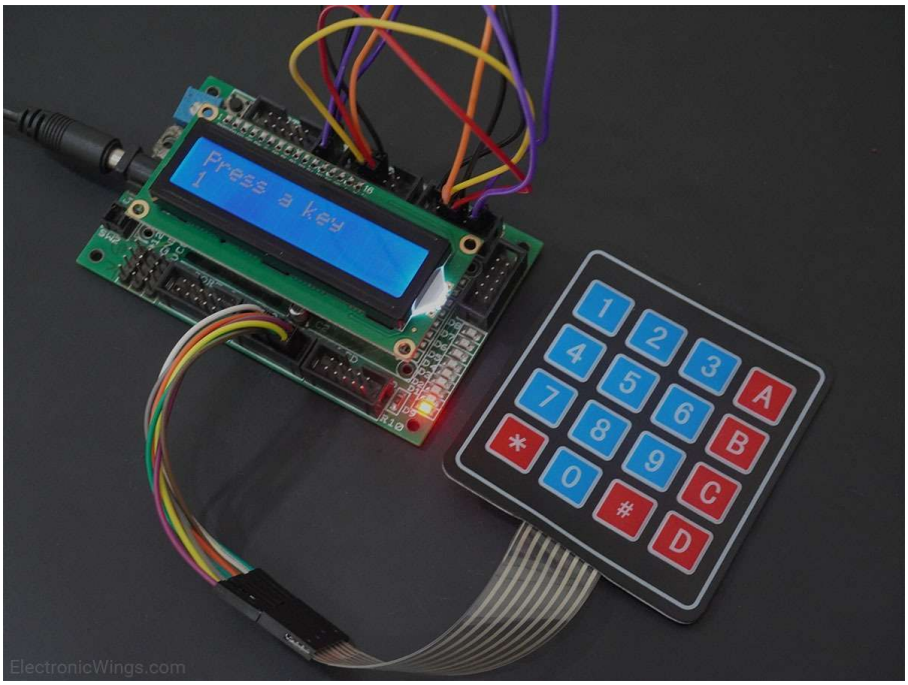
4x4 Keypad interfacing with AVR ATmega16/ATmega32



Overview of 4x4 Matrix Keypad

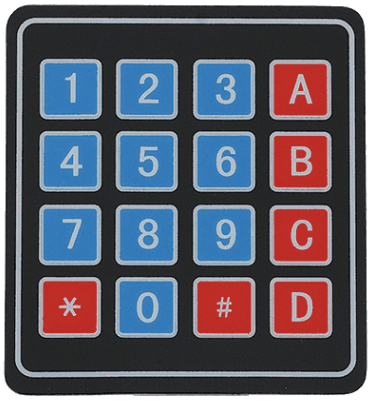
The keypad is used as an input device to read the key pressed by the user and to process it.

The 4x4 keypad consists of 4 rows and 4 columns. Switches are placed between the rows and columns. A keypress establishes a connection between the corresponding row and column between which the switch is placed.

In order to read the keypress, we need to configure the rows as outputs and columns as inputs.

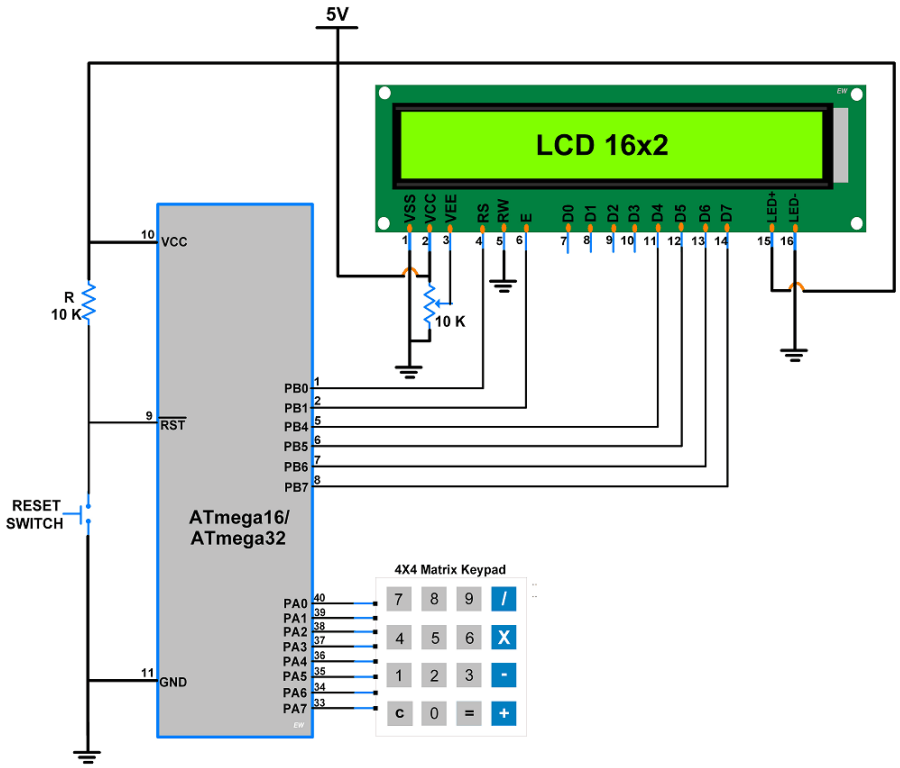
Columns are read after applying signals to the rows in order to determine whether or not a key is pressed and if pressed, which key is pressed.

For more information about the keypad and how to use it, refer to the topic **4x4 Keypad** (http://electronicwings.com/sensors-modules/4x4-keypad-module) in the sensors and modules section.

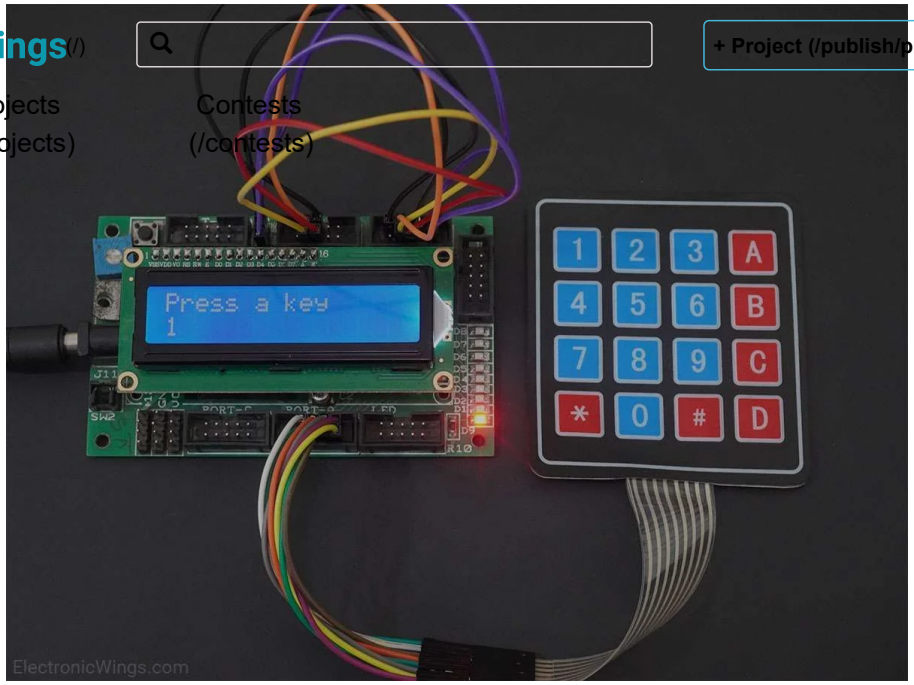


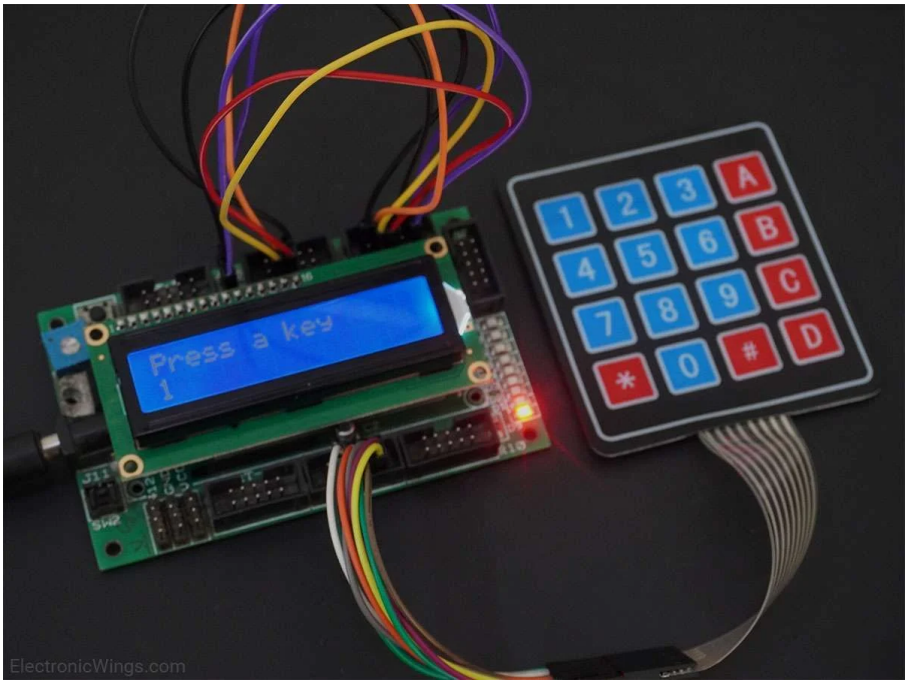
4x4 Keypad

Connection Diagram of 4x4 Keypad with ATmega16/32



Keypad Interfacing with ATmega16/32





Detect key pressed and print on LCD16x2 using ATmega16/32

Here, we are going to interface the 4x4 keypad with AVR ATmega16/ATmega32 and will display the pressed key on LCD16x2.

LCD16x2 is used here in 4-bit mode.

4x4 Matrix Keypad Code for Atmega16/32

```
/*
 * 4x4 Keypad Interfacing with ATmega16/32
 * http://www.electronicwings.com
 */

#include "LCD16x2_4bit.h"
#include <avr/io.h>
#include <util/delay.h>


#define KEY_PRT      PORTA
#define KEY_DDR      DDRA
#define KEY_PIN      PINA

unsigned char keypad[4][4] = {  {'7','8','9','/'},
                                {'4','5','6','*'},
                                {'1','2','3','-'},
                                {' ','0','=','+'}};

unsigned char colloc, rowloc;

char keyfind()
```

Components Used

ATmega 16 ATmega 16	X 1	(https://www.mouser.in/ProductDetail/Microchip-Technology-Atmel/ATMEGA16L-8PU?qs=%2Fha2pyFaduiGCJtTvs2wv8fVZbVAalLu7Iq%2FglTS0tALAx6fMenLvg%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0) Datasheet (/components/atmega-16/1/datasheet)
Atmega32 Atmega32	X 1	(https://www.mouser.in/ProductDetail/Microchip-Technology-Atmel/ATMEGA32-16PU?qs=aqrrBurbvGdpkmgj7RWmsQ%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0) Datasheet (/components/atmega32/1/datasheet)
4x4 Keypad Module Keypad is an input device which is generally us...	X 1	

Components Used

LCD16x2 Display LCD16x2 Display	X 1	(https://www.mouser.com/ProductDetail/Adafruit/1447?qs=XAKIUOoRPe6AClmsjw7y7g%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Downloads

ATmega16 Keypad Interfacing Project File	Dow nloa d (/api/download/platform-attachment/248)
ATmega16 Keypad Interfacing Simulation	Dow nloa d (/api/download/platform-attachment/249)

Comments

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hiteshpatidar20 (/users/hiteshpatidar20/profile)
2020-05-11 08:09:14

please explain the coding how it is working

Reply Like

muneneamos1999 (/users/muneneamos1999/profile)
2020-06-28 13:56:23
Please,also provide alternative code for 4x4 keypad that uses one analogue pin
Reply Like 1

LoyikNziendolo (/users/LoyikNziendolo/profile)
2020-08-15 05:34:03
bonjour besoin d'aide d'un code
description
j'ai un tableau a deux dimension de type char tab[100][100] et je emetre et recevoir des données vers un serial pc en utilisant la communication UART
Reply Like

ANANTHANAGAVIDHYALAVANYA (/users/ANANTHANAGAVIDHYALAVANYA/profile)
2022-02-01 09:44:59
Is this code only supports ps/2 keypads only or ethernet keypads also?
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