

Chapter 11: Input/Output Organisation

Lesson 13: Parallel Port

Objective

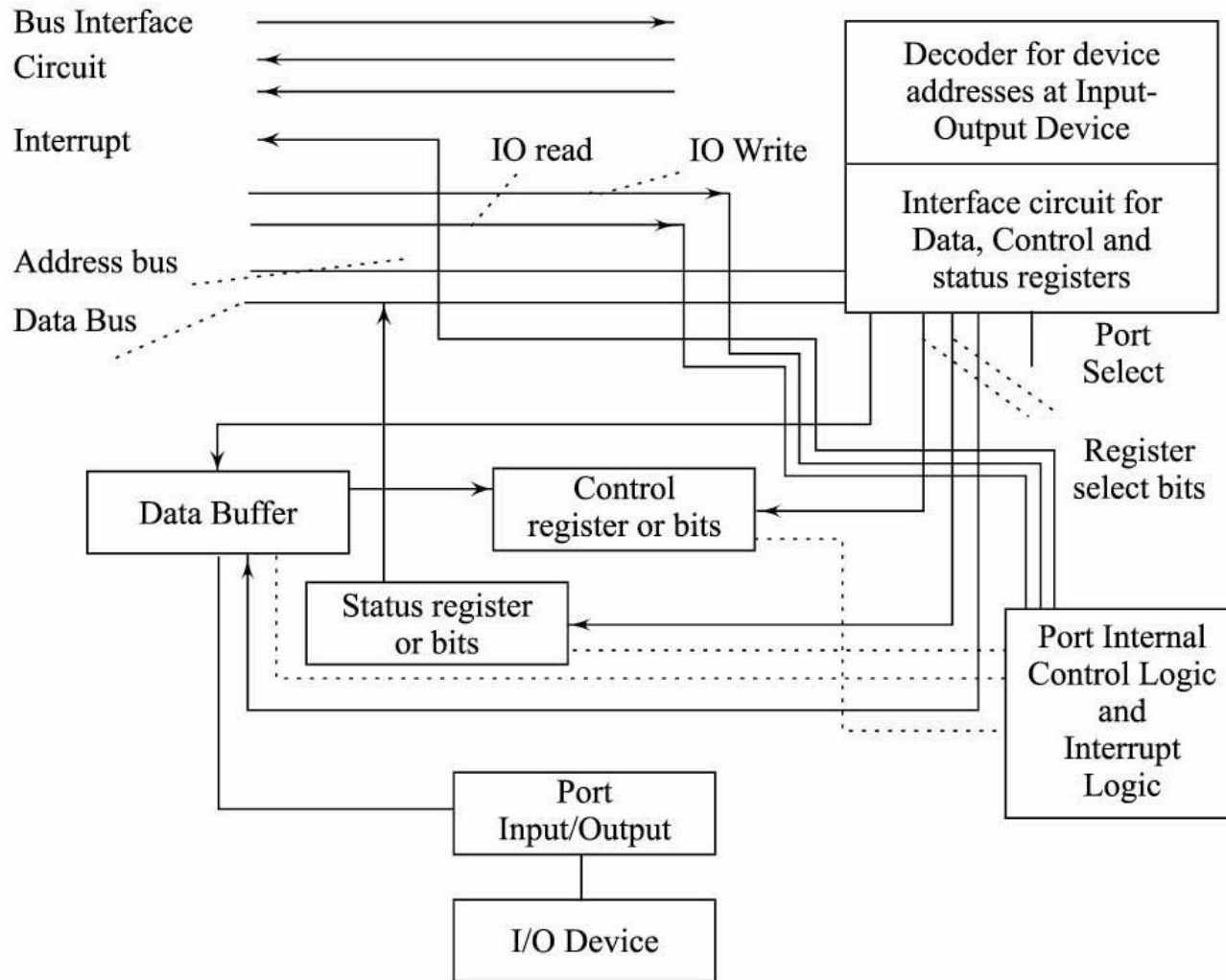
- Be familiar with parallel I/O port functioning
- Learn that a parallel port accepts or sends the 8-bits or more simultaneously and connects the bus through multiple lines
- Learn about the handshaking signals when using a parallel port

Parallel port functioning

Parallel port functioning

- Accepts or sends the 8-bits or more simultaneously and connects the bus through multiple lines
- A byte generally the minimum unit of data transfer at the device interfaced to the bus through the parallel port

Parallel port interface for inter-connecting the I/O device to the bus



Control register in Parallel port when interfacing the processor bus and I/O device

- The port (i) Control register(s), which acts as a command register and is used to tell the device what the processor (or controller using the bus) wants it to do

Status register in Parallel port when interfacing the processor bus and I/O device

- (ii) Status register(s), which is used to tell the processor (or controller) what the present status of the device is
- Status bits— port ready, finished the previously commanded action, the input buffer has data still to be read by the processor or whether the output buffer for sending the output of the device empty

Data registers in Parallel port when interfacing the processor bus and I/O device

- (iii) Output register(s) or buffer, for sending the output through the port
- (iv) input register(s) or buffer, for receiving the input from the device through the port

Parallel port Signals

Example of parallel port bus signals to and from the port

- a. A.
 1. Data bus D0-D7
 2. Interrupt
 3. Address bits A0, A1 —Registers and port select (in case of multiple port I/Os)

Example of parallel port bus signals to and from the port

4. I/O Read
5. I/O Write
6. CS (Port chip Select)
7. Reset (after this input, the port control registers need to be programmed again)

Parallel port Signals for Interfacing and handshaking

Example of parallel port I/O device signals to and from the port

1. Port I/O IO0-IO7
2. Strobe (Data ready input from device)
3. IBF (Input Buffer full) (buffer not available to device)
4. OBF (Output buffer full to device)
5. ACK (Acknowledgement from device, when received the port output)

Example printer port Centronics interface signals

1. Strobe signal (equivalent to data ready signal on asynchronous bus)
2. Acknowledgement signal (equivalent to data acknowledgement signal on asynchronous bus)
3. Busy signal to indicate that port is busy (equivalent to Bus busy)

Example printer port Centronics interface signals

4. Paper Out Status Error
5. Error Status Eight-bit
6. Data signals and corresponding ground lines

Summary

We learnt

- Parallel I/O port functioning
- Parallel port accepts or sends the 8-bits or more simultaneously and connects the bus through multiple lines
- Handshaking signals when using a parallel port

End of Lesson 13 on **Parallel Port**