6920-RT-x SERIES RETURN TRANSMITTER
INSTRUCTION MANUAL

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Specifications: Return Transmitters: F-P, DFB & CWDM

RF INPUT & PERFORMANCE PARAMETERS:

Frequency Range *(+/- 1.0 dB)*	5 MHz – 300 MHz
Optical Output *(mW) (F-P / DFB / CWDM)*	2.0 @ 1310nm /1.0 to 3.0 @ 1310nm / 2.5 @ 1xx0nm**
Return Path NPR > 15dB*	F-P: over 37dB NPR; DFB/CWDM over 41dB NPR*
Return Path Threshold	-57 dBmV/Hz (@37 or 41dB, as applicable)

** NOTE: As measured with 10dB of fiber (DFB) or 6dB of fiber (F-P) and OTOR-300 High Sensitivity Return Band Receiver*

OPTICAL PARAMETERS:

Return Loss	> 60 dB with APC connector
Optical Connector	SC/APC standard; FC/APC optional; 8° APC

ELECTRICAL, ENVIRONMENTAL & MECHANICAL PARAMETERS

Dimensions	Fit and Form as per the original OEM module
Operating Temperature Range	-40 to +70ºC *(temperature at the mounting plate)*
Powering	+25VDC
Power Dissipation	< 6 W

SAFETY WARNINGS

LASER RADIATION

The **6920-RT-x** laser transmitter emits invisible laser 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. The power to the 6920-RT-x should be turned off whenever the optical connector is opened or exposed (as when the fiber connection 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 OR OTHER DEVICES AT ANY DISTANCE FROM THE LASER TRANSMITTER.**

SHOCK HAZARD

Care should be used when installing the 6920-RT-x to prevent shock and injury as there are voltages within the Node which exceed 48 VAC.

INTRODUCTION

The **Olson Technology Inc. 6920-RT-x** is a high quality, cost effective, Return Transmitter module designed around the latest optical transmitter technology. The 6920-RT-x is a series of replacement broadband return transmitters for the 6920 series of optical nodes. The performance is equivalent to or better than that of the original transmitters. It can be used in the same applications as the original transmitter. The basic standard models are listed below. There are many other custom versions and single to dual upgrades available. Please consult Olson Technology for our latest product list. ***ALL*** **standard units have** ***SC/APC*** **connectors.**

MODEL	DESCRIPTION
6920-RT-2-SA/302	2mW, 1310nm FP
6920-RT-2-SA/303	2mW, 1310nm isolated FP
6920-RT-5-SA/304	2mW, 1310nm DFB
6920-RT-5-SA/505	2mW, 1550nm DFB
6920-RT-5-SA/5xx	2mW, 1550nm DFB CWDM

xx=47,49,51,53,55,57,59 or 61 (middle 2 digits of CWDM wavelength)

Note: Olson Technology does not recommend or support the use of FP lasers for VOIP or analog video.

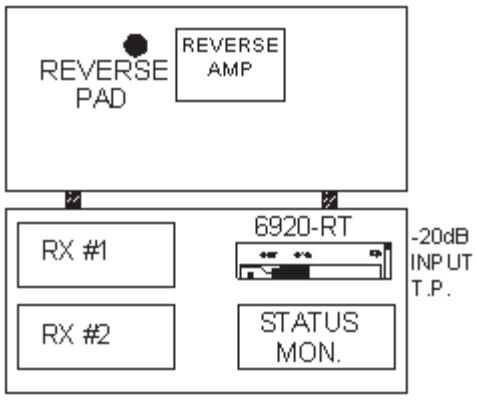
The 6920-RT-x receives preconditioned +24 VDC from the Node and plugs directly into the preexisting locations within the Node. The primary RF connection is made through the RF connector on the bottom of the transmitter. The transmitter can be ordered with an optical connection that will match the factory setup. Heat transfer for the 6920-RT-x is provided via the bottom surface of the module to the Node housing for full outdoor temperature operation.

INSTALLATION / ENVIRONMENTAL CONSIDERATIONS

The 6920-RT-x operates with an exterior temperature on the Node of -40 to + 60°C. However, like any other electronic device, it will probably have a longer life span if it is not operated at the upper limit of it's temperature range continuously. Installation of the 6920-RT-x should be done such that water, dirt and other contaminates do not enter either the Node or the module. Do not install equipment in locations that are accessible by either children or other unqualified personnel. This unit is meant to be field-installed into the SA6920 Optical Node by qualified field service technicians.

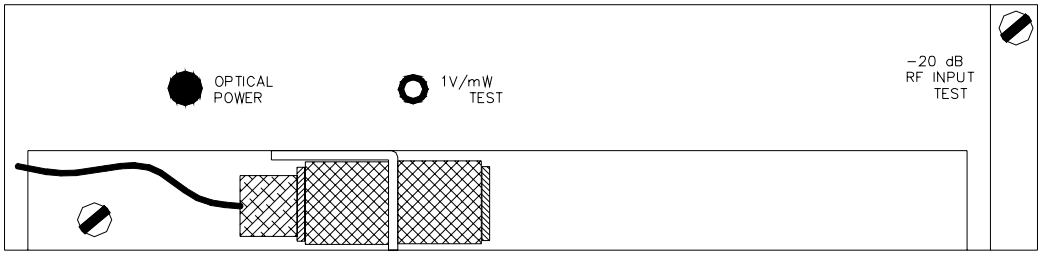
The 6920-RT-x installs in the lid of the node. The transmitter can be hot swapped without damage to the module or node. The retaining screws should be simultaneously worked down. Do not fully tighten one screw before partially engaging and tightening the other one.

Excess fiber should be coiled around the fiber organizer. Care should be exercised to avoid breaking or kinking the fiber. ***CAUTION***: The "standard" units all use **angle polished** optical connectors (**APC**) with **green** bodies or boots. Some configurations may use **flat/ultra polished** connectors (**UPC**) with **blue** bodies or boots. You **can not** mate the two different types and achieve satisfactory performance. There is a second bushing already installed to allow for simple upgrade to dual transmitters in a single housing.



EXTERNAL ADJUSTMENTS AND TEST POINTS

There are no external adjustments. There is one test point that monitors optical output power. This is scaled to 1V/mW and should be measured with a high impedance voltmeter. There is a red/green LED that will be green when the laser optical output power is OK and red if it is out of spec. There is a -20 dB return RF input test point which is normally accessed through the outside of the housing using a type 'G' connector.



INTERNAL ADJUSTMENTS AND TEST POINTS

There are no internal test points and no internal adjustments that would normally be performed in the field. The backup RF and status monitoring options require some internal changes. Due to the variety of these that are available, please consult Olson Technology. CAUTION: removing the cover allows access to static sensitive components. These operations should be performed only at a static controlled location.

REVERSE INPUT RF LEVEL SETTING

The return RF level should be set using the reverse pad on the 6920 main board. The internal pad in the return transmitter is for laser OMI matching, not for level setting. Monitor the –20db test point on the transmitter and adjust the reverse pad on the 6920 main board for the correct level from the RF drive table for the transmitter type being used.

RECOMMENDED RF DRIVE LEVEL

Laser Transmitter Option	**RF Input**	**RF Input –20db Test Point**
6920-RT-2-302/2mW (FP)	+20dBmV / Chan	0 dBmV / Chan
6920-RT-5-304/2mW (DFB)	+27.5dBmV / Chan	+7.5dBmV / Chan

CHANNEL LOADING

The optimum RF input level for the 6920-RT-x is 27.5dBmV per channel if equiped with an DFB laser and with a standard loading of six CW channels. Or 20dBmV per channel if equipped with an FP laser. The chart below shows the change in RF input level according to the amount and type of channel loading. The chart shows on the right what the RF input level is according to the -20dB test point. On the left, the RF input in dBmV is shown for FP and DFB type lasers. If loading with data channels only (QPSK, QAM) refer to the amount of total bandwidth the data channels are consuming. 27.5dBmV per CW channel is equivalent to -41.18dBmV/Hz, while 20dBmV per channel is equal to -55.68dBmV/Hz.