

## 5G Fronthaul Optical Transport

### A1600 Series



- **Flexible networking**
- **Super scalability**
- **Works with CWDM / DWDM / EDFA / OLPS (Optical Link Protection System) / OTAP (Optical Test Access Point) multi interface modules**
- **MSA (Multi-Source Agreement) compliant**
- **Supports SNMP(Simple Network Management Protocol) uniform network management platform, CLI, Web, NetRiver**
- **Supports 1+1 power back up, hot pluggable, AC or DC**

With the rapid development of 5G communication technology, 5G base stations are being deployed on a large scale. The deep coverage of base stations requires deployment locations closer to users. However, the traditional front-haul solution using optical fiber direct drive between DU (Distributed Unit) and AAU (Active Antenna Unit) suffers from a series of problems such as shortage of optical fiber resources, high cost of cable construction, long construction period, and difficulty in capacity expansion.

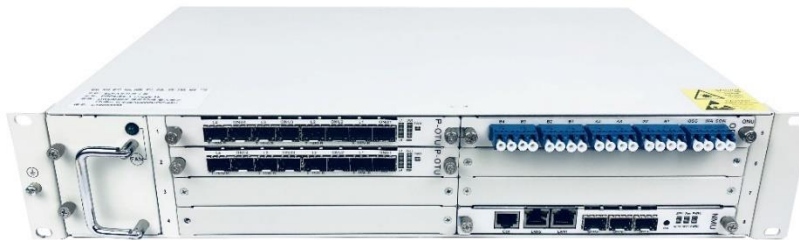
The Ascent's A1600 series 5G front-haul semi-active equipment is designed to address the problems of lack of optical cable resources, long construction period, and high cost caused by the direct drive of the optical cable between DU and AAU in the 5G front-haul under the C-RAN (Centralized Radio Access Network) architecture. The DU side of the equipment uses active WDM equipment, and the AAU side uses passive WDM plus color optical modules to form a unified management and control front-haul network, providing PC-side Web and client-side APP network management methods and high-reliability 1+1 protection functions. Realize and help operators to deploy 5G front-haul networks with low cost, high reliability and fast deployment.

## DU Active Platform

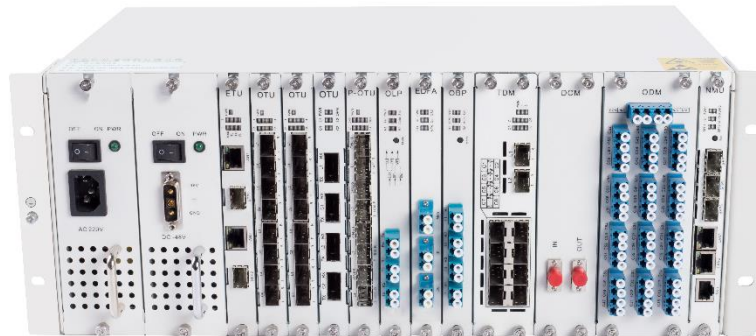
A1600 1U, 2U and 4U platforms are highly integrated, compact in size. It features standard 19" 1U, 2U, 4U chassis, power supply (AC/DC optional), 1+1 backup, ready to install. 1U, 2U, and 4U transmission platforms support max 4, 8 and 16 services slots, mixed different interface modules (hot pluggable), in-band and out-of-band network management, flexible bandwidth per channel, remote update, easy maintenance.



**1U transmission platform (A1604 series)**



**2U transmission platform (A1608 series)**

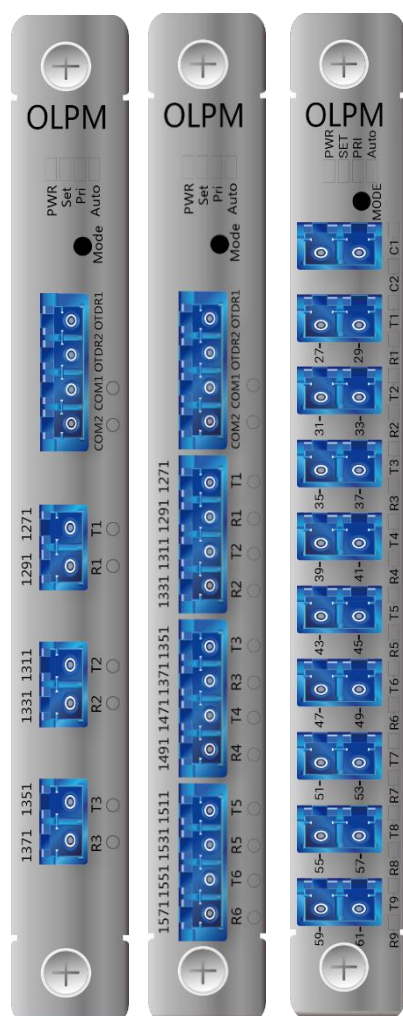


**4U transmission platform (A1616 series)**

## Optical Link Protection Module (OLPM)

The OLPM (Optical Link Protection Module) 5G fronthaul system optical protection board is used for optical fibre line backup protection systems. It adopts an advanced optical path automatic switching module. It is an optical device used in the field of optical fibre communication to switch between master and backup optical paths.

It can automatically identify the master and backup optical paths. The signal status of the optical path of the backup system can be instantly switched, thereby ensuring that when the main optical cable encounters a total obstruction, the normal operation of the system is protected and the operator's service quality is improved.



### Optical Line Protection Module (A1600-OLM-xxD)

- The OLPM board supports hot swapping and can be inserted into any slot on the front panel of a 1U, 2U, 4U, or 5U chassis.
- The 6-wave panel contains 12 indicator lights, 1 button and 10 LC optical ports;
- 12- wave panel contains 18 indicator lights, 1 button and 16 LC optical ports;
- The 18 - wave panel contains 24 indicator lights, 1 button and 20 LC optical ports.

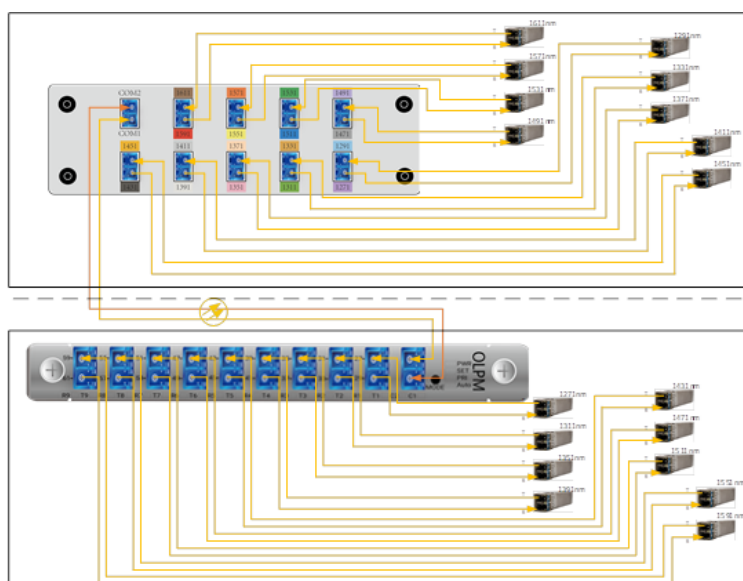
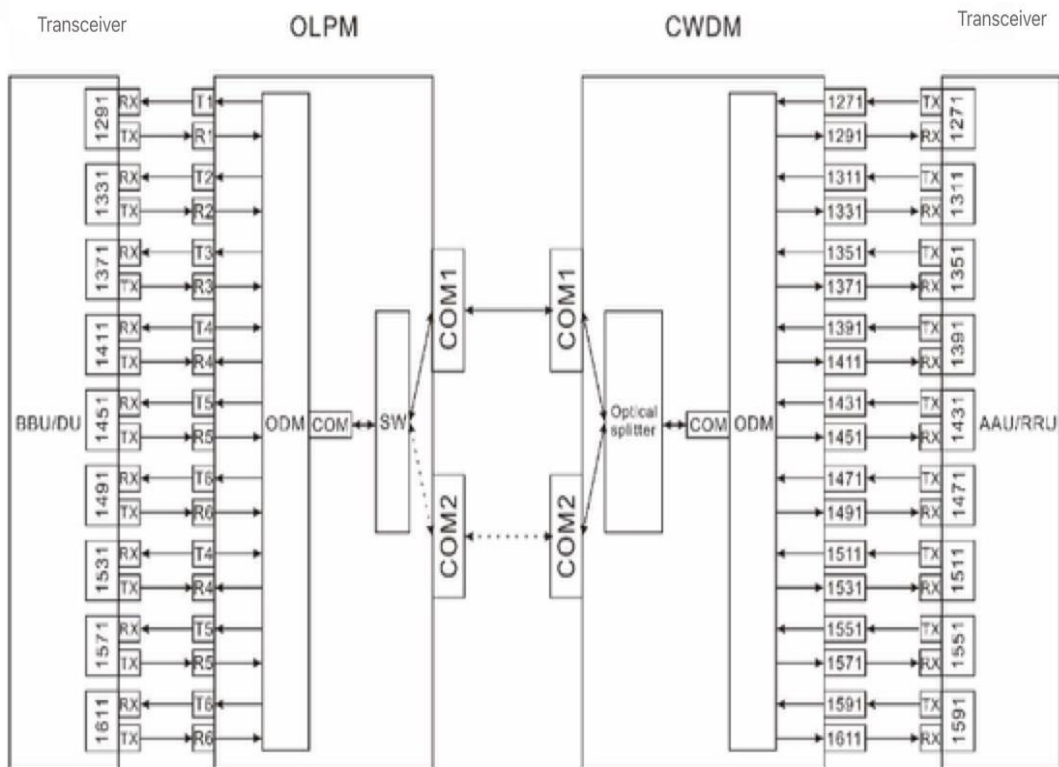
## OLPM Specification

System Parameter		Technical Index
Wavelength Range		1310±50nm & 1550±50nm
Monitoring Optical Power Range	TX	+25dBm~-50dBm
	RX	+10dBm~-50dBm
Insertion Loss	1+1 protection	Transmitting end ≤ 4.0dB Receiving end ≤ 1.5dB
	1:1 protection	≤ 1.2dB
Accuracy of Optical Power Measurement		≤0.5dB(+20dBm~-50dBm) ≤1.0dB(-40dBm~-50dBm)
Optical Power Resolution		≤0.01dB
Wavelength Dependent Loss		≤0.25dB
Polarization Dependent Loss		≤0.1dB
Switching Time		≤25ms
Return Loss		≥45dB
Crosstalk		≥55dB
Dimensions (mm)		177(W)*20(H)*225(D)
Working Temperature		-10 °C to 70 °C
Storage Temperature		-40 °C to 80 °C
Relative Humidity		5% to 95% no condensation
Safety and EMC		Compliance with FCC, UL, CE, RoHS, TUV, and CSA standards
Power Consumption		<5W

## OLP Module Application Diagram

After the optical signal from the AU of site A is split by a 50:50 coupler, it is simultaneously transmitted to the site DU through the main and backup lines. At the receiving end, based on the power of the two signals received, the receiver of the site DU chooses to receive Signal all the way. At the same time, the optical signal emitted by DU will also be transmitted to AAU through the optical path selected by the receiver.

18CH



AAU/RU

DU/CU(Centralized Unit)

## Network Management Unit (NMU)

NMU interface module is special module designed for A1600 series products; it can manage all devices under A1600 platform. NMU embeds high speed ARM processor with strong data processing, provides management interfaces NetRiver, Web, CLI. Both Server edition (C/S structure) and Standalone edition are available. Ideal network management solution to networks with different scale for telcos and enterprises.



### NMU Interface Module (A1600 series)

- Hot swappable, which will not affect the normal operation of the business card after failure.
- Local/remote upgrade simultaneously, not affecting operation of other interface modules.
- Unified SNMP network management platform, CLI, Web, NetRiver.
- In-band and out-of-band network management, 2 SFP ports, 2 RJ45 ports, 1 Console serial port.
- Provides strong multi-layers network topology management, automatic recognition of network topology, generating intuitive graphics display for analysis.
- Complies with TMN, enabling comprehensive management from device level to network level: device management, monitoring and deployment, software upgrade, configuration, alarm and performance management.

Item	Description
Ports	Optical ports: 2 × SFP ports Ethernet ports: 2 × RJ45 ports Serial interface: 1 × console port
Network Management	NetRiver, Web, CLI
Operating Case Temperature	-10 °C to 70 °C
Storage Temperature	-40 °C to 80 °C
Relative Humidity	5 % to 95 % (non-condensing)
Dimensions (W×H×D)	177 mm × 20 mm × 225 mm
Safety and EMC	Compliant with FCC, UL, CE, TUV, CSA
Power Consumption	<15W



## RRU (Remote Radio Unit) Passive Platform

A1600 1U, 3U Passive shelves and outdoor fiber termination box are compact in size. With the deepening of wireless network deployment, the construction scale of large-capacity distributed base stations is also expanding, and the deep coverage of base stations requires that deployment locations be closer to users. The passive optical fiber device utilizes the characteristics of a single optical fiber that can transmit multiple optical carriers of different wavelengths at the same time. It effectively solves the problem of the lack of optical fiber cable resources between 4G BBU (Baseband Unit) and RRU (Remote Radio Unit), 5G DU and AAU in the C-RAN architecture, and meets the requirements for deep coverage and flexible expansion of carrier base stations

- Support CWDM/DWDM.
- Low insertion loss and high channel isolation.
- Support upgrade and expansion.
- Optical wavelength customization.
- High reliability and stability.
- Waterproof, dust-proof and resistant to high and low temperatures, passive.



**1U transmission platform (A1601 Chassis)**



**3U transmission platform (A1603 series)**



**Outdoor Pole Mount Termination Box (A1602T series)**

## 1U and 3U Platform Feature

- Support CWDM 6CH, 12CH or wavelength customization
- Support 1+1 protection of optical cable line and real-time monitoring of optical power
- Support the state of the power-down optical path to remain unchanged, and does not affect the normal operation of the service
- Support automatic and manual working mode and automatic switchback function, the switching time is less than 30ms
- Support Web and APP network management mode
- Support local and remote-control functions

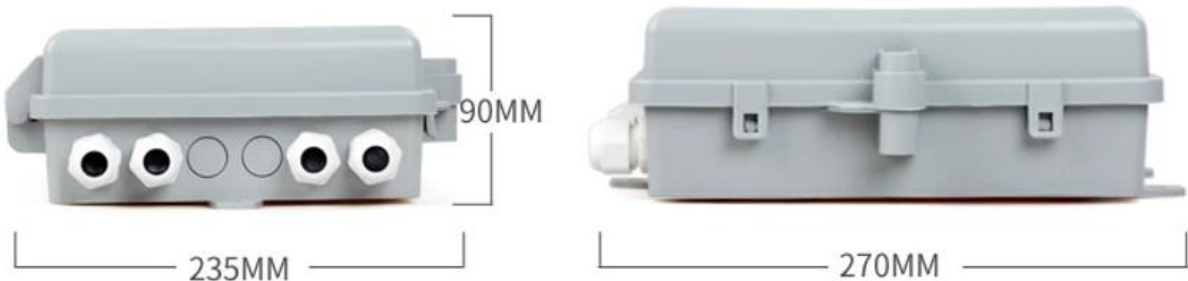
### Product Specification

System Parameter	Technical Index
Wavelength Range	CWDM: 1271nm~1611nm can be customized
Fiber Type	G.652/G.653/G.655
Service Access Types	Ethernet, CPRI, eCPRI, etc.
Line Side Protection Mode	1+1 protection
Switching Time	<50ms
Operating Mode	Automatic and manual
Insertion Loss	<7dB
Network Management Method	Web, APP.
Dimensions	177(W)*20(H)*225(D) mm
2U Chassis Dimensions	440 (W)×88(H)*285(D) mm
4U Chassis Dimensions	440(W)*176(H)×250(D) mm
Plug-in Box Size	129(W)*25(H)×113(D) mm
1U Chassis Dimensions	483(W)*45(H)×112(D) mm
3U Dimensions	129(W)*132(H)×112(D) mm
Working Temperature	-10 °C to 70 °C
Storage Temperature	-40 °C to 80 °C
Relative Humidity	5%~95% no condensation
Safety and EMC	Compliance with FCC, UL, CE, RoHS, TUV, and CSA standards
Power Consumption	<200W



Outdoor Pole Mount Termination Box

<b>Product Specification</b>	
Operating Temperature	-40 to 60 °C
Working Environment	Indoor and outdoor
Functional Features	Rainproof, dustproof, anti-theft
Loadable Equipment	Two 1-point 8 splitters or one 1-point 16 splitter/24 flanges and 24 pigtails
Protection Level	IP55
Product Size	270*235*90 mm
Packing Quantity	30 PCs in one big box
Product Weight	About kg 0.8



Outdoor Pole Mount Termination Box

## Optical Passives CWDM (AOPC)

The CWDM/DWDMs are designed to multiplex (mux) or de-multiplex (demux) optical signals in full optical spectrum with CWDM/DWDM multiple channels at an ITU standards ITU-T defined spacing. It comes as different form factor packages, 1RU 19" rack-mount chassis, standard LGX modules or flat box assemblies.



### ACT Optical Passives CWDM (AOPC)

#### CWDM Specification

##### System Parameter

##### Technical Index

##### Optical Specifications

Operating Wavelength	1260 nm to 1360 and 1480 to 1611 nm
Channel Spacing	20 nm
Channels	2, 4, 6, 8, 10, or 12
Channel Pass Band	CW $\pm$ 7.5 nm
Pass Band Flatness	$\pm$ 0.5 dB
Insertion Loss 2 CH	1.2 dB max.
Insertion Loss 4 CH	1.7 dB max.
Insertion Loss 8 CH	2.5 dB max.
Insertion Loss 10 CH	3.0 dB max.
Adjacent Channel Isolation	$\geq$ 30 dB
Non-Adjacent Channel Isolation	$\geq$ 40 dB
Directivity	$\geq$ 50 dB
Return Loss	$\geq$ 45 dBS

##### General Specifications

Operating Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Operating Humidity	5 % to 95 % RH (non-condensing)
Dimensions (W × D × H)	Varies by model LGX : Industry standard Flat Box: 100 mm × 80 mm × 10.5 mm ( $\leq$ 8 output ports) 140 mm × 115 mm × 18 mm ( $>$ 8 output ports)

Weight	Note
Ship Weight	Note

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