



Baudcom BD-FE1-IP-G FE1 Over Gigabit Ethernet Multiplexer User Manual

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Baudcom BD-FE1-IP-G FE1 Over Gigabit Ethernet Multiplexer



Product Information

The FE1 over Gigabit Ethernet Multiplexer is a series of gateway devices manufactured by Shanghai Baudcom Communication Device Co., Ltd. The series includes the following models: BD-FE1-IP-G, BD-2FE1-IP-G, and BD-4FE1-IP-G.

The FE1 over GE Multiplexer Series Gateway ensures the circuit emulation traffic priority. It provides channel-associated signal processing capability and supports 1-4 E1 interfaces and IP internet transmission of 4 1000M Ethernet interfaces. The device has high transmission efficiency, low transmission delay, and high precision clock recovery.

The FE1 over GE series devices can establish 1-4 E1 transparent channels over Ethernet or IP networks for the provision of voice, images, and other real-time business applications. It can be used to connect base station controllers, PSTN access network equipment, and other E1 terminal equipment. The device supports QoS mechanisms to ensure the priority of E1 signals.

Key Features:

- Up to 4 independent E1 interfaces with support for 75 and 120 ohm impedance
- Supports L2TPv3/IPv4, UDP/IPv4, Metro Ethernet (MEF-8), MPLS (MFA-8), and other protocols
- E1 interface complies with G.703 and G.704 standards
- Supports two 1000 Mbps Ethernet optical interfaces
- Configurable via CLI/Web/SNMP(v1/v2c/v3)
- Supports Tag VLAN (802.1q)
- Supports software and firmware upgrades
- Supports Ring Protection with recovery time

Product Usage Instructions

1. Connect the FE1 over Gigabit Ethernet Multiplexer to the power source using the provided power cable.
2. Connect the E1 interfaces to the corresponding E1 terminal equipment using E1 cables.
3. Connect the Ethernet interfaces to the desired network devices using Ethernet cables.
4. **Configure the device using one of the following methods:**
 - **CLI:** Use a command-line interface to configure the device settings.
 - **Web:** Access the device's web interface using a web browser and configure the settings through the

user-friendly interface.

- **SNMP:** Use SNMP (Simple Network Management Protocol) to configure the device settings remotely.

5. If necessary, enable Tag VLAN (802.1q) to segment network traffic.
6. If required, perform software and firmware upgrades to ensure the device is running the latest version.
7. If desired, configure Ring Protection to provide recovery time in case of network failures.

Please refer to the user manual provided by Shanghai Baudcom Communication Device Co., Ltd. for detailed instructions on configuring and operating the FE1 over Gigabit Ethernet Multiplexer.

For further assistance or technical support, you can contact Shanghai Baudcom Communication Device Co., Ltd. through their website at <http://www.baudcom.com.cn>, via email at info@baudcom.com.cn, or by calling +86 21 37709251.

Version Description

- **Manual version:** V1.0

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Disclaimer

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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.

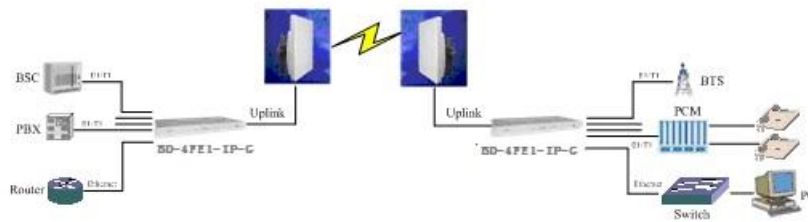
Introduction

Overview

The FE1 over GE 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. Support 1-4 E1 interface and IP internet transmission of 4 1000M Ethernet interface.

Applications

FE1 over GE 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 GE 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 GE. The internal QoS mechanisms of FE1 over GE can ensure the priority of E1 signal.

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
- Support two 1000 Mbps Ethernet optical interface
- Configure via CLI/Web/SNMP(v1/v2c/v3)
- Support Tag VLAN (802.1q)
- Support software and firmware upgrade
- Support Ring Protection(recovery time<20ms) and 1+1 Protection
- Support NTP, SNMP, RSTP protocol
- Support TACACS+
- Support Qos setting
- Support for log management and configuration file import and export
- Support Web, Console, Telnet, SNMP network management, remote monitoring and software upgrades, easy to operate and maintain

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 external clock modes)
- **Number of differential Clock Input Interface:** 1
- **Point-to-point one-way additional processing delay (Minimum delay setting):** $\leq 1.2\text{ms}$
- **Output frequency stability (adaptive timing, Stable):** $\leq 50\text{ppb}$
- **Output Jitter (adaptive timing):** $\leq 0.03\text{UI}$

Ethernet Interface

- **Number of Ports:** 2-port UTP and 2-port SFP
- **Interface Type:** 10/100/1000M GE RJ45 ports and 1000M SFP optical ports
- **Data Rate:** 32Kbps~1000Mbps(Minimum setting unit is 32Kbps)
- **Protection:** 1+1 Protection, Ring Protection (recovery time < 20 msec)
- **Max Frame Size:** 9Kb
- **Protocol:** IPV4, IPV6 (Planning), MPLS, MEF, UDP
- **Standard**
 - IEEE 802.3 (10BASE-T)
 - IEEE 802.3u (100BASE-T)
 - IEEE 802.3z (1000BASE-X)
 - IEEE 802.3ab (1000BASE-T)
 - IEEE 802.1ad (Q in Q)
 - IEEE 802.3ad (Link Aggregation) (Planning)
 - 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)
 - External (E1 via dedicated port) (optional)
 - Loopback (derived from the E1/T1 receive line)
 - Adaptive (regenerated from Ethernet link)
- **Adaptive Clock accuracy:** $\pm 10\text{ppb}$
- **Jitter Buffer Size:** 1 to 256 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
- **SNMP:** SNMP (v1/v2), SNMPv3 (Planning)
- **Support:** telnet, web, SYSLOG, Activity logging (user activities), TACACS+, SNTTP
- **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:** ≤6W

Operation

This chapter:

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

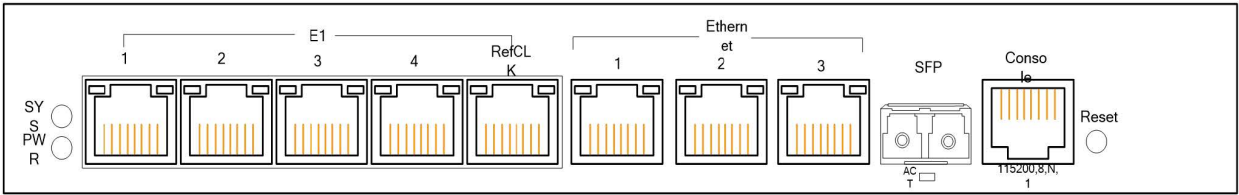
Turning on the Unit

- To turn on the unit:
 - Connect the power cord to the mains.

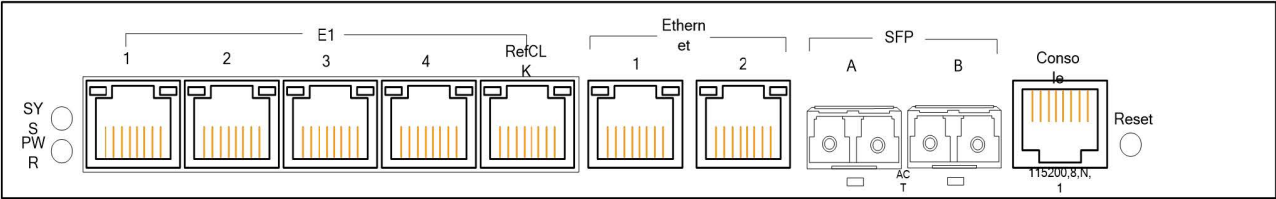
The PWR indicator turns on and remains on as long as FE1 over GE receives power. Once installed, FE1 over GE requires no operator attention, except for occasionally monitoring the front panel indicators. Intervention is only required when the unit must be configured to its operational requirements, or when diagnostic tests are performed.

Device's Panel

Figure 3-1 lists the front panel of different specifications Figure 2-1 4FE1 over GE Device Front Panel Picture



BD-4FE1-IP-G with 3GE+1FX



BD-4FE1-IP-G with 2GE+2FX

Figure 2-2 FE1 over GE Device Rear Panel Diagram



Figure 2-3 dip the bottom



Indicators

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

| 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 | RED | Optical port LEDs (No this function) | On | Connected |
| | | | Off | Not connected |
| | | | Blinking | Data Transceiving |

E1 Interface

Support 4 E1 interface and a differential clock input, 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 |

Table 2-3 Differential Clock Input Pinouts

| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|----|----|----|---------|---------|----|----|----|
| Function | NC | NC | NC | CLK IN+ | CLK IN+ | NC | NC | NC |

Ethernet Interface

- Supports 2-port UTP + 2-port SFP.
- **Data rate:** 1000Mbps.

Console Interface

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

| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------|----|----|------|------|------|------|----|----|
| Func tion | NC | NC | TX D | GN D | GN D | RX D | NC | NC |

Dip the bottom

E1 and differential clock inputs Unbalanced (75Ω) and balance (120Ω) DIP, the default unbalanced impedance (120Ω).The DIP function definition as follow:

| DIP No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------|---|---|---|---|------------------|------------------------------------|---|---|
| Description | 1-4 channel impedance setting | | | | E1 reference CLK | Reserved | | |
| 75Ω | Setting 75Ω:E1 impedance 75Ω Setting 120Ω:E1 impedance 120Ω | | | | | DIP No.6/7/8 default:120Ω position | | |
| 120Ω | | | | | | | | |

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.

Turning Off the Unit

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

NMS Configuration

Operating condition:

- PC operating systems: WINDOWS98/XP/Win 7
- Network connection: 10/100/1000Base-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 GE: IP address: 192.168.0.168 Subnet Mask: 255.255.255.0.

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.

System Settings

System Information

This page setting device name, device ID, device address, contact information and certification mode selection; Display hardware version, software version, firmware version, MAC address of the network management device, and other information equipment uptime.

Welcome to FE1 over Ethernet Multiplexer Web Manager!

- ☐ **System Configuration**
 - System Information
 - Network Configuration
 - System Reboot
 - System Upgrade
 - Language Selection
 - Configuration Management
- ☒ **Service Configuration**
- ☒ **Qos Configuration**
- ☒ **Statistical Information**

System Information

| Attribute | Parameter |
|---------------------|--|
| Device Name | BD-FE1-IP-G |
| Device Number | ***** |
| Device Location | ShangHai |
| Contact Information | BaudCom |
| Note Information | ***** |
| Hardware Version | 1.0.0 |
| Software Version | 1.1.0 |
| Firmware Version | 1.2.4 |
| Authentication Mode | None Authentication <input type="button" value="v"/> |
| MAC Address | a4:c2:ab:01:90:e1 |
| System Uptime | 0-days 0-hours 19-mins 23-secs |

Network Configuration

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

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Network Configuration

| Attribute | Parameter |
|-----------------|-------------------|
| IP Address | 192.168.0.168 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.0.1 |
| MAC Address | a4:c2:ab:00:01:25 |

Tip: Address changes, please enter the new address in the browser to access the device.

System Reboot

This page can restart the device or restore the factory default configuration

System Configuration

- System Information
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System Reboot

| Attribute | Parameter |
|---------------|--|
| System Reboot | ----- |
| | Reboot Now Restore the default configuration. |

Refresh Settings

Tips:
The default device IP address is : 192.168.0.168

System Upgrade

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

System Configuration

- System Information
- Network Configuration
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- System Upgrade
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System Upgrade

Step 1: Upload File

浏览... Upload

Step 2: Upgrade

--- Upgrade

Step 3: Reboot

--- Settings

Current Status: No file upload

Tips:
Step 1: Upload the upgrade file;
Step 2: Follow the prompts to choose to upgrade software, firmware or configuration files;
Software upgrade is completed automatically reboot.
The firmware upgrade is completed, please reboot manually.

- **Step 1:** 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.

Language Selection

Equipment web pages default English version of this page can be switched in the Chinese and English version.

System Configuration

- System Information
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Language Selection

| Attribute | Parameter |
|--------------------|---------------|
| Language Selection | ----- |
| | 中文 English |

Refresh Settings

Service Configuration

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

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Simulation Gateway Configuration

E1 Branch Configuration

Ethernet Port Configuration

NTP Configuration

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Simulation Gateway Configuration

| Attribute | Parameter |
|-----------------|--|
| Network Type | <input checked="" type="radio"/> IPv4 <input type="radio"/> NEF <input type="radio"/> MPLS |
| Protocol Type | <input checked="" type="radio"/> L2TPv3 <input type="radio"/> UDP |
| Destination IP | 192.168.1.11 |
| Destination MAC | a4:c2:ab:00:01:16 |
| Source IP | 192.168.1.12 |
| Source MAC | a4:c2:ab:00:01:28 |
| Subnet Mask | 255.255.255.0 |
| Gateway | 192.168.1.1 |

Refresh Settings

Tips:

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

E1 Branch Configuration

Set E1 frame mode, E1 timeslot, frame size, RTP timestamp mode, the clock recovery mode, E1 line loopback function enabled and disabled, E1 alarm settings such as enable and disable.

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Statistical Information

E1 Branch Configuration

E1 Branch: 1

| Attribute | Parameter |
|-----------------------|--|
| Frame Packing Mode | <input type="radio"/> SAToP <input checked="" type="radio"/> CESoPSN non CAS |
| Frame Mode | <input type="radio"/> UnFramed <input type="radio"/> PCM30 <input checked="" 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 |
| RTP Timestamp Mode | Differential Mode |
| Clock Recovery Mode | Adaptive Clock Mode |
| Jitter Buffer(1-256) | 5 ms |
| E1 Loopback Enabled | Disable |
| E1 Alarm Enabled | Enable |

Refresh Settings

Ethernet Port Configuration

Set Vlan enable and disable, 1+1 protection mode, RSTP enabled and disabled, and the port speed configuration Vlan table settings

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Ethernet Port Configuration

| Attribute | Parameter |
|--------------------------|--|
| TagVlan Enabled | Enable |
| Ethernet Protection Mode | <input checked="" type="radio"/> Disable <input type="radio"/> 1+1 Protection <input type="radio"/> RSTP |
| Master Port/Slave Port | Ethernet 1 Ethernet 2 |

| Attribute | Parameter | | | | | |
|------------|----------------|------|-----|---------------------|--------------------------|-----------------------------|
| Port | Operating Mode | PVID | VTU | Forced PVID Enabled | Uplink Speed Limit(Kbps) | Downlink Speed Limit (Kbps) |
| Ethernet 1 | AUTO | 1 | 0 | Disable | 0 | 0 |
| Ethernet 2 | AUTO | 1 | 0 | Disable | 0 | 0 |
| SFP A | FULL-1000 | 1 | 0 | Disable | 0 | 0 |
| SFP B | FULL-1000 | 1 | 0 | Disable | 0 | 0 |
| TCN | Enable | 1 | 0 | Disable | 0 | 0 |

Refresh Settings

Tips:
 VTU value is determined by five digits, from low to high, respectively, the case data out port 0-4.
 VTU value meaning of the value of each digit: 0 means output frame unchanged; 1 means output frame without tag; 2 means output frame with tag; 3 means output frame with tag and priority.
 For example: Port 0 VTU is 12301, show that enter frames from port 0 can be no change from the port 1 output, can not output from port 2, can be output 3 then the Uplink/Downlink Speed Limit value is 0, close port speed limit.
 Settings take effect immediately.

Tips:

Under the 1+1 protection mode, master port should be connected to the other device's master port.

NTP Configuration

Network Time Protocol (NTP) to enable and disable, when NTP almighty you need to set the server IP and port number.

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Statistical Information

NTP Configuration

| Attribute | Parameter | | |
|-------------------------|---------------|-----|--|
| NTP Enabled | Enable | | |
| Master Server: IP/Port | 192.168.1.100 | 123 | |
| Standby Server: IP/Port | 192.168.0.101 | 123 | |

RefreshSettings

Tip:
When the NTP is enabled, the NTP server must be set up.

SNMP Configuration

Configure SNMP protocol parameters:

- When the trap mode select V1 or V2 Mode, you need to set Set_key and Get_key;
- When the trap mode selection V3 Mode, you need to set Auto_proto and Poli_proto;
- When the trap mode select All Mode, you need to set all parameters.

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SNMP Configuration

| Attribute | Parameter | | |
|-------------------------|--------------|-----|--|
| Trap Mode | v1 Mode | | |
| Master Server: IP/Port | 192.168.0.79 | 161 | |
| Standby Server: IP/Port | 0.0.0.0 | 0 | |
| Set_Key | public | | |
| Get_Key | | | |
| Auth_Proto | | | |
| Poli_Proto | | | |

RefreshSettings

Tip:
When the trap mode is v1 or v2 mode, you must set Set_Key and Get_Key;
When the trap mode is v3 mode, you must set Auth_Proto and Poli_Proto;
When the trap mode is all mode, all parameters must be set.

Tacacs+ Configuration

Tacacs + authentication protocol parameter settings, you need to set the authentication IP, audit IP, the session IP and other related parameters.

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Tacacs+ Configuration

| Attribute | Parameter | | | |
|--------------------------------|--------------|---------|---------|---------|
| Authentication IP1/IP2/IP3/IP4 | 192.168.0.79 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 |
| Authentication Port | 49 | | | |
| Authentication Key | #0004 | | | |
| Audit IP1/IP2/IP3/IP4 | 192.168.0.79 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 |
| Audit Port | 49 | | | |
| Audit Key | #0004 | | | |
| Audit Service | login | | | |
| Audit Protocol | tcp | | | |
| Session IP1/IP2/IP3/IP4 | 192.168.0.79 | 0.0.0.0 | 0.0.0.0 | 0.0.0.0 |
| Session Port | 49 | | | |
| Session Key | #0004 | | | |
| Session Service | login | | | |
| Session Protocol | tcp | | | |

RefreshSettings

Syslog Configuration

- Logging turned on and off, open the Local Logging, click View The Current Log in system logging.
- Open the Server Logging, you need to set the log server IP and port number.

System Configuration

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Syslog Configuration

Tip: When the Server logging is enabled, the log server IP, port must be set.

| Attribute | Parameter |
|--------------------------|--------------------|
| Syslog Enabled | Disable |
| Syslog Server 1: IP/Port | 192.168.0.100 9000 |
| Syslog Server 2: IP/Port | 0.0.0.0 0 |
| Syslog Server 3: IP/Port | 0.0.0.0 0 |
| Syslog Server 4: IP/Port | 0.0.0.0 0 |

Refresh Settings

History Logging

Tip: If history logging can't be found, then no history log.

| Syslog | View |
|-----------------|----------------------|
| The Current Log | View |
| History Log 0 | View |
| History Log 1 | View |
| History Log 2 | View |
| History Log 3 | View |
| History Log 4 | View |
| History Log 5 | View |
| History Log 6 | View |
| History Log 7 | View |

QoS Configuration

Port's QoS Configuration

Select the port Qos debug mode, Qos mode, the default priority setting, the system default port priority

System Configuration

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QoS Configuration

Statistical Information

Port's Qos Configuration

| Port | Ethernet 1 | Ethernet 2 | SFP A | SFP B | TDM |
|---------------------|------------------|------------------|------------------|------------------|------------------|
| Qos Scheduling Mode | 8-4-2-1(default) | 8-4-2-1(default) | 8-4-2-1(default) | 8-4-2-1(default) | 8-4-2-1(default) |
| Qos Mode | IP(Tos) | IP(Tos) | IP(Tos) | IP(Tos) | IP(Tos) |
| Default Priority | 0 | 0 | 0 | 0 | 0 |

Refresh Settings

Tip:
Data input/output port Qos scheduling mode must be the same.
Data input/output port Qos mode must be the same.

Tos Map

Set Tos value and the priority mapping table.

System Configuration

Service Configuration

QoS Configuration

Statistical Information

Tos Map

DSCP(IP Priority) Value (DSCP valid range of values is 0-63)

Refresh Settings

Tos Value and the Priority Mapping Table ((Tos Value(DSCP value) - Priority))

| | | | | | | | |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 0x00(00) - 0 | 0x04(01) - 0 | 0x08(02) - 0 | 0x0C(03) - 0 | 0x10(04) - 0 | 0x14(05) - 0 | 0x18(06) - 0 | 0x1C(07) - 0 |
| 0x20(08) - 0 | 0x24(09) - 0 | 0x28(10) - 0 | 0x2C(11) - 0 | 0x30(12) - 0 | 0x34(13) - 0 | 0x38(14) - 0 | 0x3C(15) - 0 |
| 0x40(16) - 1 | 0x44(17) - 1 | 0x48(18) - 1 | 0x4C(19) - 1 | 0x50(20) - 1 | 0x54(21) - 1 | 0x58(22) - 1 | 0x5C(23) - 1 |
| 0x60(24) - 1 | 0x64(25) - 1 | 0x68(26) - 1 | 0x6C(27) - 1 | 0x70(28) - 1 | 0x74(29) - 1 | 0x78(30) - 1 | 0x7C(31) - 1 |
| 0x80(32) - 2 | 0x84(33) - 2 | 0x88(34) - 2 | 0x8C(35) - 2 | 0x90(36) - 2 | 0x94(37) - 2 | 0x98(38) - 2 | 0x9C(39) - 2 |
| 0xA0(40) - 2 | 0xA4(41) - 2 | 0xA8(42) - 2 | 0xAC(43) - 2 | 0xB0(44) - 2 | 0xB4(45) - 2 | 0xB8(46) - 2 | 0xBC(47) - 2 |
| 0xC0(48) - 3 | 0xC4(49) - 3 | 0xC8(50) - 3 | 0xCC(51) - 3 | 0xD0(52) - 3 | 0xD4(53) - 3 | 0xD8(54) - 3 | 0xDC(55) - 3 |
| 0xE0(56) - 3 | 0xE4(57) - 3 | 0xE8(58) - 3 | 0xEC(59) - 3 | 0xF0(60) - 3 | 0xF4(61) - 3 | 0xF8(62) - 3 | 0xFC(63) - 3 |

Tip:
Priority: 0 is the lowest, 3 highest.

Cos Map

Set Cos value and the priority mapping table.

System Configuration

Service Configuration

QoS Configuration

Statistical Information

Cos Map

COS(Tag Priority) Value (COS valid range of values is 0-7)

Refresh Settings

Cos Value and the Priority Mapping Table ((Cos Value - Priority))

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

Tip:
Priority: 0 is the lowest, 3 highest.

Statistical Information

Ethernet Statistics

Display Ethernet port statistics information.

System Configuration

Service Configuration

Qos Configuration

Statistical Information

Ethernet Statistics

E1 Statistics

E1 Alarm Display

Ethernet Statistics

| Port | in_good_octets | in_bad_octets | in_unicast | in_broadcasts | in_multicasts | out_octets | out_unicast | out_broadcasts | out_multicasts |
|------------|----------------|---------------|------------|---------------|---------------|------------|-------------|----------------|----------------|
| Ethernet 1 | 48118 | 0 | 2237 | 2048 | 1641 | 38303 | 53479 | 23618 | 0 |
| Ethernet 2 | 61354 | 0 | 26942 | 11810 | 0 | 28045 | 26151 | 13858 | 1641 |
| SFP A | 0 | 0 | 0 | 0 | 0 | 49029 | 3742 | 25667 | 1637 |
| SFP B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Refresh

Clear

Tip:

Language Selection

Automatically refresh every 5 seconds.

E1 Statistics

E1 port statistics information display.

System Configuration

Service Configuration

Qos Configuration

Statistical Information

Ethernet Statistics

E1 Statistics

E1 Alarm Display

E1 Statistics

| E1 Branch | Send | Receive | Receive Loss | CRC Error |
|-----------|-----------|-----------|--------------|-----------|
| 1 | 118202266 | 118176834 | 0 | 0 |
| 2 | 118198122 | 118173053 | 2871 | 0 |
| 3 | 118198132 | 118173062 | 576 | 0 |
| 4 | 118198141 | 118173071 | 800 | 0 |

Refresh

Clear

Tips:

Automatically refresh every 5 seconds.

E1 Alarm Display

E1 port alarm information display

| <div><div>System Configuration</div><div>Service Configuration</div><div>Qos Configuration</div><div>Statistical Information</div><div>Ethernet Statistics</div><div>E1 Statistics</div><div>E1 Alarm Display</div></div> | <div>E1 Alarm Display</div> <table><tr><th>E1 Branch</th><th>Alarm</th></tr><tr><td>1</td><td>No Alarm;</td></tr><tr><td>2</td><td>LOS;</td></tr><tr><td>3</td><td>LOS;</td></tr><tr><td>4</td><td>LOS;</td></tr></table> <div>Refresh</div> <div>Tips: Automatically refresh every 5 seconds.</div> | E1 Branch | Alarm | 1 | No Alarm; | 2 | LOS; | 3 | LOS; | 4 | LOS; |
|---|--|-----------|-------|---|-----------|---|------|---|------|---|------|
| E1 Branch | Alarm | | | | | | | | | | |
| 1 | No Alarm; | | | | | | | | | | |
| 2 | LOS; | | | | | | | | | | |
| 3 | LOS; | | | | | | | | | | |
| 4 | LOS; | | | | | | | | | | |

Technical Specifications

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 -40℃ +80℃
- Storage Temperature 40℃ +70℃
- Relative Humidity 10 % 95 %
- Atmospheric Pressure 70 106 kpa

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

Power Supply Section

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

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
- **Number of differential Clock Input Interface:** 1
- **Point-to-point one-way additional processing delay (Minimum delay setting):** ≤1.2ms
- **Output frequency stability (adaptive timing, Stable):** ≤ 50ppb
- **Output Jitter (adaptive timing):** ≤ 0.03UI

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, 802.3u, 802.3z, 802.3ab, 802.3x, 802.3ad, 802.1q VLAN, 802.1ad Q in Q, 802.1p
- **Connector Type:** RJ45 with LEDs

Ethernet Optical Interface

- **Type:** 1000Base-FX
- **Compliance:** IEEE 802.3, 802.1P 802.1Q
- **Connector Type:** LC SFP
- **Wavelength:** 1310/1550nm
- **Transmission distance:** 10km 20km 40km optional

Physical Characteristics

- **Housing:** Metal
- **Weight:** 1.0 kg (2.2 lb)
- **Dimensions:** 265×44.5×160mm (10.4×1.75×6.3 in.)

Installation

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.

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.

Power Supply

1. 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.
2. 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.

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.

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.

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

The E1 warning LED is set by Dip to confirm the local E1 alarms or remote E1 alarms, When E1 LOS LED is on, loss of E1 signal fault is detected. 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 (with CAS) corresponding TDM Pseudowire Access Gateway (with CAS)
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 FE1 over GE. Whether both sides of the E1 in the asynchronous state. If there is no public reference clock source, FE1 over GE 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.

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 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 ices will be charged:
 1. Over 36 months from the date of purchase.
 2. User fails to provide certificate of purchase date and the product's serial number indicates the date of manufacture is more than 39 months.
 3. Including but not limited to damages caused by severe impact, extrusion, drops, liquid immersion and other abnormal conditions.
 4. The frangibility label is damaged.
 5. Unauthorized disassembling product behavior.
 6. 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.

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Documents / Resources

| | |
|---|--|
|  | Baudcom BD-FE1-IP-G FE1 Over Gigabit Ethernet Multiplexer [pdf] User Manual BD-FE1-IP-G, BD-2FE1-IP-G, BD-4FE1-IP-G, BD-FE1-IP-G FE1 Over Gigabit Ethernet Multiplexer, FE1 Over Gigabit Ethernet Multiplexer, Over Gigabit Ethernet Multiplexer, Gigabit Ethernet Multiplexer, Ethernet Multiplexer, Multiplexer |
|---|--|

References

- [Home - Baudcom](#)