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USER GUIDE AMX32

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Deutschland

Installation and Operation Manual

AMX32FE – Access Multiplexer with Fast Ethernet

USER GUIDE

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I. History

Rev.	Date	Author(s)	Remarks
1.0	28.11.09	AZI	Initial document
1.1	27.09.10	AZI	Changes after Review.

Access Multiplexer with Fast Ethernet

Chapter 1 Overview

AMX32FE is a new product series of modular optical transmission equipment released by our company in adoption of modularized structure, supported with the company's independently developed universal software platform, and in use of high-performance processor and bus technology, etc. This series of modular optical transmission equipments can fully meet various more flexible and individualized user demands during networking, maintenance and escalation.

The AMX32FE can provide full speed 100Mbps fast Ethernet (FE) interface accordant to IEEE 802.3 and E1 interface complying with 16-channel standard. At the same time, it also provides sufficient network management interface function and realizes SNMP network management or device management via hyper terminal. The device itself is supplied with a LCD displayer for user to carry out configuration and management. The whole system adopts modularized structure. 16 channels of 2M services are divided into four modular slots, with four channels for each. Different interface modules can be applied based on networking requirements of different users, and different user requirements for application environment and business growth can be met through addition or replacement of interface modules. The equipment can cater to the network application of general scale.

The company will incessantly release new interface modules to keep

pace with the growth of user business. As a manufacturer for networks and communications with independent intellectual properties, the company's network products feature more advantages in security and networking flexibility.

Currently, along with the penetration of corporate business on network platform, user requirements have been ever changing at the same time. It has become the motivation and theme of user requirements for achieving continuous innovation on business supported by the latest network technologies. This series of modular transmission equipment has been recommended to adapt to this demand.

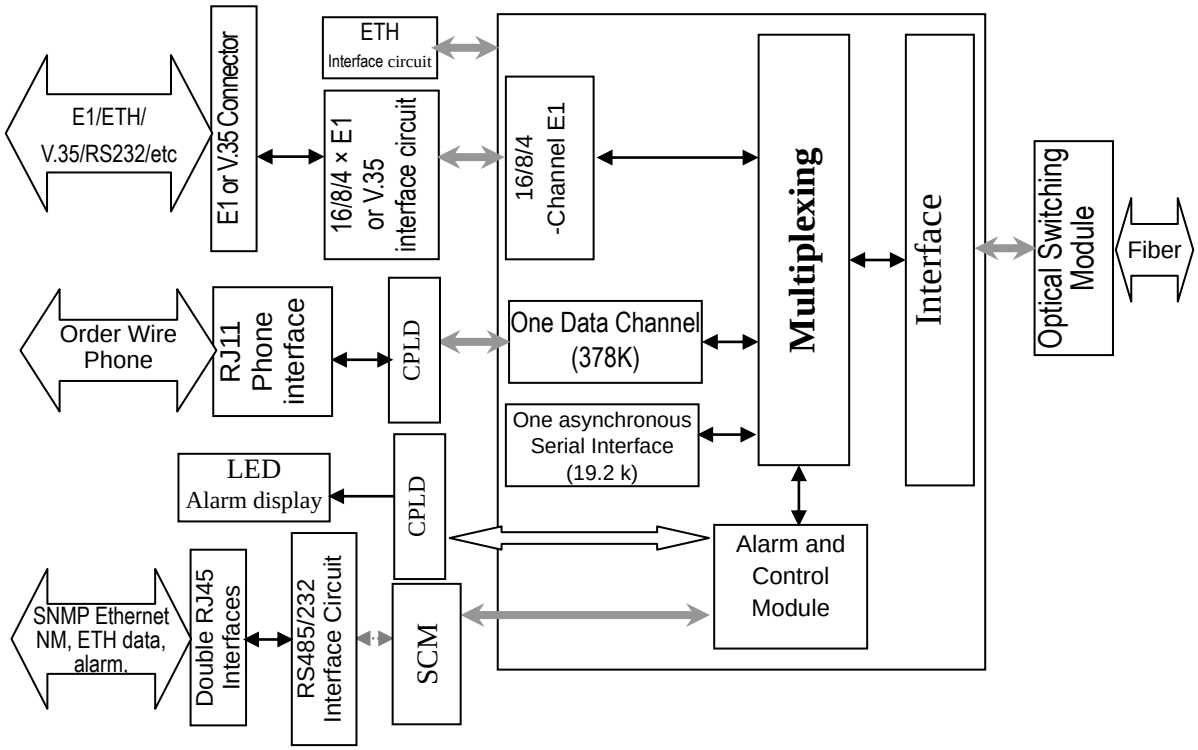
Chapter 2 System General Description

The **AMX32FE** is created with 16E1+100M full speed Ethernet capacity of transmission interfaces. The equipment also provides various interface modules for voice, data and video services in cities and industrial districts. Its optional interfaces support multiservice transmission of large customers and customer groups such as MSEs, governmental organizations, schools and intelligent residential areas. Open and standard interfaces are applied to guarantee prompt interlinking of various devices.

The **AMX32FE** family series integrates modular and strong functionalities, low in cost and convenient for use and expansion. Multi-protocol interfaces have been integrated in one device to facilitate multiservice access and transmission, able for connection with communication

networks of an enterprise distributed in different parts. It has been proved to be applicable to all kinds of data, voice and video traffic applications in experiments of different China Mobile, China Unicom, China Netcom and army terminals.

2. 1. System Schematic Diagram



2. 2. Equipment Features

The **AMX32FE** is created with optical path interoperability, flexible structure and modular design. Its function modules are independent of each other but easy for assembly, which enables it to derive a series of optical multiplexer products with multiservice interfaces. The equipment is furnished with four modular slots. According to the networking requirements of different users, various kinds of interface modules can be

employed. Users can also add or replace interface modules to accommodate to the requirements of different application environments to protect their existing investment. Meantime, the equipment allows users to activate expandable interfaces to adjust the scale of network interfaces based on business growth, so as to help realize real-time follow up of network to business.

1+1 Optical Redundancy Backup: Protection of dual optical interface available to ensure that business will not be interrupted when one pair of optical fibres is confronted with failure. Supporting hot add/drop of optical interface, and fulfil switching without error code during hot add/drop.

- **Flexible Configuration**: 4/8/12/16E1 optical multiplexers and multiservice interfaces are derivable from main system board and different functional modules, to meet different user requirements and customizations.
- **Various Functional Modules**: User interface modules (N×64K V.35, FV.35, FXO/FXS, E/M, RS232/RS485, and etc.), order wire module, network management module (RS232, and Ethernet Interface, etc.), and alarm output terminal module, etc. available.

2. 3. Operating Principles

The **AMX32FE** adopts plug-in board structure and can be functionally divided into five general parts, including:

A. Compound unit of 4/8/12/16-channel E1 or V.35

B. Optical interface

C. Order wire unit

D. Network management unit

E. Secondary power supply module

A, B and E are the three basic components. Unit A is used for completing reversible conversion from 4/8/12/16 2048kbit/s signals to laser signals. The function of Unit B is to perform framing and deframing of photoelectric signals and E3/E6 optical switch. Unit C and Unit D are used for playing auxiliary functions.

The features of every unit are given as follows:

4/8/12/16 Compound Unit's core circuit is composed of one large-scale ASIC circuit and a few peripheral devices. This circuit integrates 4/8/12/16 2048kbit/s HDB3 signals from switch or sent out by PCM into one NRZ digital stream signal, decomposes NRZ signal of the opposite terminal into eight 2048k signals synchronously and outputs them through drive circuit in the end. This unit compounds NRZ signals, order wire services and alarms, then encodes and output NRZ signals to drive laser, and achieves the reverse process for the above mentioned part at the same time. It can be plugged in 4/8/12/16 channels of E1 plug-in board, V.35 board or voice board etc. according to the actual user requirements.

Optical Interface Unit is to achieve dual optical interface of 1+1 redundancy backup; priority-level switch and mandatory switch of active/standby optical path; and so on.

Switching mode for dual optical interface: Dual transmission with optimal reception;

Switching time for optical pass: ≤ 50ms;

Type of optical pass: One active and one standby (the active pass is in operation when it's normal, and the active pass switches to standby pass when it is confronted with switching alarm levels such as OPL, SYL, E3, and E6; The operation will finally return to the active pass after a

certain period of time when active pass is resumed to normal condition);

When the equipment is started, it is preferential to have both local end and remote end operating with the A optical interface.

ALS (Automatic Laser Shutdown/Automatic Laser Reduction) function: When a fiber disconnection in this optical pass is detected, the average output power at the optical transmitting end is reduced by more than 20dB, and it resumes to normal status when optical fiber is recovered.

The **optical interface** applies an optical transmitting/receiving integrated module of impact structure. It features high-power transmission, high-sensitivity receiving and independent transmission and receiving. The new version supports hot plugging/swap of optical interface. In the case that one optical interface runs into trouble, the fault optical interface board can be drawn out online and replaced with a new one.

Network management Unit is designed to control all settings on the control panel and to realize communications between multiplexer and computer. The unit can send commands (such as alarm-off, remote bypass loop-back and so on) to nodes through computer. Users can directly query and set the status of a pair of devices with Hyper Terminal software via RS232 crosswire. NM-ETH interface (10/100M auto-negotiating, to be configured) can be directly connected with a computer via a crosswire or with a HUB via a straight-through wire to fulfill management. It can realize ALS (Automatic Laser Shutdown/Automatic Laser Reduction) to prevent personnel from fiber injury. The user can select network management functions according to its actual requirements.

Secondary Power Supply is a power supply module with function of over-current and over-voltage protection. It can be used to fulfill conversion from DC-48V to +5V or from AC220V to DC-48V or +5V. Users can either choose to use DC-48V power supply alone or apply DC-48V and AC220V as mutual backup power supplies at the same time. It supports hot swap of power supply.

Chapter 3 Description about Modules

A basic **AMX32FE** consists of a motherboard, four slots for optional pluggable interface boards, a power switch module and a user interface card. Order wire module, network management module, and alarm output module are also prepared for user selection. The system is provided in a structure of 19″ standard rack. It can be used not only as the desktop device independently but also installed inside the 19″ rack. The equipment height is 1.2U.

3. 1. Motherboard

(1) To achieve encoding and decoding of 16-channel 2.048 MHz signals;

(2) To fulfill conversion of framing signals and optical signals

(3) To set up the internal and external clocks as well as speed rate of speed-adjustable interface board

(4) To achieve loop-back of all bypass signals

(5) To provide monitoring, order wire, and other functions

(6) To indicate various alarming messages

(7) To indicate various status

3. 2. Service Interface Cards

- **G.703 Interface Card**

  4 channels of G.703 interface available
  DB37 Interface, to provide corresponding external interface through adapter
  Fully compliant with ITU-T G.703 recommended standards
  Interface Code Type: HDB3
  Bit Rate: 2.048Mbit/s ± 50ppm

- **Dual V.35 Interface Card**

  Two channels of V.35 interface available
  Interface Electric Level: In compliance with CCITT V.35 standard
  Physical Interface: DB25
  Interface Bit Rate: 2.048Mbit/s

- **4-Channel V.35 Interface Card**

  4 channels of V.35 Interface to be framed
  Interface Electric Level: In Compliance with CCITT V.35 Standard
  Physical Interface: DB37
  Speed of Interface: N×64Kbit/s

- **FXO/FXS Voice Channel Interface Card**

  Physical interface: DB9 (hole) or RJ45
  FXO interface card: to provide 4-channel or 8-channel FXO interface connected with switch.

FXS interface card: to provide 4-channel or 8-channel FXS interface connected with ordinary telephone sets.

Supports display of incoming calls.

Supports billing function of inverted polarity.

- **RS232 Interface Card**

  Physical interface: RJ45

  Four RS232 transmission channels available

  Transmission Speed: 110~115.2K bps

  Transmission Mode: Full-Duplex

- **RS422/RS485 Interface Card**

  Physical interface: RJ45

  Four RS422/RS485 transmission channels available

  Transmission Speed max. 115.2K bps

  Transmitting Mode: full/half duplex

Chapter 4 Technical Specifications

4. 1. Electrical Interface

4E1 Interface Card: **(Each card contains 4 E1 Interfaces: 4xE1)(In accordant with G.823 standard)**

Interface Bit Rate	2.048 Mbit/s ± 50 ppm
Impedance	75Ω unbalanced / 120Ω balanced
Interface Code Type	HDB3
Max. Input Port Frequency Bias	> ±81ppm
Max. Input Port Attenuation	≥ 6dB
Allowable Input Port	18kHz ≥ 0.2UI

Jitter	
	100kHz ≥ 0.2UI
Max. Output Jitter	LF limit f1~f4 < 0.25UI
	HF limit f3~f4 < 0.05UI
Jitter Shifting Property	400Hz < 0.1UI
Reflecting Attenuation	51.2kHz~102.4kHz ≥ 12dB
	102.4kHz~2048kHz ≥ 18dB
	2048kHz~3072kHz ≥ 14dB

4E1 Interface Adapter:

For standard DB37 female interface, refer to ***Appendix 1*** for pin definitions. Two modes of 75Ω unbalanced transmission and 120Ω balanced transmission are available (Please specify one when ordering).

When unbalanced transmission mode is used, please use 75Ω coaxial adapter joint, as shown in the following figure:

DB37F-8G

Four standard G.703 signals (2048kbit/s), IN1, IN2, IN3, and IN4, are used to receive 4 input signals respectively, and OUT1, OUT2, OUT3, and OUT4 are the 4 corresponding output signals.

When balanced transmission mode is applied, please use 120Ω joint (RJ45) adapter ordered and purchased as in the following right figure:

1 2 3 4

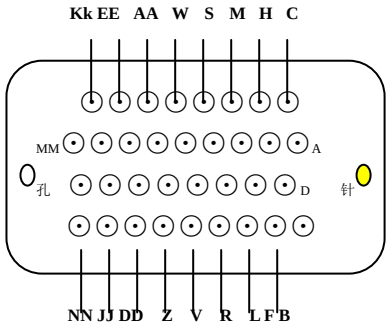
DB37F-RJ45

Refer to ***Appendix 1*** for pin definitions.

Dual V.35 Interface Card: (Each card contains two V.35 interfaces: 2xV.35)

Interface Bit Rate: 2.048Mbit/s

Interface Electric Level: In compliance with CCITT V.35 standard



Front View of V. 35 Connector

Note: The physical interface is DB25. If equipment is furnished with V.35 interface, then the DB25-V.35 conversion line shall be provided. It is used to butt connect with DTE port to convert DB25M into DB34F and can also be used for direct connection with DTE equipment. If equipment needs to be connected with DCE device, cross connection in DCE-to-DCE structure can be applied. Please make it clear when placing order.

Provided that 2×V.35 card is plugged in the slot I on the mainboard, the lower V.35 channel and the upper V.35 channel may correspond to 1st and 2nd indicators on the

front panel respectively.

Provided that 2×V.35 card is plugged in the slot II on the mainboard, the lower V.35 channel and the upper V.35 channel may correspond to 5th and 6th indicators on the front panel respectively.

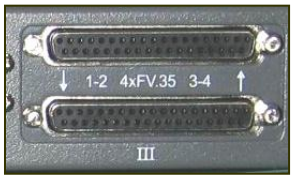
Provided that 2×V.35 card is plugged in the slot III on the mainboard, the lower V.35 channel and the upper V.35 channel may correspond to 9th and 10th indicators on the front panel respectively.

Provided that 2×V.35 card is plugged in the slot IV on the mainboard, the lower V.35 channel and the upper V.35 channel may correspond to 13th and 14th indicators on the front panel respectively.

***4(2)-Channel N×64k framing V.35 Interface Card* (Each card contains four (two) V.35 Interfaces: 4(2) xFV.35)**

Physical interface is DB37, and if there is 4-channel V.35 interface card fitted in the equipment configuration, then DB37 to V.35 one-for-two conversion line (DB37M-2DB34F) is fitted with the equipment, used for butt joint with DTE port. Through this line DB37F can be converted into DV34F, and can be directly connected with DTE device.

DB37M-2DB34F



The interface under double-layer female DB37 interface card is the 1st and 2nd channels of V.35, and the interface above is the 3rd and 4th channels of V.35.

Different pins of DM34 (Needle Type) Interface and DB37 (Cellular Type) are defined as follows:

Pin No. of DM34 Cellular Type	Circuit S/N	Function	Signal Direction	Pin No. of DB37 Cellular Type (Upper/Lower Layer)	
				1st/3rd Channel of V35	V35 2nd/4th Channel of V35
1	Kk				
2	Ee				
3	Aa	Timing for sending code element of signal (B)	DCE→DTE	24	15
4	W	Timing for terminal sending code element of signal (B)	DTE→DCE	3	31
5	S	Sending data (B)	DTE→DCE	21	12
6	M				
7	H	Data terminal ready	DTE→DCE		
8	C	Request for sending	DTE→DCE		
9	Mm				
10	Hh				
11	Cc				
12	Y	Timing for sending code element of signal (A)	DCE→DTE	5	33
13	U	Timing for terminal sending code element of signal (A)	DTE→DCE	22	13
14	P	Sending data (A)	DTE→DCE	2	30
15	K	Local loop test			
16	E	Data device ready	DCE→DTE	27	18
17	A	Rack ground	PGND	1	29
18	Ll				
19	Ff				
20	Bb				
21	X	Timing for receiving code element of signal (B)	DCE→DTE	25	16
22	T	Receiving data (B)	DCE→DTE	4	32
23	N				
24	J	Ringing Indicator	DCE→DTE		
25	D	Allow sending	DCE→DTE	9	37
26	Nn				
27	Jj				
28	Dd				
29	Z				
30	V	Timing for receiving code element of signal (A)	DCE→DTE	6	34
31	R	Receiving data (A)	DCE→DTE	23	14

32	L				
33	F	Receiving line signal test	DCE→DTE	28	19
34	B	Signal ground or public loop	GND	26	17

Attentions:

(1) The corresponding relationships of pins for upper and lower two layers of DB37 are the same, of which 37 core of the lower layer corresponds to the 1st and 2nd channels of V35, and that of the upper layer corresponds to the 3rd and 4th channels of V35.

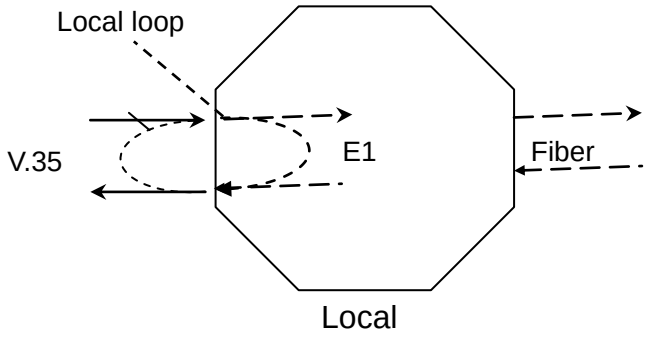
(2) This device, when working as DCE mode of V35, can be directly connected with DTE device. When it is required for device to be connected with DCE device, cross-connection in DCE-to-DCE structure can be made through cross cable. Please specify V.35M-V.35M/0.5M when ordering adapter for connection in tail-to-tail structure.

Pin definitions for cross connection in tail-to-tail structure adapter V.35M-V.35M/0.5M:

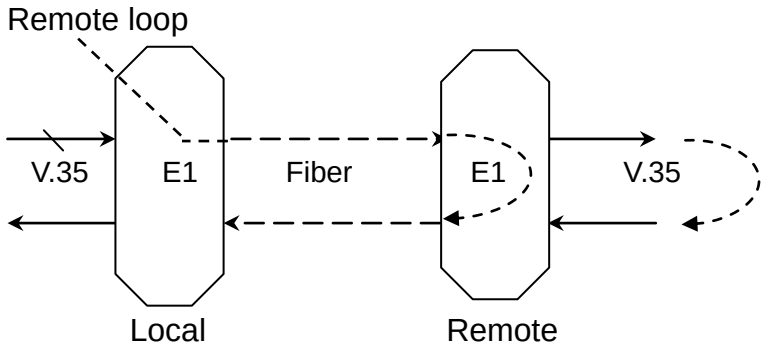
DB34 (Needle) A	Function	DB34 (Needle) B
A	Protective Ground	A
B	Signal Ground	B
P	Sending Data A	R
S	Sending Data B	T
R	Receiving Data A	P
T	Receiving Data B	S
C	Request for Sending	F
D	Clear Sending	D
E	DCE Ready	H
H	DTE Ready	E
F	Data Carrier Detected	C
U	Sending Clock A (From DTE)	V
W	Sending Clock B (From DTE)	X
Y	Sending Clock A (From DCE)	Y

AA	Sending Clock B (From DCE)	AA
V	Receiving Clock A (From DCE)	U
X	Receiving Clock B (From DCE)	W

(3) When maintaining the equipment, the fault can be determined by loop-back. The detailed definition of loop-back is as follows:



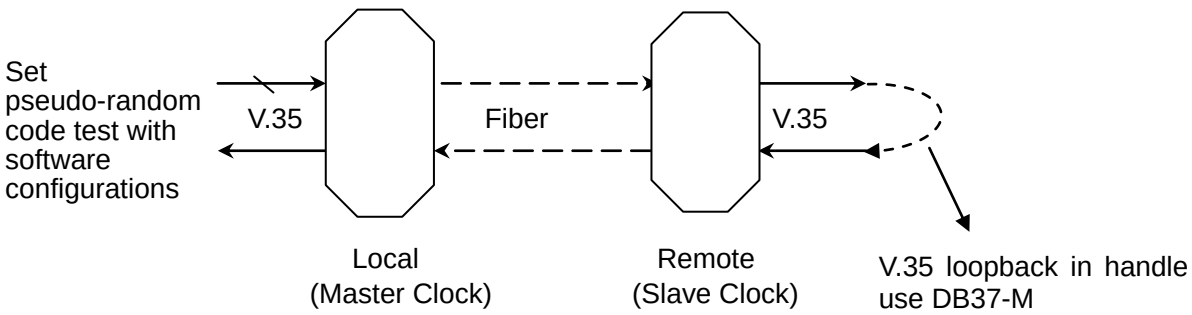
Schematic diagram of local V.35 (E1) loop-back



Schematic diagram of remote V.35 (E1) loop-back

Note: When V.35 time slot being configured to be 2M transparent transmission, the command configuration of the remote V.35 (E1) loop-back will be ineffective.

(4) Pseudo random code test:



Pseudo random code test

The making method of V.35 self-loop connector with straight DB37-M:

The 1st channel of V.35 self loop:

23-2 shorted
4-21 shorted
22-6 shorted
3-25 shorted

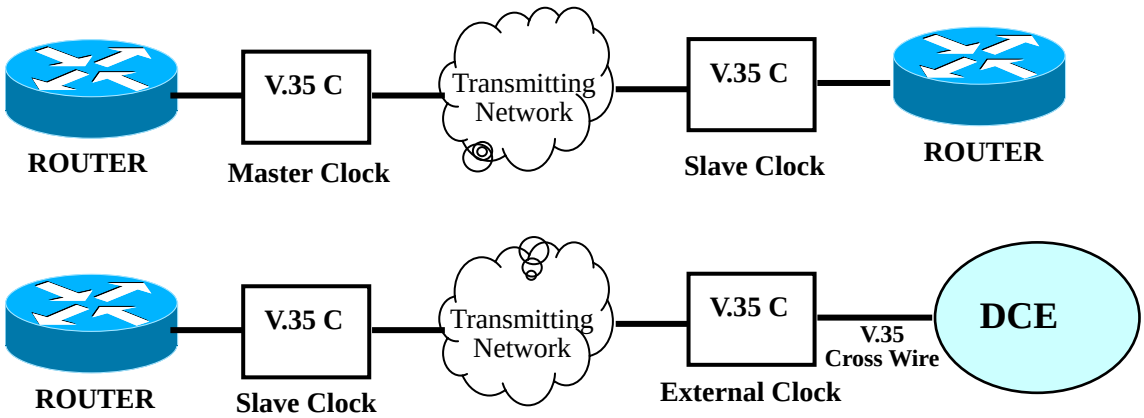
The 2nd channel of V.35 self loop:

14-30 shorted
32-12 shorted
13-34 shorted
31-16 shorted

Timeslot and Clock Setting:

Each V.35 interface can be configured through network management interface, including assignment of timeslots, and clock setting, etc. The ex-work default is 2M transparent transmission and can also be set as customized. It can also be configured via hyper terminal or LCD. See the relevant operation manual for details.

Typical Application Methods:



Attentions:

(1) It must be avoided that all devices use line clock. If it can be

confirmed that there is already a clock provided by device in the line, then all the rest devices shall be set into line clocks, while if it cannot be confirmed that if there is already clock provided by device in the line, then it is to be set as internal clock.

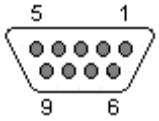
(2) If V.35 interface needs to be butt jointed with DCE device (such as DDN, ATM, HDSL, and V.35 interface of base band MODEM), cross cable is required. If V.35 interface of opposite DCE is set as internal clock, then the rest is to be set as external clock, namely extract clock from V.35 interface.

(3) Preferentially only apply one device in the line to provide clock.

FXO/FXS Voice Channel Interface Card: (Each card contains four or eight channels of FXO/FXS interface: 4(8) ×VOICE)

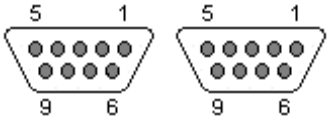
FXO Interface Card, to provide FXO interface connected with switch;
FXS Interface Card, to provide FXS interface connected with ordinary telephone set.

1. DB9 (hole) Interface:



4-Channel FXO/FXS Interface

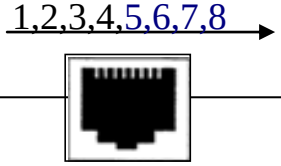
1,2 ： The 1st channel loop audio
3,4 ： The 2nd channel loop audio
5,6 ： The 3rd channel loop audio
7,8 ： The 4th channel loop audio



8-Channel FXO/FXS Interface

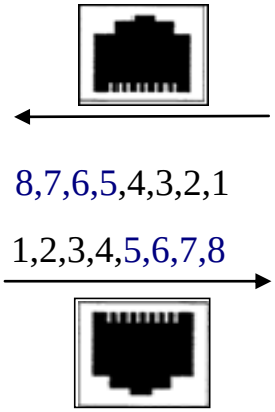
Left DB9： 1,2 ： The 1st channel loop audio
3,4 ： The 2nd channel loop audio
5,6 ： The 3rd channel loop audio
7,8 ： The 4th channel loop audio
Right DB9： 1,2 ： The 5th channel loop audio
3,4 ： The 6th channel loop audio
5,6 ： The 7th channel loop audio
7,8 ： The 8th channel loop audio

2. RJ45 Interface:



4-Channel FXO/FXS Interface

1,2 The 1st Loop Audio
3,4 The 2nd Loop Audio
5,6 The 3rd Loop Audio
7,8 The 4th Loop Audio



8-Channel FXO/FXS Interface

Lower RJ45

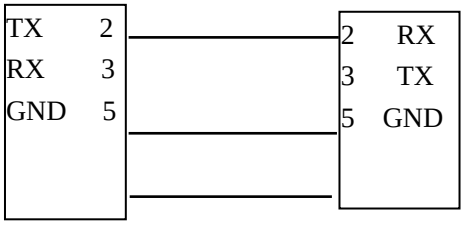
1,2 The 1st Loop Audio
3,4 The 2nd Loop Audio
5,6 The 3rd Loop Audio
7,8 The 4th Loop Audio

Upper RJ45

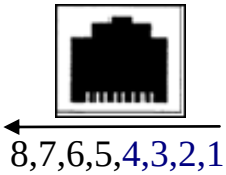
1,2 The 5th Loop Audio
3,4 The 6th Loop Audio
5,6 The 7th Loop Audio
7,8 The 8th Loop Audio

RS232 Interface Cards (4xRS232):

Each card contains four RJ45 interfaces, providing four RS232 serial data ports.



RS232 Interface Card RJ45 PC RS232 Interface DB9



Transmitting Speed: 110~115.2 Kbps

Transmitting Mode: Full Duplex

RS422/RS485 Interface Card (4xRS422/485):

Each card contains four RJ45 interfaces, providing 4 RS422/RS485 data ports.

The definitions of pins are as follows:

RS-422 Interface: 8, 7, 6 and 5 as A(R+), B(R-), Z(T-) and Y(T+) respectively.

RS-485 Interface: 6, 7 shorted as B; 5, 8 shorted as A.

Transmitting Speed: 110~115.2 kbps

Transmitting Mode: Full Duplex / Half Duplex

4. 2. Optical Interface

Optical Source:	LD
Speed of optical interface:	155Mbps
Quantity of interface:	2(work and protection)
Output Power:	≥ -9dBm (dual fiber)
Receiver Type:	PINFET
Receiver Sensitivity:	≤ -35dBm (BER≤ 10^{-11}) (dual fiber)
Type of Optical Connectors:	FC/SC
Focus Wavelength:	1310/1550 nm
Detecting equipment:	optical power meter, etc.
Optional Transmitting Distance:	0~40 km (40~120 km, to be customized)

Provide dual optical interface module allowing hot add/drop, fulfill optical interface switching without error code.

4. 3. Power Supply

Quality module power supply is adopted to allow wide range of voltage fluctuation, strong anti-jamming capacity, good isolation, and stable performance. Separate power supply modules of 220AC~5V, DC-48V and ~5V are supplied for free selection. It supports hot swap of power supply, i.e. the user can replace any one of the power supply modules during online operation.

Input Voltage:	AC 220 V / DC-48 V
Voltage Fluctuation:	165 VAC~265 VAC or -36 VDC~-72 VDC
Power Consumption:	≤40 W (Subject to certain change for configuration of different interfaces)

4. 4. Physical Parameters

Standalone Type (19" 1U):

Dimension: 440 mm(W) × 43.5 mm(H) × 220 mm(D)
Weight: < 6.0 kg
Rack Type: EIA 19" Rack

Chapter 5 Environmental Requirement

The complete appliance is able to work in a wide range of environmental temperature and operate normally and steadily in environmental extremes.

Operating Temperature: -5℃ ~ +40℃

Storage Temperature: -25℃ ~ +55℃

Relative Humidity: ≤ 85% (30℃)

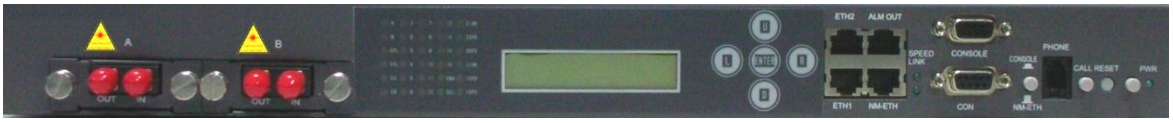
Atmospheric pressure: 70 ~ 106 kPa

No corrosive and solvent gas, and free from flying dust and magnetic-field interference.

Chapter 6 Function Description

The peripheral interfaces of **the AMX32FE** can be divided into optical interface, electrical interface, monitor interface and order wire interface etc based on different functions.

Front panel:



6. 1. Description of optical interface

There are two 1+1 standby optical interfaces on the left of the front panel, optical interfaces A and B. The two optical interfaces can be switched as parallel optical interfaces, or the optical interface A can be set as the main optical interface. In the case of the latter condition, the currently working interface shall be the optical interface A provided that both the optical interfaces A and B are in order.

6. 2. Description of indicators

A: the green indicator of the work of optical interface A. The light on refers to this optical interface in working.

B: the green indicator of the work of optical interface B. The light on refers to this optical interface in working.

OPL: Alarm indication of optical loss at the currently working optical interface; flashing refers to the alarm occurs.

SYL: indication of optical out-of-step at the currently working optical interface; light on refers to the alarm occurs.

E3: indication of a system error code larger than 10^{-3} at the currently working optical interface; light on refers to the alarm occurs.

E6: indication of a system error code larger than 10^{-6} at the currently working optical interface; light on refers to the alarm occurs.

1-16: Red light used to indicate that signal loss has occurred to the 1st to 16th E1 channels. Quick blinking is local loopback, Slow blinking is remote loopback.

RMA: Yellow light used to indicate remote alarm.

CALL: Yellow light used to indicate calling of order wire telephone; alternatively, alarm indication in the case of the optical loss at the unselected optical interface, light on refers to the alarm occurs.

1LINK: Green, indicating the normal connection of the 1st Ethernet interface chain.

1DPX: Green, indicating full duplex or half duplex of the 1st Ethernet interface chain. Light on refers to full duplex, off refers to half duplex.

1SPD: Green, indicating the rate of the 1st Ethernet interface chain to be 10M or 100 M. Light on refers to 100M, off refers to 10M.

2LINK: Green, indicating the normal connection of the 2nd Ethernet interface chain.

2DPX: Green, indicating full duplex or half duplex of the 2nd Ethernet interface chain. Light on refers to full duplex, off refers to half duplex.

2SPD: Green, indicating the rate of the 2nd Ethernet interface chain to be 10M or 100 M. Light on refers to 100M, off refers to 10M.

6. 3. Description of LCD keys

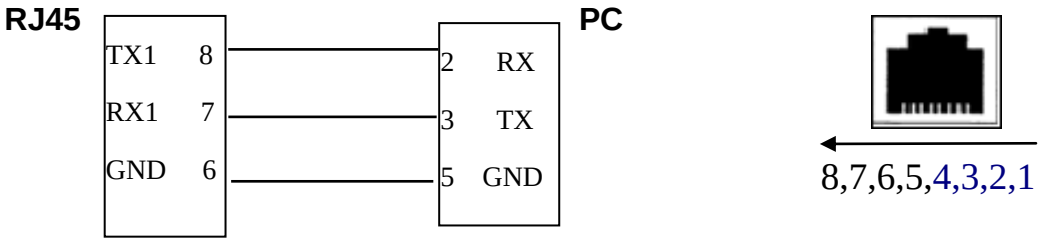
The button “L” is used to exit to the upper level or quit configuration; press the button “R” to enter the submenu. The buttons “U” and “D” are used to select menus in the same level. The button “ENTER” is used to parameter setting or confirmation of parameter setting.

6. 4. Description of 4×RJ45 port

ETH1 stands for the 1st Ethernet data interface; ETH2 stands for the 2nd Ethernet data interface; ALM OUT stands for alarm output or RS232 data channel. NM-ETH stands for 10M/100M Ethernet network management interface; green SPEED light on refers to 100M, light-off refers to 10M; green LINK light on refers to 100M, light-off refers to 10M.

Note: All Ethernet Port need use cross network cable to connect with PC.

Data Channel Interface (RS232): (to be customized)



The typical configuration description of the data format of RS232:
Bit rate: below 19200bps auto-negotiating
Data bit: 8, 7, 6 and 5 auto-negotiating
Stop bit: 1, 1.5 and 2 auto-negotiating
Check bit: auto-negotiating
Flow control: no/software

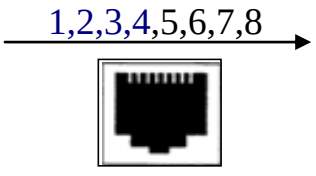
Alarm Output Terminal Interface *(Optional)*:

The interface refers to RJ45 on the ALM OUT of the rear panel.
Alarm modes that users can choose include electrical level output alarm or relay output alarm (optional only one). Electrical level output alarm can send alarm signals to alarm disc on the rack directly for output. Relay output alarm can effectively isolate the equipment and avoid the alarm disc from electrical interferences.

Electrical level output alarm: Alarms are accompanied by output of local general alarm (RJ45-4PIN) and remote general alarm (RJ45-2PIN). Low electrical level will be found when there is alarm output, and electrical level is +5V when there is no alarm output.
The equipment provides ground GND (RJ45-3PIN) output at the same time.

Relay output alarm:

RJ45-1PIN RGL+ (Remote alarm output +)
RJ45-2PIN RGL- (Remote alarm output -)
RJ45-3PIN LGL+ (Local alarm output +)
RJ45-4PIN LGL- (Local alarm output -)



When there is remote alarm, connect RGL+ and RGL- in short circuit.
When there is local alarm, connect LGL+ and LGL- in short circuit. When

there is no alarm, cut off the above connections.

6. 5. HyperTerminal(CONSOLE/CON)

The dual-layer DB9 hole refers to the HyperTerminal interface of RS232 interface. The upper one is HyperTerminal of the equipment (CONSOLE), and the lower DB9 hole is the Hyper Terminal of network management (CON), as standby. In order to apply HyperTerminal, connect the interface with computers via one crosswire with male DB9 (2, 3, 5) at one end and female DB9 (3, 2, 5) at the other.

HyperTerminal Interface(CONSOLE): HyperTerminal software can be used for the interface. To apply this interface to configure the equipment, press the right switching button CONSOLE/NM-ETH at its left. With CONSOLE/NM-ETH pushed down, NM-ETH Ethernet interface will disconnect with the equipment and the equipment will be off line. That is to say, if CONSOLE/NM-ETH pressed down, the equipment will be off line. Only with the button released back to NM-ETH, can the SNMP interface of NM-ETH work.

Note: Whenever CONSOLE/NM-ETH is pushed down, the equipment will be off line.

Properties of COM interface:
“Bit/second”: 19200
“Data bit”: 8
“Parity”: none
“Stop bit”: 1
“Data flow control”: none
Defaulted enter password: 123456

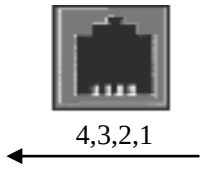
6. 6. Description of button

CONSOLE/NM-ETH is used to switch Hyper Terminal and Ethernet network management interface. Push it down to use HyperTerminal; release it to switch to Ethernet network management interface.

6. 7. PHONE at order wire phone interface *(optional)*

The equipment can supply a line of order wire phone to facilitate the connection between debug and maintenance equipments and the central equipment room. Press the button CALL down to call the opposite end, keep it pushed down during calling; release the button CALL to hang up or hold on.

The definition of pins is as follows:



1: VOICE OUT
2: GND
3: VOICE IN
4: GND

6. 8. RESET

The button is a push button. Being pressed once refers to reset the whole configuration. Be cautious to use this button!

6. 9. Power indicator

PWR, green, light-on refers to normal working.

6. 10. Back panel

Power supply：

AC220V or DC48V, 1+1 redundant standby power supply, to be replaceable externally.

Service slots：

Four optional interface boards, I, II, III and IV.

6. 11. Bottom Board Preset Holes

There is a 4-digit patch switch inside the 4 small rectangular holes on the bottom board of equipment.

I) When the plug-in interface board is G.703 (4×E1) interface board, the switch is used as impedance match for E1 interface. The switch is set up as per ordering instructions at the ex-work time. ***(Attention: External adapter must be corresponding!)***

1 (The 1st E1)		2 (The 2nd E1)		3 (The 3rd E1)		4 (The 4th E1)	
ON	OFF	ON	OFF	ON	OFF	ON	OFF
75Ω	120Ω	75Ω	120Ω	75Ω	120Ω	75Ω	120Ω

II) When the plug-in interface board is 2×V.35, the switch is used as the clock setup for V.35 interface.

1	2			3	4	

ON	ON	2 V.35 clocks in anti-phase		ON	ON	2 V.35 master clocks
ON	OFF	The 1st V.35 clock in anti-phase		ON	OFF	2 V.35 external clocks
OFF	ON	The 2nd V.35 clock in anti-phase		OFF	ON	
OFF	OFF	Neither of the two V.35 clocks in anti-phase		OFF	OFF	2 V.35 slave clocks

III) When 4×RS422/485 interface board is plugged in, the switch is used for option of RS422/RS485.

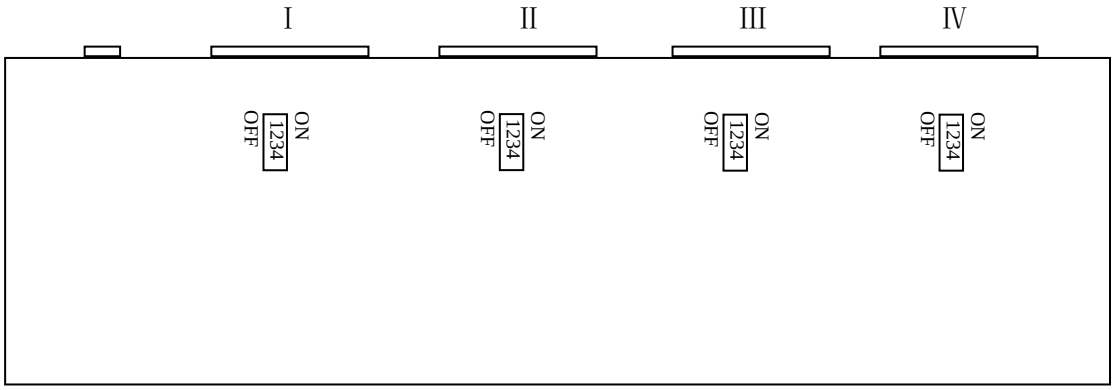
1 (The 1st Interface)		2 (The 2nd Interface)		3 (The 3rd Interface)		4 (The 4th Interface)	
ON	OFF	ON	OFF	ON	OFF	ON	OFF
RS485	RS422	RS485	RS422	RS485	RS422	RS485	RS422

IV) When 2M Ethernet interface board is plugged in, the switch is used for setting up watchdog and speed of Ethernet interface.

The 1st Switch	ON	Watchdog Disabled	
	OFF	Watchdog Enabled	
The 2nd Switch	**The 3rd Switch**	**The 4th Switch**	**Ethernet Setup**
ON	ON	ON	Auto Negotiation
OFF	OFF	OFF	10M, Half-Duplex
OFF	ON	OFF	10M，Full-Duplex
ON	OFF	OFF	100M, Half-Duplex

ON	ON	OFF	100M, Full-Duplex

V) When other interface boards are plugged in, the 4-digit patch switch would possibly be invisible.



Chapter 7 Installation of Optical Multiplexer

7. 1. Equipment Package and Appearance Check

1) After equipment arrives, first check if its external packing is damaged or not. Contact the After-Service Department of our Company at once if there is any serious damage, for timely solutions.
2) After the equipment is unpacked, check it as per packing list. Please contact the installers or the After-Service Department of our Company directly, if any damage is found with exterior of the machine frame, for timely replacement.
3) The equipments can only be used in pairs. Consistent configuration must be guaranteed before they are put into use.

7. 2. Equipment Room and Grounding

1) The machine room should be arranged to facilitate movement of people and equipment.

2) It should be in a dry, neat, and well ventilated surrounding environment.
3) Necessary anti-static measures shall be taken during installation, application, and maintenance of the equipment. Therefore, the casing should be grounded, to strengthen its anti-inference and thunder-proof capacity. Separately set working ground and protection ground should be provided prior to use of equipment, and a satisfactory grounding system shall be ensured.

7. 3. Installation of Equipment

1) Fix the equipment in the machine frame (rack).
2) Check the fuse holder to make sure that it is in tact.
3) Protective grounds of the equipment and the equipment room should be well connected.
4) Connect with optical fiber. Check whether the end of optical fiber is clean first. Insert the FC/SC fiber jumper, and then screw the fiber jacket gently (radius of bending curvature of the fiber should be equal to or larger than 50mm).
5) Connect signal cables in turn, and then turn on all the branch alarm signals.
6) Proceed with the following procedures after the completion of the above operations: Select the corresponding receptacle and connect with the power supply according to those provided by the equipment.
7) Before the equipment is used, independent protective ground should be provided and well earthed. It should also be connected properly with protective ground. A simple and convenient installation is now completed.

7. 4. Installation Precautions

1) Avoid intense vibration and mechanical damage with equipment during shipment and installation.
2) Pay attention to rational optical fiber arrangement inside the machine room, the radius of fiber curvature shall be ≥ 50mm.
3) Carefully check if voltage value and polarities accord with marks on the rear panel before equipment is energized. Otherwise, the equipment could be subject to irremediable damages!
4) Optical connectors are not to be polluted and fiber optic splices shall be gently scrubbed with alcohol prior to use; otherwise, transmission effect would be influenced. If optical connectors are not butt jointed and aligned properly, it could lead to relative substantial power attenuation. Pay attention to adjusting optical connectors as per actual situation.
5) In the case of dual optical interface, the optical ports A and B at the local end shall be connected with the optical ports A and B at the remote end correspondingly and the optical interface A shall be taken as master optical interface. In the case of single optical interface, the butt connection of optical ports A shall be applied.

Chapter 8 Application and Maintenance

8. 1. Power Supply Requirement

Only two kinds of power supply are applicable for the product: AC 50Hz, 220V or DC -48V.

8. 2. Precautions Prior to Startup

Based on the description in *Chapter VII*, after the optical multiplexer is installed, please carefully read the following three points before power on the equipment:

1) Prior to startup, make sure that the pushbutton of CONSOLE/NM-ETH on the panel is released. Otherwise the equipment shall not be started.
2) After startup, the button CONSOLE/NM-ETH shall be released in order to apply SNMP network management.
3) The optical multiplexer can be put into normal work about 5 seconds later after startup for procedure initialization.
4) After normal startup, NM-ETH port of the optical multiplexer can be used; If RS232 Hyper Terminal of the optical multiplexer is to be used, the pushbutton of CONSOLE/NM-ETH on the panel shall be pushed down.

8. 3. Description about Application

As in the example of 220V power supply, 8×E1, 8×V.35, one channel of Ethernet (in 10M half-duplex status):

Have the equipment installed, and after confirming that power supply socket is well grounded, proceed with operation as per following steps:

1) Connect with 220 power supply
2) Ensure that the pushbutton CONSOLE/NM-ETH on the panel is released, open the switch for power supply and the power supply indicator (PWR) turns on, indicating that voltage is normal.
3) Connect with fiber; first check if optical fiber head is clean or not. Scrub it gently with industrial alcohol if not clean. When FC/SC fiber jumper is inserted, align fiber connector properly. Then gently screw down the fiber jacket (radius of the fiber bending curvature to be ≥ 50mm). At this point, the OPL lamp turns off, indicating that this equipment has received optical signal from opposite end.

Avoid by all means to look directly into the fiber jack from a close distance.

Connect with 2M signal line: open all the alarm signals of 8 bypasses, namely dial downward the MASK to set into not masking E1 Bypass Alarm. Plug in IN1, 2, 3, 4 in turn, and their corresponding relationship is: IN1-OUT1，IN2-OUT2，IN3-OUT3，IN4-OUT4. At the time of startup, if the 4 alarming lamps of E1L1, E1L2, E1L3, E1L4 turn out successively, it indicates that all the 2M bypass signals have entered the optical multiplexer.

8. 4. Maintenance of Equipment

1) The equipment has been adjusted to the optimum state before leaving the factory. All the functional interfaces are located on the front and rear panels. Only professional technicians are allowed to open the enclosure with relevant approval.
2) In the case the equipment runs into a fault, analyze the possible cause based on the fault indicators, otherwise, self loop the single unit to determine the fault range, and contact your local arcutronix sales representative for a solution.

Chapter 9 Fault Diagnosis

Once an alarm occurs, the cause location shall be judged above all based on the alarm indication on the panel. Distinguish whether it is an equipment fault or a circuit fault, and then obtain a corresponding solution.

1. Power supply fault

Phenomenon	Cause	Diagnosis and solution

Abnormal Power supply	The power supply does not comply with the requirement	Check the power supply for the conformance with the requirement
	The power supply switch has not been on	Switch on the power supply switch
	The power supply connection is disconnected or poor connected	Replace the power supply connection
	The fuse in the power socket is broken	Replace the fuse

Alarm:

- The fuse is in the power socket.
- The power shall be switched off when replacing the fuse.
- Open the case and replace with a fuse of same specification.

2. Fault of electrical interface (E1 or V.35)

Phenomenon	Cause	Diagnosis and solution
Alarm of E1 or V.35 interface	Fault taken place on the line, E1 or V.35 interface board or multiplexer	Connect with a self-loop connector, if normal, the line is free of fault; if abnormal, either E1/V.35 interface board or multiplexer fails

Note: the making method of self-loop connector for electrical interface (E1 or V.35).

3. Fault of optical interface

Phenomenon	Cause	Diagnosis and solution
Optical loss alarm at both ends	If the self-loop check at two ends are normal, the transmission fiber-optic connection is free of fault; if the optical loss alarm remains, the	Replace the transmission fiber-optic, or check out the fault point with optical time-domain reflector and repair the fault of the transmission fiber-optic

	transmission fiber-optic fails	
One end is normal, while optical loss alarm occurs at the other end	Self loop the two ends respectively, one end is normal, the other end emits an alarm, which shows the fault end	Replace the equipment or measure the optical power, or contact with the supplier for repair

4. Fault of call

Phenomenon	Cause	Diagnosis and solution
two big noise	weak optical signal	Measure the optical power
Disconnection	line disconnection or order wire fault	Replace the telephone set or repair the order wire

Note: When measuring the optical power, the ALS function shall be switched off.

(Please refer to the ALS configuration of LCD part)

Chapter 10 Operation Manual of LCD

10. 1. Description of menu system

The key-press “L” is used to go back to the upper menu or quit setting; “R” to enter the submenu. The key-presses “U” and “D” are to select menus in the same level. The key-press “ENTER” is for parameter setting or confirmation of parameter setting.

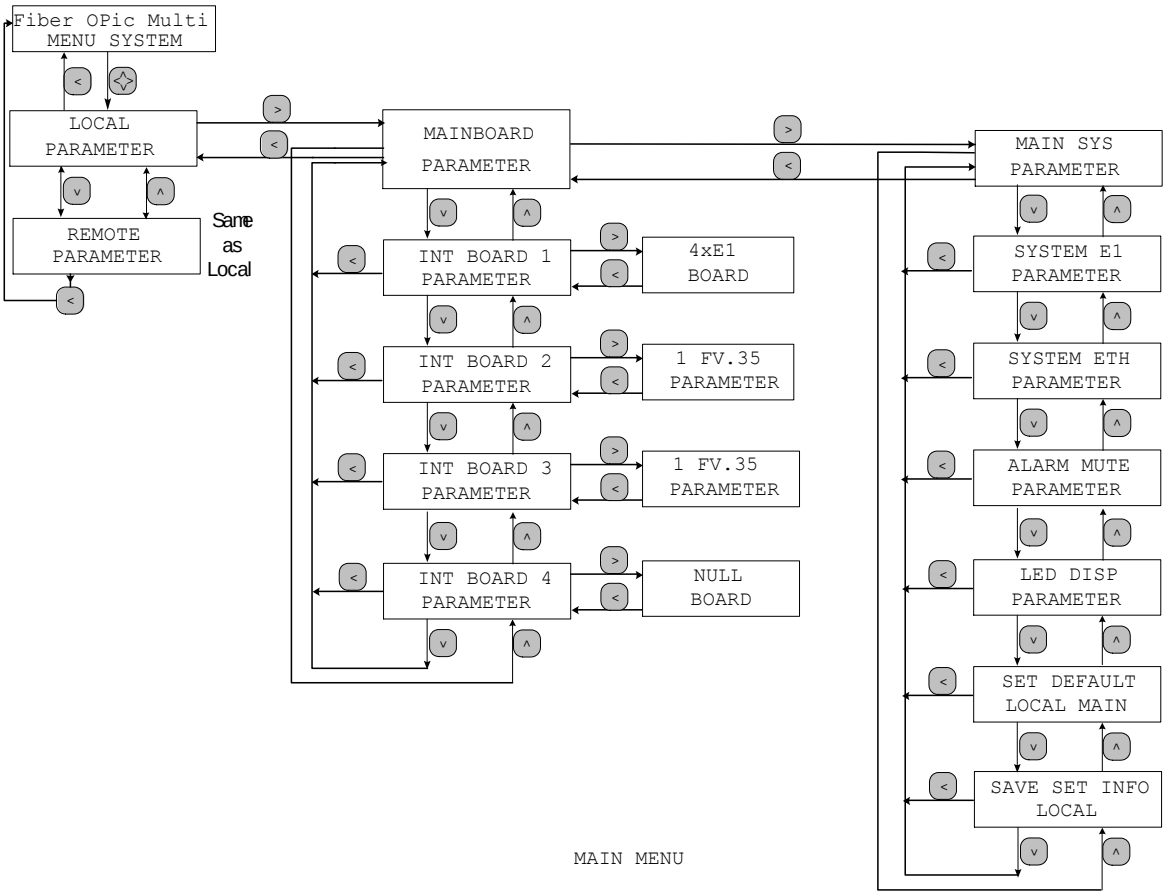
Menu system: upon the system is energized, the system will be initialized for approximately four seconds, and then enter the uppest level of the menu system: “Fiber Opti Multi | MENU SYSTEM”. Now press “L” or “R” or “U” or “D” to enter the menu for query and setting. Provided that

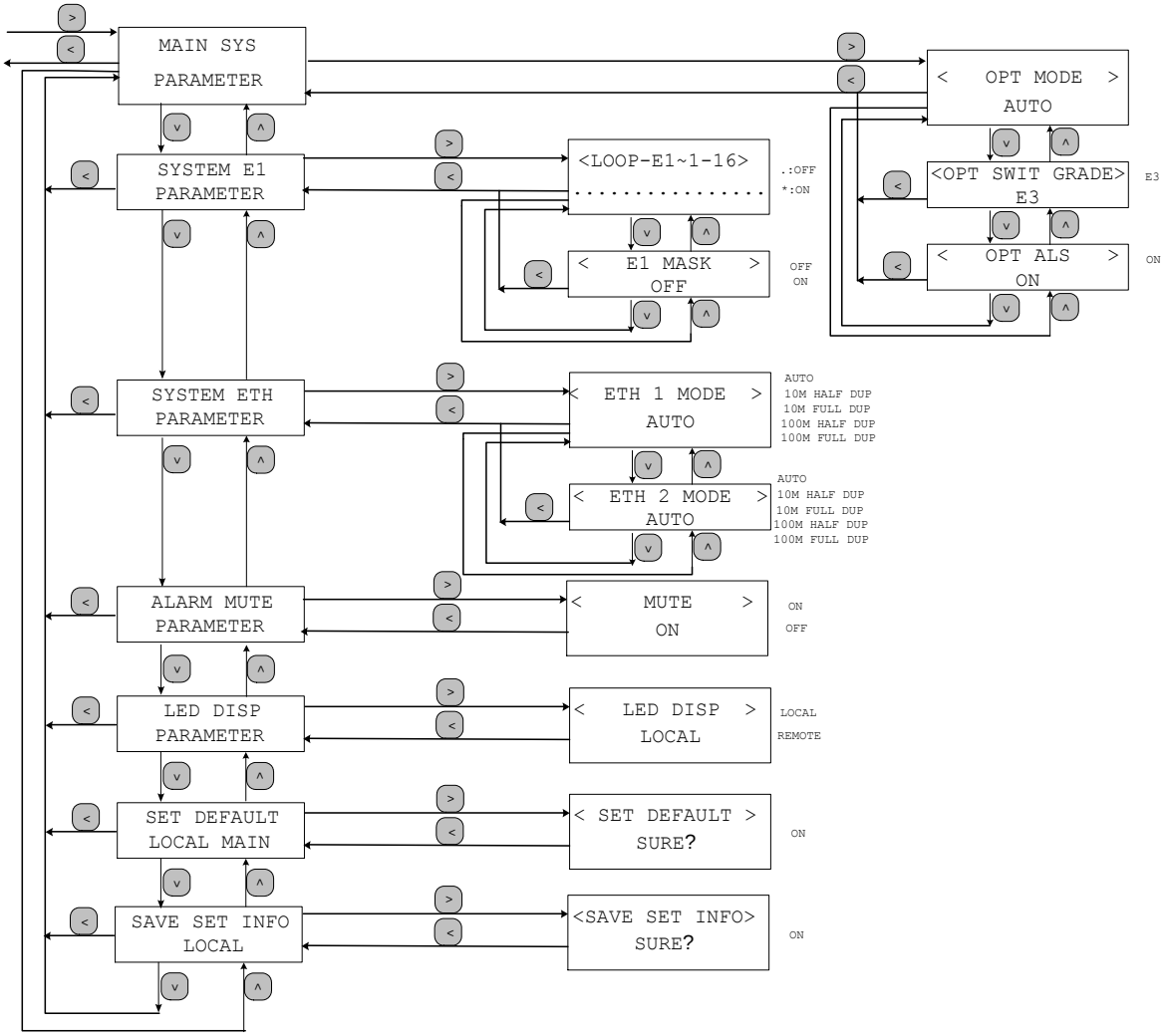
no key is pressed after 2 minutes and 25 seconds, the screen will go back to the uppest level of the menu system: “Fiber Opti Multi | MENU SYSTEM”.

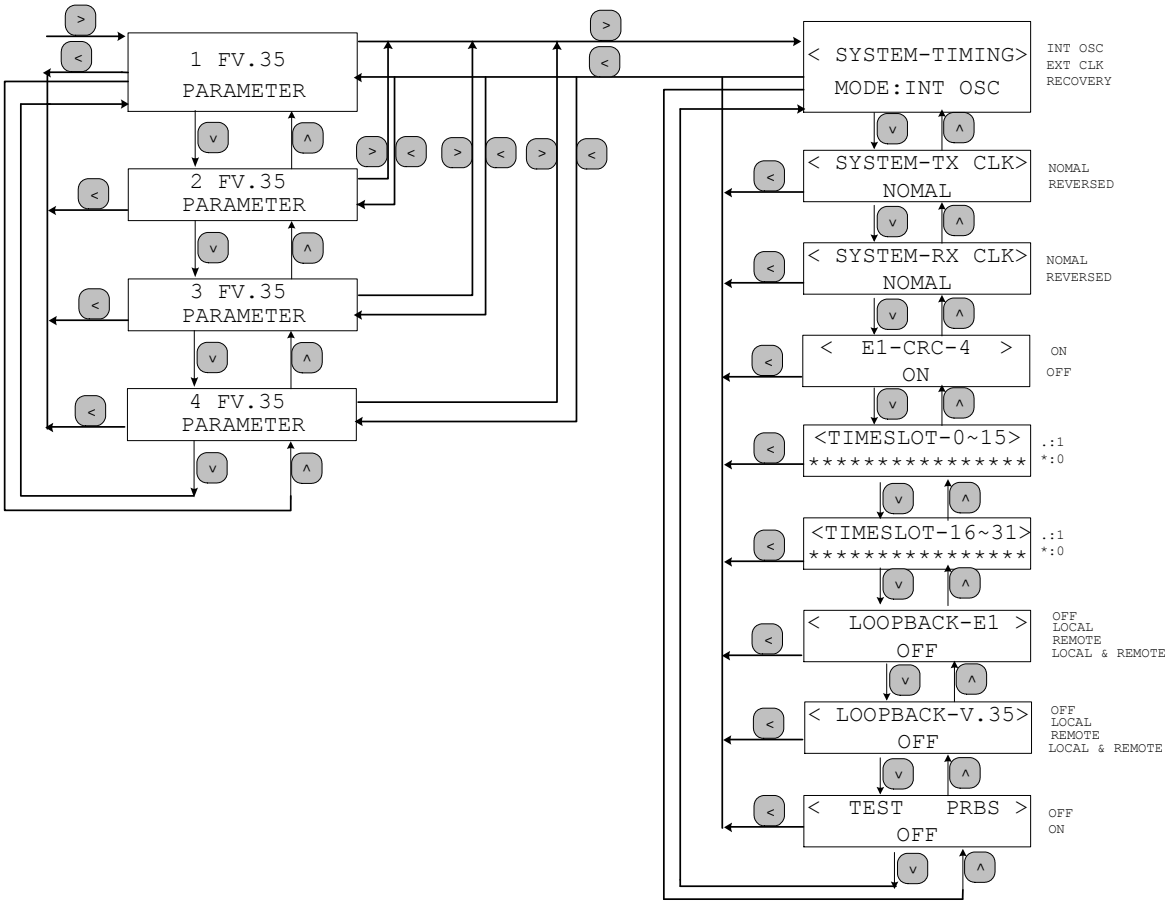
When the screen displays <***>| ***, press “ENTER” to enter for setting. When the screen displays ***| <***>, use “U” or “D” to select the parameter value and confirm the setting. The screen will go back to <***>| *** if the key “ENTER” is pressed again, when it allows to query whether the setting succeeds or not.

When the screen displays <***>| ***, the status of *** on the second line of the menu is the running status of the device.

The detailed operation flow chart of the menu system of Fiber Optic Multiplexer (FOM) is shown as follows:




MAIN SYS
PARAMETER
SYSTEM E1
PARAMETER
SYSTEM ETH
PARAMETER
ALARM MUTE
PARAMETER
LED DISP
PARAMETER
SET DEFAULT
LOCAL MAIN
SAVE SET INFO
LOCAL
<LOOP-E1~1-16>
. . . . . .
.:OFF
*:ON
< E1 MASK >
OFF
OFF
ON
< OPT MODE >
AUTO
<OPT SWIT GRADE>
E3
E3
< OPT ALS >
ON
ON
< ETH 1 MODE >
AUTO
AUTO
10M HALF DUP
10M FULL DUP
100M HALF DUP
100M FULL DUP
< ETH 2 MODE >
AUTO
AUTO
10M HALF DUP
10M FULL DUP
100M HALF DUP
100M FULL DUP
< MUTE >
ON
ON
OFF
< LED DISP >
LOCAL
LOCAL
REMOTE
< SET DEFAULT >
SURE?
ON
<SAVE SET INFO>
SURE?
ON



FV.35 MENU

Example: the steps to set the speed of the 4th channel of V.35 basic framing transmission (i.e. PCM31, CCS) on the 4th interface board (4xFV.35 interface board) of the remote device to be 31*64=1984Kbps

1. Press “L” or “R” or “U” or “D” to enter LOCAL|PARAMETER;
2. Press “U” or ”D” to enter REMOTE|PARAMETER;
3. Press “R” to enter MAINBOARD|PARAMETER;
4. Press “U” to enter INT BOARD 4|PARAMETER;
5. Press “R” to enter 1 FV.35|PARAMETER;
6. Press “U” to enter 4 FV.35|PARAMETER;
7. Press “R” to enter <SYSTEM-TIMING>|MODE:INT OSC;
8. Press “D” to enter <SYSTEM-TX CLK>|NORMAL;
9. Press “D” to enter <SYSTEM-RX CLK>|NORMAL;
10. Press “D” to enter <E1-CRC-4>|ON;
11. Press “D” to enter <TIMESLOT-0-15>|…….;
12. Press “ENTER” to enter TIMESLOT-0-15|…….;

13. Press “R” to move the cursor to the right, and associatively use the key “U” or “D” to select “*” or “.”. “*” refers to select the time slot, “.” means not to select the time slot. Use “U” or “D” to switch between “*” and “.”. the setting result of time slot is: TIMESLOT-0-15|.**********;
14. Press “ENTER” again to enter <TIMESLOT-0-15>|.**********; the setting of 0-15 time slots is finished.
15. Press “D” to enter <TIMESLOT-16-31>|…….;
16. Press “ENTER” to enter TIMESLOT-16-31|…….;
17. Press “R” to move the cursor to the right, and associatively use the key “U” or “D” to select “*” or “.”. “*” refers to select the time slot, “.” means not to select the time slot. Use “U” or “D” to switch between “*” and “.”. the setting result of time slot is: TIMESLOT-16-31|**********;
18. Press “ENTER” again to enter <TIMESLOT-16-31>|**********; the setting of 16-31 time slots is finished.
19. Press the key “L” all the time to go back to the uppest level of the menu system: “Fiber Opti Multi | MENU SYSTEM”.

Chapter 11 Management Manual of HyperTerminal Network

11. 1. Utilization of HyperTerminal at CONSOLE interface on the front panel

Function: query and configure the equipment states

I>. Notes for Application:

1, All commands shall be described in small letters;

2, Input the commands in strict accordance with the command format, including the spaces contained in the commands.

3, In the case of wrong input when inputting a command in the HyperTerminal, press Enter to cancel and repeat the input, or use Backspace to erase.

4, If the user cannot remember a command clearly, input "help" following the command prompt (>).

5, If the set command is correct, the device will return with a message "O.K.". In the case of query, the queried information will be returned directly. Provided with an incorrect command, no message returns.

6, The setting of PC HyperTerminal: 19200bps, 8-bit data bit, 1 stop bit, no parity bit; flow control: NO.

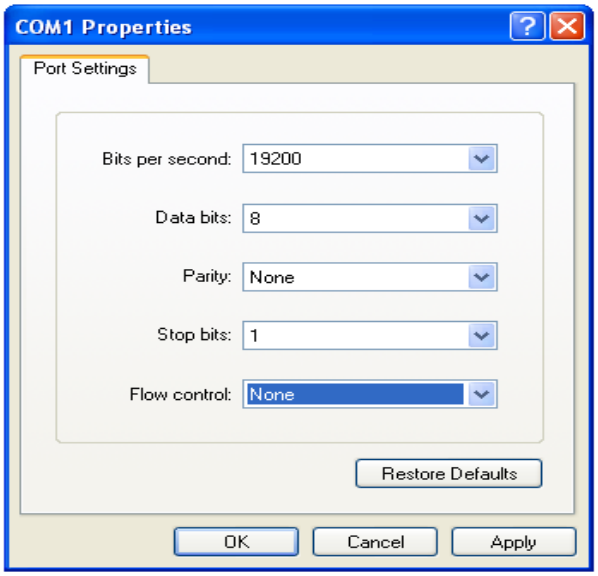
7, The description of the button CONSOLE/NM-ETH: being pressed down refers to CONSOLE。

Note: Not to press down before start up!

8, The connection between HyperTerminal and PC: RS232 crosswire (straight B9M to DB9F)

II>. Setting Process of HyperTerminal Interface:

1, The properties setting of COM port:



2. After enter HyperTerminal, open the menu (File) --------> Properties, the below window pops up. Set according to the window instruction, and enter "Confirm" reenter the HyperTerminal interface.

III>. Usage of Commands

a> <u>Get information command</u>

1. getlinfo: to query the local mainboard information of the device.

E.g.: \>getlinfo↙

2. getrinfo: to query the remote mainboard information of the device.

E.g.: \>getrinfo↙

3. getlinfo [1/2/3/4 boards] fv.35: to query the local fv.35 daughter board information of the device.

E.g.: \>getlinfo 1 fv.35↙ refers to query the information of the first daughter board. If the first daughter board is not fv.35 daughter board, no response will occur.

4. getrinfo [1/2/3/4 boards] fv.35: to query the remote fv.35 daughter board information of the device.

E.g.: \>getrinfo 1 fv.35↙ refers to query the information of the first daughter board. If the first daughter board is not fv.35 daughter board, no response will occur.

b> <u>Set information command</u>

5. setl(r)mainsys + : to set the information of local mainboard

setlmainsys+space+lop(loop back)+space+o(f) +00~15 +[space+ 00~15+space + 00~15 +space + 00~15]

E.g.:

>setlmainsys lop o 01↙ to set the 1st channel of local 2M to loop back

>setlmainsys lop f 01↙ to cancel the loopback of the 1st channel of local 2M

>setrmainsys lop o 01↙ to set the 1st channel of remote 2M to loop back

>setlmainsys lop o 01 03 12 06↙ to set the 1st, 3rd, 6th and 12th channels of 2M to loop back

>setlmainsys lop f 01 03 12 06↙ to cancel the loopback of the 1st, 3rd, 6th and 12th channels of 2M

<Note: the command can support up to four random channels of 2M once. "O" means enable, i.e. on, "f" means disable, i.e. off; "setl" refers to set local, and "setr" refers to remote >

setl(r)mainsys+space+lop(loop back)+space+o(f) al

For example:

> setlmainsys lop o al↙ to set the local all loopback

>setlmainsys lop f al ↙ to cancel all loopback of the local

> setrmainsys lop o al ↙ to set the remote all loopback

> setrmainsys lop f al ↙ to cancel all loopback of the remote

setl(r)mainsys+space+msk(to mask the unused E1 alarm) +o(f)(ON or OFF)

E.g.:

>setlmainsys msk o↙ to set the local to mask the unused E1 alarm

>setlmainsys msk f↙ to cancel the mask of unused E1 alarm of the local

>setrmainsys msk o↙ to set the remote to mask the unused E1 alarm

>setrmainsys msk f↙ to cancel the mask of unused E1 alarm of the remote

setl(r)mainsys+space+als(automatic optical shutoff) +o(f)(ON or OFF)

E.g.:

>setlmainsys als o↙ to set local ALS function enabled

>setlmainsys als f↙ to disable the local ALS function

>setrmainsys als o↙ to set remote ALS function enabled

>setrmainsys als f↙ to disable the remote ALS function

setl(r)mainsys+space+f-b(compulsory optical interface B)

E.g.:

>setlmainsys f-b↙

>setrmainsys f-b↙

setl(r)mainsys+space+f-a(compulsory optical interface A)

E.g.:

>setlmainsys f-a↙

>setrmainsys f-a↙

setl(r)mainsys+space+aut(auto-switching)

E.g.:

>setlmainsys aut↙

>setrmainsys aut↙

setl(r)mainsys+space+aut(auto-switching)+space+a(preferential switching)

E.g.:

>setlmainsys aut a↙

>setrmainsys aut a↙

setl(r)mainsys+space+grd(auto-switching grade)+space+e-3(e3 error code switching)

E.g.:

>setlmainsys grd e-3↙

>setrmainsys grd e-3↙

setl(r)mainsys+space+grd(auto-switching grade)+space+e-6(e6 error code switching)

E.g.:

>setlmainsys grd e-6↙

>setrmainsys grd e-6↙

setl(r)mainsys+space+mut(mute) +o(f)(ON or OFF)
E.g.:
>setlmainsys mut o↙
>setrmainsys mut o↙

setl(r)fv.35 + : to set the information of the local 4(2)xFV.35.
Setl(r)fv.35+space+1-4 (1-4 pieces of plugged boards) +space+1-4 (1-4 channels of V.35) +clk(clock)+space+
mclk(sclk eclk) master clock (slave clock, external clock)
rdcr(receiving data clock reversal) rdcp(receiving data clock positive)
crco(crc-4 ON)
crcf(crc-4 OFF)
E.g.: \>setlfv.35 1 1 clk mclk↙
E.g.: \>setlfv.35 1 1 clk rdcr↙
E.g.: \>setlfv.35 1 1 clk crco↙

setl(r)fv.35+space+1-4 (1-4 pieces of plugged boards) +space+1-4 (1-4 channels of V.35) +lop(loop back)+space+
lvlo(local v.35 loopback ON)
lvlf(local v.35 loopback OFF)
rvlo(remote v.35 loopback ON)
rvlf(remote v.35 loopback OFF)
lelo(local e1 loopback ON)
lelf(local e1 loopback OFF)
relo(remote e1 loopback ON)
relf(remote e1 loopback OFF)
E.g.: \>setlfv.35 1 1 lop lvlo↙
E.g.: \>setlfv.35 1 1 lop lelo↙

setl(r)fv.35+space+1-4 (1-4 pieces of plugged boards) +space+1-4 (1-4 channels of V.35) +slt(timeslot)+space+ 4/3/2/1 + s7s6s5s4s3s2s1s0
s31-s0 might be either 0 or 1.
The corresponding E1 of V.35 has three working status (0＝timeslot selected, 1＝timeslot unselected):

1. 2M transparent transmission (for either of the two situations): (1) the timeslots of s0 and s16 are set as 0 (ON); (2) all timeslots are set as 1 (OFF),

as defaulted;

2. Basic frame transmission (i.e. PCM31, CCS): s0 timeslot is set as 1 (OFF), one or more other timeslots are selected;
3. Multiple frame transmission (i.e. PCM30, CAS): s0 timeslot is set as 0 (ON) and s16 timeslot is set as 1 (OFF).

E.g.:

>setlfv.35 1 1 slt 4 11110000↙ to set the upper 8 timeslots of the first channel of the first plugged board FV.35, i.e. s31~s24

>setlfv.35 1 1 slt 3 11110000↙ to set the middle 8 timeslots of the first channel of the first plugged board FV.35, i.e. s23~s16

>setlfv.35 1 1 slt 2 11110000↙ to set the lower 8 timeslots of the first channel of the first plugged board FV.35, i.e. s15~s8

>setlfv.35 1 1 slt 1 11110000↙to set the lowest 8 timeslots of the first channel of the first plugged board FV.35, i.e. s7~s0

Command to save the information:

setl(r)save save the local/remote configured information

Command to configure Ethernet:

setl(r)mainsys eth vlan 1[2]

1 → enable

2 → diable

setl(r)mainsys eth spd 1/2 0/1/2/3/4

0 -> Cancel the configuration

1 -> 1M; 2 -> 2M; 3 ->10M

4 -> 50M;

setl(r)mainsys eth forc 1/2 0/1/2/3/4

1/2 → port1 or port2

0/1/2/3/4 →Auto-negotiating/100M full duplex/100M half duplex /10M full duplex/10M half duplex

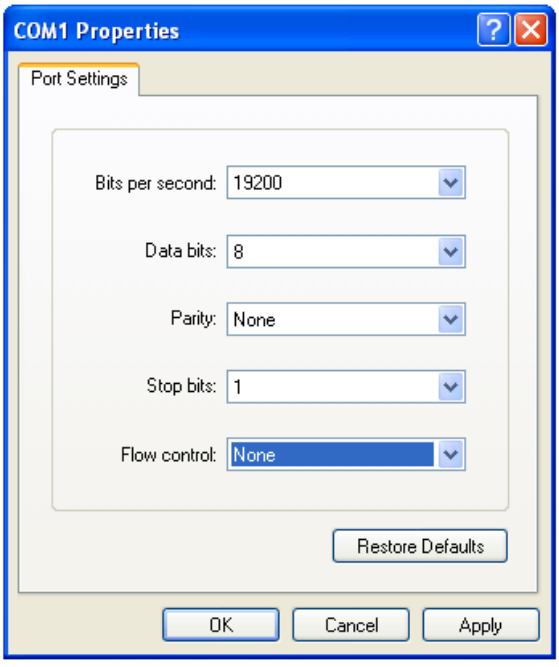
Note: When using the command getl(r)info, the indicated Ethernet message shall be corresponding to this.

11. 2. Utilization of HyperTerminal of CON interface on the front panel

Function: to configure the SNMP Ethernet interface (NM-ETH).

§11.2.1 The following operation shall be performed with the power being off.

1. Prepare a RS 232 crossover line and connect it with the CON on the front panel.
2. Open the configuration view of the HyperTerminal software as shown below:



3. Switch on the power

4. Knock on the key "ENTER" within 5-6 seconds to enter the configuration interface, otherwise, linux will be started up to enter into the running state so that the configuration cannot be performed.
5. Input the password 123456↵
6. The prompt \> appears

§11.2.2 The following operation shall be performed with the power being on

a) Prepare a RS232 crossover line and connect it with the CON on the front panel.

1. Open the configuration view of HyperTerminal software as shown below:
2. Press down the button RESET and release it again.
3. Knock on the key "ENTER" within 5-6 seconds to enter the configuration interface, otherwise, linux will be started up to enter into the running state so that the configuration cannot be performed.
4. Input the password 123456↵
5. The prompt \> appears

§11.2.3 Interpretation and samples of commands:

After correctly entering HyperTerminal, the following commands can be input:

help↵ : help command

boot↵ : Startup command, i.e. to start up the agent and enter the running state.

Ipcfg : Query and modify the IP address of agent. Normally it is used to set the IP address of agent.
Query: Simply input ipcfg↵
Modify: Input ipcfg ＊.＊.＊.＊
To modify the address to 192.168.0.101, it shall input: ipcfg 192.168.0.101

setdevip : Query/modify the IP address of monitoring PC.
setdevip –l to indicate the IP address of nine

monitoring PCs;

setdevip –M[I] To modify the IP address of nine monitoring PCs, the parameter I can be applied to modify a single address.

Note: The IP address shall ensure the location in the same network segment as the computer.

setpswd ： Modify the startup password. The effective length shall be less than 12 bytes.

setbaud ： Query and modify the transmission speed.

Query: Simply input setbaud;

Modfiy: When the baud rate set at 19200, input setbaud 1;When the baud rate set at 9600, input setbaud 0

setmask ： Query/modify the subnet mask of the agent. Normally it is used to set the mask.

Query: Simple input setmask↵

Modify: input setmask ＊.＊.＊.＊↵

To change to 255.255.255.0, simply input setmask 255.255.255.0

setgate ： Query and modify the gateway address of the agent. In the case of trans-segment, the command is used to set gateway.

Query: Simple input setgate↵

Modify: input setgate ＊.＊.＊.＊↵

To change to 192.168.0.1, simply input setgate 192.168.0.1

setname: Set a name of a byte amount no more than 20, to facilitate the identification of the agent in the management.

s**etkey:** The command can set the agent key, which provides a base for the agent to manage a certain number of equipment. The agent can not work in order without a proper key.

- Special note: All the above-mentioned commands are presented as small letters.

- Illustration of command configuration:

The following is the application process of these commands operated in HyperTerminal (for reference only, applied according to the actual situation). Press down the button RESET, and release it again. Knock on a random key on the keyboard within 5-6 seconds to make the agent enter into the startup and configuration state, then input the password.

\>ipcfg↵
to query the IP address of the current equipment
Unlock finished
IP address: 192.168.0.168

\>ipcfg 192.168.0.102↵
to modify the IP address of the current equipment
Unlock finished
Set IP address: 192.168.0.102
Erase block at 0x23c0000ok
The IP is saved.

\>setbaud↵
to query the current baud rate
Unlock finished
Baud Rate: 19200

\>setbaud 1↵ (unnecessary to be set normally)
to modify the current baud rate to 19200. The default is 19200.
Unlock finished
Erase block at 0x23c0000ok
The Baud Rate is: 19200.

\>setbaud 0↵
to modify the current baud rate to 9600.
Unlock finished
Erase block at 0x23c0000ok
The Baud Rate is: 9600.

The Baud Rate is: 19200.

\>setgate↵
to query the current gateway
Unlock finished
Net Gate: 192.168.0.1

\>setgate 192.168.0.1↵
to modify the current gateway
Unlock finished
Set Net Gate: 192.168.0.1
Erase block at 0x23c0000ok
The Net Gate is saved.

\>setmask↵
to query the current mask
Unlock finished
Net Mask: 255.255.255.0

\>setmask 255.255.255.0↵
to modify the current mask
Unlock finished
Set Net Mask: 255.255.255.0
Erase block at 0x23c0000ok
The Net Mask is saved.

\>setdevip -l↵
to query the IP address of the PC on the console

Unlock finished
The IP of devices <1> is : 192.168.000.018
The IP of devices <2> is : 192.168.000.112
The IP of devices <3> is : 010.010.000.018
The IP of devices <4> is : 010.010.000.112
The IP of devices <5> is : 010.010.000.113

The IP of devices <6> is : 010.010.000.165
The IP of devices <7> is : 192.168.000.165
The IP of devices <8> is : 255.255.255.255
The IP of devices <9> is : 255.255.255.255

\>setdevip -m↵
to modify the IP address of the PC on the console

Unlock finished
*The IP of devices <1> is : 192.168.000.018 [yes/no?][y]*y↵
*Please enter the IP:***192.168.0.31**↵

The IP of devices <2> is : 192.168.000.112 [yes/no?][y]
The IP of devices <3> is : 010.010.000.018 [yes/no?][y]
The IP of devices <4> is : 010.010.000.112 [yes/no?][y]
The IP of devices <5> is : 010.010.000.113 [yes/no?][y]
The IP of devices <6> is : 010.010.000.165 [yes/no?][y]
The IP of devices <7> is : 192.168.000.165 [yes/no?][y]
The IP of devices <8> is : 255.255.255.255 [yes/no?][y]
The IP of devices <9> is : 255.255.255.255 [yes/no?][y]

Erase block at 0x23c0000ok
The IP is saved.

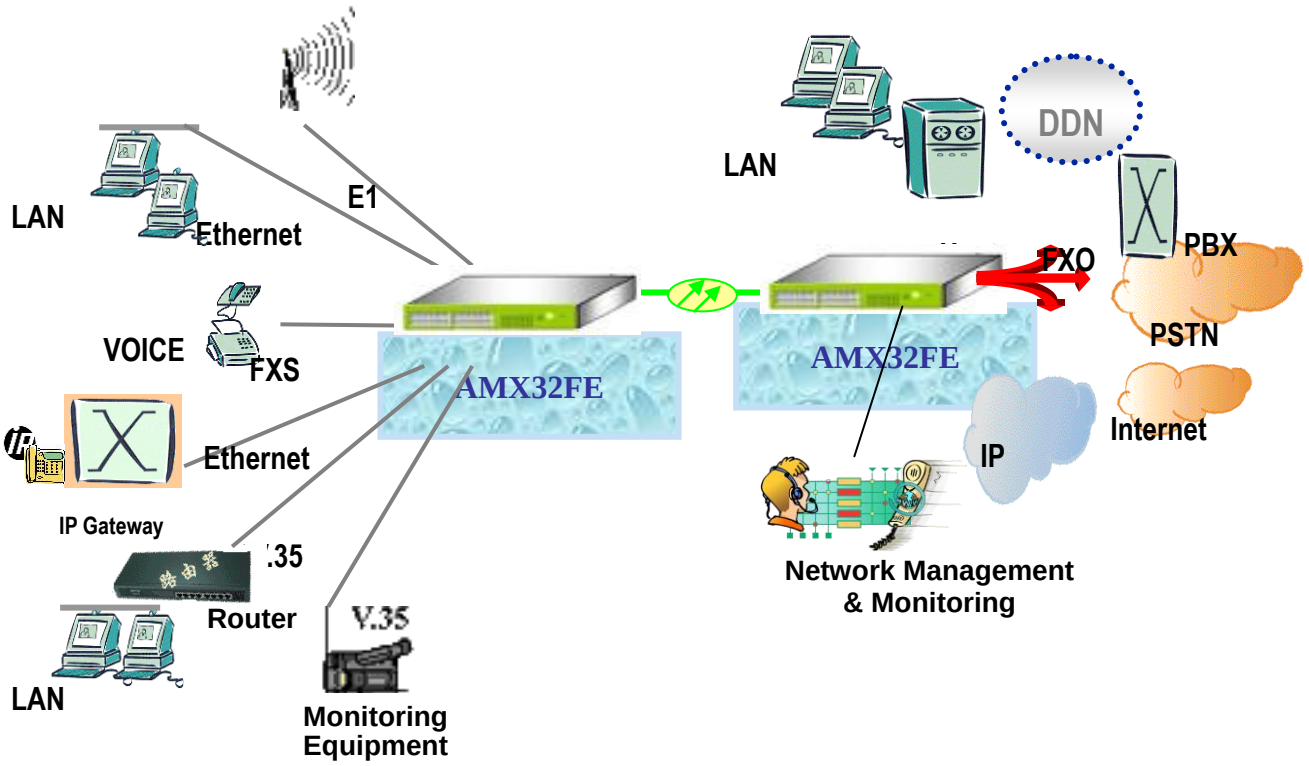
\>boot↵
Input the command boot after configuration to start up, the state will move from the configuration state to the monitoring state.

boot from flash, are you sure? [y/n]y
Next, the program bootloader will instruct the operation system uClinux to start up.

Note: After completing the configuration on the SNMP Ethernet interface, boot↵ shall be used to start up the operation system for entering into Ethernet network management mode.

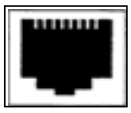
Default of IP address: 192.168.0.253
Default of gateway: 192.168.0.1
Default of mask: 255.255.255.0

Chapter 12 Typical Networking Scheme

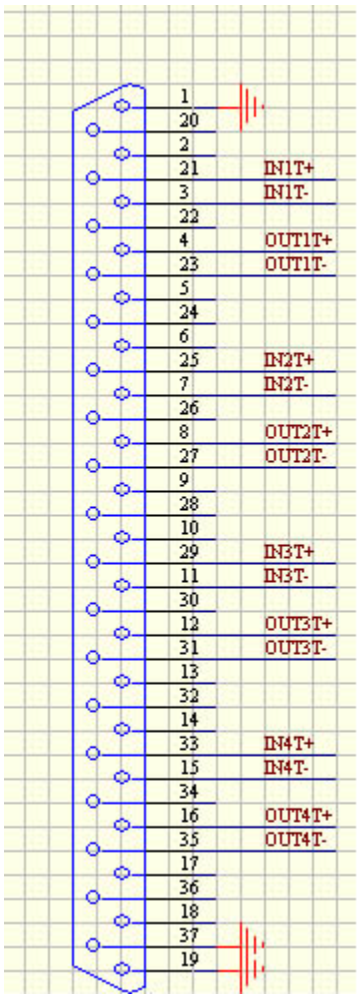


Chapter 13 DB37-RJ45 (120Ω) Pin Definitions

RJ45 Socket: 1,2,3,4,5,6,7,8



DB37 Socket



	Input			Output		
	Pin No.		Pin Definition	Pin No.		Pin Definition
	–	+		–	+	
DB37	3	21	IN1	23	4	OUT1
RJ45-1	6	7		2	3	
DB37	7	25	IN2	27	8	OUT2
RJ45-1	6	7		2	3	
DB37	11	29	IN3	31	12	OUT3
RJ45-1	6	7		2	3	
DB37	15	33	IN4	35	16	OUT4
RJ45-1	6	7		2	3	

P.S.: The 1st and the 8th pins of each RJ45 modular plug are connected with the 1st, 19th, and 37th pins of DB37 plug seat. The 1st, 19th, and 37th pins of DB37 plug seat have been connected with signal ground, while the 22nd, 24th, 26th, 28th, 30th, 32nd, 34th, and 36th pins are not connected, and are to be connected with the 1st, 19th, and 37th pins if grounding is required.

DB37 "-" pin and the 1st, 19th, and 37th pins in 75Ω coaxial adapter shall be connected with signal ground.

Attention: Operation and maintenance of network equipments requires professional technology, knowledge and experience. We recommend the equipment to be managed only by qualified technicians. Therefore, if you have any technical problems, please consult your provider.

Thank you for reading this manual !

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