

PROGRAMMABLE PERIPHERAL INTERFACE -8255

8255 PPI

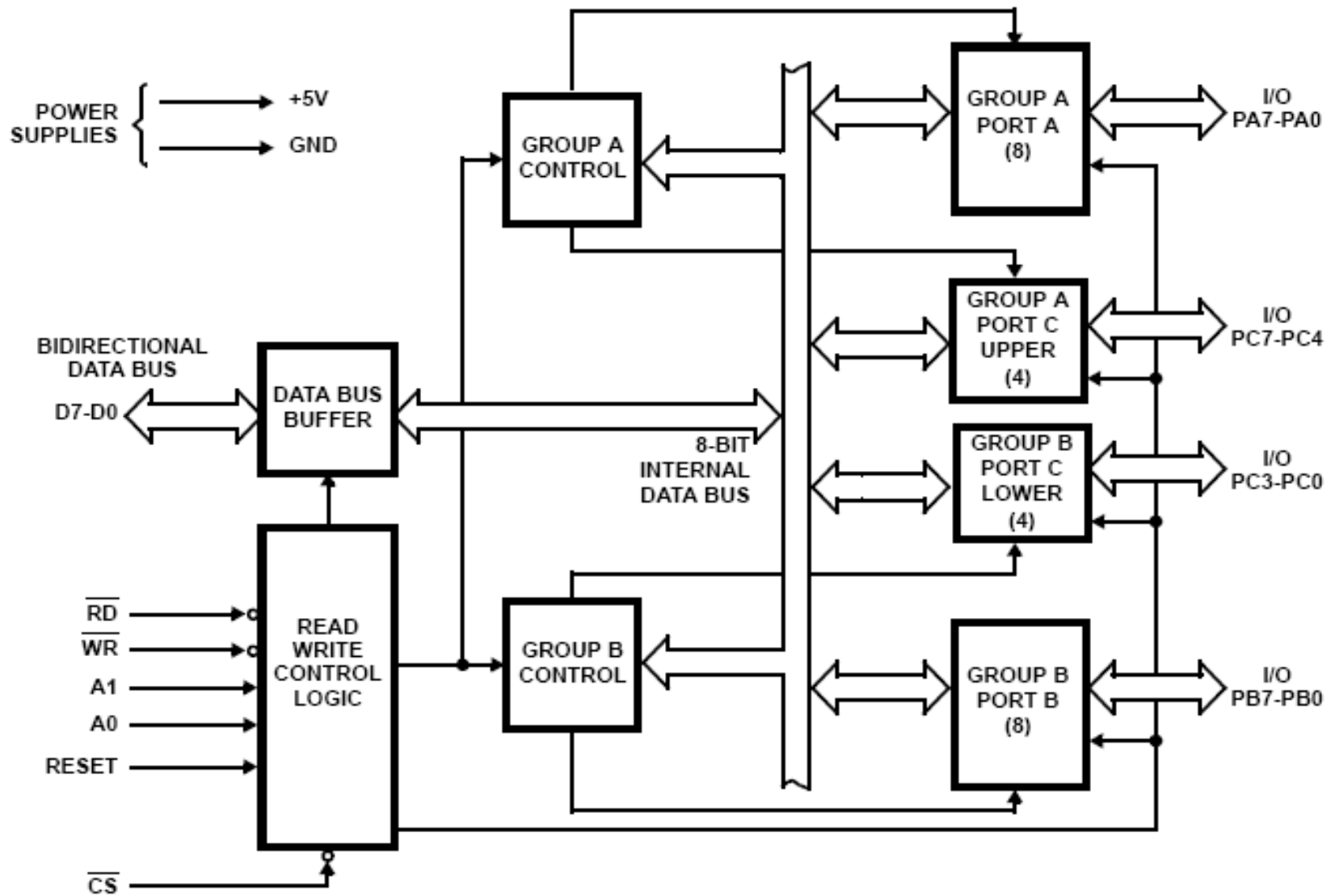
- It is an I/O port chip used for interfacing I/O devices with microprocessor system.
- It is device used to implement parallel data transfer between processor and slow peripheral devices like ADC, DAC, keyboard, 7-segment display etc.

Features:

- It is a programmable device.
- It has 24 I/O programmable pins like PA,PB,PC.
- 8255A has three ports
 - PORT A
 - PORT B
 - PORT C
- **Port A** (PA0-PA7) and **Port B** (PB0-PB7) are 8 bit parallel ports.
- **Port C** can be split into two parts, i.e. PORT C lower (PC0-PC3) and PORT C upper (PC7-PC4).

- These three ports are further divided into two groups.
 - i.e. Group A includes PORT A and upper PORT C.
 - Group B includes PORT B and lower PORT C.
- These two groups can be programmed in three different modes.
- Three operating modes :
 - Mode-0(simple I/O port)
 - Mode-1(Handshake I/O port)
 - Mode-2(Bidirectional I/O port)

Block Diagram-8255



Data Bus buffer:

- It is a 8-bit bidirectional Data bus.
- Data bus(D_0 - D_7): These are 8-bit bi-directional buses, connected to 8086 data bus for transferring data.
- The direction of data buffer is decided by Read/Write Control Logic.

Read/Write Control Logic:

- CS: This is Active Low signal. It stands for Chip Select. A LOW on this input selects the chip and enables the communication between the 8255 and the CPU.
- Read: This is Active Low signal, when it is Low the microprocessor reads data from a selected I/O port of 8255.
- Write: This is Active Low signal, when it is Low the microprocessor writes data into a selected I/O port .

- Address (A_0 - A_1): This is used to select the ports.

A1	A0	Select
0	0	PA
0	1	PB
1	0	PC
1	1	Control reg.

Group A and Group B controls:

- Group A and B get the Control Signal from CPU and send the command to the individual control blocks.
- Group A send the control signal to port A and Port C (Upper) PC7-PC4.
- Group B send the control signal to port B and Port C (Lower) PC3-PC0.

PORT A:

- PA_0 - PA_7 : It is the 8-bit bi-directional I/O pins used to send the data to peripheral or to receive the data from peripheral.
- It can be programmed by mode 0, mode 1, mode 2.

PORT B:

- PB_0 - PB_7 : It is the 8-bit bi-directional I/O pins used to send the data to peripheral or to receive the data from peripheral.
- It can be programmed by mode 0 and mode 1.

PORT C:

- PC_0 - PC_7 : This is also 8-bit bidirectional I/O pins. These lines are divided into two parts.
 1. PC_0 to PC_3 (Lower Part)
 2. PC_4 to PC_7 (Upper Part)
- It can be programmed by bit set/reset operation.

Modes of Operation in 8255

- There are two basic modes of operation of 8255.
 - 1.I/O mode
 - 2.Bit set-reset mode: Bit set/reset mode is used to set resets the port-c bits.
- In the I/O mode, 8255 ports works as programmable I/O ports, while in BSR mode only port-c(pc0-pc7) cab be used to set or reset its individual port bits.
- Under the I/O mode of operation, further there are three modes. they are mode0,mode1,mode2