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HW - USBN - 2 B USE GUIDE



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V1.1	4/16/2023 Change channel to add FAQs

Technical Support with feedback

Shenzhen Feilu Technology Co., Ltd. provides a full range of technical support, in the process of use if you have any questions or suggestions, You can contact the company directly:
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Contents

1 Overview	5
2. JTAG programming Design	6
3. SPI FLASH programming	10
4. I2C programming.....	12
5 Read back the data	19
6 Frequently Asked Questions	20

Step 1: Overview

This document mainly describes the basic use process of HW-USBN-2B download. The software used is Diamond programmer. **Pay attention to the whole operation, do not put in the Unicode directory, only english directory.**

Separate burning software programmer download address:

http://183.207.33.38:9011/files.latticesemi.com/c3pr90ntc0td/Diamond/3.12/3.12.0.240.2_Diamond_Programmer.zip

Or go to the lattice diamond download screen to download.

<https://www.latticesemi.com/Products/DesignSoftwareAndIP/FPGAandLDS/LatticeDiamond>

Note for diamond Programmer stand - u.s version to support production chips, need at www.latticesemi.com to apply for the registration license. The license is free, but requires a network adapter MAC address.

diamond programmer does not require license binding support for older chips that you're using. However, some programs require older legacy chips. A stand-alone version of diamond programmer will need to be installed. A separate free license is also required so that the older chip burning function can be enabled.

If there is no web site account, please register your account in

<https://www.latticesemi.com/Accounts/AccountRegister>.

Then log into your account at

<https://www.latticesemi.com/Support/Licensing/DiamondAndICEcube2SoftwareLicensing/DiamondFree> to apply for a free license.

Please follow these steps to request your Lattice Diamond Free Software license:

1. Review your Web Account information below. [[Edit](#)]

Name:

Email:

2. Fill in the Software License Request Form and Submit.

Finding the Host NIC:

For Windows, from an MS-DOS window, use the `ipconfig /all` command

For Linux, from the command prompt, use the `ifconfig -a` command

The Physical Address is a 12-digit hexadecimal value split into pairs with dashes, like this: **00-01-02-66-1D-E0** depending on

After you successfully complete and submit this form, a new license file with instructions on how to install it will be emailed to

For more information about Licensing, please go to <http://www.latticesemi.com/en/Support/Licensing> and raise a Support Case technical issues

Software License Request Form

Note: The license file will be sent to the web account email address: **lichenlin@szfpga.com**

Host NIC (physical address) *

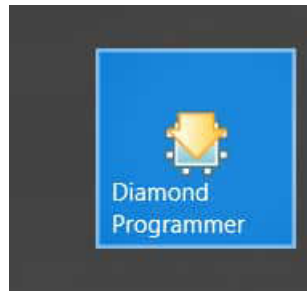
☐ I verify that I am not an employee of Cadence Design Systems, Mentor Graphics Corporation, or Synopsys, Inc.

Enter your MAC address in NIC. And select "I Verify" to confirm.

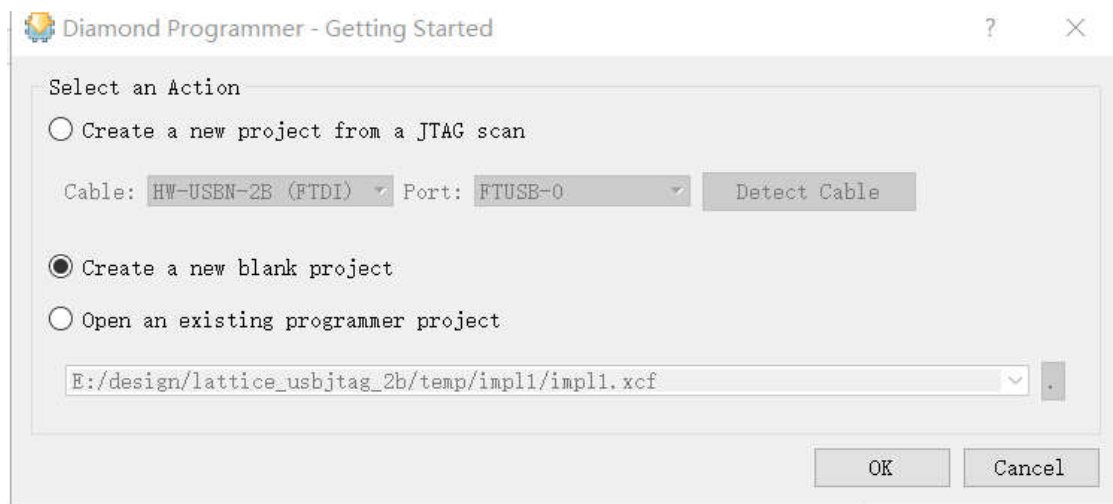
You will get the license file at the email address you registered.

2. JTAG programming design

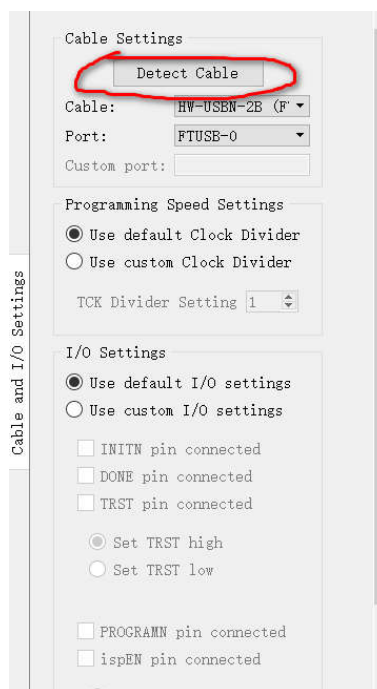
Open Diamond programmer.



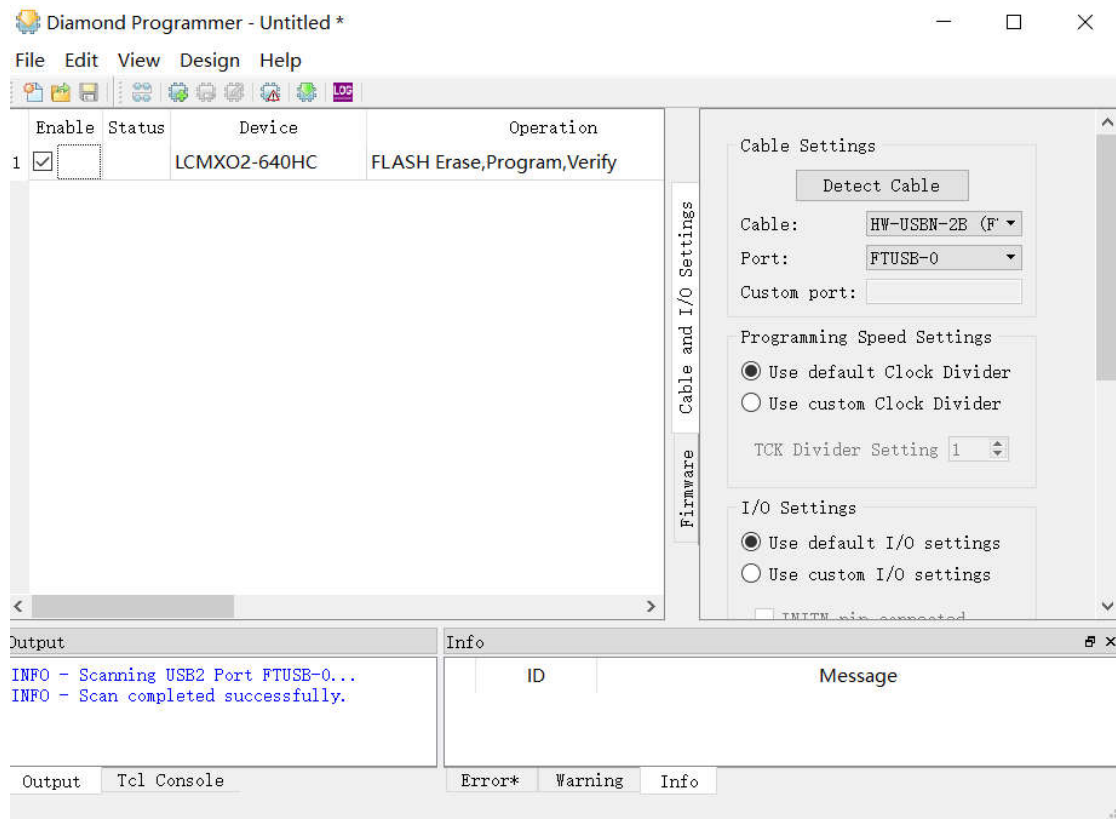
Select create a new blank project.



Select detect cable



Select channel FTUSB-0, the new upgrade only has channel 0, no need to select 0 and 1. Older versions need to select Channel A (If You find two channels)

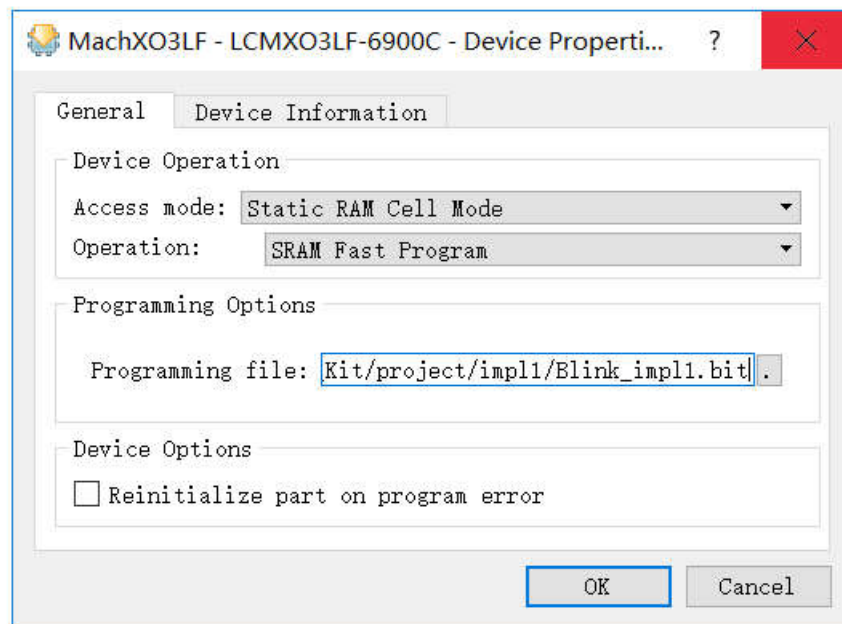


Select the JTAG SCAN button to scan the device.



Select static ram cell mode under operation double click. Select SRAM Fast Program under operation below. , select the programming file with the suffix bit.

Operation	File Name
FLASH Erase,Program,Verify	



Select again, Device Programming.



See programming complete in output.

```

Output
INFO - Multiple cables were detected.
INFO - Check configuration setup: Start.

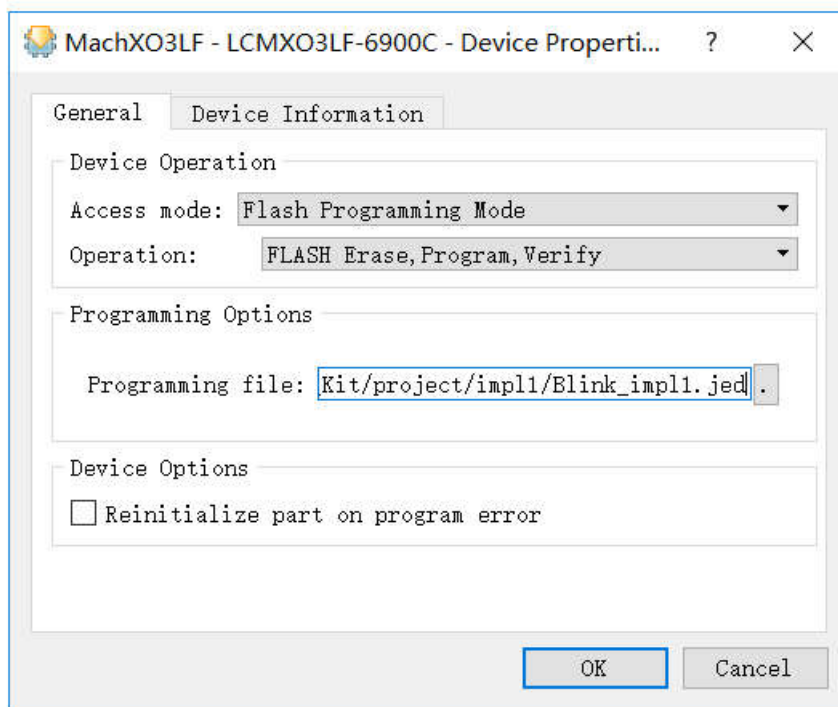
INFO - JTAG Chain Verification. No Errors.
INFO - Check configuration setup: Successful.
INFO - Device1 LCMXO3LF-6900C: SRAM Fast Program
INFO - Operation Done. No errors.
INFO - Elapsed time: 00 min : 02 sec
  
```


3. SPI FLASH programming

- 1) Internal nvcm or flash programming.

Double click in operation and select flash programming mode. Select flash erase. Program. verify. Select the jed file and select ok.

Operation	File Name
SRAM Fast Program	...achXO3LF_Starter_Kit/project/in

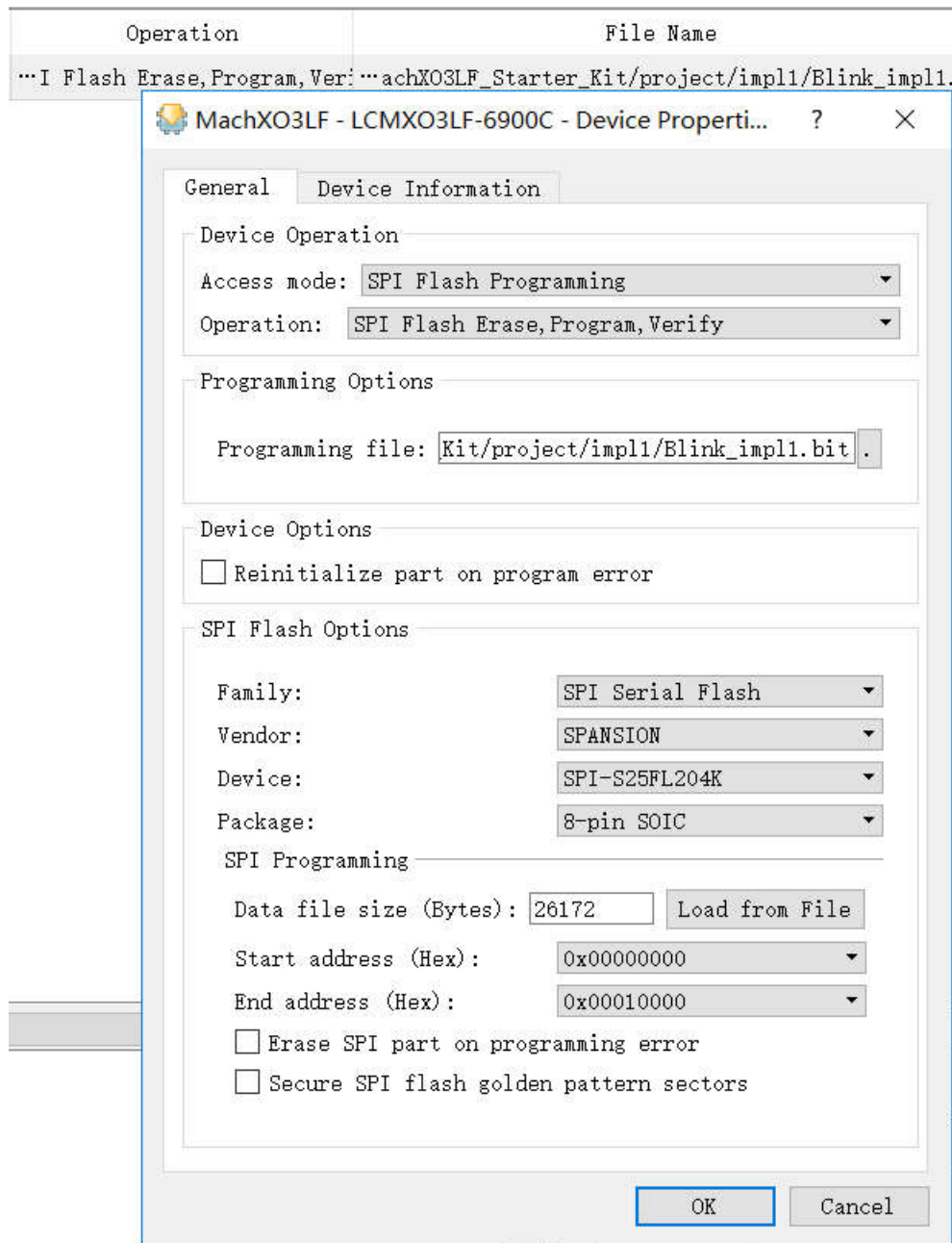


Select, Device Programming, and finish programming.



2) External spi flash programming.

Double click Select in operation. SPI FLASH programming. Select spi flash erase, program, verify in operation. , you can select bit or msc file in programming file. Select the spi flash model, look at the hardware schematic to select the manufacturer, model. Then confirm.



Select, device programming, complete programming.



4 Program I2C

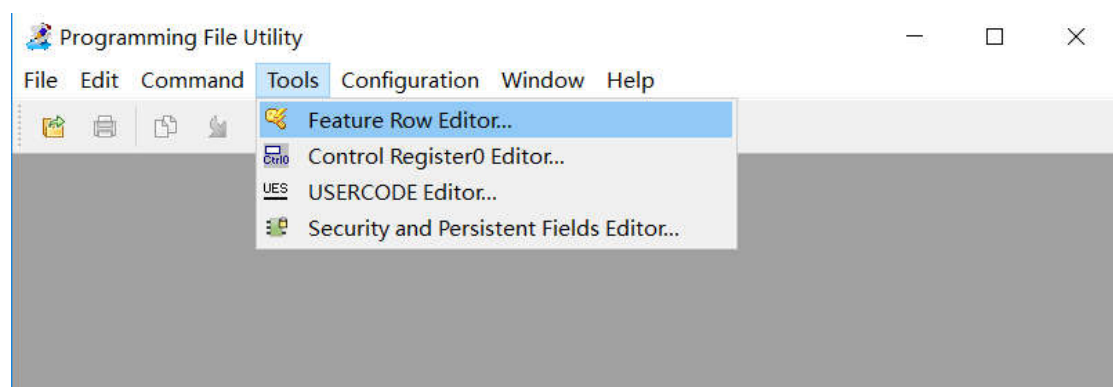
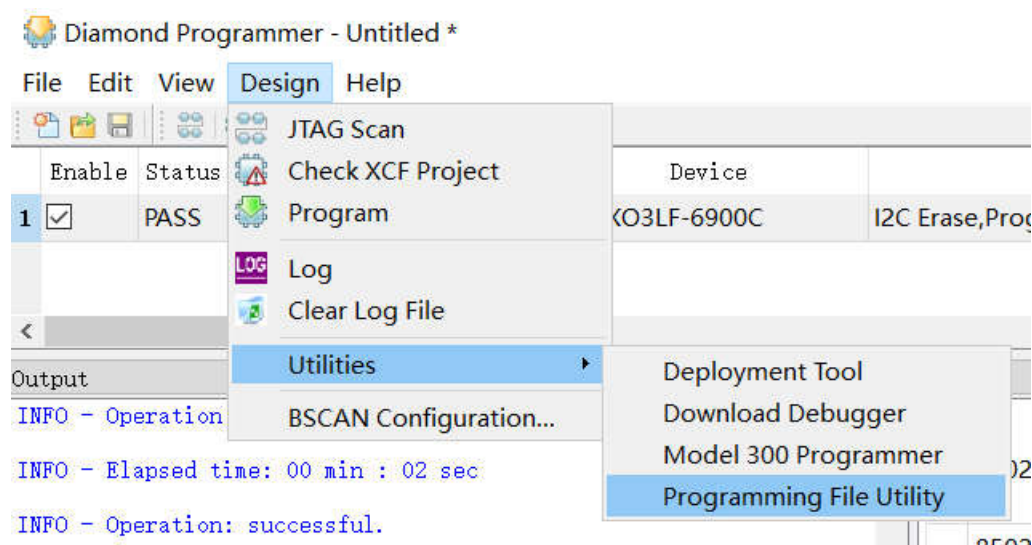
Lattice i2c have some trouble.

The first one to ensure the connection to the download requires 4 wires: VCC, GND, SDA, SCK.

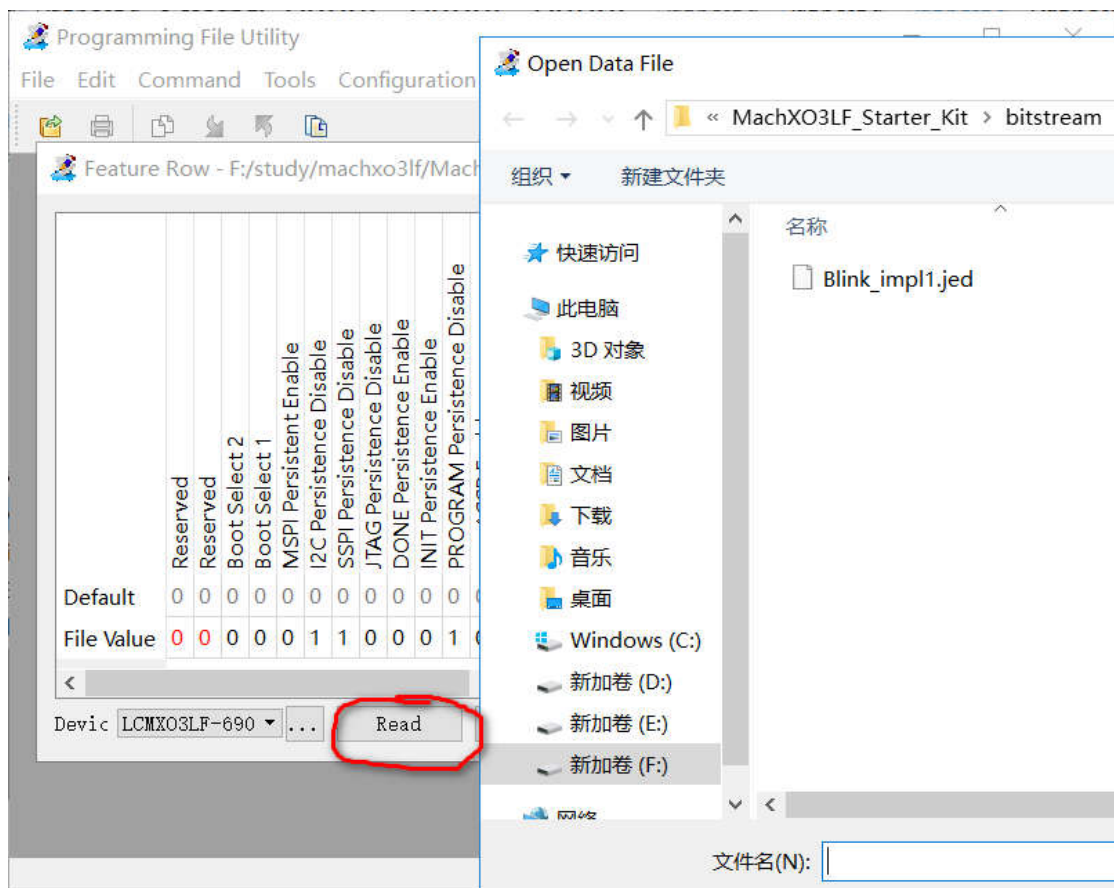
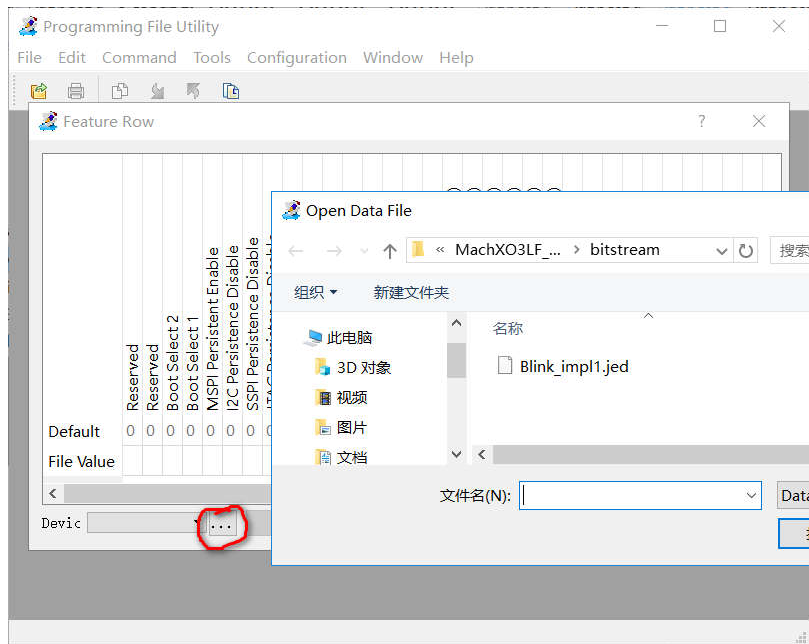
The second is to make sure that chip I2C is enabled by default, that is, only when whitespace has been erased and I2C is not used for other functions:

I2C programming flow, first programming feature row parameters, then down jed file .

So we need to modify the lattice jed file. Modify jed's feature row parameter at Programmer.



Open the file, and click read



Feature Row - F:/study/machxo3lf/MachXO3LF_Starter_Kit/MachXO3LF_Starter_Ki...

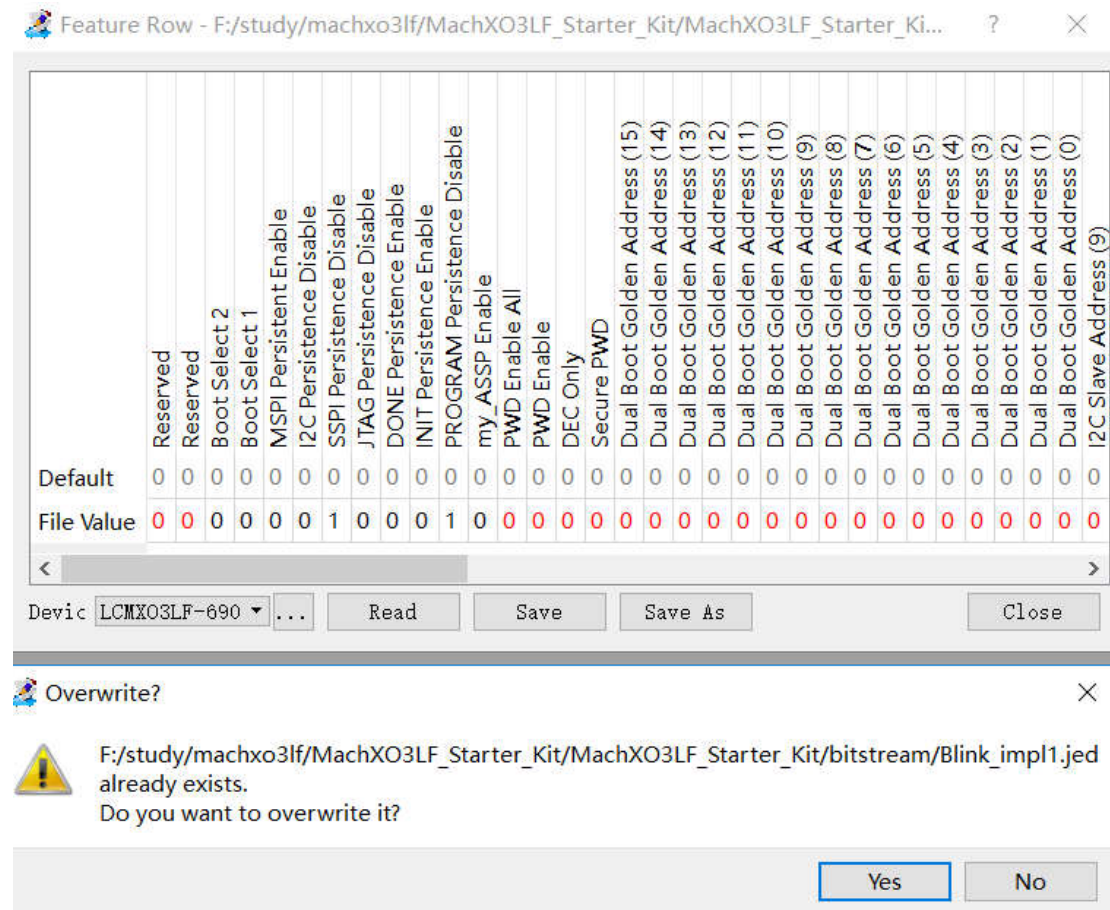
Default	File Value	Parameter
0	0	Reserved
0	0	Reserved
0	0	Boot Select 2
0	0	Boot Select 1
0	0	MSPI Persistent Enable
0	1	I2C Persistence Disable
0	1	SSPI Persistence Disable
0	0	JTAG Persistence Disable
0	0	DONE Persistence Enable
0	0	INIT Persistence Enable
0	1	PROGRAM Persistence Disable
0	0	my_ASSP Enable
0	0	PWD Enable All
0	0	PWD Enable
0	0	DEC Only
0	0	Secure PWD
0	0	Dual Boot Golden Address (15)
0	0	Dual Boot Golden Address (14)
0	0	Dual Boot Golden Address (13)
0	0	Dual Boot Golden Address (12)
0	0	Dual Boot Golden Address (11)
0	0	Dual Boot Golden Address (10)
0	0	Dual Boot Golden Address (9)
0	0	Dual Boot Golden Address (8)
0	0	Dual Boot Golden Address (7)
0	0	Dual Boot Golden Address (6)
0	0	Dual Boot Golden Address (5)
0	0	Dual Boot Golden Address (4)
0	0	Dual Boot Golden Address (3)
0	0	Dual Boot Golden Address (2)
0	0	Dual Boot Golden Address (1)
0	0	Dual Boot Golden Address (0)
0	0	I2C Slave Address (9)

Device: LCMXO3LF-690 ... Read Save Save As Close

To see the feature row parameter, first change the I2C Persistence Disable to 0.

0	0	I2C Persistence Disable
0	0	SSPI Persistence Disable
0	1	JTAG Persistence Disable
0	0	DONE Persistence Enable
0	0	INIT Persistence Enable
0	1	PROGRAM Persistence Disat
0	0	my_ASSP Enable
0	0	PWD Enable All
0	0	PWD Enable
0	0	DEC Only
0	0	Secure PWD

Select save to save to the file. Select yes, overwrite.

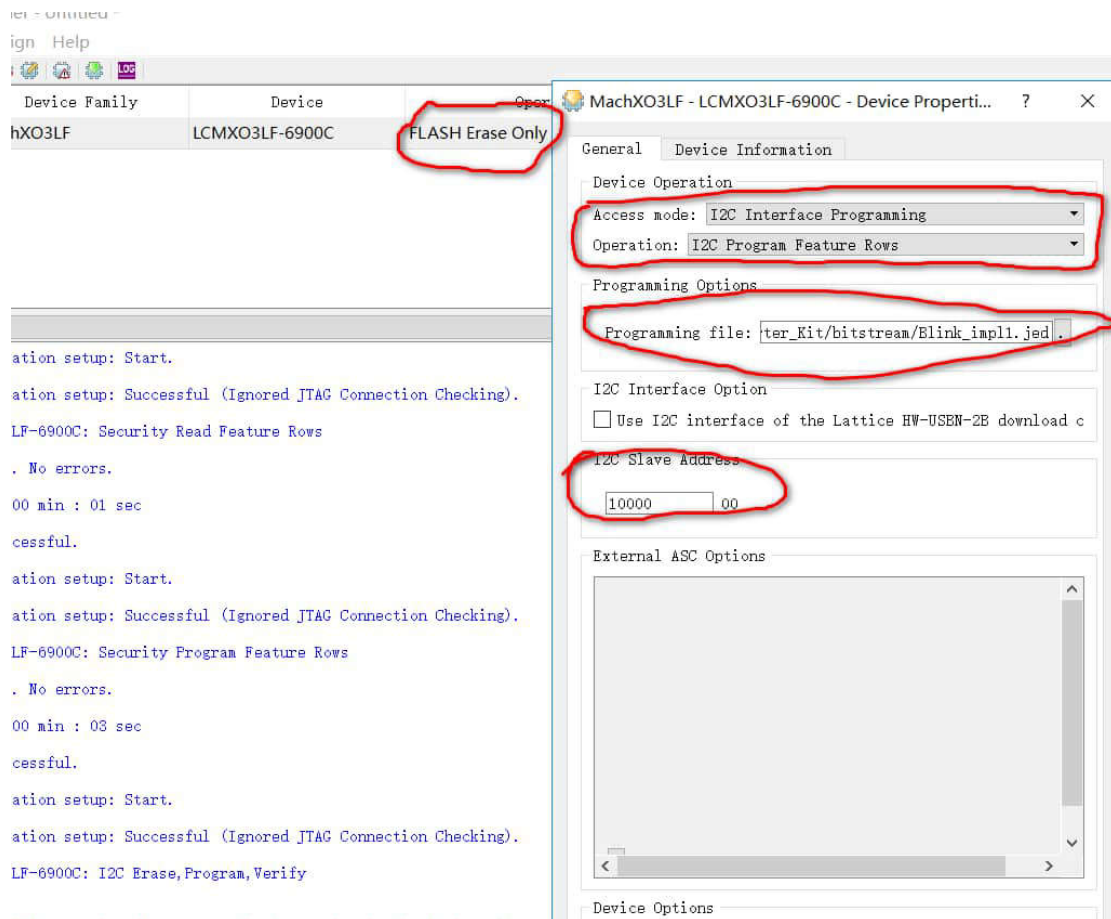


Close Find a software.


First in the diamond program, select the corresponding device.

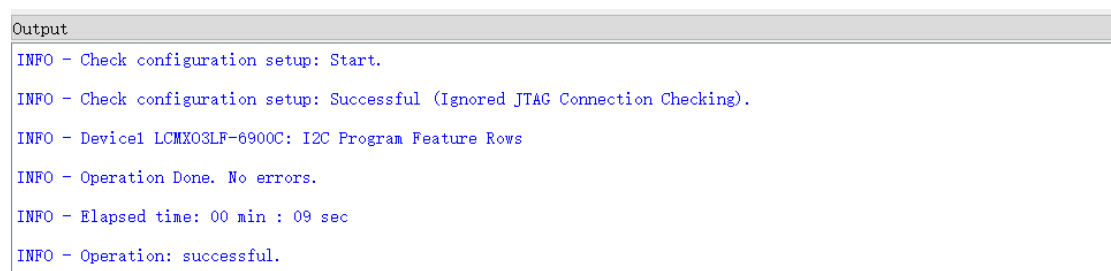
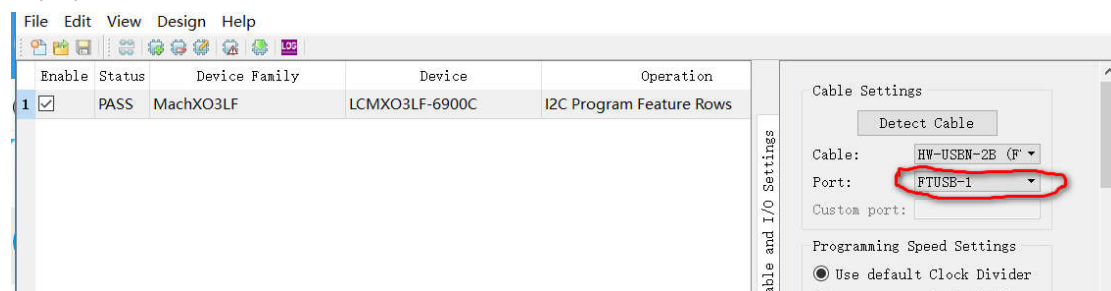


Select operation and double-click to open, i2c interface programming, select i2c program feature rows, and set the files of programming options as the corresponding modified files. Select the default address of 10000 for I2c slave address.

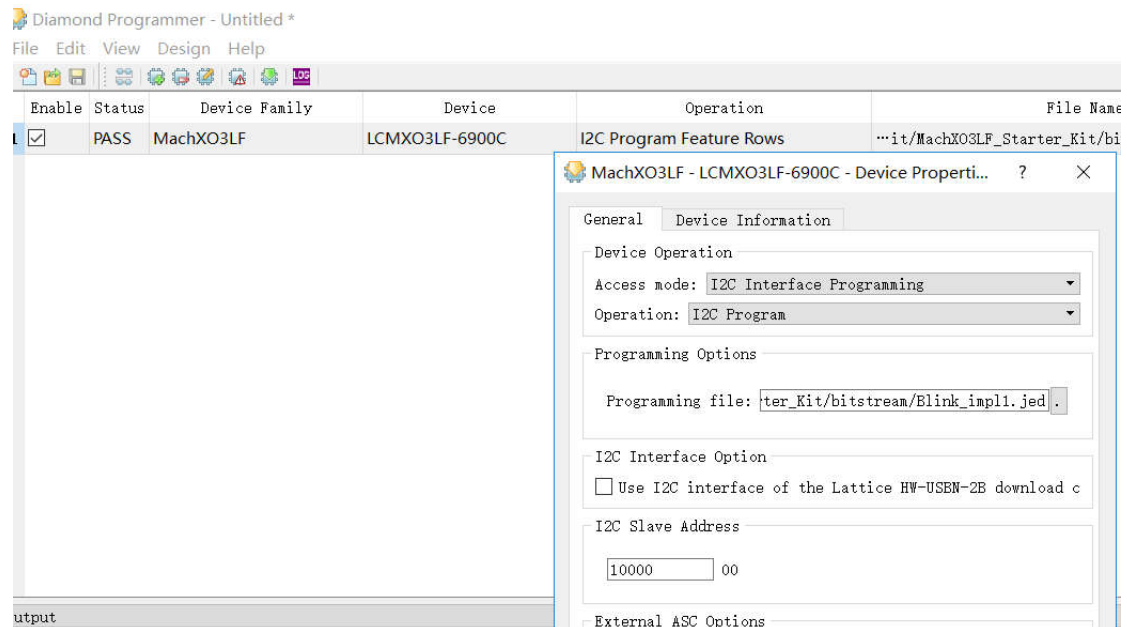


First of all, under the refresh of **detec cable**, the new version does not need to select the channel, in the old version, pay attention to select the FTUSB-1 of **HW-USBN-2B** (note that the old version must be the B channel, which may be 0 or 1), corresponding to the function of I2C.

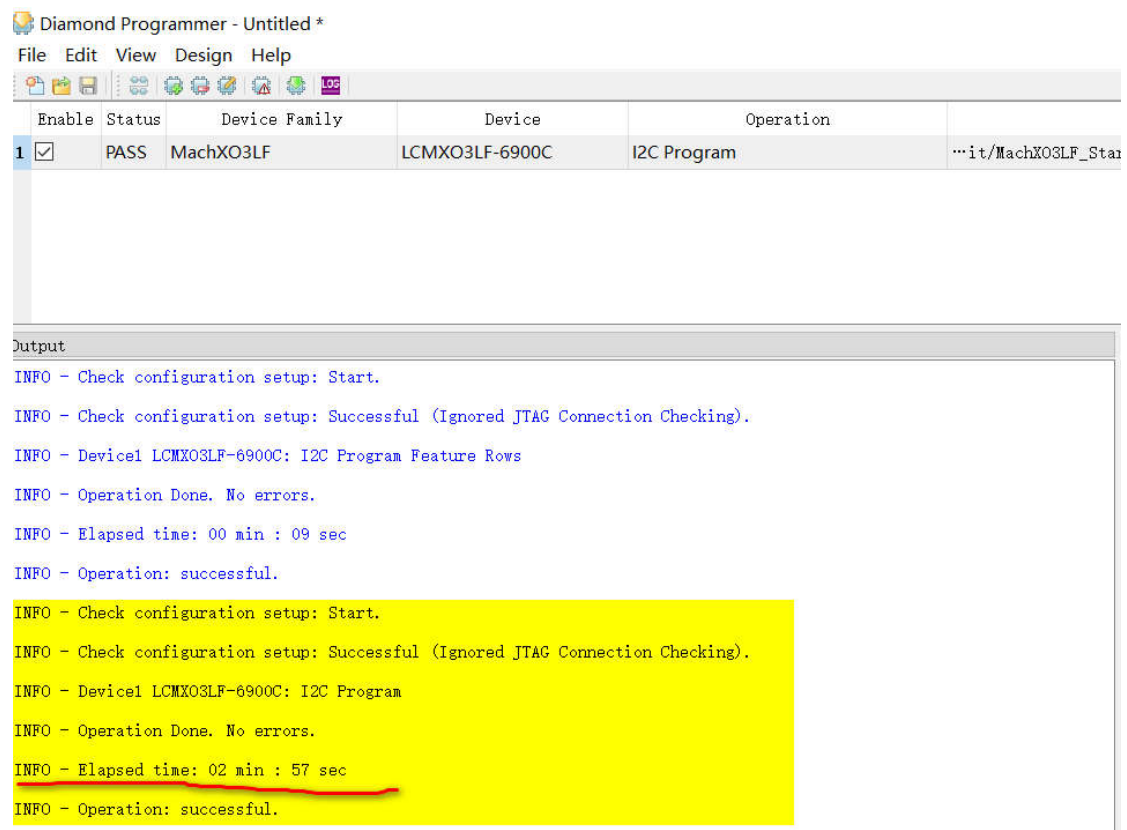
Select programming.  A successful burning feature row performance parameter window is displayed.



Double-click in operation and select I2C program in the operation that pops up. Select OK. Because I2C is slow to program, it will take a long time to finish.



After completion, output, burning successful results.



Note that the blank chip supports I2C programming, and if flash has been programmed once, the blank must be erased first, then program with I2C.

Diamond Programmer - Untitled *

File Edit View Design Help

Enable	Status	Device Family	Device	Operation	File Name
<input checked="" type="checkbox"/>	PASS	iCE40UL	iCE40UL1K	Fast Program	.._Implant/sbt/outputs/bitmap/cdpga_bx_bitmap.he

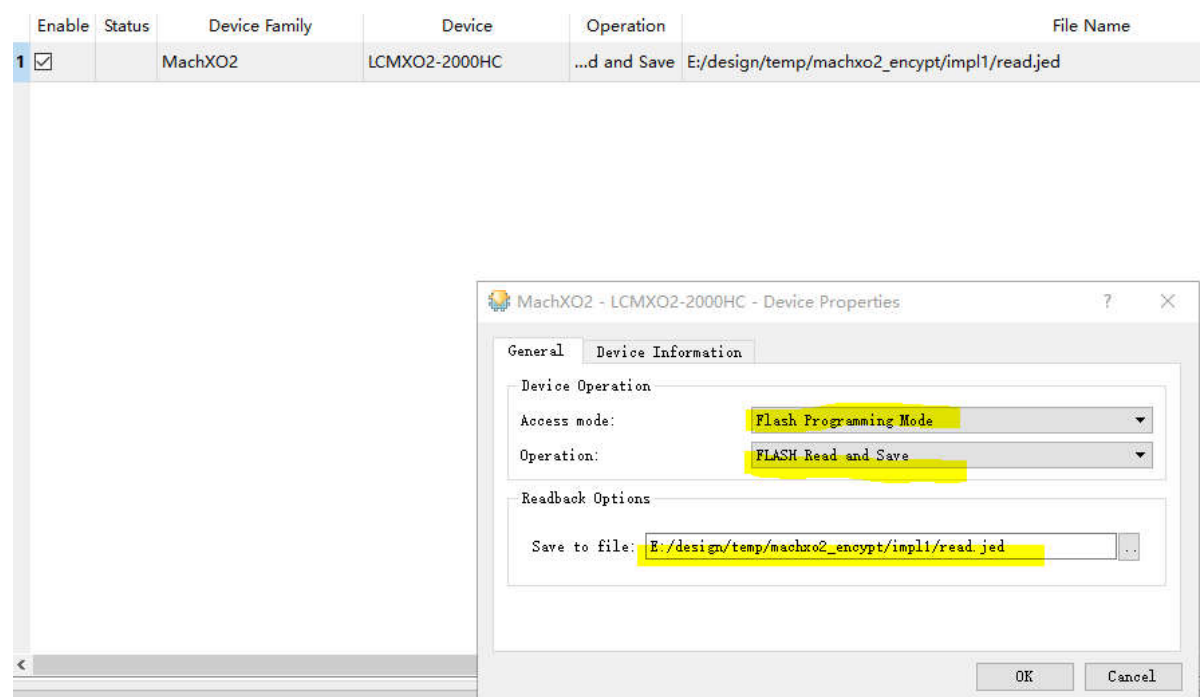
Output	Info
attice VM Drivers detected (HW-DLN-3C (Parallel), HW-USBN-2B (FTDI))	
rogrammer device database loaded	
NFO - Scanning USB2 Port FTUSE-0...	2342002 INFO - Scannin
NFO - Scan completed successfully.	2342003 INFO - Scan co
NFO - Check configuration setup: Start.	85021074 INFO - Check c
NFO - Check configuration setup: Successful (Ignored JTAG Connection Checking).	85021077 INFO - Check c
NFO - Device1 iCE40UL1K: Fast Program	85021278 INFO - Device1
NFO - Operation Done. No errors.	85021298 INFO - Operati
NFO - Elapsed time: 00 min : 01 sec	85021371 INFO - Elapsed
NFO - Operation: successful.	85021373 INFO - Operati
NFO - Check configuration setup: Start.	85021074 INFO - Check c
NFO - Check configuration setup: Successful (Ignored JTAG Connection Checking).	85021077 INFO - Check c
NFO - Device1 iCE40UL1K: Fast Program	85021278 INFO - Device1
NFO - Operation Done. No errors.	
NFO - Elapsed time: 00 min : 01 sec	
NFO - Operation: successful.	

5 Read back the data

For an encrypted chip, there is no meaning in reading back, because all 0 or 1 data content.

If the data is not encrypted, the content can be reading back.

Select operation, select flash programming mode, select flash read and save, then select save to file to select Directory. Select the location of the saved file to read back.



Select, read back the file contents.



6 Frequently asked Questions

A). What if I can't find the device?

First confirm whether the download is recognized by the system, normally in the device manager is two USB Serial names. Then Detect Cable and make sure to operate on the A-000 channel. Scan the chip again, and if a yellow prompt appears, click the chip again and select Save Project.

For old chips or chips with too long wiring, reduce TCK speed test, set the TCK Divider to above 3, and test again.

Note: Please do not burn chips in the development board of Lattice with FT2232HL, there will be a conflict.

B) What is VCC and should the burner be connected?

The download belongs to the online burner, need the target board support, does not support off-line single chip burning. VCC is the port reference voltage of the JTAG of the download, which must be consistent with the circuit reference voltage of the JTAG of the target board sub-chip, so as to ensure the burning. In JTAG, SPI, I2C, all three must ensure that VCC, GND connection is normal. The downloader light is displayed in yellow.

C) I2C burning how to link?

I2C link, need links SCL, SDA, VCC, GND. Also make sure that the burning chip is SCL, SDA pull-up resistor. And the chip needs blank chip or wipe clean chip, otherwise I2C function can not be used.

D) Crosslink, Ice40 chip how to link

flywire mark	-----	Chip pin name
VCC	<----->	Chip vccio-0 voltage
TDO	<----->	SPI-MISO
TCK	<----->	SPI-SCK
TRST	<----->	CRESET-B
ISPEN	<----->	SPI-SS
TDI	<----->	SPI-MOSI
GND	<----->	Power supply GND

Only on-board chip burning is supported, make sure the chip circuit is powered properly, SPI-SS pull-up, CRESET-B pull-up. If the cable is inserted incorrectly, please be sure to replace it after power off, and then power on for detection. Because Crosslink has a special power-on process. See

the chip documentation for details.

E) How to insert the 2A adapter board

2A belongs to the switching board. Please make sure that the interface sequence is on the corresponding operating board. Pay attention to the anti-dumbness.



When not 2A, insert directly with 2 x 7 dupont wire. Be careful against stars.



F) Error: failed to set cable port (cable:USBport:EzUSB-0 error:-1).

Why program can detect the HW-USBN-2B device, but RVL cannot detect the device.
error: failed to set cable port(cable:USBport:EzUSB-0 error:-1).



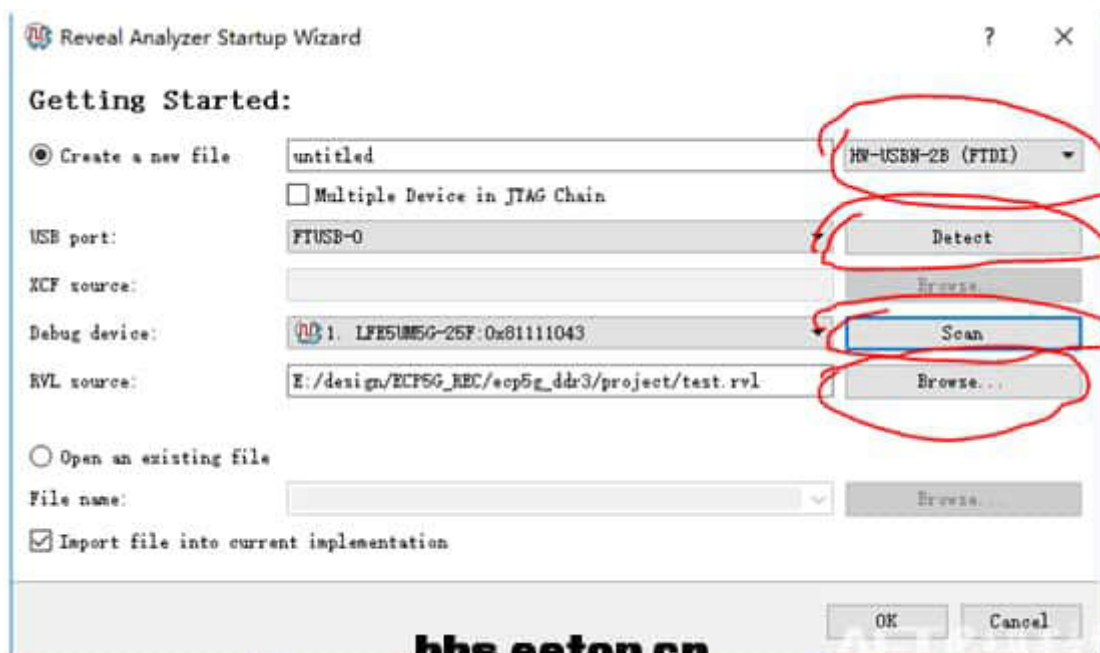
The first reason is that the simulation speed of HW-USBN-2A is too slow, which leads to the exception. Only by replacing HW-USBN-2B faster device can the root problem be solved.

Second, since 2A equipment was used to detect the waveform before, the waveform engineering setting file needs to be modified. In the project, find these files and delete them. Rva waveform analysis engineering related names.

untitled.rva	2019/5/7 10:25	RVA 文件	21 KB
untitled.svf	2019/5/7 10:27	SVF 文件	230 KB
untitled.trc	2019/5/7 10:28	TRC 文件	0 KB

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Reselect rvl analyzer.



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In the wizard, create a new file, select the device corresponding to FTDI, detect the port, scan the device, and select the RVL file. If these choices are correct, there will be OK to confirm.