



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

19ECB211 – MICROCONTROLLER PROGRAMMING & INTERFACING

II YEAR IV SEM

UNIT II– PIC TIMER,SERIAL PORT AND INTERRUPT

TOPIC 1 – PIC I/O Ports and TRIS Register



PIC I/O PORTS



- **PIC 16F877** series normally has five input/output ports. They are used for the input/output interfacing with other devices/circuits.
- Most of these port pins are multiplexed for handling alternate function for peripheral features on the devices.
- All ports in a PIC chip are bi-directional. When the peripheral action is enabled in a pin, it may not be used as its general input/output functions.



PIC GPIO Registers

- The basic and important feature of any controllers is the number of GPIO's available for connecting the peripherals.
- PIC16F877A has 33-gpio's grouped into five ports namely PORTA-PORTE as shown in the below table.

PORT	Direction Register	Number of Pins	Alternative Function
PORTA	TRISA	6 (PA0-PA5)	ADC
PORTB	TRISB	8 (PB0-PB7)	Interrupts
PORTC	TRISC	8 (PC0-PC7)	UART,I2C,PWM
PORTD	TRISD	8 (PD0-PD7)	Parallel Slave Port
PORTE	TRISE	3 (PE0-PB2)	ADC



PIC MICROCONTROLLER –TRIS Register

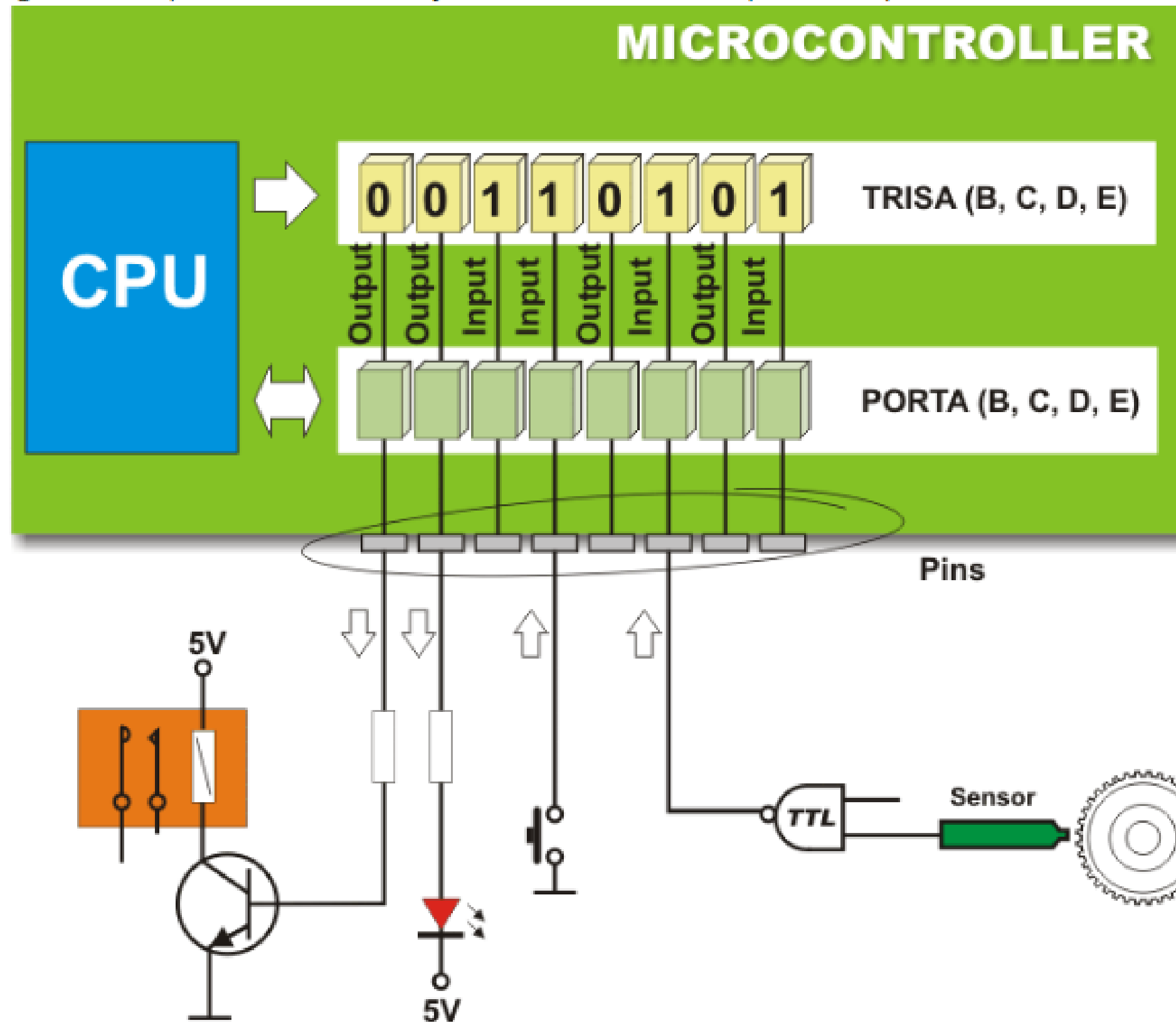


Register	Description
TRISx	Used to configure the respective PORT as output/input
PORTx	Used to Read/Write the data from/to the Port pins

- **TRISx:** TRI-State Register/ Data Direction Register.
- Before reading or writing the data from the ports, their direction needs to be set.
- Unless the PORT is configured as output, the data from the registers will not go to controller pins.



TRIS & PORT Registers





PIC MICROCONTROLLER –TRIS Register



- This register is used to configure the PORT pins as Input or Output.
- Writing 1's to TRISx will make the corresponding PORTx pins as Input.
- Similarly writing 0's to TRISx will make the corresponding PORTx pins as Output.

```
1. TRISB = 0xff; // Configure PORTB as Input.  
2.  
3. TRISC = 0x00; // Configure PORTC as Output.  
4.  
5. TRISD = 0x0F; // Configure Lower nibble of PORTD as Input and higher nibble as Output  
6.  
7. TRISD = (1<<0) | (1<<3) | (1<<6); // Configure PD0,PD3,PD6 as Input and others as Output
```



References

<https://www.circuitstoday.com/inputoutput-ports-and-tris-registers-in-pic-16f877>

https://en.wikipedia.org/wiki/Embedded_system

<https://www.circuitstoday.com/inputoutput-ports-and-tris-registers-in-pic-16f877>

<https://microcontrollerslab.com/pic16f877a-introduction-features/>

Mazidi M. A., McKinlay R. D., Causey D. "PIC Microcontroller And Embedded Systems" Pearson Education International, 2008(Unit I,II,III, IV & V)

Thank You