**電通二甲微處理器實驗 實驗結報**

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| **實驗名稱** | **Lab 09 BLE** | | |
|  | **06050375** | **組員** | **張博硯** |

1. **實驗目的**

**Checkpoint1 由手機App 看到自己的 7697 iBeacon**

**Checkpoint2 由手機 App 看到自己的 7697 EddyStone URL Beacon Checkpoint3 由手機 App 控制 7697 LED**

1. **實驗步驟**

**Checkpoint1**

**下載範例程式BeaconAdvertisement**

**修改 configAsIBeacon中的 Major/Minor為自己學號後四碼**

**Checkpoint2**

**執行範例程式 EddystonURLadvertisement**

**將 URL 修改為自己的網址**

**由手機 App 搜尋 7697 Beacon**

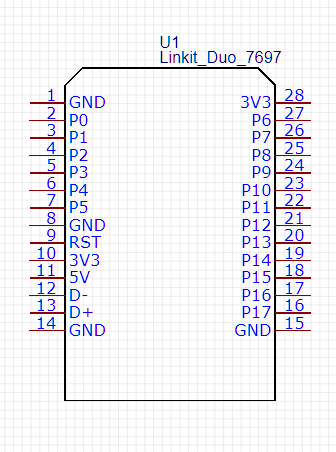
**Checkpoint3**

**下載範例程式 SimplePeripheral**

**將 UUID 前八碼 ”19B10010” 改成自己的學號”**

**將所有 “BLE LED” 字串改成自己的名字;**

1. **電路圖**



1. **程式碼**

**Checkpoint1**

**#include <LBLE.h>**

**#include <LBLEPeriphral.h>**

**void setup() {**

**//Initialize serial and wait for port to open:**

**Serial.begin(9600);**

**// Initialize BLE subsystem**

**Serial.println("BLE begin");**

**LBLE.begin();**

**while (!LBLE.ready()) {**

**delay(100);**

**}**

**Serial.println("BLE ready");**

**// configure our advertisement data as iBeacon.**

**LBLEAdvertisementData beaconData;**

**// This is a common AirLocate example UUID.**

**LBLEUuid uuid("E2C56DB5-DFFB-48D2-B060-D0F5A71096E0");**

**beaconData.configAsIBeacon(uuid, 03, 75, -40);**

**Serial.print("Start advertising iBeacon with uuid=");**

**Serial.println(uuid);**

**// start advertising it**

**LBLEPeripheral.advertise(beaconData);**

**}**

**void loop() {**

**// The underlying framework will advertise periodically.**

**// we simply wait here.**

**//**

**// You can use iBeacon apps such as**

**// "Locate Beacon" by Radius Networks on iOS devices**

**// to locate this beacon.**

**delay(3000);**

**}**

**Checkpoint2**

**#include <LBLE.h>**

**#include <LBLEPeriphral.h>**

**void setup() {**

**//Initialize serial and wait for port to open:**

**Serial.begin(115200);**

**// Initialize BLE subsystem**

**Serial.println("BLE begin");**

**LBLE.begin();**

**while (!LBLE.ready()) {**

**delay(100);**

**}**

**Serial.println("BLE ready");**

**// configure our advertisement data as iBeacon.**

**LBLEAdvertisementData beaconData;**

**// make an Eddystone-URL beacon that board casts**

**// https://labs.mediatek.com**

**// Note 1: You can obmit the suffix and tail part, e.g.**

**// https://goo.gl/Aq18zF**

**// can be constructed with**

**// configAsEddystoneURL(EDDY\_HTTPS, "goo.gl/Aq18zF");**

**// Note 2: Note that total url length must not exceed 17 bytes.**

**//**

**// Please refer to https://github.com/google/eddystone/tree/master/eddystone-url#url-scheme-prefix**

**// to know how the prefix/suffix/tails are expanded.**

**beaconData.configAsEddystoneURL(EDDY\_HTTPS, "06050375 ", EDDY\_DOT\_COM);**

**Serial.print("Start advertising Eddystone-URL");**

**// start advertising it**

**LBLEPeripheral.advertiseAsBeacon(beaconData);**

**}**

**void loop() {**

**// The underlying framework will advertise periodically.**

**// we simply wait here.**

**//**

**// You should be able to search this beacon with tools such as "Beacon Tools" on iOS or**

**// "Physical Web" app on Android.**

**delay(3000);**

**}**

**Checkpoint3**

**#include <LBLE.h>**

**#include <LBLEPeriphral.h>**

**// Define a simple GATT service with only 1 characteristic**

**LBLEService ledService("06050375-E8F2-537E-4F6C-D104768A1214");**

**LBLECharacteristicInt switchCharacteristic("06050375-E8F2-537E-4F6C-D104768A1214", LBLE\_READ | LBLE\_WRITE);**

**void setup() {**

**// Initialize LED pin**

**pinMode(LED\_BUILTIN, OUTPUT);**

**digitalWrite(LED\_BUILTIN, LOW);**

**//Initialize serial and wait for port to open:**

**Serial.begin(9600);**

**// to check if USR button is pressed**

**pinMode(6, INPUT);**

**// Initialize BLE subsystem**

**LBLE.begin();**

**while (!LBLE.ready()) {**

**delay(100);**

**}**

**Serial.println("BLE ready");**

**Serial.print("Device Address = [");**

**Serial.print(LBLE.getDeviceAddress());**

**Serial.println("]");**

**// configure our advertisement data.**

**// In this case, we simply create an advertisement that represents an**

**// connectable device with a device name**

**LBLEAdvertisementData advertisement;**

**advertisement.configAsConnectableDevice("Rick");**

**// Configure our device's Generic Access Profile's device name**

**// Ususally this is the same as the name in the advertisement data.**

**LBLEPeripheral.setName("Rick");**

**// Add characteristics into ledService**

**ledService.addAttribute(switchCharacteristic);**

**// Add service to GATT server (peripheral)**

**LBLEPeripheral.addService(ledService);**

**// start the GATT server - it is now**

**// available to connect**

**LBLEPeripheral.begin();**

**// start advertisment**

**LBLEPeripheral.advertise(advertisement);**

**}**

**void loop() {**

**delay(1000);**

**Serial.print("conected=");**

**Serial.println(LBLEPeripheral.connected());**

**if (digitalRead(6))**

**{**

**Serial.println("disconnect all!");**

**LBLEPeripheral.disconnectAll();**

**}**

**if (switchCharacteristic.isWritten()) {**

**const char value = switchCharacteristic.getValue();**

**switch (value) {**

**case 1:**

**digitalWrite(LED\_BUILTIN, HIGH);**

**break;**

**case 0:**

**digitalWrite(LED\_BUILTIN, LOW);**

**break;**

**default:**

**Serial.println("Unknown value written");**

**break;**

**}**

**}**

**}**

1. **心得討論**

**今天難在要懂他在做什麼，不然只是改改程式誰都會**