

SmartElex AT89S52 Development Board

USER MANUAL

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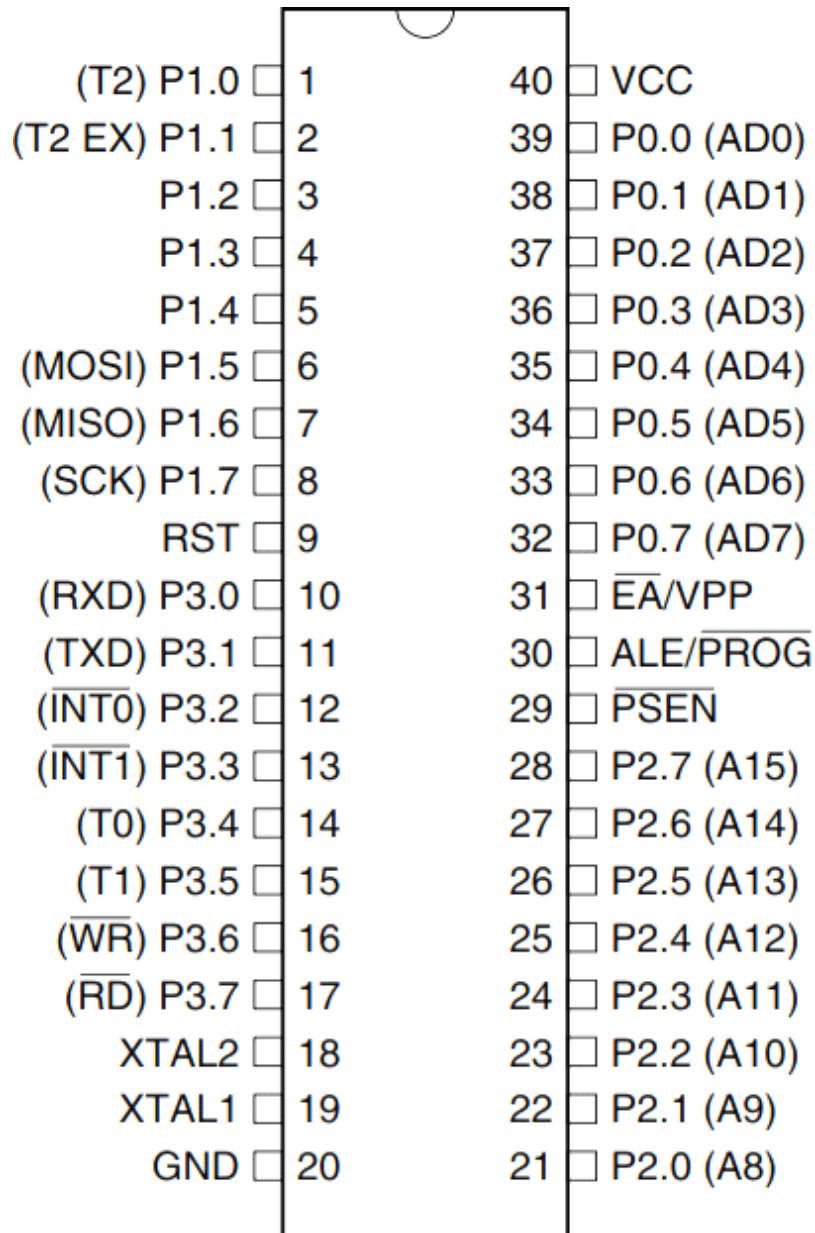
1. Description:-

The **SmartElex AT89S52 Development Board** can be used to evaluate and demonstrate the capabilities of AT89S52 microcontroller. The MCU socket onboard provides support for 40 pin DIP package of AT89S52 controller. This board designed for General Purpose application. Board has onboard power supply circuit, Micro USB for USBASP programmer, Micro USB for CH340G serial communication with the computer and other serial devices, power status LED, Reset switch, Buzzer, 8 User LED, DC motor driver L298P, 4x4 matrix keypad, 16x2 LCD and port extensions for all 4 ports. You can power the Board through the DC plug-in jack. The on-board power regulator can handle anything from 9 to 15VDC.

2. Features:-

- ❖ Recommended Input Voltage: 12V
- ❖ Min-Max Input Voltage: 9-15V
- ❖ 5 mm standard DC plug-in jack for Input supply
- ❖ On-board 5V regulator (78M05) circuit.
- ❖ On-Board power supply on-off switch
- ❖ Power Status LED.
- ❖ On-Board DC motor Driver L298P
- ❖ On-Board 4x4 Matrix Keypad.
- ❖ On-Board 4 bit 16x2 LCD Display.
- ❖ 11.0592MHz crystal.
- ❖ Port extensions for all ports with detailed pin labelling for easy identification of pins
- ❖ On-board USB TO Serial - CH340 Chip.
- ❖ Onboard Micro USB USBASP for loading HEX file.
- ❖ Four 3mm mounting holes for easy mounting

3. AT89S52A Pin Diagram, Features & Specification:-



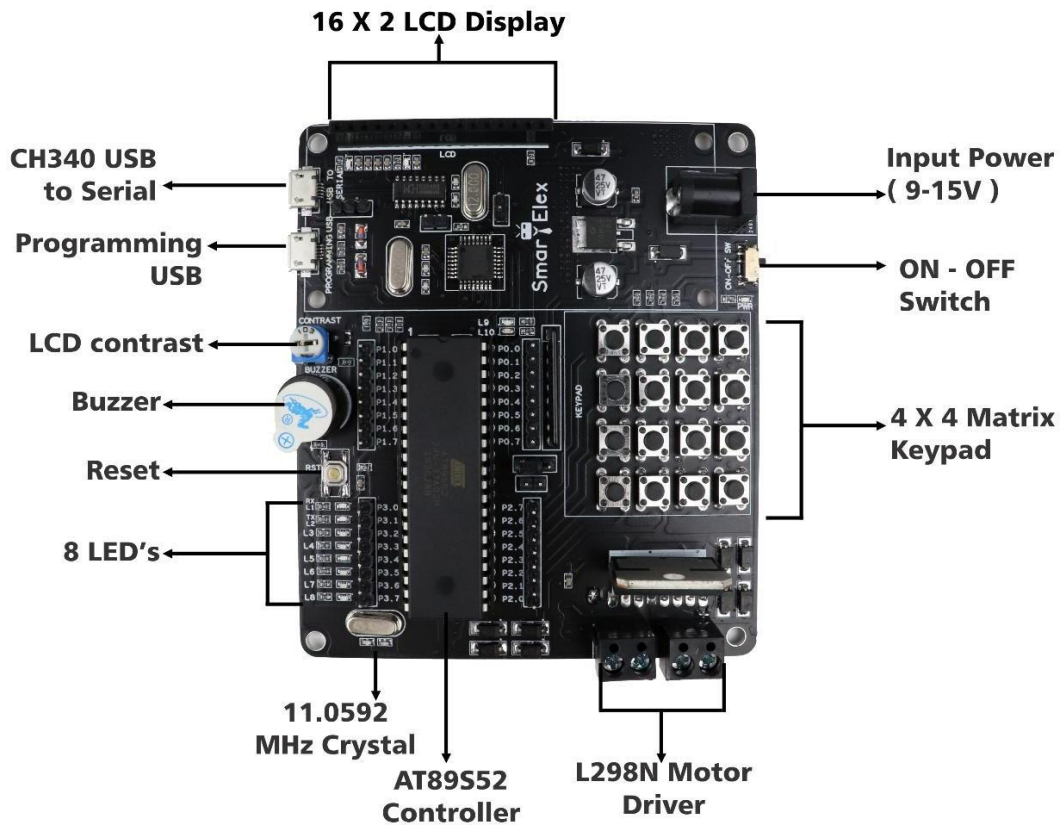
AT89S52 Features:-

- ❖ Compatible with MCS®-51 Products
- ❖ 8K Bytes of In-System Programmable (ISP) Flash Memory – Endurance: 10,000 Write/Erase Cycles • 4.0V to 5.5V Operating Range
- ❖ Fully Static Operation: 0 Hz to 33 MHz
- ❖ Three-level Program Memory Lock
- ❖ 256 x 8-bit Internal RAM
- ❖ 32 Programmable I/O Lines
- ❖ Three 16-bit Timer/Counters
- ❖ Eight Interrupt Sources
- ❖ Full Duplex UART Serial Channel
- ❖ Low-power Idle and Power-down Modes
- ❖ Interrupt Recovery from Power-down Mode
- ❖ Watchdog Timer
- ❖ Dual Data Pointer
- ❖ Power-off Flag
- ❖ Fast Programming Time
- ❖ Flexible ISP Programming (Byte and Page Mode)

AT89S52 Specification:-

- ❖ 8K Bytes of In-System Reprogrammable Flash Memory
- ❖ Fully Static Operation: 0 Hz to 33 MHz
- ❖ 256 x 8-bit Internal RAM
- ❖ 32 Programmable I/O Lines
- ❖ Three 16-bit Timer/Counters
- ❖ Eight Interrupt Sources
- ❖ Low-power Idle and Power-down Modes
- ❖ 4.0V to 5.5V Operating Range
- ❖ Full Duplex UART Serial Channel
- ❖ Dual Data Pointer
- ❖ Fast Programming Time
- ❖ Flexible ISP Programming (Byte and Page Mode)

4. Product Layout:-



5. Pin Configuration of SmartElex AT89S52 Dev Board:-

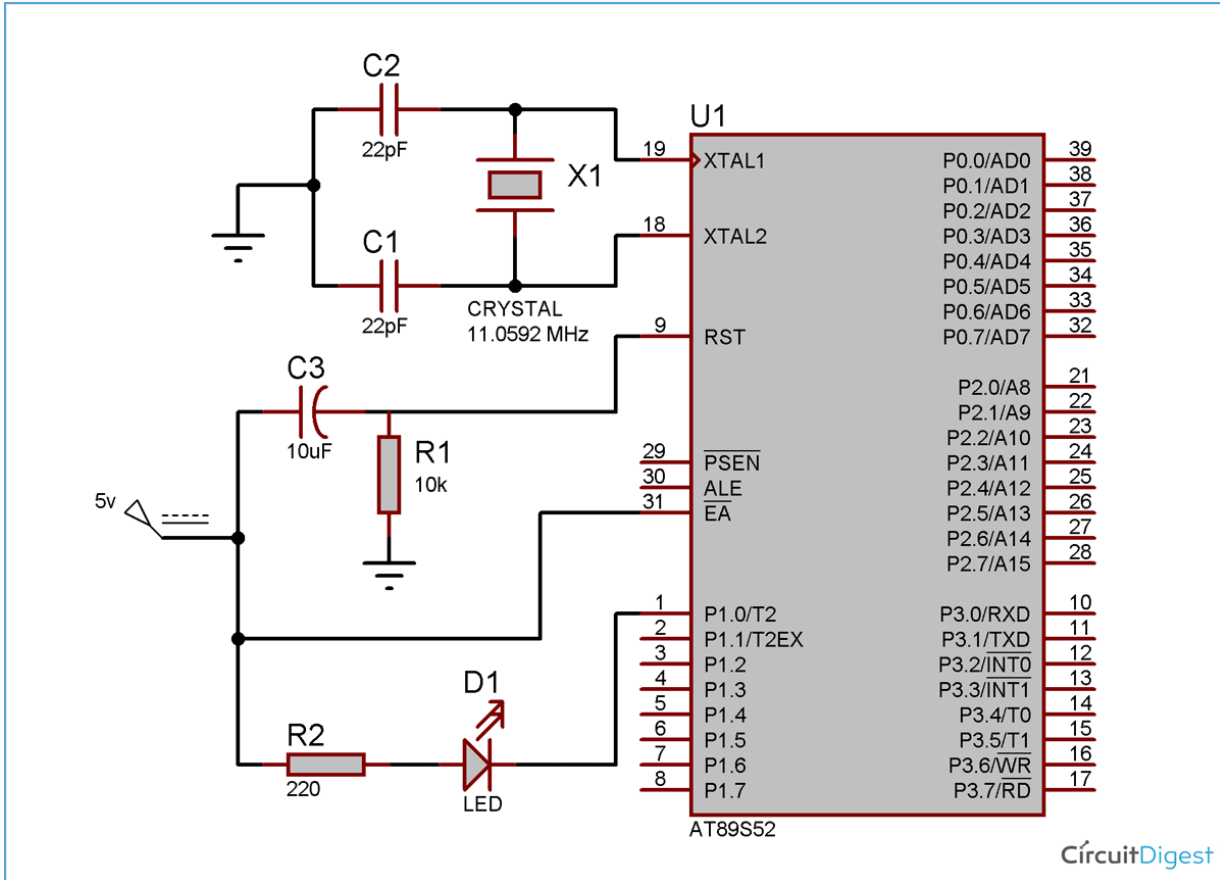
Sr.no.	Microcontroller Pin	Peripheral connection
PORT2		
1.	P2.0	Keypad C4
2.	P2.1	Keypad C3
3.	P2.2	Keypad C2
4.	P2.3	Keypad C1
5.	P2.4	Keypad R4
6.	P2.5	Keypad R3
7.	P2.6	Keypad R2
8.	P2.7	Keypad R1
PORT0		
9.	PO.0	L298P_EN1
10.	P0.1	L298P_EN2
11.	P0.4	LCD_D4
12.	P0.5	LCD_D5
13.	P0.6	LCD_D6
14.	P0.7	LCD_D7
PORT1		
15.	P1.0	LCD_RS
16.	P1.1	LCD_R/W
17.	P1.2	LCD_EN
18.	P1.3	BUZZER
PORT3		
19.	P3.0	RXD/LED1
20.	P3.1	TXD/LED2
21.	P3.2	L298P_IN1/LED3
22.	P3.3	L298P_IN2/LED4

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23.	P3.4	L298P_IN3/LED5
24.	P3.5	L298P_IN14/LED6
25.	P3.6	LED7
26.	P3.7	LED8

Note:- For Buzzer operation connect external pullup resistor 1K between VCC(pin no. 40) & P1.3 (pin no. 4) of Microcontroller.

6. RESET AND CRYSTAL CIRCUIT:-



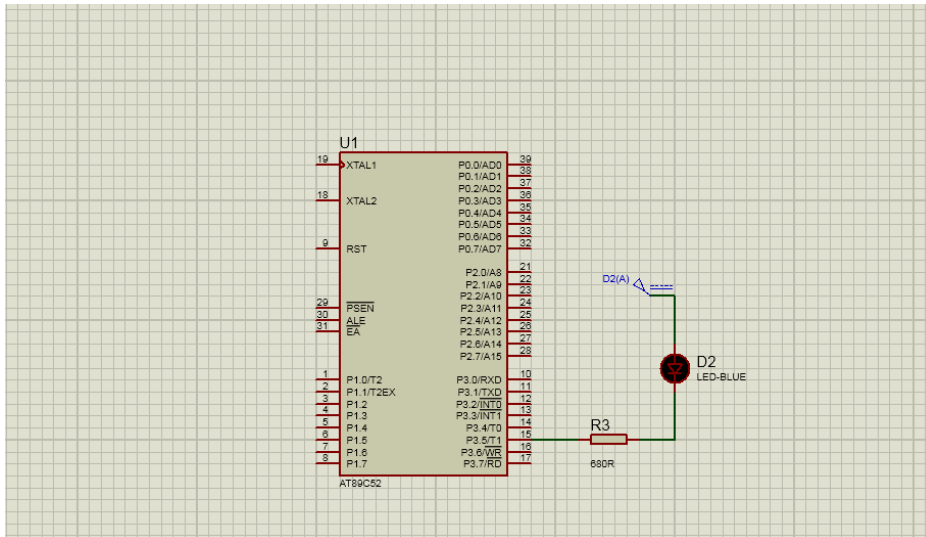
7. Example of LED BLINKING

CODE :-

```
*****START*****  
  
#include<reg52.h>      // special function register declarations  
                        // for the intended 8051 derivative  
  
sbit LED = P3^5;      // Defining LED pin  
  
void Delay(void);     // Function prototype declaration  
  
void main (void)  
{  
    while(1)          // infinite loop  
    {  
        LED = 0;      // LED ON  
        Delay();  
        LED = 1;      // LED OFF  
        Delay();  
    }  
}  
  
void Delay(void)  
{  
    int j;  
    int i;  
    for(i=0;i<10;i++)
```

```
{  
    for(j=0;j<1000;j++)  
    {  
        }  
    }  
}
```

*****END*****



SCHEMATIC FOR LED BLINKING

Note: - Other Sample code will available on the website.

8. Warranty

1. Standard warranty of the product is 6 months.
2. Warranty only applies to manufacturer defect.
3. No warranty will apply if the Product has been subject to misuse, static discharge, neglect, accident, modification, or has been soldered or altered in any way.