



SatellitePlus Model OLMR

Mini L-Band Receiver

10-3,600 MHz

OPERATING MANUAL



24926 Highway 108
Sierra Village, CA 95346
Phone: (800) 545-1022
Fax: (209) 586-1022

E-Mail: sales@olsontech.com

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SAFETY

Safety Precautions

The optical emissions from the units are laser-based and may present eye hazards if improperly used. **NEVER USE ANY KIND OF OPTICAL INSTRUMENT TO VIEW THE OPTICAL OUTPUT OF THE UNIT.** Be careful when working with optical fibers. Fibers can cause painful injury if they penetrate the skin.

Laser Safety Procedure

ALWAYS read the product data sheet and the laser safety label before powering the product. Note the operation wavelength, optical output power and safety classifications.

If safety goggles or other eye protection are used, be certain that the protection is effective at the wavelength emitted by the device under test **BEFORE** applying power.

ALWAYS connect a fiber to the output of the device **BEFORE** power is applied. Power should never be applied without an attached fiber. If the device has a connector output, a connector should be attached that is connected to a fiber. This will ensure that all light is confined within the fiber waveguide, virtually eliminating all potential hazard.

NEVER look at the end of the fiber to see if light is coming out. **NEVER!** Most fiber optic laser wavelengths (1310 nm and 1550 nm) are totally invisible to the unaided eye and will cause permanent damage. Shorter wavelength lasers (e.g., 780 nm) are visible and are very damaging. Always use instruments, such as an optical power meter, to verify light output.

NEVER, NEVER, NEVER look into the end of a fiber on a powered device with **ANY** sort of magnifying device. This includes microscopes, eye loupes and magnifying glasses. This **WILL** cause a permanent and irreversible burn on your retina. Always double check that power is disconnected before using such devices. If possible, completely disconnect the unit from any power source.

If you have questions about laser safety procedures, please call Olson Technology before powering your product.

GENERAL FEATURES

The Olson Model OLMR Miniature L-Band Receiver offers a high performance, versatile receiver in a very compact package. The Model OLMR Miniature L-Band Receiver has been engineered to meet today's high performance standards for L-Band transport. Its extreme bandwidth range allows the system to handle the next generation of satellite signals. The receiver may be used with any L-Band transmitter from Olson Technology, Inc. It is ideal for a wide variety of communications applications including L-Band satellite antenna remoting, trunking radio, telemetry tracking, plus GPS time and frequency reference signal distribution.

The extended frequency range to 3.6GHz allows this system to accommodate additional transponders coinciding with common European satellite communication applications. The expanded RF bandwidth to 3.6GHz facilitates stacked LNB applications to accommodate additional transponders. These may contain enhanced programming services (e.g., HDTV, local channels, etc.) for DBS television signal distribution in campus, fiber-to-the-premise (FTTx), and multiple dwelling unit (MDU) environments over single-mode fiber. The receiver offers a 75 Ohm impedance standard. Optical connector options include FC/APC and SC/APC. Power is via an Olson Model OTPS-12A power supply.

RECEIVER DESCRIPTION

The OLMR Mini L-Band Receiver can handle 10MHz to 3,600MHz RF signals. The unit may be ordered as a low RF gain receiver (Model OLMR-X3600-LG-FA/SA) or as a high RF gain receiver (Model OLMR-X3600-HG-FA/SA). Optical input power ranges from -15dBm to +3dBm in the wavelength range of 1270-1610nm. The receiver offers high sensitivity for a maximum optical link budget. A built-in LED indicator allows the receiver to be easily set up and maintained.

POWER SUPPLY DESCRIPTION

The Model OTPS-12A Universal AC Power Supply outputs +12 Volts DC, 1.5 Amps.

RF PERFORMANCE

The specifications are cited below with 12dB link optical loss and >-55dB optical back-reflection. If the link optical loss differs from 12dB, the RF gain will change 2dB for each 1dB of optical loss (i.e., a link with a 6dB of optical loss will have a minimum RF gain of +3dB.) Also, when optimizing the RF performance, the main concern involves setting the RF signal level. Typically, the optimal total RF power into the transmitter should be near -37dBm per transponder, assuming 32 transponders; this corresponds to a total RF input power level of -22dBm. Due to the wide dynamic range of this system, the RF input power can deviate from this optimal value and still provide good results.

| Item | Specifications @ +25°C |
|---------------------------|---|
| RF Frequency Range | 10-3,600MHz |
| Gain Flatness (>50MHz) | ± 1.5dB for any 500MHz ± .35dB for any 40MHz |
| Return Loss | 10dB typical |
| I/O Connector | F-Type Female (75 Ohms) |
| Link Gain (HG Version) | -4 ± 5dB |
| Link Gain (LG Version) | -16 ± 5dB |
| Noise Figure | 15-45dB |
| Rx Output 1dB Compression | >-20dBm |

Note: Link gain is typical when used with the Olson OLRT-X3613-F3-SA, L-Band transmitter.

OPTICAL PERFORMANCE

| Item | Specification |
|------------------------|--|
| Optical Fiber | Single Mode 9/125 μ m (Corning SMF-28 or Equiv.) |
| Rx Wavelength | 1270-1610nm |
| Rx Optical Input Power | -15dBm to +3dBm |
| Rx Optical Return Loss | >55dB typical |
| Rx Optical Connector | SC/APC (Standard) FC/APC (Optional) |

Optical Loss Budget

| Tx Laser Type | Fabry-Perot | DFB | DFB | DFB/DWDM |
|---------------------|-------------|-----------|-----------|-----------|
| Tx Output Power | +3dBm | +4dBm | +5dBm | +10dBm |
| Optical Loss Budget | 0 to 18dB | 1 to 19dB | 2 to 20dB | 7 to 25dB |

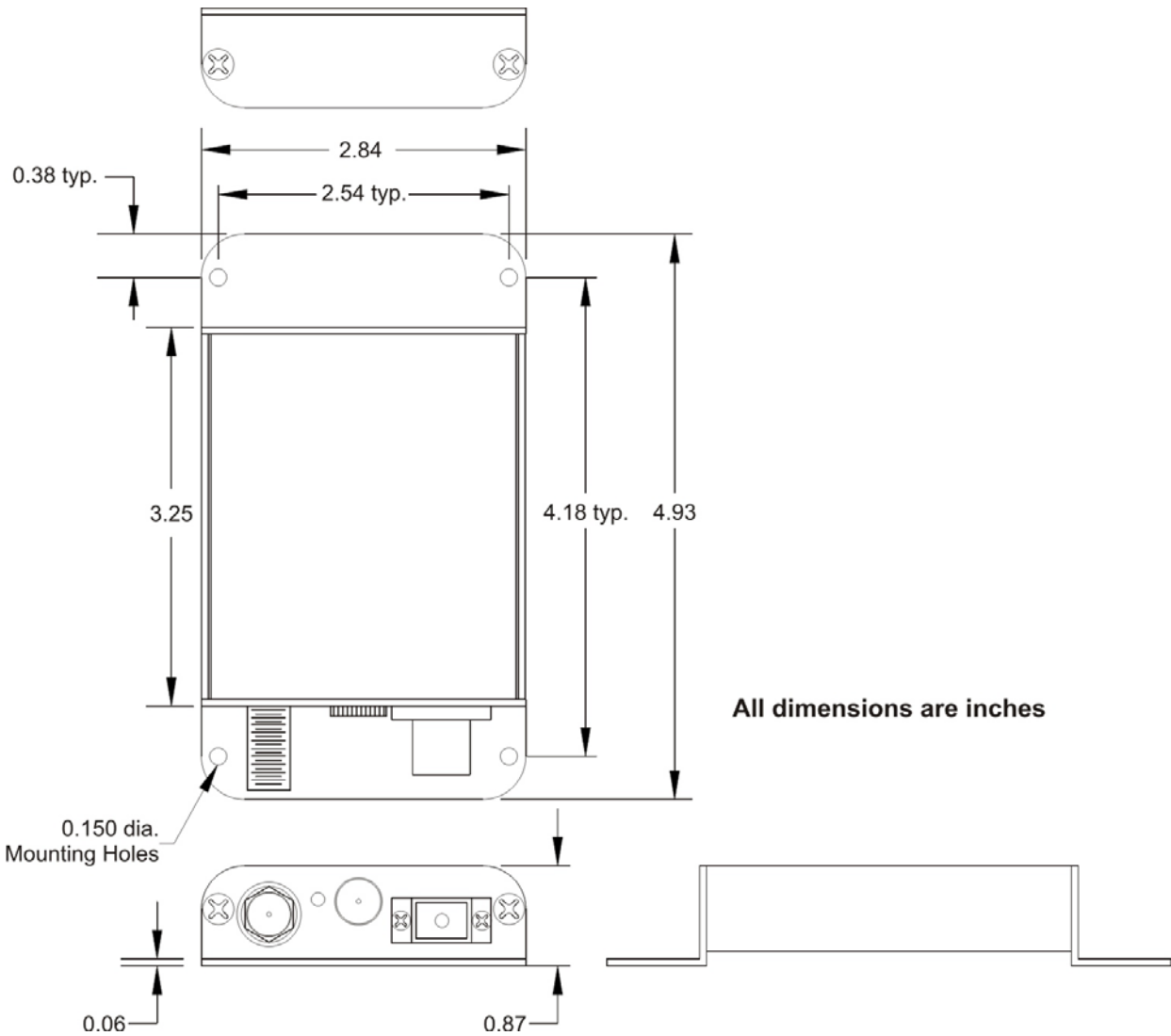


Figure 1 - Dimensioned Unit

DC POWERING AND INDICATORS

The unit operates with the OTPS-12A AC/DC power supply. The typical current requirements for the receiver with that power supply is 150mA. The current draw for other voltages is as follows:

| Input Voltage | 8V _{DC} | 12V _{DC} | 15V _{DC} | 18V _{DC} | 24V _{DC} |
|---------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Rx Current | 200mA | 150mA | 120mA | 100mA | 70mA |

An LED indicator is provided for easy setup and maintenance. The tri-color indicator LED is yellow when the optical input is too low, red when the optical input is too high and is green when the optical input is in the usable range, -15dBm to +3dBm.

INSTALLATION

Optical Connectors

There are many optical connectors on the market. There are also different ways the optical cable is terminated such as “Flat” and “Angled”. The L-Band link is only offered with SC/APC and FC/APC types of connectors (Angled Precision Connector). One of the most common errors encountered in the field is the use of the wrong type of connectors. The most common is using SC/PC (Flat) with SC/APC(angled). The connectors will fit together but the optical loss will be high and performance is unpredictable and both connectors may be permanently damaged.

Cleaning Optical Connectors

Fiber optic connectors should be clean and capped, so one can usually remove the cap and make the connection without cleaning the connector, but if there is any doubt it is good practice to clean the optical connectors before making the connection. Once the connection is made, there should be no need clean the connector as long as the connector remains connected.

Use caution when handling the connectors. Any grease from your finger, scratch or small piece of dust or dirt can strongly affect performance. To clean, use a lint-free wipe such as Kimwipes or cotton swab, moisten with alcohol and gently wipe the tip of the connector. Let the connector air dry completely or use dry compressed air to dry. When making the connection, be sure the key is aligned with the bulkhead connector. With SC connectors, gently press in until the connector “clicks” in to place.

Mounting

Mount modules to enclosure using #6 screws and split lock washers. It is suggested that the modules be mounted in a watertight enclosure with the RF and Optical connectors mounted down to prevent moisture from entering the connectors. Apply power to the receiver, the system should now be operational as there are no user adjustments required on the modules

| Typical NF vs. Rx Power | |
|-------------------------|------------|
| Rx Optical In | Typical NF |
| (dBm) | (dB) |
| 3 | 13 |
| 0 | 16 |
| -3 | 20 |
| -6 | 25 |
| -9 | 30 |
| -12 | 35 |
| -15 | 40 |
| -18 | 45 |

Table 1 - Typical Noise Figure Behavior

TYPICAL APPLICATIONS
MDU (Multiple Dwelling Unit)

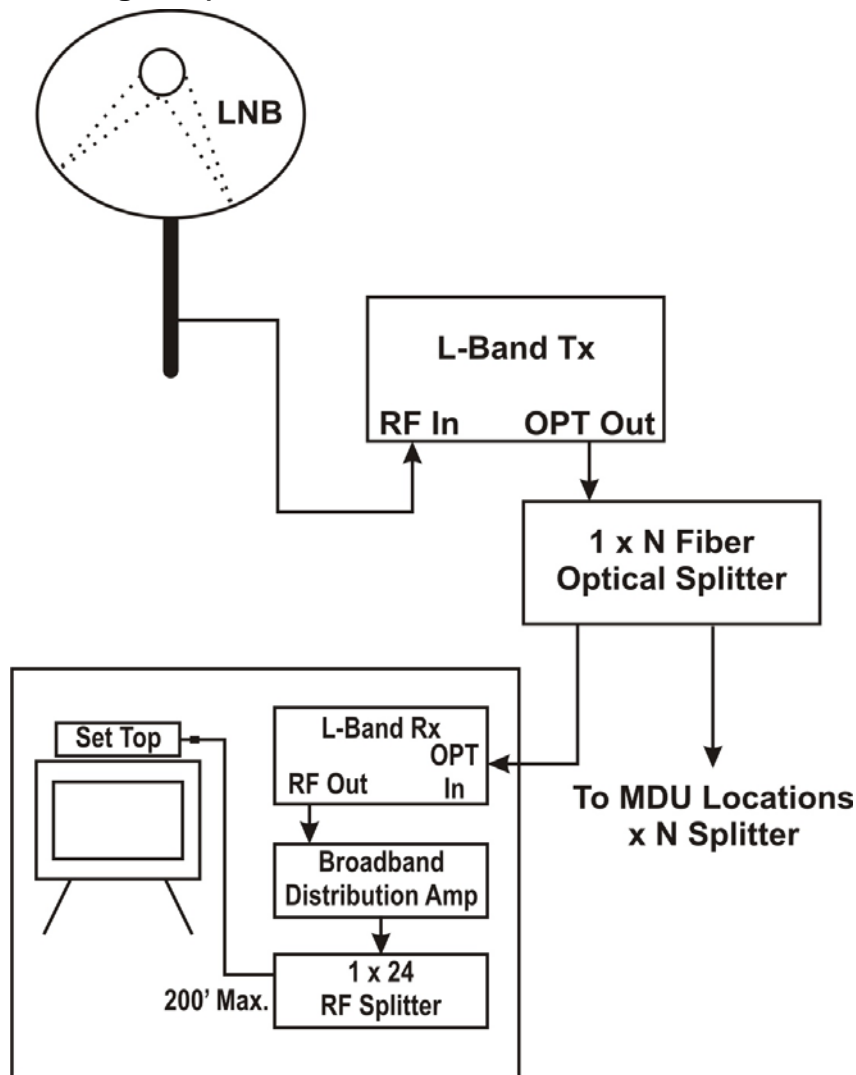


Figure 2 - Typical Multiple Dwelling Unit Application

ORDERING INFORMATION

| Rx Model Number | Description |
|------------------------|--|
| OLMR-X3600-LG-SA | 10MHz-3.6GHz L-Band Rx, Standalone, 1270-1610nm, -15 to +3 dBm Input, Low Gain, 75 Ohm, SC/APC* |
| OLMR-X3600-LG-FA | 10MHz-3.6GHz L-Band Rx, Standalone, 1270-1610nm, -15 to +3 dBm Input, Low Gain, 75 Ohm, FC/APC* |
| OLMR-X3600-HG-SA | 10MHz-3.6GHz L-Band Rx, Standalone, 1270-1610nm, -15 to +3 dBm Input, High Gain, 75 Ohm, SC/APC* |
| OLMR-X3600-HG-FA | 10MHz-3.6GHz L-Band Rx, Standalone, 1270-1610nm, -15 to +3 dBm Input, High Gain, 75 Ohm, FC/APC* |

* NOTE: For FC/APC optical connector option, substitute “FA” suffix for “SA” suffix in the Model No.

| PS Model Number | Description |
|------------------------|--|
| OTPS-12A | Universal AC Power Supply, +12 Volts, 1.5 Amps |