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Preface

Version Description

Manual version: V1.1

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Brief Introduction

This User Manual describes the installation and operation of 16E1Optical Multiplexer Equipment. Before you use our device for the first time, please read all the included materials carefully, and install and operate this series of products in keeping with items listed in the manual, so as to avoid damaging the device resulting from malpractice. Thank you for choosing our products.

Environmental Protection

This product complies with the design requirements associated with environmental protection. The storage, use and disposal of the product should be conducted in accordance with related national laws and regulations.

We welcome you to put forward advice and suggestion to our work, which shall be viewed as the ultimate support to us.

Chapter One Introduction

1.1 Overview

This device apply large-scale integrated circuit developed independently as its hardcore and can multiple 16-channel E1 signal, 2-channel RS232 and 1 hot-line port onto a pair of fiber to realize the hybrid transmission.

1.2 Features

High density monolithic design for easy integration

Complete function switches and alarm indications to display the working status, and the local led indications can display the status of remote device

Supports the loop back function on each E1 channel

Supports two RS232 channels or one RS232 and one ex-warning indications channel

Supports console interface according the order of the customer

Supports one hot-line port according the order of the customer

Supports the AC220V and DC48V power supply simultaneously

Chapter Two Function Specification

2.1 The Front Panel Description



Figure 2-1 Front Panel Layout

2.1.1 LED Indicators

There are thirty-four LED, one 16-bit DIP switch and on the front panel

Name	Color	Function	Description	
PWR	Green	Power Status	On	supply of DC5V Power works normal
			Off	Power off or power error exists
SYS	Yellow	the rulers of device working parameters	On	Following the network management settings
			Off	Following the DIP switches settings
			Flash	The DIP control switches is unlock when followed the DIP switches setting
PHO	Yellow	phone calling status	On	Both sides are in through status
			Off	Both sides are in off -hook status
			Fast Flash	The local is called
			Slow Flash	The local is calling
RA	Yellow	Remote alarm indicator	On	alarm event is occurred in the fiber or some E1 channel of remote device
			Off	normal
LOS	Red	Alarm indicator of optical line	On	Loss of signal at optical interface
			Off	Line is normal
SYL	Red	Alarm indicator of optical frame-lost	On	Out of frame at optical line
			Off	Optical input is correct.
E3	Red	Received code	On	Received code error ratio \geq 10-3

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		error ratio $\geq 10^{-3}$	Off	normal
E6	Yellow	Received code error ratio $\geq 10^{-6}$	Active	Received code error ratio $\geq 10^{-6}$
			Off	normal
SOL (Reserved, Not affect the version)	Yellow	The optical signal loss of the not working port	Active	When the optical signal of current not working port lost
			Off	Normal
OSB (Reserved, Not affect the version)	Yellow	Optical port select indicator	Active	A port selected
			Off	B port selected
E1L1~E1L16	Red	Alarm indicator of the 1st ~16th E1 channel	Active	The 1st E1 channel is code-breaking
			Off	normal
			FAST Blanking	The local E1 line is in loop back status
			SLOW Blanking	The remote E1 line is in loop back status
Link 1-2 (Reserved, Not affect the version)	Green	Ethernet Link status	Active	when linked
			Off	Not Linked
			Blanking	blinking when transmitting or receiving data
DUP 1-2 (Reserved, Not affect the version)	Green	Ethernet Duplex status	Active	when in Full Duplex operation
			Off	when in Half Duplex operation
SPD 1-2 (Reserved, Not affect the version)	Green	Ethernet Speed status	Active	when in 100M operation
			Off	when in 10M operation

Note :

- 1、 Every LED indicators can display the remote working status according demand command except the PWR, PHO, RA
- 2、 when SYS displays the remote the status , the flash mode is lack.
- 3、 the display priority from high to low as follows : fast blanking ,slow blanking, on ,off
- 4、 fast blanking period is 0.5 second, the duty factor is 50%
- 5、 fast blanking period is 2 seconds, the duty factor is 50%
- 6、 all indicators would be on if the fiber interface is selected to display the remote status when the fiber interface works not correct

2.1.2 Switches Settings and Explanation:

Note: To make the setting of the DIP switches effective, please turn on the S1 [1] first, then do the setting, and then turn the S1 [1] off.

Name		Function	Description		
SW1	[1]	Setting control lock	ON	The setting lock is unlock	
			Off	The setting lock is lock	
	[2]	The alarm buzzer silence	ON	The alarm buzzer is silence	The phone beeper is not controlled by this switches
			Off	The alarm buzzer is on	
	[3]	The status select of the led indicators	ON	The led indicators display the local status	
			Off	The led indicators display the remote status	
	[4] (Reserve d, Not affect the version)	Ethernet auto cut-off	On	Cut-off the local 100M Ethernet port when optical alarms	
			Off	Does not cut-off the local 100M Ethernet port when optical alarms	

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	[5] (Reserve d, Not affect the version)	VLAN setting	On	Turn on the Isolate function of two Ethernet ports	
			Off	Turn off the Isolate function of two Ethernet ports	
	[6..7]	Reserved			
	[8]	Mask E1 line pseudo-alar m	ON	Mask the loss alarm of E1 line that are line loss when switching from OFF to ON.	Need to turn the switch from OFF to ON again to process the pseudo -alarm
	OFF		Unmask the E1 line loss alarm		
SW2	[1]	Mask the E1 line loop back function	ON	Loop back function is valid	[2~7] are valid only if the switch is on
			Off	Loop back function is invalid	
	[2]	The select of local/remot	ON	Set the local device loop back	

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	e loop back of E1 line	Off	Set the remote device loop back	
[3]	Set all the E1 lines loop back	ON	Set all the E1 lines loop back	[SW2-4~7] are valid only if the switch is off
		Off	Cancel the all E1 line loop back	
[4~7]	The line select of E1 line loop back	[4~7]=[ONOFFOFFOFF]	The 1st E1 line loop back	The loop back direction depend on the switch [SW2-2]
		[4~7]=[OFFFONOFFOFF]	The 2nd E1 line loop back	
		[4~7]=[ONONOFFOFF]	The 3rd E1 line loop back	
		[4~7]=[OFFOFFFONOFF]	The 4th E1 line loop back	
		[4~7]=[ONOFFFONOFF]	The 5th E1 line loop back	
		[4~7]=[OFFFONONOFF]	The 6th E1 line loop back	

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			[4~7]= [ONONONOFF]	The 7th E1 line loop back	
			[4~7]= [OFFOFFOFFON]	The 8th E1 line loop back	
			[4~7]= [ONOFFOFFON]	The 9th E1 line loop back	
			[4~7]= [OFFFONOFFON]	The 10th E1 line loop back	
			[4~7]= [ONONOFFON]	The 11th E1 line loop back	
			[4~7]= [OFFOFFONON]	The 12th E1 line loop back	
			[4~7]= [ONOFFONON]	The 13th E1 line loop back	
			[4~7]= [OFF ON ONON]	The 14th E1 line loop back	
			[4~7]= [ON ON ONON]	The 15th E1 line loop back	
			[4~7]= [OFFOFFOFFOFF]	The 16th E1 line loop back	

	[8]	Network management type select	ON	RS-232 Console
			OFF	invalid

Tips (loop back figures) :

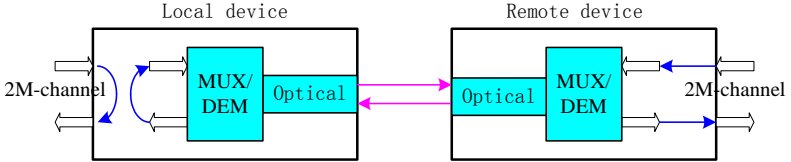


Figure 2-2 local loop back

Note: the E1 channel will be loop back to the remote device when set as loop back local.

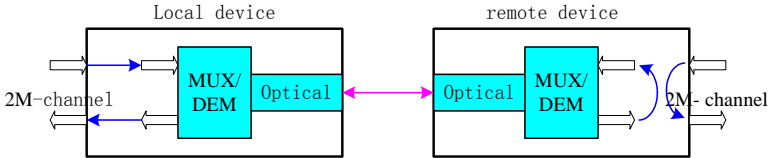


Figure 2-3 remote loops back

Note: The remote device will loop back to local when set as the remote loop back

2.1.3 Hot-line port switch

ON: pick up, to call remote peer or answer the remote calling

OFF: off -hook

Note: the phone is only controlled by this switch.

2.1.4 Phone physical interface

Phone physical interface: RJ11-4

2.1.5 CONSOLE/NM (Network Management) interface

Reserved

2.1.6 RS-232/ExAlm

Physical interface: RJ45 jack

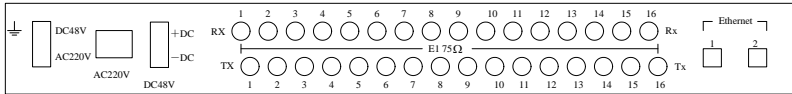
Provides two RS-232 channels or one RS-232 + 1 ex-Alarm channel

2.1.7 Optical interface

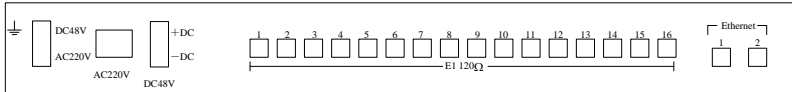
RX: indicators the receiving of optical signal

TX: indicators the sending of optical signal

2.2 The Rear Panel Description



The rear panel layout (matched load resistance of E1 line is 75Ω)



The rear panel layout (matched load resistance of E1 line is 120Ω)

2.2.1 Ethernet Interface

There are two Ethernet Ports. (Reserved, Not effective the version)

2.2.2 E1 physical interface

E1 physical interface(75Ω) : BNC

E1 physical interface(120Ω) : RJ45

75Ω/RX : 75Ω un-balanced E1 input

75Ω/TX : 75Ω un-balanced E1 output

120ΩE1 : 120Ω balanced E1 input and output

2.2.3 Power supply

AC220V/DC-48V is both available; users can select the power supply input according to requirements.

If -48V is needed, push switch on “DC-48V”; if AC220V is needed, push switch on “AC220V”.

If the power supply is -48V, connect the device + pole with power GND pole, the device -pole with power -48V.

Chapter Three Technical Specifications

3.1 Environmental

Operating Temperature: 0 to 50°C 95% RH

Storage Temperature: -40 to 70°C 95% RH

atmospheric pressure: 70 ~ 106 kpa

Non-corrosion and non-solvent gas; Non-dust; Non-magnetic field interference.

3.2 Power Requirements

Power Input: AC220V /DC-48V

Power Range: DC-48V (-36V ~ -72V) or AC220V (165~265V)

Power Consumption: <5 Walt

3.3 Mechanical Specifications

Dimensions: 430mm(Weight)×44mm(height)×203mm(depth)

3.4 Optical Interface Specification

Wave-length : 850、1310、1550nm optional

Typical output power : $\geq -8\text{dBm}$ (single mode、1310nm)

$\geq -18\text{dBm}$ (multi-mode、850nm)

$\geq -25\text{dBm}$ (multi-mode、1310nm)

Receiver Sensitivity: $\leq -36\text{dBm}$

Connector Type: FC/SC optional ; single-mode/multi-mode optional ;

Single optical fiber/double optical fiber optional

3.5 E1 Interface Specification

Electric Characteristics of Interface: compatible with ITU-T G.703 standard

Transfer Characteristics of Interface: compatible with ITU-TG.823 standard

Jitter Characteristics of Interface: compatible with ITU-T G.823 standard

Bit rate: transmission port 2048Mbps \pm 50ppm

Line Code Pattern: HDB3

Interface Impedance: 75Ω/120Ω

Interface Connector: Q9(75Ω), RJ45(120Ω)

3.6 Ethernet Specifications (Reserved, Not effective the version)

Supports auto-negotiation, 10/100M Speed Full/half-duplex

Supports Auto MDI/MDIX function

Fully compliant with IEEE 802.3/802.3u

Physical Interface: RJ45 jack

3.7 RS232 Specifications

Speed : ≤115.2kbps auto-negotiation

Mode : Asynchronous Receiver/Transmitter

Physical Interface: RJ45 jack

Chapter four Getting Started

4.1 Deliverables

- The 16E1 Optical Multiplexer itself
- Sixteen Two BNC connectors
- One RJ45 jack
- One 220V power line
- One -48V power line
- Two Rack-mounted panels
- Six Rack-mounted screws
- One User Guide

4.2 Configuration Straps

Pay attention to distribute fiber reasonably, whose curvature radius must be equal to or bigger than 50mm.

Fiber connector cannot be polluted, and it should be cleaned with alcohol gently before using, otherwise it would affect the transmission result. If the fiber connector isn't connected with each other correctly, that may cause high power consumption, so you should adjust it according to the factual situation.

Make sure all of the switches on the front panel are in off state except the S1 [1]

Before operating, please do the following test:

When power up, all of the led indicators would be flash once last for 0.5 seconds except the PWR led, and then enter the normal status. At this time, the PWR led、RA led、LOS、E1L1~16 are on, SYS led is flashing and others are off.

Connect two devices back to back with fiber jumper; two indicators LOS are both OFF.

Connect the E1 line or Fiber Optic line、twisted pair line, and the telephone line correctly.

Power on, the device in the normal working state.

If it doesn't work normally, please contact with supplier or the local agent.

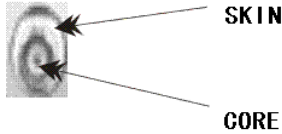
Chapter Five Appendix

5.1. Method of making lines

5.1.1. Method of making E1 lines

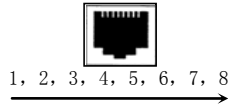
Method of making E1 lines for 75Ω :

Connect core to core, skin to skin, but core not to skin.



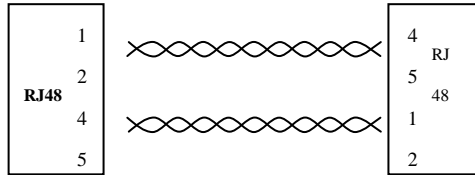
Method of making E1 lines for 120Ω:

Physical interface is J48-C for 120Ω. (Marked with RJ48-C on the rear panel)

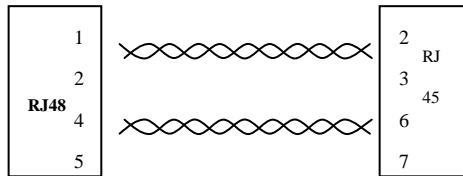


4, 5 Output 1, 2 Input

I/O ports of the two –termination units are accordant, the connection method is as follows:



When connecting RJ48-C port to RJ45 port, Connection method is as follows :



I/O Pin sequence of the other-termination unit is not accordant with those of

ours; connect output pins of ours to input pins of the other, input pins of ours to output pins of the other.

In order to ensure transmission distance and reduce interference, two-input and two-output wiring must be made in the same TP.

5.1.2 RS232 and alarm output interface

1.The pin definition and connected method when the device provides two RS-232 :

RJ45	Definition	DB9 (female)	DB9 (female)
1	RXD1 : the input of the A channel RS232	3	
2	CTS&CSR&DCD	1、 6、 8	
3	TXD1 : the output of the A channel RS232	2	
4	GND	5	
5	RXD2 : the input of the B channel RS232		3
6	CTS&CSR&DCD		1、 6、 8
7	TXD2 : the output of the B channel RS232		2
8	GND		5

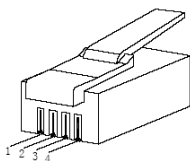
2.the pin definition and connected method when the device provides 1 RS-232 + 1 ex-alarm:

RJ45	definition	DB9 (female)	Alarm output description
1	RXD1 : the input of the A channel RS232	3	
2	CTS&CSR&DCD	1、 6、 8	
3	TXD1 : the output of the A channel RS232	2	

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4	GND	5	
5	Alarm Close		5 and 6 is connected when there is an alarm output, otherwise 6 and 7 is connected
6	Alarm Comm		
7	Alarm Open		
8	GND		

5.1.3. Phone interface



Pin	Definition	Description
1	SPEAKER +	Speaker output positive
2	MIC -	MIC input negative
3	MIC +	MIC input positive
4	SPEAKER -	Speaker output negative

5.1.4. CONSOLE and RS485 network management

pin	definition
1	RS232 input
2	null
3	RS232 output
4	GND
5	RS485 output positive
6	RS485 output negative
7	RS485 input negative
8	RS485 input positive

5.2 Trouble Shooting

Symptom	Probable cause	Solutions
Indicator PWR is off	1. Not completely pressed on controlling switch. 2. Incorrect connection in polarity	1. Completely pressed 2. Exchange their polarities 3. Plug in power supply.

	<p>3. Failing connection in power supply.</p> <p>4. Short circuit between power supply and ground due to conduct material's drop into cabinet.</p> <p>5.Failure in Power supply module</p>	<p>4. Reject the conduct.</p> <p>5.Contact with supplier</p>
<p>LOS alarm after optical interface connection</p>	<p>1、 The receiving and sending terminals of optical interface are connected in reverse.</p> <p>2、 Transmission distance is beyond regulated.</p> <p>3、 Fault in optical interface module.</p>	<p>1、 Exchange the receiving and sending terminal.</p> <p>2、 Set the transmission according to requirements.</p> <p>3、 Contact with supplier.</p>
<p>LOS alarm after connecting with E1 interface</p>	<p>1、 The receiving and sending terminals of E1 interface are connected in reverse.</p> <p>2、 Wrong hand-making of E1 connecting wires.</p> <p>3、 Transmission distance is beyond standard.</p> <p>4、 Fault in E1 module</p>	<p>1、 Exchange the receiving and sending terminal.</p> <p>2、 Correct making E1 wires</p> <p>3、 75Ω : 300m 120Ω:500m</p> <p>4、 Contact with suppliers</p>

5.2 Warranty Card

Our company is committed to provide users with the following terms:

1. Warranty service

- 1) Within the charge free warranty term (within 12 months since the purchase of the product), damaged parts can be exchanged free of charge and maintenance charges will be free in the conditions that the device is considered to be malfunctioned in normal service by our company.
 - 2) Within the charged warranty term (more than 12 months and within 36 months since the purchase of the product), damaged parts will be charged for corresponding cost with free maintenance service in the conditions that the device is considered to be malfunctioned in normal service by our company.
2. Users can not enjoy warranty service with the following cases and corresponding cost of damaged parts replacing and maintenance service will be charged
1. Exceed 36 months since the purchase of the product
 2. Can't provide certificate of purchasing date, and serial No. of product shows that ex-works term has exceeded 36 months;
 3. Include but not limit to the abnormal service conditions such as violent knocking, extrusion, drop, liquid immersion that cause damages;
 4. Fragile label on the device is damaged;
 5. User disassembles this product himself
 6. Force majeure that leads to product damage, such as earthquake, flooding and lightening stroke;
3. The newly installed parts after maintenance will be repaired free of charge within 12 months since the installation date.
4. When malfunction occurs, users can choose to send it to our company to receive maintenance service or to post it to maintenance points of our company all over the country to be repaired.
5. Our company does not undertake any responsibilities for losses caused by abnormal operation; for losses really caused by product itself, including but not limited to all direct or indirect losses due to data loss, our company will only undertake responsibilities within the selling price of products.

Repair and Maintenance Record

Product Name: 16E1 Optical Multiplexer		Device No.:
Maintenance date		No. of Service Bill
1		
2		
3		
4		
5		

