

FDD

Frequency division duplex (FDD) is a communication technique where the connected parties can communicate with each other in both directions through use of separate frequency bands for transmitting and receiving. Since FDD uses different frequency bands for upstream data and downstream data, the sending and the receiving signals do not interfere with each other.

FDD in Cellular Networks

Cellular networks use FDD to separate the channels. One block of the electromagnetic spectrum is allocated for uplink, which carries data from mobile phones to a base station. A different block of the spectrum is allocated to downlink, carrying data from a base station to mobile phones. Each of the blocks are divided into a number of channels.

In advanced mobile phone systems (AMPS), 832 full-duplex channels are used, each comprising of a pair of simplex channels, one for uplink and the other for downlink. The uplink channels are separated from the downlink channels through guard bands.

Advantages

- ➡ It uses paired spectrum on continuous basis for both the directions and hence it can achieve higher rates for similar distances as TDD system.
- ➡ Due to above, FDD system requires fewer base stations (or eNBs) compare to TDD as it covers larger distances with same rates as of TDD.
- ➡ Due to requirements of less number of Base Stations, overall deployment, operation and maintenance costs are less

Disadvantages

- ➡ In FDD, frequencies are allocated dedicately. This leads to wastage of spectrum when it is not used. Moreover guard band is used between uplink and downlink to avoid interference, this part is wasted as it is not used for useful traffic.
- ➡ FDD can not be deployed where spectrum is un-paired.
- ➡ Though it saves in number of Base Station requirements, hardware costs associated with FDD are higher