



OTPN-400C

OLSON TECHNOLOGY PREMISE NODE

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-400C 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-400C) OR OTHER DEVICES AT ANY DISTANCE FROM THE LASER TRANSMITTER.

SHOCK HAZARD

The OTPN-400C is designed for indoor use only. Direct exposure to moisture must be avoided. Connect the AC Adapter into the OTPN-400C ***BEFORE*** plugging the adapter into the wall.

INTRODUCTION

The Olson Technology Inc. OTPN-400C is a high-quality, cost-effective CATV node designed around the latest optical receiver technology. It is designed to operate with optical input levels ranging from -8dBm to 0dBm. The OTPN-400C operates with external +12 V_{DC} source either direct or “up the coax” with optional power inserter. An AC power adapter is also available for supplying +12V_{DC}. Power consumption is less than 5 Watts. The OTPN-400C has flanges on the bottom to allow mounting to a flat surface.

INSTALLATION / ENVIRONMENTAL CONSIDERATIONS

The OTPN-400C is specified to operate from 0°C to +70°C. It usually will 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-400C should not be installed in areas that are accessible to children.

The OTPN-400C may be installed and operated in any position on a flat surface. The unit has two slots in the bottom flange to accommodate mounting hardware. The unit should be mounted by sliding under one screw and then installing and 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-400C can be powered in two ways. Power can be inserted into the coax going to the “RF OUT /+12V_{DC}” port via the optional power inserter, or by plugging the optional AC-to-DC power supply into the “+12V_{DC}” port. A type “F” adapter has been supplied to allow the AC-to-DC power supply to plug directly into the “+12V_{DC}” port or the optional power inserter.

Figure 1 shows the key dimensions of the OTPN-400C.

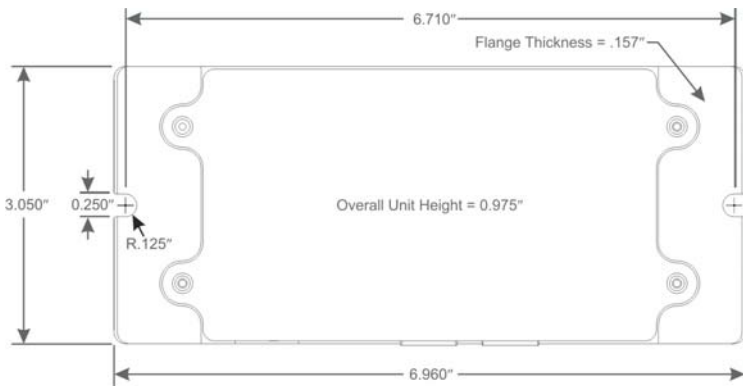


Figure 1 - OTPN-400C Key Dimensions

OPTICAL CONNECTORS AND CLEANING

The standard optical connector is an SC/APC. In order to use an FC/APC connectors, you must order a conversion kit, OTLL-SCFCKIT. The standard optical connector location is on the same side as the RF connector. 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. Pre-packaged alcohol wipes are the most convenient means of cleaning optical connectors. Clean alcohol and lint free wipes, such as Kim-Wipe type 34155, or swabs may also be used.

OPERATIONAL SETUP – RECEIVER (FORWARD PATH)

The OTPN-400C 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-400C basically determine the link performance. Both the laser modulation and the receiver output level are basically limited by total optical 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

is lowered, the RF input level to the transmitter can be raised. This results in increased RF levels at the OTPN receiver and 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.

Chart 1 assumes approximately 77 channels from 50MHz to 550MHz and digital loading from 550MHz to 1,000MHz at -6dB.

Chart 1 - Test Point Voltage and RF Output Level vs. Optical Input

Optical Input	Received Power TP	Approx. RF Output Level
-8dBm	0.16V	+14dBmV
-6dBm	0.25V	+18dBmV
-4dBm	0.40V	+22dBmV
-2dBm	0.63V	+26dBmV
-1dBm	0.79V	+28dBmV
0dBm	1.00V	+30dBmV

Although the node will operate at optical input levels as high as +0dBm, there is little improvement in the CNR performance of the node at optical input levels above 0dBm. For optimum distortion performance it is recommended that the optical input to the node be kept at or below -1dBm. At -1dBm, the DC test point voltage will be 0.79 Volts.

Unlike many optical nodes, the OTPN-400C is designed to perform down to an optical input of -8dBm. Figure 2 shows the approximate CNR performance at various receiver optical input levels and transmitter equivalent RF channel loading. This performance may vary considerably depending upon fiber and laser performance so it is presented as a design aid only.

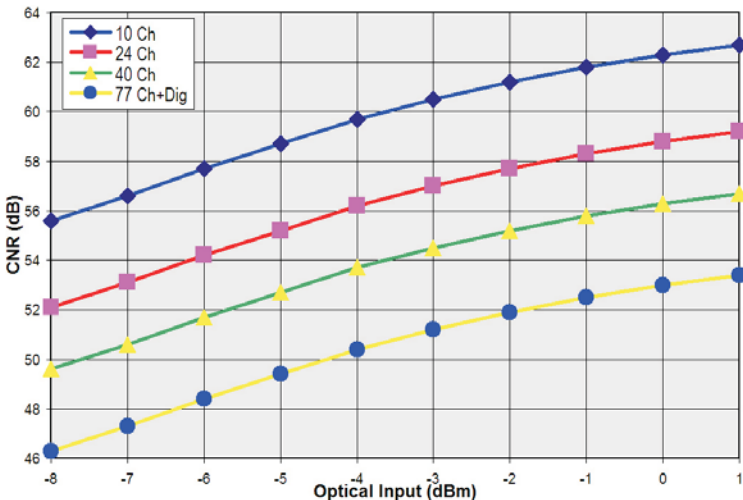


Figure 2 - CNR vs. Optical Input Level

TEST POINTS and ADJUSTMENTS

The OTPN-400C 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.

ORDERING INFORMATION

MODEL	DESCRIPTION
OTPN-400C	PremiseNode (40-1,000MHz), Rx Only, +28dBmV @ -1dBm, SC/APC Optical Connector
OTPS-12A-F	Power Supply and "F" Connector Adapter, 110/220 Volts AC => +12 Volts / 1.5Amps DC
OTPS-12A-PIC	Power Supply and Power Inserter Coupler, 110/220 Volts AC => +12 Volts / 1.5Amps DC
OTLL-SCFCKIT	Optical Connector Adapter Kit, SC/APC to FC/APC
OTOA-1000	Optical Fiber Attenuator, 1310nm, 1-7dB Variable Steps

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