# G.698.6 Multichannel WDM applications with single-channel optical interfaces in the O-band

- Recommendation ITU-T G.698.6 (ex G.owdm2) provides optical parameter values for physical layer interfaces of wavelength division multiplexing (WDM) systems primarily intended for mobile fronthaul and metro applications in the O-band, optimized for 5-km transmission distances.

- Applications are defined using optical interface parameters and values for single-channel interfaces of multichannel WDM optical systems in point-to-point applications. The Recommendation uses a system architecture comprising a head-end equipment (HEE) connecting to the tail-end

equipment (TEE) through a black link.

- For mobile fronthaul applications, the HEE is in a central office while the TEE is in a remote antenna site. A single bidirectional transmission fibre or a pair of unidirectional transmission fibres is used in the black link to connect the HEE to the TEE.

- The current version of the Recommendation includes unidirectional and bidirectional WDM applications at 25 Gbit/s per channel with alternating channel wavelength spacing of 7 nm and 13 nm in the O-band.
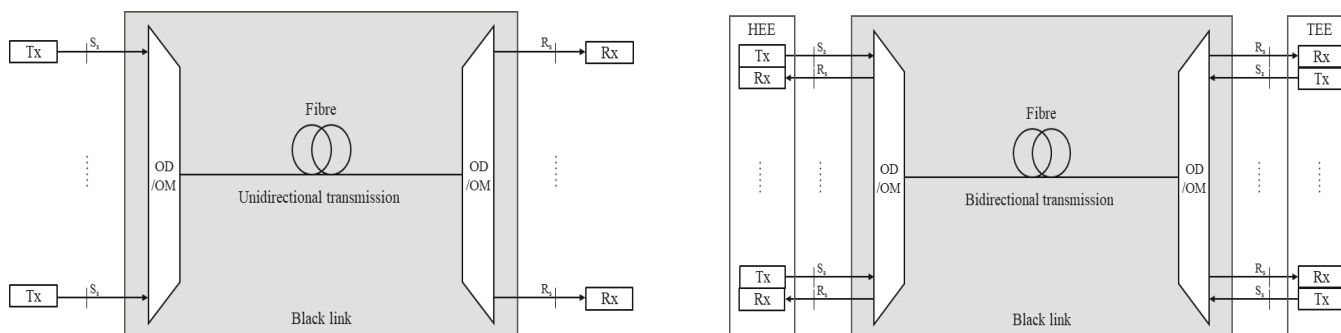
Reference configurations for unidirectional (left) bidirectional (right) transmission applications

Direction	Channel number	Nominal central wavelength (nm)	Direction	Channel number	Nominal central wavelength (nm)
From HE to TE	1	1267.5	From TE to HE	2	1274.5
	3	1287.5		4	1294.5
	5	1307.5		6	1314.5
	7	1327.5		8	1334.5
	9	1347.5		10	1354.5
	11	1367.5		12	1374.5

Nominal bidirectional optical channel wavelengths and their pairing for bidirectional application code M12-5B-9-D1

Reference points
The reference points in the reference configurations are defined as follows:
– S_S is a single-channel reference point at the black link tributary input;
– R_S is a single-channel reference point at the black link tributary output.
At the S_S interface, a single channel signal enters the black link from an optical transmitter.
At the R_S interface, a single channel signal exits the black link towards an optical receiver.

Key features
Recommendation describes WDM systems that include the following features:
- operating wavelength band: the O-band
- nominal wavelength spacing: alternating between 7 nm and 13 nm
- nominal bit rate of signal channel: 25 Gbit/s

- nominal transmission distance: 5 km
- maximum capacity: 12 unidirectional channels or 6 bidirectional channels (12 total wavelengths) at 25 Gbit/s per channel.

Application codes
The application code notation is constructed as
   Mc-dD-y-tz,
where M is the indicator of WDM applications defined in the Recommendation, c is the number of channels, d is a number indicating the span distance in km, D is the indicator of unidirectional (U) or bidirectional (B) transmission; y indicates the highest class of optical tributary signal supported; t indicates the configuration supported by the application code with D indicating that the black link does not contain any optical amplifiers, and z indicates the fibre type, whose value in the current version of the Recommendation is 1, indicating ITU-T G.652 fibre.