

Mux & Decoder

Electrical Engineering

Two combinational blocks that are near mirror images of each other.

Multiplexer

- Many inputs, one output
- n select lines choose one of 2^n inputs
- Used to share a bus or a resource
- Can implement any logic function
- A demultiplexer is the reverse

Decoder

- One input code, many outputs
- n inputs drive 2^n outputs, one active
- Used for addressing and chip select
- An enable pin gates the whole device
- An encoder is the reverse

THE DIFFERENCE THAT MATTERS

A decoder plus an OR gate builds any sum of products; a multiplexer reaches the same result with fewer parts.

Both scale badly: each extra select line doubles a decoder's outputs and doubles a multiplexer's data inputs.