

ER-DBC240120-1.1

MCU 8051 Development Board & Kit User Guide



EastRising Technology Co., Limited

Attention:

- A. Some specifications of IC are not listed in this datasheet. Please refer to the IC datasheet for more details.
- B. The related documents for interfacing, demo code, ic datasheet are all available, please download from our web.

REV	DESCRIPTION	RELEASE DATE
1.0	Preliminary Release	May-15-2018

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1. ORDERING INFORMATION

1.1 Order Number

Part Number(Order Number)	Description
ER-DBC240120-1.1	8051 Microcontroller Development Board & Kit

1.2 What's included in the package

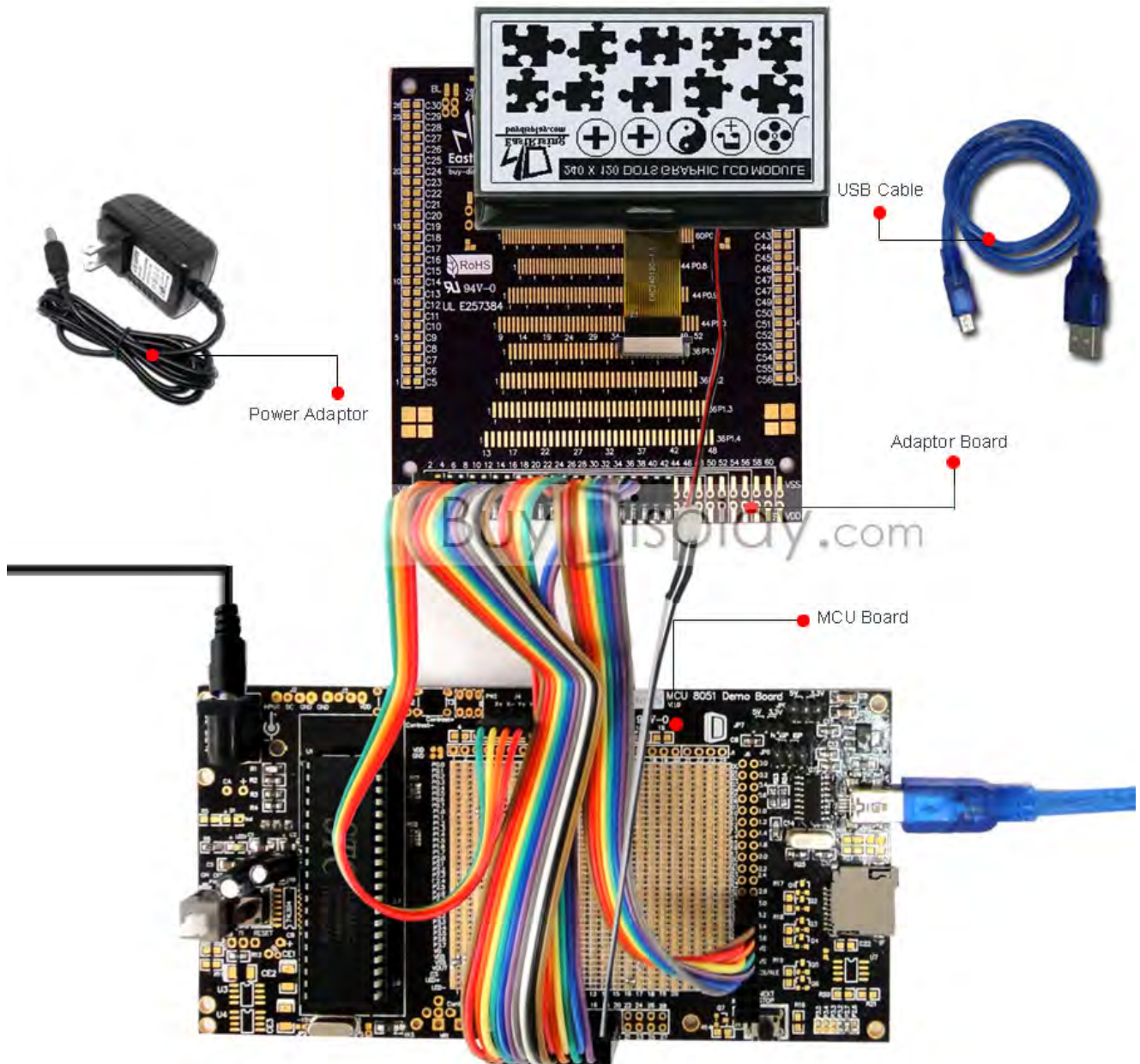
No	Standard Accessory Name	Quantity
1	MCU Board	1
2	Adaptor Board	1
3	Power Adaptor (12V 1A)	1
4	USB Cable	1

1.3 Compatible with following displays:

No.	Part Number	LCD Type	Backlight Color	Graphic & Font Color	Background Color
1	ERC240120FYG01-1	FSTN Positive	Yellow Green Color	Black Color	Yellow Green Color
2	ERC240120SBS01-1	STN Negative Blue	White Color	White Color	Blue Color
3	ERC240120FS01-1	FSTN Positive	White Color	Black Color	White Color
4	ERC240120FR01-1	FSTN Positive	Red Color	Black Color	Red Color
5	ERC240120FG01-1	FSTN Positive	Green Color	Black Color	Green Color
6	ERC240120FB01-1	FSTN Positive	Blue Color	Black Color	Blue Color
7	ERC240120FP01-1	FSTN Positive	Purple Color	Black Color	Purple Color
8	ERC240120FAM01-1	FSTN Positive	Amber Color	Black Color	Amber Color
9	ERC240120F701-1	FSTN Positive	RGB Color	Black Color	RGB Color
10	ERC240120DNYG01-1	FFSTN Negative	Yellow Green Color	Yellow Green Color	Black Color
11	ERC240120DNS01-1	FFSTN Negative	White Color	White Color	Black Color
12	ERC240120DNR01-1	FFSTN Negative	Red Color	Red Color	Black Color
13	ERC240120DNG01-1	FFSTN Negative	Green Color	Green Color	Black Color
14	ERC240120DNB01-1	FFSTN Negative	Blue Color	Blue Color	Black Color
15	ERC240120DNP01-1	FFSTN Negative	Purple Color	Purple Color	Black Color
16	ERC240120DNAM01-1	FFSTN Negative	Amber Color	Amber Color	Black Color
17	ERC240120DN701-1	FFSTN Negative	RGB Color	RGB Color	Black Color

2. QUICK START

2-1 Simply plug the power adaptor into an AC outlet and plug FFC(Cable) of lcd display into the ZIF connector of adaptor board as the below image shows.



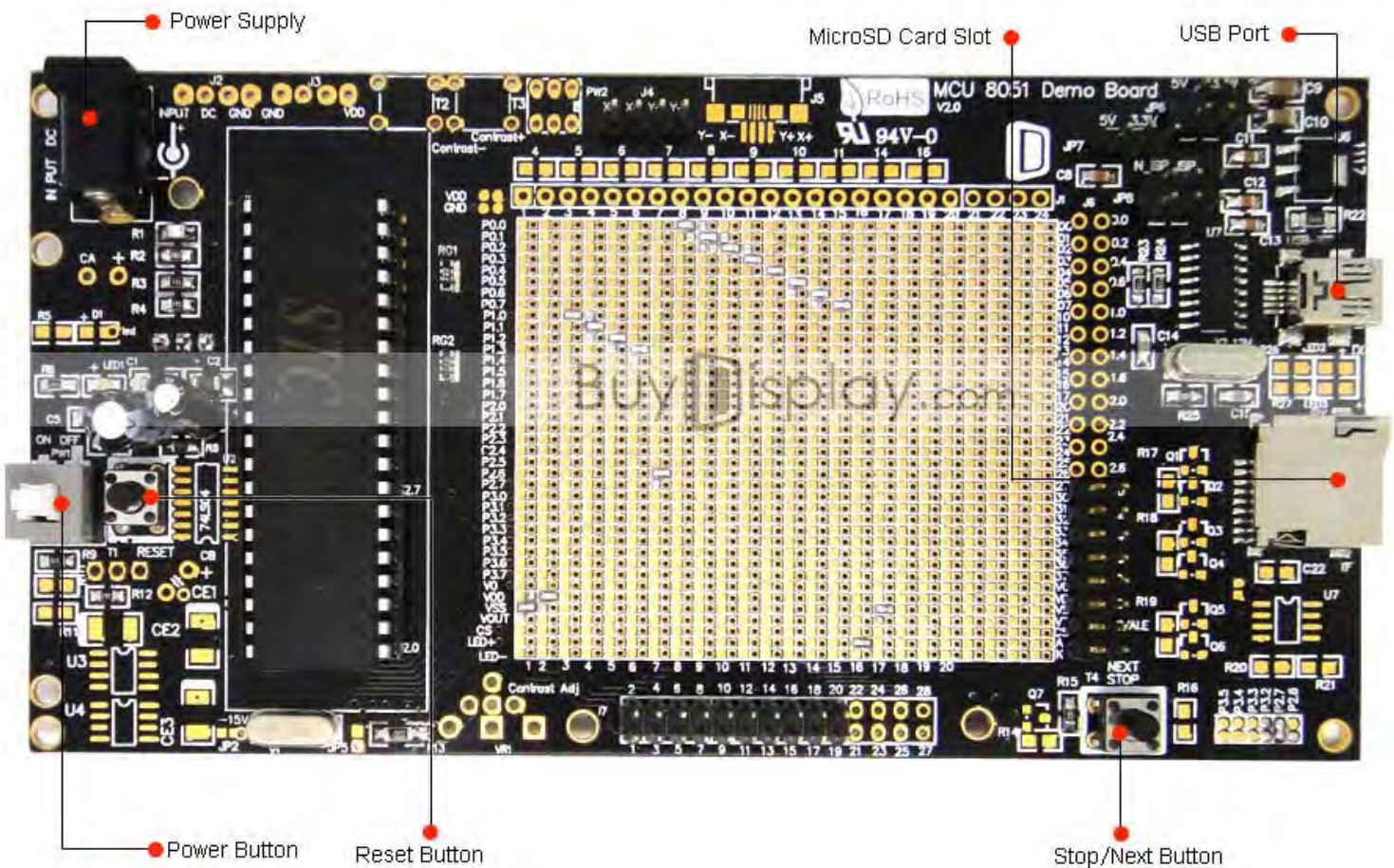
2-2 Press the power button to run the demonstration program.

3. BUTTONS DEFINITIONS

Button Name	Description
*Stop/Next Button	Stop or Next the Image Slideshows
Reset Button	Restart to Initialized State
Power Button	Press On or Press Off

*For color display, this button is used to next the image slideshows.

For mono display, this button is used to stop the image slideshows.



4. SPECIFICATION

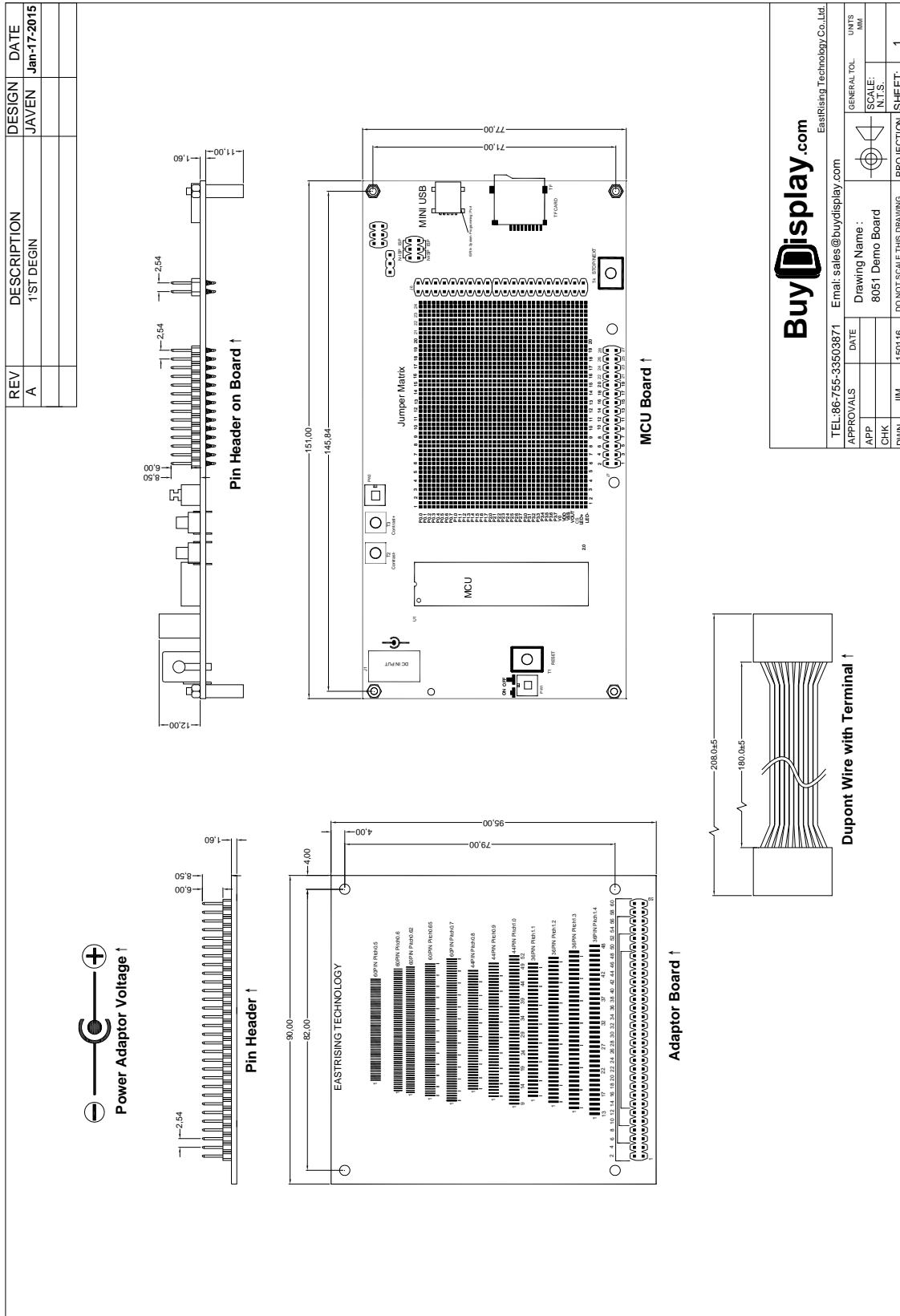
4.1 Mechanical Specification

ITEM	STANDARD VALUE	UNIT
MCU Board Outline Dimension	151.00×77.00	mm
Adaptor Board Outline Dimension	90.00×95.00	mm
Gross Weight for Whole Demo Kit	0.40	kg

4.2 Electrical Specification

ITEM	STANDARD VALUE	UNIT
Microcontroller	STC89LE52RC	--
Interface	6800/8080 8-bit Parallel,4-wire Serial	--
Power Supply Voltage	12V	V

5. OUTLINE DRAWING



6. HOW TO MAKE A CUSTOM DEMONSTRATION

By using the software of LCD Font Maker or Image2LCD and ISP(In System Programming) to customize the demonstration that includes your own bitmap images, personalized fonts, symbols, icons and burn sketches. The large capacity of the MicroSD card allows you to store more fonts or images. We also prepare the demo code, interfacing document (download from each product page) and schematic MCU datasheet (download from each 8051 microcontroller development board page) for your further study.

LCD Font Maker: <http://www.buydisplay.com/download/software/LCDFontMaker.zip>

Image2LCD: <http://www.buydisplay.com/download/software/Image2Lcd.zip>

7. METHODS FOR USING IN SYSTEM PROGRAMMING

7-1 Hardware Preparation

7-1-1 Please power off the development board,

7-1-2 No power supply is connecting with 8051 development board,

7-7-3 The jumpers on JP8 is on ISP position as below image shows



7-2 Install the USB to RS232 Driver

<http://www.buydisplay.com/download/software/USB-TO-RS232-DRIVER.rar>



7-3 Connecting the 8051 development board to computer by USB Cable and you should find the new port USB-SERIAL CH340 in Computer-System Properties-Device Manager as below image shows and remember the COM number that would be used in Step7-4.



7-4 Install STC 8051 Microcontroller ISP(In System Programming)Software

<http://www.buydisplay.com/download/software/STC-ISP-V4.86-NOT-SETUP-ENGLISH.zip>

7-5 Open ISP and Select COM Port that should be the same with the step 7-2 you see from Device Manager.



7-6 Select MCU part number that should be the same with your purchased one.
(Refer to 4.2 Electrical Specification)

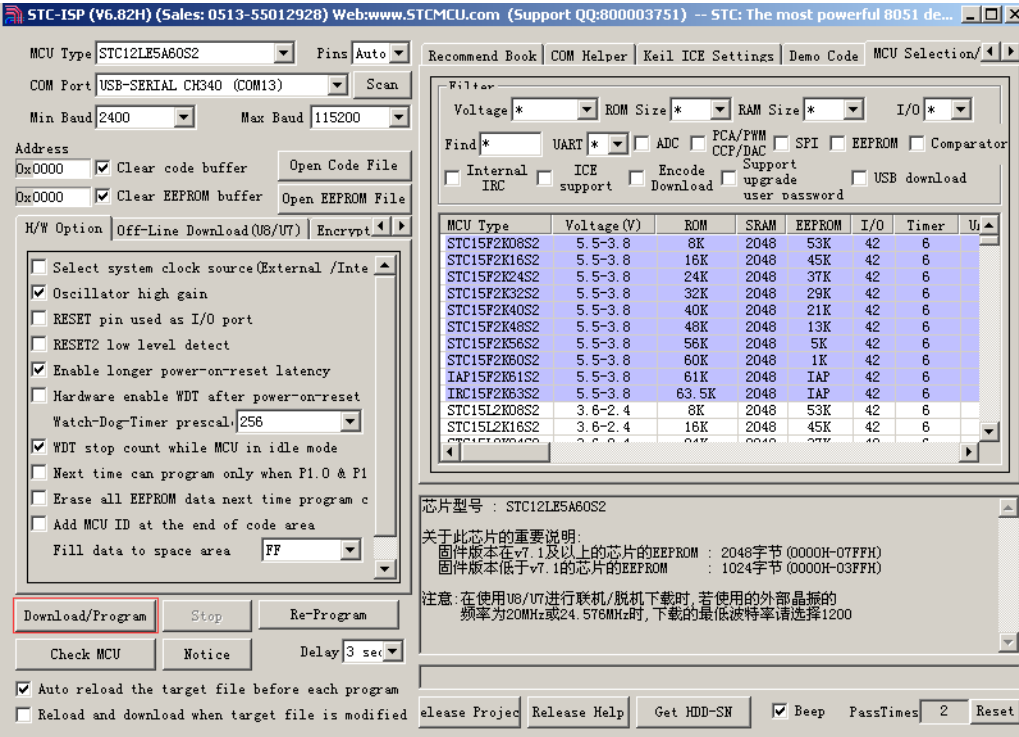


7-7 Open target “.hex” file by clicking open code file



7-8 Programming

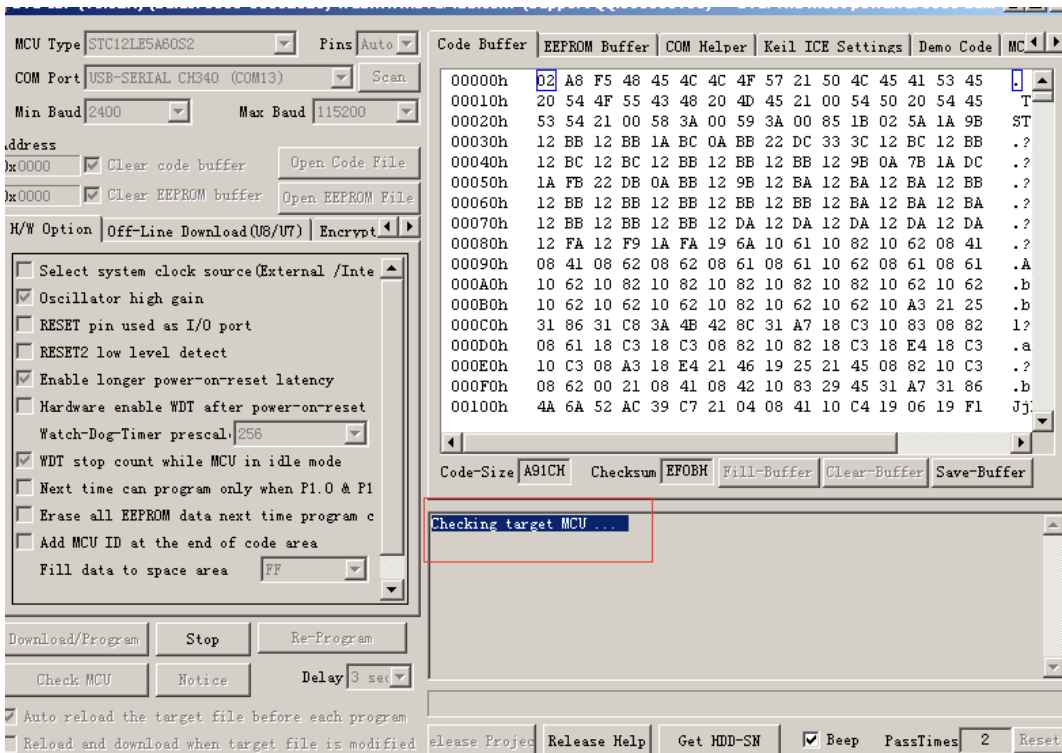
7-8-1 Click Download/Program



The screenshot shows the STC-ISP software interface. The 'Download/Program' button is highlighted with a red box. The interface includes various settings for MCU Type (STC12LE5A60S2), COM Port (USB-SERIAL CH340), and baud rates. A table of MCU options is visible, and the 'Download/Program' button is located at the bottom left of the main settings area.

MCU Type	Voltage (V)	ROM	SRAM	EEPROM	I/O	Timer	U ₁
STC15F2K06S2	5.5-3.8	8K	2048	53K	42	6	
STC15F2K16S2	5.5-3.8	16K	2048	45K	42	6	
STC15F2K24S2	5.5-3.8	24K	2048	37K	42	6	
STC15F2K32S2	5.5-3.8	32K	2048	29K	42	6	
STC15F2K40S2	5.5-3.8	40K	2048	21K	42	6	
STC15F2K48S2	5.5-3.8	48K	2048	13K	42	6	
STC15F2K56S2	5.5-3.8	56K	2048	5K	42	6	
STC15F2K60S2	5.5-3.8	60K	2048	1K	42	6	
IAP15F2K61S2	5.5-3.8	61K	2048	IAP	42	6	
IRC15F2K63S2	5.5-3.8	63.5K	2048	IAP	42	6	
STC15L2R06S2	3.6-2.4	8K	2048	53K	42	6	
STC15L2K16S2	3.6-2.4	16K	2048	45K	42	6	
STC15L2K24S2	3.6-2.4	24K	2048	37K	42	6	
STC15L2K32S2	3.6-2.4	32K	2048	29K	42	6	
STC15L2K40S2	3.6-2.4	40K	2048	21K	42	6	
STC15L2K48S2	3.6-2.4	48K	2048	13K	42	6	
STC15L2K56S2	3.6-2.4	56K	2048	5K	42	6	
STC15L2K60S2	3.6-2.4	60K	2048	1K	42	6	

7-8-2 Then you will see "Checking target MCU...."

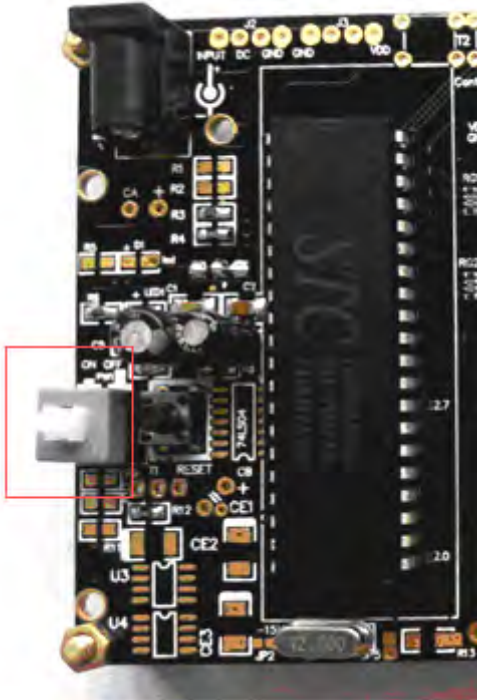


The screenshot shows the STC-ISP software interface during the programming process. The 'Checking target MCU....' status message is highlighted with a red box. The interface displays a hex dump of the target MCU memory, with the 'Code Buffer' tab selected. The 'Download/Program' button is still visible at the bottom left.

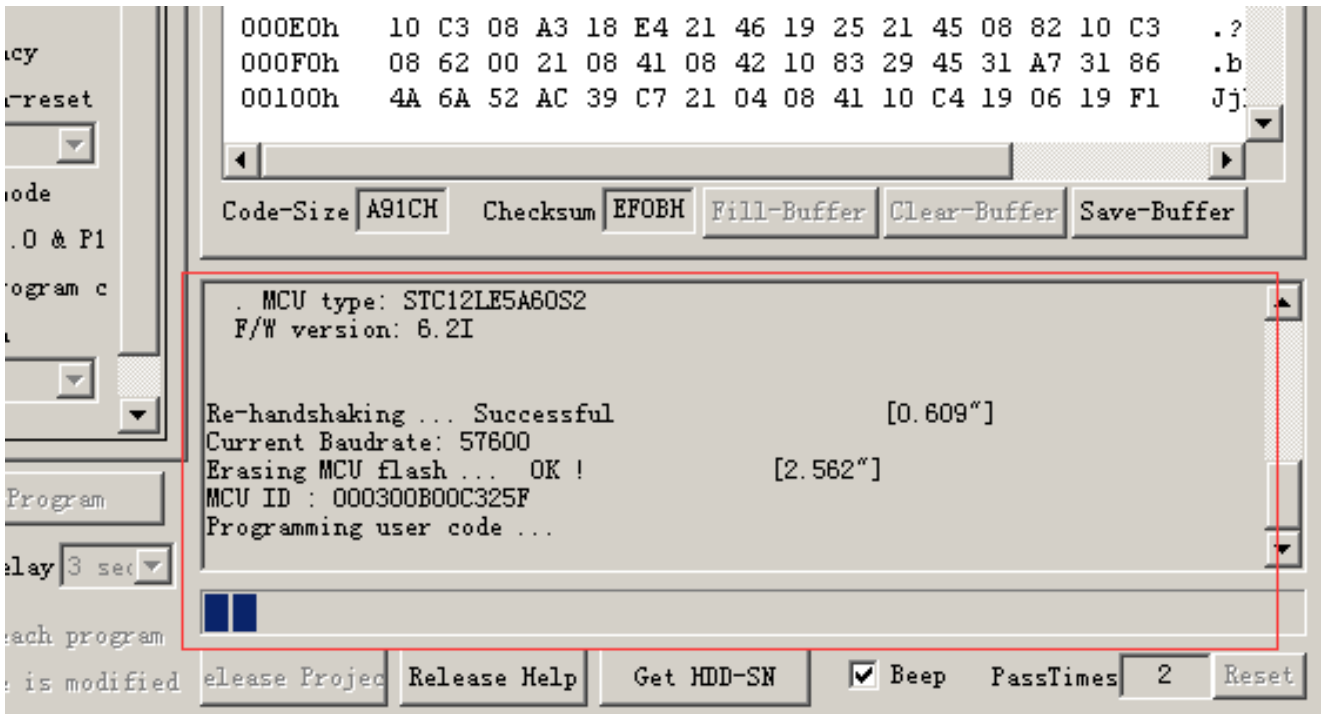
```

Code Buffer
00000h 02 A8 F5 48 45 4C 4C 4F 57 21 50 4C 45 41 53 45
00010h 20 54 4F 55 43 48 20 4D 45 21 00 54 50 20 54 45
00020h 53 54 21 00 58 3A 00 59 3A 00 85 1B 02 5A 1A 9B
00030h 12 BB 12 BB 1A BC 0A BB 22 DC 33 3C 12 BC 12 BB
00040h 12 BC 12 BC 12 BB 12 BB 12 BB 12 BA 12 DA 12 DA
00050h 1A FB 22 DB 0A BB 12 9B 12 BA 12 BA 12 BA 12 BB
00060h 12 BB 12 BB 12 BB 12 BB 12 BB 12 BA 12 BA 12 BA
00070h 12 BB 12 BB 12 BB 12 DA 12 DA 12 DA 12 DA 12 DA
00080h 12 FA 12 F9 1A FA 19 6A 10 61 10 82 10 62 08 41
00090h 08 41 08 62 08 62 08 61 08 61 10 62 08 61 08 61
000A0h 10 62 10 82 10 82 10 82 10 82 10 62 10 62 10 62
000B0h 10 62 10 62 10 62 10 82 10 62 10 62 10 A3 21 25
000C0h 31 86 31 C8 3A 4B 42 8C 31 A7 18 C3 10 83 08 82
000D0h 08 61 18 C3 18 C3 08 82 10 82 18 C3 18 E4 18 C3
000E0h 10 C3 08 A3 18 E4 21 46 19 25 21 45 08 82 10 C3
000F0h 08 62 00 21 08 41 08 42 10 83 29 45 31 A7 31 86
00100h 4A 6A 52 AC 39 C7 21 04 08 41 10 C4 19 06 19 F1
  
```

7-8-3 Power on the development board by pressing the white power button



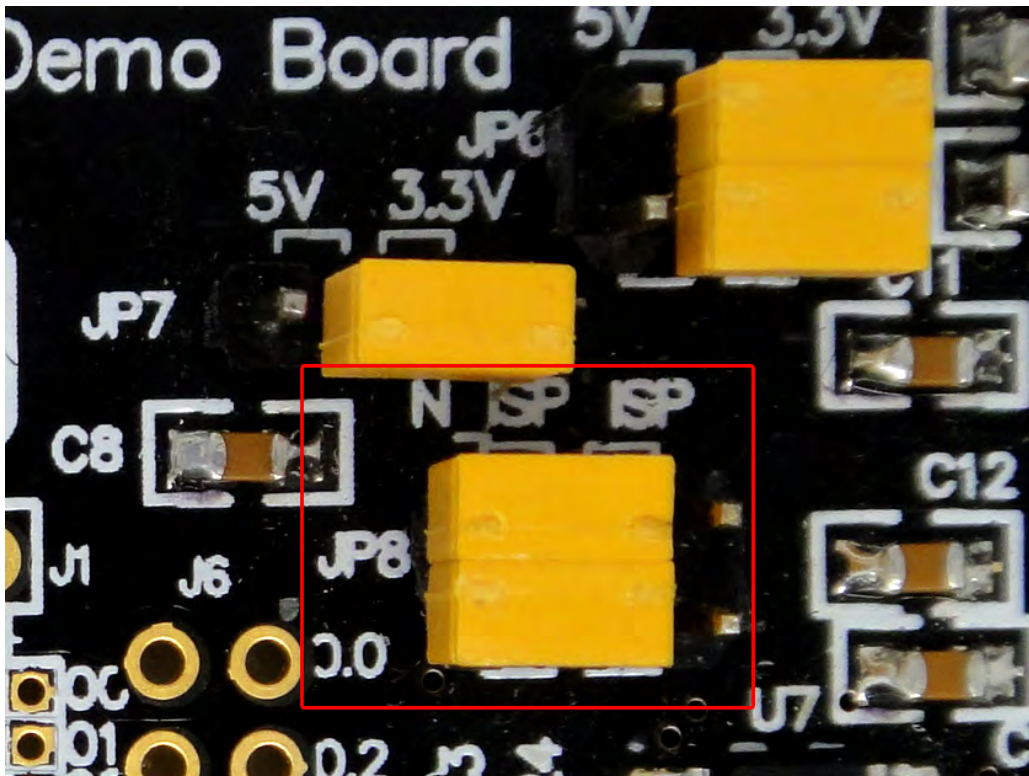
7-8-4 Now you could see the process of programming



7-8-5 Programming Finished



8 Please move the jumpers on JP8 from ISP to N_ISP as below image shows.



8. CARE AND HANDLING PRECAUTIONS

The kit is sold with a module mounted on it. If you attempt to modify the board to work with other modules, the warranty is void. For optimum operation of the module and demonstration board and to prolong their life, please follow the precautions below.

8.1 ESD (Electro-Static Discharge)

The circuitry is industry standard CMOS logic and susceptible to ESD damage. Please use industry standard antistatic precautions as you would for any other PCB such as expansion cards or motherboards.

8.2 Avoid Shock, Impact, Torque and Tension

- ◇ Do not expose the module to strong mechanical shock, impact, torque, and tension.
- ◇ Do not drop, toss, bend, or twist the module.
- ◇ Do not place weight or pressure on the module.

8.3 LCD&OLED Display Glass

- ◇ The exposed surface of the LCD "glass" is actually a polarizer laminated on top of the glass. To protect the soft plastic polarizer from damage, the module ships with a protective film over the polarizer. Please peel off the protective film slowly. Peeling off the protective film abruptly may generate static electricity.
- ◇ The polarizer is made out of soft plastic and is easily scratched or damaged. When handling the module, avoid touching the polarizer. Finger oils are difficult to remove.
- ◇ If the LCD panel breaks, be careful not to get the liquid crystal fluid in your mouth or eyes. If the liquid crystal fluid touches your skin, clothes, or work surface, wash it off immediately using soap and plenty of water.
- ◇ Be very careful when you clean the polarizer. Do not clean the polarizer with liquids. Do not wipe the polarizer with any type of cloth or swab (for example, Q-tips). Use the removable protective film to remove smudges (for example, fingerprints) and any foreign matter. If you no longer have the protective film, use standard transparent office tape. If the polarizer is dusty, you may carefully blow it off with clean, dry, oil-free compressed air.

8.4 Operation

- ◇ Use only the included AC adapter to power the board.
- ◇ Observe the operating temperature limitations: from -20°C minimum to +70°C maximum with minimal fluctuations. Operation outside of these limits may shorten the life and/or harm the display.
 - At lower temperatures of this range, response time is delayed.
 - At higher temperatures of this range, display becomes dark. (You may need to adjust the contrast.)
- ◇ Operate away from dust, moisture, and direct sunlight.

8.5 Storage and Recycling

- ◇ Store in an ESD-approved container away from dust, moisture, and direct sunlight.
- ◇ Observe the storage temperature limitations: from -30°C minimum to +80°C maximum with minimal fluctuations. Rapid temperature changes can cause moisture to form, resulting in permanent damage.
- ◇ Do not allow weight to be placed on the modules while they are in storage.
- ◇ Please recycle your outdated displays at an approved facility.