



**HFC** *Enhance*<sup>®</sup>

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D3.1/CCAP™  
Compliant

## **QHFCN CATV Optical 2-way Mini Node**

**INSTALLATION & OPERATION MANUAL**

Although every effort has been taken to ensure the accuracy of this document it may be necessary, without notice, to make amendments or correct omissions. Specifications subject to change without notice.

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# IMPORTANT SAFEGUARDS

## 1. Important Safeguards

ATX Networks strongly advises you to read the following safety instructions prior to installing and operating this equipment.

- **Read These Instructions First** – All safety and operating instructions should be read before installing or operating this equipment.
- **Retain This User Manual** – Safety and operating instructions must be retained for future reference.
- **Ventilation** – The optical mini node should be kept at a distance from other objects to keep from overheating. **Maximum operating ambient temperature is 150°F (65°C).**
- **Power Sources** – The mains circuit should be a dedicated, un-switched supply. Keep the unit away from high voltage or other interference creating devices such as motors, compressors, etc.



**CAUTION:** For continued protection against risk of fire, replace circuit breakers/fuses (if necessary) with one of only the same type and rating.



**OPTICAL OUTPUT SAFETY:** Optical mini node units may emit harmful invisible laser radiation if powered on and the case is opened or the beam path is exposed.



The ATX Networks' QHFCN optical mini node is classified as Class 1M per IEC/EN 60825-1/A2:2001. This product complies with FDA/CDRH, 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated 26 July, 2001.

Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers and Miniscopes) within a distance of 100 mm may pose an eye hazard.

Laser power up to 26 mW at 1310 nm could be accessible if optical connector is open or fiber is broken. Lasers are Powered ON whenever the unit is powered.

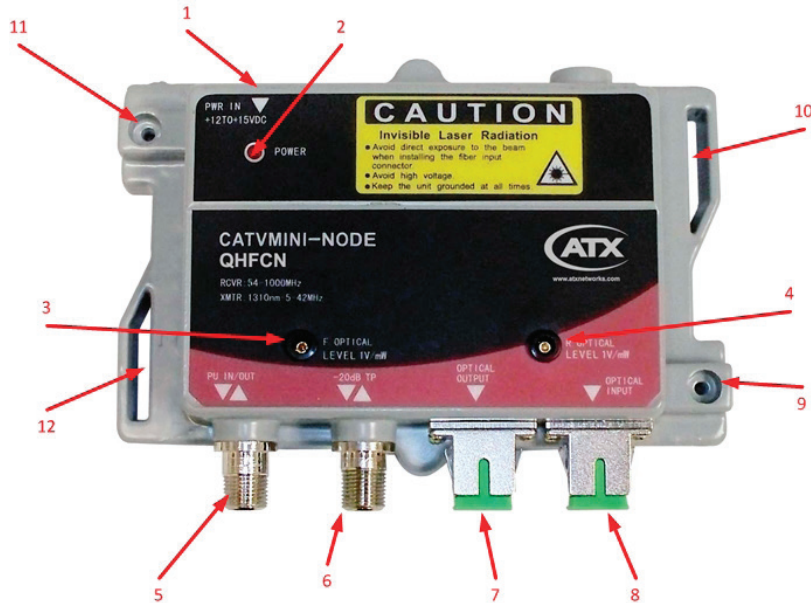


**CAUTION:** Use of controls, adjustments, and procedures other than those specified herein may result in hazardous laser radiation exposure.

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# INSTALLATION AND OPERATION

## 2. Installation and Operation



1. Power input +12~+15VDC
2. Power ON LED display
3. Output power test point (1V/mW)
4. Input power test point (1V/mW)
5. Downstream RF output / Upstream RF input / power input (DC+12V)
6. Upstream/ Downstream RF input level test port (-20dB)
7. Upstream fiber output
8. Downstream fiber input
9. Set-screw grounding location
10. Mounting screw slot
11. Set-screw grounding location
12. Mounting screw slot

Figure #1 - QHFCN Mini Node

1. Connect the optical input signal
  - Inspect and clean the fiber strand optical connector. Using an optical power meter, verify that the optical input signal is between -6 and + 3 dBm (0.25 to 2 mW).
    - Alternatively, connect the optical input and measure the DC voltage with respect to ground at the optical input test point (4). The voltage is approximately 1V/mW (between 0.25 and 2.0 V), for proper operation.
  - Using an RF signal meter, measure the RF downstream power level output (5). The output level should be approximately +25 dBmV per channel with an optical input of 0 dBm (+/- 2 dB RF for each 1 dB +/- optical input).
    - Alternatively, measure the RF output at downstream level test port (6). The level at the test port will be approximately 20 dB below the actual RF output level.
  - Using an optical power meter, measure the output of the return path upstream laser connector (7). The output power is a nominal 0 dBm (1 mW).
    - Alternatively, measure the DC Voltage at the output power test point (3) with respect to ground. The reading should be approximately 1.0 V (1.0V/mW).
  - Using an RF signal meter, verify the RF input to the mini node is a nominal 20 dBmV. The measurement at RF upstream input test port (6) will be 20 dB below the actual input level.
2. Use only single mode fiber (SMF) optic cable (9/125µM). Multi-mode fiber (MMF) is incompatible with the equipment and will result in unacceptable performance and possible damage to the equipment.
3. All fiber splices should be fusion-type splices. Avoid mechanical or compression type connections.
4. For optimum performance, fiber runs should be made directly from the transmitter to the receiver. Minimize the use of adapters, patch panels, and additional points of failure and signal loss.
5. In order to ensure return loss is maximized, use only SC/APC connectors. Clean and inspect connectors and fiber endfaces prior to installation, and every plug in/out cycle.
6. Use only industry approved methods, materials, and solutions for cleaning.
7. Do not turn on the transmitter alone or without a protector cover at the unit connector end, otherwise the laser can do harm, especially to eyes. This is especially critical because the laser is invisible.
8. Always turn off the laser prior to making connections to the transmitter. Failure to do so may cause irreparable damage to the laser and transmitter.

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## SPECIFICATIONS

### 3. Specifications

SPECIFICATIONS	QHFCN
<b>RECEIVER (Forward Path)</b>	
WAVELENGTH	1280-1620nm
OPTICAL INPUT POWER RANGE	-6 to +3 dBm
FREQUENCY RANGE	54-1000 MHz
RF OUTPUT POWER	+25 dBmV ( $\pm 1$ dB)
CARRIER-TO-NOISE RATIO	52 dB (78 channel loading, 0 dBm input)
COMP. 2nd ORD.	-60 dBc (78 channel loading, 0 dBm input)
COMP. TR. BT.	-65 dBc (78 channel loading, 0 dBm input)
OPTICAL CONNECTOR	SC/APC
<b>TRANSMITTER (Optional Return Path)</b>	
WAVELENGTH	1310nm $\pm 20$
OPTICAL OUTPUT POWER	0.5 to +2 dBm (1 dBm typical)
RF FREQUENCY	5-42 MHz or 5-65 MHz
RETURN PATH RF INPUT POWER	+20 dBmV
FREQUENCY RESPONSE	$\pm 0.75$ dB (5-42 MHz)
OPTICAL CONNECTOR	SC/APC
<b>ELECTRICAL &amp; ENVIRONMENTAL</b>	
DC POWER	11.5-16 VDC
TOTAL POWER CONSUMPTION	< 3 watts typical @ 12 VDC
AC POWER ADAPTER	Universal AC Adapter, 12 VDC Out
DC POWER INPUT RANGE	40-60 VDC
LED INDICATORS	DC Power, Optical Transmit, Optical Receive
OPTICAL TEST POINTS	Input Power, Optical Output Power (1V/mW)
RF TEST PORTS	Forward and Return Path F Connector
OPERATING TEMPERATURE	-20°C to +60°C (-4°F to +140°F)
HUMIDITY	5-95% Non-condensing
DIMENSIONS	1.25"H x 5.25"W x 4.25"D (3.2H x 13.3W x 10.8D cm)
WEIGHT	0.62 lbs (0.28 kg)

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## SERVICE & SUPPORT

### 4. Service & Support

#### 4.1 Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX to obtain a valid RMA number for any ATX products that require service and are in or out-of-warranty before returning a failed module to ATX.

##### TECHNICAL SUPPORT

Tel: 289.204.7800 – press 1  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [support@atx.com](mailto:support@atx.com)

##### SALES ASSISTANCE

Tel: 289.204.7800 – press 2  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [insidesales@atx.com](mailto:insidesales@atx.com)

##### FOR HELP WITH AN EXISTING ORDER

Tel: 289.204.7800 – press 3  
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only  
Email: [orders@atx.com](mailto:orders@atx.com)  
Web: [www.atx.com](http://www.atx.com)

#### 4.2 Warranty Information

The ATX Networks QHFCN mini node has a one year warranty and is subject to ATX Networks' standard warrantee terms. There are no user serviceable components inside the unit. The warranty is void if the unit is opened or is damaged due to misuse.



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