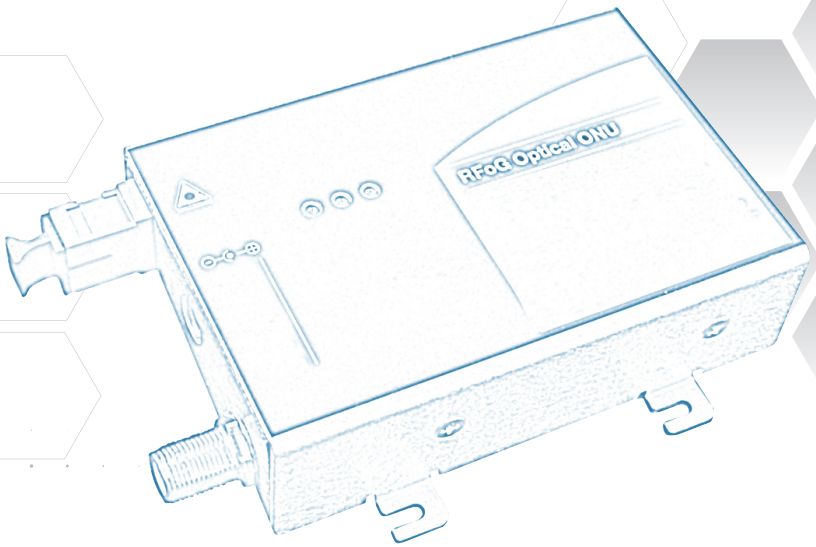
Discontinued

HFC *Enhance*®

D3.1/ CCAP™ Compliant

HEMNO RFoG ONU Mini Node

Installation & Operation Manual



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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 HEMNO should be kept at a distance from other objects to keep from overheating. Connecting the HEMNO to the enclosure heat sink (if applicable) is recommended. Maximum operating HEMNO case temperature is 150°F (65°C).
- **Power Sources** – The mains circuit should be a dedicated, un-switched supply. Keeps 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 HEMNO units may emit harmful invisible laser radiation if powered on and the case is opened or the beam path is exposed.*

The ATX Networks HEMNO 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 Nanoscopes) 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. It is possible that the laser is 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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HEMNO NODE

2. HEMNO Node

2.1 What's Included in the Box:

- HEMNO
- DC Power Supply (sold separately)
- Power Inserter (sold separately)
- DC Block (sold separately)

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INSTALLATION INSTRUCTION

3. Installation Instruction

- Position HEMNO unit on a flat surface, and put mounting screws on all four brackets. The grounding wire should be connected to one of the legs.
- Connect the fiber optical jumper cable into the SC adaptor on the HEMNO.
- Plug in the RF coax cable into the F-connector of HEMNO.
- If 12VDC power comes off the RF cable, the HEMNO should be powered on. If the alternative power is supplied through the DC Jack, install a DC block at the F-connector first, then plug the power source into the DC jack to turn on the unit.

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OPERATIONS NOTICE

4. Operations Notice

- If HEMNO is powered from DC jack, a DC block at the F connector is required to prevent damage from DC voltage/ current entering into the connecting equipment or causing a short circuit to the HEMNO power supply (if the equipment input does not have a DC block or has a short circuit to the ground).
- If HEMNO is powered from F connector, the DC power jack connector should be left un-connected to prevent damage on both the HEMNO and the powering unit.
- Always turn off power prior to making connections to the HEMNO. Failure to do so may cause irreparable damage to the HEMNO.
- Do not turn on the transmitter alone or without a protector cover at the HEMNO optical connector end, otherwise the laser can do harm, especially to eyes. This is especially critical because the laser is invisible.
- 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 +1 dBm (0.25 to 1 mW).
  - Using a RF Signal Meter to measure the RF Downstream power, it should be approximately +18 dBmV/ ch +/- 2dB @ 550MHz (3.5% OMI assumed).
  - Using an Optical Power Meter, measure the output of the Return Path Upstream Laser connector. The output power is set to the specified power within +/- 0.5dB.
- 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.
- All fiber splices should be fusion-type splices. Avoid mechanical or compression type connections.
- 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.
- In order to ensure return loss is maximized, use only SC/APC connectors. Clean and inspect connectors and fiber end-faces prior to installation, and every plug in/out cycle.
- Use only industry approved methods, materials, and solutions for cleaning.

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SPECIFICATIONS

5. Specifications

SPECIFICATIONS	MIN.	TYPICAL	MAX.	UNIT	CONDITION
DOWNSTREAM					
WAVELENGTH	1540		1565	nm	
RESPONSIVITY		0.85		A/W	λ_{down} = 1550nm
OPTICAL RECEIVED POWER	-6		1	dBm	
LOSS OF OPTICAL POWER THRESHOLD		-13		dBm	RED LED ON when below threshold
RF OPERATING FREQUENCY	52		1002	MHz	
RF OUTPUT POWER @ 550 MHz	19			dBmV	0 dBm Optical Input, OMI 3.5%/ch
OPTICAL AGC TIME CONSTANT		20		ms	
RF RESPONSE TILT (53-1002 MHz)	3	5	7	dB	54-1002 MHz
RF FLATNESS (Fit to Linear Slope)	-1		1	dB	54-1002 MHz
RF RETURN LOSS, 75 Ω	16	18		dB	
CARRIER-TO-NOISE RATIO @ -6 dBm	48			dB	RIN<-156 dB/Hz, 3.5% OMI/ch(1)
COMP. 2ND ORD. @ 0 dBm			-60	dBc	
COMP. TR. BT. @ 0 dBm			-60	dBc	
UPSTREAM					
WAVELENGTH	1250	1310	1350	nm	Over Operating Temperature
RF OPERATING FREQUENCY	5		42	MHz	
RF FLATNESS	-1		1	dB	
RF RETURN LOSS, 75 Ω	16	18		dB	
RF INPUT RANGE	20		45	dBmV	
RF THRESHOLD POWER		15		dBmV	
NPR DYNAMIC RANGE	10			dB	@ threshold of 38 dB NPR
TX OPTICAL POWER, HIGH	3	4	5	dBm	RF Input Power > RF_{th},(2)
TX OPTICAL POWER, OFF			-48	dBm	RF Input Power < RF_{th}
TURN-ON TIME	0.5		1.5	µs	
TURN-OFF TIME	0.5		1.5	µs	

NOTES:
(1) Channel loading: 50-552 MHz CW analog, 552-1002 MHz digital, 20 km fiber + passive loss.
(2) For TX output power higher than 4 dBm, please consult with ATX.

Table #1: Downstream and Upstream Specifications

SPECIFICATIONS	MIN.	TYPICAL	MAX.	UNIT	CONDITION
RECOMMENDED OPERATING CONDITIONS & ENVIRONMENTAL					
OPERATING TEMPERATURE	-40ºC (-40ºF)		+65ºC (+149ºF)	ºC (ºF)	Ambient
DC CONNECTIONS	Power through DC jack or F connector. Note when powering through DC jack, DC voltage can pass through the F connector, a DC block in series with the F connector is recommended for safety.				
OPERATING ANALOG SUPPLY VOLTAGE	11.5	12	16	V	
OPERATING CURRENT		0.26	0.4	A	Laser Diode is OFF
POWER CONSUMPTION			3.5	W	12V VCC
HUMIDITY	5		95	%	Non-condensing
LEDs	RED Receive Power Alarm, GREEN Power ON, GREEN Upstream Laser ON				
DIMENSIONS (Excluding Adaptors)	1.06"H x 3.85"W x 2.68"D (2.69H x 9.78W x 6.80D cm)				
WEIGHT	0.38 lbs (0.17 kg)				

Table #2: Recommended Operating Conditions & Environmental Specifications

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SERVICE & SUPPORT

6. Service & Support

6.1 Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products. Please contact ATX Customer Service 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 the factory.

RF & OPTICAL TECHNICAL SUPPORT
Tel: (905) 428-6068
Toll Free: (800) 565-7488 (USA & Canada only)
► Press *3 for **Technical Support**
► Then press 2 for **RF & Optical Products (MAXNET, SignalOn, HFC Enhance, PCI Filters, Q-Series, FLEXNET, SCN, SMAC, FiberLinx)**
Email: rfsupport@atxnetworks.com

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Toll Free: (800) 565-7488 (USA & Canada only)
► Press *1 for **Customer Service**
Fax: (905) 427-1964
Toll Free Fax: (866) 427-1964 (USA & Canada only)
Web: www.atxnetworks.com
Email: support@atxnetworks.com

6.2 Warranty Information

The ATX Networks RFoG HEMNO has a 2-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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