



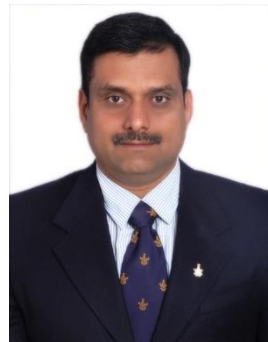
Microprocessors and Interfaces: 2021-22

Lecture 27 :

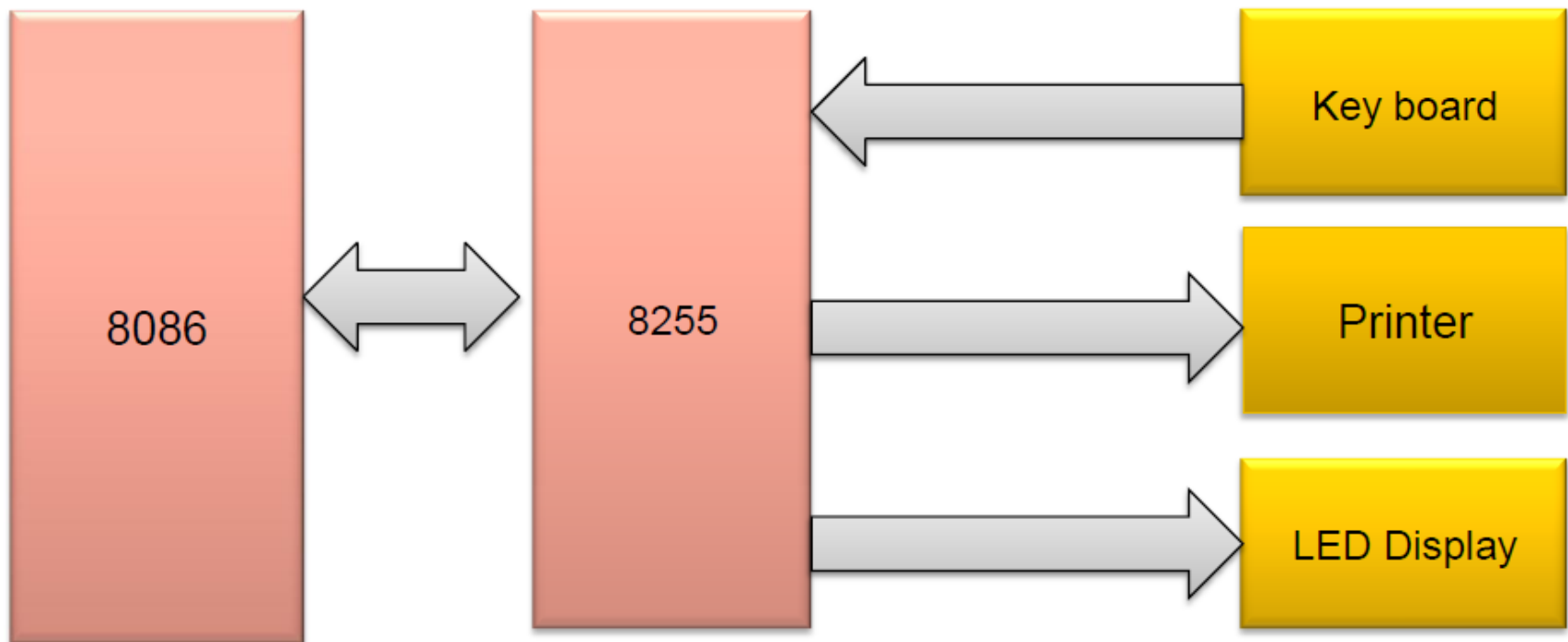
8255 Programmable Peripheral Interface

Part:1

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8255- PPI



8255- PPI

Intel has developed several peripheral control chips for 80x86 family

–provide complete I/O interface to x86 chip

8255 PPI

PPI provides 3, 8-bit I/O ports (A, B and C) in one package

Chip can be directly interfaced to the data bus of 8086.

Other Peripheral Devices

8253/8254 –Programmable Interval Timer (PIT)

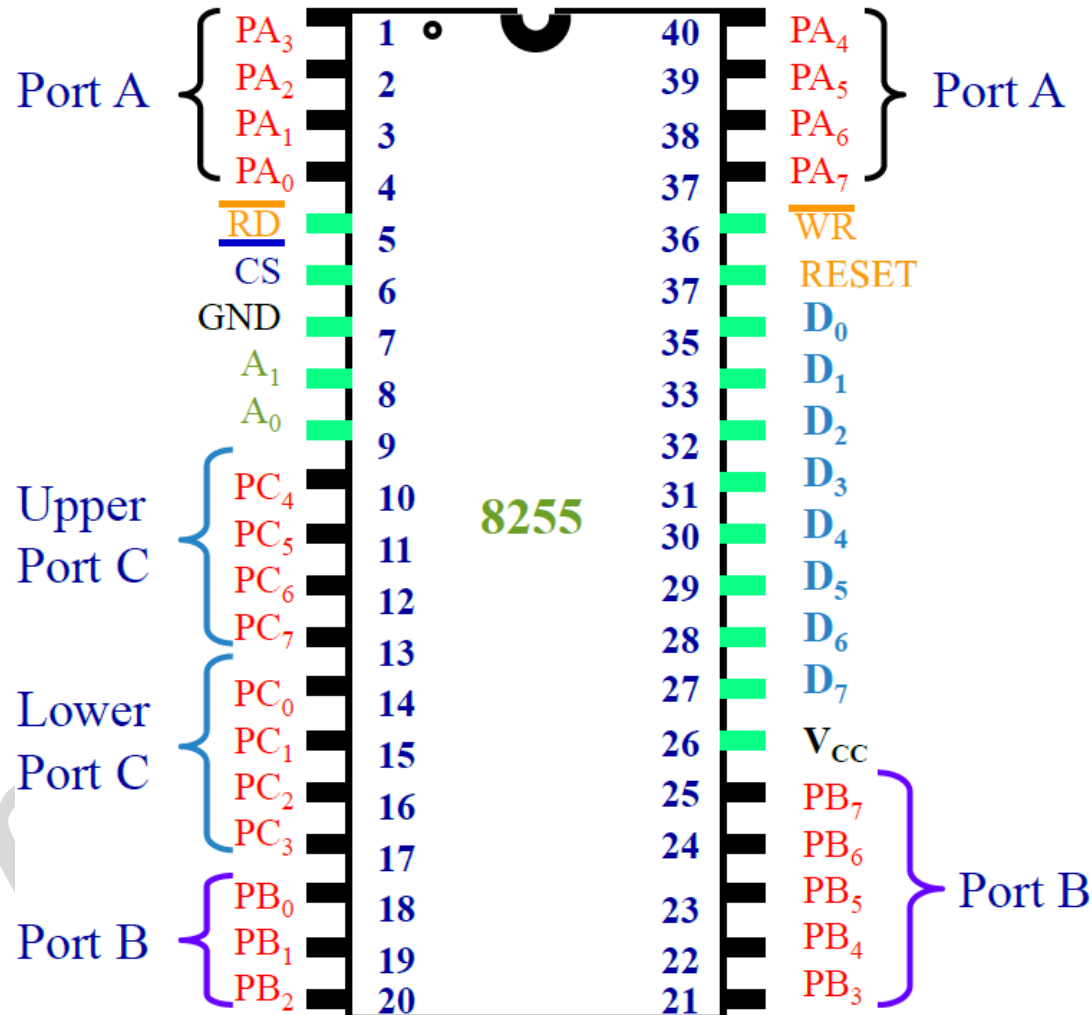
8259 –Programmable Interrupt Controller (PIC)

8237 –Direct memory Access Controller (DMAC)

8255- PPI

- 82C55 **programmable peripheral interface (PPI)** is a popular, low-cost interface component
- The PPI has **24 pins for I/O**, programmable in groups of 8/12 pins (Group A ,B,C)
- The groups operate in three distinct modes of operation (Mode 0, Mode 1 and Mode 2)
- The 82C55 (CMOS version) requires **wait states** if operated with a processor using higher than an 8 MHz clock.

Pin Diagram of 8255

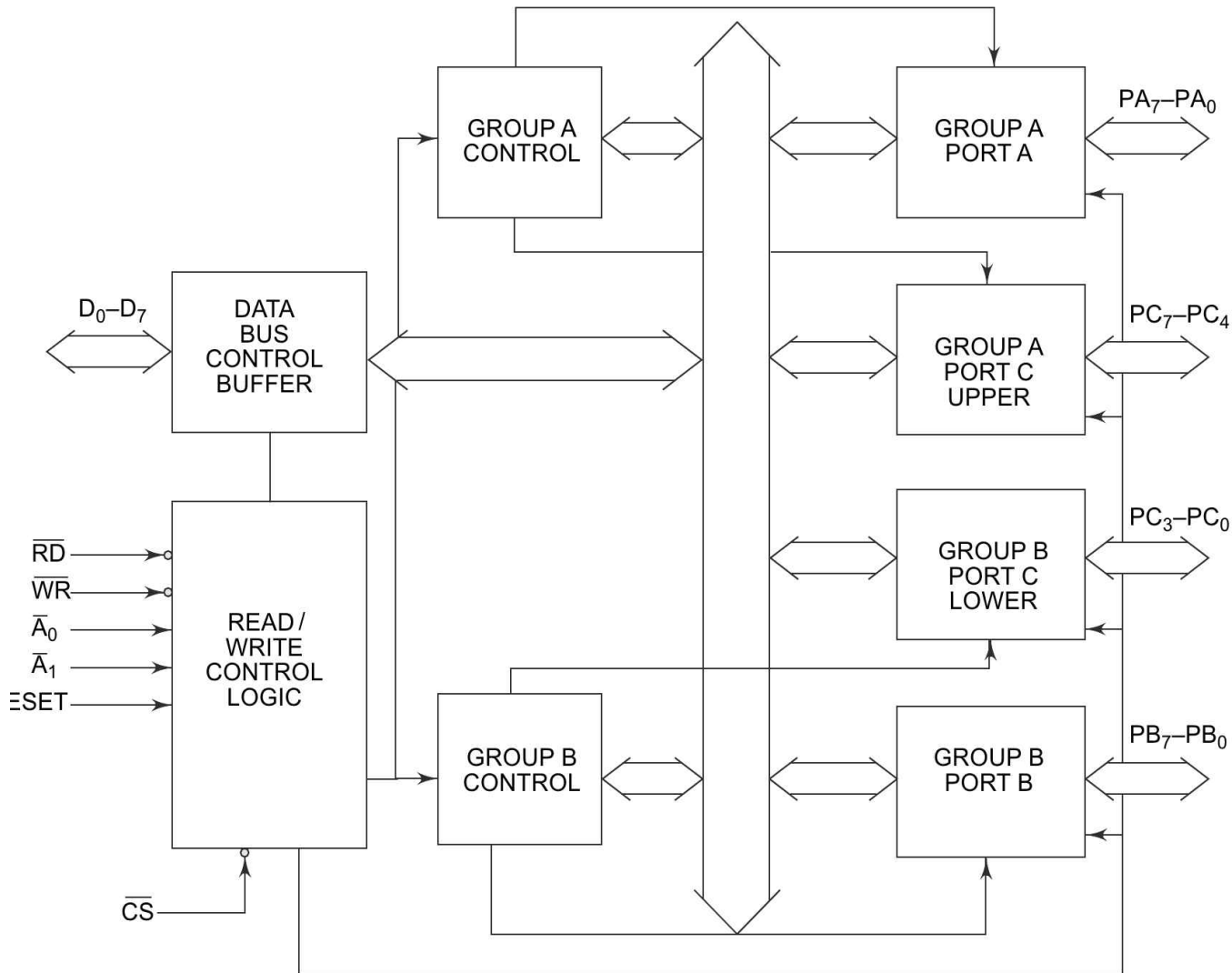


Selection of ports

CS'	A ₁	A ₀	Selected
0	0	0	Port A
0	0	1	Port B
0	1	0	Port C
0	1	1	Control Register
1	X	X	8255 Not Selected

Selecting Port / Programming 8255

Internal block diagram of 8255

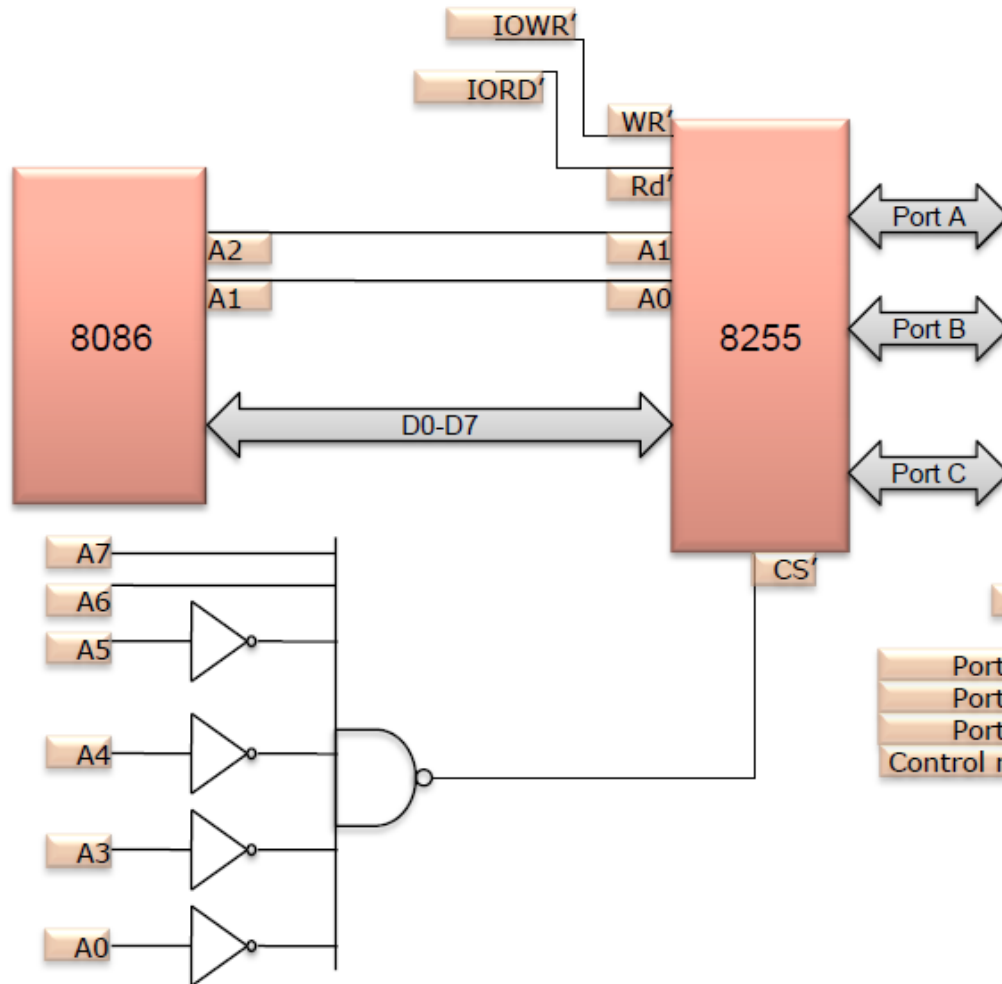


$2^{14} = 16K$
8255 can be connected

Mode 0: 3 ports per 8255

Mode 1/2 : 2 ports per 8255

Interfacing with 8086



Programming 8255
 MOV DX 0FFF6h;
 MOV AL 80h;
 OUT DX AL;

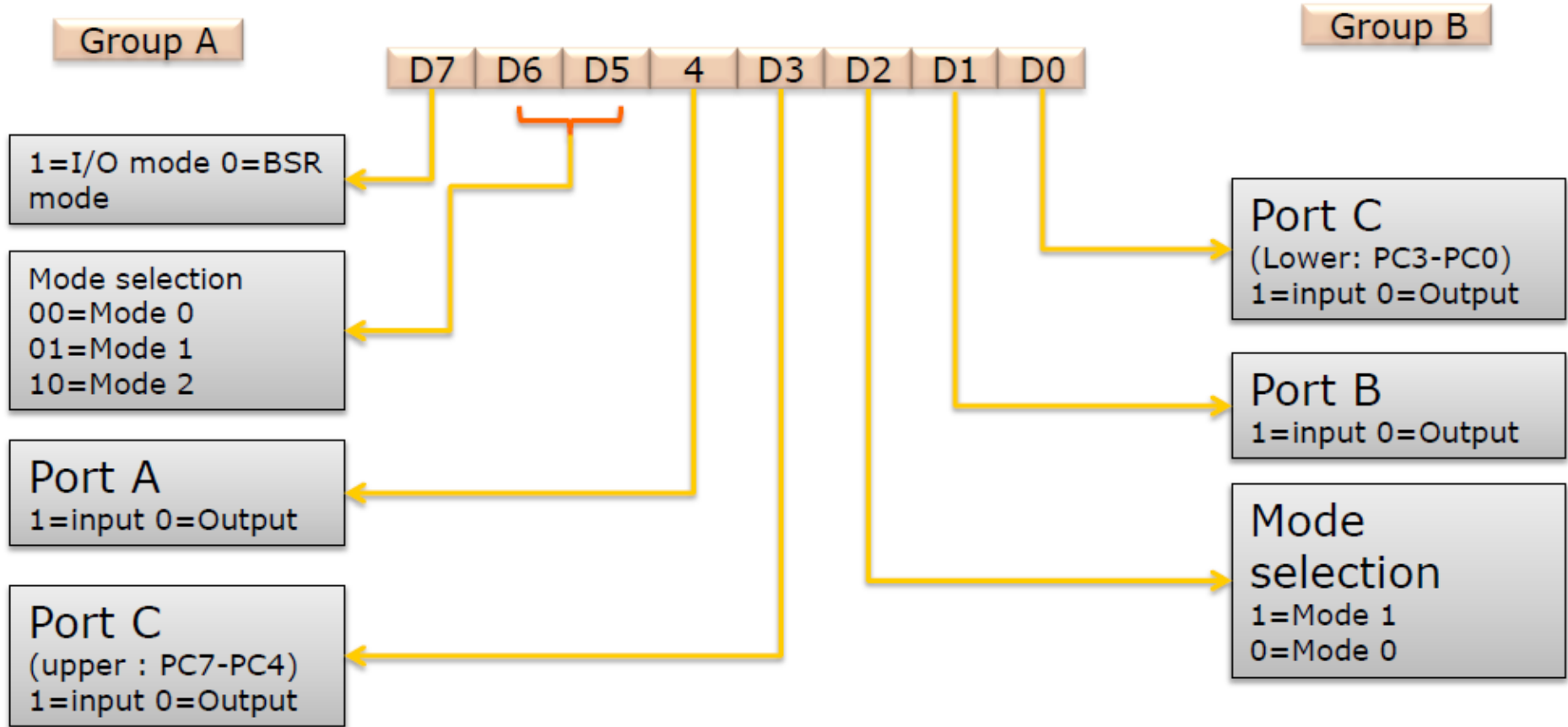
Port A
 MOV DX 0FFF0h;
 OUT DX AL;

Port addresses	
Port A	C0
Port B	C2
Port C	C4
Control register	C6

Port B
 MOV DX 0FFF2h;
 OUT DX AL;

Port C
 MOV DX 0FFF4h;
 OUT DX AL;

Control word Format

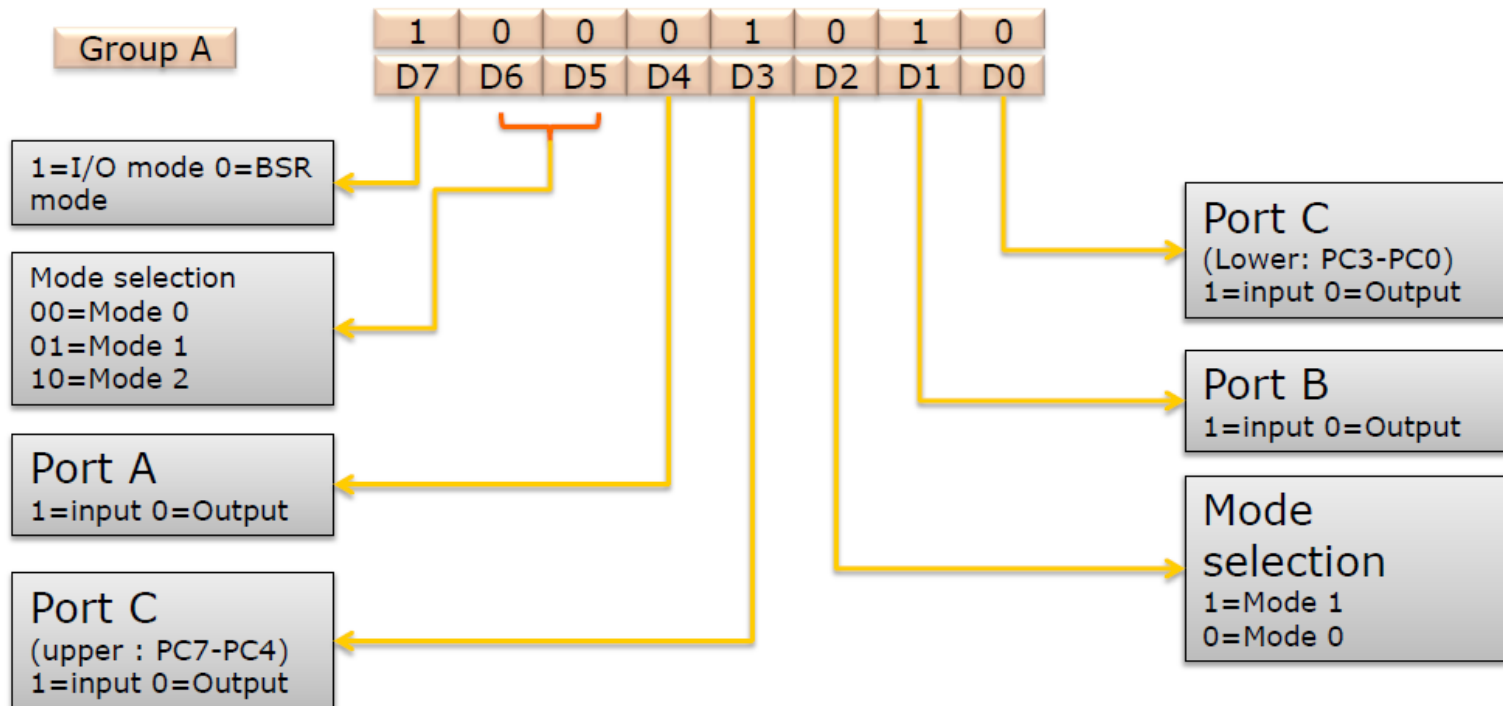


Control word Format

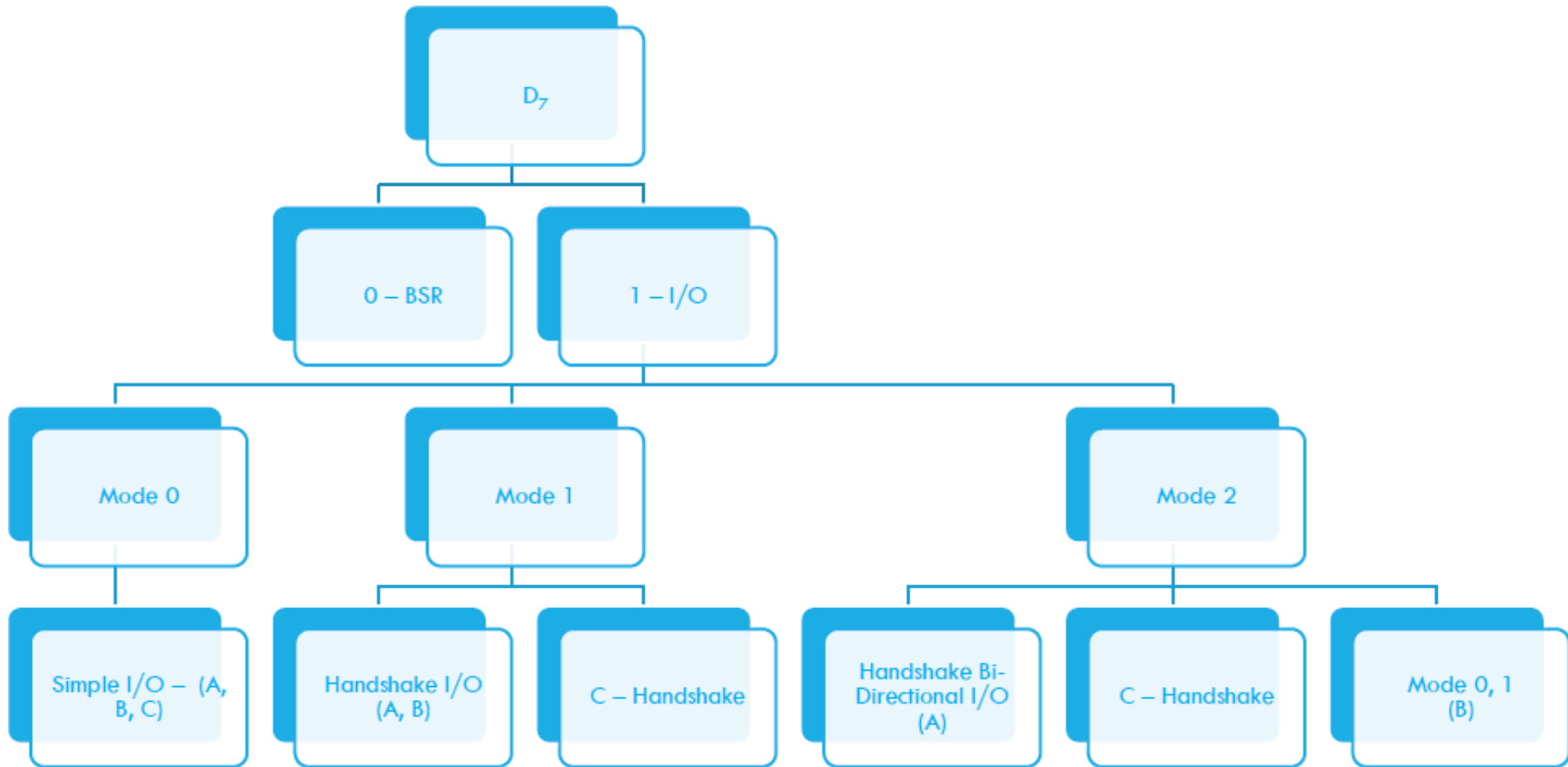
D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
	Port A Mode		Port A	Port C Upper	Port B Mode	Port	Port C Lower
Always 1 for I/O Mode	0 0 - Mode 0 0 1 - Mode 1 1 x - Mode 2		1 - I/P 0 - O/P	1 - I/P 0 - O/P	0 - Mode 0 1 - Mode 1	1 - I/P 0 - O/P	1 - I/P 0 - O/P
	Group A				Group B		

Example

Configure the ports of an 8255 chip in **mode 0**, with Port B and Port C upper (PCU) as inputs and Port A and Port C lower (PCL) as outputs.



Modes of operation of 8255





Thank You