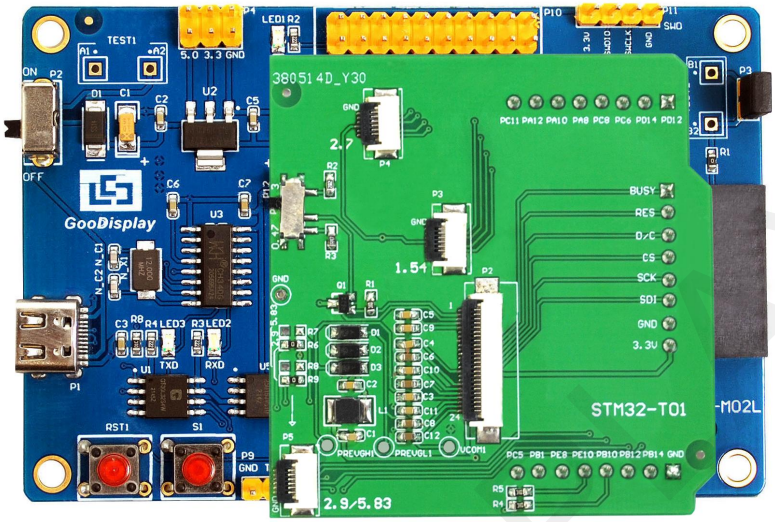
E-paper Display Demo Kit

DESPI-L(T01)

GooDisplay®

Dalian Good Display Co., Ltd.

Product Specifications



Customer	**Standard**
Description	**E-paper Display Demo Kit**
Model Name	**DESPI-L(T01)**
Date	**2023 / 05 / 09**
Revision	**1.0**

	Design Engineering		
	Approval	**Check**	**Design**
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1.Overview

DESPI-L(T01) can assist developers in the development of E-paper display projects. It is specially designed for SPI E-paper display and supports 0.97 inch, 1.54 inch, 2.13 inch, 2.6 inch, 2.7 inch, 2.9 inch, 3.71 inch, 4.2 inch, 5.83 inch and 7.5 inch E-paper in monochrome and three colors; it also supports 1.54-inch, 2.7-inch, and 2.9-inch E-paper display with touch screen and supports E-paper and touch working simultaneously so to provide with convenience for users in the early stage of development.

The main board has LED indicator, reset button, font chip, FLASH chip, etc. The DESPI-L(T01) development kit includes two parts: the main board DESPI-M02L and the adapter board STM32-T01. The DESPI-L(T01) development kit only provides programs to drive the electronic paper display and touch screen. The application of other functions such as WiFi and Bluetooth needs to be developed by the customer according to the project.

2. Structure Specification

Parameter	Specification
Model	DESPI-L(T01)
Platform	Keil4
Dimension	Mother board：70mm x 54mm (DESPI-M02L) Adapter：53mm x 51mm (STM32-T01)
Power Supply	Type-C
Example Code	Available
Operating Temp.	-20 ℃ ~ 70 ℃
Main Function	Learn to drive E-paper display; Test and evaluate E-paper displays; Secondary development based on this board
Additional Function	Type-C interface, LED indicator, reset button, current detection, font chip, flash chip, etc., touch screen port

3. Functions

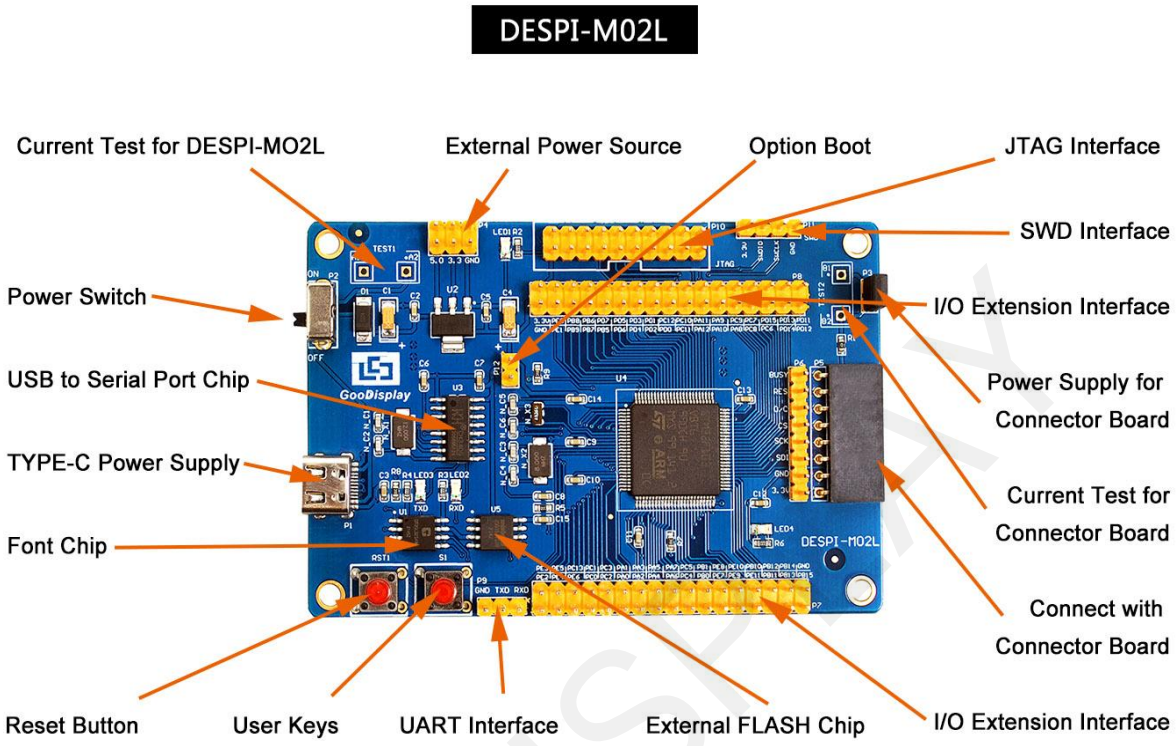


Figure 1 Mother Board DESPI-M02L

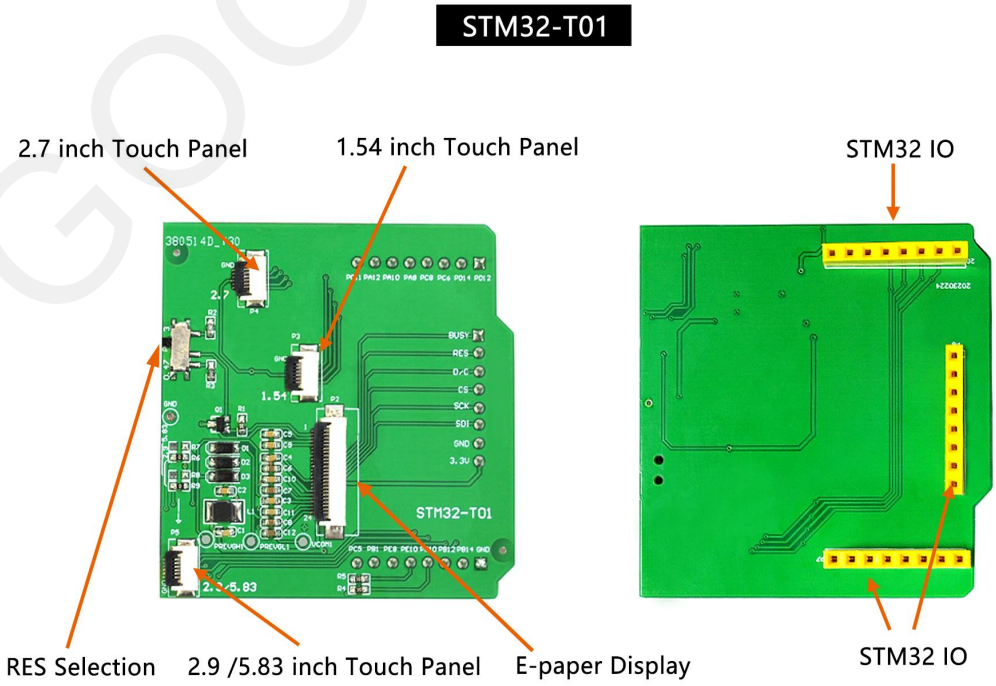


Figure 2 Adapter STM32-T01

3.1 Power Supply

The input voltage of this board is DC5V, which is powered by the USB port. Since the e-paper is 3.3V powered, it is necessary to connect VCC at P6 to 3.3V when using.

3.2 USB to serial port transmission

This development board uses USB to serial port communication. Users should install CH340 driver on computer before downloading program.

3.3 P3 short-circuit jumper

P3 short-circuit jumper controls STM32-T01 ' s power supply, which is e-paper ' s power supply. Be sure to short it when using.

3.4 Current measurement

The development kit supports current measurement of motherboard DESPI-M02L and STM32-T01.

1)Motherboard current measurement: Turn off the power switch and connect the ammeter to TEST1 in series.

2)Current measurement of the adapter board: Turn the power switch ON, remove the P3 short-circuit cap, connect the ammeter to TEST2 in series, and then connect the P3 short-circuit cap after the test.

3.5 I/O port extension

This development board led out the digital I/O 0~13 and the analog I/O 0~5 for development.

3.6 LED indicator light

There is a indicator light reserved for developing.

3.7 Reset key

This development board contains a reset key for users operation.

3.8 STM32-T01 Adapter

In addition to driving E-paper, the adapter also supports 1.54 inch, 2.7 inch, 2.9 inch E-paper touch screen.

3.9 Expanded Functions

Built-in Chinese font chip GT30L32S4W.
Built-in data storage chip W25Q16.

4. Connection and RESE Switch

4.1. Connecting the adapter to the mother board

Connect the mother board and the adapter as shown in Figure 3, and connect the E-paper FPC to the adapter as shown in Figure 4 (note the connection of E-paper).

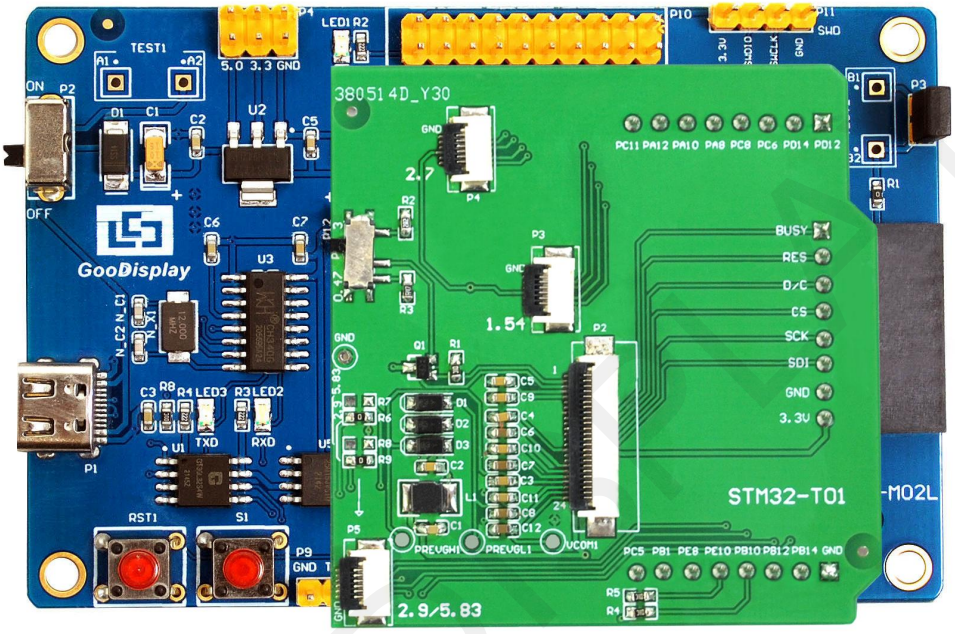


Figure 3 Connecting Mother Board and Adapter

4.2. Connecting E-paper display to the adapter

1) Identify the front and back of the E-paper, and insert the E-paper into the adapter with the front facing up

Note: The mirror surface of E-paper display facing down, the display facing up.

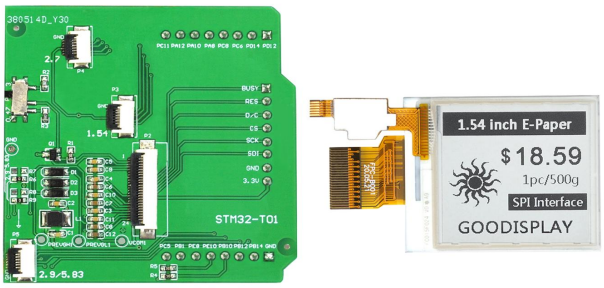
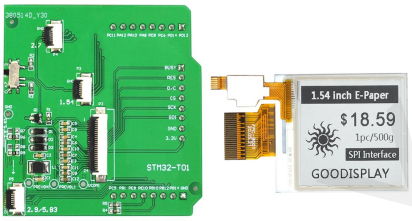
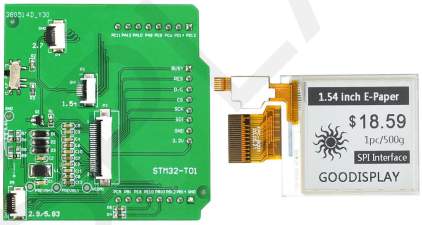
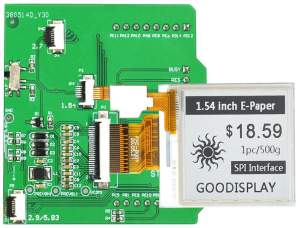
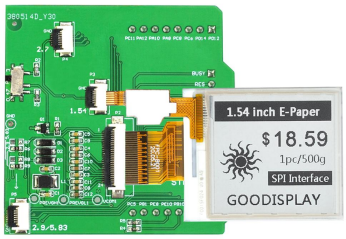


Figure 4 Connecting Adapter and E-paper display

1.Getting ready the adapter and the display. EPD facing up as shown in the right.	
2.Open FPC Connectors	
3.Insert the gold fingers of EPD and touch screen to the connectors	
4.Close connectors	

4.3. RESE Resistance Selection

The switch P1 is a selection switch for the matching resistance (RESE resistance) of the current feedback part of the peripheral boost circuit of the E-paper. Different types of E-paper need to be matched with different RESE resistors. Choosing the wrong RESE resistor will cause the E-paper to fail to refresh.

Note: Users should strictly follow the circuit design in the E-paper specification when designing the actual product.

1）When RESE is set to 0.47 ： Applicable to ULTRACHIP series driver ICs (starting with UC), fiti power series driver ICs (starting with JD)

1.54 inch: GDEW0154T8D、GDEW0154I9FD、GDEW0154M09、GDEW0154M10
2.13 inch：GDEW0213T5D、GDEW0213I5FD、GDEW0213M21
2.6 inch：GDEW026M01
2.7 inch：GDEW027W3
2.9 inch：GDEW029M06、GDEW029Z13
3.71 inch：GDEW0371W7、GDEY037T03、GDEY037Z03
4.2 inch：GDEW042T2、GDEQ042Z21
5.83 inch：GDEW0583T8、GDEW0583Z83
7.5 inch：GDEY075T7、GDEY075Z08

2）When RESE is set to 3：Applicable to Solomon series driver ICs (starting with SSD)

1.54 inch：GDEY0154D67、GDEY0154D90LT、GDEY0154Z90、GDEY0154T94
2.13 inch：GDEY213B74、GDEY213B75、GDEY0213D32LT
2.66 inch：GDEY0266T90、GDEY0266Z90

2.7 inch：GDEY027T91

2.9 inch：GDEY029T94

4.2 inch：GDEY042T91

5. Program Downloading

This development board supports three ways downloading program. They are JTAG, SWD and UART. JTAG and SWD is recommended, because these two can make online downloading available for debug.

5.1 JTAG

We need to use J-link simulator and Keil4, the operation steps are as follows:

1) Connect the simulator to DESPI-M02's JTAG interface (align the raised part of the figure 6 simulator interface to the notch direction of the JTAG interface) and connect the computer USB port at the other end.

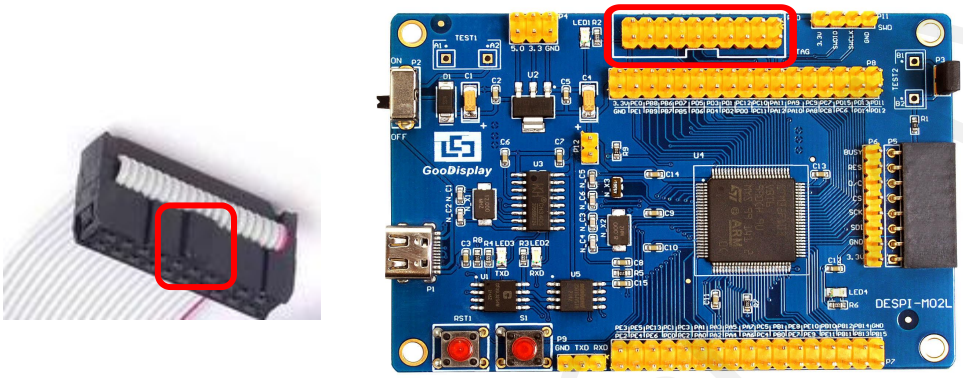


Figure 6 : Connection between JTAG and simulator

2) Open the "mdk.uvproj" in the program folder "Project" shown in Figure 7 with Keil4.

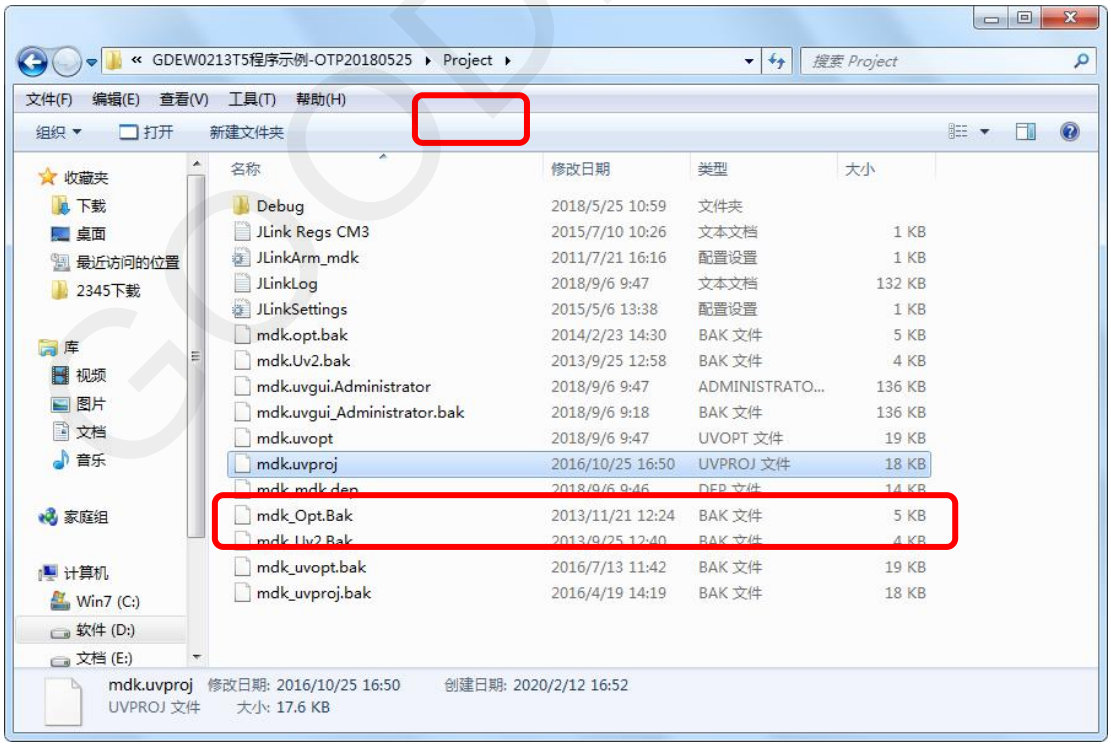


Figure 7 : Open the mdk.uvproj

3) The Keil4 toolbar is shown in Figure 8. Please click at the first time using the simulator and a box like Figure 9 will pop up. Choose the simulator model of yours in the "Debug" bar, and click "OK" to confirm.

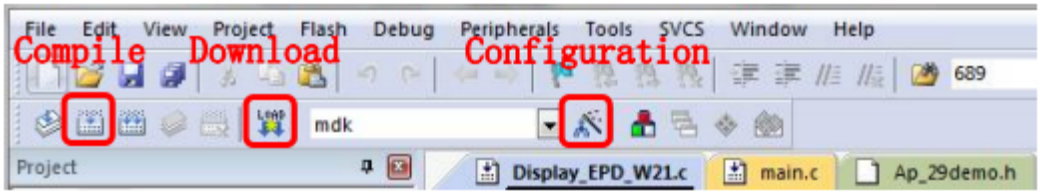


Figure 8 : Keil4 toolbar

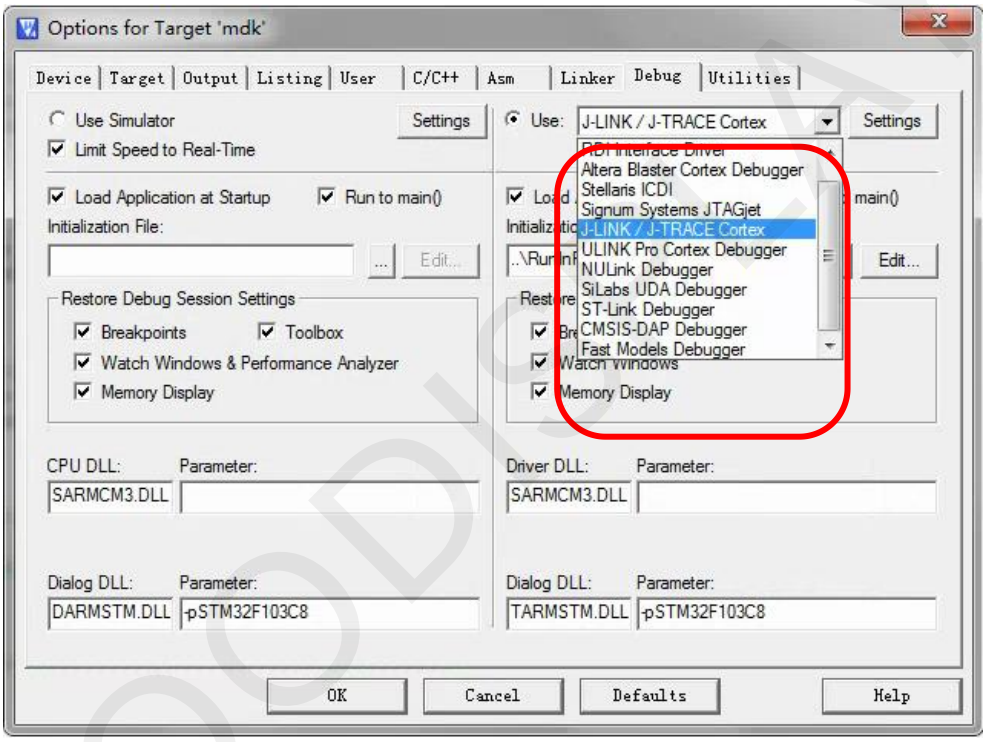


Figure 9 :Choose the simulator model

4)Click Ap_29demo.h in Figure 10 to change the image data that needs to be displayed(the image data needs to be achieved by image2lcd).

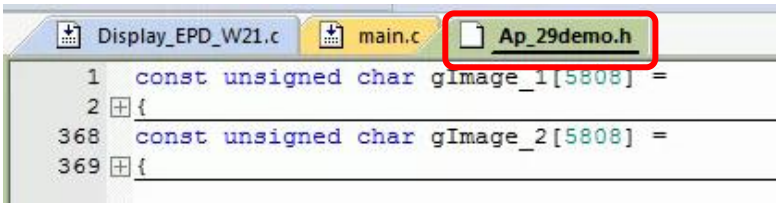


Figure 1 0 :change the image data

5)Click in the toolbar in Figure 8 to compile.

6)Click in the toolbar in Figure 8 to download.

5.2 SWD

We need to use ST-link simulator and Keil4, the operation steps are as follows:
1) As shown in figure 11, DESPI-M02L has a 4-wire SWD interface, which can be connected to the simulator interface by 4 wires and then connect the simulator to the computer.

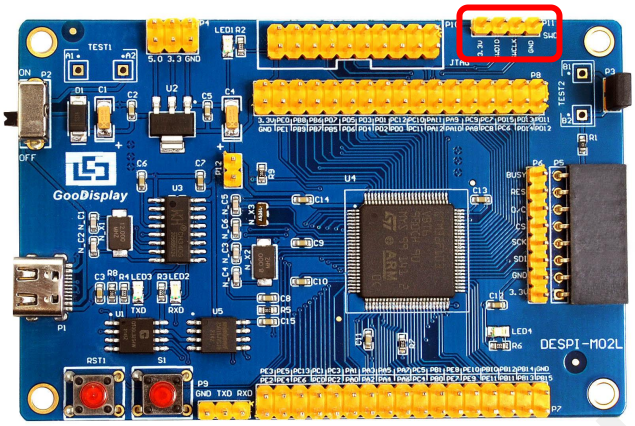


Figure 11 :SWD interface

2) Download program with Keil4 by the same steps with JTAG.

5.3 UART

This development board supports USB to serial port download, which need to use Micro USB data cable, CH340 driver and FlyMcu download tool, the operation steps are as follows:

1) We need to install the CH340 driver on the computer before downloading for the first time.

2) Connect the USB port of DESPI-M02L to the computer with USB data cable.

3) Connect P12 with a short-circuit jumper, the position of P12 is shown in Figure 12.

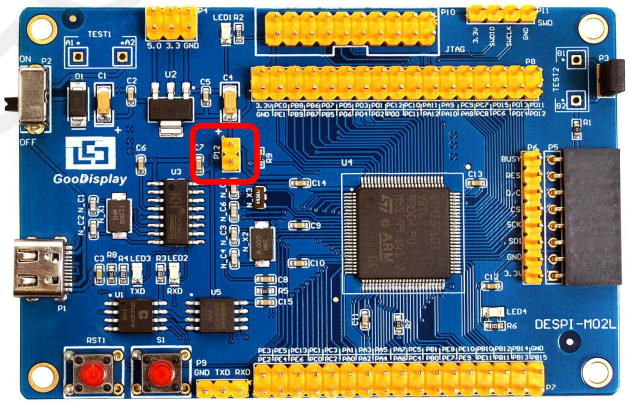


Figure 12 : The position of P12

Tips: When downloading a program with UART, P12 must be shorted. And the short-circuit jumper must be removed after downloading, otherwise the program cannot run.

4) Open the FlyMcu downloading tool and configure it as shown in Figure 13.

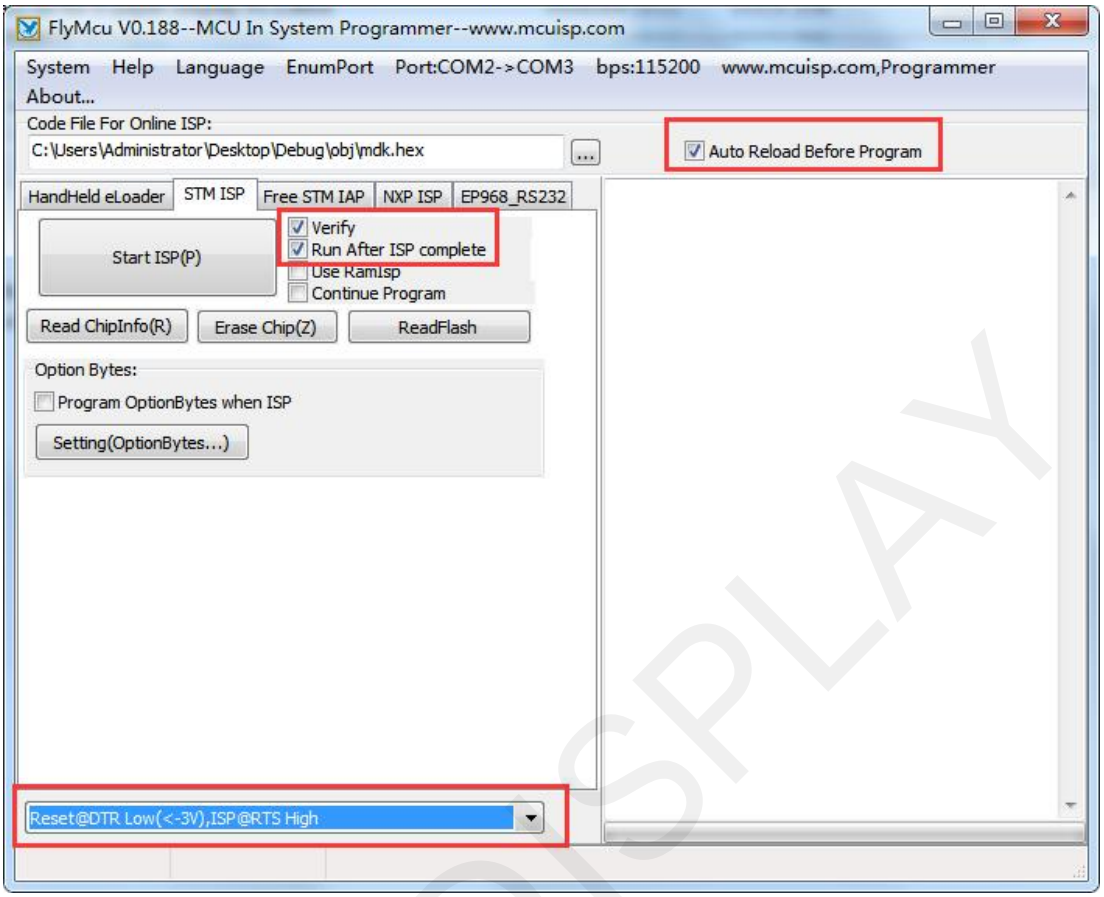
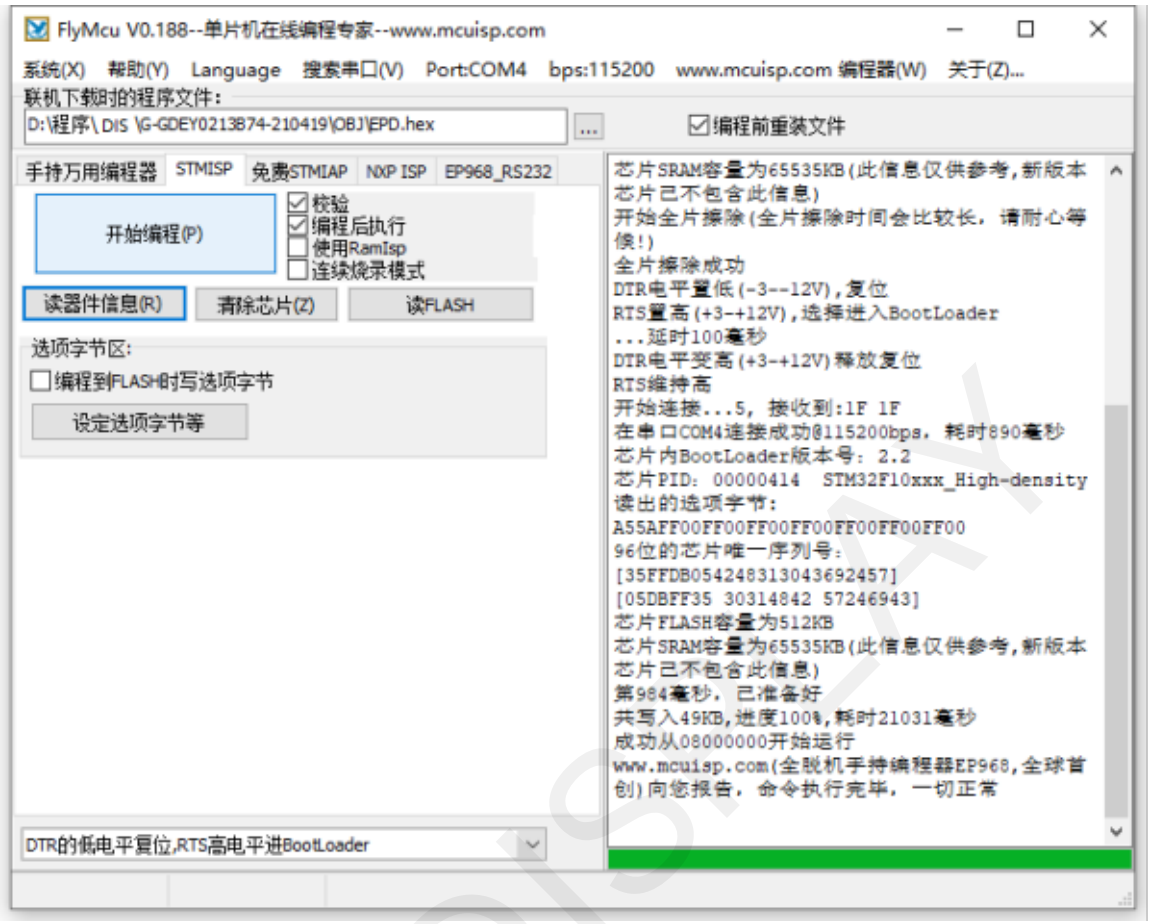


Figure 13 : Configuration of FlyMcu

5) Click “Search Serial Port”, choose the COM port corresponding to the board, “bps” choose “115200”.

6) Choose the program file with the file path: Project > Debug >obj > mdk.hex.

7) Click “Start ISP” to download.



8) When download is complete, remove the short-circuit jumper of P12 and re-energize the board, then the program will run.

9) If you want to change a image, you need to use Keil4 to change the image data (Figure 10), compile it (Figure 8) to generate a new mdk.hex file, and then re-select the file to download it.