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# **OPCOM600-OAU(A) User Manual**

**200803**

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## Feedback

Comments and questions about how the NView iEMS system software works are welcomed. Please review the FAQ in the related manual, and if your question is not covered, send email by using the following web page:

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If you have comments on the NView iEMS specification, instead of the web page above, please send comments to:

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We hope to hear from you!

# CONTENTS

<b>Chapter 1</b>	<b>System Overview</b>	<b>1</b>
1.1	Overview	1
1.2	Function feature	1
1.3	Ordering information	1
<b>Chapter 2</b>	<b>Technical Parameter</b>	<b>2</b>
2.1	Basic parameters	2
2.2	technical parameters	2
<b>Chapter 3</b>	<b>Installation and Connection</b>	<b>3</b>
3.1	Installation and fiber connection	3
3.2	front panel switch indication	4
3.3	Note	4
<b>Chapter 4</b>	<b>System Structure</b>	<b>5</b>
4.1	device front panel	5
<b>Chapter 5</b>	<b>Typical Application</b>	<b>7</b>
5.1	Point to point application	7
5.2	CATV application	7
<b>Chapter 6</b>	<b>Network Management</b>	<b>9</b>
6.1	Device view	9
6.2	configure the module	9
6.3	Reset the module	10
<b>Appendix A</b>	<b>FAQ</b>	<b>11</b>



## Preface

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### About This Manual

This manual introduces primary functions of the configuration management software for RC series products.

### Who Should Read This Manual

Sales and marketing engineers, after service staff and telecommunication network design engineers could use this manual as a valuable reference. If you want to get an overview on features, applications, architectures and specifications of Raisecom RC series integrated access devices, you could find useful information in this manual as well.

### Compliance

The RC series products developed by Raisecom are strictly complied with the following standards as well as ITU-T, IEEE, IETF and related standards from other international telecommunication standard organizations:

YD/T900-1997 SDH Equipment Technical Requirements - Clock

YD/T973-1998 SDH 155Mb/s and 622Mb/s Technical conditions of optical transmitter module and receiver module

YD/T1017-1999 Network node interface for the Synchronous Digital Hierarchy (SDH)

YD/T1022-1999 Requirement of synchronous digital hierarchy (SDH) equipment function

YD/T1078-2000 SDH Transmission Network Technique Requirements-Interworking of Network Protection Architectures

YD/T1111.1-2001 Technical Requirements of SDH Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Receiver Modules

YD/T1111.2- 2001 Technical Requirements of SHD Optical Transmitter/Optical Receiver Modules——2.488320 Gb/s Optical Transmitter Modules

YD/T1179- 2002 Technical Specification of Ethernet over SDH

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

G.707 Network node interface for the synchronous digital hierarchy (SDH)

G.774 Synchronous digital hierarchy (SDH) - Management information model for the network element view

G.781 Synchronization layer functions

G.783 Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks

G.784 Synchronous digital hierarchy (SDH) management

G.803 Architecture of transport networks based on the synchronous digital hierarchy (SDH)

G.813 Timing characteristics of SDH equipment slave clocks (SEC)

G.823 The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy

G.825 The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)

G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections

G.828 Error performance parameters and objectives for international, constant bit-rate synchronous digital paths

G.829 Error performance events for SDH multiplex and regenerator sections

G.831 Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)

G.841 Types and characteristics of SDH network protection architectures

G.842 Interworking of SDH network protection architectures

G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy

G.691 Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers

G.664 Optical safety procedures and requirements for optical transport systems

I.731 ATM Types and general characteristics of ATM equipment

I.732 ATM Functional characteristics of ATM equipment

IEEE 802.1Q Virtual Local Area Networks (LANs)

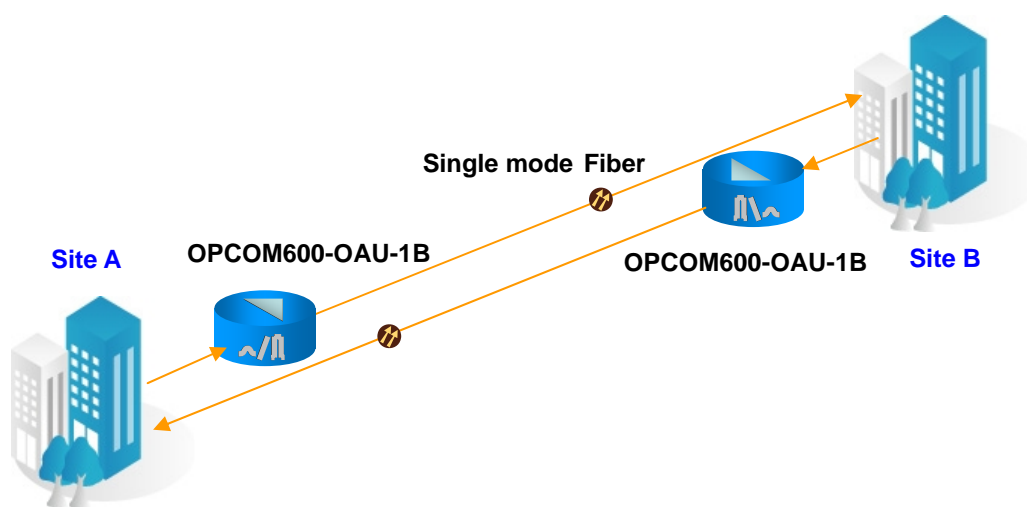
IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering

IEEE 802.3 CSMA/CD Access Method and Physical Layer Instruction

## Chapter 1 System Overview

### 1.1 Overview

OPCOM600-OAU is an EDFA boost optical amplifier, enabling the directly amplification of the single or dual channel optical signal at 1550nm. The erbium doped fiber amplifier (EDFA) can easily compensate for the attenuation of optical signal, extending the total transmission distance up to 160km. The typical application of OPCOM-OAU-1B is shown in the following diagram.



### 1.2 Function feature

- ◆ Amplify the optical signal at 1550nm, extending the transmission distance.
- ◆ Support Auto Laser Shutdown (ALS) function, as well as open or shutdown laser manually.
- ◆ Support Auto Power Reduction (APR) function
- ◆ Query performance information such as input and output optical power and working temperature through network management.
- ◆ Query alarm information such as output optical power and working temperature alarms through network management.

### 1.3 Ordering information

Card type	Version	Description
OPCOM600-OAU-1B	REV A	Single channel optical amplifier card
OPCOM600-OAU-2B	REV A	Double channel optical amplifier card

## Chapter 2 Technical Parameter

### 1.1 Basic parameters

Size (Height*width*depth)	240mm*24.9mm*225mm
Optical interface	SC/PC interface with auto laser shade
Transmission media	Signal mode fiber
Working temperature (°C)	(0, 45)
Storage temperature (°C)	(-40, 80)
Power (W)	Typical value: 7W
Humidity	5%~90% no condensation

### 2.2 technical parameters

	Parameter	Minimum Value	Typical Value	Maximum Value	Unit	Note
1	Working wavelength $\lambda_{OP}$	1528		1563	nm	
2	Input optical power	-5		3	dBm	
3	Output optical power			15	dBm	
4	Noise factor (@ $P_{in}=2dBm$ , $P_{out}=Max$ )			6.0	dB	
5	Polarization gain			0.5	dB	
6	Polarization mode dispersion (PMD)			0.5	ps	
7	Return loss ( including optical interface )			45	dB	



## Chapter 3 Installation and Connection

### 3.1 Installation and fiber connection

Insert OPCOM600-OAU into RC006 chassis, and connect fiber interface well.

Please notice the following details before connection:

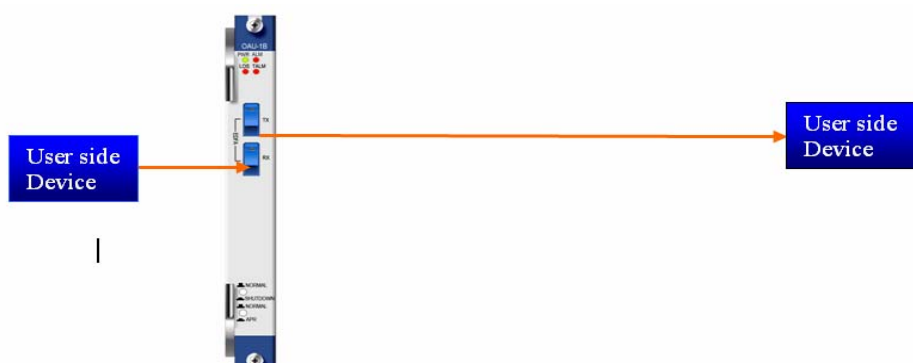
1. The wavelength of optical signal to be amplified should between 1528 and 1563nm. Otherwise, a wavelength converting card can be used to convert the wavelength to 1550nm.
2. The power of optical signal to be amplified should between -5dBm and 3dBm. If the optical power is lower than -10dBm, OPCOM600-OAU would be shutdown; if the optical power is between -10dBm and -5dBm, OPCOM600-OAU would work normally, but can not guarantee that the OAU output optical power is 15dBm.
3. Check out front panel switches status. When OPCOM600-OAU works normally, all switches should be ON.

After confirm the optical wavelength and power, please follow the connection procedure:

1. Connect user side device output to OPCOM600-OAU RX port
2. Connect OPCOM600-OAU TX port to line side optical fiber.
3. It is better to fill in the optical power table

	Input optical power at RX port (-5~3dBm)	Output optical power at TX port (15dBm)
EDFA1		
EDFA2		

The connection method is shown in the following diagram.



### 3.2 front panel switch indication

There are 2 function switches at device front panel (shown in the device front panel indication in next page), the function switches is indicated as following table:

Switch	Function
SHUTDOWN	SHUTDOWN: indicates that OAU module is shutdown NORMAL: indicates that OAU module is open
APR	ARP: indicates that ARP function is enable NORMAL: indicates that ARP function is disable

Note: when OPCOM600-OAU works properly, both function switches should be at NORMAL status. In order to avoid mistaken touches during installation or operation, the key-press of function switch implements undercut pattern design. When function switch is at NORMAL status, the key-press top is at same level as front panel, so that it only can be pressed down by special tools.

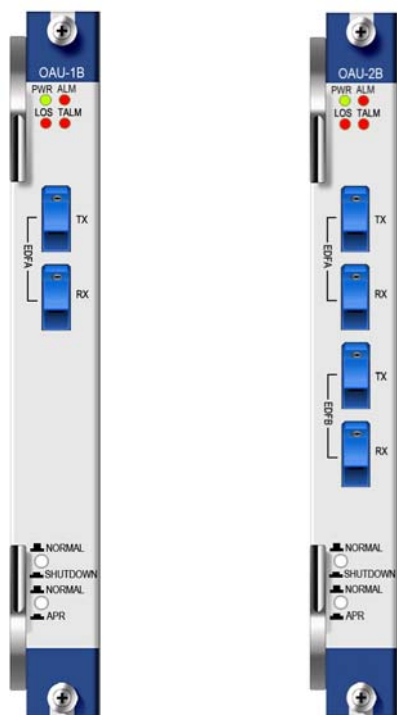
### 3.3 Note

Please make sure that the fiber interface surface for connection is clean. Since the output optical power is much stronger than general communication device, the dust or particle at fiber interface surface would generate much more heat which would damage fiber interface surface, resulting in increase of attenuation and reduction of transmission distance.

Please pay attention to laser safety at fiber connection process. Make sure that flange is able to work properly. It is forbid to straight look at the output port by naked eye. The laser safety level of OPCOM600-OAU is Class IIIB

## Chapter 4 System Structure

### 4.1 device front panel



The device front panel is shown in the above picture. The interface is indicated as the following table:

Interface	Description
EDFA	The EDFA interface of OAU-1B, which consists of RX and TX Port
EDFA n	N is 1 or 2, indicating the first or second EDFA interface of OAU-2B. Each EDFA interface consists of RX and TX port.

LED indicator definition:

LED	Color	Status instruction
PWR	Green	Power supply indicator <i>ON</i> : Power supply is working normally <i>OFF/Dark</i> : Power supply is not working normally
ALM	Red	Device alarm indicator

LOS	Red	<p>Loss of signal on EDFA input interface</p> <p><i>ON</i>: Loss of signal EDFA input interface</p> <p><i>OFF</i>: EDFA input interface single receiving is normal</p>
TALM	Red	EDFA module temperature alarm

Front panel switch instruction:

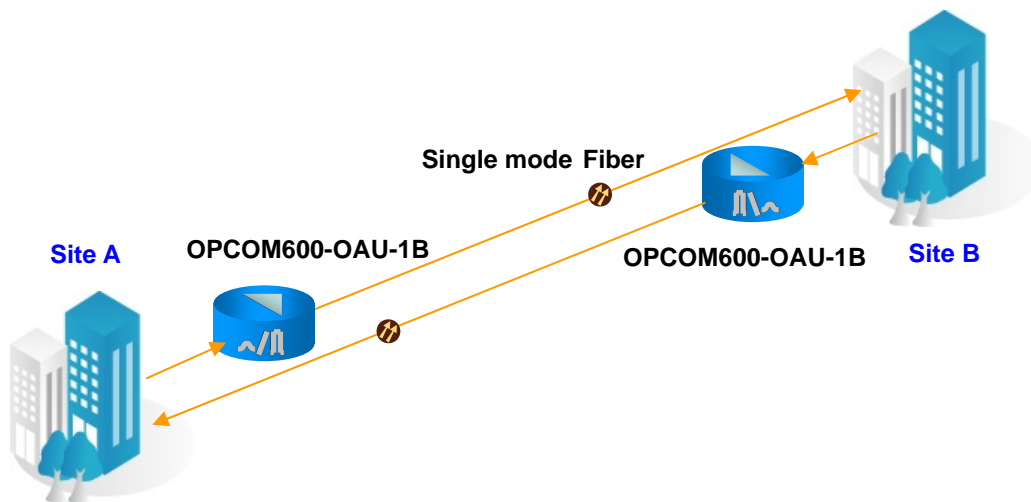
Switch	Status	Status instruction
Shutdown	NORMAL	<p>OAU is open, and it is working normally</p> <p>It is set to NORMAL by default</p>
	SHUTDOWN	<p>OAU is shutdown.</p> <p>Almost no output at TX port</p>
APR	NORMAL	<p>APR function disable</p> <p>It is set to NORMAL by default</p>
	APR	<p>APR function enable</p> <p>The output optical power is +3dBm when input is normal</p>

## Chapter 5 Typical Application

### 5.1 Point to point application

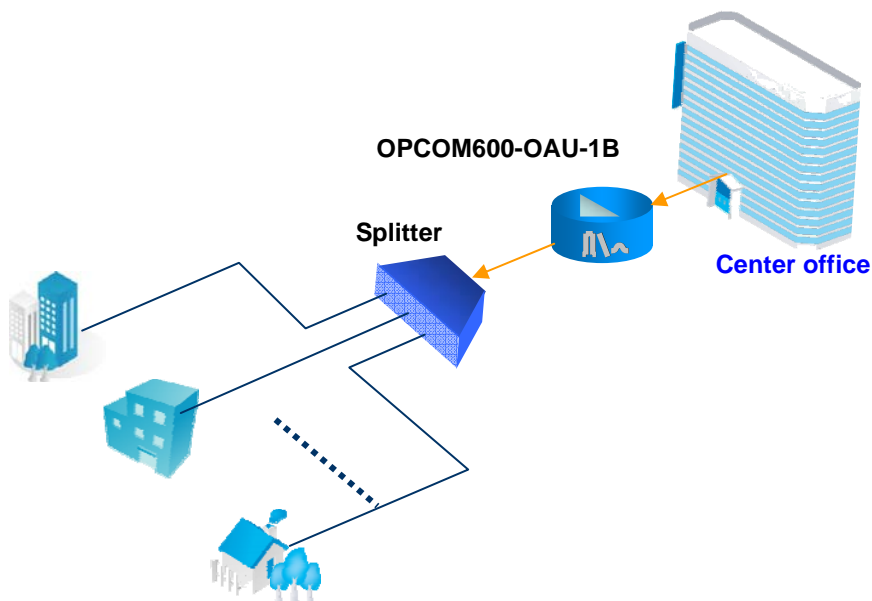
Due to the limitation of SFP output optical power and receiving sensitivity, the transmission distance for 100M or 1000M data only can reach up to 120km and for 2.5G data up to 100km. By using the Erbium Doped Fiber Amplifier (EDFA), the output optical power can be dramatically increased, extending the transmission distance from 40 to 60km (increase the optical power budget 17dB at least).

It is better to implement OPCOM600-OAU-1B/2B near user side device TX. Thus, by increasing the user side output optical power (13dBm~17dBm), the transmission distance can be increased.



Point to point application

### 5.2 CATV application



CATV application

In CATV optical fiber network, one central office is related to many customers with different places. Through OPCOM600-OAU-1B/2B optical amplifier, more services or longer transmission distance can be realized.

## Chapter 6 Network Management

### 6.1 Device view

Through network management software, users can view the status information of OPCOM600-OAU as well as query and configure it.

The status information of OPCOM600-OAU that will show when conducting the “Device View” command is shown in the table below:

No.	Status, controllable and configurable item and Card type	Value	Feature
1	Card type	OPCOM600-OAU-1B OPCOM600-OAU-2B	Queryable, configurable
2	Optical signal transmission open	Enable, disable	Queryable, configurable
3	Auto power reduction (APR)	Enable, disable	Queryable, configurable
4	Working temperature		Queryable
5	Input optical power		Queryable,
6	Output optical power		Queryable,
7	Input optical power threshold value		Queryable, configurable
8	output optical power threshold value		Queryable
9	Loss of receiving optical signal (LOS)	Alarm, normal	Queryable
10	Output optical power alarm	Alarm, normal	Queryable
11	Working temperature alarm	Alarm, normal	Queryable

### 6.2 configure the module

The configurable items of OPCOM600-OAU in the above table can be configured using the commands for configuring the module. The configurable items include: open or shutdown optical signal transmission, APR enable or disable and input optical power alarm threshold value configuration.

## 6.3 Reset the module

Users can reset OPCOM600-OAU using the “module reset” command. The configuration will not change after the reset.



## Appendix A      FAQ

### 1. No output signal or output optical power is very low.

Answer: please follow the guides as below:

- ◆ Make sure that function switch at front panel is at NORMAL status.
- ◆ The input optical power at OPCOM600-OAU RX port should be above -10dBm. Otherwise, OAU would shutdown output automatically. The typical optical power value should be between -5dBm and +3dBm.
- ◆ Clean the optical fiber surface well, and then reconnect the fiber interface. Make sure that the fiber interface is connected properly.

### 2. Input optical power alarm

Answer: please follow the guides as below:

- ◆ Measure the input optical power, the typical value should be between -5dBm and +3dBm
- ◆ Check out whether the input optical power alarm threshold value is changed by mistake through network management. If it is changed, please reset the threshold value to the default value -10dBm.
- ◆ Clean the optical fiber surface well, and then reconnect the fiber interface. Make sure that the fiber interface is connected properly.



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