

1. Introduction



FreaksTimer is a timer for geekers. Its appearance is cylindrical. There are two digitron leds in the side to display the remaining time. There is a knob of encoder. We can use the knob to setup the time. And press the button of encoder to begin count down. There are 8 LED lights on the side of FreaksTimer to around a circle. They will light around when the timer is counting down. There is a buzzer in the timer. It will make a voice of “tick tock” when the timer is counting down. If the time is up, the 8 LED lights will flash and the buzzer will tweet. The knob of encoder is rotated, the time is minus or plus 1 minute. The range of time is from 1 minute to 99 minutes. the feature of FreaksTimer is open source. We open the source code, circuit diagram and appearance design.

2. Theory

The chip of FreaksTimer is 32u4 of ATMEL. We use timer interruption of mcu to count time exactly. Every times to turn it on, the timer interruption initialize automatically. But it is not enable. The users setup the time to count down, and press the button of encoder, the timer interruption is enable. The program will into the interruption every 1 second to make the time minus 1 second. When the time is 0, the timer interruption is unenable, the buzzer tweet and LED lights flash.

3. Hardware and Software



Hardware:

- 1、FreaksTimer
- 2、MicroUSB Data Line

Software:

- 1、ArduinoIDE
- 2、Example Program

4. Install ArduinoIDE

Download the ArduinoIDE from the site:

Arduino official site: <https://www.arduino.cc/>

Download: <https://www.arduino.cc/en/Main/Software?setlang=cn>

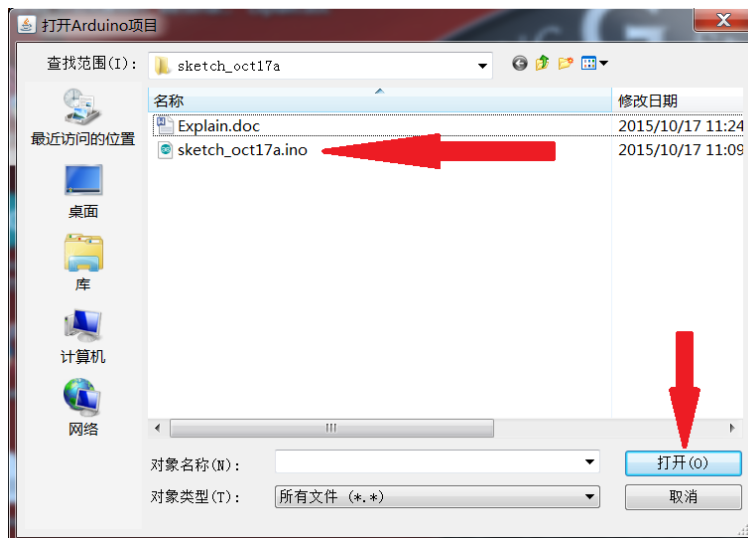
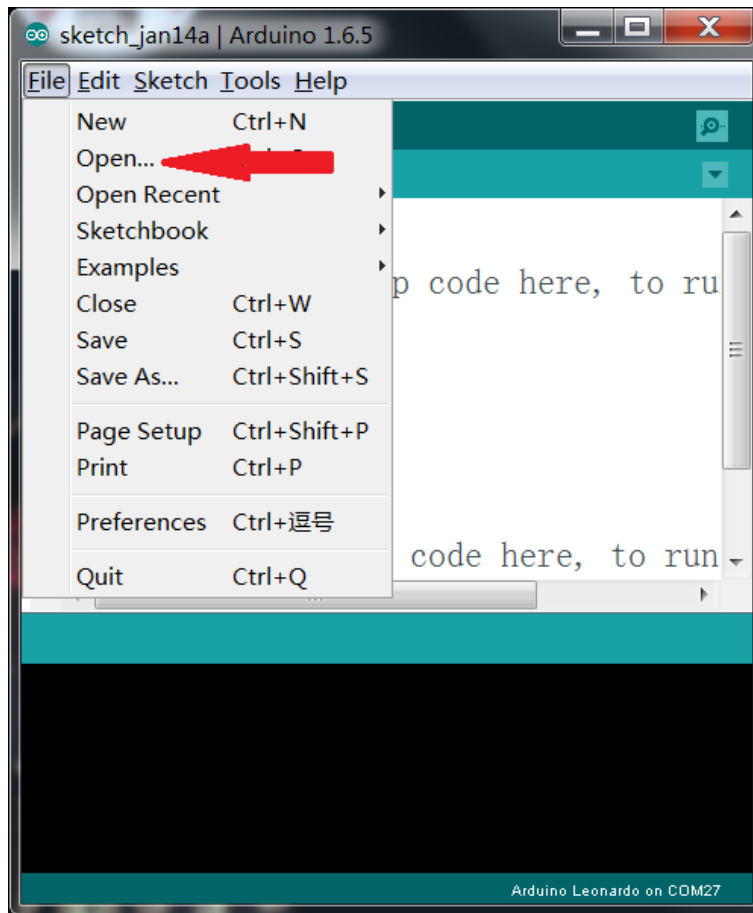
5. Connection



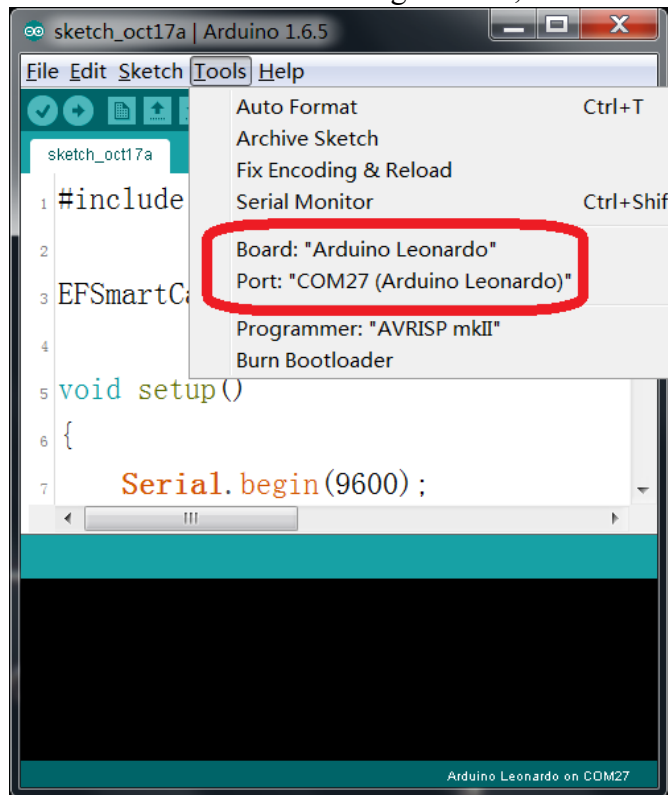
- 1、 Connect the FreaksTimer with computer by the microUSB data line

6. Upload SourceCode

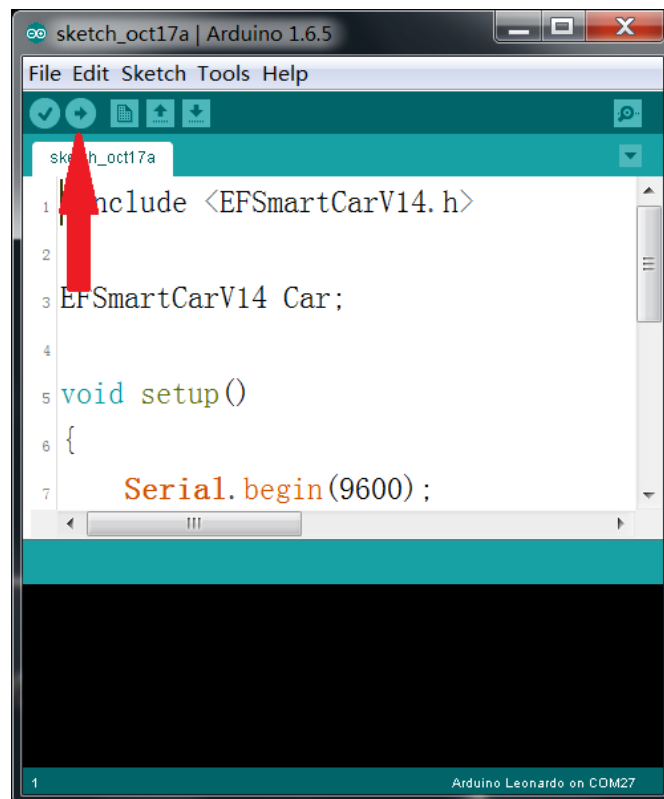
- 1、 Run your Arduino IDE, and click “File”, “Open” to find the source code file. Into the directory to find it, “FreaksTimer->English->Part5_UserGuide->FreaksTimer_SourceCode->sketch_xxxxxx”, choose the file which end is by “.ino”.

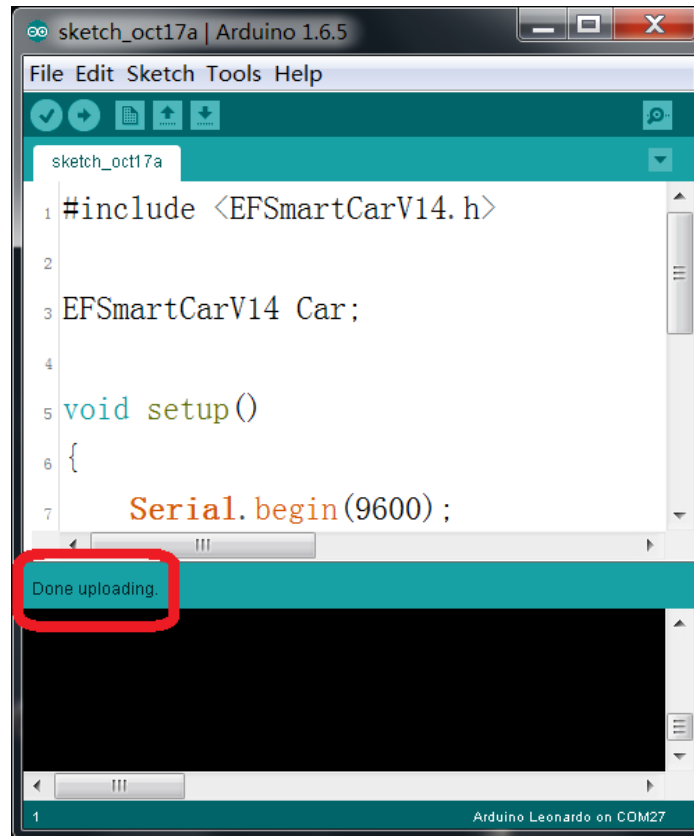


2、 Use MicroUSB data line to connect the FreaksCar with your computer. Clicking “Tools”, “Board” to choose “Arduino Leonardo”. And Clicking “Tools”, “Port” to choose your own com.



3、 点击上传按钮，等待你的电脑把程序上传到FreaksTimer里， 如图所示：





7. Use

- 1、 After uploading the source code, waiting for the nixie tubes to display 00. It means the mcu initialize completely.
- 2、 Rotating the knob of encoder to setup the time.
- 3、 Pressing the button of encoder to make the FreaksTimer begin to count down.
- 4、 You cannot setup the time by rotating the knob of encoder while the FreaksTimer is counting down.
- 5、 Pressing the button of encoder while the FreaksTimer is counting down, it will pause.
- 6、 You can rotate the knob of encoder to setup the time while it is pause.
- 7、 再 Pressing the button of encoder, it will continue to counting down
- 8、 If the time is 00, the LED lights will flash and the buzzer will tweet. You can press the button to stop them.