

FT-FTX1310-14-SCAPC-1218

User Manual



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1. Preface

This manual provides detailed information about the features, specifications, installation, and operation of the FT-FTX1310-14-SCAPC-1218 optical transmitter.

To ensure proper installation and safe operation, read this manual thoroughly before installing, adjusting, or operating the transmitter. Always follow the instructions and safety precautions provided. Failure to do so may result in equipment or property damage, improper operation, or personal injury.

Please contact North American Cable Equipment at 800-688-9282 if you have any questions or require additional assistance.



2. Safety and Maintenance

Before installing, servicing, or operating the FT-FTX1310-14-SCAPC-1218 optical transmitter, read this manual thoroughly and observe the following safety precautions:

- **Qualified Personnel Only:** Installation and servicing must be performed by trained, qualified personnel familiar with CATV RF and optical-fiber systems.
- **Laser Safety Warning:** This transmitter is a Class III laser product. Invisible laser radiation may be emitted from the optical output ports, connectors, or exposed fiber ends and may cause permanent eye or skin injury. Never look directly into an optical output port, connector, or fiber end. Using controls, adjustments, or procedures other than those specified in this manual may result in hazardous laser-radiation exposure.
- **Proper Grounding Required:** Before operating the transmitter, verify that the chassis and power receptacle are properly and reliably grounded.
- **Disconnect Power Before Servicing:** Disconnect the transmitter from its power source before removing or replacing any modules unless the applicable procedure specifically permits hot-swapping.
- **Protect Optical Connections:** Keep unused optical connectors and ports clean and securely capped to prevent contamination or damage.
- **Maintain Proper Ventilation:** Keep all ventilation openings unobstructed. Remove accumulated dust using appropriate ESD-safe cleaning methods.
- **Protect the Operating Environment:** Do not expose the transmitter to moisture, condensation, corrosive substances, or temperatures outside the limits specified in this manual.
- **Recommended Power and Climate Control:** For stable, reliable, and long-term operation, the use of an uninterruptible power supply (UPS) and a temperature-controlled, air-conditioned environment is strongly recommended.

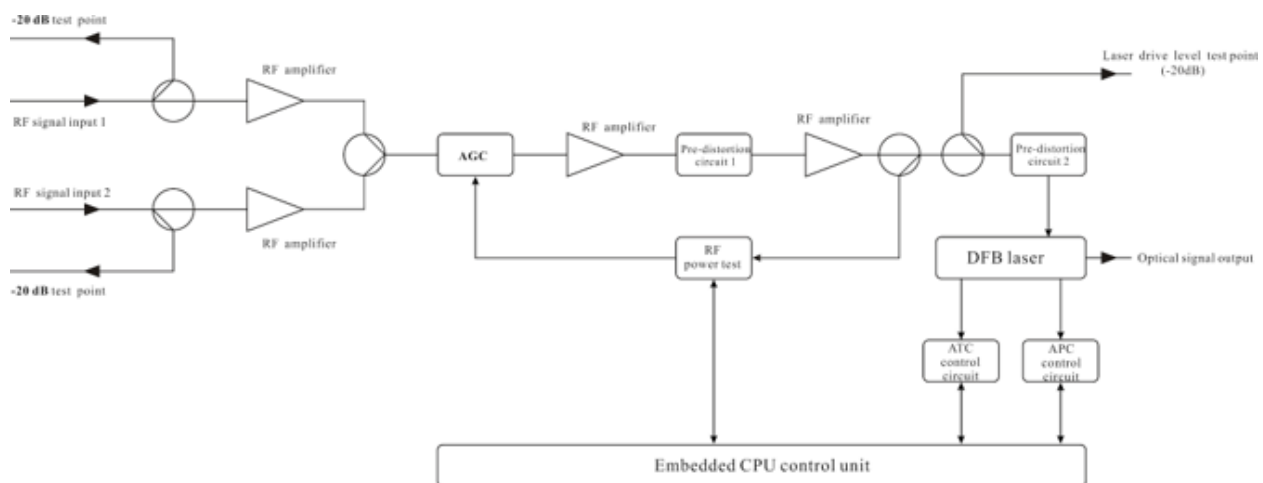
3. Product Overview

The FiberTronix FT-FTX1310-14-SCAPC-1218 is a professional-grade 1310 nm downstream optical transmitter designed for Cable Television (CATV) and Hybrid Fiber-Coaxial (HFC) broadband networks. It supports a 47–1218 MHz RF bandwidth, making it ideal for DOCSIS® 3.1 downstream applications, and provides 14 dBm nominal optical output through an SC/APC optical connector.

A high-performance Distributed Feedback (DFB) laser combined with advanced pre-distortion circuitry delivers excellent carrier-to-noise ratio (CNR) while minimizing Composite Second Order (CSO) and Composite Triple Beat (CTB) distortion. This ensures exceptional signal quality for analog television, digital television, Quadrature Amplitude Modulation (QAM), and Cable Modem Termination System (CMTS) downstream transmission.

4. Key Features

- 1310 nm DFB (Distributed Feedback) laser with 14 dBm nominal optical output
- 47–1218 MHz downstream RF bandwidth, compatible with DOCSIS® 3.1 networks
- Dual high-isolation RF inputs for broadcast and signal insertion applications
- Selectable Automatic Gain Control (AGC) and Manual Gain Control (MGC) RF level adjustment
- Advanced pre-distortion circuitry for excellent carrier-to-noise ratio (CNR) and low CSO/CTB distortion
- Real-time monitoring of laser output power, bias current, laser temperature, and TEC (thermoelectric cooler) current
- Front-panel LCD with status indicators and intuitive menu navigation
- Ethernet (LAN) and RS-232 interfaces for local and remote management
- Dual hot-swappable power supplies for maximum system availability
- Compact 19-inch, 1RU rack-mount chassis



The two RF inputs are amplified and combined, regulated through the AGC/MGC control path, processed by pre-distortion stages and applied to the DFB laser. The embedded control unit monitors RF drive, laser power, bias and temperature.

6. Specification

Specifications	
Optical	
Optical wavelength	1310 $\pm$ 20 nm
Output optical power	14 dBm nominal
Laser type	Distributed Feedback (DFB) laser
Optical modulation	Direct Intensity Modulation (IM)
Optical connector	SC/APC
Optical return loss	>45 dB
RF	
Frequency range	47 - 1218MHz
RF input level	20 $\pm$ 5 dBmV
Flatness in band	$\pm$ 0.75 dB
RF input impedance	75 Ω
Input return loss	$\geq$ 16 dB
RF AGC control range	$\pm$ 5 dB
RF MGC attenuation range	0 - 15 dB
RF input isolation	Up to 50 dB between two RF inputs
RF input test ports	-20 $\pm$ 1 dB
Laser drive level test port	-20 $\pm$ 1 dB
Performance	
C/N	$\geq$ 52 dB (reference test conditions)
C/CTB	$\geq$ 67 dB
C/CSO	$\geq$ 62 dB
General	
Power supplies	Dual hot-swappable; 100-240 VAC, -48 VDC option
Maximum power consumption	$\leq$ 15 W
Operating temperature	23 - 113 °F (-5 - 45°C)
Storage temperature	-4 - 149°F (-20 - 65°C)
Dimensions (W x D x H)	19 x 13.18 x 1.75" (483 x 335 x 44.45 mm) 1RU
Weight	12 lbs. (5.5 kg)
Warranty	1 Year Warranty

7. Front Panel Display and Menu Operation

The front-panel LCD and keypad allow you to monitor system status, configure operating parameters, and view alarm conditions.

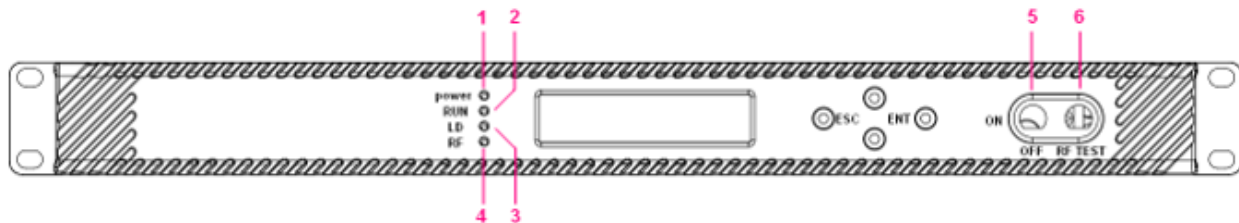
Use the navigation keys as follows:

- **▲ / ▼** – Scroll through menu items or adjust values.
- **ENT** – Enter a submenu or confirm a selection.
- **ESC** – Cancel a change or return to the previous menu.

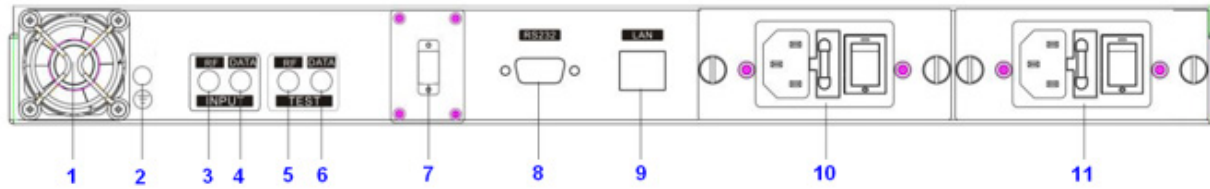
Menu	Function
Display Parameters	View operating status, including laser output power, laser bias current, laser temperature, TEC current, RF channel count, RF drive level, RF control mode, AGC reference, MGC attenuation, +5 V, -5 V, and +24 V power supply voltages, operating wavelength, serial number, chassis temperature, IP address, subnet mask, default gateway, MAC address, and software version.
Set Parameters	Configure optical power display units (dBm or mW), buzzer alarm, RF control mode (AGC or MGC), AGC reference level, MGC attenuation, RF channel count, network settings (IP address, subnet mask, gateway), and restore factory default settings.
Alarm Status	View active alarms for RF input level, laser temperature, laser bias current, TEC current, laser output power, and +5 V, -5 V, and +24 V power supplies.

Default alarm guidance: Factory alarm thresholds may be adjusted through network management. Typical defaults include RF drive 80-110 dBuV, laser temperature 25 +/- 10 C, laser bias 20-90 mA, output optical power 2-25 mW, TEC current -1.5 to +1.5 A, +5 V +/-1 V, -5 V +/-1 V and +24 V +/-2 V.

8. Front and Rear Panel Description



Number	Front Panel Function
1	Power indicator
2	Run indicator; flashes approximately once per second during normal operation
3	Laser status: green = normal; red = laser off; flashing red = alarm
4	RF drive indicator: green = normal; flashing red = RF drive alarm
5	Laser ON/OFF switch; keep OFF during initial power-up and turn ON after self-test
6	Laser drive level test port, -20 dB



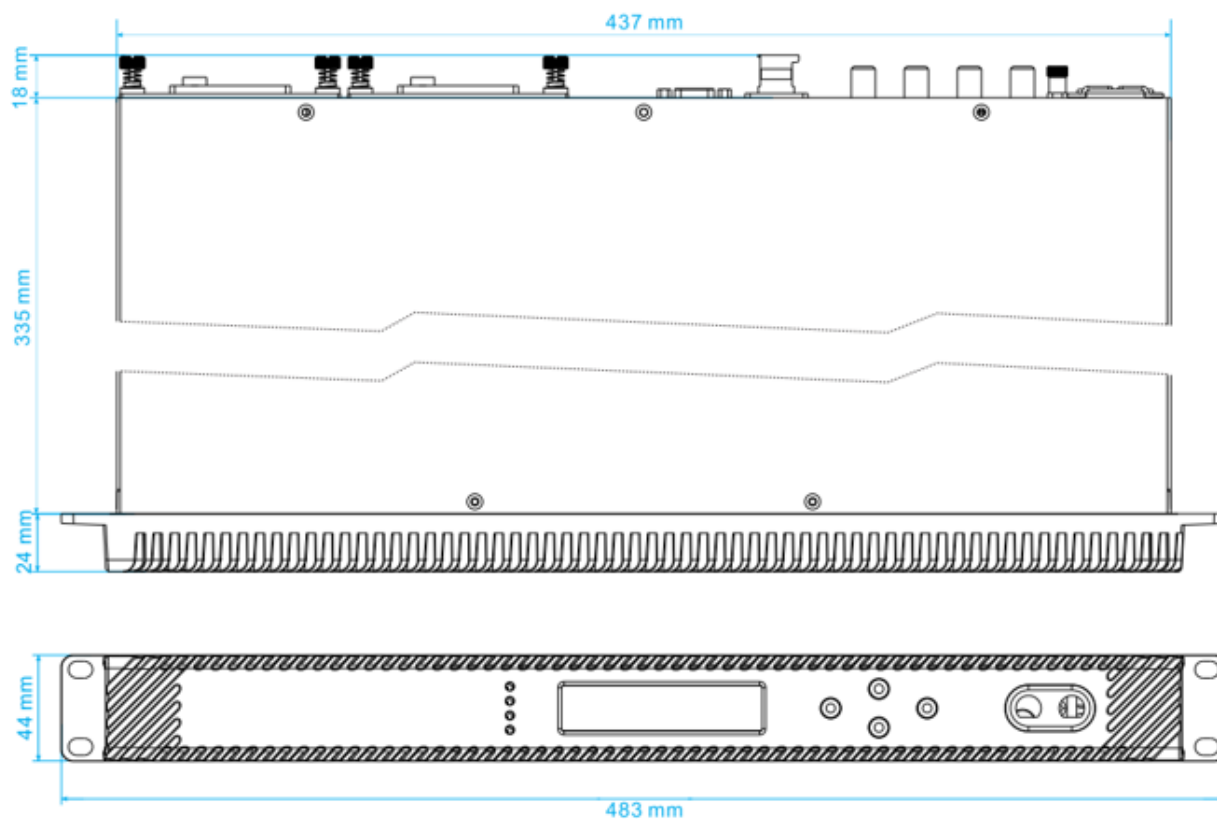
Number	Front Panel Function
1	Cooling fan
2	Ground stud
3	RF input 1
4	RF input 2
5	RF input 1 test port, -20 dB
6	RF input 2 test port, -20 dB
7	SC/APC optical output
8	RS-232 interface
9	LAN interface
10	Power module 1, hot-swappable
11	Power module 2, hot-swappable

9. Installation and Start-Up

- Inspect the shipping carton and equipment for visible damage. Do not apply power to damaged equipment.
- Mount the transmitter in a standard 19-inch rack with adequate front and rear airflow.
- Connect the chassis ground stud to the facility grounding system before connecting power.
- Verify that the installed power modules match the site power source.
- Keep the laser switch OFF. Connect the RF input signal(s), RF monitoring cables if needed, and the clean SC/APC optical patch cord.
- Apply power and allow the unit to complete its self-test. Confirm that the power and run indicators show normal operation.
- Verify RF input level and select Automatic Gain Control (AGC) or Manual Gain Control (MGC) mode as required.
- Turn the laser switch ON. Confirm optical output and alarm status on the display before connecting the downstream fiber plant.
- Record the serial number, IP configuration, RF settings and measured optical output for the site documentation.

SC/APC connector care: Use only clean SC/APC connectors. Never connect UPC or PC-polished connectors to an APC port. Inspect and clean fiber end faces before every connection.

10. Dimensions



Approximate chassis dimensions: 19 in wide x 13 in deep x 1.75 in high (19-inch, 1RU). Allow additional rear clearance for fiber bend radius, RF cables, management cables and power cords.

11. Basic Troubleshooting

Condition	Corrective action
No power indication	Verify the AC power source, confirm the power supply module is fully seated, check the fuse or circuit breaker, and ensure the chassis is properly grounded.
Run indicator is not flashing	Power cycle the unit. If the condition persists, record the information displayed on the front-panel LCD and contact Technical Support.
Laser status indicator is red	Verify that the laser is enabled (ON). Review the Alarm Status menu for laser output power, bias current, temperature, or TEC current alarms.
RF drive alarm	Verify the RF input level, confirm a proper 75-ohm termination, and check the AGC/MGC settings.
Low or no optical output	Clean and inspect the SC/APC optical connector, verify that the laser is enabled, and confirm the displayed optical output power. Never look directly into an active optical connector or fiber.
Network management unavailable	Verify the Ethernet (LAN) connection, IP address, subnet mask, default gateway, and local network connectivity.

Warning: Never look directly into an optical connector or the end of an optical fiber when the transmitter is powered on. Invisible laser radiation may be present and can cause permanent eye injury.

12. Technical Support

For product assistance, contact NACE / FiberTronix Technical Support. Have the model number, serial number, software version, RF input level, optical output reading and alarm status available.

800-688-9282 | sales@nace.tv | www.nace.tv

Specifications and procedures are subject to change without notice. This manual is based on the manufacturer documentation supplied for the 1310nm 1.2 GHz transmitter platform and is tailored to FiberTronix model FT-FTX1310-14-SCAPC-1218.



13. FIBERTRONIX 1-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 you 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.