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1. 🖾 General

1.1 Overview

Thank you for selecting the Techroutes-TDMOIP series E1/T1 over Ethernet multiplexer product designed and made by **Techroutes Network Pvt.Ltd.**,. This converter T1 / E1 data encapsulated in the packet , support SAToP agreement and UDP/IP packet mode, that supports transportation of $4\sim16$ E1 /T1 over FE port, that can be used to provide E1 communication channels over Ethernet or IP networks.

In addition, Techroutes-TDMOIP series also support the 2 local Ethernet data access, its internal buildup QoS which set the local Ethernet priority is lower than T1/E1 data, so as to ensure the T1/E1 signal priority transmission.

The Techroutes-TDMOIP series has many optional parameters, which can be modified by the user to suite different application requirements. Please read this manual carefully before installing the product. Techroutes-TDMOIP series model number is the table1.1-1

Туре	E1/T1connector qty	100Base-Tx electrical port	100Base-Fx optical qty	remark
16E1-4ETH	16	4	1	
8E1-4ETH	8	4	1	
4E1-4ETH	4	4	1	
16E1-4ETH-P	16	4	1	2 unlink nort
8E1-4ETH-P	8	4	1	support(POE)
4E1-4ETH-P	4	4	1	Tuncuon

Table 1.1-1 Techroutes-TDMOIP series model number

Techroutes-TDMOIP series Features

- Provide 4/8/16 channel of E1/T1 over one Ethernet adaptive
- Provide 4 100Base-Tx electrical ports (2 for uplink, 2 for user data or monitoring) and 1 Ethernet optical port optical port can be used for uplink or user data
- Support SAToP protocol, Ethernet encapsulation support IP/UDP, support E1 Qos
- E1 clock supports 3 mode: local clock, adaptive and loopback
- 2 uplink Ethernet electrical port support 1 + 1 nondestructive protection; For

Techroutes-TDMOIP-4E1-4ETH-P /8E1-4ETH-P /16E1-4ETH-P , 2 uplink port support Ethernet feeder (POE) function, can provide the equipment with 55V DC, feeder power can arrive 50 W

- Ethernet built-in layer 2 switch, support VLAN(802.1Q based and QinQ based), port based、8021.1P based and TOS based) Support port speed limited, flow control, MAC address automatic learning and MAC address aging time set
- Support RJ-48C form of $120\Omega _E1/100\Omega _T1$ interface, through the dip of bottom setting and special cable change into the 75 Ω unbalanced interface, so as to realize the impedance matching
- High transmission efficiency, low transmission delay
- Frequency reduction stability, low jitter and drifting
- Resist to packet loss, no jump frequency, with frame synchronization protection
- Enough jitter buffer to resist packet delay variation (PDV)
- User-friendly Web server supported for easy setup and maintenance
- Support SNMP network management (V2 version)
- Support Local and remote Software and hardware online upgrade
- Support SNTP network time setting
- Support software test E1 error
- Techroutes-TDMOIP-4E1-4ETH-P /8E1-4ETH-P /16E1-4ETH-P support AC 100 ~ 260V and DC-48V double power supply, Techroutes-TDMOIP-4E1-4ETH /8E1-4ETH /16E1-4ETH support AC + DC) or double DC power supply, realize 1 + 1 backup

1.2 Applications

Techroutes-TDMOIP series could be worked with E1 over Ethernet interface multiplexer Techroutes-TDMOIP-63E1, make point-to-multipoint application, and point to point of connection, Typical application is shown in Fig 1.2-1~Fig 1.2-3.



Figure 1.2-1 TECHROUTES-TDMOIP series Aggregate Application



Figure 1.2-2 Techroutes-TDMOIP series Typical application of wireless network



Fig. 1.2-3 Techroutes-TDMOIP series typical application of cable network

Techroutes-TDMOIP series could cooperate with wireless bridge of most manufactories in wireless network application use, At present, some the sold wireless bridge transmission bandwidth change with the Ethernet packets, some Bridges will introduce the packet delay jitter, when work with the different wireless bridge, need to adjust E1/T1 signal packet length and jitter, in order to get the best transmission effect.

Note : This equipment is used together with the wireless Bridges, usually connected with outdoor antenna system of wireless bridge through Ethernet cable, there is lightning risk at this time, must be in an upward in combination of Ethernet lightning protection protector, otherwise lightning will make seriously damage to the equipment, danger to the staff .

1.3 Timing modes

To emulate a transparent E1 channel over a packet network, the Techroutes-TDMOIP series not only conveys data stream content correctly from the source to the destination, but also recovers the E1/T1 timing from the source at the destination accurately. Packet networks do not provide such built-in timing transparency mechanism as TDM networks do. TECHROUTES-TDMOIP series uses its proprietary algorithm to reconstruct the E1 clock at the destination. The recovered clock is of very high quality, with low jitter and wander. Typical frequency offset is within \pm 5ppm, and jitter is below 0.1UI. It can be adopted in most applications. This timing mode of rebuilding the E1 clock at the destination is called Adaptive Timing.

Therefore, Techroutes-TDMOIP series equipment provides another mode , loop back timing mode. In this mode, Techroutes-TDMOIP series equipment with T1 / E1 input signal from the port of clock T1 / E1 reconstruction output data stream, by Techroutes-TDMOIP series equipment of internal memory will absorb completely network transmission of the formation of the drift. Once the input signal loss fault, will automatically switch to adaptive timing. Techroutes-TDMOIP series equipment with two kinds of timing mode is as the figure 1.3-1



Fig.1.3-1 Timing modes

Correct timing mode setting is important for smooth operations. In most cases, setting both units to adaptive timing mode is sufficient. But sometimes, setting one unit to loop timing mode may work better. For example, setting the TECHROUTES-TDMOIP unit connected with the clock master (such as local exchange) to loop back mode, and the other unit connected with the clock slave (such as PBX or remote module) to adaptive mode, is probably better than setting both to adaptive modes.

One typical error in telecom applications is to connect two communication devices that are both clock slaves. Neither will TECHROUTES-TDMOIP support such operation no mater how the timing modes are set.

Note: The Lock Clock usually takes several minutes to stabilize. During

٥π

that period, clock drift may exceed the limit, errors and slips may occur.

Various timing schemes are listed in Table 1.4-1, for applications depicted in Fig.1.3-2.



Fig.1.3-2 Timing mode scheme reference diagram

A side	B side	A side	B side	
Equipment	Equipment	TDMoIP	TDMoIP	Note
clock mode	clock mode	Timing mode	Timing mode	
mastar	mostor	loop back	loop back	Equipment A & B
master	master	adaptive	adaptive	clocks synchronous
mostor	mostor	adamtiva	adaptiva	Equipment A & B
master	master	adaptive	adaptive	clocks plesiochronous
mastar	alava	loop back	adaptive	
master	slave	adaptive	adaptive	
alava	mostor	adaptive	loop back	
slave	master	adaptive	adaptive	
slave	slave			Not allowed

Table 1.3-1 Timing mode schemes

2. D System Architecture

2.1 Function Description

The core of TECHROUTES-TDMOIP is the TDM/Packet processing unit. It truncates E1/T1 data stream, and encapsulates the data into Ethernet packet with or without IP headers. The packets are passed to the Ethernet switch unit via MII interface, and are sent out through the uplink ports.

In the reverse direction, packets from the uplink ports are sent to the TDM/Packet processing unit for reassembling the original E1/T1 data stream, and outputting via E1/T1 interface. TDM/Packet processing unit need to process the reassembled data to recover the E1 clock which is the key element of the device. Very sophisticated algorithm is used to ensure that the reconstructed clock will meet the stringent requirement of TDM applications. The most important parameters are bit rate, jitter, wander, and signal delay.

The user can set various operational parameters through Network Management.

2.2 Structure

TECHROUTES-TDMOIP adopt standard 1U box, which is composed by system board and power module. TECHROUTES-TDMOIP system structure is shown in Fig 2.2-1-2.2-2



Fig 2.2-1 TECHROUTES-TDMOIP system structure



Fig 2.2-1 TECHROUTES-TDMOIP system structure

2.3 Front panel

2.3.1 Diagram

TECHROUTES-TDMOIP, all service interface ,power port ,indicators and dips are in the front of panel , no indicators or dips in the rear panel , TECHROUTES-TDMOIP series front panel is shown in Fig 2.3-1~Fig 2.3-9.



Fig. 2.3-1 Front panel of TECHROUTES-TDMOIP-4E1-4ETH

(DC-48V/100~240V AC)



Fig. 2.3-2 Front panel of TECHROUTES-TDMOIP-4E1-4ETH (Dual DC-48V)



Fig. 2.3-3 Front panel of TECHROUTES-TDMOIP-4E1-4ETH-P (-48V $DC/100{\sim}240V~AC$)



Fig. 2.3-4 Front panel of TECHROUTES-TDMOIP-8E1-4ETH (-48V DC/100~240V AC)



Fig. 2.3-5 Front panel of TECHROUTES-TDMOIP-8E1-4ETH (Dual -48V DC)



Fig. 2.3-6 Front panel of TECHROUTES-TDMOIP-8E1-4ETH-P (-48V DC/100~240V AC)



Fig. 2.3-7 Front panel of TECHROUTES-TDMOIP-16E1-4ETH (-48V DC/100~240V AC)



Fig. 2.3-8 Front panel of TECHROUTES-TDMOIP-16E1-4ETH (Dual -48V DC)



Fig. 2.3-9 Front panel of TECHROUTES-TDMOIP-16E1-4ETH-P(-48V DC/100~240V AC))

2.3.2 LED's

The definition is shown in Table 2.3-1:

Table 2.3-1 the indicators definition of TECHROUTES-TDMOIP serie
--

Identification Color Qty		Definition	Remark	
SYS	Green	1	System working state instructions Blink: Normal On: System is on configuration or work abnormally Off: System does not work or abnormally work	
PWR FAIL Red 2		2	The power failure alarm instructions On: Power Off / Failure Off: Normal	Indicators 1, 2 is corresponding to the left and right power supply
L/A	Green	1	Optical Ethernet interface state instructions On: Connected with remote Ethernet optical interface Off: Not connected with Ethernet optical interface	Optical Ethernet interface indicators
OLOS	Red	1	Optical Ethernet interface receiving	

			instructions On: No receiving Off: Receiving normally	
(Ethernet electrical port LINK)	Green	4	Ethernet electrical interface instructions On: Link normally Blink: Data transmitting/receivin g Off: Link abnormally	One link indicator on the left of each Ethernet electrical interface
(Ethernet electrical port FDX)	Yellow	4	Ethernet electrical interface rate instructions: On : rate is HULL Off : rate is HALF	One FDX indicator on the right of Ethernet electrical interface
POE	Yellow	2	Uplinked POE instructions: On : power supply Off : no power supply	Only TECHROUTES-TDMOIP-4/8/16E1-4ETH-P, indicators 1, 2 is separately corresponding to the unlinked port 1, 2
FAR-END UP 1~16	Green	16	E1 / T1 addressing the remote equipment link state instructions On: Addressing the remote MAC address Off: unaddressing the remote MAC address	
PKT LOS 1~16	Red	16	E1 / T1 service lost package instructions in Ethernet link On: Cannot receive the E1/T1 remote package Blink: Remote E1/T1 lost package or disorderly sequence Off: Remote E1/T1 no lost package and disorderly sequence	
LOS/AIS 1~16	Red	16	E1 / T1 port alarm status instructions On: LOS alarm Regular slow blink: AIS alarm Irregular fast blink:	

	receive HDB3	
	code ,wrong E1/T1	
	signal	
	Off: no alarm	

2.3.3 Dip Switches Definition

There are four Dip Switches on the front panel, the definition show in Table 2.3-2.

Table 2.3-2 TECHROUTES-TDMOIP

Dip	label	Definition				
DIP-1	LLB	E1/T1 port Tx to Rx loop back ON: set local E1/T1 port Tx to Rx loop back				
		OFF: cancel local E1/T1 port Tx to Rx loop back				
		E1/T1 port Rx to Tx loop back				
DIP-2	RLB	ON: set local E1/T1 port Rx to Tx loop back				
		OFF: cancel local E1/T1 port Rx to Tx loop back				
		Alarm mask set				
DIP-3	MASK	ON: set local alarm mask				
		Off; cancel local alarm mask				
DIP-4	TMP_IP	IP set ON: restore default IP address 192.192.192.192 OFF: use the user's Setting IP address				
		orr. use the user's Setting if address				
Note :1) Dial	Note :1) Dial TMP_IP dip , 5 minutes later, no matter whether the user dial up ,will					
return to the original user Settings IP						
2) Dial down all the dips, power failure will recover the default setting of the						
factory, but keep the current IP address, MAC address						

Dip Switches Definition of front panel

There is one group of 8 DIP 1, on the bottom of TECHROUTES-TDMOIP-4E1, two groups of 8 dips, DIP1~DIP2 on the bottom of TECHROUTES-TDMOIP-8E1,4 groups of 8 dips, DIP1~DIP4 on the bottom of TECHROUTES-TDMOIP-16E1,used to control the T1/E1 interface impedance and 75 Ω unbalanced interface shell grounding , every 8 dips control 4 channel T1/E1 interface, which DIP1definiation is as the table 2.3-3 shows, DIP2-DIP4 definition is on the analogy of .this

Table 2.3-3 TECHROUTES-TDMOIP

Dip Switches Definition of bottom panel

Dip	Definition					
One	ON: the first channel of $E1/T1$ Interface impedance is 75Ω OFF: the first channel of $E1/T1$ Interface impedance is 120Ω - $E1/100\Omega$ - $T1$					

Two	ON: the first channel of E1/T1Interface shell groundingOFF: the first channel of E1/T1Interface shell suspended				
Three	ON: the second channel of E1/T1 Interface impedance is 75Ω OFF: the second channel of E1/T1 Interface impedance is 120Ω -E1/100 Ω -T1				
Four	ON: the second channel of E1/T1 interface shell grounding OFF: the second channel of E1/T1 interface shell suspended				
Five	On: the third channel of E1/T1 Interface impedance is 75Ω Off: the third channel of E1/T1 Interface impedance is 120Ω -E1/100 Ω -T1				
Six	ON: the third channel of E1/T1 interface shell grounding OFF: the third channel of E1/T1 interface shell suspended				
Seven	On: the fourth channel of E1/T1 Interface impedance is 75 Ω Off: the fourth channel of E1/T1 Interface impedance is 120 Ω -E1/100 Ω -T1				
eight	ON: the fourth channel of E1/T1 interface shell grounding OFF: the fourth channel of E1/T1 interface shell suspended				

2.3.4 E1/T1 Port

TECHROUTES-TDMOIP-4E1-4ETH with 4 equipment channel of 120Ω-E1/100Ω-T1 balance interface, TECHROUTES-TDMOIP-8E1-4ETH equipment 120Ω-E1/100Ω-T1 with 8 channel of balance interface, **TECHROUTES-TDMOIP-16E1-4ETH** equipment with 16 channel of 120Ω-E1/100Ω-T1 balance interface, all adopt RJ-48C form. RJ-48C joints and wire sequence and signals defined as follows.



Fig 2.3-5 RJ-48C socket pin sequence

Table 2.3-4 TECHROUTES-TDMOIP-4E1 and 8E1 RJ-48C socket signal definition

Pin	1	2	3	4	5	6	7	8
	-	+		+	-			
Signal	E1-IN		GND	E1-0	DUT	GND		

Table 2.3-5 TECHROUTES-TDMOIP-16E1-4ETH RJ-48C socket signal definition

PIN	E1connecting	Twisted pair	Using 5 cable making pairs color of the recommended
1	E1_IN (1) -	pair	Blue

2	E1_IN (1) +		Blue white
3	E1_OUT (1) +	main	Orange
4	E1_OUT (1) -	pair	Orange white
5	E1_IN (2) -	noir	Green
6	E1_IN (2) +	pan	Green white
7	E1_OUT (2) +	main	Brown
8	E1_OUT (2) -	pair	Brown and white

On the bottom of TECHROUTES-TDMOIP series equipment have $1 \sim 4$ group of 8 DIP, used to control the impedance of the T1/E1 interface and 75 Ω unbalance When interface interface shell grounded. the choose 75Ω impedance. Techroutes-TDMOIP-4/8E1-4ETH/P equipment can use BH4.815.122 cable which convert 120 Ω -cable E1/100 Ω -T1 balance interface (RJ-48C) to 75 Ω unbalanced "+" interface (BNC). The connect core. "connect skin. Techroutes-TDMOIP-16E1-4ETH/P equipment use the BH4.815.123 cable which convert 120 Ω -cable E1/100 Ω -T1 balance interface (RJ-48C) to 75 Ω unbalanced interface (BNC). The "+" connect core "-" connect skin.

TECHROUTES-TDMOIP series equipment T1/E1 interface through network provide $Rx \rightarrow Tx$, $Tx \rightarrow Rx$ loop back operation, convenient opening, maintain test. Loop back definition details are in 3.1.2 description. Section

△ Node :

- 1. T1/E1 interface card don't support a hot swap. if need to change , please shut off the power
- 2. T1/E1 interface using RJ-48C socket, TECHROUTES-TDMOIP-16E1-4ETH equipment one socket corresponding two channel T1/E1, belonging to private definition, don't make the interface with the TECHROUTES-TDMOIP-4E1 and 8E1 equipment standard RJ-48C socket confusion, or it will damage the interface.
- 3. T1/E1 interface choice set by the network management software.

2.3.5 Ethernet port

There are four 100Base-Tx Ethernet electrical ports (two ports are uplink ports used to connect with transmission network and the other two are local data ports used to connect with local Ethernet), and one 100Base-Fx optical port used as either uplink port or local data port. Ethernet electrical port supports three modes: auto-negotiation, 10M full duplex/half-duplex and 100M full-duplex/half-duplex. Ethernet optical port supports auto-negotiation or 100M full-duplex mode.

Ethernet built-in layer-2 switches function. Supporting Ethernet packet size

up to 2000 bytes, Support port speed limited, IEEE802.3 x flow control, the MAC address automatic learning and MAC address aging time function set e tc.VLAN setting based on 802.1Q or QinQ, QoS setting based on port, 8021. 1P and TOS.

Ethernet electrical port adopts RJ45 socket. RJ45 Ethernet socket is defined in Table 2.3-5. Ethernet optical port can use double-fiber SFP optical module and the port labeled (\rightarrow is for optical signal output, (\leftarrow for input. Also Ethernet optical port can use single-fiber optical module which has only one optical interface The wavelength of the single fiber module is the optical wavelength, or for 1310 nm, or for 1550 nm.

Depending on different transmission distance, Different SFP optical module could be selected.

Pin	1	2	3	4	5	6	7	8
Definition	TxD+	TxD-	RxD+			RxD-		

Table 2.3-5 RJ45 socket definition

TECHROUTES-TDMOIP(P) series equipment two unlinked electrical Ethernet port control (POE) function by Webserver network management, open after POE by Ethernet data pin provide 55V DC (support output short circuit pr otection function) to net Bridges, feeding power can be up to 50W, at the same time, not influence the data transmission. Its RJ45 Ethernet socket ap plication feet when idle power supply, pin 4, and 5 connection is for the po sitive, pin 7, 8 connection for is negative, such as table 2.3-6 description.

	1 aoit 2.2	,-o supp	DOILIOL	Tunction	KJ4J Eu	cifict soc		nion
Pin	1	2	3	4	5	6	7	8
Defini on	TxD+	TxD-	RxD+	55V+	55V+	RxD-	55V-	55V-

Table 2.3-6 support POE function RJ45 Ethernet socket definition

Note:

- 1. TECHROUTES-TDMOIP(P) series equipment can make Ethernet supply power function that the uplinked port in the transmission of data and will provide 55V DC continuously, need to pay attention to safety, Ethernet cable don't be naked.
- 2. TECHROUTES-TDMOIP(P) series equipment can make Ethernet supply power function that the uplinked port must not connect with monitoring computer, in order to avoid damage. Therefore recommended

Data2 / NM monitoring port

3. TECHROUTES-TDMOIP(P) series equipment can make Ethernet supply power function that cannot set Ethernet loop back (including software loop back and adopted Ethernet cable of hardware loop back)



IN auto-negotiation mode, TECHROUTES-TDMOIP Ethernet electrical port supports HP auto-MDIX function and it can check the transmission and receiving sequence and make configuration. So both MDI and MDI-X interfaces are supported and both cross line and direct line can be selected.

2.3.6 Power Switch and Power Socket

Two power options are available, \sim 220V AC or -48V DC. It should be specified at the time of purchase.

3. *III Installation*

3.1 Mechanical

TECHROUTES-TDMOIP can be placed at the table top or mounted on a 19" rack, The mechanical dimensions of TECHROUTES-TDMOIP are given in Fig.3.1-1.



Fig.3.1-1 TECHROUTES-TDMOIP Mechanical dimensions

3.2 Electrical

3.2.1 Power connection

For the -48V type, connect -48 supply to the power connector -48V port, and ground to the other port. For \sim 220V equipment, connect the device to the \sim 220V

outlet with standard power cord supplied with the equipment.

WARNING: The system must be securely connected to a good protective ground for safety.

3.2.2 E1/T1 connections

TECHROUTES-TDMOIP-4E1-4ETH supports 4 channels E1-120 Ω /T1-100 Ω balanced interface and TECHROUTES-TDMOIP-8E1-8ETH can support 8 channels E1-120 Ω /T1-100 Ω balanced interfaces. TECHROUTES-TDMOIP-16E1-4ETH can support 16 channels E1-120 Ω /T1-100 Ω balanced interfaces. The RJ-48C sockets are default for all the ports. Besides, it can also support 75 Ω non-balanced interface by the Dip switches on the rear panel and external impedance converting cable.

Note: TECHROUTES-TDMOIP-16E1-4ETH one socket corresponding two E1/T1, belong to the proprietary protocol, should not make mix up with the RJ-48C socket of TECHROUTES-TDMOIP-4E1 and 8E1, It may damage the interface.

E1/T1 interface provide $Rx \rightarrow Tx$, $Tx \rightarrow Rx$ through NMS, and the loopback of E1 channels can be set up independently. $Rx \rightarrow Tx$, $Tx \rightarrow Rx$ loop back definition is shown in Fig 3.1.-1:



Fig 3.1-1 E1/T1 loop back

 $Rx \rightarrow Tx$ can test E1/T1 connection cable, and $Tx \rightarrow Rx$ is used to test the whole circuit including TECHROUTES-TDMOIP in the two ends and the link between them.

3.2.3 Ethernet cable/optic fiber connections

TECHROUTES-TDMOIP provides four 100Base-Tx Ethernet electrical interfaces (two ports are uplink port and the other two are local data ports,Data2 is as the monitoring port), and one 100Base-Fx optical interface used as either uplink port or local Ethernet port

Ethernet Optical adopts SFP integrated optical modules, and the port labeled (\rightarrow is for optical signal output, (\leftarrow for input. Also Ethernet optical port can use single-fiber optical module which has only one optical interface. The wavelength of single-fiber optical module means its luminescence wavelength, 1310nm or 1550nm. It should note that equipments with the same luminescence wavelength cannot

connect with each other. So it should select the equipments with the match luminescence wavelength when using the single-fiber module.

b Note:

1. At auto-negotiation mode, Ethernet electrical port supports HP auto-MDIX function and it can check the transmission and receiving sequence and make configuration. So both MDI and MDI-X interfaces are supported and both cross line and direct line can be selected.

4. DTroubleshooting

After power up of equipment TECHROUTES-TDMOIP, the system should start after 90seconds to work properly. The system completion startup SYS light change from long bright to flashing light. You can observe each interface light to judge each port working statue.

4.1 Common fault diagnosis and ruled out

This paragraph describes common faults that may occur during installation and maintenance. Please seek support from Techroutes-TDMOIP for other problems.

4.1.1 PWR FAIL LED ON

The PWR FAIL light indicates that the corresponding power supply board is not complete plugged in or not connected with, please check the following subject: the power supply to meet the requirements or not, he power plug is connected, the switch is open.

4.1.2 SYS LED does not blink

After star up 90 seconds or during working statue, the SYS light flashing that is mean system have not start up completion or program problem, you can turn off the power and reboot, if still does not start up properly you need to find supplier for technical support.

4.1.3 Ethernet Electrical port LINK LED OFF

Ethernet electrical port LINK light off indicates that corresponding Ethernet port does not connect properly. You can check the cable connection, cable line ordering, under mandatory mode does it using the straight-through cable (crossover cable),the electrical interface connection does match the client configuration whether, and connection with network device is working properly or not.

4.1.4 Ethernet optical port L/A LED OFF or OLOS LED ON

Ethernet optical ports L/A light off indicate that the corresponding Ethernet does not establish connect properly. The OLOS light on indicates no received light.

Can check the corresponding fiber is connected or not, the using single-fiber module and the equipment connected to the same emission wavelength (should using wavelength as pair optical modules), and device working properly or not.

4.1.5 E1/T1 Alarm LED ON

There are two groups of LEDs, PKT LOS and LOS for E1 alarms LEDs.

When E1 LOS LED is on, loss of E1 signal fault is detected by Techroutes-TDMOIP. Possible causes include:

- The downstream equipment such as telephone exchange or PCM terminal is powered off.
- The E1 cable connection looses or broken.

E1 LOS LED blinks when respective input E1 signal is AIS, i.e. the content of E1 data is all 1. Such alarm indicates fault conditions on the part of the downstream equipment.

E1 LOS site is controlled by Dip Switch RA state. When RA Dip Switch ON, the red LEDs indicate remote E1 LOS state. When RA Dip Switch OFF, the red LEDs indicate local E1 LOS state.

4.1.6 TWO ENDS DEVICES CANNOT CONNECT

Both sides of devices in the same Ethernet broadcast domain, checking both side of device IP address should on dual relationship. Check MAC address is unique (include other device on the same network); Using Ping command to check network, checking bandwidth is sufficient or not.

If two sides of devices are not in same Ethernet segment, checking device IP default gateway setting, IP address, IP address mask, and check conflicts of MAC address or IP address; check bandwidth is sufficient. IP address and gateway address can be set by NMS, MAC address set by manufacture.

Check both ends of the device VLAN setting should be in accordance with eachother.

4.1.7 Both Sides devices of E1/T1 have slip

Check both sides devices TECHROUTES-TDMOIP E1/T1 clock setting, at least one of device should be Master-Clock.

Check TECHROUTES-TDMOIP time mode setting. If both sides of the E1/T1 equipment are not in the state of the synchronization, TECHROUTES-TDMOIP timing model must be adaptive timing, not loop timing.

At beginning of startup, slip is normal.

5. 🖾 Web Manager

TECHROUTES-TDMOIP support Web Server to monitoring devices. Login Web Server need Username and Password, the default Username and password are "admin", as below picture showed, at System setting you can change it.



All Web Server include 7 parts: System Info, Alarm Status, Alarm Management, ETH Management, E1 Management, SNMP Management, and System.



Following will introduce the Web Server Management of TECHROUTES-TDMOIP

5.1 System Info

After login Web Server, will show Welcome page. In this page include Hardware version number, Software version number, Web manager version number, IP address, Subnet Mask, Gateway IP address, MAC address. IP address and Subnet address and Gateway address can be set by customer, other only for checking. As shown in Fig 5.1-1. The default setting IP address is 192.168.1.2.

chroutes		User Man
• System Info		
• Alarm Status	System Info> Equipment Info	
• Alarm Management		
• ETH Management	Hardware Version	01.00.06
+ El Management	Application Version	01.00.01
• SNMP Management	Web Manager Version	01.00.02
* System	IP Address	192.168.0.9
	Subnet Mask	255. 255. 255. 0
	Gateway IP Address	192. 168. 0. 100
	MAC Address	00:1D:80:00:2D:09
	JRAC AGGress	Submit Reset

Fig 5.1-1 System Info

5.2 Alarm Status

Alarm status include E1 channel, Ethernet port, power supply and alarm log.

5.2.1 E1 Channel Status

Click left side of Alarm Status—Channel will show E1 Channel Service name, Loop status, E1 port LOS, AIS alarm and calculation of LOS, Remote Connection Status. E1 loop for testing connection, definition of LOOP please check 3.1.2. E1 Loop setting after submitting will changed, but not saved, after device startup E1 not in Loop stats. Please check Fig 5.2-1.

Status	Alarm Statu							
Channel	Port	Service Name	Loopback	Alarn TDW/Port	Plet	PktLOS Count	HDB3 Err Count	FAR-EN
I Port	1	Service - 01				0	0	UP
er Alarm	2	Service - 02	~		-	0	0	UP
m Log	3	Service - 03	~			0	0	UP
Management	4	Service - 04				0	0	UP
interingent on	5	Service - 05	Tx->Rx Ru->Tu			0	0	UP
Janagement	6	Service - 06	~			0	0	UP
nagement	7	Service - 07	~			0	0	UP
Management	8	Service - 08	~			0	0	UP
En la companya da companya	9	Service - 09	v			0	0	UP
	10	Service - 10	~			0	0	UP
	11	Service - 11	~			0	0	UP
	12	Service - 12	~			0	0	UP
	13	Service - 13	~			0	0	UP
	14	Service - 14	~		1.000	0	0	UP
	15	Service - 15	~		-	0	0	UP
	16	Service - 16	💌		1	0	0	UP
			Quick Set			Clear	Clear	

图 5.2-1 E1 Alarm Status

5.2.2 Ethernet Port Status

Click Left side Alarm Status – ETH Port will show 4 Ethernet electrical ports and 1 optical port LINK UP/DOWN stats, as shown in Fig5.2-2.

System Info			
Alarm Status	ETH Management > ETH Port ()	BHH Alarm Status)	
• E1 Channel	Port	Service Name	Alarn
· ETH Der	1 (Uplink1)	Uplink-1	
* EIM POIL	2 (Uplink2)	Uplink-2	
Power Alarm	3 (Datal)	Data-1	DOWN
Alarm Log	4 (Monitor)	Data-2	
	5 (FX)	Data-3	OLOS
Alarm Management			
ETH Management			
1 Management		Refresh	

Fig 5.5-2 ETH port Alarm Status

5.2.3 Power Status

Click left side Alarm Status – Power Status will show Power Alarm Status, include 2 power off alarm Status information, as shown in Fig 5.2-3.

ystem Info	
Alarm Status	Alarm Status > Pover Alarm (Power Al
E1 Channel	Power
ETH Port	1
Power Alarm	2
arm Log	1
rm Management	
anagement	
gement	
P Management	
stem	

Fig 5.2-3 Power Status

5.2.4 Alarm Log

Click Left side Alarm Status – Alarm Log, include Alarm Type, Alarm Item, Port number, time. As shown in Fig 5.2-4.

stem Info	Alarn Status — >	Alarn Log				
larm Status	Alarm Type		annel		Ethernet	Power
1 Channel						
ETH Port		submit				
Power Alarm						
Alarm Log	Iten	Alarn Type	Alarn Item	Item	Start Time	End Time
m Management	1	Ethernet	LINKDOWN	2	2010-01-01 00:24:54	2010-01-01 00:24:56
	2	Ethernet	LINKDOWN	5	2010-01-01 00:24:34	Pending
Management	3	Ethernet	OLOS	5	2010-01-01 00:24:34	Pending
fanagement	4	Ethernet	LINKDOWN	3	2010-01-01 00:24:34	Pending
IP Management	5	Power	PWR_FAIL	2	2010-01-01 00:24:34	Pending
tem			Lis	st Wrap 🗹	Confirm	
			Previou	c1	ear All Next	

Fig 5.2-4 Alarm Log

5.3 Alarm Management

This section includes E1 channels, Ethernet port and power alarm shielding.

5.3.1 Alarm Shielding Management

If set alarm mask, then this alarm will be shielded at alarm log, alarm indicator on panel and will not display no matter what situation is unless the mask is canceled. E1 channel supports not only shielding any alarm of any channel, but also batch shielding. But Ethernet port alarm and power alarm shielding can only be set one by one. As shown in Fig 5.3-1, Fig 5.3-2 and Fig5.3-3

Alarm Managoment - Port 1 2 3 4 5 6 7 8 9 10	-> El Channel (El Char Service Name Service - 01 Service - 02 Service - 03 Service - 04 Service - 05 Service - 06	nnel Alarm Mask)	AIS	RM_TDM_ERR	W-Dist.		
Port 1 2 3 4 5 6 7 8 9	Service Name Service - 01 Service - 02 Service - 04 Service - 05 Service - 06		AIS	RM_TDM_ERR	W-Dist.		
1 2 3 4 5 6 7 8 9	Service - 01 Service - 02 Service - 03 Service - 04 Service - 05 Service - 06			IGH_TDH_BIGC		COP_CND	Pour Cot
2 3 4 5 6 7 8 9	Service - 02 Service - 03 Service - 04 Service - 05 Service - 06				nor kt	PAR ERD	NOV SEC
3 4 5 6 7 8 9	Service - 03 Service - 04 Service - 05 Service - 06					Ē	
4 5 7 8 9	Service - 04 Service - 05 Service - 06						
5 6 7 8 9	Service - 05 Service - 06						
6 7 8 9	Service - 06						
7 8 9							
8	Service - 07						
9	Service - 08			<u> </u>			
	Service - 09			2			
10	Service - 10						
12	Service = 12						
13	Service - 13						
14	Service - 14		Г				
15	Service - 15	Ē		Ē		Ē	
16	Service - 16						
Col Set							
		Sub	nit	Reset			
I	Fig.5.3-1 E	1 alarm i	mana	agemen	t		
flore Ma	Fig.5.3-1 E	1 alarm 1	mana	agemen	t		
Alarm Mar	Fig.5.3-1 E	1 alarm 1 (ETH Alara Mask	mana	agemen	t		
Alarm Mar	Fig.5.3-1 E nagonent> ETH Fort Port	1 alarm 1 (EIH Alarm Mask Service Nam	mana)	agemen Alara	t		Nask
Alarn Mat	Fig.5.3-1 E	1 alarm 1 (ETH Alarm Mask Service Nam Uplink-1	mana >	Agemen Alara Link Do	t		Hask
Alaxin Mar	Fig.5.3-1 E	1 alarm 1 (EIH Alarm Mack Service Nam Uplink-1 Uplink-2		Alarn Link Do Link D	t vn vn		Nask
Alarm Mar	Fig.5.3-1 E	1 alarm 1 (ETH Alarm Mack Service Nam Uplink-1 Uplink-2 Data-1	mana) 10	Alarn Link Do Link Do Link Do	t m m m		Hask
Alarn Mar	Fig.5.3-1 E	1 alarm 1 (ETH Alarn Mack Service Nam Uplink-1 Uplink-2 Uplink-2 Data-1 Data-2	mana)	Alarn Link Do Link Do Link Do Link Do	t vn vn vn		Hask
Alarn Ka	Fig.5.3-1 E	1 alarm 1 (ETH Alarn Mark Service Nan Uplink-2 Data-1 Data-2 Data-3	mana)	Alarn Link Do Link Do Link Do Link Do Link Do	t vn vn vn vn vn		Nask
Alara Ma	Fig.5.3-1 E	1 alarm n (ETH Alarm Mack Service Nam Uplink-1 Uplink-2 Data-1 Data-2 Data-3	man:	Alarn Link Do Link Do Link Do Link Do Link Do Link Do	ל יייי יייי יייי יייי יייי		Kask C C C C C
Alara Kar	Fig.5.3-1 E	1 alarm 1 (ETH Alarn Mack Service Nam Uplink-1 Uplink-2 Data-2 Data-3	man:	Alarn Link Do Link Do Link Do Link Do Link Do OLOS	רמי רמי מיז מיז מיז		Nask
	12 13 14 15 16 Col Set	12 Service - 12 13 Service - 13 14 Service - 14 15 Service - 16 16 Service - 16 Col Set	12 Service - 12 13 Service - 13 14 Service - 14 15 Service - 15 16 Service - 16 Col Set Subscription	12 Service - 12 13 Service - 13 14 Service - 14 15 Service - 15 16 Service - 16 16 Service - 16 Col Set Submit	12 Service - 12 13 Service - 13 14 Service - 14 15 Service - 16 16 Service - 16 Col Set Submit Reset	12 Service - 12 13 Service - 13 14 Service - 14 15 Service - 15 16 Service - 16 Col Set Submit	12 Service - 12 <

Fig.5.3-3 power alarm management

5.4 Ethernet Management

This section includes Ethernet port management, Ethernet senior management (MAC address aging time, QoS management and port Throughput limiting) and VLAN management.

5.4.1 Ethernet Management

em Info							
m Status	EIH Management> EIH Po	ort (Ethernet Manageme	int)				
Jarm Management	Port	Service Name	Link	Speed	Duplex		Mode
TH Management	1 (Uplink1)	Uplink-1	DOWN			Auto	~
ETU D.	2(Uplink2)	Uplink-2	DOWN			Auto	~
ETH Port	3(Data1)	Data-1	DOWN			Auto	*
Advanced	4 (Monitor)	Data-2	UP	100 Mbps	FULL	Auto	~
• VLAN	5(FX)	Data-3	DOWN			Auto	
El Management						10 Full	
SNMP Management			-			100 Ful	11
			Submit	Keset		100 Hal	lf

Fig.5.4-1 Ethernet Management

Paramet	ers	Options Explanation		
	Port		5 Ethernet ports number	
	Service No.		Ethernet service No.: support at most 15 capital/small letters, digit and part special character input. Chinese character support 7 numbers(not support some special characters, as "/", "\" input).	
	Link		Link: indicate current Ethernet link(Up/Down)	
Speed	Speed		Speed: indicate current Ethernet port speed(10/100Mbps)	
Ethernet Management	Duplex		Duplex: indicate current Ethernet work mode (HALF/FULL)	
	Mode	Auto ,100 M full, 100M half, 10M full, 10M half	5 Ethernet ports work mode configuration: <u>Auto-adaptive (default)</u> 100M full 100M half 10M full 10M half Electrical interface work modes have Auto, 100M full, 100M half, 10M full and 10M half. Optical interface work modes have Auto and 100M full	

Table 5.4-1 Ethernet management parameters

Note: The sentence with underline is default settings.

5.4.2 Ethernet Senior Management

Ethernet senior management supports MAC address aging time, Ethernet port QoS management and throughput limiting. MAC address aging time range is 0~524287s (default: 300s).as the fig 5.4-2

noures			User M
• System Info	ETH Management > Advanced (ETH Adva	nce Configuration)	
* Alarm Management	Attribute	Configuration	
- ETH Management • ETH Port	MAC Ageing Time	300 Seconds	
• Advanced	QOS Configuration	>>	
• VLAN • El Management	Rate Control	>>	
• SNMP Management		Submit Recet	
		Submitt	

Fig 5.4-2 Ethernet management

For Ethernet interface 1~5, we can enable QoS (based on port, IEEE 802.1p and TOS)

ystem Info				
arm Status	ETH Management> QOS	Configuration		
Alarm Management	Port	Port-Based	IEEE 802.1p	TOS/DSCP
ETH Management	1 (Uplink1)		🗹 Enable	🗹 Enable
B111 Management	2 (Uplink2)		🗹 Enable	🗹 Enable
• ETH Port	3 (Datal)		🗹 Enable	🗹 Enable
Advanced	4 (Monitor)	M Enable	🗹 Enable	🗹 Enable
• VLAN	5 (FX)		🗹 Enable	🗹 Enable
E1 Management	Return			
SNMP Management			NAUGA Brock	
System		E	Neset	

Fig 5.4-3 Ethernet QoS configuration

Port throughput limiting of Ethernet senor management includes enable Ethernet port throughput limiting and speed configuration (supporting entry speed limiting) and storm Refrain . As shown in Fig 5.4-4. Speed class of Ethernet interface is shown in Table 5.4-2. When we configure the maximum port speed, if the value is not equal to any speed class, it will select the lower speed class proximal to this value. For example, value is set to 70, after clicking Submit, the value will change to 64, means the maximum speed is 64KB.

Marm Status	ETH Hanagement $$ Advanced (Rate	: Control)	
Marm Management	Port	Enable	Value
TH Management	1 (Uplink1)	Enable	0 KB
TH Port	2 (Uplink2)	Enable	0 KB
Advanced	3 (Data1)	Enable	0 KB
	4 (Monitor)	Enable	0 KB
VLAN	5 (FX)	Enable	0 KB
Management			
NMP Management	Keturn		
ystem		Submit Reset	
	ETH Management > Advanced (Stor	n Suppression)	
	ETH Management > Advanced (Stor Storm Suppression	n Suppression) Suppression Type	Rate Limit
	ETH Management > Advanced (Stor Storm Suppression	n Suppression) Suppression Type I Broadcast	Rate Linit 50000 KB
	EIH Hansgement	n Suppression) Suppression Type 🕑 Broadcast 🕑 Multicast	Rate Linit 50000 KB
	EIH Mangement > Advanced (Stor Stora Suppression Enable v	n Suppression) Suppression Type Ø Broadcast Ø Multicast Unknown DA Unicast	Rate Limit 50000 KB
	EHH Management > Advanced (Ster Stora Suppression Enable v Return	n Suppression) Suppression Type I Broadcast Multicast Unknown DA Unicast	Rate Limit 50000 KB

Fig 5.4-4 Ethernet port speed limiting configuration and storm Refrain .

Speed limiting range	speed class interval	minimum speed	maximum speed
Lower than 2M	64KB	64KB	1.792MB
Higher than 2M, lower than 100M	1MB	2MB	100MB

 Table 5.4-2 Speed class of Ethernet interface

5.4.3 VLAN Management

Two uplink Ethernet electrical interfaces support 1+1 Nondestructive protection. After enabling 1+1 protect, equipment configure Q in Q VLAN automatically and user only need to configure VID of uplink Ethernet electrical interface and monitoring port. As shown in Fig 5.4-5 and Fig 5.4.6.

Info			
Status	Service Protection		
Nanagement anagement	Protection Control:	Enable 💌	
H Port dvanced LAN Manageπent	Attribute Uplink 1 Uplink 2 Date(facitor	Ethernet Port 1 2 3 4 5	VID (1-4094) 2 3
hagement	Data Annitor	Back Submi	t l

Fig 5.4-5 uplink 1+1 Nondestructive configuration

stem Info				
larm Status		ETH Management>VLAN (VLAN Config	guration)	
larm Management				
TH Management		Service Protection :	Enable	>>
ETH Port				
Advanced		VLAN Rode:	Arud wore	
LAN		E1/T1 Port :		>>
Management		Ethernet Port		NN.
P Management		Etherhet Fort .		22
stem		VLAN Table :		>>
		All VLAN Configuration:		
	-	Subnit		
	l	Subnit		

Fig 5.4-6 configure Q in Q VLAN automatically

Forbid uplink 1+1 nondestructive protection function, TECHROUTES-TDMOIP Ethernet supports 802.1 Q VLAN and Q in Q VLAN. 802.1Q VLAN is that adding the VLAN tag in front of Ethernet frame type. Q in Q VLAN is that nesting the VLAN (S-Tag) of operators in 802.1Q outer layer to enable the VLAN stacking. VLAN management parameters are shown in Table 5.4-3.

tem Info			
arm Status	ETH Management>VLAN (VLAN Conf)	iguration)	
arm Management			
'H Management	Service Protection :	Disable	>>
H Port			
dvanced	VLAN Mode:	Disable 💌	
/LAN	E1/T1 Port :	802.1Q Mode	>>
nagement		QinQ Mode	
Management	Ethernet Port :		>>
em	VLAN Table :		>>
	All VLAN Configuration:		Efficient
	Submit		

Fig 5.4-7 VLAN management 1-VALN configuration

• System Info	ETH M			
		Port	WTD (1-409d)	Priority (0-7)
•Alarm Management		1	901	6
- ETH Management		2	902	6
• ETH Port		3	903	6
e Adversed		4	904	6
Advanced		5	905	6
• VLAN		6	906	6
◆El Management		7	907	6
 SNMP Management 		8	908	6
• System		9	909	6
		10	910	0
		12	912	6
		13	913	6
		14	914	6
		15	915	6
		16	916	6
			Furning Parameter Guerr	Reserved Payameter Query
			Kuluting raraneter query	Reserved ratameter query
			Back	Save





Fig 5.4-9 VLAN management 3-Ethernet port VLAN configuration

• System Info	VLAN Conf	igurati	on - VLAN	Table											
• Alarm Status				WID	1 (Ue1	(all a)	2 (1)	al (sale)	2.7	Dette	A (Mani	(10.1	E (P	7)	
•Alarm Management	Ite	m.	Select	(1-4094)	Mbr.	Untag	2 (O) Mb:	r. Untag	ль	r. Untag	Wbr.	Untag	Mbr.	Untag	
- ETH Management	1 Offer	itor)		1	1		1		Г	E E	~	V	1		
• ETH Port		2	V	188	1										
• Advanced		3		166					Г						
• ULAN															
- VLAN															
El Management					Delete S	elected	I	elete All		Add or Char	nge				
• SNMP Management				Rura	ning Para	neter Que	ry		Reserved	Parameter	Query				
System												_			
				Back		Add a lin	ne	First	Page	Nex	t Page				

Fig 5.4-10 VLAN management 4—VLAN Table

stem Info			
urm Status	ETH Management>VLAN (VLAN Confi	guration)	
rm Management			
{ Management	Service Protection :	Disable	>>
I Port			
vanced	VLAN Node:	802.10 Rode -	
AN	E1/T1 Port :		>>
anagement	Ethomat Dant -		NN.
lanagement	Ethernet Fort :		
n	VLAN Table :		>>
	All VLAN Configuration:		Efficient
	Submit		

Fig 5.4-11 VLAN management 5-VLAN configuration confirmation

Parameters	Options	Explanation
	Disable	No VLAN tag
VLAN Mode	802.1Q	Add the VLAN tag before Ethernet frame type.
	Q in Q	Add operators VLAN (S-Tag) in 802.1Q. Realizing VLAN stack.
Samiaa	Protection Control	Disable: not supply slave transmission channel. Enable: Both master and slave transmission channels transport service and no data loss during protection switching.
Protection	Attribute	Attribute of 1~5 Ethernet port, including uplink port and data/monitoring port.
	Ethernet Port	Ethernet port number 1~5.
	VID	VLAN ID, support 4094 VLAN, ID, range (1-4094)
	Port	E1port number $1 \sim 2$
E1 Channel VLAN	VID	VLAN ID, support 4094 VLAN, ID, range (1-4094)
Configuration	Priority	Define customer priority, including 8 PRI degrees (0-7). PRI is higher when this number is bigger.
	Eth Name	Ethernet port number 1~5.
Ethernet Port VLAN	VID	VLAN ID, support 4094 VLAN, ID, range (1-4094)
Configuration	Priority	Define customer priority, including 8 PRI degrees (0-7). PRI is higher when this number is bigger.
VLAN Table	VLAN table	configurations, inquiry, add and delete.

Table 5.4-3 VLAN management parameters

Parameters	Options	Explanation
	Select	When adding VLAN group or VLAN members, property configuration changed, it should be tick off.
	VID	VLAN group ID, support 1-4094
	Mbr.	VLAN group member, it will be VLAN member when tick off
	Untag	tagged/untagged, ticking off means (untag)

Note: According to the PVID value of Data2/NM port, it will automatically generate a default monitoring VLAN entry and it cannot be changed. If it needs to modify the monitoring VID value, it needs to modify the PVID of monitoring port.

5.5 E1 Management

E1 management includes E1 service management, E1 senior management, Bit error test. Every section has many parameters setting. As shown in Table 5.5-1:

5.5.1 E1 Service Management

and the second								
t	Port	Service Name	Enable	Timing Mode	Jitter Buffer	Destination IP	Source	Port
	1	Service - 01		Adaptive 🗸	16 25	192, 168, 1, 3	2142	2142
	2	Service - 02	2	Adaptive V	16 ns	192.168.1.3	2143	2143
	3	Service - 03	2	Adaptive 🗸	16 n.s	192.168.1.3	2144	2144
	4	Service - 04		Adaptive 🗸	16 n.s	192.168.1.3	2145	2145
	5	Service - 05		Adaptive 🐱	16 n.s	192.168.1.3	2146	2146
	6	Service - 06	V	Adaptive 🗸	16 n.s	192.168.1.3	2147	2147
	7	Service - 07		Adaptive 🖌	16 n.s	192.168.1.3	2148	2148
	8	Service - 08		Adaptive 🔽	16 n.s	192.168.1.3	2149	2149
	9	Service - 09		Adaptive 🖌	16 n.s	192.168.1.3	2150	2150
	10	Service - 10	V	Adaptive 🔽	16 n.s	192.168.1.3	2151	2151
	11	Service - 11	2	Adaptive 😽	16 n.s	192.168.1.3	2152	2152
	12	Service - 12	1	Adaptive 🐱	16 n.s	192.168.1.3	2153	2153
	13	Service - 13		Adaptive 🔽	16 n.s	192, 168, 1, 3	2154	2154
	14	Service - 14		Adaptive 🗸	16 n.s	192.168.1.3	2155	2155
	15	Service - 15		Adaptive 🔽	16 n.s	192.168.1.3	2156	2156
	16	Service - 16	4	Adaptive 🔽	16 ns	192.168.1.3	2157	2157

Fig 5.5-1 E1 channel Management

5.5.2 E1 Senior Management

 System Info 			14 A
+ Alarm Status	El Manage	nent> Advanced (PW Advanced Configur	ation)
+ Alarm Management		Attribute	Configuration
+ ETH Management		Encapsulation	IPv4 UDP v
- El Management			
• El Channel		Line Type	E1 🛩
Advanced		Frame Size	28128
BER Test		11000 0120	Direction byte
 SNMP Management 		RTP	Enable 🖌 Byte
+ System		TTI /TOS	55
		110 100	
		Subnit	Reset
		Submit	Reset

Fig 5.5-2 E1 channel senior Management

eciii.onre2		User Man
• System Info		
Alarm Status	El Management> Advanced (PW Configuration TTL)	05)
Alarm Management	Port Service Name	TTL TOS
FTH Management	1 Service - 01	128 184
	2 Service - 02	128 184
EI Management	3 Service - 03	128 184
E1 Channel	4 Service - 04	128 184
Advanced	5 Service - 05	128 184
BER Test	6 Service - 06	128 184
SNMB Management	7 Service - 07	128 184
Sivir Management	8 Service - 08	128 184
System	9 Service - 09	128 184
	10 Service - 10	128 184
	11 Service - 11	128 184
	12 Service - 12	128 184
	13 Service - 13	128 184
	14 Service - 14	128 184
	16 Service - 15	128 184
	16 Service - 16	128 184
		East Cat
	Return	Past Set
	Sub	uit Reset



Param	eters	Selections	Explanations
	Service Name		E1 service name : support at most 15 capital/small letters, digit and part special character input. Chinese character support 7 numbers(not support some special characters, as "/", "\" input).
	Enable		Enable this E1 channel. <u>Default: disable</u>
	Timing Mode Loopba		Adaptive mode:E1 timing from remote E1 stream
			Loop back mode:E1 timing comes from local E1 stream
E1 Channel		Local	Local mode: E1 timing comes from local equipment crystal oscillator
	Jitter Buffer	4~256ms	Jitter absorption buffer: worked with the link with bigger jitter, used to buffer the receiving packets. Coming packets buffer to eliminate jitter. Range: 4~256ms Default: 16ms
	Destinati on IP		Remote end IP address; 4 E1 line IP addresses can be set separately Default 192.168.1.3
	LIDP Port	Source	UDP Source Port: Effective range:1024~65535
		Destination	UDP Destination Port: Effective range:1024~65535
Advanced	Encapsul ation	IPv4_UDP	<u>IP Encapsulation</u>

Table	5 5-1	F1	Management	narameters
Table	5.5-1	БI	Management	parameters

¢

Parame	eters	Selections	Explanations
		1×128	Every Ethernet packet encapsulation length can
	Frame Size	byte	select 1×128 byte $/2 \times 128$ byte/ 4×128 byte. The
		2×128	longer the packet is, the more E1 data encapsulated
		byte	in the packet, the lower expense ratio is, the higher
			bandwidth efficiency is and the bigger time delay
		4 ~ 120	is. Vise versa.
			Default: 2
		Enable	Real-time Transport Protocol, used to define E1
	ртр	2	time
	KIP	Disable	Stamp.
		Disable	Default: Enable
	TTL/TOS		TTL: Time To Live, Default: 128
	11L/105		TOS: Type Of Service, Default: 184

Supplementary item:

- 1. Whether E1 bandwidth is adaptive depends on whether enable this E1. **Suggestion:** If this E1 is not used, it is better to let this E1 channel disabled.
- 2. Each end of Ethernet devices has a unique and fixed with 12 a hexadecimal MAC address, such as 80-80-80-80-80-80, can make the communication with other equipment. TECHROUTES-TDMOIP-63E1 equipment Ethernet MAC address has formed, not need to set. TECHROUTES-TDMOIP series equipment support ARP protocol addressing, the opposite equipment or default gateway equipment's MAC address can automatically get through Negotiation, no need to set the opposite end MAC address, but need set up IP address

Note: In Ethernet broadcast domain, all the equipment's MAC address s must be the only, otherwise it will cause address conflict.

3. In order to improve the transmission service quality of E1 data , according to provide transmission Ethernet whether support IEEE 802.1 Q, 802.1 AD and 802.1 p standard, TECHROUTES-TDMOIP series equipment can set the standard is packed to join contain priority VLAN label (V-Tag) or QinQ label (S-Tag). According to 802.1 Q/QinQ / 802.1 p standard packing, the encapsulation spending slightly bigger, but can be transmitted by higher priority. But not support 802.1p standard network, there is no practical significance, but increases unnecessary transmission bandwidth costs , therefore, will make VLAN set to Disable

5.5.3 Error test

Click BER Test will display error Test, including error Test enable, the selection of Test channels, the selection of test start and end, port state r frame synchronization out-of-frame), (Bit), error-rate and Test duration, as shown in

figure 5.5-4. If need to test error for channel, the first elected "enable" and "start", and second click "submit" button for beginning to test. The end could choose the channel "stop", and click "submit" button, this time display test results. During test click on the "Refresh" button, can inquiry test error.

By the current time

System Info							
Alarm Status	Alarm Status — > B	lER Test					
Alarm Management				BER	Enable		
ETH Management							
1 Management		03 [] 04 [060 060		90 100 11		15 16 16
E1 Channel				BER Ob	servation		
Advanced							
BER Test	Port	Start	Stop	State	Count	Bit Error Rate	Test Time
IMP Management	1				0	0.000000E+00	No record
stem							
				Submit	Refresh		

Fig 5.5-4 Error test

5.6 SNMP Management

SMMP management is the figure 5.6-1, SNMP parameters is in the table 5.6-1

m Management	Attribute	Value
Eanagement	SEMP Read Community	public
anagement	SBMP Write Community	private
Vapagement	SHMP Trap Community	public
adragement	SBMP Fort Number	161
em		
		Submit Reset
		Submit Reset
	(1919) Managament and (1919) From Johnson and	Submit Reset
	SHMF Management> SMMP Trap Address an	Submit Reset
	SNRP Management> SNRP Trap Address an Attribute Add	Submit Neset
	SDDF Warnigement> SDDF Trup Address an Attribute Add Trup 0 [19]	Submit Reset 4 Four 2 2.168.111 [62]
	SNDF Warragement → SNDF Trap Address an Attribute Add Trap 0 [52] Trap 1 [6.1	Subatt Reset 1 Fort Part 2.168.111 [26] 0.0 0
	SDD* Management ->> SDD* Traps Address and Attribute Add Traps Imagement Imagement	Subat Reset 5 fort Purt 10:05 164 0.0.0 0 0.0.0 0
	2000 Wanapement> 2000 Yang Address and Attribute Address and Frag 0 FR Trap 1 FL FL Trap 2 FL FL Trap 3 FL FL	Solutit Reset 1 Part Part 2 Reset Part 3 Reset Part

Fig 5.6-1 SNMP management

Fable 5.6-1	SNMP	management	parameters
-------------	------	------------	------------

Paran	Parameters		Explanations
SNMP Configuration Information	SNMP Read Community		Read commands of device nodes (Read-only) <u>Default: public</u>
	SNMP Write Community		Configure commands of device nodes <u>Default: private</u>
	SNMP Trap Community		Receive commands of Trap Default: public

Paran	neters	Option	Explanations
	SNMP Port Number		The communication ports connecting the devices with SNMP, <u>SNMP protocol</u> , <u>Default: port: 161</u>
SNMP Trap Address and Port	SNMP Trap Address MP Trap ddress nd Port		Address used to receive Trap information: The most addresses and ports can be set is up to 5. That means the device can sent Trap information to 5 network management equipments. SNMP Trap Address needs to be configured at the first time(initial value: 0), but it can be saved and recovered.
	SNMP Trap Port		Ports used to receive Trap information: it needs to be configured at the first time (initial value: 0), but it can be saved and recovered.

5.7 System Configuration

This section includes time configuration, change the password, Default parameter recovery, upgrade online and reboot system.

5.7.1 System time management

System time can be modified in three ways: manually enter the time, Get Local PC Time or SNTP network time. As shown in Fig 5.7-1.

SNIP Management System Time • System Time • Password • Default Config • Update Firmware • Reboot Status Surver IP Ig20 Minutes Ig20 Minutes Ig20 Minutes Ig20 Server IP Ig21 Ig21 • Reboot Iest	• System Info • Alarm Status • Alarm Management • ETH Management • EI Management
System Time Mode Inable Password Time Interval I20 Minutes Ipdate Firmware Status Skitus Skitus Test Test	• SNMP Management - System
* Keboot Test Test Test	 System Time Password Default Config Update Firmware
	• Reboot

Fig 5.7-1 system time management

SNTP management includes SNTP server option (stop/start/test), time setting interval (10~60000 minutes), SNTP server IP address and SNTP server status

display (disable/enable, connect successfully/fail).

A Note: It needs to get the current time again once the power is off.

5.7.2 password management

• System Info • Alarm Status	System> Password (Change Password)		
Alarm Management ETH Management EI Management SNMP Management Svetem	Current Password New Password Confirm New Password		
• System Time • Password		Sub	nit
•Default Config •Update Firmware •Reboot			



The change will be valid after confirm the submitting.

5.7.3 Default parameter recovery

Default parameter recovery can make all the parameters recover to factory default except the IP address of equipments and the devices will reboot automatically. If not selected to remain current IP, IP address will also recover to factory default (192.168.1.2). At the same time, due to the change of IP, it will show Access failed. Then we need to restart Web Server.

A Sumbon Tofo
• System Info
*Alarm Status
◆Alarm Management
•ETH Management
•El Management
• SNMP Management
-System
• System Time
• Password
•Default Config
• Update Firmware
• Reboot

Fig 5.7-3 default parameters recovery

TECHROUTES-TDMOIP supports changing E1/T1 port number. For example, change TECHROUTES-TDMOIP E1/T1 port number to 1. It is shown as follows:

Step 1. Generate the configuration code by verification code. Input the MAC address of TECHROUTES-TDMOIP and set E1 number as 1 and then click Generate.



<mark>촕</mark> 验证码生成器			
起始MAC地址: 00:1D:80:00):2D:74	结束MAC地址: 00:1D:80:00:2D:74	
☑ 启用 E1数目: 1	V		
MAC地址	E1数目	配置码	
00-1D-80-00-2D-74	1	E7EEF3986COACDB01A6E4A7BAE2FDB65	
			51印关闭

Fig 5.7-4 generate configuration code



vstem Info	
arm Statue	
ann Status	System> Default Config (Retain default configuration)
arm management	
1 Management	This operation will retain all the default configuration.
Management	
MP Management	✓ Ketain the current IP address.
stem	
stem Time	Submit
assword	
efault Config	System \longrightarrow Default Config (Configure the device ports)
pdate Firmware	Attribute Value
hoot	
	Configuration Status 16 E1/T1 Ports
	Configuration Code E7EEF3986COACDB01A6E4A7BA2FDB65
	Submit

Fig 5.7-5 change E1/T1 port number

Step 3 .Check the E1/T1 number in Configuration Status to confirm whether the change is successful.

Techroutes	User Ma
• System Info • Alarm Status	
* Alarm Management * ETH Management * EI Management * SNMP Management	system> Detault Config (Ketain default configuration) This operation will retain all the default configuration. If Retain the current IP address.
- System • System Time • Password	Submit
• Default Config • Update Firmware • Reboot	System -> Default Config (Configure the device ports) Attribute Value Configuration Status 1 El/TI Ports
	Configuration Code E7EEF3986COACDB01A6E4ATBAE2FDB65

Fig 5.7-6 change is successful

5.7.4 Upgrade online

Both TECHROUTES-TDMOIP hardware and software program can be upgraded by ftp. Following will introduce Web Server upgrade online operation.

Step 1: Use any FTP tool or input ftp://root:root@192.168.1.2/home/ftp directly in My Computer address bar to access the ftp server. And then copy the upgrade program to the server, as figure 5.7-7.

Note: Hardware program file name is H_Patch.r, and software program file name is S_patch.r. The file name cannot be changed.

🕸 ftp://192.168.1.4/ho	ome/ftp/		_ 🗆 ×
文件(F) 编辑(E) 查看((V) 收藏(A) 工具(T) 帮助(H)		A 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997
😪 后退 🔹 💮 🕤 🏂	🔎 捜索 🌔 文件夹 🛄 🕶		
地址 (D) 👰 ftp://192.168.	.1.4/home/ftp/		💌 🄁 转到
其它位置	*		
 Q₂ hone Q₂ 我的文档 >>> 共享文档 >>>> 科学公括 >>>>>>>>>>>> >>>>>>>>>>>>>>>>>>> >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	正在复制 ≫ 正在复制 'S_patch.r'	- 『× - 『× - 『×	
		用户: root	Internet

Fig 5.7-7 upgrade online 1—upload upgrade program

Step 2: Select program type (it is available to select software and hardware at the same time) and click Upgrade to start.

• System Info	System> Upgrade Firmware
+Alarm Status	
+Alarm Management	Stan 1. Please upload the upgrade files to
◆ETH Management	"/home/ftp" using FTP.
+E1 Management	Step 2: Select an upgrade mode
• SNMP Management	☑ Software
- System	Hardware
• System Time	
• Password	Upgrade
•Default Config	Bicrosoft Internet Explorer
•Update Firmware	7 The moftware will be upgraded,
• Reboot	So wait at least 100 seconds please
	職定取消

Fig 5.7-8 upgrade online 2—upgrade program

It may take several minutes to complete the upgrade. During the upgrade, we can refresh to check upgrade progress.

• System Info	
+Alarm Status	
◆Alarm Management	
+ ETH Management	
+El Management	
• SNNP Management	
- System	
• System Time	
• Password	Software is being upgraded, wait for please
•Default Config	
• Update Firmware	
• Reboot	4%

Fig 5.7-9 upgrade online 3—during the upgrade

When the upgrade is done, click Confirm to reboot the equipment. Login Web management again to check the version number and confirm the upgrade is successful.

• System Info	
+ Alarm Status	
+ Alarm Management	
+ ETH Management	
• El Management	
SNMP Management	
-System	
• System Time	
• Password	Software is being upgraded, wait for please
Default Config	
• Update Firmware	
* Reboot	100%
	■icrosoft Internet Explorer
	Software upgrade is completed !Device is being reboot, please wait 2 minute:
	确定

Fig 5.7-10 upgrade online 4—operate successfully

Note: If the power is off during upgrade, it may make equipment not start and need to program procedures with download line.

5.7.5 Reboot system

rstem Info arm Status System> Reboot (Reboot Equipment) arm Management This operation will reboot the device Management All configurations will be applied. NP Management rstem Submit
stem Info arm Status System> Reboot (Reboot Equipment) arm Management H Management This operation will reboot the device MP Management stem Submit
arm Status System> Reboot (Reboot Equipment) arm Management This operation will reboot the device Management All configurations will be applied. WF Management stem Submit
arm Management H Management This operation will reboot the device Nanagement Nanagement W Management rstem Submit
H Management This operation will reboot the device Management All configurations will be applied. MP Management
Management All configurations will be applied. MP Management rstem Submit
MP Management rstem Submit
Subnit
Suctem Time
Dysten The
Default Config
Update Firmware
Reboot

Fig5..7-11 Reboot equipment

6. Description

6.1 Capacity

TECHROUTES-TDMOIP-4E1-4ETH 4 E1/T1 ports, 4 100Base-Tx Ethernet electrical ports, 1 100Base-Fx Ethernet optical port;

TECHROUTES-TDMOIP-8E1-4ETH 8 E1/T1 ports , 4 100Base-Tx Ethernet electrical ports, 1 100Base-Fx Ethernet optical port

TECHROUTES-TDMOIP-16E1-4ETH 16 E1/T1 ports, 4 100Base-Tx Ethernet electrical ports, 1 100Base-Fx Ethernet optical port

6.2 E1/T1 Interface Features

Comply with ITU-T G.703 recommendation End-to-end delay (minimum delay setting): ≤ 10 ms Output frequency offset (adaptive timing, stabilized): $\leq \Box 5$ ppm Output jitter (adaptive timing): $\leq 0.1UI$ Interface Impedance default: E1-120 Ω /T1-100 Ω ; Supporting 75 Ω Connector: RJ-48C Ports: TECHROUTES-TDMOIP-4E1-4ETH : 4 E1/T1 ports TECHROUTES-TDMOIP-8E1-4ETH : 8 E1/T1 ports TECHROUTES-TDMOIP-16E1-4ETH : 16 E1/T1 ports

6.3 Ethernet Port

Comply with IEEE 802.3 802.1Q 802.1ad 802.1P and relative other protocol.

Operating Mode: electrical port support auto-negotiation forced 10M/100M, Half/Full Duplex , optical support forced 100M full duplex

MTU: 2000 byte Connector: 100M Electrical port: RJ45 100M Optical Port: LC Interface no.: 100M Electrical Port: 4 100M Optical Port: 1

6.4 POE function

TECHROUTES-TDMOIP-4/8/16E1-4ETH-P uplinked could support POE function

voltage: 55V power: 50W

6.5 Power

AC: 100V~260V/50Hz ~60Hz (fuse: 1A)

DC: -36V ~ -72V

Power Consumption: TECHROUTES-TDMOIP-16E1-4ETH: ≤7W

TECHROUTES-TDMOIP-4/8E1-4ETH: ≤6.5W

6.6 Operating condition

Temperature: $(0 \sim 45)$ °C

Humidity: ≤90%RH (non-condensing)

6.7 Dimensions

Width \times Height \times Depth (mm): 440× 44× 136.5

6.8 Weight

Net weight ≤3.5kg

Appendix

Specialized terminologies and acronyms:

Acronym	Explanations	
TDM	Time Division Multiplex	
SAToP	Structure-Agnostic TDM over Packet	
DSCP	Differentiated Services Code point	
UDP	User Datagram Protocol	
QoS	Quality of Service	
TOS	terms of service	
TTL	Time To Live	
VLAN	Virtual Local Area Network	
RTP	Real-time Transport Protocol	
SNTP	Simple Network Time Protocol	
POE	Power Over Ethernet	