USER MANUAL

E1U-ET100

Ethernet over Unframed E1 Bridge Line Card
For ERM01

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E1U-ET100 Unframed E1 Ethernet Bridge Card
For ERM01 Rack Mount Series
Ethernet 10/100Base-TX Bridge (E1U-ET100)
Installation and Operation Manual
Version 1.0 Dec 2009 Release

This manual supports the following models:

ERM-01, E1U-ET100

This document is the first release manual. Please check CTC Union's website for any updated manual or contact us by E-mail at info@ctcu.com. Please address any comments for improving this manual or to point out omissions or errors to marketing@ctcu.com. Thank you.

This document is based on hardware card version 1.2G with firmware version 1.01.

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Chapter 1. Introduction & Specifications

1.1 Introduction

Thank you for selecting CTC Union equipment for your network needs. We hope you find everything in order and are satisfied with our quality network products. The manual will explain the installation and settings for the E1U-ET100 Ethernet over Unframed E1 Bridge Line Card.

1.2 Product Description

The E1U-ET100 is an Ethernet over Unframed G.703 E1 Line Card for use in the ERM01 E1 Concentrator Rack.

The E1 circuits in this product are designed for eXtra Long Haul (XLH) operation with a receive sensitivity from 0dBm to -43dBm. The pulse shape complies with ITU-T G.703 recommendations.

The bridge is based upon the Infineon ADM6993 HDLC to Ethernet Converter which can support rates from 64Kbps to 50Mbps. This sets very easily with the 2Mbps rate of Unframed E1.

There are two (2) DIP switches, one for the E1 circuit settings and one for the Bridge settings. At the time of this writing, this card is not supported by the ERM01-SNMP. In fact, and this is very important, the E1U-ET100 CANNOT be placed into a managed ERM01 chassis. This card is incompatible with the SNMP management option at this time. It is planned that a later firmware version will allow both placing this card in a managed chassis and managing it in the chassis.

1.3 Product Outlook

The E1U-ET100 is a slide-in card for the ERM01. The PCB edge connector provides power and all interface connections from the ERM01 backplane. The front panel has the status LED indicators and pushbutton switches for E1 loopback and integral BERT pattern generator.

Figure 1-1 : Physical outlook of the E1U-ET100 line card.

1.4 Features & Specifications

FEATURES

- 10BASE-T/100BASE-TX, Full Duplex or Half Duplex
- HP Auto-MDIX, detects and corrects crossed cables
- Up to 2k MAC Unicast addresses with a 4-way associative hashing table
- IEEE 802.3x flow control enable/disable
- HDLC WAN flow control enable/disable
- Real-time filtering with 256 address tables
- Automatic address learning, aged and deleted with 5 minutes
- 6K x 64bit packet-buffering capacity
- Support Ethernet packet sizes from 64 to 1536 bytes
- Forwarding and filtering rate at WAN speed with throughput latency of 1 frame
- Automatic TP polarity correction

SPECIFICATIONS

E1

Conforms to ITU-T G.703 Recommendations
Unframed (non-structured)
Bit Rate : 2.048Mbps
Jitter complies with ITU-T G.823
Clock Source : Selectable E1 Rx Recovery (loop) or Internal Oscillator
Line Code : SelectableHDB3 or AMI
Impedance : Selectable 75 or 120 Ohms

BRIDGE

- LAN Table: 256 MAC address with 5 minute automatic aging
- Filtering and Forwarding: WAN speed (2048Kbps)
- Buffer: 6K x 64bit SRAM
- Delay: 1 frame
- WAN Protocol: Standard HDLC (not compatible with Cisco modified HDLC)

LAN

Standard: Conforms to IEEE 802.3 / 10Base-T and IEEE802.3u / 100Base-TX
Data Rate: 10Mbps (20Mbps in Full Duplex) or 100Mbps (200Mbps Full Duplex)
Auto-negotiation or Forced Mode Selectable
Forced Mode supports 10/100 Speed and Full/Half Duplex
Auto-MDIX enable or disable
Maximum packet size : 1536 Bytes

Address Learning

When this feature is disabled (S2-7 OFF), all frames are passed transparently. In this configuration, the **ET100** acts as a repeater (this is the preferred setting when connecting to a switch). When the address learning is enabled, frame destinations are tested against the internal MAC address table. Address Learning enabled is the normal selection for Bridging.

Chapter 2. Installation & Operation

2.1 Installation/Removal

Installation of an E1U-ET100 Line Card is accomplished sliding the card into the ERM01 chassis in any slot 1 to 13 (numbered from right to left), seating the board into the connector, and then tightening the two (2) captive thumb screws.

Removal is accomplished by loosing the two (2) captive screws on the face plate of the card module, and then pulling the card straight out of the chassis with the same screws. Apply equal pulling force to both top and bc

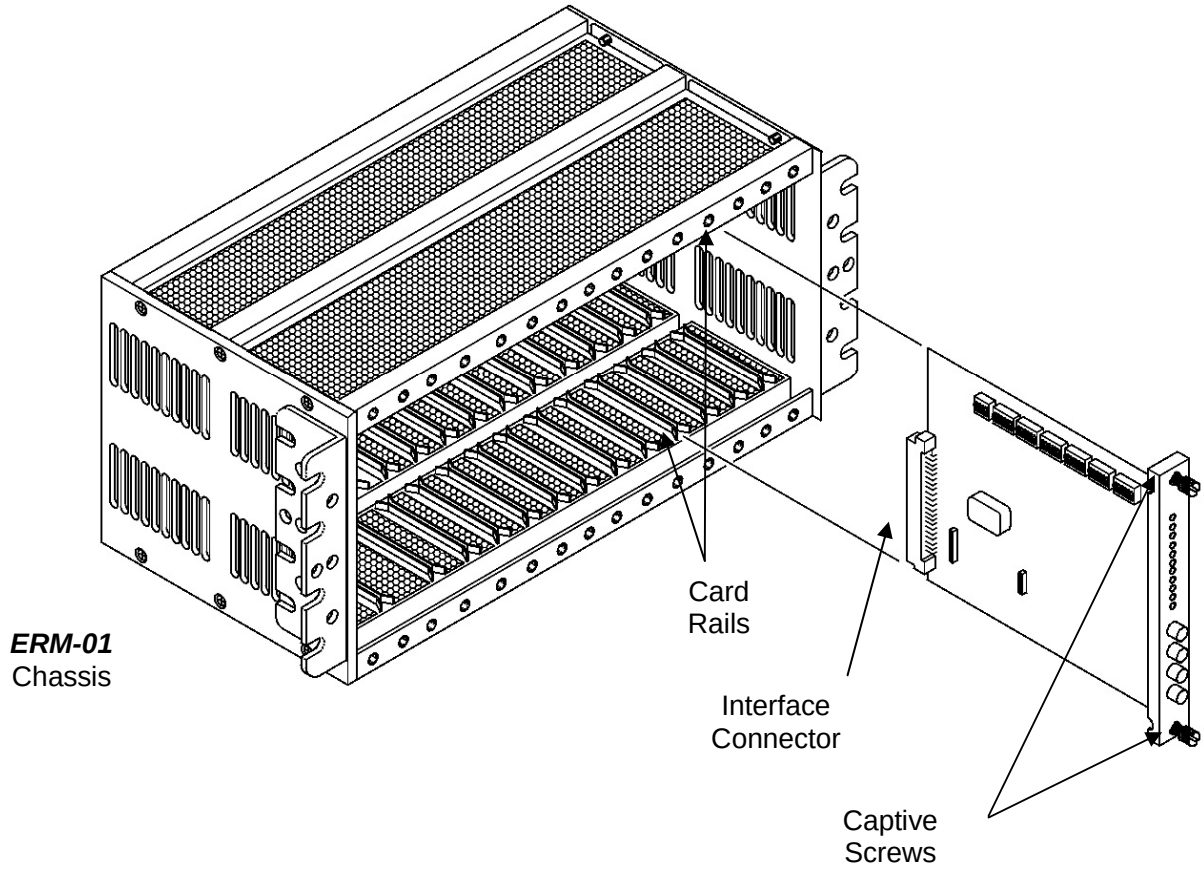

Figure 2-1 : Installation/Removal of E1U-ET100 Line Card in ERM01 Chassis

2.2 LED Indicators

PWR: This green LED should be lit when the chassis is powered and the E1U Card is seated in the rack slot.
LAN Link: This green LED will light when the card is connected to an active 10Base-T or 100Base-TX connection.
LAN Activity: This green LED will flash in the presence of LAN traffic.
LAN 100M: This green LED will light when the connected active Ethernet has 100M speed.
LAN Full: This green LED will light when the connected Ethernet is in Full Duplex mode.

E1 Tx Data: This green LED will light and flash when the E1 is transmitting data.
E1 Rx Data: The green LED will light and flash when the E1 is receiving data.
E1 Signal Loss: This red LED indicated an E1 loss of signal alarm (no received E1).
E1 AIS: This red LED indicates that the received E1 signal has AIS or Alarm Indication Signal.

Bert Error: When BERT is running, this red LED flashes to indicate received Bit Errors.
TEST: This red LED lights if either loopback or BERT (bit error rate test) are active.

2.3 Push Buttons

Remote Loopback: When depressed, this pushbutton will activate a remote loop back of the E1.
Bert: When the Bertn switch is depressed, the local E1 Line Card sends out a 511-bit test pattern (according to ITU-T V.54) on the E1 link, enabling testing of the entire link.

2.4 E1U-ET100 Ethernet Bridge Card Settings

When the ***ERM01*** is ordered with an **ERM01-E1U-ET100** option, an Unframed ONLY E1 **E1U-ET100** card and HDB26 to RJ-45 adapter are supplied and configured according to the following table. The Unframed E1 Line Card is an "all on board" solution for low cost "Ethernet over E1" applications. This Line Card has two (2) DIP switches which may only be accessed by removing the line card from the ***ERM01*** chassis. (Refer to Figure 3-4.)

The **E1U-ET100** Bridge Ethernet card provides an auto-MDIX function which enables connection of PCs or HUB devices with only a straight through UTP cable. Auto-MDIX is enabled by default. Disable it if the connecting devices have trouble linking to the Ethernet. Auto-negotiation is also enabled by default. Disable and use manual settings for legacy equipment that does not support N-Way negotiation.

Connection to HUB (MDI)		Connection to PC (MDI-X)	
HDB26	RJ-45	HDB26	RJ-45
11	1 T+	11	1 R+
12	2 T-	12	2 R-
13	3 R+	13	3 T+
14	4	14	4
15	5	15	5
16	6 R-	16	6 T-
17	7	17	7
18	8	18	8

Figure 2-2 : Connection Pin assignment for HDB26 to RJ-45 Ethernet connector.

2.5 DIP Switch Setting Tables

Please refer to the next page for the graphic showing the location of the configuration DIP switches on the **E1U-ET100** card.

S1	Set	Comment			Comment
1	OFF*	E1 Recovery Timing			ON = E1 Internal OSC Timing
2	OFF*	HDB3 Line Coding			ON = AMI Line Coding
3	OFF*	120 Ω Impedance			ON = 75 Ω Impedance
	4		5	6	Data Rate
	OFF*		OFF*	OFF*	2048Kbps
4	ON		OFF	OFF	1024Kbps
	OFF		ON	OFF	512Kbps
5	ON		ON	OFF	256Kbps
	OFF		OFF	ON	128Kbps
6	ON		OFF	ON	64Kbps
	OFF		ON	ON	32Kbps
	ON		ON	ON	16Kbps
7	OFF*	Set By DIP Switch			ON = Follow SNMP
8	OFF*	Disable Front Pushbuttons			ON = Enable Pushbuttons

* factory settings

Table 2-1 : **E1U-ET100** Line Card DIP Switch 1 Settings

S2	Set	Comment	Comment
1	OFF*	Auto-negotiation enabled	ON = Forced mode enabled
2	OFF*	Full Duplex (in Forced)	ON = Half Duplex (in Forced)
3	OFF*	100M (in Forced)	ON = 10M (in Forced)
4	OFF*	LAN Flow Control	ON = No LAN Flow Control
5	OFF*	WAN Flow Control	ON = No WAN Flow Control
6	OFF*	Enable Auto-MDIX	ON = MDI (1:1 to HUB)
7	OFF*	Repeater	ON = Bridging
8	NA	reserved	

* factory settings

Table 2-2 : **E1U-ET100** Line Card DIP Switch 2 Settings

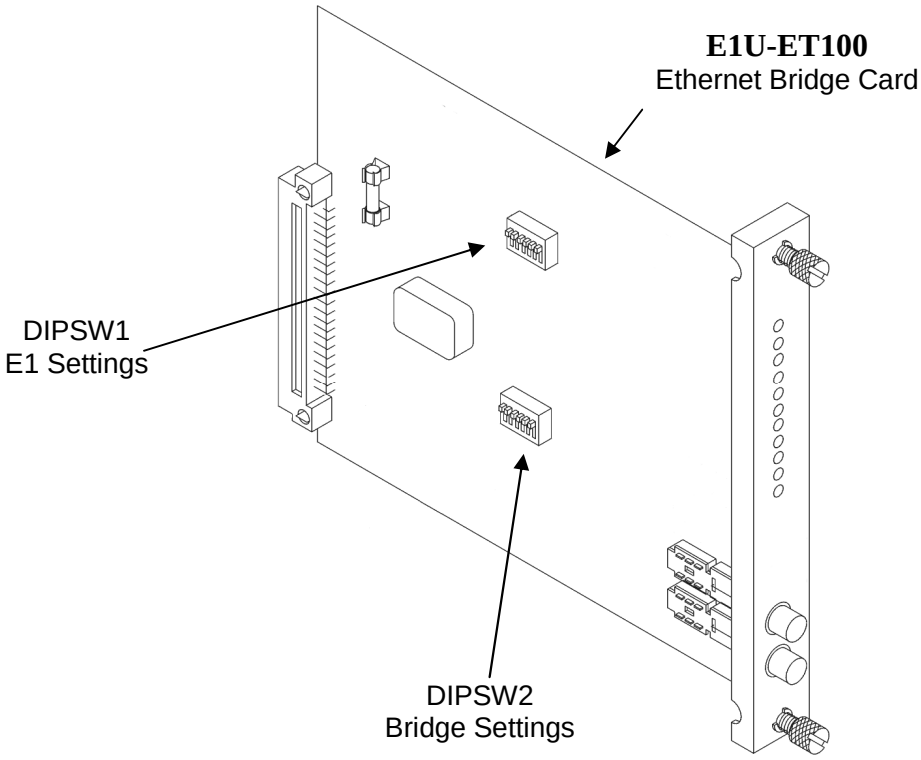

Figure 2-3 : E1U-ET100 DIP Switch locations

2.6 Typical Application

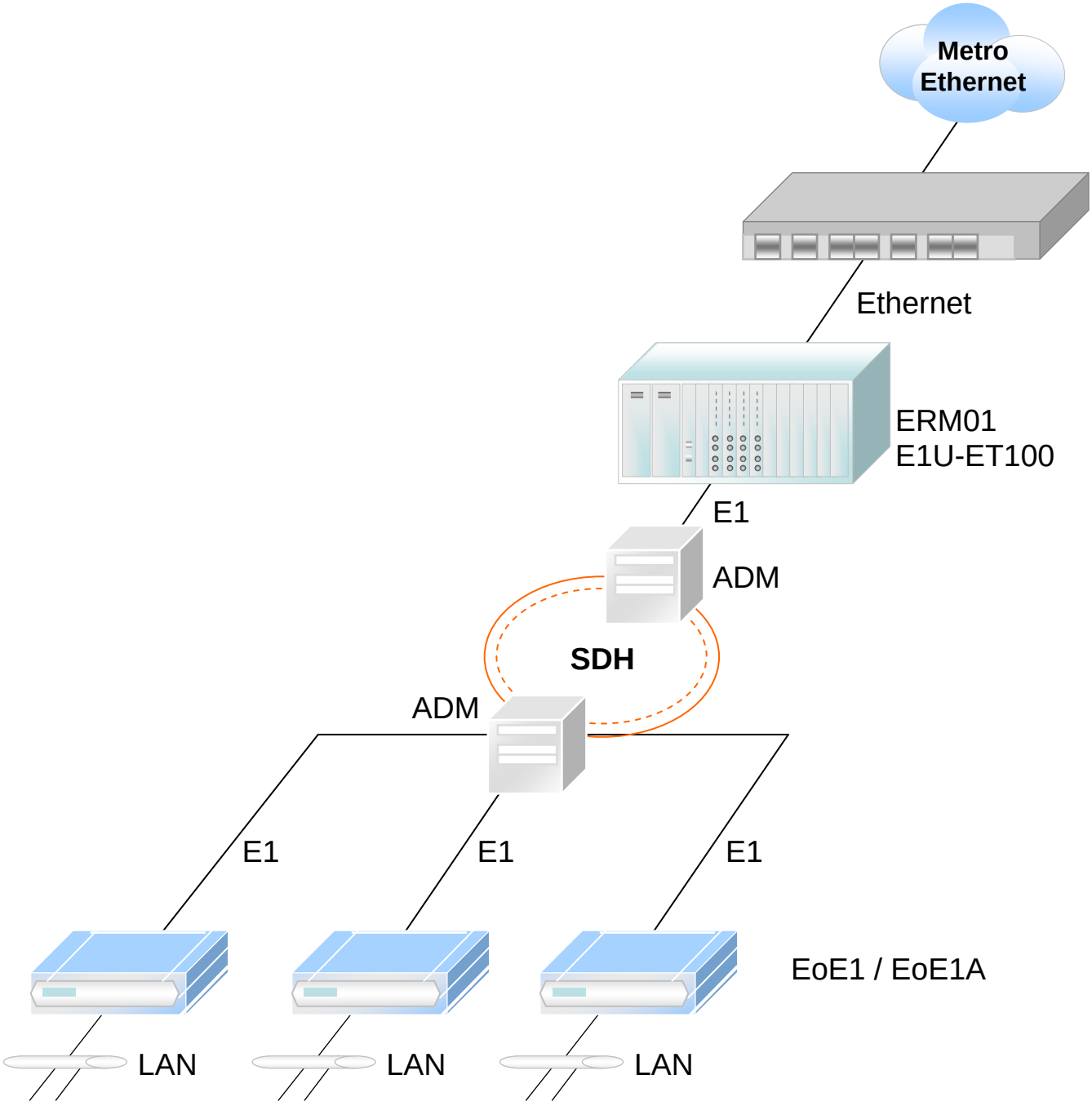

Figure 2-4 : Ethernet over Unframed E1 application.

The ***ERM01*** with **E1U-ET100** in combination with ***EoE1*** or ***EoE1A*** remote stand-alone E1 bridge units can be utilized in an Ethernet over E1 application as shown above.

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