Lesson 13 Control Buzzer

1. Working Principle

Control the buzzer to sound after powering on by setting level.

The path to the source code of the program is 5. MaxArm Hardware Basic Learning/Arduino Development/Game Programs/Buzzer Control/ Buzzer_Control/Buzzer_Control.ino

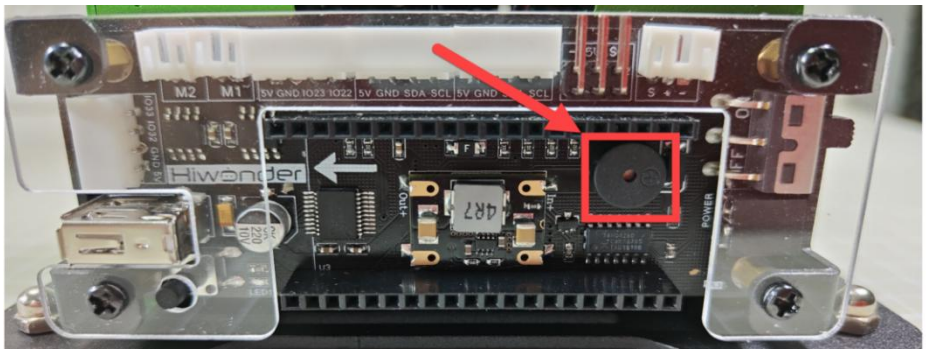
```
void setup(){
    Buzzer_init(); // Initialize buzzer driving library
}

bool start_en = true;
void loop(){
  if(start_en){
    setBuzzer(100); // The buzzer is set to sound for 100ms
    delay(1000);
    setBuzzer(300); // The buzzer is set to sound for 300ms
    delay(1000);
    start_en = false;
  }
  else{
    delay(500);
  }
}
```

The setBuzzer() function in Buzzer.h library is called to set the sounding time of the buzzer. In the code “setBuzzer(100)”, “100” represents the sounding time and its unit is ms.

2. Preparation

2.1 Hardware

There is a buzzer on MaxArm controller, as shown in the figure below:

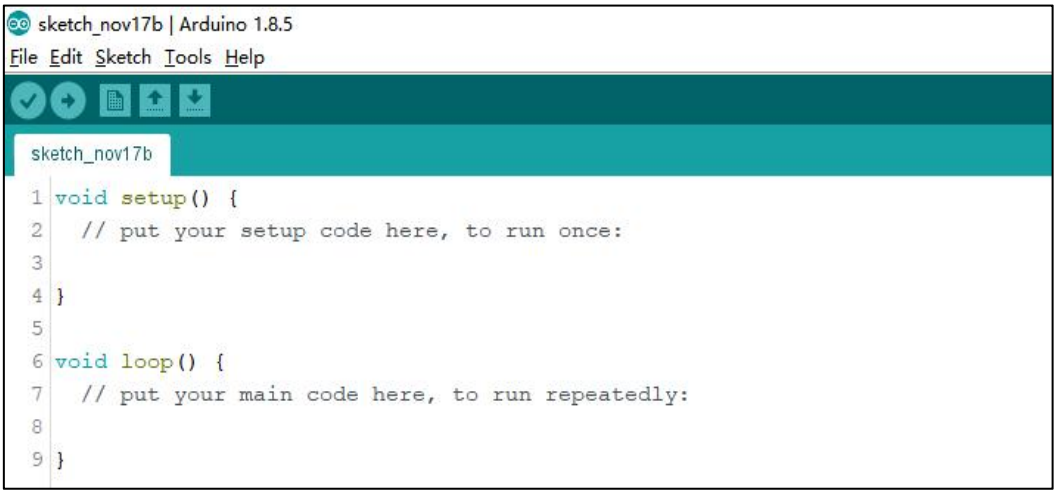


2.2 Software

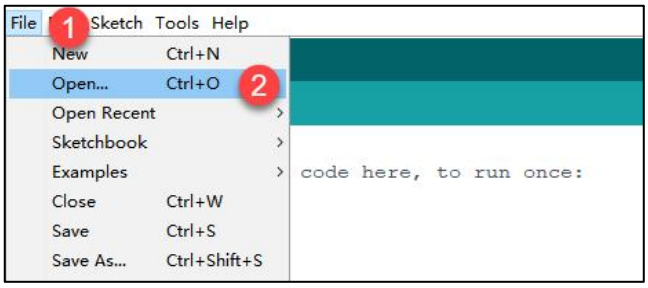
Please refer to the material in folder “4.MaxArm Underlying Program Learning/Arduino Development/Lesson 1 Set Development Environment” to connect ESP32 controller to Arduino Editor.

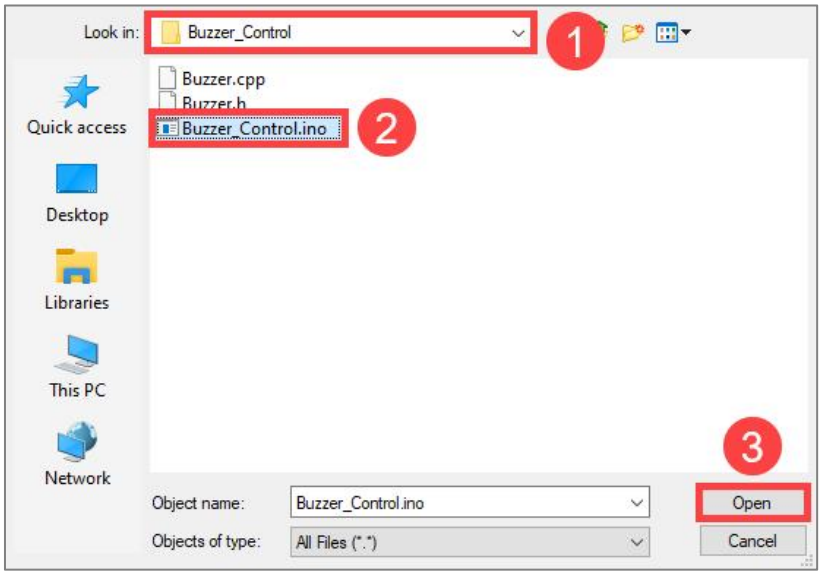
3. Program Download

1) Double click on  icon to open Arduino IDE.

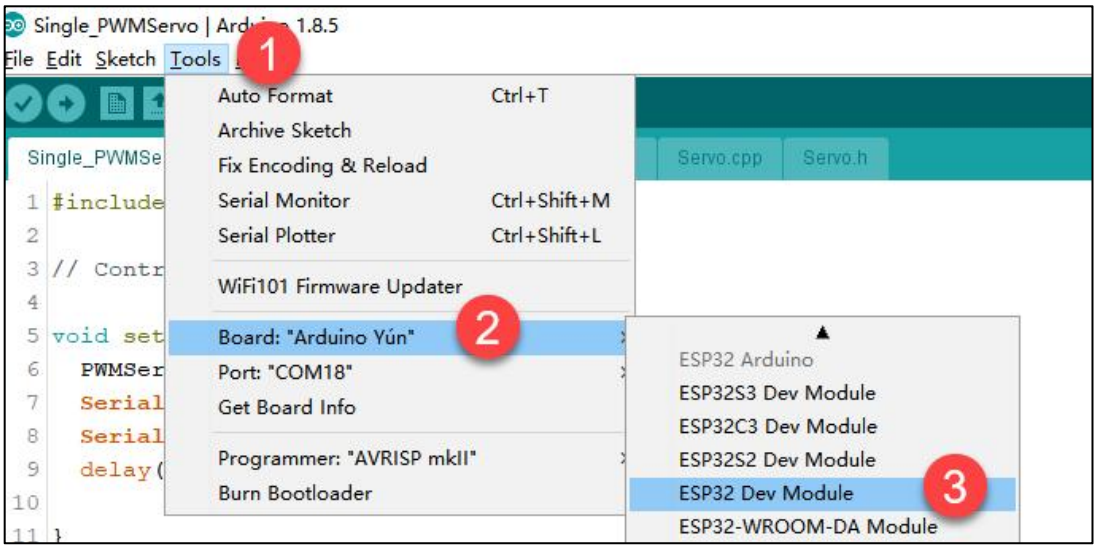


2) Click “File->Open” in turn, and select the program “**Buzzer_Control**” in the folder “5.MaxArm Hardware Basic Learning/Arduino Development/Game Programs/Control Buzzer/ **Buzzer_Control**”.



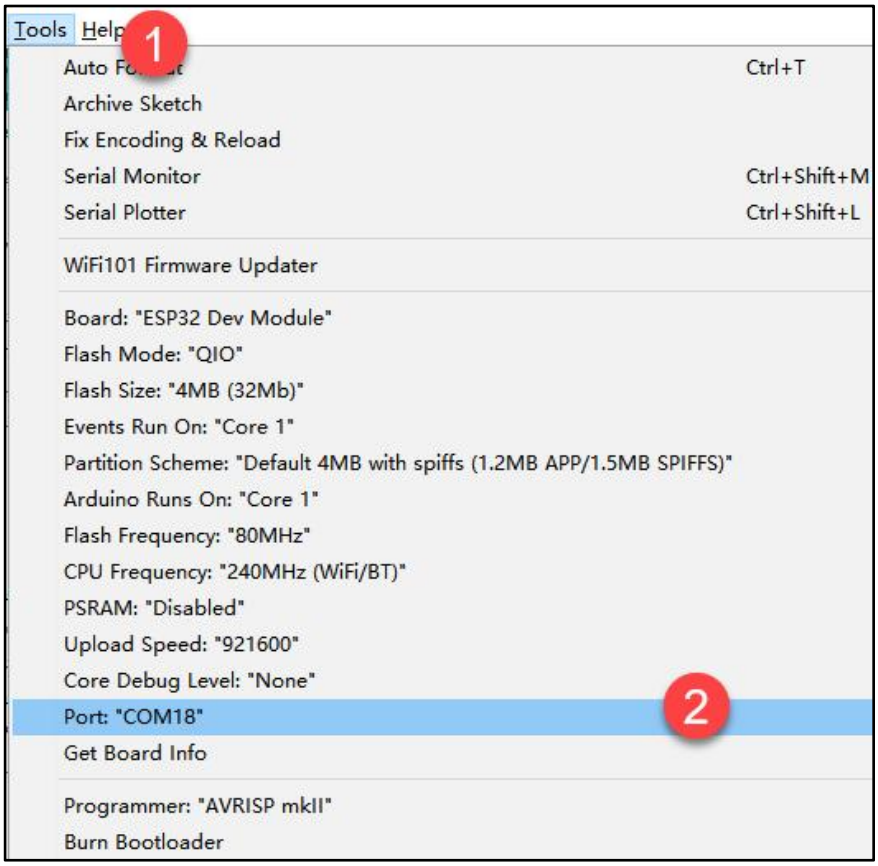


3) Check the board model. Click “Tools->Board” and select “ESP 32 Dev Module”. (If the model of development board has been configured when setting the development environment, you can skip this step.)

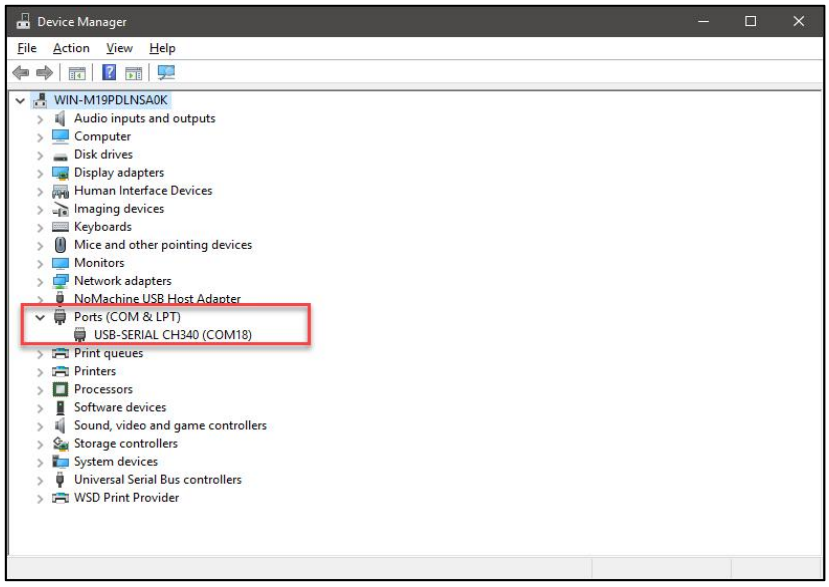


4) Select the corresponding port of ESP32 controller in “Tools->Port”. (Here take the port “COM5” as example. Please select the port based on your

computer. If COM1 appears, please do not select because it is the system communication port but not the actual port of the development port.)

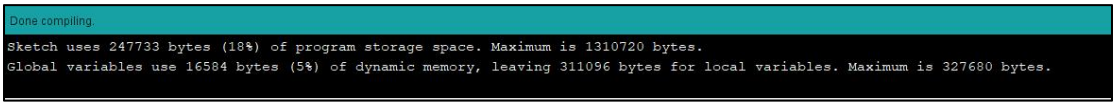


5) If you're not sure about the port number, please open the "This PC" and click "Properties->Device Manger" in turns to check the corresponding port number (the device is with CH340).

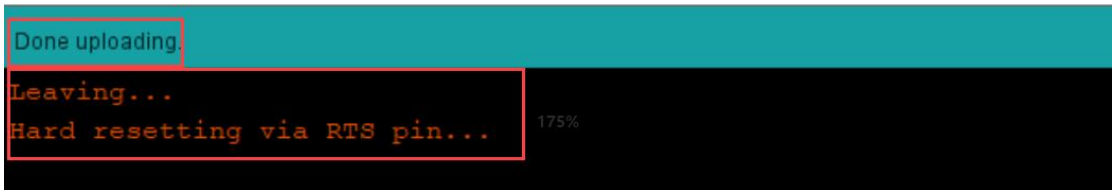


6) After selecting, confirm the board “ESP32 Dev Module” in the lower right corner and the port number “COM5” (it is an example here, please refer to the actual situation).

7) Then click on  icon to verify the program. If no error, the status area will display “Compiling->Compile complete” in turn. After compiling, the information such as the current used bytes, and occupied program storage space will be displayed.



8) After compiling, click on  icon to upload the program to the development board. The status area will display “Compiling->Uploading->Complete” in turn. After uploading, the status area will stop printing the uploading information.



4. Project Outcome

When the program is running, the buzzer will sound for 0.1s first following by being silent for 2s, then sound for 0.3s. Finally, automatically exit the program.

5. Function Extension

The buzzer originally set in program will sound for 0.1s first following by being

silent for 2s, then sound for 0.3s. If want to change the sounding time, you can modify the time parameter in setBuzzer() function. This section will change the time parameter 100 and 300 to 1000. The specific operation steps are as follow:

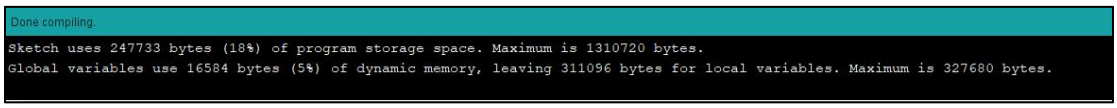
1) Find the following program code.

```
bool start_en = true;
void loop(){
  if(start_en){
    setBuzzer(100); // The buzzer is set to sound for 100ms
    delay(1000);
    setBuzzer(300); // The buzzer is set to sound for 300ms
    delay(1000);
    start_en = false;
```

2) Change the time parameter 100 and 300 to 1000, as shown in the figure below:

```
bool start_en = true;
void loop(){
  if(start_en){
    setBuzzer(1000); // The buzzer is set to sound for 100ms
    delay(1000);
    setBuzzer(1000); // The buzzer is set to sound for 300ms
    delay(1000);
    start_en = false;
```

3) After modifying, click on  icon to verify the program. At this time, the terminal will show the following prompt.



4) Click on  icon.

5) Refer to the steps 6-8 in “3. Program Download” to download the program and check the outcome.