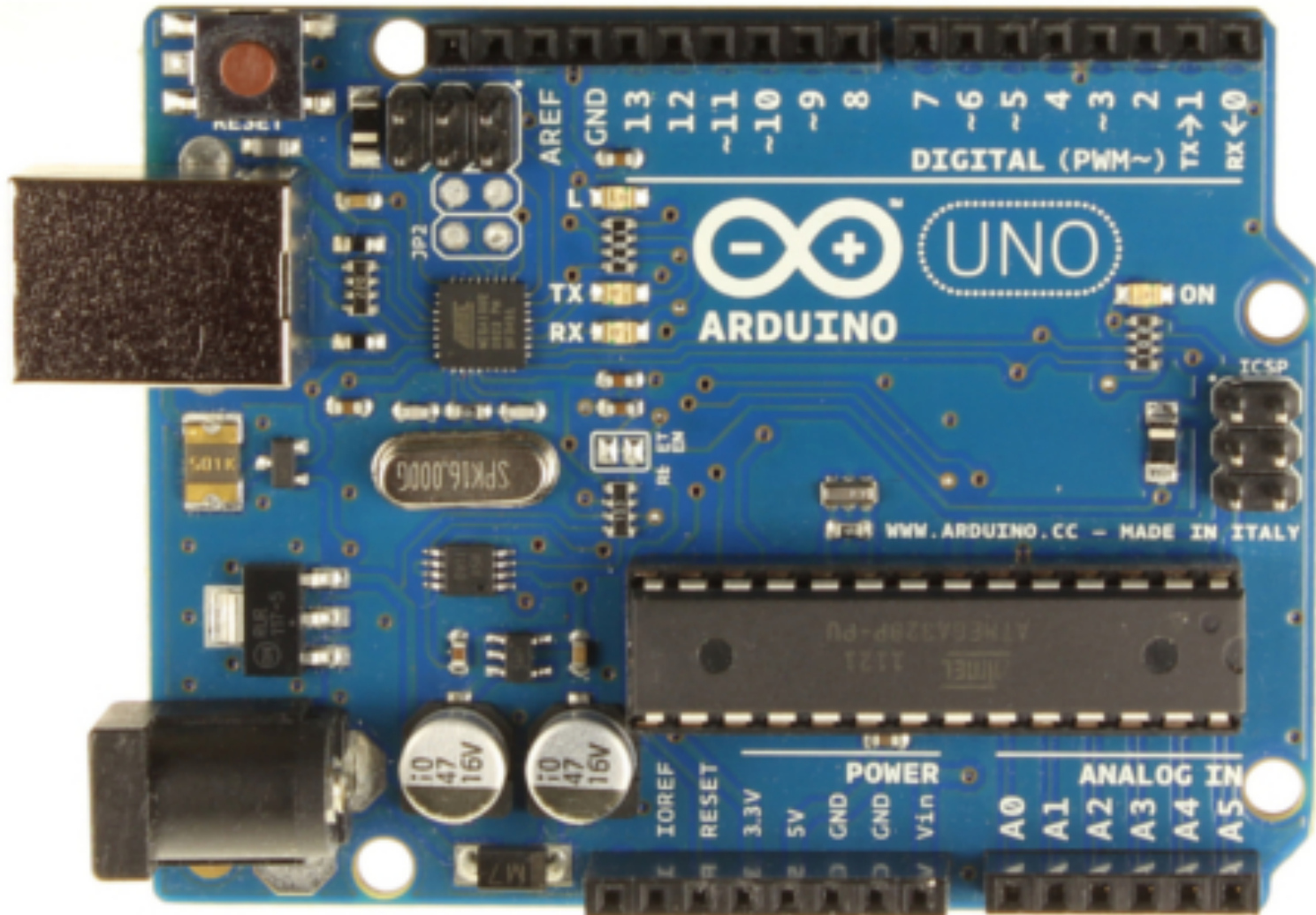# ARDUINO UNO

Connecting Sensors/Actuators
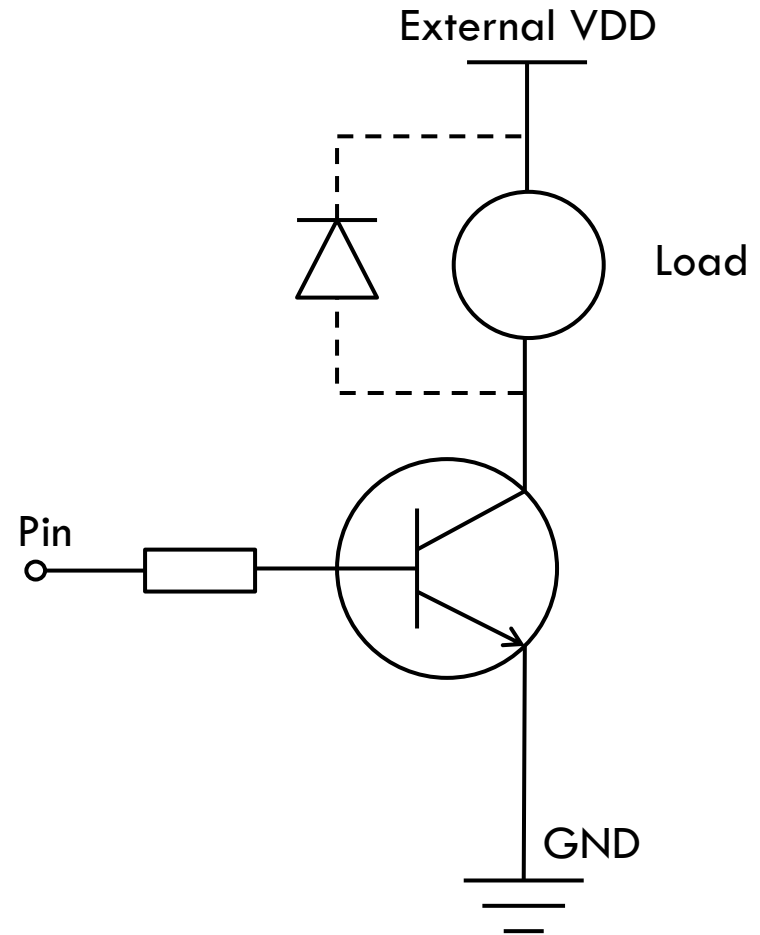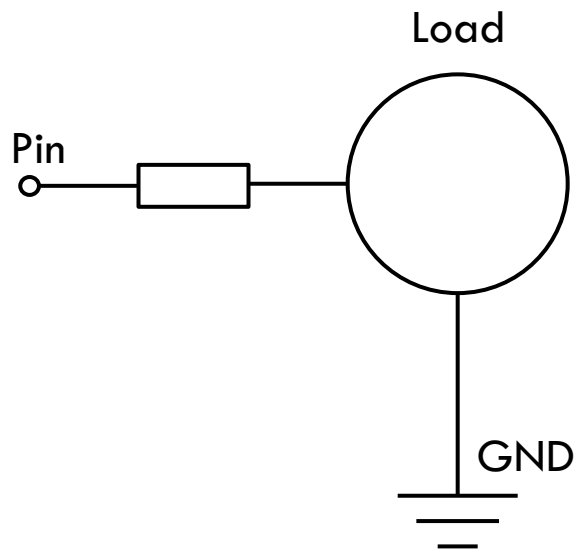
The board

Connecting a sensor

VDD

Vout

To Analog Input

GND

VDD

Variable resistor

To Analog Input
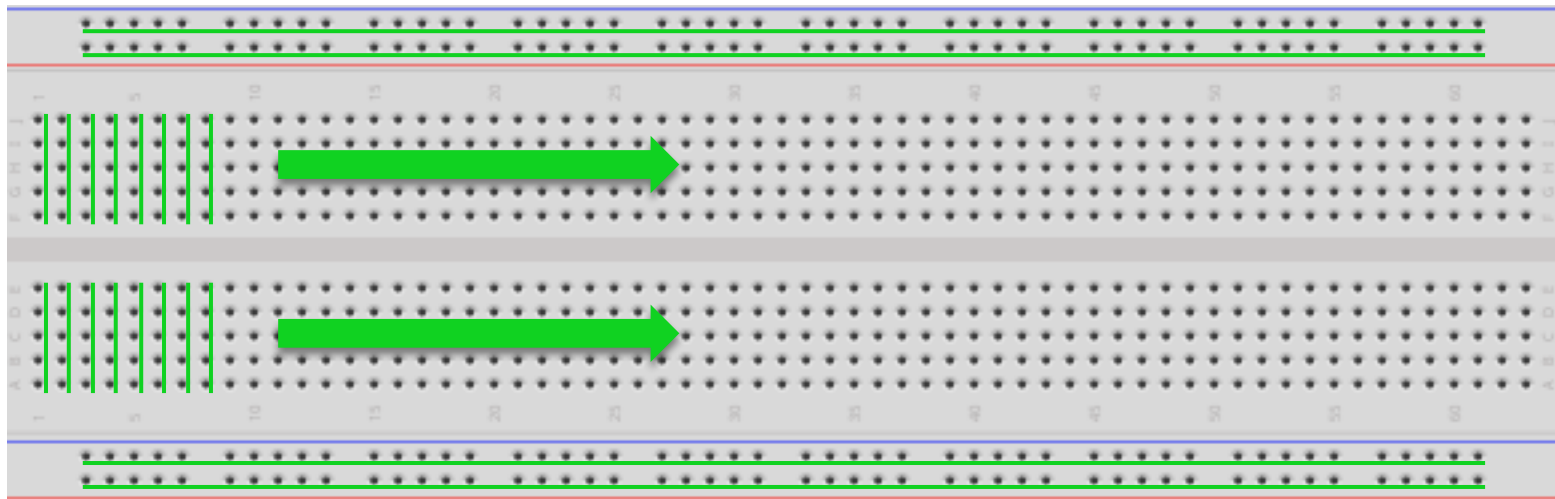
Pull Down Resistor

GND
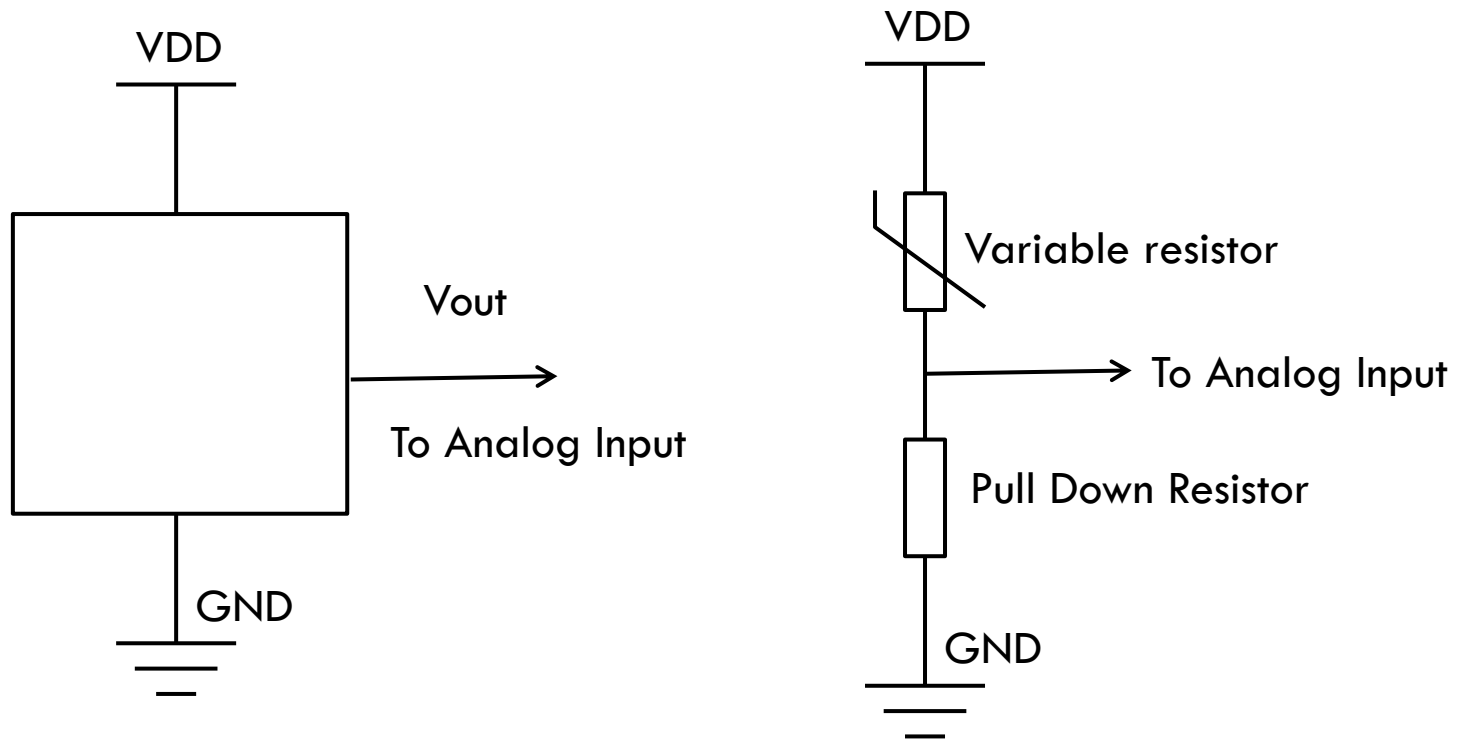
# Connecting an actuator or a load

Breadboard

- Useful for rapid prototyping
- Holes connected by green lines are short-circuited

# A preliminary example with Fritzing

Fritzing is an open-source hardware initiative that makes electronics accessible as a creative material for anyone. They offer a software tool, a community website and services to support designers and artists ready to move from physical prototyping to actual product.

Made with 🔲 Fritzing.org

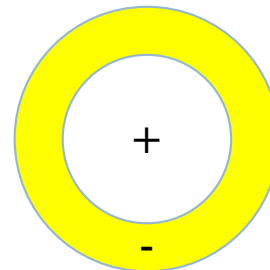# A preliminary example with Fritzing
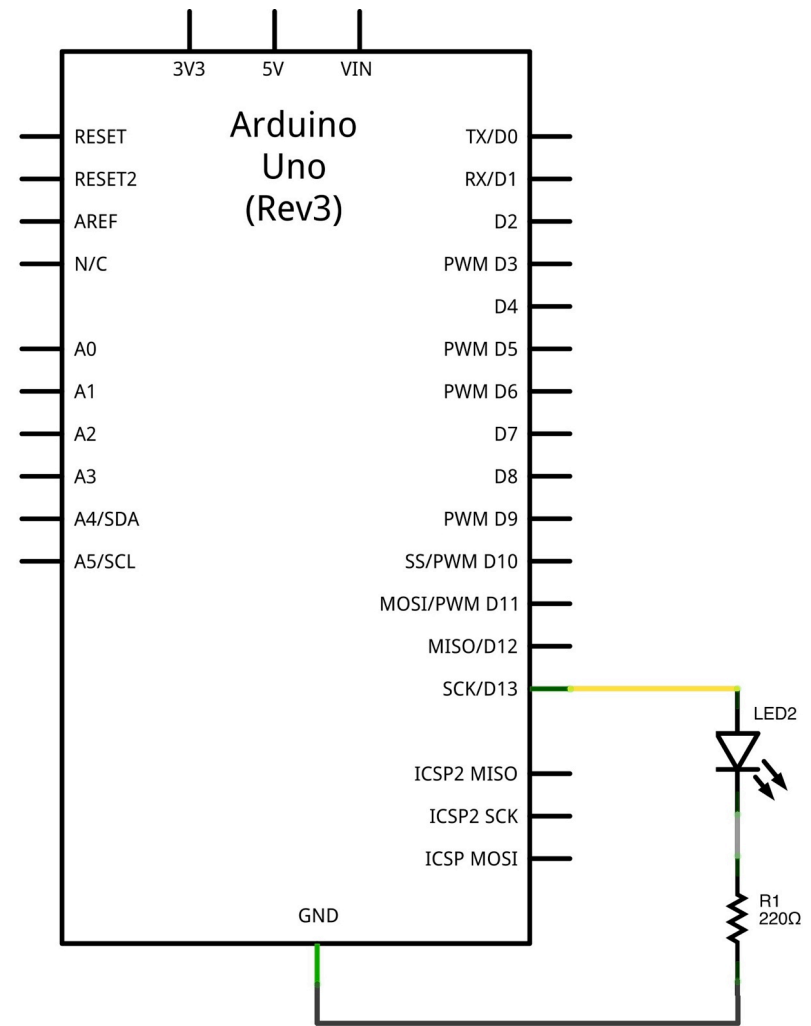
Made with **Fritzing.org**
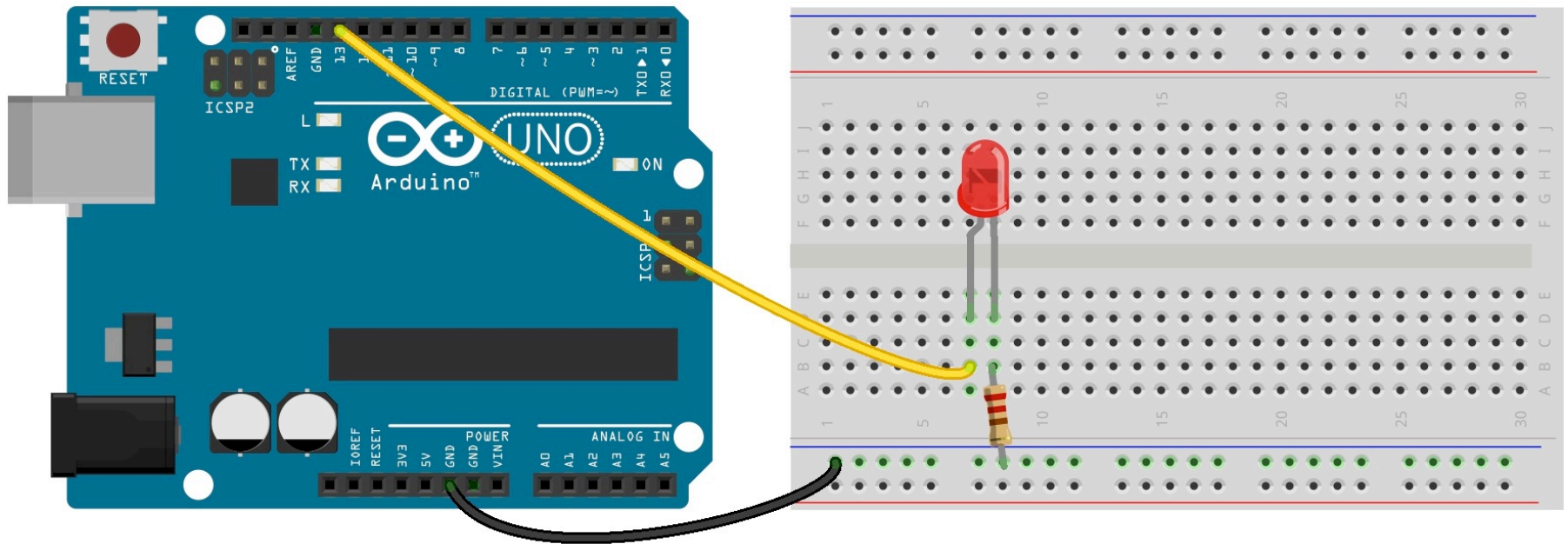
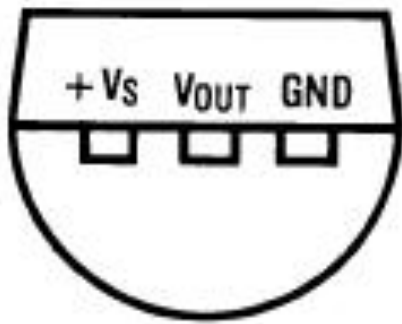# Other examples: Piezo

Made with ▢ Fritzing.org
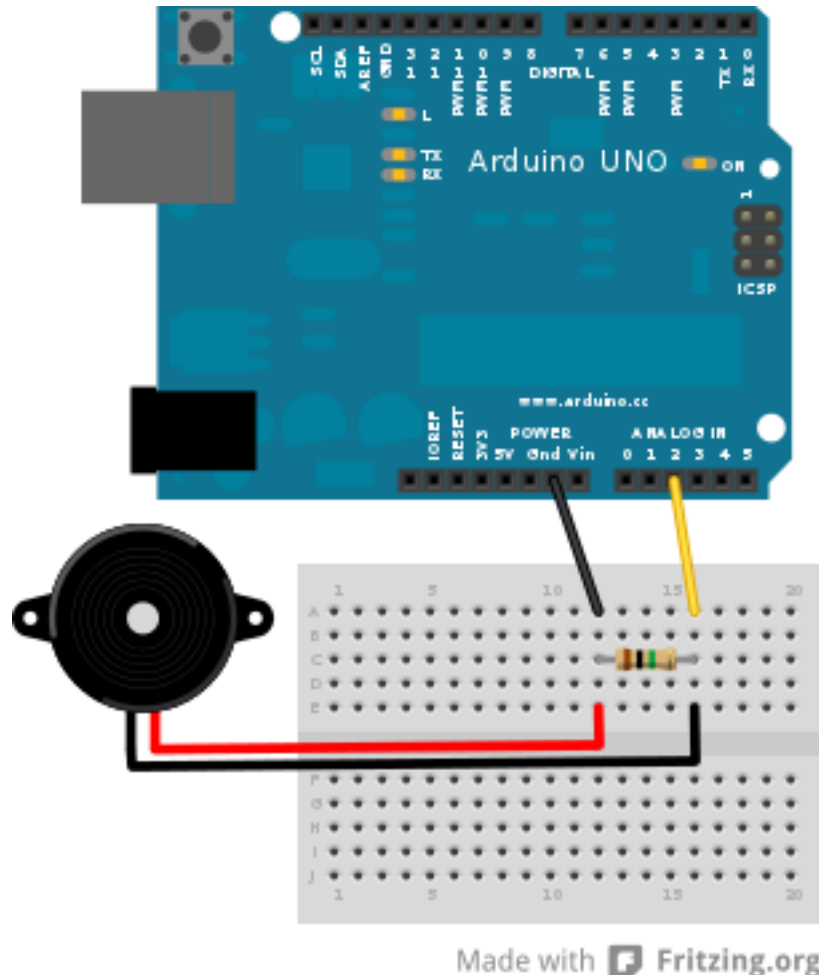
Can act as input or output (knock sensor or buzzer).

In the picture there is the knock sensor configuration

Temperature sensor: LM35

TO-92
Plastic Package

+Vs VOUT GND

BOTTOM VIEW

LM35

+5
Out
Gnd
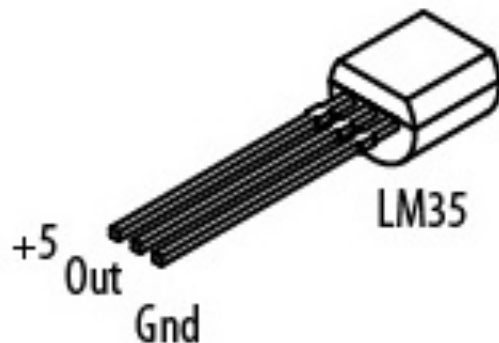
LM35DZ (TO-92 Package) is a precision integrated-circuit temperature sensor, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature (Linear + 10.0 mV/°C scale factor). As it draws only 60 µA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over a −55°C to +150°C temperature range.

BT Module: BlueSMiRF

- Can communicate with any other Bluetooth device that supports SPP

- Recognized as "FireFly-XXXX" with XXXX last part of MAC address

- Pairing password is 1234

- Baud rate is 9600 symbols/s (default was 115200 symbols/s)

https://www.sparkfun.com/products/12582

BT Module: BlueSMiRF

- Test it with a BT terminal e.g. *GetBlue Demo* (Android app).

GetBlue Demo settings:

- Source => BT

- Destination => None

- Bidirectional mode.

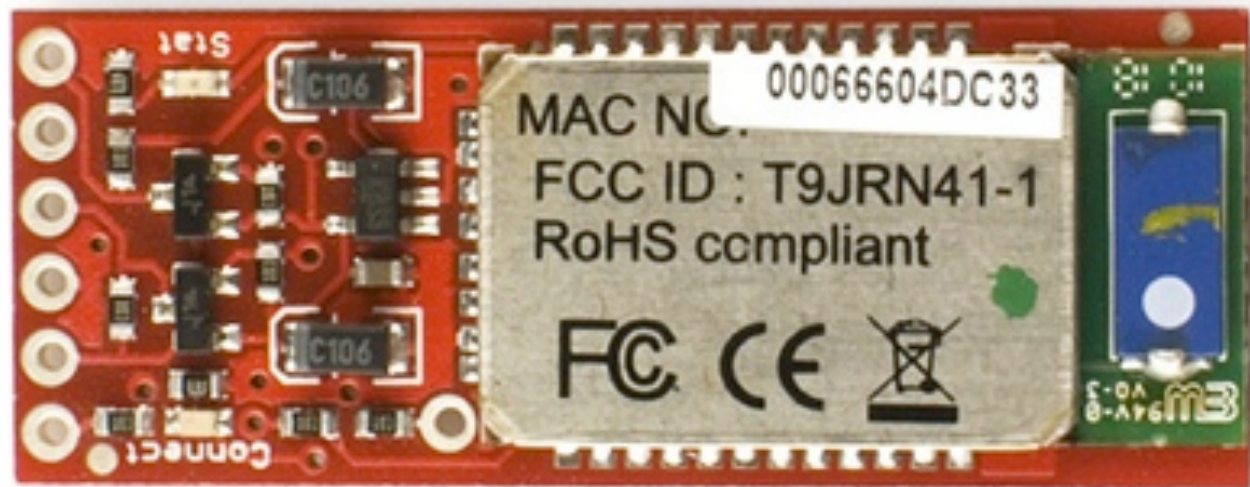# BT Module: BlueSMiRF

Pin Names:

RTS – O
RX – I
TX – O
GND
VCC
CTS–I

VCC range goes from 3.3V to 6 V

Remember:

BlueSMiRF TX => Arduino RX

BlueSMiRF RX => Arduino TX

LCD Module: LCD05

- Adjustable backlight and contrast with software commands
- 100 byte FIFO buffer
- Start-up screen can be personalised
- 20x4 or 16x2 screens can be used
- Keypad automatically scanned
- Array of useful commands
- Custom character generation
- Supports I2C/Serial modes
- 5 useable addresses for I2C

LCD Module: LCD05

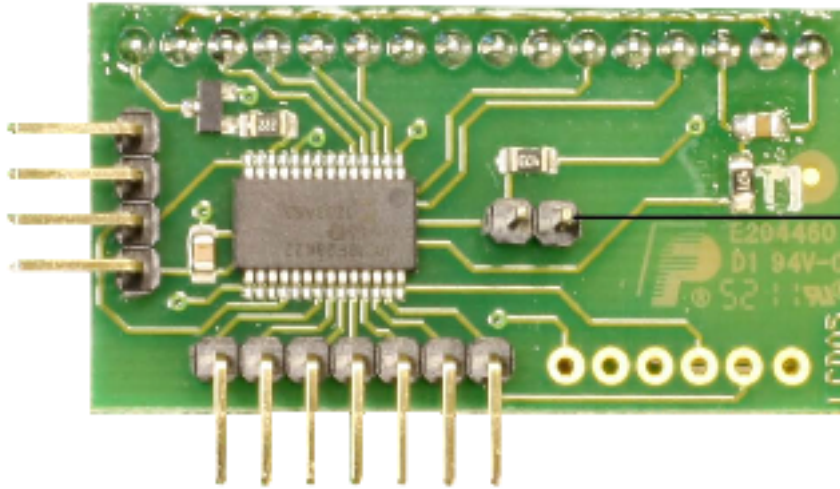PIN names:

VCC (5V)
SDA/TX
SCL/RX
GND

Mode:
Open =>I2C
Closed => Serial

Keypad connections
(see link below)

Remember:
LCD TX => Arduino RX
LCD RX => Arduino TX

http://www.robot-electronics.co.uk/htm/Lcd05tech.htm
http://andatche.com/code/arduino/lcd03/

RFID Module: Parallax RFID Reader

- Serial RFID Reader

- Baud rate 2400 symbols/s

- /ENABLE (LOW means: device enabled)

- Tags length is 12 bytes:

  \n + data + \r

  - \n = 0x0A = 10 => 1 byte

  - data => 10 bytes ID

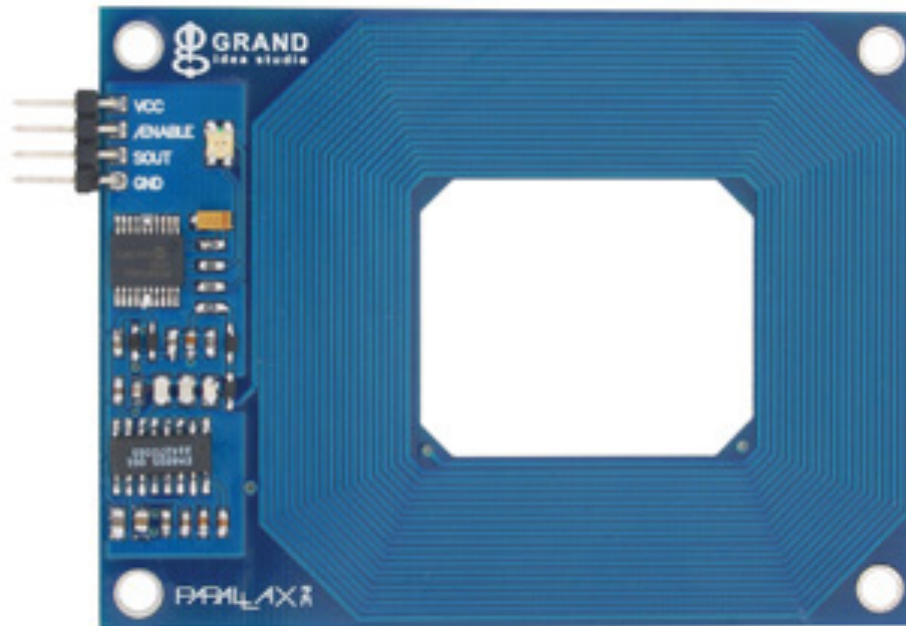 - \r = 0x0D = 13 => 1 byte

RFID Module: Parallax RFID Reader

PIN names:

VCC (5V)
/Enable
TX
GND

Remember: RFID TX => Arduino RX