



**F5-45x3/85x3 10/100Mbps  
Ethernet to 4E1/8E1  
Converter User Manual**

**(Version 1.1)**

**Beijing Fibrbridge Co., Ltd.**

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## 1. Overview

This series of products are orientated in the broadband access system for its high-quality, high-stability and low price. F5-45x3/85x3 is the most newly promoted product that can map 100Base-TX or 10Base-T Ethernet data into 4 or 8 E1 channels, and vice versa. This protocol converter provides bandwidth up to 15.872Mbps for Ethernet connection. And it also provides completed indicators to show the status and alarm messages of the E1 channels and Ethernet ports. It is widely used in LAN connection, IP transmission and video broadcasting.

The production has the features of setting E1 channels CRC error threshold and monitoring the E1 channel working status. If the CRC error rate in any E1 channel exceeds the threshold, the system will shut down this channel automatically, and reassign the data flow to valid E1 channels.

The standalone device has 4 Ethernet ports, and for the module, only one Ethernet port is available. Ethernet ports support forced 10/100Mbps, forced full/half duplex, auto-negotiation, and MDI/MDI-X auto crossover. E1 ports are compatible with 75Ω unbalanced and 120Ω balanced transmission lines.

## 2. Features

### 2.1. Hardware

- 1~4 or 1~8 E1 channels carry 10/100M Ethernet data
- Comply with ITU-T G.703, G.803 for E1 ports and IEEE802.3, 802.3u, 802.3x for Ethernet ports
- 64Mbits high-speed SDRAM inside used to cache
- Rearrange Ethernet packages in E1 channels to ensure data transfer efficiency and stability
- Allow the delay time between any two channels up to 16ms
- For each E1 channel, the payload capability is up to 1.984Mbps
- Auto-detect the valid E1 channels and auto-balance the data flow among the valid E1 channels
- Provide CRC error threshold setting for each E1 channel. If the CRC error rate of any E1 channel exceeds the threshold, the system will shut down this channel, and reassign the data flow to the valid E1 channels automatically
- Even if all the receive lines of E1 channels is shut down, the local alarm and management information can still be transferred in the transmission line. While the converter

work with an optical equipment, this functionality affords a convenient and efficient way to locate the fault.

- 75Ω and 120Ω line impedance are optional for E1 channels.
- Ethernet ports supports auto-negotiation and forced 10/100Mbps, half/full duplex mode. And furthermore, MDI/MDI-X auto crossover makes it easy and convenient to connect with other Ethernet equipment.
- Full LED on front panel provides comprehensive indication of device working status
- Standalone and module installed in chassis are optional
- 220VAC and -48VDC power supply for standalone and chassis are optional
- Provide SNMP, WEB and CONSOLE management for the chassis with a management card. Viewing and configuring local and remote device easily.

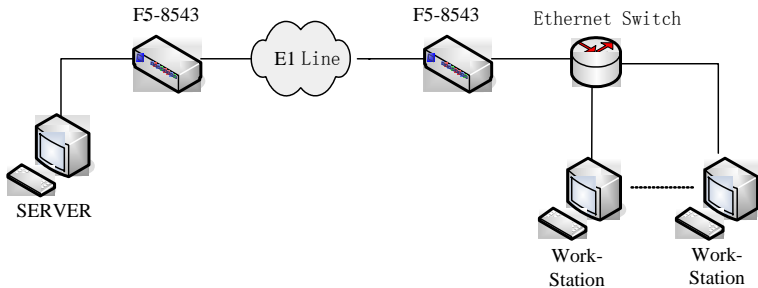
## **2.2. Software**

- Support Console, WEB and SNMP management
- Show details of system information, including device name, location information, IP address, start-up time, software and hardware version
- View & configure the working status of each port, including link status, link speed, duplex mode, self-negotiate status

- Configure the code error limitation、LOS、 LOF、 AIS and overtime alarm information
- Configure system setting mode, CPU or hardware configure
- Choose to show local alarm or remote alarm
- Show the detailed information of power supply, including AC/DC type, output power and running status
- Support SNMP management. Set Trap Destination, Community Name, and authority
- Provide MIB file, make it easy to be integrated into the third-party SNMP management software
- Reset device to factory default, with network configuration resetting or not selectable
- Support firmware updating, with the update tool program and new version firmware file download from our website.
- Adopt the centralized management style and the tree-view catalogue, which can manage many sets of device at the same time in a single window.

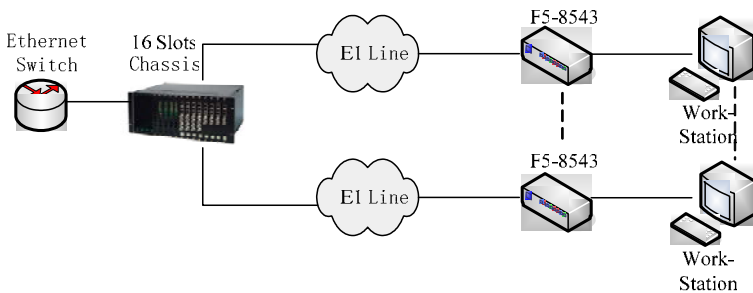
## 3. Applications

### 3.1. Peer-to-peer application with standalone



In this application, two F5-45x3 or F5-85x3 converters carry Ethernet data to connect a host with a LAN.

### 3.2. Star-topology with chassis and standalone



In this application, eight F5-85x3 converter modules installed in a chassis and eight standalones set up a star-topology network.



## 4. Specification

### 4.1. E1 Interface

- Data rate: 2.048Mbps
- Code type: HDB3
- Compliant with ITU-T G.703, G.823
- Line impedance: 75Ω for unbalanced or 120Ω for balanced
- Connector: BNC for unbalanced or RJ45 for balanced
- Jitter: Compliant with ITU-T G.823
- Unframed mode
- Channel number: 4 for F5-45x3 and 8 for F5-85x3

#### Definition of RJ45 connector pins for 120Ω E1 balanced ports

| PIN         | 1   | 2   | 4   | 5   | 3, 6 | Others   |
|-------------|-----|-----|-----|-----|------|----------|
| Description | TX- | TX+ | RX- | RX+ | GND  | Reserved |

### 4.2. Ethernet Interface

- Speed: Forced 10/100Mbps or auto-negotiation
- Compatible with IEEE802.3, 802.3u and 802.3x
- Connectors: RJ-45
- Duplex mode: Forced half/full duplex or auto-negotiation
- MDI/MDI-X auto crossover
- Design specially for supporting VLAN package

- Transfer distance:  $\leq 100$  meters
- Port number: 4 for standalone and 1 for module

### **4.3. Power**

- Power Input:  
AC Power: 198V~242VAC, 50/60Hz  
DC Power: -48VDC
- Power Consumption: <5W

### **4.4. Environment**

- **Operating**  
Temperature: 0~+50°C  
Humidity: 0~90% (non-condensing)
- **Storage**  
Temperature: -25~+70°C  
Humidity: 0~95% (non-condensing)

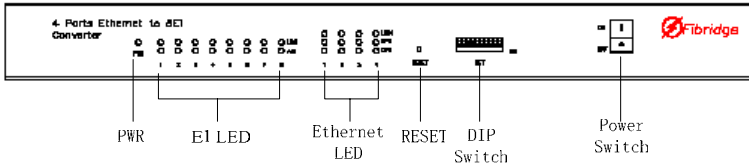
### **4.5. Dimension & Weight**

- **Dimension**  
Standalone: 434 Width × 44 Height × 155.5 Depth (mm):  
Module: 50.7 Width × 176 Height × 340 Depth (mm)
- **Weight**  
Standalone: 2Kg (approx.)  
Module: 0.5Kg (approx.)

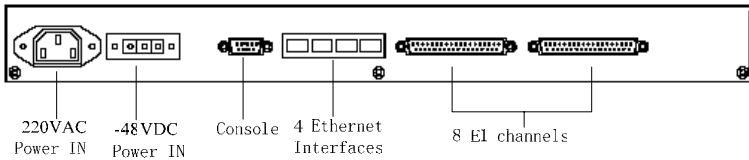
## 5. Operation Instruction

### 5.1. Panel sketch map

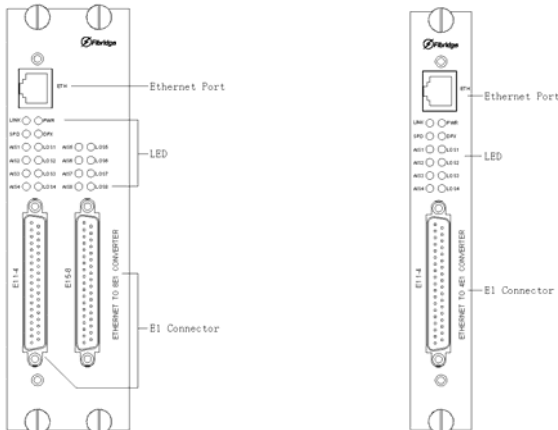
#### Front panel of standalone



#### Rear panel of standalone



#### Front panel of module



## 5.2. LED Description

### LED Description for Standalone

| LED                        | Color  | Function                        | Stat. | Description  |
|----------------------------|--------|---------------------------------|-------|--|
| PWR                        | Green  | Power                           | ON    | Power supply is OK   |
|                            |        |                                 | OFF   | Power off or failed  |
| LOS <sub>n</sub><br>n=1~8  | Red    | 1~8 E1 channel loss of signal   | ON    | Local or remote E1 channel loss of signal, or frame asynchronous |
|                            |        |                                 | OFF   | No LOS or LOF alarm  |
| AIS <sub>n</sub><br>n=1~8  | Red    | 1~8 E1 channel AIS alarm        | ON    | Local or remote E1 channel has AIS alarm                         |
|                            |        |                                 | OFF   | No AIS alarm   |
| LINK <sub>n</sub><br>n=1~4 | Green  | 1~4 Ethernet ports' link status | ON    | Ethernet port linked   |
|                            |        |                                 | OFF   | Ethernet port not link   |
|                            |        |                                 | Blink | Ethernet port is transferring data                               |
| SPD <sub>n</sub><br>n=1~4  | Green  | 1~4 Ethernet ports' speed       | ON    | Ethernet port running at 100Mbps                                 |
|                            |        |                                 | OFF   | Ethernet port running at 10Mbps                                  |
| DPX <sub>n</sub><br>n=1~4  | Yellow | 1~4 Ethernet ports' duplex mode | ON    | Ethernet port running at full duplex                             |
|                            |        |                                 | OFF   | Ethernet port running at half duplex                             |
|                            |        |                                 | Blink | Ethernet port running at half duplex, but with data collision    |

### LED Description for Module

| LED                       | Color  | Function                               | Stat. | Description  |
|---------------------------|--------|--|-------|--|
| PWR                       | Green  | Power                                  | ON    | Power supply is OK   |
|                           |        |  | OFF   | Power off or failed  |
| LOS <sub>n</sub><br>n=1~8 | Red    | 1~8 E1<br>channel<br>loss<br>of signal | ON    | Local or remote E1 channel<br>loss of signal, or frame<br>asynchronous |
|                           |        |  | OFF   | No LOS or LOF alarm  |
| AIS <sub>n</sub><br>n=1~8 | Red    | 1~8 E1<br>channel<br>AIS<br>alarm      | ON    | Local or remote E1 channel<br>has AIS alarm                            |
|                           |        |  | OFF   | No AIS alarm   |
| LINK                      | Green  | Ethernet port<br>link status           | ON    | Ethernet port linked   |
|                           |        |  | OFF   | Ethernet port not link   |
|                           |        |  | Blink | Ethernet port is transferring<br>data                                  |
| SPD                       | Green  | Ethernet port<br>speed                 | ON    | Ethernet port running at<br>100Mbps                                    |
|                           |        |  | OFF   | Ethernet port running at<br>10Mbps                                     |
| DPX                       | Yellow | Ethernet port<br>duplex mode           | ON    | Ethernet port running at full<br>duplex                                |
|                           |        |  | OFF   | Ethernet port running at half<br>duplex                                |
|                           |        |  | Blink | Ethernet port running at half<br>duplex, but with data<br>collision    |

### 5.3. Port Description

#### Port Description for Standalone

| Name           | Description   |
|----------------|---|
| POWER          | 220VAC and 48VDC power supply input jacks                                     |
| DTE            | RS-232 management port  |
| 1~4 RJ45       | 1~4 Ethernet ports  |
| E1 1~4, E1 5~8 | 1~8 E1 ports, connected with DB37~8BNC(75Ω) adapter or DB37~4RJ45(120Ω) cable |

#### Port Description for Module

| Name          | Description   |
|---------------|---|
| ETH           | Ethernet ports  |
| E1 1~4,E1 5~8 | 1~8 E1 ports, connected with DB37~8BNC(75Ω) adapter or DB37~4RJ45(120Ω) cable |

### 5.4. DIP-switch Description

| Name                | Bit  | Stat. | Description                                      |
|---------------------|------|-------|--|
| SET<br>(DIP-Switch) | DIP1 | ON    | Enable VLAN                                      |
|                     |      | OFF   | Disable VLAN                                     |
|                     | DIP2 | ON    | Force Ethernet ports working at half duplex mode |
|                     |      | OFF   | Force Ethernet ports working at full duplex mode |
|                     | DIP3 | ON    | Force Ethernet ports working at 10Mbps           |
|                     |      | OFF   | Force Ethernet ports working at 100Mbps          |
|                     | DIP4 | ON    | Disable Ethernet auto negotiation                |
|                     |      | OFF   | Enable Ethernet auto negotiation                 |
|                     | DIP5 | ON    | Show remote end device alarms                    |

|        |                 |            |  |
|--------|-----------------|------------|--|
|        |                 | OFF        | Show local end device alarms                                   |
|        | DIP6<br>DIP7    | OFF<br>OFF | No CRC error threshold   |
|        |                 | OFF<br>ON  | CRC error threshold is $1 \times 10^{-4}$                      |
|        |                 | ON<br>OFF  | CRC error threshold is $1 \times 10^{-5}$                      |
|        |                 | ON<br>ON   | CRC error threshold is $1 \times 10^{-6}$                      |
|        |                 | DIP8       | ON   |
|        | OFF             |            | Disable local E1 loop back                                     |
|        | DIP9<br>DIP10   | OFF<br>OFF | Local device is controlled by DIP-switch                       |
|        |                 | OFF<br>ON  | Local device is controlled by local management                 |
|        |                 | ON<br>ON   | Local device is controlled by remote end device via E1 channel |
| RESET  | Reset           | Down       | Reset the equipment  |
|        |                 | Up         | Normal operation   |
| ON/OFF | Power<br>Button | ON         | Power on   |
|        |                 | OFF        | Power off  |

As factory default, reset button is UP, power button is set OFF, and DIP-switches are all OFF.

## 6. Installation & Operation

### 6.1. Installation Steps

#### 6.1.1. Preparation

- Open the package and check if the device or accessories are damaged. Then, compare the device and accessories with content of the “Packing List” in package. If something is missing or damaged, please contact us immediately.
- Prepare the cables. If you want to use the 75 ohm interface for E1 channel, please take out BNC from package and fix it on E1 coaxial cable. If you want to use 120 ohm interface for E1 channel, fix RJ45 connector on twisted-pair cable. Please refer to **4.1 E1 Interface** in this document to get RJ45 pin description.
- Set button and DIP-switches. Generally, the equipment works well at default status. If you have special demand at some functions, e.g., Ethernet status, CRC error threshold, alarm etc., you could change the button or switches status according to **5.4 DIP-switch description**.

#### 6.1.2. Connection

- Connect Ethernet ports with RJ45 twisted-pair line.
- Connect E1 1~4 and E1 5~8 ports with DB37~8BNC (75Ω) or DB37~4RJ45 (120Ω) adapters, then link with 75Ω



coaxial cables or 120Ω twisted-pair cables to the adapter.

- Push modules into chassis and connect power supply to chassis power module and standalone.
- When all the accessories are fixed, set power button ON. The “PWR” LED should be lighted on, Ethernet “LINK” should be “ON”(if it’s transmitting or receiving data, it should be “blink” ). Ethernet “SPD” and “DPX” is “ON” or “OFF” according to its working status. All the alarm LED is “OFF”.

## **6.2. Notice**

E1 ports should be linked in pairs and one-to-one, e.g., IN1 at local end device should be connected with OUT1 at remote end device. Otherwise, they can not receive data.

## **6.3. Faults & Solutions**

### **6.3.1. Power LED OFF**

Please check whether the power button is “ON”, or whether the module is pushed into chassis along with the slot rail correctly.

### **6.3.2. LOS LED ON**

Please check whether the relevant E1 channels IN and OUT are already linked, or whether it has bit errors in the channels.

### 6.3.3. No alarm, but can't transfer data

Please check whether E1 channels are linked in pairs and one-to-one.

## 7. Order Information

| <b>P/N</b>      | <b>Description</b>   |
|-----------------|--|
| <b>F5-8543A</b> | 4 ports 10/100M Ethernet to 8E1 converter, standalone, 220VAC power supply |
| <b>F5-8543D</b> | 4 ports 10/100M Ethernet to 8E1 converter, standalone, -48VDC power supply |
| <b>F5-8513M</b> | 1 port 10/100M Ethernet to 8E1 converter, module                           |
| <b>F5-4543A</b> | 4 ports 10/100M Ethernet to 8E1 converter, standalone, 220VAC power supply |
| <b>F5-4543D</b> | 4 ports 10/100M Ethernet to 8E1 converter, standalone, -48VDC power supply |
| <b>F5-4513M</b> | 1 port 10/100M Ethernet to 8E1 converter, module                           |
| <b>FC-416</b>   | 16-slot chassis, 19 inch wide, 4U high                                     |
| <b>FC-416-M</b> | Management Card for FC-416   |

Notice: The P/Ns shown in above table are for 75ohm E1 channels only. Append suffix “-H” for each to represent 120ohm E1 channels.

\*\* We Reserve the right to vary descriptions and specifications without notice due to FibrIDGE's policy of continuous product improvement\*\*

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