



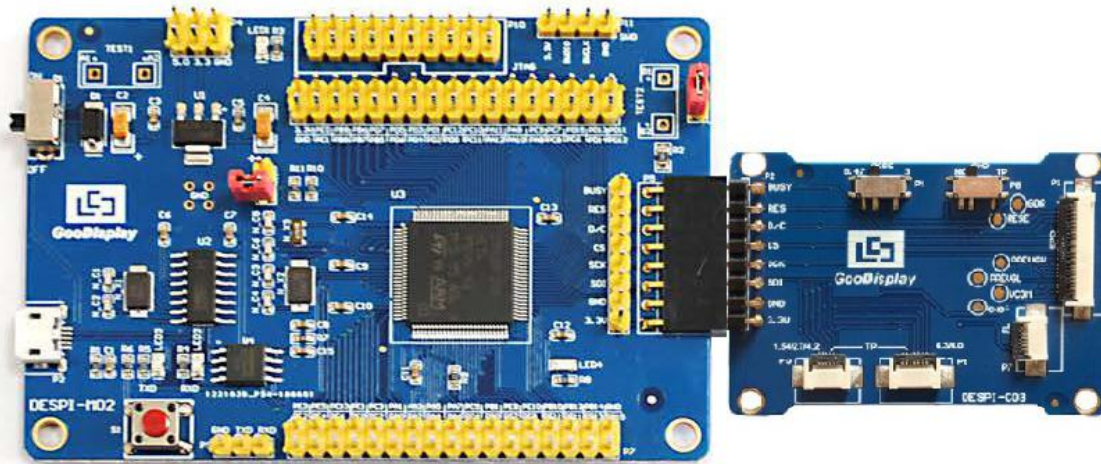
Development Kit for E-paper Display



DESPI-V3.0

Dalian Good Display Co., Ltd.

Product Specifications



Customer	Standard
Description	Development Kit for E-paper Display
Model Name	DESPI-V3.0
Date	2020/03/11
Revision	3.1

	Design Engineering		
	Approval	Check	Design
			

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1. Overview

This development kit is used to help users develop e-paper display projects with provided source code to create more differentiated solutions. It is designed for SPI e-paper display. It supports driving Good Display's black-white e-paper display and three-color (black, white and red/Yellow) e-paper display: 1.54", 2.04", 2.13", 2.6", 2.7", 2.9", 3.71", 4.2", 5.83" and 7.5". And it is added the functions of USB serial port and LED indicator light, etc. It also supports being updated by computer directly. What's more, DESPI-C03 can drive touch panel and front light panel.

DESPI-V3.0 development kit consists of motherboard DESPI-M02 and connector board DESPI-C03.

2. Mechanical Specifications

Parameter	Specification
Model	DESPI-V3.0
Platform	STM32
Dimension	90mm x 60mm (DESPI-M02) 52mm x 36mm (DESPI-C03)
Power Interface	USB interface
Sample Code	Available (please contact sales)
Operating Temp.	-20°C ~+70°C
Main Function	Learn to drive e-paper display, touch panel and front light panel; Test and evaluate e-paper display; For secondary development.
Additional Function	USB to serial port; Indicator light; Reset key; Current measurement.

3.Functions

DESPI-M02

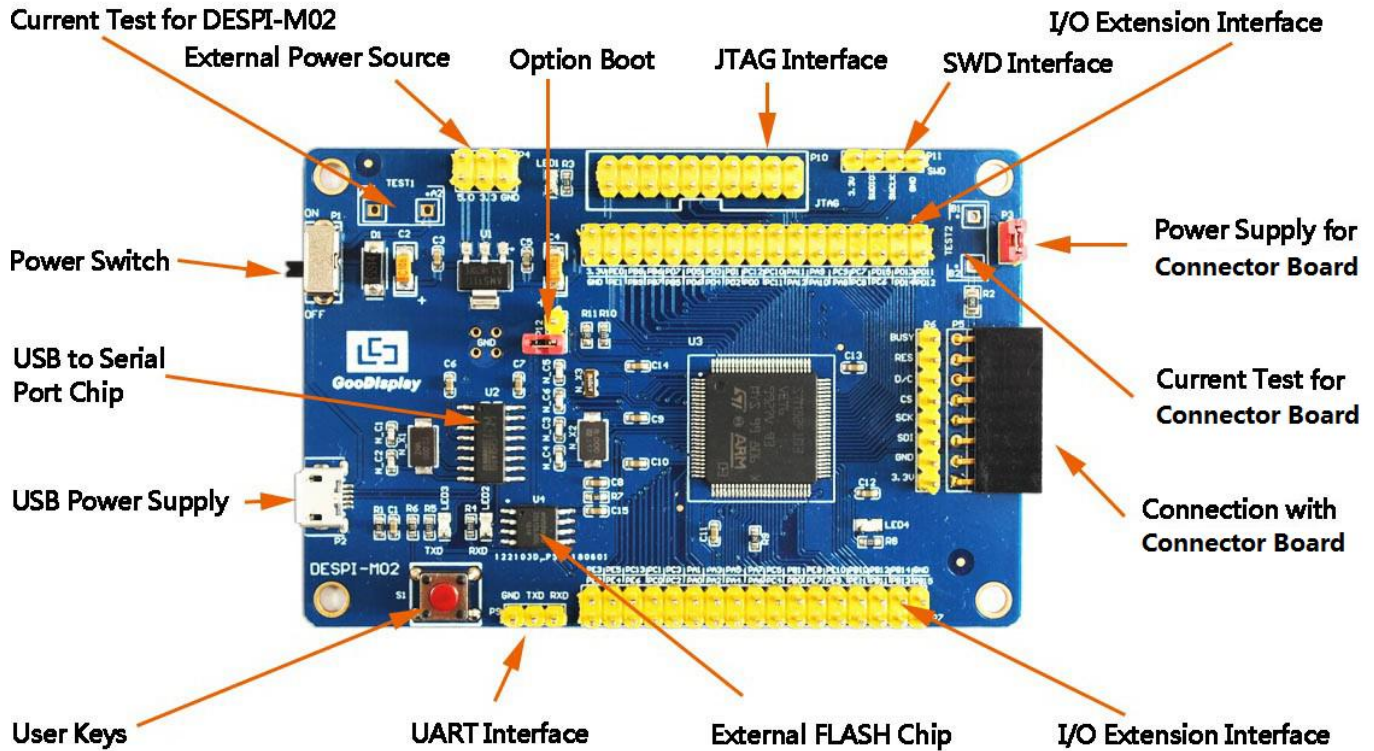


Figure 1 : DESPI-M02

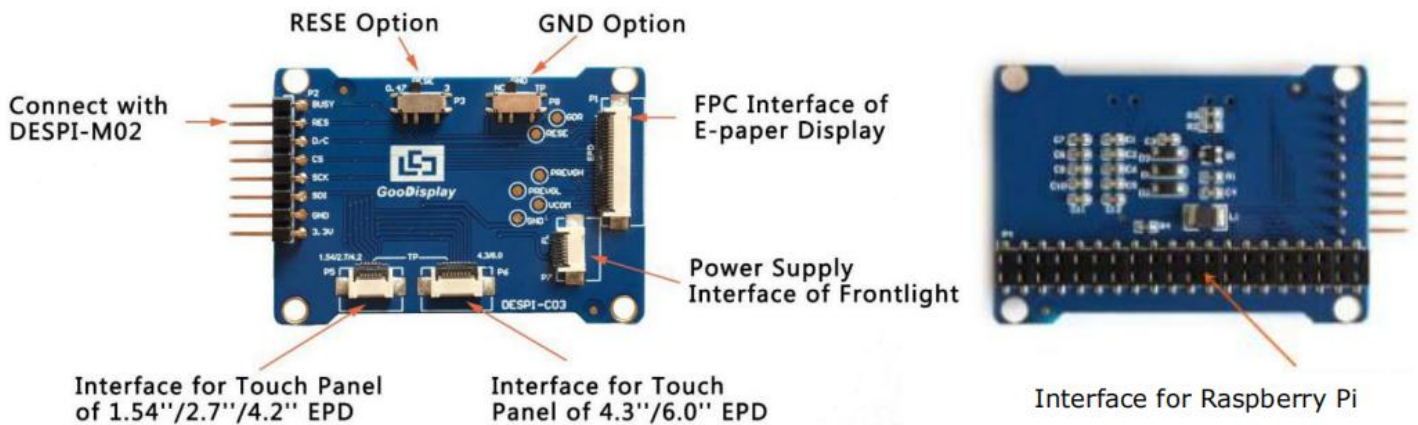


Figure 2 : DESPI-C03

3.1 Power Supply

The input voltage of this board is DC5V, which is powered by the USB port.

3.2 USB to serial port transmission

This board has USB to serial port transmission function. Please install the driver program CH340 to use it.

3.3 P3 and P12 short-circuit jumper

- 1) P3: P3 short-circuit jumper controls DESPI-C03's power supply, which is e-paper's power supply.
- 2) P12: P12 short-circuit jumper is used to select the download mode. You need to connect it when you download a program by UART mode, and remove it after you have downloaded it, otherwise the program will not run. If you connect it, you will not be able to download program by other ways.

3.4 Current measurement

The development kit supports current measurement of DESPI-M02 and DESPI-C03.

- 1) DESPI-M02: Power off and make series connection between ampere meter and TEST1.
- 2) DESPI-C03: Power on and take off the short-circuit jumper P3, then make series connection between ampere meter and TEST2. Put on the short-circuit jumper P3 after measurement.

3.5 I/O port extension

The I/O port of STM32 has been led out for developing.

3.6 LED indicator light

There is a indicator light reserved for developing.

3.7 Key

There is a key reserved for developing.

3.8 Touch panel and front light panel driving

DESPI-C03 supports 1.54-inch, 2.7-inch, 4.2-inch, 4.3-inch and 6.0-inch touch panel driving and 3.3V-powered front light panel driving.

3.9 Raspberry Pi interface

There is a Raspberry Pi interface in the back of DESPI-C03, which can connect Raspberry Pi motherboard to the e-paper.

4.Connection Mode and Switches

4.1 Connection between DESPI-M02 and DESPI-C03

Connect DESPI-C03 to DESPI-M02 as shown in Figure 3.

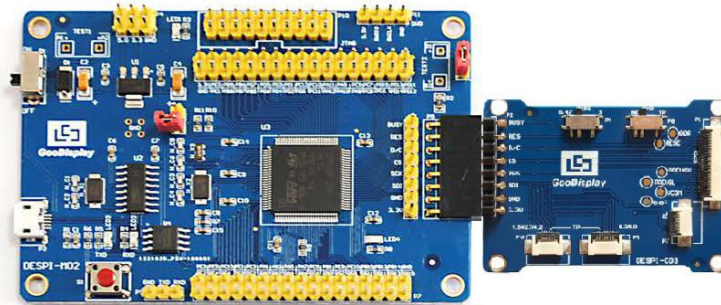


Figure 3 : Connection between DESPI-M02 and DESPI-C03

4.2 Connection between DESPI-C03 and e-paper

Connect the e-paper FPC to DESPI-C03 as shown in Figure 4.

(Pay attention to the direction of the e-paper.) And set P8 to NC.

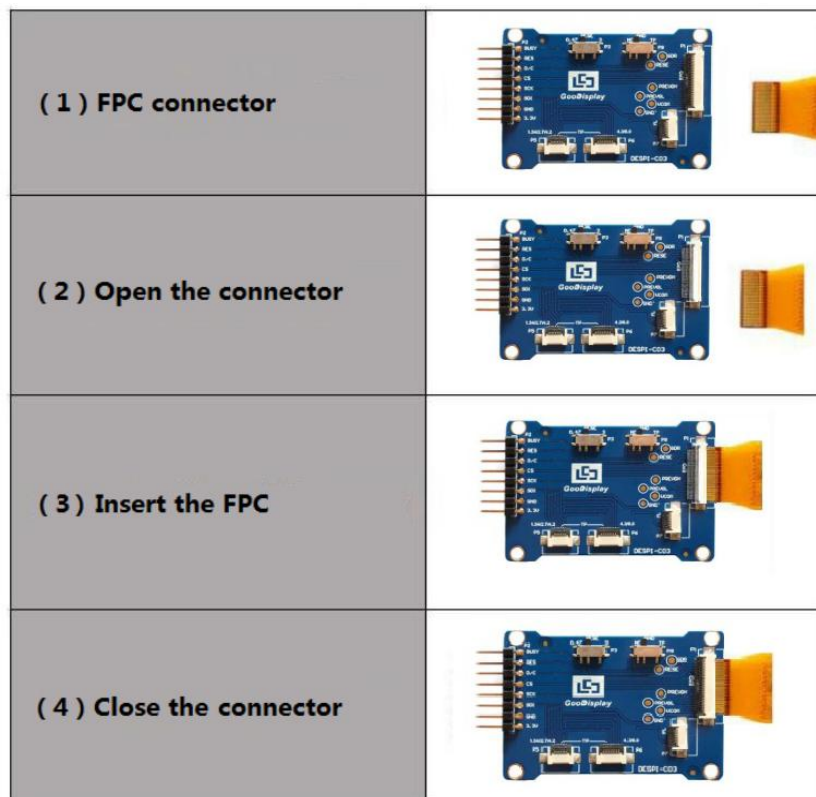


Figure 4 : Connection between DESPI-C03 and e-paper

4.3 Connection between DESPI-C03 and front light panel

DESPI-C03 supports 3.3 V powered front light panel driving, the corresponding interface is P7 as shown in Figure 5. The pin definitions are as follows: 3.3V (1,2), NC (3,4), GND (5,6). The power supply of front light panel must be divided from the power supply of e-paper, otherwise it may affect the display of e-paper.



Figure 5 : Connection between DESPI-C03 and front light panel

4.4 Connection between DESPI-C03 and touch panel

As shown in Figure 6, 1.54-inch, 2.7-inch, 4.2-inch touch panel use interface P5, and 4.3-inch, 6.0-inch touch panel use interface P6. Connect the touch panel to DESPI-C03 with the touch area upside. In addition, P8 needs to be set to TP when driving touch panels.

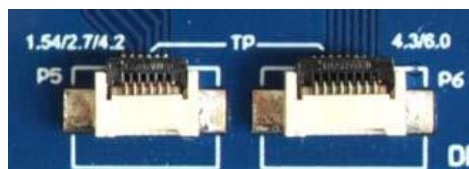


Figure 6 : Connection between DESPI-C03 and touch panel

4.5 Switch P8 on DESPI-C03

The switch P8 on DESPI-C03 is used to select GND. It needs to be set to NC when driving e-papers (default NC), and to TP when driving touch panels.

4.6 Switch P3 on DESPI-C03

The switch P3 on DESPI-C03 is used to select the RESE resistor, different e-papers need to match different RESE resistors, a wrong RESE resistor will cause the e-paper cannot be refreshed.

When RESE is set to 0.47 :

1.54 inch : GDEW0154T8、GDEW0154I9F、GDEW0154Z17、
GDEW0154Z04、GDEW0154C39

2.13 inch : GDEW0213T5、GDEW0213I5F、GDEW0213Z16、
GDEW0213C38

2.6 inch : GDEW026T0、GDEW026Z3

2.7 inch : GDEW027W3、GDEW027C44

2.9 inch : GDEW029T5、GDEW029I6F、GDEW029Z10、
GDEW029C32

3.71 inch : GDEW0371W7、GDEW0371Z80

4.2 inch : GDEW042T2、GDEW042Z15、GDEW042C37

5.83 inch : GDEW0583T8、GDEW0583Z21、GDEW0583Z83、
GDEW0583C64

7.5 inch : GDEW075T7、GDEW075Z08、GDEW075Z09、
GDEW075C21、GDEW075C64

When RESE is set to 3 :

1.54 inch : GDEP015OC1、GDEH0154D67、GDEM0154E97LT

2.04 inch : GDE021A1

2.13 inch : GDEH0213B73、GDEH0213D30LT、GDEM0213E28LT

2.9 inch : GDEH029A1、GDEH029D56LT、GDEM029E27LT

5.83 inch : GDEW0583T7

7.5 inch : GDEW075T8

4.7 Connection between DESPI-C03 and Raspberry Pi

Connect DESPI-C03 to Raspberry Pi motherboard in the direction shown in Figure 7. The pins of DESPI-C03 should in the same direction with the USB interface of Raspberry Pi.

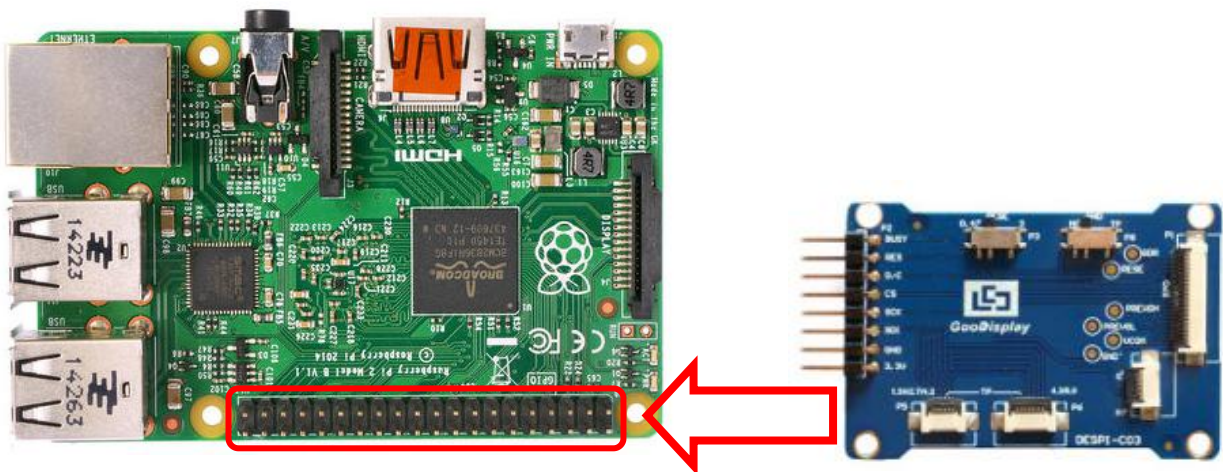


Figure 7 : Connection between DESPI-C03 and Raspberry Pi

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 8 simulator interface to the notch direction of the JTAG interface) and connect the computer USB port at the other end.

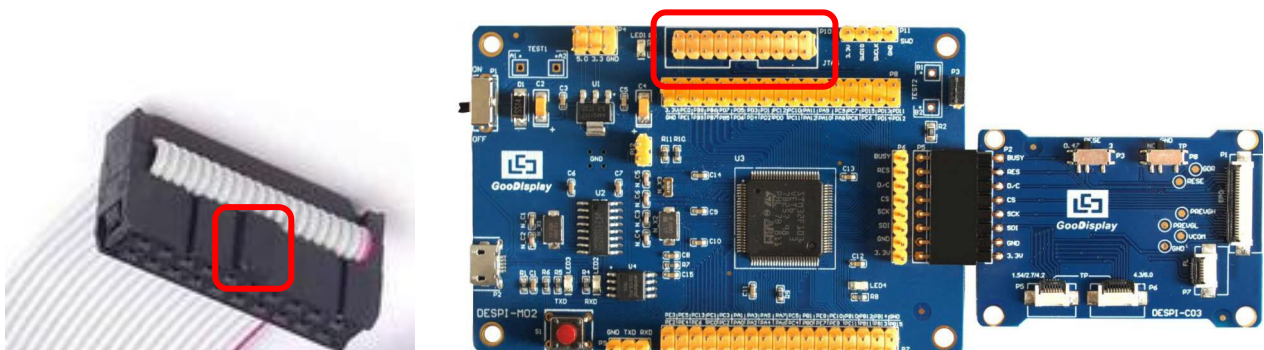


Figure 8 : Connection between JTAG and simulator

- 2) Open the "mdk.uvproj" in the program folder "Project" shown in Figure 9 with Keil4.

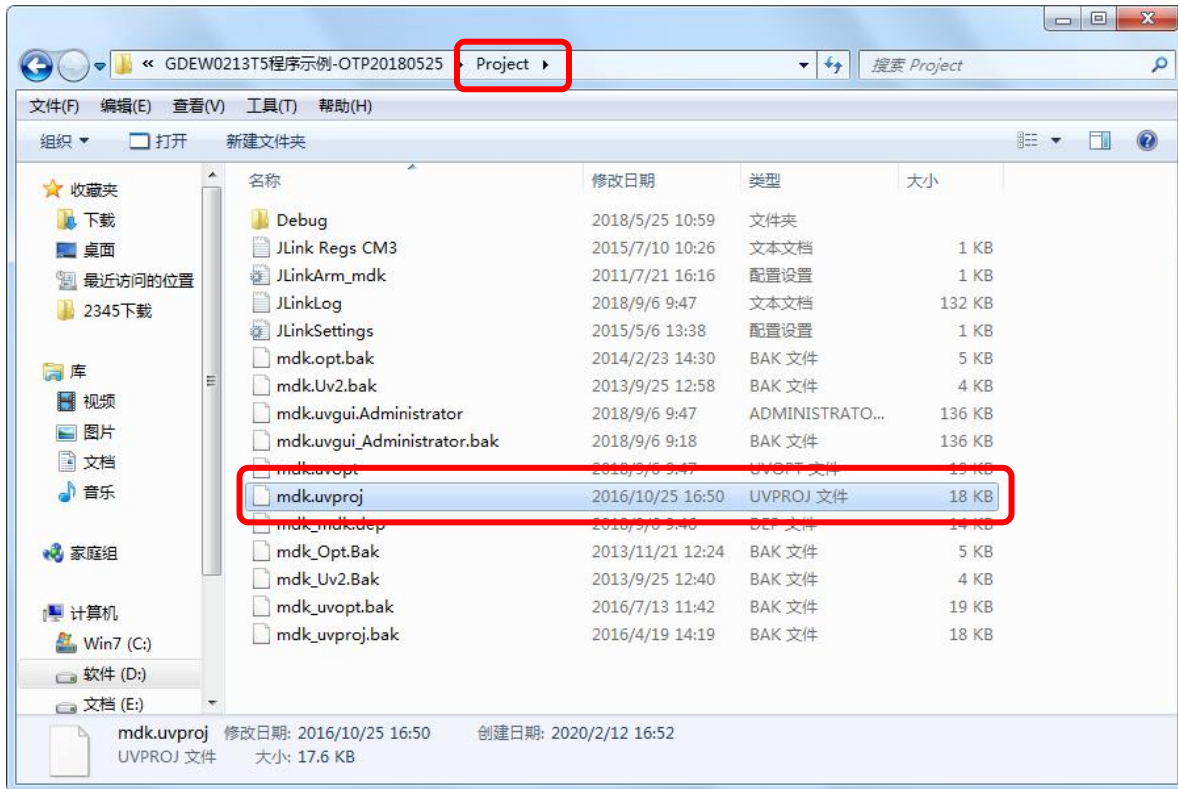



Figure 9 : Open the mdk.uvproj

3) The Keil4 toolbar is shown in Figure 10. Please click  at the first time using the simulator and a box like Figure 11 will pop up. Choose the simulator model of yours in the "Debug" bar, and click "OK" to confirm.

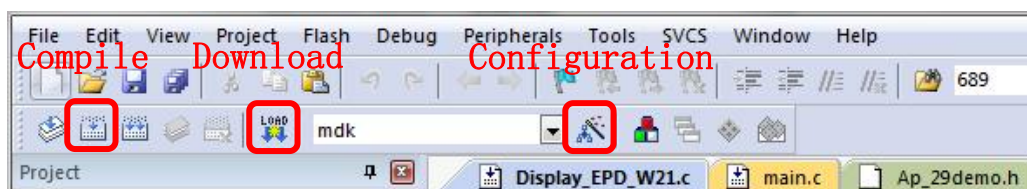


Figure 10 : Keil4 toolbar

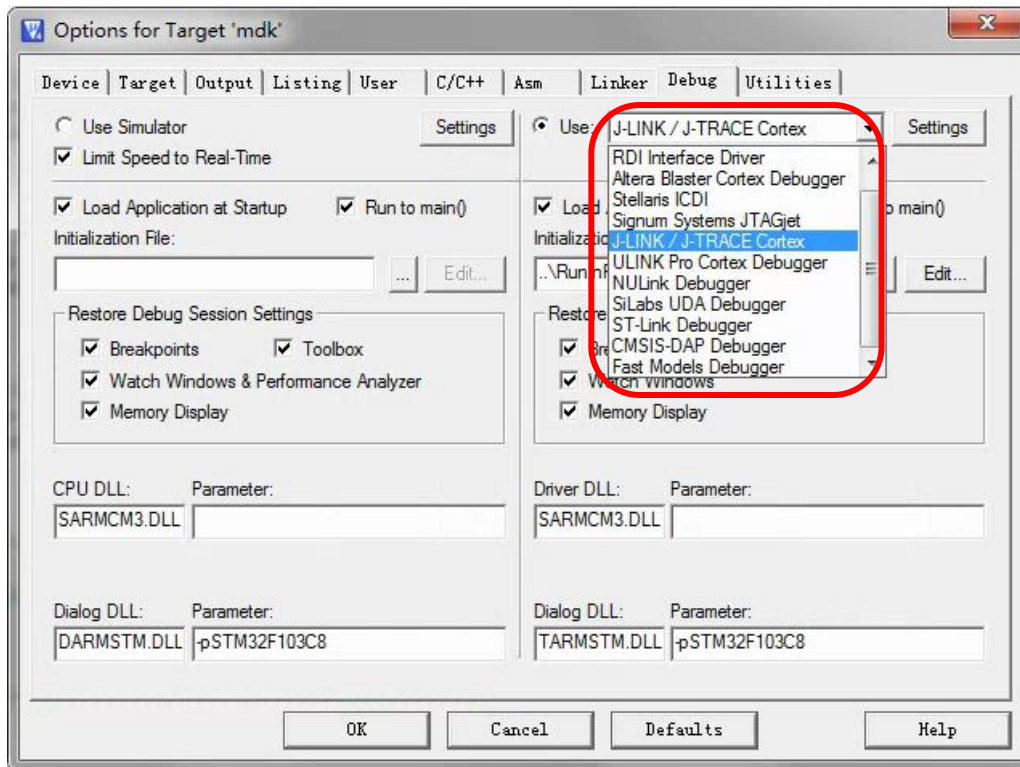




Figure 11 : Choose the simulator model

4) Click Ap_29demo.h in Figure 12 to change the image data that needs to be displayed (the image data needs to be achieved by image2lcd).



Figure 12 : change the image data

- 5) Click  in the toolbar in Figure 10 to compile.
- 6) Click  in the toolbar in Figure 10 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 13, DESPI-M02 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.

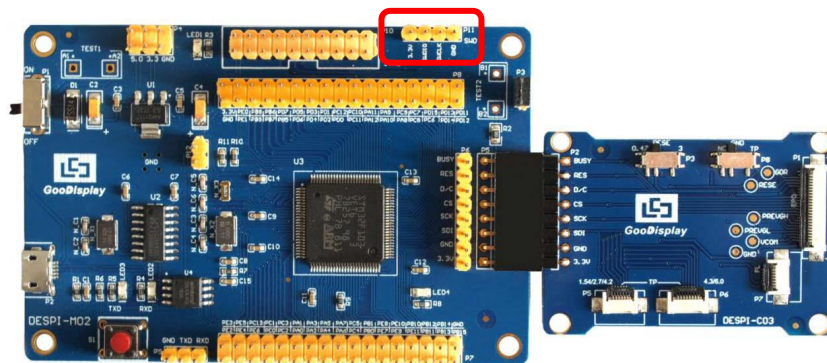


Figure 13 : SWD interface

- 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-M02 to the computer with USB data cable.
- 3) Connect P12 with a short-circuit jumper, the position of P12 is shown in Figure 14.

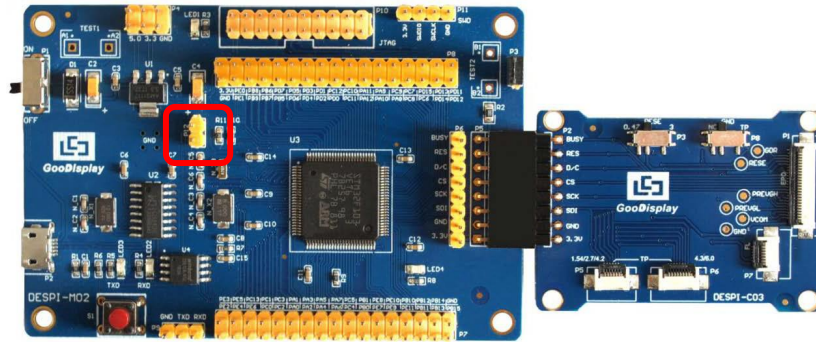


Figure 14 : The position of P12

4) Open the FlyMcu downloading tool and configure it as shown in Figure 15.

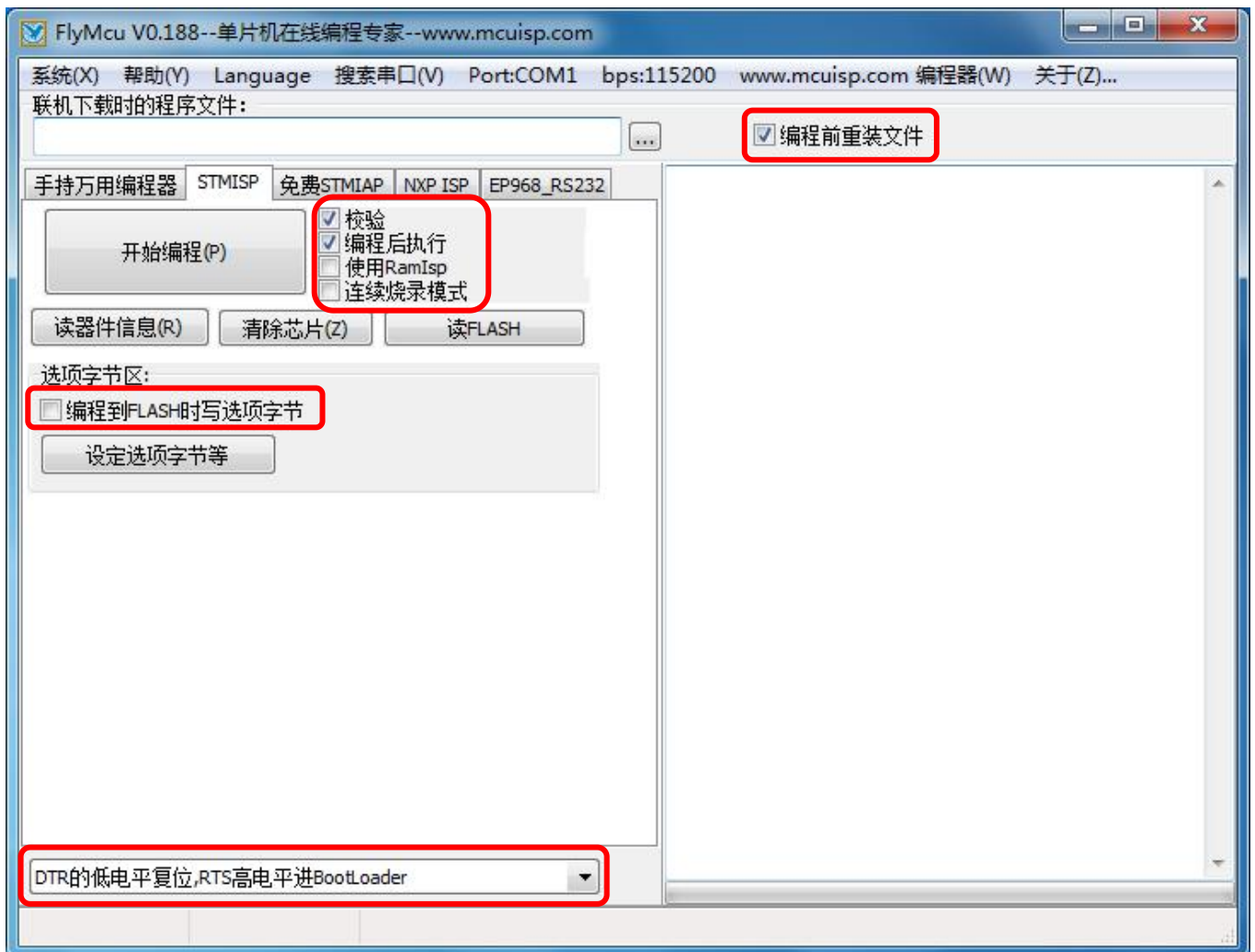


Figure 15 : Configuration of FlyMcu

- 5) Click “搜索串口”, 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 “开始编程” 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 12), compile it (Figure 10) to generate a new mdk.hex file, and then re-select the file to download it.

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.