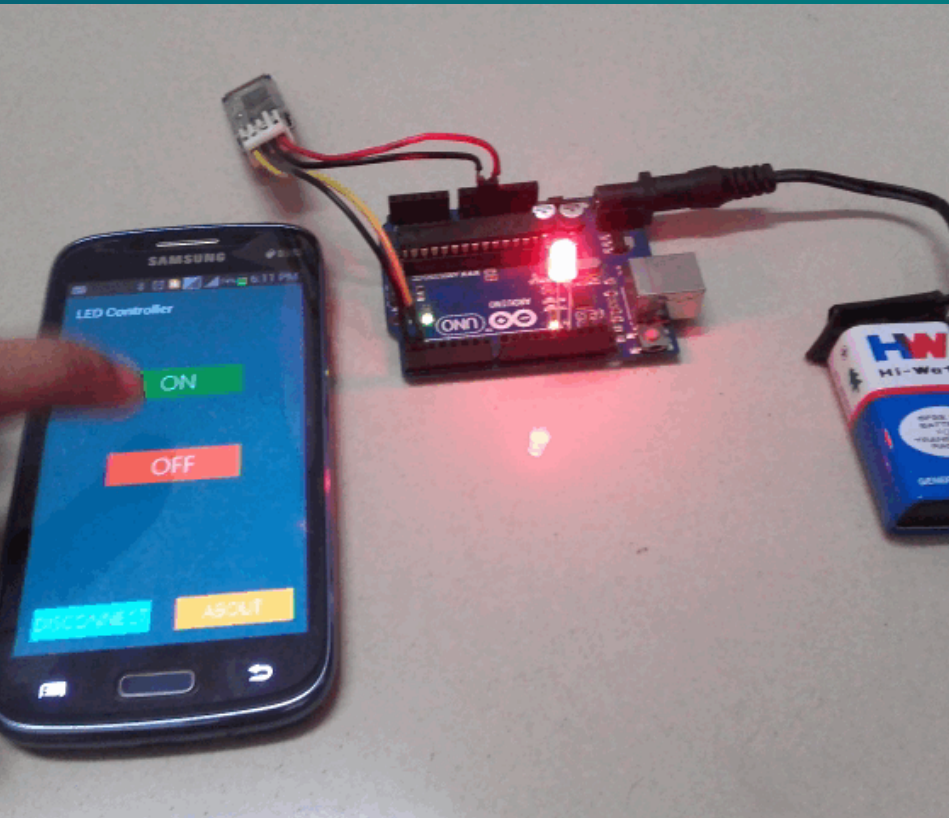


Internet Of Things



Bluetooth Connectivity

Go wireless!



Bluetooth is a standard wire-replacement communications protocol primarily designed for low-power consumption, with a short range based on low-cost transceiver microchips in each device using using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz.

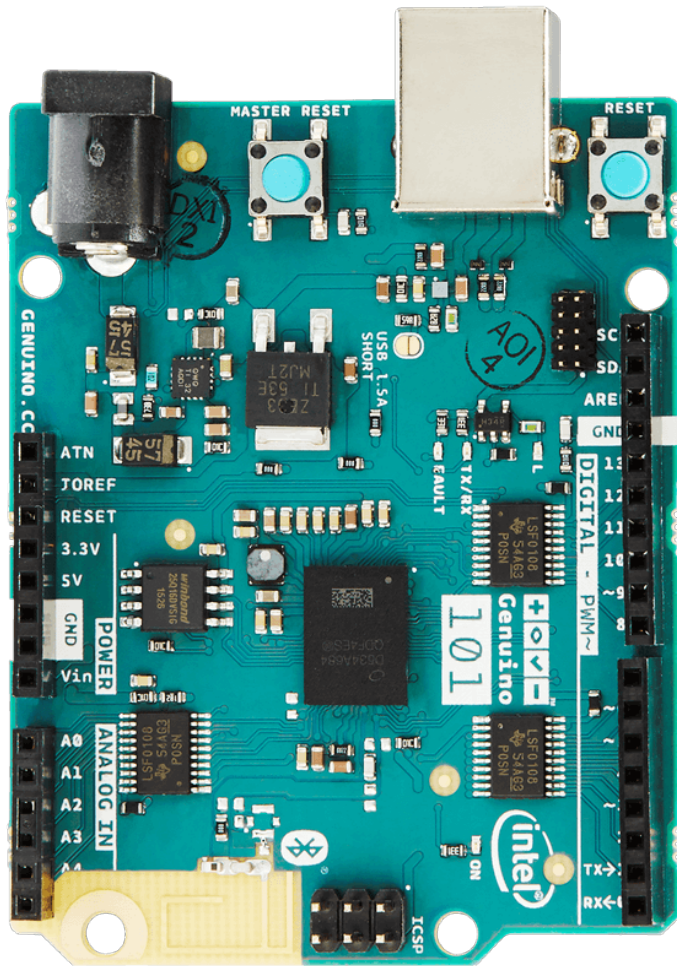
Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. The latest bluetooth technology module, Bluetooth 5, officially unveiled during a media event in London (UK) on June 16th, 2016.

Bluetooth Classic HC-05



Bluetooth protocol: Bluetooth v2.0 + EDR
Frequency: 2.4GHz ISM band
Modulation: GFSK
Emission power: $\leq 4\text{dBm}$, Class 2
Sensitivity: $\leq -84\text{dBm}$ at 0.1% BER
Speed Asynchronous: 2.1 Mbps (Max)
Speed Synchronous: 1 Mbps
Security: Authentication & encryption
Profiles: Bluetooth serial port
Power supply: +3.3 VDC 50 mA
Working temperature: -20 ~ +75 Centigrade
Dimension: 26.9 mm x 13 mm x 2.2 mm

Arduino 101 Bluetooth Low Energy



Microcontroller: Intel Curie
Operating Voltage: 3.3V (5V I/O)
Input Voltage: 7-12V
Digital I/O: Pins 14
PWM Digital I/O: Pins 4
Analog Input: Pins 6
DC Current per Pin: 20 mA
Flash Memory: 196 kB
SRAM: 24 kB
Clock Speed: 32MHz
Features: Bluetooth LE, 6-axis accel/gyro
Length: 68.6 mm
Width: 53.4 mm
Weight: 34 gr



Arduino & Bluetooth

1. AT Commands

2. Arduino Serial Communication

3. Android MIT App Inventor

AT Commands

AT commands are instructions used to control a modem or wireless communication module such as bluetooth device. AT is the abbreviation of **ATtention**, and every command line starts with "AT" or "at". That's why it commands are called AT commands.

AT+NAME=Lin01	// change name to "Lin01"
AT+ADDR?	// view MAC Address
AT+PSWD?	// view password, default = 1234
AT+PSWD=9876	// change password to = 9876

[https://www.itead.cc/wiki/Serial_Port_Bluetooth_Module_\(Master/Slave\)_:__HC-05](https://www.itead.cc/wiki/Serial_Port_Bluetooth_Module_(Master/Slave)_:__HC-05)

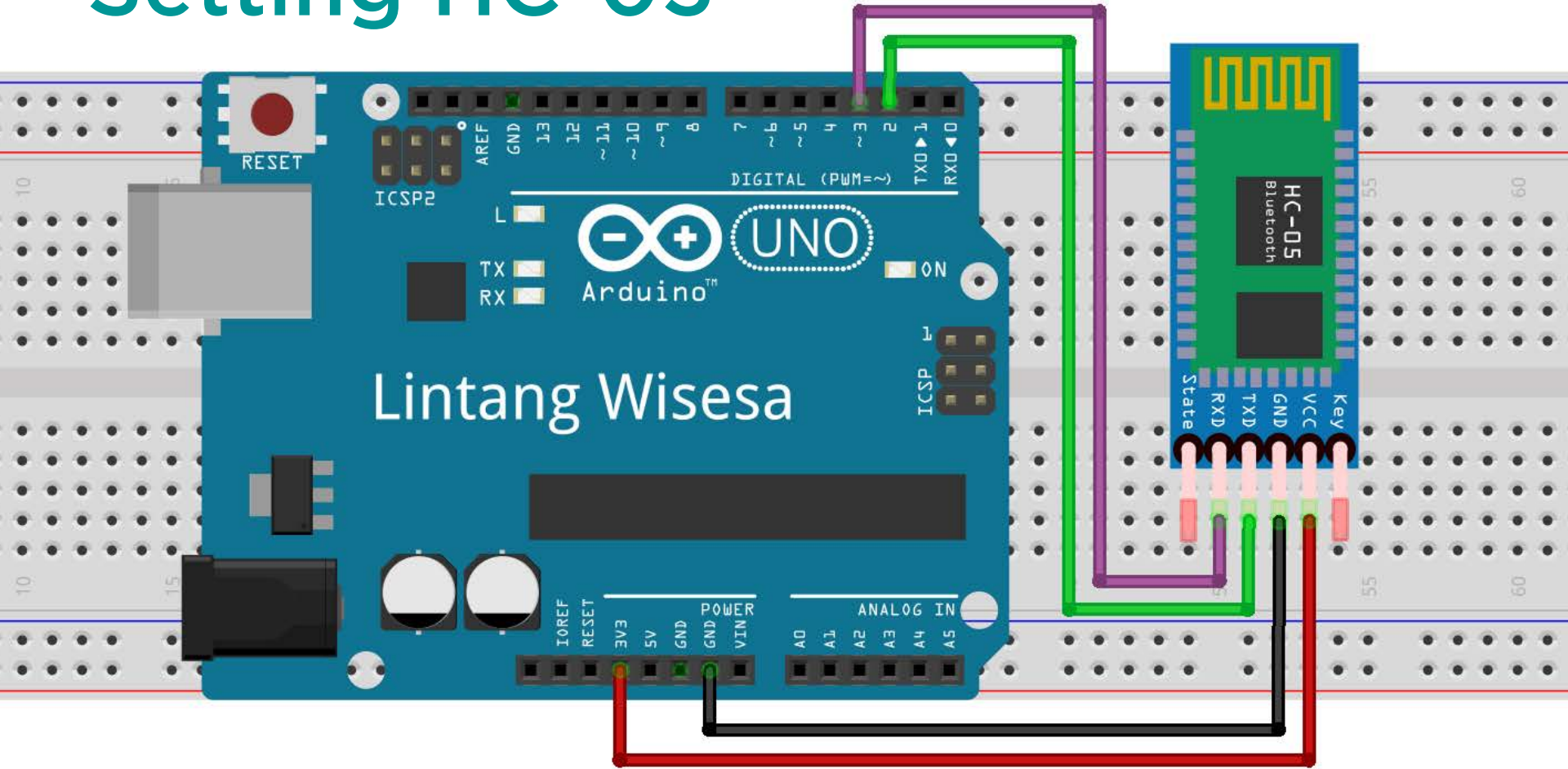
Setting BT HC-05

```
#include <SoftwareSerial.h>
SoftwareSerial btSerial(2, 3); // RX | TX

void setup() {
    Serial.begin(9600);
    Serial.println("Enter AT commands:");
    btSerial.begin(38400);
    // HC-05 default baudrate in AT commands
}

void loop() {
    if (btSerial.available())
        Serial.write(btSerial.read());
    if (Serial.available())
        btSerial.write(Serial.read());
}
```


Setting HC-05



- ❖ Untuk masuk mode AT, saat memasang VCC ke 3.3v sembari tekan & tahan tombol reset kecil di HC-05.
- ❖ Tanda sudah masuk mode AT: HC-05 blink lambat tiap 2 detik & AT command dapat diakses via serial monitor (Both NL&CR).



Setting Bluetooth HC-05

Open Serial Monitor & Access AT Command

AT // test AT command, respond = “OK”

AT+ADDR? // view MAC Address

AT+PSWD? // view password, default = 1234

AT+NAME=Lin01 // change name to “Lin01”

AT+PSWD=9876 // change password to = 9876



BlueTerm

pymasde.es Communication

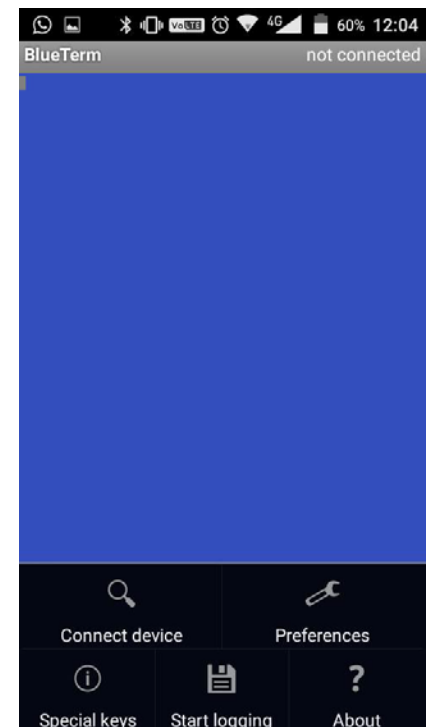
★★★★★ 1,285

3+

! You don't have any devices

+ Add to Wishlist

Install



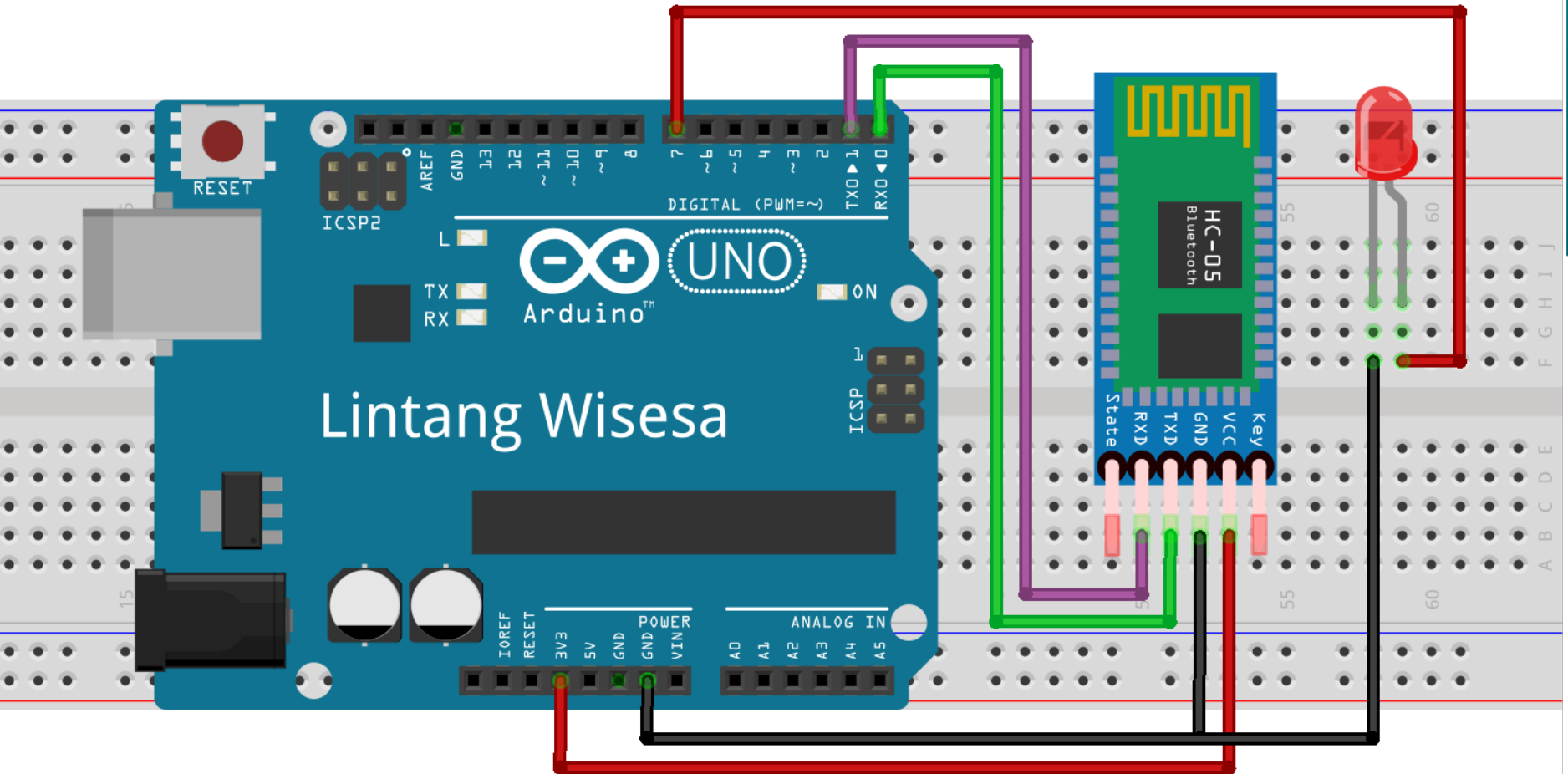
Bluetooth Control & Monitor

```
int led = 7; char input;

void setup () {
  pinMode (led,OUTPUT);
  Serial.begin(9600);
  Serial.println("Komunikasi Serial BT");}

void loop () {
  if (Serial.available()) {
    input = Serial.read();
    if (input == 'a' || input == 'A')
      {digitalWrite(led, HIGH);
      Serial.println("LED Hidup");}
    if (input == 's' || input == 'S')
      {digitalWrite(led, LOW);
      Serial.println("LED Mati");}
  }
}
```

Bluetooth Control & Monitor





Android MIT App Inventor

1. Click *ai2.appinventor.mit.edu*
2. Design your app's interface
3. Code your app with block



Android MIT App Inventor

MIT App Inventor 2 Beta

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Purwadhika_IoT Screen1 • Add Screen ... Remove Screen Designer Blocks

Palette

- User Interface
- Layout
- Media
- Drawing and Animation
- Sensors
- Social
- Storage
- Connectivity
 - ActivityStarter
 - BluetoothClient**
 - BluetoothServer
 - Web
- LEGO® MINDSTORMS®
- Experimental
- Extension

Viewer

☐ Display hidden components in Viewer
☐ Check to see Preview on Tablet size.

Screen1

9:48

Sambung BT

Putus BT

ON

OFF

Components

- Screen1
 - ListPicker1
 - Button1
 - Button2
 - Button3
 - BluetoothClient1

Rename Delete

Properties

Screen1

AboutScreen

AlignHorizontal
Center : 3

AlignVertical
Center : 2

AppName
Purwadhika_IoT

BackgroundColor
Orange

BackgroundImage
None...

CloseScreenAnimation
Default

Icon
None...

OpenScreenAnimation
Default

ScreenOrientation
Unspecified

Scrollable

Media



Android MIT App Inventor

MIT App Inventor 2 Beta

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Purwadhika_IoT

Screen1 • Add Screen ... Remove Screen

Designer Blocks

Built-in

- Control
- Logic
- Math
- Text
- Lists
- Colors
- Variables
- Procedures

Screen1

- ListPicker1
- Button1
- Button2
- Button3
- BluetoothClient1

Any component

Rename Delete

Show Warnings

when ListPicker1 .BeforePicking

do set ListPicker1 . Elements to BluetoothClient1 . AddressesAndNames

when ListPicker1 .AfterPicking

do set ListPicker1 . Selection to call BluetoothClient1 .Connect address ListPicker1 . Selection

when Button1 .Click

do call BluetoothClient1 .Disconnect

when Button2 .Click

do call BluetoothClient1 .SendText text " a "

when Button3 .Click

do call BluetoothClient1 .SendText text " s "

Purwadhika
Startup and Coding School



MIT AI2 Companion

MIT Center for Mobile Learning Education

★★★★★ 16,381

3+

! You don't have any devices

+ Add to Wishlist

Install

