# Lesson 2 Detection Button

1. Project Purpose

Use the button on the controller to control the on and off of the LED light.

2. Project Principle

When mechanical button is pressed or released, due to the effect of mechanical elasticity, the mechanical jitter of the contacts usually stabilizes after a certain period of time, and the jitter time is generally 5-10ms. If the on/off status of the button is detected during the contact jitter, it may lead to an error in judgment.

The mechanical jitter of the button can be eliminated by using hardware circuits or software de-jittering method. In this section, software method is used to eliminate jitter.

The principle of software de-jittering is to execute a delay program about 10ms first when a button pressed is detected, and then re-detect whather the button is still pressed to confirm that the button pressed is not caused by jitter. Similarly, when a button released is detected, the method of delaying and then judging is used to eliminate the effect of jitter.
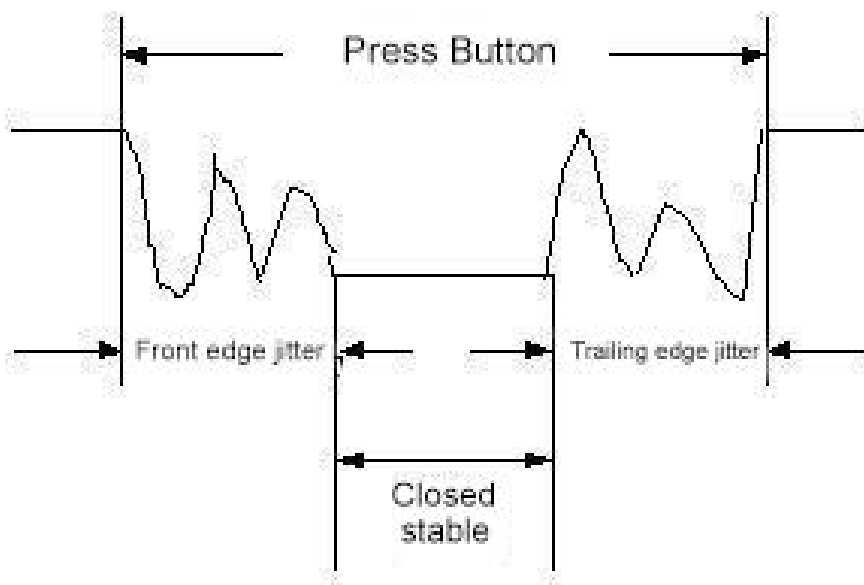
3. Program Analyst

We can see this program in App.cpp as the figure shown below:

```
256
257    if(digitalRead(KEY) == LOW)
258    {
259      delay(60);
260      {
261        if(digitalRead(KEY) == LOW)
262        {
263 //          LED = ~LED;
264          LedFlip();
265          FullActRun(100, 1);
266        }
267      }
268    }
269
```

Firstly, we need to judge whether the button is pressed. If it is pressed, detect whether the button is pressed after a delay of 60ms.

If the button is still pressed, we can judge that the key is pressed and then execute the following operations: flash the LED light once and finally run No.100 action group once.