

## 8255 Programmable Peripheral Interface and Interfacing

The 8255 is a widely used, programmable parallel I/O device. It can be programmed to transfer data under various conditions, from simple I/O to interrupt I/O. It is flexible, versatile and economical (when multiple I/O ports are required). It is an important general purpose I/O device that can be used with almost any microprocessor.

The 8255 has 24 I/O pins that can be grouped primarily into two 8 bit parallel ports: A and B, with the remaining 8 bits as Port C. The 8 bits of port C can be used as individual bits or be grouped into two 4 bit ports: CUpper (CU) and CLower (CL). The functions of these ports are defined by writing a control word in the control register. 8255 can be used in two modes: Bit set/Reset (BSR) mode and I/O mode. The BSR mode is used to set or reset the bits in port C. The I/O mode is further divided into 3 modes: mode 0, mode 1 and mode 2. In mode 0, all ports function as simple I/O ports. Mode 1 is a handshake mode whereby Port A and/or Port B use bits from Port C as handshake signals. In the handshake mode, two types of I/O data transfer can be implemented: status check and interrupt. In mode 2, Port A can be set up for bidirectional data transfer using handshake signals from Port C, and Port B can be set up either in mode 0 or mode 1.

PA3	1		40	PA4
PA2	2		39	PA5
PA1	3		38	PA6
PA0	4		37	PA7
RD	5		36	WR
CS	6		35	RESET
gnd	7		34	D0
A1	8		33	D1
A0	9		32	D2
PC7	10	8255	31	D3
PC6	11	PPI	30	D4
PC5	12		29	D5
PC4	13		28	D6
PC0	14		27	D7
PC1	15		26	Vcc
PC2	16		25	PB7
PC3	17		24	PB6
PB0	18		23	PB5
PB1	19		22	PB4
PB2	20		21	PB3

**Fig. 6.1** Pin Configuration of 8255

### Control Logic of 8255

**RD (Read) :** This signal enables the Read operation. When the signal is low, microprocessor reads data from a selected I/O port of 8255.

**WR (Write) :** This control signal enables the write operation.

**RESET (Reset) :** It clears the control registers and sets all ports in input mode.

CS, A0, A1: These are device select signals. CS is connected to a decoded address and A0, A1 are connected to A0, A1 of microprocessor.

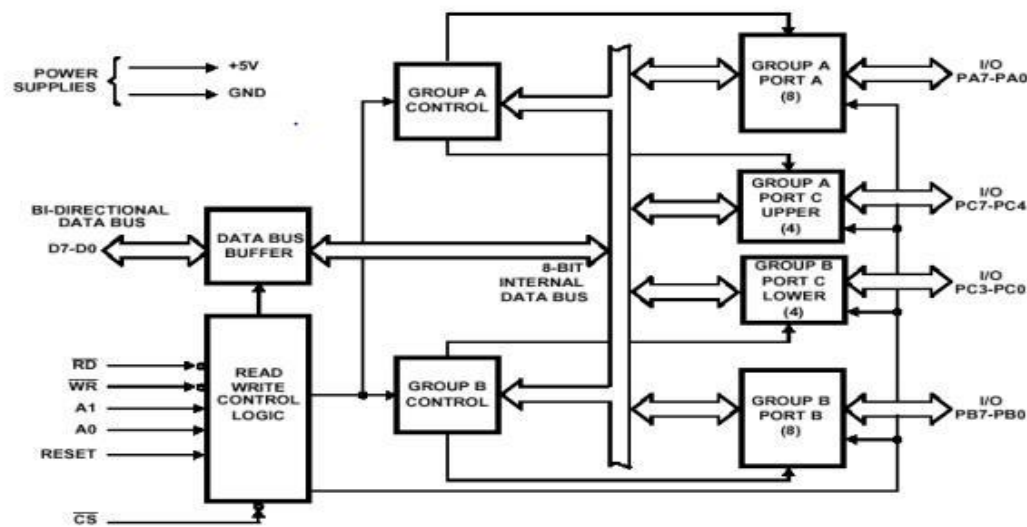
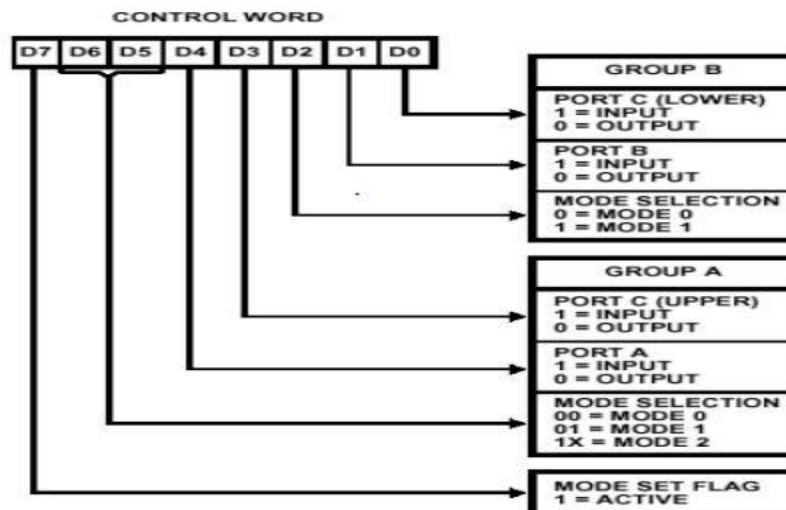


Figure : Block diagram of 8255



## STEPPER MOTOR INTERFACING

A stepper motor is stepped from one position to the next by changing the currents through the fields in the motor. The two common field connections are referred to as two phase or four phase. There are three main areas of applications for stepper motor.

- i. Instrumentation
- ii. Computer peripherals
- iii. Machine drives.

They are used in floppy drives, dot-matrix printers, X-Y plotters, digital watches, etc to rotate things in steps of small angles. The step size in typical stepper motor varies from 0.9deg to 30deg.

A stepper motor is a device used to obtain an accurate position control of rotating shafts. A stepper motor employs rotation of its shaft in terms of steps, rather than continuous rotation as in