

H9MO-LMXE

SDH/MSTP multiplexer



> Overview

H9MO-LMXE is a carrier-class, cost-effective, compact (only 3U high), STM-1/STM-4/STM-16 SDH/MSTP platform that is designed for application in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers.

H9MO-LMXE is a card based compact SDH equipment, designed mainly as a gateway node between the core SDH network and a number of remote CPE boxes. It may also be used as a multi service SDH ADM node in a typical ring or mesh network. The 3U high 19" wide chassis of the H9MO-LMXE has 19 slots, with 2 slots for the 1+1 power cards, 1 slot for network management card, 2 slots for network interface unit(NIU) cards, and 14 slots for local interface unit(LIU) cards.

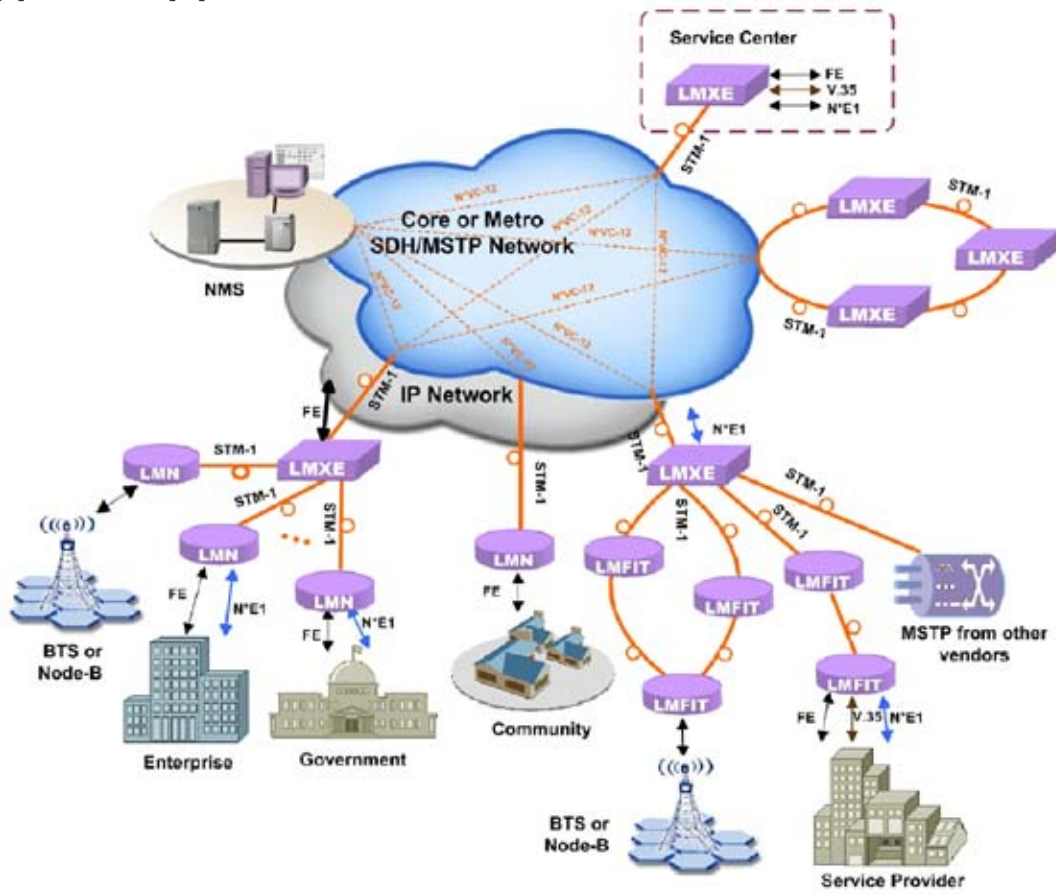
> Features

1. Support up to STM-1/STM-4/STM-16
2. Large cross-connect matrix capacity is 128*128 high order VC-4 cross connection or 2016*2016 VC-12 or 96*96 VC-3 level full cross connection
3. Support 1+1 MSP, SNCP protection
4. Management channel can be DCC/E1/VC12
5. Clocking mode supports: internal clock / external clock / line clock / clock holdover
6. Ethernet service supporting GFP encapsulation, VC12 virtual concatenation and LCAS, P VLAN and 801.1Q VLAN
7. E1 BER tester is embedded
8. Support up to 110 Ethernet over 8*E1 (EoPDH or EoE) remote CPEs
9. Support up to 756 Ethernet over 1*E1 (EoPDH or EoE) remote CPEs
10. Support up to 110 Ethernet over VC-12 (EoSDH or EoS) remote CPEs
11. Online upgrading
12. Full redundancy design

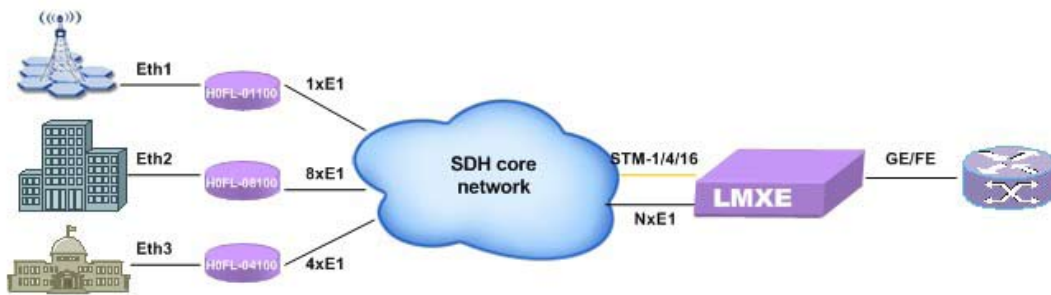
Technical Specifications

Index		Performance Parameter
Max	STM-1	4 aggregation + 28 tributary STM-1 optical interfaces
	STM-4	4 aggregation + 4 tributary STM-4 optical interfaces, SFP
	STM-16	4 aggregation STM-16 interface, SFP
Connector		SC/PC or FC/PC or SFP
Spec.	S-1.1, S1.2, L-1.1, L-1.2, S4.1, S4.2, L4.1, L4.2, S16.1, S16.2, L16.1, L16.2	
	Single fiber bi-directional interface can be optionally supported	
PDH interface	Max E1	336 E1
	Max E3/DS3	14 E3/DS3
Ethernet	Interface	10/100Base-Tx or 100Base-Tx, Comply with IEEE 802.3
	Max FE/FX Interface	56 FE ports (14 FE01 or FE02 cards support)
	Encapsulation	Comply with ITU-T G.7041 (VCAT, GFP, LCAS)
	GE(electrical/optical)	14 GE ports(14 GX01A/GX02A)
V.35	Max Interface	28 V.35 interfaces (framed or unframed) DCE/DTE
Cross-connect Capacity	Uplink STM-1	High order 20×20 VC-4s Low order 1260×1260 VC12s
	Uplink STM-4	High order 32×32 VC-4s Low order 32x32 VC-4s (2016×2016 VC-12s)
	Uplink STM-16	High order 128×128 VC-4s Low order 32x32 VC-4s (2016×2016 VC-12s)
Management	Interface	10/100 Base-T (can be cascaded)
EOW interface		Standard socket RJ11
Physical Dimension(H/D/W)		3U: 136 × 240 ×440 (mm)
Power	Supply	-48V DC / ~110 V AC/ ~220V AC
		Power redundancy supported
	Consumption	≤100W
	Cooling system	fan embedded
Environment	Temperature	0°C~50°C
	Humidity	≤90 %(non-condensing)
Weight		≤8 kg

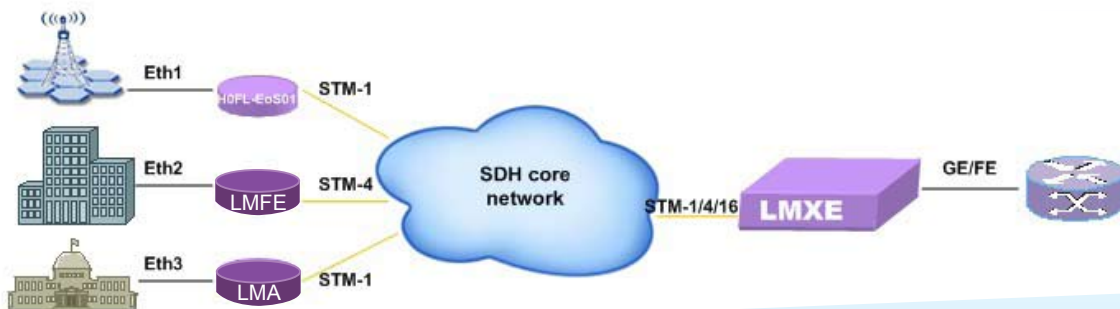
Typical Application



SDH ADM



EoE aggregation



EoS aggregation

NM02

Overview

NM02 card provides management to the operator. It can monitor and show the status of all cards and the remote equipment.

Features

1. 2 FE ports for management
2. The Ethernet port is 10/100Base-T auto
3. Default IP address is 192.192.4.2.
4. Support concatenation
5. Online upgrading



OX01

Overview

The OX01 card is one of the core units of the H9MO-LMXE.its interface capacity is 2 STM-1.It contains a large cross connect block and a clock block. It can be used to connect to the core network nodes or form a ring network of H9MO-LMXE.

Features

1. provide 2 STM-1 interface
2. VC4 and VC12 level cross connection
3. cross connects capacity: 20x20VC-4
4. 2 built-in E1 BER testers
5. Clock complies with ITU-T G.813. with one pair of external clock input and output on the backplane



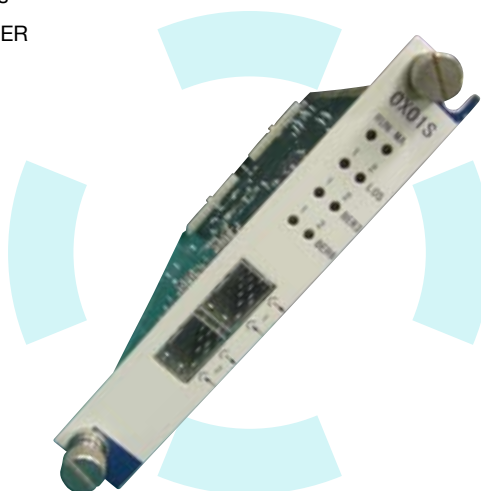
OX01S

> Overview

The OX01S card is one of the core units of the H9MO-LMXE. It has the function to connect STM-1 up interface, It's also provide cross-connect unit and SDH equipment clock unit. Every card provide Dual STM-1 SFP interface, used for backbone layer network SDH/MSTP connecting, aggregate every tributary 'service to uplink SDH signal ,The cross-connect matrix capacity is 20 VC-4, The type of cross-connect support unidirectional □bi-directional□multicast/broadcast □loopback. The cross-connect Support 1+1 protection. The OX01S cards has 2 built-in E1 BER testers.

> Features

1. 2 STM-1 SFP interfaces.
2. The OX01S card provides cross-connect unit and SDH equipment clock unit. The cross-connect matrix capacity is 20x20 VC-4.
3. Each OX01S card has 2 built-in E1 BER testers and 2 built-in E1 management channels. E1 BER testers and E1 management channels can be inserted by cross matrix.
4. The cross connection and clock units in the two aggregation cards can make of 1+1 protection.



OX04

> Overview

OX04 card is one of the core units of the H9MO-LMXE. A H9MO-LMXE may have up to 2 OX04 cards, providing 4 network sides STM-4 interfaces. They can either be used to connect to the core network nodes, or form a ring network of H9MO-LMXEs.

> Features

1. 2 STM-4 SFP interfaces
2. Support cross-connect and clock function
3. Built-in BER tester
4. The cross connects capacity of each OX04 card is 32x32VC-4 and 2016x2016VC-12
5. The cross connection and clock units in the two aggregation cards can make of 1+1 protection.



OX16

Overview

The OX16 card is one of the core units of the H9MO-LMXE. It has the function to connect STM-16 up interface, it also provides cross-connect unit and SDH equipment clock unit. Every card provide dual STM-16 SFP interfaces, used for backbone layer network SDH/MSTP connecting, aggregate every tributary service to uplink SDH signal. The cross-connect matrix capacity is 128x128 VC-4. The type of cross-connect supports unidirectional □bi-directional □multicast/broadcast and loop back. The cross-connect supports 1+1 protection. The OX16 card has 2 built-in E1 BER testers.

Features

1. 2 STM-16 SFP interfaces
2. The OX16 card provides cross-connect unit and SDH equipment clock unit.
3. The cross-connect matrix capacity is 128x128 VC-4.
4. Each OX16 cards has 2 built-in E1 BER testers and 2 built-in E1 management channels. BER testers and E1 management channels can be inserted by cross matrix.
5. The cross connection and clock units in the two aggregation cards can make of 1+1 protection.



EX01

Overview

The EX01 card is one of the core units of the H9MO-LMXE. Each EX01 card provides dual STM-1 electrical ports. At the same time, the cross connection and clock units in the two aggregation cards can make of 1+1 protection. Each EX01 cards has 2 built-in E1 BER testers and 2 built-in E1 management channels. E1 BER testers and E1 management channels can be inserted by cross matrix

Features

1. Each EX01 cards has 2 built-in E1 BER testers and 2 built-in E1 management channels. E1 BER testers and E1 management channels can be inserted by cross matrix.
2. The electrical port in EX01 adopts CC4 sockets; there are 4 LEDs, 4 BNC sockets on the panel.
3. Each EX01 card provides dual STM-1 electrical ports. At the same time, the cross connection and clock units in the two aggregation cards can make of 1+1 protection.



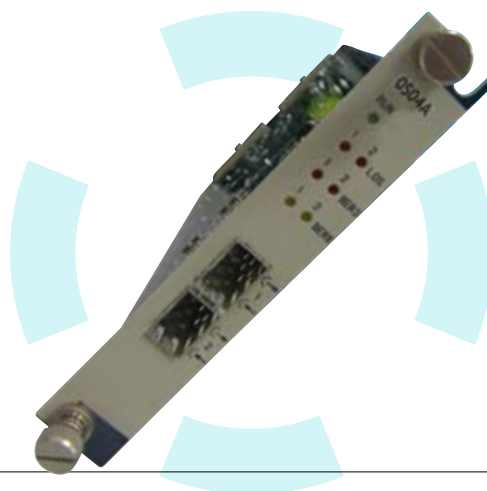
OS04A

➤ Overview

The OS04A card is a dual STM-4 fiber optical tributary card. It can be inserted into A type slots (slot 07 and slot 08). The 2 STM-4 fiber ports can connect to separate remote CPEs. They may act as east and west ports of an ADM node. There are local cross connect blocks at VC-12 and VC-4 levels.

➤ Features

1. provide 2 STM-4 SFP tributary interface
2. support MSP and SNCP 1+1 protection



OS01

➤ Overview

The OS01 card is a dual STM-1 fiber optic line card. It can be inserted into any of the 14 LIU slots. The 2 STM-1 fiber ports can connect to separate remote CPEs. They may act as east and west ports of an ADM node. There are local cross connect blocks at VC12 levels.

➤ Features

1. provide 2 STM-1 SC/FC tributary interface
2. support MSP and SNCP 1+1 protection
3. Default is SC/PC S1.1.
4. L1.1,L1.2, Single fiber Bi-Directional options are Available



OS01S

Overview

The OS01S card is a dual STM-1 fiber optic line card. It can be inserted into any of the 14 LIU slots. The different between OS01 and OS01S is that OS01S provides SFP interface but OS01 provides SC/FC interface. The 2 STM-1 fiber ports can connect to separate remote CPEs. They may act as east and west ports of an ADM node. There are local cross connect blocks at VC12 levels.

Features

1. provide 2 STM-1 SFP tributary interface
2. support MSP and SNCP 1+1 protection
3. Optical interfaces are decided by SFP



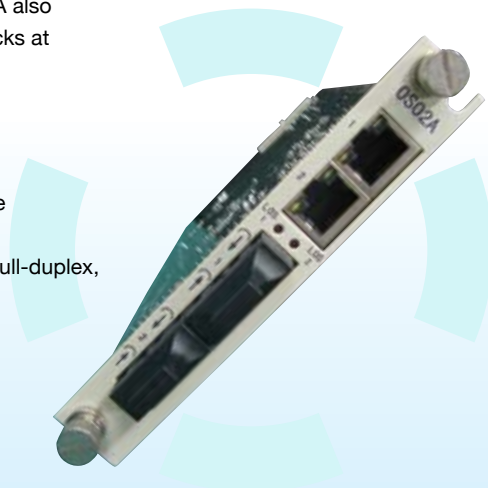
OS02A

Overview

The OS02A card is a dual STM-1 fiber optic line card. It can be inserted into any of the 14 LIU slots. The 2 STM-1 fiber ports can connect to separate remote CPEs. They may act as east and west ports of an ADM node. Besides the STM-1 interfaces, OS02A also provides 2 Ethernet ports. There are local cross connect blocks at VC12 levels.

Features

1. provide 2 STM-1 SC/FC tributary interface + 2 FE interface
2. support MSP and SNCP 1+1 protection
3. Ethernet port support auto-negotiated and manual 100M full-duplex, 100M half-duplex, 10M full-duplex, 10M half-duplex



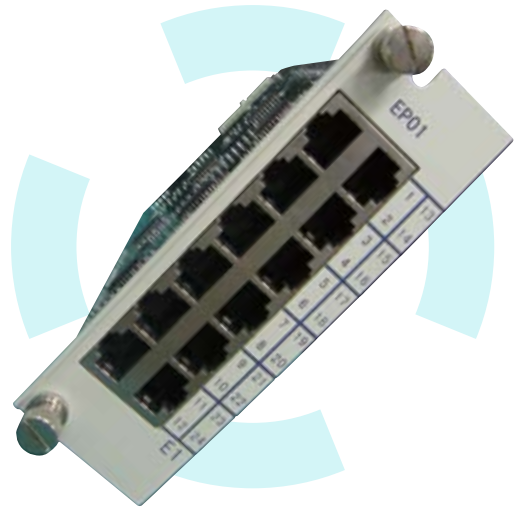
EP01

> Overview

The EP01 card is a PDH interface card with 24 E1 ports. This card occupies 2 service slots.

> Features

1. Each RJ45 connector provides 2xE1
2. Balanced or unbalanced



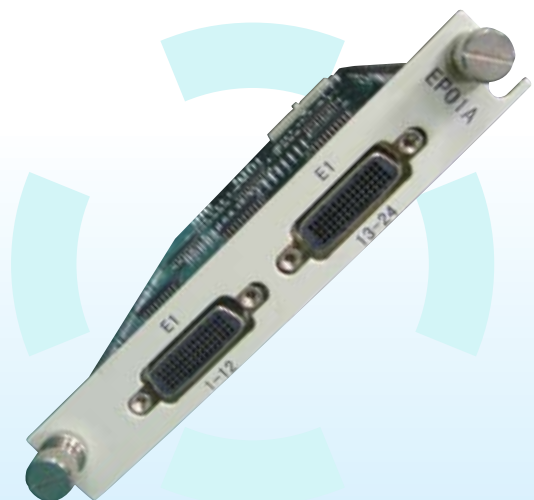
EP01A

> Overview

The EP01A card is a PDH interface card with 24 E1 ports. This card occupies 1 service slot.

> Features

1. DB-60 connector
2. Only 120Ω



EP02

Overview

EP02 is PDH interface card with E3/DS3 port which can provide one channel of E3 or DS3.

Features

1. E3/DS3 interface adopts 75Ω unbalance BNC or CC4 sockets
2. use the dip switch or software to select E3/DS3
3. only 75Ω



EP03

Overview

The EP03 card is a PDH interface card with 12 E1 ports. This card occupies 1 service slot.

Features

1. RJ45, each RJ45 connector provides 2xE1.
2. balanced or unbalanced



EP03A

➤ Overview

The EP03A card is a PDH interface card with 12 E1 ports. This card occupies 1 service slot.

➤ Features

1. DB-60 connector
2. Only 120Ω



FE01

➤ Overview

The FE01 card is used to provide Ethernet connection to the network through EoS(Ethernet over SDH/VC-12) technology. There are 4 100Base-Tx Ethernet ports on the card. Traffic from each Ethernet port is adapted to a separate VCG channel through VC-12 virtual concatenation.

➤ Features

1. 4 100/10Base-Tx Ethernet ports on the card.
2. Each Ethernet port is adapted to a separate VCG channel through VC-12LCAS
3. VLAN supported



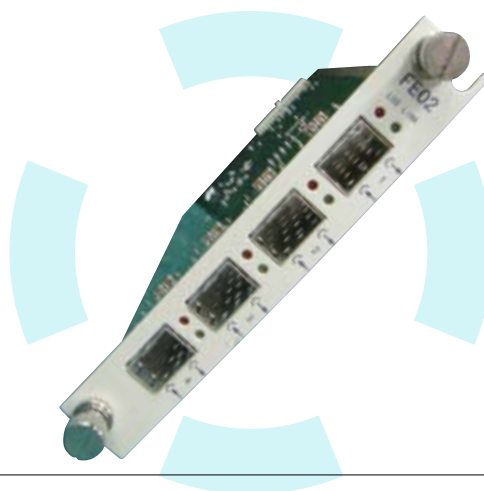
FE02

Overview

The FE02 card is used to provide Ethernet connection to the network through EoS (Ethernet over SDH) technology. There are 4 100Base-Fx Ethernet ports on the card, which are fiber based. It can connect to 100Base-Fx ports on other equipment, as well as to Fx port on a media converter. The Fx ports use pluggable SFP optical modules, so that the user can chose modules with required optical parameters.

Features

1. 4 100Base-Fx Ethernet ports on the card.
2. It can connect to 100Base-Fx ports on other equipment
3. The Ethernet ports can auto adapt to cable crossing with the link partners.
4. VLAN supported



FE04

Overview

EoS card FE04 accomplishes transmission Ethernet service via E1 channels, using private protocol. It can connect to 100Base-Tx ports on other equipment. In each channel Ethernet frame format will be converted into E1 frame format.

Features

1. 4 100Base-Tx Ethernet ports over 4 E1 channels
2. E1 channel bandwidth from 1 to 16 E1
3. VLAN supported



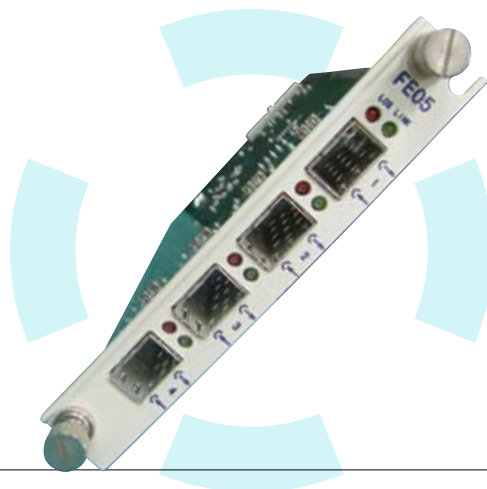
FE05

➤ Overview

EoE card FE05 accomplishes transmission optical Ethernet service via E1 channels, using private protocol. It can connect to 100Base-Fx ports on other equipment. In each channel Ethernet frame format will be converted into E1 frame format.

➤ Features

1. 4 100Base-Fx Ethernet ports over 4 E1 channels
2. E1 channel bandwidth from 1 to16 E1
3. VLAN supported



FE06

➤ Overview

EOS aggregation card FE06 has 2 100M Ethernet ports. It realizes Ethernet over SDH service aggregation and layer 2 switches. This card can be inserted into any universal slots of H9MO-LMXE. The card can fulfill the data switch between 8 internal virtual concatenation channels and 2 external interfaces.

➤ Features

1. 8 internal EOS aggregation channels, ratio 8:1
2. 2 100/10 Base-Tx interfaces
3. VLAN based on 802.1Q
4. Ethernet adopts GFP encapsulation,
5. LCAS supported
6. Auto-negotiation and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



FE07

Overview

EOE aggregation card FE07 has 2 100M Ethernet ports. It realizes Ethernet over E1 service aggregation and layer 2 switches. This card can be inserted into any universal slots of H9MO-LMXE. The card can fulfill the data switch between 8 internal virtual concatenation channels and 2 external interfaces.

Features

1. 8 internal EOE aggregation channels, ratio 8:1
2. Each channel supports to 8 E1
3. VLAN based on 802.1Q
4. Auto-negotiation and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



GX01

Overview

GE port aggregation type EOS card (GX01) is 10/100/1000M Ethernet Tx switch card, realizing Ethernet over SDH service aggregation and layer 2 switch of 6 Ethernet from backboard and 8 VCG accessed Ethernet data, to 1 GE port. GX01 can be inserted to Ethernet aggregation slot (slot 4 or 11) to get other slots Ethernet service aggregation and provide Ethernet management channel.

It can also be inserted into any universal slots other than slot4 or slot11 to provide 8 internal VCAT channels of Ethernet data aggregation to 1 GE port.

Features

1. 1 GE electrical port
2. 8 internal virtual concatenation channels support VC-12 VCAT, the total largest bandwidth can get 1 STM-1.
3. 8 internal VCAT channels can set VLAN, VLAN type could be selected based on ports or based on 802.1Q.
4. Ethernet adopts GFP encapsulation, providing GFP alarm. It supports LCAS.
5. Ethernet provides QoS guarantee
6. GE port in GX01 card supports 1000M auto-negotiated and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



GX02

> Overview

GE port aggregation type EOE card (GX02) is 10/100/1000M Ethernet Tx switch card, realizing aggregation and layer 2 switches of 1 or 6 external Ethernet services from backboard and 8 internal Ethernet accessed by several E1 channels, converging to 1 GE port. When the card is configured in Ethernet aggregation slot (slot 4 and 11), it support 6 aggregation side ports, fulfill other slots Ethernet services aggregation by backboard Ethernet bus to GX02 GE port. It could also be inserted to other universal slots to provide 8 Ethernet over E1 channels and 1 aggregation side port converge to 1 GE port.

> Features

1. 1 GE electrical port
2. The GX02 card provides 8 internal EOE Ethernet ports. The 8 internal EOE Ethernet's largest bandwidth can reach to 1xSTM-1.
3. Ethernet protocol adopted in GX02 is private, EOE encapsulation.
4. Ethernet package is encapsulated in N*E1 ($1 \leq N \leq 8$) in order to transmission Ethernet based on E1.
5. Bandwidth could be adjusted automatically by valid E1 channels
6. GE port in GX01 card supports 1000M auto-negotiated and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



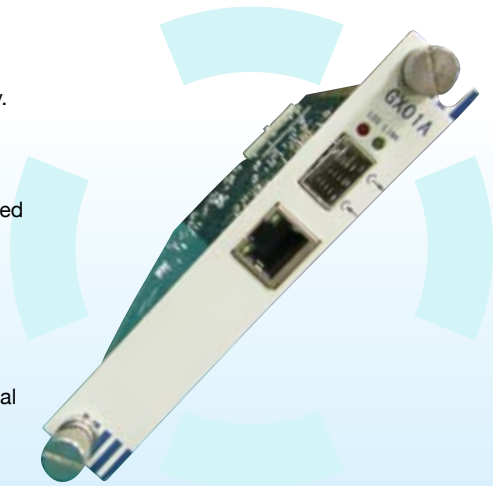
GX01A

> Overview

GX01A has one more GE optical SFP interface than GX01. It realizes Ethernet over SDH service aggregation and layer 2 switch of 6 Ethernet from backboard and 8 VCG accessed Ethernet data, to 1 GE port. GX01 can be inserted to Ethernet aggregation slot (slot4 or slot11) to get other slots Ethernet service aggregation and provide Ethernet management channel, it also can be inserted into any universal slots of H9MO-LMXE to provide 8 internal VCAT channels of Ethernet data aggregation to 1 GE port.

> Features

1. Electrical port and SFP optical port can not be used simultaneously.
2. 8 internal virtual concatenation channels support VC-12 VCAT, the total largest bandwidth can get 1 STM-1.
3. 8 internal VCAT channels can set VLAN, VLAN type could be selected based on ports or based on 802.1Q.
4. Ethernet adopts GFP encapsulation, providing GFP alarm.
5. support LCAS functions
6. Ethernet provides QoS guarantee.
7. GE port in GX01A card supports 1000M auto-negotiated and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



GX02A

Overview

GX02A has one more GE optical SFP interface than GX02. It realizes aggregation and layer 2 switches of 1 or 6 external Ethernet services from backboard and 8 internal Ethernet accessed by several E1 channels, converging to 1 GE port. When the card is configured in Ethernet aggregation slot (slot 4 and 11), it support 6 aggregation side ports, fulfill other slots Ethernet services aggregation by backboard Ethernet bus to GX02 GE port. And it also could be inserted to other universal slots to provide 8 Ethernet over E1 channels and 1 aggregation side port converge to 1 GE port.

Features

1. Electrical port and SFP optical port can not be used simultaneously.
2. The GX02 card provides 8 internal EOE Ethernet ports. The 8 internal EOE Ethernets' largest bandwidth can reach 1 STM-1.
3. Ethernet protocol adopted in GX02 is private, EOE encapsulation.
4. Ethernet package is encapsulated in N*E1 ($1 \leq N \leq 8$) in order to transmission Ethernet based on E1..
5. Bandwidth could be adjusted automatically by valid E1 channels
6. GE port in GX01 card supports auto-negotiated and manual 100M full-duplex, half-duplex, 10M full-duplex and half-duplex.



ED01

Overview

Card ED01 provides dual V.35 ports, which can be inserted in any one of the 14 universal slots

Features

1. 2xV.35 Card(framed or unframed)
2. DB-25 connector
3. The work mode and bandwidth of V.35 port can be set by NMS and dip switches



DX01

➤ Overview

DX01 card can support VC-4, VC-3 level complete cross of 20 STM-1, and VC-12 level complete cross of 32 STM-1. It provides the cross connection and concatenation of VC12, VC3, VC4 level channels between all tributary cards and cross connection cards. There is one clock input and one clock output channel in the built-in SDH equipment clock units complied with ITU-T G.813. The clock interfaces are located in backboard, or from OW/Overhead card front panel. It supports 2Mbit and 2MHz two kinds of clock mode.

Each DX01 card has 2 built-in E1 BER tester, they can test the of tributary optical uplink (aggregation side) and downlink (tributary side) simultaneously. Each SDH cross connection also can be built in 2 E1 monitor channel to transmit management information. E1 BER tester and E1 monitor channel can be inserted by cross matrix.

➤ Features

1. Capability : VC-4 level 20xSTM-1, VC-12 level 32xSTM-1
2. Clock module embedded
3. 2 built-in E1 BER tester



DX02

➤ Overview

Card DX02 include 64kbps timeslot cross matrix, which can realize the 30(not include timeslot 16th) or 31 (include timeslot 16th) 64kbps time slot cross connection of each E1 in 63 E1

➤ Features

1. Full 64E1 DS0 cross connection (2048×2048 64k)
2. For the framed E1 channel adopted CAS, the 16th time slot can realize signaling cross connection automatically.
3. For the framed E1 channel adopted CCS, the 16th time slot also can be set to transmit data, realizing cross connection.



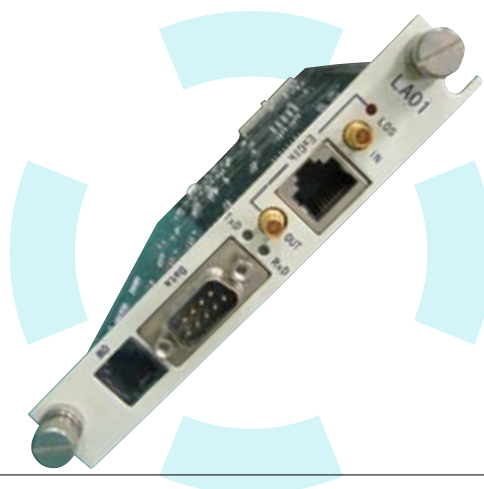
LA01

➤ Overview

LA01 can be configured order wire telephone, other overhead pass and external clock input interface. LA01 adopts 64 kbit/s PCM code, providing order wire telephone functions, supporting ordinary dial-up telephone calls, providing electricity and telephone Ling flow. LA01 can provide users access byte F1 overhead access, providing 64 kbps data voice access road, reserved for users for the purpose of the provisional safeguard official contact.

➤ Features

1. supporting ordinary dial-up telephone calls
2. providing electricity and telephone Ling flow
3. provide users access byte F1 overhead access
4. interface mode RS232
5. clock port 75Ω or 120Ω



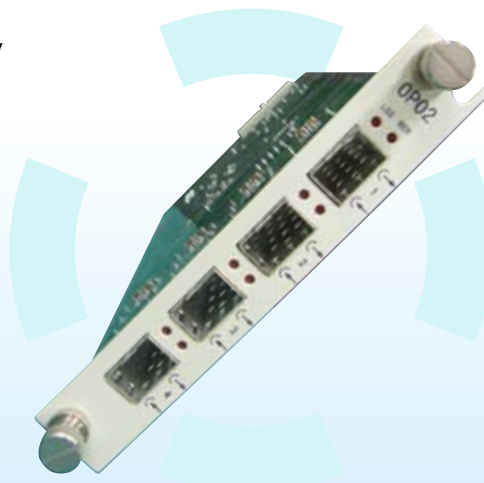
OP02

➤ Overview

OP02 is a PDH tributary card. It has 4 PDH optical ports. Each port provides 2xE1 or 1xE1+1xV3.5. OP02 tributary card can be inserted in the 14 universal slots.

➤ Features

1. This card can built network as point to point, star topology
2. provide 2xE1 or 1xE1+1xV3.5 service
3. PDH tributary card with SC connector, FC optional
4. 4 optical interfaces connected 4 remote PDH sites.
5. Remote site is Huahuan H10MOS-60 or H10MOS-60AF



OP03

> Overview

OP03 is a PDH tributary card with 2 PDH optical ports. (SC connector FC optional). Each port supports 2×E1+1×100Base-Tx PDH interface. Ethernet interface mode can be set to auto-negotiated, manual 100M full duplex, 100M half duplex, 10M full duplex, 10M half duplex. OP 03 tributary card can be inserted in the 14 universal slots

> Features

1. remote site is Huahuan PDH H10MOS-60BW
2. H10MOS-60BW has 2×E1+1×100Base-Tx PDH interface
3. 2 optical ports, each port supports 1x H10MOS-60BW
4. This card can built network as point to point, star topology
5. PDH tributary card with SC connector, FC optional



OP05

> Overview

OP05 is a PDH tributary card with 2 PDH optical ports. (SC connector FC optional).Each optical port supports 4E1+FE. Ethernet interface mode can be set to auto-negotiated, manual 100M full duplex, 100M half duplex, 10M full duplex, 10M half duplex. OP 05 tributary card can be inserted in the 14 universal slots.

> Features

1. remote site is Huahuan PDH H10MO-120B
2. each H10MO-120B has 4E1+FE
3. 2 optical ports, each port supports 1x H10MO-120B
4. This card can built network as point to point, star topology
5. PDH tributary card with SC connector, FC optional



OP06

➤ Overview

OP06 is a PDH tributary card with 2 PDH optical ports. (SC connector FC optional) Ethernet interface mode can be set to auto-negotiated, manual 100M full duplex, 100M half duplex, 10M full duplex, 10M half duplex. OP 06 tributary card can be inserted in the 14 universal slots.

➤ Features

1. Remote site is Huahuan PDH H10MO-120+
2. Each H10MO-120+ has 1x4E1 PDH interface
3. 2 optical ports, each port supports 1xH10MO-120+
4. This card can built network as point to point, star topology
5. PDH tributary card with SC connector, FC optional

