

Building a Fiber Optic CATV/HFC Network

LaserLite
LaserPlus

Olson Technology, Inc. has specialized for years in developing hybrid-fiber-coax (HFC) networks for the transport of CATV signals. Olson's *LaserLite* and *LaserPlus* optical/HFC transport platforms offer a multi-tiered solution for highly reliable CATV transmission. Today's HFC network reduces cost while increasing transmission range and maintaining superior performance.

An HFC network typically uses coaxial cable for short runs between peripheral equipment and the transmitter or cable receiver at the user end. At the same time, optical transmission links between headends use singlemode fiber to greatly extend the transmission distance. This combination allows the system designer to maximize cost-effectiveness when selecting the system components. Olson, Technology, Inc.'s full line of CATV links can be configured to meet any network requirement. This includes:

- Medium Size Private Networks
- Large Scale Campus and Municipal Networks
- Short-Haul CATV Transport
- Long-Haul CATV Transport

Figure 1 illustrates a basic CATV/HFC network.

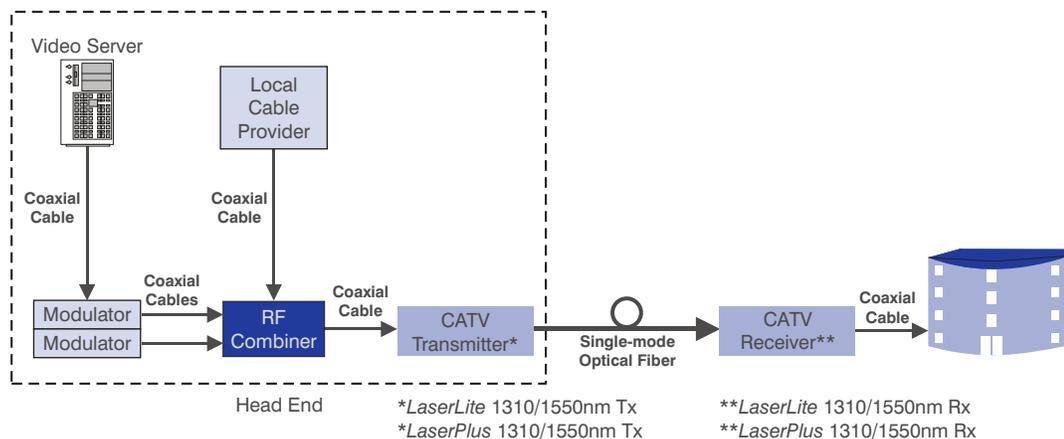


Figure 1 - Basic Elements of a Hybrid Fiber/Coax Network

Large Scale Campus and Municipal Networks

Olson Technology, Inc.'s family of CATV Transport Links can be configured in 1RU or 3RU configurations to transport 1550nm optical signals over one singlemode fiber. The highly flexible family of fiber optic links can be configured in a number of ways to create large scale unidirectional or bidirectional CATV networks.

The Model OTOT-870-EM55x Externally Modulated 1550nm transmitter offers dual optical outputs for signal redundancy. This feature-rich 1RU transmitter provides a front panel LCD that shows laser status, RF status, system temperature, and power status. In addition, status indicator LEDs, also on the front panel, monitor the transmitter OMI, gain control mode, laser pump

status, RF input status, casing temperature, and power supply status.

When combined with EDFA optical amplifiers, such as the *LaserLite* Model OTEA-x or *LaserPlus* Model LP-EA-x, the Model OTOT-EM55x allows system operators to cost-effectively transport a full slate of wideband video and data services over very long distances, or alternatively allows them to distribute signals to a multitude of remote optical receiver/node locations, by utilizing the lower fiber attenuation characteristic of the 1550 nm optical window.

Figure 2 illustrates a large scale campus or municipal network transmitting multiple forward path CATV channels as well as a return path.

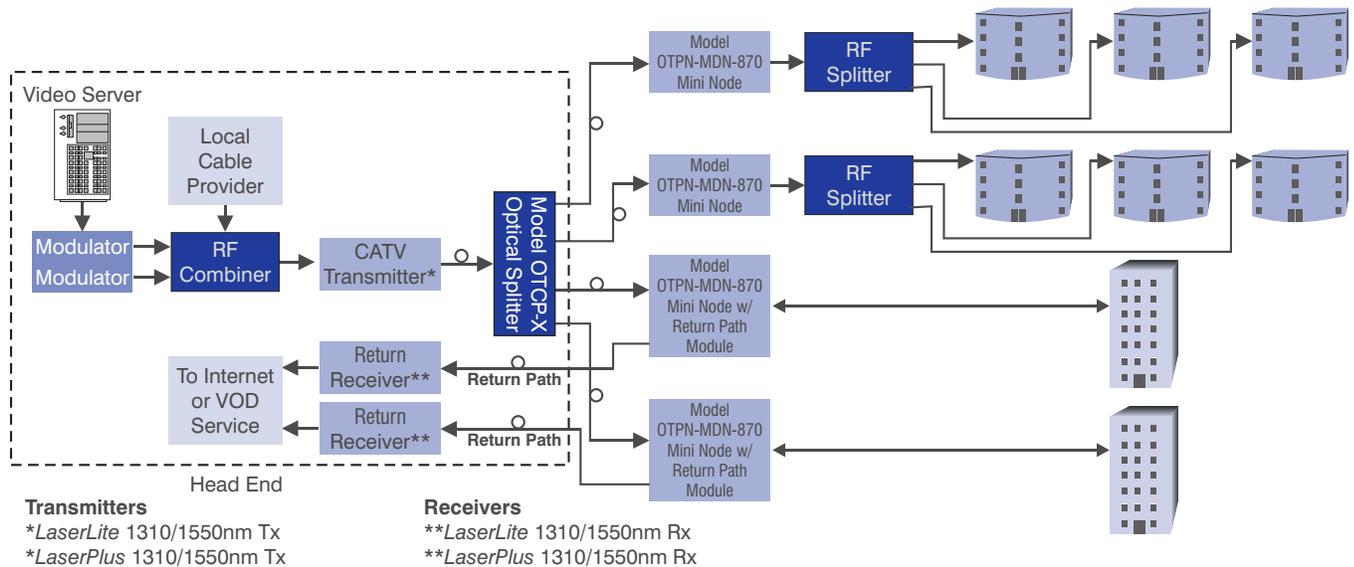


Figure 2 - CATV Transmission with a Return Path

The Model OTPN-MDN-870 Fiber Optic Mini Digital Node offers superior performance due to its high optical sensitivity of -8 to +4.5 dBm and +38 dBmV RF output. A top mounted LCD display shows the link's equalization and attenuation as well as the optical input into the receiver. A tri-colored indicator LED shows the optical input levels, and a -20 dB RF test point simplifies installation and troubleshooting.

The addition of a DFB or FP laser module increases the level of flexibility by accommodating return path applications. Return path optics may be ordered with the receiver or as a separate drop-in cartridge and offer wavelengths of 1310nm and 1550nm. This allows the cable provider to offer video on demand or high-speed data connectivity to customers with minimal expense in equipment upgrades.

Small to Medium Size Private Networks

Olson Technology, Inc. CATV transport links can also be configured for small to medium size private networks. The Model OTOT-1000 1310 or 1550nm fiber optic transmitters offer powerful CATV transport at a very affordable price.

Wide 48-1000MHz bandwidth allows the transport of 77 standard analog CATV channels stacked at 6MHz intervals using singlemode optical fiber for distances up to 20km between the transmitter and receiver. In conjunction with a Model OTCP-X Optical

Splitter/Coupler, end users may quickly configure a point-to-multipoint CATV network.

As with the Model OTOT-870-X transmitters, multiple discrete laser power options allow the customer to specify exactly the output power needed for their system. The transmitter may be paired with the Model OTOR-300 optical receiver for point-to-point or point-to-multipoint applications or the Model OTPN-MDN-870 Fiber Optic Mini Digital Node, which supports a true optical return path. Figure 3 illustrates a point-to-multipoint CATV network.

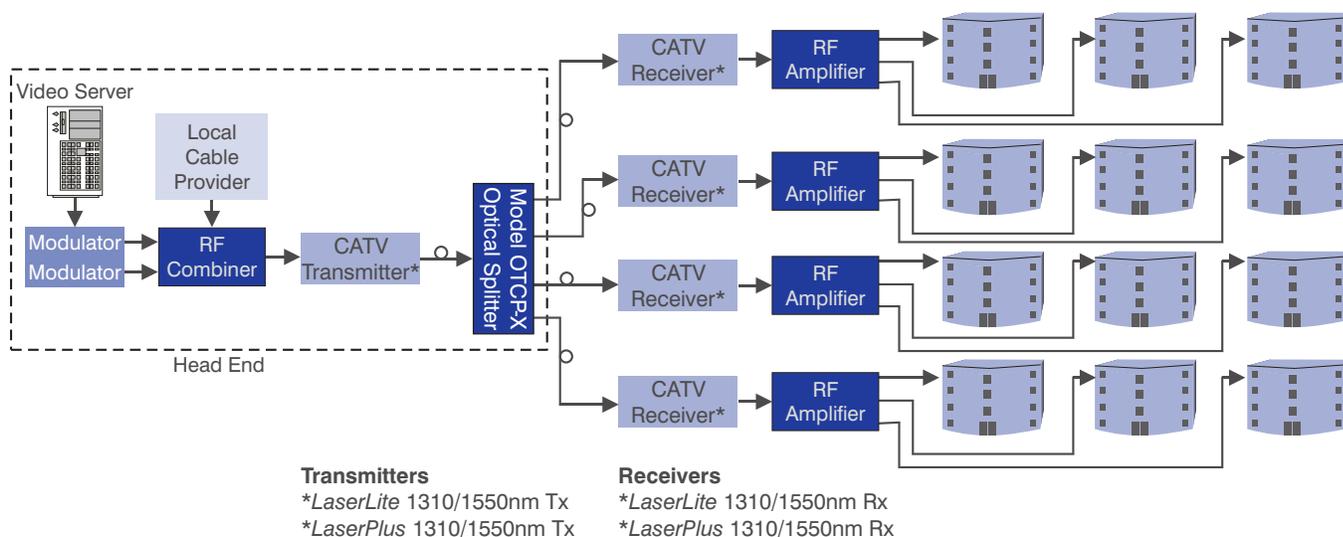


Figure 3 – A Point-to-Multipoint Private Network Solution (PNS)

The Model OTOR-300 is a high quality, cost effective CATV Return Path Receiver which utilizes a new low noise, impedance matched, high efficiency 1310/1550nm broadband photodiode and advanced RF amplification circuitry to facilitate carriage of critical downstream video, data, telephony and internet traffic in an HFC broadband environment.

The unit features a unique provision which allows the OTOR-300 to perform as a standalone downstream receiver or as a 1RU rack-mount return receiver. Up to (3) OTOR-300's can be mounted in a 1RU (1.75") 19" EIA space with each kit.

The OTOR-300 is the perfect companion to other models in the Olson Technology, Inc. *LaserLite* and *LaserPlus* product families, but is also designed to mate with optical transmitters and receivers from most leading manufacturers. The OTOR-300 can also be co-located with the Olson Model OTOT-870-x Optical Transmitter to form the headend side of a two-way "transceiver" configuration, when mated on the remote subscriber end with the Olson Model OTPN-1000 indoor node or Olson Model OTMN-II outdoor 4-port node.

Small Private CATV Networks

Olson Technology, Inc. CATV products also work well for small private networks, intra-facility CATV transport, or short transmission spans. The *LaserLite* Model OTOT-1000 is a high quality, full featured, cost effective CATV transmitter designed around the latest optical component technology to reliably deliver a full slate of multiplexed video, high speed data and telephony services in an HFC broadband environment. A comprehensive lineup of DFB laser offerings provides superior performance over a wide range of optical budgets to 21-25dB, allowing unrepeated spans of over 60-70km (38-45 miles) when used in conjunction with high performance, high-sensitivity node receivers like the Olson Technology Models OTPN-1000 or OTMN-II.

The OTOT-1000 is a rugged, self-contained device with exterior RF and optical connections and test points. The field-configurable SC-APC (or optional FC-APC) optical

output connector can be mounted on the front-panel or rear-panel of the unit. The OTOT-1000 is forced air cooled via an external high-MTBF fan, which is designed to be field-replaceable without interrupting operation.

The unit features a unique provision which allows the unit to perform as a standalone transmitter or as a rack mount transmitter. Up to (3) OTOT-1000's can be mounted in a 1RU (1.75") 19" EIA space with each kit. The transmitter works with the Model OTOR-300 receiver to achieve maximum performance and cost-effectiveness.

Figure 4 illustrates a small private network, such as one might find in a educational or business campus, where local cable feeds can be routed throughout the campus to multiple receive sites.

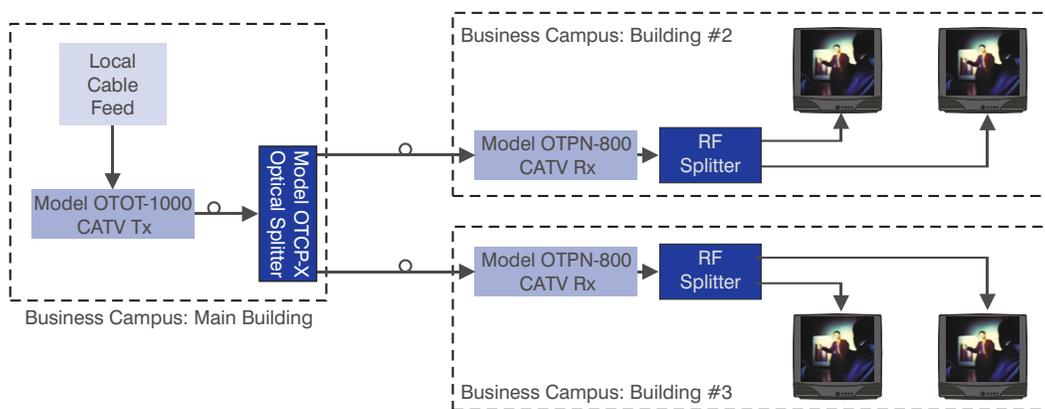


Figure 4 - Limited Distance Solution (LDS) Between Buildings on a Business Campus

Regardless of the requirements of a CATV network, Olson Technology, Inc. provides solutions for multichannel video networks from very high end, long distance applications to intra-facility CATV distribution. With flexible system options and a variety of optical output powers, CATV system designers can specify

exactly what they need - or future-proof their installation with products that can be upgraded, replaced, or expanded with a minimum of system cost. In HFC or all-optical applications, Olson's line of products offers the next generation in optical transport solutions.