

Communication peripheral inspired by SpaceWire

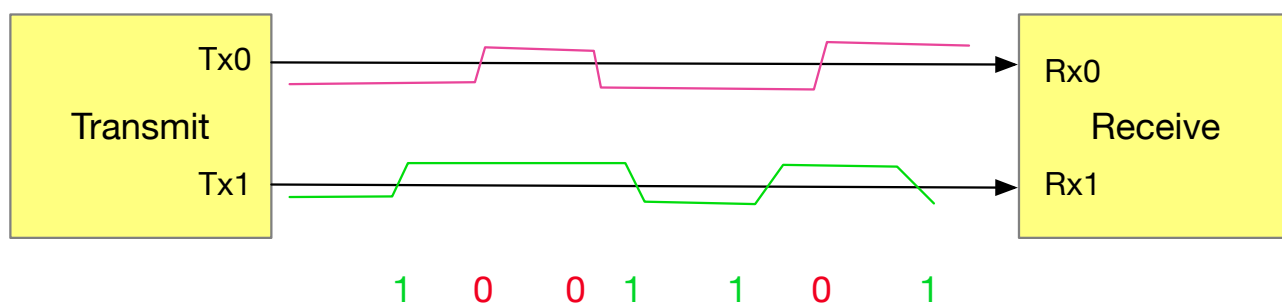
We are talking about point to point communication between two stations.
Spacewire is a protocol that uses two wires in each direction and doesn't require the stations to know each other clock frequency.
Any change in one wire signifies ZERO and change in the another wire signifies ONE.

The hardware resource of each station are much more modest when compared to SERDES. Applications include fast side channels between FPGA or ASIC or Chiplets.

More advanced implementation uses clock-less logic for Tx and Rx.

Spacewire

Using Spacewire name is a bit misleading. Full Spacewire protocol is defined by space agencies and covers much more topics. Here we just use basic signaling inspired by Spacewire.

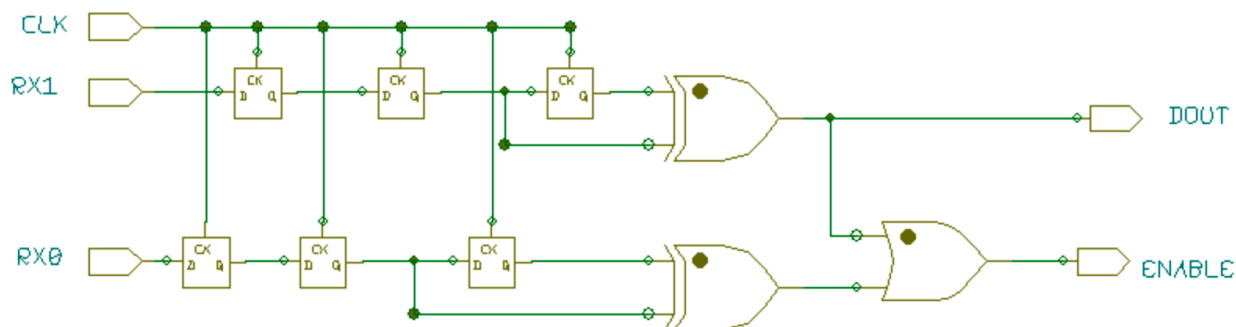


Two wires in each direction. Change in one wire signifies ZERO, change in another stands for ONE. The distinction of this type of communication is that the stations do not need to coordinate the frequencies. There is of course an upper limit to rates, but it is limited by each station constraints and by timing skew of optionally long wires.

Sync implementation

Using synchronizers and system clock and flops. The drawback is high needed frequency and high power because of constant high frequency. Below is simple schematics of Tx and Rx .

This is RX side:



This is basic Tx Side.

