Microprocessors and Interfaces: 2021-22
Lecture 27 :
8255 Programmable Peripheral Interface
Part:1

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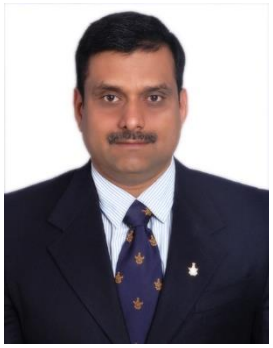
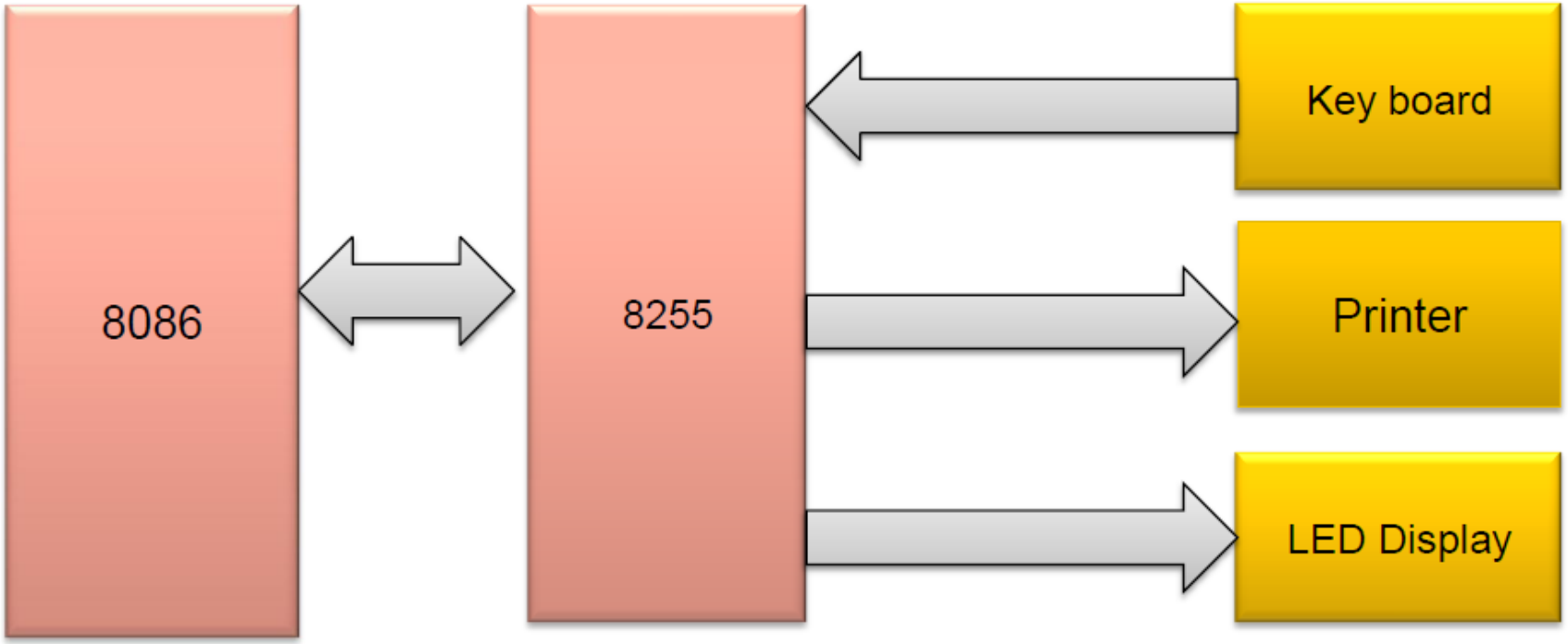


8255- PPI



8255- PPI

Intel has developed several peripheral control chips for 80x86 family
–provide complete I/O interface to x86 chip

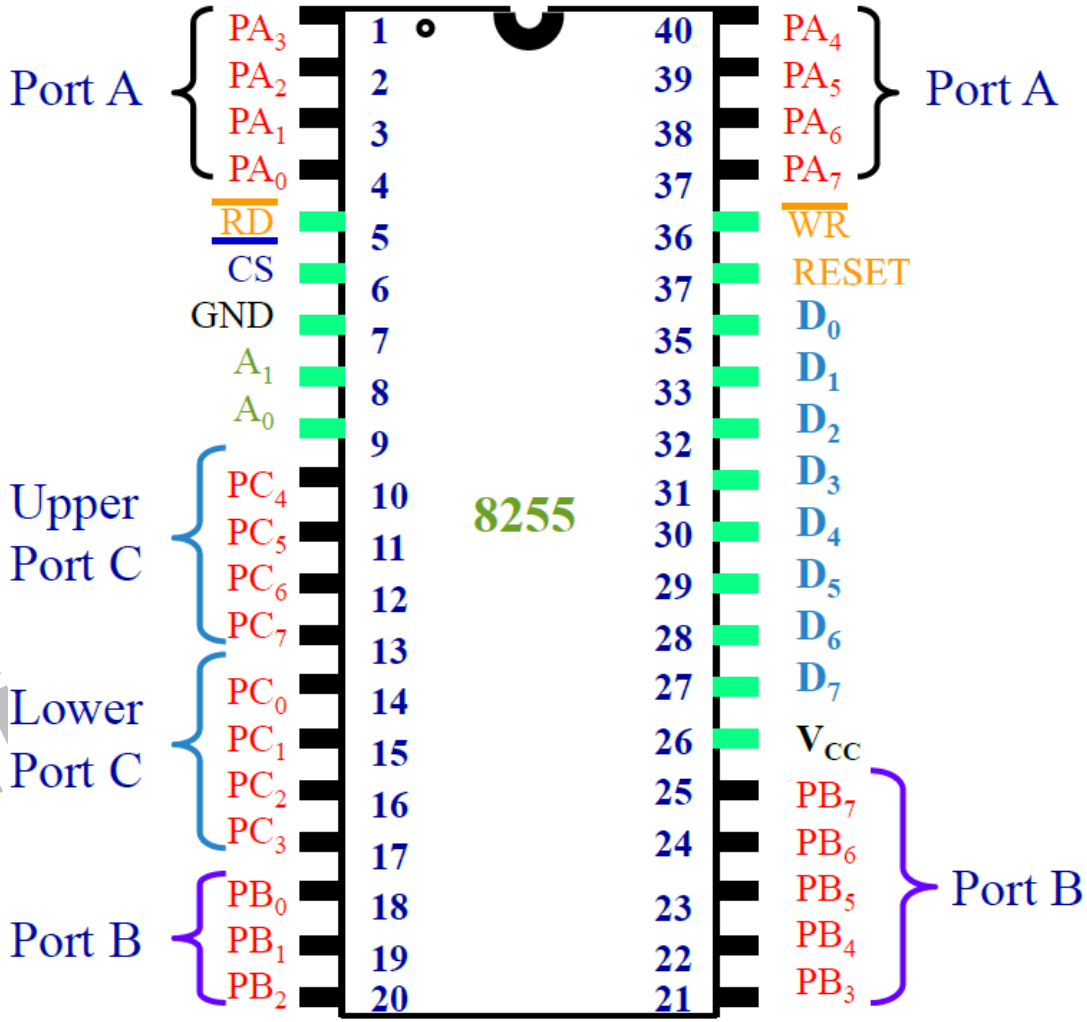
8255 PPI
PPI provides 3, 8-bit I/O ports (A, B and C) in one package
Chip can be directly interfaced to the data bus of 8086.

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

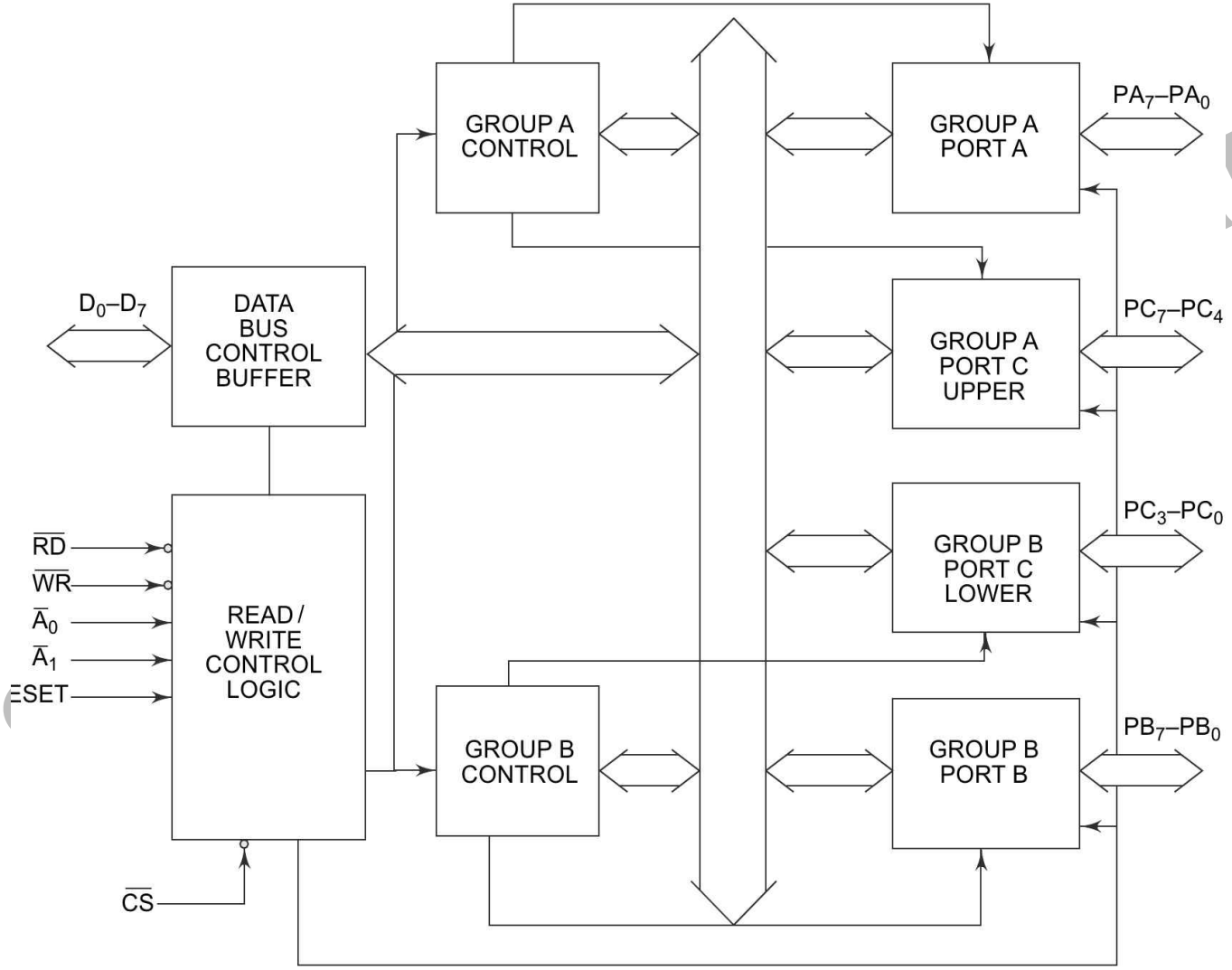


Selection of ports

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

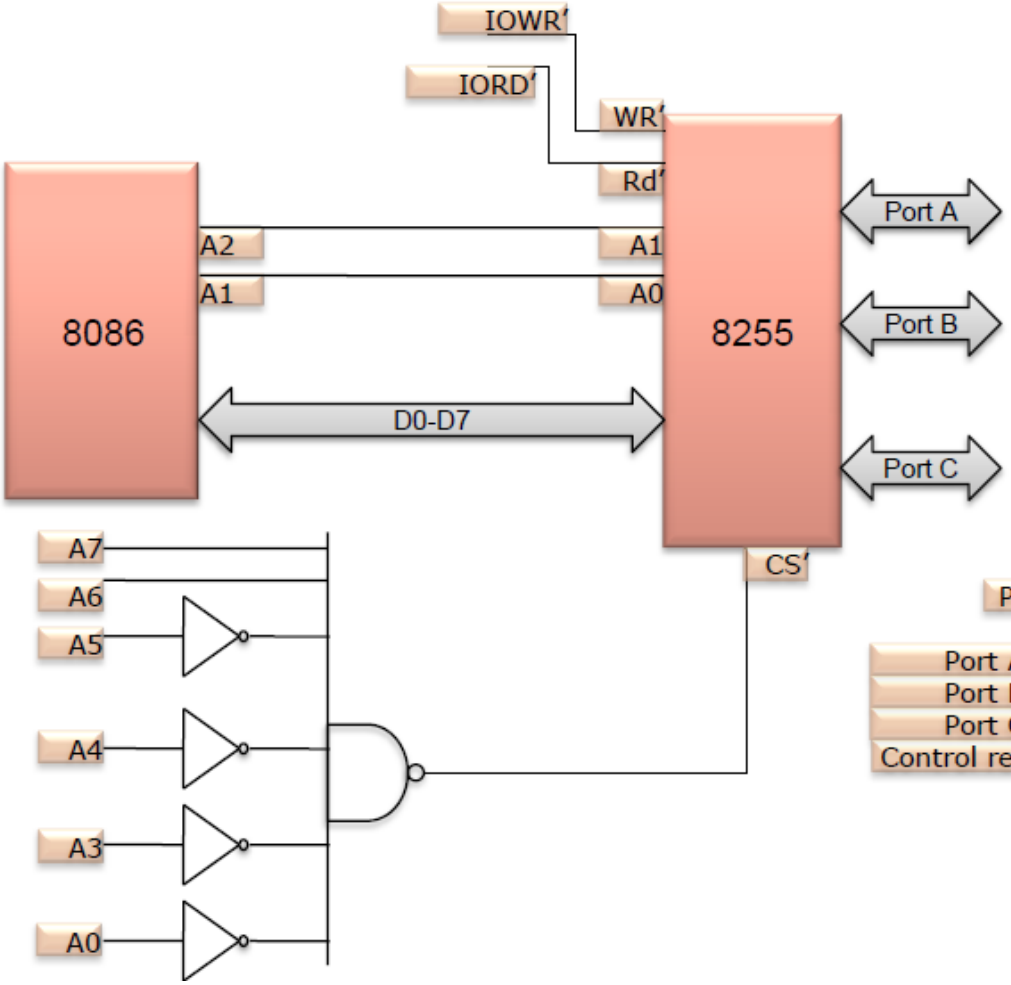


2^{14} = 16K
8255 can be connected

Mode 0: 3 ports per 8255

Mode 1/2 : 2 ports per 8255

Interfacing with 8086



Port addresses

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

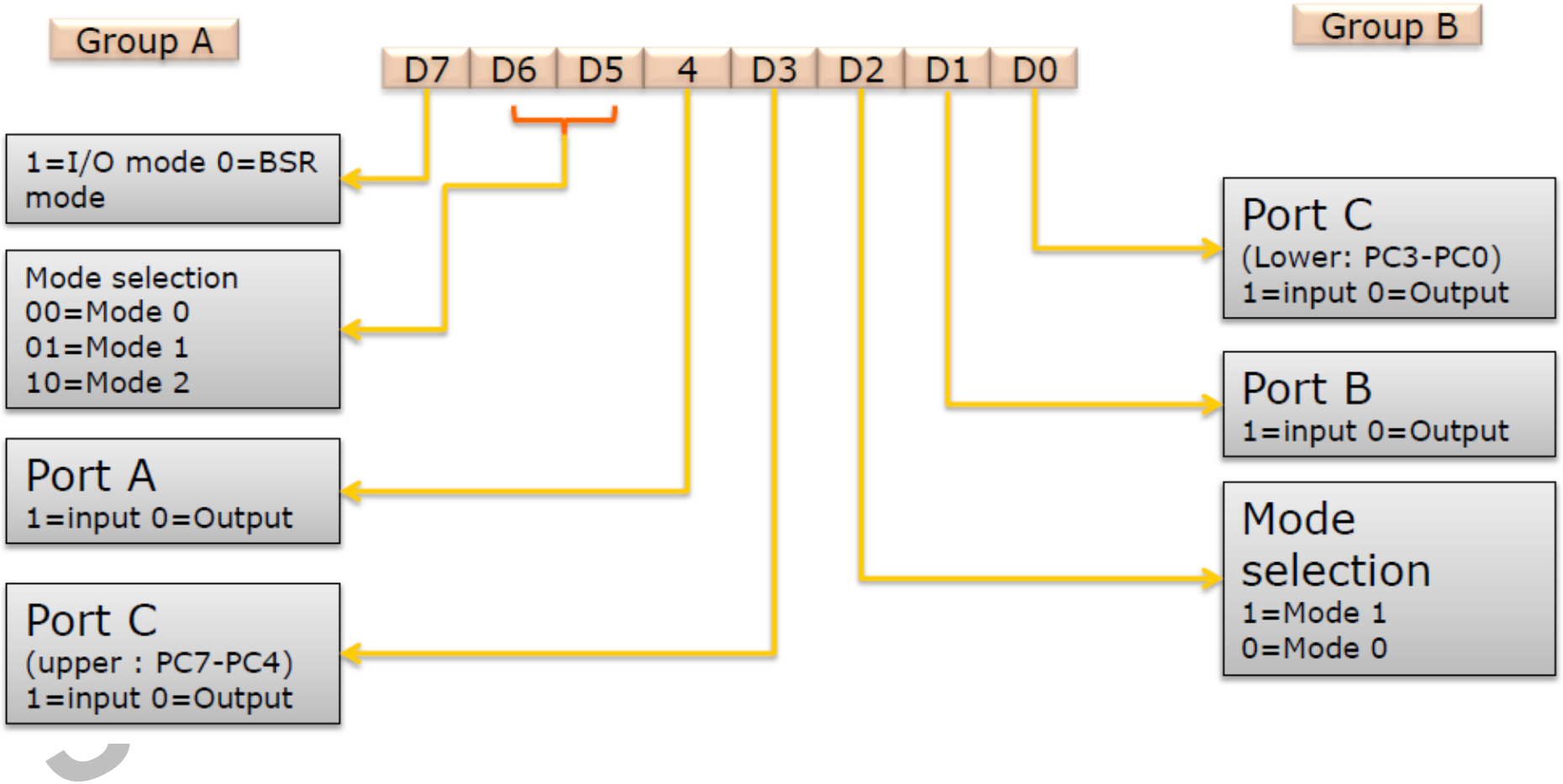
Programming 8255
MOV DX 0FFF6h;
MOV AL 80h;
OUT DX AL;

Port A
MOV DX 0FFF0h;
OUT DX AL;

Port B
MOV DX 0FFF2h;
OUT DX AL;

Port C
MOV DX 0FFF4h;
OUT DX AL;

Control word Format

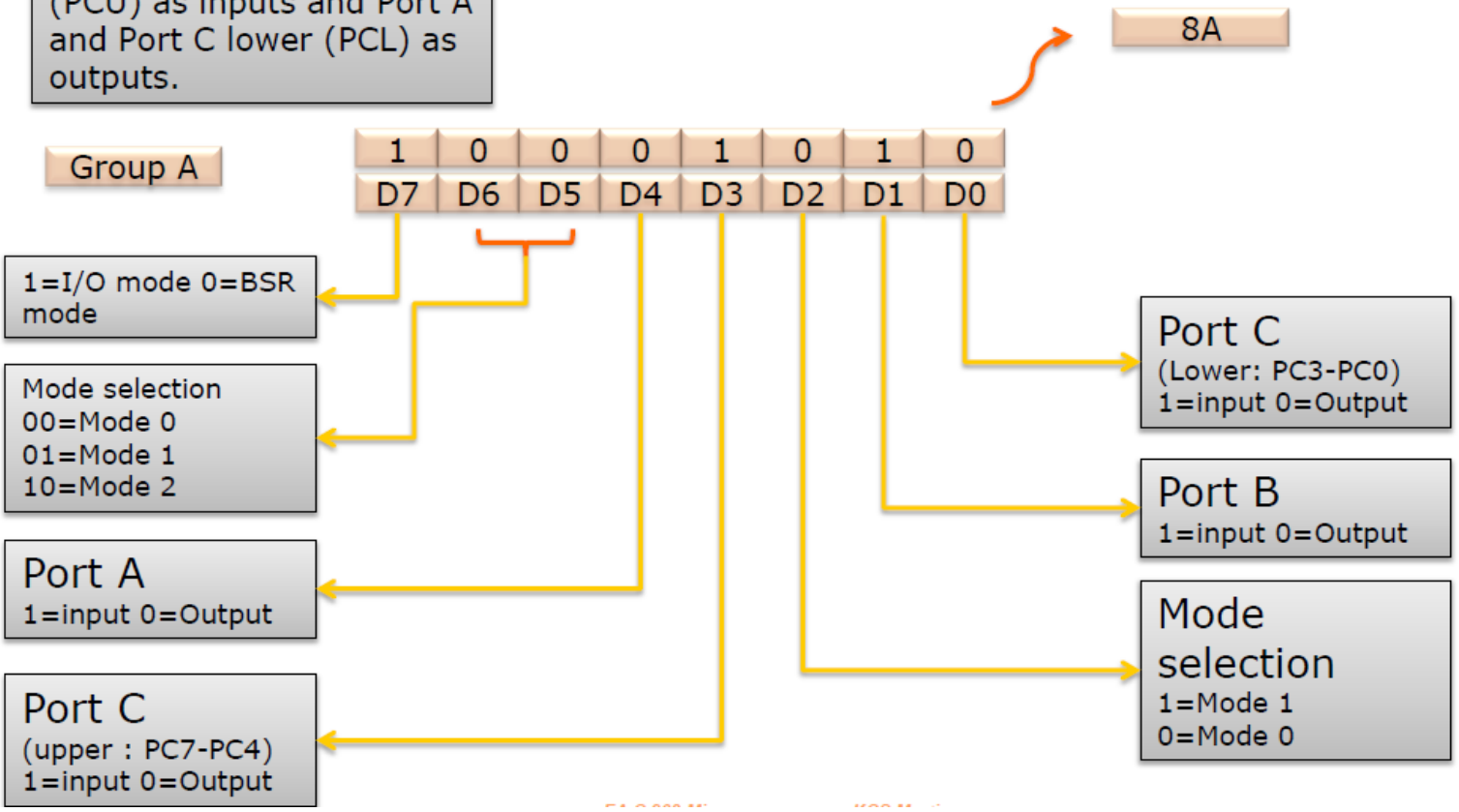


Control word Format

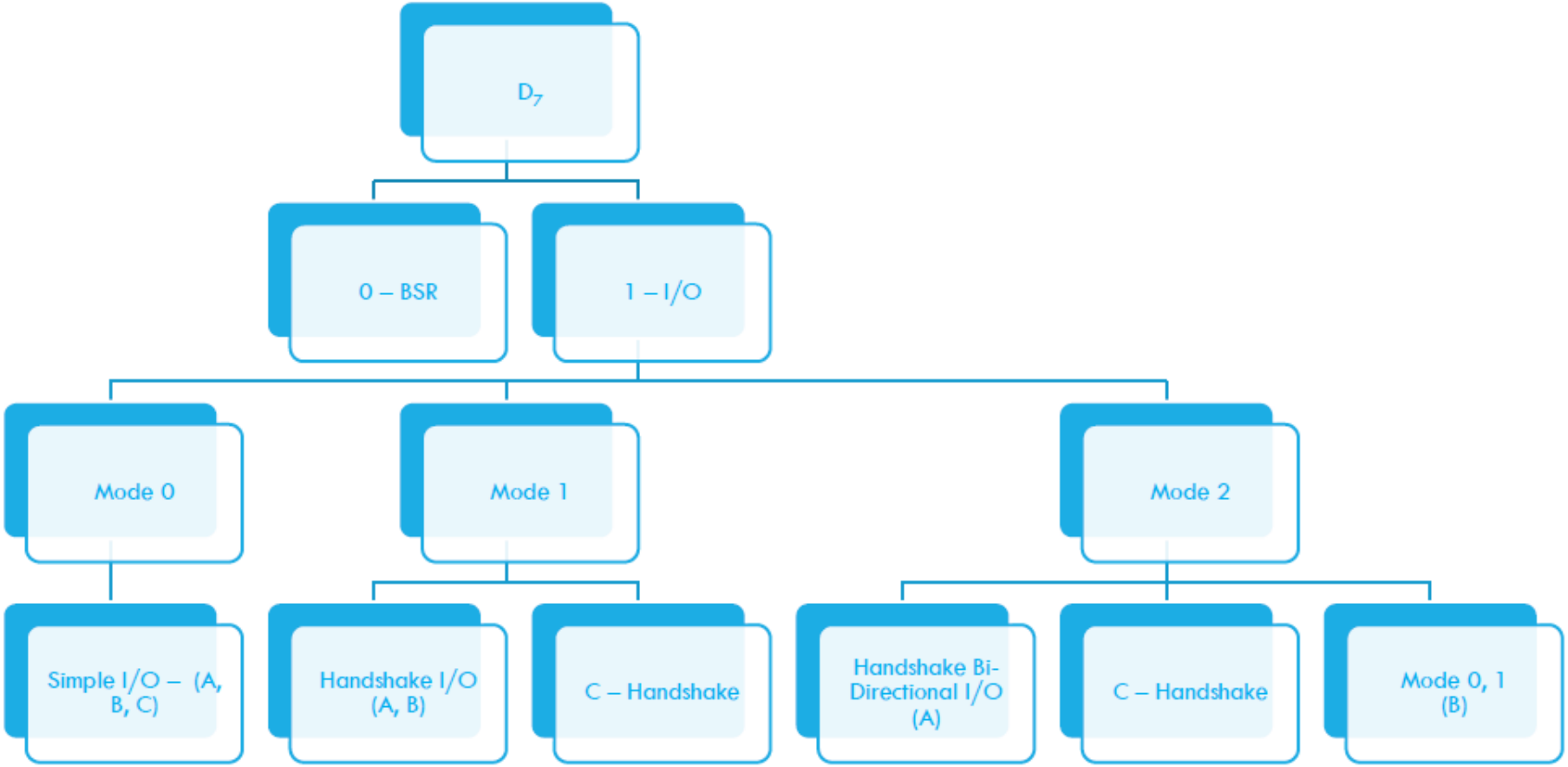
D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
	Port A Mode		**Port A**	**Port C Upper**	**Port B Mode**	**Port**	**Port C Lower**
Always 1 for I/O Mode	0 0 - Mode 0 0 1 - Mode 1 1 x – Mode 2		1 - I/P 0 - O/P	1 - I/P 0 - O/P	0-Mode0 1-Mode1	1 - I/P 0 -O/P	1 - I/P 0 - O/P
	Group A				**Group B**		

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