

Design of encoder and decoder module for optical code division multiple access (OCDMA) systems for zero cross correlation (ZCC) code based on arrayed waveguide gratings (AWGs)

Abstract

We apply the Arrayed Waveguide Grating (AWGs) method for Encoder and Decoder design for complete transmitter and receiver system. The Encoder and Decoder module will be using the AWG to encode and to decode optical source into useful signal to carry the data and transmit it using a single optical fibre. This module was designed to suite the Zero Cross Correlation (ZCC) Code. In this paper the study conduct to design of Encoder/Decoder for Optical Code Division Multiple Access (OCDMA) system based AWGs and performance of ZCC code using this system. Results demonstrate that the Encoder/Decoder design of ZCC code using AWGs is capable of up to 100km with BER less than 10^{-9} which is typically allowed in optical communications.