

# AccessCON-Eth

## **FRACTIONAL E1/ETHERNET ACCESS UNIT**

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Installation and Operation Manual

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# 1 INTRODUCTION

## 1.1 Overview

AccessCON-Eth is a cost-effective, single-port fractional E1/Ethernet access unit. The fractional E1 service makes unused time slots on long-range E1 trunks available for other users.

AccessCON-Eth provides a interface conversion between E1 and Ethernet. The available data rates are integer multiples of 64 Kbps; the multiples range is 1 through 32, corresponding to a maximum of 2048 Kbps. The user's payload data is packed into time slot of an E1 (CEPT 2.048 Mbps) data stream, for transmission over public or private E1 networks.

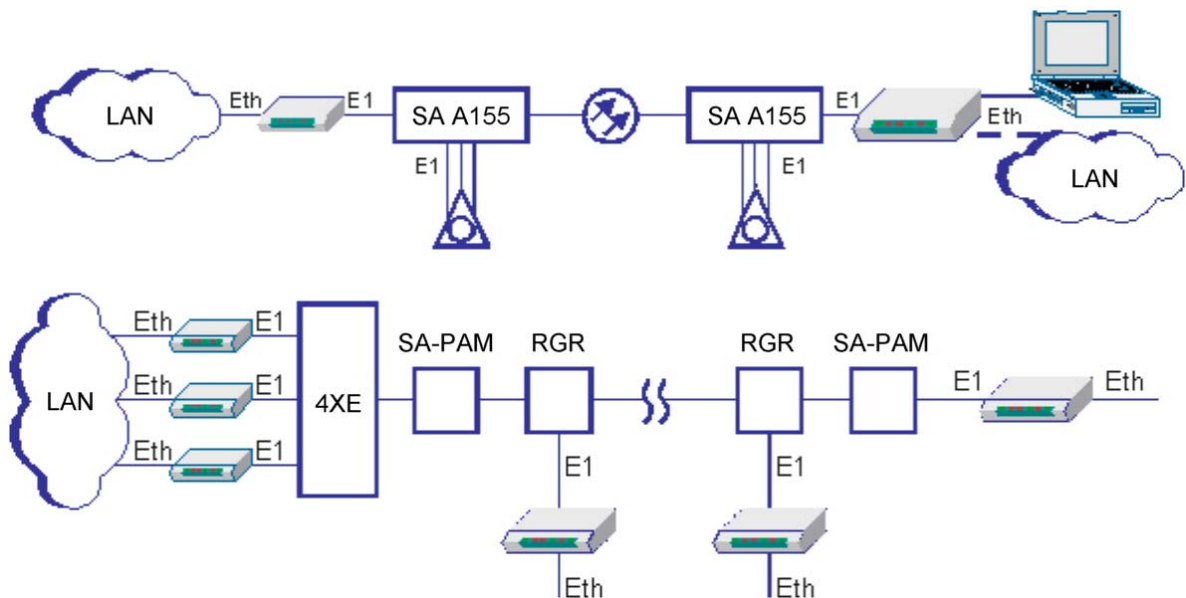


Figure 1.1 shows a typical AccessCON-Eth applications

### Features

- Interface conversion between G.703 and Ethernet.
- Built-in NVRAM to store user setting.
- LED indicators include PWR, SYN, BPV, LINK/ACT and 10/100.
- Supports idle code insert or pass through function.
- Provides universal switching power adapter to enhance reliability.
- Compact size easy to setup anywhere.
- Selectable data rates of  $n \times 64\text{Kbps}$ , up to 2048 Kbps.
- Framing format: PCM31, PCM30.
- Unframed E1 access unit with 2048 Kbps data rate.
- Controls and setting via 16 x 2 LCD and 4 keypads.
- Firmware upgradeable through console port.

- Connect 10BaseT and 100BaseT LANs and VLANs over E1.

## 1.2 Physical Description

AccessCON-Eth are designed for desktop installation.

Installation procedures for the AccessCON-Eth models and respective versions are provided in Chapter 2, Installation and Setup.

Top Panel

### LED's

The LED indicators on the top panel (see Figure 1-2) indicate the operating status of AccessCON-Eth. Various indicators display status of E1 or Ethernet port, alert conditions, work mode.

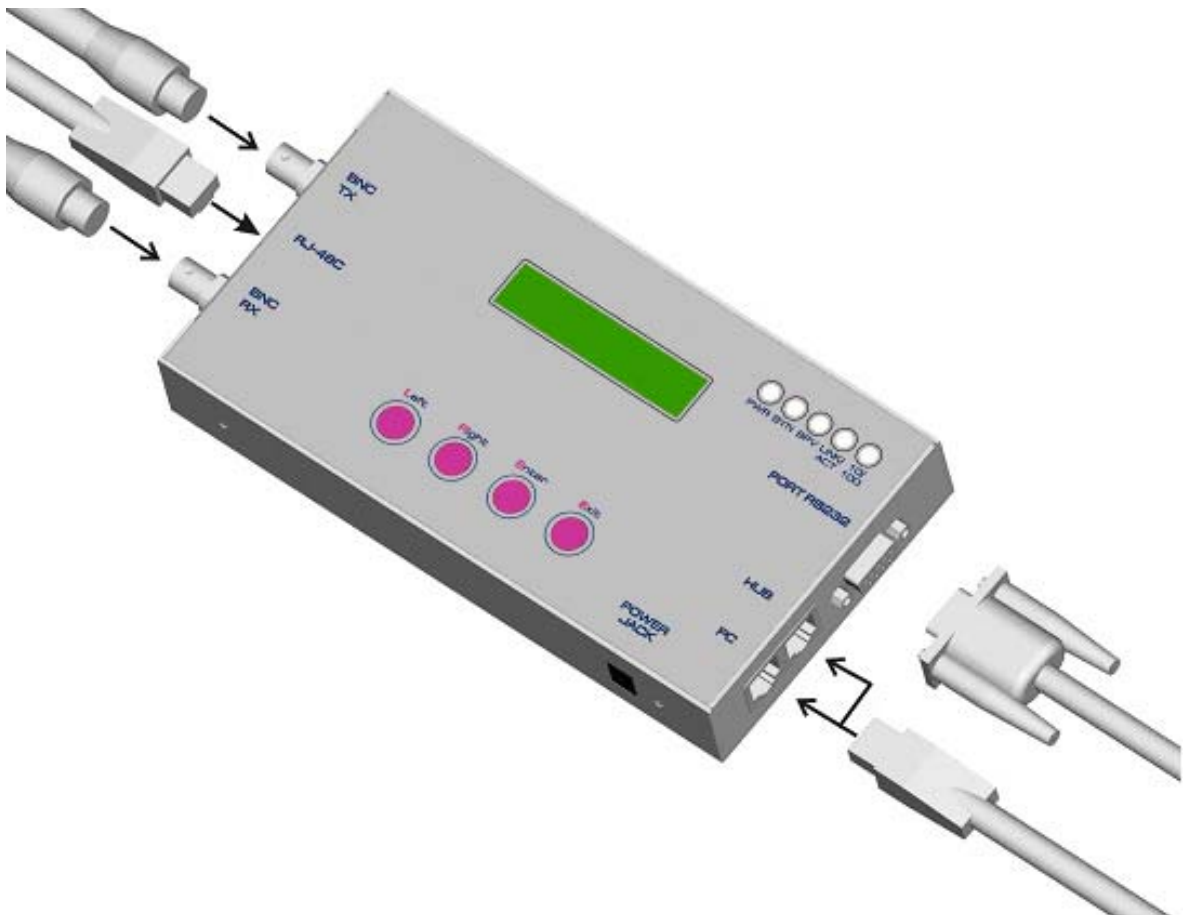


Figure 1.2 General View

### Connectors

The power and interface connectors are located on the lateral panel of AccessCON-Eth. A description of the lateral panel can be found in APPENDIX A interfaces and connectors.

### 1.3 Functional Description

AccessCON-Eth has a Ethernet interface. The user can connect to PC or HUB through PC or HUB port.

#### ***E1 Interface Characteristics***

The AccessCON-Eth E1 link interface meets the requirements of ITU-T Rec. G.703, G.704, G.706, G.823.

The E1 link interface offers two types of line connector: One is 120 ohms balanced line interface terminated in a RJ-48 eight-pin female connector, the other is 75 ohms unbalanced interface terminated in two BNC female connectors. Line coding is HDB-3 or AMI. The nominal balanced interface transmit level is  $\pm 3V$ , and the unbalanced interface transmit level is  $\pm 2.37 V$ . Jitter performance complies with the requirements of ITU-T Rec. G.823.

The E1 link interface supports PCM 31 frames (time slot 16 available for user's data), and PCM 30 frames (time slot 16 not available for user's data). AccessCON-Eth also supports the CRC-4 option specified in ITU-T Rec. G.704. The framing mode and the use of the CRC-4 option are independently selectable by the user.

In addition, AccessCON-Eth can also operate in the unframed mode. In this mode, AccessCON-Eth operates as an interface converter, enabling the transfer of unstructured 2.048 Mbps data streams via the E1 network.

AccessCON-Eth offer two types of clock source as below:

- internal clock oscillator, having an accuracy of  $\pm 30$  ppm;
- the recovered receive clock signal from E1.

#### ***Control of AccessCON-Eth Operation***

AccessCON-Eth is designed for fully automatic, unattended operation. Its configuration is determined by keypads and LCD-menu tree, console port or via Telnet. Top panel LED indicators and LCD display show the operating status of AccessCON-Eth. Various indicators display the E1 link status and Ethernet port status, and alert when an alarm condition (major or minor) are present in the system.

AccessCON-Eth provides diagnostic capabilities of DL loopback, controlled by top panel keypads and LCD-menu tree to determine failure point.

### Selection of System Timing Mode

This section explains the interaction between the user's port timing mode, and the E1 link transmit timing mode.

- Internal timing mode: The AccessCON-Eth E1 link transmit signal is derived from the internal clock oscillator. This timing mode used is necessary in point-to-point application over leased lines, e.g., short-range applications, where one AccessCON-Eth must provide the timing reference for the link. (Figure 1.3) In this case, one AccessCON-Eth must use the internal oscillator, and other must operate on the recovered clock signal.

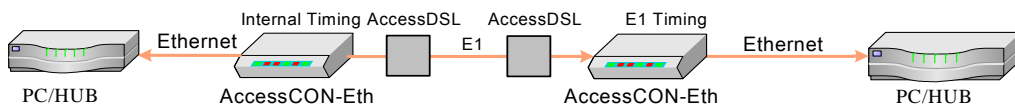


Figure 1.3 Internal timing mode

- E1 timing mode: With E1 timing, the AccessCON-Eth link transmit signal is locked to the recovered E1 receive clock. This is usually the timing mode selected for network operation, as shown in Figure 1.4. In the application illustrated in Figure 1.4, the master clock of the network determines the timing of the two AccessCON-Eth units. In case the E1 receive signal is lost, AccessCON-Eth automatically switches to the internal oscillator.



Figure 1.4 E1 timing mode

## 1.4 Technical Specifications

E1 Link Interface	Framing	Unframed mode PCM31 without CRC-4 PCM31 with CRC-4 PCM30 without CRC-4 PCM30 with CRC-4
	Bit rate	2.048 Mbps
	Line code	HDB3 AMI
	Line impedance	Balanced interface 120 ohms Unbalanced interface 75 ohms
	Signal levels	Transmit level: Balanced interface $\pm 3V \pm 10\%$ Unbalanced interface $\pm 2.37V \pm 10\%$ Receive level 0 to -36dB
	Jitter performance	As per ITU-T Rec. G.823
	Connectors	Balanced interface RJ-48 eight-pin connector Unbalanced interface Two BNC coaxial connectors
	Transmit timing	Internal- $\pm 30$ ppm oscillator E1- Locked to the recovered E1 receive clock
Ethernet port	Connector	RJ-45 eight-pin connector
	Interface	Ethernet
TimeSlot allocation	Framed modes	User data inserted in user assert time slots Others can be bypassed User-selectable idle code in empty time slots (7F or FF)
	Unframed mode	Bit-by-bit transfer from data port to E1 link
Diagnostics	Test loops	Digital loopback (DL), towards local E1 link
Indicators	LED	Power indicator SYNC E1 sync loss indicator BPV alarm indicator LINK/ACT indicator 10/100 indicator

### Mechanical Characteristics

Power Requirements		Use external power adapter Support voltage: I/P: 90-240 VAC $\pm 10\%$ , 47 to 63 Hz O/P: 5VDC $\pm 10$ , 10W
Environmental	Temperature	0 to 50°C
Characteristics	Humidity	Up to 90%, non-condensing



## 2 INSTALLATION AND SETUP

### 2.1 General

This chapter provides instructions for mechanical and electrical installation of the AccessCON-Eth model.

After installing the unit, refer to Chapter 3, Operation for operating instructions. In case a problem is encountered, refer to Chapter 4 Troubleshooting & Diagnostics for test and diagnostics instructions.

**Warning:** *No internal setting, adjustment, maintenance, and repairs may be performed by either the operator or the user; such activities may be performed only by a skilled technician who is aware of the hazards involved. Always observe standard safety precautions during installation, operation, and maintenance of this product.*

### 2.2 Site Requirements & Prerequisites

AC powered AccessCON-Eth units should be installed within an easily accessible, grounded AC outlet capable of furnishing the nominal supply voltage.

The ambient operating temperature of AccessCON-Eth is 0 to 50°C at a relative humidity of up to 90%, non-condensing

### 2.3 Package Contents

A preliminary inspection of the equipment container should be made before unpacking. Evidence of damage should be noted and reported immediately. The AccessCON-Eth package includes the following items:

- AccessCON-Eth unit
- CD or Installation and Operation Manual
- External power adapter
- CAT.5 UTP cable
- Phone cable

## 2.4 Interfaces and Connections

**Warning:** *ELECTRICAL SHOCK HAZARD: Access to the inside of the unit is permitted only to qualified and authorized service personnel.*

*Any adjustment, maintenance, and repair of the opened instrument under voltage should be avoided as much as possible and, when inevitable, should be carried out only by a skilled technician who is aware of the hazard involved. Capacitors inside the instrument may still be charged even after the instrument has been disconnected from its source of supply.*

**Caution:** AccessCON-Eth contains components sensitive to electrostatic discharge (ESD). To prevent ESD damage, avoid touching internal components and before moving jumpers, touch the AccessCON-Eth frame.

### **E1 Link Connections**

AccessCON-Eth E1 link has an RJ-48C eight-pin connector for the balanced interface, and two BNC connectors for the unbalanced interface. APPENDIX A, E1 Balanced Port Connector provides the pin allocation for the RJ-48C connector.

Connecting the E1 link cables to the connector(s) correspond to the interface type in use.

**Warning:** *Do not connect to both the balanced and unbalanced connectors!*

*When using the balanced interface, connect to the RJ-48C connector.*

*When using the unbalanced interface, connect to the two BNC connectors designated TX and RX. Pay attention to the correct connection of the received and transmitted cables to the TX and RX connectors.*

The maximum allowable line attenuation between the AccessCON-Eth E1 link port and the Central E1 network interface is 1000 Ft / 26AWG in general case.

### **Ethernet Port Connections**

The AccessCON-Eth Ethernet port has dual 8-pin RJ-45 connectors.

One is PC port, which connects LAN port of PC. The other is HUB port, which connects to HUB. Those two ports cannot be used simultaneously.

### ***Connecting the Power***

AccessCON-Eth itself only accept +5VDC input voltage witch is provided by a universal switching Power adaptor. This universal switching Power adaptor is +5VDC, 2A output with input 100~240VAC@50~60Hz suitable for every region.

Before first time installation, check that the power adapter nominal supply voltage, marked on a label on its top panel, matches the nominal voltage available at your mains outlet.

## **2.5 Setup**

After Installation, You must be to check below list:

- The Power LED indicator always lights when AccessCON-Eth is powered.
- The LCD panel will work after 10 seconds for power-on self-test (POST).

To configure setting the AccessCON-Eth, use keypads and LCD on top panel as shown in Figure 2.1. The settings are listed in Table 2.2. You can follow the rules below table to setup the AccessCON-Eth.

Besides use the keypads and the LCD on the panel to set the AccessCON-Eth, it also can use the following way to set the parameters for the AccessCON-Eth.

### 1. Console port

User can use a standard RS232 cable to connect with the console port of AccessCON-Eth. And use the Terminal or the PC, which has installed communication software to set the AccessCON-Eth.

The definition of the console port for AccessCON-Eth, Please, refer to APPENDIX A.3.

### 2. Telnet

User also can use Telnet software to set AccessCON-Eth through the Ethernet. But before use the Telnet, the Telnet mode for AccessCON-Eth must set to "ON", and IP-address, Subnet Mask and IP router also must set under the network rules.

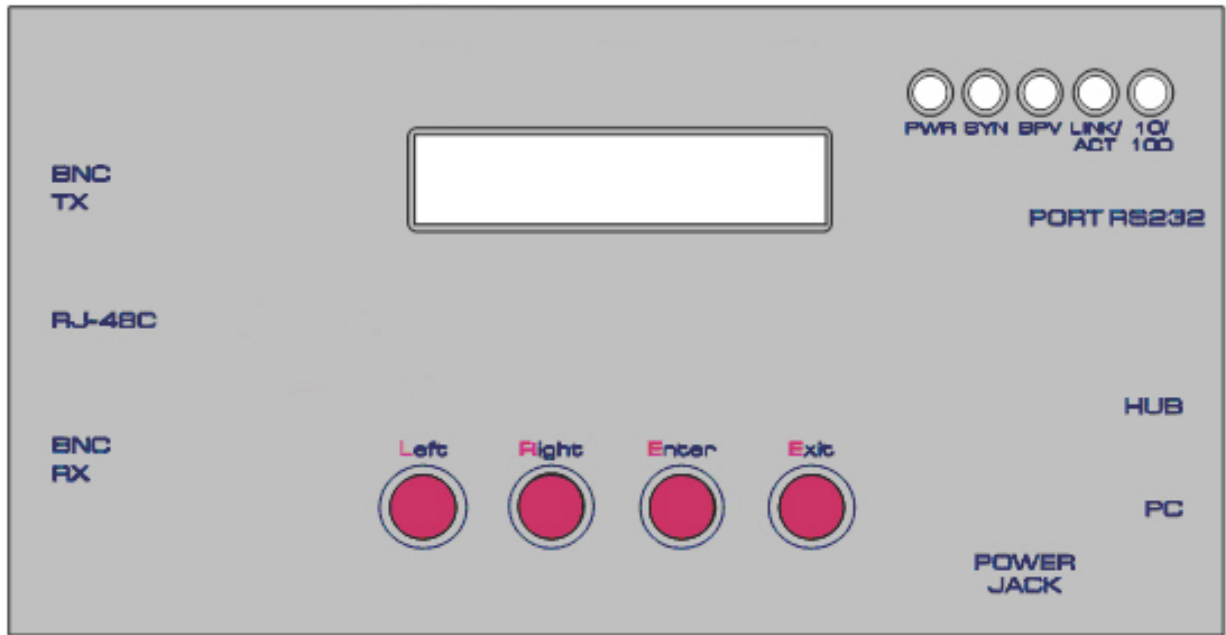


Figure 2.1. AccessCON-Eth Top Panel View

Table 2.2 Settings

Identification of Setting	Function	Settings	Factory Setting
Main→E1 SETUP →FRAMER Mode	Select E1 Frame operating mode	PCM31 CCS PCM31 CCS +CRC4 PCM30 CAS	PCM31
		PCM30 CAS +CRC4 UNFRAMED	
Main→ E1 SETUP →IDLE CODE	Selects the idle code transmission	7F – Symbol in HEX. FF – Symbol in HEX. Pass –Pass through E1 Rx timeslot data to Tx.	Pass
Main→ E1 SETUP → LINE CODING	Select E1 port coding, frame structure	AMI HDB3	HDB3
Main→ E1 SETUP →INTERFACE TYPE	Selection of E1 link interface	BNC – Unbalanced 75 ohms interface RJ48C – Balanced 120 ohms interface	RJ48C
Main→ E1 SETUP →CLOCK SOURCE	Selects system reference clock	INTERNAL - follow internal oscillator E1 (G.703) –Locked to E1 recovered receive clock. In case the E1 receive signal is lost, switches to the internal oscillator automatically.	INTERNAL
Main→ TS MAPPING	Select use timeslot and operating data rate	ALL – Setting all timeslot to carry data or non-used. *- Enable timeslot to carry data F– Inhabited by Framing	ALL
Main→ ETHERNET SETUP→LAN TYPE	Set the negotiation method	Auto Negotiation 100M Full 100M Half 10M Full 10M Half	Auto Negotiation
Main→ ETHERNET SETUP→ TELNET MODE	Setup telnet mode	ON – Turn on telnet function OFF –Turn off telnet function	OFF
Main→ ETHERNET SETUP→ IP ADDRESS	Setup IP address	IP address - 192.168.1.1	192.168.1.1

Main→ ETHERNET SETUP→SUBNET MASK	Setup subnet Mask	Subnet Mask - 255.255.255.0	255.255.255.0
Main→ ETHERNET SETUP→IP ROUTER	Setup router IP	IP Router - 192.168.1.1	192.168.1.1

After setting any configuration with AccessCON-Eth, the internal NVRAM will save setting immediately. When power down-to-up process occur or system reset, the AccessCON-Eth will recover setting automatically.

## 3 OPERATION

### 3.1 General

In this chapter you will find detailed operating instructions for the AccessCON-Eth versions.

The information presented in this chapter includes:

Description of indicators and LCD screens.

Operating procedures

Refer to Chapter 4, Troubleshooting & Diagnostic and troubleshooting instructions.

### 3.2 Indicators

Figure 3.1 illustrates the top panel of AccessCON-Eth.

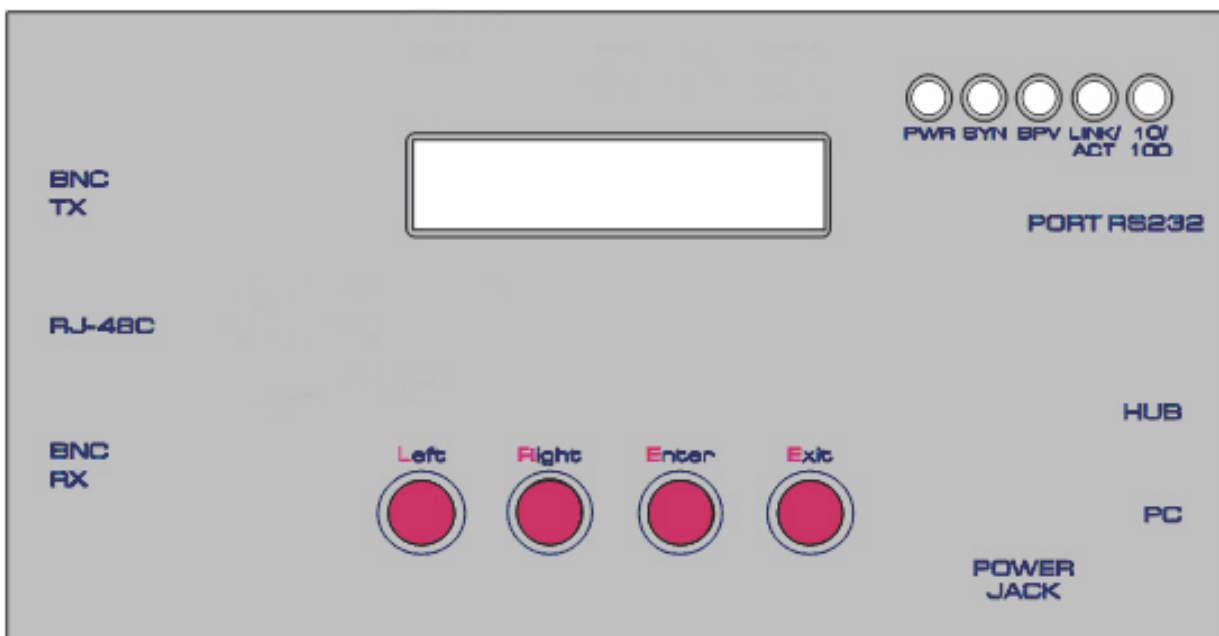


Figure 3.1 AccessCON-Eth panel

Table 3.1 lists the functions of the controls and indicators located on the top panel of the AccessCON-Eth.

Table 3.1

ITEM	Control or Indicator	Function
1	PWR indicator	Lights when AccessCON-Eth is powered
2	SYN indicator	Lights when the E1 link port synchronization
3	BPV indicator	Lights when one or more bipolar violations detected on E1 link receiver.
4	LINK/ACT indicator	Lights when Ethernet link is up. Flash when LAN is transmitting/receiving data.
5	10/100 indicator	Lights when LAN is operating at 100Mbps. Light off indicating LAN is operating at 10Mbps.
6	Left, Right, Enter, Exit buttons	When depressed, activates the LCD screen to move to next by your choose.

### 3.3 Operating Instructions

AccessCON-Eth is designed for unattended operation. After settings are completed, AccessCON-Eth operates automatically.

When Connect the AC universal switching power adapter to the mains outlet, the AccessCON-Eth will powered on automatically. Initially, AccessCON-Eth performs a self-test. Observe the following top-panel indicator:

- During the self-test, all the AccessCON-Eth indicators should illuminate: confirm that all are operating
- During the test second step, all the indicators except PWR must blinks
- Following the test, all the indicators except PWR

AccessCON-Eth is now ready for operation.

#### **Normal Indications**

During normal operation, the PWR, SYN and LINK/ACT indicators must light.

#### **Fault Indications**

If a fault occurs, the BPV alarm indicators light, and data transfer may be interrupted. To obtain additional information, observe the state of the LCD screens and then refer to Troubleshooting Instructions for troubleshooting information.

### 3.4 LCD displays

The following sections describe the major options of the menu tree. Please refer to APPENDIX B for detail structure of the menu tree.



Main Menu

E1-E1 PCM31  
RJ48C LAN 1984K

E1: First E1 indicates the operate mode. Other includes DL When operates loopback function.

E1: Second E1 indicates reference clock sources such as INT or E1.

PCM31: To indicate the E1 link framing type

RJ48C: To indicate the E1 link interface type such as BNC.

LAN: To indicate LAN port.

1984K: To indicate payload data rate.

TimeSlots mapping menu  
TS00-07 31:1984K

ALL [F\*\*\*\*\*] 01

TS00-07: To indicate the screen timeslot range

31: total assigned timeslots

1984K: user data port data rate (equal = total timeslots x 64K bps)

ALL: all timeslots (by framing type) are assigned or dis-assigned.

**Note** When framing is PCM31, the timeslot 0 is inhibited. Its means TS 0 cannot be assigned by user. When framing is PCM30, the timeslot 0 and 16 are inhibited. When unframed mode, all timeslot can assigned by user.

F: Inhabited timeslot (Framing Used)

\*: User assign carry data timeslots

01: To indicate the cursor position timeslot number

### **E1 Link port alarm status**

E1 STATUS  
LOF:\* YEL:\* CRC:\*

LOF: Receive loss of frame alignment

YEL: Receive yellow alarm

CRC: When use frame mode with CRC, Receive error CRC-4 code

\*: Error or loss occurs

***Ethernet port status***

100M FULL  
LINK UP  
PACKET ERRORS

0

100M: LAN speed is operating at 100Mbps

10M: LAN speed is operating at 10Mbps

FULL: LAN is in full duplex operation

HALF: LAN is in half duplex operation

PACKET ERRORS: Packets lost during data transmitting/receiving

## 4 TROUBLESHOOTING & DIAGNOSTICS

### 4.1 General

This chapter presents information related to the AccessCON-Eth diagnostics functions. The information presented in this chapter include:

- User-controlled test functions
- Troubleshooting

### 4.2 User-Controlled Test Functions

#### *Loopback Function*

The user-controlled test functions are activated by means of the buttons and LCD screen.

#### *Digital Loopback*

Find the function in Menu-tree of AccessCON-Eth. The digital loopback returns the data sent by the remote E1 equipment towards the remote E1 equipment. In case, clock reference source will change to E1 automatically. Signal path shown in Figure 4.1. On Main menu screen you can find "DL" to confirm setting surely.

This test checks the connections between two E1 equipments, and the local E1 link port interface.

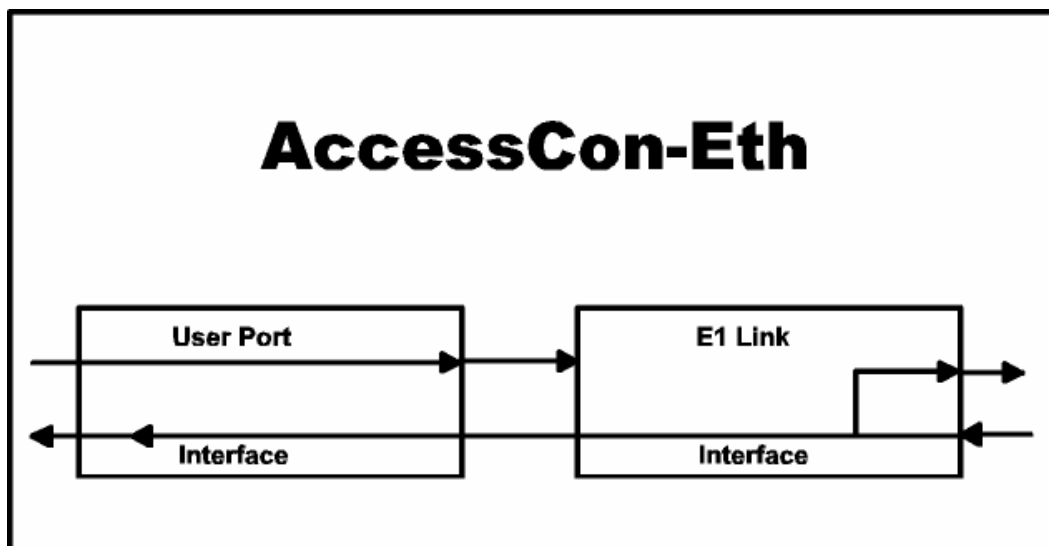


Figure 4.1 Digital Loopback

### 4.3 Troubleshooting Instructions

#### *Preliminary Checks*

In case a problem occurs, perform the following preliminary checks:

- Check the configuration of the local and remote AccessCON-Eth units against the prescribed configuration
- Check cable connections, and the equipment used on the E1 link connecting the local AccessCON-Eth to the remote equipment
- Observe the top-panel indicators and analyze the indications. Refer to Status Indications for descriptions of indicator functions.

### **Troubleshooting**

If the trouble cannot be corrected by performing the preliminary checks listed above, use the information in Table 4.1 to identify the trouble symptoms and perform the actions listed under Corrective Measures in the order given until the problem is corrected.

If the problem cannot be corrected by carrying out the listed actions, have the AccessCON-Eth check by the technical support personnel.

Table 4.1 Troubleshooting Chart

N	Trouble Symptoms	Probable Cause	Corrective Measures
1	AccessCON-Eth are "dead" (all the indicators, including PWR, are off)	No power	Check that both ends of the AccessCON-Eth power cable are properly connected, and that power is available at the outlet
		Defective AccessCON-Eth	Replace the AccessCON-Eth
2	Local AccessCON-Eth reports sync loss	Problems on the E1 link	Troubleshoot the E1 link between the local and the remote AccessCON-Eth
		Defective AccessCON-Eth	Replace the AccessCON-Eth
3	BPV indicator on the local AccessCON-Eth blinks	Problems on the E1 link	Troubleshoot the E1 link between the local and the remote AccessCON-Eth
		Defective AccessCON-Eth	Replace the AccessCON-Eth
4	LINK/ACT indicator is off	Wrongly connect to Ethernet port (PC, HUB)	Check the user's equipment is connecting to right port of the AccessCON-Eth. (PC to PC or HUB to HUB)
		Defective cable	Replace the cable connecting to the AccessCON-Eth
5	No transmission of data	E1 port or Ethernet port interface not inserted correctly	Re-insert E1 port or Ethernet port interface cable

## APPENDIX A INTERFACE SPECIFICATIONS

### A.1 E1 Balanced Port connector

The E1 balanced port interface is terminated in an eight-pin RJ-48C connector, designated E1 LINK, and wired in accordance with Figure A-1

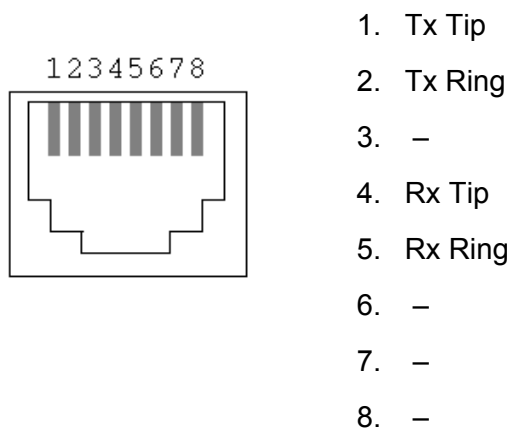


Figure A.1 E1 LINK Connector, Pin Allocation

### A.2 Ethernet Port Connector

The data port interface is terminated in a dual 16-pin RJ-45 connector, wired in accordance with Figure A-2.

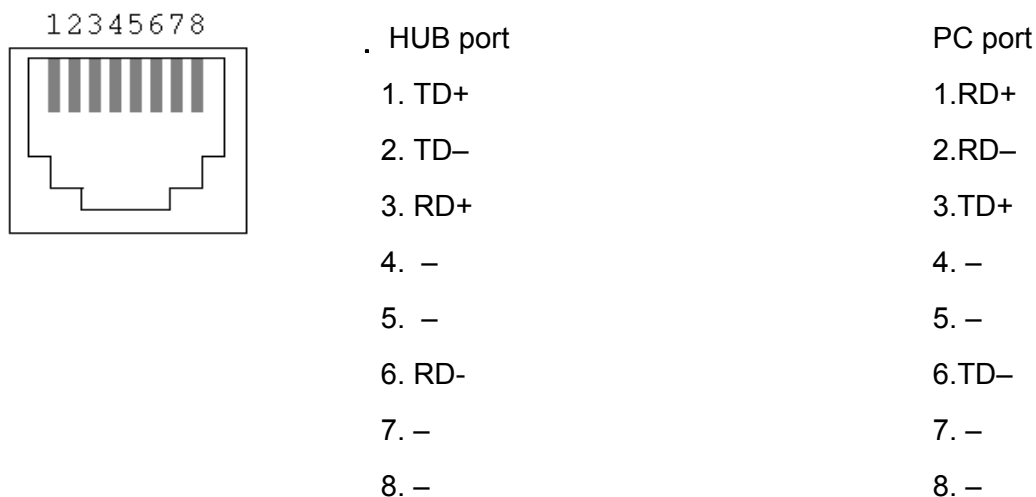


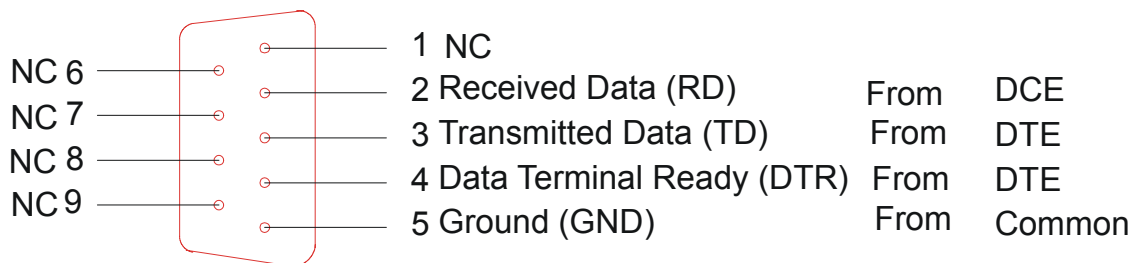
Figure A.2 Ethernet Port connector Wiring

### A.3 Console port

This console port is for user to control the device via terminal.

Please adjust your terminal emulation software according to the following table:

PARAMETERS	VALUE
Speed (baud rate)	38400bps
Data bits	8 bits
Parity	None
Stop bit	1 bit
Flow control	NONE
Terminal emulation	VT-100 or ANSI



**APPENDIX B MENU TREE OF ACCESSCON-ETH**

