Fire Bird V P89V51RD2

ADC interfacing and Displaying Sensor Value on LCD

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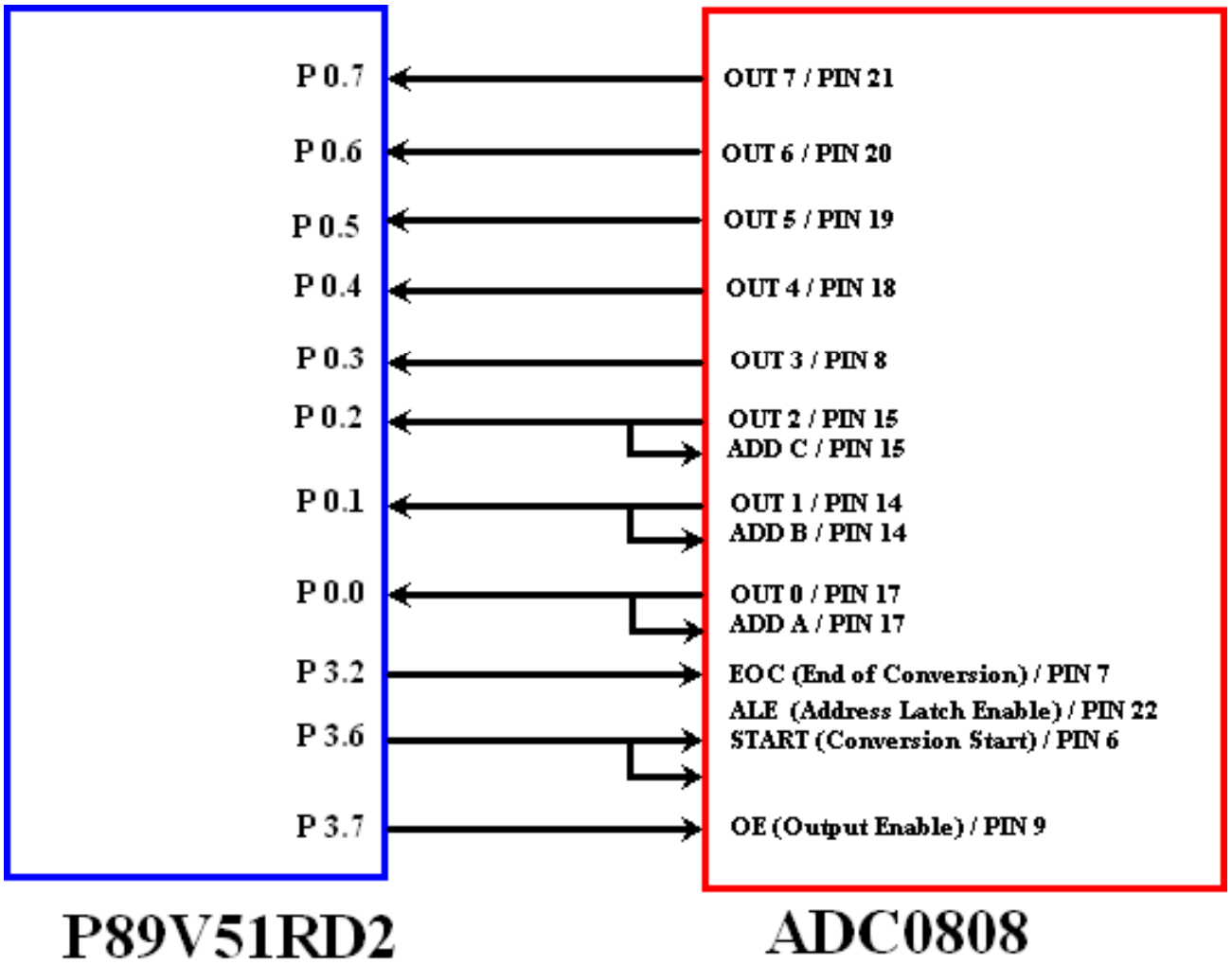
Analog To Digital Converter (ADC)

- The ADC0808 is an 8-bit analog to digital converter with a 8 channel analog multiplexer.
- Fire Bird V P89V51RD2 has many analog sensors.
  - white line sensors, IR Proximity sensors sensors, Sharp IR Range sensors and battery voltage sensing etc.
- Analog signals are converted to digital form using ADC0808 which is interfaced with the microcontrollers PORT0.

ADC0808 interfacing with P89V51RD2



Functional Description

- The ADC0808 can be controlled with the help of 4 control signals:
- ALE (Address Latch Enable): On a Low to High transition at this pin the ADC latches the channel address on its multiplexed address lines.
- START: A High to Low transition at this pin will start the analog to digital conversion
- OUTPUT ENABLE: A High signal at this pin will latch the conversion output onto the output lines, which can be read by the Microcontroller.
- EOC (End of Conversion): The EOC pin goes low after a conversion has completed

Sensors interfacing with ADC0808

- IN0-----> IR Proximity sensor 3 (front)
- IN1-----> Batt. Voltage
- IN2-----> Front Sharp IR Range sensor
- IN3-----> IR Proximity sensor 2 (left side)
- IN4-----> Left Whiteline
- IN5-----> Center Whiteline
- IN6-----> Right Whiteline
- IN7-----> IR Proximity sensor 4 (right side)

Initialization of ADC

- P3^6 is connected to Start and ALE pin of ADC0808
  - sbit start_conv = P3^6;
- P3^7 is connected to Output Enable Pin of ADC0808.
  - sbit output_enable = P3^7;

Calling subroutine of ADC in main

```
void main()
{
 unsigned char i=0;
 output_enable = 0;
 start_conv = 0;        //de-assert all control signals to ADC
 LCD_INIT();            //Initialize LCD
 while(1)
  {
              for(i=0;i<8;i++)
              {
                        data_array[i] = ADC_conversion(i);
              }
             LCD_PRINT(data_array);//call this function to print the array onto the screen
      delay_ms(500);
  }
}
```

Subroutine for ADC

```
unsigned char ADC_conversion(unsigned char ADC_ch_no)
{
unsigned char ADC_data;
P0 = ADC_ch_no;    // to select channel no. send address on P0

start_conv = 1;        // ADC0808 will latch the address on L-H transition on the ALE pin
start_conv = 0;        // ADC0808 will start conversion on H-L transition on the start pin
delay_ms(2);           // conversion time for ADC0808

P0 =0xFF;              // output enable and read
output_enable = 1; //Enabling o/p of ADC0808 for to read the converted data
ADC_data = P0;         //storing adc_data
output_enable = 0; //disabling ADC 0808 o/p
return ADC_data;   //returning adc_data
}
```

Display ADC sensor values on LCD