

# FT-SAT-TX-6 & FT-SAT-RX-6 User Manual





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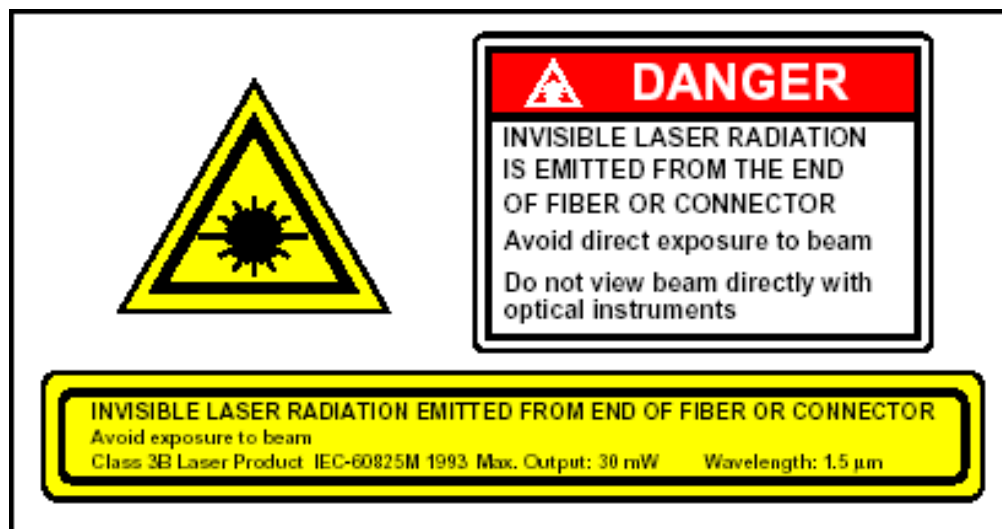
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## Preface

This manual is designed for FT-SAT-TX-6 & FT-SAT-RX-6 6ch CWDM wideband RF over one SM fiber to one or multi locations. This manual has detailed description of product feature, specification and installation. To install this system successfully and use it safely, users must read the manual before installation, and perform the installation and adjustment according to this manual. Otherwise, some practices may lead to property damage or personal injury. Please contact North American Cable Equipment if you have any questions.

### Important User Information

- **Caution:** There are invisible laser beams from Fiber output ports, which may cause permanent injury to skin or eyes.
- Ground transmitter before connecting power. (Resistance should be less than 4Ω), as to prevent laser and user from static damage
- UPS power supply and air condition environment are highly recommended for the stable and long-time transmitter operation.





## Chapter 1 Overview

FT-SAT-TX-6 & FT-SAT-RX-6 is a modular 6ch CWDM Satellite RF fiber link, transmitting 6ch wideband 174MHz~2350MHz RF over one SM fiber to one or multiple optical receivers. Each CWDM optical wavelength carries one 174~2350MHz RF, supporting Terrestrial TV 174~806MHz and 950~2150MHz Sat RF. ensuring excellent RF performance and mutual isolation among RF inputs. With CWDM lasers/photodiode and low noise RF gain control circuit, one FT-SAT-TX-6 can deliver high quality RF to maximum 32 FT-SAT-RX-6 optical receivers in 5Km fiber distance.

## Chapter 2 Features

- Metal housing
- 6ch 174~2350MHz RF over one SM fiber
- 6ch CWDM uncooled DFB Lasers
- AGC at optical transmitter and receiver
- High Linearity Photodiode
- Higher than 30dB RF Isolation
- Low noise RF Gain Control circuit

## Chapter 3 Specifications

### 3.1 FT-SAT-TX-6 Specifications

| RF Input                  |  |
|---------------------------|--|
| RF Input Ports            | 6  |
| RF Bandwidth at each port | 174 - 2350MHz  |
| Minimum RF Input Power    | -50dBm   |
| Maximum RF Input Power    | -30dBm   |
| RF Connector              | F-Type   |
| RF Return Loss            | >10dB  |
| RF Impedance              | 75 Ohm   |
| RF AGC                    | Preset at 25 RF carriers in each CWDM channel  |
| RF Flatness               | ±4.0 dB (174 - 2350MHz)  |
| Optics                    |  |
| Optical Output Port       | One  |
| Fiber                     | 9µm/125µm single-mode fiber  |
| Fiber Connector           | SC/APC   |
| Output Optical Wavelength | 1470nm/1490nm/1510nm<br>1530nm/1550nm/1570nm   |
| Laser                     | CWDM DFB laser with one stage isolator   |
| Average CWDM Optical Loss | <2.8dB@ CWDM wavelength  |
| Laser Output Power        | >10dBm (All CWDM wavelengths)  |
| LED Status                | 12 Green Color LED on the panel, representing each laser has power and 6 RF inputs. LED "ON" when there is the corresponding signal. |
| General                   |  |
| Power Supply              | 19V 3A DC Power Adapter  |
| Power Consumption         | <12W   |
| Dimensions (W x H x D)    | 7.48" x 6.10" x 1.57" ( 190 x 155 x 40mm)  |
| Operating Temperature     | 14 - 113 °F (-10 - +45 °C)   |
| Storage Temperature       | -40 - 185 °F (-40 - +85 °C)  |
| Humidity                  | 10 - 90% non-condensing  |
| Weight                    | 4.4 lbs (2 Kg)   |
| Warranty                  | 2-year Limited Warranty  |

### 3.2 FT-SAT-RX-6 Specifications

| Optical Input             |  |
|---------------------------|--|
| Optical Input Ports       | One  |
| Fiber                     | 9µm/125µm single-mode fiber  |
| Fiber Connector           | SC/APC   |
| Input optical wavelength  | 1470nm/1490nm/1510nm<br>1530nm/1550nm/1570nm   |
| Average CWDM Optical Loss | <2.8dB@ CWDM wavelength  |
| Optical Input Power       | -12dBm - +3dBm (All CWDM wavelengths)  |
| RF Output Ports           | Six F Type 75 Ohm  |
| RF Output Bandwidth       | 174 - 2350MHz  |
| SAT RF Output Level       | >-76dBuV@-6dBm optical input<br>>-70dBuV@-10dBm optical input<br>>-65dBuV@-12dBm optical input                                       |
| RF Flatness               | ±4.0 dB (174 - 2350MHz)  |
| RF Return Loss            | >10dB  |
| RF Connector              | F Type   |
| RF Impedance              | 75 Ohm   |
| IMD 2nd order             | ≥32dB (two input tones at -15 dBm)   |
| IMD 3RD order             | ≥52dB (two input tones at -15 dBm)   |
| LED Status                | 6 Green Color LEDs on the panel, representing 6 RF Ports and DC Power.<br>LED "ON" when there is signal on the corresponding RF port |

| General                |   |
|------------------------|---|
| Power Supply           | 12V 1A power adapter                      |
| Power Consumption      | <9W                                       |
| Dimensions (W x H x D) | 5.55" x 6.10" x 0.98" ( 141 x 155 x 25mm) |
| Operating Temperature  | 14 - 122 °F (-10 - +50 °C)                |
| Storage Temperature    | -40 - 185 °F (-40 - +85 °C)               |
| Humidity               | 10 - 90% non-condensing                   |
| Weight                 | 2.2 lbs (1 Kg)                            |
| Warranty               | 2-year Limited Warranty                   |

## Chapter 4 Function Guide

### 4.1 FT-SAT-TX-6 RF Inputs



1. No DC reverse power at RF port
2. When FT-SAT-TX-6 is powered ON, the LD LED will be Green
3. When no RF signal is present, or weak RF signal is detected at the RF input port, the corresponding RD LED will be off. When RF power is higher than -50dBm, the corresponding RF LED will be Green

### 4.2 FT-SAT-TX-6 Fiber Output and Power Input



### 4.3 FT-SAT-RX-6 RF Output



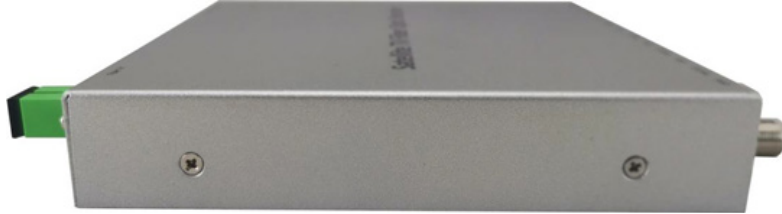
When the FT-SAT-RX-6 optical receiver is powered on by the 12V DC adapter, all 6 LEDs will be Red. When optical input power is higher than -12dBm, the channel LED will turn "Green". When optical input power is higher than 0dBm, the channel LED will turn "Orange", warning the user to reduce optical input power.

When the LED is Green, FT-SAT-RX-6 RFX port will output high quality RF when there is the same RF on the RFX input of FT-SAT-TX-6, where X= 1 or 2 or 3 or 4 or 5 or 6.

- RF1 is associated with 1570nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6
- RF2 is associated with 1550nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6
- RF3 is associated with 1530nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6
- RF4 is associated with 1510nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6
- RF5 is associated with 1490nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6
- RF6 is associated with 1470nm wavelength at both FT-SAT-TX-6 and FT-SAT-RX-6

## Chapter 5 Wall Mount Modification

The FT-SAT-TX-6 transmitter and FT-SAT-RX-6 receivers modular design, allows for wall mount installation



The above screws can be removed to add the following part.



## Chapter 6 Installation & Adjustment

### 6.1 Opening the cover

- 6.1.1 Inspect the package. If there is any damage, please contact the freight company or contact NACE 800.688.9282
- 6.1.2 After unpacking, check equipments and accessories according to packing list. Any question, please contact NACE 800.688.9282
- 6.1.3 If you think equipment has been damaged, please don't turn on the power to avoid worse damage. Please contact NACE 800.688.9282

### 6.2 Installation Tools and Equipment

- An optical power meter
- A Satellite meter
- A satellite receiver
- A digital multimeter
- A standard fiber test jumper (SC/APC)
- Waterless alcohol and nosocomial degrease cotton

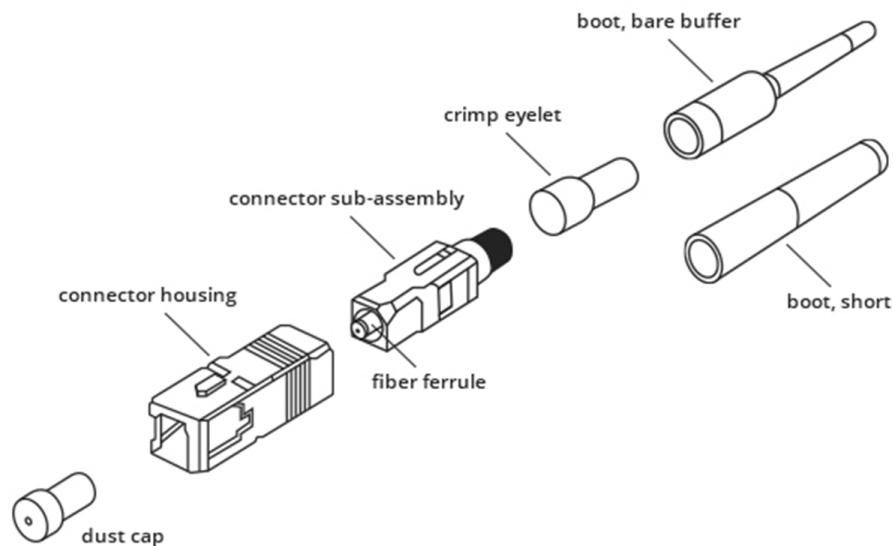
### 6.3 Installation

- a. Install equipment on wall or in the desired location and ground the case.
- b. Check power adapter output voltage using a digital multimeter in accordance with power requirement. The FT-SAT-TX-6 is powered by 19V DC and the FT-SAT-RX-6 is powered by 12V DC.
- c. Ensure that SAT RF levels are within appropriate range (-55dBm to -25dBm). Dish adjustment may be necessary.
- d. Check the output optical power of FT-SAT-TX-6 fiber transmitter (higher than +10dBm) or the input power to FT-SAT-RX-6 optical receiver (higher than -12dBm, recommended working input optical power is -10dBm ~ -2dBm). Making sure that the fiber connectors to FT-SAT-TX-6 and FT-SAT-TX-6 are SC/APC.
- e. Connect FT-SAT-RX-6 with coaxial cable to satellite receiver.
- f. If low MER or SNR at the RF output is present, please check the optical power to the FT-SAT-RX-6 optical receiver first. ("Orange" LED means too high of an optical input; "Red" LED means too low of an optical input). Adjust the RF input level to FT-SAT-TX-6 accordingly.

## Chapter 7 Cleaning & Maintenance

Fiber connections may be polluted by dust or dirt in the installation process, which will result in optical link loss. When this occurs, the installer should clean and maintain the fiber active connector.

Cleaning recommendations are below:



- Carefully disconnect the active fiber connector from the adapter, avoiding eye and skin contact with the active laser.
- Using appropriate cleaning methods, carefully clean each fiber connector, allowing 1-2 minutes for the active connector surface to air dry. Never blow on the connector, as you may introduce moisture onto the surface of the fiber connector.
- Carefully reconnect each fiber connector.
- The fiber connector should be cleaned on both ends. If optical power is still low after cleaning, it is recommended that you clean the inner adapter.
- Compressed air assists in the cleaning of fiber. It is an effective way to clear connectors and dust caps of loose dust particles.

**Notice: Avoid aiming the laser at the human body or eyes.**



## Chapter 8 FIBERTRONIX 2-Year Limited Warranty

FIBERTRONIX. (the “Company”) warrants to the Original Purchaser that the item purchased is free from defects in workmanship or material under normal use. This warranty starts on the date of shipment of the hardware to the Original Purchaser.

During the warranty period, the Company agrees to repair or replace, at its sole option, without charge to Original Purchaser, any defective component. To obtain service, the Original Purchaser must return the item to the Company properly packaged for shipping. All defective products must be returned to the Company within thirty (30) days of failure. Products must be returned with a description of the failure and Return Merchandise Authorization (RMA) number supplied by the Company. To receive a RMA number and a return shipping address on where to deliver the hardware, call 610-429-1821. The shipping, and insurance charges incurred in shipping to the Company will be paid by Original Purchaser, and all risk for the hardware shall remain with the Original Purchaser until such time as Company takes receipt of the hardware. Upon receipt, the Company will promptly repair or replace the defective unit, and then return said unit to Original Purchaser, shipping prepaid. The Company may use reconditioned or like-new parts or units, at its sole option, when repairing any hardware. Repaired products shall carry the same amount of outstanding warranty as from original purchase. Any claim under the warranty must include dated proof of purchase or invoice. In any event, the Company’s liability for defective hardware is limited to repairing or replacing the hardware.

This warranty is contingent upon proper use of the hardware by Original Purchaser and does not cover: if damage is due to Acts of God (including fire, flood, earthquake, storm, hurricane or other natural disaster), accident, unusual physical, electrical, or electromechanical stress, modifications, neglect, misuse, operation with media not approved by the Company, tampering with or altering of the hardware, riot, war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, labor dispute, strike, lockout or interruption or failure of electricity, air conditioning, or humidity control, Internet, network, or telephone service.

The warranties given herein, together with any implied warranties covering the hardware, including any warranties of merchantability or fitness for a particular purpose, are limited in duration to one year from the date of shipment to the Original Purchaser. Jurisdictions vary with regard to the enforceability of warranty limitations, and you should check the laws of your local jurisdiction to find out whether the above limitation applies to you.



The Company shall not be liable to your for loss of data, loss of profits, lost savings, special, incidental, consequential, indirect, or other similar damages arising from breach of warranty, breach of contract, negligence, or other legal action even if the Company or its agent has been advised of the possibility of such damages, or for any claim brought against your by another party. Jurisdictions vary with regard to the enforceability of provisions excluding or limiting liability for incidental or consequential damages. You should check the laws of your local jurisdiction to find out whether the above exclusion applies to you.

This warranty allocates risks of product failure between Original Purchaser and the Company. The Company's hardware pricing reflects this allocation of risk and the limitations of liability contained in this warranty. The warranty set forth above is in lieu of all other express warranties, whether oral or written. The agents, employees, distributors, and dealers of the Company are not authorized to make modification to this warranty, or additional warranties binding on the Company. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by the Company and should not be relied upon.

This warranty gives you specific legal rights. You may also have other rights which vary from one jurisdiction to another.