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Preface

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Manual version: V2.0

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Disclaimer

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Brief Introduction

This User Manual describes the installation and operation of Ethernet Timeslot Drop/Insert Device. 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 Overall Introduction

1.1 Summary

The Ethernet timeslot drop/insert device is an economical digital access solution to framed E1 and partial E1 network service. The device can drop several continuous timeslots from the up standard ITU-T G.703 E1 interface as Ethernet service, and the remainder is straight-through from up E1 to down E1. The device can be cascade connected to the same devices or the other related devices, each node uses several timeslot, and the 32 timeslots in E1 make it possible that the data from 31 nodes can be collected to the center node to be transmitted by 2M channel. The device is suitable for the service transmux in one E1 from several nodes with little transmission services and it increases the utilization rate of the E1 resource and reduces the quantity and simplifies the structure of the network. It can be used to connect the down E1 circuit to public E1 network, or connect the down E1 to PABX or other E1 devices through timeslot drop/insert then to public network. The down E1 and ETH are absolutely physically isolated.

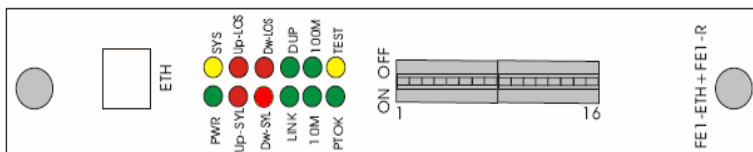
1.2 Interface Features

- The integrated circuit is based on our own intellectual property rights. G.703 E1 line adopts HDB3 encoding, and the E1 interface channel and coding mode are in line with the ITU-T G.703 and ITU-T G.704 protocols. All-digital clock recovery technology and integrated phase locked loop are adopted and the jitter performance is far superior to G.823 and G.742 protocol standards;
- Rate of the interface: $2.048\text{Mbit/s} \pm 50\text{ppm}$, the data transmission rate supports $N * 64\text{K}$ ($N=1 \sim 32$), and the hardware realizes arbitrary selection of the several continuous timeslots from 31 timeslots.
- Clock mode: The output clock of up E1 is as dropped clock from input up E1 signal. Line clock in down line (synchronized to down received clock)/main clock (own crystal clock) (optional).
- Full indicators for warning on panel.

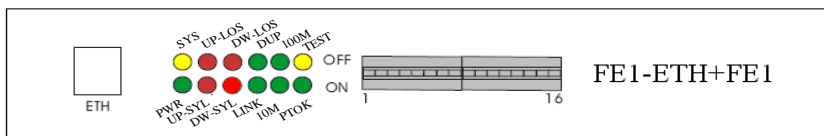
- The ETH interface is adaptive for crossover or straight-through cable, and supports 10M / full-duplex 10M / half-duplex, 100M / half-duplex, 100M / full-duplex, 10M/100M adaptive mode.
- The network administration channel is reserved; the network administration function can be added according to the need.

Chapter Two Function Specification

2.1 Introduction to Front Panel of the Device



Front panel (card type, transverse)



Front panel (platform type)

2.1.1 Front Panel Indicators Specification

There are 9 indicators on the front panel, and their functions are:

Indicator	Function	Discription	
PWR	Indication of 5V power supply	On	5V power supply is OK.
		Off	5V power is off.
SYS	Reserved(Invalid)		
LNK	Indication of Ethernet connection	On	Normal connection in Ethernet interface
		Off	Disconnected.
DUP	Indication of Ethernet full/half	On	Full duplex.
		Off	Half duplex.

	duplex		
100M	Indication of 100M work mode and date dispatch	On	Working under 100M
		Flash	Working under 100M with data dispatch
10M	Indication of 10M work mode and date dispatch	On	Working 10M
		Flash	Working under 10M with data dispatch
LOS1	Warning indication of loss of signal in up E1	On	Local end device transmission channel E1 signal loss warning
		Off	In normal operation.
SYL1	Warning indication of loss of frame alignment or all "1" in up E1	On	Local end device transmission channel E1 frame loss
		Off	In normal operation.
		Flash	E1 all "1" Warning
LOS2	Warning indication of loss of signal in down E1	On	Local end device transmission channel E1 signal loss
		Off	In normal operation.
SYL2	Warning indication of loss of frame alignment or all "1" in down E1	On	Local end device transmission channel E1 frame misalignment
		Off	In normal operation.
		Flash	E1 all "1" Warning
PTOK	Reserved (invalid)		
TEST	Reserved (invalid)		

2.1.2 Front Panel Switches Specification

There are 2 groups DIP switches and the total number is 16, and their functions are:

SW[1-3]	VLAN status configuration	Switch Function		9	10	11
		10M half duplex		ON	ON	ON
		10M full duplex		ON	OFF	ON
		100M half duplex		ON	ON	OFF
		100M full duplex		ON	OFF	OFF
		auto-negotiation		OFF	X	X
SW[4]	Mode	ON	Terminla Mode, E1(Down) port invalid			
	Selection	OFF	Insert Mode. But when E1(Down) port warns, it works under terminal mode.			
SW[5]	Clocking mode selection	ON	Main (Internal) clock. The device adopts the clock generated by internal cristal oscillator.			
		OFF	Following (line) clock. The device adopts the clock recovered from up E1.			
SW[6]	PCM selection	ON	PCM30			
		OFF	PCM31			
SW[7-11]	Starting timeslot selection	SW[7..11] are binary BCD code, SW[7] is least significant bit and SW[11] is most significant bit. Please refer to Appendix 1				
SW[12-16]	Rate Selection	SW[12..16] are binary BCD code, SW[12] is least significant bit, and SW[16] is most significant bit. Please refer to Appendix 2;				

Appendix 1: Starting Timeslot Sectionf for Ethernet

Switch Timeslot Position	SW [7]	SW[8]	SW[9]	SW[10]	SW[11]
TS31	ON	ON	ON	ON	ON

TS30	OFF	ON	ON	ON	ON
TS29	ON	OFF	ON	ON	ON
TS28	OFF	OFF	ON	ON	ON
TS27	ON	ON	OFF	ON	ON
TS26	OFF	ON	OFF	ON	ON
TS25	ON	OFF	OFF	ON	ON
TS24	OFF	OFF	OFF	ON	ON
TS23	ON	ON	ON	OFF	ON
TS22	OFF	ON	ON	OFF	ON
TS21	ON	OFF	ON	OFF	ON
TS20	OFF	OFF	ON	OFF	ON
TS19	ON	ON	OFF	OFF	ON
TS18	OFF	ON	OFF	OFF	ON
TS17	ON	OFF	OFF	OFF	ON
TS16	OFF	OFF	OFF	OFF	ON
TS15	ON	ON	ON	ON	OFF
TS14	OFF	ON	ON	ON	OFF
TS13	ON	OFF	ON	ON	OFF
TS12	OFF	OFF	ON	ON	OFF
TS11	ON	ON	OFF	ON	OFF
TS10	OFF	ON	OFF	ON	OFF
TS9	ON	OFF	OFF	ON	OFF
TS8	OFF	OFF	OFF	ON	OFF
TS7	ON	ON	ON	OFF	OFF
TS6	OFF	ON	ON	OFF	OFF
TS5	ON	OFF	ON	OFF	OFF
TS4	OFF	OFF	ON	OFF	OFF
TS3	ON	ON	OFF	OFF	OFF
TS2	OFF	ON	OFF	OFF	OFF

TS1	ON	OFF	OFF	OFF	OFF
Invalid	OFF	OFF	OFF	OFF	OFF

Appendix 2: Rate Setting of Ethernet

Switch Rate (Kbit/s)	SW[12]	SW[13]	SW[14]	SW[15]	SW[16]
1984	ON	ON	ON	ON	ON
1920	OFF	ON	ON	ON	ON
1856	ON	OFF	ON	ON	ON
1792	OFF	OFF	ON	ON	ON
1728	ON	ON	OFF	ON	ON
1664	OFF	ON	OFF	ON	ON
1600	ON	OFF	OFF	ON	ON
1536	OFF	OFF	OFF	ON	ON
1472	ON	ON	ON	OFF	ON
1408	OFF	ON	ON	OFF	ON
1344	ON	OFF	ON	OFF	ON
1280	OFF	OFF	ON	OFF	ON
1216	ON	ON	OFF	OFF	ON
1152	OFF	ON	OFF	OFF	ON
1088	ON	OFF	OFF	OFF	ON
1024	OFF	OFF	OFF	OFF	ON
960	ON	ON	ON	ON	OFF
896	OFF	ON	ON	ON	OFF
832	ON	OFF	ON	ON	OFF
768	OFF	OFF	ON	ON	OFF
704	ON	ON	OFF	ON	OFF
640	OFF	ON	OFF	ON	OFF
576	ON	OFF	OFF	ON	OFF

512	OFF	OFF	OFF	ON	OFF
448	ON	ON	ON	OFF	OFF
384	OFF	ON	ON	OFF	OFF
320	ON	OFF	ON	OFF	OFF
256	OFF	OFF	ON	OFF	OFF
192	ON	ON	OFF	OFF	OFF
128	OFF	ON	OFF	OFF	OFF
64	ON	OFF	OFF	OFF	OFF
0	OFF	OFF	OFF	OFF	OFF

Note: Principles in clock selection:

1. Avoid that all devices adopt circuit clock. If a clock is provided by a device in the circuit, the other devices are set to adopt circuit clock, otherwise, the device is set to internal clock mode.
2. It is recommended that only one device provides a clock.

2.1.3Front Panel Ethernet Interface Specification

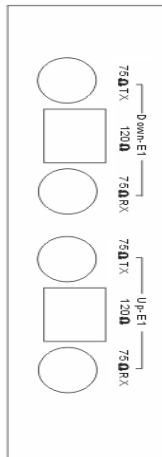
There are One RJ45 ports on the front panel, The Ethernet interface supports cross cable automatic adjusting, excusing the bother of remaking cable.

2.2 Introduction of the bottom panel

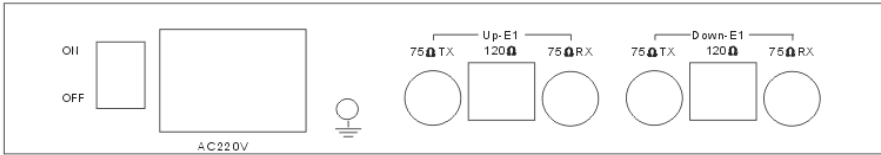
Switch Name	Function	Discription		Remark
SW[1..2]	E1 (Up) impedance select	ON	75Ω unbalanced	
		OFF	120Ω balanced	
SW [3]	E1 (Up) calculated ground	ON	The ground of 75Ω E1 transmission cable is connected to PGND of the device.	Only one-end of grounding on E1 must be guaranteed.
		OFF	The ground of 75Ω E1 transmission cable is broken from PGND of the device.	
SW [4]	E1(Up) sending ground	ON	Ground of 75Ω E1 transmission cable connects to local ground.	

		OFF	Ground of 75Ω E1 transmission cable disconnects from local ground.	
SW [5..6]	E1 (Down) impedance selection	ON ON	75Ω unbalanced	
		OFF OFF	120Ω balanced	
SW [7]	E1 (Down)calculated ground	ON	Ground of 75Ω E1 transmission cable connects to local ground.	Only one-end of grounding on E1 must be guaranteed.
		OFF	Ground of 75Ω E1 transmission cable disconnects from local ground.	
SW [8]	E1 (Down)sending ground	ON	Ground of 75Ω E1 transmission cable connects to local ground.	
		OFF	Ground of 75Ω E1 transmission cable disconnects from local ground.	

2.3 Introduction to the rear panel of the device



Back view (card type)



Back view (platform type)

2.3.1 Power Supply

The power supply has two options: AC and DC, which should be specified upon ordering. The device supports both voltages 220V and 48V. The device supports two power versions: 220V and $-48V$, with up to 20% fluctuation. Note that the DC power supply has positive and negative poles. The negative/positive pole of $-48V$ power source should be plugged into the negative/positive pole of the power input on the device. **The power is off when the switch is on “OFF” position. Otherwise the power is on.**

2.3.2 E1 Interface

2 个 E1 120Ω Interfaces: Interface Type is RJ45, DOWN for down port, UP for port

E1 75Ω/DOWM(RX): 75Ω unbalanced down E1 signal input

E1 75Ω/DOWM(TX): 75Ω unbalanced down E1 signal output

E1 75Ω/UP(RX): 75Ω unbalanced up E1 signal input

E1 75Ω/UP(TX): 75Ω unbalanced up E1 signal output

Chapter Three Technical Specifications

3.1 Operating Environment

The device has a wide range of operating temperature and is able to work normally and stably in highly adverse environment.

Working Temperature $0^{\circ}\text{C} \sim +50^{\circ}\text{C}$

Storage Temperature $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$

Relative Humidity 10% ~ 95%

Atmospheric Pressure 70 ~ 106 kpa

The environment should be free from corrosive and solvent gases, dust, and magnetic interference.

3.2 Power Supply Section

Using high-quality power adaptor, the device has a wide fluctuation

tolerance and strong anti-interference and isolation quality to ensure a stable operation.

Input voltage AC 220V / DC -48V

Voltage fluctuation 165VAC~265VAC or -36VDC~-72VDC

Power consumption <5 W

3.3 Mechanical Specifications

Appearance dimension Width230mm×Height49mm×Depth143mm

3.4 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

Rate: transmission port 2048Mbps±50ppm

Line Code Pattern: HDB3

Interface Impedance: 75Ω/120Ω

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

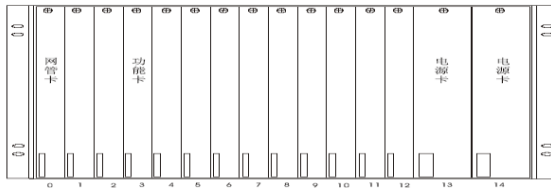
3.5 Ethernet Interface Specification

Rate of Ethernet interface: 10M/100M self adjustable, 10M half duplex , 10M full duplex , 100M half duplex , 100M full duplex optional

Ethernet interface is compatible with IEEE 802.3 protocol and supports IEEE 802.1Q

Chapter Four Introduction to Centralized Frame

4.1 Frame Front Panel Discription



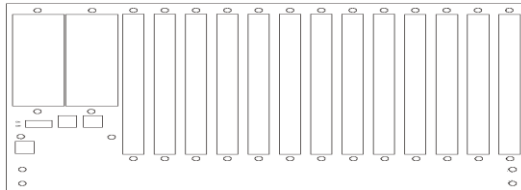
4.1.1 Operation Card

Maximally, 13 operation cards can be inserted into one frame. Mixed use of operation cards of various series of our devices is supported, and the operation is the same as desktop devices.

4.1.2 Power Supply Card

Customer can insert the needed power supply card according to actual configuration. The power supply card has temperature display, and voltages 220V, -48V and powers 75W are available. Power supply hot standby supported.

4.2 Discription of Frame Rear Panel



4.2.1 Address Switch

There are 8-bit DIP switches on rear panel, and it can be used to set address if the network needs to be administered.

4.2.2 Cascade Interface

There are 2 RJ45s on the right of the rear panel (back side) used as cascade interface if the network needs to be administered.

Chapter Five Installation

5.1 Safety Requirement

Please read the following safety items before installation to avoid physical injury and damage to this product or any other products connected. To avoid potential hazard, the product can be used only within specified scope. **Maintenance can be conducted only by technical personnel authorized by our company.**

1. Avoid fire or physical injury.
2. All power supply should be shut off during installation, which can be turned on only when all terminals have been connected correctly and

checked to be free from mistakes.

3. Connect and disconnect in a properly. When device is powered up, do not connect or disconnect data cable without due cause.

4. Grounding. The product should be linked to the ground through earthed conductor. To avoid electric shock, the earthed conductor must be in connection with the ground. Make sure that the product is correctly earthed before connecting with the input or output terminals.

5. Correct connection. Users are expected to use accompanied accessories. In the event that special connections are needed, please pay attention to the corner allocation requirements.

6. Don't operate when there is no cover plate over the device . Do not operate the product if the cover plate or panel has been dismantled.

7. No contact with bare circuit is allowed. Do not touch bare connectors or components when power is on.

8. No operation is allowed if there is suspicion of failure. Call authorized maintenance personnel for examination and reparation should the product be suspected of damage.

9. Good ventilation. Do not operate under humid or explosive environment.

10. Maintain the surface of the product clean and dry.

5.2 Inspection upon Unpacking

After unpacking the product, inspect the type, quantity and condition of device and accessories inside according to the list of contents specified in this manual. Contact the Company or its distributors and agencies immediately should abnormal circumstances arise.

5.3 Power Supply

Check the power supply of the device. The power input should be configured in accordance with related requirements. Pay particular attention to the voltage and polarity if the power supply is DC.

5.4 Test

Please first carry out the following test before usage:

1. Check whether all the switches on the front panel are in "OFF" position, turn on the power, the PWR light, UP-LOS light, DW-LOS light will light constantly, and UP-SYL light and DW-SYL light will flash for one time and be out.
2. Connect the device with E1 interface by 75ΩE1 crossover cable or 120ΩE1 cable, and the LOS lights will be out.

5.5 Configuration and Connection

If the indicator lamps of devices can operate normally as described in paragraph 5.4, turn off the power, and set clock and E1 impedance according to the conditions of the network, and plug the E1 cable and net cable. Turn on the power, and the device will be in normal operation condition.

If the devices can't operate normally as the above 6.4 describes, please look up diagnosis and troubleshooting. If fails in removing malfunctions, please contact our company or distributors and agents of our company at once.

Chapter Six Accessories

6.1 Method of making lines

6.1.1 How to make E1 connecting cable

75ΩLine Making Method:

Connection between core and core and between skin and skin;
No connection between skin and core



120ΩLine Making Method:

The pins are arranged as follows:



1, 2, 3, 4, 5, 6, 7, 8 →

1 (+), 2 (-) pins are output ports

4 (+), 5 (-) pins are input ports

6.1.2 Making of Ethernet Interface Connecting Cable

Ethernet interface Connecting Cable adopts twisted pair line with its

specific making methods divided into two international standards, which are EIA/TIA568A and EIA/TIA568B. Position the tail of crystal head downward (i.e. the flat side upward), determine the lines with figures as 1 2 3 4 5 6 7 8 from left to right, and the distributions of each line are as follows:

(EIA/TIA568A standard)			(EIA/TIA568B standard)		
Pin No.	Connection signal	Sequence of twisted pair line	Pin No.	Connection signal	Sequence of twisted pair lines
1	TX+(transmission)	White and green 1	1	TX+(transmission)	White and orange
2	TX-(transmission)	Green	2	TX-(transmission)	orange
3	RX+(receive)	White and orange	3	RX+(receive)	White and green
4	Not to be used	Blue	4	Not to be used	Blue
5	Not to be used	White and blue	5	Not to be used	White and blue
6	RX-(receive)	Orange	6	RX-(receive)	Green
7	Not to be used	White and brown	7	Not to be used	White and brown
8	Not to be used	Brown	8	Not to be used	Brown

RJ-45 twisted pair line is specified as follows:

- 1) 1, 2 used to send; 3, 6 used to receive; 4, 5, 7, 8 are bi-directional lines.
- 2) 1, 2 must be pair twisted; 3, 6 pair twisted; 4, 5 pair twisted; 7, 8 pair twisted.

Making of straight-through line: both heads are connected as per T568B line sequence standard. Making method of crossover line: one head is connected as per T568A line sequence while the other head is connected as per T568B line sequence. The follows are specific connection conditions:

- 1) The device is connected with PC and router: straight-through line shall be adopted with the same connecting method on both ends of

network line.

2) The device is concatenated with switch (or HUB): crossover line shall be adopted with different connecting method on both ends of network line.

6.2 Diagnosis and troubleshootings

Phenomena	Potential Cause	Measures
Power indicator of device PWR lamp fails to be ON.	<ol style="list-style-type: none"> Control switch is not in place Incorrect connection of power polarity External power supply is not plugged in Conductor dropped into machine frame that leads the power supply to be short circuited with the ground. Malfunctions of power supply module 	<ol style="list-style-type: none"> Press the switch in place Change the polarity of power supply Plug the external power supply Remove the conductor Contact the supplier
LOS warning after the connection of E1	<ol style="list-style-type: none"> RX and TX of E1 are reversed. The making of connection cable is not correct. Transmission distance exceeds the standard specification. The clock setting mode in the circuit line is incorrect. 	<ol style="list-style-type: none"> Exchange RX and TX terminals. Make the lines correctly. 75Ω : 300M 120Ω:500M Set the clock mode of the other devices.
After E1 (optical fiber) is connected, ALOS and ASYL would alarm	<ol style="list-style-type: none"> Reverse connection of sending and receiving elements of E1 (optical fiber) Wrong making of Connecting Cable of E1 (optical fiber) Transmission distance exceed standard specification Malfunctions of E1 (optical) module There are wrong configurations of clock mode of device in the links. 	<ol style="list-style-type: none"> Exchange the sending and receiving elements Make lines correctly 75Ω: 300M 120Ω:500M; according to the power of optical module Contact the supplier Adjust the other device clock mode on the line.

<p>Ethernet interface can ping through, but there are packet-loss problems</p>	<ol style="list-style-type: none"> 1. Network line is not made in twisted line form 2. There are too much concatenated HUBER in the network 3. Working modes are not corresponded with each other 4. There are wrong configurations of clock mode of device in the links. 	<ol style="list-style-type: none"> 1. Make the lines Correctly 2. Change the structure of network and decrease the multi-level concatenated HUBER 3. Set the correct working mode 4. Adjust the other device clock mode on the line.
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6.3 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: Ethernet timeslot drop/insert device		Device No.:
Maintenance date		No. of Service Bill
1		
2		
3		
4		
5		

