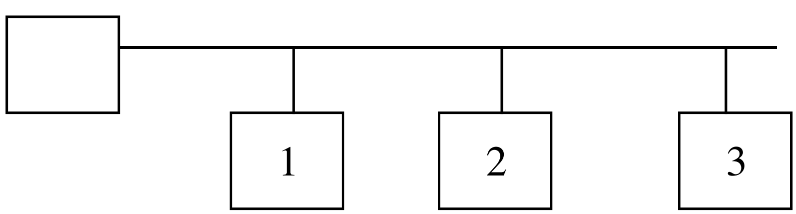
Data Link Control Standards

- HDLC
  - High level data link control
- LAPB
  - Link Access Protocol-Balanced
- LAPD
  - Link Access Protocol D
  - Used in ISDN and based on LAPB

Data Link Control Standards

Flag	Address	Control	Data	CRC	Flag
8 bits	8 bits	8 bits		16 bits	8 bits

- Address ⇨ Provide capability for multidrop lines

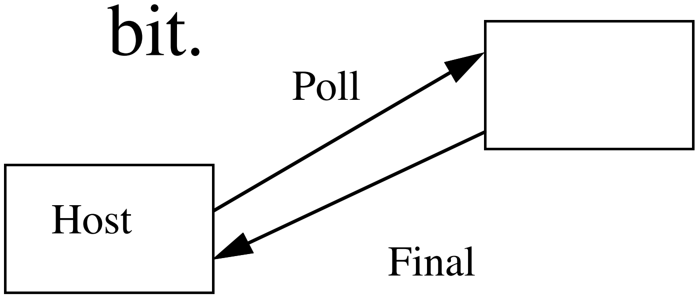


Data Link Control Standards

- Control
  - Sequence Numbers
  - Ack
  - Frame type
- Data
  - Network layer PDU
  - Variable length
- CRC

Data Link Control Standard

- Control structure I-frame
  - Bit 1 = 0 indicate I-frame
  - Bits 2-4 are the sequence number
  - Bit 5 is the Poll/Final (P/F) bit.



  - Bits 6-8 are the Next bits, i.e, sequence number for the piggyback ack.

Data Link Control Standard

- Control structure S-frames
  - Type 1: Receive Ready (RR)
    - Used to ack when no piggyback used
  - Type 2: Receiver-not-Ready (RNR)
    - Used to tell transmitter to stop sending
  - Type 3: Selective Reject
    - Not used in LAPB and LABD

Data Link Control Standard

- Data link control protocol modes
  - Normal response mode (NRM)
    - Master/slave
  - Asynchronous balanced mode (ABM)
    - Equal partners