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基礎知識

2. 開始使用 **ARDUINO IOT CLOUD**

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1. 甚麼是物聯網 (IoT) ?

物聯網 (Internet of Things , 簡稱 IoT) 是指透過互聯網聯繫不同具有獨立功能的設備，讓它們之間互聯互通，實現遠端監測、遙控及收集資料等操作。

2. 甚麼是 Arduino IoT Cloud?

Arduino IoT Cloud 是一個在線平台，可讓你輕鬆創建、部署和監控 IoT 項目。

使用 Arduino IoT Cloud，你需要一塊有 WiFi 的開發板。你可以選擇使用官方 Arduino 開發板或基於 ESP32 / ESP8266 微控制器的開發板。

3. 創建一個 Arduino 帳戶

在開始使用 Arduino IoT cloud 之前，我們要先在 Arduino 網頁開設一個帳戶。(<https://create.arduino.cc/iot/things>)

想要使用 Arduino 的所有雲上服務，包括 Arduino Web Editor 和 Arduino IoT Cloud，你都必須要有一個 Arduino 帳戶。

帳戶的建立是完全免費的，只需要提供一個電郵地址即可。

4. 使用 Arduino IoT Cloud

在本節中，我們會學習在 Arduino Cloud IoT 中設置和使用 ESP8266 開發板。我們會嘗試在開發板上產生一個隨機數，並發送到雲端。我們也會從雲端去遙控開發板上的 LED。

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自 學 教 材

Sample

專案一：寵物餵食器

目錄

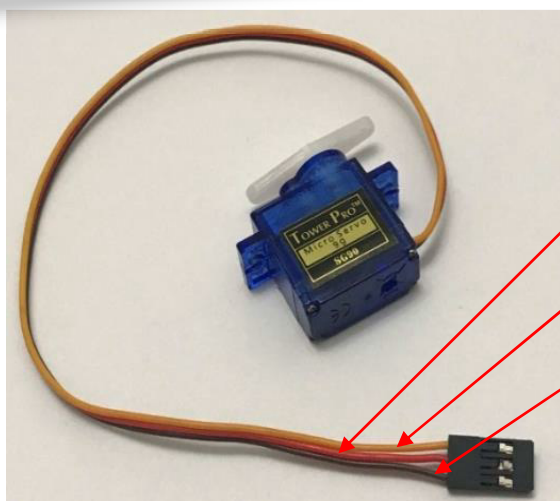
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1. 所需硬件

- NodeMCU 開發板 (連 USB 線)
- 麵包板
- SG-90 伺服電機 (180 度轉動)
- 15cm 杜邦線 (公對公、母對母)
- iOS 或 Android 系統的智能手機或平板電腦

2. 使用 slide 組件來控制伺服電機

伺服電機是一種具有輸出軸的小型設備。通過向伺服系統發送編碼信號，可以將該軸定位到特定的角度位置。只要輸入線上存在編碼信號，舵機就會保持軸的角度。如果編碼信號發生變化，則軸的角度也會發生變化。伺服電機常見於遙控飛機的升降舵和方向舵。它們也應用在遙控車和木偶，當然還有機器人。



Power Supply

Control Signal

Ground

最常見的伺服電機，輸出軸可以被控制在 0 到 180 度的範圍內旋轉。伺

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自學教材

專案二：小型氣象站

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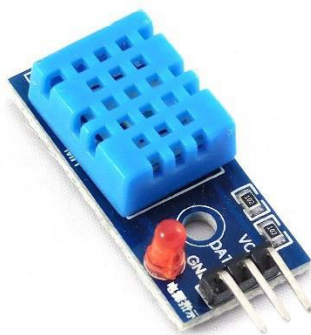
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1. 所需硬件

- NodeMCU 開發板 (連 USB 線)
- 麪包板
- DHT11 溫濕度感應器模組
- GY-30 BH1750 光強度模組
- 15cm 杜邦線 (公對公、母對母)
- iOS 或 Android 系統的智能手機或平板電腦

2. DHT11 溫濕度感應器模組

DHT11 是一種常用的溫濕度感應器。該感應器帶有一個專用的 NTC 熱敏電阻來測量溫度和一個 8 位元微控制器來將輸出的溫度和濕度值變為串行數據。



該感應器可以測量 0°C 至 50°C 的溫度和 20%至 90%的濕度，精度為 $\pm 1^{\circ}\text{C}$ 和 $\pm 1\%$ 。

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Basic Knowledge

2. GETTING STARTED WITH ARDUINO IOT CLOUD

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1. What is Internet of Things (IoT)?

The Internet of Things (IoT) refers to the linkup of separate devices of independent functions so that communications and connections exist among them with the purpose of performing such operations as monitoring, remote control and data collection from the remote end.

2. What is Arduino IoT Cloud?

The Arduino IoT Cloud is an online platform that makes it easy for you to create, deploy and monitor IoT projects.

To use the **Arduino IoT Cloud**, a cloud compatible board is required. You can choose between using an official Arduino board, or a board based on the ESP32 / ESP8266 microcontroller.

3. Creating an Arduino Account

To starting using the Arduino IoT cloud, we first need to log in or sign up to Arduino. (<https://create.arduino.cc/iot/things>)

An Arduino account is needed to use all of the Arduino Cloud services including Arduino IoT Cloud and the Arduino Web Editor.

As of January 2023, the sign up is totally free. All you need is a legitimate email account.

4. Using the Arduino IoT Cloud

In this section, we will go through the steps necessary to set up our ESP8266

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Self-learning Guide

Sample

PROJECT 1: PET FEEDER

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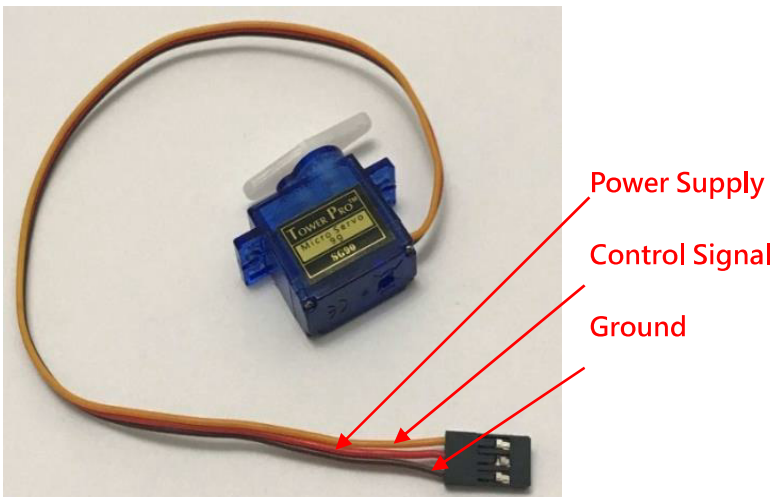
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1. Hardware List

- NodeMCU Development Board (with a USB cable)
- Breadboard
- SG-90 Servo Motor (180-degree rotation)
- 15cm Jumper Wires (M/M, F/F)
- iOS or Android Smartphone or Tablet Computer

2. Using Slide widget to control Servo Motor

A Servo Motor is a small device that has an output shaft. This shaft can be positioned to specific angular positions by sending the servo a coded signal. As long as the coded signal exists on the input line, the servo will maintain the angular position of the shaft. If the coded signal changes, the angular position of the shaft changes. In practice, servos are used in radio-controlled airplanes to position control surfaces like the elevators and rudders. They are also used in radio-controlled cars, puppets, and of course, robots.



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Self-learning Guide

PROJECT 2: MINI WEATHER STATION

Sample

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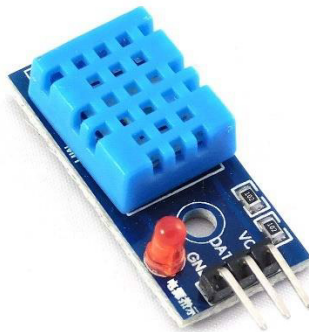
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1. Hardware List

- NodeMCU Development Board (with a USB cable)
- Breadboard
- DHT11 Humidity & Temperature Sensor Module
- GY-30 BH1750 Light Intensity Module
- 15cm Jumper Wires (M/M, F/F)
- Smartphone or Tablet Computer (iOS or Android)

2. DHT11 Temperature and Humidity Sensor

The DHT11 is a commonly used Temperature and humidity sensor. The sensor comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data.



The sensor can measure temperature from 0°C to 50°C and humidity from 20% to 90% with an accuracy of $\pm 1^\circ\text{C}$ and $\pm 1\%$.