2E1-2ETH Converter

User Manual

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Preface

Data communication standard is agreed on, published and abided by in order to accomplish communication among the different units from different vendors. But different communication networks have different standards due to their development periods, background and other historical reasons. For example, G703, V.35, X.21, V.36, RS-422 and RS-530 are all used in high-speed communication with little functional difference. But they differ in their physical and electrical characteristics. Multiple existing standards inhibit their direct communication as to need a media between different products. Our conversion products are designed to meet the above requirements. For the application, convertible forms are available as follows:

Electrical: Converting the signal levels;

Physical: Providing a different connector type

Functional: Converting the functional operation of the signals

Rate: Converting from one data rate to another.

Contents

General Safety Requirements

Please read the following notes on safety, so as to avoid personal injury, and prevent this product as well as any other products connected with it from damaging. In order to avoid the possible danger, it's only permitted to use the product in specified ranges.

Only the technicians authorized by our company can implement the relative maintenance work.

Avoid Fire or Personal Injury.

Use appropriate power supply. Check the type of power supply for this product as well as the polarity carefully.

Correct connection and disconnection. When the equipment is in power-on condition, do not connect or disconnect the data cable casually.

Product Earthing. In order to avoid electric shock, the earthed conductor must be connected with the ground. Before it is connected with the input or output terminal of this product, please ensure that this product has been earthed correctly.

Correct connection. When connecting, Please use the factory-providing accessories. If special connecting, please pay attention to the distribution requirements for pins.

Avoid touching the exposed circuit. When this product is electrified, do not touch the exposed connection points or components.

When there is suspected fault, do not operate. If you doubt that this product has been damaged, please have the technicians authorized by our company to do maintenance.

Provide sound ventilation environment.

Do not operate in humid environment.

Do not operate in explosive environment.

Please keep the surface of this product clean and dry.

Quick guide

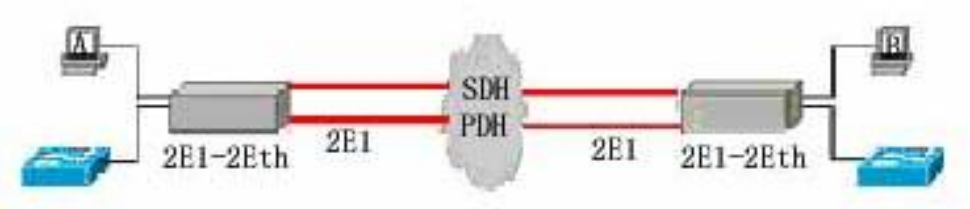
2E1- 2Eth converts E1 signal and Ethernet signal to each other. There are five work modes for Ethernet interface. And E1 interface is with 75Ωor 120Ω. Please indicate when ordering.

1) Connect proper power supply according to POWER mark on the rear panel. When needing DC–48V, set AC/DC switch to DC-48V. When needing AC220V, set AC/DC switch to AC220V.

2) Select the needed branch of physical interface according to E1 line. When the sending signal E1 interface is connected with the receiving signal E1 interface, there would be no E1 alarm. If there be, please check the fault by E1 loop.

3) Ensure Ethernet interfaces status without E1 line fault. There are five work mode of Ethernet interface for user to select.

4） when 2E1-2Eth converter connected, LINK indicator will light normally. While whether F/D and SPD indicators are ON or not depends on the setting mode of Ethernet working status. If Link indicator is not ON, please check whether cable is made according to requirement. (SW5 must be off) Two Ethernet interfaces can be freely used if needed.



Without special requirement, users can operate 2E1 to 2Eth converter according to factory setting

5） Ethernet interface is cross cable and direct connecting cable auto-negotiation. User can select either cross connecting cable or direct connecting cable.

6） When working normally, PWR and LINK indicators are both ON. Whether F/D and SPD indicators are ON or OFF depends on the setting mode of Ethernet working status. The other LED indicators are all OFF.

7）Without special requirement, it can work normally with Sw1-4,SW6-8 on and the others off.

8）If the unit still can work normally according to the above operating and the manual, please contact with your supplier and technicians.

Operating manual

1．Function

① Converts signals between E1 interface and G.703 interface.

② a self-learning remote Ethernet Bridge with high performance. Apply to those bridging whose cost is sensitive and can be stretcher and breaker for LAN basic on bite stream. The unit can continuously learn MAC destination address of the connected LAN and determine whether frames can be forwarded or filtered

according to MAC destination address of data frames

③ Transmits Ethernet MAC fame data through E1 channels (channel 1 to channel 2) by point to point. Max. E1 transmission rate can be up to 7.936 Mbps.

④ Supports SNMP.

2. Features

1. E1 channels (from channel 1 to channel 2) are used to transparently transmit Ethernet data at 10M/100M.
2. Have build-in SDRAM controller with capacity of 1MX 16Bits.
3. When Ethernet data transmitted, the frames are reordered in the E1 channel so as to assure frame's order effectively and improve the transmission rate.
4. It allows that the Max. Transmission time difference of frames' order between each two E1 channels can be 32 ms, which can assure be used stably and reliably in each complicated network.
5. When Ethernet data transmitted, bandwidth attenuation of every E1 channel is only 64Kbps. And the actual effective bandwidth is 1.984Mbps.
6. Automatically check the used E1 channel numbers and automatically assign bandwidth.

Supports limitation setting of CRC error code. When error code rate is beyond the limitation, the system can automatically isolate the E1 link.

7. Abundant alarm functions of LED indicator are for fast diagnostics
8. When the units works normally, Plug and play any E1 line,will not influence the units.

9.Local loop function available (Four E1 channels are looped together)

10. Support CRC error limitation function.

11. When error code over E1 transmission direction is beyond limitation, only E1 transmission direction is isolated. It has no impact on the other direction. Asymmetry is materialized in process of Ethernet transmission to assure the Max. Data transmission rate with E1 fault.

12.When a receiving direction of any E1 link

Receives LOS, AIS and LOF alarms, the corresponding send direction will not be influenced so that Asymmetry transmission is materialized over E1 link.

13.when all the receiving directions of E1 links are cut off and isolated, local alarm and SNMP information can still be transmitted to the remote endpoint through sending direction of E1 link. Uni-direction transmission is materialized over E1 link. The Function is especially suitable for associated operating between protocol converters and optical equipments. It is used to diagnose fiber failure when the uni-direction fiber of optical equipment is shut off.

3. Specification

1. G.703 interface

* rate： n *(2.048Mbit/s±50ppm) (N=1～2)
* Code type： HDB3
* Impedance： 75Ωunbalanced/120Ωbalanced
* Interface standard： Meets G.703and G.704standards

* Connector： Q9 (75Ω),RJ48－C（120Ω）

Must used in pair.

2. Ethernet interface

- Standard MII interface. Meets IEEE802.3 standard Two Ethernet interface with switching function can save a SWITCH for users.
- Supports flow control of full duplex PAUSE
- No. of Ethernet interface： Two
- Requirement for making lines：Cross cable and direct connecting cable auto-negotiation.

3.Voltage：

Desktop: AC 220V, DC -48V Compatible

Rack: AC 220V or DC -48V with heat backup function.

4. Fluctuant voltage

180 VAC ~ 260 VAC

or -38 VDC ~ - 72 VDC

5.Power consumption：< 5W (desktop)

< 75W (rack)

6. Operating condition

Temperature -20℃ ～ +70℃

Humidity 95%

Atmospheric pressure 70Kpa ~ 106Kpa

Non-corrosion and non-solvent gas

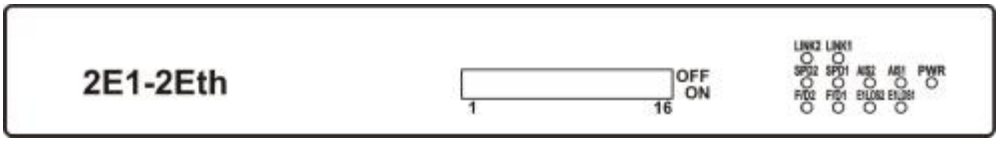
Non-dust

Non-magnetic field interference.

7. Dimension

Dimension for desktop 218mm*136mm*44mm

4. Front panel



.LED indicators

There are eleven LED indicators on the front panel.

LED indicators			Working status
Name	Function	Status	
PWR	POWER indication	ON	PWR is working normally
		OFF	PWER is OFF
AIS1~AIS2	Two E1 connection indication	on	E1 interface has received AIS alarm
		off	E1 interface have not received AIS alarm.
E1Los1 ～ E1Los2	Alarm for E1 signal loss	ON	Alarming for E1 signal loss
		twinkling	Alarming for E1 framing desynchronizing

		OFF	Four E1 links are working normally
Link1 ～ Link2	Ethernet connection indication	ON	Ethernet links are working normally
		OFF	No other units access to our units
SPD1 ～ SPD2	Ethernet rate indication	ON	Ethernet works at rate of 100M
		OFF	Ethernet works at rate of 10M
F/D1 ～ F/D2	Duplex indication	ON	Full duplex
		OFF	Half duplex

DIP switches

DIP switches		Description
Serial number		
S1	SW1	Alarm indication for the local or remote unit OFF--For the remote unit, On—for the local unit
	SW2 to SW3	limitation setting of error code ON， ON -- No limitation ON， OFF-- Limitation value:1×10^{-4}; OFF，ON -- Limitation value :1×10^{-5}; OFF，OFF -- Limitation value :1×10^{-6}。

DIP switches		Description
Serial number		
	SW4	For the local E1 loop OFF--Loop；ON—NO loop When testing loop function, pls cut off Ethernet firstly in case of broadcast storm.
	SW5 to SW6	Setting off, On to work normally If needing to change Ethernet work mode and VLAN, please switch SW5 to on first and then to Off.
	SW7	For new reversion
	SW8	For new reversion
S2	SW9	Setting for Ethernet duplex OFF—Full duplex；ON—half duplex
	SW10	Ethernet rate ON--10M；OFF--100M
	SW11	Auto-negotiation function for Ethernet Then Sw9 and Sw10 ineffective OFF—Can auto-negotiation；ON- no

DIP switches Serial number		Description
	SW12	VLAN setting fro Ethernet interface OFF—VLAN effective，and two Ethernet interfaces are isolated and can't access each other. ON—VLAN ineffective，and Two Ethernet interface are switchable ,and can access each other.
	SW13to SW16	For new reversion

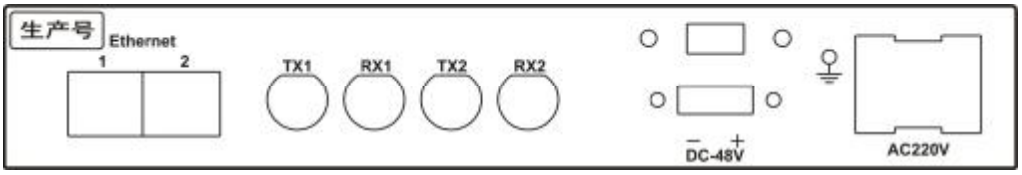
Attachment: Comparison table of Ethernet work modes

SWITCH / FUNCTION		9	10	11
MODE SEL	100Mfull duplex	OFF	OFF	ON
	100Mhalf duplex	ON	OFF	ON
	10Mfull duplex	OFF	ON	ON
	10Mhalf duplex	ON	ON	ON
	Auto-negotiation	X	X	OFF

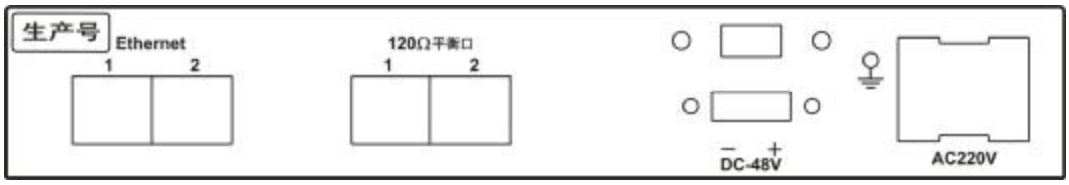
Note: X can be either ON or OFF, ON effective and OFF ineffective.

5. Rear panel

1) E1 interface with 75Ω. The rear panel as follows:



2) E1 interface with 120Ω.The rear panel as follows:



Power supply

Power supply has Ac220V/DC-48 compatible which can be selected by the users.

If the user need -48V , Set AC/DC switch to “DC-48V”.If the user need 220V, Set AC/DC switch to “AC220V”.

When power supply is –48V, positive polarity of unit should be connected with positive polarity of the power supply in the room. And so does the negative polarity.

E1 interface

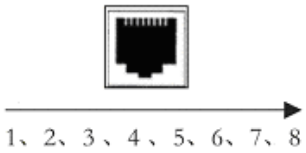
Users can select the line according to requirement.

E1 line with 75Ω: Offer two interfaces with impedance of 75Ω.

E1 line with 120Ω：Provides four E1 interfaces with 120Ωfor user to select.

ETH interface：

Ethernet interface is a standard MII interface. Two Eth interfaces are available on the rear panel. Cross and direct connection cable auto-negotiation for Ethernet interface. Supports flow control of full duplex PAUSE. Pins of Ethernet interface are 1, 2,3 and 6。



Note : When Ethernet cable at the Eth interface is longer, two pins of receiving signal must be connected to one UTP and two pins of sending signal are connected to one UTP.

6. Bottom panel

2 DIP switches

ON --indicating E1 signal is grounded

OFF—indicating E1 signal is not grounded

SW1: receiving signal grounded

SW2: sending signal grounded

Notice: On the whole E1 link, assure only one termination is grounded.

The rack device has these two switched on the back of casette side.

Hanging function (optional)

If needing hanging function, please indicate in order list.

7． Method of making cables

（1）method of making 75Ω cables:

Core is connected with core, out layer sheet is connected with out layer and core is disconnected with out layer sheet.

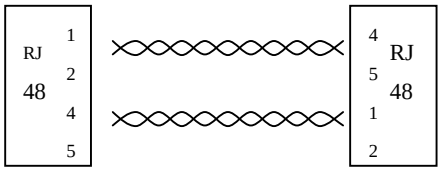
(2)The method of making 120Ω cables:

The physical interface is RJ48-C(Marked with “RJ48-C”On the rear panel)

1, 2, 3, 4, 5, 6, 7, 8

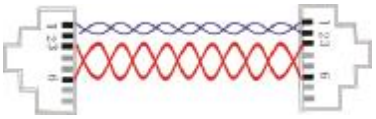
4, 5 Out， 1,2input

IF the units are used in pair, the method of making a line is shown as follows:



（2）The method of making an Ethernet cable

The method for straight Ethernet cable：



The method for cross-over Ethernet cable

8. Installation Process

Before operation, please read the notice carefully, and pay more attention to the

marked.

Such marks as “note”, “warning” in operation manual are specially remarked on how to operate safely and correctly, which should be observed strictly.

Packing and appearance checking

1) After you receive devices, firstly you should check whether the packing is damaged, if it is, please contact with our after-service department immediately so as to solve the problem in time.

2) Please check according to the loading list with the box open. If there is damage on the outside of rack, please contact with installation person or after-service department directly so as to exchange.

Installation

1） Fasten the equipment in the rack-Mounted.

2）Input the power, If it is DC input, First measure its voltage value and its polarity with multi meter, our device will self- detect automatically while you can detect whether the indication lights work normally.

3）Sending signal and receiving signal over E1 interface should corresponding.

Equipment Maintenance

1) Before leaving the factory, the equipments have been adjusted at their best. And all the functional interfaces are located in the front and rear panel. So do not open the equipment by yourself without our technicians.

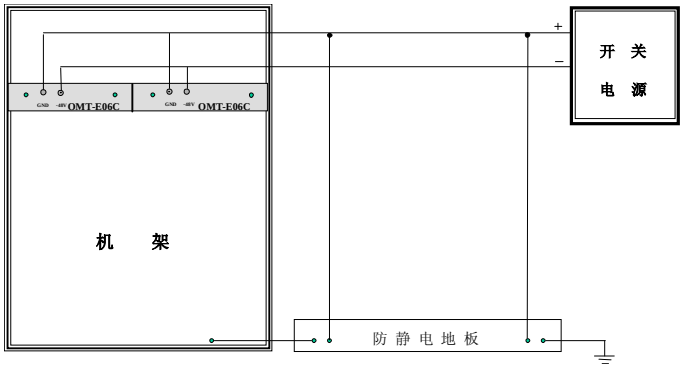
2) When the equipment encountered with troubles, you can check the trouble area range by single self-loop function and contact with our company in time.

Requirement for apparatus room and grounding

1) It should be placed in a stable place where is convenient for personnel to test and set.

2) Ambient environment should be dry, tidy and draughty.

3) During the installation and maintenance of the equipment, necessary anti-static measures should be taken, so the rack should be grounded to strengthen anti-jamming ability and prevent lighting strike. Working and protection ground of independent erection should be available and ensures to grounded well for equipment operation. Connecting method is shown as follows:



9. Trouble shooting

Phenomenon	causes	solutions
Power LED is OFF.	1.Not completely pressed 2.Incorrect in Power polarity connection 3. Failing to connect with power supply.	1.Completely pressed 2.Exchange their polarities 3. Plug in power supply. 4. Reject the conduct. 5. contact with your supplier

	4. Short circuit between power supply and ground due to conduct materials dropped into cabinet. 5. Failure in Power supply module.	
E1LOS alarm when E1 is connected and will be off when running a E1 loop	**1.TX AND RX INTERFACES ARE CONNECTED IN REVERSE.** **2.ERROR IN MAKING E1 LINE** **3.TRANSMISSION DISTANCE IS BEYOND STANDARD.** **4.FAILURE IN TRANSMISSION SIDE.** **5.FAILURE IN E1 MODULE**	1. Exchange the TX and RX interface connectors. 2.Refer to fabricating method 3.75ohms：300M 120ohms:500M 4. Check the loop mode. 5.Contact your supplier
LINK LEDs are OFF	1. Making network cable incorrectly.	1.Refer to methods of making Ethernet cables

	2 NO.5 dial-up switch on 3.Fault in Ethernet module	2. Turn SW5 to off. 3. Contact with supplier.
Data can PING, but lose many packets	1.many HUBER and PC caused data packet collision 2. Gridline is abnormal or too long.	1. Replace HUBER with switch and never have too much pc within one conflict field. 2. Fabricating network cable again.
Low Ethernet rate	1. Data collision in the sectional network	1. Skip our device; check whether it is caused by network conflict or other reasons.

Typical application