MAXNET® II
Platinum Series

Pat.# U.S. 7,142,414

CCAP™ Compliant

MPTX8
Optical Transmitter Manual

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PRODUCT DESCRIPTION

1.   Product Description

ATX has developed a line of optical transmitter modules for their MAXNET II RF Management Platform. The product line consists of transmitter modules of varying power levels with a single input for Broadcast Spectrum and Narrowcast Spectrum inputs through an integrated 8-way RF combiner. An appropriate MAXNET II Power Supply in the MAXNET II Chassis powers all of the above modules. The transmitters are dual width and take up two slots in the MAXNET II Chassis.

Modules can be status monitored through SNMP based managers and the MAXNET II interface is HMS compliant. Also, all of the modules include front access alarm indication and a -20 dB test point.

Please refer to the web page for up-to-date specifications – www.atxnetworks.com

Part Number	Description
MPTX8-**	1310nm Forward Path Optical Transmitter with 8 Narrowcast Inputs, ** dBm, SC/APC; ** = 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13 ,14 or 15
MPTX8F-**	1310nm Forward Path Optical Transmitter with 8 Narrowcast Inputs (7 rear and 1 front), with F Backplane (including MPTXFBP), Front Fiber, ** dBm, SC/APC; ** = 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13 ,14 or 15
MPTXFBP	Replacement F Connector Backplane for MPTX8F-* Modules; Fastens to MP3FA Chassis
MPTX4F-**	1310nm Forward Path Optical Transmitter with 4 Narrowcast Inputs, with F Backplane (including MPTX4FBP), Front Fiber, ** dBm, SC/APC; ** = 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13 ,14 or 15
MPTX4FBP	Replacement F Connector Backplane for MPTX4F-* Modules; Fastens to MP3FA Chassis

Table #1: MPTX8 Ordering Information

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FUNCTIONAL DIAGRAMS / TECHNICAL SPECIFICATIONS
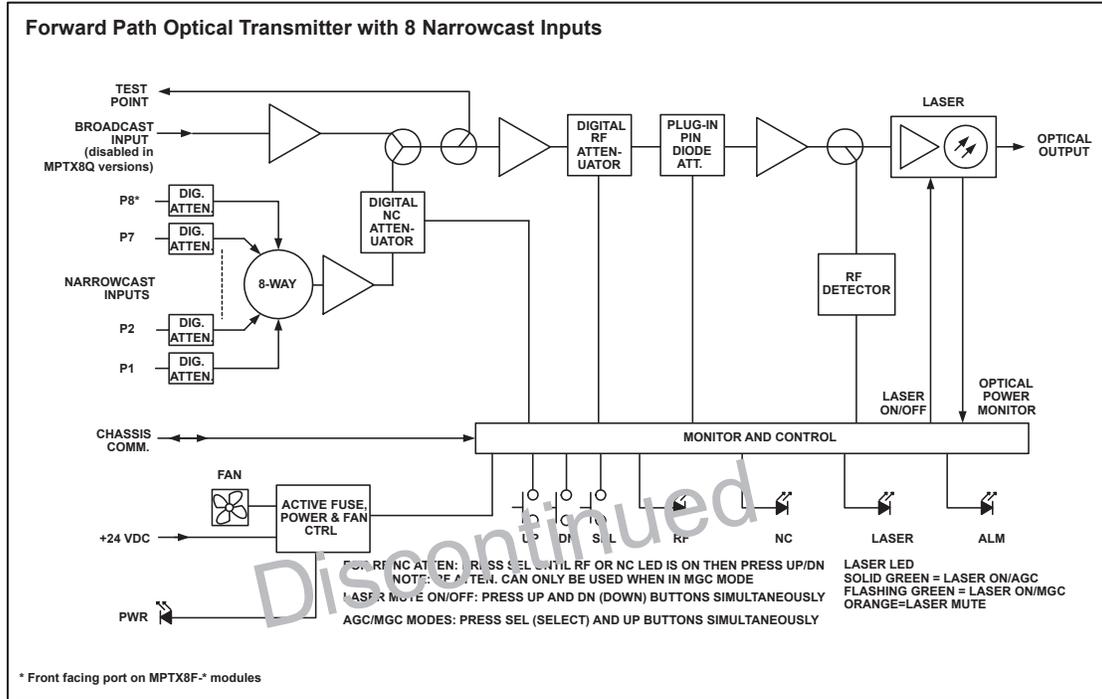
2. Functional Diagrams / Technical Specifications

Figure #1: MPTX8: Optical Transmitter with Integrated 8-way Narrowcast Combiner

RF & OPTICAL SPECIFICATIONS		
WAVELENGTH	1310 +/- 20nm	
OUTPUT POWER	2-15 dBm in 1 dB Increments / Nominal -0.5 + 1.0 dB	
CONNECTOR TYPE	SC/APC (std.), Others on Special Order	
BANDWIDTH	50-1000 MHz	
	50-550 MHz	**50-1000 MHz**
FLATNESS BROADCAST	+/- 0.5 dB	+/- 0.75 dB
NARROWCAST	+/- 1.0 dB	+/- 1.25 dB
BROADCAST PORT RF INPUT LEVEL	13-19 dBmV (Analog) + QAM @ -6 dB	
AUTOMATIC GAIN CONTROL (AGC)	**Range:** 6 dB (for above mentioned broadcast input levels)	
MIN. NARROWCAST PORT RF INPUT LEVEL[2]	7 dBmV (Digital QAM)	
INPUT RETURN LOSS (Min. 50-1000 MHz)	Broadcast: 17 dB / Narrowcast: 18 dB	
TEST POINT	Front: -20 dB +/- 1.0 dB Relative to Broadcast Input	
ISOLATION (Min. 50-1000 MHz)[4]	Narrowcast - Broadcast: >50 dB / Narrowcast - Narrowcast >50 dB	
MANUAL GAIN CONTROL (MGC)	**Set and Control:** Front Access Pushbutton, HMS SNMP v2c, Web Browser, Proprietary Network Interface **Range:** 15.5 dB Digital Attenuator	
NARROWCAST PORT ATTENUATION	0-31 dB in 0.5 dB Steps, Each Port Adjustable Separately	
MUTE	Front Access Pushbutton, HMS SNMP v2c, Web Browser	
COMP. 2ND ORD.[1]	> 65 dBc	
COMP. TR. BT.[1]	> 70 dBc	
CARRIER-TO-NOISE RATIO	> 53 dB (assuming link loss is all fiber and received power is 0 dBm)	
OTHER		
TRANSMITTER STATUS INDICATION	Front LEDs, HMS SNMP v2c, Web Browser, Proprietary Network Interface	
CURRENT[3]	420mA	

NOTES:
(1) 80 NTSC modulated analog carriers, 50-550 MHz & 550-1000 MHz QAM at -6 dBc (AGC mode).
(2) Adjust broadcast input levels and/or narrowcast input levels and/or narrowcast attenuator to optimize QAM levels relative to analog carriers.
(3) DC current required from 24V chassis bus.
(4) Assumes QAM input of 19 dBmV and NC port attenuation of 12 dB. Up to 12 dB lower QAM input levels possible by reducing port attenuation.

Table #2: MPTX8 Technical Specifications

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INSTALLATION

3. Installation

3.1. Product Inspection

Carefully unpack the transmitter module from the shipping box. If the box or transmitter module is damaged, please notify the freight company to make a damage claim. DO NOT INSTALL any transmitter that you suspect has sustained damage into a MAXNET II Chassis.

3.2. Installing F Connector "Wire-once" Modules into the MAXNET® II Chassis

Slide the Transmitter module into any open slot in the MAXNET II Chassis (slots 1-2 and 3-4 are required for MAXNET II power supplies) until the module drops into the positive lock position. If the module is installed properly, the transmitter will make contact with the 24 VDC power bus in the chassis. If a MAXNET II power supply module is already installed in the chassis, and it is plugged into the respective power source, the Module's LED 'Power' indicator will light Green. Next, attach the patch panel by sliding its push-fit connectors over the modules F connectors. Secure patch panel to chassis rail using its captive screws. The module is now ready for coax installation.

3.3. Module Installation into the MAXNET® II Chassis

Slide the Transmitter module into any open slot from slots 5-6 to 23-24 in the MAXNET II Chassis until the module drops into its lock position. If the module is installed properly, the transmitter will make contact with the 24 VDC power bus in the chassis. If there is a MAXNET II power supply module installed in the chassis, and it is plugged into the respective power source, the Module's LED 'Power' indicator will light Green.

3.4. Optical Connections

Before removing the dust cap from the Transmitter's SC/APC bulkhead connector, clean the SC/APC ferrule on the optical jumper cable that will eventually connect to the transmitter module. This can be done using a commercial cleaning tape, isopropyl alcohol, lint free tissues or compressed air.

NOTE: Never use compressed air on the MAXNET II Transmitter's SC/APC bulkhead.

Figure #2: MAXNET® II MPTX8 Front & Rear Panel

Figure #3: MAXNET® II MPTX8F Front & Rear Panel

Once the optical jumper cable's ferrule has been cleaned, it is recommended that you measure the optical output power using an optical power meter. To prevent damage to the power meter, ensure that the meter can accept a power level greater than the total output power of the transmitter.

⚠️ **CAUTION: DO NOT LOOK INTO THE SC/APC CONNECTOR AT ANY TIME AFTER REMOVING THE DUST CAP FROM THE TRANSMITTER'S SC/APC BULKHEAD CONNECTOR.**

DO NOT CLEAN FIBER TERMINATIONS WHILE LASER IS ON.

IN 14 dBm OR HIGHER TRANSMITTERS, DO NOT CONNECT/DISCONNECT FIBER WHILE LASER IS ON.

3.5. RF Connections

The RF input jacks on the transmitter's rear panel are either F port connectors in the MPTX F series or MCX (female) for the MPTX series. There will be one Broadcast RF input and up to 8 Narrowcast inputs plus one front panel -20 dB test point. Connect a test jumper from the -20 dB Test Point to a signal level meter or spectrum analyzer to facilitate setting the RF levels into the Transmitter Module. Ensure that all unused RF inputs are terminated wtih 75-ohm F port or MCX terminators (depending on platform).

3.6. Transmitter RF Set-up

3.6.1. Transmitter LED Indicators

The MAXNET II forward path transmitters have three LED indicators, PWR, ALM and LSR. The PWR (Power) LED indicator verifies that the transmitter module is receiving power from the MAXNET II power supply through the 24 VDC chassis bus. The ALM (Alarm) LED indicator will flash Red if there is a problem with the transmitter or if any of the monitored functions are beyond the specified limits. The LSR (Laser) LED indicator will light solid Orange if the transmitter optical output is muted. The LSR LED indicator will light solid Green to indicate AGC (Automatic Gain Control) and lash Green to indicate MGC (Manual Gain Control). See below how to switch between AGC and MGC.

3.6.2. Transmitter Front Panel Pushbutton Switches & Controls

Figure #4: MAXNET II MPTX8 Front Panel Pushbuttons

Remove the access cover from the front of the transmitter module by turning the thumbscrew counter-clockwise. This will expose three pushbutton switches labeled ⇧ (UP), ⇩ (DOWN) and SEL (SELECT). You can switch between AGC and MGC by pressing the SELECT button and the UP button simultaneously. The LSR LED indicates the AGC and MGC modes as follows:

LSR LED Indicators	
LASER LED (LSR)	*Operation*
Solid GREEN	AGC
Flash GREEN	MGC
ORANGE	Mute

When in MGC mode, the operator can adjust the level of the combined BC/NC (Broadcast/Narrowcast) RF signals into the laser transmitter stage, using the 'Digital RF Attenuator' (see Functional Diagram). The Narrowcast drive level can also be independently adjusted prior to BC/NC combining, using the 'Digital NC Attenuator' (see Functional Diagram). Both the RF and the NC Attenuator can be adjusted within a 15.5 dB range.

When in AGC mode, the operator cannot adjust the 'Digital RF Attenuator', even though he can select it through the Front Panel pushbutton. This RF Attenuator will be locked and automatically preset for optimal performance. In some models, the common narrowcast attenuators front panel is locked and can only be adjusted on Web/SNMP interface. In such situations, the SEL (SELECT) pushbutton has no effect.

To select the RF or NC digital attenuator, press the SEL (SELECT) button to light the RF or NC LED. The respective attenuator can now be adjusted by pressing the UP & DOWN pushbuttons. The UP & DOWN pushbuttons have to be pressed and released as many times as needed to set the desired level. Holding them pressed doesn't result in a continuous change of the attenuation value. Each time the UP/DOWN pushbuttons are pressed the attenuation value increases/decreases by approx. 0.5 dB.

3.6.3. Set Laser Drive Level

After switching to MGC, as explained above, the LSR LED will be flashing Green.

The RF input levels are defined in spec sheet which can be found on the support section on www.atxnetworks.com website. The relationship between NTSC and QAM channels present at the BC RF Input can be monitored at the front panel MCX –20 dB Test Point. This Test Point is –20 dB relative to the BC input.

Once signals with proper level are fed to the Broadcast input, you must adjust the Narrowcast signals level, if they are present. Narrowcast signals can be set to desired level relative to BC signals by monitoring the front panel Test Point and adjusting:

a) The NC digital attenuator setting (affects the combined signal of all NC inputs)

b) Narrowcast signal levels before entering the NC RF inputs.

c) Any individual port attenuator.

3.6.4. Set Laser Drive Level - AGC Mode

In AGC mode it is not possible to adjust the integrated Digital RF Attenuator. If the BC/NC levels are set in accordance with above instructions, the AGC circuitry will maintain the proper level into the laser to attain the published specifications. No other adjustment is necessary.

3.6.5. Set Laser Drive Level - MGC Mode

In MGC mode it is now possible to also adjust the integrated Digital RF Attenuator. However, this *directly impacts the OMI* of the laser and can be driven too high (distortions) or too low (poor CNR). Adjusting too far from the AGC setpoint level is NOT recommended.

3.7   Muting the Transmitter Optical Output

Press both the UP and DOWN pushbuttons at the same time and the Transmitter Optical output will be muted as indicated by the steady 'ORANGE' LSR LED indicator. Press both the UP and DOWN pushbuttons at the same time again to reactivate the Transmitter Optical output. The 'ORANGE' LSR LED will switch back to flashing or steady 'GREEN' LSR LED depending on what status, AGC or MGC, the Transmitter was in before muting it.

Figure #5: MPTX8 Web Interface Parameter Page (example)

MAINTENANCE & TROUBLESHOOTING

4.   Maintenance & Troubleshooting

4.1.   Maintenance

Daily, ensure that the Power LED's are on for all of the modules and that there are no Alarm lights.

Weekly, ensure that all module cooling fans are operational and unobstructed.

Monthly, vacuum all module cooling fans.

4.2.   Troubleshooting

The following Guide will help the operator to locate active modules that have become non-operational.

4.2.1.   Power Light "Off" on MAXNET® II MPAC or MPDC

4.2.1.1. Power Supply, Cord or Line Failure

1.   Check the fuse continuity on the MPAC or MPDC module.
2.   Verify that the 110 VAC electrical outlet is active using a voltmeter and checking the circuit breaker. (In the case of the MPDC insure that there is -48 VDC on the rear terminal block)
3.   Verify that IEC power cord is properly inserted into the receptacle on the rear of the module and properly connected to a 110 VAC electrical outlet.
4.   Remove and replace the "suspected-faulty" MPAC or MPDC with another "known good" module.
5.   If you swap-out the "suspected-faulty" Power Supply with a "known-good" Power Supply and the Power LED "does" light, obtain an RMA number from ATX and return the non-operational Power Supply module to the ATX factory for repair.
6.   If you swap-out the "suspected-faulty" Power Supply with a "known-good" Power Supply module and the Power LED still "does not" light, the problem might be with another active module loading down the power bus in the MAXNET II Chassis.

4.2.1.2. Active Module Failure

1.   With the "known-good" Power Supply module installed in the MAXNET II Chassis, sequentially remove active modules from the Chassis to locate a possible failed module that is loading down the power bus. If on the removal of a specific MAXNET II Active module the Power Supply's Power LED "does" light, then the problem is with that specific active module that was temporarily removed from the Chassis power bus. Obtain an RMA number from ATX and return the non-operational module to the factory for repair.
2.   If all active modules have been removed from the Chassis and the Power Supply's Power LED still "does not" light, the problem might be with the Chassis power bus.

4.2.1.3. Chassis Power Bus Failure

1.   Install the "suspected-faulty" Power Supply module in a separate "known good" MAXNET II Chassis.
2.   If the power LED on the "suspected-faulty" Power Supply module "does" light when the Power Supply module is installed in a separate "known good" MAXNET II Chassis, the problem is with the Chassis power bus. Obtain an RMA number from ATX and return the non-operational Chassis to the factory for repair.

With a "known good" Power Supply and "known good" Chassis and good line/ DC power, the Power LED on the Power Supply should be lit. At this point, if the power light is still "not" lit, please contact ATX for Technical Support.

4.2.2. Power Light "Off" on any MAXNET® II Active Module

4.2.2.1. Active Module Failure

1. If the Power LED on the MPAC or MPDC "is" lit but a specific active module's Power LED is "not" lit, suspect a problem with the specific active module.
2. Swap the "suspected-faulty" active module with a "known-good" module.
3. If the Power LED on the "known-good" module "does" light when replacing the "suspected faulty" active module, obtain an RMA number from ATX and return the faulty active module to the factory for repair.
4. If the Power LED on the "known-good" module "does not" light when replacing the "suspected faulty" active module with a "known-good" active module suspect a problem with the particular slot of the MAXNET II Chassis.

4.2.2.2. Chassis Slot Failure

1. Slide the "suspected-faulty" active module into another "known-good" slot in the MAXNET II Chassis. If the Power LED on the "suspected faulty" module "does" light when installed in a "known-good" slot in the MAXNET II Chassis, obtain an RMA number from ATX and return the faulty MAXNET II Chassis to the factory for repair.

With a "known good" active module installed in a "known good" slot in the MAXNET II Chassis with an active Power Supply and good line/ DC power, the Power LED on the active module should be lit. At this point, if the power light on the module is still "not" lit, please contact ATX for Technical Support.

4.2.3. Temperature Alarm on any MAXNET® II Active Module

Check to see if the module fan is operating. If not replace with a new fan from ATX (Part # MPFANB) using the below procedure.
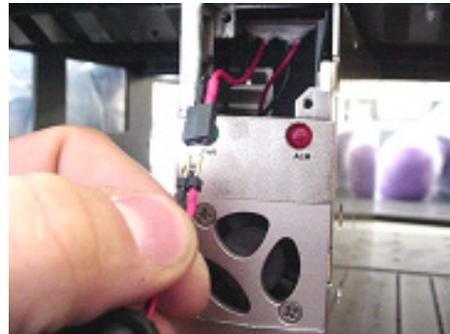

1. Remove two screws holding plate and fan in place.

2. Remove fan cover and screws.

3. Pull out fan with tweezers.

4. Remove push-fit power connections.

5. Install replacement fan in the opposite order shown. Ensuring that:
   a) The red and black wires are aligned.
   b) The labelled side of the fan faces inward toward the module.
   c) The wires do not bunch up behind the fan, interfering with fan rotation.

SERVICE & SUPPORT

5.   Service & Support

5.1.   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.

TECHNICAL SUPPORT
Tel: (905) 428-6068
Toll Free: (800) 565-7488 (USA & Canada only)
► Press *3 for **Technical Support**
    ► Then press 1 for **Digital Video Products (DVIS, DigiVu, UCrypt, etc.)**
    ► OR, press 2 for **All Other Products**
Email: digitalvideosupport@atxnetworks.com for **Digital Video Products**
Email: jleskovar@atxnetworks.com for **All Other Products**

CUSTOMER SERVICE
ATX Networks
1-501 Clements Road West
Ajax, ON L1S 7H4 Canada

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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

5.2.   Warranty Information

All of ATX Networks' products have a 1-year warranty that covers manufacturer's defects or failures.

5.3.   Safety

IMPORTANT! FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The device should be connected to a power supply only of the type described in the operating instructions or as marked on the device.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of the device is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the device.

SERVICING: The user should not attempt to service the device beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FUSING: If your device is equipped with a fused receptacle, replace only with the same type fuse. Refer to replacement text on the unit for correct fuse type.

Discontinued

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