



E1 and V.35 Fiber Modem
User Manual
(Version 1.0)

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1. Overview

E1 Fiber Modem or V.35 Fiber Modem can convert G.703 E1 signal or V.35 signal to single-mode or multimode fiber which extend the transmitting distance greatly. E1 signal support framed and unframed mode. When in framed mode, continuous or discontinuous time-slot can be selected. E1 fiber modem and V.35 fiber modem can work together. Both of them are widely used in extending user interface in ATM or DDN.

2. Features

- Fully compatible with ITU-T, G.703, G.704, G.823, V.35 recommendation
- Standalone and module available, support hot-swap
- Framed (N*64Kbps) and unframed (2.048Mbps) optional
- Frame mode support PCM30/ PCM31
- CRC/non-CRC auto-negotiation on E1 interface
- Support internal clock, E1 recovery clock, optical line clock or V.35 line clock
- Provide local loop back test, functional diagnostic loop back test and remote loop back test
- For V.35 interface, at receive side, clock is reversed and

non-reversed auto-negotiation, while at transmission side, clock can be configured as reversed or non-reversed

- For E1 interface, 75 ohm (unbalanced) and 120 ohm (balanced) available and auto-negotiation
- Comprehensive LED indicators on front panel, convenient for the diagnosis of equipment working state
- –48VDC or 220VAC power supply selectable
- 16-slot, 4U-height elaborate cooling design and two redundant power supply chassis available

3. Specification

3.1. E1 interface

- Compliant with G.703, G.704
- Code type: HDB3
- Data rate: 2.048Mbps or n*64Kbps, n=1~31
- Line impedance: 75 Ω (Unbalanced) / 120 Ω (Balanced)
- Interface connector: BNC(75 Ω) / RJ45(120 Ω)
- Jitter performance: Compliant with ITU-T G.742 and G.823
- Frame mode: Framed / Unframed optional

Definition of RJ45 connector (120 Ω E1 balanced):

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

3.2. Optical interface

- Line code type: 1B1C
- Bit rate: 4.096Mbps
- Wavelength: MM 850/1310nm optional, SM 1310/1550nm optional
- Connector: FC/SC/ST optional
- Transmission distance: MM: 0~2Km, SM: 0~120Km

3.3. V.35 Interface

- Data rate: 2.048Mbps or $n \times 64\text{Kbps}$, $n=1\sim 31$
- Jitter performance: Compliant with ITU-T V.35 standard
- Connector: DB25 female jack
- Operation mode: DTE/DCE optional

Definition of V.35 interface (DB25 pins)

No.	Definition	Description
1	GND	Ground
2	TDA	Transmit data line A
3	RDA	Receive data line A
4	RTS	DTE ask for transmitting data
5	CTS	DCE clear the transmitting
6	DSR	DCE ask for transmitting data
7	GND	Ground

8	DCD	DCE transmit carrier wave signal
9	RCB	Receive clock line B
11	XTCB	DTE transmit clock B
12	TCB	Transmit clock line B
14	TDB	Transmit data line B
15	TCA	Transmit clock line A
16	RDB	Receive data line B
17	RCA	Receive clock line A
20	DTR	DTE Prepare for receiving data
24	XTCA	DTE transmit clock A
Others, N.A.		

3.4. Size

Standalone: 252 (Width) × 136 (Depth) × 36 (Height)

Module: 220 (Length) × 176 (Width) × 25.3 (Height)

16-slot chassis: 441 (Width) × 340 (Depth) × 180 (Height)

3.5. Power

Power supply:

AC Power: 100V-240V, 0.4-0.2A, 50-60 Hz

DC Power: -48V, 0.4A

Power consumption <2W

3.6. Environment

Operation

Temperature: 0°C ~ 50°C;

Humidity: 0% ~ 90% (25°C, non-condensed);

Transport and store

Temperature: -20°C ~ 60°C;

Humidity: 0% ~ 90% (25°C, non-condensed);

4. Appearance

4.1. Front panel of standalone

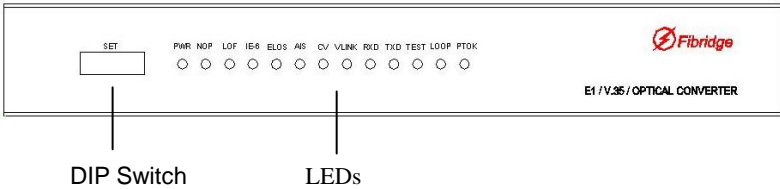


Figure1 Front Panel of the Standalone

4.2. Back panel of standalone

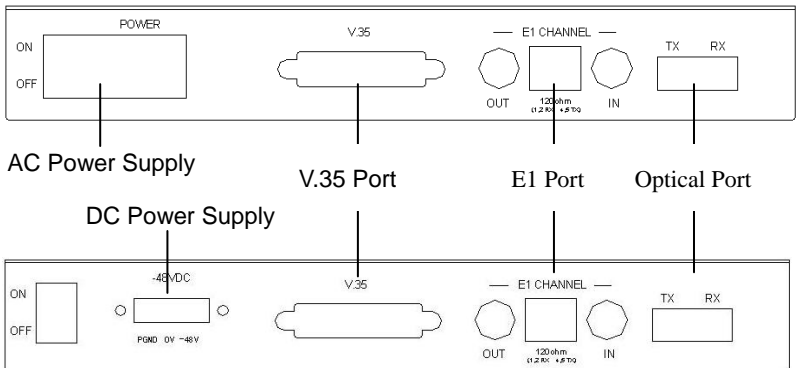
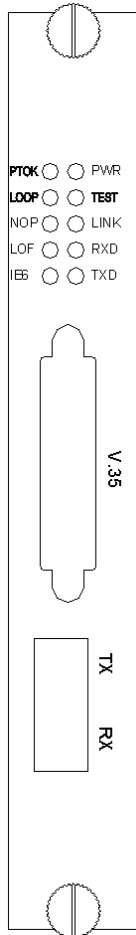


Figure2 Back Panel of the Standalone

4.3. Front panel of chassis

✧ V.35 Fiber modem



✧ E1 Fiber modem

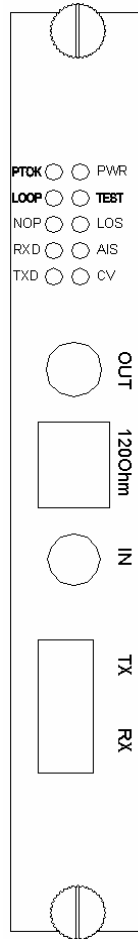


Figure3 Panel of the Module

4.4. LED Description

Table 1 LED Description

LED	Color	Status	Function Description
PWR	Green	ON	Power OK
		OFF	Power off or failed
NOP	Red	ON	Local optical signal loss
		BLINK	Remote optical signal loss
		OFF	No optical signal loss
LOF	Red	ON	Local Optical Line lose synchronization
		BLINK	Remote Optical Line lose synchronization
		OFF	No Optical Line LOF
IE-6	Red	ON	Local optical line's bit error rates is over 10^{-6} .
		BLINK	Remote optical line's bit error rates is over 10^{-6} .
		OFF	No Optical Line IE-6
ELOS	Red	ON	Local E1 signal loss
		BLINK	Remote E1 signal loss
		OFF	No E1 LOS
AIS	Red	ON	Local AIS
		BLINK	Remote AIS
		OFF	No E1 AIS
CV	Red	ON	Local E1 code invalid
		BLINK	Remote E1 code invalid
		OFF	No code invalid
VLINK	Green	ON	V.35 port linked

		OFF	V.35 port not linked
RXD	Yellow	BLINK	Receiving data from V.35 or E1 channel
		OFF	No data from V.35 or E1 channel
TXD	Yellow	BLINK	Transmitting data from V.35 or E1 channel
		OFF	No data from V.35 or E1 channel
TEST	Yellow	ON	Test enabled and loop successful
		BLINK	Test enabled but loop unsuccessful
		OFF	Test disabled
LOOP	Yellow	ON	Local/Diagnostic loop back or the remote device set remote loop
		BLINK	Remote loop back or the remote device set diagnostic loop
		OFF	Normal operation
PTOK	Yellow	ON	No bit error
		OFF	If test enabled, it means bit errors, and no meaning if test disabled.

4.5. DIP SWITCH DESCRIPTION

Table 2 Function Description of SET/SW5

Bit	ON Definition	OFF Definition	Default
1	Remote loop back	No loop back	OFF
2	Diagnostic loop back	No loop back	OFF
3	Local loop back	No loop back	OFF
4	Use local time-slot settings	Follow remote time-slot settings	OFF

5	Bit error test	Normal operation	OFF
6	V.35 clock NORMAL	V.35 clock RESERVED	OFF
7	Timing mode selection. Referring to table 3		OFF
8			OFF

Note: 1) “SET” is for standalone, and “SW5” is for module.

2) ‘**Follow remote timeslot setting**’ means one side of F4-56’s timeslot will follow to the other side of F4-56’s all the time. Only in framed mode & Bit7 Bit8 being set as ON OFF, it is available. For example, you use one pair of F4-56 device. One named A, the other named B. For setting B’s timeslot following A, you should set the ‘SET’ DIP SWITCH as follows:

Bit	1	2	3	4	5	6	7	8
A	OFF	OFF	OFF	OFF	OFF	X1	ON	OFF
B	OFF	OFF	OFF	X2	OFF	X1	ON	ON

X1 lies on the router, for X2, both ON and OFF are OK.

Table3 E1 Fiber Modem Timing Source Selection

Description	Timing Source	ON DIP SWITCH SET/SW5	
		BIT7	BIT8
For E1 used in Framed Mode	Internal OSC	ON	ON
	Recovered from E1 Clock	OFF	ON
	Recovered from optical clock	ON	OFF
For E1 used in unframed mode	Recovered from E1 Clock	OFF	OFF

Table4 V.35 Fiber Modem Timing Source Selection

Timing Source	ON DIP SWITCH SET/SW5	
	BIT7	BIT8
Internal OSC.	ON	ON
Recovered from optical clock	ON	OFF
V.35 DTE Clock	OFF	OFF
N.A.	OFF	ON

Table5 Time-slot Setting

DIP Switch TS0-TS31	Function	ON	OFF
TS0	Time-slot 0	Available	Not Available
TS1	Time-slot 1	Available	Not Available
TS2	Time-slot 2	Available	Not Available
TS3	Time-slot 3	Available	Not Available
TS4	Time-slot 4	Available	Not Available
TS5	Time-slot 5	Available	Not Available
TS6	Time-slot 6	Available	Not Available
TS7	Time-slot 7	Available	Not Available
TS8	Time-slot 8	Available	Not Available
TS9	Time-slot 9	Available	Not Available
TS10	Time-slot 10	Available	Not Available
TS11	Time-slot 11	Available	Not Available
TS12	Time-slot 12	Available	Not Available

TS13	Time-slot 13	Available	Not Available
TS14	Time-slot 14	Available	Not Available
TS15	Time-slot 15	Available	Not Available
TS16	Time-slot 16	Available	Not Available
TS17	Time-slot 17	Available	Not Available
TS18	Time-slot 18	Available	Not Available
TS19	Time-slot 19	Available	Not Available
TS20	Time-slot 20	Available	Not Available
TS21	Time-slot 21	Available	Not Available
TS22	Time-slot 22	Available	Not Available
TS23	Time-slot 23	Available	Not Available
TS24	Time-slot 24	Available	Not Available
TS25	Time-slot 25	Available	Not Available
TS26	Time-slot 26	Available	Not Available
TS27	Time-slot 27	Available	Not Available
TS28	Time-slot 28	Available	Not Available
TS29	Time-slot 29	Available	Not Available
TS30	Time-slot 30	Available	Not Available
TS31	Time-slot 31	Available	Not Available

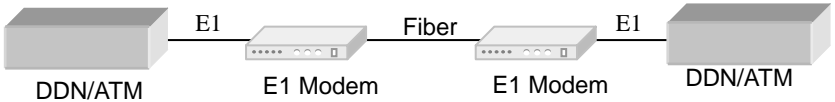
Notice:

- a) If you want to make the converter work under unframed mode, you should set TS0 to TS31 all to ON or OFF.
- b) Under framed PCM30 mode, TS16 of E1 channel is used to carry command instead of payload. TS0 and TS16 should be set OFF, and the most bandwidth is 1920Kbps.

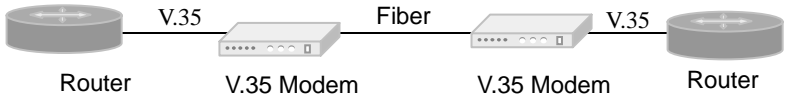
5. Typical Application

5.1. Peer to Peer

- ◇ E1 modem used in pairs



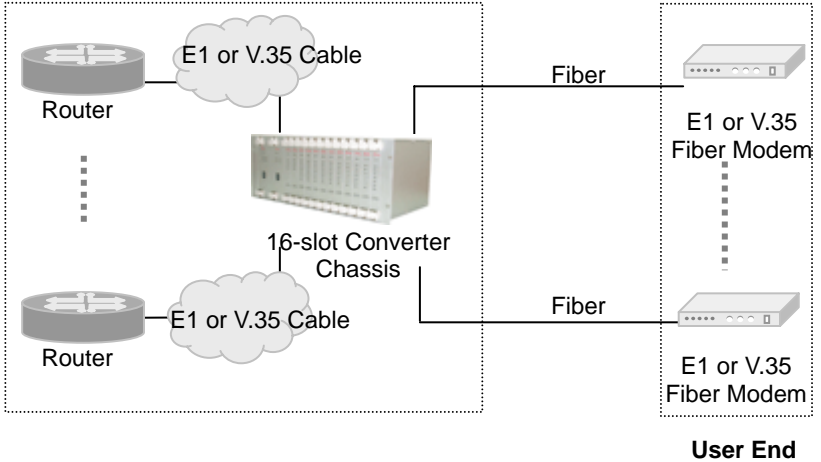
- ◇ V.35 modem used in pairs



- ◇ E1 modem & V.35 modem used together

In the above application, it is recommended that user select router's timing signal as unique timing source, and makes all the other equipment follow this timing source.

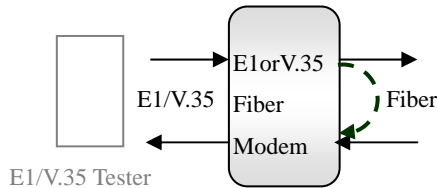
5.2. Star Topology



6. Diagnosis and Maintenance

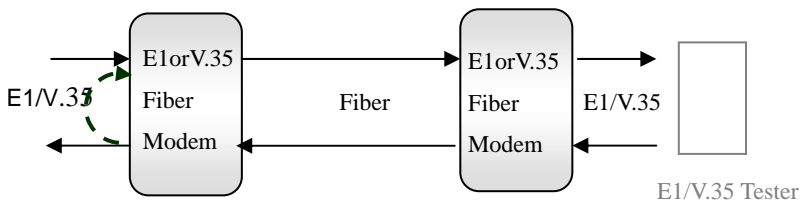
6.1. Local Loop Back Setting

- Set bit 3 of SET/SW5 ON, then the E1 or V.35 fiber modem is forced to under local loop back test mode.
- Or, connect the TX and RX of optical port with a fiber cable.



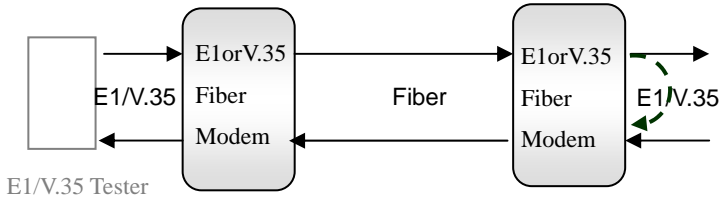
- c) Connect E1 or V.35 port on fiber modem to a Router or a Transmission Analyzer, as picture above.
- d) If local loop back successful, all red LEDs on the converter should be off, and TXD & RXD LEDs should blink.

6.2. Diagnostic Loop Back Setting



- a) As the picture above, set E1 or V.35 fiber modem working in framed mode.
- b) Set bit 2 of SET/SW5 on remote end ON to perform diagnostic loop back.
- c) Set bit 7 and bit 8 of SET/SW5 on remote end ON, which means remote end is the timing source.
- d) Set bit 7 ON and bit 8 OFF of local SET/SW5, which means local end follows the Fiber port timing.
- e) If diagnostic loop back successful, LOS LED on local and remote end should be off, TXD & RXD LEDs on local end should blink. For V.35 fiber modem, VLINK of on local end should be on, under diagnostic loop back.

6.3. Remote Loop Back Setting



- As the picture above, set E1 or V.35 fiber modem working in framed mode.
- Set bit 1 of SET/SW5 on local end ON to perform remote loop back.
- Set bit 7 and bit 8 of SET/SW5 on local end ON, which means remote end is the timing source.
- Set bit 7 ON and bit 8 OFF of remote SET/SW5, which means local end follows the Fiber port timing.
- If remote loop back successful, LOS LED on local and remote end should be off, TXD & RXD LEDs on local end should blink. For V.35 fiber modem, VLINK of on local end should be on, under remote loop back.

7. Order Information

7.1. Model

F9-480 E1 Optical Multiplexer

For more detailed order information, please check the Part Number.

7.2. Part Number (P/N)

F9-E1abbcde	E1 Fiber Modem
F9-V35abbcde	V.35 Fiber Modem
F9-E1V35abbcde	E1&V.35 Modem , E1 interface & V.35 interface optional
FC-416	16-slot Protocol converter chassis, with SNMP management

abbcde represents fiber parameter separately as follows:

a: Optical port type

S: Single mode, M: Multimode, W: Single strand

bb: Optical port transmission distance

02:20Km, 04:40Km, 06:60Km, 08: 80Km, 10: 100Km, 12: 120Km

c: Wavelength

1: 850nm, 2:1310nm, 3:1550nm

d: Connector type

F: FC, C: SC, T: ST

e: Power input type

A: 220VAC, D: -48VDC

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