Password Lock

Introduction

After having learnt so many modules separately, let's use these modules together to make some funny interactive works! In this lesson, we will use an I2C LCD1602, a relay module, a potentiometer and a keypad to assemble a simple password lock. It is built based on a SunFounder microcontroller and can be applied in security doors.

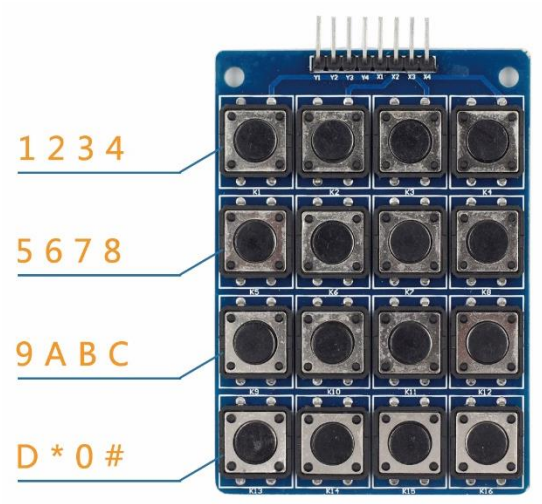
Components

- 1* SunFounder Uno board
- 1 * USB data cable
- 1 * Relay module
- 1 * I2C LCD1602
- 1 * Keypad
- Several jumper wires
- 1 * Breadboard

Experimental Principle

Set a password (for example 123456) by programming. The I2C LCD1602 displays "Welcome!" after power on. At this point, the normally open contact of the relay is disconnected, and the indicator LED on the relay module keeps off. Press the asterisk "*****" key to input the password, and then press "#".

If the password is correct, the normally open contact of the relay will be closed and the indicator light will be on. The I2C LCD1602 will display "Input Correctly" "Please Come In". If you input other contents, the I2C LCD1602 will display "Input Error!" "Please Again", and the relay will keep the initial state. Two seconds later, the I2C LCD1602 displays "Welcome!".



*NOTE: Through programming, we've set the four keys in the first row (with pins at the top as shown in the figure above) as 1, 2, 3, 4; those in the second row as 5, 6, 7, 8; in the third as 9, A, B, C; and in the fourth as D, *, 0, #.*

Experimental Procedures

Step 1: Build the circuit

The wiring between the I2C LCD1602 and the SunFounder board:

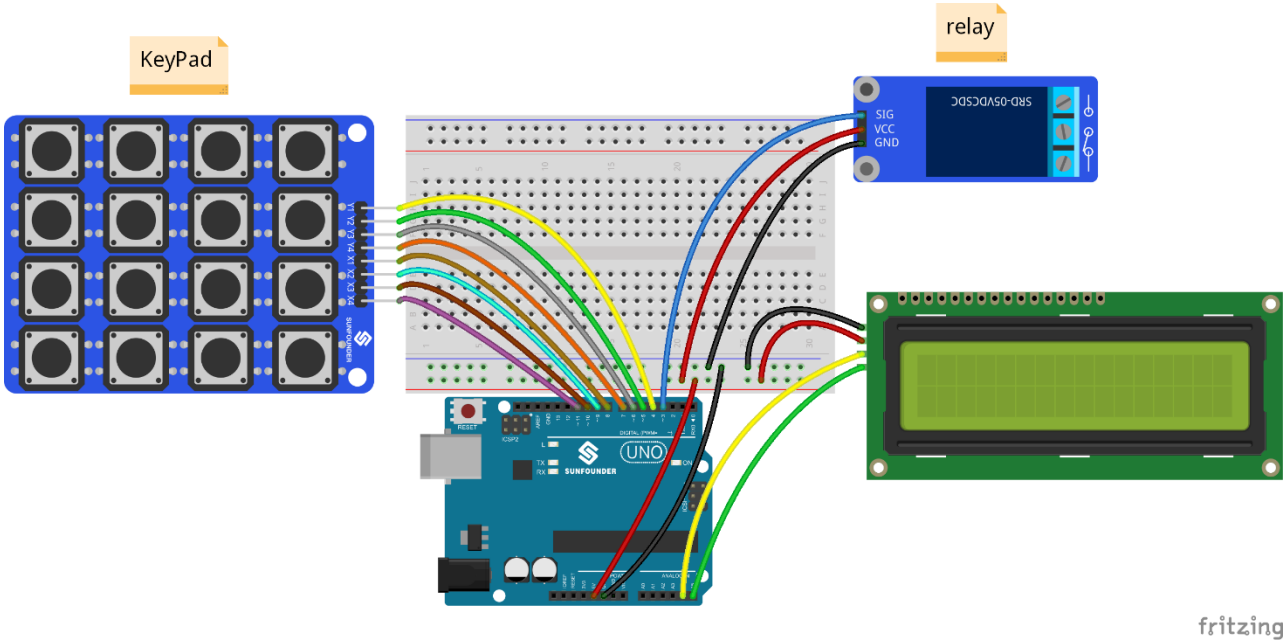
I2C LCD1602	SunFounder Uno
GND	GND
VCC	5v
SDA	A4
SCL	A5

The wiring between the relay module and the SunFounder board:

Relay Module	SunFounder Uno
SIG	3
VCC	5V
GND	GND

The wiring between the keypad and the SunFounder board:

Keypad	SunFounder Uno
X1	8
X2	9
X3	10
X4	11
Y1	4
Y2	5
Y3	6
Y4	7



Step 2: Program (Please refer to the example code in LEARN -> Get Tutorials on our website)

Note: *Here you need to add a library. Refer to the description in Lesson 4 previously in the manual.*

Step 3: Compile the code

Step 4: Upload the sketch to the SunFounder Uno board

Now, the I2C LCD1602 will display **"**Welcome!**"** after power on. At this point, the indicator LED on the relay keeps off. When you press "*****" key, it will prompt "Input Your Code:". If you enter "123456" and press "**#**" key to confirm, the indicator LED on the relay module will light up. The I2C LCD1602 will display "Input Correctly" "Please Come In". Two seconds later, "Welcome!" will be displayed on the I2C LCD1602. But if you input other contents, it will display "Input Error!" "Please Again", and the relay will keep the initial state. Two seconds later, the I2C LCD1602 displays "Welcome!".