DCI3100 Integrated DWDM Equipment

Product description

The process of informatization and automation in various industries is in full swing, large bandwidth services emerge in endlessly, and the trend of centralized and unified management is intensifying.Therefore, the capacity of the basic transmission pipeline must be upgraded;Simple network planning, fast service deployment, smooth bandwidth upgrade and convenient maintenance operation are the enterprise information of industry customer construction.The core appeal of the net.

Based on wavelength division multiplexing (WDM) technology, the company independently developed DCI3100 integrated wavelength division equipment.The transmission capacity of 400 G, 800 G, 1.2 T and 1.6 T is used to build the network in batches, which eliminates the complex optical layer configuration and reduces the redundant connection of optical fibers.Switch-like connection, fast network construction and simple maintenance perfectly match the transmission needs of industry customers in the metropolitan area.To solve the customer's demands to the greatest extent.

Device view

Figure 1 DCI3100 Integrated Wavelength Division Device

Functional features

- The equipment is designed in a simple box-type form, with a height of only 1 U, and can be stacked, which can effectively save space in the computer room and achieve flexible migration.
- 1RU supports a maximum transmission capacity of 1.6 T (16 * 100G), and the transmission capacity can be effectively extended to 1 fiber 3.2 T through equipment stacking.
- The equipment supports mixed transmission of multiple services, including 100GE and other service types, and the service interface and quantity can be flexibly customized by the customer.
- The equipment has no complex optoelectronic crossing, transparent service transmission, complete physical quarantine of service ports, and improved network security.
- The equipment has simple networking, does not change the original network topology structure, has no complex optical layer design,It is only necessary to select the equipment model according to the attenuation or the number of kilometers.

- The equipment supports 1 + 1 line protection at the optical cable side, automatically selects the transmission route, and improves the network reliability.
- The equipment supports in-band monitoring channel, and the whole network SNMP management can be realized by optical path connection.
- One-box delivery by site, power-on, plug-and-play; no fiber skipping, no manual intervention.
- Front air and rear air outlet design, AC power supply, reasonable height, width and depth design, adapt to the server rack requirements of the data center room.Can be deployed with the server.
- Dual server power supply configuration, hot plug, Load Share mode 1 + 1 hot backup.

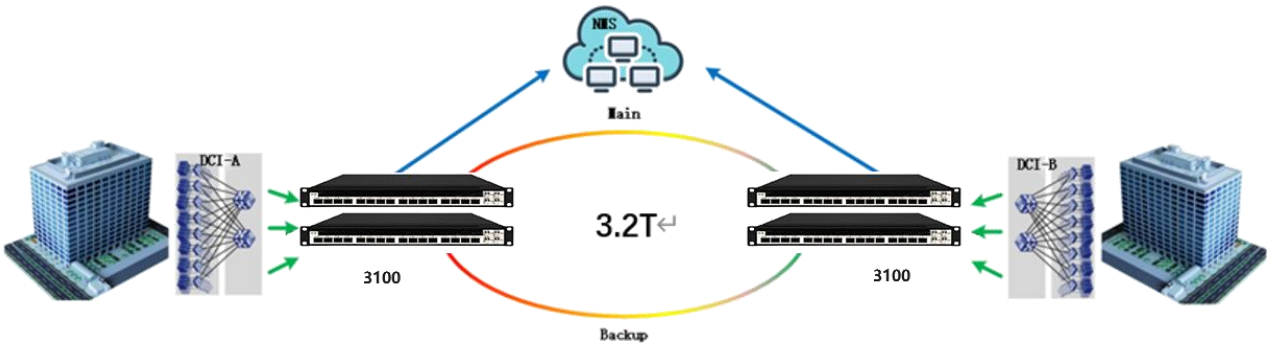
Technical parameters

Function	Explain	Remark
Size of equipment	1RU: 44 (H) × 442 (W) × 600 (D) mm	
Maximum transmission capacity of a single machine	1RU 1.6Tbps（16*100G）	
Maximum transmission capacity of single fiber	2 * 1RU equipment stack capacity expansion to 3.2 Tbps	
Maximum transfer rate of single port	100Gbit/s	
Service port type	● 100G QSFP 28 optical port	Customized according to customer needs
Maximum number of ports for a single machine	● 16 QSFP 28 optical ports	
Types of services supported	● 100GE	Determined by service port type
Network level protection	Support line side 1 + 1 protection	
Device-level protection	● Power supply 1 + 1 hot backup ● 4 sets of fan hot backup	
Installation method	19 "Server Cabinet	
Power supply mode	● AC: 90 ~ 260V 2 hot-swappable server power modules	
Management mode	● Visual Web interface ● DCI3100 Network Management System	
Heat dissipation	Forward air, rear air outlet, 4 hot-swappable fan units	
Power consumption	< 600W (fully equipped)	
Operating temperature range	-10 ℃ ~ 60 ℃ (typical)	
Operating humidity range	5-95% non-condensing	
Storage temperature range	-40℃～85℃	

MTBF	> 100,000 hours	

Application scenario

The DCI3100 integrated wavelength division device is developed for data center interconnection (DCI) scenarios.It can be smoothly expanded to the transmission capacity of 1 fiber 3.2 T through equipment stacking.High-density optoelectronic integration technology is adopted to avoid complex fiber jumper connection, which is similar to switchboard type.An end-to-end complete wavelength division transmission scheme is easily for,It brings huge transmission capacity, perfectly matches the installation conditions of the data center computer room, and minimalist management mode.Bring the ultimate user experience to the DCI bearer network in the metropolitan area.



The DCI3100 Integrated Wavelength Division Device product chassis is a standard 1U 19-inch rack architecture.Physical dimensions: 44 mm (height) × 442 mm (width) × 600 mm (depth), suitable for installation of 19-inch cabinet (800-1200 mm deep rack);Adopt hot backup power supply mode, meet AC: 90 ~ 260 V, 2 hot-swappable server power supply modules;Four fan units provide heat dissipation for the chassis and support temperature monitoring and automatic speed regulation.Ensure that the equipment can work normally and efficiently at the design temperature.

Chassis structure

1.Front view of the product

The chassis of DCI3100 integrated wavelength division equipment adopts the front panel outgoing line mode, and all optical interfaces and network management interfaces are designed on the front;The air duct is designed to be forward and backward, and air inlets are designed right in front of and right above the chassis.The cooling fan unit absorbs cold air to the inside of the chassis and then leads the cold air out of the air outlet on the back of the chassis.

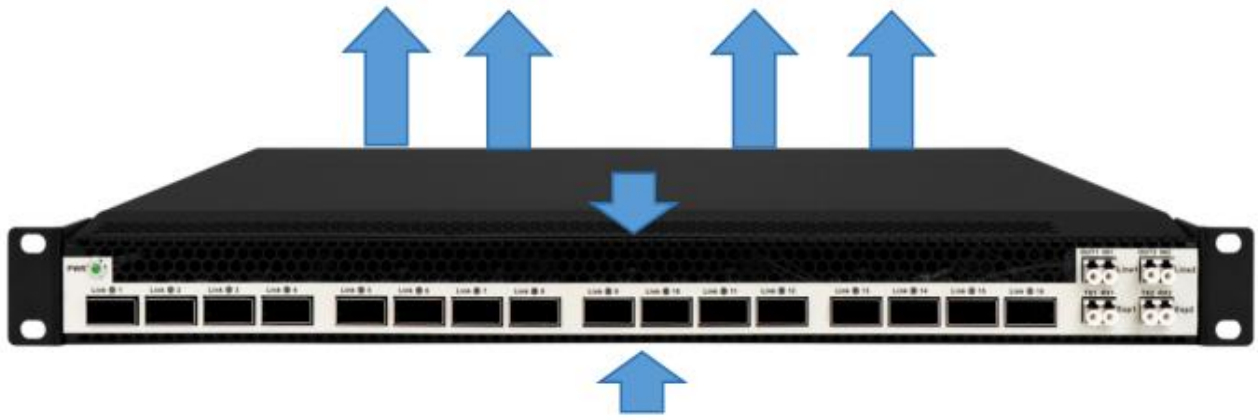


Figure 2 Front View of DCI3100 Integrated Wavelength Division Device

Front Panel Identification Description

Panel identification	Explain
Link1～16	Input/output optical interface of 100GE client side module
IN1/OUT1	Primary route receive/output interface
IN2/OUT2	Backup route receiving/output interface
Rx1/Tx1	The I/O port of the monitoring channel is connected to the network management card SFP TX to transmit the network management information
Rx2/Tx2	Upgrade/download port for channel signal upload/download

Front Panel Indicator Description

Indicator light identification	Explain
Link1～16	Light receiving indicator, on, normal light receiving, off, abnormal light receiving
PWR	Power indicator, on, power supply of network management panel is normal, off, power supply failure

2.Side view of the product

The side of the chassis of the DCI3100 integrated wavelength division equipment product is designed with a tail supporting structural member,It is used to support the tail of the cabinet when the cabinet without tray is installed.

Figure 3. DCI3100 Integrated Wavelength Division Device Side View

3. Back view of product

There are two power slots and four fan slots on the back of the chassis of the DCI3100 integrated wavelength division device.Two power supply slots support hot-pluggable standard server power supply configuration and adopt Load Share mode 1 + 1 hot backup;Four fan slots support four hot-swappable fan cooling unit configurations.The fan unit can monitor the temperature of the chassis in real time and automatically adjust the speed of the cooling fan; the four groups of fans are backup for each other.

Figure 4 View of the back of the DCI3100 Integrated Wavelength Division Device

Introduction to rear panel identification

Panel identification	Explain
SFP1、SFP2	The module input optical interface is connected to the transmission optical cable through the OSC interface to realize the convergence of the branch node network management information to the network management center. The dual optical ports realize the transmission in two directions and realize the 1 + 1 protection.
ETH1、ETH2	Two Ethernet management RJ45 electrical interfaces support rate 10/100/1000M self-adaptation, and the two interfaces can be exchanged with each other and can be used at the same time
RST	Restart button: press the restart button to restart the network management system of the equipment (the restart will not affect the existing service operation)
Console	Micro-USB local management serial port

Rear Panel Indicator Description

Indicator light identification	Explain
RUN	The system operation light flashes once every 0.5 seconds, and the network management system operates normally, always on or always off, and the operation fails.
ALM	Alarm indicator light. If the light is off, it indicates that the equipment works normally. If the light is on, it indicates that the equipment has an abnormal alarm. 1.Rack type unknown alarm on 2.Any power supply and fan fault alarm is on. 4.Temperature warning on 5.Unknown card message type alarm is on

NMS: Network Management Board

NMS is a network management function module specially designed for integrated DWDM equipment products. Its main function is to provide the interface between equipment and network management system. Together with the OTN network management system of integrated wavelength division equipment, it completes all kinds of management, maintenance and management signal transmission of network elements, realizes real-time monitoring, maintenance and management of equipment network elements and the whole synchronous equipment network, and provides a good solution for equipment monitoring.

1. Product Features

- The high-speed ARM processor provides powerful data processing ability, collects the status information, alarm events and performance parameters of each functional module, transforms, processes and stores it, and transmits the control and management information to other functional blocks of the equipment.
- Provides 1 Console interface to support simulation terminal operation.
- Provides 2 RJ45 Ethernet interfaces and supports graphical SNMP network management based on IP.
- Provides 2 SFP optical module interfaces, supports in-band management of equipment, realizes the processing of 2 optical monitoring channels, and completes the receiving and transmitting processing of optical signals in the optical monitoring channels of each site.

2. Technical Parameters

Function	Description
Network management	Supports CLI, Telnet, SNMP, Web and other network management methods
Switching function	Support IP communication function between devices to realize comprehensive management of multiple devices
Protection function	The failure will not affect the existing business
Maintenance function	Supports local or remote software online upgrades
Reset function	Supports operating buttons to reset local NMS board hardware
Initialization function	Supports operating keys to initialize local NMS board hardware
Operating Temperature	-10℃~+60℃
Operating humidity	5%~95%
Maximum power consumption	5W

MTBF	> 100,000 hours
Factory default IP address	192.168.1.188

EDFA: Dual-stage Independent Optical Amplification Module

EDFA series optical amplifiers are erbium-doped fiber amplifier series products. They can provide multi-functional, low-noise, high-gain erbium-doped fiber amplifier solutions, especially suitable for DWDM dense wavelength division multiplexing systems to solve the problem of insufficient power in long-distance transmission. EDFA module adopts a single module two-way independent amplification design, and a single module supports BA+PA design to save space; low noise figure: typical value 5dB, high gain flatness: DWDM 96-wave gain flatness <1dB, multiple working modes: support AGC gain adjustable, APC output adjustable, transient response control: high-performance transient response control, to ensure power and gain stability, without affecting existing signals, ASE automatic correction function: automatically optimize ASE noise to ensure that the noise index is at the minimum value.

1. Technical Parameters

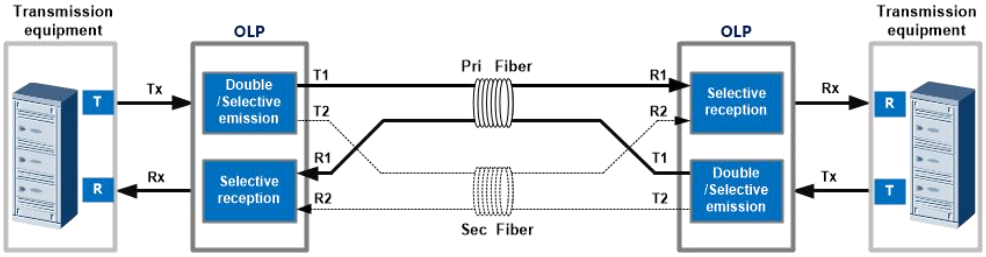
Parameter		Min.	Typ.	Max.	Unit
Working Wavelength		1528		1565	nm
Input Power	OBA	-14		+8	dBm
	OPA	-28		-5	
Output Power				23	dBm
Gain				33	dB
Noise Figure			5.0		dB
Gain Flatness			1.0		dB
Polarization Dependence Loss				0.3	dB
Polarization Dependence Gain				0.4	dB
Return Loss		45			dB

OLP: 1 +1 Protection Module

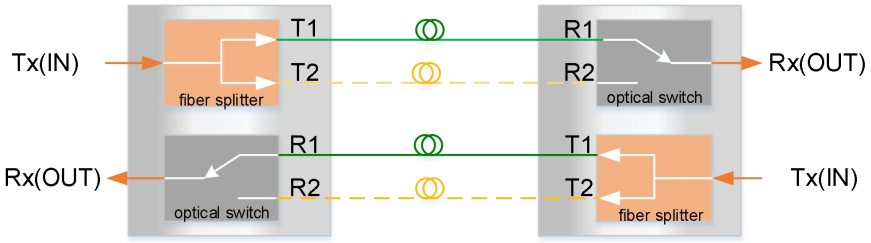
The main function of the OLP optical protection module box is to assist the integrated DWDM equipment to complete optical layer protection solutions such as optical line 1 +1 protection and optical wavelength 1 +1 protection. It can monitor the signal status of the main and standby routing optical paths in real time. Once an optical signal occurs If the signal is interrupted or the performance deteriorates, it can automatically switch safely between the main and standby routes to ensure the rapid recovery of the

system optical signal; OLP technology is to complete the routing switching operation in the optical layer. Optical layer protection has incomparable advantages over upper layer service protection, and it is the best solution to provide users with unblocked communication.

1. Engineering Link Diagram



2. Signal View



3. Technical Parameters

Parameter	1:1	1+1	Unit
Working Wavelength	1310±50nm &1550±50nm		nm
Optical Power Range	+23～-50		dBm
Accuracy of the Optical Power	±0.25		dB
Monitoring optical power resolution	±0.01		dB
Return Loss	≥55		dB
Polarization Dependent Loss	≤0.05		dB
Wavelength Dependent Loss	≤0.1		dB
Insertion Loss	Tx <1.2; Rx <1.2	Tx <4; Tx<1.2	dB
Switch Speed	<30	<15	ms

ODM04: Multiplexer & Demultiplexer Module

ODM04 is a multiplexing module based on wavelength division multiplexing (WDM) technology. The multiplexing module multiplexes multiple standard DWDM or CWDM wavelengths on the same optical fiber for transmission. The demultiplexer module resolves multiple standard DWDM or CWDM wavelengths transmitted on a single optical fiber.

1. Technical Parameters

Parameter		Specification	Unit
Channel Wavelength		ITU Grid	nm
Channel Spacing		100GHz	Ghz
Channel		4	
Channel Passband		> 0.3	nm
Insertion Loss Flatness		<0.5	dB
Insertion Loss		<1.8	dB
Channel Isolation	Adjacent	25	dB
	Non-adjacent	40	dB
Polarization Dependent Loss		<0.1	dB
Directivity		>50	dB
Return Loss		>45	dBm
Maximum Power Handling		26	mw