



MODEL: BD-FE1-IP/BD-2FE1-IP/BD-4FE1-IP

FE1 over Fast Ethernet Multiplexer **User Manual**

SHANGHAI BAUDCOM COMMUNICATION DEVICE CO.,LTD

Website: <http://www.baudcom.com.cn>

Email: info@baudcom.com.cn

Tel: +86 21 37709251

Fax: +86 21 37709302

Contents

| | |
|--|----|
| Chapter 1 Introduction | 3 |
| 1.1 overview | 4 |
| 1.2 Applications | 4 |
| 1.3 Features | 5 |
| 1.4 Technical Specifications | 5 |
| Chapter 2 Operation..... | 8 |
| 2.1 Turning on the Unit | 8 |
| 2.2 Device's Panel | 8 |
| 2.3 Indicators | 9 |
| 2.4 Turning Off the Unit | 10 |
| Chapter 3 NMS Configuration | 11 |
| 3.1 User Login | 11 |
| 3.2 System Settings | 11 |
| 3.3 Ethernet Port Configuration | 13 |
| Configuration | 14 |
| Chapter 4 Technical Specifications | 20 |
| 4.1 Operating Environment | 20 |
| 4.2 Power Supply Section | 20 |
| 4.4 E1 Interface | 20 |
| 4.5 Ethernet Electrical Interface | 20 |
| 4.6 Ethernet Optical Interface | 21 |
| 4.7 Physical Characteristics | 21 |
| Chapter 5 Installation..... | 22 |
| 5.1 Safety Requirement | 22 |
| 5.2 Inspection upon Unpacking | 23 |
| 5.3 Power Supply | 23 |
| 5.4 Test | 23 |
| 5.5 Set Up and Connection | 24 |

Preface

Version Description

Manual version: V1.0

Copyright Notice

The copyright of this manual is reserved to our company, who retains the final rights of explanation and revision to this manual and notice. No part of this manual may be photocopied, excerpted, reproduced, revised, transmitted, translated into other languages, or used for commercial purpose in full or in part, without the prior written permission of the Company.

Disclaimer

This manual is made according to currently available information and subject to change without further notice. Whilst every effort has been made to ensure the accuracy and reliability of the contents contained herein, the Company cannot be held liable for any harm or damage resulting from any omissions, inaccuracies or errors contained in the manual.

Brief Introduction

This User Manual describes the installation and operation of E1 communications conversion device. Before you use our device for the first time, please read all the included materials carefully, and install and operate this series of products in keeping with items listed in the manual, so as to avoid damaging the device resulting from malpractice. Thank you for choosing our products.

Environmental Protection

This product complies with the design requirements associated with environmental protection. The storage, use and disposal of the product should be conducted in accordance with related national laws and regulations.

We welcome you to put forward advice and suggestion to our work, which shall be viewed as the ultimate support to us.

Chapter 1 Introduction

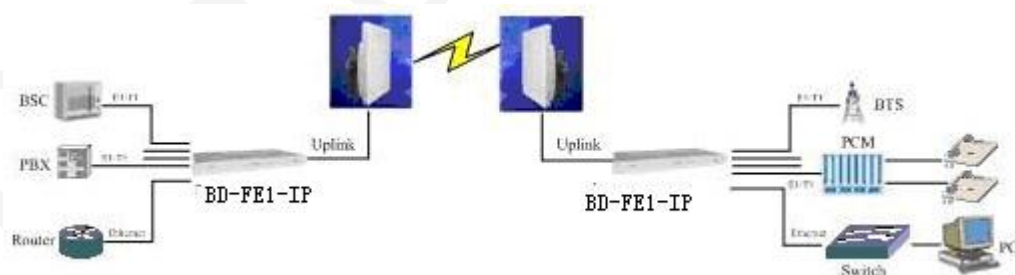
1.1 overview

The FE1 over FE Multiplexer Series Gateway ensure the circuit emulation traffic priority,. Restructuring any slot group of each E1 interface with built-in time slot allocation circuit-TSA, providing Channel associated signal processing capability. Having the performance of high transmission efficiency, low transmission delay, high precision clock recovery.

The FE1 over FE Series provide one 100M SFP optical port, and two 10/100M Ethernet ports in the Ethernet side of the device, while 4 E1 interface in the TDM Side.

1.2 Applications

FE1 over FE series devices can establish 1-4 E1 transparent channels over Ethernet or IP network for the provision of voice, images and other real-time business, Typical applications as shown in figure.



In the Figure above, FE1 over FE provide 1~4 channels of E1 over Ethernet to connect the base station controller, the PSTN access network equipment and other E1 terminal equipment. The two routers at two sides can share local Ethernet data by any Ethernet port of FE1 over FE . The internal QoS mechanisms of FE1 over FE can ensure the priority of E1 signal.

1.3 Features

- Up to 4 independent E1 interface, E1 interface impedance support 75Ω and 120 Ω
- Support L2TPv3/IPv4, UDP/IPv4, Metro Ethernet (MEF-8) and MPLS (MFA-8) and other agreements
- E1 interface complies with G.703, G.704 standard
- Each E1 support jitter buffer depth of 1-255msec
- Configure via CLI/Web
- Support VLAN tagging and QinQ function
- Support Qos setting
- Provide statistics for Ethernet+E1
- Support software and firmware upgrade

1.4 Technical Specifications

E1 Interface

- Number of E1 Ports: 4
- Interface Standard: G.703 G.704
- Line Impedance and Connector
Impedance: 120 Ω, balanced
75Ω, unbalanced
Connector Type: RJ-45
- Data Rate: 2.048 Mb/s±50ppm
- Line Code: HDB3
- Framing: unframed, framed, with or without CRC-4
- Jitter and Wander Performance:
ITU-T G.823 (for internal, loopback and Adaptive clock modes)

Ethernet Interface

- Number of Ports: 3-port UTP and 1-port SFP

-
- Interface Type: 10/100M FE RJ45 ports and 100M SFP optical ports
 - Protocol: IPV4, IPV6 (Planning), MPLS, MEF, UDP
 - Standard
 - IEEE 802.3 (10BASE-T)
 - IEEE 802.3u (100BASE-T)
 - IEEE 802.1ad (Q in Q)
 - IEEE 802.3x (Flow Control)
 - IEEE 802.1p (COS priority)
 - IEEE 802.1Q (Virtual LAN)
 - Magnetic Isolation Protection: 1.5 KV built-in
- PSEUDOWIRE**
- Compliance
 - IETF: RFC4623 (PWE3), RFC4553 (SAToP), RFC5086 (CESoPSN),
 - ITU-T: Y.1413 and Y1453
 - MFA: IA 8.0.0
 - MEF: 8
 - Number of PW Connections: 128
 - Timing
 - Internal (from internal oscillator) (optional)
 - Loopback (derived from the E1/T1 receive line)
 - Adaptive (regenerated from Ethernet link)
 - Jitter Buffer Size: 1 to 255 msec
- Internal Bridge**
- Number of VLANs: 1-4094 with 16 VLAN support
 - Compliance: 802.1Q
 - LAN Table: Up to 2K MAC addresses
 - L2CP handling: transparent and Termination

-
- QoS Priority Queues: 4
 - Port-Based VLAN: Untagged, tagged, unmodified

Management

- Console Port:
Interface standard: RS-232
Connector: RJ-45
Baud rate: 115.2kbps
- Out-of-Band Ethernet Management: Any one of the User Ethernet port should be configured as an out of band management port.

Power Requirements

- AC/DC dual power supply Adaptive input
- AC: 100V~240V/50Hz
- DC: -36V ~ -72V
- Power Consumption: $\leq 4.5W$

Chapter 2 Operation

This chapter:

- Explains how to power FE1 over FE up and down.
- Describes the device's panel
- Provides a detailed description of the front panel controls and indicators and their functions.

2.1 Turning on the Unit

➤ To turn on the unit:

- Connect the power cord to the mains.

The PWR indicator turns on and remains on as long as the device receives power.

Once installed, FE1 over FE requires no operator attention, except for occasionally monitoring the front panel indicators. Intervention is only required when the unit must be configured to its operational requirements, or when diagnostic tests are performed.

2.2 Device's Panel

Figure 3-1 lists the front panel of different specifications

Figure 2-1 FE1 over FE Device Front Panel Diagram

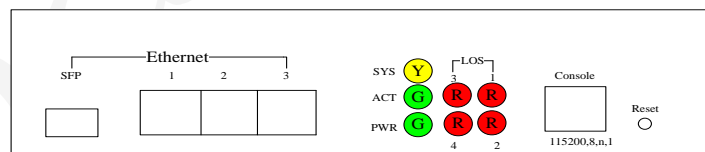
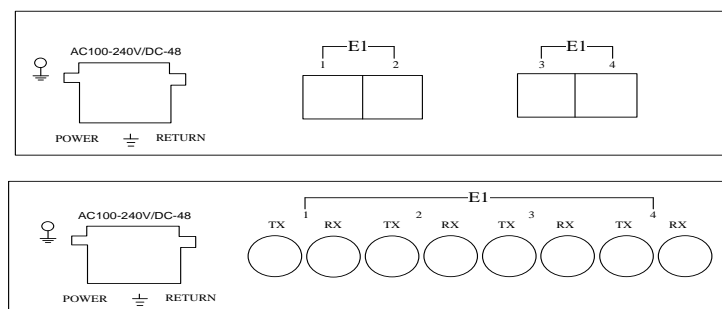


Figure 2-2 FE1 over FE Device Rear Panel Diagram



2.3 Indicators

The unit's LEDs are located on the front panel. Table 2-1 lists the functions of the LED indicators.

Table 2-1. LEDs and Controls

| Name | Colors | Functions | Status | Description |
|--------------------|--------|--------------------------------------|----------|-------------------------|
| SYS | YELLOW | System Operating Indication | Blinking | System is Working |
| | | | Off | System is Abnormal |
| PWR | GREEN | Power Indication | On | Unit is Powered |
| | | | Off | Unit is Off |
| E1 Indicator | RED | E1 LOS Indication | On | E1 No Signal, LOS Alarm |
| | | | Blinking | E1 LOF Alarm |
| | | | Off | E1 Normal |
| Ethernet Port LEDs | YELLOW | Ethernet Data Transceiver Indication | On | No Data Transceiving |
| | | | Blinking | Data Transceiving |
| | | | Off | Not Connected |
| | GREEN | Ethernet Speed Indication | On | 1000Mbps Connect |
| | | | Off | 10/100Mbps Connect |
| ACT | GREEN | Optical port LEDs (No this function) | On | Connected |
| | | | Off | Not connected |
| | | | Blinking | Data Transceiving |

E1 Interface

Support 4 E1 interface All are used with the red LED RJ45. wired according to the following table

Table 2-2 E1 Connector Pinouts

| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|-----|-----|----|-----|-----|----|----|----|
| Function | Tx+ | Tx- | NC | Rx+ | Rx- | NC | NC | NC |

Ethernet Interface

Supports 3-port UTP + 1-port SFP.

Data rate: 100Mbps.

Console Interface

The Console interface is an 8-pin RJ-45 connector, Support 115200bps baud rates, wired according to Table 2-4.

Table 2-4 Console Pinouts

| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|----|----|-----|-----|-----|-----|----|----|
| Function | NC | NC | TXD | GND | GND | RXD | NC | NC |

Reset

Restore to factory default setting by pressing 5 second

Power

The device supports two voltage, AC220V or DC-48V input. Allows power fluctuations in the range of 10%. Please note that there are positive and negative polarity DC input. DC-48V: POWER connect to the cathode, RETURN then negative.

2.4 Turning Off the Unit

- To turn off the unit:
 - Remove the power cord from the power source.

Chapter 3 NMS Configuration

Operating condition:

PC operating systems: WINDOWS98/XP/Win 7

Network connection: 10/100Base-TX Ethernet interface, the AUTO MDI / MDI-X. Internet Explorer 5.0 or later

Parameter settings:

IP address settings: PC IP address and subnet mask must be in the same segment with the device IP address and subnet mask, and must not be the same IP address.

The default value of **FE1 over FE** : IP address: 192.168.0.168
Subnet Mask: 255.255.255.0.

3.1 User Login

This product provides Web browser-based configuration interface, this configuration program is suitable for any MS Windows or UNIX platforms, browser, for example.

Enter "192.168.0.168" in the address bar, press Enter, you will see the login screen that below shows. Input user name and password in the login dialog box (the default factory settings are "admin"), select the language (in Chinese and English, and here only on the Chinese), click the submit button.

3.2 System Settings

3.2.1 System Information

This page setting device name, device description, device location, notes; Display hardware version, software version, firmware version, MAC address of the network management device, and other information equipment uptime.

- [-] **System Config**
 - System Info
 - Network Config
 - System Upgrade
 - System Reboot
- [+] **Ethernet Config**
- [+] **Simulation Gateway & E1**
- [+] **VLAN & QinQ**
- [+] **QoS Config**
- [+] **Statistics**
- [+] **Admin**

System Info

| Item | Setting |
|--------------------|-------------------------------------|
| Device Description | E8004L |
| Device Name | E8004L |
| Device Location | xxx |
| Notes | xxx |
| Hardware Version | 1.01 |
| FPGA Version | 1.24 |
| Software Version | 1.02 |
| MAC | A4:C2:AB:01:68:40 |
| Running Time | 0-Days 1-Hours 34-Minutes 9-Seconds |

3.2.2 Network Configuration

This page can set the device network IP address, subnet mask, and default gateway, display network MAC.

- [-] **System Config**
 - System Info
 - **Network Config**
 - System Upgrade
 - System Reboot
- [+] **Ethernet Config**
- [+] **Simulation Gateway & E1**

Network Config

| Item | Setting |
|---------|--|
| IP | <input type="text" value="192.168.0.40"/> |
| MASK | <input type="text" value="255.255.255.0"/> |
| Gateway | <input type="text" value="192.168.0.1"/> |

3.2.3 System Reboot

This page can reboot the device or reboot to factory default configuration

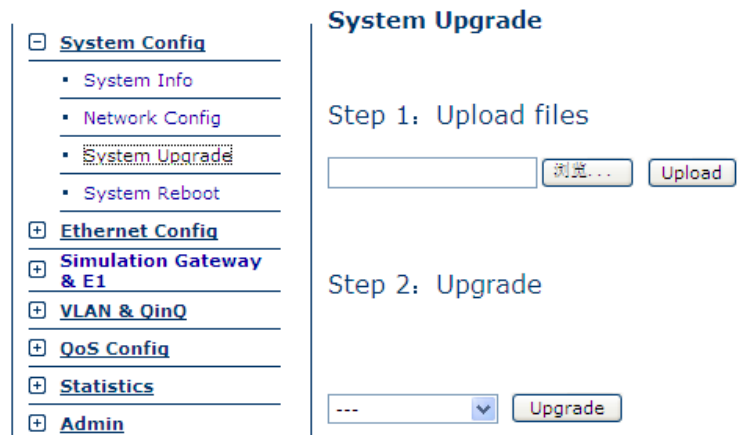
- [-] **System Config**
 - System Info
 - Network Config
 - System Upgrade
 - **System Reboot**
- [+] **Ethernet Config**

System Reboot

| Item | Setting |
|---------------|---|
| System Reboot | <input type="text" value="Do not reboot"/> <div style="border: 1px solid #ccc; padding: 2px; margin-top: 2px;"> <ul style="list-style-type: none"> Do not reboot Reboot now Reboot to factory </div> |

3.2.4 System Upgrade

Software or firmware upgrade file, reboot the device after the upgrade is complete



Step1: Upload the upgrade file;

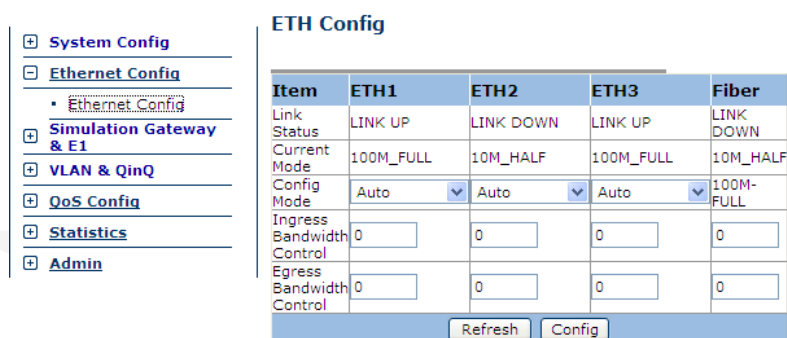
Step 2: Follow the prompts to choose to upgrade software or configuration files;

Software upgrade is completed automatically reboot.

The firmware upgrade is completed, please reboot manually.

3.3 Ethernet Port Configuration

Show the Link Status and Current mode. Set the port speed configuration.



3.4 3.3.3 Ethernet Port Configuration

Show the Link Status and Current mode. Set the port speed configuration.

- System Config
- Ethernet Config
 - Ethernet Config
- Simulation Gateway & E1
- VLAN & QinQ
- QoS Config
- Statistics
- Admin

ETH Config

| Item | ETH1 | ETH2 | ETH3 | Fiber |
|---------------------------|-----------|-----------|-----------|-----------|
| Link Status | LINK UP | LINK DOWN | LINK UP | LINK DOWN |
| Current Mode | 100M_FULL | 10M_HALF | 100M_FULL | 10M_HALF |
| Config Mode | Auto | Auto | Auto | 100M-FULL |
| Ingress Bandwidth Control | 0 | 0 | 0 | 0 |
| Egress Bandwidth Control | 0 | 0 | 0 | 0 |

Refresh Config

Configuration

3.3.1 Simulation Gateway Configuration

Support four network protocol: IPv4/L2TPv3, IPv4/UDP, MEF, MPLS, supports point to point communication, the purpose of MAC, IP settings for the end purpose of the same type of equipment source MAC, source IP, subnet mask and gateway based on where the network to set up.

Note:

The device has two MAC and IP, one is used for network management, another for business transfer, gateway simulation parameters source MAC, source IP for business transfers

- System Config
- Ethernet Config
- Simulation Gateway & E1
 - Simulation Gateway Config
 - E1-1 Config
 - E1-2 Config
 - E1-3 Config
 - E1-4 Config
 - E1 Loopback
 - E1 Alarm
- VLAN & QinQ
- QoS Config

Simulation Gateway Config

| Item | Setting |
|-----------------|------------------|
| Network Type | MPLS |
| Protocol Type | L2TPv3 |
| Destination IP | 192.168.2.12 |
| Destination MAC | a4:c2:ab:1:68:41 |
| Source IP | 192.168.2.11 |
| Source MAC | a4:c2:ab:1:68:39 |
| Subnet MASK | 255.255.255.0 |
| Gateway | 192.168.2.1 |

Refresh Config

Tips:the local device's destination IP/MAC should set to the remote device's source IP/MAC

3.3.2 E1 Branch Configuration

Set E1 frame mode, E1 timeslot, package size, RTP timestamp mode, the clock recovery mode, Jitter Buffer.

- [System Config](#)
- [Ethernet Config](#)
- [Simulation Gateway & E1](#)
 - [Simulation Gateway Config](#)
 - [E1-1 Config](#)
 - [E1-2 Config](#)
 - [E1-3 Config](#)
 - [E1-4 Config](#)
 - [E1 Loopback](#)
 - [E1 Alarm](#)
- [VLAN & QinQ](#)
- [QoS Config](#)
- [Statistics](#)
- [Admin](#)

E1-1 Config

| Item | Setting |
|--|--|
| E1 Enabled | Enable <input type="button" value="v"/> |
| Frame Packing Mode | <input checked="" type="radio"/> SAToP <input type="radio"/> CESoPSN non CAS |
| Frame Mode | <input checked="" type="radio"/> Unframed <input type="radio"/> PCM30 <input type="radio"/> PCM31 <input type="radio"/> PCM30CRC <input type="radio"/> PCM31CRC |
| E1 Timeslot Selection | <input checked="" type="checkbox"/> 00 <input checked="" type="checkbox"/> 01 <input checked="" type="checkbox"/> 02 <input checked="" type="checkbox"/> 03 <input checked="" type="checkbox"/> 04 <input checked="" type="checkbox"/> 05 <input checked="" type="checkbox"/> 06 <input checked="" type="checkbox"/> 07 <input checked="" type="checkbox"/> 08 <input checked="" type="checkbox"/> 09 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 12 <input checked="" type="checkbox"/> 13 <input checked="" type="checkbox"/> 14 <input checked="" type="checkbox"/> 15 <input checked="" type="checkbox"/> 16 <input checked="" type="checkbox"/> 17 <input checked="" type="checkbox"/> 18 <input checked="" type="checkbox"/> 19 <input checked="" type="checkbox"/> 20 <input checked="" type="checkbox"/> 21 <input checked="" type="checkbox"/> 22 <input checked="" type="checkbox"/> 23 <input checked="" type="checkbox"/> 24 <input checked="" type="checkbox"/> 25 <input checked="" type="checkbox"/> 26 <input checked="" type="checkbox"/> 27 <input checked="" type="checkbox"/> 28 <input checked="" type="checkbox"/> 29 <input checked="" type="checkbox"/> 30 <input checked="" type="checkbox"/> 31 <input type="checkbox"/> Select All |
| Package Size | 4 Frame <input type="button" value="v"/> |
| RTP Timestamp Mode | Differential Mode <input type="button" value="v"/> |
| Clock Recovery Mode | Adaptive Clock Mode <input type="button" value="v"/> |
| Jitter Buffer (1-255) | 5 ms |
| <input type="button" value="Refresh"/> <input type="button" value="Config"/> | |

3.4 Vlan and QinQ Configuration

3.4.1 Global configuration

Select the vlan and QinQ function: Enable or Disable

Set QinQ TPID ,QinQ PVID and Provider port configuration.

Set Port isolation enable or disable.

- [System Config](#)
- [Ethernet Config](#)
- [Simulation Gateway & E1](#)
- [VLAN & QinQ](#)
 - [Global Config](#)
 - [VLAN Table](#)
 - [VLAN Port](#)
- [QoS Config](#)
- [Statistics](#)
- [Admin](#)

VLAN Global Config

| Item | Setting |
|--|--|
| VLAN Enable | Disable <input type="button" value="v"/> |
| QinQ Enable | Disable <input type="button" value="v"/> |
| QinQ TPID | 0X88a8 |
| QinQ PVID(1--4094) | 1 |
| Provider Port | Fiber <input type="button" value="v"/> |
| Port isolation Enable | Disable <input type="button" value="v"/> |
| <input type="button" value="Refresh"/> <input type="button" value="Config"/> | |

3.4.2 VLAN Table configuration

802.1Q VLAN Config

| Group VID | ETH1 | ETH2 | ETH3 | Fiber | WAN(E1) |
|-----------|------|------|------|-------|---------|
| 1 | --- | --- | --- | --- | --- |

Refresh Config

| Group VID | ETH1 | ETH2 | ETH3 | Fiber | WAN(E1) |
|-----------|----------|--------|--------|--------|---------|
| 1 | 1 Member | Member | Member | Member | Member |
| 2 | 0 | | | | |
| 3 | 0 | | | | |

FE1 over FE series supports 16 vlan tables.

- 1) Vlan table is valid when 'Vlan Enable' enabled in 'Vlan and QinQ' page.
- 2) Set the vid to 0 means delete the vlan.
- 3) The pvid of ports need re-configure if the corresponding vlan deleted.

3.4.2 VLAN Port configuration

Pvid Config

| Item | ETH1 | ETH2 | ETH3 | Fiber | WAN(E1) |
|------|--------|--------|--------|--------|---------|
| MODE | Access | Access | Access | Access | Access |
| PVID | 1 | 1 | 1 | 1 | 1 |

Refresh Config

Port Mode: Vlan-Access (Untag) or Vlan-Trunk (Tag). Valid when vlan enable.

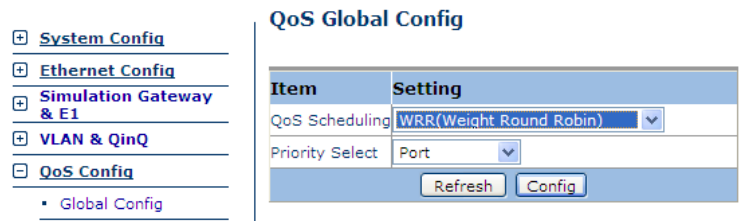
PVID: Port Vlan ID Valid when vlan enable.

3.5 QoS Configuration

3.5.1 Global Configuration

Set QoS scheduling :WRR(Weight Round Robin) and SP(Strict Priority)

Set Priority Select: Port,802.1Q Cos and DSCP.

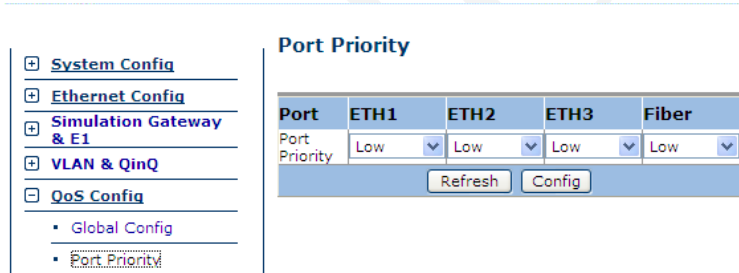


The screenshot shows the 'QoS Global Config' interface. On the left is a navigation tree with 'QoS Config' selected, containing 'Global Config'. The main area has a table with 'Item' and 'Setting' columns. 'QoS Scheduling' is set to 'WRR(Weight Round Robin)' and 'Priority Select' is set to 'Port'. There are 'Refresh' and 'Config' buttons at the bottom.

| Item | Setting |
|-----------------|-------------------------|
| QoS Scheduling | WRR(Weight Round Robin) |
| Priority Select | Port |

3.5.2 Port priority configuration

Set the port priority mapping table.

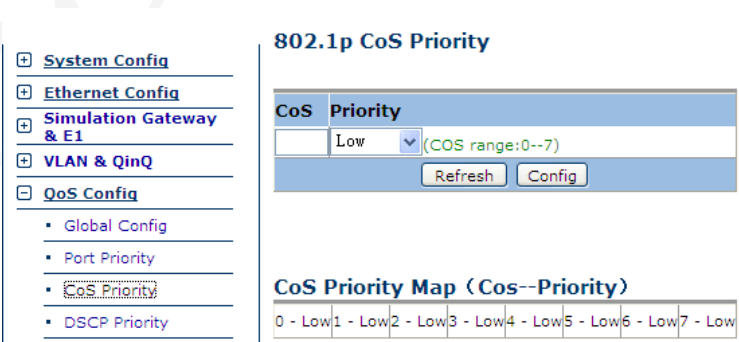


The screenshot shows the 'Port Priority' configuration interface. The left navigation tree has 'Port Priority' selected under 'QoS Config'. The main area shows a table with columns for 'Port' and 'Priority' for 'ETH1', 'ETH2', 'ETH3', and 'Fiber'. All 'Priority' values are set to 'Low'. There are 'Refresh' and 'Config' buttons at the bottom.

| Port | ETH1 | ETH2 | ETH3 | Fiber |
|---------------|------|------|------|-------|
| Port Priority | Low | Low | Low | Low |

3.5.3 Cos priority configuration

Set Cos value and the priority mapping table.



The screenshot shows the '802.1p CoS Priority' configuration interface. The left navigation tree has 'CoS Priority' selected under 'QoS Config'. The main area shows a table with 'CoS' and 'Priority' columns. The 'CoS' value is 'Low' and the 'Priority' is 'Low'. A note '(COS range:0--7)' is visible. There are 'Refresh' and 'Config' buttons. Below is a 'CoS Priority Map (Cos--Priority)' table.

| CoS | Priority |
|-----|----------|
| Low | Low |

CoS Priority Map (Cos--Priority)

| | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 0 - Low | 1 - Low | 2 - Low | 3 - Low | 4 - Low | 5 - Low | 6 - Low | 7 - Low |
|---------|---------|---------|---------|---------|---------|---------|---------|

3.5.4 DSCP priority configuration

Set DSCP priority mapping table.

- ⊕ System Config
- ⊕ Ethernet Config
- ⊕ Simulation Gateway & E1
- ⊕ VLAN & QinQ
- ⊖ QoS Config
 - Global Config
 - Port Priority
 - CoS Priority
 - DSCP Priority

DSCP Priority

| DSCP Code | Priority(0-3) |
|--------------|---------------|
| EF(101110) | 0 |
| AFL1(001010) | 0 |
| AFM1(001100) | 0 |
| AFH1(001110) | 0 |
| AFL2(001001) | 0 |
| AFM2(010100) | 0 |
| AFH2(010110) | 0 |

3.5 Statistical Information

3.5.1 Ethernet Statistics

Display Ethernet port statistics information.

- ⊕ System Config
- ⊕ Ethernet Config
- ⊕ Simulation Gateway & E1
- ⊕ VLAN & QinQ
- ⊕ QoS Config
- ⊖ Statistics
 - Ethernet Statistics
 - E1 Statistics

Ethernet Statistics

| Port | ETH1 | ETH2 | ETH3 | Fiber |
|------------|------|------|--------|----------|
| Rx Packets | 0 | 0 | 199926 | 66816311 |
| Tx Packets | 0 | 0 | 265599 | 66816408 |

3.5.2 E1 Statistics

E1 port statistics information display.

- ⊕ System Config
- ⊕ Ethernet Config
- ⊕ Simulation Gateway & E1
- ⊕ VLAN & QinQ
- ⊕ QoS Config
- ⊖ Statistics
 - Ethernet Statistics
 - E1 Statistics

E1 Statistics

| E1 Branch | E1-1 | E1-2 | E1-3 | E1-4 |
|--------------|----------|----------|----------|----------|
| Send | 17338913 | 17338909 | 17338933 | 17338941 |
| Receive | 17297918 | 17293675 | 17298037 | 17298047 |
| Receive Loss | 1673 | 652 | 839 | 2386 |
| CRC Error | 0 | 0 | 0 | 0 |

3.5.3 login password configuration

Login password configuration page

The default password is root.

- System Config
- Ethernet Config
- Simulation Gateway & E1
- VLAN & QinQ
- QoS Config
- Statistics
- Admin
 - Login Password

admin

| Item | Setting |
|------------------|----------------------|
| User | admin |
| Old Password | <input type="text"/> |
| New Password | <input type="text"/> |
| Password Confirm | <input type="text"/> |

Baidu.com

Chapter 4 Technical Specifications

4.1 Operating Environment

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

| | |
|-----------------------------|---------------|
| Working Temperature | 0°C ~ +50°C |
| Storage Temperature | -40°C ~ +70°C |
| Relative Humidity | 10 %~95 % |
| Atmospheric Pressure | 70~106 kpa |

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

4.2 Power Supply Section

Input Voltage: AC:220V or DC:-48V

4.4 E1 Interface

Number of E1 Ports: 4

Data Rate: 2.048 Mb/s±50ppm

Line Code: HDB3

Interface Impedance: RJ45, 75Ωunbalanced/120Ω balanced

Connector Type: RJ45

Interface Standard: ITU-T G.703 G.704 G.706

Wander Performance: ITU-T G.823

Framing: unframed, framed, with or without CRC-4

4.5 Ethernet Electrical Interface

Speed rate: 10M/100M Auto-negotiation、10M half-Duplex、10M Full Duplex、100M Half-Duplex, 100M Full Duplex Optional.

Interface Standard: IEEE 802.3,802.1P, 802.1Q

Connector Type: RJ45 with LEDs

4.6 Ethernet Optical Interface

Type: 100Base-FX

Compliance: IEEE 802.3, 802.1P, 802.1Q

Connector Type: LC (SFP)

Wavelength: 1310/1550nm

Transmission distance: 10km, 20km, 40km optional

4.7 Physical Characteristics

Housing : Metal

Weight: 0.5 kg

Dimensions: 210mm×133mm×38.5mm

Chapter 5 Installation

5.1 Safety Requirement

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

1. Avoid fire or physical injury.
2. All power supply should be shut off during installation, which can be turned on only when all terminals have been connected correctly and checked to be free from mistakes.
3. Connect and disconnect in a properly. When device is powered up, do not connect or disconnect data cable without due cause.
4. Grounding. The product should be linked to the ground through earthed conductor. To avoid electric shock, the earthed conductor must be in connection with the ground. Make sure that the product is correctly earthed before connecting with the input or output terminals.
5. Correct connection. Users are expected to use accompanied accessories. In the event that special connections are needed, please pay attention to the corner allocation requirements.
6. Don't operate when there is no cover plate over the device. Do not operate the product if the cover plate or panel has been dismantled.
7. No contact with bare circuit is allowed. Do not touch bare connectors or components when power is on.

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

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

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

11. Don't use the laser beam straight to the eyes, to prevent damage to the retina.

5.2 Inspection upon Unpacking

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

5.3 Power Supply

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

Please disconnect the power supply before you plug in/out power cable. And operate the device under the environment which is suggested by the user manual.

5.4 Test

Test the following steps before operating: Connect correctly to the power supply and the PWR and LOS LED light on, SYS and WRK LED light flashing and other LED indicators are all off.

5.5 Set Up and Connection

According to the network environment requires the connection, turn on the power, the device enters the normal working condition.

If the device is not working properly, see Troubleshooting, such as the problem still persists, please follow the Company or with the Company's distributors, agents contact.

Baidu.com

Appendix A

We can preliminarily judge whether each interface is working properly by observing the light of each interface after device startup is completed.

Common Faults and Troubleshooting

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

A.1 E1 Alarms

Troubleshooting is through the following steps:

First: check the E1 terminal equipment, such as the PCM device, whether it is shutdown.

Second: check if the E1 connection is reliable, whether the E1 cable is broken or loses, which will lead to the loss of input signal.

A.1 Cannot set up E1channel

Cannot set up E1channel may be caused by a variety of reasons, and the main causes as the following:

- (1) If both ends of the gateway are powered on.
- (2) If both ends of the device's network cable are connected properly, observe that whether the link LED is on, the cable is good contact.
- (3) Check both ends of the network cable is normal.
- (4) Check the network that both ends of the device transport through is normal.

By the ping command to ping NMS IP address of remote device(Need to confirm both ends of the NMS card IP address

setting are right) or by using NMS send and receive data packets to check if the MAC address of peer equipment is obtain.

(5) IP and MAC address settings of the device are normal (all 0s or all 1s is prohibited), check if the IP address in the network segment is repeated, the MAC address is unique.

(6) Check whether the agreement of both sides is set to the same, as the following:

UDP/IPv4 corresponding UDP/IPv4

L2TPv3/IPv4 corresponding L2TPv3/IPv4

MEF corresponding MEF

MPLS corresponding MPLS

(7) Whether both sides select the RTP header (both sides choose the RTP header, or both sides do not choose the RTP Header).

(8) UDP mode, whether UDP port numbers that corresponding to the E1 port are the same; L2TPv3 mode, whether the session ID that corresponding to the E1 port are the same, the cookie can choose of both sides are consistent; the MEF mode, whether the ECID that corresponds to the E1 port is consistent; the MPLS mode, whether the inner label is consistent.

(9) Whether both sides of the circuit simulation protocol settings is consistent.

SAToP corresponding SAToP

TDM Pseudowire Access Gateway (not with CAS) corresponding TDM Pseudowire Access Gateway (not with CAS)

TDM Pseudowire Access Gateway corresponding TDM Pseudowire Access Gateway, If the time slots settings of both sides are the same in TDM Pseudowire Access Gateway mode.

(10) Check that the transmission network has enough bandwidth. It can be judged by the growing number of NMS data buffer empty.

(11) Check that whether the jitter from network is too large, to judge by the number of NMS data buffer empty and full. If the network jitter is too large, we can determine it is true or not by setting the jitter buffer size.

(12) Check for E1 alarms, whether the local E1 cable dropped or poor contact or line broken. If there is a local LOS alarm, please check whether the end of E1 cable is dropped or poor contact or line broken.

(13) Both ends of the gateway are set to the differential clock mode, but common clock source does not exist.

A.1 Downstream reporting slips

Check the timing mode settings of EoE200x. Whether both sides of the E1 in the asynchronous state. If there is no public reference clock source, **FE1 over FE** device timing mode must be set to adaptive timing mode, both ends cannot work in loopback timing mode.

At the transition time after power on or reapplying the E1 signal, slips and errors are acceptable. Such transition may take several minutes. If it slips for a long time, further analysis is required to find out the reasons. And it may be caused by one or several reasons:

(1) The transmission network does not have enough bandwidth. It can be judged by the growing number of data buffer empty.

(2) Network in half duplex mode, but the network needs to be in full-duplex status.

(3) Network itself result in error.

-
- (4) E1 interface cable problems or poor contact.
 - (5) E1 itself has line error.
 - (6) Both sides of E1 equipment in asynchronous state, but both ends of the device work in loopback clock recovery mode.
 - (7) Different sources clock of both ends of the device, but both ends of the device set to be at system clock operating mode.
 - (8) One end of the device choose adaptive mode and the other end choose differential mode.
 - (9) Both ends of the device set differential mode while their public reference clock from different sources.
 - (10) make sure that both ends of the device have good ground.

Appendix B

Warranty Card

The Company guarantees:

1. Warranty
 - 1) In free warranty period (12 months from the date of purchase), upon Company recognized normal use circumstances, the Company will be responsible for replace or repair any component that was damaged under free of charge.
 - 2) In charged warranty (out of 12 months free warranty and beyond or less than 36 months), under recognized normal use circumstances, the Company will charge for the replacement component, but shall keep the maintenance services free.
2. The Warranty does not cover the follows, and the maintenance services will be charged:
 - 3) Over 36 months from the date of purchase.
 - 4) User fails to provide certificate of purchase date and the product's serial number indicates the date of manufacture is more than 39 months.
 - 5) Including but not limited to damages caused by severe impact, extrusion, drops, liquid immersion and other abnormal conditions.
 - 6) The frangibility label is damaged.
 - 7) Unauthorized disassembling product behavior.
 - 8) Force majeure results in product damage, such as earthquakes, floods, lightning, etc.
3. After product been repaired, the new replacement parts will enjoy 12 months free warranty start from the date of replacement.

-
4. If there is any failure of the product, user may choose to send the product back to the Company or mail the product to service agencies of the Company throughout the country.
 5. For any damage caused due to improper operations, the company does not assume any responsibility. If indeed the product itself causes damages, the company only assume responsibilities within the product price range and does not including but not limited to all direct or indirect losses caused by data loss