



The playground is a publicly-editable wiki about Arduino.

[view](#) [history](#) [edit](#) [print](#) [login](#) [register](#)

- [Manuals and Curriculum](#)
- [Board Setup and Configuration](#)
- [Development Tools](#)
- [Interfacing With Hardware](#)

analog multiplexer/demultiplexer----- ---4051

- [Output](#)
- [Input](#)
- [Storage](#)
- [Communication](#)
- [Power supplies](#)
- [General](#)

[Interfacing with Software](#)

[Code Library and Tutorials](#)

[Suggestions & Bugs](#)

[Electronics Technique](#)

[Sources for Electronic Parts](#)

[Related Hardware and](#)

[Initiatives](#)

[Arduino People/Groups & Sites](#)

[Exhibition](#)

[Project Ideas](#)

[Languages](#)

PARTICIPATE

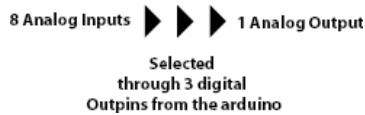
- [Create an account](#)
- [Suggestions](#)
- [Formatting suggestions](#)
- [All recent changes](#)
- [PmWiki](#)
- [WikiSandBox training](#)
- [Basic Editing](#)
- [Cookbook \(addons\)](#)
- [Documentation index](#)

[edit SideBar](#)

A multiplexer or demultiplexer enables you to expand the in-and outputs on your Arduino board. The 4051 is an 8 channel analog multiplexer / demultiplexer, thus:

- If you use the 4051 as a Multiplexer: You can choose between 8 different inputs and select just one you want to read at the time.
- If you use the 4051 as a Demultiplexer you can choose between 8 different outputs and select just one you want to write at the time.

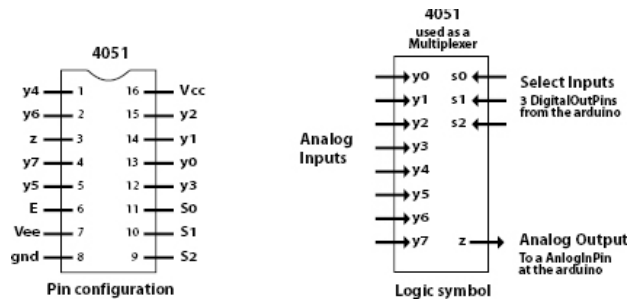
Futhermore, the 4051 is able to work with analog values; in the case of the Arduino, you are able to use the analog inputs with a voltage between 0-5V and route them to an Analog-In Pin on your Arduino.



To select the Pin we would like to read or write, we have to use the three Select Pins (So, S1 and S2). Each of these pins have to be connected to one digital out pin on the Arduino. Every pin is representing a number (So = 1; S1 = 2; S2 = 4) and if we set one of these Select pins to HIGH, the number the pin is representing will be transmitted to the 4051. For example:

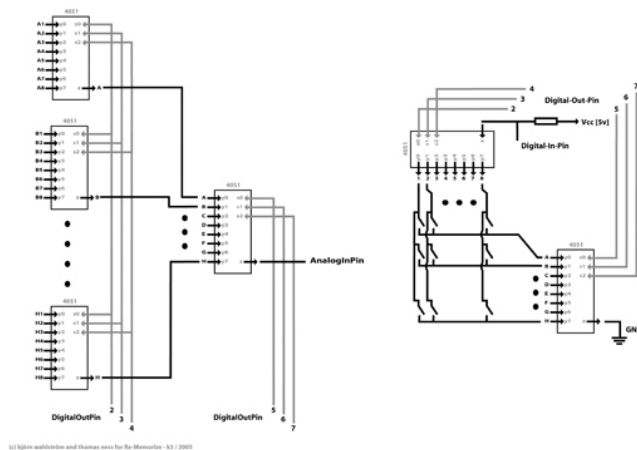
- If So and S1 are HIGH and S2 is LOW pin y3 is selected (1+2+0 = 3).
- If So and S2 is HIGH and S1 LOW pin y5 is selected (1+0+4 = 5).

It is not possible to read or write more than one pin on the 4051 at the same time, because you can only select one pin at a time. But you can read and write to the pins quite fast. There is no delay needed between selecting and read or writing the pin.



- Z ---- common input/output (connected to Arduino Input/Output)
- E ---- enable input (active LOW) (connected to ground (gnd))
- Vee --- negative supply voltage (connected to ground (gnd))
- gnd --- ground (0 V)
- So-S2 - select inputs (connected to three arduino digitalOut Pins)

- yo-y7 - independent inputs/outputs
- Vcc --- positive supply voltage (5v)



The left image above is an example how to use 9 multiplexer to read 64 analog Inputs just with one Analog-In-Pin on the arduino. The right image above is an example how to use two 4051 (one as demultiplexer and one as multiplexer) in a 8x8 Matrix to check 64 buttons or other digital Inputs just with one digital-In-Pin on the arduino (with the second setup you can just have two buttons on at the same time, otherwise you have to use the first (left) setup).

////////////////////////////////////code example

```

1.  /*
2.  * codeexample for using a 4051 * analog multiplexer / demultiplexer
3.  * by david c. and tomek n.* for k3 / malm høgskola
4.  *
5.  */
6.
7.  int led = 13;    //just a led
8.  int r0 = 0;     //value select pin at the 4051 (s0)
9.  int r1 = 0;     //value select pin at the 4051 (s1)
10. int r2 = 0;     //value select pin at the 4051 (s2)
11. int row = 0;    // storing the bin code
12. int count = 0; // just a count
13. int bin [] = {000, 1, 10, 11, 100, 101, 110, 111}; //bin = bin r, some times it is so easy
14.
15. void setup(){
16.
17.   pinMode(2, OUTPUT); // s0
18.   pinMode(3, OUTPUT); // s1
19.   pinMode(4, OUTPUT); // s2
20.   digitalWrite(led, HIGH);
21.   beginSerial(9600);
22. }
23.
24. void loop () {
25.
26.   for (count=0; count<=7; count++) {
27.     row = bin[count];
28.     r0 = row & 0x01;

```

```
29.   r1 = (row>>1) & 0x01;
30.   r2 = (row>>2) & 0x01;
31.   digitalWrite(2, r0);
32.   digitalWrite(3, r1);
33.   digitalWrite(4, r2);
34.   //Serial.println(bin[count]);
35.   delay (1000);
36. }
37. }
```

[\[Get Code\]](#)

all this stuff is also available in a pdf:
[analog multiplexer demultiplexer 4051.pdf](#)

(edited by tomek ness (k3/fhp))

 Share |     