**電通四甲微處理器實驗 實驗結報**

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| **實驗名稱** | **Lab 08—中斷控制與超音波測距** | | |
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1. **實驗目的**

**Arduino於當按下Pin2外部中斷0時,讀入超音波測距之值顯示於PC上**

1. **如何讀取超音波測距之值**
2. **如何將超音波測距之值顯示於LCD?**
3. **Arduino 如何規劃外部中斷 INT0?**
4. **接一SW,當按下SW時暫停所有中斷,實驗結果又如何?**
5. **實驗步驟**
6. **讀取超音波測距之值並顯示在 LCD 上**
7. **修改setup() 程式碼, 改LOW改成FALLING/RAISING**
8. **修改int0() 程式碼, 於int0中執行超音波讀值，並將結果顯示在LCD上**
9. **Check Point 1程式碼**

**#include <Ultrasonic.h>**

**#define TRIGGER\_PIN 13**

**#define ECHO\_PIN 14**

**Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);**

**void setup() {**

**Serial.begin(9600);**

**}**

**void loop() {**

**float cmMsec, inMsec;**

**long microsec = ultrasonic.timing();**

**cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM);**

**inMsec = ultrasonic.convert(microsec, Ultrasonic::IN);**

**Serial.print("MS: "); Serial.print(microsec);**

**Serial.print(" CM: "); Serial.print(cmMsec);**

**Serial.print(",IN: "); Serial.print(inMsec);**

**delay(1000);**

**delay(100);**

**}**

1. **實驗結果及分析1**
2. **Check Point 2程式碼**

**#include <Ultrasonic.h>**

**#define TRIGGER\_PIN 13**

**#define ECHO\_PIN 14**

**volatile boolean state=LOW;**

**const byte intPin=8;**

**Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);**

**void setup() {**

**pinMode(6,INPUT);**

**Serial.begin(9600);**

**attachInterrupt(intPin, int0, FALLING);**

**}**

**float cmMsec, inMsec;**

**long microsec;**

**void loop() {**

**if(digitalRead(6) == LOW) {**

**noInterrupts();**

**}**

**else {**

**interrupts();**

**}**

**Serial.print("MS: "); Serial.print(microsec);**

**Serial.print(", CM: "); Serial.print(cmMsec);**

**Serial.print(", IN: "); Serial.println(inMsec);**

**delay(1000);**

**}**

**void int0() { //interrupt handler**

**microsec = ultrasonic.timing();**

**cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM);**

**inMsec = ultrasonic.convert(microsec, Ultrasonic::IN);**

**}**