

User Manual

FRM301

Fiber Media Platform Rack
16 Slot, 3U, Manageable



CTC Union Technologies Co., Ltd.
Far Eastern Vienna Technology Center (Neihu Technology Park)
8F, No. 60 Zhouzi St.
Neihu District
Taipei 114
Taiwan
Tel: +886-2-26591021
Fax: +886-2-27991355
Email: info@ctcu.com
URL: <http://www.ctcu.com>

FRM301 User Manual

Fiber Media Platform Rack, 16 Slot, 3U, Manageable

Version 3.0 December 2005

Copyright © 2002-2005, CTC Union Technologies, Inc.
All rights reserved.



All specifications are subject to change without prior notice.

Table of Contents

1.0 Introduction	7
1.1 Functional Description	7
1.2 Chassis Front Description	7
1.3 Chassis Rear Description	8
1.4 Chassis Specifications	8
1.5 Line card options	9
1.6 SNMP	9
1.7 Line Card Specifications	10
1.71 FIB1-10/100	10
1.72 FIB1-1000	10
1.73 FIB1-Serial	11
1.74 FIB1-E1/T1	12
1.75 FIB1-Data	13
1.76 FIB1-1000E	14
1.8 Fiber Optical Options	15
1.9 FRM301 Application	16
2.1 General	17
2.2 Site Preparation	17
2.3 Mechanical Assembly	17
2.4 Electrical Installation	18
2.5 Power Supply Modules	19
2.6 Installation	20
2.7 FIB1-10/100	21
2.8 FIB1-1000	23
2.9 FIB1-1000E	24
2.10 FIB1-Serial	25
2.11 FIB1-DATA	27
2.12 FIB1-E1/T1	37
3.1. Introduction	41
3.2 Terminal Mode	42
Control Port General	42
Terminal Connection	42
Menu System Detail	44
10/100Base Line Card Detail	45
10/100Base Line Card Menu Breakdown	46
1000Base Line Card Detail	47
1000Base Line Card Menu Breakdown	48
1000E Line Card Detail	49
E1 / T1 Line Card Detail	50
E1 / T1 Line Card Menu Breakdown	51
Serial Line Card Detail	52
Serial Line Card Menu Breakdown	53
Data Line Card Detail	54
Data Line Card Detail (second page)	55
Data Line Card Menu Breakdown	56

Table of Contents

3.3 TCP/IP Configuration	57
General	57
Two Step Configuration	57
Configuration Process	57
Conclusion	59
4.0 Introduction.....	60
4.1 Software Installation and Removal	60
4.11 Introduction.....	60
4.12 System Requirements.....	60
4.12.1 Operation System.....	60
4.12.2 Hardware	60
4.13 Installation.....	61
4.14 Remove GUIMGR.....	65
4.14.1 Control Panel Add/Remove programs	65
4.2 SNMP Card Configuration.....	67
4.21 Introduction.....	67
4.22 HyperTerminal™ settings	67
4.23 Connecting to the FRM301	67
4.24 FRM301 menu system	68
4.25 SNMP Card settings.....	68
4.26 SNMP Agent Configuration	69
4.27 Manager Configuration	69
4.3 GUIMGR Configuration and Operation.....	72
4.31 Introduction.....	72
4.32 Configuration	72
4.32.1 Start the GUIMGR application.....	72
4.32.2 Configure user password	74
4.32.3 Edit the SNMP Agent	75
4.33 Operation.....	76
4.33.1 Rack Detail	77
4.33.2 Ethernet Line Card Settings	78
4.33.3 Remote Functions.....	79
4.33.4 Gigabit Ethernet Line Card Settings	81
4.33.5 Gigabit Ethernet Line Card Settings	82
4.33.6 E1/T1 Line Card Settings.....	83
4.33.7 DATA Line Card Settings	85
4.33.8 Serial Line Card Settings	87
5.4 Troubleshooting	89
5.41 Network Settings	89
5.41.1 Review Agent Settings	89
5.41.2 Review Manager Settings	90
A.1 SNMP Upgrade Procedure	91
A.1.1 Preconditions	91
A.1.2 Items required	91
A.2 Equipment Setup	91
A.3 Setup the FRM301.....	92

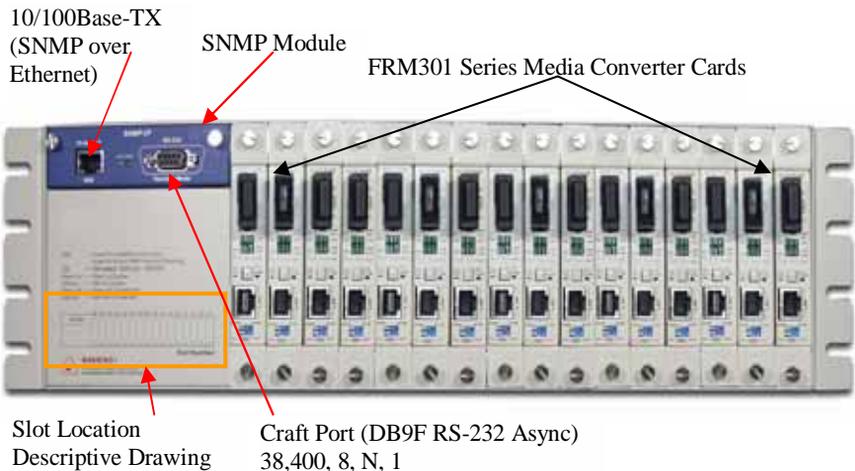
1.0 Introduction

The **FRM301** is a 3U high 19" Rack, 16 slot modular media converter center. The **FRM301** provides an economic solution in high density Fiber Converter installations such as central offices. The Power Modules are designed for redundant power supply operation. An additional feature allows the **FRM301** to detect the working or failing status either of power module or any fan assembly in the unit. There are 16 slots available for installation of FIB1 Converter Cards in the **FRM301** compact rack. An optional SNMP Card may be installed, for local and remote management purposes. Each FIB1 Card is an independent fiber to copper converter. A variety of cards are available that support multi-mode or single-mode fiber types and connections to SC, ST, LC or MT-RJ or even the latest WDM (Wave Division Multiplexing) in ranges from 2Km to 120Km. Converter cards include Fast Ethernet, Gigabit Ethernet, Serial (RS-485, RS-423, RS-232 and TTL), E1, T1, and Datacom (V.35, RS-530, X.21, RS-449, and RS-232).

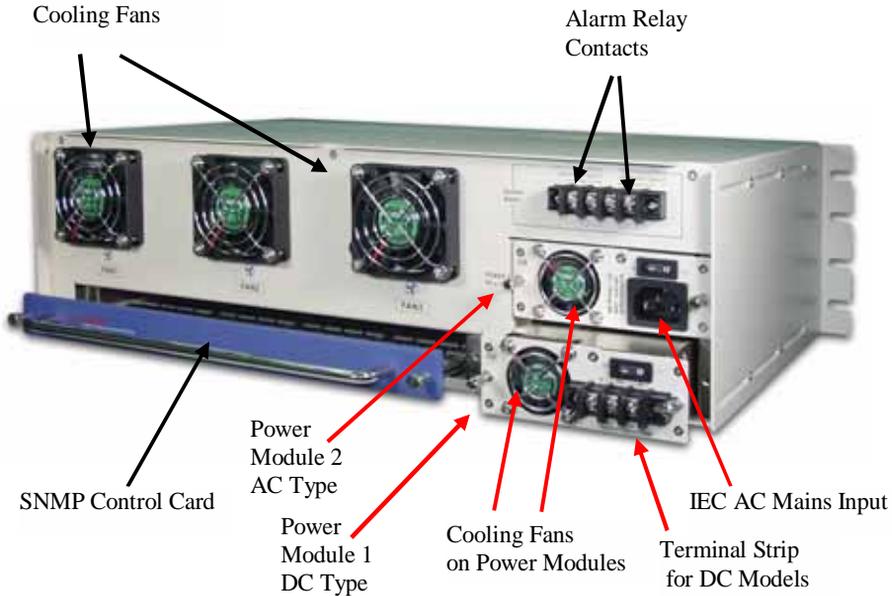
1.1 Functional Description

The **FRM301** optionally incorporates a redundant Power Module and SNMP. The supply, depending on the model, derives its power from either an AC power source (90 ~ 264VAC) and/or DC (18 to 56VDC) power source. When two modules are installed, they provide for power redundancy and are hot swappable even during the FIB1 Cards' transmissions. The **FRM301** provides all copper interface connections on the face of each FIB1 Card. The fiber interface connectors are also located on the individual FIB1 Card's face, along with status indicator LEDs and any required control switches. The status LED indicators provide for quick indications of both copper and fiber link statuses.

1.2 Chassis Front Description



1.3 Chassis Rear Description



1.4 Chassis Specifications

Environment

Temperature	0 - 50°C
Humidity	10-90% non condensing

Alarm relay contact ratings

125VAC	1A
110VDC	0.6A
30VDC	4A

Power Module Specifications

AC Power Module

Input : Universal, 90 (Min.) ~ 264 (Max.) VAC; Frequency : 47~63 Hz
Output : DC 12V, 8.5A

DC Power Module

Input : -18~-56 VDC (-36~-72VDC special option)
Output : DC 12V, 8.5A

Physical Specifications

Dimensions : 440mm (Width) X 280mm (Depth) X 130.6mm (Height)

Standard Package Shipping Weight : 7.875kgs (17.3lbs)

(includes 1 AC power module & two bracket panels for rack-mounting)

Basic Package Shipping Weight : 10kgs (22lbs)

(includes 2 AC power modules, 1 FRM301 series line card & two bracket panels for rack-mounting) [due to weight considerations, additional line cards are packaged separately]

1.5 Line card options

As of this manual version, the **FRM301** supports eight basic line card types which may be mixed and matched in any slot of the rack.

1. FIB1-10/100 : IEEE 802.3(10Base-T) and IEEE 802.3u(100Base-TX) to fiber.
2. FIB1-1000 : IEEE 802.3ab (1000Base-TX), IEEE 802.3z to fiber.
3. FIB1-1000MS : Converts 1000Base-SX to 1000Base-LX or multi-mode to single-mode gigabit fiber.
4. FIB1-1000E : 10/100/1000Base Ethernet to gigabit fiber media converter.
5. FIB1-E1 : G.703 E1 (2.048mbps unframed) over fiber media.
6. FIB1-T1 : DS1 (1.544mbps unframed) over fiber media.
7. FIB1-Serial : Provides RS-485/422/232/423/TTL interfaces over fiber.
8. FIB1-Data : V.35, X.21, RS-530, RS-449 (V.36) and RS-232 over fiber media.

1.6 SNMP

When the **FRM301** is ordered with an optional SNMP Card, the card is placed above the power modules. A Control card, which is designed to link all the line cards to the SNMP agent, is also placed into the rear of the chassis. Management is accomplished either via local control on the asynchronous RS-232 port with an ASCII terminal or via Ethernet and any standard SNMP network management software that supports MIB-II. The SNMP GUI Windows® based program provides an easy method for the user to operate and monitor the whole system. All line cards are supported with the datacom, E1/T1 and serial line cards additionally supporting remote configuration when paired with another FIB1 standalone or FIB2 converter.

1.7 Line Card Specifications

1.71 FIB1-10/100

The FIB1-10/100 line card is an Ethernet Fiber Media Converter that is compliant with IEEE802.3 10Base-T, IEEE802.3u 100Base-TX and 100Base-FX Ethernet. The 10/100Base RJ-45 connectors are all located on the front panel of the FIB1 card. One RJ-45 connector is provided for each interface converter. All connections are designed as auto MDI-X type, requiring only a straight connection to any device. A unique feature of the FIB1-10/100 converter is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack.

RJ-45 Pin	MDI-X type	MDI type
1	Rx+	Tx+
2	Rx-	Tx-
3	Tx+	Rx+
6	Tx-	Rx-

10Base-T UTP Cable Requirement

Cable type: Category 3, 4 or 5. Maximum cable distance: 100 meters (328 feet)

100Base-TX UTP Cable Requirement

Cable type: Category 5. Maximum cable distance: 100 meters (328 feet)

1.72 FIB1-1000

The FIB1-1000 line card is an Ethernet Fiber Media Converter that is compliant with IEEE802.3z 1000BASE-TX or Gigabit Ethernet and 1000Base-SX/LX Gigabit Fiber. One RJ-45 connector is provided for connection to either MDI-X (To PC) or MDI (To HUB) equipment. Utilizing Auto MDI/MDIX allows all UTP connections to be made using only a common straight-through UTP cable. A unique feature of the FIB1-1000 converter is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack. This converter may force full or half duplex mode on the fiber port.

RJ-45 Pin	568-A type	568-B type
5	Pair1-Tip	Pair1-Tip
4	Pair1-Ring	Pair1-Ring
3	Pair2-Tip	Pair3-Tip
6	Pair2-Ring	Pair3-Ring
1	Pair3-Tip	Pair2-Tip
2	Pair3-Ring	Pair2-Ring
7	Pair4-Tip	Pair4-Tip
8	Pair4-Ring	Pair4-Ring

1000BASE-TX UTP Cable Requirement

Cable type: 1000Base-TX; 4 pair, Cat. 5 or 6, EIA/TIA-568, STP/UTP
Maximum cable distance: 100 meters (328 feet)

1.73 FIB1-Serial

The FIB1-SERIAL is a fiber converter solution to extend RS-485 transmission distance up to 2Km over multimode fiber or up to 120Km over single mode fiber. The converter is equipped with multiple interface circuits, for connection to RS-232, RS-423, or RS-485/422 (2 or 4 wire).

The FIB1-SERIAL secures data transmission over EMI immune fiber at speeds up to 256kbps for RS-232 or up to 1024kbps for RS-422/485. All media converters are available with connectors for SC, ST or FC. In single mode, WDM (Wave Division Multiplexing with SC connector) is also available in 20 or 40KM reach which will provide the ability to transmit and receive data using only a single optical fiber. A unique feature of the FIB1-Serial converter is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack.

Data Formats :

- RS-485/422 2-Wire
- RS-485/422 4-Wire
- RS-232 + RTS/CTS 5-Wire
- RS-232 3-Wire
- RS-423 + RTS/CTS 5Wire
- RS-423 3-Wire
- TTL 3-Wire

Maximum Baud Rate:

- RS-485 1024 kbps
- RS-232 256 kbps
- RS-423 256 kbps
- TTL 1024 kbps

Bit Error Rate :

<10⁻¹¹

4 diagnostic LEDs :	Power, Data, Test & Fiber linking status
Temperature:	0 - 50° C (Operating); 0 - 70° C (Storage)
Humidity:	Up to 90% non-condensing
Consumption	<5W
Dimensions:	138mm x 86mm x 20mm (LxWxH).
Weight:	300g.
Emission Compliance:	FCC part 15 class A, CE EN55022, EN60950.
Optical:	ST/SC/FC type
Data:	6-Pole 'Molex type' with detachable screw terminal

1.74 FIB1-E1/T1

The FIB1-E1 is a fiber media transport for G.703 E1 transmission. The BNC model provides unbalanced 75 Ohm coaxial connections while the RJ-45 model provides balanced 120 Ohm connections over twisted pair wiring. The FIB1-T1 is a fiber media transport for G.703 T1 transmission and features an RJ-45 connector for connection to 100 Ohm twisted pair wiring. All media converters are available with either multi-mode or single-mode optical transceivers and with connectors for SC, ST, or FC. In single mode, WDM (Wave Division Multiplexing with SC connector) is also available in 20 or 40KM reach which will provide the ability to transmit and receive data using only a single optical fiber. A unique feature of the FIB1-E1 and FIB1-T1 converters is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack.

E1 Technical Specifications

Ports	1 port
Standards	ITU-T G.703, G.704, G.706, G.732, G.823
Framing	Unframed (transparent clear channel)
Data rate	2.048 Mbps
Line Code	HDB3/AMI
Receive Level	Long haul - 43dB
Line impedance	75 ohms for FIB2-E1B 120 ohms for FIB2-E1R
Connector	BNC for 75 ohms RJ-45 for 120 ohms

T1 Technical Specifications

Ports	1 port
Standards	ITU-T G.703, G.704, AT&T TR-62411, ANSI T1.403
Framing	Unframed (transparent clear channel)
Data rate	1.544 Mbps
Line Code	B8ZS/AMI
Receive Level	Long haul - 36dB
Line impedance	100 ohms for FIB2-T1R
Connector	RJ-45 for 100 ohms

Technical Specifications

Power consumption	<4W
EMI	FCC Class A, CE (EN55022), (EN60950)
Dimensions:	122.6 x 85.6 x 20 mm (H x W x D)
Weight	11 Oz (340g)
Temperature	0 - 50°C (Operating) ; 0 - 70°C (Storage)
Humidity	20 - 80 % non-condensing (Operating) 10 - 90 % (Storage)

1.75 FIB1-Data

The FIB1-DATA is a media converter for V.35, RS-232, RS-530, X.21 or RS-449 high-speed synchronous or low-speed synchronous and asynchronous data transmission over optical fiber media. All media converters are available with either multi-mode or single-mode optical transceiver and with connectors for SC, ST, or FC. In single mode, WDM (Wave Division Multiplexing with SC connector) is also available in 20 or 40KM reach, which will provide the ability to transmit and receive data using only a single optical fiber. A unique feature of the FIB1-Data converter is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack.

Technical Specifications

Ports	1 port V.35/RS232/RS530/X.21/RS449
Connector	HDB26F (adapter cable to DB15, 25, 37 or MB34)
Line Code	NRZ
Data rate	n x 64Kbps where n=1 to 32 (64 ~ 2048Kbps), Low Speed Synchronous & Asynchronous 75 ~ 115.2k baud rate
Clock modes	Transparent, Recovery, External, Internal RC, TC, ETC normal or inverted
Control Signals	CTS constantly ON or follows RTS DSR constantly ON, except during tests DCD constantly ON, except during signal loss
Test Loops	LLB (Local Loop Back) RLB (Remote Loop Back) ITU-T V.54

Optical Specifications

Connector Type	ST,SC,FC,LC,MT-RJ or WDM(single fiber) connectors.
Optical mode	Multi-mode or Single-mode
Wave length	1310nm,1550nm
Power Margin	11dB(2Km,M/M) ,12dB~ 35 dB(15 ~ 120Km,S/M) Data rate 40.32Mbps
Line coding	Scrambled NRZ
Bit Error Rate	Less than 10^{-11}

Environmental

Power consumption	<4W
EMI	FCC Class A, CE (EN55022), (EN60950)
Dimensions:	122.6 x 85.6 x 20 mm (H x W x D)
Weight	11 Oz (340g)
Temperature	0 - 50°C (Operating) 0 - 70°C (Storage)
Humidity	20 - 80 % non-condensing (Operating) 10 - 90 % (Storage)

1.76 FIB1-1000E

The FIB1-1000E is a standalone optical fiber media converter for 10/100/1000Base Ethernet to fiber that also provides NMS functions for Link-Loss-Forwarding, Remote-Monitoring-Status, and Loop-Back-Test. These optional features are especially useful when the standalone units are linked to the FRM301 with SNMP management. When auto-negotiation is selected, these units will automatically tailor themselves to convert 10, 100, 1000 full or half duplex, depending on your specific network needs. A unique feature of the FIB1-1000E converter is the use of a common PCB card which may either be used as a standalone converter (FIB1 series) or placed in the FRM301 rack.

Features and Specifications

Ports one 10/100/1000Base-TX port
 one 1000Base-SX/LX port

Two versions support :

 SFP with LC

 GBIC with SC (3.3V voltage SX-Multi-mode, LX-Single-mode)

- * Store and Forward Switching Mechanism
- * Auto-Cross over for MDI/MDIX in TP port
- * Auto-Negotiation in TP port
- * Supports Auto / Force Mode in FX port
- * Supports 4K MAC address
- * Supports 256K Byte Packet Buffer
- * Maximum Packet Size: 1536K Byte
- * 6 diagnostic LEDs for Power, TX link/transmit, FX link/transmit, Full/Half Duplex mode, LLF and speed.
- * Supports Link-Loss-Forwarding function
- * Supports Loop-Back, remote status
- * Complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX and 100Base-FX, IEEE 802.3z/ab 1000Base-T, IEEE 802.3x full-duplex flow control, 1000Base-SX/LX standards.
- * Data Transfer Rate: 2000Mbps/full-duplex
- * Emission Compliance: FCC part 15 class A, CE Mark, European standards EN55022:1994/A1:1995 A2:1997 Class A, EN61000-3-2:1995, EN61000-3-3:1995 and EN50082-1:1997
- * Power Consumption : < 5W
- * Temperature 0 - 50°C (Operating); 0 - 70°C (Storage)
- * Humidity 20-80% non condensing (Operating) 10-90% (Storage)
- * Dimensions 122.6mm x 85.6mm x 20mm (LxWxH)
- * Weight 340g (11 Oz)

1.8 Fiber Optical Options

Fiber access connectors are provided for fiber optic cable connection on each card. Each connector has labeling for "TX" (for transmission of optical data) and "RX" (for reception of optical data). The various multi-mode and single mode types are shown below with transmission reach.

10/100 Base Media Converter Card Specifications (Normal type)

Card Type	10/100M/2	10/100S/15	10/100S/30	10/100S/50	10/100S/120	TP Ports	Shielded RJ-45 jacks
Fiber Mode	Multi	Single	Single	Single	Single	Cable	Cat. 5 UTP up to 100 meters
Wave Length	1310nm	1310nm	1310nm	1310nm	1550nm	Environment	Temperature : 0~50 C Relative Humidity : 10%~90% non-condensing
Connector	*	*	*	*	*		
Fiber Cables	2 62.5/125um	9/125um	9/125um	9/125um	9/125um	Dimensions :	17.7x25.5x2.4cm
Max. Length	2Km	15Km	30Km	50Km	120Km		
MDI	Auto	Auto	Auto	Auto	Auto		

* Available with ST, SC, FC or LC type connectors

10/100 Base Media Converter Card Specifications (WDM type)

Card Type	10/100W/20A	10/100W/20B	10/100W40A	10/100W40B	TP Ports	Shielded RJ-45 jacks
Fiber Mode	Single	Single	Single	Single	Cable	Cat. 5 UTP up to 100 meters
Wave Length	1310/1550nm	1550/1310nm	1310/1550nm	1550/1310nm	Environment	Temperature : 0~50 C Relative Humidity 10%~90% non-condensing
Connector	SC (WDM)	SC (WDM)	SC (WDM)	SC (WDM)		
Fiber Cables	1 9/125um	9/125um	9/125um	9/125um	Dimensions :	17.7x25.5x2.4cm
Max. Length	20Km	20Km	40Km	40Km		
MDI	Auto	Auto	Auto	Auto		

1000 Base Media Converter Card Specifications

Card Type	1000-M/550	1000-S/010	1000-S/030	1000-S/050	1000-S/080	TP Ports	Shielded RJ-45 jacks
Fiber Mode	Multi	Single	Single	Single	Single	Cable	Cat. 5 or 6 UTP up to 100 meters
Wave Length	1310 nm	1310nm	1550nm	1550nm	1550 nm	Environment	Temperature : 0~50 C Relative Humidity 10%~90% non-condensing
Connector	GB or LC	GB or LC	GB or LC	GB or LC	GB or LC		
Fiber Cables	1 62.5/125um	9/125um	9/125um	9/125um	9/125um	Dimensions :	17.7x25.5x2.4cm
Max. Length	550m	10Km	30Km	50Km	80 Km		
MDI	Auto	Auto	Auto	Auto	Auto		

Datacom Converter Card Specifications (Normal type)

Card Type	E1B-M/2	E1B-S/15	E1B-S/30	E1B-S/50	E1B-S/120	BNC Ports	Coaxial 75 ohm G.703 E1
Card Type	E1R-M/2	E1R-S/15	E1R-S/30	E1R-S/50	E1R-S/120	RJ-45 Ports	USOC RJ-48C 120 ohm G.703 E1
Card Type	T1-M/2	T1-S/15	T1-S/30	T1-S/50	T1-S/120	RJ-45 Ports	USOC RJ-48C 100 ohm DS1
Card Type	Data/V35/M2	Data/V35/S15	Data/V35/S30	Data/V35/S50	Data/V35/S120	HD26	adapter to MB34F or M (V.35)
Card Type	Data/X21/M2	Data/X21/S15	Data/X21/S30	Data/X21/S50	Data/X21/S120	HD26	adapter to DB15F or M (X.21)
Card Type	Data/530/M2	Data/530/S15	Data/530/S30	Data/530/S50	Data/530/S120	HD26	adapter to DB25F or M (RS-530)
Card Type	Data/449/M2	Data/449/S15	Data/449/S30	Data/449/S50	Data/449/S120	HD26	adapter to DB37F or M (RS-449)
Card Type	Data/232/M2	Data/232/S15	Data/232/S30	Data/232/S50	Data/232/S120	HD26	adapter to DB25F or M (RS-232)
Card Type	Serial/M2	Serial/S15	Serial/S30	Serial/S50	Serial/S120	Terminal	6 pin wire terminal**

** Supports 3/5 wire RS-232, 2/4 wire RS-485, TTL and RS423

Fiber Mode	Multi	Single	Single	Single	Single	Cable	
Wave Length	1310nm	1310nm	1310nm	1310nm	1550nm	Environment	Temperature : 0~50 C Relative Humidity : 10%~90% non-condensing
Connector	*	*	*	*	*		
Fiber Cables	2 62.5/125 m	9/125 m	9/125 m	9/125 m	9/125 m	Dimensions :	17.7x25.5x2.4cm
Max. Length	2Km	15Km	30Km	50Km	120Km		

* Available with ST, SC, or FC type connectors

All Datacom converter cards are also available with WDM type transceivers, which must be matched in pairs (A to B) and in either 20KM or 40KM reach.

Please ask our Sales or representative for availability and/or specifications of other transceiver types not listed above.

2.1 General

This chapter explains in detail the requirements and procedures for the installation of the **FRM301** Rack Mount Series Fiber Converter Concentrator.

2.2 Site Preparation

Install the **FRM301** within reach of an easily accessible grounded AC outlet. The outlet should be capable of furnishing 90 to 250 VAC. Refer to 2.4 Electrical Installation. Allow at least 10cm (4 inch) clearance at the front of the **FRM301** for the Ethernet cables.

2.3 Mechanical Assembly

The **FRM301** is designed for rack mount installation and will require 3U space in a standard EIA 19" or 23" rack. For the **FRM301**, there are three fan units in the rear side of the chassis and an independent fan assembly on each power module. Without operation fans, excessive temperatures within the unit might cause it to electrically shutdown. The **FRM301** chassis is delivered completely assembled, however converter cards may or may not be installed in the chassis upon delivery. The rack mount adapters may be placed along the front or centrally located on the chassis. Optional brackets also allow installation into a 23" rack and in this configuration, central mounting is recommended.

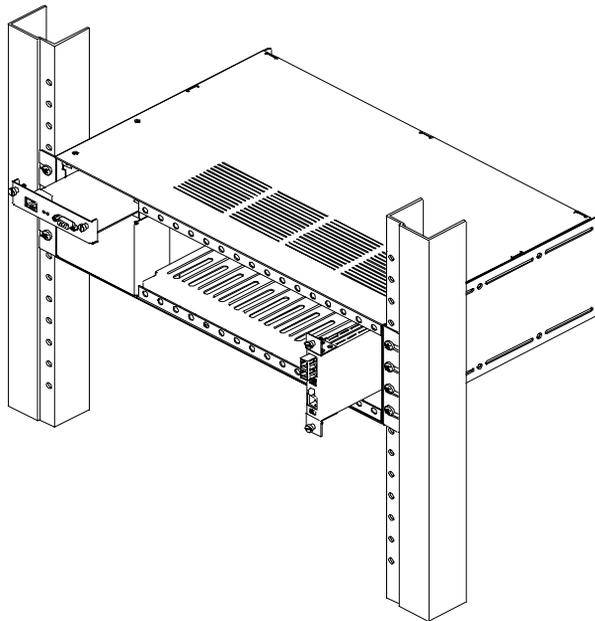


Figure 2-1 Standard 19" Rack-Mount Installation of **FRM301** Unit

Chapter 2 Installation

The **FIB1** Media Converter may serve as a standalone or be mounted in the **FRM301** chassis. When installing in the chassis, the outer cover is removed and mounting brackets are installed. Ensure the brackets are properly installed as illustrated in Figure 2-2. As you can see, there are four holes on the brackets; the upper two holes are the recommended location for the two screws fixed here.

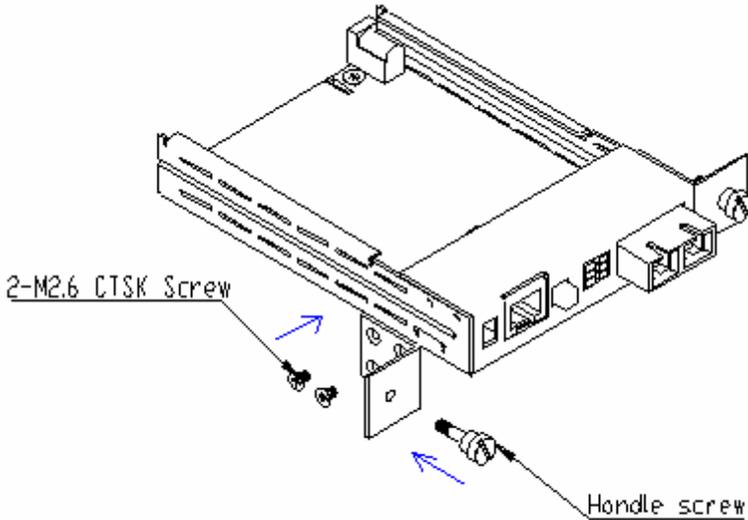
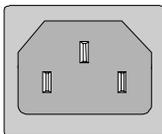


Figure 2-2 Bracket installation for **FRM301** card

2.4 Electrical Installation

In the AC model, AC power is supplied to the **FRM301** through a standard IEC 3-prong receptacle, located on the rear of the chassis. In the DC model, DC -48V is connected to the lower terminal block, observing the proper polarity. The **FRM301** should always be grounded through the protective earth lead of the power cable in AC installations, or via the ground connection for DC installations.



Left: Live line
Right: Natural line
Middle: Ground

Figure 2-3 IEC power connector pin assignment

The alarm relay provides one set of Power Failure contacts (normally open) and another set of FAN Failure contacts (normally open) contacts for monitoring the power and fans condition of the **FRM301**.



125VAC 1A
110VDC 0.6A
30VDC 4A

Figure 2-4 The Alarm Relay Contacts

2.5 Power Supply Modules

The Power Supply Modules in the **FRM301** are available in two versions, AC or DC. The AC universal version supports input voltages of 90 to 264 volts at frequencies of 47 to 63 Hertz. The DC version supports 18 to 56VDC input voltage. (An optional 36 to 72VDC is available upon special order.) Only one power supply module is required to power a completely full rack. When two Power Supply Modules are installed, the supplies are hot swappable and redundant, meaning any one supply may be removed and replaced without impacting the operation of the **FRM301** Rack.



Figure 2-5 Power Modules for **FRM301**

2.6 Installation

The Line Cards for the **FRM301** are Media Converter Cards which slide into the **FRM301** chassis, and interface with the pack panel "main board". The back panel provides a connection to the converter cards for power and serial control. When the SNMP and Control cards are installed, the rack and all line cards become manageable by industry standard SNMP protocol. The media converter cards are designed to be "hot" swappable, meaning the **FRM301** chassis need not be powered off in order to remove or replace a card. Removal and installation of converter cards with the rack chassis under power will not effect the operation of other converter cards.

Removal of a converter card is accomplished by loosening the two (2) captive screws (upper and lower) and then pulling the card straight out of the chassis with the same screws. Apply equal pulling force to both top and bottom captive screws to avoid the card binding in the rails of the chassis. Replace the card by reversing the procedure, align in the slot groove and gently seat the card, retightening the captive screws.

To convert a standalone media converter for use in the **FRM301** rack, first remove the two flat head screws on the side panel. Then slide the cover as indicated in figure 3-1, Step1. Second, attach the card brackets as shown in figure3-1, Step2. Lastly, insert the card into the **FRM301** rack as in figure 3-1, Step3.

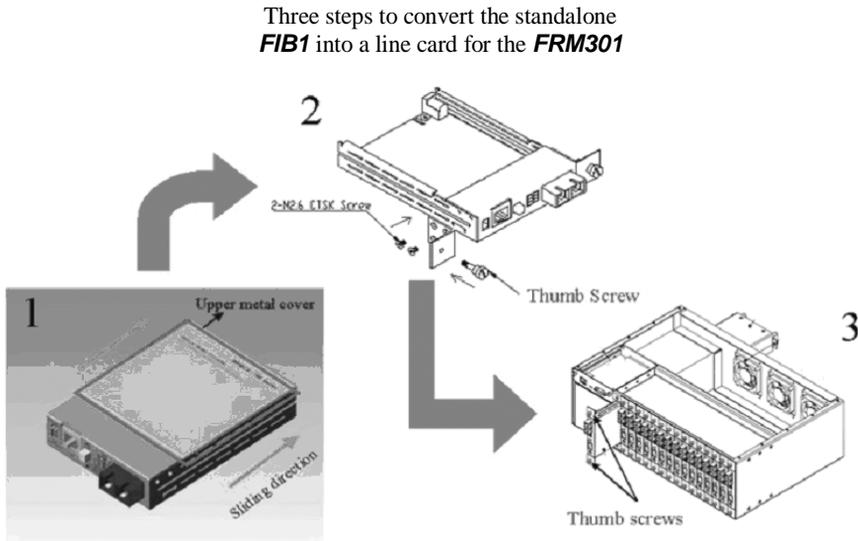


Figure 2-6 Convert a Standalone Media Converter for Rack Use

2.7 FIB1-10/100

The FIB1-10/100 is an Ethernet media converter that supports 10Base-T or 100Base-TX and converts to 100Base-FX (fiber). The UTP side supports auto-negotiation or forced settings for speed and duplex by setting of internal DIP switch. When the FIB1-10/100 is placed in the FRM301 with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored.

There are two distinct hardware versions of FIB1-10/100 cards. The old version was based upon a Kendin 8995E chip. This chip may easily be identified as it has an aluminum heatsink attached to the chip. The newer (current) version card uses an IC+ IP113A chip, easily identified by its small 8x8mm foot print. Both versions have a 6 pole DIP switch. The differences in switch settings and specifications are shown in the table below.

	Kendin 8995E based	IC+ IP113A based
MDI / MDI-X	manual push button switch ¹	supports auto MDI-X ¹
Switch 6 OFF	standard 1522 Bytes packets ²	up to 1600 Bytes packets ²
Switch 6 ON	supports 1536 Bytes packets ²	up to 1600 Bytes packets ²

notes:

1. A number of models with IC+ chip still have the pushbutton switch for MDI/MDI-X, however, link will occur in either position since this chip supports auto MDI-X.
2. Switch 6 has no effect on this converter. All packets up to and including 1600 Byte jumbo packets are supported.

DIP Switch Setting Table	
DIP	functional description
1	OFF=Auto-negotiation enabled / ON=Manual, Forced (Dip 2&3 apply)
2	OFF=Full Duplex / ON=Half Duplex (DIP 1 must be ON)
3	OFF=100 / ON=10 (DIP 1 must be ON)
4	reserved
5	OFF=LLF OFF / ON=LLF ON (Link Loss Forwarding function)
6	reserved *

* On the legacy FIB1-10/100, this switch ON will allow VLAN Tag packets up to 1536 Bytes. When OFF, the converter will support up to 1522 Byte packets only.

Link Loss Forwarding

This media converter incorporates a Link Forwarding feature which allows indirect sensing of a Fiber or UTP Link Loss via the 100 Base-TX UTP connection. Whenever the media converter detects a Link Loss condition on the Receive fiber (Fiber LNK OFF), it disables its UTP transmitter so that a Link Loss condition will be sensed on the receive UTP port. (See the following figure) The link loss can then be sensed and reported by a Network Management agent at the host equipment of remote UTP port

Chapter 2 Installation

LED Status Indicators

<u>LED</u>	<u>Function</u>	<u>State</u>	<u>Status</u>
PWR	Power indicator	On	Converter has power.
		Off	Converter has no power.
		Blinking	No SNMP card with the SNMP Control card inserted or SNMP card bad.
Fiber Full	mode display	On	Fiber side full duplex mode (200mbps).
		Off	Fiber side half-duplex mode
Fiber Link	Fiber link	On	The fiber link is ok.
		Off	No link or the link is faulty.
		Blinking	Receiving data on the fiber.
LAN 100	mode display	On	UTP side is operating in 100Mbps mode.
		Off	UTP side is operating in 10Mbps mode
LAN Full	mode display	On	UTP side full duplex mode (20/200mbps).
		Off	UTP side half-duplex mode (10/100mbps).
LAN Link	Ethernet link	On	The UTP link is ok.
		Off	No link or the link is faulty.
		Blinking	Receiving data on Ethernet.

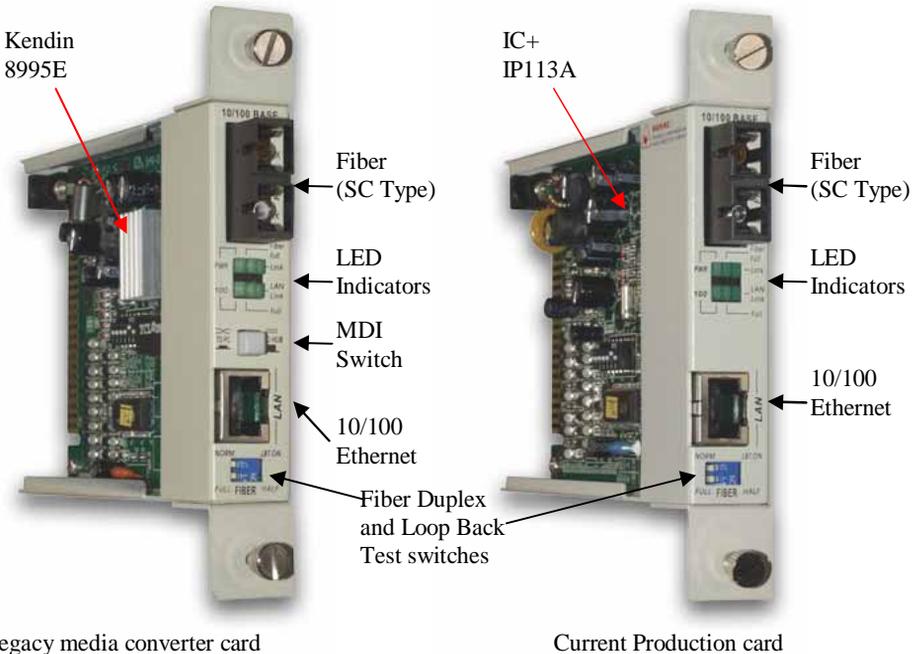


Figure 2-7 FIB-10/100 Old and New Ethernet Media Converter Cards

2.8 FIB1-1000

The **FIB1-1000** is a Gigabit Ethernet media converter that supports 1000Base-TX and converts to 1000Base-LX or SX (fiber). The UTP and fiber sides support forced setting for full or half duplex. The front panel DIP switch is also used to enable or disable the link loss forwarding function or to perform loop back test with another connected **FIB1-1000** converter. When the **FIB1-1000** is placed in the **FRM301** with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored.

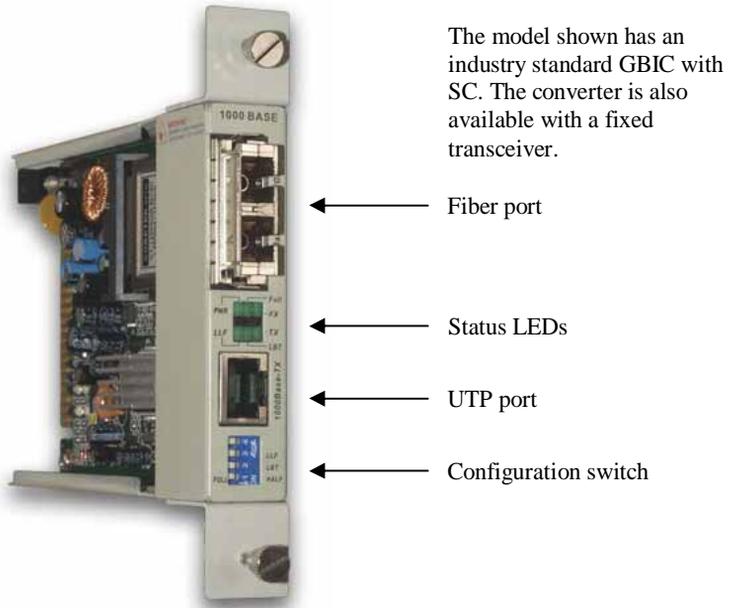


Figure 2-8 FIB-1000 Ethernet Media Converter Card

Configuration switch settings

Position	Function	Description
1	Mode	Forces fiber and UTP to Full or Half Duplex
2	LBT	Initiates a loop back test with other fiber connected unit
3	LLF	Enables or disables the link loss forwarding function
4	Reserved	

2.9 FIB1-1000E

The **FIB1-1000E** is our 'enhanced' Gigabit Ethernet media converter that supports 10Base-T, 100Base-TX and 1000Base-TX and converts to 1000Base-LX or SX (fiber). The UTP side supports auto-negotiation for speed and duplex or the settings may be forced by DIP switch setting. The front panel DIP switch is also used to enable or disable the link loss forwarding function or to perform loop back test with another connected **FIB1-1000E** converter. When the **FIB1-1000E** is placed in the **FRM301** with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored.



The model shown has an industry standard SFP with LC. The converter is also available with GBIC or fixed transceiver.

- Fiber port
- Status LEDs
- UTP port
- Configuration switch

Figure 2-9 FIB1-1000E Gigabit Ethernet Media Converter card

1	2	3	Configuration Setting
OFF	OFF	OFF	Auto Negotiation
ON	OFF	OFF	Forced 1000Base / Full
OFF	ON	OFF	Forced 100Base / Full
ON	ON	OFF	Forced 10Base / Full
OFF	ON	ON	Forced 100Base / Half
ON	ON	ON	Forced 10Base / Half
4	OFF = Normal, ON= enable Loop Back Test		

UTP Configuration Settings

2.10 FIB1-Serial

The **FIB1-Serial** (formerly known as FIB1-485A) is a Datacom fiber media converter that supports RS-232, RS-485 and RS-423 conversion to fiber media. Other features include the ability to remove interface termination (go high-impedance), run in TTL interface mode, and the ability to supply external +5VDC to the auxiliary equipment.

The **FIB1-Serial** uses a 6 pin, in-line, terminal block with removable header. Wires may be easily terminated at the header's screw posts without soldering. The front panel has a 4 position DIP switch for setting the interface type and termination. When the **FIB1-Serial** is placed in the **FRM301** with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored. Additionally, when placed in the managed rack, the remotely linked **FIB1-Serial** unit is also controlled and configured through the management system.

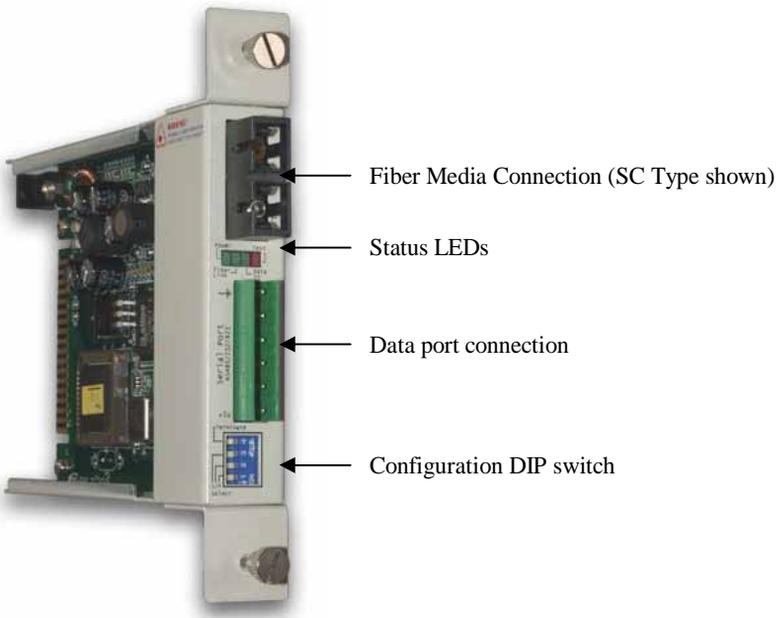


Figure 2-10 FIB1-Serial Media Converter Card

Chapter 2 Installation

The configuration DIP switch, located on the face of the converter, provides setting for interface selection. When placed in a managed rack, the DIP settings are ignored and the unit must be configured via the local control console, GUI application or via SNMP set/get commands.

The 6 pin interface connector has pin assignments displayed in the table below. Pin 1 provides a +5V connection that may be used for logic or to power a small interface converter. Pin 6 provides a common for all the signals. DIP Switch 4 when ON provides normal interface termination. When off, the circuit presents a high impedance to other connected equipment.

Pin assignment and DIP setting for FIB1-Serial

Pin Definition				I/F Type	DIP SW		
2	3	4	5		1	2	3
NC	NC	+	-	485-2W	ON	OFF	OFF
DO+	DO-	DI+	DI-	485-4W	OFF	OFF	OFF
NC	DO	NC	DI	232-3W	ON	ON	OFF
FI	DO	FO	DI	232-5W	OFF	ON	OFF
NC	DO	NC	DI	423-3W	ON	OFF	ON
FI	DO	FO	DI	423-5W	OFF	OFF	ON
NC	DO	NC	DI	TTL-3W	OFF	ON	ON

Legend: NC=No Connection, FI=Flow Control In, FO=Flow Control Out, DI=Data IN, DO=Data Out

The **FIB1-Serial** is designed to provide two clear channels in each direction. In an RS-232 5-wire application, one channel is used for data transmission while the other may be used as a handshaking line for flow control. The connected system functionally works like that in the diagram below.

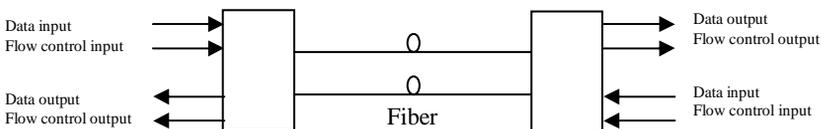


Figure 2-11 FIB1-Serial's logical signal flow

2.11 FIB1-DATA

The **FIB1-DATA** is a high-performance serial over fiber media converter. These converters fully support Nx64 data transmissions up to 2.048Mbps and completely handle flow control and clocking signals in synchronous applications over fiber media. Additionally, the converters support low speed asynchronous connections as well.

There are five models of **FIB1-DATA** media converters, V.35, RS-232, RS-530, X.21, and RS-449 which are based upon three basic hardware types, V.35, RS-232, and RS-530. The RS-530 hardware is also the source for the X.21 and RS-449 models. All models require adapter cables to adapt the unit's HDB26 interface connectors.

There are two 8 position DIP switches located on the side of the **FIB1-DATA** to configure the units when used standalone. When the **FIB1-DATA** is placed in the **FRM301** with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored. Additionally, when placed in the managed rack, the remotely linked **FIB1-DATA** unit is also controlled and configured through the management system.

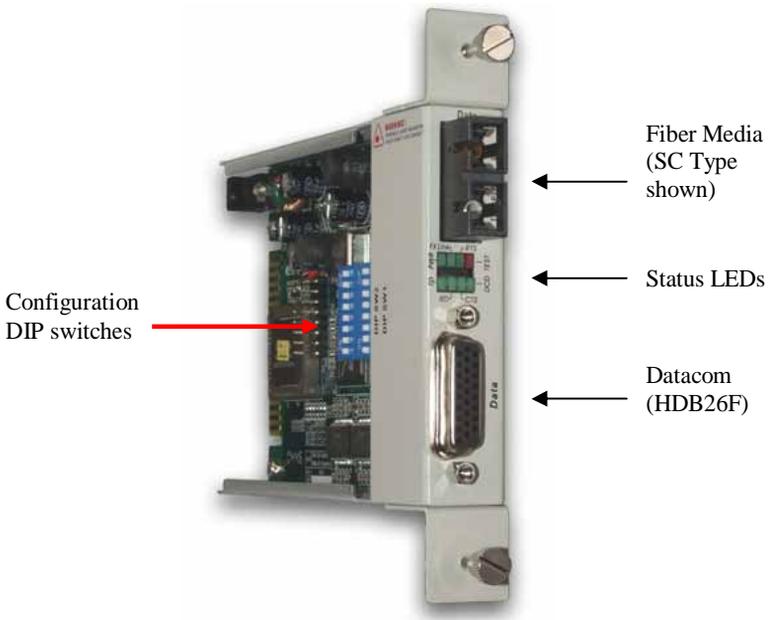


Figure 2-12 FIB1-DATA Media Converter Card

Clocking Modes

There are three clocking schemes for the **FIB1-DATA** converters, shown below.

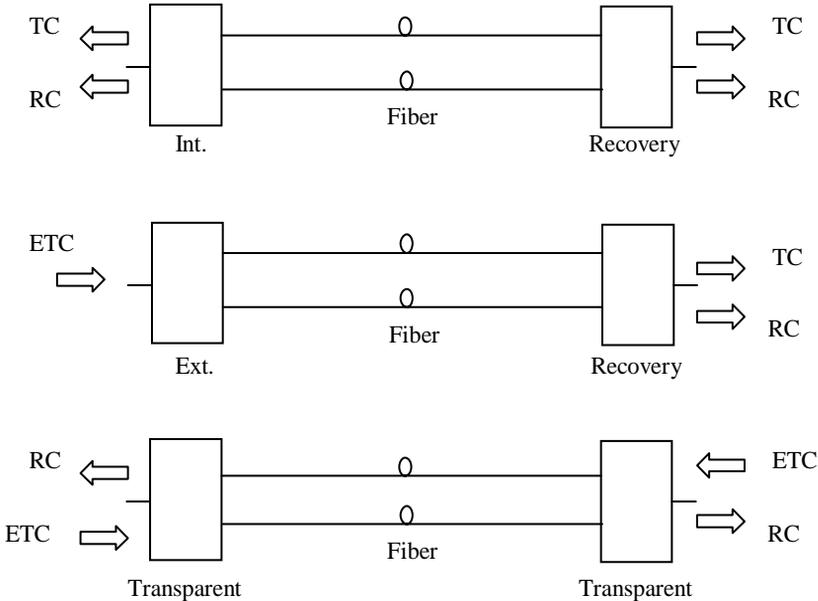


Figure 2-13 FIB1-DATA Clocking Modes

All models of the **FIB1-DATA** have a physical interface which is DCE. A crossover cable is required when acting as a DTE device. In the first example, the units act as 'Fiber Modems' with the internal clocking unit acting as a master time source and the remote or loop unit recovering timing from the fiber side. In this configuration, both units are acting as DCE.

In the second example, an external clock is received at one unit and the clock is passed to the remote for recovery via the fiber. In this scheme, the left side unit acts as a DTE and a crossover cable is required. The right hand unit recovers clock from the fiber and acts as a DCE.

In our last example, transparent clocking is employed; the transmit clock on one side is used as the source for receive clock on the other. In this scheme the units may act as DCE or DTE depending on the cable used.

LED Status LED Detailed Description

LED	Function	State	Status
PWR	Power indicator	On	Converter has power
		Off	Converter has no power
		Blinking	No SNMP is installed in FRM301
FX Link	Fiber link	On	The fiber link is up
		Off	No signal or fiber link is down
		Blinking	Remote side fiber Sync loss
Test	Mode display	On	Any loop back test is on
		Off	Normal status
TD	Mode display	On	"Data Signal" is in "High" state
		Off	"Data Signal" is in "Low" state
		Blinking	Normal Data transmitting status
RD	Mode display	On	"Data Signal" is in "High" state
		Off	"Data Signal" is in "Low" state
		Blinking	Normal Data transmitting status
RTS	Mode display	On	"Data Signal" is in "High" state
		Off	"Data Signal" is in "Low" state
CTS	Mode display	On	"Data Signal" is in "High" state
		Off	"Data Signal" is in "Low" state
DCD	Mode display	On	"Data Signal" is in "High" state
		Off	"Data Signal" is in "Low" state

Loop Back Features of the FIB1-DATA

The **FIB1-DATA** features local and remote loop back functions for both the data port and the fiber connections. When management features are installed in the rack, loop back may be performed from local console, network connected management workstation or from a workstation running the Windows® GUI (Graphical User Interface) software.

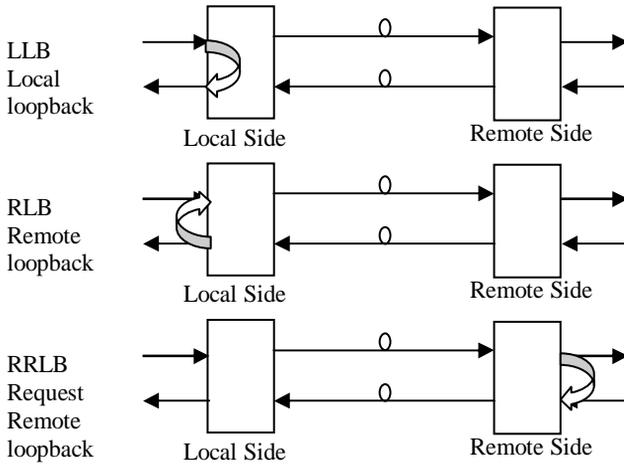


Figure 2-14 FIB1-DATA Data Port loop back diagnostic modes

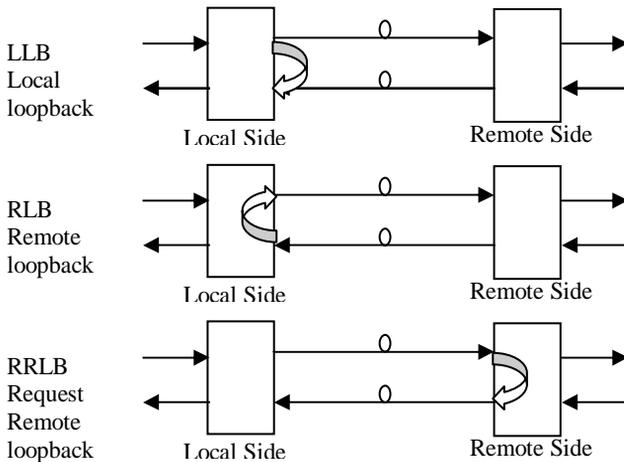


Figure 2-15 FIB1-DATA Optical loop back diagnostic modes

Chapter 2 Installation

DIP Switch Settings of the FIB1-DATA (DIP SW 1)

DIP SW1	STATE					Function Description	
1,2	1		2			Timing mode select:	
	OFF		OFF			Transparent	
	ON		OFF			Recovery	
	OFF		ON			Data port	
	ON		ON			Internal oscillator	
3	3					Data Rate group setting	
	OFF					N x 64K	
	ON					Low speed	
4,5,6,7,8	4	5	6	7	8	Data Rate setting	
						N x 64K	Low speed
	OFF	OFF	OFF	OFF	OFF	64K	75
	ON	OFF	OFF	OFF	OFF	128K	112.5
	OFF	ON	OFF	OFF	OFF	192K	150
	ON	ON	OFF	OFF	OFF	256K	225
	OFF	OFF	ON	OFF	OFF	320K	300
	ON	OFF	ON	OFF	OFF	384K	450
	OFF	ON	ON	OFF	OFF	448K	600
	ON	ON	ON	OFF	OFF	512K	900
	OFF	OFF	OFF	ON	OFF	576K	1200
	ON	OFF	OFF	ON	OFF	640K	1800
	OFF	ON	OFF	ON	OFF	704K	2400
	ON	ON	OFF	ON	OFF	768K	3600
	OFF	OFF	ON	ON	OFF	832K	4800
	ON	OFF	ON	ON	OFF	896K	7200
	OFF	ON	ON	ON	OFF	960K	9600
	ON	ON	ON	ON	OFF	1024K	11400
	OFF	OFF	OFF	OFF	ON	1088K	19200
	ON	OFF	OFF	OFF	ON	1152K	28800
	OFF	ON	OFF	OFF	ON	1216K	38400
	ON	ON	OFF	OFF	ON	1280K	57600
	OFF	OFF	ON	OFF	ON	1344K	76800
	ON	OFF	ON	OFF	ON	1408K	115200
	OFF	ON	ON	OFF	ON	1472K	
	ON	ON	ON	OFF	ON	1536K	
	OFF	OFF	OFF	ON	ON	1600K	
	ON	OFF	OFF	ON	ON	1664K	
	OFF	ON	OFF	ON	ON	1728K	
	ON	ON	OFF	ON	ON	1792K	
OFF	OFF	ON	ON	ON	1856K		
ON	OFF	ON	ON	ON	1920K		
OFF	ON	ON	ON	ON	1984K		
ON	ON	ON	ON	ON	2048K	ASYNC MODE	

Table 2-1 FIB1-DATA, DIP switch 1 setting

DIP Switch Settings of the FIB1-DATA (DIP SW 2)

DIP Switch Number 2 Table		
Switch and State		Function Description
1		Data port RC polarity setting:
OFF		Normal
ON		Inverted
2		Data port TC polarity setting:
OFF		Normal
ON		Inverted
3		Data port ETC polarity setting:
OFF		Normal
ON		Inverted
4		Data port RTS setting:
OFF		Follow CTS
ON		Always ON
5		Far End Fault (FEF) Setting
OFF		Disabled
ON		Enabled
6		Loop Back Selection
OFF		Fiber Loop Back
ON		Data Port Loop Back
7	8	Loop back test setting
OFF	OFF	All loop back off
ON	OFF	Local Loop Back (LLB)
OFF	ON	Remote Loop Back (RLB)
ON	ON	Request Remote Loop Back (RRLB)

Table 2-2 FIB1-DATA DIP switch 2 setting

For more detailed technical specifications, please refer to Chapter 1, Introduction.

Chapter 2 Installation

When the **FIB1-DATA** is ordered with a V.35 interface, the unit comes with a HDB26 male to MB34 Female adapter cable, 1 meter long. The pin assignment follows the table below.

Abbreviation	HDB26 PIN#		MB34 PIN#	V.35 Circuit
FG	1	↔	A	Frame
SG	7	↔	B	Signal Ground
TD(A)	2	↔	P	TD(A)
TD(B)	11	↔	S	TD(B)
RD(A)	3	↔	R	RD(A)
RD(B)	21	↔	T	RD(B)
RTS(A)	4	↔	C	RTS
CTS(A)	5	↔	D	CTS
DSR(A)	6	↔	E	DSR
DTR(A)	20	↔	H	DTR
DCD(A)	8	↔	F	DCD
ETC(A)	24	↔	U	ETC(A)
ETC(B)	16	↔	W	ETC(B)
TC(A)	15	↔	Y	TC(A)
TC(B)	23	↔	AA	TC(B)
RC(A)	17	↔	V	RC(A)
RC(B)	25	↔	X	RC(B)
RLB	9	↔	HH	RL
LLB	18	↔	JJ	LL
TM	10	↔	KK	TM

Table 2-3 FIB1-DATA V.35 cable

Chapter 2 Installation

When the **FIB1-DATA** is ordered with a RS-530 interface, the unit comes with a HDB26 male to DB25 Female adapter cable, 1 meter long. The pin assignment follows the table below.

Abbreviation	HDB26 PIN#		DB25 PIN#	RS-530 Circuit
FG	1	↔	1	Frame
SG	7	↔	7	AB
TD(A)	2	↔	2	BA(A)
TD(B)	11	↔	14	BA(B)
RD(A)	3	↔	3	BB(A)
RD(B)	21	↔	16	BB(B)
RTS(A)	4	↔	4	CA(A)
RTS(B)	13	↔	19	CA(B)
CTS(A)	5	↔	5	CB(A)
CTS(B)	14	↔	13	CB(B)
DSR(A)	6	↔	6	CC(A)
DSR(B)	22	↔	22	CC(B)
DTR(A)	20	↔	20	CD(A)
DTR(B)	12	↔	23	CD(B)
DCD(A)	8	↔	8	CF(A)
DCD(B)	26	↔	10	CF(B)
ETC(A)	24	↔	24	DA(A)
ETC(B)	16	↔	11	DA(B)
TC(A)	15	↔	15	DB(A)
TC(B)	23	↔	12	DB(B)
RC(A)	17	↔	17	DD(A)
RC(B)	25	↔	9	DD(B)
RLB	9	↔	21	RL
LLB	18	↔	18	LL
TM	10	↔	25	TM

Table 2-4 FIB1-DATA RS-530 cable

Chapter 2 Installation

When the **FIB1-DATA** is ordered with a RS-449 interface, the unit comes with a HDB26 male to DB37 Female adapter cable, 1 meter long. The pin assignment follows the table below.

Abbreviation	HDB26 PIN#		DB37 PIN#	RS-449 Circuit
FG	1	↔	1	Frame
SG	7	↔	19,20,37	SG,RC,SC
TD(A)	2	↔	4	SD(A)
TD(B)	11	↔	22	SD(B)
RD(A)	3	↔	6	RD(A)
RD(B)	21	↔	24	RD(B)
RTS(A)	4	↔	7	RS(A)
RTS(B)	13	↔	25	RS(B)
CTS(A)	5	↔	9	CS(A)
CTS(B)	14	↔	27	CS(B)
DSR(A)	6	↔	11	DM(A)
DSR(B)	22	↔	29	DM(B)
DTR(A)	20	↔	12	TR(A)
DTR(B)	12	↔	30	TR(B)
DCD(A)	8	↔	13	RR(A)
DCD(B)	26	↔	31	RR(B)
ETC(A)	24	↔	17	TT(A)
ETC(B)	16	↔	35	TT(B)
TC(A)	15	↔	5	ST(A)
TC(B)	23	↔	23	ST(B)
RC(A)	17	↔	8	RT(A)
RC(B)	25	↔	26	RT(B)
RLB	9	↔	14	RL
LLB	18	↔	10	LL
TM	10	↔	18	TM

Table 2-5 FIB1-DATA RS-449 cable

Chapter 2 Installation

When the **FIB1-DATA** is ordered with a X.21 interface, the unit comes with a HDB26 male to DB15 Female adapter cable, 1 meter long. The pin assignment follows the table below.

Abbreviation	HDB26 PIN#		DB15 PIN#	X.21 Circuit
FG	1	↔	1	Shield
SG	7	↔	8	Ground
TD(A)	2	↔	2	Transmit(A)
TD(B)	11	↔	9	Transmit(B)
RD(A)	3	↔	4	Receive(A)
RD(B)	21	↔	11	Receive(B)
RTS(A)	4	↔	3	Control(A)
RTS(B)	13		10	Control(B)
DCD(A)	8	↔	5	Indication(A)
DCD(B)	26		12	Indication(B)
ETC(A)	24	↔	7	Ext. Timing(A)
ETC(B)	16	↔	14	Ext. Timing(B)
RC(A)	17	↔	6	Signal Timing(A)
RC(B)	25	↔	13	Signal Timing(B)

Table 2-6 FIB1-DATA X.21 cable

When the **FIB1-DATA** is ordered with a RS-232 interface, the unit comes with a HDB26 male to DB25 Female adapter cable, 1 meter long. The pin assignment follows the table below.

Abbreviation	HDB26 PIN#		DB25 PIN#	RS-232 Circuit
FG	1	↔	1	Frame
SG	7	↔	7	SG
TD	2	←	2	TD
RD	3	→	3	RD
RTS	4			RTS
CTS	5		5	CTS
DSR	6		6	DSR
DTR	20	↔	20	DTR
DCD	8		8	DCD
ETC	24		24	ETC
TC	15		15	TC
RC	17		17	RC

Table 2-7 FIB1-DATA RS-232 cable

2.12 FIB1-E1/T1

The **FIB1-E1** and **FIB1-T1** are high-performance G.703 E1 or T1 (DS1) over fiber media converters. These converters fully support transparent transmissions of 2.048Mbps (or 1.544Mbps for T1) and completely handle clocking in point-to-point or network applications. Additionally, the converters may be linked to **FIB1-DATA** converters in unframed E1 (T1) at fixed data rate of 2048Kbps (1544Kbps for T1).

There are three models of **FIB1-E1** and **FIB1-T1** media converters, E1-BNC, E1-RJ-45, and T1-RJ-45. The E1-BNC model supports coaxial connections with BNC connectors at 75 ohm impedance, while the E1-RJ-45 model accepts twisted pair wiring at 120 ohm impedance on a shielded RJ-45 connector wired to industry standard USOC RJ-48C. The T1 model sports an RJ-48C for twisted pair wiring at 100 ohms impedance.

There is one 4 position DIP switch located on the face of the **FIB1-E1** and **FIB1-T1** to configure the units when used standalone. When the **FIB1-E1** and **FIB1-T1** is placed in the **FRM301** with SNMP, the settings are controlled by the chassis management system and any DIP settings are ignored. Additionally, when placed in the managed rack, the remotely linked **FIB1-E1** and **FIB1-T1** units are also controlled and configured through the management system.

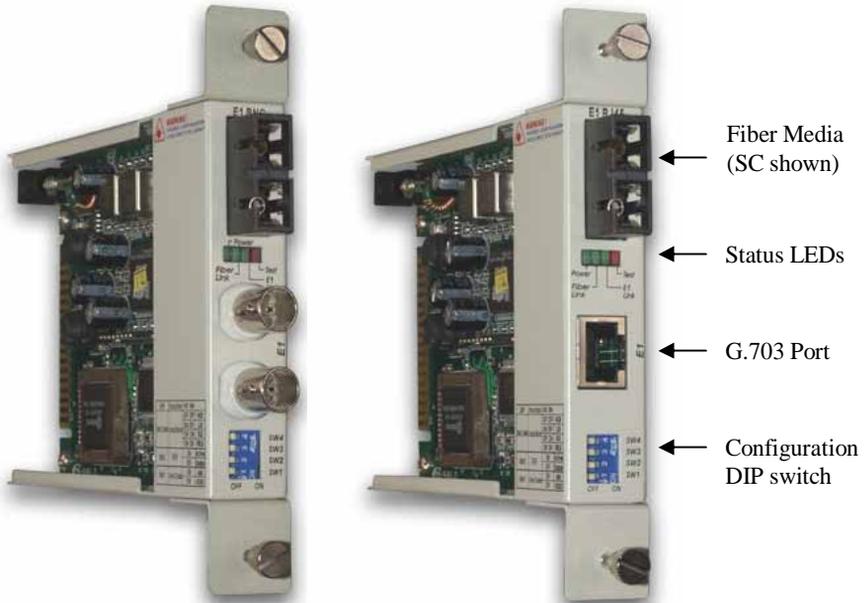


Figure 2-16 FIB1-E1/T1 Fiber Media Converter Cards
(E1 BNC model on left, E1 RJ-45 model on right)

Chapter 2 Installation

The **FIB1-E1** and **FIB1-T1** fiber media converters' transmissions are transparent to clock and data. They are designed to be placed in an existing E1 or T1 application as an extension over fiber. When connected by fiber pair, the received analog signal of each device is used to generate the transmitted optical signal. Because of their transparent nature, they can be applied where the transmissions are unframed or fractional without regard and with minimal configuration (only need to configure the proper line code).

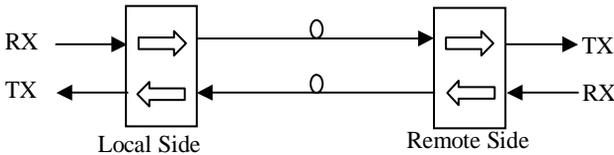


Figure 2-17 Transparent operation of FIB1-E1 and FIB1-T1

The **FIB1-E1/T1** media converter incorporates a Far End Fault feature which allows the converters on both ends of a pair of fibers to be informed when there is a problem with one of the fibers. Without Far End Fault, it is impossible for a fiber interface to detect a problem that affects only its Transmit fiber. When Far End Fault is supported and enabled, a loss of receive signal (link) will cause the transmitter to generate a Far End Fault pattern in order to inform the device at the far end of the fiber pair that a fault has occurred. When the local receiver again detects a signal, the local transmitter automatically returns to normal operation. The design of the **FIB1-E1/T1** utilizes the FEF to generate AIS to the connected CSU equipment, so that alarms are transmitted in the traditional fashion when there is a fiber fault.

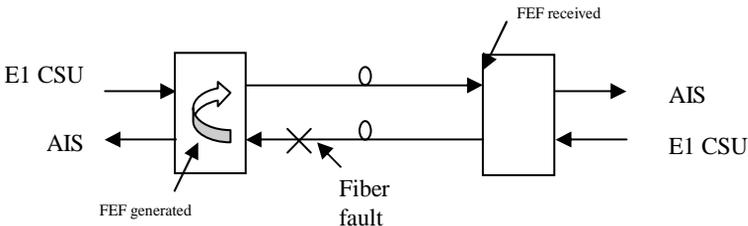


Figure 2-18 Far End Fault feature of FIB1-E1 and FIB1-T1

Chapter 2 Installation

The **FIB1-E1** and **FIB1-T1** media converters incorporate Loop back testing features that may be used with BER (Bit Error Rate) test equipment. Loop back is enabled by the DIP switch#3&4 on the front panel. When installed in a manageable rack, loop back testing is enabled via the console menu, Telnet menu, SNMP get/set commands, or with the Windows® GUI software.

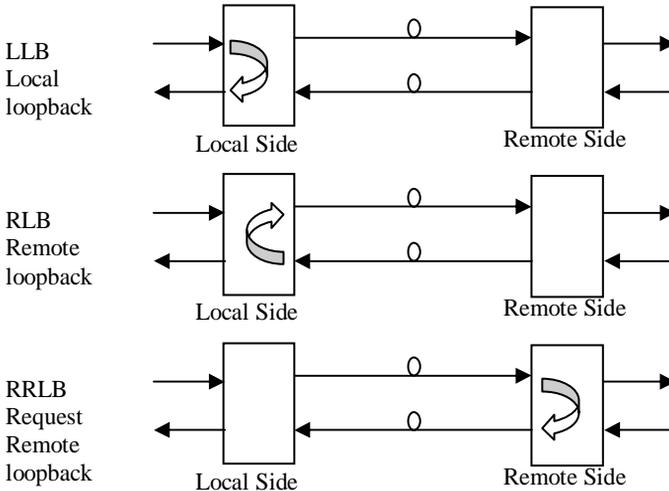


Figure 2-19 FIB1-E1 and FIB1-T1 loop back functions

DIP	Setting		Function	Description
1	OFF		HDB3 (BZ8S)	Line Code
	ON		AMI	
2	OFF		Disable	FEF
	ON		Enable	
3 & 4	3	4	Loop Back Selection	
	OFF	OFF	Normal	
	ON	OFF	LLB - Local Loop Back	
	OFF	ON	RLB - Remote Loop Back	
	ON	ON	RRLB - Request Remote LB	

Table 2-8 DIP setting table for FIB1-E1 and FIB1-T1

Chapter 2 Installation

The **FIB1-E1** and **FIB1-T1** may also be applied in a transparent DSU/CSU configuration, ie. paired with an **FIB1-DATA** converter. Below are some typical clocking applications when paired in this configuration.

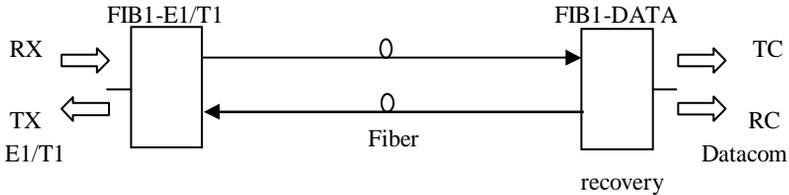


Figure 2-20 E1/T1 with Datacom (V.35, X.21, RS-530 etc.) termination

In the above example, the connected E1/T1 equipment provides the clock source for the **FIB1-E1/T1** converter. The **FIB1-DATA** recovers the clock from the fiber and acts as a DCE to any connected DTE device (such as a router). Because this is a transparent application, the data rate must be 2.048Mbps (1.544Mbps for T1), clear channel.

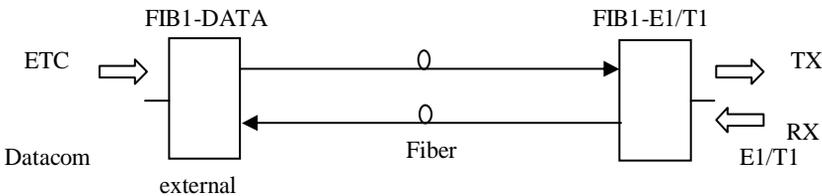


Figure 2-21 E1/T1 extension from Datacom network

In the example above, a serial datacom network provides clock and data to the connected **FIB1-DATA**. The data is then transmitted transparently over the fiber and recovered by the **FIB1-E1/T1**, where data is transmitted at the received data rate. Because this is a transparent application, the data rate must be 2.048Mbps (1.544Mbps for T1), clear channel.

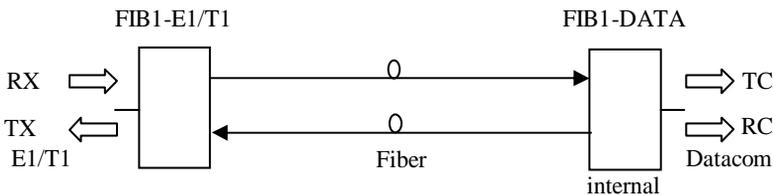


Figure 2-22 Another application with FIB1-DATA as clock source

3.1. Introduction

All of the features and controls described in this chapter require the **FRM301** chassis to have both CPU Control card and SNMP card installed and configured. The Management System is a collection of three control modes for the FRM series. The simplest and most basic mode is "Terminal Mode". The terminal or console mode requires an ASCII based terminal and an RS-232 connection to the RS-232 console port of the SNMP card. Configuration and monitoring are performed through a series of menus and menu selection items. All changes made to line cards through terminal mode are executed immediately and do not require any separate 'save' operations. From the terminal mode, the initial network configuration can be accomplished which will allow remote network configuration to proceed from Telnet connection (remote console), Windows® GUI software or any network management software after compiling the MIB-II compliant file for **FRM301 SNMP**. A MIB browser provides another platform for the user to setup using the SNMP protocol.

A unique feature of the NMS, the system can restore all the previous settings in case some unexpected event occurs such as the sudden power loss. After power is restored all the settings will be restored to each line card and remote units that apply.

Prior to any use of the LAN interface on the SNMP card, the configuration settings for networking must be set. This includes the SNMP device's IP address and subnet mask, the network's default gateway, the IP address of any TFTP server that may be used to upgrade the SNMP firmware. Lastly the IP address of the management workstation that will be managing the system needs to be set.

The front panel of the SNMP card provides the connections and indicators. The LAN connector is an RJ-45 designed for direct connection to a HUB device. The interface supports 10/100Base Ethernet. The DB9 Female connector is an RS-232 DCE connector designed to connect directly to a terminal or a PC running terminal emulation software. The 'LINK' LED will light to indicate the Ethernet has a successful link and flash when there is activity on the Ethernet. The SNMP will flash once per second when the SNMP has successfully booted and is running.

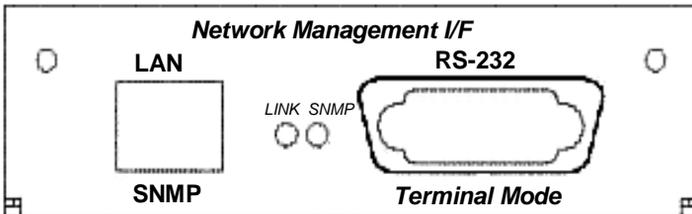


Figure 3-1 SNMP card front panel, management interface

3.2 Terminal Mode

Control Port General

The **FRM301 SNMP** Console Port, labeled RS-232 on the card face, is an RS-232 asynchronous console terminal port designed to facilitate monitoring the condition of all converter cards and links as well as setup of all SNMP parameters through the use of a standard text based terminal or any terminal emulation program running on a Personal Computer.

Terminal Connection

A notebook computer has become an invaluable tool of the Systems Engineer. Connection to the computer is very simple. The **FRM301 SNMP** acts as a DCE to the PC's DTE communications port. The only hardware required is a DB9-pin one-to-one, male to female cable. A convenient application, provided with the Microsoft Windows® operating systems, is "HyperTerminal™". To Start the HyperTerminal, following the steps below: Please follow the instruction to connect the terminal mode.

1. Start "HyperTerminal" program --
Click 'Start', select 'Programs', 'Accessories', 'Communication', 'HyperTerminal'
Enter Connection Name
Select an Icon ' Click OK
2. Select COM port to communicate with SNMP Card
Choose direct to COM1 or COM2 ' click OK
3. Set Port Properties --
Port Setting:
Bit per second: 38400
Data bits: 8
Stop bits: 1
Parity bits: None
Flow Control: None

NOTE : Make the appropriate connections between the SNMP card and the COM port, apply power to the **FRM301** , then press ESC, SPACE or ENTER after SNMP card is fully booted. When you see the SNMP LED flashing steadily once per second, you may use the "Terminal Mode" to access the **FRM301**.

Chapter 3 Management System

The settings for console port communication with the **FRM301** are 38.4K baud, 8 bits, no parity, 1 stop bit and no flow control. In the HyperTerminal program terminal window click the "properties" icon and set the communication parameters as in the following graphics. Click the "Configure..." button in the properties window and set the port settings. When set properly, click "OK".

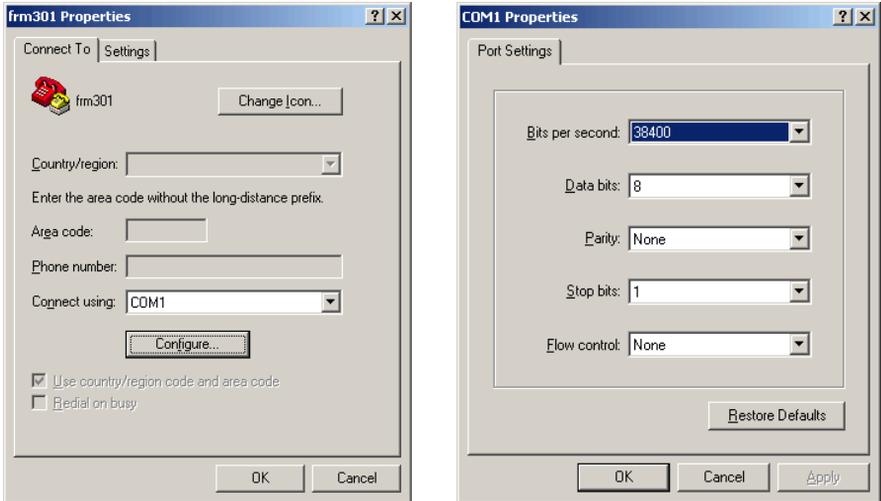


Figure 3-2 HyperTerminal port settings for FRM301

The console port of the **FRM301** is an RS-232 interface (DCE) that utilizes a DB9F connector. Use the configuration cable that is supplied with the **FRM301** or prepare a three wire DB9(F) to DB9(M) cable with the following pin out:

DB9 (M)	signal	DB9 (F)
5	GND	5
2	TD	2
3	RD	3

Chapter 3 Management System

Menu System Detail

To enter "terminal mode", a password may be required. Normally, there is no password set from the factory. The superuser password for the "terminal mode" is "1021". The user password provides security to protect the system. From a Telnet connection, if you enter the wrong password three times, the security system will not allow any login again for 15 minutes. After entering the correct password, you will see the main menu display on the screen as follows :

```
version meaning: SNMP 4.06, CPU 2.17
*****
*** CTC UNION TECHNOLOGIES CO., LTD  V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Main Menu and Rack Status:
1:Slot #1 >> 10/100 Base << || 9:Slot #9 >> 10/100 Base <<
2:Slot #2 >> 10/100 Base << || A:Slot #10 >> 10/100 Base <<
3:Slot #3 >> E1 BNC << || B:Slot #11 >> 10/100 Base <<
4:Slot #4 >> E1 BNC << || C:Slot #12 >> 10/100 Base <<
5:Slot #5 >> SERIAL << || D:Slot #13 >> 10/100 Base <<
6:Slot #6 >> SERIAL << || E:Slot #14 >> 10/100 Base <<
7:Slot #7 >> V.35 << || F:Slot #15 >> 1000E <<
8:Slot #8 >> V.35 << || G:Slot #16 >> 1000 Base <<

Command Function Key:
'1' to '9', 'A' to 'G': I/O Cards Setting
'P': Show Fans and Powers Status
'R': Refresh Status
'ESC' Logout
'M': Manager Configuration Setup
'S': System Configuration and TFTP Setup
Console:[On line] Telnet:[Off line] GUI:[Off line]
```

The card status of all slots in the rack is shown. If a valid card is found in the slot, the slot status will identify the card. If no card is found, the slot status will display "Empty". As we can see in the above example, sixteen cards are inserted in the rack. No card slots are empty. The immediate, 'Command Function', shown in the middle of the display, is to display the status of the I/O cards. The cards are number 1~16, right to left and can be selected with single keyin of 1~9 or A~G. Remember, cards are numbered right to left from the FRONT of the chassis. Pressing the card number will immediately display card's status. The other function keys are explained below.

P: this key will immediately display the status of the power supplies and all fans.

R: this key will refresh the display.

ESC: the escape key will logout of the terminal mode.

M: the 'M' key will enter the Manager Configuration screen, where the manager workstation IP is configured and the trap destinations may be setup.

S: the 'S' key enters the System Configuration screen, where the SNMP card's networking settings are configured.

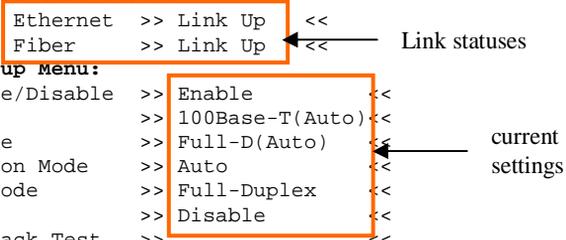
The console line displays the connected status of any Telnet or GUI session.

Chapter 3 Management System

10/100Base Line Card Detail

The following is the display screen for a 10/100Base Ethernet fiber converter.

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Slot #01 10/100 Base Card Status:
  Ethernet >> Link Up <<<
  Fiber >> Link Up <<<
Card Parameter Setup Menu:
  0: Channel Enable/Disable >> Enable <<<
  1: UTP Speed >> 100Base-T(Auto) <<<
  2: UTP Tx/Rx Mode >> Full-D(Auto) <<<
  3: UTP Negotiation Mode >> Auto <<<
  4: Fiber Tx/Rx Mode >> Full-Duplex <<<
  5: LLF Function >> Disable <<<
  6: Remote Loop Back Test >> <<<
  7: Get Remote (CPE) Data >> <<<
  8: Reset Channel Setting to Default >> <<<
Command Function Key:
'0' to '5': Toggle I/O Card Settings
'6' to '8': I/O Card Commands
'R': Refresh Status
'ESC': Main Menu
```



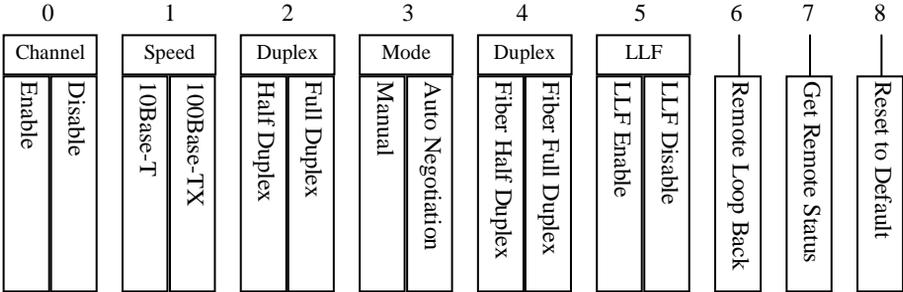
The following are descriptions of the function keys available and the actions which they perform.

- 0:** This key toggles the channel enable/disable and can be used to halt transmission on this line card to the remote cpe side.
- 1:** In manual mode, this key toggles between 10Base-T and 100Base-TX Ethernet.
- 2:** In manual mode, this key toggles between Full and Half duplex Ethernet.
- 3:** This key toggles between manual mode setting and auto negotiation of Ethernet.
- 4:** This key toggles between Full and Half duplex mode on the fiber (FX) side.
- 5:** This key toggles the Link Loss Forwarding function enabled or disabled.
- 6:** This key initiates the remote loop back test.*
- 7:** This key initiates the get remote status function.*
- 8:** This key will reset the card settings to factory default.
- R:** This key will refresh the screen display.
- ESC:** This key will leave the card setting menu.

* During Get Remote CPE and/or loop back tests, normal traffic is interrupted.

Chapter 3 Management System

10/100Base Line Card Menu Breakdown



Chapter 3 Management System

1000Base Line Card Detail

The following is the display screen for a 1000Base Ethernet fiber converter.

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Slot #16 1000 Base Card Status:
                Ethernet >> Link Up <<
                Fiber   >> Link Up <<
Card Parameter Setup Menu:
0: Channel Enable/Disable >> Enable <<
1: Fiber/UTP Tx/Rx Mode >> Full-Duplex <<
2: LLF Function >> Disable <<
3: Remote Loop Back Test >> <<
4: Get Remote (CPE) Data
5: Reset Channel Setting to Default
Command Function Key:
'0' to '2': Toggle I/O Card Settings
'3' to '5': I/O Card Commands
'R': Refresh Status
'ESC': Main Menu
```

The following are descriptions of the function keys available and the actions which they perform.

0: This key toggles the channel enable/disable and can be used to halt transmission on this line card to the remote cpe side.

1: This key toggles between Full and Half duplex mode on the fiber (FX) side.

2: This key toggles the Link Loss Forwarding function enabled or disabled.

3: This key initiates the remote loop back test.*

4: This key initiates the get remote status function.*

5: This key will reset the card settings to factory default.

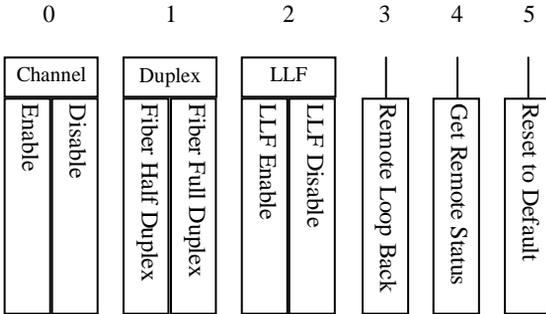
R: This key will refresh the screen display.

ESC: This key will leave the card setting menu.

* During Get Remote CPE and/or loop back tests, normal traffic is interrupted.

Chapter 3 Management System

1000Base Line Card Menu Breakdown



Chapter 3 Management System

1000E Line Card Detail

The following is the display screen for a 1000Base Ethernet fiber converter.

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Slot #15 1000E      Card Status:
                   Ethernet >> Link Up <<
                   Fiber    >> Link Down <<
Card Parameter Setup Menu:
0: Channel Enable/Disable >> Enable <<
1: UTP Speed >> 100 Base <<
2: UTP Tx/Rx Mode >> FULL-Duplex <<
3: UTP Negotiation Mode >> Manual <<
4: LLF Function >> Disabled <<
5: Remote Loop Back Test >> <<
6: Get Remote (CPE) Data
7: Reset Channel Setting to Default
Command Function Key:
'0' to '4': Toggle I/O Card Settings
'5' to '7': I/O Card Commands
'R': Refresh Status
'ESC': Main Menu
```

The following are descriptions of the function keys available and the actions which they perform.

0: This key toggles the channel enable/disable and can be used to halt transmission on this line card to the remote cpe side.

1: In manual mode, this key toggles between 10 / 100 / 1000Base Ethernet.

2: In manual mode, this key toggles between Full and Half duplex Ethernet.

3: This key toggles between manual mode setting and auto negotiation of Ethernet.

4: This key toggles the Link Loss Forwarding function enabled or disabled.

5: This key initiates the remote loop back test.*

6: This key initiates the get remote status function.*

7: This key will reset the card settings to factory default.

R: This key will refresh the screen display.

ESC: This key will leave the card setting menu.

* During Get Remote CPE and/or loop back tests, normal traffic is interrupted.

Chapter 3 Management System

E1 / T1 Line Card Detail

The following is the display screen for the E1 BNC fiber converter.

Slot #03 E1 BNC Select Menu:

```
Select Menu:
 1: Local Setting
 2: Remote Setting
Command Function Key:
'1' to '2': Select Menu
'ESC': Main Menu
```

The E1 / T1 card supports remote management features; Select 1 or 2.

Slot #03 E1 BNC Card Status:

```
      E1      >> Link Up   << H/W Version: 1.1
      E1 AIS   >> Off      << F/W Version: 1.1
      Fiber   >> Link Up   <<
      Test LED >> Off      <<
```

Card Parameter Setup Menu:

```
0: Channel Enable/Disable >> Enable   <<
1: Far End Fault Setting  >> Disable  <<
2: AIS Setting            >> Disable  <<
3: Line Code              >> HDB3     <<
4: Port Reset            >> Disable  <<
5: E1/T1 Loop-Back test  >> Off      <<
6: Fiber Loop-Back test  >> Off      <<
7: Reset Channel Setting to Default
```

Command Function Key:

```
'0' to '4': Toggle I/O Card Settings
'5' to '7': I/O Card Commands
'R': Refresh Status
'ESC': Previous Menu
```

The following are descriptions of the function keys available and the actions which they perform.

0: This key toggles the channel enable/disable and can be used to halt transmission on this line card to the remote cpe side.

1: This key toggles the FEF setting enabled or not.

2: This key toggles the AIS; normal condition should disabled.

3: This key toggles between AMI and HDB3 (BZ8S for T1) Line coding.

4: This key toggles the Port Reset.

5: This key initiates the E1 remote loop back test.*

6: This key initiates the Fiber remote loop back test.*

7: This key will reset the card settings to factory default.

R: This key will refresh the screen display.

ESC: This key will leave the card setting menu.

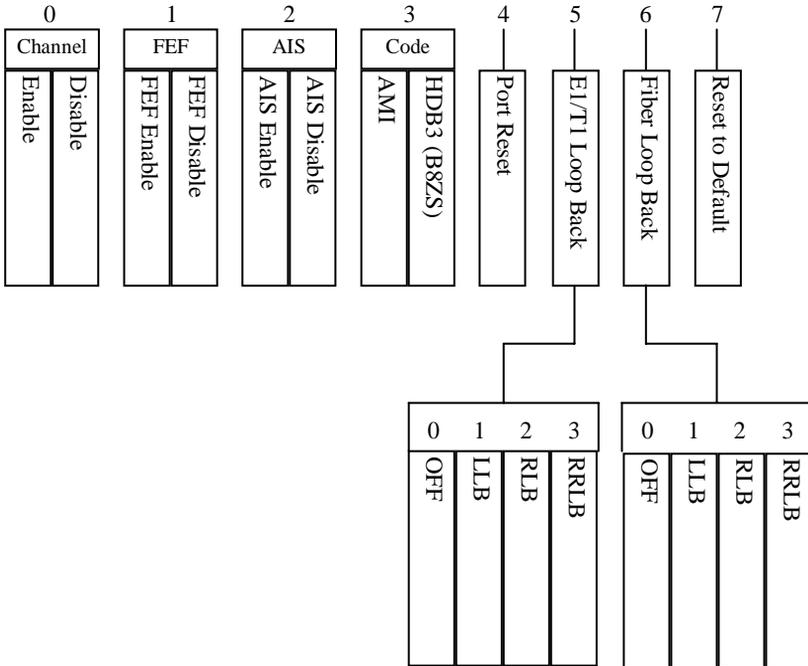
* During loop back tests, normal traffic is interrupted.

Chapter 3 Management System

E1 / T1 Line Card Menu Breakdown

2 - Remote

1 - Local



Chapter 3 Management System

Serial Line Card Detail

The following is the display screen for the Serial fiber converter.

Slot #05 SERIAL Select Menu:

```
Select Menu:
 1: Local Setting
 2: Remote Setting
Command Function Key:
'1' to '2': Select Menu
'ESC': Main Menu
```

The Serial card supports remote management features; Select 1 or 2.

Slot #05 SERIAL Card Status:

```
Data In Status >> Mark << H/W Version: 1.0
Fiber >> Link Up << F/W Version: 1.0
Test LED >> Off <<
```

Card Parameter Setup Menu:

```
0: Channel Enable/Disable >> Enable <<
1: Far End Fault Setting >> Disable <<
2: Port Reset >> Disable <<
3: Mode Setting >> RS-232 3 Wire <<
4: SERIAL Termination >> Disable <<
5: Fiber Loop-Back test >> Off <<
6: Reset Channel Setting to Default
```

Command Function Key:

```
'0' to '4': Toggle I/O Card Settings
'5' to '6': I/O Card Commands
'R': Refresh Status
'ESC': Previous Menu
```

The following are descriptions of the function keys available and the actions which they perform.

0: This key toggles the channel enable/disable and can be used to halt transmission on this line card to the remote cpe side.

1: This key toggles the FEF setting enabled or not.

2: This key toggles the Port Reset.

3: This key toggles between the different mode settings for RS-232,485, and 423.

4: This key toggles the setting of termination for the serial interface lines.

5: This key initiates the fiber remote loop back test.*

6: This key will reset the card settings to factory default.

R: This key will refresh the screen display.

ESC: This key will leave the card setting menu.

* During loop back tests, normal traffic is interrupted.

Data Line Card Detail (second page)

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Slot #07 V.35      Card Status:                               page:2/2
TD   >> Flash      << | CTS                >> Space << H/W Ver: 1.0
RD   >> Flash      << | RTS                >> Space << F/W Ver: 1.1
      | DCD                >> Space <<
Fiber >> Link Up   << | Test LED           >> Off   <<

Card Parameter Setup Menu:
0: CTS Setting                >> Follow RTS   <<
1: RC Polarity Setting        >> Normal     <<
2: TC Polarity Setting        >> Normal     <<
3: ETC Polarity Setting       >> Normal     <<
4: Data Port Loop-Back test   >> Off        <<
5: Fiber Loop-Back test       >> Off        <<
6: Reset Channel Setting to Default

Command Function Key:
'0' to '3': Toggle I/O Card Settings
'4' to '6': I/O Card Commands
'R': Refresh Status           'P': Previous Page
'ESC': Previous Menu
```

The following are descriptions of the function keys available and the actions which they perform.

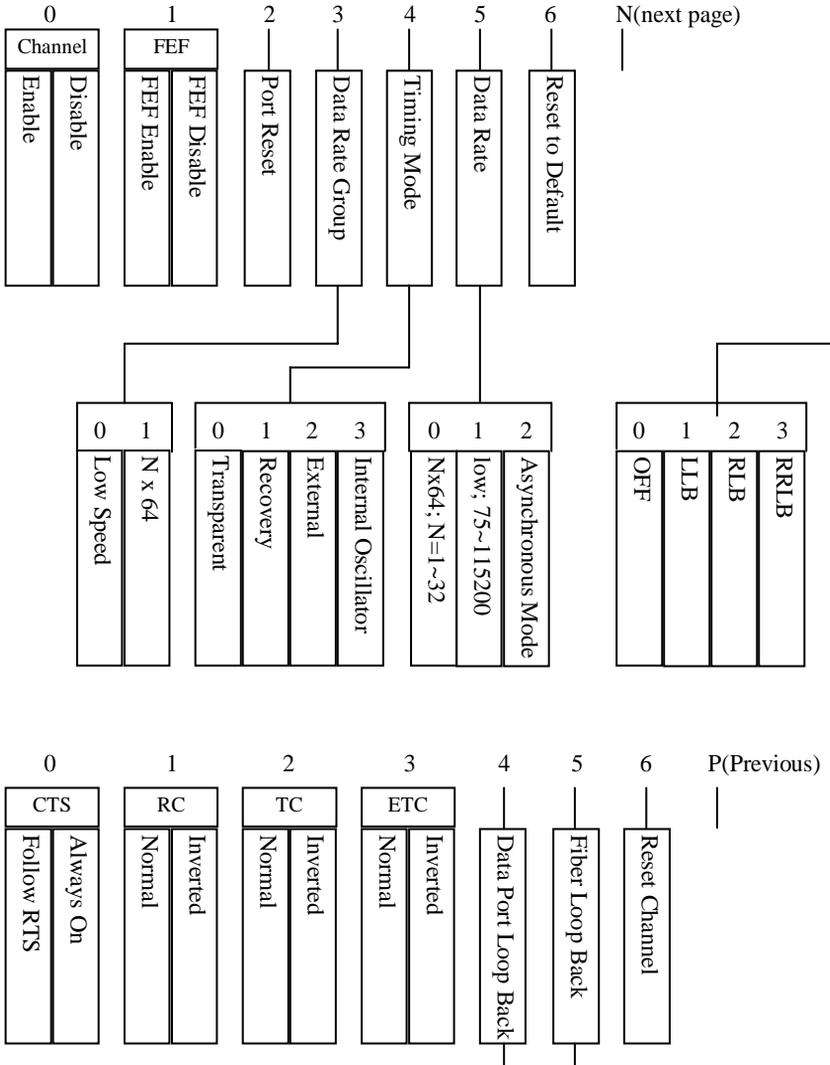
- 0:** This key toggles the CTS setting between follows RTS or always ON.
- 1:** This key toggles the Receive Clock polarity between normal or inverted.
- 2:** This key toggles the Transmit Clock polarity between normal or inverted.
- 3:** This key toggles the External Clock polarity between normal or inverted.
- 4:** This key toggles the Data port loop back test On or Off.*
- 5:** This key toggles the Fiber loop back test On or Off.*
- 6:** This key will reset the card settings to factory default.
- R:** This key will refresh the screen display.
- P:** This key selects the previous configuration page.
- ESC:** This key will leave the card setting menu.

* During loop back tests, normal traffic is interrupted.

Chapter 3 Management System

Data Line Card Menu Breakdown

- 2 - Remote
- 1 - Local



3.3 TCP/IP Configuration

General

The Network Management modes that require TCP/IP communications must first have all TCP/IP configuration settings completed while in the "Terminal Mode". Once the settings are completed, the **FRM301 SNMP** card can be accessed by Telnet, the Windows GUI or via standard SNMP protocol.

Two Step Configuration

The configuration process is broken down into two logical steps. First the SNMP agent (the FRM301 SNMP card itself) must be configured with an IP address, subnet mask and gateway IP. Second, the agent must be told who the network manager is, ie. its IP address. Included in the second step are the community string settings and IP address to send the unsolicited trap messages (alarm messages).

Configuration Process

To configure the card for use by SNMP, certain parameters must be set. They are:

- a. The SNMP card (agent) needs its own IP address.
- b. The SNMP card needs to know the IP address of the management workstation.
- c. The community string must be set.
- d. The SNMP card's subnet mask can be set.

From the main menu type 'S':

```
*****  
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***  
*** FRM-301 Fiber Optical Media Converter Rack Management ***  
*****
```

System Configuration and TFTP Setup Menu:

```
MAC Address           : 0002AB091234  
1:IP Address         : 172.24.1.4  
2:Subnet Mask        : 255.255.0.0  
3:Gateway IP         : 172.24.190.254  
4:TFTP Server IP     : 172.24.1.125  
5:TFTP Server Path   :  
   frm3v406.bin
```

Command Function Key:

```
'1' to '5': Configure Setting  
'R': Reset All Setting to Default  
'S': Store Setting and Reboot  
'T': TFTP and Flash  
'ESC': Main Menu
```

The following are descriptions of the function keys available and the actions which they perform.

- 1: Use this key to set the SNMP card's IP address.

Chapter 3 Management System

- 2: Use this key to set the SNMP card's subnet mask.
- 3: Use this key to set the SNMP card's default gateway.
- 4: Use this key to set the IP address of the TFTP server, for upgrading.
- 5: Use this key to set the path and filename of the upgrade image file.
- R: This key will reset all settings to factory default.
- S: This key will store the settings and reboot the SNMP with new settings.
- T: This key will initiate the TFTP image transfer and flash upgrade.
- ESC: This key will leave the system setting menu.

Be sure to save and reboot!! Now that the system settings are complete, from the first menu page press 'M' to configure the management settings.

```
*****  
*** CTC UNION TECHNOLOGIES CO., LTD V4.06 -17[Oct. 28th] ***  
*** FRM-301 Fiber Optical Media Converter Rack Management ***  
*****
```

Manager Configuration:

```
Access Password: disable  
Community String #1 (Read/Write): secret  
Community String #2 (Read Only) : public
```

```
Access IP          SNMP Community Trap  
-----
```

#1:192.168.0.103	secret	Yes
#2:192.168.0.49	secret	Yes
#3:192.168.0.130	secret	Yes
#4:172.24.1.125	secret	Yes

These managers all have read/write access and will receive trap messages

Command Function Key:

```
'1': Edit Access IP#1          '3': Edit Access IP#3  
'2': Edit Access IP#2          '4': Edit Access IP#4  
'5': Edit Community#1 String (Read/Write)  
'6': Edit Community#2 String (Read Only)  
'7': User Password            '8': Manager Password  
'9': Terminal Access Password ON/OFF  
'R': Delete All Setting  
'ESC': Main Menu
```

The following are descriptions of the function keys available and the actions which they perform.

- 1-4: Use these keys to set the IP addresses of up to 4 management destinations.
- 5: Use this key to edit the read/write community string.
- 6: Use this key to edit the read only community string.
- 7: Use this key to set the user password.
- 8: Use this key to set the manager password.
- 9: Use this key to toggle the terminal access password on or off.
- R: This key will delete all manager settings.
- ESC: This key will leave the system setting menu.

Conclusion

Now that both the 'System' and 'Manager' settings are complete, the **FRM301** is now ready to be managed remotely. The system provides a remote Telnet feature that allows login over TCP/IP networks and provides a menu display almost identical to that of the Terminal mode console. Some functions are disabled in the Telnet session. For example, you cannot change the **FRM301 SNMP's** IP address from remote Telnet. To do so would cause immediate disconnection. However, the individual line card settings remain the same as with serial console.

The **FRM301 SNMP** is supplied with a MIB file (Management Information Base) that can be compiled into any standard SNMP network management software. The MIB file is compliant with MIB-II standards.

The following chapter will describe in detail the operation of the optional Windows GUI software. This software allows graphical management of many chassis in a convenient and popular Windows environment. The actual communications between the GUI and the SNMP card are all via standard SNMP protocol.

4.0 Introduction

This chapter will explain the installation / removal, configuration and operation of the **FRM GUI** (Graphical User Interface), a Windows® based program that uses SNMP protocol to monitor and configure the **FRM301** fiber media converter rack. This first section will deal with the installation and removal of the **GUIMGR** software.

4.1 Software Installation and Removal

4.11 Introduction

The following section deals with the software installation and removal process. Please skip to section 4.2 if the **GUIMGR** software is already installed or if you are familiar with the normal installation and removal procedures for standard Windows® applications.

4.12 System Requirements

4.12.1 Operation System

The GUI program, hereafter called GUIMGR, is designed for installation in any Microsoft™ Windows® based computer. The program runs a standard Windows installer and is compatible on any 32bit OS (Windows 95/98/ME) or NT based OS (Win NT 4.0, Windows 2000, & Windows XP). Also highly recommended is the HyperTerminal program which is not installed by default in Windows 95/98.

4.12.2 Hardware

The minimum recommended hardware requirements for running **GUIMGR** are a Pentium™ class computer with 128MB memory, 5MB free disk space (the final installed software is less than 2MB), CDROM drive (for installing the software), VGA graphics display with 800x600 minimum resolution (1024x768 highly recommended), and a configured 10Base-T or 100Base-TX Network Interface Card (NIC). Our example will use a PC with the following static settings:

IP of 172.24.1.126
Subnet mask 255.255.0.0
Gateway of 172.24.190.254

The management station may be attached directly to the **FRM301 SNMP** card with an Ethernet crossover cable. Typically the workstation will be attached to a network's HUB or switch and the equipment to be managed may be connected to the same subnet or may be connected on a remote network that has access via a router to the local subnet.

4.13 Installation

If you have only the trial version of **GUIMGR**, then it may not require normal installation. Simply un-zip the compressed transport file and place the executable file (GUI_trial.exe) and information file (agentIP.INI) in a convenient location. Create a shortcut to the "exe" file on the desktop, or place the executable file on the desktop itself. The "agentIP.INI" file must be in the same directory as the "exe" file to run properly.



GUI_trial.exe

If you have the full distribution version of the **GUIMGR** program, then please place the **GUIMGR** installation CDROM in the computer's CDROM drive. Use "My Computer" or "Explorer" to browse to the CDROM's contents. Double click on the "Setup" icon to start the program installation.

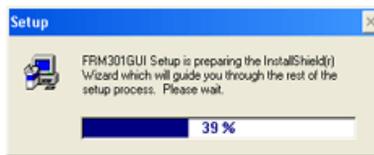


Figure 4.1 Setup started InstallShield Wizard

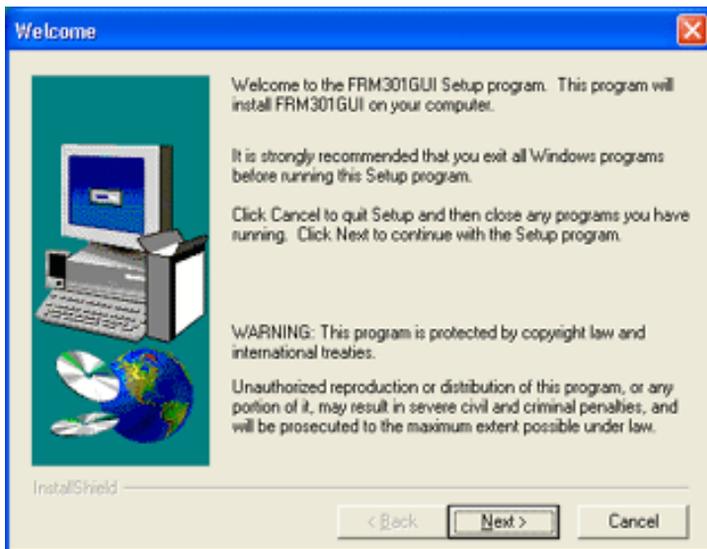


Figure 4.2 Setup welcome page, click "Next"

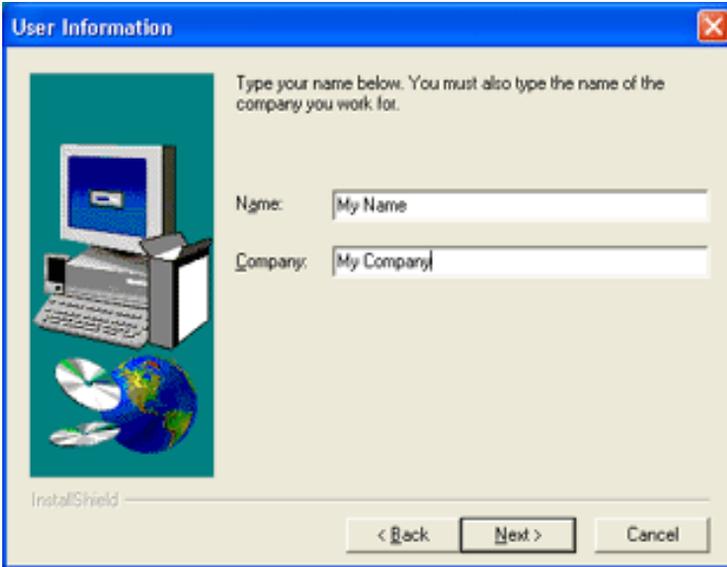


Figure 4.3 Enter your User information.

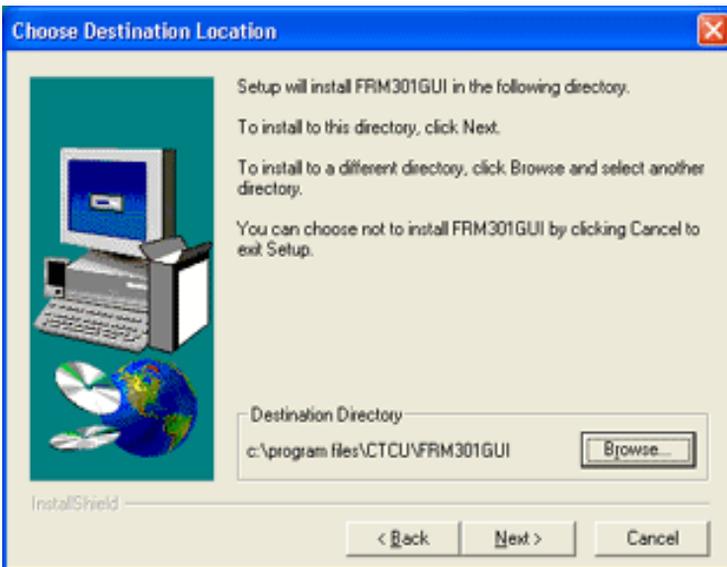


Figure 4.4 Choose program directory, click "Next" to use default.



Figure 4.5 Select the Program Folder, click "Next" for default.

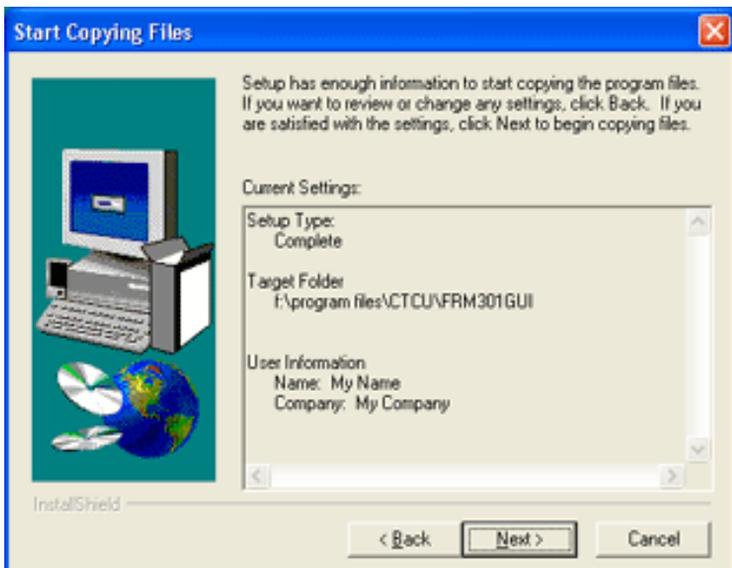


Figure 4.6 Start copying files, click "Next"

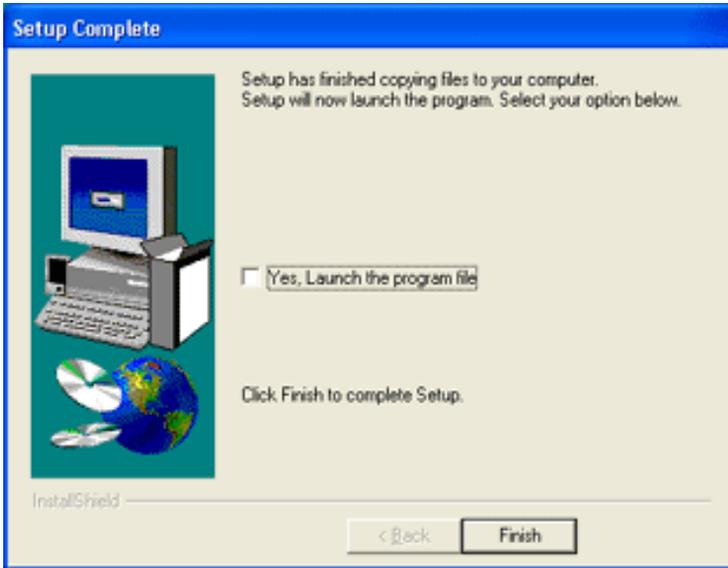


Figure 4.7 Setup Complete

Click 'Finish' to complete the installation of the GUIMGR software program.

4.14 Remove GUIMGR

4.14.1 Control Panel Add/Remove programs

To open the control panel, click the Windows "Start" button and select "Control Panel". In the Control Panel window, double click the "Add or Remove Program" icon. The following window will open. Find the **FRM301GUI** icon as shown below.

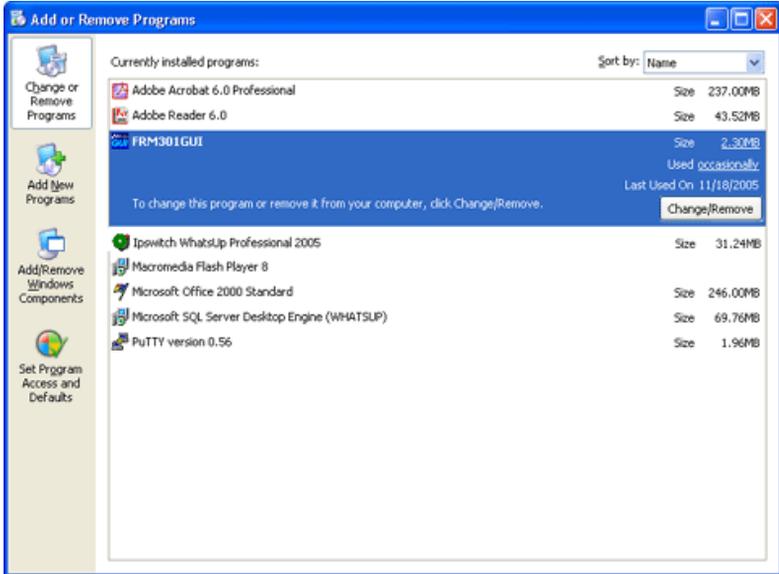


Figure 4.8 Add/Remove Programs window (Click the "Change/Remove" button)

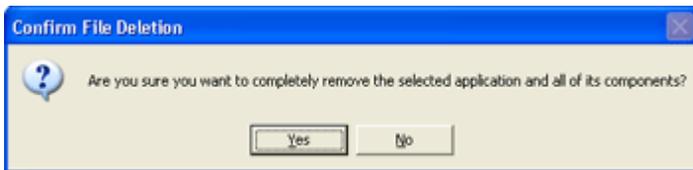


Figure 4.9 Confirm application removal, click "Yes" to continue uninstall.

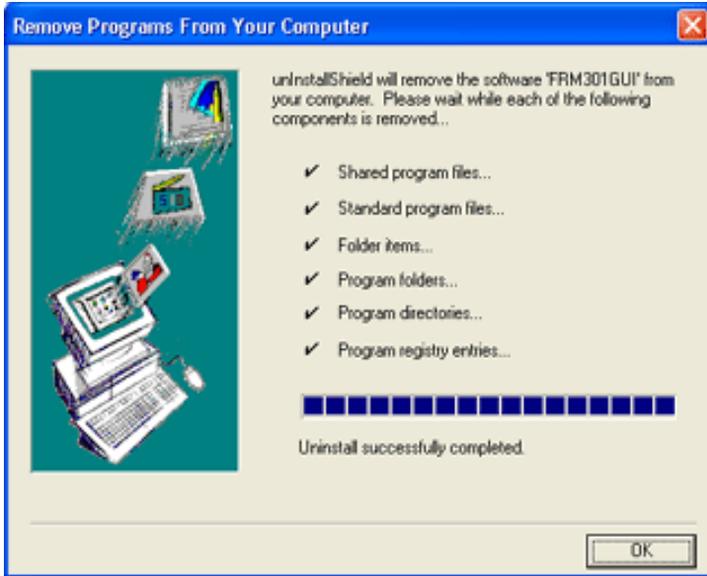


Figure 4.10 Uninstall completed successfully, then click "OK".

The **GUMGR** computer program has now been uninstalled from your computer. To remove all traces of the **GUMGR** from the registry, delete GUMGR under the HKEY_LOCAL_MACHINE/SOFTWARE location.

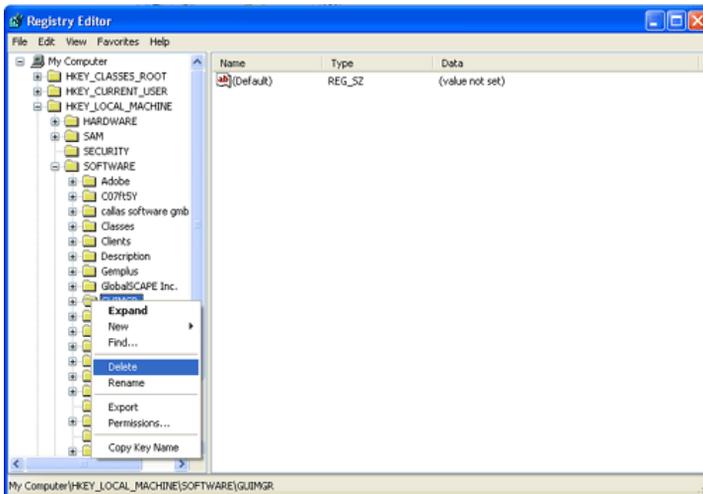


Figure 4.11 Remove the GUMGR entry in the system registry.

4.2 SNMP Card Configuration

4.2.1 Introduction

The **FRM301 SNMP** card is an optional component, installed in the **FRM301** chassis, and provides serial terminal, Telnet and SNMP access. The setting of the SNMP card is performed through the terminal console port of the **FRM301**.

4.2.2 HyperTerminal™ settings

The settings for console port communication with the **FRM301** are 38.4K baud, 8 bits, no parity, 1 stop bit and no flow control. In the HyperTerminal program terminal window click the "properties" icon and set the communication parameters as in the following graphics. Click the "Configure..." button in the properties window and set the port settings. When set properly, click "OK".

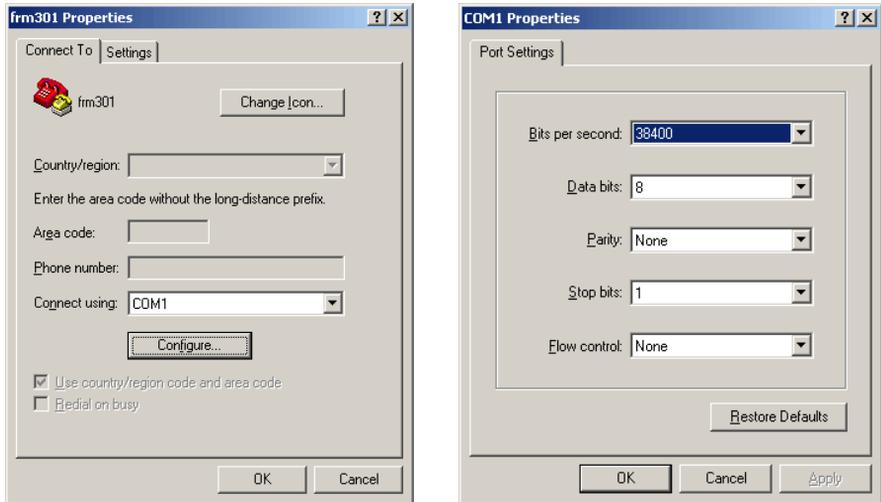


Figure 4.12 HyperTerminal port settings for FRM301

4.2.3 Connecting to the FRM301

The console port of the **FRM301** is an RS-232 interface (DCE) that utilizes a DB9F connector. Use the configuration cable that is supplied with the **FRM301** or prepare a three wire DB9(F) to DB9(M) cable with the following pin out:

DB9 (M)	signal	DB9 (F)
5	GND	5
2	TD	2
3	RD	3

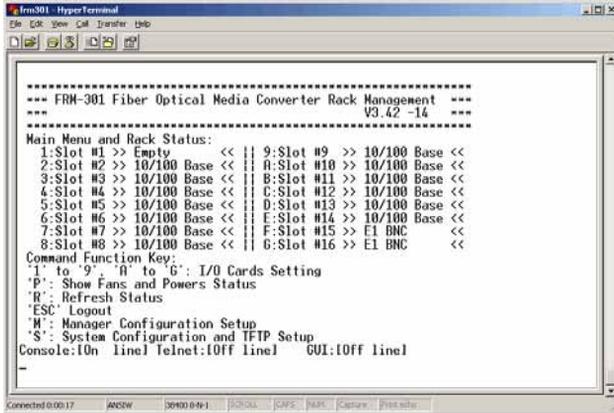


Figure 4.13 FRM301 main screen in console mode.

Connect the PC running HyperTerminal to the FRM301 that has an installed SNMP card option. The above screen indicates successful communication with the FRM301.

4.24 FRM301 menu system

Details of the menu system operation and meaning of menu items are described in detail in Chapter 4. The following information is only for configuration of the SNMP option for use with a network management system. From the main welcome screen, press "S" to enter the system configuration of the FRM301.

4.25 SNMP Card settings

```
*****
*** FRM-301 Fiber Optical Media Converter Rack Management ***
***                                     V3.42                 ***
*****
```

```
System Configuration and TFTP Setup Menu:
  MAC Address           : 0002AB025678
  1:IP Address          : 192.168.0.218
  2:Subnet Mask         : 255.255.255.0
  3:Gateway IP         : 192.168.0.254
  4:TFTP Server IP     : 192.168.0.45
  5:TFTP Server Path   :
  /300.bin
```

```
Command Function Key:
'1' to '5': Configure Setting
'R': Reset All Setting to Default
'S': Store Setting and Reboot
'T': TFTP and Flash
'ESC': Main Menu
```

4.26 SNMP Agent Configuration

The "agent" is the **FRM301** SNMP. The IP address, subnet mask, default gateway, and TFTP server's IP address/path are all set within the System Configuration.

Select "1" IP Address

IP Address->172.24.1.3

Key-in the IP address for the SNMP agent in the **FRM301**. This IP address is also the Telnet IP address of the **FRM301** rack.

Select "2" Subnet Mask

Subnet Mask->255.255.0.0

Key-in the subnet mask for the agent.

Select "3" Gateway IP

Gateway IP->172.24.190.254

Key-in the default gateway IP address.

Select "4" TFTP Server IP

TFTP Server IP->172.24.1.126

Key-in the IP address of a server running the TFTP protocol (trivial FTP) used for updating the SNMP firmware image in the SNMP card.

Select "5" TFTP Server Path

TFTP Server Path->d:\342.bin

Review the settings and make any necessary corrections. If all entries are correct press "S" to Store Settings and Reboot the SNMP agent.

4.27 Manager Configuration

From the SNMP main menu, select item "M", Manager Configuration Setup. Manager configuration is required to tell the agent (the SNMP card) who has authority to access the SNMP via "Get" commands (read) or "Set" commands (write) and where to send "trap" messages (unsolicited messages that are usually generated by alarms in the **FRM301**).

Chapter 4 GUI Software

```
*****
*** FRM-301 Fiber Optical Media Converter Rack Management ***
***                                     V3.42                 ***
*****
Manager Configuration:
  Access Password: disable
  Community String #1 (Read/Write): public
  Community String #2 (Read Only) : *

      Access IP          SNMP Community Trap
      =====          =====
#1:*                   public                Yes
#2:*                   *                    *
#3:*                   *                    *
#4:*                   *                    *

Command Function Key:
'1': Edit Access IP#1          '3': Edit Access IP#3
'2': Edit Access IP#2          '4': Edit Access IP#4
'5': Edit Community#1 String (Read/Write)
'6': Edit Community#2 String (Read Only)
'7': User Password            '8': Manager Password
'9': Access Password ON/OFF
'R': Delete All Setting
'ESC': Main Menu
```

The manager configuration has the ability to setup access for up to four (4) different management workstations. The community strings act like passwords in dealing with the device via SNMP protocol. By changing the community strings for read / write ('public' in this case) and read only (undefined here) access, and assigning a community string to an access IP, an administrator can control access to the **FRM301**.

Enter the IP address of the management workstation that will be running the **GUIMGR** software, the access authority and whether or not it will be sent trap messages. Select "1":

```
IP('*':disable) ->172.24.1.126 #IP of manager
community '1' or '2'->1 #Manager has r/w privilege
trap 'y'es or 'n'o->y #Manager will be sent trap messages
```

Here are the results of our management configuration.

```
*****
*** FRM-301 Fiber Optical Media Converter Rack Management ***
***                               V3.42                               ***
*****
Manager Configuration:
  Access Password: disable
  Community String #1 (Read/Write): public
  Community String #2 (Read Only) : *

      Access IP          SNMP Community Trap
      =====          =====
#1:172.24.1.126      public                Yes
#2:*                 *                    *
#3:*                 *                    *
#4:*                 *                    *

Command Function Key:
'1': Edit Access IP#1          '3': Edit Access IP#3
'2': Edit Access IP#2          '4': Edit Access IP#4
'5': Edit Community#1 String (Read/Write)
'6': Edit Community#2 String (Read Only)
'7': User Password            '8': Manager Password
'9': Access Password ON/OFF
'R': Delete All Setting
'ESC': Main Menu
```

When leaving the Manager Configuration menu, the changes are automatically saved.

Note that in the above example, the management workstation with IP address 172.24.1.126 and using the community string 'public', has full read and write access and receives traps. If your management workstation has a different IP address, modify the above settings for your application. It is highly recommended that the read/write community string 'public' be changed using the menu selection '5'. Please also note that community strings are case sensitive. (public is not equal to Public)

4.3 GUIMGR Configuration and Operation

4.3.1 Introduction

This section assumes that the **GUIMGR** application has already been installed on the workstation as in section 1 and that the SNMP agent has been correctly configured as in section 2. This chapter will detail the **GUIMGR** configuration and the operation of the software in monitoring and controlling the **FRM301** Platform Media Rack.

4.3.2 Configuration

4.3.2.1 Start the GUIMGR application

Start the application by clicking the Windows "Start" button => Programs => SNMP GUIMGR => GUIMGR. A login password may or may not be required to enter the application. If password is set from initial installation of the software, it is "1021". The user password may be changed via the "Config" pull down menu. Trial versions only need to click the "exe" file or shortcut and by default have no password set.



Figure 4.14 GUI manager login

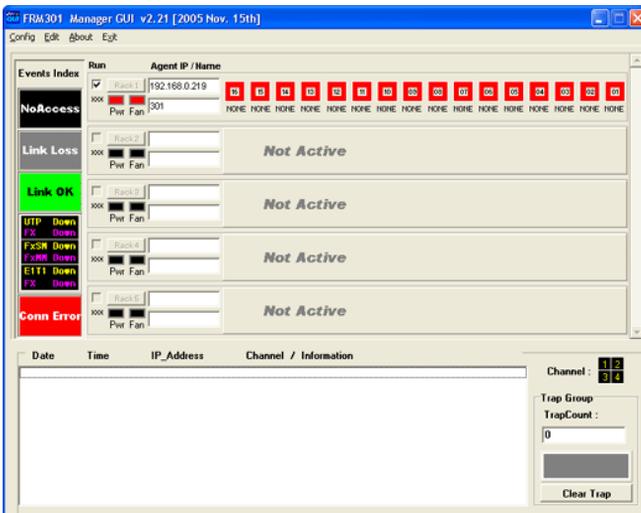


Figure 4.15 GUIMGR first started

The **GUMGR** behaves just like any other Windows® application. The following graphic shows all of the areas that may be clicked for further configuration. Some items are 'grayed' out until the application has connected with an actual **FRM301** unit.

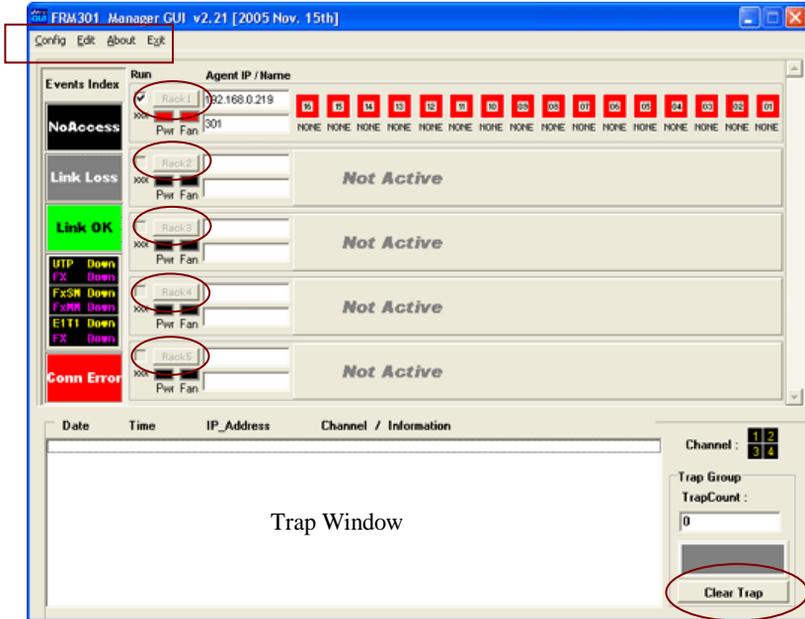


Figure 4.16 Selectable features of the Main GUMGR

4.32.2 Configure user password

Click on "Config" from the window menu bar.

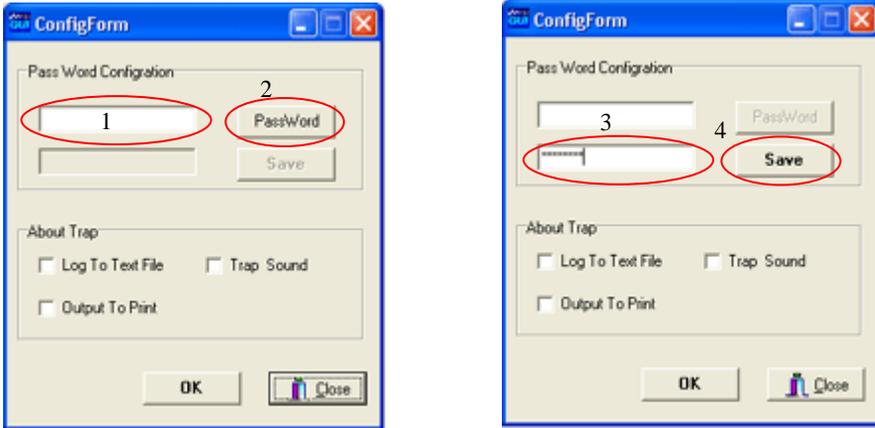


Figure 4.17 Configuration Form

Use this form to change the user password for the GUI. In four steps, (1)keyin the current password, (2) click the 'PassWord' button, (3)keyin the new password and (4)finish by clicking 'Save'. Note also that trap messages may be sent to a text file for logging, output to the default printer, and/or issue a warning beep on the PC by clicking the appropriate check box.

The password is stored as plain text in the Windows® system registry. If the password is ever forgotten, Open the registry with regedit and browse to the following path:

HKEY_LOCAL_MACHINE/SOFTWARE/GUIMGR/config/Pass_word

You may edit the password directly in the registry or note it and change it through the application.

4.32.3 Edit the SNMP Agent

Click on "Edit" from the window menu bar to enter the Edit SNMP Agent Window.



Figure 4.18 Edit the SNMP Agent

The entries already entered are there by default if the software was just installed. They are just for reference as examples of how the format should be entered into the window. If we continue with our example from the previous chapters, then the **FRM301** unit which we wish to manage (the agent) is at IP address 172.24.1.3 and the r/w community string is 'public'. So we will click in the lower window (or select the already entered text) and backspace over it until the window is empty. Then we will enter our own format string. Be extremely careful to enter only a single space between the parameters:

```
1 172.24.1.3 public FRM301
  ^         ^         ^
```

Then click the "Save" button. Now the **GUIMGR** is set to manage a **FRM301** at IP address 172.24.1.3 with a community string of 'public' and our manager will display the rack name as **FRM301**.

4.33.2 Ethernet Line Card Settings

Click the button marked "Chx". From the Card Setting window we can display the individual line card's status, setup the card's working status, configure the UTP and fiber modes, get the remote unit's status or do loop back functions. Use the "Get" button to read the card's status. Use the "Set" button to write new status to the card. (The operations are all preformed via SNMP protocol.)

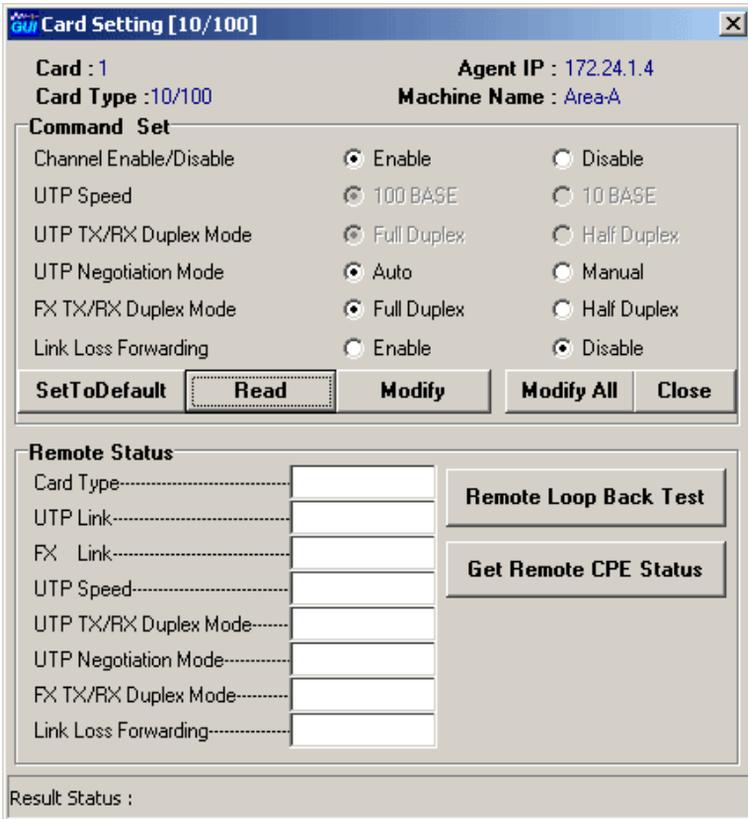


Figure 4.19 Ethernet Line Card Settings

The card slot, type, address of machine and machine type are shown in the header information. The '**Command Set**' window is used for channel enable/disable, UTP mode setting, Fiber mode setting, LLF function enable/disable, and normal or extended packet frame length setting. The settings may be '**Set ToDefault**' or '**Read**' from the current card settings. Once the radio buttons are chosen the single card is set by the '**Modify**' button or all same type cards can be set identically by clicking the '**Modify All**' button.

4.33.3 Remote Functions

The lower half of the window addresses the functions that can be performed when the fiber is connected to an FIB1-10/100 remote unit. Both of these functions are performed "in-band" and will cause a momentary loss of transmission in the link while they are being performed. The 'Remote Loop Back Test' button will test the fiber link by issuing a loopback code, sending pattern data, verifying the pattern data and then removing the loopback for normal transmissions.

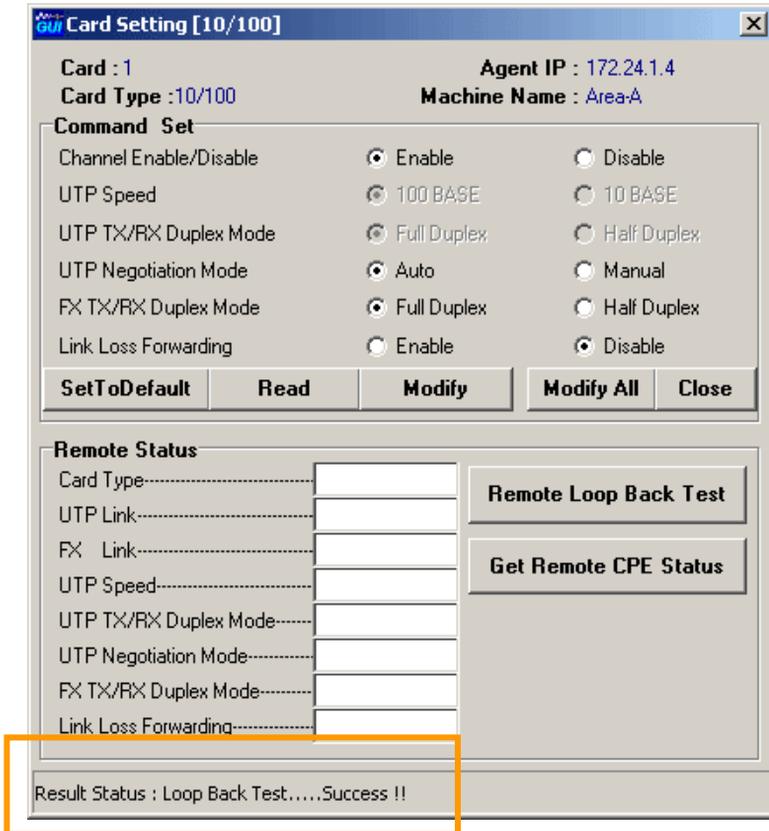


Figure 4.20 Loopback test with CPE

The 'Get Remote CPE Status' button will attempt to identify and read all the settings in the remote CPE unit.

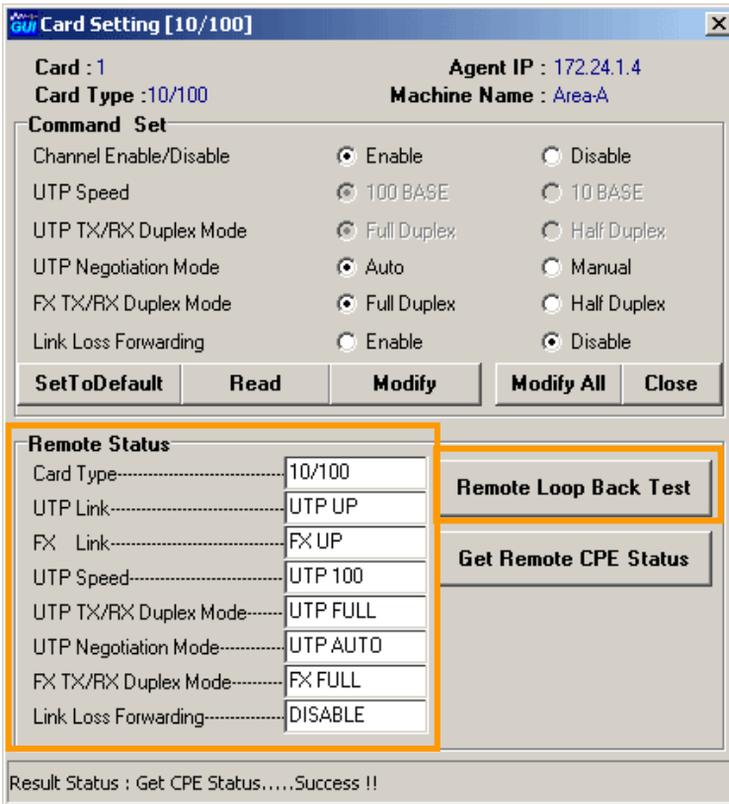


Figure 4.21 Remote Status for CPE

The card type, UTP and Fiber link status and other settings are all displayed for the remote side CPE. Remember, this is an inband operation which will block normal Ethernet transmissions while the get remote status is in operation. While the settings from the remote can be gathered and displayed, there is no way to remotely set the CPE side unit.

Click the "Close" button to close the Card Setting window.

4.33.4 Gigabit Ethernet Line Card Settings

Click the channel button for a 1000Base line card to view and configure the local line card. Under the GUI, the card's status, Tx/Rx Duplex mode and LLF function may be read or modified.

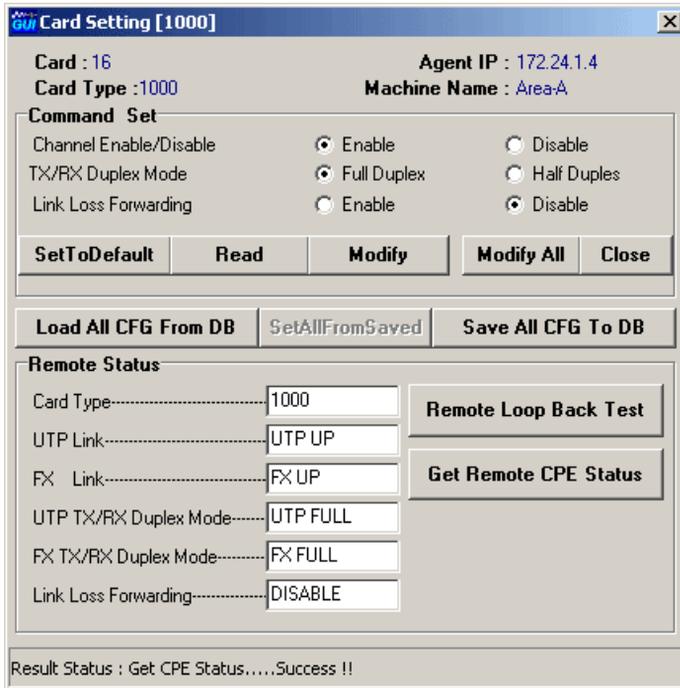


Figure 4.22 Gigabit Line Card Settings

The functions are very similar to those of the 10/100 Ethernet converter. Note the 'Command Set' can only enable / disable the channel, set the fiber full or half duplex, and enable/disable the Link Loss Forwarding function. When connected to an FIB1-1000, the loop back and get remote status functions may be used as well. The display example shows a connected FIB1-1000 card.

4.33.6 E1/T1 Line Card Settings

If an E1/T1 Line Card is installed in any slot, the status of the E1/T1 link, port settings and loop back functions may be viewed by clicking the channel button. Use the 'Get' button to read settings and the 'Set' button to send any modifications to the line card.

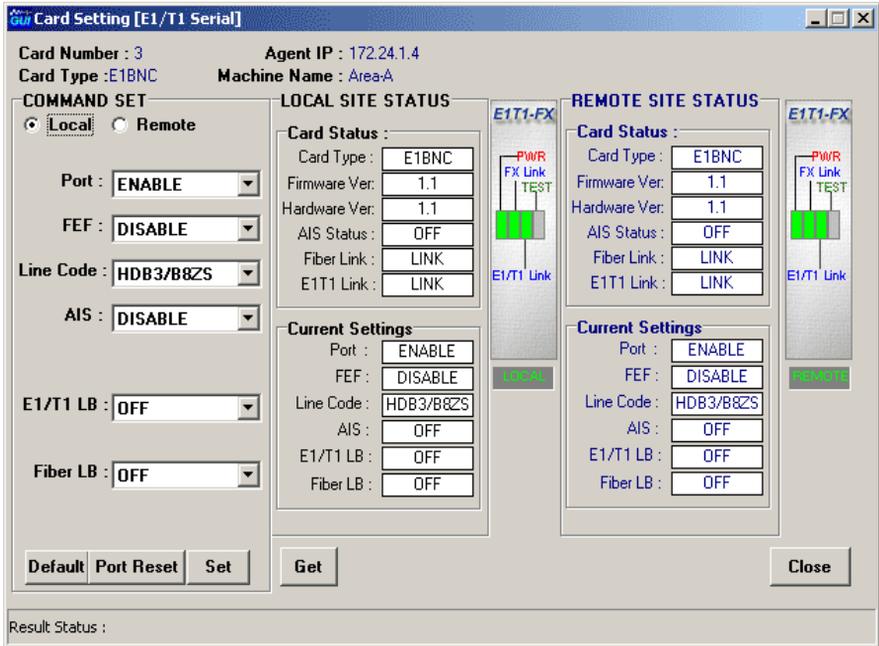


Figure 4.24 E1/T1 Line Card Settings

The command sets may be performed on the local converter in the rack or on the remote FIB1-E1/T1 fiber converter. The LEDs show the real time status of the card and remote converter. Both the local and remote status and settings are displayed. A full set of loop back functions are available for both the E1/T1 or the fiber line.

After modifying any function in the GUI, click the 'Set' button to send the changes, via SNMP protocol, to the managed device. Click the 'Get' button to update the display readings.

Refer to Chapter 3 for detailed meanings of all the configuration settings.

Chapter 4 GUI Software

Here is a review of the loop back functions available for the E1/T1 line card.

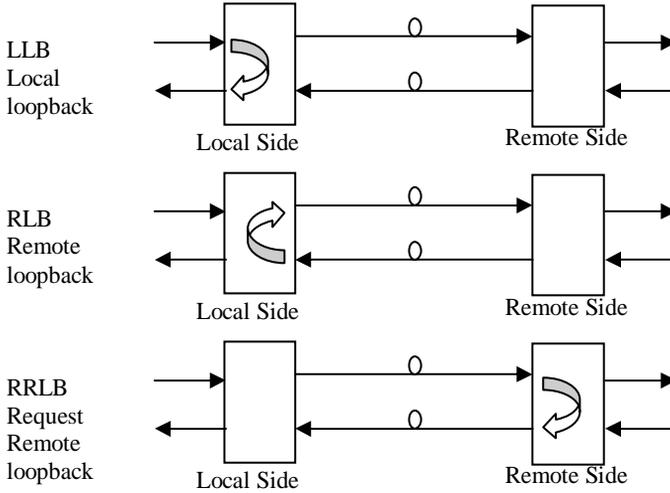


Figure 4.25 E1/T1 Loop Back Functions

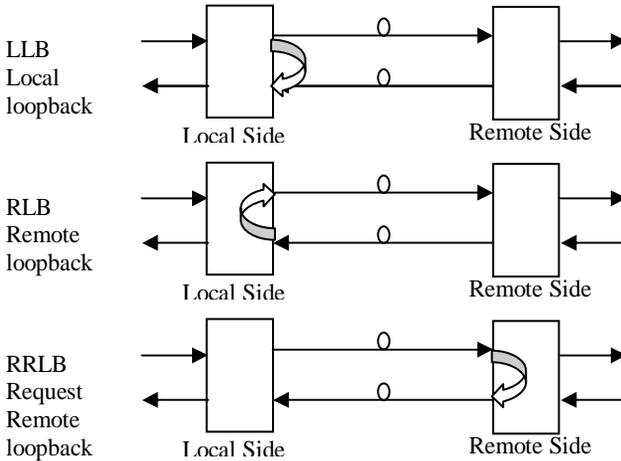


Figure 4.26 Fiber Loop Back Functions

4.33.7 DATA Line Card Settings

If a DATA Line Card is installed in any slot, the status of the serial interface link, port settings and loop back functions may be viewed by clicking the channel button. Use the 'Get' button to read settings and the 'Set' button to send any modifications to the line card.

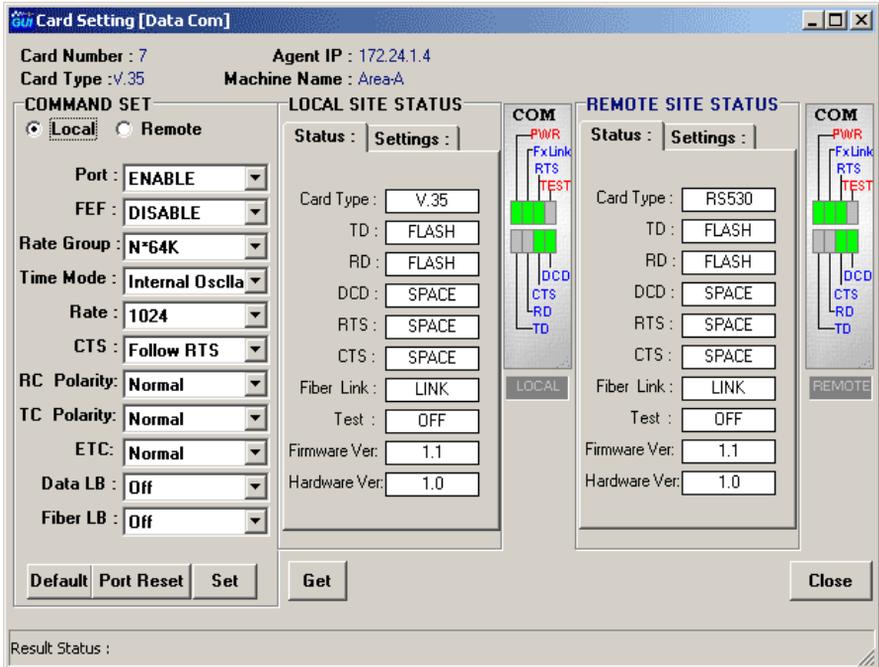


Figure 4.27 DATACOM Line Card Settings

The command sets may be performed on the local converter in the rack or on the remote FIB1-Data fiber converter. The LEDs show the real time status of the card and remote converter. Both the local and remote status and settings are displayed. A full set of loop back functions are available for both the Datacom or the fiber line.

After modifying any function in the GUI, click the 'Set' button to send the changes, via SNMP protocol, to the managed device. Click the 'Get' button to update the display readings.

Refer to Chapter 3 for detailed meanings of all the configuration settings.

Chapter 4 GUI Software

Here is a review of the loop back functions available for the Data Com line card.

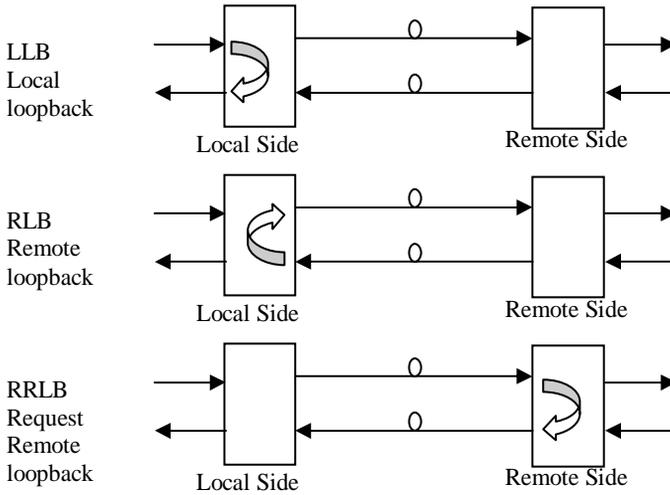


Figure 4.28 Datacom Loop Back Functions

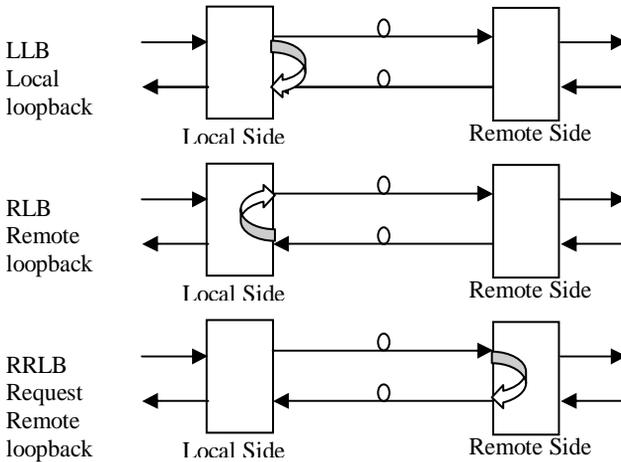


Figure 4.29 Fiber Loop Back Functions

4.33.8 Serial Line Card Settings

If a Serial Line Card is installed in any slot, the status of the serial interface link, port settings and loop back functions may be viewed by clicking the channel button. Use the 'Get' button to read settings and the 'Set' button to send any modifications to the line card.

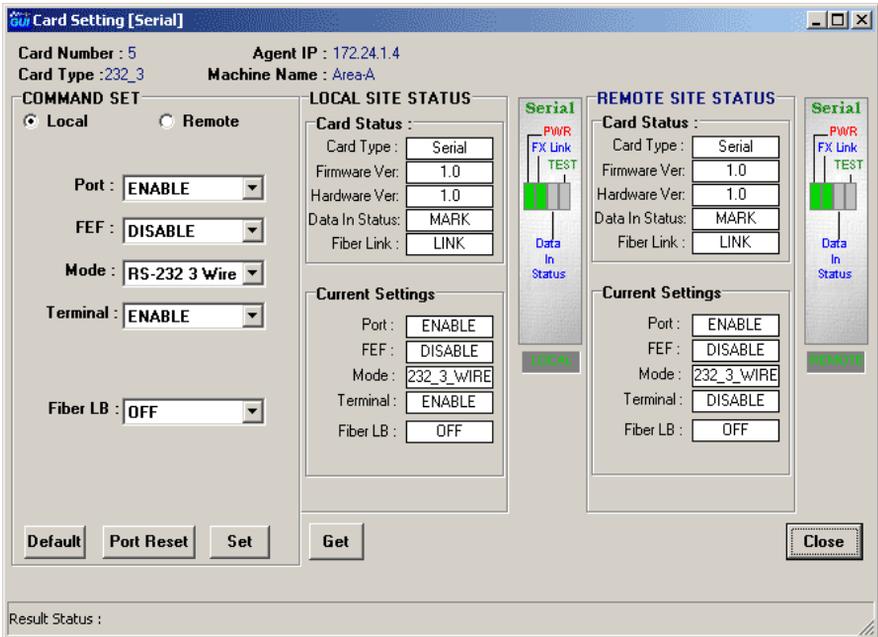


Figure 4.30 Serial Line Card Settings

The command sets may be performed on the local converter in the rack or on the remote FIB1-Serial fiber converter. The LEDs show the real time status of the card and remote converter. Both the local and remote status and settings are displayed. Only a fiber loop back function is available with the Serial line card.

After modifying any function in the GUI, click the 'Set' button to send the changes, via SNMP protocol, to the managed device. Click the 'Get' button to update the display readings.

Refer to Chapter 3 for detailed meanings of all the configuration settings.

Here is a review of the loop back functions available for the Serial line card.

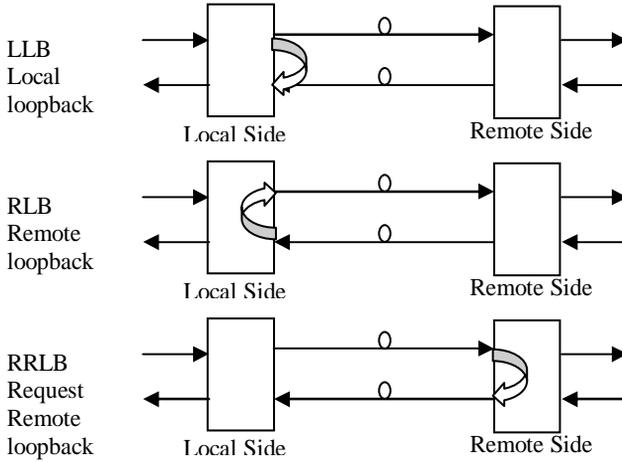


Figure 4.31 Fiber Loop Back Functions of Serial Line Card

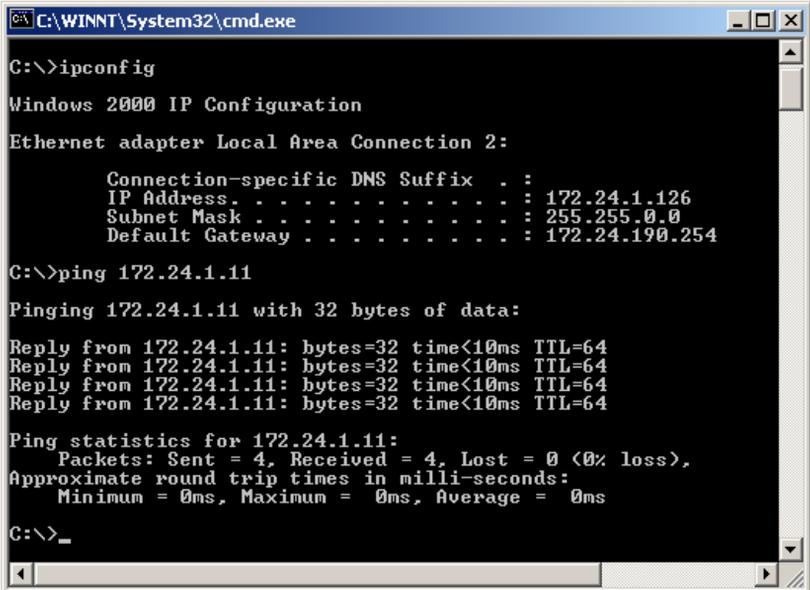
5.4 Troubleshooting

5.4.1 Network Settings

5.4.1.1 Review Agent Settings

During unit startup, the "SNMP" LED will light as the agent boots up, then it should blink at about one cycle per second after boot up and during normal operation. Refer to Chapter 3 section 3.1 for the SNMP agent settings. Be sure you have a valid IP address for the attached network, that the subnet mask is properly set and that the default gateway is set if you wish to manage the FRM from a remote network.

Attach a network cable to the FRM's front panel LAN/SNMP connector using a straight cable if connecting to a HUB or a cross over cable if connecting directly to another MDI device, such as direct connection to a workstation. The Link LED should be on or flashing. No link LED means no link. From any PC on the network, confirm the agent can be pinged.



```
C:\WINNT\System32\cmd.exe

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . :
    IP Address. . . . .                : 172.24.1.126
    Subnet Mask . . . . .              : 255.255.0.0
    Default Gateway . . . . .          : 172.24.190.254

C:\>ping 172.24.1.11

Pinging 172.24.1.11 with 32 bytes of data:

Reply from 172.24.1.11: bytes=32 time<10ms TTL=64

Ping statistics for 172.24.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>_
```

Figure 5.1 Ipconfig and Ping

The "ipconfig" command from a command window in NT will display the workstation's IP, subnet and gateway settings. The "ping" command will send an ICMP protocol message to the agent, which in turn should reply. If no reply, double check all network connects, connect directly from a workstation to the FRM, or as a last resort replace the SNMP card of the FRM.

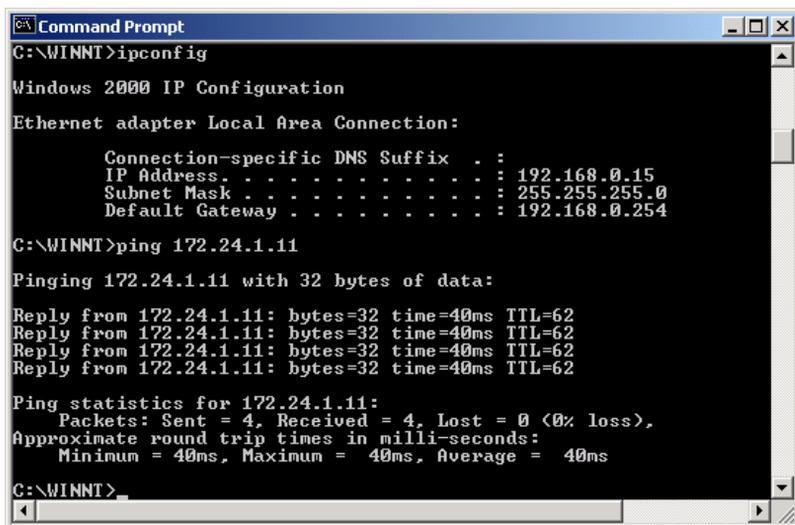
Chapter 5 Troubleshooting

5.41.2 Review Manager Settings

For the GUIMGR to connect to the FRM for management, the FRM's SNMP must be properly configured with the manager's IP address and authorized for read/write (via community string setting) and trap messages. Review the settings explained in 2.5.2.

Review the "Edit" settings in 3.2.3 of the GUIMGR application, and confirm that the monitor mode is set to "1", IP address and community string for read/write match those as set from section 3.3.

If the management workstation is on a remote network, ensure it can also pass the ping test.



```
C:\WINNT>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 192.168.0.15
    Subnet Mask . . . . .             : 255.255.255.0
    Default Gateway . . . . .         : 192.168.0.254

C:\WINNT>ping 172.24.1.11

Pinging 172.24.1.11 with 32 bytes of data:

Reply from 172.24.1.11: bytes=32 time=40ms TTL=62

Ping statistics for 172.24.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 40ms, Maximum = 40ms, Average = 40ms

C:\WINNT>
```

Figure 5.2 Ipconfig and Ping Remote Network

Check with your network administrator to ensure that any firewalls in place will allow passing of SNMP protocol in order to connect with an FRM on a remote network. By default SNMP uses port 161.

Always check all connections and double check all configurations. We have tested the FRM and GUIMGR extensively on local networks, on remote networks through bridges and routers and even over wireless links. You should not experience any problems if you follow each and every step in this guide. We hope you enjoy using the FRM with SNMP option and GUIMGR manager software.

A.1 SNMP Upgrade Procedure

The purpose of this section is to outline the procedures and pitfalls in upgrading the SNMP of the **FRM301**.

A.1.1 Preconditions

The **FRM301** must be using hardware version 2.0 SNMP card. The Control Card in the rack must be using version 2.17 CPU firmware version (as of this writing). If an SNMP option is being installed for the first time, you will also be installing a Control Card. Now would be the best time to be sure the Control Card has the latest firmware. The Control Card's CPU firmware upgrade is support by chip replacement only.

The original version 2.0 hardware SNMP was released with SNMP code version 3.42 for the **FRM301**. The SNMP is upgraded by using TFTP (Trivial File Transfer Protocol). The SNMP agent provides the ability to upload the new code, re-flash the flash memory and reboot with the new SNMP operational code.

A.1.2 Items required

- a. The **FRM301** unit with SNMP option installed and network connection. Version 3.4X to be upgraded to version 4.06. (as of December 2006)
- b. A Windows® based PC with a network connection and with at least one free Com port, telnet and terminal emulation software (such as HyperTerminal).
- c. Serial console cable (DB9M to DB9F)
- d. Ethernet UTP cables
- e. SNMP ver. 4.06 binary image file (or newer)
- f. CTC Union TFTP server for Windows® (or other TFTP server)

A.2 Equipment Setup

The upgrade procedure could possibly have effect on the traffic passing through an online **FRM301** unit. It is recommended that the unit be taken offline for maintenance. Obviously, changing of Control Card firmware requires removing the card with power off. If you are going to upgrade a unit's SNMP while the rack is online and transmitting traffic, choose a time of day when the few seconds of traffic interruption will have minimal effect (such as the middle of the night).

Two connections are required between the PC that will do the upgrade and the **FRM301** that will be upgraded. First, a console connection, with terminal emulation program such as HyperTerminal with settings of 38.4K baud, 8 bits, no parity, 1 stop bit, and no flow control. The second connection is an Ethernet connection, either through a network or with a direct connection and crossover UTP cable.

Check the Ethernet settings of the **FRM301** through the console mode. Either change the settings to match the network settings of your PC or set the PC's settings to match the **FRM301**'s network settings. In the following example, we are on a 172.24.0.0 network with a subnet mask of 255.255.0.0 and a default gateway of 172.24.190.254. Our PC is set with an IP address of 172.24.1.126 and our **FRM301** has an IP address of 172.24.1.4.

A.3 Setup the FRM301

The following screens will show the detailed procedures to setup the networking for the **FRM301** and prepare for TFTP upgrade of the SNMP.

Once the console port is connected to a terminal, the following screen will display.

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD          V3.45 -17  ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Main Menu and Rack Status:
 1:Slot #1 >> Empty          << || 9:Slot #9 >> E1 BNC      <<
 2:Slot #2 >> Empty          << || A:Slot #10 >> 10/100 Base <<
 3:Slot #3 >> Empty          << || B:Slot #11 >> 10/100 Base <<
 4:Slot #4 >> Empty          << || C:Slot #12 >> 10/100 Base <<
 5:Slot #5 >> Empty          << || D:Slot #13 >> 10/100 Base <<
 6:Slot #6 >> Empty          << || E:Slot #14 >> 10/100 Base <<
 7:Slot #7 >> Empty          << || F:Slot #15 >> 10/100 Base <<
 8:Slot #8 >> Empty          << || G:Slot #16 >> 10/100 Base <<
Command Function Key:
'1' to '9', 'A' to 'G': I/O Cards Setting
'P': Show Fans and Powers Status
'R': Refresh Status
'ESC' Logout
'M': Manager Configuration Setup
'S': System Configuration and TFTP Setup
Console:[On line] Telnet:[Off line]   GUI:[Off line]
```

If you are presented with login prompt, please enter the unit's password. If you forgot it, the super user password for terminal mode is '1021' (no quotes).

The actions we must first take are to configure the TCP/IP settings of the **FRM301**, if they are not already set. Next, we will setup the information required to access the TFTP server. Lastly, once the TFTP server is running on our network, we will execute the TFTP upgrade.

Select item 'S', "System Configuration and TFTP Setup"

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD                V3.45      ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
System Configuration and TFTP Setup Menu:
  MAC Address           : 0002AB091234
  1:IP Address         : 172.24.1.4
  2:Subnet Mask        : 255.255.0.0
  3:Gateway IP        : 172.24.190.254
  4:TFTP Server IP    : 172.24.1.126
  5:TFTP Server Path  :
    c:\frm3v345.bin

Command Function Key:
'1' to '5': Configure Setting
'R': Reset All Setting to Default
'S': Store Setting and Reboot
'T': TFTP and Flash
'ESC': Main Menu
```

If the TCP/IP settings are not already correct, use menu items 1-3 to set the **FRM301** for your network. For menu items 4 and 5, set the IP address for the TFTP server or the PC running the TFTP Server daemon. Enter the path and filename where the image file is placed on the TFTP server.

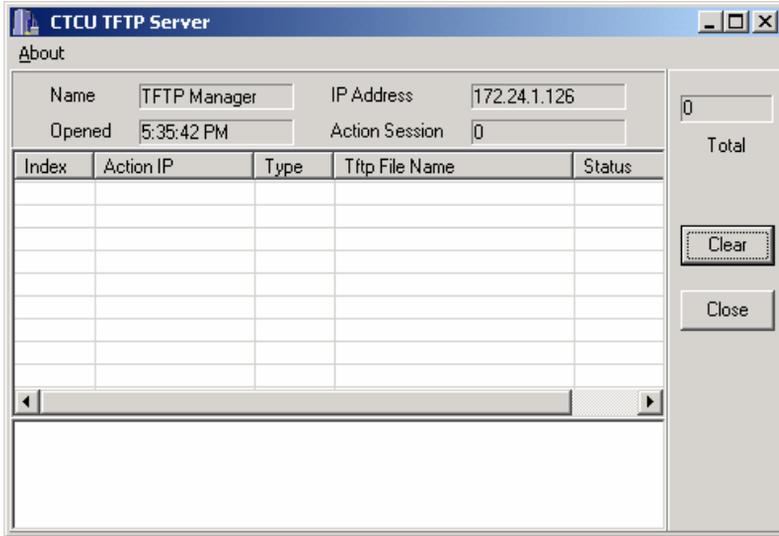
For example, to set the TFTP server's IP address, press '4'.

```
TFTP Server IP->172.24.1.126
TFTP Server Path->c:\frm3v4061.bin
```

Enter the IP address of the PC running the TFTP service, in our case '172.24.1.126' and the path to the upgrade file.

If you have made any changes to items 1-5, you must store and reboot the SNMP. Press 'S' to store the results and reboot the SNMP agent. If this is an online upgrade, each line card will experience a brief (2 seconds) loss in transmission while the card is polled by the SNMP at boot time.

Start the TFTP server on the connected PC. In our example, we are using the CTC Union TFTP server.

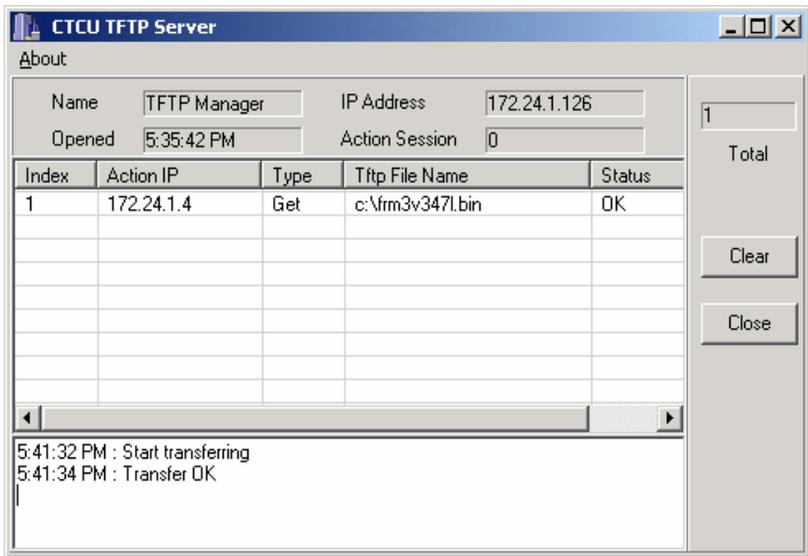


When the agent comes back up on our terminal, enter the password, if required, and again go to the "System Configuration and TFTP Setup" menu.

Press 'T' to start the TFTP upgrade. Press 'Y' to confirm.

```
Sure to TFTP and Reset ?(Y/N)
TFTP NOW, LOADING...
Loading ok!
Please don't power off! Flashing now...
oooooooooooooooooooooooooooooooooooo
Flash completed!
System reset! Please wait...
Attached TCP/IP interface to secEnd unit 0
Attaching interface lo...done
```

To confirm that a TFTP transfer actually took place, you may view the TFTP application on the PC before closing it.



Note that one transfer did occur.

Watch the 'SNMP' LED on the SNMP card of the **FRM301**. When the LED returns to a constant 1 blink per second, the SNMP agent has rebooted. If this is an online upgrade, each line card will experience a brief (2 seconds) loss in transmission while the card is polled by the SNMP at boot time.

You may now 'Close' the TFTP server on the PC.

OK, now let's verify the version number of the SNMP. Login to the terminal of the **FRM301**.

Note that the version is now 4.06. The '-17' denotes that the Control Card's CPU firmware version is 2.17.

```
*****
*** CTC UNION TECHNOLOGIES CO., LTD  V4.06 -17[Oct. 28th] ***
*** FRM-301 Fiber Optical Media Converter Rack Management ***
*****
Main Menu and Rack Status:
 1:Slot #1 >> Empty      << || 9:Slot #9 >> E1 BNC      <<
 2:Slot #2 >> Empty      << || A:Slot #10 >> 10/100 Base <<
 3:Slot #3 >> Empty      << || B:Slot #11 >> 10/100 Base <<
 4:Slot #4 >> Empty      << || C:Slot #12 >> 10/100 Base <<
 5:Slot #5 >> Empty      << || D:Slot #13 >> 10/100 Base <<
 6:Slot #6 >> Empty      << || E:Slot #14 >> 10/100 Base <<
 7:Slot #7 >> Empty      << || F:Slot #15 >> 10/100 Base <<
 8:Slot #8 >> Empty      << || G:Slot #16 >> 10/100 Base <<

Command Function Key:
'1' to '9', 'A' to 'G': I/O Cards Setting
'P': Show Fans and Powers Status
'R': Refresh Status
'ESC' Logout
'M': Manager Configuration Setup
'S': System Configuration and TFTP Setup
Console:[On line] Telnet:[Off line] GUI:[Off line]
```

This completes the SNMP upgrade procedure.

Fiber Series



CTC Union Technologies Co., Ltd.

Far Eastern Vienna Technologies Center
(Neihu Technology Park)

8F, No. 60, Zhouzi St., Neihu, Taipei, Taiwan

Phone:(886) 2.2659.1021 Fax:(886) 2.2.799.1355

E-mail: info@ctcu.com

<http://www.ctcu.com>