



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**  
**An Autonomous Institution**

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## **DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

### **19ECT221 – MICROPROCESSORS AND MICROCONTROLLERS**

**II YEAR - IV SEM**

**UNIT 2 – 8279 Keyboard and Display Controller**



## 8279- Keyboard and Display controller

- 8279 programmable keyboard/display controller is designed by Intel that interfaces a keyboard with the CPU.
- The Keyboard can be interfaced either in the interrupt or the polled mode. In the **Interrupt mode**, the processor is requested service only if any key is pressed, otherwise the CPU will continue with its main task.
- In the **Polled mode**, the CPU periodically reads an internal flag of 8279 to check whether any key is pressed or not with key pressure.



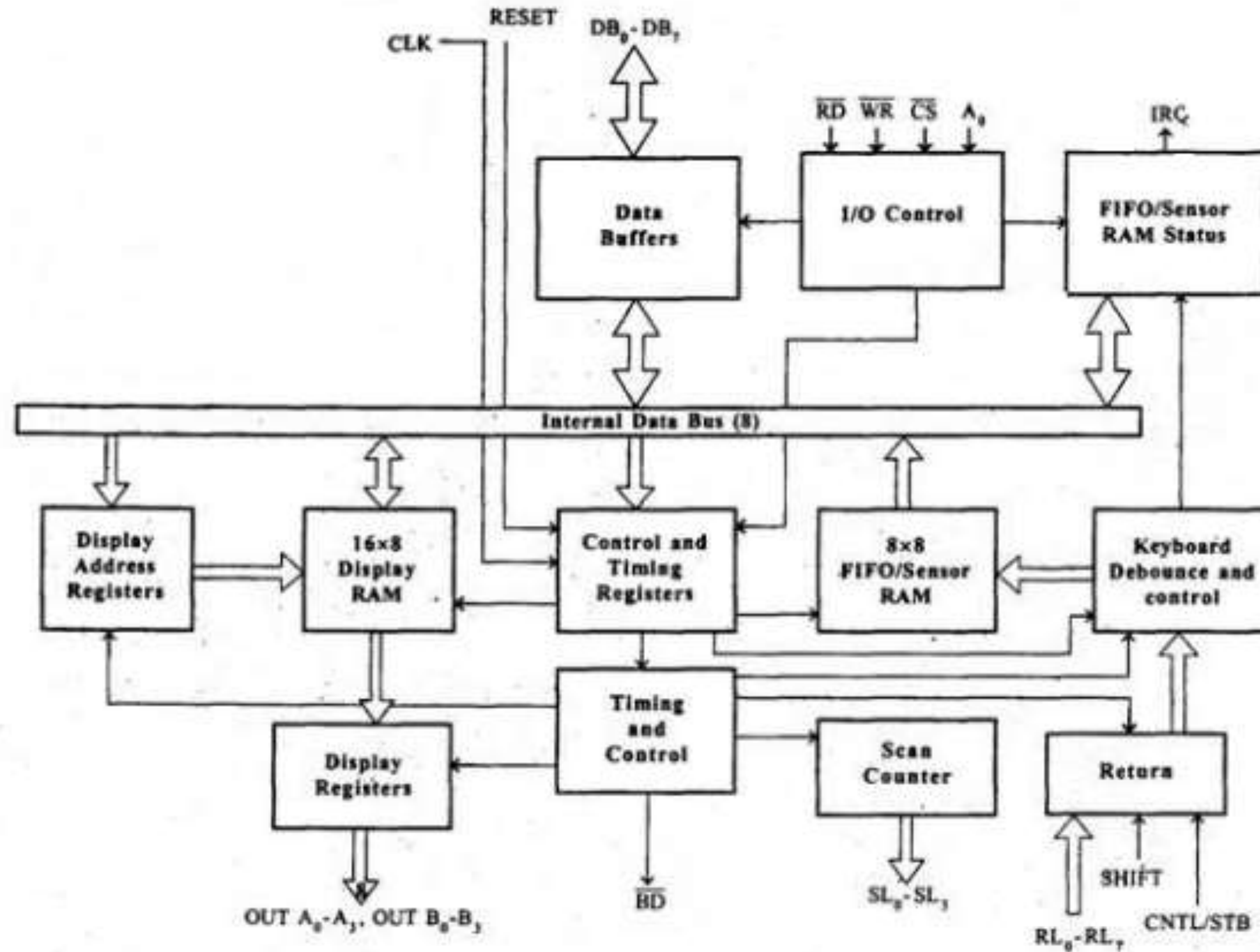
## How does 8279 Keyboard works?

- The keyboard consists of maximum 64 keys, which are interfaced with the CPU by using the key-codes.
- These key-codes are de-bounced and stored in an 8-byte FIFO RAM, which can be accessed by the CPU.
- If more than 8 characters are entered in the FIFO, then it means more than eight keys are pressed at a time.
- This is when the overrun status is set.



## How does 8279 Keyboard works?

- If a FIFO contains a valid key entry, then the CPU is interrupted in an interrupt mode else the CPU checks the status in polling to read the entry.
- Once the CPU reads a key entry, then FIFO is updated, and the key entry is pushed out of the FIFO to generate space for new entries.





# Architecture of 8279



- I/O Control and Data Buffer
- Control and Timing Register and Timing Control
- Scan Counter – Encoded mode and decoded scan mode
- Return Buffers, Keyboard Debounce, and Control
- FIFO/Sensor RAM and Status Logic
- Display Address Registers and Display RAM



# Operational Modes of 8279



- There are two modes of operation on 8279 – **Input Mode** and **Output Mode**.
- **Input Mode:** Scanned keyboard mode
  - Scanned sensor Matrix
  - Strobed mode
- **Output Mode:** Display scan and Display entry



# How many ways the keyboard is interfaced with CPU?



- There are two modes of operation on 8279

## **Interrupt Mode and Polled Mode**

- **Interrupt mode-** CPU address the only when the key is pressed
- **Polled mode-** CPU periodically checks/reads an internal flag of 8279 to check whether any key is pressed or not.





# References

<https://www.geeksforgeeks.org/difference-between-memory-mapped-io-and-io-mapped-io-with-reference-to-8085-microprocessor/>

[https://www.tutorialspoint.com/microprocessor/microprocessor\\_io\\_interfacing\\_overview.htm](https://www.tutorialspoint.com/microprocessor/microprocessor_io_interfacing_overview.htm)

<https://circuitglobe.com/difference-between-memory-mapped-io-and-io-mapped-io.html>

Ramesh S.Gaonkar,” Microprocessor – Architecture, Programming and Applications with the 8085”, Penram International Publisher,7<sup>th</sup> Ed., 2016

*Thank You*