# Product Catalog

Beijing Huahuan Electronics Co.,Ltd.

Huahuan

# Introduction

## Beijing Huahuan Electronics

Founded in 1989, Huahuan is a hi-tech company with majority holdings by Tsinghua University, listed in China Shenzhen Stock Exchange in 2006, named “Huahuan Electronics”, coded “430009”.
Our R&D objective is to satisfy customer needs using the latest technologies. We invest over 10% of our revenue into R&D. Our emphasis is on timely response and prompt delivery to market requirements.
In the past several years, Huahuan pushed into internationals markets. We have successfully participated in CommunicAsia in Singapore, EXPO COMM MEXICO in Mexico, CEBIT in Germany, ITU-T Expo in HongKong, SVIAZ/EXPO COMM MOSCOW in Russia. Huahuan’s products are getting more and more deployment in overseas telecom carriers and private network operators.
Huahuan successfully obtained ISO9001:2000 in June, 1998 and was granted CE certificate for STM-1 ADM Mux, Ethernet to E1 converter, TDM over IP mux, etc.. All of our products have been granted Network Access Licenses issued by the Ministry of Information Industry (MII) of P.R.China.
Huahuan was appraised as

“Top 10 Chinese Most Competitive Optical Transmission and Network Access Equipment Manufacturing Enterprises” in 2007, 2008 and 2009;
“Top 50 Hi-Tech Companies” in 2006;
“100 Successful Solutions in China Communication Industry” in 2004;
“Top 10 New-tech Companies in China Communication Industry” in 2003; “Excellent New-tech Company of Zhongguancun Science Park” in 2000.

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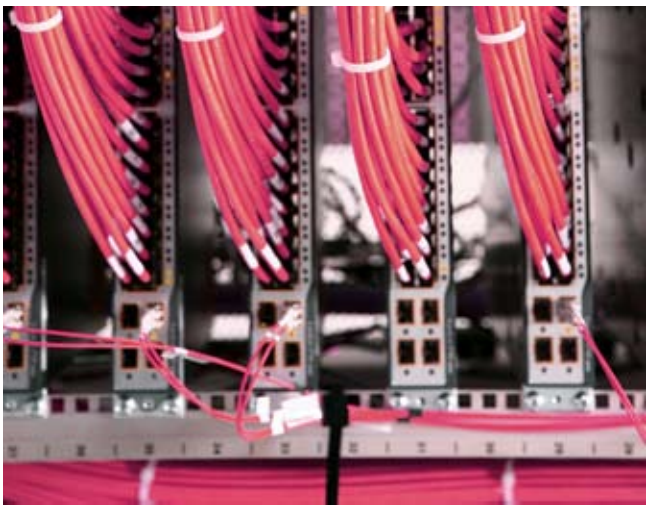

**We offer complete solution for metro and access network. Now Huahuan's products portfolio includes:**

- SDH MSPP Multiplexer
- PDH Fiber Transmission Equipment
- Ethernet over TDM
- Media Converter & Converter Pool
- Ethernet over Fiber
- PCM Multiplexer/FOM, etc.
- TDM over IP

# Contents

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# 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.

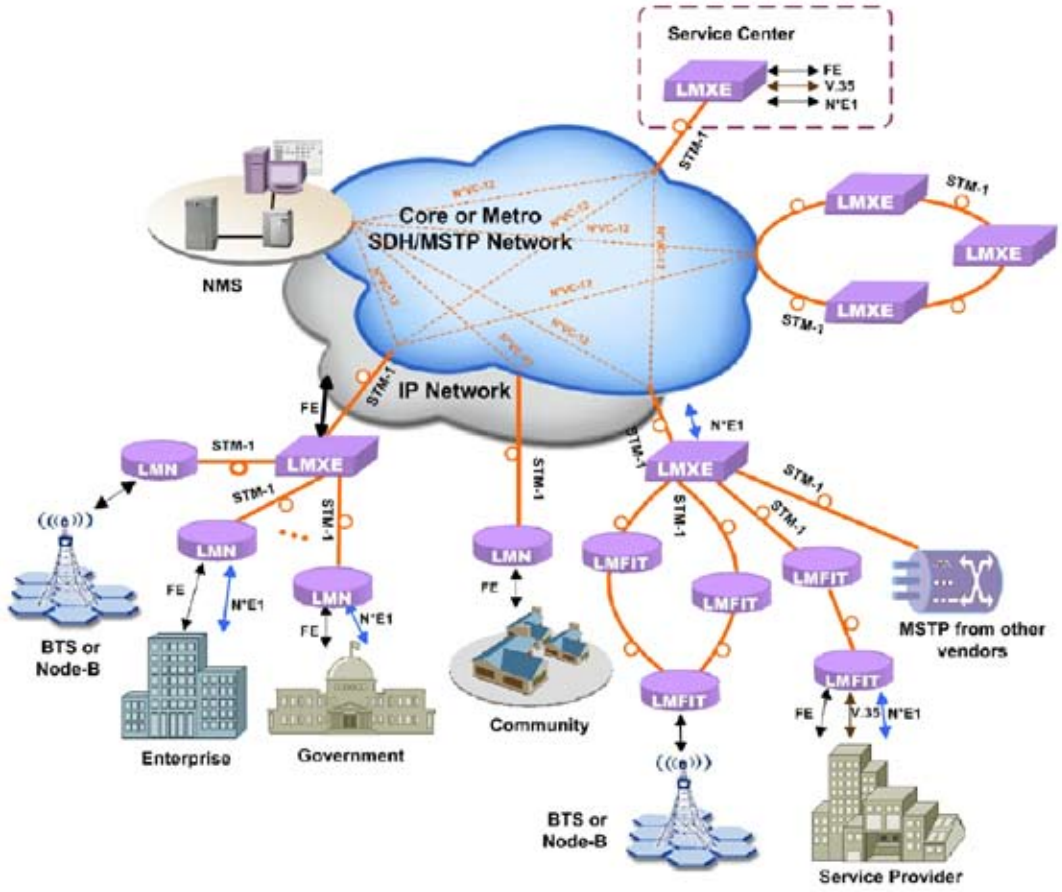
## Features

1. Support up to STM-1/STM-4/STM-16
2. Large cross-connect matrix capacity is 96*96 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

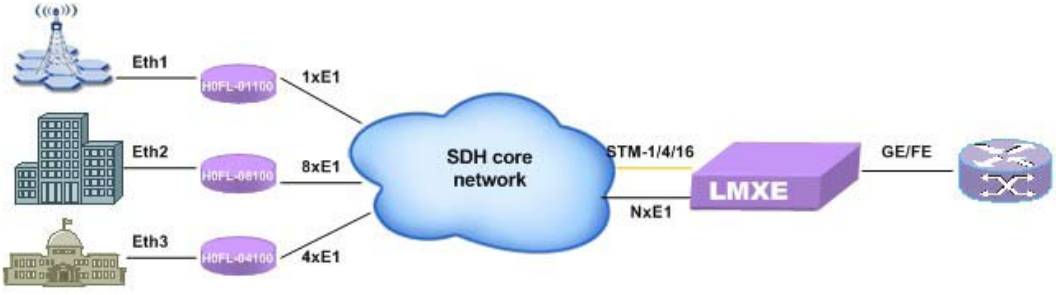
# Technical Specifications

| 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<br>Low order 1260×1260 VC12s |
| | | Uplink STM-4 | High order 32×32 VC-4s<br>Low order 2016×2016 VC-12s |
| | | Uplink STM-16 | High order 96×96 VC-4s<br>Low order 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 |

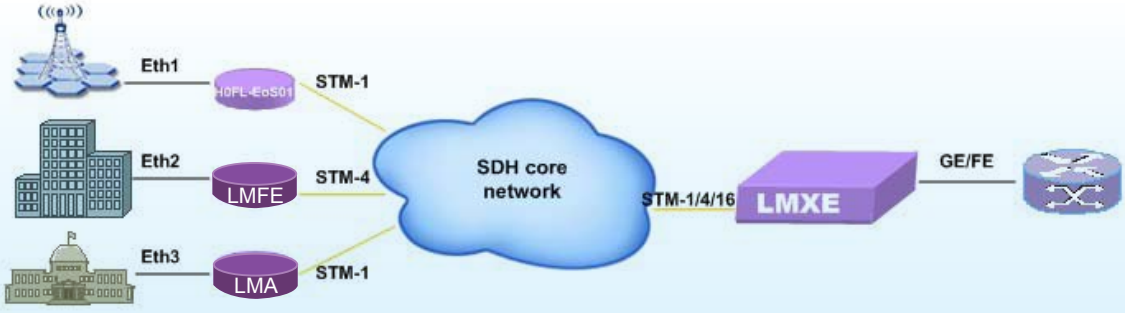
# Typical Application




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.

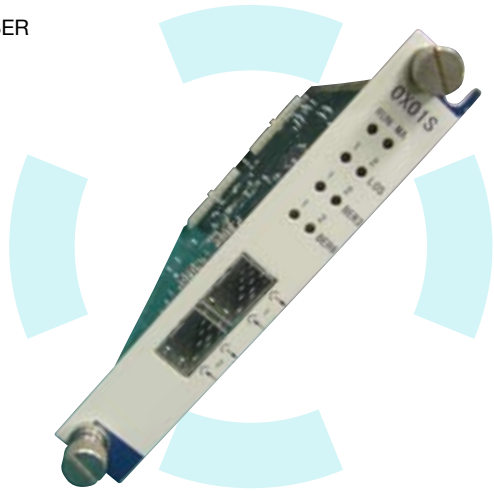
## Features

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 96x96 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 96x96 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

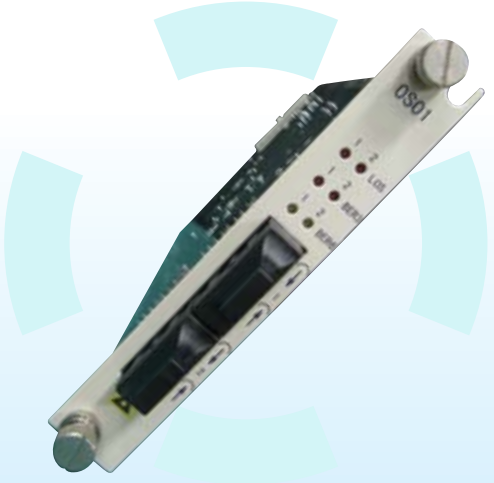

# OS01

## 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

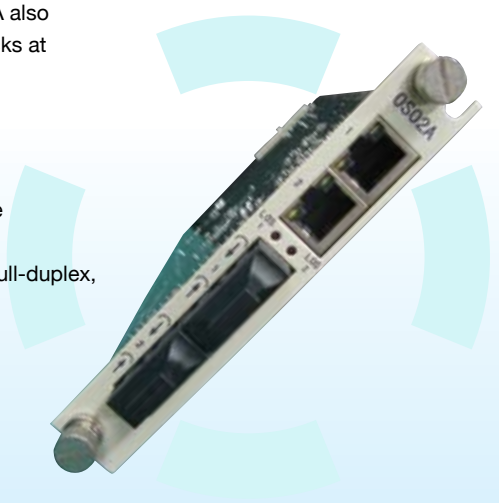

# OS02A

## 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



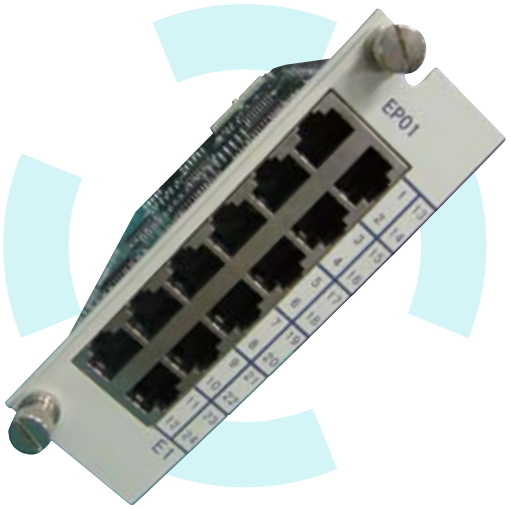
# EP01

## 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

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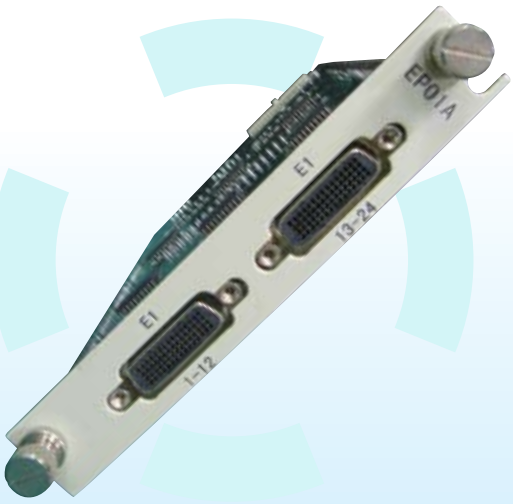
# EP01A

## 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



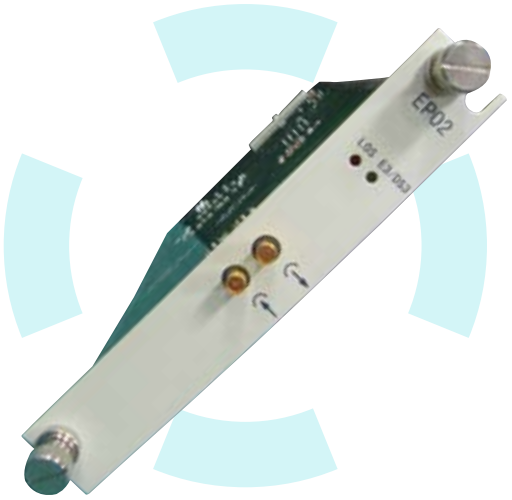
# EP02

## 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

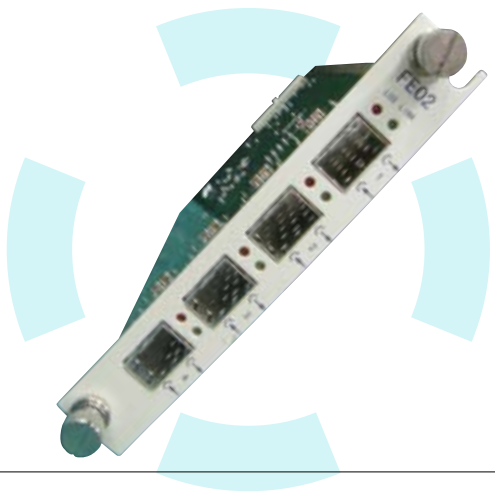
# FE02

## 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

EoE 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 to16 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 Ethernets' 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≤N≤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.

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# 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≤N≤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. 2×V.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.

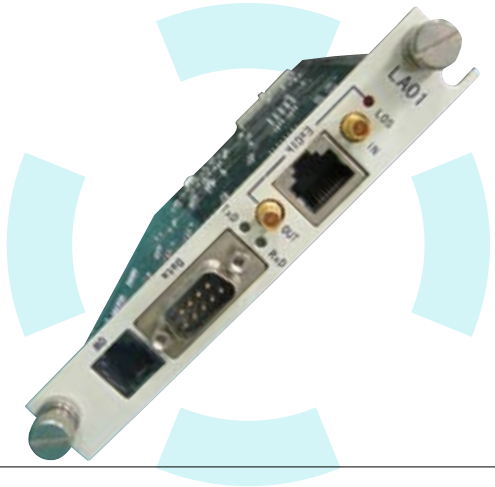
# LA01

## 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



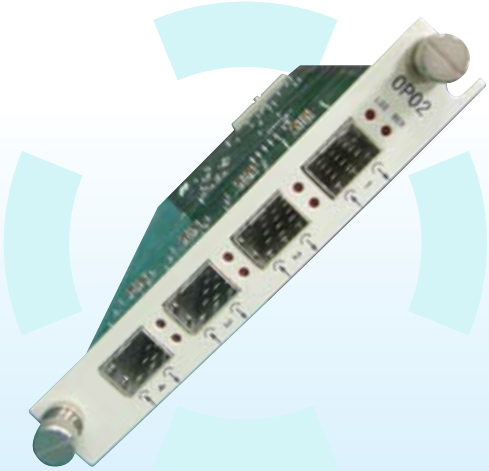

# OP02

## Overview

OP02 is a PDH tributary card. It has 4 PDH optical ports. Each port provides 2xE1 or 1xE1+1xV.35. OP 02 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

# H9MO-LMFE

## SDH MSTP Multiplexer

## Overview

H9MO-LMFE is a carrier-class, cost-effective, compact (only 1U high), STM-1/STM-4/STM-16 SDH/MSPP 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. It is a mini type of H9MO-LMXE. It can use all cards of H9MO-LMXE.

H9MO-LMFE 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 1U high 19” wide chassis of the H9MO-LMFE has 8 slots, with 2 slots for the DC(1+1)/AC power supply, 1 slot for network management card, 1 slots for STM-1/STM-4 /STM-16 uplink, and 4 slots left for services (STM-1/ STM-4/STM-16, Ethernet, E1, E3/DS3,V.35 Etc.).

## Features

1. Support 1+1 MSP, SNCP protection
2. Management channel can be DCC/E1/VC12
3. Support up to STM-16
4. E1 BERT test is embedded
5. 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. Large cross-connect matrix capacity is 96*VC-4 VC-4 level full cross connection or 32*VC-4 VC-12 or VC-3 level full cross connection
8. 32 remote site’s Ethernet over 8*E1 aggregation
9. 132 remote site’s Ethernet over 1*E1 aggregation
10. 32 Ethernet over SDH aggregation

# Technical Specifications

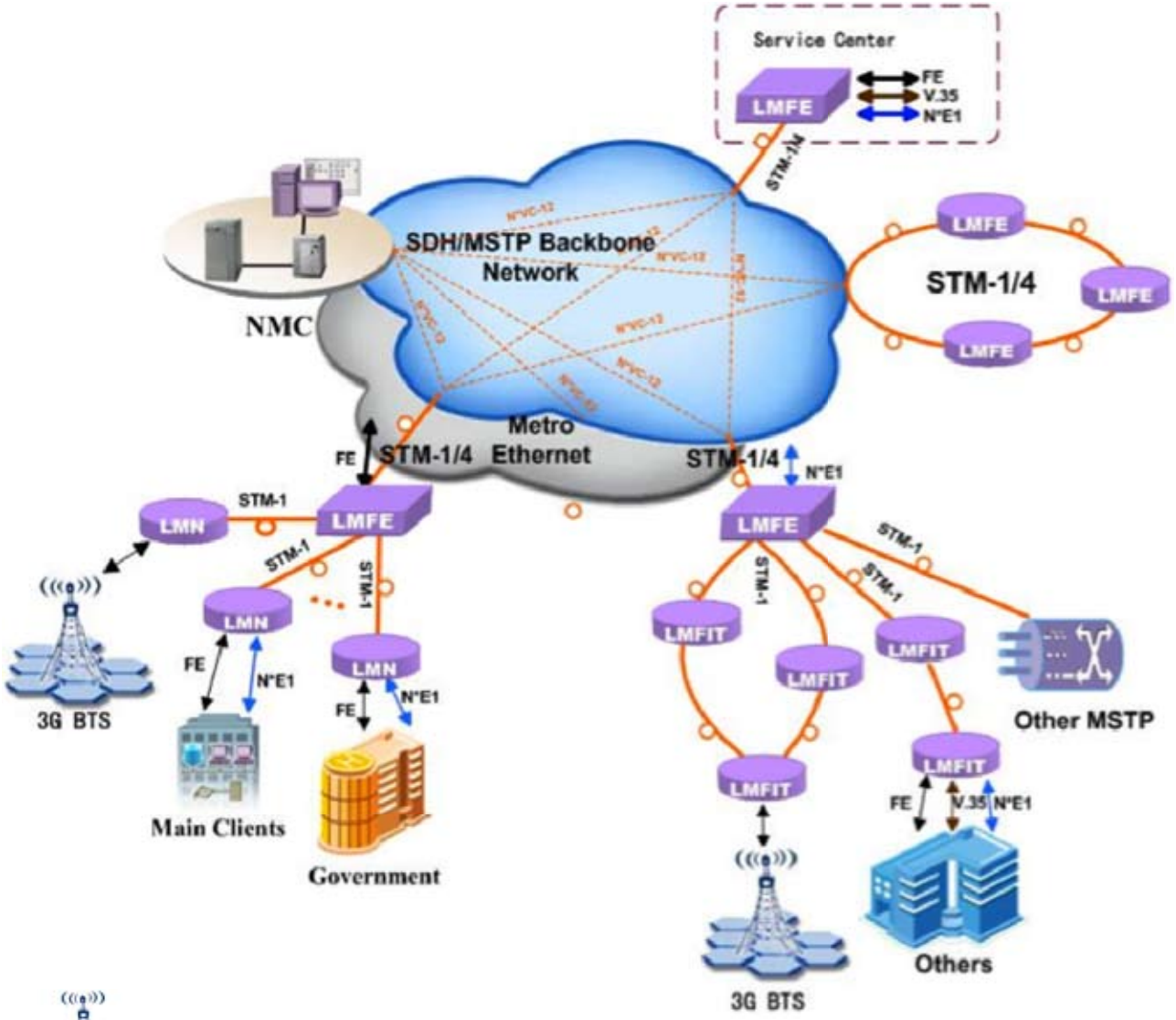
| Index | | | Performance Parameter |
|---|---|---|---|
| SDH Interface | Max | STM-1 | 2 aggregation + 8 tributary STM-1 optical interfaces |
| | | STM-4 | 2 aggregation STM-4 optical interfaces, SFP |
| | | STM-16 | 2 aggregation STM-16 interface, SFP |
| | Connector | | SC/PC or SFP |
| | Spec. | | 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 |
| Service Card | PWR01 | | DC-48V power card, 1+1 backup |
| | PWR02A | | Power Card ~220V AC |
| | PWR02B | | Power Card ~110V AC |
| | NM02 | | EMS Management Card |
| | OX01 | | Dual STM-1 aggregation optical card |
| | OX01S | | Dual STM-1 aggregation optical card |
| | OX04 | | Dual STM-4 aggregation optical card |
| | OX16 | | Dual STM-16 aggregation optical card |
| | EX01 | | Dual STM-1 aggregation electrical card |
| | OS01 | | Dual STM-1 tributary optical card, SC or FC |
| | OS01S | | Dual STM-1 tributary optical card, SFP |
| | OS02 | | 2 Ethernet +Dual STM-1 tributary optical card |
| | OS02A | | 2 separate Ethernet +Dual STM-1 tributary optical card |
| | OS03 | | 1 Ethernet +Single STM-1 tributary optical card |
| | OS04A | | Dual STM-4 tributary optical card |

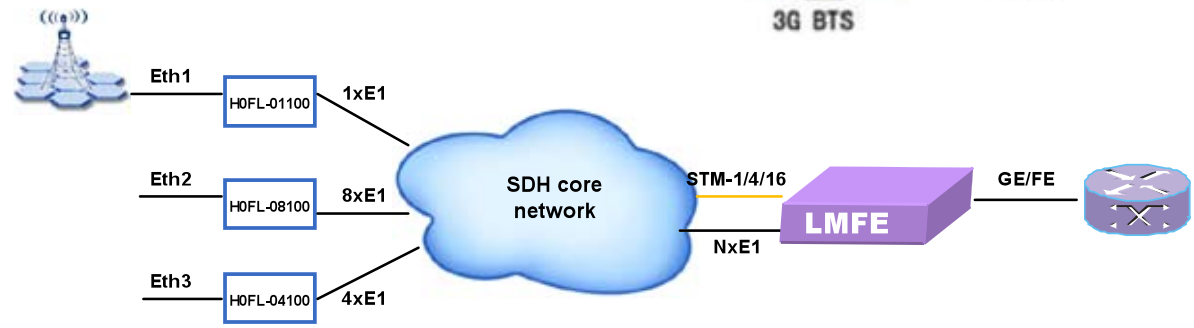
# Technical Specifications

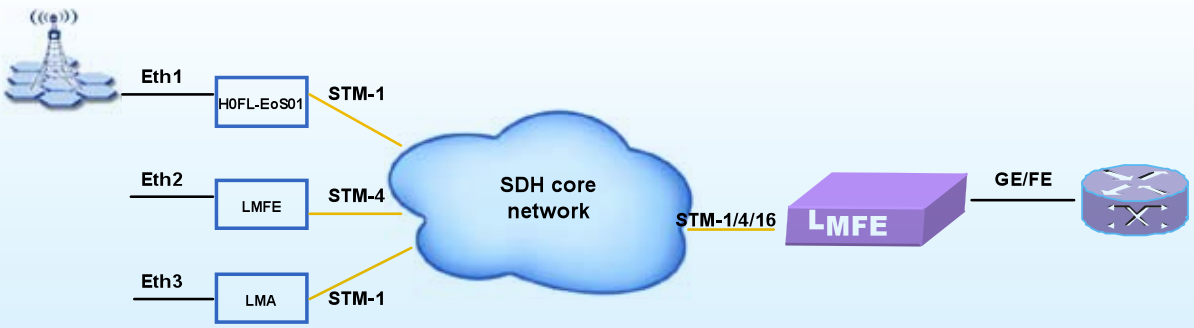
| Index | | Performance Parameter |
|---|---|---|
| Service Card | OP02 | 2×E1+1×V.35 PDH card |
| | OP03 | 2×E1~1×100Base-Tx PDH card |
| | OP05 | 4×E1~1×100Base-Tx PDH card |
| | OP06 | 4×E1 PDH card |
| | EP01 | 24×E1 (75Ω or 120Ω RJ45, occupies 2 slots) |
| | EP01A | 24×E1 (120Ω, DB60) |
| | EP03 | 12×E1 (75Ω or 120Ω RJ45) |
| | EP03A | 12×E1 (120Ω, DB60) |
| | EP02 | 1×E3/DS3 |
| | FE01 | 4 FE over 4 VCG trunks (EoS) |
| | FE02 | 4 Fx over 4 VCG trunks (EoS), SFP |
| | FE04 | 4 FE over 1~16E1 (EoE) |
| | FE05 | 4 Fx over 1~16E1 (EoE), SFP |
| | FE06 | Ethernet aggregation, EOS, aggregation ratio: 8:2, dual FE ports |
| | FE06A | Ethernet aggregation, EOS, aggregation ratio: 4:1, single FE port |
| | FE07 | EOE, Ethernet aggregation, aggregation ratio: 8:2, dual FE ports |
| | GX01 | EOS, Ethernet aggregation, aggregation ratio: 8:1, single GE port |
| | GX01A | EOS, Ethernet aggregation, aggregation ratio: 8:1, single GE electrical or optical port |
| | GX02 | EOE, Ethernet aggregation, aggregation ratio: 8:1, single GE port |
| | GX02A | EOE, Ethernet aggregation, aggregation ratio: 8:1, single GE electrical or optical port |
| | ED01 | 2×V.35 Card(framed or unframed) |
| | DX01 | VC-4/VC-3/VC-12 level cross connection |

| Index | | Performance Parameter |
|---|---|---|
| Service Card | DX02 | Full 64E1 DS0 cross connection (2048×2048,64K) |
| | LA01 | Order wire and external clock card |
| | DSL01 | 1 FE over VC-12 + 1 Digital subscriber line access |
| PDH interface | Max E1 | 96 E1 |
| | Max E3/DS3 | 4 E3/DS3 |
| Ethernet | Interface | 10/100Base-Tx or 100Base-Tx, Comply with IEEE 802.3 |
| | Max FE Interface | 16 FE ports (4 FE01 or FE02 cards support) |
| | Encapsulation | Comply with ITU-T G.7041 (VCAT, GFP, LCAS) |
| 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<br>Low order 1260×1260 VC12s |
| | Uplink STM-4 | High order 32×32 VC-4s<br>Low order 2016×2016 VC-12s |
| | Uplink STM-16 | High order 96×96 VC-4s<br>Low order 2016×2016 VC-12s |
| Management | Interface | 10/100 Base-T (can be cascaded) |
| EOW interface | | Standard socket RJ11 |
| Physical Dimension(H/D/W) | | 1U: 440 × 44 ×280 (mm) |
| Power | Supply | -48V DC or dual power supply |
| | Consumption | ≤40W |
| Environment | Temperature | 0°C~50°C |
| | Humidity | ≤90 %(non-condensing) |
| Weight | | ≤3.5KG |

# Typical Application



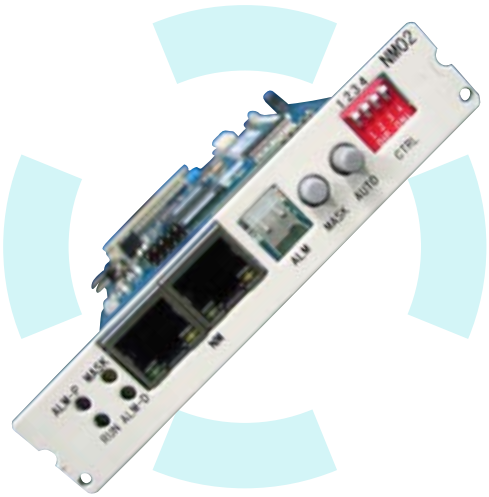
## Service cards

H9MO-LMFE and H9MO-LMXE use the same service cards.

# NM02

## Overview

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



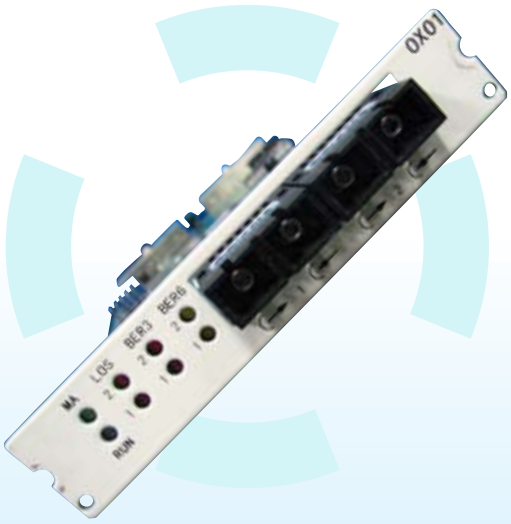

## Features

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-LMFE.




## 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

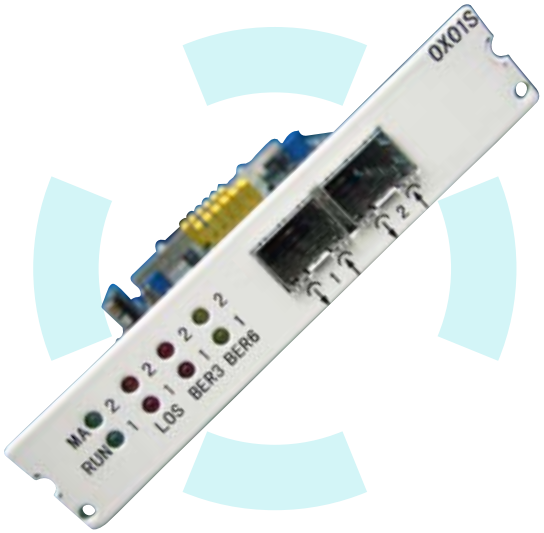
# OX01S

## Overview

The OX01S card is one of the core units of the H9MO-LMFE.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 card 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.

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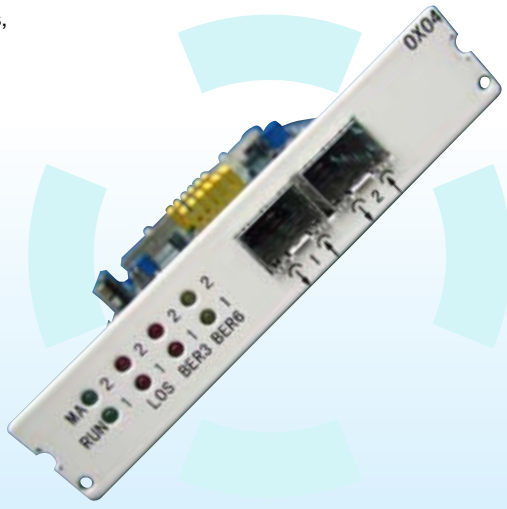
# OX04

## Overview

OX04 card is one of the core units of the H9MO-LMFE. It has two SFP interfaces for STM-4. It should be inserted to the aggregation slot. OX04 can either be used to connect to the core network nodes, or form a ring network of H9MO-LMFEs.

## 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-LMFE.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 96x96 VC-4. It supports VC-4/VC-3/VC-12 level cross connection. 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 96x96 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.

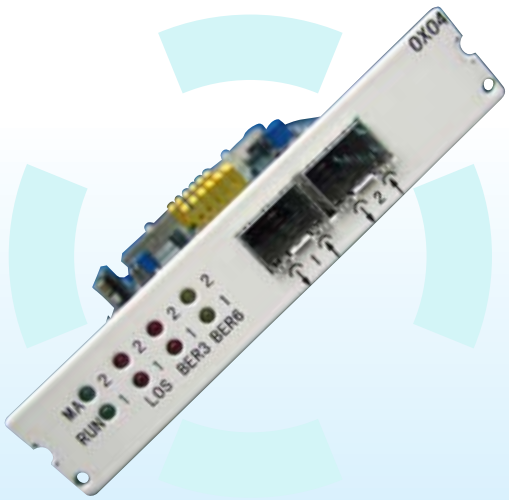

# EX01

## Overview

The EX01 card is one of the core units of the H9MO-LMFE.Each EX01 card provides dual STM-1 electrical interfaces. 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 04). Each H9MO-LMFE can insert 1 OS04A. 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 4 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 4 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.

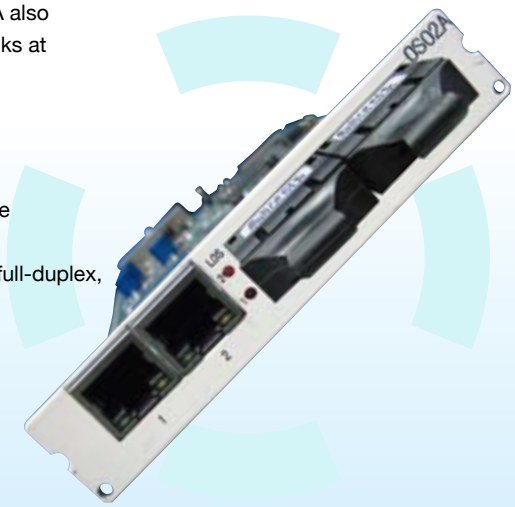

## Features

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 4 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

# EP01A

## Overview

The EP01A card is a PDH interface card with 24 E1 ports. This card occupies 1 service slot. The connector is DB60.

## Features

1. Each card has two DB-60 sockets
2. Each DB-60 socket provide 12 E1
3. Only 120Ω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# 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. Each card has 1 DB-60 connector
2. The DB-60 connector provides 12 E1
3. Only 120Ω

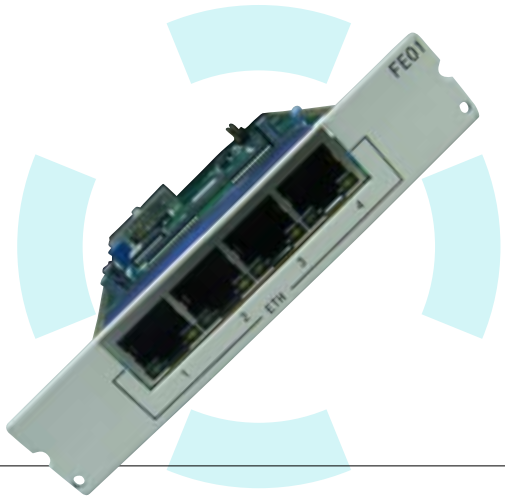
# FE01

## 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



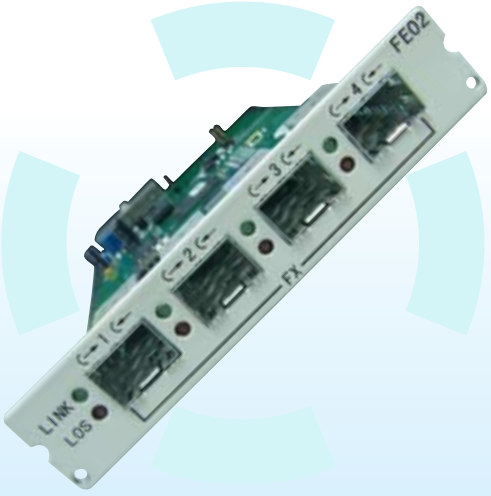

# FE02

## 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



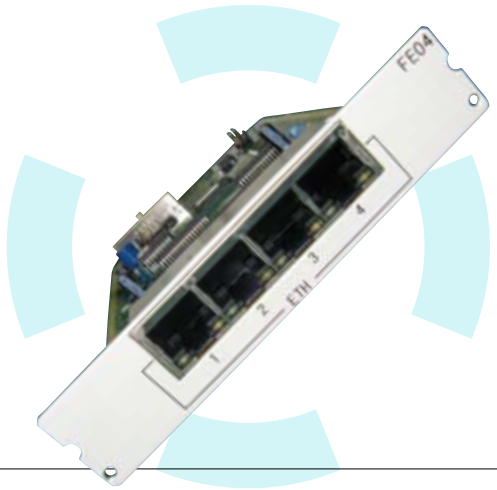
# FE04

## Overview

EoE 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 to16 E1
3. VLAN supported



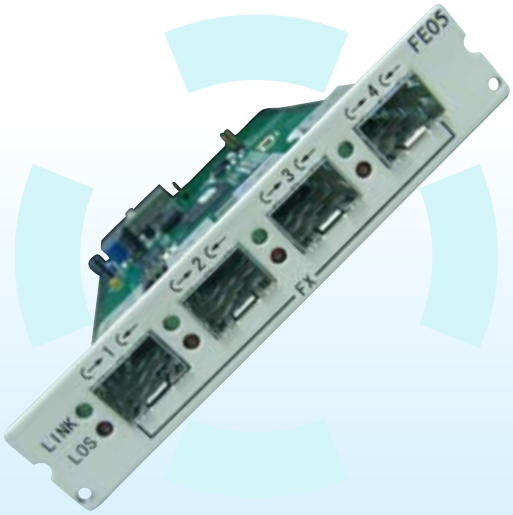

# FE05

## 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

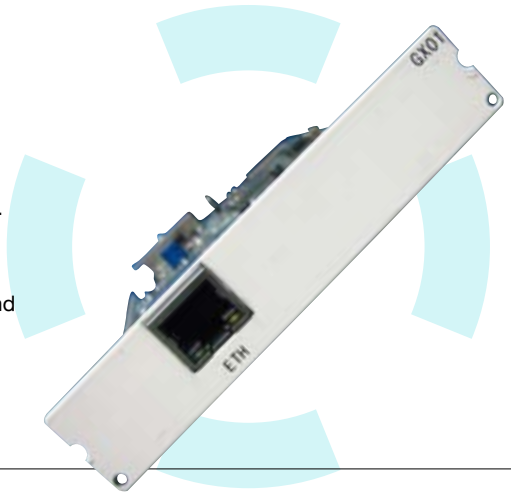
## Overview

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 3) to get other slots Ethernet service aggregation and provide Ethernet management channel.

It can also be inserted into any universal slots other than slot3 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

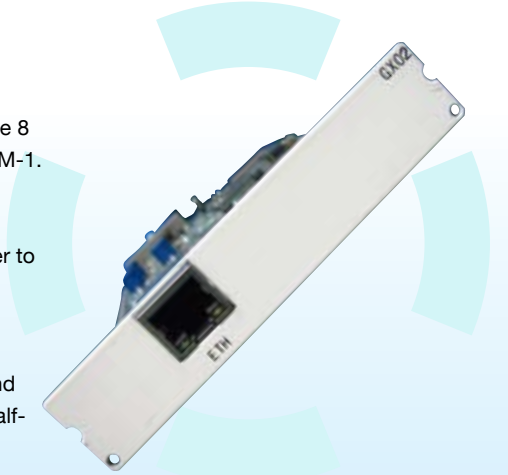
## Overview

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 3), 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 Ethernets' 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≤N≤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 (slot3) to get other slots Ethernet service aggregation and provide Ethernet management channel, it also can be inserted into any universal slots of H9MO-LMFE 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.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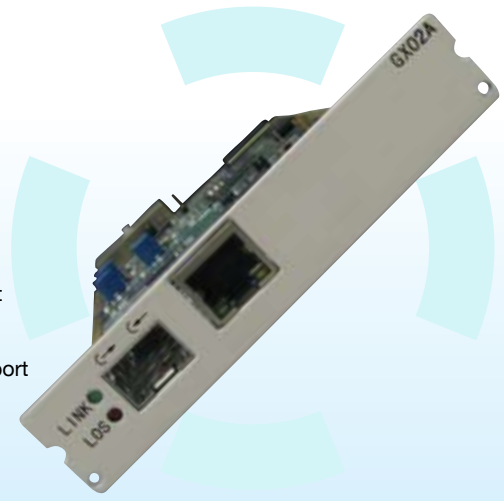
# GX02A

## 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 3), 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 cannot 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≤N≤8) in order to transmission Ethernet based on E1..
5. Bandwidth could be adjusted automatically by valid E1 channels

GE port in GX01 card supports auto-negotiated and manual 100M full-duplex, half-duplex, 10M full-duplex and ha

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# ED01

## Overview

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

## Features

1. 2×V.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 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

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# 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.

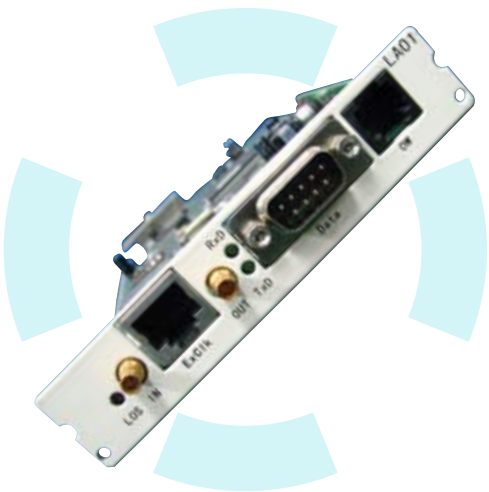
# LA01

## 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



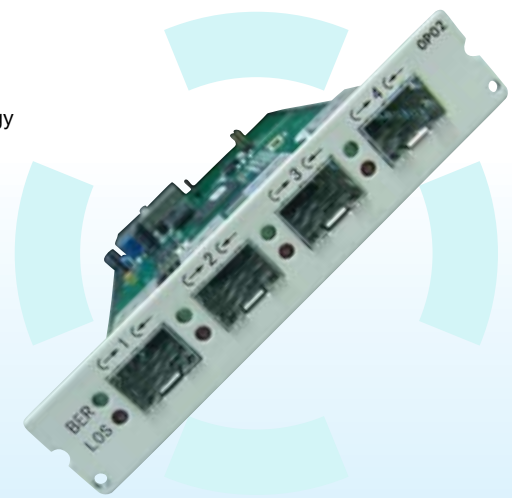

# OP02

## Overview

OP02 is a PDH tributary card. It has 4 PDH optical ports. Each port provides 2xE1 or 1xE1+1xV.35. OP 02 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

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# 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.

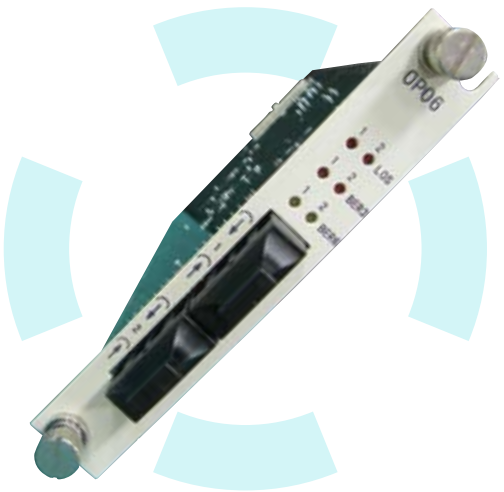

## Features

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. 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

## Ordering Information

| Type | Description |
|---|---|
| H9MO-LMFE.BOX | 19", 1U,with 2 Power Slots, 1 Fan Slot, 1 Network Management Slot, 1 Aggregation Service Slot, 4 Tributary Service Slots |
| H9MO-LMFE.FAN01 | Pluggable Fan Unit (must equip) |
| H9MO-LMFE.PWR01 | DC -48V Power Supply, Can be 1+1 |
| H9MO-LMFE.PWR02A | AC 220V Supply, Can be 1+1 |
| H9MO-LMFE.PWR02B | AC 110V Supply, Can be 1+1 |
| H9MO-LMFE.NM02 | Network Management Card with 2 RJ45 Management Ethernet Ports, Supporting Online Upgrading |

# Ordering Information

| Type | Description |
|---|---|
| H9MO-LMFE.OX01 | Dual STM-1 Interfaces per Card (Default S1.1), SC Type. Cross connection Matrix and Timing Processing are Embedded. (L1.1,L1.2, Bi-Directional WDM options are Available) |
| H9MO-LMFE.OX01S | Dual STM-1 Interfaces per Card, SFP Type. Cross connection Matrix and Timing Processing are Embedded. (SFP should be Ordered Separately). (S1.1,L1.1,L1.2, Bi-Directional WDM options are Available). |
| H9MO-LMFE.OX04 | Dual STM-4 Interfaces per Card, SFP Type. Cross connection Matrix and Timing Processing are Embedded. (SFP should be Ordered Separately) (S4.1,L4.1,L4.2, Bi-Directional WDM options are Available). |
| H9MO-LMFE.OX16 | Dual STM-16 Interfaces per Card, SFP Type. Cross connection Matrix and Timing Processing are Embedded.(SFP should be Ordered Separately) (S16.1,L16.1,L16.2, Bi-Directional WDM options are Available). |
| H9MO-LMFE.EX01 | Dual STM-1 Electrical Interfaces per Card, CC4 Interface Type. Cross connection Matrix and Timing Processing are Embedded. |
| H9MO-LMFE.OS01 | Dual STM-1 Interfaces per Card (Default S1.1), SC Type.(L1.1,L1.2, Bi-Directional WDM options are Available) |
| H9MO-LMFE.OS01S | Dual STM-1 Interfaces per Card, SFP Type.(SFP should be Ordered Separately). (S1.1,L1.1,L1.2, Bi-Directional WDM options are Available). |
| H9MO-LMFE.OS02A | Dual STM-1 & Dual FE Ports per Card |
| H9MO-LMFE.OS03 | Single STM-1&FE Port per Card |
| H9MO-LMFE.OS04A | Dual STM-4 tributary card |
| H9MO-LMFE.EP03 | 12E1 per Card□RJ45 Type,75ohms□BH4.850.107 Cable Should be Equipped Separately |
| H9MO-LMFE.EP03/T | 12E1 per Card□RJ45 Type,120ohms |
| H9MO-LMFE.EP01A/T | 24E1 per Card□DB60 Type,120ohms, Two DB60 Cable BH4.850.124-B Should be ordered Separately |
| H9MO-LMFE.EP03A/T | 12E1 per Card□DB60 Type,120ohms, DB60 Cable BH4.850.124-B Should be ordered Separately |

| Type | Description |
|---|---|
| H9MO-LMFE.FE01 | 4 Electrical Fast Ethernet Ports per Card, EoS, GFP/LCAS/VCAT |
| H9MO-LMFE.FE02 | 4 Optical Fast Ethernet Ports per Card, EoS, GFP/LCAS/VCAT, SFP Type (SFP should be ordered Separately). |
| H9MO-LMFE.FE04 | 4 Electrical Fast Ethernet Ports per Card, EoPDH or EoE (Ethernet over n*E1, One Channel: 1≤n≤16) |
| H9MO-LMFE.FE05 | 4 Optimal Fast Ethernet Ports per Card, EoPDH or EoE( (Ethernet over n*E1, One Channel: 1≤n≤16), SFP Type (SFP should be ordered Separately). |
| H9MO-LMFE.FE06 | Ethernet Aggregation Card (EoS), Ratio 8:2, Two External FE ports |
| H9MO-LMFE.FE07 | Ethernet Aggregation Card (EoPDH or EoE), Ratio 8:2,Two External FE ports |
| H9MO-LMFE.GX01 | Gigabit Ethernet Aggregation Card (EoS), Ratio 8:1, One Electrical Gigabit Ethernet Port |
| H9MO-LMFE.GX02 | Gigabit Ethernet Aggregation Card (EoPDH or EoE), Ratio 8:1, One Electrical Gigabit Ethernet Port |
| H9MO-LMFE.GX01A | Gigabit Ethernet Aggregation Card (EoS), Ratio 8:1, One Electrical Gigabit Ethernet Port or One Optical Gigabit Ethernet Port (SFP Type)(SFP should be ordered Separately) |
| H9MO-LMFE.GX02A | Gigabit Ethernet Aggregation Card (EoPDH or EoE), Ratio 8:1, One Electrical Gigabit Ethernet Port or One Optical Gigabit Ethernet Port (SFP Type)(SFP should be ordered Separately) |
| H9MO-LMFE.ED01 | Two V35 ports per Card. DTE/DCE. (BH4.851.103 DCE Cable should be ordered separately) |
| H9MO-LMFE.DX02 | Full 64E1 DS0 Cross connection. Matrix: 2048*2048 |
| H9MO-LMFE.EP02 | One E3 per Card. CC4 Interface Type |
| H9MO-LMFE.LA01 | Order wire interface and one external clock input/output interface and one RS232 Asynchronous Interface |

# H9MO-LMFIT

## SDH/MSTP Multiplexer

## Overview

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

H9MO-LMFIT is a modularized unit with 4 universal slots, supporting different interface cards, such as STM-1 fiber optic cards, E1 cards, Ethernet cards (EoS VCAT), and V.35 card. The main board cross-connect capacity is 504×504 VC-12s (8×8 VC-4s), allowing non-blocking adding/dropping services among different interfaces. It supports the hybrid transmission of SDH, PDH, Ethernet and N×64K V.35 services within the same equipment. It also supports 2048×2048 64K (full 64E1) cross-connect capacity using FDXC64 card. With the large capacity cross-connect matrix, the H9MO-LMFIT can be configured as ADM, TM, and REG. It is suitable for multiple network topologies such as point-to-point, chain, ring, hub, and mesh networks.

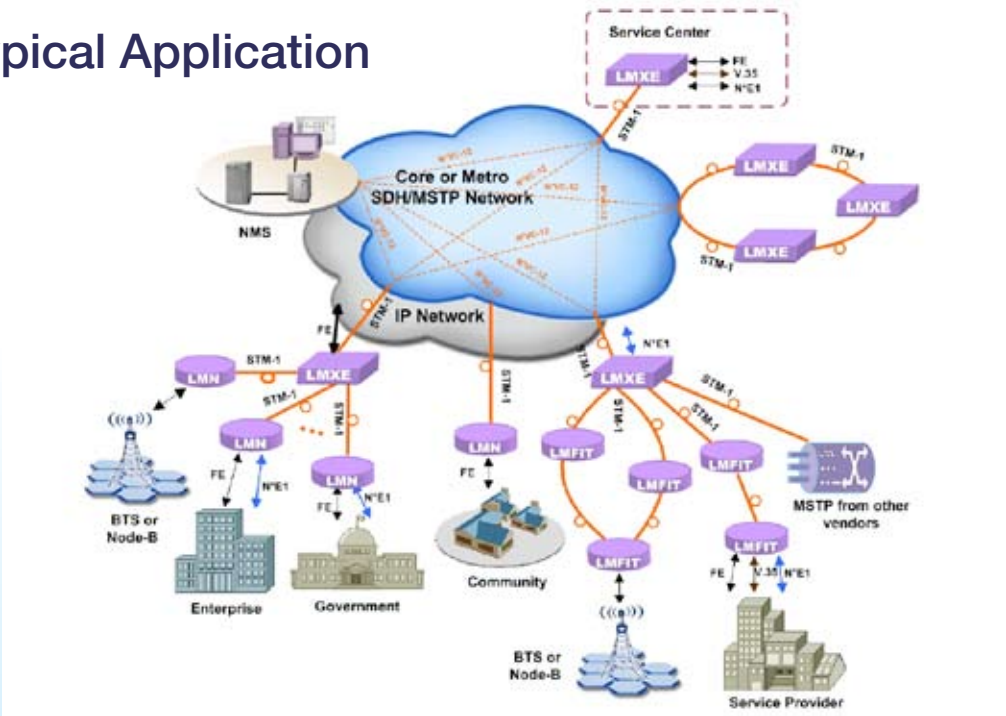
## Features

1. 4 General Slots, supporting a range of interface cards, including SDH, PDH, Ethernet and V.35 cards.
2. Ethernet service supporting GFP encapsulation, VC12 virtual concatenation (1~63 VC12)
3. Large cross-connect matrix capacity is 504×504 VC12s (8×8 VC4s) and powerful networking ability
4. LCD display for system configuration and alarm
5. Inter-working with popular SDH/MSPP products of various vendors
6. Suitable for 3G access network transmission
7. Easy commissioning and maintenance
8. High integration, compact design
9. High reliability, low CAPEX and OPEX

# Technical Specifications

| Index | Performance Parameter | |
|---|---|---|
| SDH Interface | Max | 8 STM-1 optical interfaces ( Four F155-DO cards used ) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service Card (4 General Slots) | F155-O | Single STM-1 optical interface card |
| | F155-DO | Dual STM-1 optical interfaces card |
| | F4XE1 | 4×E1 interface card ( 75Ω ) |
| | F8XE1 | 8×E1 interface card ( 75Ω or 120Ω ) |
| | FFE201 | 2 FE over 1 VCG trunks ( EoS ) |
| | FFE404 | 4 FE over 4 VCG trunks ( EoS ) |
| | FFX404 | 4 Fx over 4 VCG trunks ( EoS ) |
| | FFE201E | 2 FE over 1 n×E1 ( EoE ) |
| | FFE404E | 4 FE over 4 n×E1 ( EoE ) |
| | F2XV35 | 2×V.35 interface card ( framed or unframed ) |
| | FDXC64 | Full 64E1 DXC (2048×2048 64k cross-connect) |
| | FE2T63 | 63 Ethernet over E1(EoE) to 2 FE aggregation card |
| PDH interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3 |
| | Max E1 | 24E1 (Three F8XE1 cards support) |
| Ethernet | Interface | 10/100Base-Tx, Comply with IEEE 802.3 |
| | Max FE Interface | 12 FE (Three FFE404 cards support) |
| | Encapsulation | Comply with ITU-T G.7041 (GFP) |
| V.35 | Max Interface | 6 V.35 interfaces (n×64K) (Three F2XV35 cards support) DCE/DTE |
| Cross-connect Capacity | Low order VC12 | 504×504 VC12 |
| Management | Protocol | SNMP or Q3 |
| | Interface | 10Base-T and RS232 RS485 |
| EOW interface | | Standard socket RJ11 |
| LCD Display | | Support |
| Physical Dimension | | 1U: 440 × 44 ×230 (mm) |
| Power | Supply | -48V DC or 220V AC or dual power supply +24VDC |
| | Consumption | ≤ 15W |
| Environment | Temperature | 5°C ~ 45°C |
| | Humidity | ≤ 90 %(non-condensing) |
| Weight | | ≤ 3.5 kg |

# Typical Application



# H9MO – LMA

## STM-1 Multi-service ADM MUX

## Overview

H9MO-LMA is a member of Huahuan's Metro-Edge Express SDH/MSPP product family. This family of products is aimed at the access network establishment, providing TDM and Ethernet services to meet the needs of today's network evolution. Other members in the Metro-Edge Express include H9MO-LMX, H9MO-LM, H9MO-LMFIT, H9MO-LMV, H9MO-LM63, etc.

The H9MO-LMA is derived form the card-based H9MO-LMFIT to provide a more cost effective solution. It is of single board design with fixed number of interface ports. As an ADM MUX, it has two STM-1 fiber optic ports, and a set of service ports. According to the number of service ports, the H9MO-LMA comes in different models, as shown in below table.

| Model | STM-1 optical Ports | E1 Ports | Ethernet Ports | V.35 Ports |
|---|---|---|---|---|
| H9MO-LMA841 | 2 | 8 | 4 | 1 |
| H9MO-LMA840 | 2 | 8 | 4 | 0 |
| H9MO-LMA441 | 2 | 4 | 4 | 1 |
| H9MO-LMA440 | 2 | 4 | 4 | 0 |
| H9MO-LMA400 | 2 | 4 | 0 | 0 |

## Features

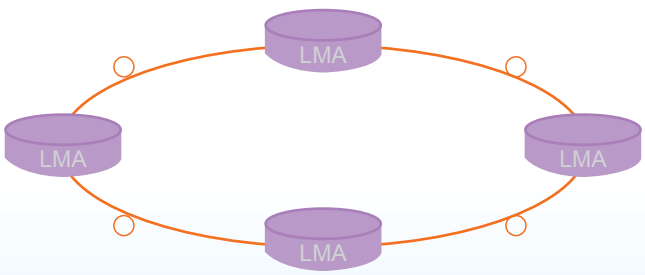
1. ADM, suitable for ring and linear topologies
2. Supports MSP and SNCP protection switching
3. Flexible options for the STM-1 fiber optic interface, including single fiber duplex, as well as different power and wavelength choices.
4. Multi-Service, including E1, FE, V.35
5. Standard based GFP/VC-12 VCAT EoS
6. Built-in BERT and loop-back capabilities
7. Framed and unframed V.35
8. Remote AC power failure alarm
9. Standard 19 inch 1RU box, compact, lightweight, low power consumption
10. Dual mode power supply, -48V DC or 100~240V AC field selectable
11. RoHS compliant

# Technical Specifications

| | | | | |
|---|---|---|---|---|
| **STM-1 Fiber Port** | | | | |
| Bit rate: | 155520kbit/s ± 4.6ppm | | | |
| Line code: | Scrambled NRZ | | | |
| Wavelength: | Default: | 1310nm | Option /5: | 1550nm |
| Connector: | Default: | SC | Option /F: | FC |
| Fiber Spec. | S-1.1, L-1.1, L-1.2 Single fiber bi-directional interface can be optionally supported | | | |
| **E1 Port** | | | | |
| Bit rate: | 2.048 Mbps ± 50 ppm | | | |
| Line code: | HDB3 | | | |
| Impedance: | Default: 75Ω Option /T: 120Ω | | | |
| Frame Structure: | Non-framed | | | |
| Number of ports: | H9MO-LMA840: 8 H9MO-LM400: 4 | | | |
| **V.35 Port** | | | | |
| Bit rate: | Nx64kbps ± 50 ppm, N≤31 | | | |
| Frame Structure: | G.704 or unframed | | | |
| Interface mode: | DCE or DTE | | | |
| Number of ports: | 1 | | | |
| **Ethernet Port** | | | | |
| Interface mode: | 10Base-T/100Base-T, Half/Full duplex, auto-negotiation, HP auto-MDIX | | | |
| Trunk port: | NxVC-12 N≤63, GFP | | | |
| Number of ports: | 4 | | | |
| **Management Port** | | | | |
| Ethernet: | RJ45, 10Base-T, MDI port | | | |
| Others: | DCC, E1(VC-12) | | | |
| **Timing** | | | | |
| Internal, STM-1 Line, E1 tributary line | | | | |
| **Mechanical/Electrical** | | | | |
| Dimension: | 44mm x 138mm x 440mm (H/D/W) | | Working temp: | 0 ~ 50°C |
| Net weight: | 2kg | | Humidity: | 0-95%RH (non-condensing) |
| Power (AC): | 100 ~ 240 V, 50/60Hz | | Ethernet socket: | RJ-45 |
| Power (DC): | -48 V (-58V ~ -38V) | | V.35 socket: | DB25 |
| Consumption: | ≤ 10W | | E1 socket: | RJ48 |

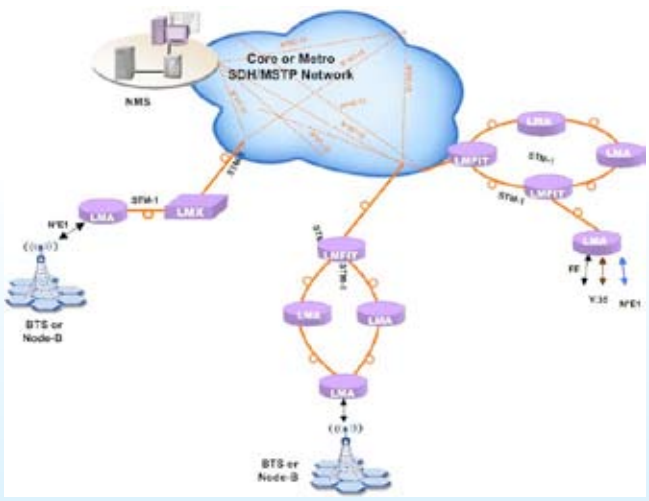
# Application

Ring Network




Line Network


Mesh Network



# H9MO-LM63

## SDH/MSPP Access Device (MetroEdge-Express)

## Overview

H9MO-LM63 is a carrier-class, cost-effective, compact (only 1U high) SDH/MSTP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide 63E1 TDM interfaces in only 1Ustandard 19" box. H9MO-LM63 is best suitable for point-to-point network or standard SDH TM node. Working together with other SDH/MSTP family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

## Features

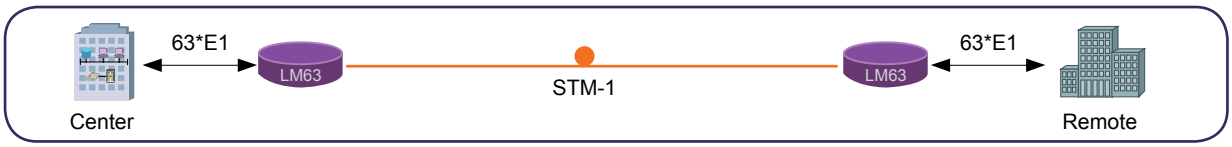
1. 1U box SDH/MSPP with 1 or 2 STM-1 optical interfaces and 63E1 interface.
2. Optical interface supports ALS (Auto Laser Shutdown) function
3. Inter-working with popular SDH/MSPP products of various vendors
4. Support TUG3-TUG2-TU12 tributary channel numbering and time slot numbering at ease
5. Support internal, STM-1 line clock, external and tributary clocking
6. LCD display for system configuration and alarm
7. Support remote power-off alarming function
8. SDH/MSPP core, PDH price
9. Support online upgrading
10. Easy commissioning and maintenance
11. High integration, compact design
12. High reliability, low CAPEX and OPEX

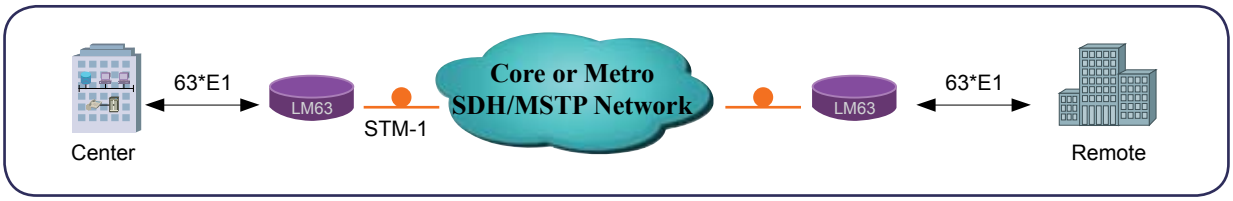
# Technical Specifications

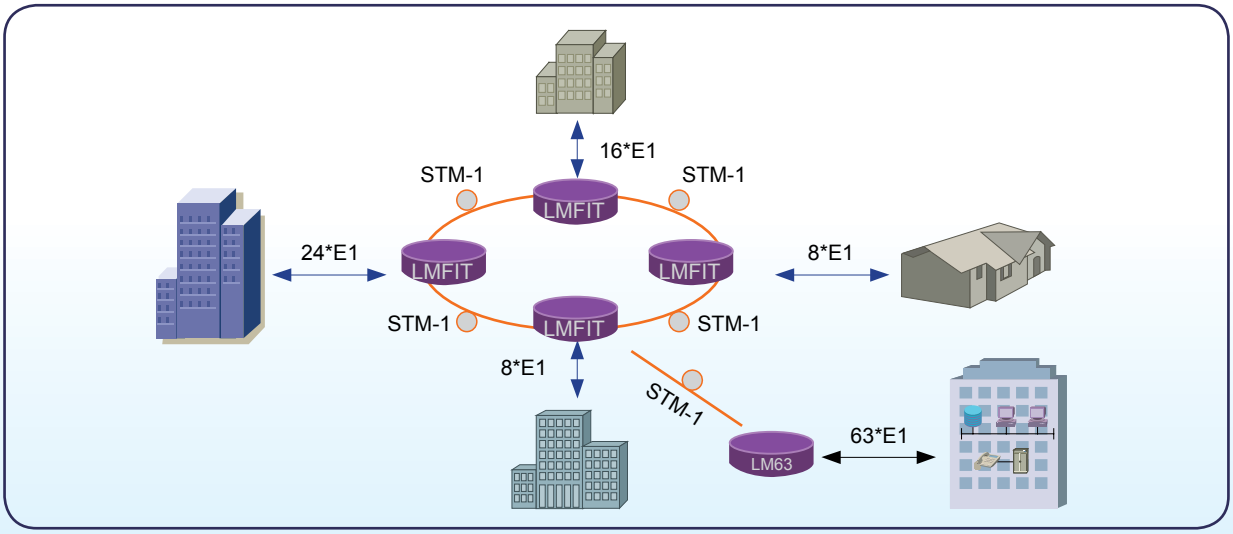
| Index | Performance Parameter | |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces (1+1 MSP supported ) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| PDH interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3 |
| | Max E1 | 63E1 |
| Data | RS485 | Asynchronous RS485 data |
| Management | Protocol | SNMP or Q3 |
| | Interface | 10Base-T and RS485 |

| LCD Display | Supported | |
|---|---|---|
| Physical Dimension | 1U: 440 × 44 ×230 (mm) | |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply +24VDC |
| | Consumption | ≤ 15 w |
| Environment | Temperature | 0°C ~ 50°C |
| | Humidity | ≤90 % |

# Typical Application



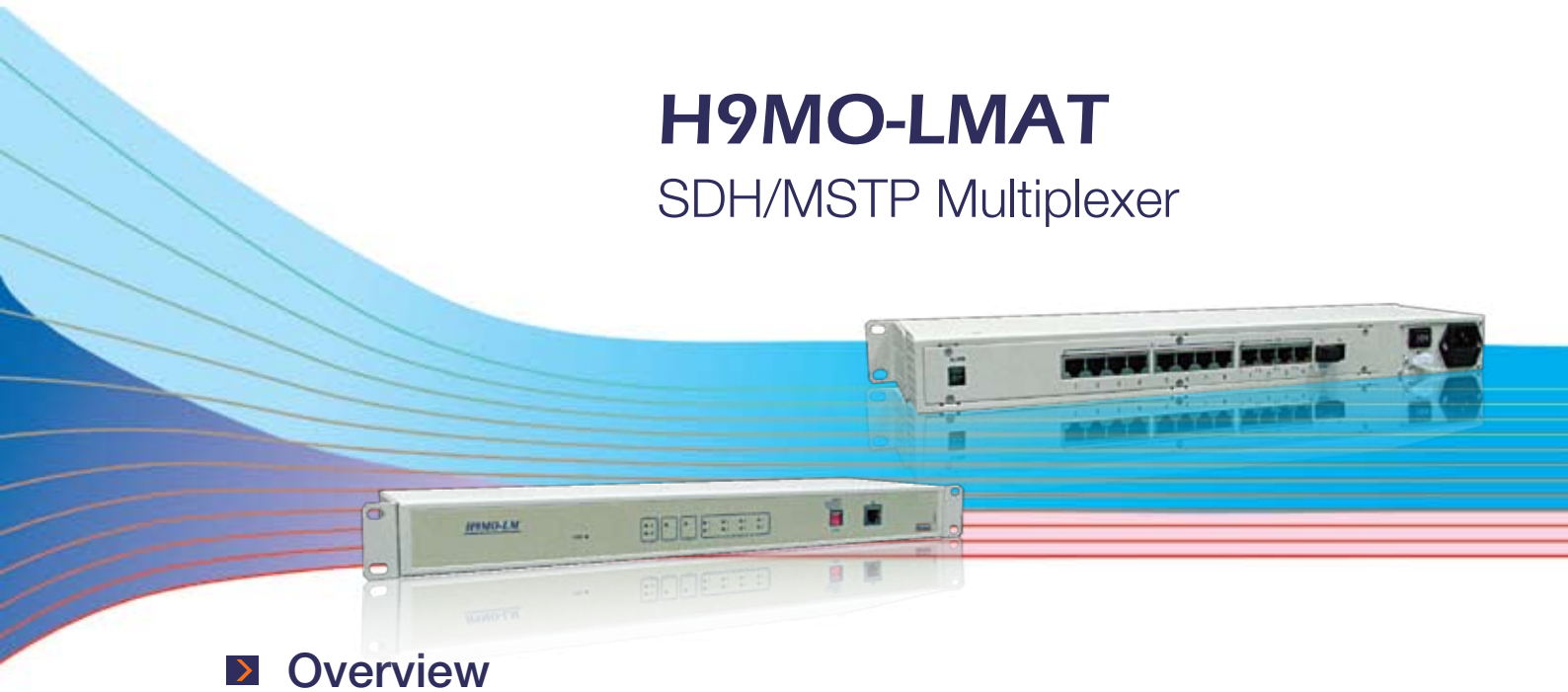



# Ordering Information

| Card/Module Type | Description |
|---|---|
| H9MO-LM63/EJ | One STM-1 interface, 63E1,75ohms,BH4.850.107 Cable Should be Equipped Separately. AC/DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63/EJP | 1+1 STM-1 interfaces, 63E1,75ohms,BH4.850.107 Cable Should be Equipped Separately. AC/DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63/TEJ | One STM-1 interface, 63E1,120ohms. AC/DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63/TEJP | 1+1 STM-1 interfaces, 63E1,120ohms. AC/DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63RP/8D | One STM-1 interface, 63E1,75ohms,BH4.850.107 Cable Should be Equipped separately. Dual DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63/8DP | 1+1 STM-1 interfaces, 63E1,75ohms,BH4.850.107 Cable Should be Equipped separately. Dual DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63RP/T8D | One STM-1 interface, 63E1,120ohms. Dual DC Power Supply. With LCD and Ethernet Management port |
| H9MO-LM63/T8DP | 1+1 STM-1 interfaces, 63E1,120ohms. Dual DC Power Supply. With LCD and Ethernet Management port |

# H9MO-LMAT

## SDH/MSTP Multiplexer



## Overview

H9MO-LMAT is a member of SDH/MSTP product family. This family of products is aimed at the access network establishment, providing TDM and Ethernet services to meet the needs of today's network evolution. Other members in the SDH/MSTP product family include H9MO-LMXE, H9MO-LMA, H9MO-LMFIT, H9MO-LMV, H9MO-LM63, etc.

The H9MO-LMAT is derived form the ADM MUX H9MO-LMA to provide a more cost effective solution. It is of single board design with fixed number of interface ports. It has one STM-1 fiber optic ports, and a set of service ports. According to the number of service ports, the H9MO-LMAT comes in different models, as shown in below table:

| Model | STM-1 optical Ports | E1 Ports | Ethernet Ports | V.35 Ports |
|---|---|---|---|---|
| H9MO-LMAT841 | 1 | 8 | 4 | 1 |
| H9MO-LMAT840 | 1 | 8 | 4 | 0 |
| H9MO-LMAT800 | 1 | 8 | 0 | 0 |
| H9MO-LMAT441 | 1 | 4 | 4 | 1 |
| H9MO-LMAT440 | 1 | 4 | 4 | 0 |
| H9MO-LMAT400 | 1 | 4 | 0 | 0 |

## Features

1. TM, Multi-Service, including E1, FE, V.35
2. Flexible options for the STM-1 fiber optic interface, including single fiber duplex, as well as different power and wavelength choices.
3. Standard based GFP/VC-12 VCAT, support VLAN, EoS
4. Built-in BERT and loop-back capabilities
5. Framed and unframed V.35
6. Remote AC power failure alarm
7. Standard 19 inch 1RU box, compact, lightweight, low power consumption
8. Dual mode power supply, -48V DC or 100~240V AC field selectable
9. Support online upgrade of embedded program and FPGA program

# Technical Specifications

### STM-1 Fiber Port

| | | | | |
|---|---|---|---|---|
| Bit rate: | 155520kbit/s ± 4.6ppm | | | |
| Line code: | Scrambled NRZ | | | |
| Wavelength: | Default: | 1310nm | Option /5: | 1550nm |
| Connector: | Default: | SC | Option /F: | FC |
| Fiber Spec. | S-1.1, L-1.1, L-1.2 Single fiber bi-directional interface can be optionally supported | | | |

### E1 Port

| | |
|---|---|
| Bit rate: | 2.048 Mbps ± 50 ppm |
| Line code: | HDB3 |
| Impedance: | Default: 75Ω Option /T: 120Ω |
| Frame Structure: | Non-framed |
| Number of ports: | 4~8 |

### V.35 Port

| | | | |
|---|---|---|---|
| Bit rate: | Nx64kbps ± 50 ppm, N ≤ 31 | Interface mode: | DCE or DTE |
| Frame Structure: | G.704 or unframed | Number of ports: | 0~1 |

### Ethernet Port

| | |
|---|---|
| Interface mode: | 10Base-T/100Base-T, Half/Full duplex, auto-negotiation, HP auto-MDIX |
| Trunk port: | NxVC-12 N ≤ 63, GFP |
| Number of ports: | 0~4 |

### Management Port

| | |
|---|---|
| Ethernet: | RJ45, 100Base-T, MDI port |
| Others: | DCC, E1 |

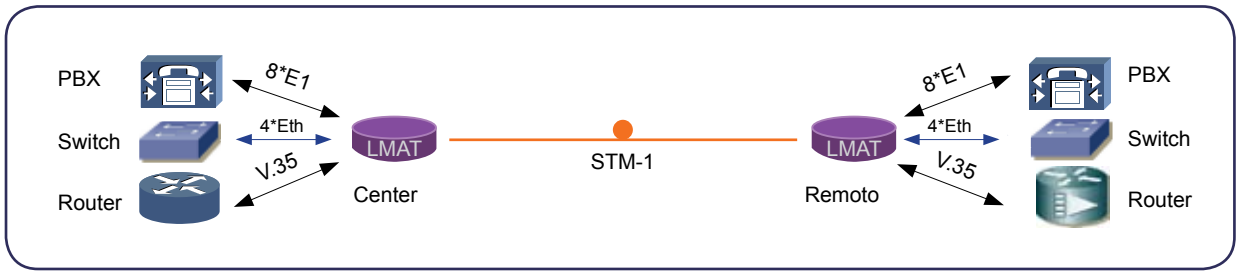
### Timing

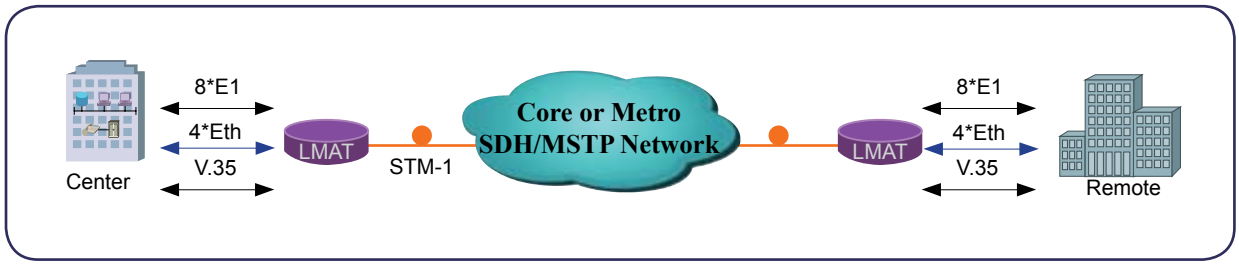
Inner clock, STM-1 line clock, E1 interface clock, external clock.

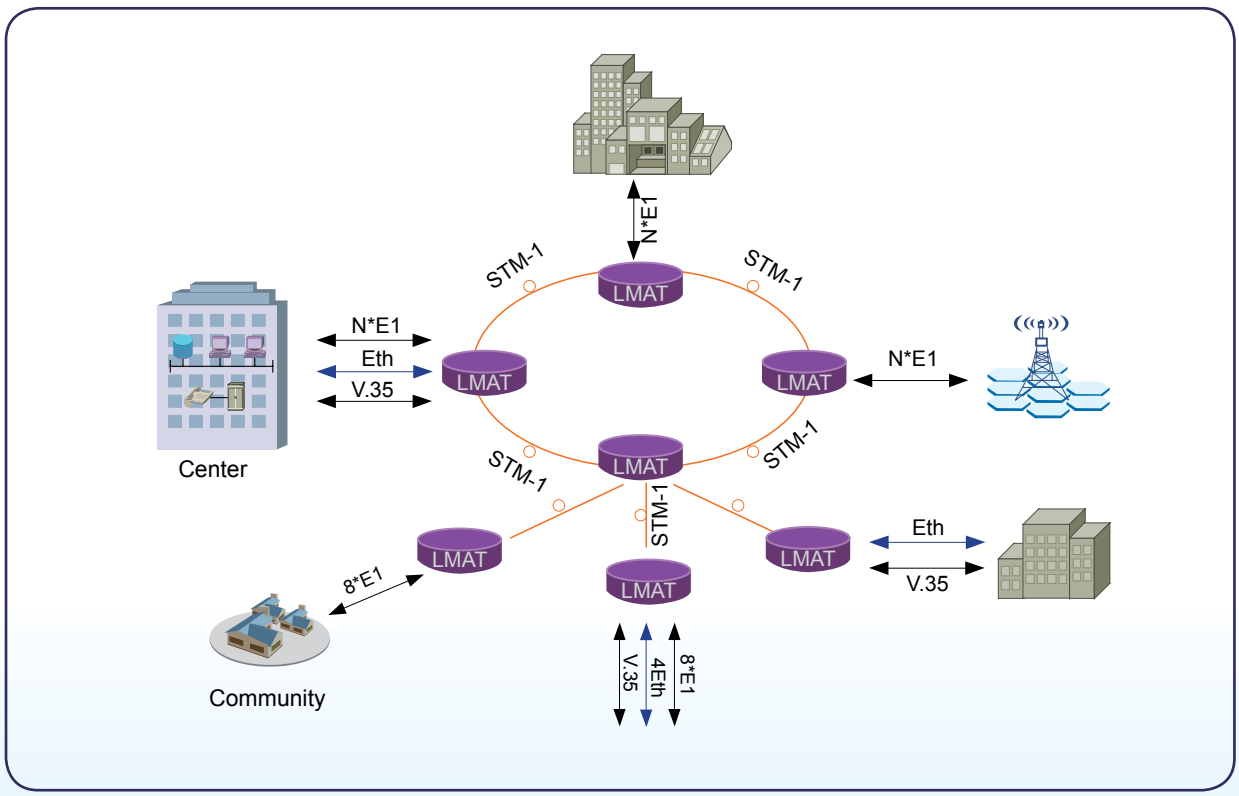
### Mechanical/Electrical

| | | | |
|---|---|---|---|
| Dimension: | 44mm x 138mm x 440mm (H/D/W) | Working temp: | 0 ~ 45°C |
| Net weight: | 2kg | Humidity: | 0-90%RH (non-condensing) |
| Power (AC): | 100 ~ 240 V, 50/60Hz | Ethernet socket: | RJ-45 |
| Power (DC): | -48 V (-58V ~ -38V) | V.35 socket: | DB25 |
| Consumption: | ≤ 10W | E1 socket: | RJ48 |

# Typical Application



# Ordering Information

| Card/Module Type | Description |
|---|---|
| H9MO-LMAT841/EJ | SDH TM Multiplexer. 1STM-1, 8E1+4FE+1V.35. STM-1 interface (Default S1.1), SC/PC. (L1.1,L1.2, Single fiber Bi-Directional options are available) . E1 is 75ohms/120ohms selectable. RJ45 Type. BH4.850.105A or BH4.850.122 Cable Should be ordered Separately when used as 75ohms. AC/DC power supply |
| H9MO-LMAT840/EJ | SDH TM Multiplexer. 1STM-1, 8E1+4FE. STM-1 interface (Default S1.1), SC/PC. (L1.1,L1.2, Single fiber Bi-Directional options are available) . E1 is 75ohms/120ohms selectable. RJ45 Type. BH4.850.105A or BH4.850.122 Cable Should be ordered Separately when used as 75ohms. AC/DC power supply |
| H9MO-LMAT800/EJ | SDH TM Multiplexer. 1STM-1, 8E1. STM-1 interface (Default S1.1), SC/PC. (L1.1,L1.2, Single fiber Bi-Directional options are available) . E1 is 75ohms/120ohms selectable. RJ45 Type. BH4.850.105A or BH4.850.122 Cable Should be ordered Separately when used as 75ohms. AC/DC power supply |
| H9MO-LMAT810F/EJ | SDH TM Multiplexer. 1STM-1, 8E1+Fx. STM-1 interface (Default S1.1), SC/PC. (L1.1,L1.2, Single fiber Bi-Directional options are available) . E1 is 75ohms/120ohms selectable. RJ45 Type. BH4.850.105A or BH4.850.122 Cable Should be ordered Separately when used as 75ohms. Ethernet interface is 100Base-Fx. (1310nm). AC/DC power supply |

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# H9MO-LMC

## SDH/MSTP Multiplexer

## Overview

H9MO-LMC is a carrier-class, cost-effective, compact (only 1U high) SDH/MSTP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide 16E1 TDM interfaces and 1 physical slot that can be inserted with 4E1/8E1/2Ethernet/4Etherent/2V.35 service card in only 1U standard 19” box. H9MO-LMC is best suitable for point-to-point network or standard SDH TM node. Working together with other SDH/MSTP family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

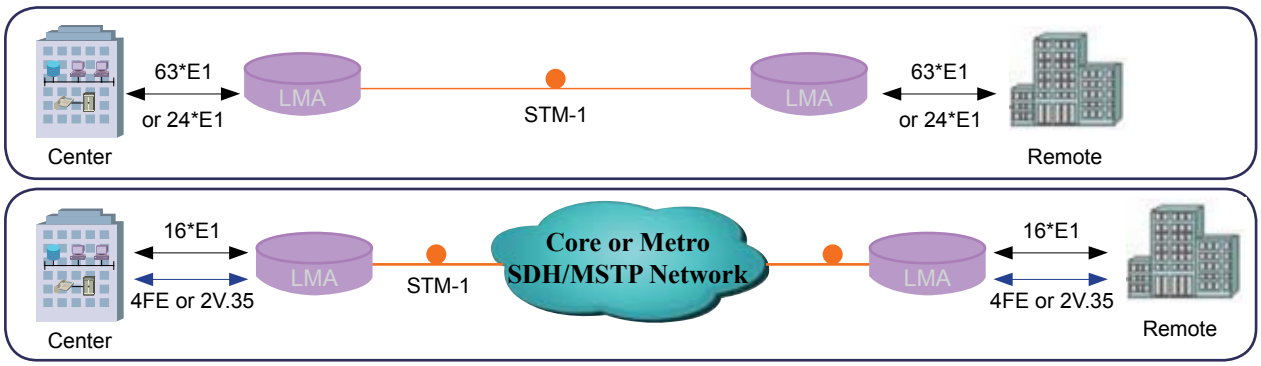
## Features

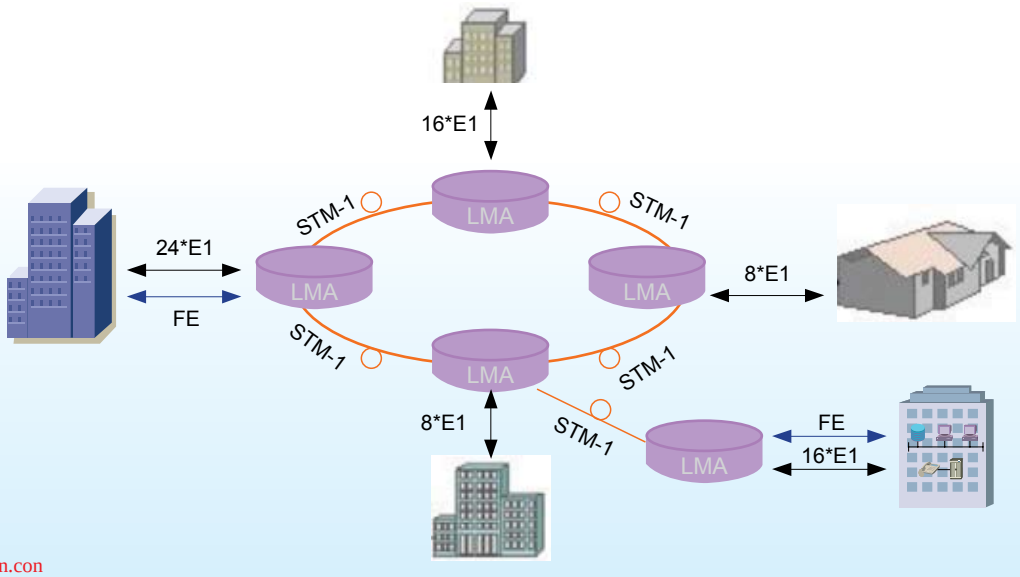
1. 1U box SDH/MSPP with 1 optical interfaces and 16E1 interface and one flexible card
2. One flexible physical slot can be inserted with various service card
3. Flexible cards support 4E1/8E1/2Ethernet/4Etherent/2V.35 cards
4. Optical interface supports ALS (Auto Laser Shutdown) function
5. Inter-working with popular SDH/MSPP products of various vendors
6. SDH/MSPP core, PDH price
7. Easy commissioning and maintenance
8. High integration, compact design
9. High reliability, low CAPEX and OPEX

# Technical Specifications

| Index | Performance Parameter | |
|---|---|---|
| SDH Interface | Max | 1 STM-1 optical interface |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| PDH interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3 |
| | Ma × E1 | 16E1+ 8E1 |
| Data | RS485 | Asynchronous RS485 data |
| Service card (1 physical slot) | F4 × E1 | 4XE1 interface card (75Ω) |
| | F8 × E1 | 4XE1 interface card (75Ω or 120Ω) |
| | FFE201 | 2XFE interface card (2FEs over a single virtual concatenation channel) ITU-T G.7041 GFP |
| | FFE404 | 4XFE interface card (4FEs over 4 independent virtual concatenation channels) ITU-T G.7041 GFP |
| | F2 × V.35 | 2XV.35 framed interface card (NX64K) |
| Management | Protocol | SNMP |
| | Interface | 10Base-T, MDI, |
| EOW interface | | Standard socket: 4P4C |
| Physical Dimension | | 1U: 440 × 44 × 230 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply +24VDC |
| | Consumption | ≤15 w |
| Environment | Temperature | 0°C ~ 50°C |
| | Humidity | ≤ 90 % |

# Typical Application



# H9MO-LMN

## SDH/MSPP Access Device (MetroEdge-Express)

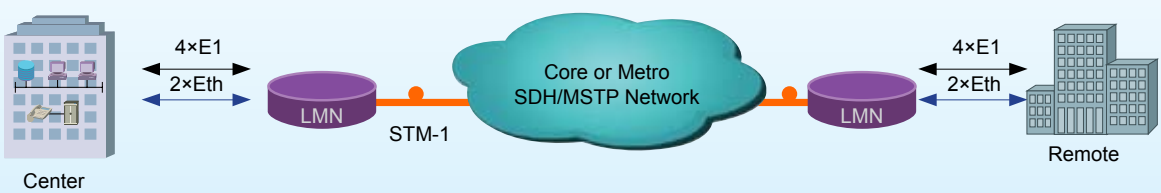
## Overview

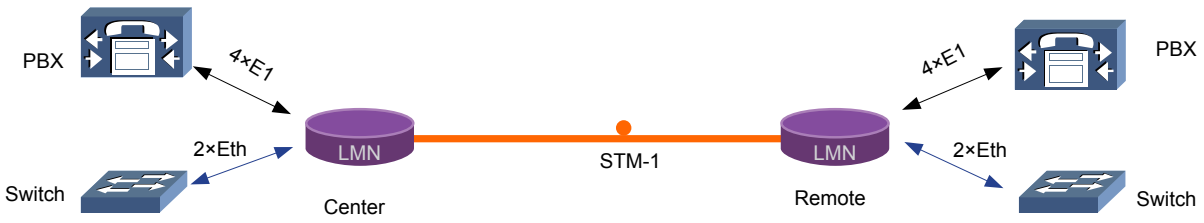
As a key member of Huahuan SDH/MSTP Product family, H9MO-LMN is a carrier-class, cost-effective, compact (only 1U high) SDH/MSTP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide various service interfaces: 4×E1s, and 2×100Base-T Ethernet ports in only 1U standard 19" box. H9MO-LMN is best suitable for point-to-point network or standard SDH TM node. Working together with other SDH/MSTP family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

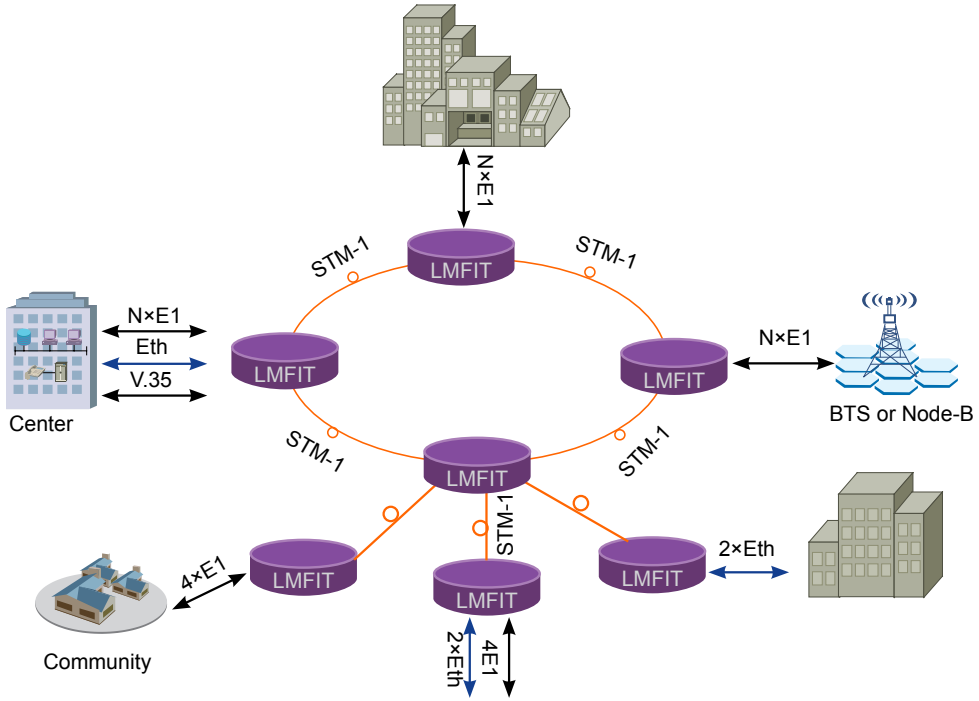
## Features

1. 1U box SDH/MSPP with four E1s, and two 100Base-T Ethernet ports.
2. Ethernet service supporting GFP encapsulation, VC12 virtual concatenation
3. Inter-working with popular SDH/MSPP products of various vendors
4. SDH/MSPP core, PDH price
5. Support remote site power-off indication
6. Easy commissioning and maintenance
7. High integration, compact design
8. High reliability, low CAPEX and OPEX

## Typical Application






## Technical Specifications

| Index | | Performance Parameter |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces(1+1 supported) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3<br>4E1 supported<br>75Ω or 120Ω |
| | Ethernet port | 10/100Base-Tx<br>Comply with IEEE 802.3 |
| Management | Protocol | SNMP |
| | Interface | 10Base-T |
| Physical Dimension | | 440 × 44 ×138 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply<br>+24VDC |
| | Consumption | ≤8 W |
| Environment | Temperature | 0°C~45°C |
| | Humidity | ≤90 %(non-condensing) |

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# H9MO-LMN4E1

## SDH/MSPP Access Device (MetroEdge-Express)

## Overview

As a key member of Huahuan SDH/MSTP Product family, H9MO-LMN is a carrier-class, cost-effective, compact (only 1U high) SDH/MSTP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide various service interfaces: 4×E1s, and 2×100Base-T Ethernet ports in only 1U standard 19" box. H9MO-LMN is best suitable for point-to-point network or standard SDH TM node. Working together with other SDH/MSTP family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

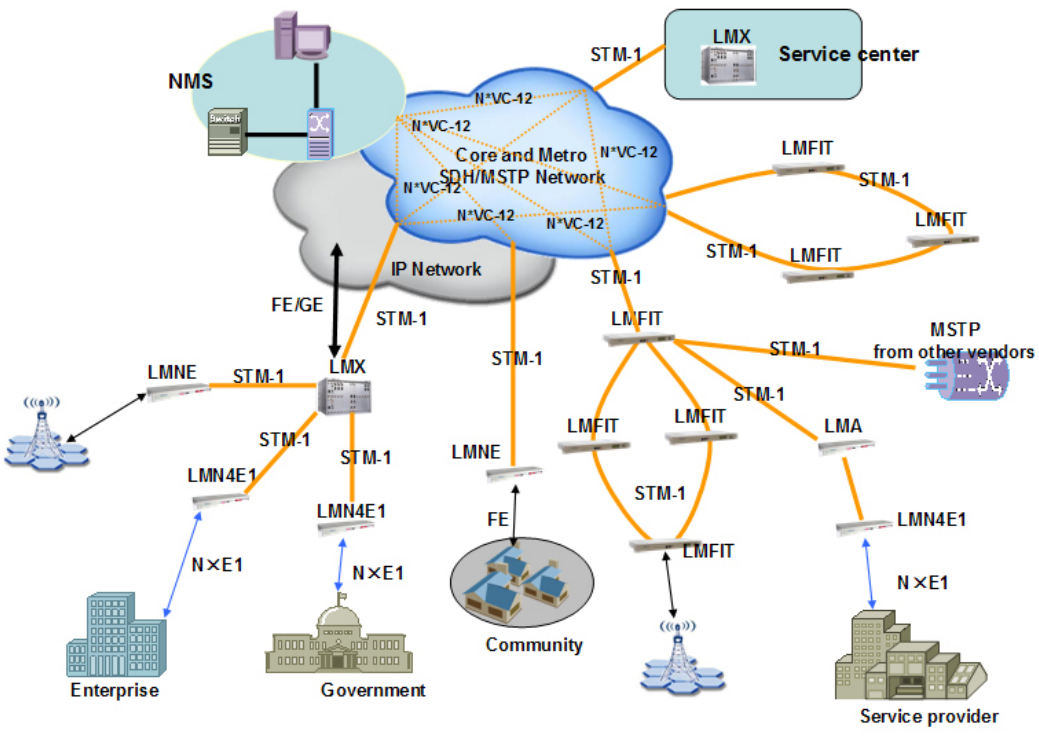
## Features

1. 1U box SDH/MSPP with four E1s
2. Optical STM-1ports support APS(1+1 MSP)protection.
3. E1 services standard SDH mapping
4. Inter-working with popular SDH/MSPP products of various vendors
5. E1 ports comply with ITU-T G .703, with functions of online error monitor and loop back test.
6. Q3 or SNMP(10Base-T) network management port
7. -48V DC or ~220V AC power supply, or DC+24V supported
8. Support remote site power-off indication
9. Easy commissioning and maintenance
10. High reliability, low CAPEX and OPEX

# Technical Specifications

| Index | | Performance Parameter |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces (1+1 supported) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3<br>4E1 supported<br>75Ω or 120Ω |
| Management | Protocol | SNMP |
| | Interface | 10Base-T |
| Physical Dimension | | 440 × 44 ×138 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply<br>+24VDC |
| | Consumption | ≤6 W |
| Environment | Temperature | 0°C~45°C |
| | Humidity | ≤90 %(non-condensing) |

# Typical Application



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# H9MO-LMT

## SDH/MSTP Multiplexer

## Overview

H9MO-LMT is a carrier-class, cost-effective, compact (only 1U high) SDH/MSPP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide various service interfaces: 4 E1s, V.35 ports and 100Base-T Ethernet port in only 1U standard 19" box. H9MO-LMT is best suitable for point-to-point network or standard SDH TM node. Working together with other SDH/MSTP family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

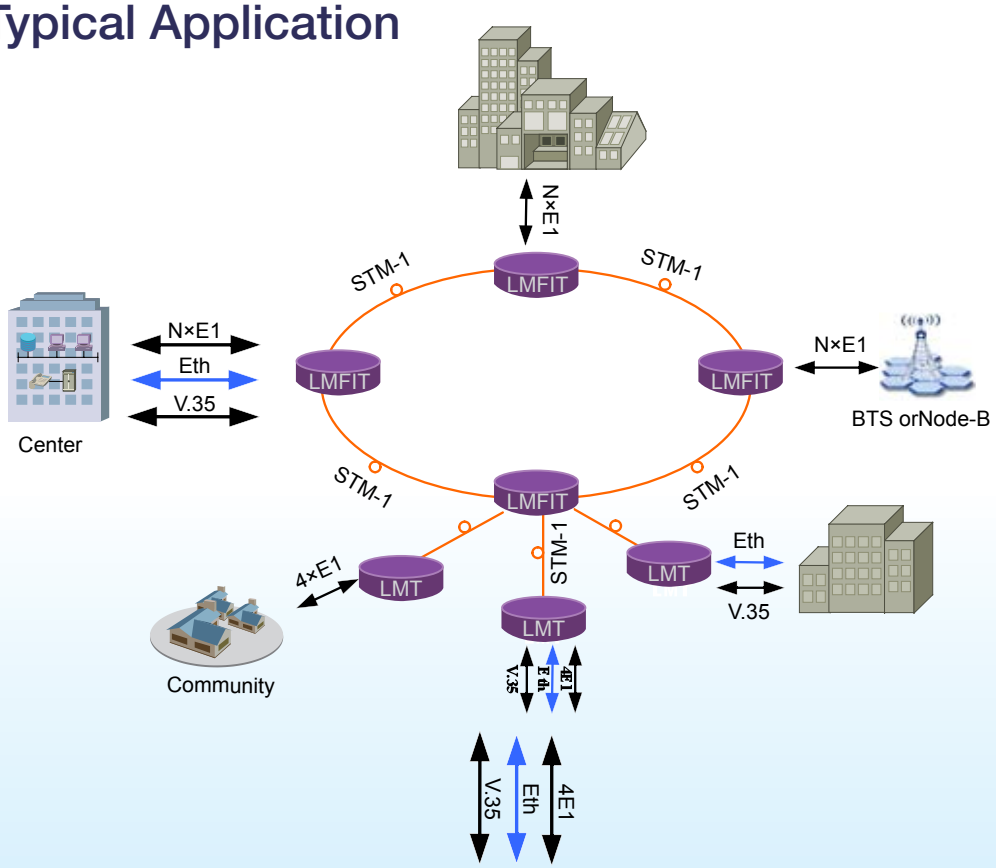
## Features

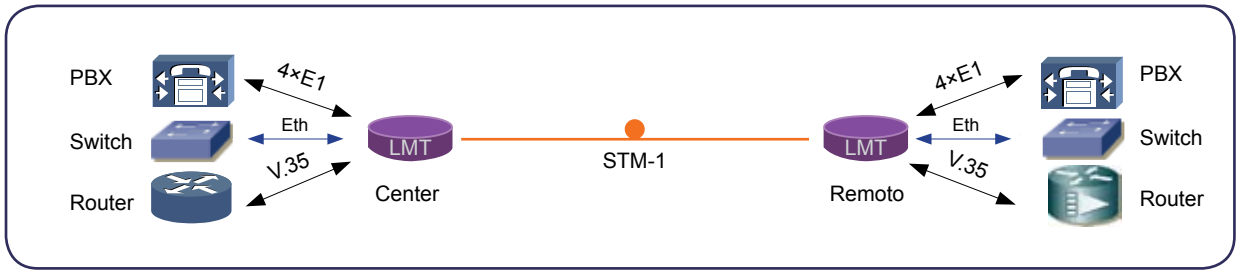
1. 1U box SDH/MSPP with 4 E1s, V.35 ports and 100Base-T Ethernet port
2. All configuration can be set and displayed in front LCD
3. Ethernet service supporting GFP encapsulation, VC12 virtual concatenation
4. Inter-working with popular SDH/MSPP products of various vendors
5. SDH/MSTP core, PDH price
6. Support remote site power-off indication
7. Easy commissioning and maintenance
8. High integration, compact design
9. High reliability, low CAPEX and OPEX

# Technical Specifications

| Index | | Performance Parameter |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces (1+1 supported) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3<br>4E1 supported<br>4 lines 75Ω or 3 lines 75Ω and 1 line 120Ω |
| | V.35 port | Comply with ITU-T V.35, DCE<br>N ×64kbps (1 ≤ N ≤ 32) |
| | Ethernet port | 2×10/100Base-Tx<br>Comply with IEEE 802.3 |
| Management | Protocol | SNMP |
| | Interface | 10Base-T |
| EOW interface | | Standard socket: 4P4C |
| Physical Dimension | | 1U: 440 × 44 ×138 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply<br>+24VDC |
| | Consumption | ≤10 w |
| Environment | Temperature | 0°C~50°C |
| | Humidity | 0-90%RH(non-condensing) |

# Typical Application



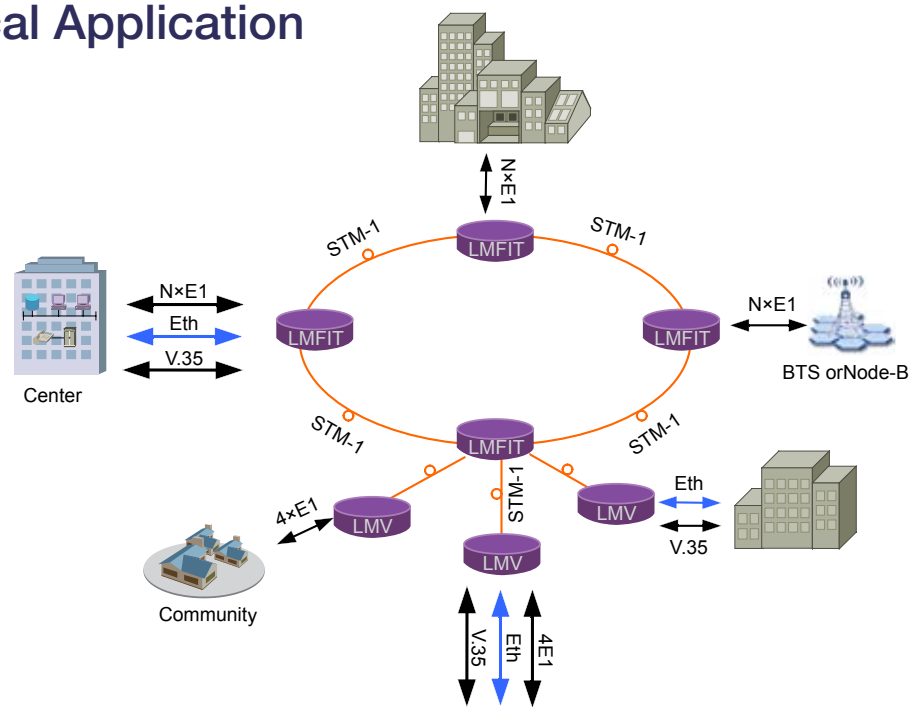

## Ordering Information

| Card/Module Type | Description |
|---|---|
| H9MO-LMT0441/J | SDH TM Multiplexer. 1STM-1, 4E1+4FE (FE over VC12)+V.35. Dual pluggable optical interfaces are available. The first E1 is 75ohms(BNC)/120ohms(RJ45) selectable. The other three E1 is 75ohms (BNC). AC/DC power supply. LCD and touch panel are embedded. Ethernet supports IEEE802.1Q, 802.1p and 802.1ad etc. |
| H9MO-LMT0440/J | SDH TM Multiplexer. 1STM-1, 4E1+4FE (FE over VC12). Dual pluggable optical interfaces are available. The first E1 is 75ohms(BNC)/120ohms(RJ45) selectable. The other three E1 is 75ohms (BNC). AC/DC power supply. LCD and touch panel are embedded. Ethernet supports IEEE802.1Q, 802.1p and 802.1ad etc. |
| H9MO-LMT0400/J | SDH TM Multiplexer. 1STM-1, 4E1. Dual pluggable optical interfaces are available. The first E1 is 75ohms(BNC)/120ohms(RJ45) selectable. The other three E1 is 75ohms (BNC). AC/DC power supply. LCD and touch panel are embedded. |
| HX.OPT | Pluggable Optical module. STM-1 interface (Default S1.1), SC/PC. (L1.1,L1.2, Single fiber Bi-Directional options are available). Up to two modules can be configured. |

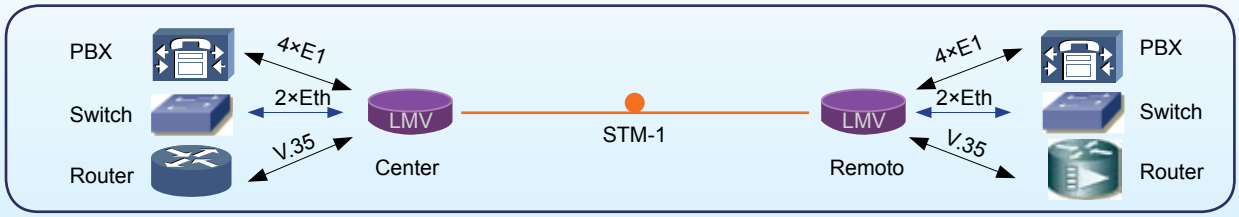
# H9MO-LMV

## SDH/MSTP Multiplexer

## Typical Application







# Technical Specifications

| Index | | Performance Parameter |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces (1+1 supported) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service interface | E1 Spec. | Comply with G.703, 2.048Mbps, HDB3<br>4E1 supported<br>75Ω or 120Ω |
| | V.35 port | Comply with ITU-T V.35/V.36, DCE or DTE<br>N×64kbps (1 ≤ N ≤ 32)<br>One V.35 supported |
| | Ethernet port | 2×10/100Base-Tx<br>Comply with IEEE 802.3 |
| Data | RS485 | Asynchronous RS485 data |
| Management | Protocol | SNMP |
| | Interface | 10Base-T |
| EOW interface | | Standard socket: 4P4C |
| Physical Dimension | | 1U: 440 × 44 ×138 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply<br>+24VDC |
| | Consumption | ≤10 w |
| Environment | Temperature | 0°C~50°C |
| | Humidity | ≤90 % |

# Overview

H9MO-LMV is a carrier-class, cost-effective, compact (only 1U high) SDH/MSTP platform that is designed for applications in metro and access networks to facilitate the efficient transport of traditional TDM and emerging data traffic for service providers. It can provide various service interfaces: .4 E1s, 2×100Base-T Ethernet ports and one V.35 port in only 1U standard 19" box. H9MO-LMV is best suitable for point-to-point network or standard SDH TM node. Working together with other "MetroEdge-Express" family member such as H9MO-LMFIT, it can support various network topologies such as point-to-point, chain, ring, hub, and mesh networks.

# Features

1. 1U box SDH/MSPP with 4 E1s, V.35 port and 2×100Base-T Ethernet ports
2. Ethernet service supporting GFP encapsulation, VC12 virtual concatenation
3. Inter-working with popular SDH/MSPP products of various vendors
4. SDH/MSTP core, PDH price
5. Support remote site power-off indication
6. Easy commissioning and maintenance
7. High integration, compact design
8. High reliability, low CAPEX and OPEX

# H0FL-EthMux V16

## 16xE1/T1 over Ethernet Multiplexer (TDM over IP)

## Overview

As a cost effective solution for the traditional telecom services migrate to the IP packet networking technology, H0FL-EthMux V16 adopts the innovative TDM over IP technology, with IP circuit emulation that supports transportation of 8~16 E1s and 5 GE electrical ports and 1 GE optical port. The uplink ports and user data ports are IEEE 802.3 compliant, 10/100/1000M auto-sensed Ethernet ports.

State-of-the-art design provides the highest availability with the accurate timing signal and data bit stream reconstruction. Predefined system parameter profiles that according to different application requirement; ultimately simplify the installation process and saving the maintenance cost.

H0FL-EthMux V16 could work together with other members in H0FL-Ethmux family such as EthMux V8, EthMux V804, EthMux V802, EthMux V801 etc. to run legacy E1 services. Telecom and Enterprise users can save a lot of access and equipment costs and generates new revenue by offering different types of services over their packet-switched infrastructure. It is also suitable for connecting to the wireless equipment to achieve fast deployment of E1/T1 services. One particular application is to build E1/T1 links with low cost Wireless LAN bridges, replacing much more costly microwave radios. Operators can use H0FL-EthMux to provide legacy TDM services over wired or wireless Ethernet/IP network.

## Features

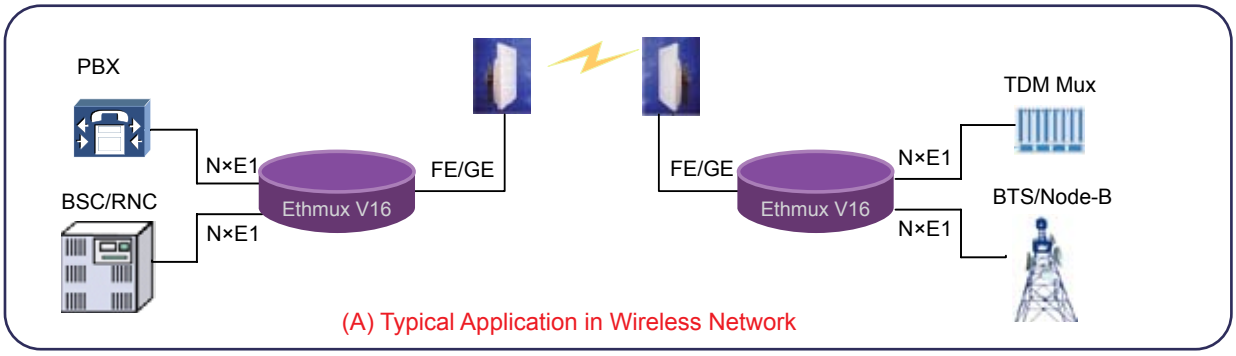
1. Provide 5 GE electrical ports and 1 GE optical port, 6 GE ports serve as network uplinks or users ports, Anyone of 5 GE electrical ports may act as NM port
2. Support Ethernet uplink port 1+1 protection
3. User-friendly Web server supported for easy setup and maintenance, alarm log provided
4. Support SNMP V1/V2 network management
5. Ethernet built-in layer 2 switch, support VLAN, comply with IEEE 802.3x, 802.1P
6. Provide two pluggable E1 cards, each card supports 8 E1/T1s
7. Point to point and point to multipoint supported
8. Stable E1/T1 clock recovery, low jitter and wander
9. Low processing delay for E1 channels, high bandwidth usage efficiency
10. Resist to packet loss, with PCM frame synchronization protection
11. User definable encapsulation packet size for different application
12. Support Ethernet encapsulation and UDP/IP protocol encapsulation.
13. Support VLAN settings for E1 service and in band VLAN management.
14. Enough jitter buffer to resist packet delay variation (PDV)
15. Local Ethernet port throughput limiting, assuring E1 QoS
16. 120Ω balanced E1/T1 port, RJ-45 connector, support 75Ω unbalanced port through outside converting cable.
17. Support cascade concatenate for more than 16 E1 ports
18. Software and hardware online upgrade
19. Power supply redundancy
20. POE power supply supported by power module with 220V AC input and 55V DC output.

## Interoperability Table with Wireless Bridges

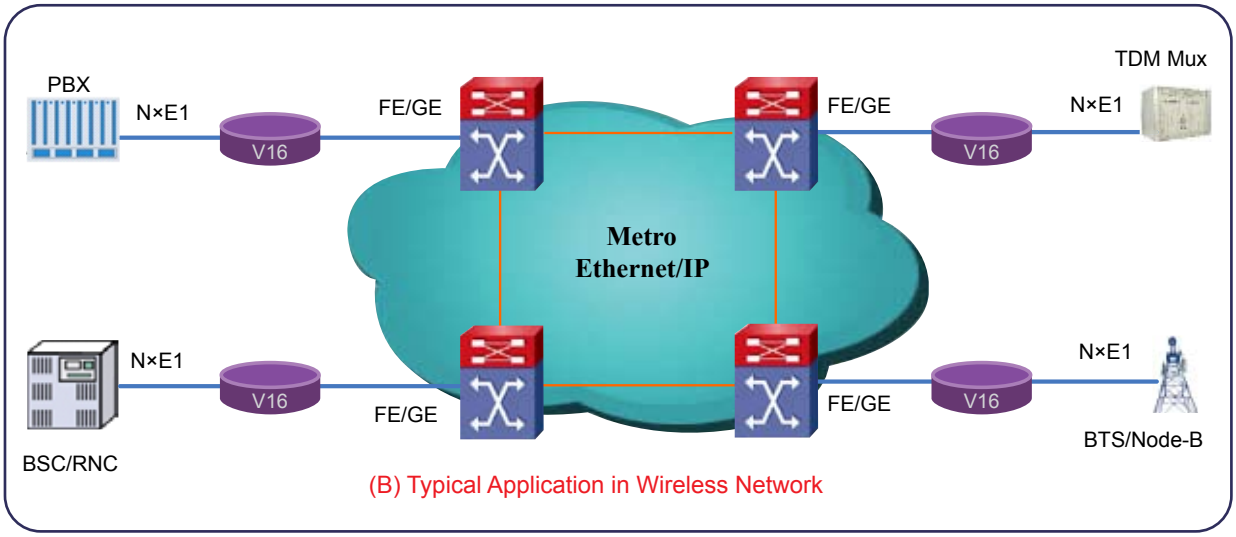
| LOGO | Manufacturer | Country of Origin | Model |
|---|---|---|---|
| | MOTOROLA | USA | PTP100 Series, PTP200 Series, PTP300 Series, PTP400 Series, PTP 500 Series, PTP600 Series |
| alvarion® Your Open WiMAX Choice | Alvarion | Israel | BreezeNET B Series B10, B14, B28, B100, B300, BreezeNET DS.11 etc |
| Proxim wireless | Proxim | USA | Tsunami™ QB-8100 Series and QuickBridge Series |
| InfiNet wireless | Infinet Wireless | Russia | InfiLink, InfiLink 2x2 etc |
| firepro wireless | Firepro Wireless | India | LR1R-H1,LR1R,SR series |

Note: More wireless bridges are supported

# Typical Application




(A) Typical Application in Wireless Network




(B) Typical Application in Wireless Network

# Technical Specifications

| Item | Description | |
|---|---|---|
| Model | H0FL-EthMux V16 | 5 GE electrical ports and 1 GE optical port, 16 E1s |
| Interfaces | IP ports | 5 GE electrical ports and 1 GE optical port<br>Comply with IEEE 802.3, 802.1Q, 802.1P<br>Speed and duplex auto-negotiation or manual |
| | E1 Ports | 16 E1 Ports Supported<br>Comply with G.703<br>Impedance: E1-120Ω or 75Ω |
| | T1 Ports | 16 T1 Ports Supported<br>Comply with G.703<br>Impedance:100Ω |
| NM port | Same as IP ports | Web server and SNMP management supported |
| Power | Supply | Pluggable dual power supply |
| | | 2DC or 2AC or DC+AC |
| | | -48V~-72VDC or 100~240VAC |
| | Consumption | ≤15W |
| Working Environment | Temperature | 0~ 50°C |
| | Relative Humidity | ≤90% (non-condensing) |
| Dimension | W x H x D (mm): | 440 x 44 x 231 |

# Ordering Information

| | |
|---|---|
| H0FL-EthMux.V16 | TDM over IP Mux, with 5 10/100/1000 Ethernet Ports and 1 1000Base-Fx slots (SPF not included), with two 8E1 cards slots (equipped separately). With two power slots. Web Server. |
| H0FL-EthMux.V16.PWR01 | DC-48V Power Module , Used in H0FL-EthMux.V16, 15W, Can be 1+1 |
| H0FL-EthMux.V16.PWR02 | AC 220V Power Module, Used in H0FL-EthMux.V16, 15W, Can be 1+1 |
| H0FL-EthMux.V16.E1/T | 8E1 Card which can be used in H0FL-EthMux.V16 (RJ45 Interface,120ohms), Two cards can be used in H0FL-EthMux.V16 Chassis |
| H0FL-EthMux.V16.E1 | 8E1 Card which can be used in H0FL-EthMux.V16 (RJ45 Interface, 75ohms), Two cards can be used in H0FL-EthMux.V16 Chassis. Need additional four BH4.850.123 cables per card |
| BH4.850.123 | E1 BNC Adaptation Cable. One cable for 2E1s. One RJ45 to four BNC connector. |

# H0FL-EthMux V8

## 8xE1 over Ethernet Multiplexer (TDM over IP)

## Overview

As a cost effective solution for the traditional telecom services migrate to the IP packet networking technology, H0FL-EthMux V8 adopts the innovative TDM over IP technology, it transports the legacy E1 data through the existing Ethernet or IP network.

H0FL-EthMux V8 is the new generation of the TDM over IP equipment with IP circuit emulation that supports transportation of eight E1 and two local Ethernet ports over Ethernet or IP network. The uplink ports and user data ports are IEEE 802.3 compliant, 10/100BaseT auto-sensed Ethernet port.

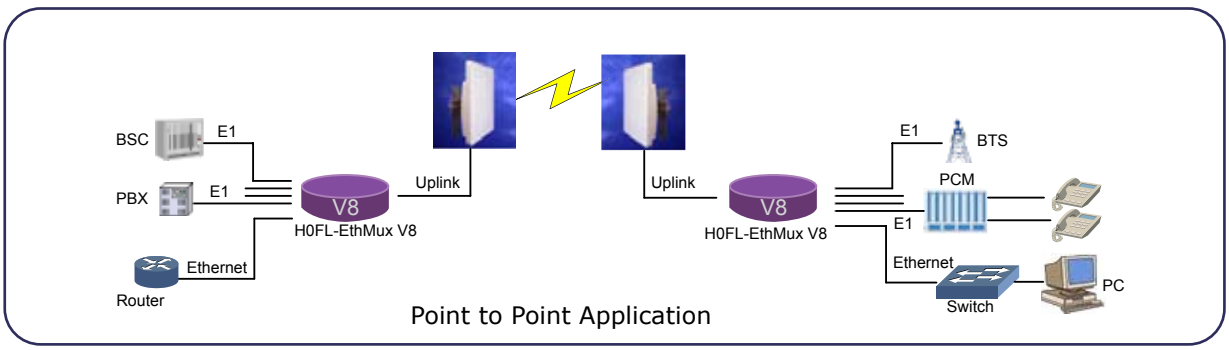
The state-of-the-art design provides the highest availability with the accurate timing signal and data bit stream reconstruction. Predefined system parameter profiles that according to different application requirement; ultimately simplify the installation process and saving the maintenance cost.

Telecom and Enterprise users can save a lot of access and equipment costs and generates new revenue by offering different types of service over existing Ethernet networks. It is also suitable for connecting to the wireless equipment to achieve fast deployment of E1 services. One particular application is to build E1 links with low cost Wireless LAN bridges, replacing much more costly microwave radios. Operators can use H0FL-EthMux V8 to provide legacy TDM services over wired or wireless packet network.

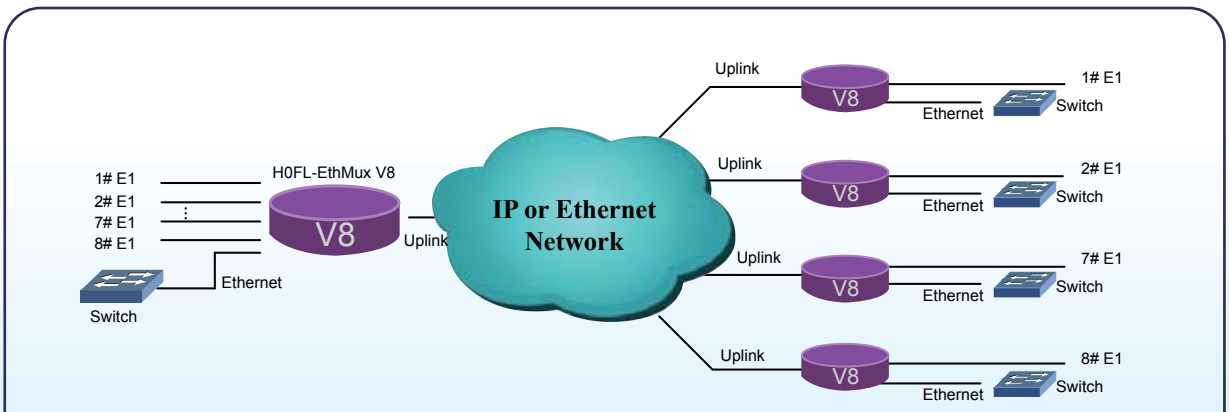
## Features

1. User-friendly Web server supported for easy setup and maintenance
2. Support SNMP V1 and V2 network management
3. Provide alarm log
4. Point to point and point to multipoint supported
5. 8 E1 Ports supported
6. Uplink ports 1+1 backup supported
7. Stable E1 clock recovery, low jitter and wander
8. Low processing delay for E1 channels, high bandwidth usage efficiency
9. Resist to packet loss, with PCM frame synchronization protection
10. User definable encapsulation packet size for different application
11. Support Ethernet encapsulation and UDP/IP protocol encapsulation.
12. Support VLAN settings for E1 service and in band VLAN management.
13. Enough jitter buffer to resist packet delay variation (PDV)
14. Local Ethernet port throughput limiting, assuring E1 QoS
15. Local and remote E1 LOS and AIS and packet loss indication for trouble-shooting and maintenance
16. Support cascade concatenate for more than 8 E1 ports

## Technical Specifications




Point to Point Application




Point to Multipoint Application

# Technical Specifications

| Item | Description | |
|---|---|---|
| Model | H0FL-EthMux V8 | 2 Uplink (1+1), 8E1s, 2 User Data Ports |
| Interfaces | Uplink | 2 Uplink Ports<br>Comply with IEEE 802.3<br>Speed and duplex auto-negotiation or forced |
| | E1 Port | 8 E1 Ports Supported<br>Comply with G.703<br>Impedance: E1-120Ω or 75Ω |
| | User Data Port | 2 User Data Ports Supported<br>Comply with IEEE 802.3<br>Speed and duplex auto-negotiation or forced<br>Web Manager Supported |
| Power | Supply | Pluggable dual power supply |
| | | 2DC or 2AC or DC+AC |
| | | -48V DC or 100~240V AC |
| | Consumption | ≤10W |
| Working Environment | Temperature | 0~ 50°C |
| | Relative Humidity | ≤90% (non-condensing) |

# Interoperability Table with Wireless Bridges

| LOGO | Manufacturer | Country of Origin | Model |
|---|---|---|---|
| | MOTOROLA | USA | PTP100 Series, PTP200 Series, PTP300 Series, PTP400 Series, PTP 500 Series, PTP600 Series |
| alvarion® Your Open WiMAX Choice | Alvarion | Israel | BreezeNET B Series B10, B14, B28, B100, B300, BreezeNET DS.11 etc |
| Proxim® wireless | Proxim | USA | Tsunami™ QB-8100 Series and QuickBridge Series |
| InfiNet wireless | Infinet Wireless | Russia | InfiLink, InfiLink 2x2 etc |
| firepro wireless | Firepro Wireless | India | LR1R-H1,LR1R,SR series |

Note: More wireless bridges are supported

# Ordering Information

| Product Model | Description |
|---|---|
| H0FL-EthMux.V8/T | TDM over IP Mux, with 1-port E1 for downlink, 2-port 10/100Bast-T interfaces for uplink, E1 120ohms, AC220V Type. Web Server. |
| H0FL-EthMux.V8 | TDM over IP Mux, with 8-port E1 (75ohms), 2-port 10/100Bast-T interfaces for uplink, 2-port 10/100Base-T for user data. With two power slots, Need additional eight BH4.850.122 cables. Web Server. SNMP |
| H0FL-PWR-48 | DC-48V Power Module , Used in H0FL-EthMux.V8 or H0FL-EthMux.V804, 15W, Can be 1+1. |
| H0FL-PWR-220 | AC 220V Power Module, Used in H0FL-EthMux.V8 or H0FL-EthMux.V804, 15W, Can be 1+1. |
| BH4.850.122 | E1 BNC Adaptation Cable. One cable for 1E1. One RJ45 to two BNC connector. |

# H0FL-EthMux V804

## 4xE1 over Ethernet Multiplexer (TDM over IP)

## Overview

As a cost effective solution for the traditional telecom services migrate to the IP packet networking technology, H0FL-EthMux_V804 adopts the innovative TDM over IP technology, it transports the legacy E1 data through the existing Ethernet or IP network.

H0FL-EthMux V804 is the new generation of the TDM over IP equipment with IP circuit emulation that supports transportation of four E1 and two local Ethernet ports over Ethernet or IP network. The uplink ports and user data ports are IEEE 802.3 compliant, 10/100BaseT auto-sensed Ethernet port.

The state-of-the-art design provides the highest availability with the accurate timing signal and data bit stream reconstruction. Predefined system parameter profiles that according to different application requirement; ultimately simplify the installation process and saving the maintenance cost.

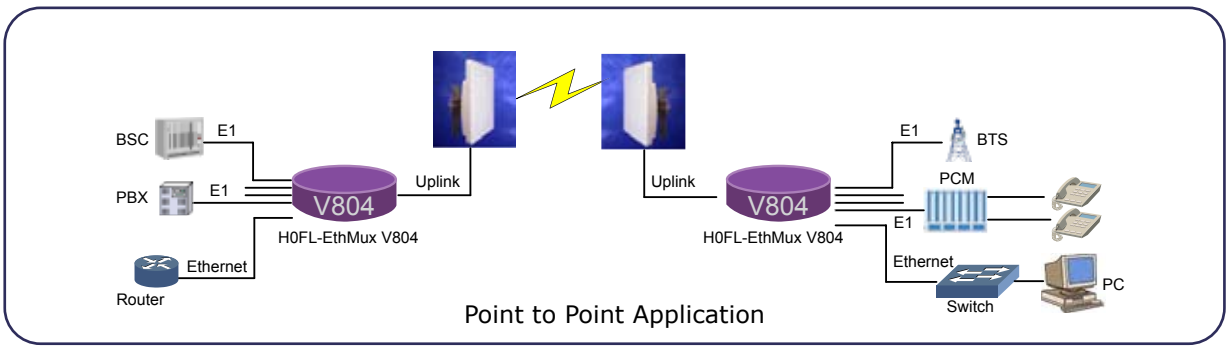
Telecom and Enterprise users can save a lot of access and equipment costs and generates new revenue by offering different types of service over existing Ethernet networks. It is also suitable for connecting to the wireless equipment to achieve fast deployment of E1 services. One particular application is to build E1 links with low cost Wireless LAN bridges, replacing much more costly microwave radios. Operators can use H0FL-EthMux V804 to provide legacy TDM services over wired or wireless packet network.

## Features

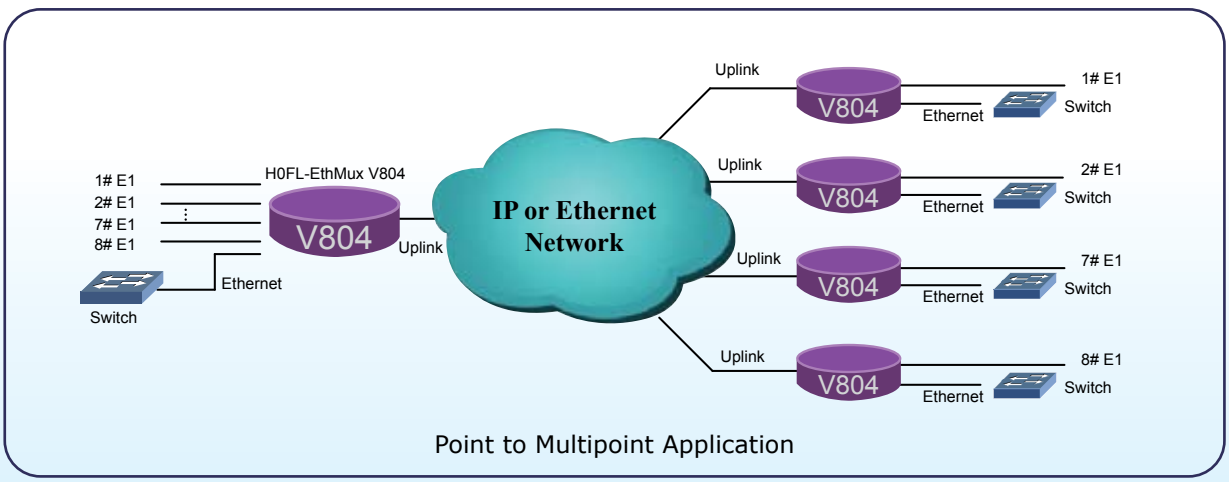
1. User-friendly Web server supported for easy setup and maintenance
2. Support SNMP V1 and V2 network management
3. Point to point and point to multipoint supported
4. Four E1 Ports supported
5. Uplink ports 1+1 backup supported
6. Stable E1 clock recovery, low jitter and wander
7. Low processing delay for E1 channels, high bandwidth usage efficiency
8. Resist to packet loss, with PCM frame synchronization protection
9. User definable encapsulation packet size for different application
10. Support Ethernet encapsulation and UDP/IP protocol encapsulation.
11. Support VLAN settings for E1 service and in band VLAN management.
12. Enough jitter buffer to resist packet delay variation (PDV)
13. Local Ethernet port throughput limiting, assuring E1 QoS
14. Local and remote E1 LOS and AIS and packet loss indication for trouble-shooting and maintenance

Support cascade concatenate for more than 4 E1 ports

## Typical Application




Point to Point Application




Point to Multipoint Application

# Technical Specifications

| Item | Description | |
|---|---|---|
| Model | H0FL-EthMux V804 | 2 Uplinks (1+1), 4E1s, 2 User Data Ports |
| Interfaces | Uplink | 2 Uplink Ports<br>Comply with IEEE 802.3<br>Speed and duplex auto-negotiation or manual |
| | E1 Port | 4 E1 Ports Supported<br>Comply with G.703<br>Impedance: 120Ω or 75Ω |
| | User Data Port | 2 User Data Ports Supported<br>Comply with IEEE 802.3<br>Speed and duplex auto-negotiation or manual<br>Web Manager Supported |
| Power | Supply | Dual power supply, Pluggable module design |
| | | 2DC or 2AC or DC+AC |
| | | -38~-62VDC or 100~240V AC |
| | Consumption | ≤10W |
| Working Environment | Temperature | 0~ 50°C |
| | Relative Humidity | ≤90% (non-condensing) |
| Dimension | W x H x D (mm): | 440 x 44 x 231 |

# Interoperability Table with Wireless Bridges

| LOGO | Manufacturer | Country of Origin | Model |
|---|---|---|---|
| | MOTOROLA | USA | PTP100 Series, PTP200 Series, PTP300 Series, PTP400 Series, PTP 500 Series, PTP600 Series |
| alvarion® Your Open WiMAX Choice | Alvarion | Israel | BreezeNET B Series<br>B10, B14, B28, B100, B300, BreezeNET DS.11 etc |
| proxim® wireless | Proxim | USA | Tsunami™ QB-8100 Series and QuickBridge Series |
| InfiNet wireless | Infinet Wireless | Russia | InfiLink, InfiLink 2x2 etc |
| firepro wireless | Firepro Wireless | India | LR1R-H1,LR1R,SR series |

Note: More wireless bridges are supported

Huahuan

# H0FL-EthMux V802

## 2xE1 over Ethernet Multiplexer (TDM over IP)

## Overview

As a cost effective solution for the traditional telecom services migrate to the IP packet networking technology, H0EL-EthMux_V802 adopts the innovative TDM over IP technology, it transports the legacy E1 data through the existing Ethernet or IP network.

H0EL-EthMux V802 is the new generation of the TDM over IP equipment with IP circuit emulation that supports transportation of E1 over Ethernet or IP network. The uplink ports are IEEE 802.3 compliant, 10/100BaseT auto-sensed Ethernet port.

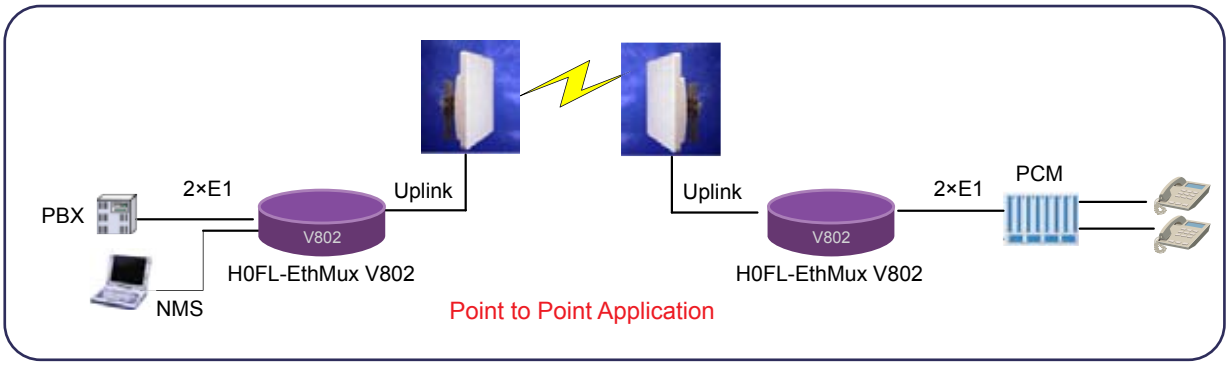
The state-of-the-art design provides the highest availability with the accurate timing signal and data bit stream reconstruction. Predefined system parameter profiles that according to different application requirement; ultimately simplify the installation process and saving the maintenance cost.

Telecom and Enterprise users can save a lot of access and equipment costs and generates new revenue by offering different types of service over existing Ethernet networks. It is also suitable for connecting to the wireless equipment to achieve fast deployment of E1 services. One particular application is to build E1 links with low cost Wireless LAN bridges, replacing much more costly microwave radios. Operators can use H0EL-EthMux V802 to provide legacy TDM services over wired or wireless packet network.

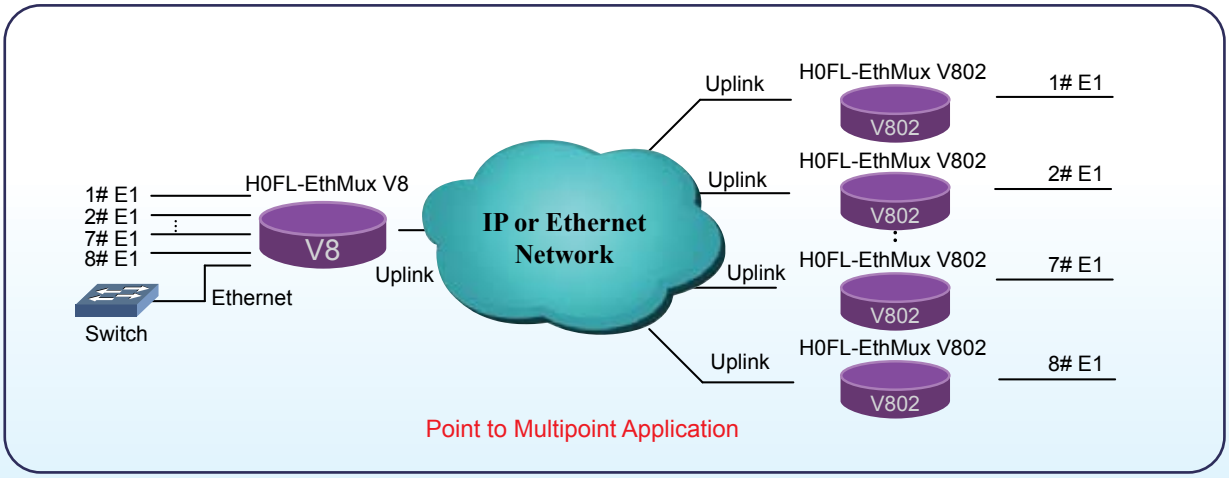
## Features

1. User-friendly Web server supported for easy setup and maintenance
2. Support SNMP
3. 2 Uplinks, 2E1/T1s
4. Stable E1/T1 clock recovery, low jitter and wander
5. Low processing delay for E1/T1 channel, high bandwidth usage efficiency
6. Resist to packet loss, with PCM frame synchronization protection
7. User definable encapsulation packet size for different application
8. Support Ethernet encapsulation and UDP/IP protocol encapsulation.
9. Support VLAN settings for E1/T1 service and in band VLAN management.
10. Enough jitter buffer to resist packet delay variation (PDV)
11. Local and remote E1/T1 LOS and AIS and packet loss indication for trouble-shooting and maintenance

## Typical Application




Point to Point Application




Point to Multipoint Application

# Technical Specifications

| Item | Description | | |
|---|---|---|---|
| Model | H0FL-EthMux V802 | 2 Uplinks(1+1), 2 E1/T1s | |
| Interfaces | Uplink | 2 Uplink Ports<br>Comply with IEEE 802.3<br>Speed and duplex auto-negotiation or manual<br>Web Manager Supported | |
| | E1/T1 Port | 2 Ports<br>Comply with G.703<br>Impedance: E1-120Ωor 75Ω/T1-100Ω | |
| Power | Supply | A | DC -48V(-36V ~ -72V) |
| | | B | AC ~220V(100V ~ 260V) |
| | Consumption | ≤3W | |
| Working Environment | Temperature | 0~ 50°C | |
| | Relative Humidity | ≤90% (non-condensing) | |
| Dimension | W x H x D (mm): | 185x35x 136.5 | |

# Interoperability Table with Wireless Bridges

| LOGO | Manufacturer | Country of Origin | Model |
|---|---|---|---|
| | MOTOROLA | USA | PTP100 Series, PTP200 Series, PTP300 Series, PTP400 Series, PTP 500 Series, PTP600 Series |
| alvarion® Your Open WiMAX Choice | Alvarion | Israel | BreezeNET B Series B10, B14, B28, B100, B300, BreezeNET DS.11 etc |
| Proxim wireless | Proxim | USA | Tsunami™ QB-8100 Series and QuickBridge Series |
| InfiNet wireless | Infinet Wireless | Russia | InfiLink, InfiLink 2x2 etc |
| firepro wireless | Firepro Wireless | India | LR1R-H1,LR1R,SR series |

Note: More wireless bridges are supported

# H0FL-EthMux V801

## E1/T1 over Ethernet Multiplexer (TDM over IP)

## Overview

As a cost effective solution for the traditional telecom services migrate to the IP packet networking technology, H0FL-EthMux V801 adopts the innovative TDM over IP technology, it transports the legacy E1 data through existing Ethernet or IP network.

H0FL-EthMux V801 is the new generation of the TDM over IP equipment with IP circuit emulation that supports transportation of E1 over Ethernet or IP network. The uplink ports are IEEE 801.3 compliant, 10/100BaseT auto-sensed Ethernet port.

The state-of-the-art design provides the highest availability with the accurate timing signal and data bit stream reconstruction. Predefined system parameter profiles that according to different application requirement; ultimately simplify the installation process and saving the maintenance cost.

Telecom and Enterprise users can save a lot of access and equipment costs and generates new revenue by offering different types of service over existing Ethernet networks. It is also suitable for connecting to the wireless equipment to achieve fast deployment of E1 services. One particular application is to build E1 links with low cost Wireless LAN bridges, replacing much more costly microwave radios. Operators can use H0FL-EthMux V801 to provide legacy TDM services over wired or wireless packet network.

# Interoperability Table with Wireless Bridges

| LOGO | Manufacturer | Country of Origin | Model |
|---|---|---|---|
| | MOTOROLA | USA | PTP100 Series, PTP200 Series, PTP300 Series, PTP400 Series, PTP 500 Series, PTP600 Series |
| alvarion Your Open WiMAX Choice | Alvarion | Israel | BreezeNET B Series B10, B14, B28, B100, B300, BreezeNET DS.11 etc |
| proxim wireless | Proxim | USA | Tsunami™ QB-8100 Series and QuickBridge Series |
| InfiNet wireless | Infinet Wireless | Russia | InfiLink, InfiLink 2x2 etc |
| firepro wireless | Firepro Wireless | India | LR1R-H1，LR1R，SR series |

Note: More wireless bridges are supported

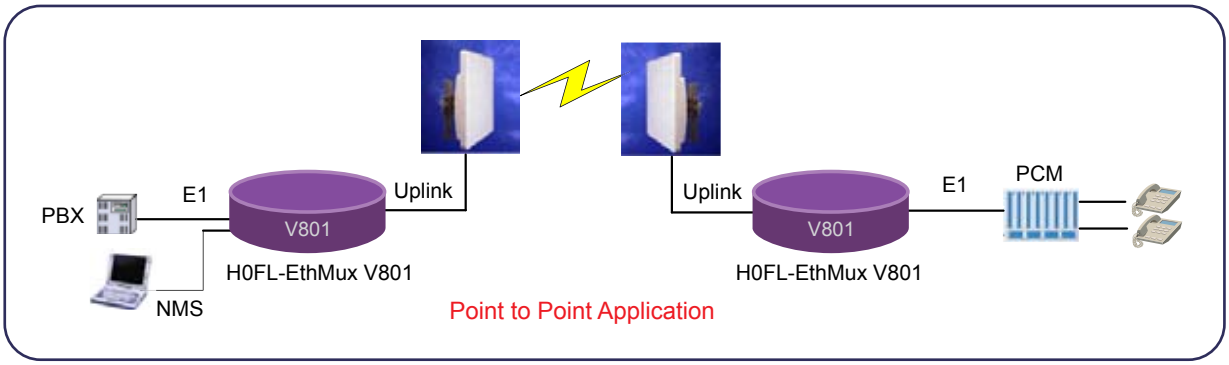
# Technical Specifications

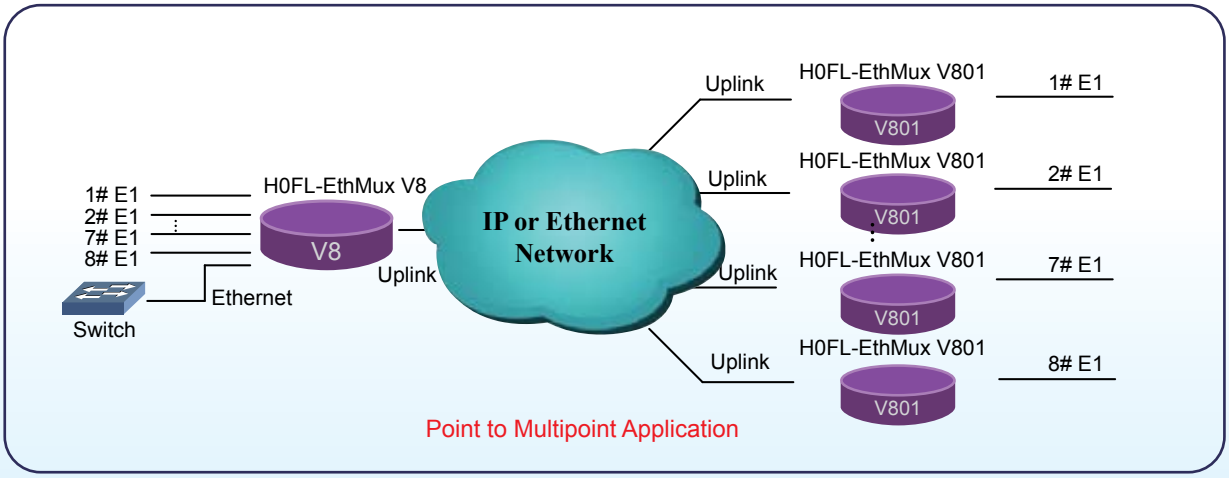
| Item | Description | | |
|---|---|---|---|
| Model | H0FL-EthMux V801 | 2 Uplinks(1+1), 1 E1/T1 | |
| Interfaces | Uplink | 2 Uplink Ports<br>Comply with IEEE 801.3<br>Speed and duplex auto-negotiation or manual<br>Web Manager Supported | |
| | E1/T1 Port | 1 E1 Port<br>Comply with G.703<br>Impedance: E1-120Ω or 75Ω/T1-100Ω | |
| Power | Supply | A | DC -48V(-36V ~ -72V) |
| | | B | AC ~220V(100V ~ 260V) |
| | Consumption | ≤3W | |
| Working Environment | Temperature | 0~ 50°C | |
| | Relative Humidity | ≤90% (non-condensing) | |
| Dimension | W x H x D (mm): | 185x35x 136.5 | |

## Features

1. User-friendly Web server supported for easy setup and maintenance
2. Support SNMP
3. 2 Uplinks(1+1), 1E1/T1
4. Stable E1 clock recovery, low jitter and wander
5. Low processing delay for E1 channel, high bandwidth usage efficiency
6. Resist to packet loss, with PCM frame synchronization protection
7. User definable encapsulation packet size for different application
8. Support Ethernet encapsulation and UDP/IP protocol encapsulation.
9. Support VLAN settings for E1 service and in band VLAN management.
10. Enough jitter buffer to resist packet delay variation (PDV)
11. Local and remote E1 LOS and AIS and packet loss indication

## Typical Application



# Ordering Information

| Product Model | Description |
|---|---|
| H0FL-EthMux.V801/T | TDM over IP Mux, with 1-port E1 for downlink, 2-port 10/100Bast-T interfaces for uplink, E1 120ohms, AC220V Type. Web Server. |
| H0FL-EthMux.V801/8T | TDM over IP Mux, with 1-port E1 for downlink, 2-port 10/100Bast-T interfaces for uplink, E1 120ohms, DC-48V Type. Web Server. |
| H0FL-EthMux.V801 | TDM over IP Mux, with 1-port E1 for downlink, 2-port 10/100Bast-T interfaces for uplink, E1 75ohms,including one BH4.850.122 Cable, AC220V Type. Web Server. |
| H0FL-EthMux.V801/8 | TDM over IP Mux, with 1-port E1 for downlink, 2-port 10/100Bast-T interfaces for uplink, E1 75ohms,including one BH4.850.122 Cable, DC-48V Type. Web Server. |

# H0FL-EoS01F

## Ethernet over STM-1 converter

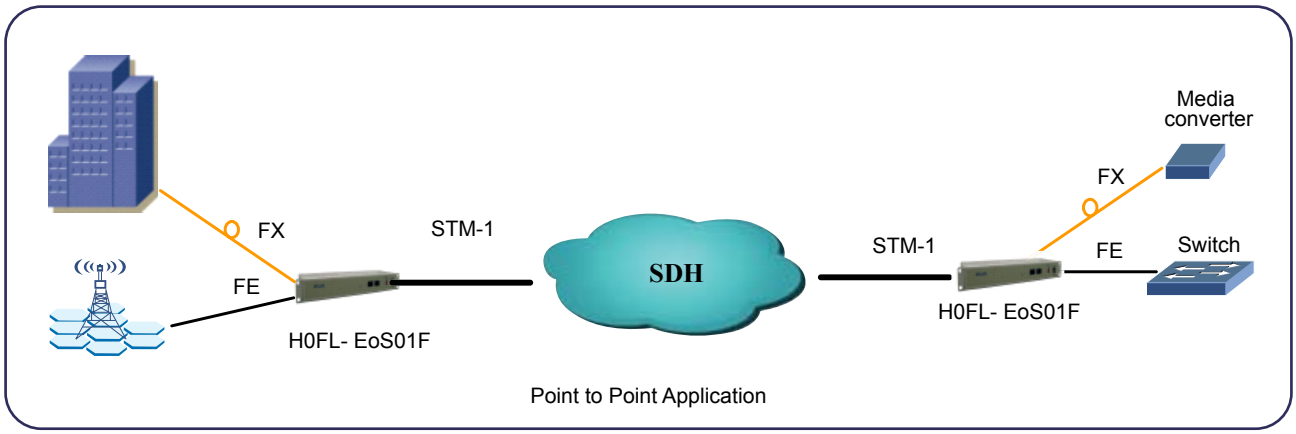
## Overview

H0FL-EoS01F Ethernet / STM-1 converter provides one or two SDH STM-1 optical interface, two Ethernet interfaces, and a 100M 100M Ethernet optical port, the Ethernet packets directly encapsulated to the payload of SDH, SDH transmission network through long-distance high-speed Ethernet connectivity. The device has a standard STM-1 optical interface with any standard STM-1 optical interface, docking, direct access to the backbone network, or constitute a simple point to point network.

## Features

1. Standard STM-1 optical interface, which provides 1 +1 protection, single fiber transmission, wavelength and light power of different interfaces and other options;
2. Provides two Ethernet interfaces, and a 100M optical port, optical port can be independently Plug
3. Ethernet mapping adopts GFP/VC-12 virtual concatenated technology; according with MSTP criterion;
4. SNMP(10/100Base-T) network management port;
5. Standard 19 inch 1 unit box;
6. -48V DC or 220V AC power supply
7. Substrate program on-line update supported.

## Typical Application




Point to Point Application

## Technical Specifications

| | |
|---|---|
| **Console port** | |
| • | Ethernet console Q port: RJ45, SNMP, 10Base-T adopts MDI port |
| **Power** | |
| • | Voltage: |
| | DC~48V(-38V~-58V); |
| | DC~48V and AC~220V(100V ~ 240V, 50~60Hz) dual power; |
| | DC +24V(18V~35V); |
| • | Consumption:≤ 8W. |
| **Environment** | |
| • | Temperature:0°C ~ 45°C |
| • | Humidity:≤ 90 %(non-condensing) |
| **Dimension** | |
| • | width×height×depth(mm): 440 × 44 × 138 |
| **Weight** | |
| • | ≤2kg |

# H0FL-EoS01

## Ethernet over STM-1 converter

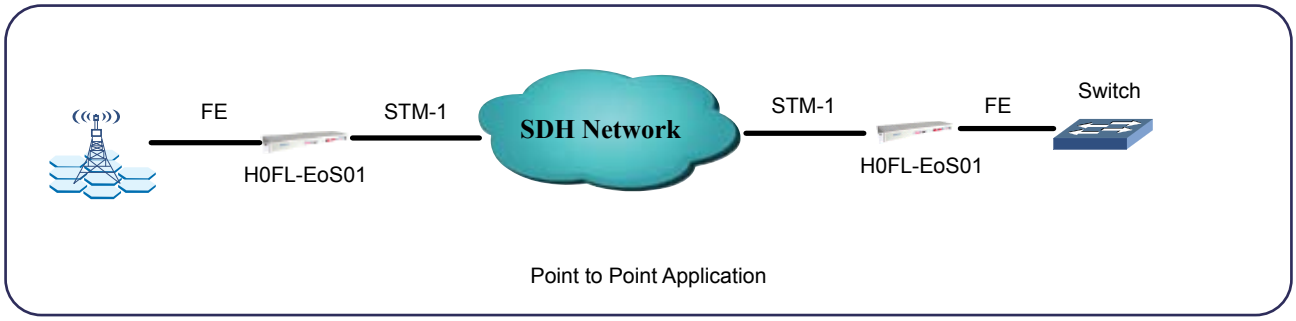
## Overview

H0FL-EoS01 is one of Ethernet/STM-1 converters which deliver Ethernet services over SDH STM-1 circuit. It provides one or two STM-1 SDH optical interfaces and two 100M full-duplex Ethernet electrical ports, encapsulates Ethernet frame to SDH payload, providing fast and cost-effective Ethernet access for carriers and service providers. The standard STM-1 enables connection with any SDH multiplexers from other vendors to access backbone network or get simple point-to-point network directly.

## Features

1. Standard STM-1 optical ports, support 1+1 protection, dual or single fiber transmission, different wavelengths and powers can be selected
2. Ethernet mapping adopts GFP/VC-12 virtual concatenated technology; according with MSTP criterion;
3. SNMP(10Base-T) network management port
4. Standard 19” 1 unit box
5. -48V DC or 220V AC power supply, support power redundancy
6. Substrate program on-line update supported
7. High reliability, low CAPEX and OPEX

## Typical Application




Point to Point Application

## Technical Specifications

| Index | | Performance Parameter |
|---|---|---|
| SDH Interface | Max | 1~2 STM-1 optical interfaces (1+1 protection supported) |
| | Connector | SC/PC |
| | Spec. | S-1.1, L-1.1, L-1.2 |
| | | Single fiber bi-directional interface can be optionally supported |
| Service interface | Ethernet port | 2×10/100Base-Tx<br>Comply with IEEE 802.3 |
| Management | Protocol | SNMP |
| | Interface | 10Base-T |
| Physical Dimension | | 1U: 440 × 44 ×138 (mm) |
| Power | Supply | -48V DC or 220V (110V) AC or dual power supply<br>+24VDC |
| | Consumption | ≤8w |
| Environment | Temperature | 0°C~50°C |
| | Humidity | ≤90 % |

# H0FL-S16100SF/SN

## Ethernet Over 16E1 Converter

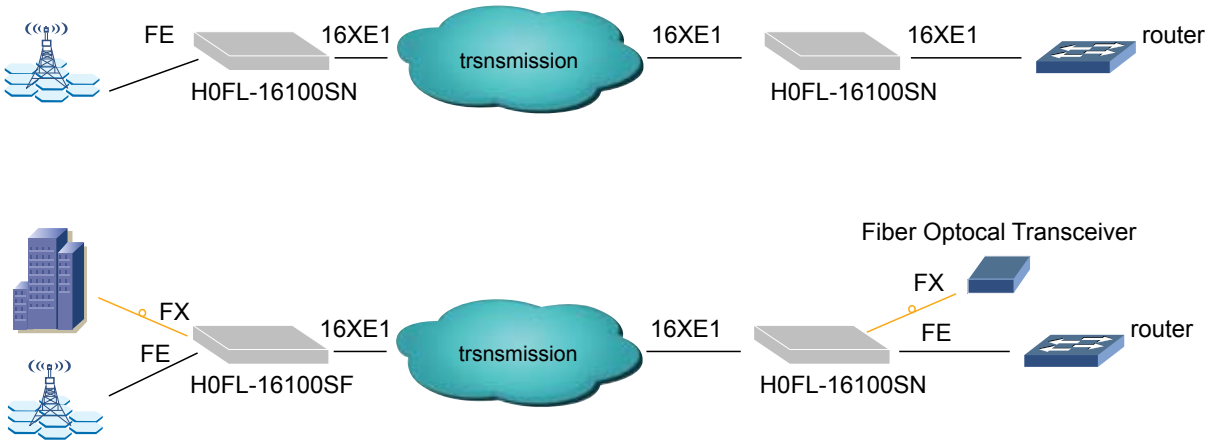
## Overview

H0FL-S16100SN/S16100SF is standard network adapter, which provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. H0FL-S16100SN/S16100SF can convert Ethernet frame format into standard E1 frame format, then revert E1 frame format into Ethernet frame format on the peer end, so as to realize Ethernet date based on E1 Transmission, to access user date. It supports standard Ethernet GFP encapsulation. So it can easily cooperate with other vendor's converter. What's more, H0FL-S16100SN/S16100SF supports SNMP management.

## Features

1. H0FL-S16100SN provides 2 10/100Base-Tx electrical Ethernet ports. H0FL-S16100SF provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. Ethernet ports comply with IEEE 802.3/IEEE 802.3u and support IEEE 802.1Q/802.1P. 802.1Q VLAN configuration is also supported.
2. Etherent ports support AUTO-MDIX under auto-negotiated mode, aoto sense crossover/direct cables, can be connect to switches, network cards and routers easily.
3. Provide 1~16 E1 ports, 75Ω /120Ω selectable, comply with ITU-T G.703;
4. 1~16 E1 channels selectable, support LCAS, valid E1 channels can be judged and bandwidth can be adjusted automatically.
5. High buffer capability, low forward delay.
6. Easy installation. Need no configuration when p2p use.
7. Provide one SNMP ( 10/100 Base-T) NMS interface.
8. Intercommunication with central equipment H0FL-P.V2 S08100 service card to realize network management and other standard Ethernet over E1 equipment produced by different manufacturers.
9. 19" 1U standard case, low consumption and high reliability
10. ~48VDC or ~220VAC or dual power supply.

## Typical Application




## Technical Specifications

| Items | Description | |
|---|---|---|
| E1 Interface | Code: HDB3<br>Bit rate 2048 kbit/s ±50ppm<br>Resistance: 75Ω/120Ω<br>Connector: RJ-48C<br>Number: 16 | |
| ETH Interface | Auto negotiation 10/100M Half duplex/full duplex<br>Connector: RJ45 for electrical ports SC/FC for optical port<br>Number: H0FL-S16100SN 2 electrical<br>H0FL-S16100SF 3(2xelectrical+1xoptical) | |
| Power | Supply | DC ~ 48V ( -36V~-72V ) |
| | Consumption | ≤6 w |
| Environment | Temperature | 0°C ~ 50°C |
| | Humidity | 0 ~ 90% ( non-condensing ) |
| Dimension | width×height×depth (mm) : 440 × 44 × 138 | |

# H0FL-S08100SF/SN

## Ethernet over 8E1 converter

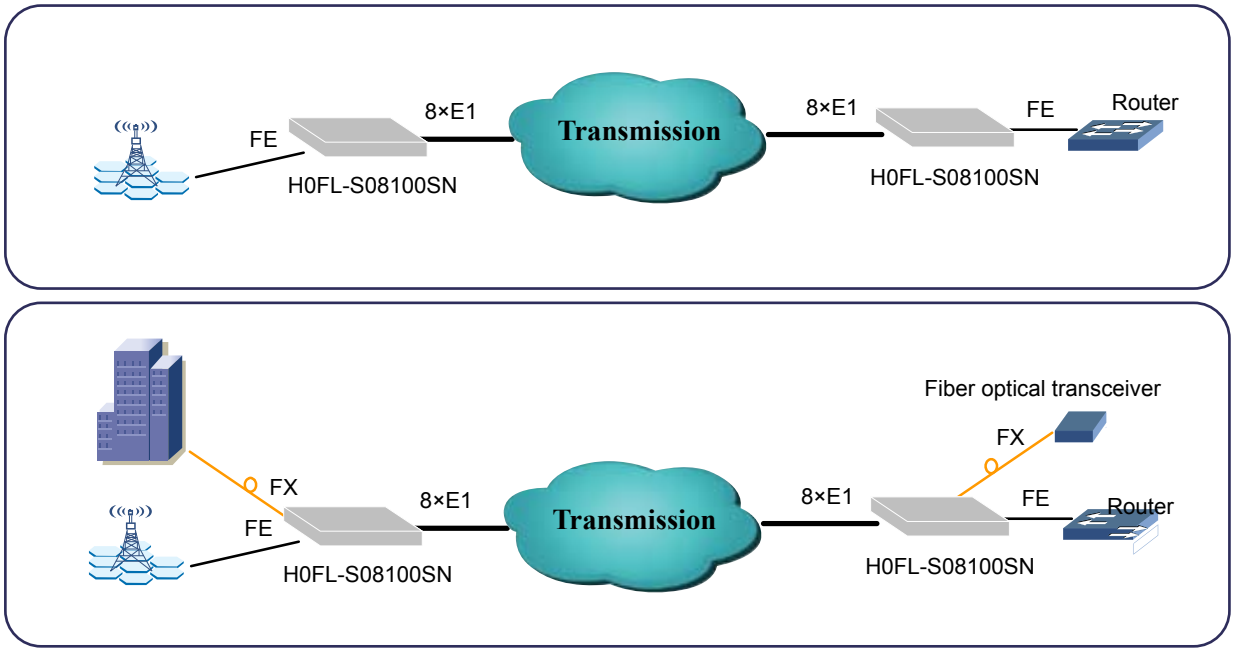
## Overview

H0FL-S08100SN/S08100SF is standard network adapter, which provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. H0FL-S08100SN/S08100SF can convert Ethernet frame format into standard E1 frame format, then revert E1 frame format into Ethernet frame format on the peer end, so as to realize Ethernet date based on E1 Transmission, to access user date. It supports standard Ethernet GFP encapsulation. So it can easily cooperate with other vendor's converter

## Features

1. H0FL-S08100SN provides 2 10/100Base-Tx electrical Ethernet ports. H0FL-S08100SF provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. Ethernet ports comply with IEEE 802.3/IEEE 802.3u and support IEEE 802.1Q/802.1P. 802.1Q VLAN configuration is also supported.
2. Etherent ports support AUTO-MDIX under auto-negotiated mode, aoto sense crossover/direct cables, can be connect to switches, network cards and routers easily.
3. Provide 1□8 E1 ports, 75Ω /120Ω selectable, comply with ITU-T G.703;
4. 1~8 E1 channels selectable, support LCAS, valid E1 channels can be judged and bandwidth can be adjusted automatically.
5. High buffer capability, low forward delay.
6. Easy installation. Need no configuration when p2p use.
7. Provide one SNMP ( 10/100 Base-T) NMS interface.
8. Intercommunication with central equipment H0FL-P.V2 S08100 service card to realize network management and other standard Ethernet over E1 equipment produced by different manufacturers.
9. 19" 1U standard case, low consumption and high reliability
10. ~48VDC or ~220VAC or dual power supply.

## Typical Application




## Technical Specifications

| Items | Description | |
|---|---|---|
| E1 Interface | Comply to ITU-T G.703<br>Code: HDB3<br>Bit rate 2048 kbit/s ±50ppm<br>Resistance: 75Ω/120Ω<br>Connector: RJ-48C<br>Number: 8 | |
| ETH Interface | Auto negotiation 10/100M Half duplex/full duplex<br>Connector: H0FL-S08100SN RJ45.<br>H0FL-S08100SF RJ45(electrical)<br>SC/FC(optical)<br>Number: H0FL-S08100SN 2 (2 electrical)<br>H0FL-S08100SF 3(2electrical~1optical) | |
| Power | Supply | DC~48V(-36V~-72V) |
| | Consumption | ≤6 w |
| Environment | Temperature | 0°C~50°C |
| | Humidity | 0~90 %(non-condensing) |
| Dimension | width×height×depth(mm): 440 × 44 × 138 | |

# H0FL-S04100SF/SN

## Ethernet over 4E1 converter

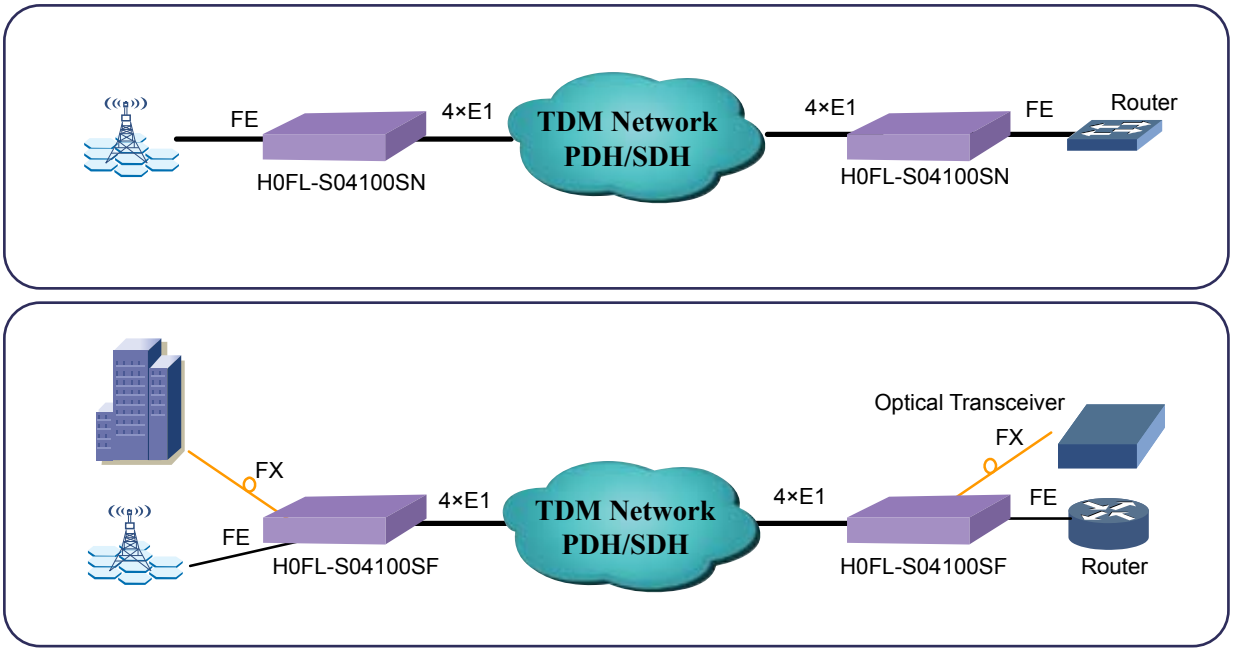
## Overview

H0FL-S04100SN/S04100SF is standard network adapter, which provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. H0FL-S04100SN/S04100SF can convert Ethernet frame format into standard E1 frame format, then revert E1 frame format into Ethernet frame format on the peer end, so as to realize Ethernet date based on E1 Transmission, to access user date. It supports standard Ethernet GFP encapsulation. So it can easily cooperate with other vendor's converter

## Features

1. H0FL-S04100SN provides 2 10/100Base-Tx electrical Ethernet ports. H0FL-S04100SF provides 2 10/100Base-Tx electrical Ethernet ports and 1 10/100Base-Fx optical Ethernet port. Ethernet ports comply with IEEE 802.3/IEEE 802.3u and support IEEE 802.1Q/802.1P. 802.1Q VLAN configuration is also supported.
2. Etherent ports support AUTO-MDIX under auto-negotiated mode, aoto sense crossover/direct cables, can be connect to switches, network cards and routers easily.
3. Provide 1□4 E1 ports, 75Ω /120Ω selectable, comply with ITU-T G.703, G.823;
4. 1~8 E1 channels selectable, support LCAS, valid E1 channels can be judged and bandwidth can be adjusted automatically.
5. High buffer capability, low forward delay.
6. Easy installation. Need no configuration when p2p use.
7. Provide one SNMP ( 10/100Base-T) NMS interface.
8. Intercommunication with central equipment H0FL-P.V2 S08100 service card to realize network management and other standard Ethernet over E1 equipment produced by different manufacturers.
9. 19" 1U standard case, low consumption and high reliability
10. ~48VDC or ~220VAC or dual power supply.

## Typical Application




## Technical Specifications

| Items | Description | |
|---|---|---|
| E1 Interface | Comply to ITU-T G.703<br>Code: HDB3<br>Bit rate 2048 kbit/s ±50ppm<br>Resistance: 75Ω/120Ω<br>Connector: RJ-48C<br>Number: 4 | |
| ETH Interface | Auto negotiation 10/100M Half duplex/full duplex<br>Connector: H0FL-S04100SN RJ45.<br>H0FL-S04100SF RJ45(electrical)<br>SC/FC(optical) | |
| Power | Supply | DC~48V(-36V~-72V) |
| | Consumption | ≤6 w |
| Environment | Temperature | 0°C~50°C |
| | Humidity | 0~90 %(non-condensing) |
| Dimension | width×height×depth(mm): 440 × 44 × 138 | |

# H0FL-08100/H0FL-F08100

## Ethernet Over 8×E1 Converter

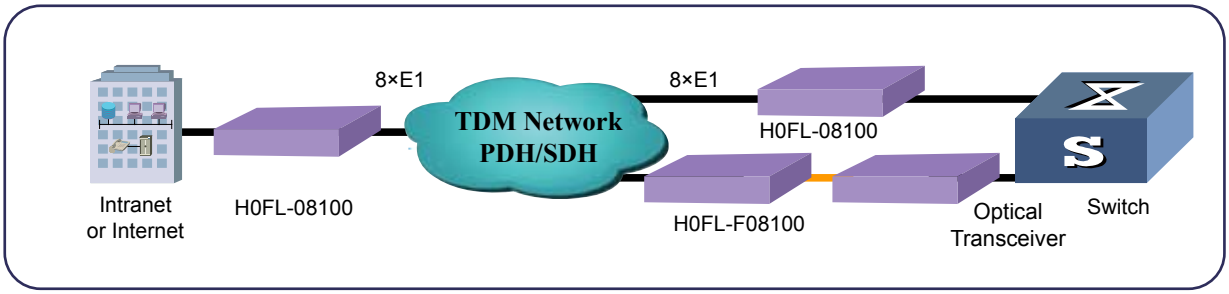

## Overview

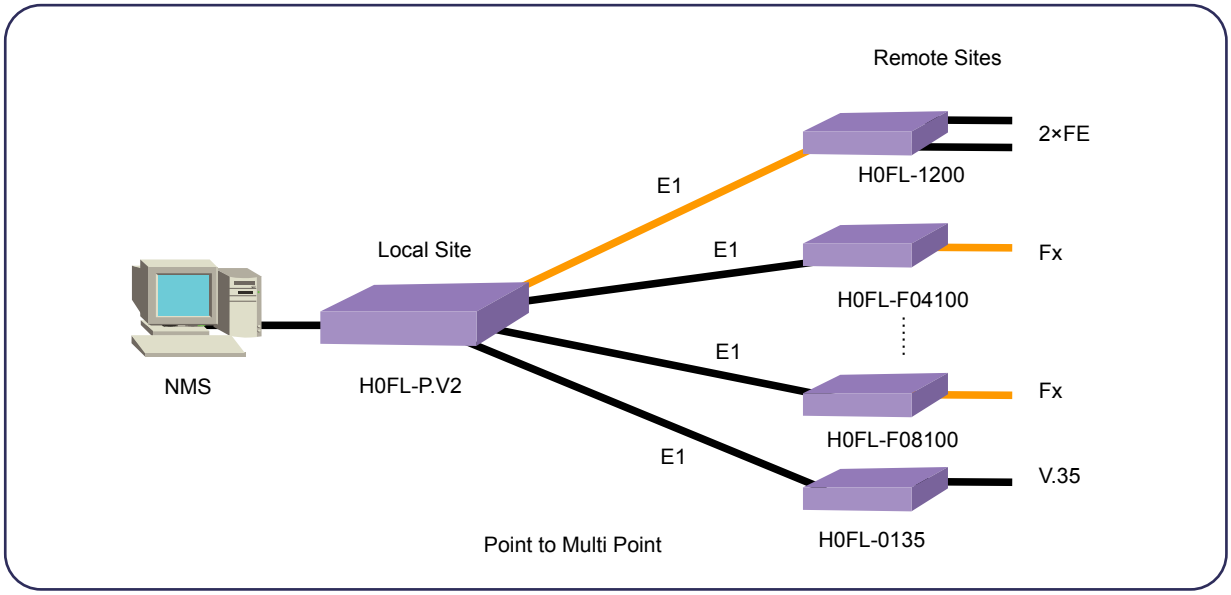
H0FL-08100/F08100 is cost-effective intelligent converters which can connect Fast Ethernet LAN over 8 E1 channel. H0FL-08100 provides one 10/100Base-Tx port and eight E1 ports. H0FL-F08100 provides one 10/100Base-Fx port and eight E1 ports. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with office device H0FL-P as a terminal device with 16 service directions.

## Features

1. Support one electrical or optical Ethernet link over 8 E1 channel.
2. Comply with IEEE802.3.
3. Automatically restrain broadcast storm
4. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs
5. Electrical Ethernet ports support 10/100M half/full duplex auto-adapted.
6. Wavelength power and transmission distance can be selected for the optical Ethernet interface.
7. Support HP auto MDIX function, MDI/MDIX auto-adapted.
8. High reliability with low CAPEX and OPEX.

## Typical Application




## Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-08100 | Connects one port 10/100Base-Tx Ethernet LAN over eight E1 channel |
| | H0FL-F08100 | Connects one port 10/100Base-Fx Ethernet LAN over eight E1 channel |
| E1 interface | Comply with ITU-T G.703, 75ohm or 120ohm optional | |
| Electrical Ethernet port | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Optical Ethernet port | 10/100Base-Fx, SC<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤3W |
| Dimension | (W×H×D) | 167mm×35mm×135mm |

# H0FL-04100/ H0FL-F04100

## Ethernet over 4E1 Converter

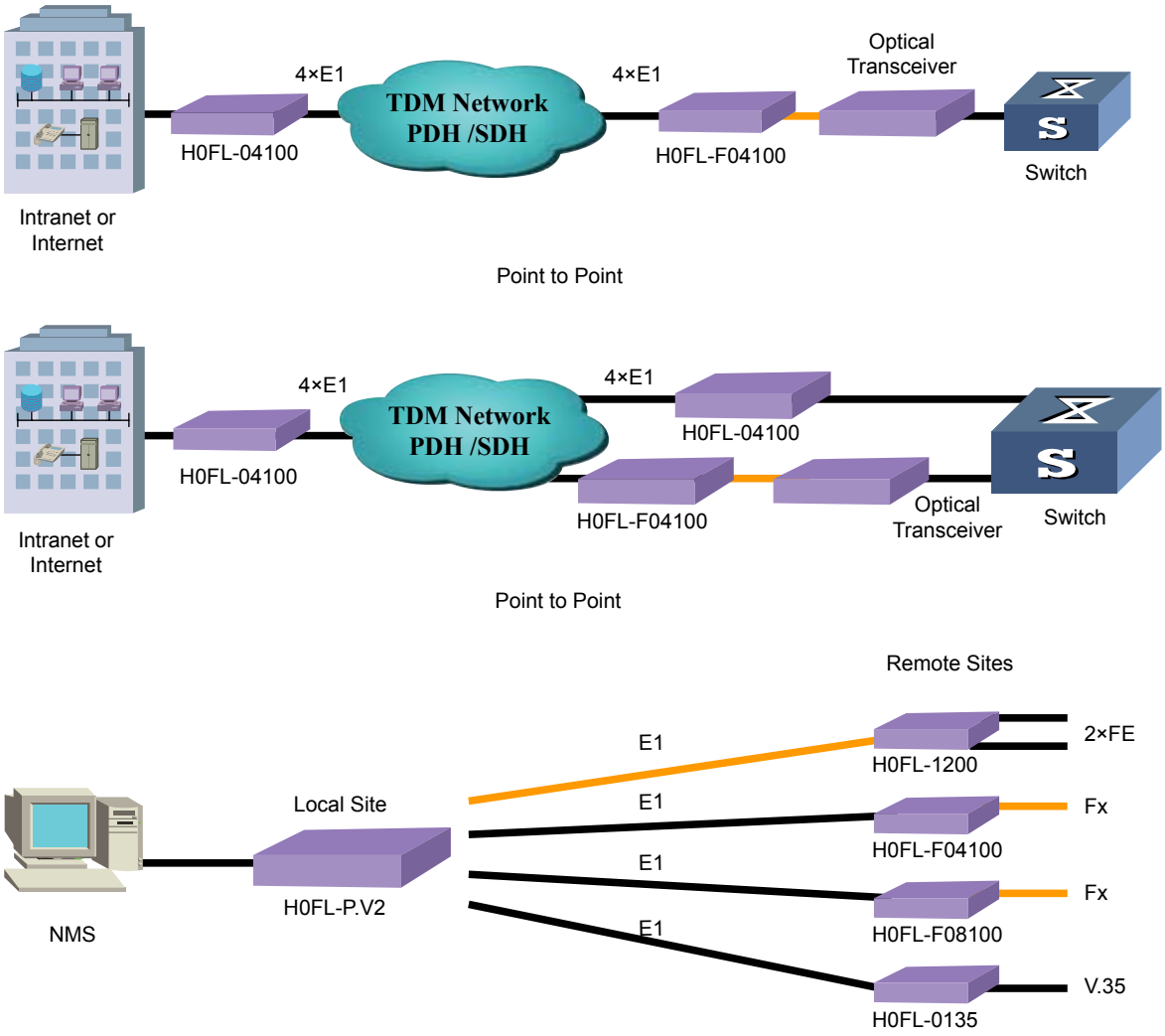

## Overview

H0FL-F04100 is cost-effective intelligent converters manufactured by Beijing Huahuan Electronics, it can provide the converting from optical Ethernet to 4 E1 channels, H0FL-F04100 provides one 10/100Base-Fx port and four E1 ports. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with office device H0FL-P as a terminal device with 16 service directions.

## Features

1. Provide one 10/100Base-Fx port, support auto-negotiated and 10M/100M full-duplex and half-duplex manual mode. Ethernet port support AUTO-MDIX under auto-negotiated mode.
2. 10/100Base-Fx port is completely compatible with the standard transceivers from other manufactories.
3. Support Ethernet transparent transmission.
4. H0FL-F04100 provides 4 channels of E1, E1 interface: 75Ω/120Ω optional, complied with ITU-T G.703.
5. E1 channels selectable, automatically judge effective E1 link and adjust bandwidth.
6. Automatically detect E1 link loop back state, and shut off this link to avoid network block.
7. Large buffer capacity, low transmit delay
8. Simple installation
9. ±48V DC or 220V AC Power supply selectable
10. Work with module F08100 card in local equipment H0FL-P, achieving remote management.

# Typical Application




# Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-04100 | Connects one port 10/100Base-Tx Ethernet LAN over four E1 channel |
| | H0FL-F04100 | Connects one port 10/100Base-Fx Ethernet LAN over four E1 channel |
| E1 interface | Comply with ITU-T G.703, 75ohm or 120ohm optional | |
| Electrical Ethernet port | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Optical Ethernet port | 10/100Base-Fx, SC<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤3W |
| Dimension | (W×H×D) | 167mm×35mm×135mm |

# H0FL-01100/F01100

## Ethernet over E1 Converter

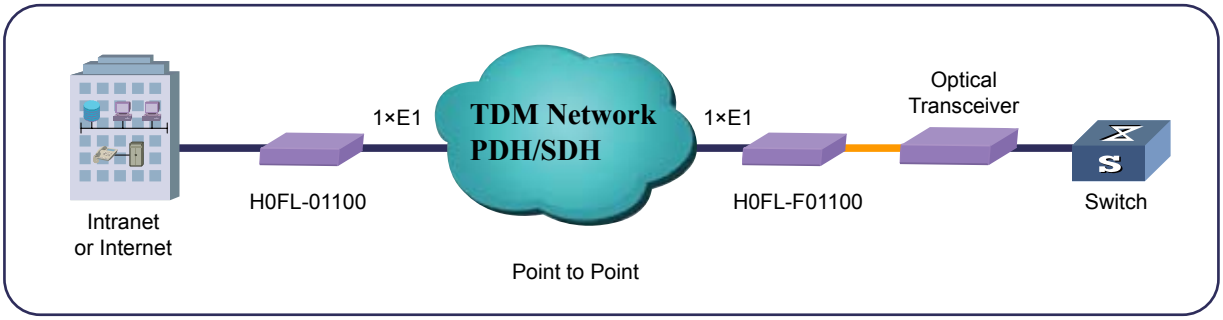

## Overview

H0FL-01100/F01100 is cost-effective intelligent converters which can connect Fast Ethernet LAN over single E1 channel. H0FL-01100 provides one 10/100Base-Tx port and one E1 port. H0FL-F01100 provides one 10/100Base-Fx port and one E1 port. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with office device H0FL-P as a terminal device with 16 service directions.

## Features

1. Support one electrical or optical Ethernet link over one E1 channel.
2. Comply with IEEE802.3.
3. Automatically restrain broadcast storm
4. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs
5. Electrical Ethernet ports support 10/100M half/full duplex auto-adapted.
6. Wavelength power and transmission distance can be selected for the optical Ethernet interface.
7. Support HP auto MDIX function, MDI/MDIX auto-adapted.
8. High reliability with low CAPEX and OPEX.

## Typical Application




## Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-01100 | Connects one port 10/100Base-Tx Ethernet LAN over one E1 channel |
| | H0FL-F01100 | Connects one port 10/100Base-Fx Ethernet LAN over one E1 channel |
| E1 interface | Comply with ITU-T G.703, 75ohm or 120ohm optional | |
| Electrical Ethernet port | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Optical Ethernet port | 10/100Base-Fx, SC<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤3W |
| Dimension | (W×H×D) | 167mm×35mm×135mm |

## Ordering Information

| Card/Module Name | Product Model | Description |
|---|---|---|
| FE to E1 Converter | H0FL-01100 | Fast ethernet to E1 converter. 220V AC. E1 is 75ohms(BNC) and 120ohms(RJ45) |
| FE to E1 Converter | H0FL-01100/8 | Fast ethernet to E1 converter. -48V DC. E1 is 75ohms(BNC) and 120ohms(RJ45) |
| Fx to E1 Converter | H0FL-F01100 | Optical fast ethernet to E1 converter. 220V AC. E1 is 75ohms(BNC) and 120ohms(RJ45).Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| Fx to E1 Converter | H0FL-F01100/8 | Optical fast ethernet to E1 converter. -48V DC. E1 is 75ohms(BNC) and 120ohms(RJ45).Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |

# H0FL-08100S

## Ethernet over 8E1 converter

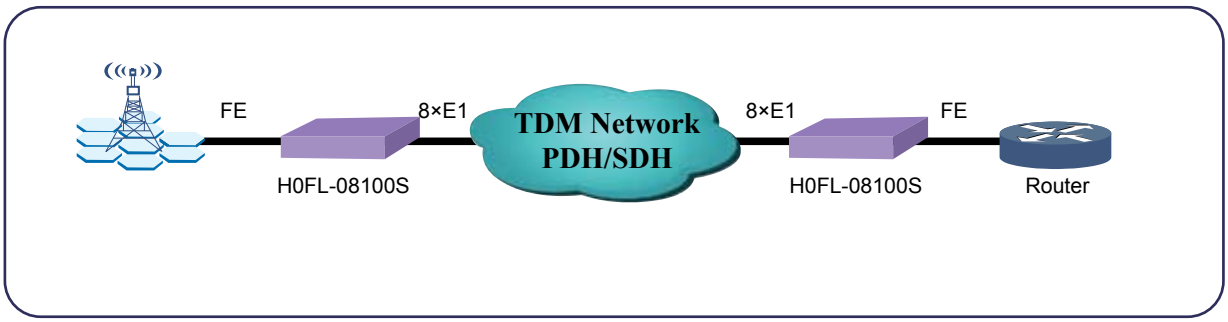
## Overview

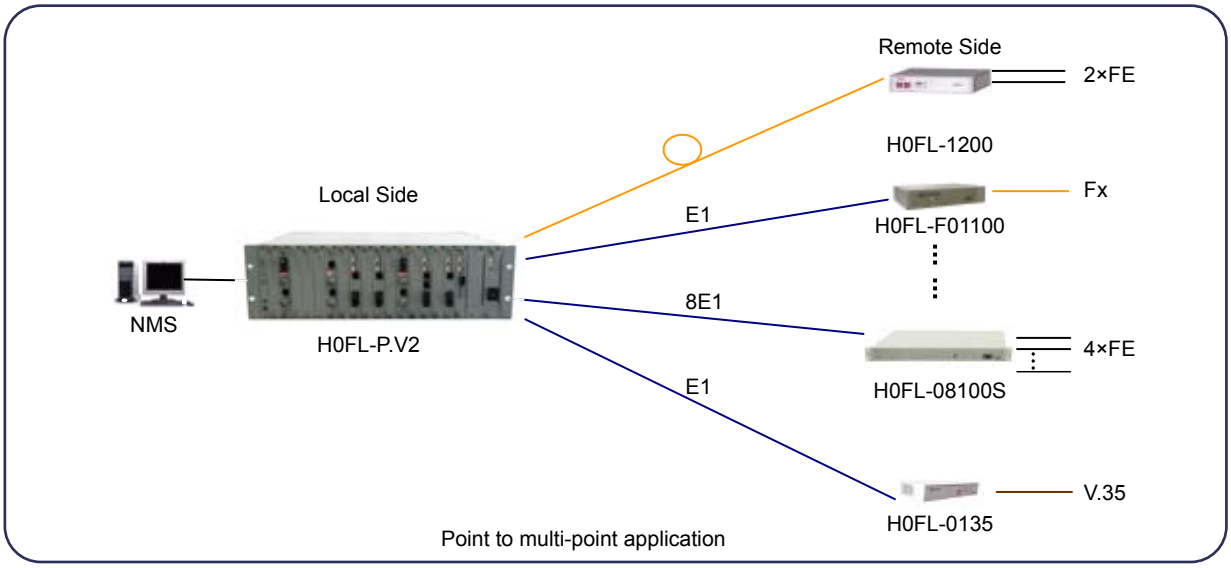
H0FL-08100S converter is a high performance, self-learning Ethernet Bridge. Its compact size and low cost make it appropriate for cost-sensitive bridging applications or as a LAN extender over TDM. It provides 4 ports 10/100Base-Tx transmitted over 1~8 separated E1 channels. The equipment is also completely compatible with the transceivers, network cards, hubs or switches from other manufactories.

## Features

1. Ethernet comply with IEEE 802.3; Transparent transmission of Ethernet data
2. 10/100Base-Tx port support auto-negotiated and 10M/100M full-duplex and half-duplex manual mode. Ethernet port support AUTO-MDIX under auto-negotiated mode.
3. Automatically restrain broadcast storm
4. E1 interface: 75Ω/120Ω optional, comply with ITU-T G.703.
5. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs
6. Large buffer capacity, low transmit delay
7. High reliability, low consumption
8. Easy maintenance and operation
9. Dual DC or dual AC or AC+DC Power supply selection
10. Work with modules in local equipment H0FL-P, remote management.

## Typical Application




## Technical Specifications

| Items | Description | |
|---|---|---|
| H0EL-8100S | 8×E1s, 4×10/100Base-Tx | |
| E1 Interface | Comply with G.703, 2.048Mbps, HDB3<br>4E1 supported, 75Ω/120Ω optional | |
| 10/100Base-Tx Interface | Comply with IEEE802.3, 10/100M auto-negotiation, half/full duplex auto-adaptive | |
| Management | RS232, TABS | |
| Physical Dimension | (W×H×D) 437.6X44 X124.7mm | |
| Power | Supply | Dual DC or dual AC or AC+DC Power supply<br>DC -48V (-32V~-72V)<br>AC 220V (165V~265V) |
| | Consumption | ≤15W |
| Environment | Temperature | 0°C~50°C |
| | Humidity | 0~90%(non-condensing) |

# H0FL-H01100/HF01100

## Ethernet over framed E1 Converter

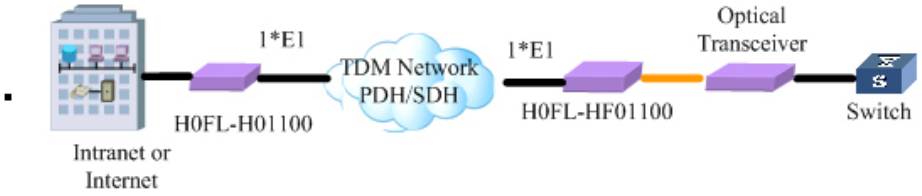

## Overview

H0FL-H01100 is cost-effective intelligent converters which can connect Fast Ethernet LAN over single E1 channel. H0FL-H01100 provides one 10/100Base-Tx port and one framed E1 port. E1's bandwidth can be adjusted to Nx64K. H0FL-HF01100 provides one 10/100Base-Fx port and one E1 port. E1's bandwidth can be adjusted to Nx64K. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with office device H0FL-P as a terminal device with 16 service directions.

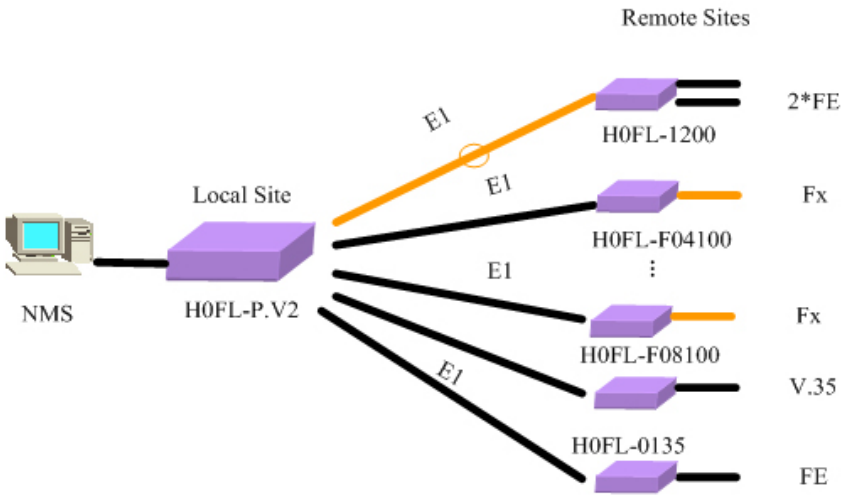
## Features

1. Support one electrical or optical Ethernet link over one E1 channel.
2. Standard HDLC encapsulation
3. Can be set Nx64k bandwidth by the hardware or NMS
4. The remote equipment can follow up the local equipment bandwidth automatically
5. Comply with G.703, G.823, IEEE802.3.
6. Automatically restrain broadcast storm
7. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs
8. Electrical Ethernet ports support 10/100M half/full duplex auto-adapted.
9. Wavelength power and transmission distance can be selected for the optical Ethernet interface.
10. Support HP auto MDIX function, MDI/MDIX auto-adapted.

## Typical Application




point to point




## Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-H01100 | 1x10/100Base-Tx electrical Ethernet over 1xE1 |
| | H0FL-HF01100 | 1x10/100Base-Fx optical Ethernet over 1xE1 |
| E1 interface | Comply with ITU-T G.703, 75ohm or 120ohm optional | |
| Electrical Ethernet port | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Optical Ethernet port | 10/100Base-Fx, SC<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤3W |
| Dimension | (W×H×D) | 167mm×35mm×135mm |

# H0FL-E3100S

## Ethernet over E3/DS3 Converter

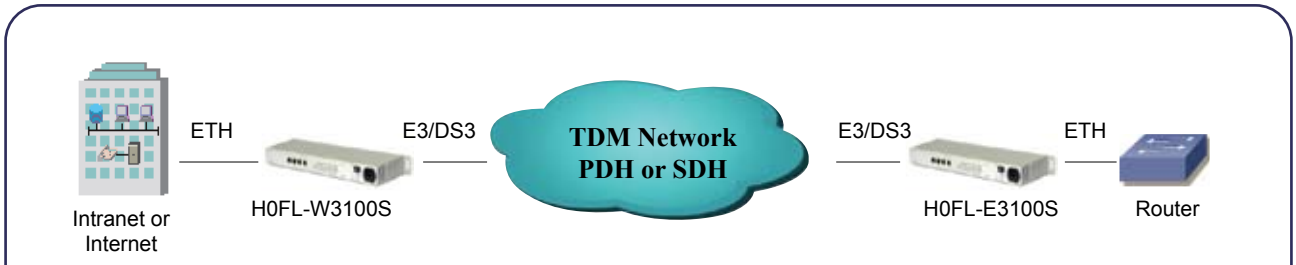
## Overview

H0FL-E3100S is cost-effective intelligent converter which offers a cost-effective connection between E3/DS3 services and 10/100BaseT LANs. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with center device H0FL-P as a terminal device with 16 service directions.

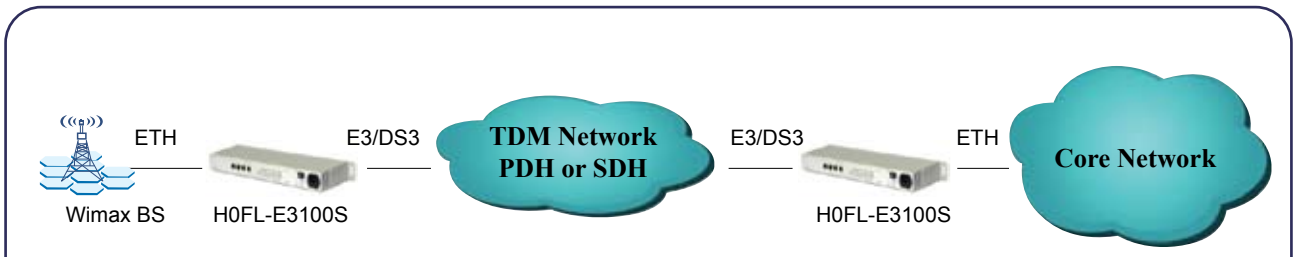
## Features

1. Support 4x10/100Base-Tx FE over 1xE3/DS3 channel;
2. Customer should offer E3 or DS3 separately, E3 and DS3 cannot be supported simultaneously;
3. Comply with IEEE802.3;
4. Automatically restrain broadcast storm;
5. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs;
6. Rich alarm indications such as E3/DS3 AIS/LOS, ETH LINK/ACT etc;
7. Ethernet ports support 10/100M half/full duplex auto-adapted;
8. Plug-and-Play LAN connection;
9. Support HP auto MDIX function, MDI/MDIX auto-adapted;
10. High reliability with low CAPEX and OPEX.

## Typical Application




Typical Application in LANs




Typical Application in Wimax Network

## Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-E3100S | Connects four-port 10/100Base-Tx Ethernet LAN over one E3/DS3 channels |
| E3 interface | Comply with ITU-T G.703, 75ohm unbalanced | |
| DS3 interface | 44.736Mbps, 75 ohm unbalanced | |
| Ethernet interface | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply optional | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤8 W |
| Dimension | (W×H×D) | 440 × 44 ×138 (mm) |

# H0FL-2E3100S

## 4xEthernet over 2xE3/DS3 Converter

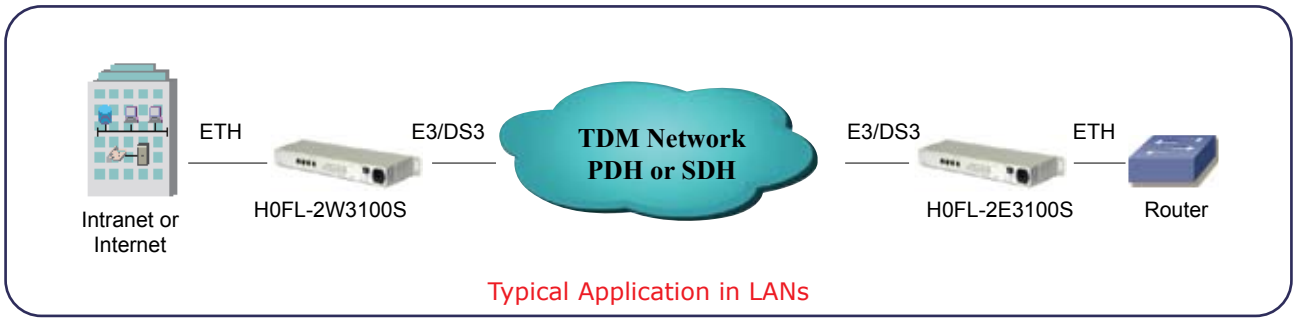

## Overview

H0FL-2E3100S is cost-effective intelligent converter which offers a cost-effective connection between E3/DS3 services and 10/100BaseT LANs. They enable service providers and ISPs to provide transparent Ethernet services without interfering with user traffic. In addition to point to point application, the equipment can also work with center device H0FL-P as a terminal device with 16 service directions.

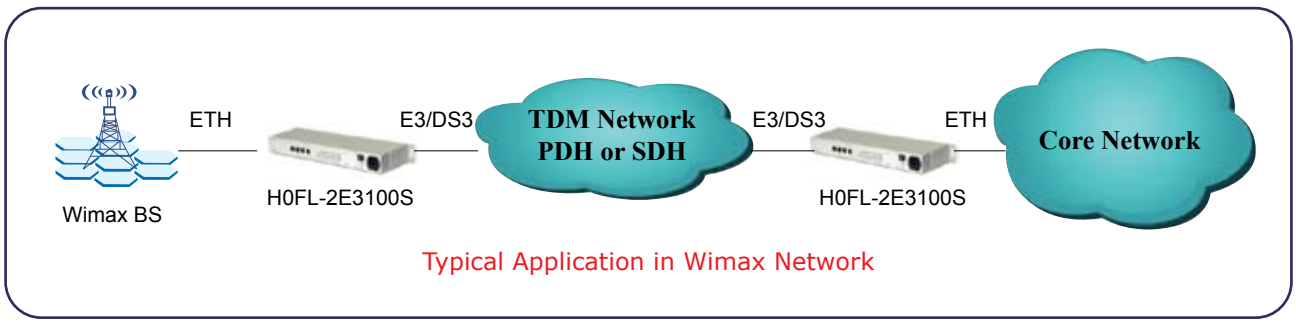
## Features

1. Support 4x10/100Base-Tx FE over 2xE3/DS3 channel;
2. Customer should offer E3 or DS3 separately, E3 and DS3 cannot be supported simultaneously;
3. Comply with IEEE802.3;
4. Automatically restrain broadcast storm;
5. Support diagnostic tools for TDM and Ethernet networks, for fast isolation of network problems, saving time and costs;
6. Rich alarm indications such as E3/DS3 AIS/LOS, ETH LINK/ACT etc;
7. Ethernet ports support 10/100M half/full duplex auto-adapted;
8. Plug-and-Play LAN connection;
9. Support HP auto MDIX function, MDI/MDIX auto-adapted;
10. High reliability with low CAPEX and OPEX.

## Typical Application




Typical Application in LANs



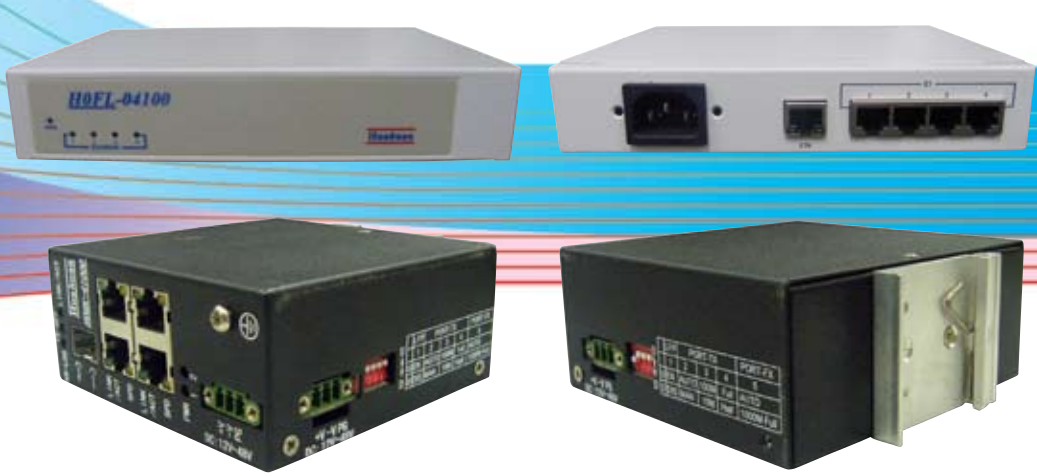

Typical Application in Wimax Network

## Technical Specifications

| Item | Description | |
|---|---|---|
| Products List | H0FL-E3100S | Connects four-port 10/100Base-Tx Ethernet LAN over two E3/DS3 channels |
| E3 interface | Comply with ITU-T G.703, 75ohm unbalanced | |
| DS3 interface | 44.736Mbps, 75 ohm unbalanced | |
| Ethernet interface | 10/100Base-Tx, RJ45<br>10/100M auto-adaptive, half/full duplex auto-adaptive | |
| Power | Supply optional | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤8 W |
| Dimension | (W×H×D) | 440 × 44 ×138 (mm) |

# H0FL-41000/H0GK-41000

## 4-port Gigabit Ethernet media converter




## Overview

H0FL-41000 is 4xGE optical transceiver. H0FL-41000 provides one SFP optical port and 4 RJ45 ports.

## Features

1. Support 4 electrical Ethernet links over one optical line
2. Comply with IEEE802.3
3. Packet length 9720 bytes
4. Ethernet port support auto-negotiated mode
5. Ethernet ports support 10/100M/1000M half/full duplex auto-adapted.
6. Support LFP

## Typical application

# Technical Specifications

12-48V DC Dual power supply, 1+1 back up supported

| Item | Description | |
|---|---|---|
| Electrical Ethernet port | RJ45<br>10/100/1000M auto-adaptive, half/full duplex auto-adaptive<br>Packet length 9720 | |
| Optical Ethernet port | SFP | |
| Power | Supply | DC -48V (-32V~-72V) |
| | | AC 220V (90V~265V) |
| | Consumption | ≤3W |
| Dimension | (W×H×D) | 167mm×35mm×135mm |
| Temperature | -25-75°C | |
| humidity | 95% non-condensing | |

# Ordering Information

| Product Model | Description |
|---|---|
| H0FL-41000 | Four gigabit ethernet ports and one optical SPF port (SFP optical module should be ordered seperatedly). 220V AC. Working temperture -25°C~70°C. |
| H0GK-41000/8D | Four gigabit ethernet ports and one optical SPF port (SFP optical module should be ordered seperatedly). Dual -48V DC power supply. Working temperture -25°C~85°C. |

# H0FL-11000

## Gigabit Ethernet media converter


## Overview

H0FL-11000 is Gigabit Ethernet Fiber Transceiver manufactured by BEIJING HUAHUAN ELECTRONICS Co.,LTD. It provides Gigabit Ethernet Optical, Electrical signal conversion.

## Features

1. H0FL-11000 provides 1000M Ethernet port which is electrical interface or optical interface.
2. Comply to 1000Base-Tx/Fx protocol standard,support the Ethernet data transparent transmission,can communicate with other factory's optical transceiver,
3. Etherent ports support AUTO-MDIX under auto-negotiated mode, aoto sense crossover/direct cables, can be connect to switches, network cards and routers easily.
4. Support Dying Gasp function (alarm when power off),The equipment will send information to remote equipment when the input voltage cann't satisfy the normal working
5. Support LFP(alarm when the line break)function,detect the ethernet port break or the optical break line automatically,and force the other port of the line to stop transmission,so that can convenient pursuit the connection faulty or not
6. High buffer capability, low forward delay.
7. -48VDC or ~220VAC or dual power supply.
8. With H0FL-P.V2 11000 card, H0FL-11000 can be monitored

## Typical Application

# Technical Specifications

| Items | Description | |
|---|---|---|
| ETH electric Interface | Interface rate: 10/100/1000M<br>Duplex model:<br>Connector: RJ-45<br>Number:1 | |
| ETH optical Interface | Interface rate: 1000M<br>Duplex model: full duplex<br>wavelength: 1310nm<br>transmission distance: 20km(dual fiber)<br>interface connecter: SC or FC<br>Number:1 | |
| Power | Supply | DC-48V(-36V~-72V) |
| | Consumption | ≤5 w |
| Environment | Temperature | 0°C~45°C |
| | Humidity | 0~90 %(non-condensing) |
| Dimension | width×height×depth(mm): 185 × 35 × 138 | |

# Ordering Information

| | |
|---|---|
| H0FL-11000 | One gigabit ethernet port and one optical port. 220V AC, SC, 1310nm, 25km |
| H0FL-11000/8 | One gigabit ethernet port and one optical port.. -48V DC, SC, 1310nm, 25km |
| H0FL-11000/5 | One gigabit ethernet port and one optical port. 220V AC, SC, 1550nm, 25km |
| H0FL-11000/58 | One gigabit ethernet port and one optical port. -48V DC, SC, 1550nm, 25km |
| H0FL-11000/M | One gigabit port and one optical port. 220V AC, SC, multi-mode, 850nm, 550m. |
| H0FL-11000/8M | One gigabit port and one optical port. -48V DC, SC, multi-mode, 850nm, 550m. |
| H0FL-11000/S | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 15km |
| H0FL-11000/S8 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 15km |
| H0FL-11000/S5 | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 15km |
| H0FL-11000/S58 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 15km |
| H0FL-11000/SL | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 40km |
| H0FL-11000/SL8 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 40km |
| H0FL-11000/SL5 | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 40km |
| H0FL-11000/SL58 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 40km |
| H0FL-11000/SLB | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 60km |
| H0FL-11000/SLB8 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 60km |
| H0FL-11000/SLB5 | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 60km |
| H0FL-11000/SLB58 | One gigabit ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 60km |

# H0FL-1200

## Optical Transceiver

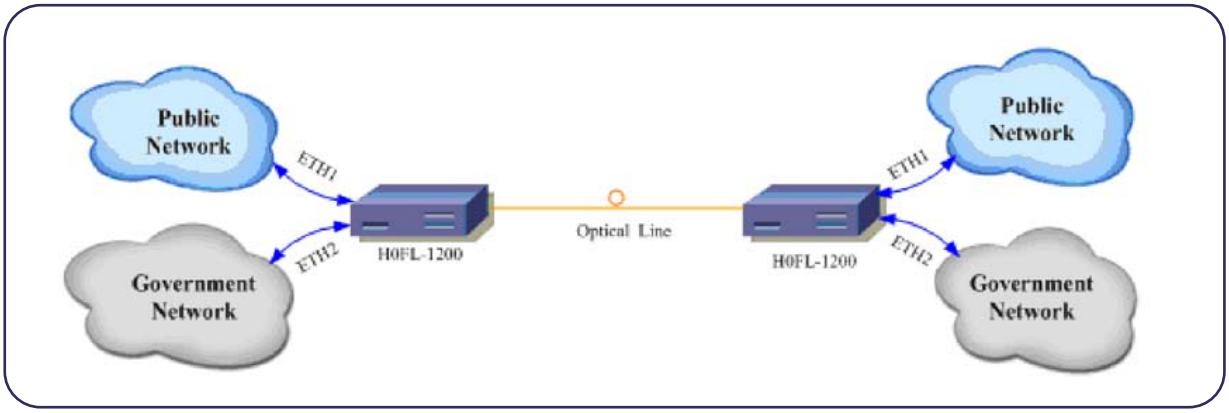

## Overview

H0FL-1200 is an optical transceiver developed by Huahuan which can provide two independent Ethernet ports and one optical port. The equipment can be applied in the data transmission of two independent networks. It can support two independent Ethernet links over one optical line. In that case, optical fiber resources can be saved. In addition to point-to-point application, the equipment can also work with office device H0FL-P as a terminal device with 16 service directions.

## Features

1. support two Ethernet links over one optical line
2. wavelength, power and transmission distance can be selected for the optical interface
3. comply with IEEE 802.3
4. Ethernet ports support 10/100M half/full duplex auto-adapted function
5. support HP auto-MDIX function, MDI/MDI-X auto-adapted
6. low consumption with power supply 220V AC or –48V DC
7. compact design: W*H*D: 167mm*35mm*135
8. High reliability with low CAPEX and OPEX

## Typical application




## Ordering Information

| Product Model | Description |
|---|---|
| H0FL-1200 | Dual ethernet ports and one optical port, both ethernet ports can be wired speed. physical isolated. 220V AC, SC, 1310nm, 25km. (other distances and single-strand options are also available) |
| H0FL-1200/8 | Dual ethernet ports and one optical port, both ethernet ports can be wired speed. physical isolated. -48V DC, SC, 1310nm, 25km. (other distances and single-strand options are also available) |
| H0FL-1200/5 | Dual ethernet ports and one optical port, both ethernet ports can be wired speed. physical isolated. 220V AC, SC, 1550nm, 25km. (other distances and single-strand options are also available) |
| H0FL-1200/58 | Dual ethernet ports and one optical port, both ethernet ports can be wired speed. physical isolated. -48V DC, SC, 1550nm, 25km. (other distances and single-strand options are also available) |

# H0FL-1101

## Optical Transceiver

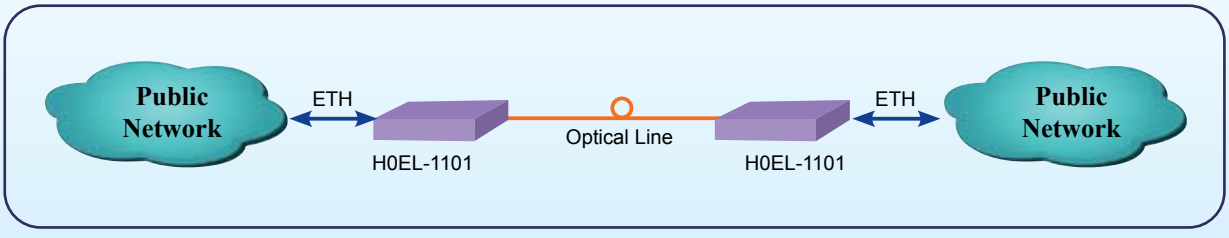

## Overview

H0FL-1101 is an optical transceiver developed by Huahuan which can provide one electrical Ethernet port and one optical Ethernet port. It can be used in point to point topology which will greatly extend the Ethernet electrical signal transmission distance. The equipment also can work with aggregation device H0FL-P as a terminal device with 16 service directions.

## Features

1. Support one Ethernet link over one optical line.
2. Wavelength power and transmission distance can be selected for the optical interfaces.
3. Comply with IEEE802.3.
4. Ethernet ports support 10/100M half/full duplex auto-adapted.
5. Support HP auto MDIX function, MDI/MDIX auto-adapted.
6. Low consumption with power supply 220V AC or -48V DC.
7. Compact design: W×H×D: 167mm×35mm×135mm.
8. High reliability with low CAPEX and OPEX.

## Typical Application



# Ordering Information

| | |
|---|---|
| H0FL-1101 | One ethernet port and one optical port. 220V AC, SC, 1310nm, 25km |
| H0FL-1101/8 | One ethernet port and one optical port. -48V DC, SC, 1310nm, 25km |
| H0FL-1101/5 | One ethernet port and one optical port. 220V AC, SC, 1550nm, 25km |
| H0FL-1101/58 | One ethernet port and one optical port. -48V DC, SC, 1550nm, 25km |
| H0FL-1101/M | One ethernet port and one optical port. 220V AC, SC, multi-mode, 850nm, 2km |
| H0FL-1101/M8 | One ethernet port and one optical port. -48V DC, SC, multi-mode, 850nm, 2km |
| H0FL-1101/L | One ethernet port and one optical port. 220V AC, SC, 1310nm, 60km |
| H0FL-1101/L8 | One ethernet port and one optical port. -48V DC, SC, 1310nm, 60km |
| H0FL-1101/LB | One ethernet port and one optical port. 220V AC, SC, 1550nm(DFB),100km |
| H0FL-1101/LB8 | One ethernet port and one optical port. -48V DC, SC, 1550nm(DFB),100km |
| H0FL-1101/S | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 20km |
| H0FL-1101/S8 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 20km |
| H0FL-1101/S5 | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 20km |
| H0FL-1101/S58 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 20km |
| H0FL-1101/SL | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 60km |
| H0FL-1101/SL8 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 60km |
| H0FL-1101/SL5 | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 60km |
| H0FL-1101/SL58 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 60km |
| H0FL-1101/SLB | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 100km |
| H0FL-1101/SLB8 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1310nm Tx, 1550nm Rx. 100km |
| H0FL-1101/SLB5 | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 100km |
| H0FL-1101/SLB58 | One ethernet port and one optical port. -48V DC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 100km |
| H0FL-1101-J/J | One ethernet port and one optical port. 220V AC, SC, 1310nm, 25km. With remote power failure detection. |
| H0FL-1101-J/J5 | One ethernet port and one optical port. 220V AC, SC, 15500nm, 25km. With remote power failure detection. |

# H0FL-P V2

## Interface Converter Rack


## Overview

H0FL-P V2 interface converter pool is designed to aggregate multiple Ethernet/V.35 ports in one standard rack at the advantage of high integration and better management. It is 3U high, 19” standard rack type used in central side, supporting up to 16 interface converting cards. It supports module as Ethernet access, protocol converter and so on. H0FL-P can connect to remote independent interface converters in the application of LAN, MAN or WAN network connection.

## Features

1. Support 16 service directions with remote interface converters;
2. Support various Ethernet access, protocol converting, media converting services and so on;
3. All service support remote management, reducing user side management workload greatly;
4. Rich LED indicators for network link and work status;
5. Support SNMP-based network management; NMS interface RS-232 /Ethernet port available;
6. Dual power supply, 1+1 back up supported;
7. Highly integration, plug and play, hot-swappable, high reliability with low CAPEX and OPEX.

# Technical Specifications

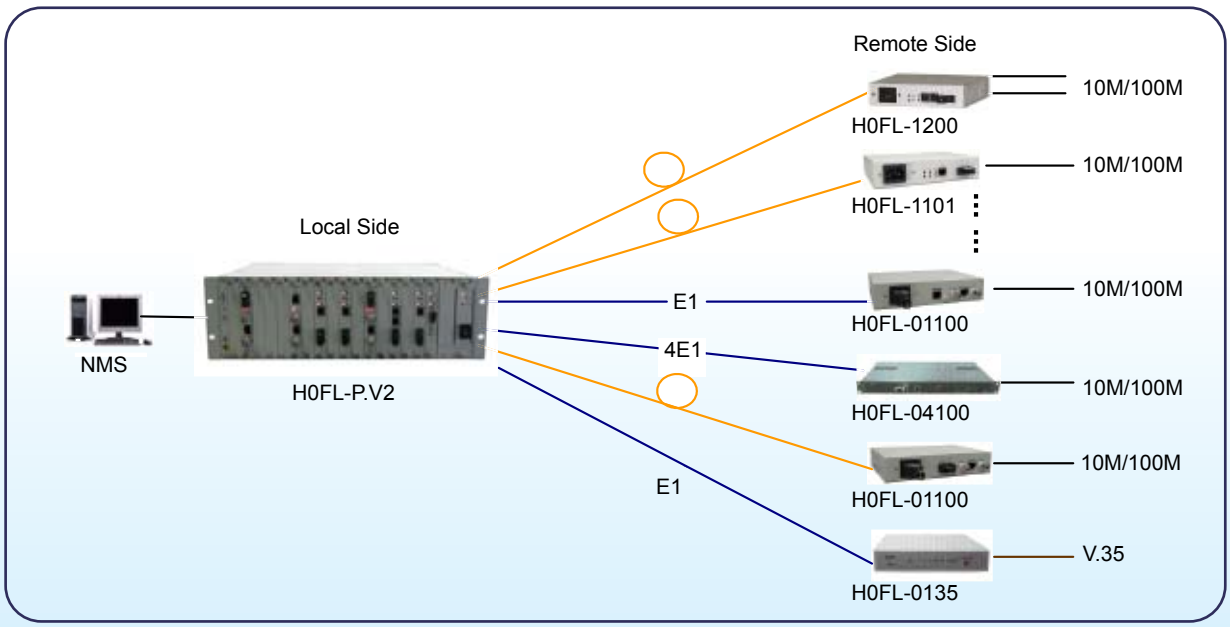
| NO. | H0FL-P.V2 module | | Remote converter | Module or Converter Port number | | | |
|---|---|---|---|---|---|---|---|
| | Module | Description | Type | FE | Fx | E1 | V.35 |
| 1 | H0FL-P.01100 | Convert electrical FE to 1×E1 | H0FL-01100 | 1 | - | 1 | - |
| 2 | H0FL-P.F01100 | Convert optical Fx to 1×E1 | H0FL-F01100 | - | 1 | 1 | - |
| 3 | H0FL-P.04100 | Convert electrical FE to 4×E1 | H0FL-04100 | 1 | - | 4 | - |
| 4 | H0FL-P.F04100 | Convert optical Fx to 4×E1 | H0FL-F04100 | - | 1 | 4 | - |
| 5 | H0FL-P.08100 | Convert electrical FE to 8×E1 | H0FL-08100 | 1 | - | 8 | - |
| 6 | H0FL-P.F08100 | Convert optical Fx to 8×E1 | H0FL-F08100 | - | 1 | 8 | - |
| 7 | H0FL-P.16100 | Convert electrical FE to 16×E1 | H0FL-16100 | 1 | - | 16 | - |
| 8 | H0FL-P.F16100 | Convert optical Fx to 16×E1 | H0FL-F16100 | - | 1 | 16 | - |
| 9 | H0FL-P.1101 | Convert electrical Fx to optical Fx (media converter) | H0FL-1101 | 1 | 1 | - | - |
| 10 | H0FL-P.1200 | Convert dual electrical FEs to optical Fx (wire speed 100M channel) | H0FL-1200 | 2 | - | - | - |
| 11 | H0FL-P.0135 | Convert V.35 to E1 | H0FL-0135 | - | - | 1 | 1 |
| 12 | H0FL-P.11000 | GE optical converter | H0FL-11000 | GE | GE_O | - | - |
| 13 | H0FL-P.H01100 | HDLC FE to 1×E1 | H0FL-H01100 | 1 | - | 1 | - |
| 14 | H0FL-P.H01100 | HDLC FX to 1×E1 | H0FL-HF01100 | - | 1 | 1 | - |
| 15 | H0FL-P.V2.30 | 1*E1,1310nm, 40KM, | H10MOS-30 series | - | - | 1 | - |
| 16 | H0FL-P.V2.60 | 2*E1,75ohm,1310nm, 40KM,CC4. | H10MOS-60 series | - | - | 2 | - |
| Spec. | E1: G.703, G.704;<br>V.35: V.35 standard;<br>Ethernet port: IEEE 802.3;<br>Power: DC:- 48V(- 32V~ - 72V);<br>AC:- 220V(- 165V~ - 265V). | | | | | | |
| | Chassis dimension: 440 x 136x 240;<br>Environment:<br>Temperature: 0°C~50°C<br>Relative Humidity: ≥90% (non-condensing) | Power consumption:<br>H0FL-01100/F01100 ≤3W; H0FL-04100/F04100 ≤5W;<br>H0FL-08100/F08100 ≤10W; H0FL-016100/F016100 ≤10W;<br>H0FL-1101/1200 ≤3W; H0FL-0135 ≤3W;<br>Converter dimension:<br>H0FL-01100/F01100 220 x 44x 141; H0FL-04100/F04100 220 x 44x 141;<br>H0FL-08100/F08100 220 x 44x 141; H0FL-016100/F016100 440 x 44x 230;<br>H0FL-1101/1200 220 x 44x 141; H0FL-0135 220 x 44x 141; | | | | | |

# Ordering Information

| Product Model | Description |
|---|---|
| H0FL-P.V2.BOX | Converter and media converter chassis with 19 slots (2 for power card, 1 for management card, 16 for service slots). System backplane board and fan are embedded. |
| H0FL-P.V2.PWR | DC -48V Power supply card. Can be 1+1 protection. |
| H0FL-P.V2.PWR220 | AC 220V Power supply card. Can be 1+1 protection. |
| H0FL-P.V2.SV | Network Management Card with Ethernnet Port. With SNMP support |
| H0FL-P.V2.SYS.1101 | One ethernet port and one optical port. SC, 1310nm, 25km. Can manage remote standalone H0FL-1101 series. |

| Product Model | Description |
|---|---|
| H0FL-P.V2.SYS.1101/5 | One ethernet port and one optical port. SC, 1550nm, 25km. Can manage remote standalone H0FL-1101 series. |
| H0FL-P.V2.SYS.1101/M | One ethernet port and one optical port. SC, multimode, 850nm, 2km. Can manage remote standalone H0FL-1101 series. |
| H0FL-P.V2.SYS.1101/L | One ethernet port and one optical port. SC, 1310nm, 60km. Can manage remote standalone H0FL-1101 series. |
| H0FL-P.V2.SYS.1101/LB | One ethernet port and one optical port. SC, 1550nm(DFB), 120km. Can manage remote standalone H0FL-1101 series. |
| H0FL-P.V2.SYS.1101/S5 | One ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 20km |
| H0FL-P.V2.SYS.1101/SL5 | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 40km |
| H0FL-P.V2.SYS.1101/SLB5 | One gigabit ethernet port and one optical port. 220V AC, SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 40km |
| H0FL-P.V2.SYS.1200 | Dual ethernet ports and one optical port, both ethernet ports can be wired speed. physical isolated. SC, 1310nm, 25km. Can manage remote standalone H0FL-1200 series. (other distances and single-strand options are also available) |
| H0FL-P.V2.SYS.11000 | One gigabit port and one optical port. SC, single-mode, 1310nm, 25km. Can manage remote standalone H0FL-11000 series |
| H0FL-P.V2.SYS.11000/5 | One gigabit port and one optical port. SC, single-mode, 1550nm, 25km. |
| H0FL-P.V2.SYS.11000/M | One gigabit port and one optical port. SC, multi-mode, 850nm, 550m. |
| H0FL-P.V2.SYS.11000/S5 | One gigabit ethernet port and one optical port. SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 15km |
| H0FL-P.V2.SYS.11000/SL5 | One gigabit ethernet port and one optical port. SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 40km |
| H0FL-P.V2.SYS.11000/SLB5 | One gigabit ethernet port and one optical port. SC, single mode, single-strand, 1550nm Tx, 1310nm Rx. 60km |

## Typical Application



Huahuan

# H0MOR.M3

## E3 Optical/Electrical Converter

## Product Brief

H0MOR.M3 is an interface converter for E3 electrical and optical interface conversion. It is designed for the PDH equipment coaxial interface and optical interface interconnect.
Complete loop-back facility supported for system diagnostic and commissioning. Compact casing and simple operation achieve the cost saving and investment protected.

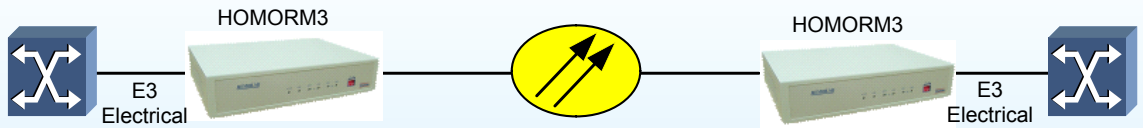
## Features

1. High reliability, comply to ITU-T G.703
2. Single Fiber Bi-Directional is selectable
3. State-of-the-art design, ensure normal working under different environment.
4. Supports local and remote loop-back on electrical or optical interface for system diagnostic.
5. Suitable for PDH E3 interface interconnection.
6. Simple operation and maintenance
7. Compact design and low power consumption.

# Technical Specifications

| Item | Description | |
|---|---|---|
| Electrical Interface | Standard | ITU-T G.703 Compliant |
| | Data Rate | 34.368 Mbps |
| | Line Code | HDB3 |
| | Physical Connector | BNC Coaxial |
| Optical Interface | Bit rate | 34.368 Mbps |
| | Coding | NRZ |
| | Connector | SC |
| | Light source | Laser Diode |
| | Wave length | 1310nm (Typical), or 1550 nm (Optional) or Single Fiber Bi-Directional (Optional) |
| | Transmit power | -12 dBm (1310nm) / -5 dBm (1550nm) |
| | Receive sensitive | -36 dBm (1310nm) / -38 dBm (1550nm) |
| Power supply | AC 220V | Range 165V to 265 V |
| | DC -48V | Range -32V to -72V |
| | Power Consumption | ≤ 3 W |
| Environment | Working Temperature | 0°C~50°C |
| | Relative Humidity | ≤ 90% (Non condensing) |
| Dimension | W×H×D(mm): 205 x 135 x 46 | |

# Typical Application



Huahuan

# H0SO-1.OEC

## STM-1 Optical/Electrical Converter

## Overview

H0SO-1.OEC is an interface converter for STM-1 electrical and optical interface conversion. It is designed for the SDH equipment coaxial interface and optical interface interconnect, as well as the ATM 155.520 Mbps interface and SDH device interconnection.

Complete loop-back facility supported for system diagnostic and commissioning. Compact casing and simple operation achieve the cost saving and investment protected.

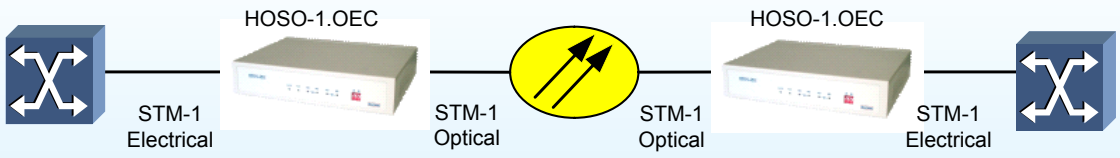
## Features

1. High reliability, comply to ITU-T G.703 and G.957
2. Single Fiber Bi-Directional is selectable
3. State-of-the-art design, ensure normal working under different environment.
4. Supports local and remote loop-back on electrical or optical interface for system diagnostic.
5. Suitable for SDH and ATM 155.52 Mbps interface interconnection.
6. Simple operation and maintenance
7. Compact design and low power consumption.

# Technical Specifications

| Item | Description | |
|---|---|---|
| Electrical Interface | Standard | ITU-T G.703 Compliant |
| | Data Rate | 155.52 Mbps |
| | Line Code | CMI |
| | Physical Connector | BNC Coaxial |
| Optical Interface | Standard | ITU-T G.957 STM-1 |
| | Bit rate | 155.520 Mbps |
| | Coding | NRZ |
| | Connector | SC |
| | Light source | Laser Diode |
| | Wave length | 1310nm (Typical), or 1550 nm (Optional) or Single Fiber Bi-Directional (Optional) |
| | Transmit power | -12 dBm (1310nm) / -5 dBm (1550nm) |
| | Receive sensitive | -36 dBm (1310nm) / -38 dBm (1550nm) |
| Power supply | AC 220V | Range 165V to 265 V |
| | DC -48V | Range -32V to -72V |
| | Power Consumption | ≤ 3 W |
| Environment | Working Temperature | 0°C~50°C |
| | Relative Humidity | ≤ 90% (Non condensing) |
| Dimension | W×H×D(mm): 205 x 136 x 42 | |

# Typical Application



Huahuan

# H0FL-0135

## V.35/E1 Converter


## Overview

H0FL-0135 V.35/E1 converter transports V.35 data via E1 network. It's widely used for router interconnection and DDN accessing as well as remote LAN connection. It can provide best solution with simplicity, efficiency cost-effectiveness and high reliability for data communication platform.

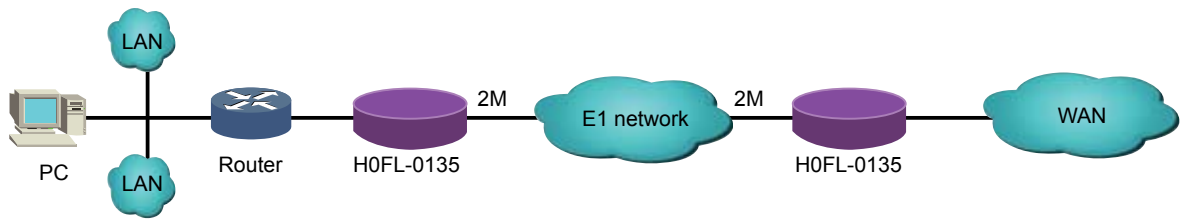
## Features

1. Excellent performance in jitter limit and transmission features of E1 port. Excel standard requirements.
2. E1 channels comply with ITU-T G .703, with loop back test function.
3. Several interface rates (N×64K, 1≤N≤32) and modes (DTE and DCE) are supported. Several clock selections (DCE internal clock, DCE E1 line clock and DTE V.35 interface clock), the 16th time slot for signaling selectable. Support framed and unframed work mode.
4. Fit for connections of data end equipment such as router with V.35 port through E1 channels, for the V35 service via E1 channels extension in DDN network.
5. Alarm indications ,equipment and line performance supervision are provided
6. Work with the module 0135 inserted in H0FL-Pin local side, Network console software can be provided to fulfill remote control.

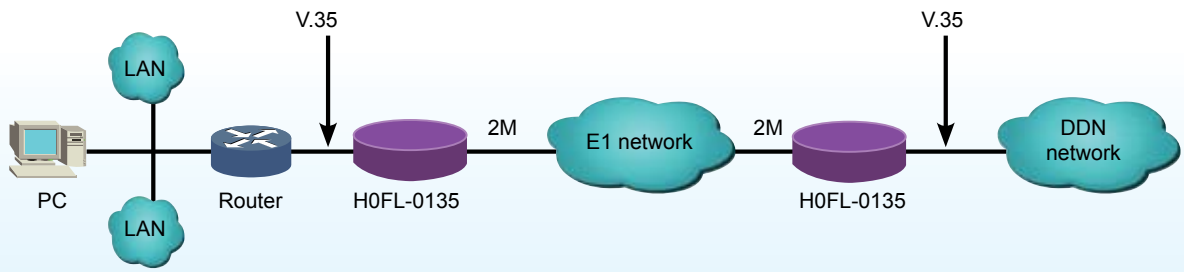
# Technical Specifications

| Item | Description |
|---|---|
| H0FL-0135 | Convert unframed or framed V.35 to E1 interface |
| E1 interface | Comply with ITU-T G.703<br>Bit rate: 2048kbit/s ±50ppm<br>Code: HDB3<br>Input impedance: 75Ω and 120Ω |
| V.35 interface | Comply with ITU-T V.35/V.36<br>Interface speed: N×64kbit/s, 1≤N≤31; unframed : 2048kbit/s<br>Work mode: DCE, DTE optional |
| Power supply | AC or DC optional<br>DC -48V (-38V ~ -72V)<br>AC~220V (100V ~ 260V) |
| Consumption | ≤3W |
| Dimension | W×H×D(mm): 185×35×138 |
| Environment | Temperature: (0~45) °C |
| | Humidity: ≤90% (non-condensed) |

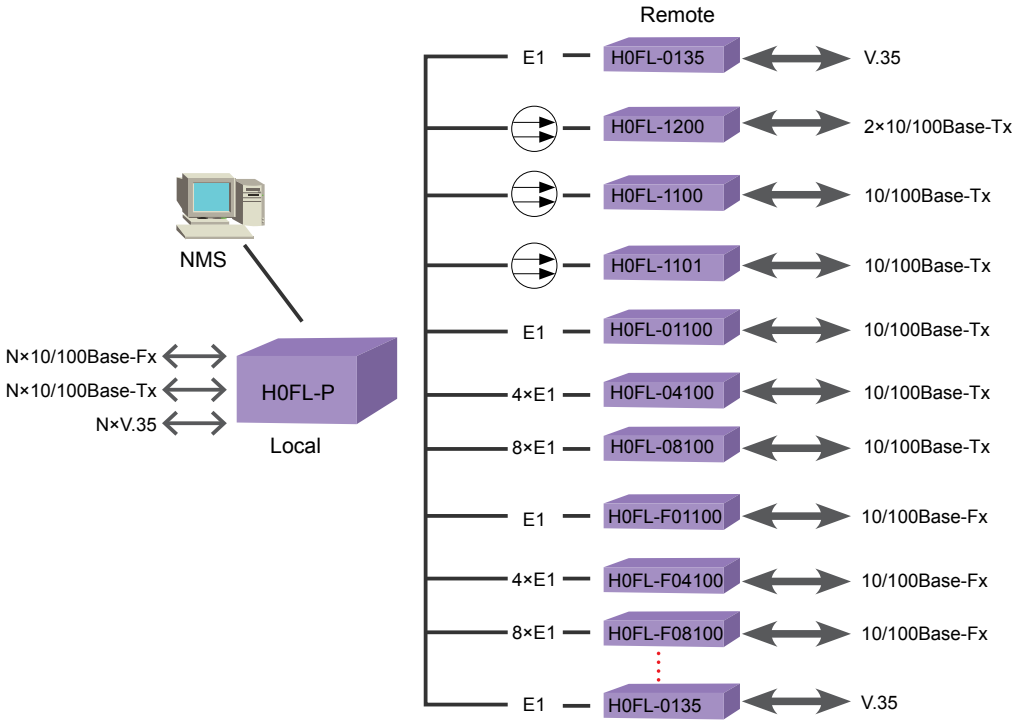
# Typical Application



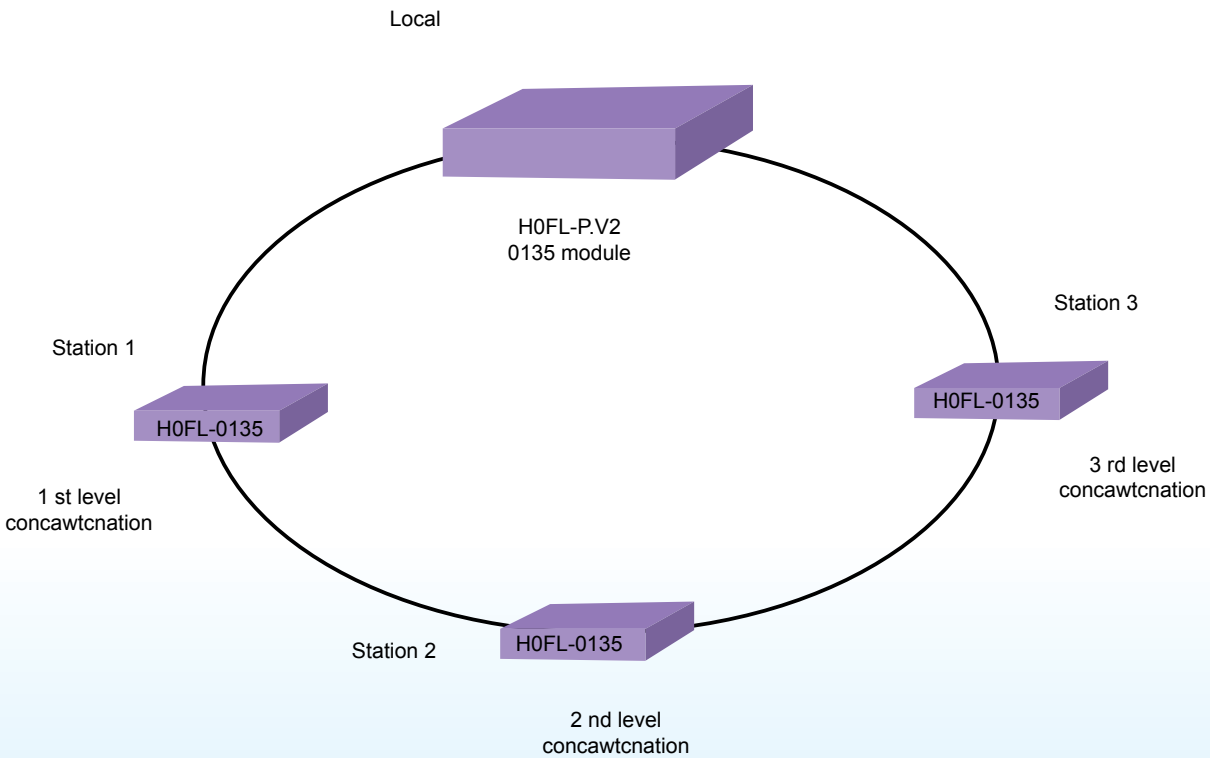

Typical application 1: point to point




Typical application 2: point to point




Typical application 3: point to multi-point




Typical application 4: concatenation

# PDH

## Fiber Transmission Equipment

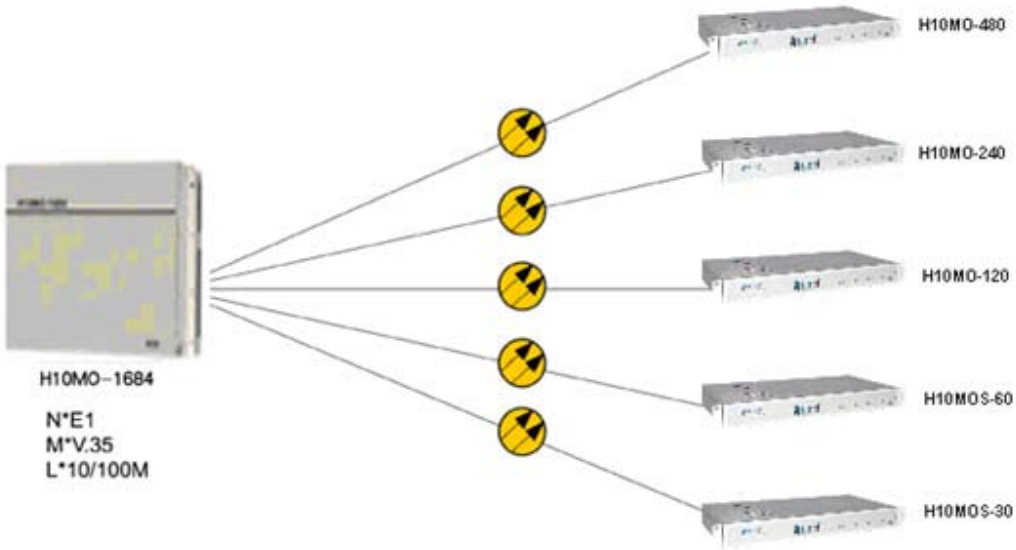
## Overview

Huahuan provides traditional PDH equipments from 1×E1 to 16×E1s as well as newer types with a variety of service interfaces such as V.35, Ethernet etc. Thus we can meet the continued demands of telecommunication operators and end users. H10MO series optical terminal equipments employs all-digital ASIC technology developed on our own, together with the patented jitter attenuation, digital phase locked loop, clock recovery and E1 interference immunity interface technologies. Auxiliary data channels and order wires of RS232, RS485 and V.35 are supported. Integrated management is supported. H10MO series are also featured as small size, lightweight, low power consumption, high interference resistance and high reliability.

## Features

1. Adopt high reliability and low consumption ASIC chip
2. Full testing and monitoring abilities for easy operation and maintenance
3. Unified network management platform
4. Ethernet link reaches line speed and speed limiting can be set.
5. Ethernet supports 10/100M, half/full duplex auto-negotiation and HP auto-MDIX.
6. Provide various power supply options (AC 220V, DC -48V, +24) and dual power supply.
7. Provide SC or FC fiber interface and various fiber power budget option for short or long haul purpose as well as 1+1 protection.

## Typical Application


## Technical Specifications

| Items | Technical Specifications | |
|---|---|---|
| Model and Interface | H10MO-480 | 16×E1/G.703 |
| | H10MO-240 | 8×E1/G.703 |
| | H10MO-240B | 8×E1/G.703+1×Ethernet |
| | H10MO-120+ | 4×E1/G.703 |
| | H10MO-120B | 4×E1/G.703+1×Ethernet |
| | H10MOS-60 | 2×E1/G.703 |
| | H10MOS-60AF | 1×E1/G.703+1×V35 |
| | H10MOS-60B | 2×E1/G.703+1×Ethernet |
| | H10MOS-30 | 1×E1/G.703 |

| Items | Technical Specifications | | | |
|---|---|---|---|---|
| Model and Interface | H10MOS-30AF | 1×V35 | | |
| | H10MOS-30B | 1×E1/G.703+1×Ethernet | | |
| Rack type | H10MO-1684 | With 14 service slots, the upper various modules above can be inserted into the H10MO-1684 | | |
| E1 interface | Comply with ITU-T G.703<br>2.048Mbps±50ppm<br>75Ω(coaxial)/120Ω(twisted pairs) | | | |
| Ethernet interface | optional | Comply with IEEE 802.3, 10/100Base-Tx<br>Line Speed is available (speeding limiting can be set, step size is 1M) | | |
| Optical Interfaces | Connector | SC or FC | | |
| | Optical Spec | Item | | |
| | | 1310nm (standard) | | |
| | | 1310nm (long haul, optional) | | |
| | | 1550nm (DFB, long haul, optional) | | |
| | | Bi-directional single fiber (Optional) | | |
| | | 1+1 optical protection | | |
| Data path | Interface<br>Data rate | One RS-458 channel and one RS-232 channel ≤116K | | |
| Monitor and alarm | Unified network management platform | | | |
| Order wire | Hotline | | | |
| Power supply | AC | 220V (165V~265V) | | |
| | DC | -48V(-36V~-72V)<br>+24(+18V~+36V) | | |
| | Dual Power (optional) | AC(220V) and DC(-48V) | | |
| | Power consumption | Different model varies: 5W~10W | | |
| Dimension | H10MO-480 H10MO-240<br>H10MO-240B H10MO-120+<br>H10MO-120B | W×H×D (mm): 440×44×138 (Different model may slight varies) | | |
| | H10MOS-30 H10MOS-30AF<br>H10MOS-60 H10MOS-60B<br>H10MOS-30B | W×H×D(mm):220×44×138 or 440 × 44 × 138 | | |
| | H10MO-1684 | W×H×D(mm):436×354×297 | | |
| Installation | Rack mount, desktop, wall mount | | | |

# Ordering Information

| | | |
|---|---|---|
| 4E1 PDH Multiplexer | H10MOS-120+/EF | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/EFP | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is FC/PC (1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/E | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is SC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/EP | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is SC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/EFT | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/ET | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is SC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/EFPT | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is FC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1 PDH Multiplexer | H10MOS-120+/EPT | 4E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is SC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/EF | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/EFP | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is FC/PC (1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/E | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is SC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |

| | | |
|---|---|---|
| 4E1+FE PDH Multiplexer | H10MOS-120B/EP | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(BNC). Optical interface is SC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/EFT | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/ET | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is SC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/EFPT | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is FC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 4E1+FE PDH Multiplexer | H10MOS-120B/EPT | 4E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(RJ45). Optical interface is SC/PC(1+1). Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 16E1 PDH Multiplexer | H10MOS-C480/FEJ | 16E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(CC4). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 16E1 PDH Multiplexer | H10MOS-C480/TFEJ | 16E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(wrap). Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 16E1+2FE PDH Multiplexer | H10MOS-C480B/FEJ | 16E1+2FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms(CC4). 2 Ethernet Ports.Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 16E1+2FE PDH Multiplexer | H10MOS-C480B/TFEJ | 16E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 120ohms(wrap). 2 Ethernet Ports. Optical interface is FC/PC. Default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 2E1 PDH Multiplexer | H10MOS-60W/E | 2E1 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms and 120ohms(RJ45). Optical interface default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| 1E1+1V.35 PDH Multiplexer | H10MOS-60AFW/E | 1E1+1V.35 PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms and 120ohms(RJ45). Optical interface default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |

| | | |
|---|---|---|
| 2E1+FE PDH Multiplexer | H10MOS-60BW/E | 2E1+FE PDH Multiplexer, 220V AC/ -48V DC. E1 supports 75ohms and 120ohms(RJ45). Optical interface default is single mode, 1310nm, 40km. (other distances and single-strand options are also available) |
| E1 Optical Modem | H10MOS-30/F | E1 optical modem (unframed). 220V AC. E1 supports 75ohms and 120ohms(RJ45). Optical interface FC/PC. Default is single mode, 1310nm, 40km. |
| E1 Optical Modem | H10MOS-30/8F | E1 optical modem (framed and unframed). -48V DC. E1 supports 75ohms and 120ohms(RJ45). Optical interface FC/PC. Default is single mode, 1310nm, 40km. |
| V.35 Optical Modem | H10MOS-30AF/F | V.35 optical modem(framed and unframed). 220V AC. Optical interface default is single mode, 1310nm, 40km. |
| V.35 Optical Modem | H10MOS-30AF/8F | V.35 optical modem(framed and unframed). -48V DC. Optical interface default is single mode, 1310nm, 40km. |
| E1 Optical Modem | H10MOS-F30-I | E1 optical modem (framed and unframed). 220V AC. E1 supports 75ohms and 120ohms(RJ45). Optical interface default is single mode, 1310nm |
| E1 Optical Modem | H10MOS-F30-I/8 | E1 optical modem (framed and unframed). -48V DC. E1 supports 75ohms and 120ohms(RJ45). Optical interface default is single mode, 1310nm |
| V.35 Optical Modem | H10MOS-30AF-I | V.35 optical modem(framed and unframed). 220V AC. Optical interface default is single mode, 1310nm |
| V.35 Optical Modem | H10MOS-30AF-I/8 | V.35 optical modem(framed and unframed). -48V DC. Optical interface default is single mode, 1310nm |
| FE Optical Modem | H10MOS-FE30-I | FE optical modem. 220V AC. |
| FE Optical Modem | H10MOS-FE30-I /8 | FE optical modem. -48V DC. |

# H5000

## Multi-Functional Integrated Service Multiplexer

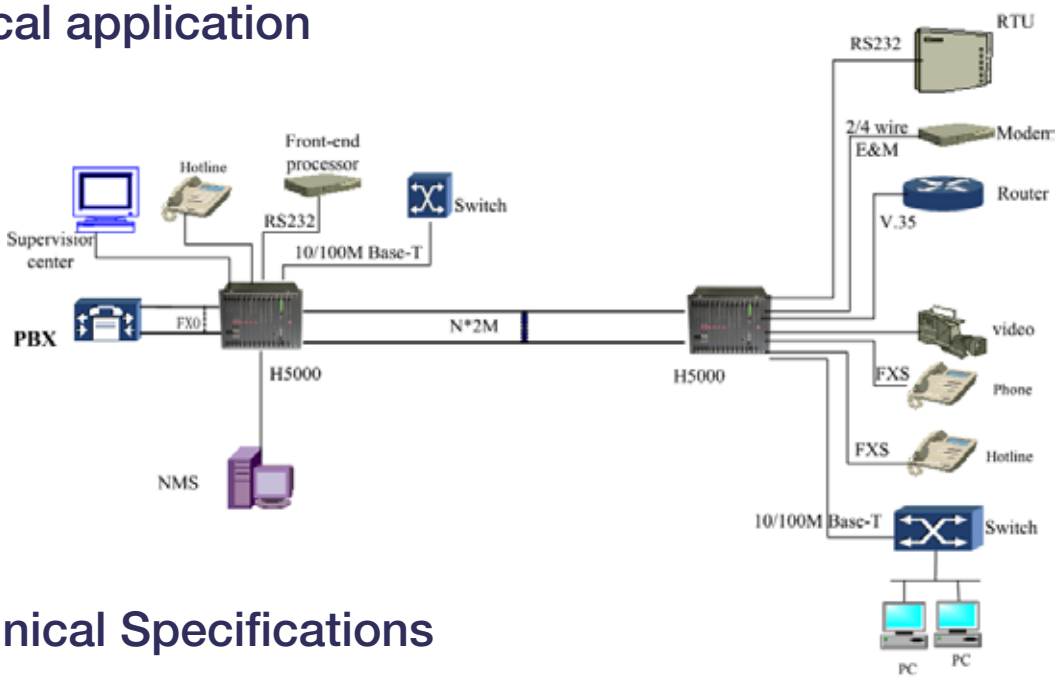
## Overview

H5000 integrated service access equipment have standard E1 interfaces, voice interfaces, data and MPEG2 or MPEG4 image interface. The equipment is an aggregation device, it integrates audio, data, and video in one system which can up to 16 insert different service cards ,which can be E1 ,MDX,DATA,CHU,VIDEO, has 16 slots including 12 general slots. The H5000 series equipments can provide network management system the management station executes TABS commands, connects the managed equipment with a RS485 or RS232 interface, easy to achieve the higher network management.

## Features

1. Integrates audio, data and video in one system.
2. 16 slots including 12 general slots
3. All the interfaces comply with the international standard.
4. Various service interface, including: E1, 10/100Base-Tx, V.35, Audio and Video, Ethernet, 64Kbps, V.35(N*64K), RS232/RS485, FXO/FXS, magnet telephone, hot line telephone, E&M etc.
5. Flexible configuration and setup, plug and play.
6. The bandwidth of data and video can be widened smoothly.
7. Max capacity of H5000 is 64*2M, max voice capacity 120 channels.
8. Powerful cross connection capacity 2048×2048 (64k basis) of H5000. H5000 can be configured as full 64×E1 DXC.
9. The power supply card and cross connection card support 1+1 redundancy with high reliability. All the cards support hot-swapping.
10. Unified network management platform, with perfect supervision and test function, remote-end manageable.

## Typical application




## Technical Specifications

| Item | | Description |
|---|---|---|
| H5000 High-end Integrated Service Multiplexer | | 19 inch standard rack with 16 physical slots, 12 slots for general service cards |
| Module type | PWR card | Support 1+1 dual protection,DC-48V input<br>Ring voltage 75V, 25Hz, provide +5V and -5V for system |
| | MDX card | Provide 64*E1 cross connection ability<br>Main control and monitoring function<br>With 8*E1 interface (75Ω or 120Ω) |
| | E1 card | With 4×E1 or 8×E1 interface for more E1 applications |
| | CHU card | Provide 10 ports voice channels, support FXO/FXS, magnet phone, hotline phone, E&M, 64Kb data, RS232 data, RS485 data, V35 data etc. |
| | Data card | Support 10/100Base-T module and V35 data module |
| | VIDEO card | With 4×E1 interface, support MPEG-2 or MPEG-4 coding and decoding |
| NMS interface | Network management system interface | RS232 or RS485<br>Ethernet (SNMP) |
| Video | Video rate | 128K-8M bps |
| | Video output mode | Fixed rate or variable rate |
| | PAL/NTSC | both supports |
| | PAL mode | 720*576, 704*576, 640*576, 480*576, 352*576, 352*288, 176*144 |
| | NISC mode | 720*480, 704*480, 640*480, 480*480, 352*240, 352*480, 176*144 |
| | Video output mode | TS/PS |
| | Code | ISO/IEC-14496-2 MPEG-4 SP@L1, L2 and L3 ISO/IEC-13818-2 MPEG-2 MP@ML |
| Audio | Audio sampling frequency | 8K, 32K, 44.1K, 48KHz |
| | Coding mode | MPEG1 Audio Layer I/II, G.729, G.711, MP3 |
| | Rate | 8K,32K, 64K, 192K, 224K, 384K bps |
| | Audio mode | Stereo, Joint, Dual, Mono |
| Power supply consumption | DC-48V <100W (full loaded) | |
| Dimension | W×H×D (mm) 440×310×265 | |

# H5002

## Multi-Functional Integrated Service Multiplexer


## Overview

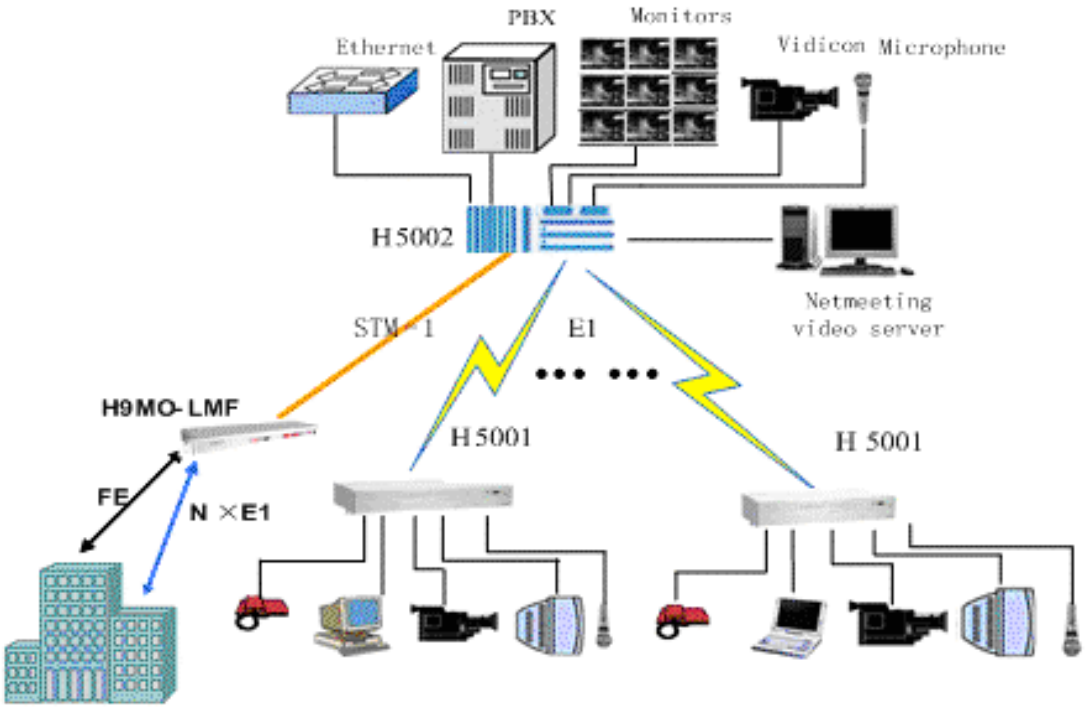
Huahuan provides all types of PCM multiplexers, from high-end to low-end, from standard size to miniaturized, from rack mount to portable. All multiplexers offer variable service interfaces, flexible system configuration, high reliability and cost competitiveness. H5002 multiplexer is a key member of PCM multiplexer family.

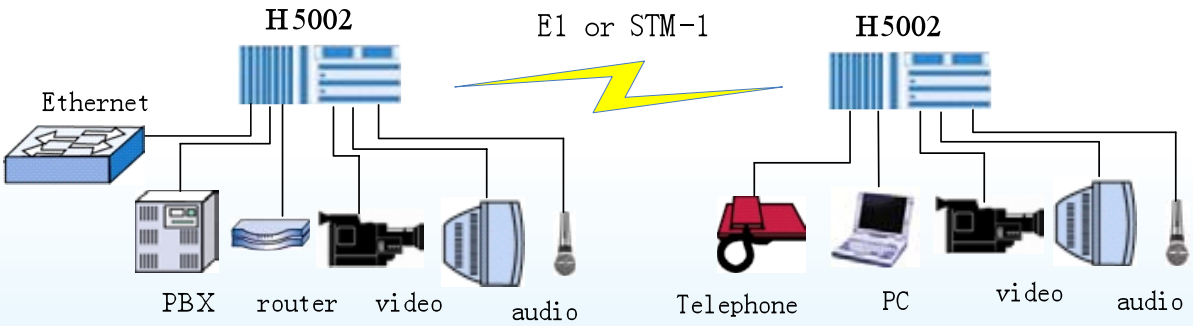
H5002 is a powerful multi-service access platform that combines video, audio, data service and SDH optical transmission together. H5002 is an aggregation device that can up to 3 insert different service cards, which can be E1, MDX, DATA, CHU, VIDEO, PWR card, etc,

## Features

1. Various service interfaces, including: STM-1 optical interface, E1, 10/100Base-Tx, V.35, Audio and Video, 64Kbps, V.35(N*64K), RS232/RS485, FXO/FXS, magnet telephone, hot line telephone, E&M interface etc.
2. Flexible configuration and setup, plug and play.
3. The bandwidth of data and video can be widened smoothly.
4. Unified H7GMSW network management platform, managing and configuring easily. With perfect supervision and test function, remote-end manageable.
5. Flexible video configuration, MPEGII and MPEGIV mode can be configured by software.
6. As MPEGII mode, transport bandwidth is 1~4 ports 2M channel. One of the channels can be divided into framed and it can be combined with the voice into one 2M channel. The transport rate is adjustable on the basis of N*64K (N=1~31).
7. As MPEGIV mode, audio can be transported with voice and data in one 2M channel.
8. For every service direction, H5002 can provide 2 ports Ethernet interface with different priority. It uses the high priority to transport image and uses the low PRI for data.
9. Max capacity of H5002 is 64*2M, max voice capacity 30 channels.
10. Powerful cross connection capacity 2048×2048 (64kbps level) of H5002. H5002 can be configured as full 64×E1 DXC.
11. The power supply card and cross connection card support 1+1 redundancy with high reliability. All the cards support hot-swapping.

## Typical application



# Technical Specifications

| Item | | Description |
|---|---|---|
| H5000 High-end Integrated Service Multiplexer | | 19 inch standard rack with 3 universal cards |
| Module type | STM-1 Optical card | Support 1 STM-1 optical port, 4 E1(75Ω) ports, 2 FE ports |
| | PWR card<br>RPWR | Support 1+1 dual protection,DC-48V input<br>Ring voltage 75V, 25Hz, provide +5V and -5V for system |
| | MDX card | Provide 64*E1 cross connection ability<br>Main control and monitoring function<br>With 8*E1 interface (75Ω or 120Ω) |
| | E1 card | With 4×E1 or 8×E1 interface for more E1 applications |
| | CHU card | Provide 10 ports voice channels, support FXO/FXS, magnet phone, hotline phone, E&M, 64Kbps data, RS232 data, RS485 data, V35 data etc. |
| | Data card | Support 10/100Base-T module and V35 data module |
| | VIDEO card | With 4×E1 interface, support MPEG-2 or MPEG-4 coding and decoding |
| NMS interface | Network management system interface | RS232 or RS485<br>Ethernet |
| STM-1 Optical Interface | Bit rate | 155520kbit/s ± 4.6ppm |
| | NRZ Line code | Scrambled NRZ |
| | Work wavelength | default: 1310nm, option: 1550nm |
| | Connector | SC/FC |
| Video | Video rate | 128K-8M bps |
| | Video output mode | Fixed rate or variable rate |
| | PAL/NTSC | both supports |
| | PAL mode | 720*576, 704*576, 640*576, 480*576, 352*576, 352*288, 176*144 |
| | NISC mode | 720*480, 704*480, 640*480, 480*480, 352*240, 352*480, 176*144 |
| | Video output mode | TS/PS |
| | Code | ISO/IEC-14496-2 MPEG-4 SP@L1, L2 and L3 ISO/IEC-13818-2 MPEG-2 MP@ML |
| Audio | Audio sampling frequency | 8K, 32K, 44.1K, 48KHz |
| | Coding mode | MPEG1 Audio Layer I/II, G.729, G.711, MP3 |
| | Rate | 8K,32K, 64K, 192K, 224K, 384K bps |
| | Audio mode | Stereo, Joint, Dual, Mono |
| Power supply consumption | H5002 | DC-48V <40W (full loaded) |
| Dimension | H5002 | W×H×D (mm) 440×130×280 |

# H5001

## Multi-Functional Integrated Service Multiplexer

## Overview

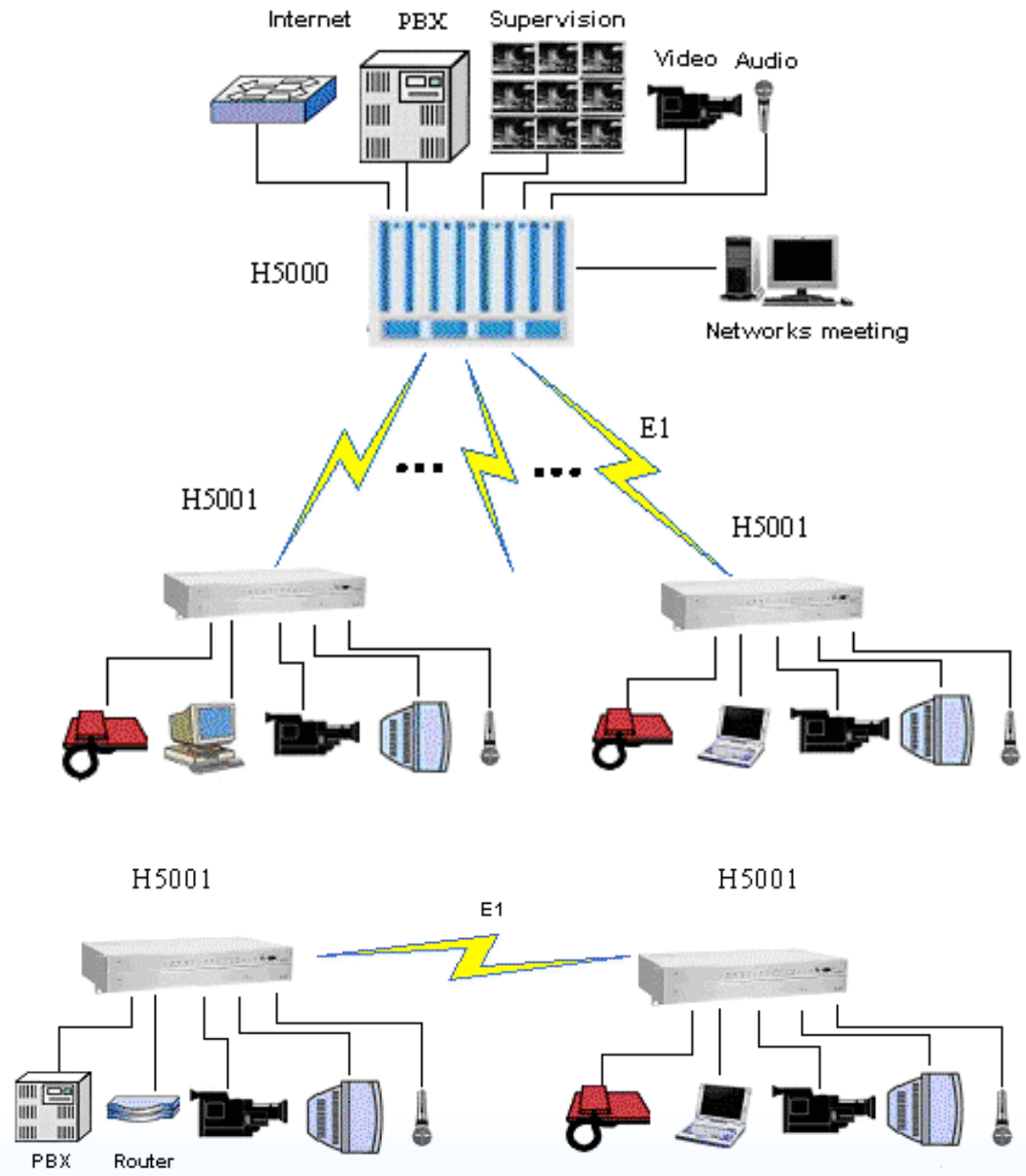
H5001 is a subscriber side equipment as the miniaturization equipment of H5000. H5001 can connect to H5000, also can connect to H5001 in a point-to-point link. It's have 4 minislot for voice/data (low speed) and 1 slot for FE data.1U height.

H5001 has eight voice interfaces or low rate datas, two N×64 kbps V.35 data interfaces, and two 100Bases-Tx Ethernet ports. It has many interfaces: such as FXO, FXS,64Kbps codirectional data interface(G.703), asynchronous data interface(RS232, RS485), hot line interface, magneto Interface, 2/4-wire voice interface, N×64 kbps V.35 data interface, E&M signalling interface.

## Features

1. Integrates audio, data and video in one system.
2. All the interfaces comply with the international standard.
3. Various service interface, including: E1, 10/100Base-Tx, V.35, Audio and Video, 64Kbps, V.35(N*64K), RS232/RS485, FXO/FXS, magnet telephone, hot line telephone, E&M etc.
6. Unified H7GMSW network management platform, managing and configuring easily. With perfect supervision and test function, remote-end manageable.
7. Flexible video configuration, MPEGII and MPEGIV mode can be configured by software.
8. Max capacity of H5000 is 4*2M, max voice capacity 16 channels.and 2 channels Ethernet service(or V.35 service ).
14. The power supply card and cross connection card support 1+1 redundancy with high reliability.

## Typical Application



# Technical Specifications

| Item | | Description |
|---|---|---|
| H5001 High-end Integrated Service Multiplexer | | 1U Compact Design with module |
| Module type | CHU module | Support up to 16 voice channels |
| | Data module | V35 data module<br>10/100 Base-T module<br>Wideband ETH*E1 module |
| NMS interface | Network management system interface | RS232 or RS485<br>Ethernet (SNMP) |
| Video | Video rate | 128K-8M bps |
| | Video output mode | Fixed rate or variable rate |
| | PAL/NTSC | both supports |
| | PAL mode | 720*576, 704*576, 640*576, 480*576, 352*576, 352*288, 176*144 |
| | NISC mode | 720*480, 704*480, 640*480, 480*480, 352*240, 352*480, 176*144 |
| | Video output mode | TS/PS |
| | Code | ISO/IEC-14496-2 MPEG-4 SP@L1, L2 and L3 ISO/IEC-13818-2 MPEG-2 MP@ML |
| Audio | Audio sampling frequency | 8K, 32K, 44.1K, 48KHz |
| | Coding mode | MPEG1 Audio Layer I/II, G.729, G.711, MP3 |
| | Rate | 8K,32K, 64K, 192K, 224K, 384K bps |
| | Audio mode | Stereo, Joint, Dual, Mono |
| | DC-48V or AC 220V <20W | |
| | W×H×D (mm) 440×44×209 | |

# H7GMSW-CS

## Network Management Software (Client/Server)

## Overview

H7GMSW network management software is specially designed by our company for management of various transmission equipment and terminal equipment manufactured, including MSTP equipment, SDH transmission equipment, DSL equipment, and PCM terminal equipment etc. Windows graphical interface both in Chinese and English is adopted which is easy to learn and operate, and has clear and straight forward alarm indications. The software is an important tool for daily maintenance and testing of network and equipment.

## Function

1. Topology Management

Display network topology structure with graphic mode. Organizing and manage various network nodes and connection between them.

2. Faulty Management

Collect and manage all network equipment of Huahuan. Provide query, filtrate start, transmitting alarm function.

3. Performance Management

Provide SDH performance management function. Through H7GMSW-CS, users many inquire all interior history register value of the NE.

4. Security Management

Support multi administration accounts; provide authorized divisional security management function. Detailed system/equipment operation log is convenient to control operation view.

5. Resource Management

Centralized manage network resource information, network clients information and the relative relations between resource and clients.

6. Log Management

Completed log management includes system operation log, equipment operation log, and system event performance management function in order to track the status and maintain system.

## Features

1. Centralized monitoring at central computer (key station). Two communication interfaces are adopted between key station and monitored equipment:

4-line RS485 interface and TABS communication protocol;

Ethernet interface and TCP/IP communication protocol, satisfying Q3 interface protocol requirements;

2. Hierarchical management mode is adopted, i.e. area>subnet>equipment>unit panel, with clear management levels, straight forward alarms, as well as fast and convenient query.

3. Monitored equipment form several subnets, each of which is allocated with a definite subnet address and has a node (main station or main equipment) connected to the key station. All subnet and equipment far from the key station can realize cross-network (area) supervision and management through transmission channels or shared monitoring channels.

4. This software can also be installed on portable computer, so that in any node, it can monitor all equipment of this subnet in some certain monitoring method.

5. For equipment with self-healing ability, self-healing adopts distributed control mode, i.e. supervisory control units of each station's equipment cooperate to fulfill self-healing operation of the network without intervention by key station. After preliminary setting, monitored network and equipment can operate independent from key station and user can decide according to his needs whether key station and network management software shall be adopted.

6. Multimedia alarm function: with a sound card correctly set, the key station can control the sound card to generate alarm buzzing specified by user as soon as the supervisory control system detects alarm on network or equipment.

7. The software program with high density and efficiency has very small requirement of system resources, and it can operate on any Windows (Windows NT ,Windows XP and Windows 2007 etc.) platform.

## Operation Environment

Hardware environment:

CPU: Intel 80486 or above;

Memory: above 16 M;

Hard disk space: 10 M;

Spare RS232 port;

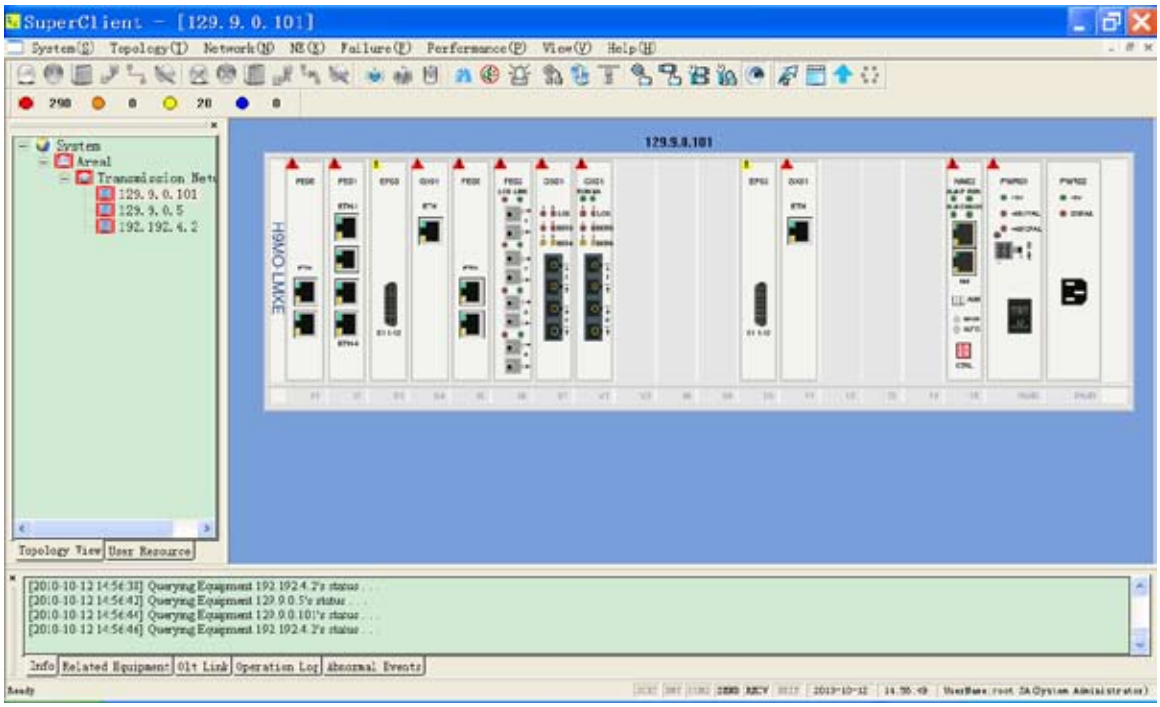
10M/100M network adapter (Ethernet monitoring);

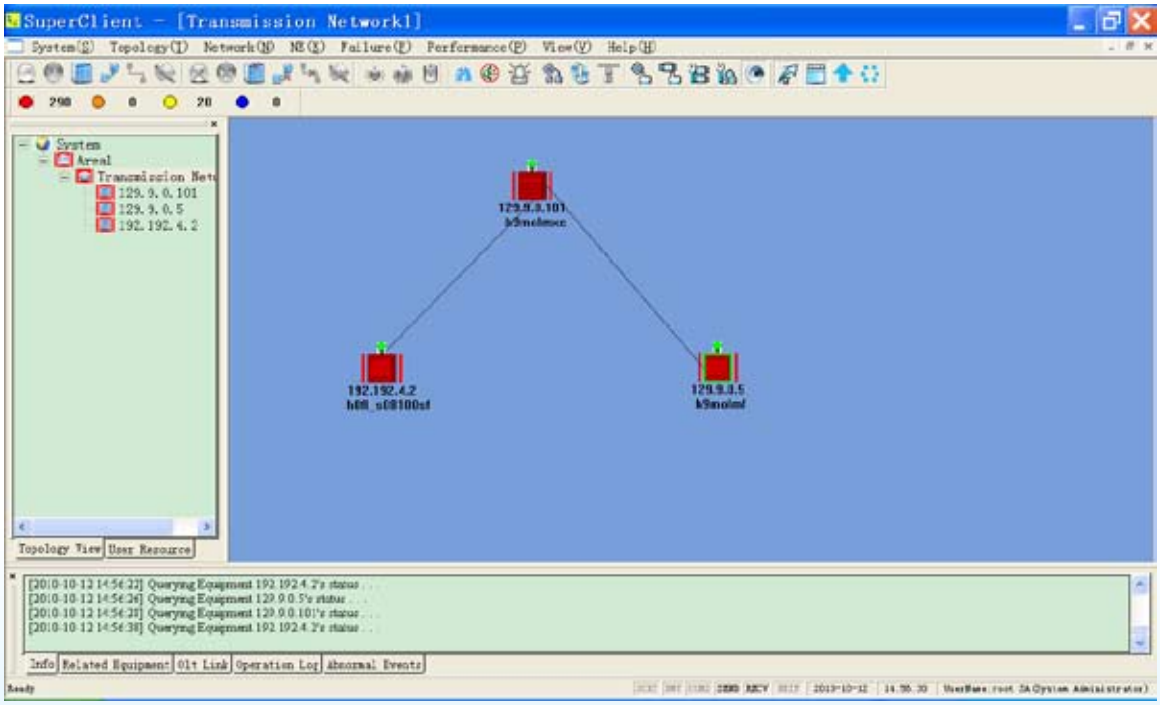
CDROM driver, mouse and monitoring lines .etc.

Software environment:

Windows platform (Windows98, Windows 2000, Windows XP or Windows 2007 etc.)

## Screenshots



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