



# 30\*phones fiber Multiplexer Unmanaged User's Reference Manual

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## **To users:**

Thank you for using our products. Before using, please read this Reference Manual carefully, and keep properly.



### **Alarm**

- 1、 This product can not be caught in or be affected with damp, for they can make the performance degressive and even broken.
- 2、 Before fixing this product ,please check the model and according to the User s' Reference Manual.

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# Chapter 1 General Introduction

## 1.1 Product Description

This model is a kind of point-to-point fiber transmission multiplexer that developed based on special large scale integrated circuits. It is with perfect alarm function, and has an alternative of 30 channels phones and 1~4 98M linear Ethernet ports (optional), 1~4 serial data (optional).The four ports provides witching interfaces, support VLAN, 10M/100M self-adapting completely.

It can realize SNMP management on stand-alone device via built-in SNMP module (optional). The electric parts are all digital with small volume, high reliability, convenient for maintenance.

## 1.2 Characters

- Based on IC of independent intellectual property rights;
- Adopt veneer structure;
- Can control the remote alarm status;
- Can control the remote alarm status;
- E1 is conformed to G.703, adopts full digital clock recovery and smooth phase lock technology;
- Offer 2 extended ports for 1~4 asynchronous data, such as RS232/RS485/RS422/Manchester; (optional)
- Ethernet is 10M/100M, full/half duplex adaptive, support VLAN; (optional)
- ETH support Auto-MDIX;

- 1-30 channels phone, support call indication;
- Audio ports support FXO and FXS, FXO connected with switches, FXS with users' phone;
- Support SNMP management; (optional)
- Can distinguish the opposite device is shut down or fiber not connected well when testing lost optical signal;
- User can become conscious of the temperature and voltage of the local device in network management stage;
- Power supply: AC220V、DC-48V/DC24V etc;
- More than 2~120km no relay transmission distance;

## Chapter 2 Functions

### 2.1 Front Panel

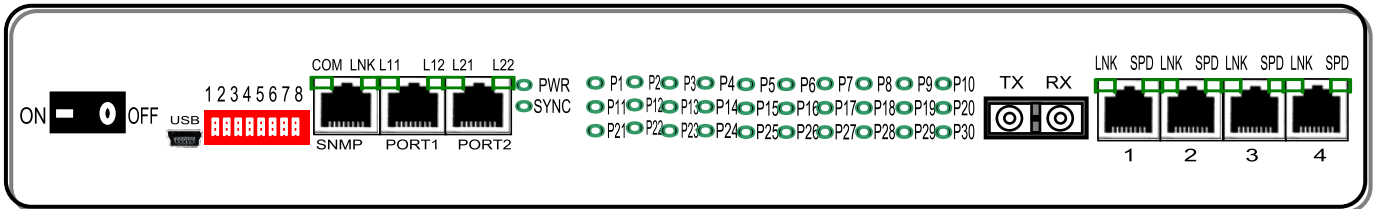


Fig1. sketch map of the front panel

**Note: the USB port is for R&D or upgrading.**

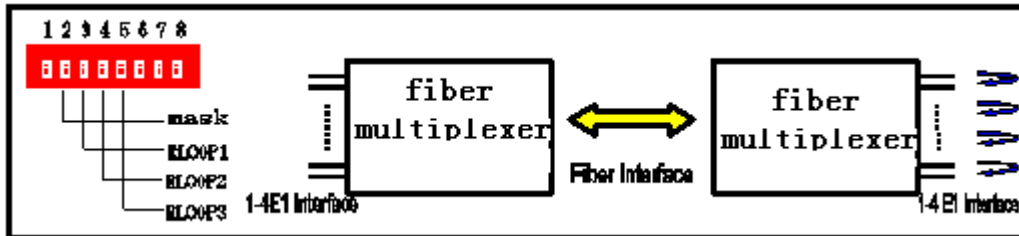
#### 2.1.1 LED

The indicators on front panel are for working status and alarm indication:

Name	Status	Description
PWR	on	Power supply is normal;
	off	No power connected;
LNK	on	Ethernet connected well;
	off	No Ethernet connected;
SPD	on	100M
	off	10M
SYNC	on	Optical signal received normally;
	off	No optical signal received;
P1-P30	on	The corresponding 1-30 channels voices are on line or FXO hung off;
	off	The corresponding 1-30 channels voices are off or no call indication;
<b>E1 indicators on the back panel</b>		
1~4	on	1~4 E1, E1 signal lost;
	off	1~4 E1, E1 signal received normally;

## 2.1.2 DIP switches

There are 8 DIP switches on the front panel for E1 line loop back function and E1 alarm indication.



When DIP2 is OFF (0), DIP3-5 combination is used to commanding the opposite E1 self loop or cancel the loop:

(1 is ON, 0 is OFF)

The x <sup>th</sup> E1 self loop	DIP2	DIP3	DIP4	DIP5
1	0	0	1	1
2	0	1	0	1
3	0	0	0	1
4	0	1	1	0
All 4E1 self loop	0	1	1	1
No E1 loop	0	Other combinations		

When DIP2 is ON (1), DIP3-5 combination is used to shield local 1~4<sup>th</sup> E1 alarm or cancel alarm:

(1 is ON, 0 is OFF)

The shielded E1	DIP 2	DIP 3	DIP 4	DIP 5
4	1	0	1	1
3-4	1	1	0	1
2-4	1	0	0	1
1-4	1	1	1	1

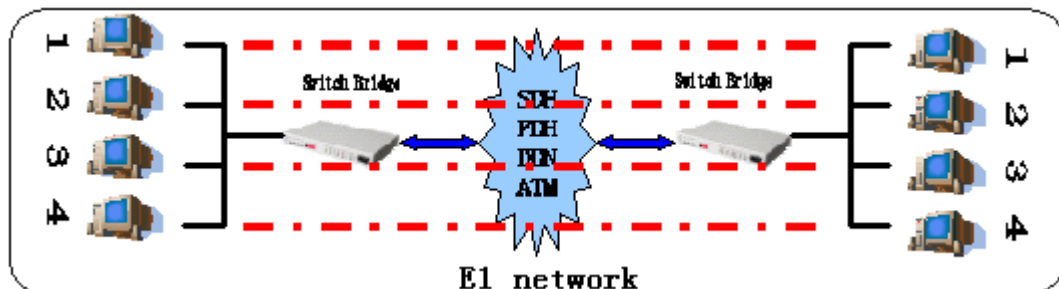
E1 is not shielded		Other combinations
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DIP-1: OFF: indicate the local status; ON: indicate the remote.

DIP-6: for digital mode selection; OFF: RS232/RS422; ON: RS485.

DIP-7: OFF: local optical interfaces not loop; ON: command the local optical interfaces self loop;

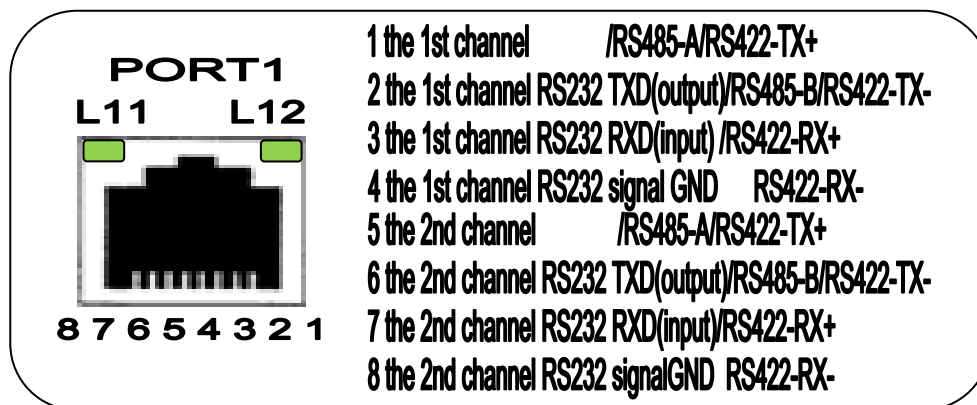
DIP8: 4 Ethernet isolated settings. ON: 1-4 Ethernet on both ends isolated separately, namely 4 Ethernet ports are consistent with the other end, 1st port to 1st .



### 2.1.3 Extensional ports (PORT1/PORT2)

These two ports can be extended for various data channels (*customizable*), such as asynchronous data (RS232/RS485/RS422/Manchester).

But one port at most get 2 channels asynchronous data, the feet pins are as below:





**L11&L12 INDICATORS:** indicate the data communication status, on is for data flow, or off.

## 2.1.4 Fiber interface

Offer one optical interface, FC、SC for option;



“TX” is for optical signal output

“RX” is for optical signal input

## 2.1.5 USB interface

For upgrading.

## 2.1.6 Ethernet port

The device offers 1-4 100M linear Ethernet, 10/100M、full/half duplex adaptive, support VLAN, and can auto learn the MAC address from the LAN connected with it, and transfer the destination address as the frame of another LAN. Transparent to TCP/IP, and provide safe, seamless connection between different interfaces. Widely used to network and monitor in WAN and LAN.

4 Ethernet ports:

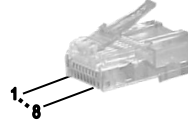
- **1 2 3 4** — totally 4 10/100Base-T ports on the front panel, RJ45, support AUTO-MDIX;
- 4 Ethernet ports can be exchangeable, or set VLAN separation.
- **LNK:** link/data indication, on denotes connection well, wink is of data flow;

- SPD: 10/100M, on is 100M.

RJ45 interface and its feet sequence:



10/100M Ethernet port



RJ45 crystal head

MDI and line sequence:

Crystal head A		Crystal head B	
The color of twisted-pair cable	sequence	sequence	The color of twisted-pair cable
White orange	1	1	White orange
orange	2	2	orange
White and green	3	3	White and blue
blue	4	4	blue
White blue	5	5	White green
Green	6	6	green
White brown	7	7	White brown
brown	8	8	brown

MDIX and line sequence:

Crystal head A		Crystal head B	
The color of twisted-pair cable	sequence	sequence	The color of twisted-pair cable
White orange	1	1	White and green
orange	2	2	Green
White and green	3	3	White orange
blue	4	4	Blue
White blue	5	5	White blue

Green	6	6	Orange
White brown	7	7	White blue
Brown	8	8	Blue

Notes: foot 1 of A links with foot3 of B; 2 of a links with 6 of B.

When the connected Ethernet cable (twisted-pair cable) is long, you should make sure that "1", "2" core line are in the same pair; "3", "6" in the same pair.

## 2.2 Rear panel

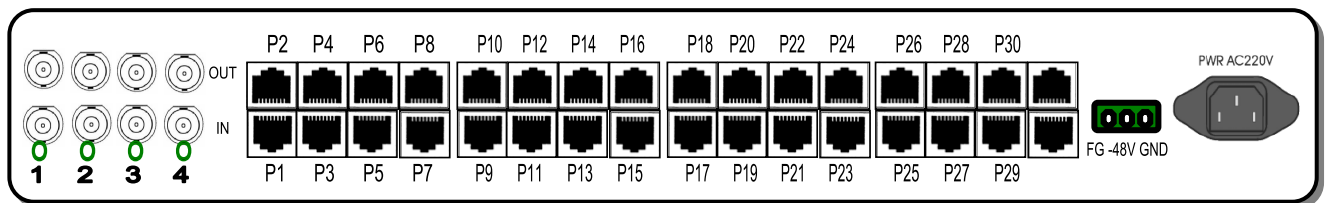


Fig. The back panel

### 2.2.1 Power supply

Support AC220V/ DC-48V(optional)

- AC220V: 180-260VAC, directly insert power wire;
- -48VDC: the positive and negative of DC-48V can be optional because there is the self-test circuit for the polarity inside the device;

Common connection “FG” to the ground;

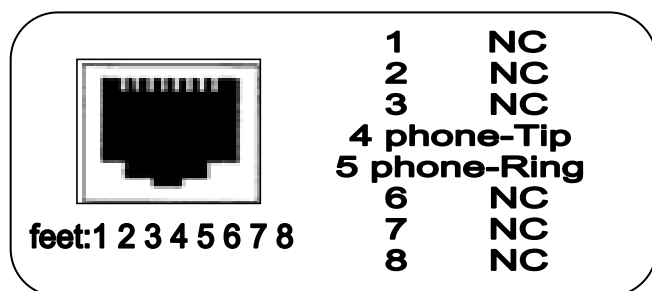
“DC-48V” to the cathode of the power;

“GND” to the anode of the power;

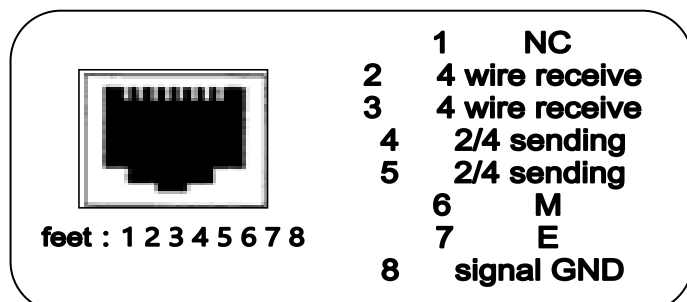
## 2.2.2 Telephone port

On the rear panel there are P1-P30 totally 30 RJ45 ports, supporting 1~30 phones connection. It owns 4 types ports: FXO、FXS、2/4 E&M、magnet call telephone. If FXO module is set in device, the port is FXO which is connected to switch. If FXS module is set in device, the port is FXS which is connected to phone.

FXS/FXO、magnet call telephone:

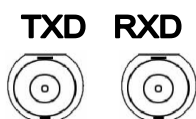


2/4 E&M:



## 2.2.3 E1 interface

**75Ω: BNC connector**



“IN” is 75Ω (BNC) unbalanced E1 input,

Namely E1 (2M) input;

“OUT” is 75Ω (BNC) unbalanced E1 output,

Namely E1 (2M) output

Name	Status	Description

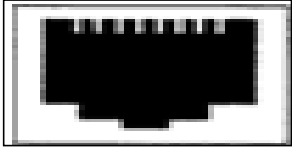
1~4 <sup>th</sup> E1 ports	IN	1~4channels E1, 2M signal input
	OUT	1~4channels E1, 2M signal output

There are two kinds of 120Ω (RJ45 connector)

**Pins for E1 connector:**

### 1. E1 port on front panel

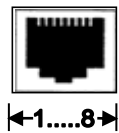
The pins:

 <p><b>120Ω E1(RJ45)</b></p>	<b>1st or 3rd E1</b> 1 TX+ (E1 TXD+) 2 TX- (E1 TXD-) 3 RX+ (E1 RXD+) 4 RX- (E1 RXD-)	<b>2nd or 4th E1</b> 5 TX+ (E1 TXD+) 6 TX- (E1 TXD-) 7 RX+ (E1 RXD+) 8 RX- (E1 RXD-)
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### 2. E1 ports on rear panel

120Ω (RJ45 connector)

The pins:



Pin	definition	description
1	TX+	E1 TXD+
2	TX-	E1 TXD-
4	RX+	E1 RXD+
5	RX-	E1 RXD-

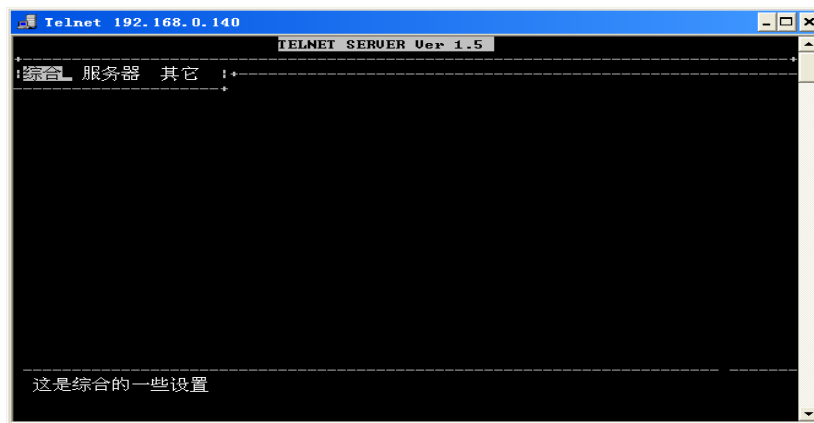
#### 2.1.1 LED

Name	Color	Status	Description
COM	Green	On	100M
		Off	10M
LNK	Green	On/wink	There is data communication of the LAN connection;
		Off	LAN disconnection;
			Wink means the network card are communicating with the cascading card.

Note: the network card need around 50s to start up the program

## 2.1.2 TELNET

Set the device IP address by CONSOLE, then you can land into the device through TELNET. In windows system, connect network line well, open the “running” in start menu, input telnet A.B.C.D (defaulted: telnet 192.168.0.140), and then select “English”, click into ‘c’ or ‘e’, and input the password for sure (user: admin, password: admin), then appear the following box:



Telnet offers graphic interface (as the upside) and command line mode (you can get through by “command mode” in “others” menu).

# Chapter 3 Parameters and Index

## 3.1 Parameters

### ■ E1 interface

Standard:	conforms to G.703 standard.
Coding:	HDB3
Interface rate:	2.048Mbps ± 50ppm
Impedance:	75Ω (unbalanced)/120Ω (balanced)

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Connector: BNC (75  $\Omega$ ), RJ45(120  $\Omega$ )

Jitter Performance: according to G.742 and G.823

Allowed attenuation: 0~6dBm

### ■ Fiber Interface

Wavelength: Single mode 1310nm/1550nm

Multiple mode 850nm/1310nm

Fiber core NO.: Double core or single core for option

Sending consumption: -9dBm/-5dBm

Transmitting range: 0-50km/120km

Receiving sensitivity:  $\leq$ -36dBm (BER<10<sup>-11</sup>)

Optical code: scrambling NRZ code

Connector: SC/FC/ST

### ■ FXS Telephone Port

Ring voltage: 75V

Ring frequency: 25HZ

2 line input impedance: 600 $\Omega$  (hanging off)

Wastage: 40db

### ■ FXO Exchange Port

Ring detecting voltage: 35V

Ring detecting frequency: 17HZ-60HZ

2 line input impedance: 600 $\Omega$  (hanging off)

Wastage: 40db

### ■ Magnet call phone port

Ring detecting voltage:	90V
2 line input impedance:	600Ω (hanging off)
Wastage:	40 dB
Balance degree:	70 dB

### 3.2 Dimension

483 (W) × 252 (L) × 44 (H) mm

### 3.3 Power supply

DC power supply: DC-48V, error range -36V~-72V;

DC power supply: DC-24V, error range -18V~-36V;

AC power supply: AC220V±20%, 50HZ

### 3.4 Operation Condition

Operating temperature: 0°C~50°C

Storing temperature: -40°C~+70°C

Relative humidity: 95 %

Without disturbance of erosive and solvent gas, raising dust or strong magnetic field.



### **3.5 Power consumption**

consumption:  $\leq 5W$

## **Chapter 4 Operation**

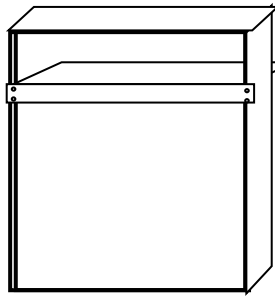
### **4.1 Equipment installation**

After unpacking and before installation, make sure checking the following:

- Make sure the package is well. If the package is damaged, contact service office quickly for solution.
- Check the package according to the product list, if find equipment severe damaged or lack of some components, please contact installation worker or service office of us.
- Check whether the equipment type meets with the type you ordered.
- Check whether the component is in integrity.
- Check the power supply type.

### **4.2 Quick installation**

***Install to the 19 inches rack***



- Connect receive and transfer optical with optical receive and transfer port of the equipment. Don't exchange receive and transfer wire, make sure the optical fiber head is clean, insert optical jumper, make sure connection well. (fiber bending radius $\geq$ 50 mm)
- Use multimeter to test power polarity and voltage, make sure it matches with equipment requirement.
- After complete installation and make sure it's ok, power on the switch. Check indicator light meet with practice situation (see related part of manual).
- A clean, steady environment and firm installation should be provided for desktop or wall hanging equipment.

### **4.3 Power installation**

Check voltage configuration, if the input is DC, take care of the voltage value; if it is AC220V, just directly link it.

### **4.4 Fiber connector**

Please screw off the plastic protection cap from the connector before

installation, then connect with the exact fiber according the mark of TX and RX. Take care that the input and output fiber should not be connected exchange, otherwise, the device can't work.

The fiber connector should remain clean, otherwise, there will be power consuming which will tamper with the transmission distance. If there is feculence on the connector, please wipe it with clean cotton dipping with pure ethanol.

## **4.5 2M signal interface**

2M interface of E1 voice multiplexing is 16 wires 2.048 Mb/s HDB3 code unbalanced interface, conforming to the ITU - T g. 703 Suggestions, it can directly contact with the switches and other equipment via 2M mouth connection. The interface is located on the back panel, BNC connector .

Weld the Q9 joint and E1 coaxial cable (75-2 or 75-3 coaxial cables) firmly, make good E1 transmission cable, and connect the Q9 joint with the corresponding E1 line.

## **4.6 Telephone port**

Before using, do the below test:

Insert FXO into input-line of phone, FXS into telephone, when the phone is hung up, you can hear the feed sound.



## Chapter 5 Diagnosis and trouble shooting

### 5.1 fault diagnosis

#### A. Power fault

Phenomenon	Cause	Solution
Power supply is abnormal	Don't meet the requirements	Change the power
	The power switch is not open	Open the switch
	The power line looses	Fasten it
	Inner fuse burnt off	Change another

#### B. Electric interface breakdown

Phenomenon	Cause	Solution
2M port (LOS ON)	The branch is not under use	Locally loop the branch
	2M signal line is not connected (E1)	Connect the E1 line well
	The input and output of 2M signal line is reversed connected	Remedy the connection
	Coaxial head fault	Check the welding joint

#### C. Telephone fault

Phenomenon	Cause	Solution
Large noise	Weak light signal	Measure the light power
voice road impassable	Disconnection or office fault	Change the phone or remedy the malfunction

## Chapter 6 Package

### Contents in each box:

30FXS (0) fiber Multiplexer -----	1
AC220V Power wire / Power adaptor-----	1
User's manual-----	1

### Note:

- This is a sensitive electronic item, please do handle with care when carrying or delivering and pay attention to against humidity.
- Within the warranty period, whenever there is a problem regarding the quality issue, we will take the responsibility for it and repair will done by us Free of Charge.
- After the warranty period, we will charge accordingly depending on the fault or damage.
- Whenever there is a malfunction of product, try to identify the problem according to alarm and contact our technical support in time.