

Efficient technology to reduce interference in passive optical networks

A new method for reducing interference in passive optical networks has been developed and patented. The technology allows the use of low cost lasers whose wavelength does not to be pre-selected, and assures a high speed communication of hundreds of users. Partners to further develop the system and/or to establish commercial agreements along with technical cooperation are sought.

The Challenge

Next-Generation Fiber-to-the-Home (FTTH) networks will use passive wavelength-division-multiplexing (WDM-PONs) in order to offer broadband GBit/s connection to hundreds of users, sharing an optical infrastructure, with low energy consumption. The challenge is to implement the concept of "Wavelength-to-the-Home λ TTH".

For the up-stream transmission, the user equipment can use a laser at a specific wavelength or at any wavelength, but with the risk of overlapping another user wavelength and ruining both communications due to the optical beat interference.

The challenge is to assure proper communication of a high number of users or homes (hundreds) at high bit rate making good use of the optical spectrum, using standard low cost lasers at the home.

The Technology

This present technique enables the use of any laser whose wavelength does not have to be pre-selected, so it can be randomly taken by the customer.

It consists of a centralized intelligent algorithm for controlling wavelength and the subcarrier in the OLT (Optical Line Terminal), which controls and commands the ONU (Optical Network Unit) wavelength mechanisms, in order to avoid possible interference while maintaining low total cost of the network.

It combines statistical multiplexing with fine thermal and current tuning, that is simply done in a standard DFB (Distributed Feedback Bragg) or VCSEL (Vertical Cavity Surface Emitting Lasers) laser, and fast adjustment of ONU RF modulation bands.

Innovative advantages

- Use of low cost lasers sources in a WDM-PON, with non-preselected wavelength.
- Hundreds of ONUs in the PON sharing the splitter-based infrastructure.
- Compatibility with GPON infrastructure.
- Specially suited for Ultra-Dense-WDM and OFDM.
- Optical Frequency demodulation (oFSK)
- Intrinsic remodulation for up-stream transmission
- Optical Amplification
- High speed (e.g. 10 GBit/s)

Current stage of development

Prototype and validity tests passed. Experimental results published at: 37th European Conference on Optical Communication (ECOC), paper Tu.5.C.2, 2011, Geneva

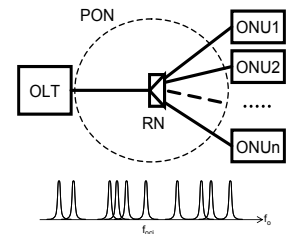
Applications and Target Market

- Broadband Telecom System Vendors
- Broadband Telecom Operators
- Telecom laser manufacturers
- Broadband Optical Communications networks: access, metropolitan, transport.
- Fiber-to-the-Home networks
- Next Generation - Passive Optical Networks (NG-PON): WDM, udWDM, OFDM.

Reference number

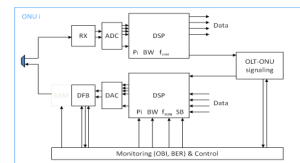
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Ultra-Broadband Bidirectional Fiber-to-the-Home System



HIGHEST BANDWIDTH FTTH ACCESS:

LOWEST COST WDM-PON



- **Home unit (ONU):**
◇ use any laser at any random wavelength
- **Central Office :**
◇ Adapts to that

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

Priority application

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