DISCONTINUED

ChromaFlex

ChromaFlex CPA EDFA

HARDWARE INTERFACE MANUAL

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PRODUCT INTRODUCTION

1. Product Introduction

The ChromaFlex CF-CPA EDFA is a high density single slot module for the ChromaFlex chassis. The CF-CPA is a Constant Power Amplifier therefore the composite output power remains the same over the specified range of optical input level. The EDFA composite gain, gain per wavelength and per wavelength output power will change with a change in the number of wavelengths or composite input power to maintain a constant output power.

Features of the CF-CPA EDFA include:

- Low noise figure
- Constant output power
- Optional integrated return path reflect port
- Front panel visual status indicators
- Input and output test points
- Setup and manage via SNMP, CLI, web GUI, local craft port

The CF-EDFA may include an optional integrated optical filter for applications where upstream optical signals need to be removed and routed to other termination equipment such as retrun path receivers or destacker modules.

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UNPACKING & INSPECTING A NEW UNIT

2. Unpacking & Inspecting a New Unit

Before shipment, ATX inspects and packs all the essential items carefully. Nevertheless, damage may occur during shipment. The carrier assumes full responsibility for a safe delivery of the equipment.

1. Inspect the package for any physical damage.
2. Open the package.
3. Remove any packing material.
4. Inspect the unit for any physical damage.
5. Shake the unit with care, paying attention to any rattling loose parts that may suggest a concealed damage (some noise due to moving cables is normal).
6. Check for any missing accessories.

When any damage is noticed to the merchandise, please notify customer service (see Service & Support section) and file a claim with the carrier as noted below.

2.1 What To Do About Physical Damage

Record any evidence of physical damage or loss on the freight bill or receipt and have the carrier's agent sign it. If you fail to do so, the carrier may refuse to honor the damage claim. The carrier will supply you with any forms required to file such a claim.

2.2 What To Do About Concealed Damage

Damage which is not apparent until the unit has been unpacked is considered concealed damage. The contents may have been damaged due to rough handling even if there is no external evidence. If you should notice damage upon unpacking the unit you should make a written request for inspection by the carrier's agent within 10 days of the delivery date. Afterwards file a claim with the carrier.

2.3 How To Return Equipment

Call customer service (see Service & Support section) for a Return Materials Authorization (RMA) number. You will need the unit's serial number, description of the problem, and some shipping information. We must receive the unit within thirty (30) days from the date a RMA number is issued. If for any reason, you want to ship the unit 30 days after the RMA number has been issued, you must obtain a new RMA number by calling customer service. Units received without an RMA number or one with an expired RMA number will not be accepted by our receiving department.

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SPECIFICATIONS

3. Specifications

Please refer to the ChromaFlex EDFA Optical Amplifier Module spec sheet located at www.atxnetworks.com under User Documents for product specifications.

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BLOCK DIAGRAM & OPERATION

4. Block Diagram & Operation

The following block depicts the optical signal flow and control bus through the CF-CPA EDFA module.

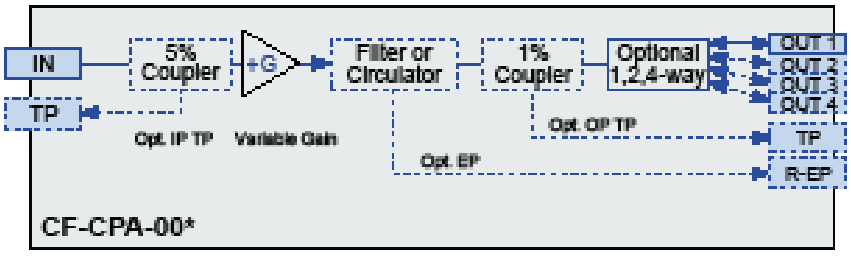

Figure 4-1: CF-CPA EDFA Module Block Diagram

The CF-CPA is a Constant Power Amplifier therefore the composite output power remains the same over the specified range of optical input level. Thus the EDFA composite gain, gain per wavelength and per wavelength output power will change with a change in the number of wavelengths or composite input power applied to the EDFA to maintain a constant output power. The CF-CPA is primarily utilized as a headend launch amplifier applications with a fixed number of wavelengths.

Optical signals in the 1530 nm to 1562 nm range are connected to the front panel optical input LC connector and first pass through an input coupler/isolator. The optical channels within the spectrum are then connected to the Erbium Doped Fiber & multiplexer gain stage where a pump laser is multiplexed with the input signal resulting in an amplified output signal. The output of the gain stage is connected to the output side coupler/isolator. The input and output coupler provides a reference signal to the micro-processor control circuitry which adjusts the pump laser and gain stage to maintain a constant composite output power with changes to the composite input power. The micro-processor also provides status monitoring signaling to the ChromaFlex chassis. The amplified output signal may be connected to an optional filter or circulator type of Express Port for inserting additional optical channels or extracting channels. A filter is typically utilized if the optical channels are separated in different bands and a circulator is utilized if channels in the upstream direction are interleaved with the downstream signals passing through the EDFA. Circulator example, utilizing downstream wavelengths of (20,21,22,23) upstream 24, downstream (25,26,27,28) upstream 29. The upstream channels 24 and 29 would be directed to the R-EP port. Note that the circulator is directional and cannot be utilized for combing purposes, only upstream extraction. A 5% coupler test point is provided at the output of the EDFA.

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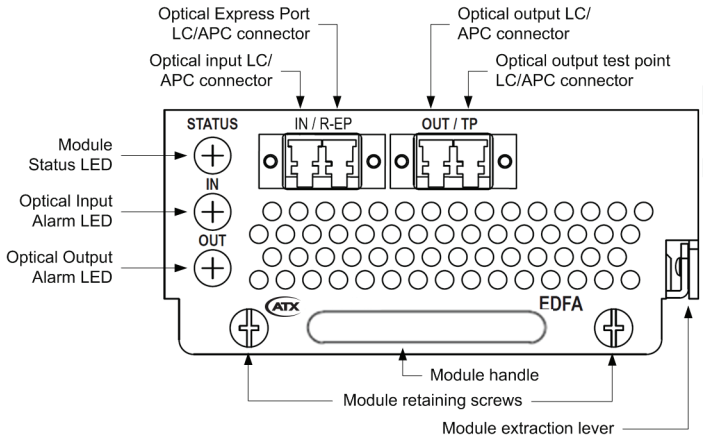
FRONT PANEL

5. Front Panel

5.1 Front Panel Illustration

The following diagram and table depicts the features of the CF-CPA EDFA module front panel.



5.2 Table of Front Panel Features

Module extraction lever	Lever to assist in removing the module from the chassis backplane connector.
Module retaining screws	Secures the module to the chassis.
Module handle	Utilized to insert and remove the module.
Optical input LC/APC connector (IN)	Optical input signal connection.
(Optional) Express Port (R-EP)	Utilized to extract or combine additional optical signals to or from other equipment. 1260 to 1620 nm. Either a circulator or filtered Express Port may be ordered. Verify which is utilized in your application. **Important Note:** be certain not to combine same channels.
Optical output LC/APC connector (OUT)	Optical output signal LC/APC connection.
Optical output test point (TP)	Optical test point (5% value) LC/APC connector.
Status Alarm LED	Visual indicator of module temperature alarm.
Optical Input Alarm LED	Visual optical input power alarm status.
Optical Output Alarm LED	Visual optical output power alarm status.

5.3 Alarm Status Indicators (CF-CPA)

LED	Function	Value
STATUS	Module temperature	Green = Normal Amber = Minor Temp alarm Red = Major Temp alarm
Optical Input	Monitors the optical input power	Green = Normal Amber = Minor alarm -1 to -2 dB below input range Red = Major alarm >-2 dB below input range
Optical Output	Monitors the optical output power	Green = Normal Amber = Minor alarm -1 to -2 dB below rated output power Red = Major alarm >-2 dB below rated output power

MODULE INSTALLATION

6. Module Installation

The CF-CPA Constant Power EDFA module occupies a single ChromaFlex chassis module slot. The modules may be inserted or removed while the chassis is powered without interrupting other operational modules in the chassis. The following module installation procedures assume the chassis is installed and powered following the instructions in the ChromaFlex Chassis Hardware Interface Manual.

1. Align the module into the desired slot opening in the ChromaFlex chassis
2. Using the handle push the module into the slot with even pressure until the module is mated with the chassis mid-plane connector.
3. Press the modules extraction levers downward against the module face.
4. Tighten the two module retaining screws until snug in an even manner.
5. The module Status LEDs should now be lit green and the optical input and output power LEDs red if an optical input has not already been connected to the module. Note, each LED will cycle through all colors during a power up cycle.

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MODULE CONNECTIONS

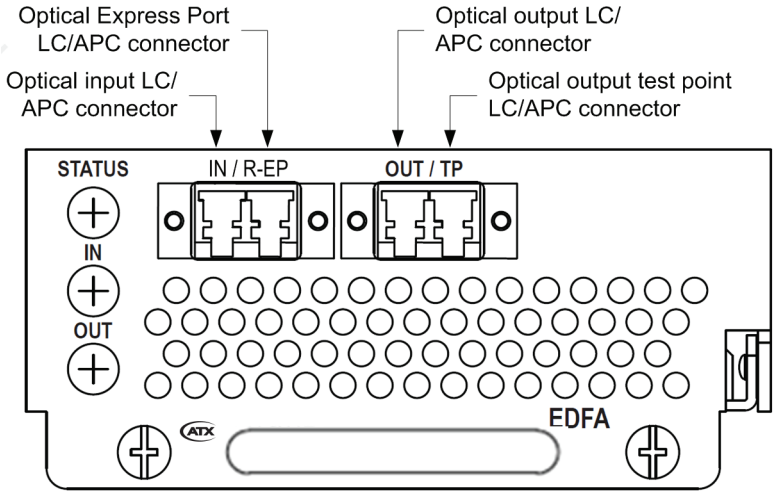
7. Module Connections

7.1 Optical Connections

The CF-CPA EDFA has one optical input port, one optical output port, one optional optical express port which may filter or reflect additional optical signals to other equipment and an output test point.

Please follow your specific design schematic for interconnecting additional equipment while paying attention to the optical levels specified for your application.

***Important* Note**: *Always clean and inspect optical connectors prior to making a connection to the CF-CPA optical ports. Never look into an optical connector when a signal is present.*



1. Check the input optical level with a power meter to be certain it is within the input operational range of the EDFA. Once the levels are verified, connect the cleaned LC/APC connector to the EDFA optical input port. You should observe the optical input and output LED change from Red to Green if a signal is present.
2. Connect a clean LC/APC jumper to the EDFA output port and verify the composite optical power level matches the specification.
3. The optional express port may be utilized for extracting or combining additional wavelengths with the wavelengths connected to the input and amplified by the EDFA module. In the case of extracting, connect a power meter to the express port with a clean LC/APC jumper and verify the level of the desired optical signal.

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MODULE SETUP

8. Module Setup

Please refer to the instructions below and the ChromaFlex Operation Manual for details on configuring the CF-CPA EDFA module setup for optimal performance with the Hand Held Display or GUI.

Please take the following steps for first time set up of the unit.

1. The CF-CPA EDFA has no user interface settings. When the input signal is within the proper operating range it will produce the proper output power.
2. Check the status of the module utilizing the Hand Held Display or GUI interface per the ChormaFlex Operation Manual.

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TROUBLESHOOTING THE CF-CPA EDFA MODULE

9. Troubleshooting the CF-CPA EDFA Module

Condition	Steps to Check
Power LED OFF (AC)	1. Check if Power Cable is Plugged in and Power Switch is in ON position. 2. Verify AC Outlet is Functional and confirm fuse on the AC feed is fine, replacing it if necessary. 3. Look for other signs of life in unit like running fan, LCD display etc.
Power LED OFF (DC)	1. Verify DC Feed is active and fuse is intact on fuse panel. 2. Verify DC Feed is not reversed. 3. Look for other signs of life in unit like running fan, LCD display etc.
Optical input LED is Amber or Red	1. Measure the optical input power to be certain it is within the input operational range of the EDFA. 2. Inspect optical connectors to be sure they are clean and not damaged.
No optical output or LED is Amber or Red	1. If there are no alarms and the output power is absent or measured low, utilizing the Hand Held display or GUI check the optical output power reading. If the status is good it may indicate a faulty output connector. With the EDFA disabled inspect the output connector.
Communication Issue with Unit	1. Please confirm setup is as described in the User Interface document 2. If problem persists, please contact InnoTrans for further help.

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SERVICE & SUPPORT

10. Service & Support

10.1 Contact ATX Networks

Please contact ATX Technical Support for assistance with any ATX products.

TECHNICAL SUPPORT

Tel: 289.204.7800 – press 1
Toll-Free: 866.YOUR.ATX (866.968.7289) USA & Canada only
Email: 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

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
Web: www.atx.com

10.2 Warranty Information

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

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Tel: 289.204.7800 | Toll-Free: 866.YOUR.ATX (866.968.7289) | support@atx.com