MuxPonder-5000

DCI/OTN SYSTEM

DCI/OTN Platform: MuxPonder-5000-2

MuxPonder-5000-2 is an optoelectronic integrated WDM transmission platform designed for Data Centre Interconnect (DCI), features high integration (optoelectronic integration), large bandwidth (25.6Tbits / Fiber), simple deployment (no complicated tuning), easy operation and maintenance (NETCONF / YANG) and safety and reliability. It can meet the rapidly growing bandwidth demand between DCs, achieve flexible deployment of equipment, create an open optical network architecture and lead the DCI market into a new era of high-speed all-optical interconnection.
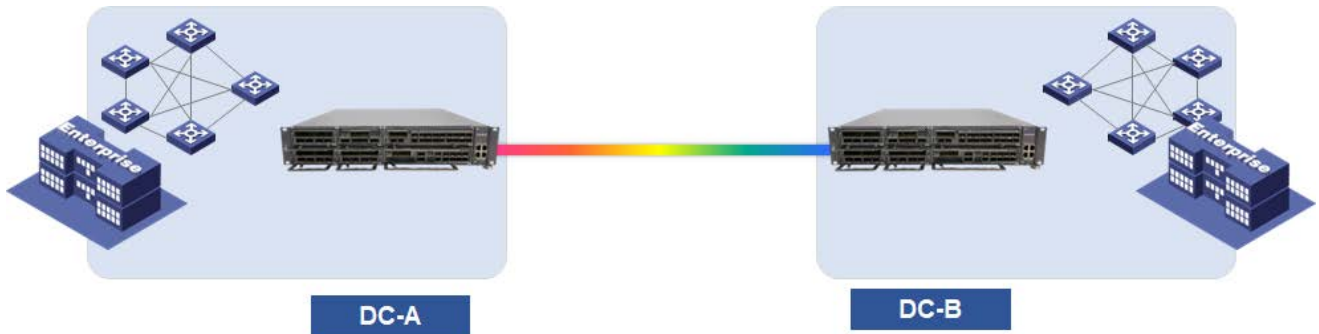
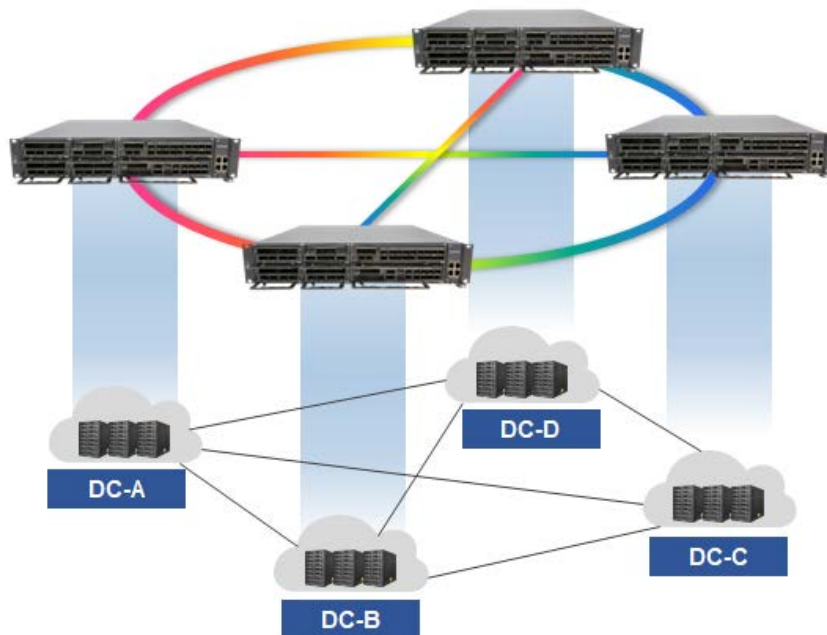### Product view

MuxPonder-5000-2

Product features

● Adopt optoelectronic integrated, pluggable modular design; components support hot-plugging, deploy and expand on demand.

● Front-air and rear-air cooling design, 2+1 FRU fan units available, automatic speed adjustment supported.

● 19" / 600mm Depth cabinet can be installed, suitable for data center rooms and can be deployed with IT equipment in common cabinets.

● Transmission capacity up to 25.6Tbit/s per pair @ C+ band 400G*64λ, up to 3.2Tbit/s per subrack.

● Single wave capacity up to 400G, continuous evolution towards 600G & 800G & 1.2T.

● Optical layer card highly integrated with OA, WSS, VOA, OSC, OTDR, OCM, OLP, etc. to simplify internal fiber connectivity.

● Supports 10GE, 100GE, 100GE FlexE (Unware), 400GE, STM-64, 10GE WAN, OTU2, OTU4 and other service access.

● Supports 9-degree ROADM networking and FlexGrid.

● Supports comprehensive performance monitoring and quality visibility at the service, OTN and optical layers.

● Provides multiple multi-layer network-level and device-level protection solutions. Protection reversal delay＜50ms, ensuring superior protection performance.

● Supports NETCONF/YANG standard open interface and GUI management platform based on B/S architecture

Application scenarios

Small network: single platform with high density optical layer card + electrical layer card for point-to-point networks.

Medium / large network：stacking of multiple electrical layers + multi-degree ROADM to form a ring network.

Product specifications

Parameter		Description
Chassis	**Dimensions (H x W x D)**	2U: 88 mm (H)×446 mm (W)×450 mm (D)
	Maximum capacity	3.2Tbit/s
	Number of service card slots	8
	Applicable cabinets	19" cabinet 600mm or deeper
Line-side port	**Rate**	● 200G (PDM_QPSK) programmable ● 200G (PDM_8QAM) programmable ● 200G (PDM_16QAM) programmable ● 400G (PDM_16QAM) programmable
	Optical module	Pluggable CFP2, wavelength adjustable
Client-side port	**Service type**	10GE, 100GE, 100GE FlexE(Unware), 400GE, OTU2, OTU4, STM-64 and 10GE WAN
	Optical module	Pluggable SFP+, QSFP28
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz
Channel spacing		Fixed grid: 50 GHz / 75 GHz / 100 GHz / 150 GHz
Central frequency range		191.35 GHz ~ 196.1 GHz
Central wavelength range		1528.77 nm ~ 1566.73 nm
Protection function		● Optical line protection (OLP) ● Optical multiplexed segment protection (OMSP) ● Optical channel protection (OCHP)
Network management		● Supports main controller 1+1 backup ● Supports CLI, NETCONF and B/S based GUI management platform ● Support OSC based DCN communication
Power supply	**Back-up**	Standard CRPS power supply 1+1 backup
	AC	● Rated voltage range: 100 V AC～130 V AC (50/60Hz) 200 V AC～240 V AC (50/60Hz) ● Max. voltage range: 90 V AC～264 V AC (45Hz~65Hz)
	HVDC	● Rated voltage range: 240 V HVDC ● Max. voltage range: 192 V HVDC～288 V HVDC
	DC	● Rated voltage range: -48 V DC/-60 V DC ● Max. voltage range: -40 V DC～-72 V DC
Heat dissipation		● Front inlet air and rear outlet air ● 2+1 Fan units backup
Typical power consumption		<1100W (Electric layer full match)
Environment	**Operating temperature**	Short-term: -5℃～+45℃; Long-term: 0℃～40℃
	Storage temperature	-40℃～+70℃
	Humidity	5%～95% (no condensation)

DCI/OTN Platform: MuxPonder-5000-1

MuxPonder-5000-1 is an optoelectronic integrated WDM transmission platform designed for Data Centre Interconnect (DCI), features high integration (optoelectronic integration), large bandwidth (25.6Tbits / Fiber), simple deployment (no complicated tuning), easy operation and maintenance (NETCONF / YANG) and safety and reliability. It can meet the rapidly growing bandwidth demand between DCs, achieve flexible deployment of equipment, create an open optical network architecture and lead the DCI market into a new era of high-speed all-optical interconnection.

Product view

MuxPonder-5000-1

Product features

- Adopt optoelectronic integrated, pluggable modular design; components support hot-plugging, deploy and expand on demand.
- Front-air and rear-air cooling design,1+1 FRU fan units available, automatic speed adjustment supported.
- 19" / 800mm depth cabinet can be installed, suitable for data center rooms and can be deployed with IT equipment in common cabinets.
- Transmission capacity up to 25.6Tbit/s per pair @ C+ band 400G*64λ, up to 1.6 Tbit/s per subrack.
- Single wave capacity up to 400G, continuous evolution towards 600G & 800G & 1.2T.
- Optical layer card highly integrated with OA, WSS, VOA, OSC, OTDR, OCM, OLP, etc. to simplify internal fiber connectivity.
- Supports 10GE, 100GE, 100GE FlexE (Unware), 400GE, STM-64, 10GE WAN, OTU2, OTU4 and other service access.
- Supports 9-degree ROADM networking and FlexGrid.
- Supports comprehensive performance monitoring and quality visibility at the service, OTN and optical layers.
- Provides multiple multi-layer network-level and device-level protection solutions. Protection reversal delay＜50ms, ensuring superior protection performance.
- Supports NETCONF/YANG standard open interface and GUI management platform based on B/S architecture.

Product specifications

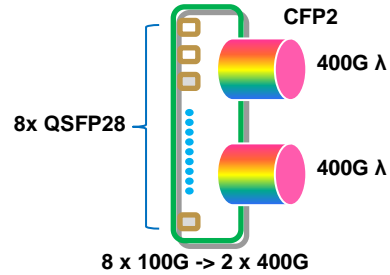| Parameter		Description
Chassis	**Dimensions (H x W x D)**	1U: 44 mm (H)×444 mm (W)×490 mm (D)
	Maximum capacity	1.6Tbit/s
	Number of service card slots	4
	Applicable cabinets	19'' cabinet 800mm or deeper
Line-side port	**Rate**	● 200G (PDM_QPSK) ● 200G (PDM_8QAM) ● 200G (PDM_16QAM) ● 400G (PDM_16QAM)
	Optical module	Pluggable CFP2, wavelength adjustable
Client-side port	**Service type**	10GE, 100GE, 100GE FlexE(Unware), 400GE, OTU2, OTU4, STM-64, 10GE WAN
	Optical module	Pluggable SFP+, QSFP28
Max. number of wavelengths		Fixed grid: 96 wavelengths @50 GHz
Channel spacing		Fixed grid: 50 GHz / 75 GHz / 100 GHz / 150 GHz
Central frequency range		191.35 GHz ~ 196.1 GHz
Central wavelength range		1528.77 nm ~ 1566.73 nm
Protection function		● Optical line protection (OLP) ● Optical multiplexed segment protection (OMSP) ● Optical channel protection (OCHP)
Network management		● Support 1 main controller ● Support CLI, NETCONF and B/S based GUI management platform ● Support OSC based DCN communication
Power supply	**Back-up**	Standard CRPS power supply 1+1 backup
	AC	● Rated voltage range: 100 V AC～130 V AC (50/60Hz) 　　　　　　　　　　　　　200 V AC～240 V AC (50/60Hz) ● Max. voltage range: 90 V AC～264 V AC (45Hz~65Hz)
	HVDC	● Rated voltage range: 240 V HVDC ● Max. voltage range: 192 V HVDC～288 V HVDC
	DC	● Rated voltage range: -48 V DC/-60 V DC ● Max. voltage range: -40 V DC～-72 V DC
Heat dissipation		● Front inlet air and rear outlet air ● 1+1 Fan units backup
Typical power consumption		<550W (Electric layer full match)
Environment	**Operating temperature**	Short-term: -5℃～+45℃; Long-term: 0℃～40℃
	Storage temperature	-40℃～+70℃
	Humidity	5%～95% (no condensation)

2*400G MuxPonder Service Card: P624

The 2*400G MuxPonder service card (P624) supports mapping 8x100G optical signals received on the client side into 2 OTUC4 signals and interconverting OTUC4 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view

Function structure

8 x 100G -> 2 x 400G

Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 600 km
- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.
- Suitable for 400G links in existing OTN/DWDM infrastructures

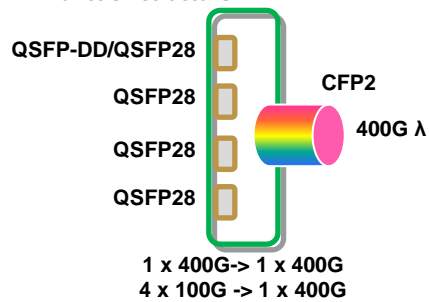| 2*400G MuxPonder（P624）	
Function	Support 8x100G service signals mapping to 2 OTUC4 signal
Slot number	2 slots
Line side	Support 2 CFP2-DCO modules hot-pluggable
Client side	Support 8 QSFP28 modules hot-pluggable
OTN function	- Frame format and overhead handling using ITU-T G709 recommendations - ODUk (k=4, C4) layer supports PM and other functions - OTUk (k=C4) layer supports SM functions
Wavelength adjustable	Range covers 191.35 THz ~ 196.1THz, support 75 GHz, 100 GHz adjustable
Support services	100GE, 100GE FlexE(Unware), OTU4
Time delay measurement	Online delay measurement based on ODU layer
Loopback	Support line side and client side loopbacks
LLDP	Ethernet Support
Performance monitoring and alarm monitoring	- Support OTN performance monitoring and alarm monitoring functions - Support optical module temperature, current, optical power monitoring, etc. - Support Ethernet RMON monitoring - Support Telemetry

400G MuxPonder Service Card: P616

The 400G MuxPonder service card (P616) supports mapping 1x400G optical signal or 4x100G optical signals received on the client side to 1 OTUC4 signal and interconverting OTUC4 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view

Function structure

QSFP-DD/QSFP28

QSFP28   CFP2

QSFP28   400G λ

QSFP28

1 x 400G-> 1 x 400G
4 x 100G -> 1 x 400G

Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 600 km

- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.

- Suitable for 400G links in existing OTN/DWDM infrastructures

Product specification

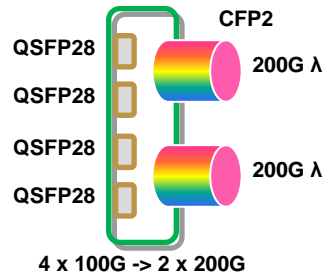| 400G MuxPonder (P616)	
Function	● Support 1x400G service signal mapping to 1 OTUC4 signal ● Support 4x100G service signals mapping to 1 OTUC4 signal
Slot number	1 slot
Line side	Support 1 CFP2-DCO module hot-pluggable
Client side	Support 1 QSFP-DD, 4 QSFP28 modules hot-pluggable
OTN function	● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=4, C4) layer supports PM and other functions ● OTUk (k=C4) layer supports SM functions
Wavelength adjustable	Range covers 191.35 THz ~ 196.1THz, support 75 GHz, 100 GHz adjustable
Support services	100GE, 100GE FlexE(Unware), 400GE , OTU4
Time delay measurement	Online delay measurement based on ODU layer
Loopback	Support line side and client side loopbacks
LLDP	Ethernet Support
Performance monitoring and alarm monitoring	● Support OTN performance monitoring and alarm monitoring functions ● Support optical module temperature, current, optical power monitoring, etc. ● Support Ethernet RMON monitoring ● Support Telemetry

2*200G MuxPonder Service Card: P524

The 2*200G MuxPonder service card (P524) supports mapping 4x100G optical signals received on the client side into 2 OTUC2 signals and interconverting OTUC2 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view

Function structure

4 x 100G -> 2 x 200G

Application case

- Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km

- Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.

- Suitable for 200G links in existing OTN/DWDM infrastructures

Product specification

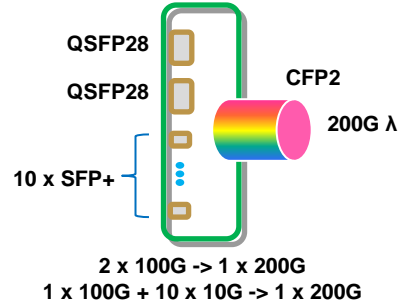| 2*200G MuxPonder (P524)	
Function	Support 4x100G service signals mapping to 2 OTUC2 signals
Slot number	1 slot
Line side	Supports 2 CFP2-DCO modules hot-pluggable
Client side	Support 4 QSFP28 modules hot-pluggable
OTN function	• Frame format and overhead handling using ITU-T G709 recommendations • ODUk (k=4, C2) layer: support for PM and other functions. • OTUk (k=C2) layer: support for SM functions
Wavelength adjustable	Range covers 191.35 THz ~ 196.1THz, support 50 GHz, 75 GHz, 100 GHz adjustable
Support services	100GE, 100GE FlexE(Unware), OTU4
Time delay measurement	Online delay measurement based on ODU layer
Loopback	Support line side and client side loopbacks
LLDP	Ethernet Support
Performance monitoring and alarm monitoring	• Support OTN performance monitoring and alarm monitoring functions • Support optical module temperature, current, optical power monitoring, etc. • Support Ethernet RMON monitoring • Support Telemetry

2*100G+10*10G MuxPonder Service Card: P514

The 2*100G+10*10G+ MuxPonder service card (P514) supports mapping 2x100G optical signals or 1x100G+10x10G optical signals received on the client side to 1 OTUC2 signal and interconverting OTUC2 signals with optical signals of WDM wavelengths conforming to ITU-T standards. The line side adopts pluggable CFP2-DCO to achieve ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view

Function structure

QSFP28

QSFP28

CFP2

200G λ

10 x SFP+

2 x 100G -> 1 x 200G
1 x 100G + 10 x 10G -> 1 x 200G

Application case

● Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km

● Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.

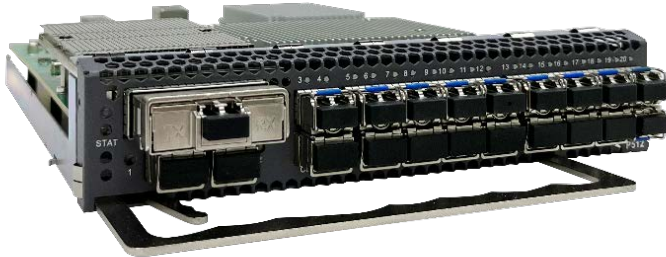● Suitable for 200G links in existing OTN/DWDM infrastructures

Product specification

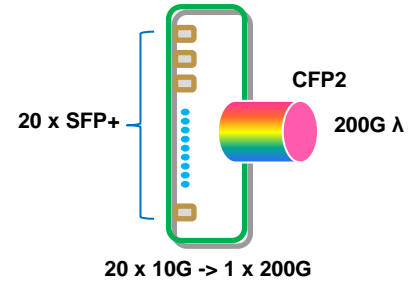| 200G MuxPonder (P514)	
Function	● Support 2x100G service signals mapping to 1 OTUC2 signal ● Support 1x100G + 10x10G service signals mapping to 1 OTUC2 signal
Slot number	2 slots
Line side	Supports 1 CFP2-DCO module hot-pluggable
Client side	Support 2 QSFP28, 10 SFP+ modules hot-pluggable
OTN function	● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=2, 2e, 4, C2) layer: support for PM and other functions. ● OTUk (k=C2) layer: support for SM functions
Wavelength tunable	The range covers 191.35 THz ~ 196.1thz, support 50GHz, 75 GHz and 100 GHz adjustable
Support service types	10GE, 100GE, 100GE FlexE(Unware), STM-64, 10GE WAN, OTU2, OTU4
Time delay measurement	Online delay measurement based on ODU layer
Loop back	Support line side and client side loopbacks
LLDP	Ethernet Support
Performance monitoring and alarm monitoring	● Support OTN performance monitoring and alarm monitoring ● Support temperature, current and power monitoring of optical module ● Support Ethernet RMON monitoring ● Support Telemetry

20*10G MuxPonder Service Card: P512

The 20*10G MuxPonder service card (P512) supports mapping the 20x10G optical signal received on the client side to a 1 OTUC2 signal and interconverting the OTUC2 signal with the optical signal of WDM wavelength in compliance with ITU-T standards. The line side adopts pluggable CFP2-DCO to realize ultra-long distance transmission based on advanced technologies such as coherent detection.

Product view

Function structure

20 x SFP+

CFP2

200G λ

20 x 10G -> 1 x 200G

Application case

● Suitable for transmission over metropolitan networks and long-distance networks up to 1000 km

● Suitable for high-capacity DCI network transmission for enterprises, campuses, cloud computing, etc.

● Suitable for 200G links in existing OTN/DWDM infrastructures

Product specification

200G MuxPonder (P512)	
Function	Support 20x10G service signal signals mapping to 1 OTUC2 signal
Slot number	2 slots
Line side	Supports 1 CFP2-DCO module hot-pluggable
Client side	Support 20 SFP+ modules hot-pluggable
OTN function	● Frame format and overhead handling using ITU-T G709 recommendations ● ODUk (k=2, 2e, 4, C2) layer: support PM and other functions ● OTUk (k=C2) layer: support SM functions
Wavelength tunable	The range covers 191.35 THz ~ 196.1thz, and supports 50GHz, 75 GHz and 100 GHz adjustable
Support service types	10GE, STM-64, 10GE WAN, OTU2
Time delay measurement	Online delay measurement based on ODU layer
Loop back	Support line side and client side loopbacks
LLDP	Ethernet Support
Performance monitoring and alarm monitoring	● Support OTN performance monitoring and alarm monitoring ● Support temperature, current and power monitoring of optical module ● Support Ethernet RMON monitoring ● Support Telemetry

Optical Transport System

⚡ Main System

Product Name	Model	Classify
CWDM / DWDM System	MuxPonder-5000-2	400G, 200G, 100G, 40G, 25G, 10G, 2.5G
DCI / OTN System	MuxPonder-5000-1	400G, 200G, 100G, 10G
5G Fronthaul WDM System	Semi-Active / Passive	25G, 10G
OLS Open Line System	MuxPonder-5000-OLS	Any
Integrated DWDM System	MuxPonder-5000 P	100G, 10G
Aggregation and Distribution System	ST-X48C6, ST32C	100G, 10G

Sub-system

Product Name	Model	Classify
Network Management System	OTNS2000	Web, NMS, GUI
Optical Amplifier System	OA, VOA	EDFA, OEO, Raman, SOA
Optical Protection System	OLP, OBP	1+1, 1:1
Optical Dispersion Compensation	DCM, TDCM	5~120km
Passive Mux / Demux System	TFF, AWG	4~ 96 CHs
OADM (Optical Add-Drop Multiplexer)	FOADM, ROADM	2 directions, 9 directions
Optical Monitoring	OCM, OTDR	Optical channel / line monitoring
Optical Transceiver		CFP2, QSFP28, QSFP+, SFP28, SFP+, SFP