Chapter 8

Digital and Analog Interfacing Methods

Lesson 7

IEEE 488/ GPIB Interface

GPIB/IEEE 488 Bus

Data Signals

1. db7-db0 data bus signals

2. GND0-GND7 eight ground lines

3. $\overline{\text{DAV}}$ = 1 asserts a need for Valid Data Available to Listener from talker or controller and = 0 when data becomes available

Handshaking Signals

4. $\overline{\text{NFRD}}$ = 0 Not yet Ready for Data and asserts 1 when ready

5. $\overline{\text{NDAC}}$ = 0 asserts 'Not Yet Accepted the data' and = 1 to assert data accepted

6. IFC Interface Clear Stop current bus activity

Management Signals

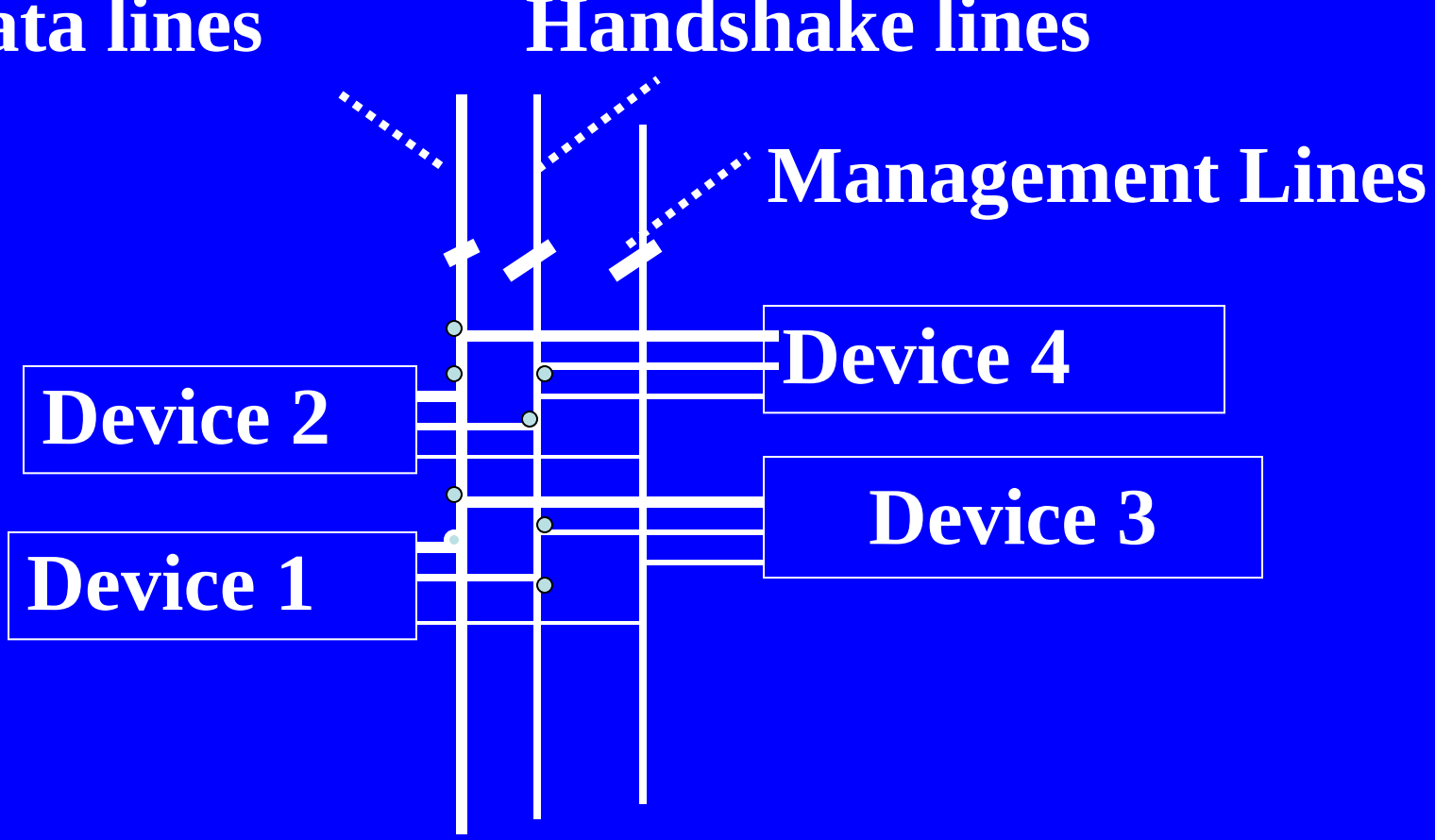
7. SRQ— Service request From Device to controller (An Interrupt to get bus access)

8. ATN— Attention from new talker or controller that intends to talk to a listener; asserts 1 when puts listener device address

9. REN— Remote Enable

10. EOI— End of an operation or Identify by polling of a device

Bus Interface



GPIB Interface- Device maybe a controller, talker or listener

Protocol

Protocol

- A talker at instance τ_1 asserts a need ($\rightarrow$ 1) for data valid $\overline{DAV}$ availability because ATN = 1 from talker when there is device-address at DB0-DB7.
- Let other device (listener) had asserted $\overline{NRFD}$ ($\rightarrow$ 0)
- Protocol is such that after $\overline{NRFD}$ ($\rightarrow$ 1) at τ_2, then only the ATN $\rightarrow$ 0 at τ'_2

Protocol

• Because device is ready, the talker at instance τ_3 asserts data valid $\overline{\text{DAV}}$ (→ 0) availability because ATN →0 from talker and there is data at DB0-DB7.

• Other device (listener) asserts $\overline{\text{NRFD}}$ (→ 0) at τ_4

•Protocol is such that after $\overline{\text{NRFD}}$ (→ 0) at τ_4 and $\overline{\text{NDAC}}$ →1 at τ'_4 the cycle finishes.

Protocol

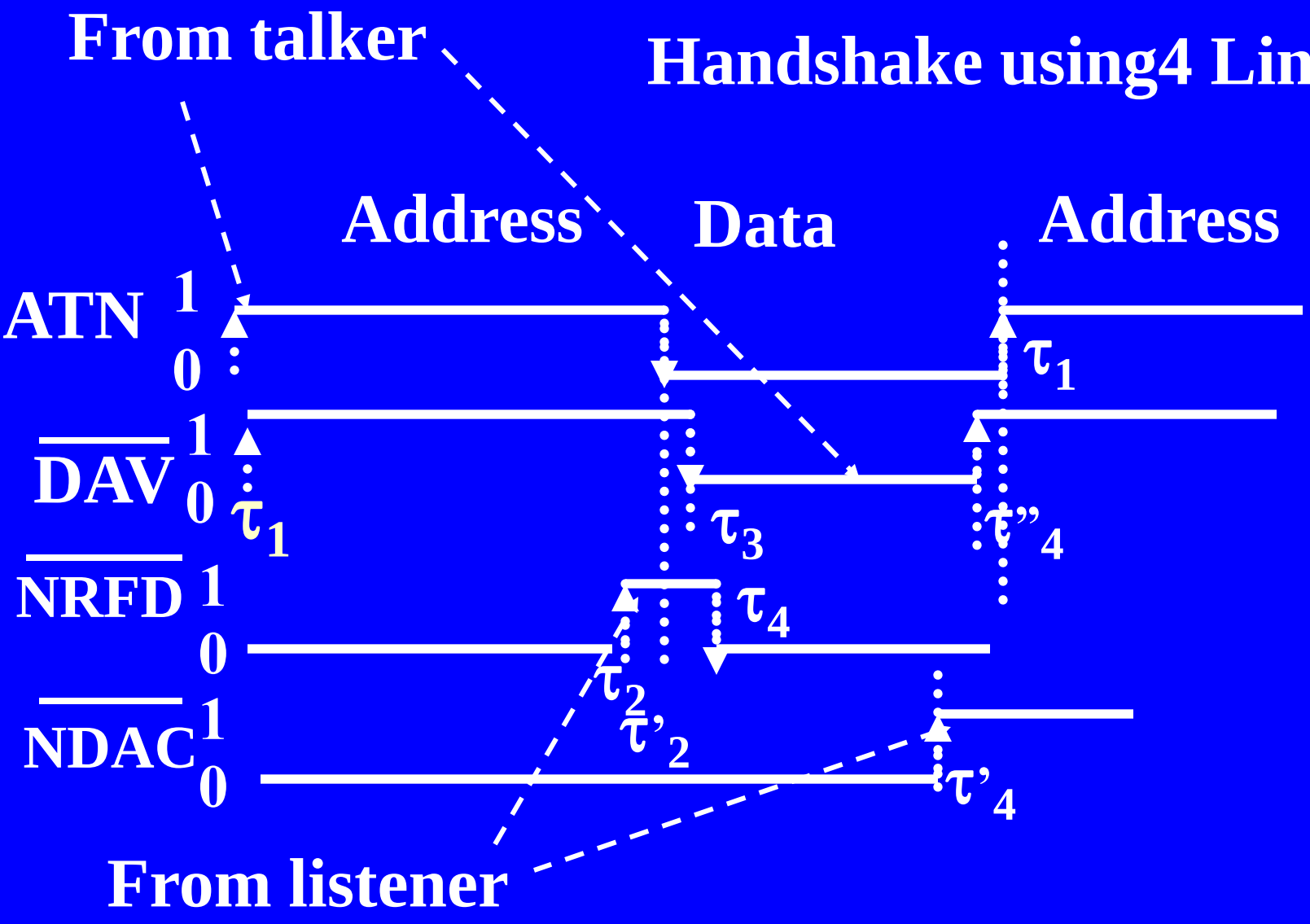
- Listener asserts at instance $\tau'4$, the $\overline{DAV}$ $\rightarrow$ 1 then new cycle ~~will st~~art after τ''_4 and due to the data valid DAV (presently1) availability need the ATN asserts $\rightarrow$ 1 from a new talker at next τ_1 and there will be new device address at DB0-DB7 till next at $\tau 2$.

Bus Signal Timings

GPIB/IEEE 488Bus data lines

Exemplary Data bits on 8Lines

Handshake using4 Lines



Summary

We learnt

GPIB IEEE 488 Bus

- 8-data lines for address as well as data from controller or listener
- 8 GND lines

We learnt

GPIB IEEE 488 Bus

4 bus management signals-

- IRC, EOI, SRQ and REN

4 Handshaking signals

- NFRD and NDAC from listener
- ATN and DAV from talker

End of Lesson 7

IEEE 488/ GPIB Interface