

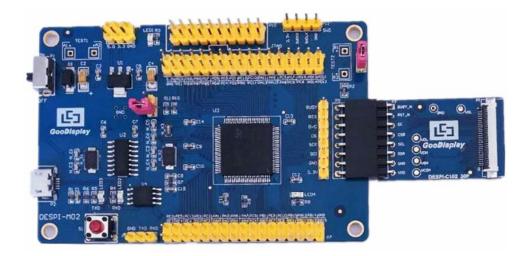


Dalian Good Display Co., Ltd.





# **Product Specifications**



| Customer    | Standard                                   |
|-------------|--|
| Description | <b>Development Kit for E-paper Display</b> |
| Model Name  | DESPI-102 (C102_30P)                       |
| Date        | 2020/03/11                                 |
| Revision    | 1.1  |

| 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 e-paper GDEW0102I3F and GDEW0102T4. And it is added the functions of USB serial port and LED indicator light, etc. It also supports being updated by computer directly.

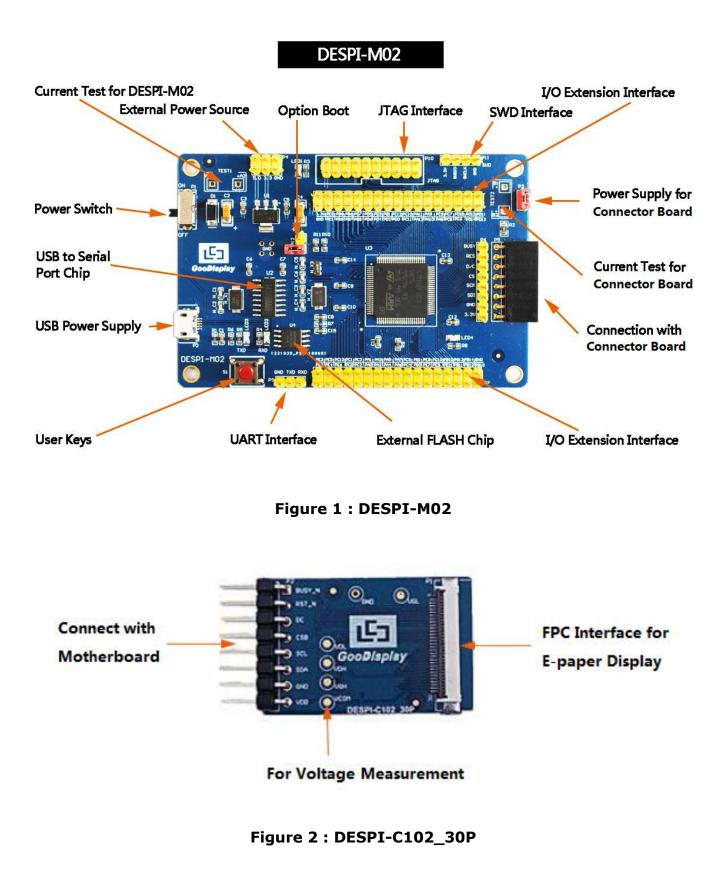
DESPI-102 (C102\_30P) development kit consists of motherboard DESPI-M02 and connector board DESPI-C102\_30P.

## **2.Mechanical Specifications**

| Parameter           | Specification   |
|---------------------|---|
| Model               | DESPI-102 (C102_30P)  |
| Platform            | STM32   |
| Dimension           | 90mm x 60mm (DESPI-M02)<br>33.8mm x 22.2mm (DESPI-C102_30P)   |
| Power Interface     | USB interface   |
| Sample Code         | Available (please contact sales)  |
| Operating Temp.     | -20°C ~+70°C  |
| Main Function       | Learn to drive e-paper display;<br>Test and evaluate e-paper display;<br>For secondary development. |
| Additional Function | USB to serial port;<br>Indicator light;<br>Key;<br>Current measurement.                             |



### **3.Functions**



#### 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

- P3: P3 short-circuit jumper controls DESPI-C102\_30P'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 test

The development kit supports current test of DESPI-M02 and DESPI-C102\_30P.

- 1) DESPI-M02: Power off and make series connection between ampere meter and TEST1.
- DESPI-C102\_30P: 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 test.

#### **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.

### **4.Connection Mode**

#### 4.1 Connection between e-paper and development board

Connect DESPI-C102\_30P to DESPI-M02 as shown in Figure 3. Connect e-paper FPC to DESPI-C102\_30P as shown in Figure 4. (Pay attention to the direction of the e-paper.)



Figure 3 : Connection between DESPI-M02 and DESPI-C102\_30P

| (1) FPC connector       |  |
|-------------------------|--|
| (2) Open the connector  |  |
| ( 3 ) Insert the FPC    |  |
| (4) Close the connector |  |

Figure 4 : Connection between DESPI-C102\_30P and e-paper

### **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:

 Connect the simulator to DESPI-M02's JTAG interface ( align the raised part of the figure 5 simulator interface to the notch direction of the JTAG interface ) and connect the computer USB port at the other end.



Figure 5 : Connection between JTAG and simulator

 Open the "mdk.uvproj" in the program folder "Project" shown in Figure 6 with Keil4.

| 牛(F) 编辑(E) 查看(V) | 工具(T) 帮助(H)                   |                  |              |        |       |   |
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| ■ 桌面             | JLink Regs CM3                | 2015/7/10 10:26  | 文本文档         | 1 KB   |       |   |
| 📜 最近访问的位置        | JLinkArm_mdk                  | 2011/7/21 16:16  | 配置设置         | 1 KB   |       |   |
| 2345下载           | 📋 JLinkLog                    | 2018/9/6 9:47    | 文本文档         | 132 KB |       |   |
| 20401.20         | JLinkSettings                 | 2015/5/6 13:38   | 配置设置         | 1 KB   |       |   |
|                  | 🗋 mdk.opt.bak                 | 2014/2/23 14:30  | BAK 文件       | 5 KB   |       |   |
| a<br>库<br>B      | mdk.Uv2.bak                   | 2013/9/25 12:58  | BAK 文件       | 4 KB   |       |   |
| - 视频             | mdk.uvgui.Administrator       | 2018/9/6 9:47    | ADMINISTRATO | 136 KB |       |   |
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| 2 文档             |                               | 2010/0/6 9.47    | UVORT 文件     | 19 KB  |       |   |
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Figure 6 : Open the mdk.uvproj

3) The Keil4 toolbar is shown in Figure 7. Please click at the first time using the simulator and a box like Figure 8 will pop up. Choose the simulator model of yours in the "Debug" bar, and click "OK" to confirm.



Figure 7 : Keil4 toolbar



| C Use Simulator   |                              | Settings 6 | Use: J-LINK               | / J-TRACE Cortex                                | Settings |
|---|------------------------------|------------|---------------------------|---|----------|
| Limit Speed to  | Real-Time                    |            |                           | erface Driver                                   | ~        |
| <ul> <li>Load Applicat</li> <li>Initialization File:</li> </ul> | ion at Startup 🔽 Run to m    | lr.        | Load Stellari<br>Signum   | Systems JTAGjet                                 | p main() |
| – Restore Debua   | Session Settings             | Edit       | Port SiLabs               | Pro Cortex Debugger<br>Debugger<br>UDA Debugger | Edit     |
| Breakpoin   |                              |            | I BreCMSIS                | < Debugger<br>-DAP Debugger                     | _        |
| 🔽 Watch Wi  | ndows & Performance Analyzer |            | ₩ Watch W                 | odels Debugger<br>naows                         | 1        |
| Memory D  | isplay                       |            | Memory D                  | isplay  |          |
|   |                              |            |                           |   |          |
| CPU DLL:  | Parameter:                   |            | river DLL:                | Parameter:                                      |          |
| CPU DLL:<br>SARMCM3.DLL   | Parameter:                   |            | river DLL:<br>SARMCM3.DLL | Parameter:                                      |          |
|   | Parameter:                   |            | THE PER                   | Parameter:                                      |          |
|   | Parameter:                   |            | THE PER                   | Parameter:                                      |          |

Figure 8 : Choose the simulator model

 Click Ap\_29demo.h in Figure 9 to change the image data that needs to be displayed (the image data needs to be achieved by image2lcd ).



#### Figure 9 : change the image data

5) Click in the toolbar in Figure 7 to compile.
6) Click in the toolbar in Figure 7 to download.

#### 5.2 SWD

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

 As shown in figure 10, 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.

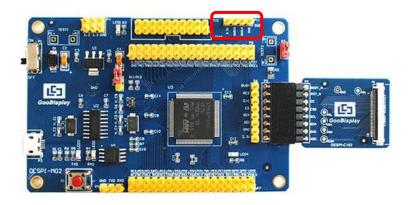


Figure 10 : SWD interface

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 11.



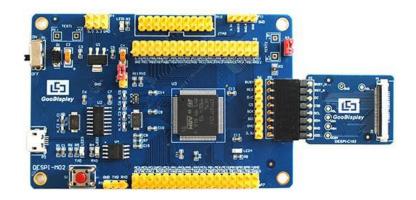


Figure 11: The position of P12

 Open the FlyMcu downloading tool and configure it as shown in Figure 12.

| ☑ FlyMcu V0.188单片机在线编程专家www.mcuisp.com                                  |       |
|---|-------|
| 系统(X) 帮助(Y) Language 搜索串口(V) Port:COM1 bps:115200 www.mcuisp.com 编程器(W) | 关于(Z) |
| 联机下载时的程序文件:   |       |
| 手持万用编程器 STMISP 免费STMIAP NXP ISP EP968_RS232                             |       |
| ア始编程(P)     ア始編程(P)   | 2.83  |
| 读器件信息(R) 清除芯片(Z) 读FLASH   |       |
| 选项字节区:  |       |
| □编程到FLASH时写选项字节   |       |
| 设定选项字节等   |       |
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| DTR的低电平复位,RTS高电平进BootLoader   |       |
|   | .21   |

Figure 12 : 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 9), compile it (Figure 7) 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.