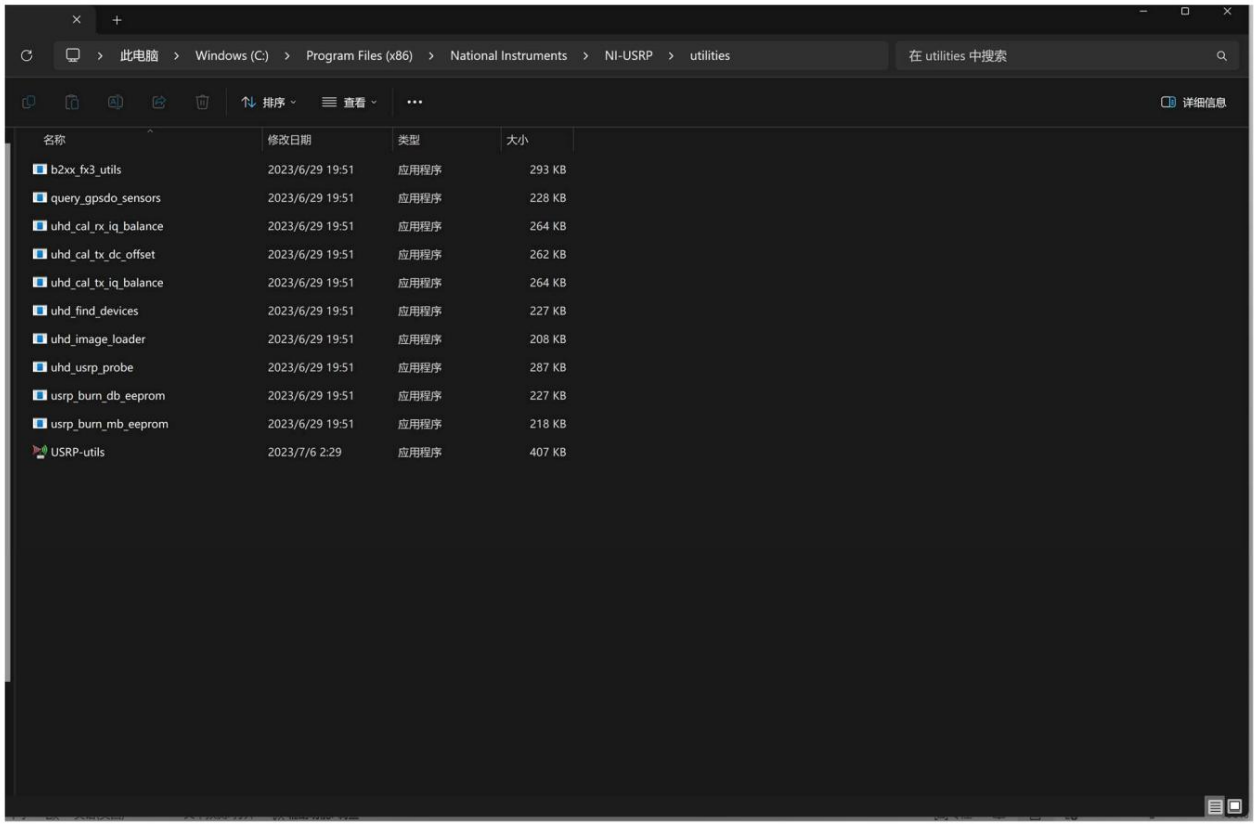
Tool for verification



picture5 uhd_usrp_probe



picture6 NI-USRP ConfigurationUtility

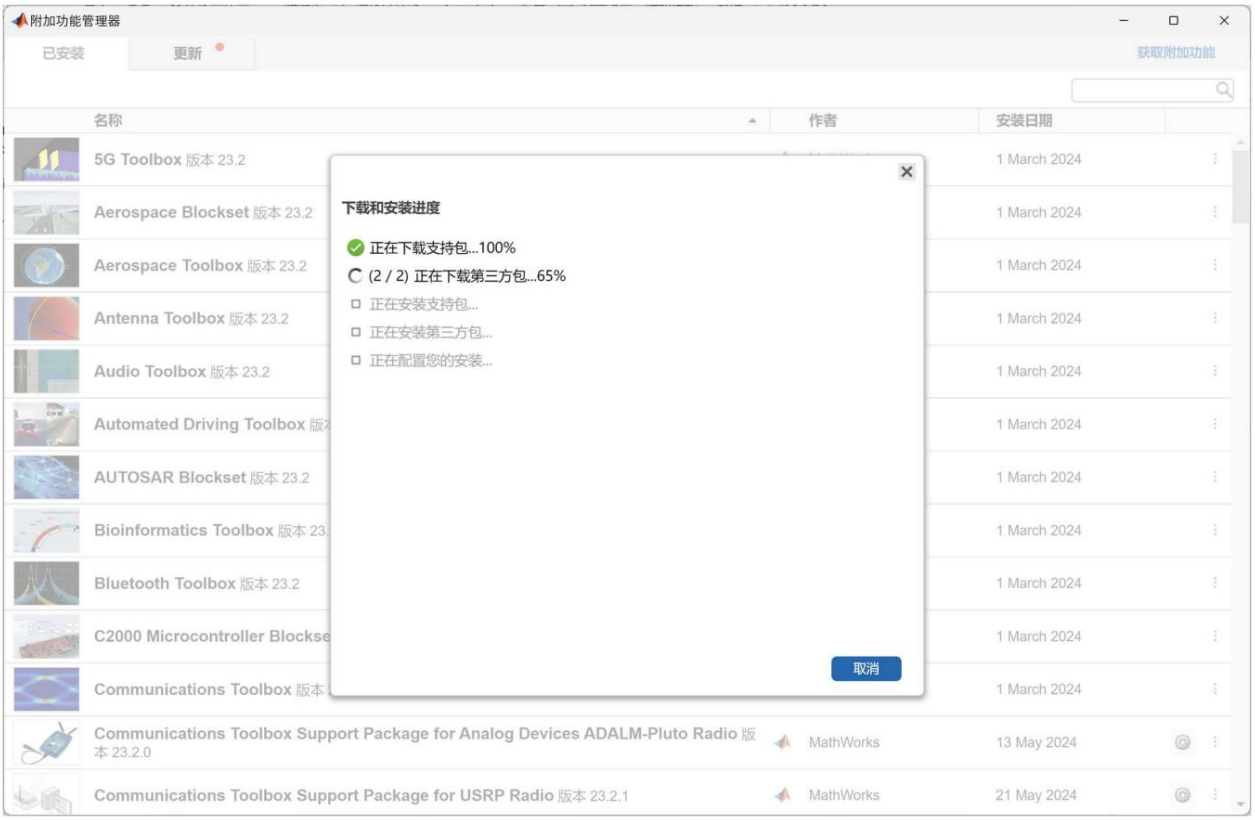


picture7 **NI-USRP utilities**

MATLAB

MATLAB does not connect the device before testing because it needs to install Winusb driver for the first time, and the device will be stuck. Connect the hardware before entering the Test interface and replace the bin file before testing.

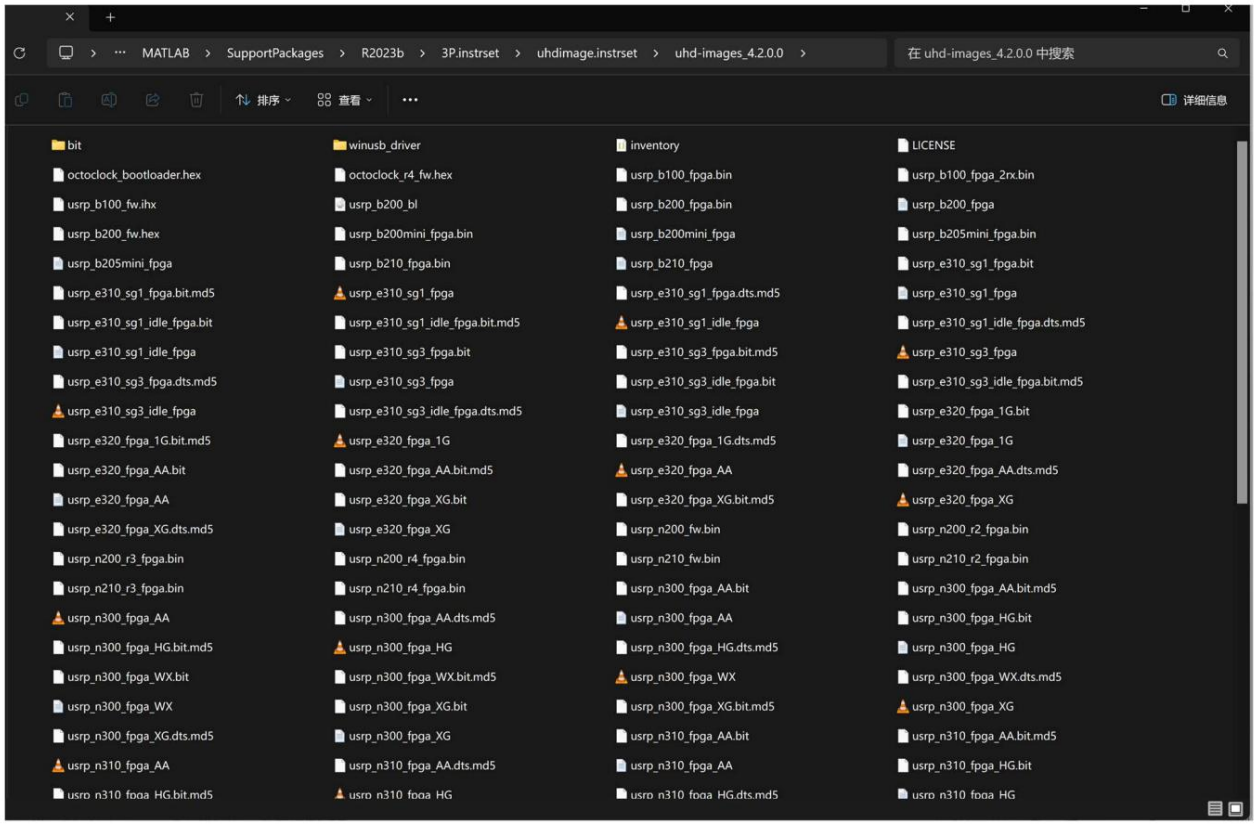
The XC7A200T has a large logic scale and takes a long time to configure. Please be patient.



picture8 MATLAB usrp Toolbox

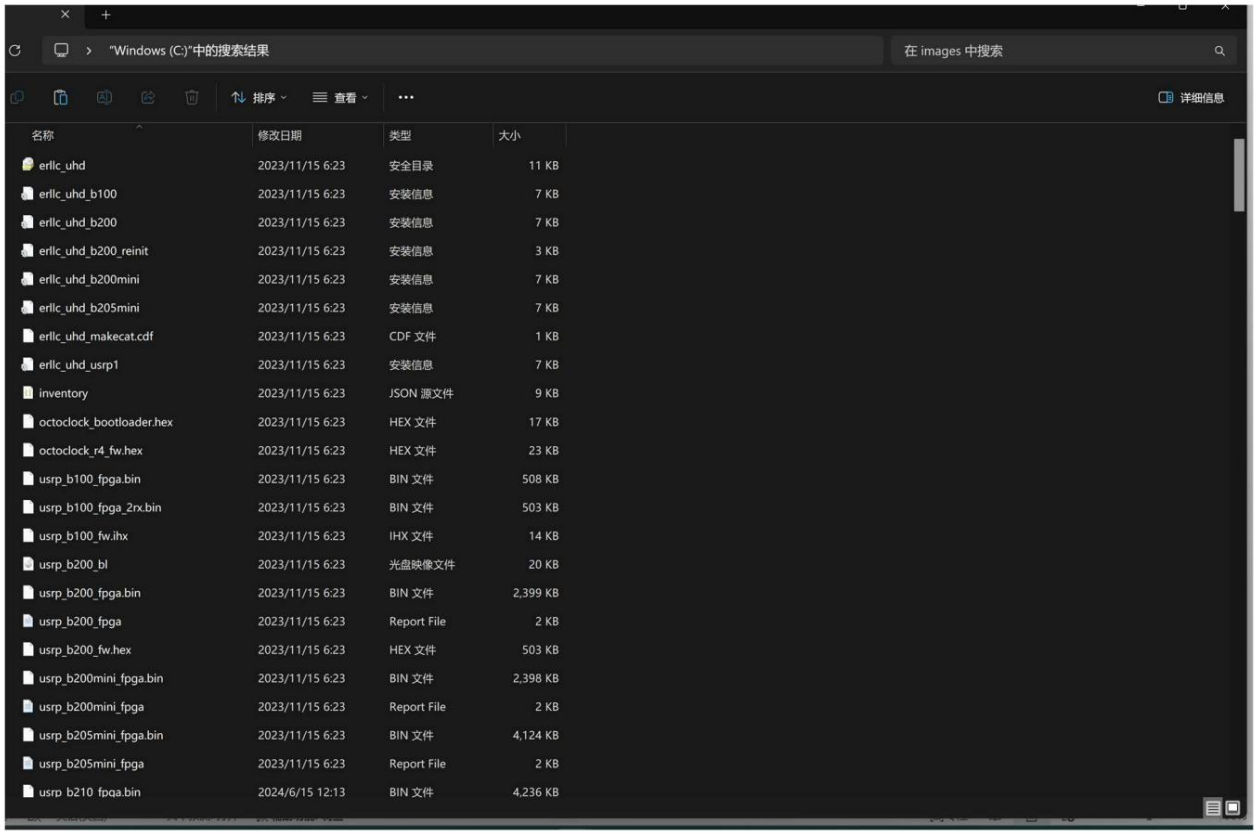
Toolbox Path

C:\ProgramData\MATLAB\SupportPackages\R2023b\3P.instrset\uhdimage.instrset\uhd-images_4.2.0.0 (this path is a hidden path)



picture9 MATLAB Toolbox Replacement Path

UHD Driver



picture 10 UHD Driver Replacement bin File Path