FT9001 Programming Guide

Version 1.0
Document Number:-

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Change List

Version	File Modification Description	Author	Date
1.0	Initial Version	Zhang Piaoxiang	20250605

1 Introduction

```
This document provides guidelines for upgrading firmware on the FT9001 chip, covering:
1. Development Notes: Chip boot process, hardware specifications
2. Simulation Debugging: Flash emulation configuration
3. Code Programming: Methods for downloading code to the chip
```

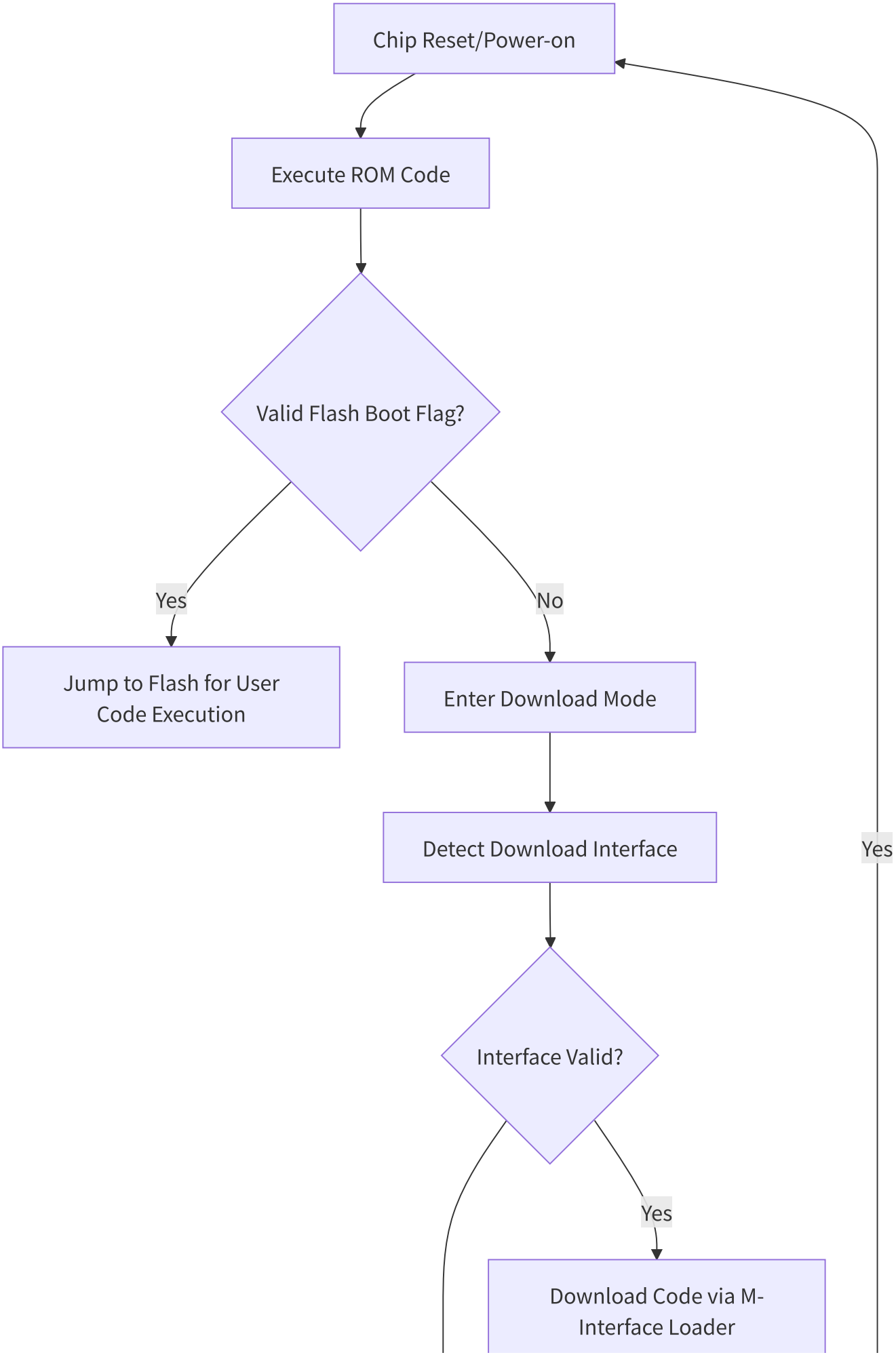
2 Development Notes

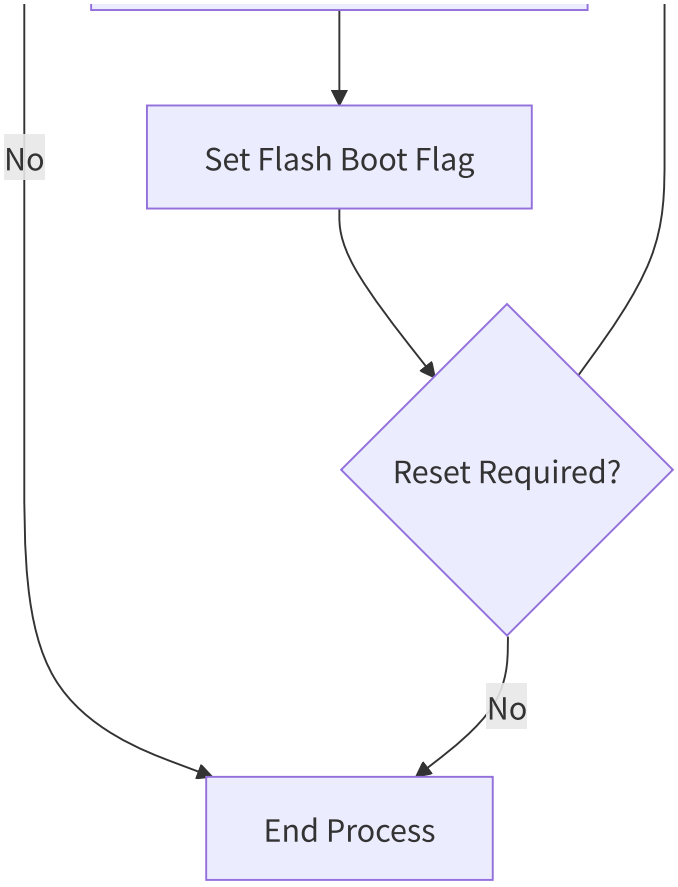
2.1 Development Kit Contents

The customer development kit includes:

- **Flash Map**:FT9001.xml&Device_FT9001.FLM
- **Test Firmware :zephyr.hex**
- **Programming Tools**
    - **JFlash Programming**: Firmware programming via JFlash.

2.2 Chip Boot Process


Chip Reset/Power-on
Execute ROM Code
Valid Flash Boot Flag?
Yes
No
Jump to Flash for User Code Execution
Enter Download Mode
Detect Download Interface
Interface Valid?
Yes
Download Code via M-Interface Loader
Yes



2.3 Hardware Specifications

2.3.1 Development Board

Different packages correspond to different development boards. Refer to hardware documentation in the development kit.

2.3.2 Emulator Connection

Supports J-Link SW interface. Connection diagram:

J-Link	Development Board
SWDIO	SWDIO
SWCLK	SWCLK
RX	TXD2
GND	GND

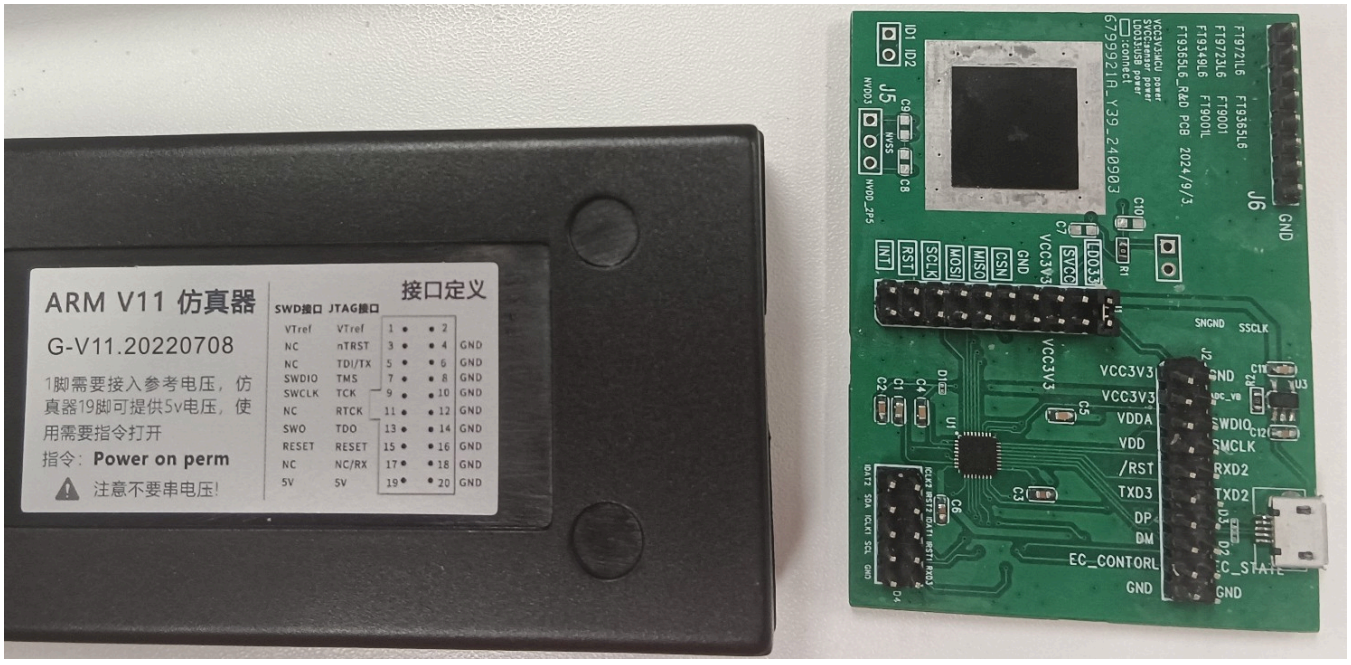
J-Link Pinout:

Pin	Function	Pin	Function
1	VCC	17	UART/RX
7	SWDIO	9	SWCLK

Pin	Function	Pin	Function
15	RESET	Other	GND

Development Board Pinout:

Pin	Function	Pin	Function
VCC3V3	3.3V Power Supply	CSN	SPI Master Chip Select
SWDIO	Debug Data	MISO	SPI Master In Slave Out
SWCLK	Debug Clock	MOSI	SPI Master Out Slave In
RXD2	UART2 Input	SCK	SPI Master Clock
TXD2	UART2 Output	RST	Sensor Reset Pin
DP	USB D+	INT	Sensor Interrupt Pin
DM	USB D-	GND	Ground
EC_CONTROL	Power Shielding		
EC_STATE	One-Key Power On		



2.4 Chip Boot Modes

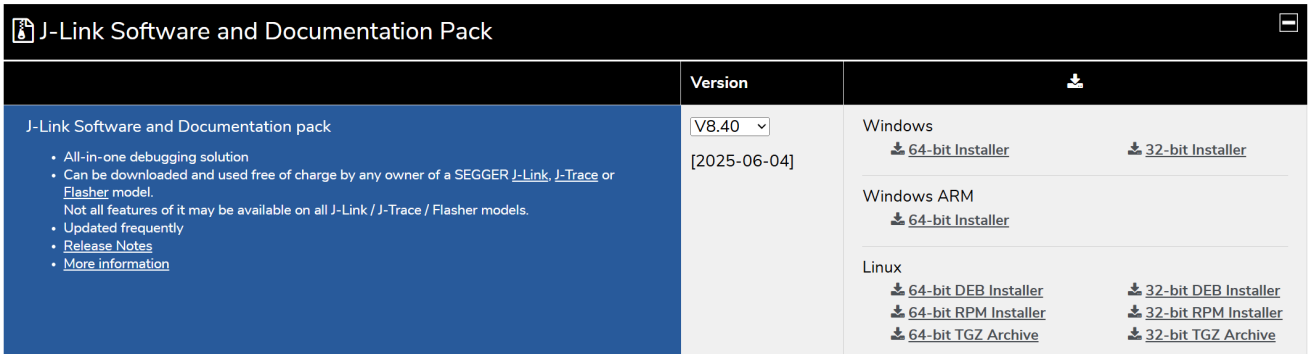
Mode	Flash Boot Flag	Description
ROM	Invalid	Boots from ROM on power-on/reset. Executes Loader code (factory default).
Flash	Valid	Jumps to Flash after ROM flag check. Can be cleared via driver interface.

3.Programming Firmware with JFlash on Windows

3.1 Install JFlash

Download latest version:

[SEGGER - The Embedded Experts - Downloads - J-Link / J-Trace]

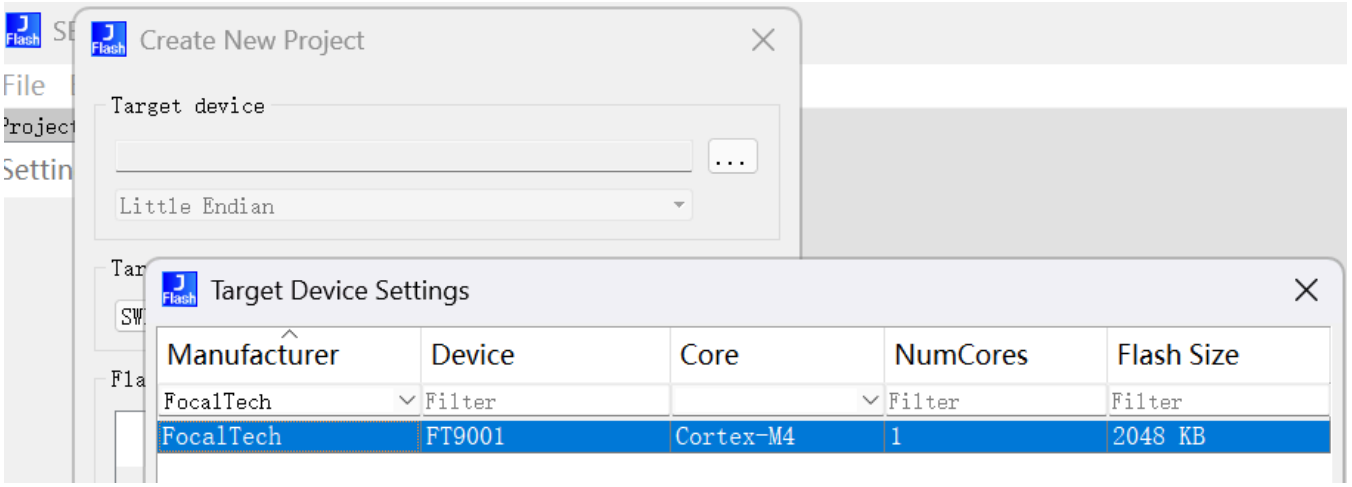


Create `JLinkDevices` directory and copy files:

```
Device_FT9001.FLM` and `FT9001.xml` → `C:\Users\
<UserName>\AppData\Roaming\SEGGER\JLinkDevices
```

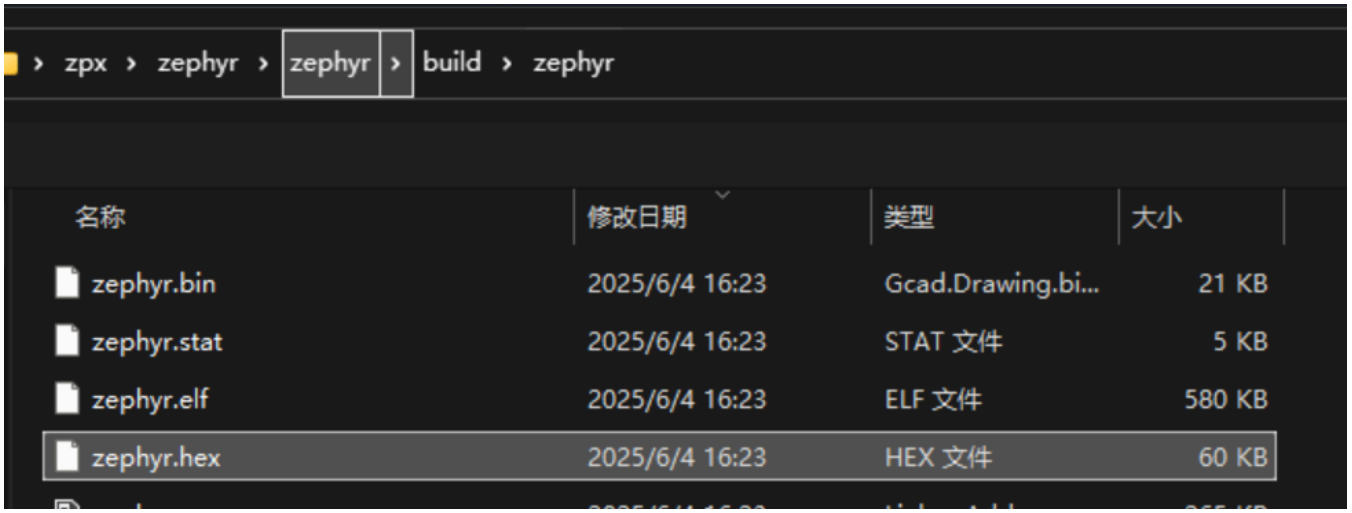
Create Project

Select **File** → **New Project** → Choose FT9001 device



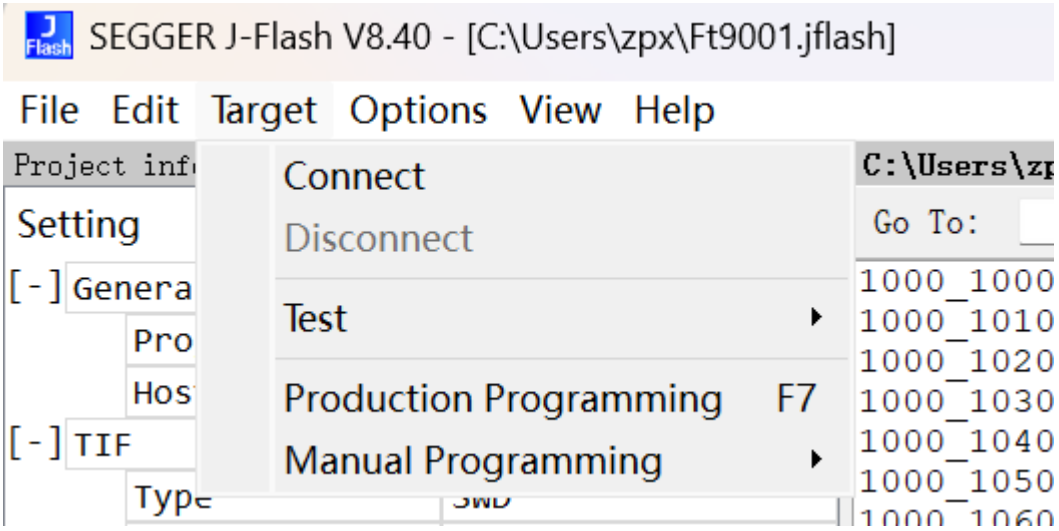
3.3Load Firmware

File → **Open Data file** → Select compiled HEX file



3.4 Program Device

Connect device → **Target** → **Connect** → **Production Programming**



4.Programming on Ubuntu 22.04

4.1Install Dependencies

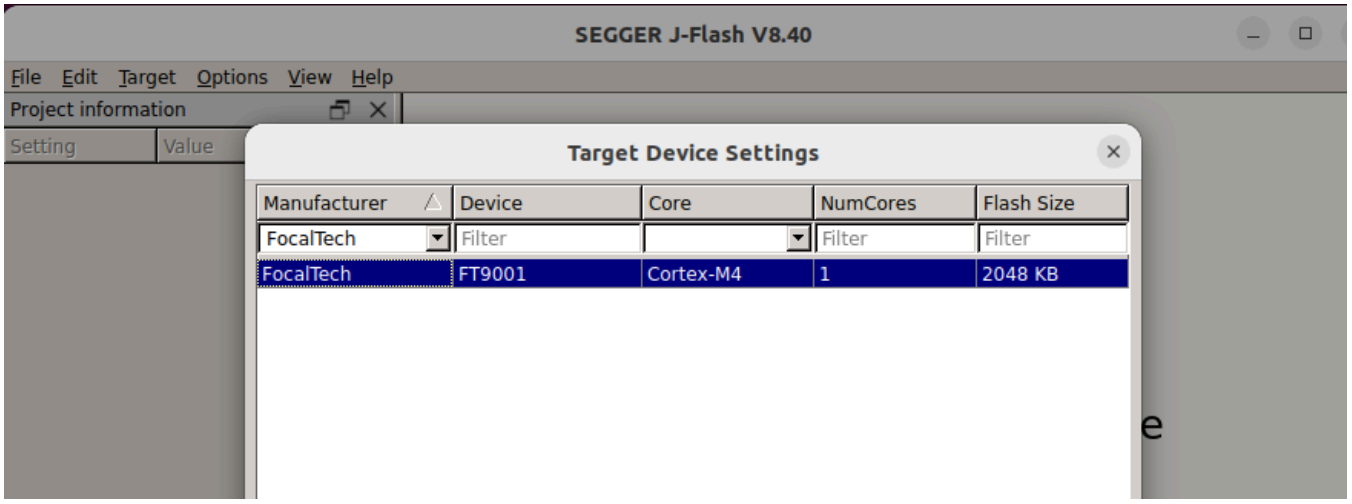
copy FT9001.xml&Device_FT9001.FLM to ~/.config/SEGGER/JLinkDevices

```
sudo apt-get install libncurses6
sudo dpkg -i JLink_Linux_V840_x86_64.deb

sudo su
root@test-laptop:cd ~/.config/SEGGER/
root@test-laptop:~/.config/SEGGER# mkdir JLinkDevices
root@test-laptop:~/.config/SEGGER# cd JLinkDevices/

root@test-laptop:~/.config/SEGGER/JLinkDevices# cp $yourPath/FT9001.xml ./
root@test-laptop:~/.config/SEGGER/JLinkDevices# cp $yourPath/Device_FT9001.FLM ./
```

```
root@test-laptop:~/.config/SEGGER/JLinkDevices#cd /opt/SEGGER/JLink
root@test-laptop:/opt/SEGGER/JLink#./JFlashExe
```

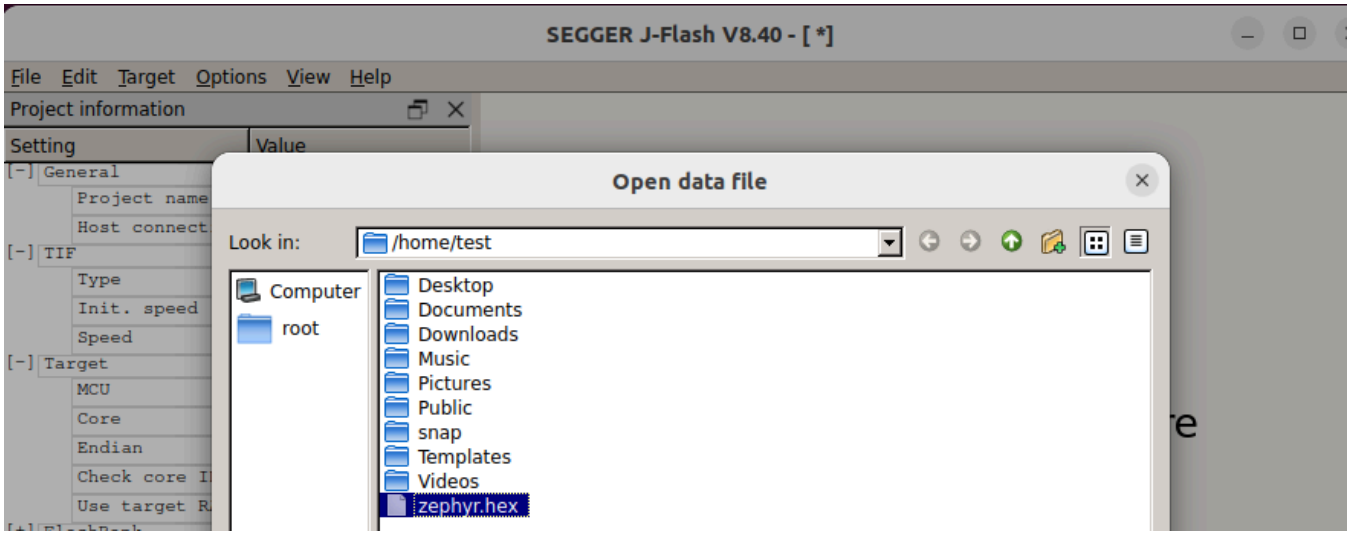
4.2 Configure JFlash

File → **New Project** → Select FT9001



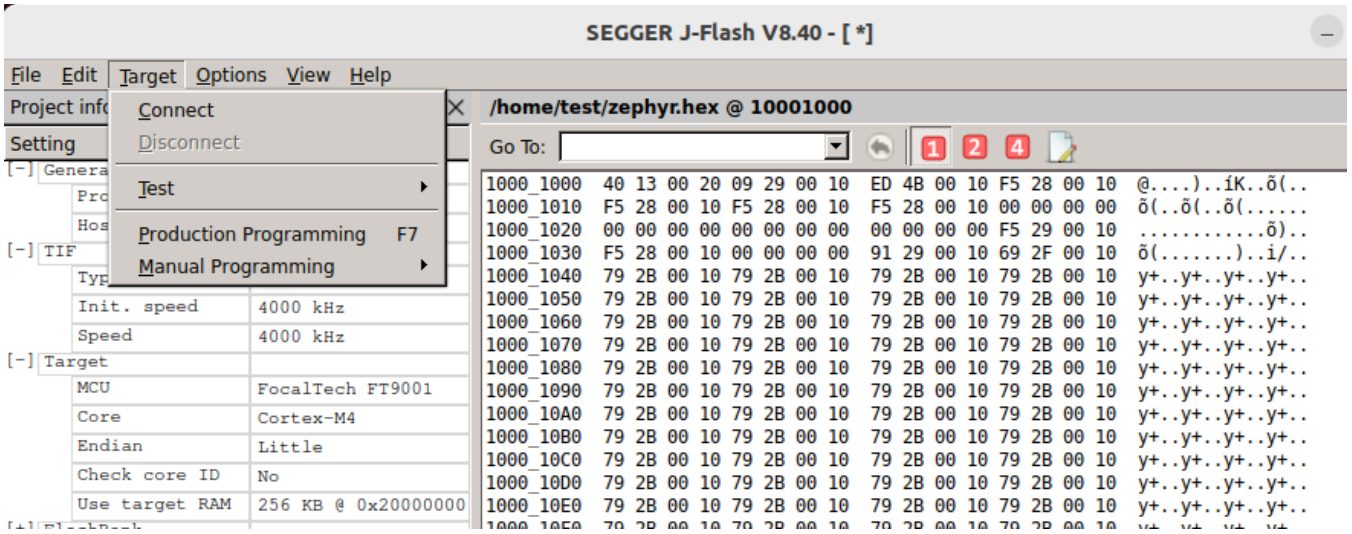
4.3 Load Firmware

File → **Open Data file** → Select HEX file



4.4 Program Device

Target → **Connect** → **Production Programming**



4.5 Program Device with console

The following commands can be used to perform a firmware update.

```
root@test-laptop:/opt/SEGGER/JLink# ./JLinkExe -autoconnect 1 -device FT9001 -if swd -speed 4000 -commandfile ~/ft9001.jlink
```

The contents of `ft9001.jlink` are as follows, **and the hex file path requires modification**.

```
loadfile /home/test/zephyr.hex 0x10001000
r
qc
```

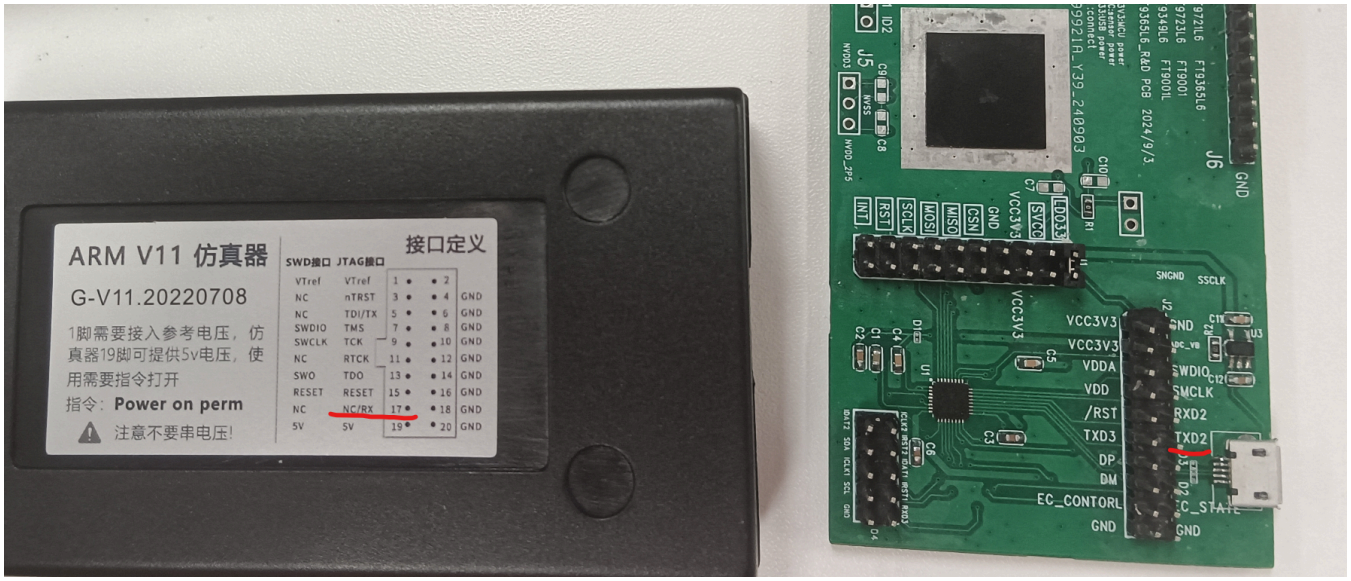
or use following commands

```
/opt/SEGGER/JLink/JFlashExe  -openprj /home/dawidn/Projects/Chromium/focaltech/ft9001.jflash -open /home/dawidn/chromiumos/src/platform/ec/build/zephyr/ft9001/build-ro/zephyr/zephyr.bin -relocate 0x10001000 -production -disconnect -exit
```

5 Firmware Verification

5.1Hardware Connection

Connect J-Link Pin 17 (RX) → Development Board TXD2



5.2 Serial Configuration

```
test@test-laptop:/opt/SEGGER/JLink$ stty -F /dev/ttyACM0 115200
test@test-laptop:/opt/SEGGER/JLink$ cat /dev/ttyACM0
```

5.3 Output Verification

Successful firmware output example:

```
test@test-laptop:/opt/SEGGER/JLink$ stty -F /dev/ttyACM0 115200
test@test-laptop:/opt/SEGGER/JLink$ cat /dev/ttyACM0
*** Booting Zephyr OS build 4.0.0 ***

Hello! I'm your echo bot.

Tell me something and press enter:
```