

E-Ink Series

Electronic paper、 E-ink display

Paper screen. Ultra-low reflection. no refresh, no power consumption.

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1. Model description

E-Ink_XXX-Z

E-Ink: The abbreviation of electronic ink paper is the abbreviation of electronic paper display;

XXX: Inch size of electric paper screen (metric size see product specification);

Z: If the suffix is used in the model, it can display Tri Color Display (Black, white, red).

For example:

E-Ink_1.54-Z: 1.54 inch electronic paper display, supporting black, white and red tri color displays

2. Product introduction

Electronic paper, also known as ink screen, is a kind of ultra-thin, ultra-light display screen. The imaging principle is electro-driven chemical changes. It is a display with obvious advantages and disadvantages. The electronic paper display is displayed on the reflected light. It has the effect of paper printing. Compared with traditional transmission LCD displays, electronic paper displays require no backlight and are easy to read. Even in the sunlight, electronic paper displays remain clear and visible. In addition, the electronic paper display is soft, non-dazzling, non-flickering, and the viewing angle can reach nearly 180°, so the electronic paper display is very suitable for reading. In addition, the paper screen supports power-off display, that is, in the case of complete power-off can still maintain the display before the power-off content (can be maintained for 4-6 months), only when the screen refresh power

consumption.

3. Product features

3.1 Main advantages

- ✓ SPI interface
- ✓ Resolution : 212x104
- ✓ Ultra-wide angle of view: >170°
- ✓ Partial refresh support: Refreshing the local area, Eliminate black and white flicker every time you change the display (Except for three color screens)
- ✓ Ultra-low power consumption: Refresh power consumption only when refresh, refresh power consumption 26.5mW
- ✓ Power outage display: After power off, it can maintain the contents of the display before power off for up to 4~6 months.
- ✓ Height reflectivity: Visible under strong light.
- ✓ Long life (no fault refresh times): More than 1 million times

3.2 Main disadvantages

- ✧ These shortcomings of the ink screen are caused by their own nature, not the company's design flaws
- ✧ no backlight
- ✧ Slow refresh
- ✧ When the screen under heavy pressure, it can easily break the pixels or cause the screen to break up.

4. Product specification

The dimensions	1.54 inch	2.90 inch	2.13 inch
Module size (L×W ×H)	46.40×32.00×2.20	87.81×36.70×2.20	67.80×29.70×2.20
Screen size (L×W ×H)	37.32×31.80×1.00	79.00×36.70×1.00	59.20×29.20×1.00
Display size	27.60(L)×27.60(W)	66.85(L)×29.10(W)	48.55(L)×23.71(W)
Point size	0.138(H) X 0.138(W)	0.226(H) X 0.227(W)	0.228(H) X 0.229(W)
Resolution	200×200	296×128	212×104
Display color	Black white		Black white red
Work voltage	3.3V		
Working temperature	0~50°C		
Storage temperature	-25~70°C		
Refresh mode	Global/Local refresh		Global refresh
Refresh time	3s	1s	8S
Refresh power	26.4mV		26.4mV
DPI:	184	112	111

4.1 Interface description

VCC : 3~6V Positive power input

GND : Power ground

SDI : SPI communication MOSI pin

CLK : SPI communication SCK pin

CS : SPI Selection pin (Low level effective)

D/C : Data / command control pin (High level write data, low level write command)

BUSY : Busy state output pin (high level is busy)

5. Usage method

5.1 STM32

The routine of STM32 is based on STM32F103C8T6, The compilation environment is Keil 5.23, Other models need to be transplanted by yourself, The pin connection is as follows:

E-Ink	STM32F103C8T6
VCC	3.3V
GND	GND
D/C	PB8
SDI	PA7
CS	PB6
CLK	PA5
BUSY	PA9

5.2 Arduino

Arduino library are based on Arduino UNO, WIFI_Kit8 and WIFI_Kit32, three different development board versions. IDE version is 1.8.3,

5.2.1 The pin of Arduino UNO connection is as follows:

E-Ink	Arduino
VCC	3.3V

GND	GND
D/C	D9
SDI	D11
CS	D10
CLK	D13
BUSY	D7

5.2.2 The pin of WIFI_Kit32 connection is as follows:

E-Ink	Arduino
VCC	3.3V
GND	GND
D/C	22
SDI	27
CS	18
CLK	5
BUSY	23

5.2.3 The pin of WIFI_Kit8 connection is as follows:

E-Ink	Arduino
VCC	3.3V
GND	GND
D/C	D2
SDI	D7

CS	D8
CLK	SCL
BUSY	D1

Arduino version of the sample code :

<https://github.com/HelTecAutomation/e-ink>

To make it easier to us, We integrate all kinds of screen and different development board drivers together, modify the macro definition in the imagedata.h file (As shown in Figure 5-1)

```
1  #ifndef E_INK_H
2  #define E_INK_H
3  #include "epdif.h"
4
5  #define USE_290
6
7  #if defined( USE_154 )
8
9  // Display resolution
10 #define EPD_WIDTH    200
11 #define EPD_HEIGHT   200
12
```




Figure 5-1

5.3 Display effect



Figure 5-2 1.54



Figure 5-3 2.13



Figure 5-4 2.90

6. Making picture

6.1 Display black

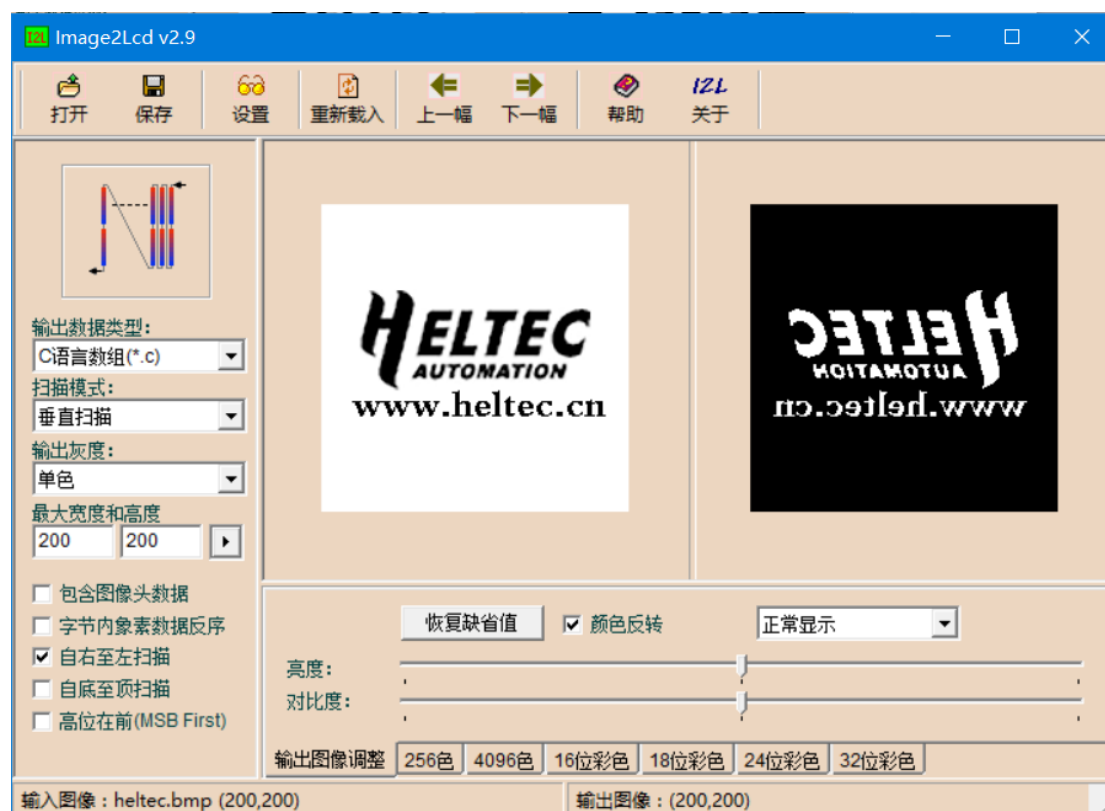
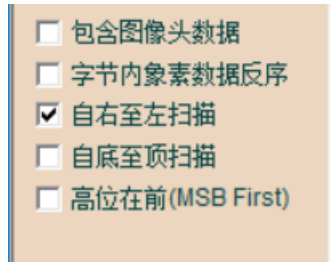


Figure 6-1

- 1) Make the black part to be displayed into a black and white picture with a resolution of 212*104, the content to be displayed is black, and save the image as BMP
- 2) Use Modulus software ImageLcd to generate code for the image: Click "open" on the ImageLcd interface to load the image that needs to be taken
- 3) Parameter setting:
 - Output data type: “C language array (*.c)” ;
 - Scan mode: vertical scan
 - Output gray level: monochromatic
 - Maximum width and height: 212*104 (After input, you must click the small

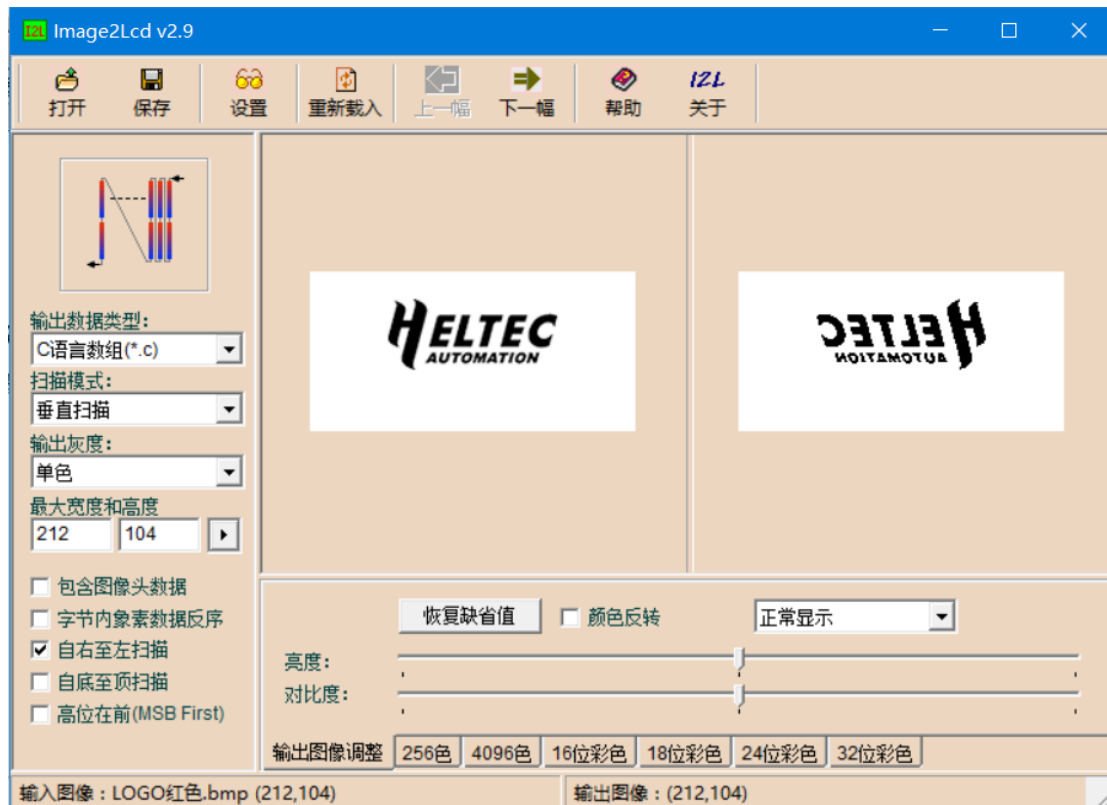
arrow to confirm)

- Tick in front of the "color reversal" (Note: Tick means "black on white" and the final display effect is as shown in the left figure in "Picture 1", but not on tick)
- Tick in front of the " scan from right to left"



Click "save", Replace the code in the generated ".c" file to the corresponding location in the program.

6.2 Display red



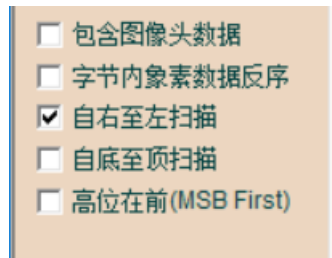
- 1) Make the black part to be displayed into a black and white picture with a

resolution of 212*104, the content to be displayed is black, and save the image as BMP

2) Use Modulus software ImageLcd to generate code for the image: Click "open" on the ImageLcd interface to load the image that needs to be taken

3) Parameter setting:

- Output data type: "C language array (*.c)"
- Scan mode: vertical scan
- Output gray level: monochromatic
- Maximum width and height: 212*104 (After input, you must click the small arrow to confirm)
- Don't tick in front of the "color reversal"
- Tick in front of the "scan from right to left"



Click "save", Replace the code in the generated ".c" file to the corresponding location in the program.

Note: There will be "Image Lcd" watermark on the picture when the software is not registered. If you want to register, please click "Registration" below, Enter the registration code: 1F3E-1A12-3CA4-1983-7D69 (If the registration code fails, please visit the registration page for application)

访问注册网页	注册码：						注册
访问作者主页							
给作者发邮件							
输出图像调整	256色	4096色	16位彩色	18位彩色	24位彩色	32位彩色	注册

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