



**OTPN-400**

**PREMISE NODE**  
**INDOOR OPTICAL NODE**

**INSTRUCTION MANUAL**

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## SAFETY WARNINGS

### LASER RADIATION



A laser transmitter emits invisible radiation that can cause permanent eye damage. ***AVOID DIRECT EXPOSURE TO BEAM.*** Operate the transmitter only with the proper optical fiber installed in the transmitter



optical connector. Power to the OTPN-400 should be turned-off or preferably, disconnected whenever the optical connector cover is opened and there is no installed fiber (as when the fiber connector is being installed or removed from the transmitter connector).

**NEVER USE ANY OPTICAL INSTRUMENT TO VIEW THE OUTPUT OF THE LASER TRANSMITTER. “OPTICAL INSTRUMENT” INCLUDES MAGNIFYING GLASSES, ETC.**

**NEVER LOOK INTO THE OUTPUT OF THE LASER TRANSMITTER**

**NEVER LOOK INTO THE OUTPUT OF A FIBER CONNECTED TO A LASER TRANSMITTER.**

**NEVER LOOK INTO OR USE ANY OPTICAL INSTRUMENT TO VIEW THE DISTANT END OF A FIBER THAT MAY BE CONNECTED DIRECTLY OR VIA AN OPTICAL SPLIT, TO A TRANSMITTER THAT MAY BE OPERATING. THIS SPECIFICALLY APPLIES TO FIBERS THAT ARE TO BE CONNECTED TO RECEIVERS (SUCH AS THE OTPN-400) OR OTHER DEVICES AT ANY DISTANCE FROM THE LASER TRANSMITTER.**

### SHOCK HAZARD

The OTPN-400 is designed for indoor use only. Direct exposure to moisture must be avoided.

## INTRODUCTION

The Olson Technology Inc. OTPN-400 is a high quality, cost effective, bidirectional CATV node designed around the latest optical receiver technology. It is designed to operate with optical input levels ranging from -8dBm to -1dBm.

The OTPN-400 operates with external  $+12 V_{DC}$  either direct or up the coax with optional power inserter. An AC Power Adapter is also available for supplying  $+12V_{DC}$ . Low power consumption, less than 5 Watts.

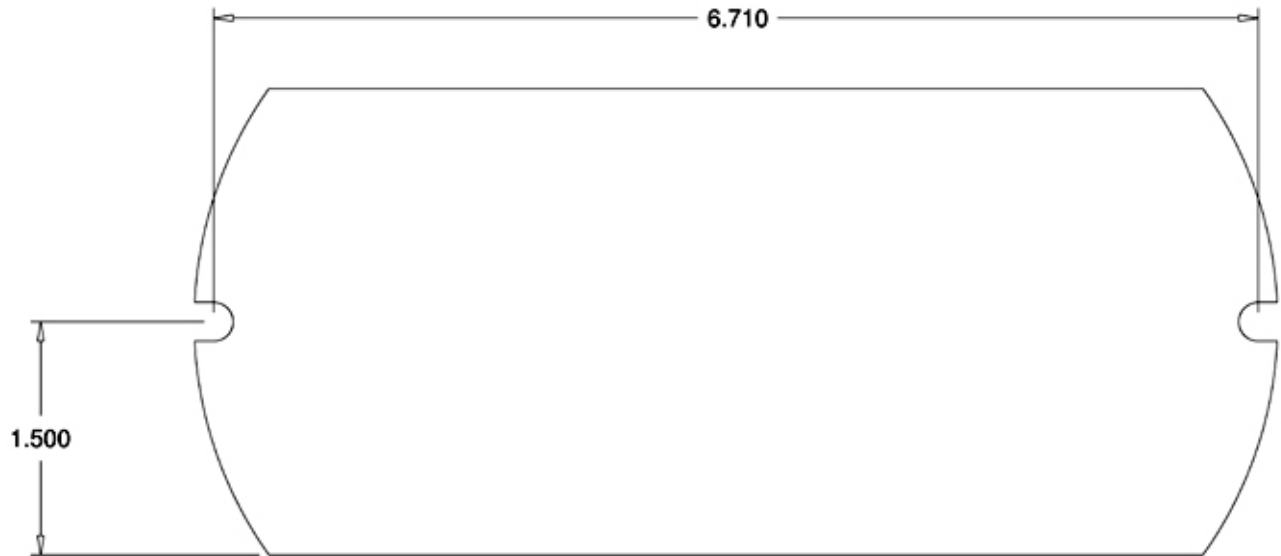
The OTPN-400 has flanges on the bottom to allow mounting it to a flat surface.

## INSTALLATION / ENVIRONMENTAL CONSIDERATIONS

The OTPN-400 is specified to operate from  $-10^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ . It will probably not require an air-conditioned environment. It should be mounted in an adequately ventilated area. Like any other electronic equipment, it will probably have a longer life span if it is not operated at the upper limit of the temperature range. Installation in wet areas or areas of extremely high humidity should be avoided. Extremely dirty or dusty areas should be avoided if possible. The OTPN-400 should not be installed in areas that are accessible to children.

The OTPN-400 may be installed and operated in any position on a flat surface. The unit has two slots in the bottom plate to accommodate mounting hardware. The unit should be mounted by sliding over one screw and then tightening the other screw. If mounting requires a wood screw, use #6 or #8 (maximum) pan-head sheet metal screws. These are commonly available at hardware stores. If mounting with a machine screw (to tapped holes), use 6-32 pan-head screws.

The OTPN-400 can be powered in two ways. Power can be inserted into the coax going to "RF OUT /  $+12V_{DC}$ " port via the optional power inserter, or by plugging the optional AC Power Adapter into the " $+12V_{DC}$ " port. A Male to Male Type 'F' adapter has been supplied to allow the AC Power Adapter to plug directly into the " $+12V_{DC}$ " port or the optional power inserter.



**OTPN-400 Mounting Diagram**

## **OPTICAL CONNECTORS AND CLEANING**

The standard optical connector is an SC/APC. In order to use FC/APC connectors, you must order a conversion kit, OTLL-SCFCKIT. The standard optical connector location is on the opposite side from the RF connector. The connector can be moved to the other side by swapping it with a cover plate. No tools are required for this operation.

The fiber ends can be damaged by the insertion of contaminated connectors. Some types of customer damage to connectors are not covered under warranty. Fiber connectors should never be left uncovered. Prepackaged alcohol wipes are the most convenient means of cleaning optical connectors. Clean alcohol and lint free wipes or swabs may also be used.

## OPERATIONAL SETUP – RECEIVER (FORWARD PATH)

The OTPN-400 optical receiver as the last component in a specific optical link will provide carrier-to-noise performance and an RF output level that is dependent on several parameters. The RF input level to the source optical transmitter and the optical input level to the OTPN basically determine the link performance.

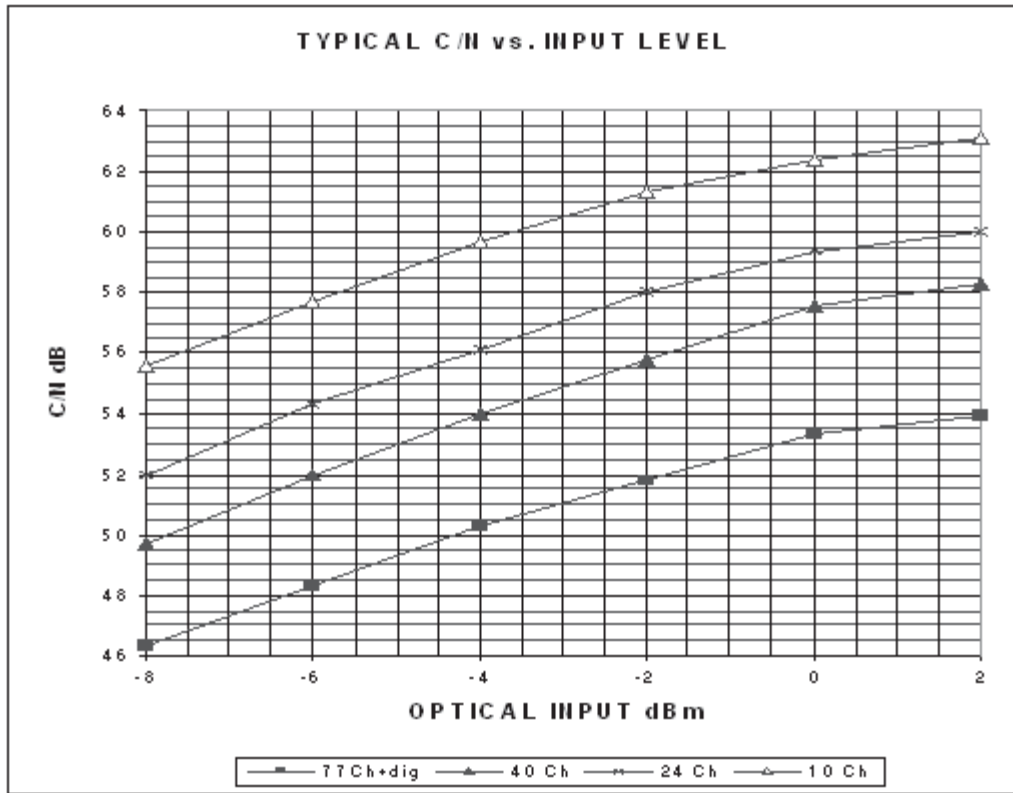
Both the laser modulation and the receiver output level are basically limited by total power. The RF input level to any optical transmitter is dependent on the number of channels being transmitted. As the number of carried channels is lowered, the RF input level to the transmitter can be raised. This results in increased RF levels at the OTPN receiver. This improves the carrier-to-noise ratio over the link. Links should be designed and transmitters should be set up using values that represent the maximum number of channels likely to be carried.

The following chart assumes approximately 77 channels from 50MHz to 550MHz and digital loading from 550MHz to 1000MHz at -6dB.

OPTICAL INPUT	RECEIVED POWER T.P.	APPROX. RF OUTPUT LEVEL
-8dBm	0.16V	+16dBmV
-6dBm	0.25V	+20dBmV
-4dBm	0.40V	+24dBmV
-2dBm	0.63V	+28dBmV
0dBm	1.0V	+32dBmV

Although the node will operate at optical input levels as high as +0dBm, there is little improvement in the C/N performance of the node at optical input levels above 0 dBm. For optimum distortion performance it is recommended that the optical input to the node be kept at or below -1dBm.

Unlike many optical nodes, the OTPN-400 is designed to perform down to an input of -8dBm . The following chart shows the approximate C/N performance at various input levels and channel loading. This performance can vary considerably depending upon fiber and laser performance so it is presented as a design aid only.



### TEST POINTS and ADJUSTMENTS

The OTPN-400 receiver has an external test point to monitor optical signal level. The received power test point is calibrated at 1V per mW @ 1310nm. Internally, there is a jumper used to select wavelengths between 1310nm and 1550nm. The factory presets the jumper to 1310nm.

### ACCESSORIES

MODEL	DESCRIPTION
OTLL-SCFCKIT	SC/APC to FC/APC Optical Connector Adaptor
OTOA-xxxx	Optical Attenuators
OTPN-12V-PIC	Power supply with power inserter