

Bi-Directional Transceivers

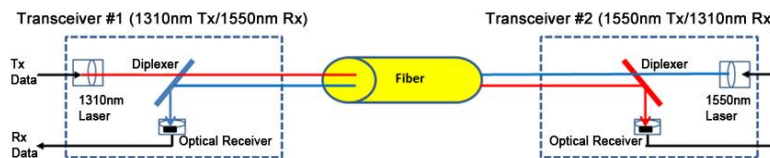
Working principle of a Bi-Directional transceiver

The primary difference between BiDi transceivers and traditional two-fibres optic transceivers is that BiDi transceivers are fitted with Wavelength Division Multiplexing (WDM) couplers which combine, and separate data transmitted over a single fibre based on the wavelengths of the light.

To work effectively, BiDi transceivers must be deployed in matched pairs with their diplexers tuned to match the expected wavelength of the transmitter and receiver, which they will be transmitting data from or to.

For example: If paired BiDi transceivers are being used to connect Device A (Upstream) and Device B (Downstream), as shown in the figure below, then:

- Transceiver A's diplexer must have a receiving wavelength of 1550 nm and a transmit of 1310 nm
- Transceiver B's diplexer must have a receiving wavelength of 1310 nm and a transmit of 1550 nm



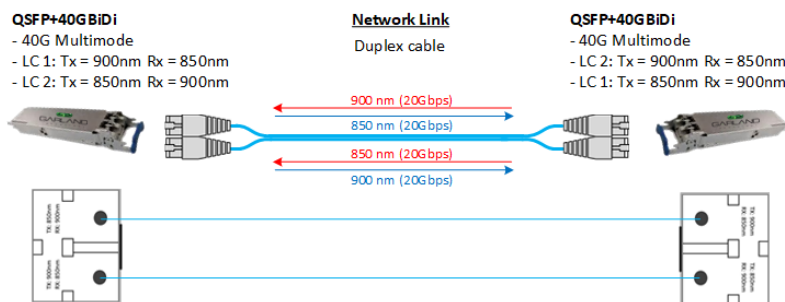
Itectras portfolio of BiDi transceivers consists of:

- 1 Gb BiDi SFP in both 1310 nm / 1490 nm and 1310 nm / 1550 nm versions Power budget: -33 dB
- 10 Gb BiDi SFP+ in 1270 nm / 1330 nm Power budget: -20 dB
- 10 Gb BiDi XFP in 1270 nm / 1330 nm Power budget: -20 dB
- 3 Gb CPRI BiDi SFP for all CWDM channels. Power budget: -20,5 dB
- 6 Gb CPRI BiDi SFP+ for all CWDM channels. Power budget: -23 dB
- 10 Gb CPRI BiDi SFP+ for all CWDM channels. Power budget: -23 dB

40 GbE / 100 GbE BiDi Transceivers

The BiDi method is also used for 40 Gbps and 100 Gbps transport over Multimode fibres. By using two different wavelengths, each strand of fibre will both send and receive traffic at a rate of 20 Gbps (2x10) or 50 Gbps (2x25). These BiDi transceivers require OM3, OM4 or OM5 multimode fibres.

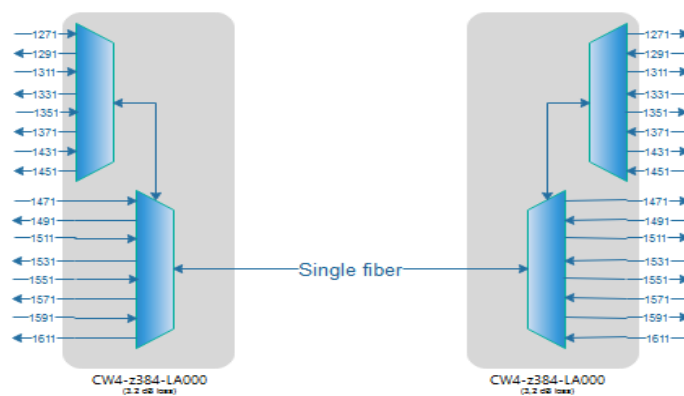
The below depicted scenario utilised both 850 nm and 900 nm for transmit 40 Gbps over a distance up to 150 m (OM4) or 100 m (OM3).



Bi-Directional C/DWDM Systems

In cases where there is shortage of fibre larger bandwidth, CWDM or DWDM can be installed as a single-strand system. This is done by utilising half of the systems channels as transmit (Tx) channels, whereas the other half are reserved for the receiving (Rx) channels.

This can be installed in CWDM system – as below depicted – and in DWDM system following the same installation principle.



Please refer to the Itectra WDM data sheet for the full range of CWDM and DWDM modules and systems.