AN-4E1-4ETH

Interface Converter

User Manual

AD-NET TECHNOLOGY CO., LTD

Content

1. Description

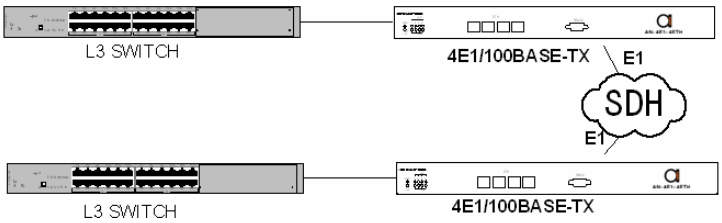
AN-4E1-4ETH Interface Converter is a device that takes ASIC chip as its core and enables Ethernet data to be transmitted through multi 4E1 channels. AN-4E1-4ETH Interface Converter breaks through the bandwidth limit of single E1 Ethernet bridge. It is very easy to make use of the existing rich E1 resources in the public networks to quickly extend the range of the Ethernet LAN. AN-4E1-4ETH Interface Converter is an enhancement model of the Ethernet to multi E1 converter. It means that with a built-in bit error detector, the device can find which E1 is not capable to be used because of too much bit errors, and then automatically cut down the bad one, to keep the Ethernet data transmission continuously.

AN-4E1-4ETH Interface Converter is a multifunction and high performance L2 switch which build in the port cross engine to realize the conversion between two Ethernet interface and E1 interface. The equipment supports the function used as Ethernet transceiver or Ethernet net bridge. As the extension of Ethernet, This converter may realize Ethernet interconnection at low cost via the E1 channel provided by existing network.

E1 interfaces conforming to ITU-T G.703 and G.704

proposals are provided at the end of WAN, supporting RJ45 and BNC connection modes. The E1 ports support both framing and un-framing architecture. Each channel can support 31 time slots for transmit. The 4 E1 channel provides a rate of 7.936 Mbps and accomplishes transparent transmission.

It is proposed to use the products of this series in pairs.



A typical application is shown in figure 1.

2. Technical specifications

Protocol: G.703, G.704, G.736, G.823, I.431 IEEE802.3
E1 interface:

Impedance 75ohm, physical interface BNC

Impedance 120 ohm, physical interface RJ45

Interface rate: 2.048 Mbps

Coding: HDB3

Jitter tolerance: according with protocol G.823

Output jitter < 0.05UI

Transmission range: 300m (UTP) 600m (coaxial cable)

Ethernet interface (RJ45):

Data Rate: 10/100Mbps auto-negotiation

Standard: Compatible with IEEE802.3

Connector: RJ-45

Full duplex auto-negotiation

Architecture:

Stand alone: 19 in standard 1U cabinet;

Rack mount: 19 in standard 4.5U cabinet;

Power supply:

Stand alone:85V～264V AC input,5V/2A output

-38V～-58V DC input,5V/2A output

Rack mount:150V～260VAC input,5V/16A、12V/1Aoutput

-38V～-58VDC input,5V/16A、12V/1Aoutput

Other Specification

Operation temperature:0℃～50℃

Storage temperature:-20℃～80℃

Humidity:5%～90%(no condensation)

3 Installation and Panel description

3.1 Unpacking (stand alone AN-4E1-4ETH)

Check the accessories and spare parts when opens the package. In case of missing, immediately contact our offices or agencies. Check for the following items:

■AN-4E1-4ETH Interface Converter

■ An Operation manual

■ A supply cord

■ 8 plugs for coaxial cable

In case of any damage in transportation, contact our offices or agencies.

3.2 Front and rear panel of the stand alone device

- The front panel of AN-4E1-4ETH Interface Converter is shown in figure 3.

Figure 3 front panel of AN-4E1-4ETH Interface Converter

Explanations for the two rows of indicators at the left are as follows in figure4:

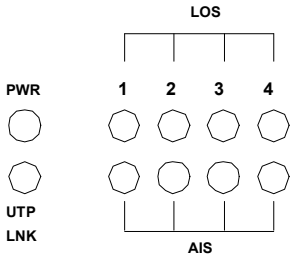


Figure 4 indicators of AN-4E1-4ETH

POWER: Power. Always lights after starting up.

UTP LNK: lights When the Electric Ethernet interface is working

LOS(1 2 3 4): E1 link interruption alarm. Always lights after starting up till synchronization is established. It also lights in case of E1 link interruption or signal loss in communication.

AIS(1 2 3 4): Always lights after receiving an alarm indication signal

RS232: Serial interface NMS DB9 socket (DB9)

- The AC input rear panel of 4E1/100BASE-TX Interface Converter is shown in figure 5.

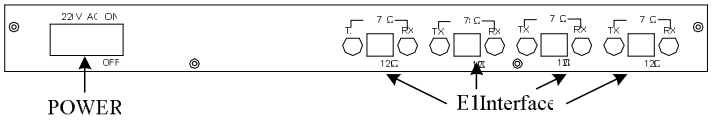


Figure5 AC input rear panel of AN-4E1-4ETH Interface Converter

220V AC: AC socket with two cores

OFF/ON： Power switch. When the ON button is pressed down, the power supply

E1-75Ω TX / RX: BNC transmission/reception socket for 75Ω impedance E1 interface

E1-120Ω: RJ45 socket for 120Ω impedance E1 interface

TX RX: socket for E1 transfer, TX indicator of E1 data transmission, RX indicator of E1 data receives.

- The DC input rear panel of AN-4E1-4ETH Interface Converter is shown in figure 6.

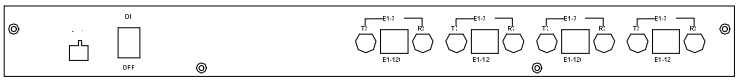


Figure6 DC input rear panel of AN-4E1-4ETH Interface Converter

48V DC： DC -48V power supply connector

The others are the same as in figure 5.

3.3 Front and rear panel of the rack mount

- Front and rear panel of the rack mount, its shown in figure 7 and figure 8

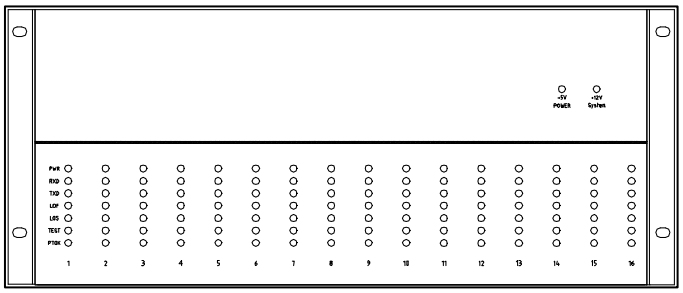


Figure 7 Front panel of RACK

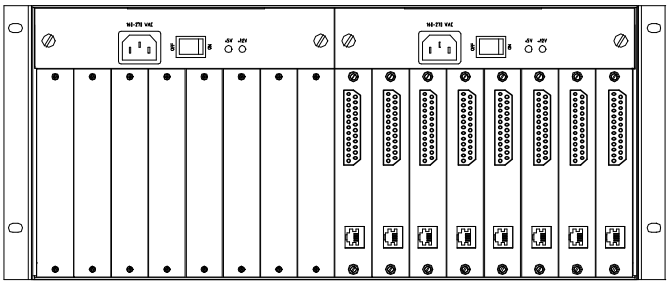


Figure 8 Rear panel of RACK

+5V: 5V main power indicator

+12V: 12V fan power indicator

PWR: Module power indicator

RXD: Data receive indicator, it will flash when received data

TXD: Data transfer indicator, it will flash when transfer data

LOF: Alarm indicator lamp for input signal out-of-frame in E1 line. Constantly lighting indicators the alarm with local device; flash indicators the alarm with opposite device. Alarm status of opposite device can be detected only at framing mode.

LOS: E1 link interruption alarm. Always lights after starting up till synchronization is established. It

also lights in case of E1 link interruption or signal loss in communication. It will flash when the opposite device E1 LOS.

TEST: Alarm indicator lamp for test. Constantly lighting indicates the device is in test; flash indicates the device management address hasn't be set.

PTOK: Alarm indicator for remote device. The 4E1/100base-TX nonsupport the pseudo-random codes test. The lamp indicates check the states of remote device. Constantly lighting indicates checked the alarm of remote device. For example the abnormally link of remote Ethernet or the E1 loop of remote, etc.

Underneath the panel there are a indicator matrix. See figure 7 about the description of the front panel of Ethernet Interface Converter for its functionality.

- The rear panel of RACK/AC is shown in figure 9.

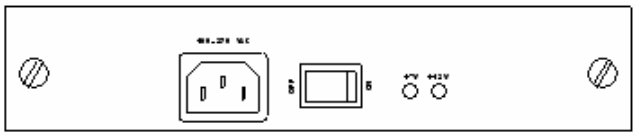


Figure 9 panel of rack/AC

The panel above consists of three different small

panels: as described below:

- The small panel of Ethernet Interface Converter module, as shown in figure 10.

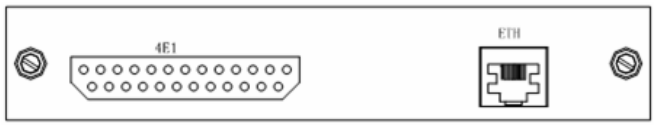


figure 10 Panel of AN-4E1-4ETH Interface Converter module

- The panel of RACK/DC DC redundant power supply is shown in figure 11.

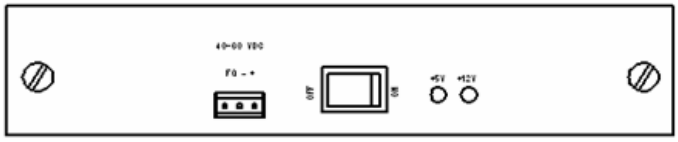


Figure 11 Panel of rack/DC DC redundant power supply

160-270VAC: AC 220V input socket

ON OFF: power converter

+5V: 5V main power indicator

+12V: 12V fan power indicator

- The panel of RACK/DC DC redundant power supply is shown in figure 12.

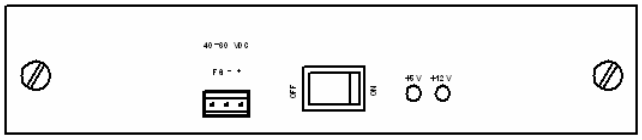


Figure 12 Panel of rack/DC DC redundant power supply

40-60VDC: DC-48V connector (FG to protective GND, "-+" is the polarity of the –48V DC input)

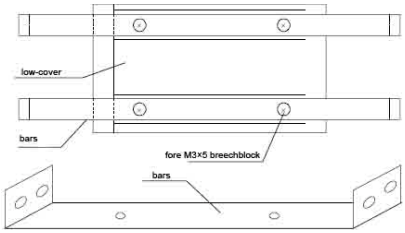
ON OFF: power converter

+5V: 5V main power indicator

+12V: 12V fan power indicator

3.4 Whole equipment installation

AN-4E1-4ETH Interface Converter is installed indoor normally, rack can placed on the desk or wall. If it be placed on general 19 inch rack , you'll add two bars under



the low-cover, its shown in figure 13

Figure 13 for Engine of Stand alone

Rack will be placed on general 19inch rack, the operation by step is blow:

Tack out the ten M3×6 breechblock on the flank of the box, which is shown in figure 14

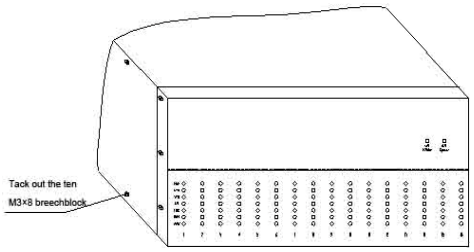


Figure 14 fix up the rack mount -1

Tack out the pair of bend-element in the appendix,

attention no exchange the left & right. Make the bend-element on the flank of the box by the ten M3×8 breechblock on the appendix, which is shown in figure 15:

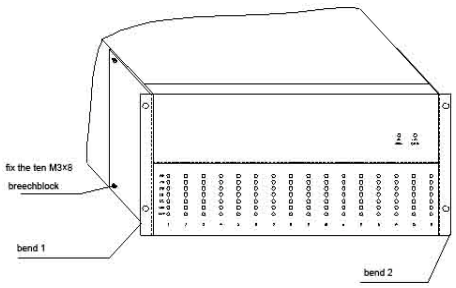


Figure 15 fix up the rack mount -2

E1 interface line will fetch out from BNC socket or RJ45 socket which are on the rear panel, Ethernet interface line also from the RJ45 socket on the rear panel.

4. Applications of AN-4E1-4ETH Interface Converter

4.1 Definition of balanced twisted-pair wire sequence for RJ45 interface

4.1.1 10/100BASE-T interface wire sequence

The RJ45 Unshielded twisted-pair for 10/100BASE-T interface can use DCE or DTE standard stipulations, it support AUTO MDI/MDX function. Complied with EIA/TIA-568A、EIA/TIA-568B.

4.1.2 E1 interface wire sequence

1 and 2 are transmitting lines, 4 and 5 are receiving lines, as shown in figure 16.

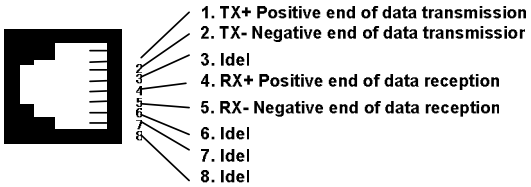


Figure 16 RJ45 balanced twisted-pair wire sequence for E1 interface

4.1.3 AN-4E1-4ETH Module E1 interface wire sequence

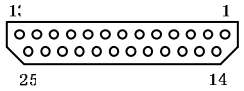


Figure 17 Module E1 use DB25 connector:

Figure 17 Module E1 of wire sequence as below:

2 ---TX1+ ， Line 1 E1 TX+
3 ---TX1- ， Line 1 E1 TX-
15---RX1+ ， Line 1 E1 RX+
14---RX1- ， Line 1 E1 RX-

4 ---TX2+ ， Line 2 E1 TX+
5 ---TX2- ， Line 2 E1 TX-
17---RX2+ ， Line 2 E1 RX+
16---RX2- ， Line 2 E1 RX-

7 ---TX3+ ， Line 3 E1 TX+
8 ---TX3- ， Line 3 E1 TX-
21---RX3+ ， Line 3 E1 RX+
20---RX3- ， Line 3 E1 RX-

11---TX4+ ， Line 4 E1 TX+

12---TX4- ， Line 4 E1 TX-

25---RX4+ ， Line 4 E1 RX+

24---RX4- ， Line 4 E1 RX-

We support DB25 converter which can converter the DB25 to 4 plugs for coaxial cable.

4.1.4 Configuration of module's code switch

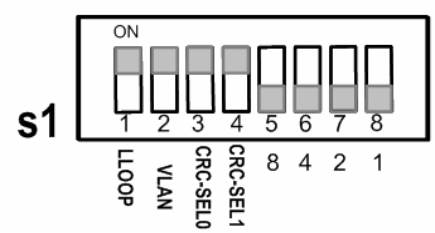


Figure18 code switch of module

S1.1 LLOOP, Local loop back setting (E1 interface in direct loop back), OFF valid.

S1.2 VLAN. OFF valid. Insignificance in the device.

S1.3~S1.4 CRC. OFF valid.

S1.5~S1.8 Define the module address. ON valid.

Notice: Out factory setting (default) is S1.1~S1.4=ON, S1.5~S1.8=OFF.

4.1.5 Configuration of Ethernet connecting devices

The equipment uses 10/100BASE-T Ethernet interfaces and supports adaptive 10/100M half/full duplex mode. Ethernet devices connected to AN-4E1-4ETH bridge (such as SWITCH, HUB, Ethernet adapter card (NIC), etc.) can be set to 10M full duplex, 10M half duplex, adaptive 10M half/full duplex and adaptive 10/100M.

4.1.6 The simple network management via the NMS console interface

Users can directly query and set the status of a pair of devices with the 4E1 management software Via RS232 wire (available 3 line,2—2,3—3,5--5). The software will automatic test the device's type model and the currently state of Ethernet, the alarm of every channel E1's LOS, LOF, AIS. For the normal E1 channel, we can check the state of remote Ethernet connecting, etc.

4.2 Simple self-test methods for devices and E1 circuits

Test 1: test of back-to-back connection

Connect two AN-4E1-4ETH bridge devices back to back, ping the other's IP address on the two computers to test the two devices show as in figure 19.

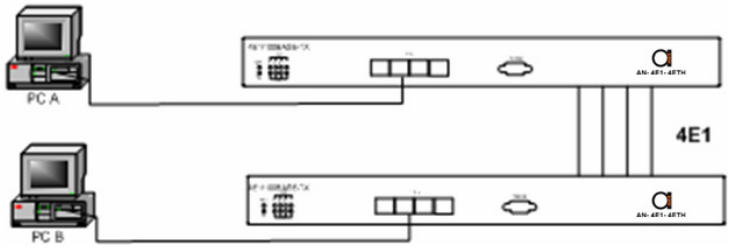


Figure 19 AN-4E1-4ETH back to back test

4.3 Common questions and their maintenance

(For independent interface converter, reference for frame bridge)

No.	Symptoms	Causes	Remedies
1	The power indicator does not light after starting up.	The power circuit has a failure.	1. The power is not connected. Check the contact of the power lines and the converters. 2. The internal fuse of the

			equipment is broken. Replace the fuse. 3. The internal power module has a failure. Send it rear to factory for repair.
2	Indicator LNK does not light when the Ethernet network is connected.	Integrity test of link has not passed.	1. The crystal head of the cable is not well molded. Check the quality of the UTP cable. 2. The internal circuit of the equipment is damaged. Send it to factory for repair.
3	Indicator LOS always lights when the cable	The circuit signals are lost.	1. Check the coaxial cable or the UTP5

	at the E1 port is connected.		twisted pair for open circuit and short circuit. Check whether the plugs are positioned. 2. The internal circuit of the equipment is damaged. Send it to factory for repair.
4	Indicators are normal, but communication can not be done.	The opposite devices are in the state of local loop test and the Ethernet link of the opposite devices has no communication.	1. The Ethernet link of the opposite interface converter has a failure. Check the opposite devices according to item No. 2 in the table.