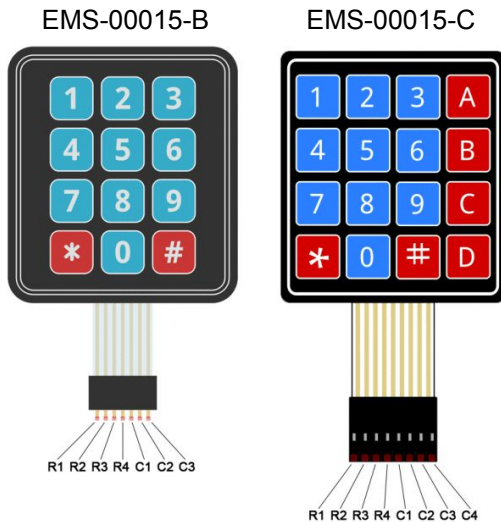


What is Keypad?



Membrane keypad is a matrix of push button switch connections with a graphics layer on top. The connections are arranged in rows and columns such that when a button is pressed one of the columns is connected to one of the rows. Available in a wide variety, keypads are used in various industrial and commercial applications. Such keyboard are specially used in applications that require cleanable surfaces, such as microwave ovens.

Scientific Fact and Applications

Existing in various types and sizes, each keypad has an array membrane switches and a connective row and column. The intersection of each row and column defines that particular switch. As the button is pressed, voltages across rows and columns are identified to determine which switch was pressed and the corresponding character.

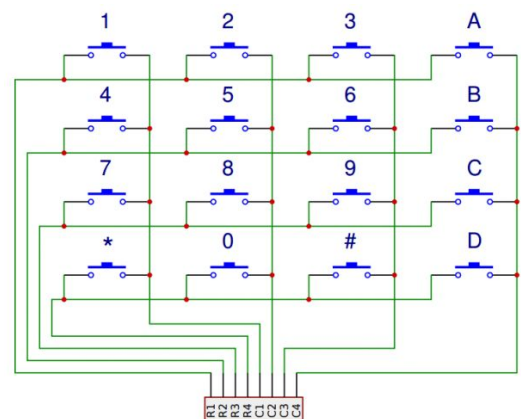
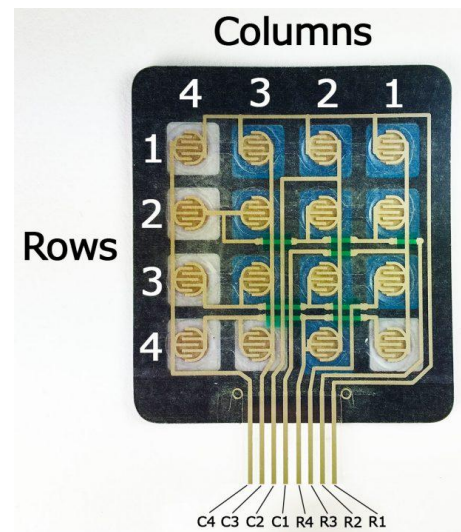
Applications:

Calculator

A very commonly used application of keypads are calculators. Calculators use keypads which can be complex, for example in scientific calculators, or simple, such as in basic calculators.

Security Lock

Many places use numerical locks with keypads to take in user input. The system is fitted with a pre-set password. If a given set of input matches the pre-set one, the lock opens. Otherwise, the lock remains closed.



Project

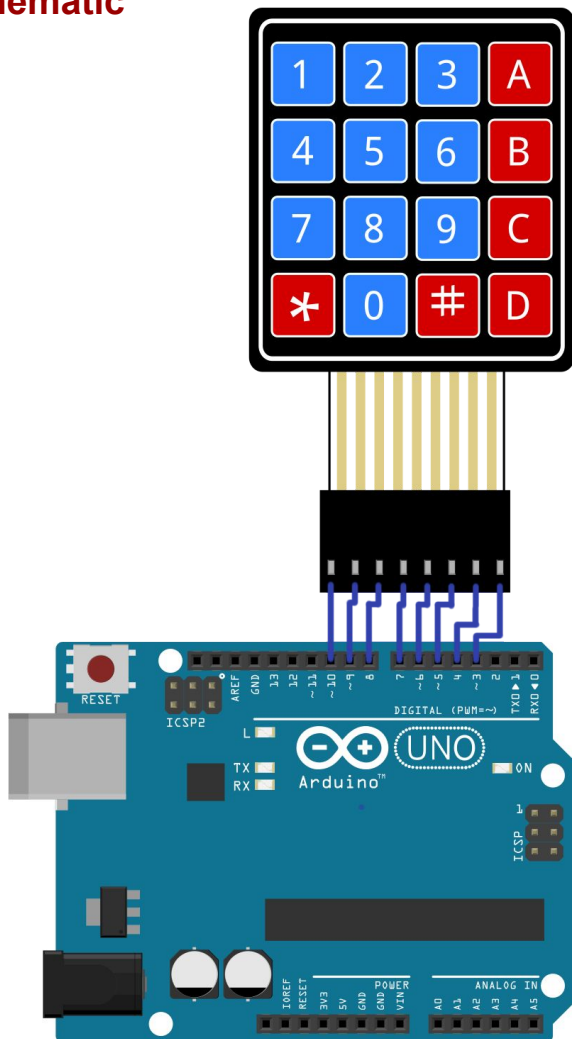
To identify which key is pressed by the user and print it on Serial Monitor

Procedure

4X4 Keypad

- Connect the Row pins ie **R1, R2, R3** and **R4** to **10, 9, 8, 7** to Arduino respectively
- Connect the Row pins ie **C1, C2, C3** and **C4** to **6, 5, 4, 3** to Arduino respectively
- Find and install the required libraries (h files) from <https://tinyurl.com/Z2MLibraries>.

Schematic



fritzing

Challenge Yourself

1. Make a secure lock with a relay system that can open only when password matches.
2. Make a basic calculator using keypad

Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
4X4 Keypad	EMS-00015-A or EMS-00015-B	1

Code

```

/*This code is written for EMS-0016-B and EMS-0016-C.*/

#include <Keypad.h> /*Library- Keypad.h*/
const byte ROWS = 4; /*No of rows = 4*/
const byte COLS = 4;

char keys[ROWS][COLS] = {
  {'1','2','3','A'},
  {'4','5','6','B'},
  {'7','8','9','C'},
  {'*','0','#','D'} };

byte rPins[ROWS] = {10, 9, 8, 7};
/*connect to the row pinouts of the keypad*/
byte cPins[COLS] = {6, 5, 4, 3}; /*connect to the column pinouts of the keypad*/

/*Create an object of keypad*/
Keypad keypad = Keypad( makeKeymap(keys), rPins, cPins, ROWS, COLS );

void setup() {
  Serial.begin(9600); /*Setting the Baud rate of communication be 9600*/
}

void loop() {
  char key = keypad.getKey();
  /* Read the key from Keypad*/

  /* Print if key pressed*/
  if (key) {
    Serial.print("Key Pressed : ");
    /*Print on serial monitor*/
    Serial.println(key);
    /*Printing the key pressed*/
  }
}

```