

## OPCOM600 CWDM/DWDM System

OPCOM600 product family is a cost-efficient and exceptionally flexibly solution for optimizing the utilization of existing fiber optics. This family is capable of operating on both dual-strand fiber and single-strand fiber to organize point to-point, hub-and-spoke and ring topologies for various applications. OPCOM600 also can be equipped with channel or path/line protection, allowing the automatic switching of the operations to secondary line in case the primary line is interrupted. This enables the most uptime for critical data transmission. Other enhanced features include 3R function, remote management, fault propagation, line-in/line-out loop back, fault pass through, rate-limiting and etc. on the CWDM/DWDM wavelength cards. OPCOM600 family basically consists of three parts: CWDM/DWDM wavelength converter for the media conversion of normally used optical/ electrical signal to CWDM/DWDM colored wavelength, MUX/DEMUX for the multiplexing/demultiplexing of CWDM/DWDM specific wavelengths and protection modules for channel, path/line protection.



OPCOM600 series CWDM/DWDM System

### Highlights

- >Available with 8 CWDM wavelengths or 16 DWDM wavelengths over a single-strand fiber;
- >Support transmission of 0 ~10Gbps per channel;
- >High performance separated design of MUX/DE-MUX & CWDM/DWDM transponder;
- >Offer MUX/DE-MUX units including passive and manageable modules for different applications;
- >Adopt a wide range of CWDM/DWDM transponders and muxponders;
- >Support optical add & drop module for chain and ring topologies;
- >Support channel, path or line protection schemes for the most uptime;
- >Compatible with iTN2100-12 chassis for hosting and network management.

## Application



Application: Point to Point transmit 16 independent services over a dual-strand fiber

## Key Features

Construction	ITN2100,OPCOM3500E-12 chassis; 6U-high 19"-inch enclosure OPCOM3500E-6 3U-high chassis; RC006-1M,RC006-1 1U-high chassis;
Service Channel	CWDM: Transport 8 channels on dual-strand fiber; DWDM: Transport 16 channels on dual-stand fiber
Data Rate	0-10Gbps per channel on wavelength converting cards; 0-10Gbps per channel on wavelength MUX/DEMUX cards;
Working Wavelength	CWDM:1271~1611nm with a spacing of 20nm between each; DWDM:1536.61~1560.61nm with a spacing of 1.58nm between each;
High Density	Mux and DeMux up to 8 service channels over one fiber pair;
Standard	ITU-T G.694.2 CWDM wavelength grid; ITU-T G.709 and G.798;
Flexibility	By applying different combinations of wavelength converter cards and MUX/DEMUX cards, OPCOM600 system is able to provide 8 channels transparent transportation on a pair of normal fiber optic,
Transmission mode	Service/protocol transparent transmission.



## Optical transponder cards

OPCOM600-OTU1 series cards provide 4 channels of wavelength conversion from client wavelengths such as 850, 1310 and 1550nm to CWDM color wavelengths from 1271 to 1611nm. They provide reshaping and reamplification for all speed services from 4M to 5 Gbps and 3R (reshaping, reamplification and retiming) for standard speed services such as STM-16, GE, STM-4 and STM-1 and so on. OPCOM600-OTU1 cards are also capable of converting between different wavelengths of CWDM/DWDM, from single strand to dual-strand fiber, and from multimode to single mode.

OPCOM600-OTU2 is Raisecom 10G wavelength converter/repeater which converts of normally used wavelength to CWDM/DWDM specific wavelength as well as performs any kind of conversion between any two kinds of fiber optic cables. The 6U dimension design enables OPCOM600-OTU2 to convert 1-channel over one board. By cooperating with CWDM/DWDM system, it presents carriers with a way to selectively increase the utilization of existing fiber lines to accommodate today's LAN and SAN applications in the MAN. The card has a extending optical interface besides a pair of client-line path optical interface. The extending interface is specialized used for user bandwidth action analysis area, which can perform optical-electrical-optical signal re-generation for uni-directional signal. OPCOM600-OTU2 provides 3R (re-shape, re-amplify, re-timing) for the standard services speed in 9.95~11.09G (OC-192/SDH-64/IEEEstd-802.3ac/ITU G.709/10G FC, etc.)



OPCOM600-OTU1-4



OPCOM600-OTU2

## Key Features

Features	Support STM1/4/16,STM16+FEC,FC1/FC2 FC4, FE/GE, and 100M~5G service optical wavelength conversion on OTU1 Support STM64/OC-192, 10G-WAN/10GE-LAN, FC-10G on OTU2 Compliant with ITU-T G.709 and G.798 Support 9.95G~11.09G service optical wavelength converting and OTN frame creation Support optional multi/single modes, single strand fiber and xWDM XFP on both client and line sides Support transparent service transmission and auto-negotiable speed at client side Assured 3R function (Re-shaping, Re-amplification and Re-timing) Hot swappable modular designs Support Auto laser shutdown (ALS), bi-direction fault-pass/link-pass-through function Support 1 channel line-client wavelength converting and 1 channel single directional wavelength converting on EXT port
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SFP LC
Transmission media	Single mode or multimode fiber
Working temperature	0 ~ 45 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 10W
Relative humidity	5 ~ 90% noncondensing



## 2GE/4GE/8GE sub-rate muxponder cards

OPCOM600-2GEMP/4GEMP cards assemble 2/4 wirespeed GE services into a single 2.66Gbps color wavelength with 1+1 protection on fiber line. It helps the customer to make full use of his fiber resources and expand capacity at the maximum. Besides, 2GEMP/4GEMP cards provide 2 auxiliary data channels sharing 10M throughput on the same transmission line. The AUX data channels can be used to transmit low-speed control signals or NMS information.

OPCOM600-8GEMP is Raisecom modular 8-port Gigabit multiplexer designed to further improve the utility of exiting fiber as well as CWDM/DWDM wavelength resource. It aggregates 8 Gigabit Ethernet tributary into a 10Gbps line port and one wavelength, with hot-swappable optical/copper SFP on client side and XFP on line port. OPCOM600-8GEM is equipped with 100/1000M RJ-45 network management port enabling operator management and configures remote chassis. Additionally its advanced features such as downlink and uplink loopback, auto laser shutdown and remote network management provide carriers a flexible, reliable and cost-effective 10 Gigabit Ethernet. Combing with OPCOM600-OMU18, OPCOM600-8GEM can upgrade CWDM system to 144Gbps transmission over one fiber.



OPCOM600-2GEMP



OPCOM600-4GEMP



OPCOM600-8GEM

## Key Features

Features	<p>2GEMP/4GEMP:</p> <ul style="list-style-type: none"><li>2 GE/4GE wire-speed multiplexing</li><li>Support Jumbo Frame to 9600 Bytes, AUX port to 1536 Bytes</li><li>GE interfaces support fiber or copper SFP</li><li>LINE interfaces support normal or color SFP</li><li>2 AUX channel for low speed services or remote NMS information</li><li>Support remote in-band management</li><li>Support fault pass through function</li><li>Support SFP with Digital Diagnostic Function</li><li>Support ALS (Auto Laser Shutdown)</li><li>1+1 protection with 0-255s configuration switchover time</li><li>Configurable auto/manual/non restore mode</li></ul> <p>8GEM:</p> <ul style="list-style-type: none"><li>Multiplex 8 independent GE services on one CWDM/DWDM channel</li><li>Available with GE service at client side and support both fiber/copper hot swappable SFPs</li><li>Available with XFP interface at line side and support hot swappable UXFP, CXFP or DXFP</li><li>Support Bi-direction fault-pass/link-pass-through function</li><li>Support Auto laser shutdown (ALS) function</li><li>Support In-service remote management</li></ul>
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SFP LC
Transmission media	LINE interface: single mode or multimode fiber GE/10GE interface: single mode or multimode fiber or copper
Working temperature	0 ~ 45 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 10W
Relative humidity	5 ~ 90% noncondensing



## EDFA boost optical amplifier

OPCOM600-OAU is an Erbium Doped Fiber Amplifier that directly amplifies optical signals without optical to electrical conversions. They are working at wavelengths from 1528- 1563nm and increase the launch power to +13~+17dB, which enables a single hop transmission distance up to 100~160km.



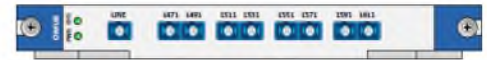
OPCOM600-OAU-2B

### Key Features

Features	Available with Erbium-doped fiber amplifier for long-haul fiber transmission Support working wavelength in a range of 1528 ~ 1562nm Support output power up to +13 ~ +17dBm Amplify one or two optical signals on one card Support Automatic Laser Shutdown (ALS) function, trap notification for temperature and optical loss Support optical input/output power monitoring
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Transmission media	LINE interface: single mode or multimode fiber GE/10GE interface: single mode or multimode fiber or copper
Working temperature	0 ~ 45 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 7W
Relative humidity	5 ~ 90% noncondensing

## 8-channel MUX/DEMUX

OPCOM600-OMU8 is respectively not only the 8-channel MUX but also DEMUX card and works in paris. OMU8 multiplexes or demultiplexes 1471,1491,1511, 1531,1551,1571,1591 and 1611nm into LINE fiber or from LINE fiber.



OPCOM600-OMU8

### Key Features

Features	Transparent to services, working at any signal speed MUX/DEMUX works without power supply Monitor and manage through NView
Operating wavelength	1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Insertion loss	< 3 dB
Adjacent channel isolation	> 25 dB
Non-adjacent channel isolation	> 35 dB
Return loss	>45 dB
Directivity	>55 dB
Transmission media	9/125um single mode fiber
Working temperature	-5 ~ 60 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 5W
Relative humidity	5 ~ 90% noncondensing



## 16-channel DWDM MUX/DEMUX

OPCOM600-DMU16 is respectively the 16-channel DWDM not only MUX but also DEMUX card and works in paris. DMU16 multiplexes 1560.61,1558.98,1557.36,1555.75,1554.14,1552.52,1550.92,1549.32, 1547.72,1546.12,1544.53,1542.94,1541.35,1539.77,1538.19 and 1536.61nm into LINE fiber or demultiplexes from LINE fiber.



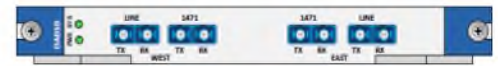
OPCOM600-DMU16

### Key Features

Features	Transparent to services, working at any signal speed MUX/DEMUX works without power supply Monitor and manage through NView
Operating wavelength	1560.61,1558.98,1557.36,1555.75,1554.14,1552.52,1550.92,1549.32, 1547.72,1546.12,1544.53,1542.94,1541.35,1539.77,1538.19, and 1536.61nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Insertion loss	< 1.0 dB
Adjacent channel isolation	> 25 dB
Non-adjacent channel isolation	> 30 dB
Return loss	>40 dB
Directivity	>50 dB
Transmission media	9/125um single mode fiber
Working temperature	-5 ~ 60 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 5W
Relative humidity	5 ~ 90% noncondensing

## Bidirectional ADM

OPCOM600-OAD1D-X is a single channel bidirectional add-and-drop card on a dual-strand fiber. It performs de-multiplexing and multiplexing of a specific color wavelength usually at an intermediate station to drop two services from both west and east directions. The 'X' suffix stands for a specific color wavelength among 1271, 1291, 1311, 1331,1351, 1371, 1391, 1411, 1431, 1451, 1471,1491, 1511, 1531, 1551, 1571, 1591 and 1611nm, thus has 18 variants.



OPCOM600-OAD1D

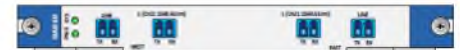
## Key Features

Features	Transparent to services, working at any signal speed ADM works without power supply Monitor and manage through NView
Operating wavelength	1271, 1291, 1311, 1331, 1351, 1371, 1391, 1411, 1431, 1451, 1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Insertion loss	< 1.5 dB
Adjacent channel isolation	> 25 dB
Non-adjacent channel isolation	> 35 dB
Return loss	>45 dB
Directivity	>55 dB
Transmission media	9/125um single mode fiber
Working temperature	-5 ~ 60 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 5W
Relative humidity	5 ~ 90% noncondensing



## Bidirectional DWDM ADM

OPCOM600-DAD2D-XX is a dual-channel bidirectional add-and-drop card on a dual-strand fiber. It performs de-multiplexing and multiplexing of a specific color wavelength usually at an intermediate station to drop two services from both west and east directions. The 'X' suffix stands for a specific color wavelength among 1560.61, 1558.98, 1557.36, 1555.75, 1554.14, 1552.52, 1550.92, 1549.32, 1547.72, 1546.12, 1544.53, 1542.94, 1541.35, 1539.77, 1538.19 and 1536.61nm, thus has 16 variants.



OPCOM600-DAD2D

### Key Features

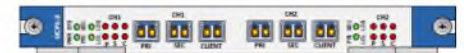
Features	Transparent to services, working at any signal speed ADM works without power supply Monitor and manage through NView
Operating wavelength	1560.61, 1558.98, 1557.36, 1555.75, 1554.14, 1552.52, 1550.92, 1549.32, 1547.72, 1546.12, 1544.53, 1542.94, 1541.35, 1539.77, 1538.19, and 1536.61nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Insertion loss	< 1.5 dB
Adjacent channel isolation	> 25 dB
Non-adjacent channel isolation	> 35 dB
Return loss	>45 dB
Directivity	>55 dB
Transmission media	9/125um single mode fiber
Working temperature	-5 ~ 60 Celsius
Storage temperature	-40 ~ 80 Celsius
Power consumption	< 5W
Relative humidity	5 ~ 90% noncondensing

## Optical channel protection card

OPCOM600-OCP1 provides the protection of a specific service channel. It has two protection modes: converts the normal wavelength service into two same color wavelength and feed into two MUX/DEMUX; or into two different color wavelengths and one MUX/DEMUX. In automatic switchover mode, it immediately switchover to secondary fiber if failure is detected in primary fiber in less than 30ms.



OPCOM600-OCP-1



OPCOM600-OCP-2

### Key Features

Features	Transparent to services, working at any signal speed ADM works without power supply Monitor and manage through NView
Operating wavelength	(1271 and 1291), (1311 and 1331), (1351 and 1371), (1391 and 1411), (1431 and 1451), (1471 and 1491), (1511 and 1531), (1551 and 1571), (1591 and 1611)nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SFP LC/PC
Transmission media	single mode fiber
Working temperature	0~ 45 Celsius
Storage temperature	-25~ 60 Celsius
Power consumption	< 10W
Relative humidity	5 ~ 90% noncondensing



## Optical line protection card

The transmit end of OPCOM100-OLP-A splits the signal into two identical copies with 50% optical power of each, and the data will be transmitted in two paths. The receiving end of OPCOM100-OLP-A will compare the two receiving signals and select the better one according to their quality. In this case, if failure is detected in primary line, OPCOM100-OLP-A will immediately switchover to secondary line within 50ms. OPCOM600-OLP-B provides 1:1 optical line protection for the transmission line. At the transmit end, OPCOM600-OLP-B transmits the optical signal on primary line at 100% optical power and the other OPCOM600-OLP-B also receives the signal on primary line at the receiving end. In case of primary line problem, both the transmit and receiving ends will switchover the transmission signal on to secondary line with in 50ms with 100% optical power.



OPCOM600-OLP-AE



OPCOM600-OLP-BE5

## Key Features

Features	Support redundant data path for the entire transmission line Support 1+1 & 1:1 optical line protections with switchover time less than 50ms Support automatic or manual switchover mode Support transparent transmission of protocols/services Assured 3R function (Re-shaping, Re-amplification and Re-timing) Support fault pass through Support Automatic Laser Shutdown (ALS) function
Operating wavelength	1270 ~ 1620 nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	SC/PC
Transmission media	single mode fiber
Working temperature	0~ 45 Celsius
Storage temperature	-40~ 80 Celsius
Power consumption	< 10W
Relative humidity	5 ~ 90% noncondensing

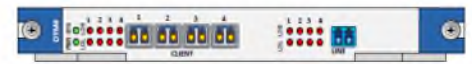
## Integrated CWDM transponder and Mux/Demux card

OPCOM600-OTM4 is a 4-channel bidirectional single fiber CWDM terminal multiplex card, which is used to complete 4-channel bidirectional single fiber transmission of any rate optical signal. It is also a integrated CWDM transponder and Mux/Demux card which completes both converting and Mux/Demux functions bidirectional on a single-strand fiber.

OPCOM600-OTM4-SL and SR or OPCOM600-OTM4-LL and LR work in pairs at two ends of single strand fiber and transport 4 services. OTM4-SL(LL) transmits at 1471, 1511,1551 and 1591nm and receives at 1491, 1531, 1571 and 1611nm; while OTM4-SR(LR) receives at 1471, 1511, 1551 and 1591nm and transmits at 1491, 1531, 1571 and 1611nm.



OPCOM600-OTM4-Gb/48-SL(SR)



OPCOM600-OTM4-Gb/48-LL(LR)

### Key Features

Features	Support complete 4-channel CWDM optical signal transparent bi-directional transmission over a single-strand fiber and integrated wavelength conversion and Mux/Demux functions in one card: OTM4=OMU8+OTU1-4+CSFP-Gb/48;
Operating wavelength	1471, 1511,1551 and 1591nm
Dimensions	240(H)*24.9(W)*225(D) mm
Optical connector	LC/PC
Transmission media	single mode fiber
Working temperature	-5~ 50 Celsius
Storage temperature	-40~ 80 Celsius
Power consumption	< 5W
Relative humidity	5 ~ 90% noncondensing



## Ordering Information

ITN2100-12	iTN2100-12(REV.C.00) chassis, 15 slots, without any modules, without power supply
ITN2100-NMS	SNMP NMS module in iTN2100, provide management and control function for the whole system, management mode: SNMP/Console/Telnet
OPCOM3500E-12	OPCOM3500E-12(REV.B.00) chassis, without any modules, without power supply
OPCOM3500E-NMS	SNMP NMS module in OPCOM3500E
RC006-FANS1	Optional accessory, 19inch, 1Unit high, within two fans.
SUB-PWRM-AC	AC 220V input power supply card, output: DC +5V, DC -5V, ringing current, DC -48V power feed. 600 watts Supporting voltage monitor function and the output and input Voltage alarm threshold can be set by software.
SUB-PWRM-DC	DC -48V input power supply card, output: DC +5V, DC -5V, ringing current, DC -48V power feed. 300 watts Supporting voltage monitor function and the output and input Voltage alarm threshold can be set by software.
SUB-PWRM-DC-300	-48V/DC Power Supply Module(300W) for OPCOM3500E-12, RC006-12 REV.B,
OPCOM600-OTU1-4	4 SFP client fibers converting to 4 SFP CWDM/DWDM fibers
OPCOM600-OTU2	1 10G XFP client fibers converting to 1 XFP CWDM/DWDM fibers
OPCOM600-2GEMP	2*10/100/1000BaseT, 2*SFP LINE, 2*10/100BaseT AUX data
OPCOM600-4GEMP	4*10/100/1000BaseT, 2*SFP LINE, 2*10/100BaseT AUX data
OPCOM600-8GEM	8*10/100/1000BaseT, 1*XFP LINE
OPCOM600-OAU-2B	2*EDFA amplifier, SC/PC connector
OPCOM600-OMU8	8-channel MUX/DEMUX, 8*client, 1*LINE, SC/PC
OPCOM600-DMU16	16-channel DWDM MUX/DEMUX, 16*client, 1*LINE, SC/PC
OPCOM600-OAD1D-X	Bidirectional ADM, X=27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61
OPCOM600-OAD1D-S-X	Bidirectional ADM on single strand fiber, X=27, 31, 35, 39, 43, 47, 51, 55, 59
OPCOM600-OTM4-Gb-SL	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel left-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-Gb-SR	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel right-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-Gb-LL	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel left-side

	MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-Gb-LR	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel right-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-48-SL	4*2.5 SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel left-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-48-SR	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel right-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-48-LL	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel left-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OTM4-48-LR	4 Gigabit SFP client fibers converting to 4 Gigabit SFP CWDM fibers, 4-channel right-side MUX/DEMUX,1*single-strand LINE
OPCOM600-OCP-1	1-channel optical channel protection card
OPCOM600-OCP-2	2-channel optical channel protection card
OPCOM600-OLP-AE	1+1 optical line protection card
OPCOM600-OLP-BE5	1:1 optical line protection card