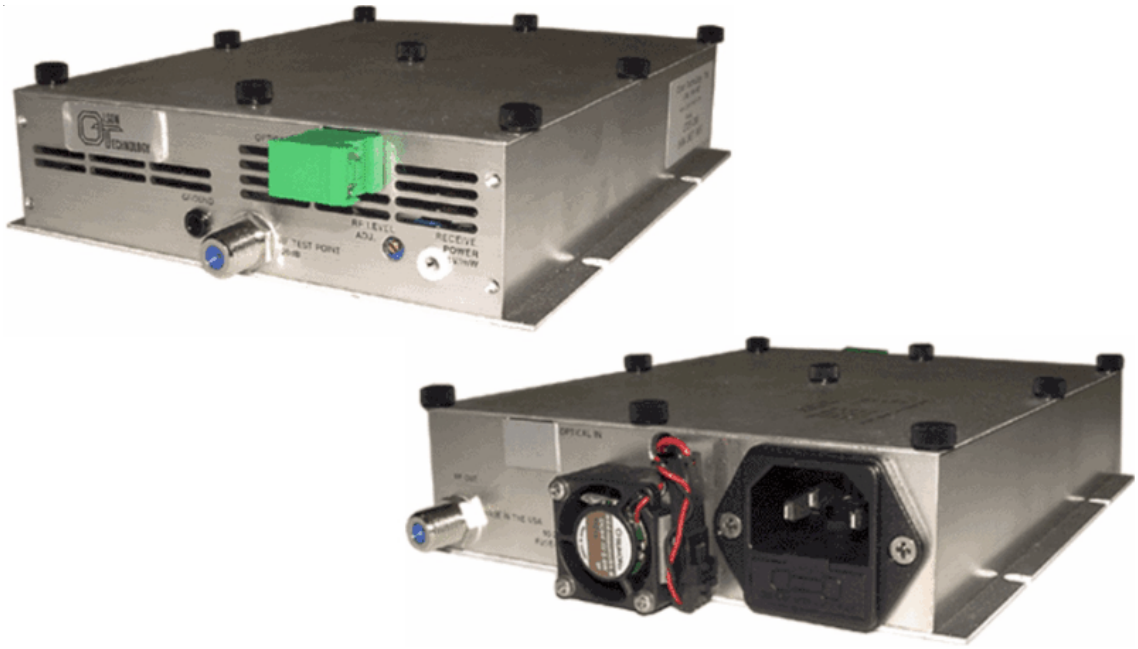
# OTOR-300

# WIDE BAND LOW COST OPTICAL RETURN RECEIVER

**5MHz to 300MHz**
**-14dBm to +3dBm INPUT**

# INSTRUCTION MANUAL



Phone: (209) 586-1022
(800) 545-1022
Fax: (209) 586-1026
E-Mail: salessupport@olsontech.com
www.olsontech.com

## TABLE OF CONTENTS



## SAFETY WARNINGS

### *LASER RADIATION*

The OTOR-300 return receiver receives invisible radiation that can cause permanent eye damage. ***AVOID DIRECT EXPOSURE TO BEAM***.

***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 OTOR-300) OR OTHER DEVICES AT ANY DISTANCE FROM THE LASER TRANSMITTER.**

#### HIGH VOLTAGE

**The inside of the OTOR-300 contains no user serviceable parts. There is exposed high voltage inside this unit. Only factory service technicians should open the unit with power applied.**

#### FIRE HAZARD

The AC line input fuse is contained in the IEC 320 power input connector. This fuse is a 250V, 0.5A, 5x20mm, slow blow fuse. To avoid a risk of fire, this fuse should be replaced only with an identically rated fuse.

#### SHOCK HAZARD

The OTOR-300 is designed for indoor use only. Direct exposure to moisture must be avoided.

# INTRODUCTION

The OLSON TECHNOLOGY OTOR-300 is a very cost effective indoor wideband optical receiver with an RF passband of 5 to 300 MHz. This transmitter is intended for indoor applications and combines the receiver and universal AC power supply in one compact housing that has a footprint of 7.5" x 5.5" x 1.6". This unit has a universal power supply and will operate from 90 to 240$V_{AC}$ at 50 or 60 Hz and consumes about 10 Watts.

The OTOR-300 is an ideal receiver for the OTPN-1000/OTPT-300 High Sensitivity Indoor Node and will allow for an optical path loss of up to 18dB. Test points are provided for optical receiver power for the setup and historical reveiw and for RF output level, again for setup and historical review.

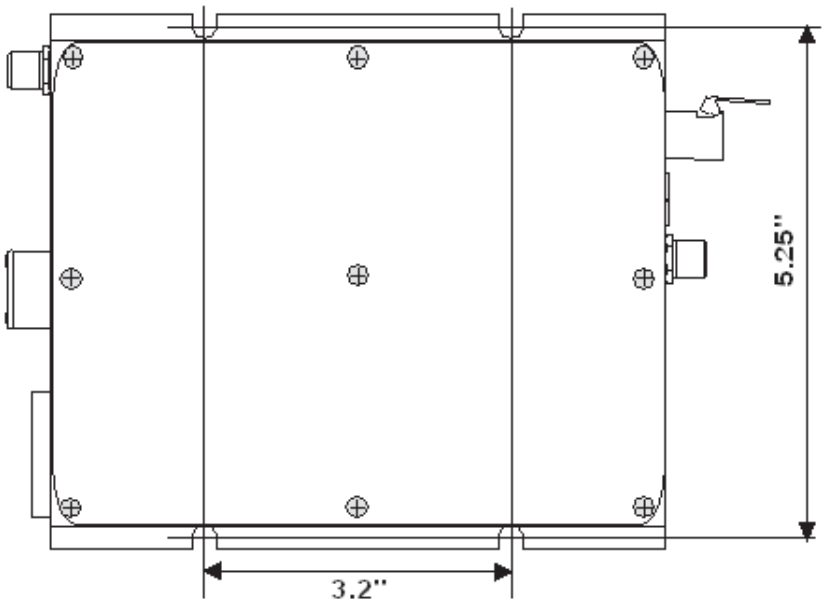
Positive cooling is provided by means of a small, high-MTBF fan, which may be replaced in the field without interrupting the operation of the unit.

The OTOR-300 has flanges on the bottom to allow mounting it to a flat surface. The available OTLL-RMKIT-1 will allow mounting up to three of these units in a standard 19" rack.

## INSTALLATION / ENVIRONMENTAL CONSIDERATIONS

The OTOR-300 is specified to operate from -10°C to +55°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. Objects or debris should not be allowed to block the openings in the housing or the fan. The unit should not be installed in areas that are accessible to children.

The OTOR-300 may be installed and operated in any position on a flat surface. The unit has four slots in the bottom plate to accommodate mounting hardware. 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.




# OTOR-300 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. Simply remove the cover with removal of the nine thumb screws.

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.

## SET-UP PROCEDURE FOR OTOR-300

1. The OTOR-300 is best set up with the use of a digital voltmeter monitoring the optical "Receive Power". The white test point on the front of the unit indicates the received optical power at 1V/mW of received optical power. Insert the positive lead into the white test port and negative lead into the black test port to monitor the received power level.
2. Internal to the unit is a plug-in attenuator that optimizes the performance of the unit based upon the received optical power. The unit is shippied with a 0 dB attenuator installed, but there are also attenuators for 5, 10, & 15dB installed in storage sockets internal to the unit. It is recommended that the attenuator listed in the table below be installed based on the received optical power.To change the internal attenuator, remove the thumb screws from the cover. Then remove the cover and find the plug-in attenuator and the 5, 10, & 15dB pads per diagram of Figure 1.

| Input Power dBm | Input Power mW | Power Mon. T.P. (V) | Internal Pad Value |
|---|---|---|---|
| -14 | 0.04 | 0.04 | 0dB |
| -4.5 | 0.35 | 0.35 | 0dB |
| >4.5 | >0.35 | >0.35 | 5dB |
| -2 | 0.63 | 0.63 | 5dB |
| >-2 | >0.63 | >0.63 | 10dB |
| 0.5 | 1.1 | 1.1 | 10dB |
| >0.5 | >1.1 | >1.1 | 15dB |
| 3.0 | 2.0 | 2.0 | 15dB |

If the optical input power is in excess of +3dBm (2mW), an optical attenuator should be utilized to reduce the input to +3dBm or lower. The OLSON TECHNOLOGY Model OTOA optical attenuator is ideal for this application.

3. The unit will function at either 1310nm or 1550nm wavelength. However, because the optical detector efficiency is different at the different wavelengths, there is an internal "Receive Power" calibration jumper plug that needs to be in the proper position depending upon the input optical wavelength. The diagram of Figure 1 shows the proper position of this plug for either wavelength. The unit is shipped with the jumper plug in the 1310nm position. For the operators convenience there is an "Internal Pad Selection Chart" on the cover of the receiver.

4. After the internal attenuator is set for optimum performance, the output level should be set with the front panel "RF Level Adj." control. It is recommended that the output level should be set for between +40dBmV and +45dBmV. An ideal method to set this is with the front panel -20dB "RF Test Point" and the output terminated in the actual load it will be operating with. If carriers are utilized to set the units output power, adjust the output of the test point for between +20dBmV and +25dBmV per carrier. If data signals are utilized which appear on a spectrum analyzer as noise, they can be set up with the output level at the test point between -28dBmV/Hz and -23dBmV/Hz utilizing the noise marker on the spectrum analyzer. Setting the output level to the levels >-45dBmV will result in the degraded performance.

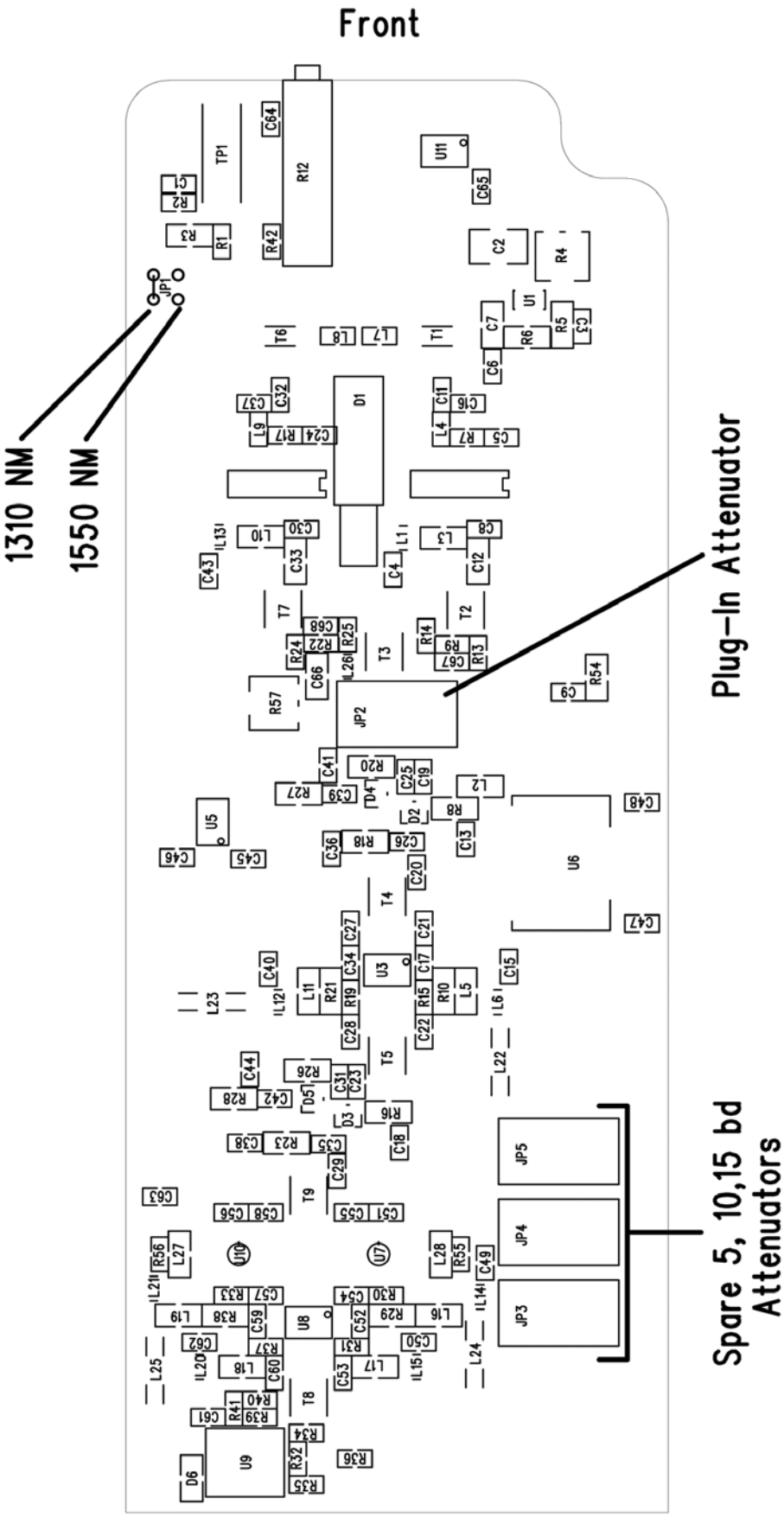
Although the unit will function at optical input levels as low as -14dBm, the output level attainable will be less than +45dBmV. +45dBmV will be attainable at optical input levels from typically -11dBmV to -12dBmV. For every 1dB decrease in optical input power the output level will decrease by 2dB. At -14dBm optical power input, the maximum output level will be approximately +40dBmV.

## ACCESSORIES

| MODEL | DESCRIPTION |
|---|---|
| OTLL-SCFCKIT | SC/APC to FC/APC Optical Connector Adapter |
| OTLL-RMKIT-1 | Rack Mount Kit (Holds 3 OTOR-300's) |
| OTOA-1000 | Optical Attenuator |
| OTLL-FANKIT | Replacement Fan Assembly |

## RELATED OLSON TECHNOLOGY PRODUCTS

| MODEL | DESCRIPTION |
|---|---|
| OTPN-1000 | Receive only wideband indoor node, 5-42MHz return band |
| OTPN-1000-PAL | Receive only wideband indoor node, 5-65MHz return band |
| OPTP-300 | Field installable return transmitter with 3mW DFB laser |
| OTPT-300-FP | Field installable return transmitter with 1.6mW FP laser |
| OTOT-1000-x | Wide-band laser transmitter from 2mW to 30mW |




Top View
OTOR-300
Figure 1