USER MANUAL

G703FTEC

T1/E1 Cross Rate Converter

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G703-FTEC T1/E1 Cross Rate Converter,

Installation and Operation Manual

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Version 1.04

This manual supports the following models:

G703-FTEC/AC 100~240VAC model

G703-FTEC/DC +/-24~+/-48VDC model

This manual includes the updates for functional firmware version 11.0 and below, including installation and operation of the Terminal Mode.

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1-1. Functional Description

The **G703-FTEC** is a T1 (US Standard) /E1 (European Standard) converter and timeslot cross connect which enables conversion between one T1 signal and one E1 signal.

T1 and E1 signals with frames employ u-Law and A-Law compander encoding principles respectively and encode those analog signals into 64kbits digital data.

Tests and diagnostics can easily be performed from the front panel pushbutton switches. Diagnostics include T1 local/remote and E1 local/remote loop back.

The T1 interface supports D4 or ESF frame formats with B8ZS or AMI line code. The E1 interface supports CCS (PCM31) or CAS (PCM30) frames without CRC-4 and frames with CRC-4. The line code is HDB3.

The **G703-FTEC** fully meets all T1/E1 specifications, including ITU G.703, G.704, G.706 and G.711.

Multiple clock source selection provides maximum flexibility in connecting both T1 and E1. The clock source may be from the T1 recovery clock, from the E1 recovery clock, from the internal oscillator, from an external clock or via transparent timing.

It operates from 110~240VAC, +/-24~ +/-48VDC. The unit is built in a compact case that can be placed on a desktop, shelf or installed, by means of an optional adapter, in a 19 inch EIA rack.

1-2. Typical System Application

In a typical application (Figure 1-1), The **G703-FTEC** is used to connector the T1 line to the E1 transmission facilities.

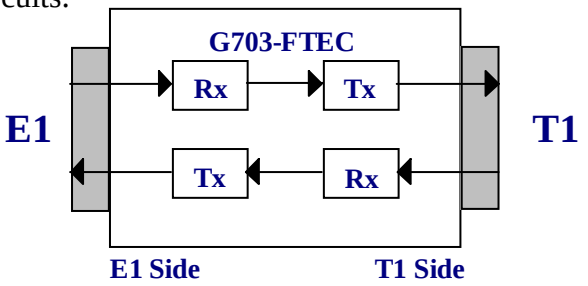
Figure 1-1 Typical applications

1-3. Timing Considerations

The eight timing options provide for flexible system timing. This section presents typical applications for each timing mode and considerations that influence the selection of each mode.

Transparent timing

In this mode, the clock signal recovered from the E1 signal by the **G703-FTEC** is used as a reference for the T1 transmit clock generation circuits. The clock signal recovered from the T1 signal by the **G703-FTEC** is used as a reference for the E1 transmit clock generation circuits.



Transparent Timing

Figure 1-2 Clock signal flow transparent timing mode

Loop Back timing

In this mode, the clock signal recovered from the E1 signal by the **G703-FTEC** is used as a reference for the E1 transmit clock. The clock signal recovered from the T1 signal by the **G703-FTEC** is used as a reference for the T1 transmit clock.

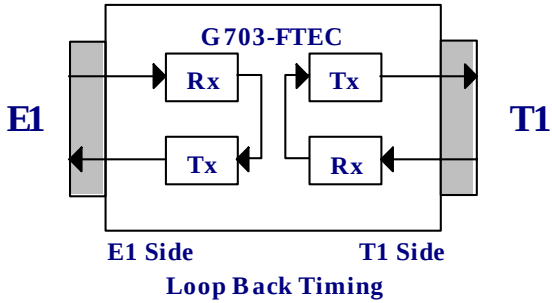


Figure 1-3 Clock signal flow in loop back timing mode

T1 recovery timing

In this mode, the clock signal recovered from the T1 signal by the **G703-FTEC** is used as a reference for the E1 and T1 transmit clock generation circuits.

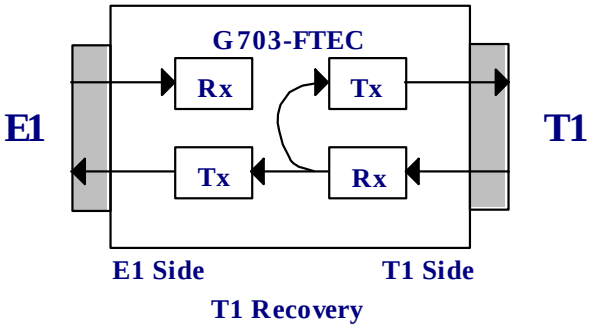


Figure 1-4 Clock signal flow in T1 recovery timing mode

E1 recovery timing

In this mode, the clock signal recovered from the E1 signal by the **G703-FTEC** is used as a reference for the E1 and T1 transmit clock generation circuits.

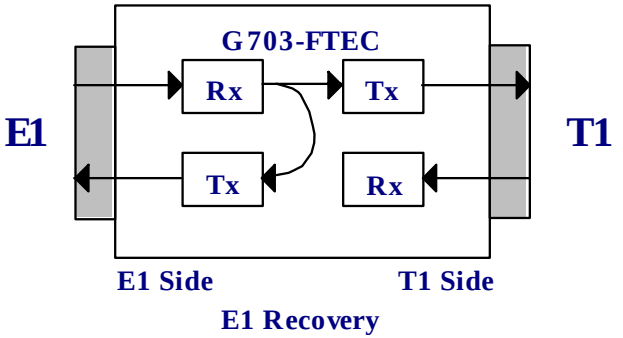


Figure 1-5 Clock signal flow in E1 recovery timing mode

Internal timing

In this mode, the internal oscillator (1544Khz or 2048Khz) of the **G703-FTEC** provides the reference clock for the T1 and E1 transmit clock generation circuits.

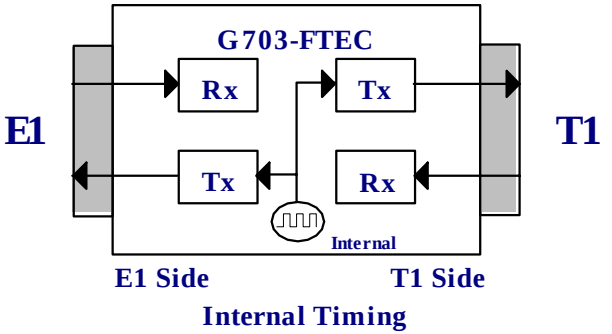


Figure 1-6 Clock signal flow in internal timing mode

External timing

In this mode, the external TTL clock (1544Khz or 2048Khz) provides the reference clock for the T1 and E1 transmit clock generation circuits.

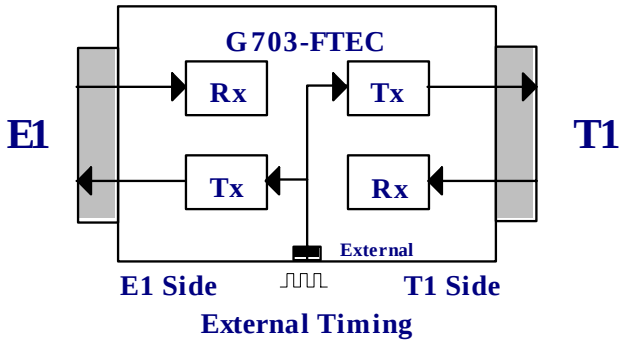


Figure 1-7 Clock signal flow in external timing mode

1-4. Technical Specifications

T1 interface specifications

Complies with:	ITU-T G.703 Recommendation
Bit rate:	1.544Mbps
Frame format:	D4 or ESF selectable
Line code:	AMI or B8ZS selectable
Equalization:	0-655 feet settable
Voice channel sample rule:	u-Law
CRC check:	CRC-6 (when ESF)
Impedance:	120 Ohm balanced
Transmit pulse level:	+/-3.0V (10%)
Receive signal level:	0 to –36dB
Connectors:	RJ-45 and Bantam jack
	DB15 and Bantam (old model)

E1 interface specifications

Complies with:	ITU-T G.703 Recommendation
Bit rate:	2.048Mbps
Frame format:	CAS (PCM30) or CCS (PCM31)
Line code:	HDB3
Voice channel sample rule:	A-Law
CRC check:	CRC-4 enable/disable
Impedance:	75 Ohm or120 Ohm selectable
Transmit pulse level:	75 Ohm +/-2.37V (10%)
	120 Ohm +/-3.0V (10%)
Receive signal level:	0 to –30dB
Connectors:	RJ-45 and BNC
	DB15 and BNC (old model)

Timeslot mapping selectable

E1 CAS mode:	TS1-TS15, TS17-TS31 any 24 timeslots
E1 CCS mode:	TS1-TS31 any 24 timeslots

Timing source

Transparent
Loop back timing
Internal oscillator timing 1544KHz
Internal oscillator timing 2048KHz
E1 recovery timing
T1 recovery timing
External 2048KHz
External 1544KHz

Elastic buffer

Buffer length:	2 T1 frames
Underflow:	A frame of data was repeated
Overflow:	A frame of data was deleted

Unconnected codes

FF Hex code (all ones) on unused timeslots

Alarm responses

Received impairment on E1: Loss Of Signal
Transmitted response on E1: Remote Alarm Indication (RAI)
Transmitted response on T1: Yellow Alarm
Received impairment on T1: Loss Of Signal
Transmitted response on T1: Yellow Alarm
Transmitted response on E1: Remote Alarm Indication (RAI)

Diagnostic tests

T1 local loop back
T1 remote control loop back
E1 local loop back
E1 remote control loop back

LED indicators for system

PWR	Green	Power ON
FAIL	Red	Failure

LED indicators for both T1 and E1

SIG LOSS	Red	Signal loss
SYNC LOSS	Red	Frame sync loss
BPV	Red	Bipolar Violation occurrence
AIS	Red	Alarm Indication Signal
SLIP	Red	Elastic buffer slip occurrence
YELLOW ALARM	Red	Remote alarm
TEST	Red	In loop back test

Power supply

Voltage:	100 ~ 240 VAC +/-24 ~ +/-48VDC +/-15%
Frequency:	47 to 63 Hz for AC power
Power consumption:	20 Watts
Fuse:	0.1A slow blow for 230 VAC 0.2A slow blow for 115 VAC 0.5A slow blow for –48 VDC

Physical

Height:	4.45 cm / 1.75 in.
Width:	19.5 cm / 7.7 in.
Depth:	26 cm / 10 in.
Weight:	1.5 Kg / 3.3 lb. net weight

Environment

Temperature:	0-50^{o}C (32-125^{o}F)
Humidity:	Up to 90% Non-condensing

Regulatory Approvals

FCC & EMC :	Part 15 & Part 22 CISPR 22 Class B

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2-1. General

This chapter provides detailed instructions for the mechanical installation of the **G703-FTEC**. Following completion of installation, please refer to Chapter 3 for operating information.

2-2. Site Preparation

Install the **G703-FTEC** within reach of an easily accessible grounded AC outlet. The outlet should be capable of furnishing 100 ~ 240 VAC (depending on rated voltage of the unit). Allow at least 10 cm (4 inches) clearance at the rear of the **G703-FTEC** for signal lines and power cables.

2-3. Mechanical Assembly

The **G703-FTEC** is designed for tabletop or bench installation, and is delivered completely assembled. No provisions are made for bolting the **G703-FTEC** to the tabletop. An optional rack mounting kit is available for standard 19" rack mounting. Units may be rack mounted as either one or two units per single rack mount space. Please refer to Appendix C at the end of this manual for detailed information on the use of the optional rack mounting kit.

2-4. Electrical Installation

2-4-1. Power connection

AC power is supplied to the **G703-FTEC** through a standard IEC 3-pronged receptacle. (Refer to Figure 2-1) The **G703-FTEC** should always be grounded through the protective earth lead of the power cable. The line fuse is located in an integral-type fuse holder on the rear panel. Make sure that only fuses of the required rating are used for replacement. Do not use repaired fuses or short-circuit the fuse holder. Always disconnect the power cable before removing or replacing the fuse.

2-4-2. Rear panel connectors

The T1 link connectors are comprised of one (1) RJ-45 and two (2) BANTAM connectors. Either link connector may be used. Do not connect both at once. The E1 link connectors are comprised of one (1) RJ-45 and two (2) BNC connectors. In the old model, the T1 used (1) DB15 and (2) two Bantam connectors, while the E1 used (1) DB15 and (2) BNC connectors.

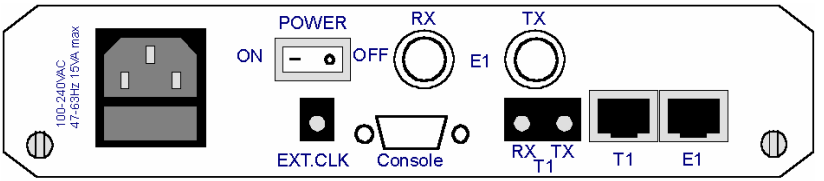


Figure 2-1. **G703-FTEC** real panel of AC type

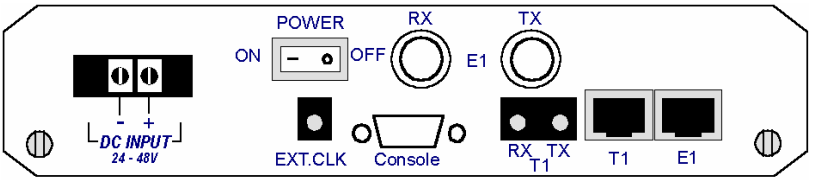


Figure 2-2 **G703-FTEC** real panel of DC type

T1 Link side

RJ-45 E1 Connector

The pin assignment for the RJ-45 connector is as follows:

Pin:	Function:
4	TTIP (Transmit data out)
5	TRING (Transmit data out)
1	RTIP (Receive data in)
2	RRING (Receive data in)

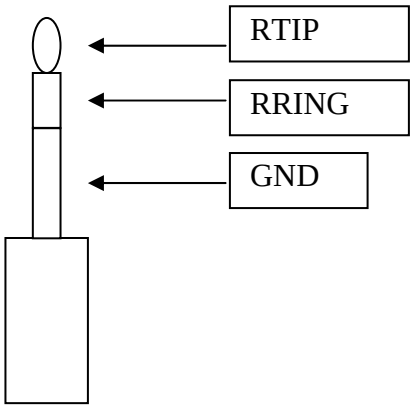
DB15 Female Connector (**old model**)

The pin assignment for the DB15 connector is as follows:

Pin:	Function:
1	TTIP (Transmit data out)
9	TRING (Transmit data out)
3	RTIP (Receive data in)
11	RRING (Receive data in)

BANTAM connector

The pin assignment for the BANTAM connectors is as follows:



E1 Link side

RJ-45 E1 Connector

The pin assignment for the RJ-45 connector is as follows:

Pin:	Function:
4	TTIP (Transmit data out)
5	TRING (Transmit data out)
1	RTIP (Receive data in)
2	RRING (Receive data in)

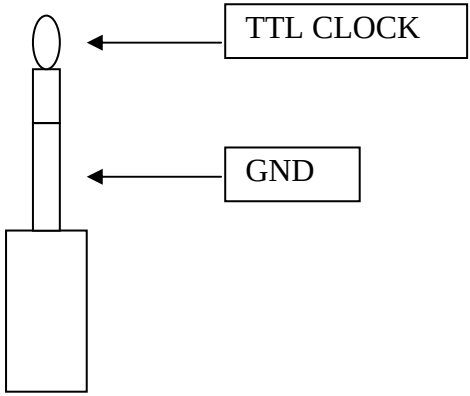
BNC coax connector

The two BNC coax connectors are marked RX and TX (They have the same functions as the E1 line DB15 connector).

External Timing Reference

BANTAM Connector

One BANTAM connector for external reference clock input (TTL level).



RS232 control port side

DB9 Female Connector

The pin assignment for the DB9 connector is as follows:

Pin:	Designation	Direction
1	DCD	Output
2	RD	Output
3	TD	Input
4	--	--
5	GND	< -- >
6	--	--
7	RTS	Input
8	CTS	Output
9	--	--

2-5. Dip Switch Setting

2-5-1. Caution

To avoid accidental electric shock, disconnect the **G703-FTEC** power cord before opening the cover. Access inside the equipment is only permitted to authorized and qualified service personnel.

2-5-2. Procedure

Turn the power OFF and disconnect the power cord from the AC outlet. Loosen the captive screws at the left/right of the rear panel. Remove the PCB by sliding it straight out the back of the unit.

Adjust the DIP switches as required, according to Table 2-1. (Appendix A describes each DIP switch function). Replace the PCB and tighten the captive screws. Refer to Appendix E for latest model setting table (V11.0).

Table 2-1 DIP Switch quick setup for FTEC V11.0

SW. NO.	DIPSW STATUS			FUNCTION			COMMENT
DSW1	1		OFF	Must set to OFF for application			
			ON	Factory test use only			
	2 through 8		OFF	E1 timeslot 1 through 7 IDLE			Of all the 31 available timeslots, only 24 timeslots may be set to ACTIVE.
			ON	E1 timeslot 1 through 7 ACTIVE			
DSW2~	1 through 8		OFF	E1 timeslot 8 through 31 IDLE			
DSW4			ON	E1 timeslot 8 through 31 ACTIVE			
DSW5~	1 through 8		OFF	T1 timeslot 0 through 23 set to DATA channel			
DSW7			ON	T1 timeslot 0 through 23 set to VOICE channel			
DSW8	1		OFF	T1 line code select: B8ZS			
			ON	T1 line code select: AMI			
	2		OFF	T1 frame format select: SF(D4)			
			ON	T1 frame format select: ESF			
	3	4	5	T1 line driving select			
	OFF	OFF	OFF	DSX-1 0 to 133 feet / CSU 0dB			
	ON	OFF	OFF	DSX-1 133 to 266 feet			
	OFF	ON	OFF	DSX-1 266 to 399 feet			
	ON	ON	OFF	DSX-1 399 to 533 feet			
	OFF	OFF	ON	DSX-1 533 to 655 feet			
	ON	OFF	ON	CSU –7.5dB			
	OFF	ON	ON	CSU –15dB			
	ON	ON	ON	CSU –22.5Db			
	6	7		Signaling Mode Select			
	OFF	OFF		According to DSW10-4,5,6 & 7			
	ON	OFF		T1 E&M signaling to E1 MFC R2 signaling			
	OFF	ON		According to Signaling Table A			
	ON	ON		Reserved			
	8	OFF		G.802 Annex B function DISABLED			
		ON		G.802 Annex B function ENABLED			1. E1 TS1 to TS15 and TS17 to TS25 must be set to ACTIVE. 2. All timeslots must be set to DATA mode. 3. T1 signaling (DSW9-1) must be set to DISABLED.
DSW9	1	OFF		T1 signaling DISABLED			
		ON		T1 signaling ENABLED			Enable for signaling bit transfers
	2	OFF		E1 CRC4 OFF			
		ON		E1 CRC4 ON			
	3	OFF		E1 frame format select: CCS (PCM31)			
		ON		E1 frame format select: CAS (PCM30)			E1 TS16 must be set to IDLE
	4	5	6	7	8	E1 line impedance select:	
	OFF	OFF	OFF	ON	ON	75 Ω	
	ON	ON	ON	OFF	OFF	120 Ω	
DSW10	1	2	3	Timing source selection			
	OFF	OFF	OFF	Transparent			
	ON	OFF	OFF	E1 side recovery			
	OFF	ON	OFF	Internal oscillator 2048Khz			
	ON	ON	OFF	External 2048Khz			
	OFF	OFF	ON	Loop back			
	ON	OFF	ON	T1 side recovery			
	OFF	ON	ON	Internal oscillator 1544Khz			

	ON	ON	ON	External 1544Khz	
	4	OFF		Signaling bit A not inverted	
		ON		Signaling bit A inverted	
	5	OFF		Signaling bit B not inverted	
		ON		Signaling bit B inverted	
	6	OFF		Signaling bit C not inverted	
		ON		Signaling bit C inverted	
	7	OFF		Signaling bit D not inverted	
		ON		Signaling bit D inverted	
	8	OFF		Set by DIPSW	
		ON		Set by terminal (RS-232)	

Signal Transfer Table A			
T1	E1	E1	T1
AB	ABCD	ABCD	AB
00	1010	1010	11
01	0110	01XX	11
10	0010	10XX	00
11	0010	11XX	00

X:Don’t Care

3-1. General

This chapter describes the **G703-FTEC** controls and indicators, explains the operating procedures and supplies instructions for field strapping changes. Operator intervention, requiring changes to the internal DIP switch settings, is only required when the **G703-FTEC** is set up for the first time or must be adapted for a new operational requirement. Installation procedures (in Chapter 2) must be completed and checked before attempting to operate the **G703-FTEC**.

3-2. Controls and Indicators

All controls (pushbutton switches) and LED indicators are located on the **G703-FTEC** front panel. Press the pushbutton in to activate (turn ON) the corresponding control. Push and release the pushbutton to deactivate (turn OFF) the control. The function of each pushbutton and indicator is described in Table 3-1 and Table 3-2.

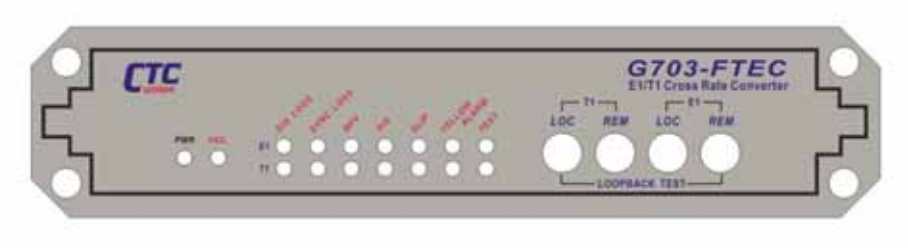


Figure 3-1 **G703-FTEC** Front Panel

Table 3-1 Control Function Switches

Item	Control Switch	Function (See Chapter 4)
1	T1 LOC	When depressed, activates the local T1 test loop back
2	T1 REM	When depressed, activates the remote T1 test loop back
3	E1 LOC	When depressed, activates the local E1 test loop back
4	E1 REM	When depressed, activates the remote E1 test loop back

Table 3-1 Control Function Switches

Table 3-2 LED Indicators

Item	Indicator	Color	Function
1	PWR	Green	ON when power is on.
2	FAIL	Red	System failure. DIP switch setting error: Active time slot channels not equal to 24. E1 in CAS mode, but timeslot 16 set to ON. DSW1-1 set to ON (factory test only).
3	E1 SIG LOSS	Red	ON when the E1 line receive signal is lost.
4	E1 SYNC LOSS	Red	ON when the E1 line receive frame sync is lost.
5	E1 BPV	Red	ON when a bipolar coding violation is detected in the E1 line.
6	E1 AIS	Red	ON when the E1 line receives all one's signal.
7	E1 SLIP	Red	ON when the E1 elastic buffer slip occurs.
8	E1 YELLOW ALARM	Red	ON when the E1 line receives a Remote Alarm Indication (RAI) signal.
9	E1 TEST	Red	ON when the E1 side is in any loop back mode.
3	T1 SIG LOSS	Red	ON when the T1 line received signal is lost.
4	T1 SYNC LOSS	Red	ON when the T1 line received frame sync is lost.
5	T1 BPV	Red	ON when a bipolar coding violation is detected on the T1 line.
6	T1 AIS	Red	ON when the T1 line receives an AIS signal.
7	T1 SLIP	Red	ON when the T1 elastic buffer slip occurs.
8	T1 YELLOW ALARM	Red	ON when the T1 line receives a yellow alarm.
9	T1 TEST	Red	ON when the T1 side is in any loop back mode.

Table 3-2 LED indicators

3-3. Operating Procedure

Preliminary settings

Release all of the LOOP BACK pushbutton switches.

Turn power on

The **G703-FTEC** is turned on when its AC power cord is connected to a live AC power outlet and the power switch is turned to the ON position.

Normal operation indications

During normal operation, all of the front panel indicators are OFF, except for the green PWR indicator light.

Turn power off

Set the rear panel power switch to the OFF position.

3-4. Terminal Mode Operating Procedure

The ***G703-FTEC*** Control Port, sometimes referred to as a Craft port, (labeled RS-232 on the front panel) is a console terminal port designed to facilitate setup of all parameters through the use of a standard text based (ANSI) terminal or any terminal emulation program running on a Personal Computer.

Connection

A notebook computer has become an invaluable tool of the Systems Engineer. Connection of the ***G703-FTEC*** to the computer is accomplished by a DB9-pin one-to-one, male to female cable. The ***G703-FTEC*** acts as a DCE to the PC's DTE communications port. A convenient application, provided with the Microsoft Windows® NT/9X operating systems, is "HyperTerminal ™". Set the properties to match the ***G703-FTEC*** control port defaults as follows: Baud=9600, Data bits=8, Parity=None, Stop bits=1, and handshaking=None and use a direct connection to the PC's COM port. Set the terminal emulation mode to ANSI. Make the appropriate connections, start the terminal application, apply power to the ***G703-FTEC***, then press ENTER or SPACE on the PC keyboard. If you are using "HyperTerminal ™" the display should look like that on the following page.

Menu System Detail

The following section will detail actual displays with descriptions of parameter settings via relevant key commands.

This is the first screen seen after connecting. Note that the first two items, "Display" and "Define" deal with all the system settings. The Display item will browse settings for viewing only, while under Define, all parameters may be both viewed and changed.

```
*********************************************
****   CTC UNION TECHNOLOGIES CO.,LTD     ****
****    G703FTEC  TERMINAL MODE            ****
****        SETUP MENU   Ver. 11.0         ****
*********************************************

1.  Display System Status.
2.  Define System Parameter.
3.  Test Function Parameter.
4.  Reset Data to Factory Default.
5.  EXIT

Enter 1-5 to select function.
```

Enter 1 to enter the Display System Status menu.

```
<< Display System Status >>
1.  Timing
2.  E1 Line
3.  T1 Line
4.  Time Slot Mapping
5.  Channel Status
6.  Control Port
7.  Test Function
8.  Signaling
9.  Signaling Mode
A.  G.703 FTEC Information
Enter 1-A or Press "ESC" to previous menu.
```

Enter 1 to display the Timing Parameters.

```
   <<  Display Timing Parameter  >>
Master Timing : Transparent
Press "ESC" to previous menu.
```

The display shows that the Master Timing is "Transparent" from the E1 link received signal.

Press ESC to return to the Display System Status menu and press 2 to display the E1 Line status. The below display shows the settings for Frame type, CRC setting, and E1 interface impedance for the E1 line.

```
   <<  Display E1 Line Parameter  >>
Frame     : CCS
CRC-4     : OFF
Impedance : 75 ohm
G.802     : DISABLE
Press "ESC" to previous menu.
```

Press ESC to return to the Display System Status menu and press 3 to display T1 Line status.

```
<<  Display T1 Line Parameter  >>
Frame         : SF(D4)
CODE          : B8ZS
DRIVE         : DSX-1 0 to 133 feet/CSU 0dB
SIGNALING     : DISABLE
```

Press ESC to return to the Display System Status menu and press 4 to display the Time Slot mapping status.

```
   <<  Display Time Slot Mapping  >>
SLOT : 00   01   02   03   04   05   06   07
TYPE : Fr    *    *    *    *    .    .    .
SLOT : 08   09   10   11   12   13   14   15
TYPE :  .    .    .    .    .    .    .    .
SLOT : 16   17   18   19   20   21   22   23
TYPE :  .    .    .    .    .    .    .    .
SLOT : 24   25   26   27   28   29   30   31
TYPE :  .    .    .    .    .    .    .    .
 *: Time slot used          .: Time slot not used
Fr: Framing                Si: Signaling
Press "ESC" to previous menu.
```

The Time Slot mapping display shows the assignments for all of the 32 timeslots of the E1 frame. All timeslots 0~31 are shown with the assigned abbreviations shown directly beneath.

Press ESC to return to the Display System Status menu and press 5 to display the channel status.

```
<<  Display Channel Status  >>
CHANNEL: 01    02     03    04     05    06     07     08
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA  DATA
CHANNEL: 09    10     11    12     13    14     15     16
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA  DATA
CHANNEL: 17    18     19     20    21    22     23     24
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA DATA
Press "ESC" to previous menu.
```

Press ESC to return to the Display System Status menu and press 6 to display the Control Port settings.

```
   <<  Display Control Port Parameter  >>
SPEED : 9600bps
DATA  : 8
PARITY: NONE
Press "ESC" to previous menu.
```

The display shows the current settings.

Press ESC to return to the Display System Status menu and press 7 to display the Test Function Parameter Menu screen.

```
<<  Display Test Function Parameter  >>
1.  T1 Local Loopback  :DISABLE
2.  T1 Remote Loopback :DISABLE
3.  E1 Local Loopback  :DISABLE
4.  E1 Remote Loopback :DISABLE
Press "ESC" to previous menu.
```

Press ESC to return to the Display System Status menu and press 8 to display the Signaling Parameter Menu screen.

```
<<  Display Signaling Parameter  >>
1. SignalingA :  Inverted
2. SignalingB :  Not Inverted
3. SignalingC :  Not Inverted
4. SignalingD :  Not Inverted
Press "ESC" to previous menu.
```

Press ESC to return to the Display System Status menu and press 9 to display the Signaling Mode screen.

```
   <<  Display Signaling Mode  >>
T1 E&M signaling to E1 MCF R2 signaling
Press "ESC" to previous menu.
```

Press ESC to return to the Display System Status menu and press A to display the G703-FTEC Information version screen.

```
<<  Display G.703-FTEC Information  >>
FPGA Version : 2.0
Program Version :11.0
Press "ESC" to previous menu.
```

Then press ESC to return to the main root menu.

```
*********************************************
****   CTC UNION TECHNOLOGIES CO.,LTD    ****
****    G703FTEC  TERMINAL MODE          ****
****        SETUP MENU   Ver. 11.0       ****
*********************************************

1.  Display System Status.
2.  Define System Parameter.
3.  Test Function Parameter.
4.  Reset Data to Factory Default.
5.  EXIT

Enter 1-5 to select function.
```

On the main root menu, press 2 to enter the "Define System Parameter" setting screen.

```
    <<  Define System Parameter  >>
1.  Timing
2.  E1 Line
3.  T1 Line
4.  Time Slot
5.  Signaling Invert
6.  Signaling Mode
7.  Channel
Enter 1-7 or Press "ESC" to previous menu.
```

On the above menu, press 1 to enter the "Define Master Timing Parameter" setting screen like below.

```
    <<  Define Master Timing Parameter  >>
Master Timing :  Transparent
1.  Transparent
2.  E1 side recovery
3.  Internal 2048K
4.  External 2048K
5.  Loop back
6.  T1 side recovery
7.  Internal 1544K
8.  External 1544K
Enter 1-8 or Press "ESC" to previous menu.
```

Press ESC to return to the Define System Parameter menu and press 2 to define the E1 Line status.

```
    <<  Define E1 Line Parameter  >>
1.  Frame
2.  CRC-4
3.  Impedance
4.  G.802
Enter 1-4 or Press "ESC" to previous menu
```

From the above menu, press 1 to enter the "Define E1 Frame Parameter" setting screen like below. Choose CCS or CAS Framing.

```
<<  Define E1 Frame Parameter  >>
Frame  :CCS
1.  CCS
2.  CAS
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the Define E1 Line Parameter menu and press 2 to enter CRC-4 mode setting screen. "Enable" or "Disable" CRC-4.

```
<<  Define E1 CRC-4 Parameter  >>
CRC-4  :OFF
1.  ON
2.  OFF
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the Define E1 Line Parameter menu and press 3 to display the E1 line impedance setting screen. This is a display only. The impedance is a hardware setting controlled by DIP switch (DIP9-4 to DSW9-8).

```
<<<  Define E1 Impedance Parameter  >>
Impedance  :75 ohm
1.  75 ohm
2.  120 ohm
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the Define E1 Line Parameter menu and press 4 to set the E1 line G.802 parameter.

```
<<  Define G.802 Parameter  >>
G.802  :DISABLE
1.  ENABLE
2.  DISABLE
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the Define E1 Line Parameter menu and press ESC again to return to the Define System Parameter Menu setting screen. On this menu setting screen, press 3 to enter the "T1 Line Parameter" setting menu as below.

```
<<  Define T1 Line Parameter  >>
1.  Frame
2.  Code
3.  Drive
4.  Signaling
Enter 1-4 or Press "ESC" to previous menu.
```

Now we will look at defining the T1 line frame parameters. To do this, enter 1.

```
<<  Define T1 Frame Parameter  >>
Frame  :SF(D4)
1.  SF(D4)
2.  ESF
Enter 1-2 or Press "ESC" to previous menu.
```

Press ESC to return to the Define T1 Line Parameter menu and press 2 to enter code parameter setting screen. Choose between B8ZS or AMI line code.

```
<<  Define Code Parameter  >>
Code  :B8ZS
1.  B8ZS
2.  AMI
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the Define T1 Line Parameter menu and press 3 to set the T1 line drive parameter. Choose the proper parameter.

```
<<  Define T1 Line Driving  Parameter  >>
Driver  :DSX-1 0 to 133 feet/CSU 0dB
1.  DSX-1 0 to 133 feet/CSU 0dB
2.  DSX-1 133 to 266 feet
3.  DSX-1 266 to 399 feet
4.  DSX-1 399 to 533 feet
5.  DSX-1 533 to 655 feet
6.  CSU -7.5dB
7.  CSU -15dB
8.  CSU -22.5dB
Enter 1-8 or Press "ESC" to previous menu
```

Press ESC to return to the Define T1 Line Parameter menu and press 4 to set the T1 line signaling parameter.

```
<<  Define T1 Signaling Parameter  >>
Signaling  :DISABLE
1.  ENABLE
2.  DISABLE
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the "Define T1 Line Parameter" menu and press ESC again to return to the Define System Parameter Root Menu setting screen. On this menu, press 4 to enter the "Timeslot Parameter" setting menu as below.

```
<<  Define Timeslot Parameter  >>
All 32 Timeslot(0~31)
1.  Active
2.  Inactive
Enter 1-2 or Press "ESC" to previous menu.
```

Press ESC to return to the "Define System Parameter" root menu and press 5 to set the Signaling Parameter.

```
<<  Define Signaling Parameter  >>
1. SignalingA :  Inverted
2. SignalingB :  Not Inverted
3. SignalingC :  Not Inverted
4. SignalingD :  Not Inverted
Enter 1-4 or Press "ESC" to previous menu
```

Press ESC to return to the "Define System Parameter" root menu and press 6 to display the "Signaling Mode Parameter" setting screen.

```
<<  Define Signaling Mode Parameter  >>
T1 E&M signaling to E1 MCF R2 signaling
1.  According to DSW10-4,5,6&7
2.  T1 E&M signaling to E1 MCF R2 signaling
3.  According to Signaling Table A
Enter 1-3 or Press "ESC" to previous menu
```

Press ESC to return to the "Define System Parameter" root menu and press 7 to display the "Channel Parameter" setting screen.

```
   <<  Define Channel Parameter  >>
CHANNEL: 01    02     03    04     05    06     07     08
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA  DATA
CHANNEL: 09    10     11    12     13    14     15     16
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA  DATA
CHANNEL: 17    18     19     20    21    22     23     24
TYPE :   DATA DATA   DATA  DATA  DATA  DATA  DATA DATA
1. Data   2. Voice
Press "ENTER" to choose next channel.
Enter 1-2 or Press "ESC" to previous menu
```

Then press ESC twice to return to the main root menu.

```
*******************************************
****   CTC UNION TECHNOLOGIES CO.,LTD    ****
****   G703FTEC  TERMINAL MODE            ****
****       SETUP MENU   Ver. 11.0         ****
*******************************************

1.  Display System Status.
2.  Define System Parameter.
3.  Test Function Parameter.
4.  Reset Data to Factory Default.
5.  EXIT

Enter 1-5 to select function.
```

On the main root menu, press 3 to enter the "Test Function Parameter" setting screen.

```
   <<  Define Test Mode Function  >>
1.  T1 Local Loopback Test
2.  T1 Remote Loopback Test
3.  E1 Local Loopback Test
4.  E1 Remote Loopback Test
Enter 1-4 or Press "ESC" to previous menu.
```

From the above menu, press 1 to enter the "T1 Local Loopback Test" screen.

```
<<  Define T1 Local Loopback Parameter  >>
Loopback : 1.DISABLE
           2.ENABLE
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the "Define Test Mode Function" menu and press 2 to set the "T1 Remote Loopback Test".

```
<<  Define T1 Remote Loopback Parameter  >>
Loopback : 1.DISABLE
           2.ENABLE
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the "Define Test Mode Function" menu and press 3 to set the "E1 Local Loopback Test".

```
<<  Define E1 Local Loopback Parameter  >>
Loopback : 1.DISABLE
           2.ENABLE
Enter 1-2 or Press "ESC" to previous menu
```

Press ESC to return to the " Define Test Mode Function " menu and press 4 to set the "E1 Remote Loopback Test".

```
<<  Define E1 Remote Loopback Parameter  >>
Loopback : 1.DISABLE
           2.ENABLE
Enter 1-2 or Press "ESC" to previous menu
```

Then press ESC twice to return to the main root menu.

```
*********************************************
****   CTC UNION TECHNOLOGIES CO.,LTD    ****
****    G703FTEC  TERMINAL MODE          ****
****       SETUP MENU   Ver. 11.0        ****
*********************************************

1.  Display System Status.
2.  Define System Parameter.
3.  Test Function Parameter.
4.  Reset Data to Factory Default.
5.  EXIT

Enter 1-5 to select function.
```

From the main root menu, press 4 to enter the "Reset Data to Factory Default" setting screen.

```
   <<  Reset Data to Factory Default  >>
Press "ENTER" to confirm, "ESC" to previous menu.
Reset Complete.
Press "ESC" to previous menu
```

Pressing "Enter" will reset the G703-FTEC to factory default settings. Pressing "ESC" will revert back to the root menu.

To exit the terminal mode press 5 on the root menu. You must exit the terminal mode before the configuration setting are saved and become active. The terminal connection will be dropped and the following will be displayed.

```
G703-FTEC TERMINAL MODE IS DISCONNECTED
```

This completes the detailed examples of terminal mode operation for the *G703-FTEC*.

4-1. General

Four loop back tests are available for diagnostics and test purposes:

- T1 local loop back.
- T1 remote loop back.
- E1 local loop back.
- E1 remote loop back.

When performing loop tests, observe the following guidelines and restrictions:

- Activation of a test loop interrupts normal traffic flow.
- Only one test may be performed at the same time. Always check that the test indicator is off before trying to activate a different test loop.
- The **G703-FTEC** and the equipment connected to it must always have a stable clock reference. The activation of a loop back may disconnect the clock reference from the system. This loss of clock signal may disrupt clock signal flow through the network and can generate alarm indications even when there is no fault.

4-2. Loop Back Tests

The loop back test buttons (T1 LOC, T1 REM, E1 LOC and E1 REM) and the LED indicators, built into the **G703-FTEC,** allow for rapid checking/testing of the **G703-FTEC**'s internal circuits and the T1 and E1 lines. Before testing the operation of the system equipment and their line circuits, ensure that all units are turned on and are configured correctly.

T1 LOCAL LOOPBACK TEST

While the T1 local loop back is activated, the T1 transmit data is disconnected from the received E1 path and the AIS signal (all ones) is transmitted to the remote T1 side. The received E1 data is looped out the E1 transmit path. The T1 received data is ignored.

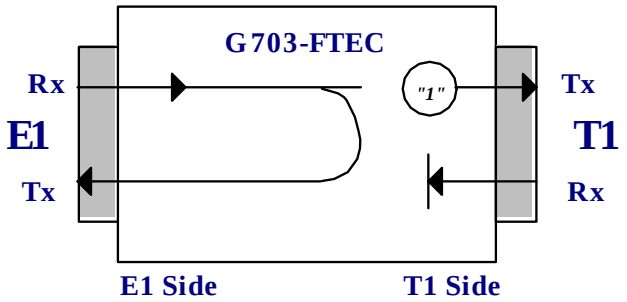


Figure 4-1. T1 local loop back

T1 REMOTE LOOPBACK TEST

While the T1 remote loop back is activated, the T1 received data is returned back to the T1 transmit path and the E1 received data is ignored. Figure 4-2 shows the T1 remote loopback.

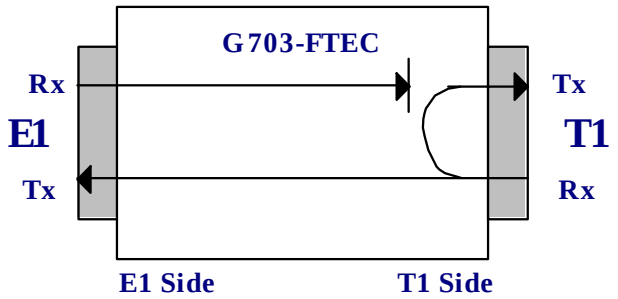


Figure 4-2. T1 remote loopback

E1 LOCAL LOOPBACK TEST

While the E1 local loopback is activated, the E1 transmit data is disconnected from the received T1 path and the AIS signal (all ones) is transmitted to the remote E1 side. The received T1 data is looped out the T1 transmit path. The E1 received data is ignored.

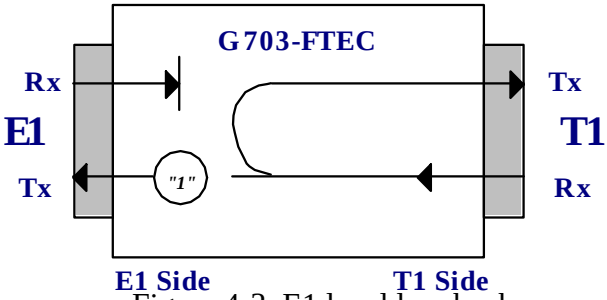


Figure 4-3. E1 local loopback

E1 REMOTE LOOPBACK TEST

While the E1 remote loop back is activated, the E1 received data is returned back to the E1 transmit path and the T1 received data is ignored.

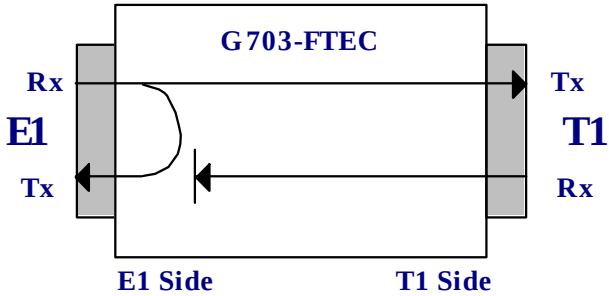


Figure 4-4. E1 remote loop back

4-3. Troubleshooting

No.	Trouble Symptoms	Probable cause	Corrective measure
1	PWR indicator off	No AC power	Check that both ends of the AC power cable are properly connected.
		Blown fuse	Replace with fuse of proper rating.
		Defective **G703-FTEC**	Replace the **G703-FTEC**
2	FAIL indicator on	DIP switch setting wrong	Check the DIP switch settings.
		Defective **G703-FTEC**	Replace the **G703-FTEC**
3	T1 SIG LOSS indicator on	No signal received from the remote device.	Check connections between **G703-FTEC** and remote device.
		Defective **G703-FTEC**	Replace the **G703-FTEC**
4	T1 SYNC LOSS indicator on	Framing mode wrong	Set to correct framing mode.
5	T1 BPV indicator on	Excessive noise on the line from remote device to **G703-FTEC**	Check that line attenuation does not exceed that specified for T1 lines.
		Defective line	Use alternate routing.
		Defective **G703-FTEC**	Connect a loop connector on the local T1 link. If the problem persists, replace the **G703-FTEC**
6	E1 SIG LOSS indicator on	No signal received from the remote device.	Check connections between **G703-FTEC** and remote device.
		Defective **G703-FTEC**	Replace the **G703-FTEC**
7	E1 SYNC LOSS indicator on	Framing mode wrong	Set to correct framing mode.
8	E1 BPV indicator on	Excessive noise on the line from remote device to **G703-FTEC**	Check that line attenuation does not exceed that specified for E1 lines.
		Defective line	Use alternate routing.
		Defective **G703-FTEC**	Connect a loop connector on the local E1 link. If the problem persists, replace the **G703-FTEC**

Table 4-1. Troubleshooting chart

A-1 ALL DIP Switch Setting Quick Reference

Please notice this reference only for the older firmware. If your firmware is V11.0 or above then please check the appendix E for your quick reference.

SW. NO.	DIPSW STATUS			FUNCTION	COMMENT
DSW1	1		OFF	Must set to OFF for application	
			ON	Factory test use only	
	2 through 8		OFF	E1 timeslot 1 through 7 IDLE	Of all the 31 available timeslots, only 24 timeslots may be set to ACTIVE.
			ON	E1 timeslot 1 through 7 ACTIVE	
DSW2~	1 through 8		OFF	E1 timeslot 8 through 31 IDLE	
DSW4			ON	E1 timeslot 8 through 31 ACTIVE	
DSW5~	1 through 8		OFF	T1 timeslot 0 through 23 set to DATA channel	
DSW7			ON	T1 timeslot 0 through 23 set to VOICE channel	
DSW8	1		OFF	T1 line code select: B8ZS	
			ON	T1 line code select: AMI	
	2		OFF	T1 frame format select: SF(D4)	
			ON	T1 frame format select: ESF	
	3	4	5	T1 line driving select	
	OFF	OFF	OFF	DSX-1 0 to 133 feet / CSU 0dB	
	ON	OFF	OFF	DSX-1 133 to 266 feet	
	OFF	ON	OFF	DSX-1 266 to 399 feet	
	ON	ON	OFF	DSX-1 399 to 533 feet	
	OFF	OFF	ON	DSX-1 533 to 655 feet	
	ON	OFF	ON	CSU –7.5dB	
	OFF	ON	ON	CSU –15dB	
	ON	ON	ON	CSU –22.5Db	
	6	7		Signaling Mode Select	
	OFF	OFF		According to DSW10-4,5,6 & 7	
	ON	OFF		T1 E&M signaling to E1 MFC R2 signaling	
	OFF	ON		According to Signaling Table A	
	ON	ON		Reserved	
	8	OFF		G.802 Annex B function DISABLED	
		ON		G.802 Annex B function ENABLED	1. E1 TS1 to TS15 and TS17 to TS25 must be set to ACTIVE. 2. All timeslots must be set to DATA mode. 3. T1 signaling (DSW9-1) must be set to DISABLED.
DSW9	1	OFF		T1 signaling DISABLED	
		ON		T1 signaling ENABLED	Enable for signaling bit transfers
	2	OFF		E1 CRC4 OFF	
		ON		E1 CRC4 ON	
	3	OFF		E1 frame format select: CCS (PCM31)	
		ON		E1 frame format select: CAS (PCM30)	E1 TS16 must be set to IDLE
	4	5	6	7 8 E1 line impedance select:	
	OFF	OFF	OFF	ON ON 75 Ω	
	ON	ON	ON	OFF OFF 120 Ω	
DSW10	1	2	3	Timing source selection	
	OFF	OFF	OFF	Transparent	
	ON	OFF	OFF	E1 side recovery	
	OFF	ON	OFF	Internal oscillator 2048Khz	

	ON	ON	OFF	External 2048Khz	
	OFF	OFF	ON	Loop back	
	ON	OFF	ON	T1 side recovery	
	OFF	ON	ON	Internal oscillator 1544Khz	
	ON	ON	ON	External 1544Khz	
	4	OFF		Signaling bit A not inverted	
		ON		Signaling bit A inverted	
	5	OFF		Signaling bit B not inverted	
		ON		Signaling bit B inverted	
	6	OFF		Signaling bit C not inverted	
		ON		Signaling bit C inverted	
	7	OFF		Signaling bit D not inverted	
		ON		Signaling bit D inverted	
	8	OFF		Set by DIPSW	
		ON		Set by terminal (RS-232)	

A-2. DSW1 Setting E1 Time Slot 1-7 Idle or Active

DSW1	STATE	FUNCTION	COMMENT
-1	OFF	Must set to OFF for application	
	ON	Only for factory test use	
-2	OFF	E1 timeslot 1 IDLE	
	ON	E1 timeslot 1 ACTIVE	
-3	OFF	E1 timeslot 2 IDLE	
	ON	E1 timeslot 2 ACTIVE	
-4	OFF	E1 timeslot 3 IDLE	
	ON	E1 timeslot 3 ACTIVE	
-5	OFF	E1 timeslot 4 IDLE	
	ON	E1 timeslot 4 ACTIVE	
-6	OFF	E1 timeslot 5 IDLE	
	ON	E1 timeslot 5 ACTIVE	
-7	OFF	E1 timeslot 6 IDLE	
	ON	E1 timeslot 6 ACTIVE	
-8	OFF	E1 timeslot 7 IDLE	
	ON	E1 timeslot 7 ACTIVE	

TABLE A-2, Setting E1 timeslot 1-7

A-3. DSW2 Setting E1 Time Slot 8-15 Idle or Active

DSW2	STATE	FUNCTION	COMMENT
-1	OFF	E1 timeslot 8 IDLE	
	ON	E1 timeslot 8 ACTIVE	
-2	OFF	E1 timeslot 9 IDLE	
	ON	E1 timeslot 9 ACTIVE	
-3	OFF	E1 timeslot 10 IDLE	
	ON	E1 timeslot 10 ACTIVE	
-4	OFF	E1 timeslot 11 IDLE	
	ON	E1 timeslot 11 ACTIVE	
-5	OFF	E1 timeslot 12 IDLE	
	ON	E1 timeslot 12 ACTIVE	
-6	OFF	E1 timeslot 13 IDLE	
	ON	E1 timeslot 13 ACTIVE	
-7	OFF	E1 timeslot 14 IDLE	
	ON	E1 timeslot 14 ACTIVE	
-8	OFF	E1 timeslot 15 IDLE	
	ON	E1 timeslot 15 ACTIVE	

TABLE A-3, Setting E1 timeslot 8-15

A-4. DSW3 Setting E1 Time Slot 16-23 Idle or Active

DSW3	STATE	FUNCTION	COMMENT
-1	OFF	E1 timeslot 16 IDLE	
	ON	E1 timeslot 16 ACTIVE	In CAS mode must not be set ON
-2	OFF	E1 timeslot 17 IDLE	
	ON	E1 timeslot 17 ACTIVE	
-3	OFF	E1 timeslot 18 IDLE	
	ON	E1 timeslot 18 ACTIVE	
-4	OFF	E1 timeslot 19 IDLE	
	ON	E1 timeslot 19 ACTIVE	
-5	OFF	E1 timeslot 20 IDLE	
	ON	E1 timeslot 20 ACTIVE	
-6	OFF	E1 timeslot 21 IDLE	
	ON	E1 timeslot 21 ACTIVE	
-7	OFF	E1 timeslot 22 IDLE	
	ON	E1 timeslot 22 ACTIVE	
-8	OFF	E1 timeslot 23 IDLE	
	ON	E1 timeslot 23 ACTIVE	

TABLE A-4, Setting E1 timeslot 16-23

A-5. DSW4 Setting E1 Time Slot 24-31 Idle or Active

DSW4	STATE	FUNCTION	COMMENT
-1	OFF	E1 timeslot 24 IDLE	
	ON	E1 timeslot 24 ACTIVE	
-2	OFF	E1 timeslot 25 IDLE	
	ON	E1 timeslot 25 ACTIVE	
-3	OFF	E1 timeslot 26 IDLE	
	ON	E1 timeslot 26 ACTIVE	
-4	OFF	E1 timeslot 27 IDLE	
	ON	E1 timeslot 27 ACTIVE	
-5	OFF	E1 timeslot 28 IDLE	
	ON	E1 timeslot 28 ACTIVE	
-6	OFF	E1 timeslot 29 IDLE	
	ON	E1 timeslot 29 ACTIVE	
-7	OFF	E1 timeslot 30 IDLE	
	ON	E1 timeslot 30 ACTIVE	
-8	OFF	E1 timeslot 31 IDLE	
	ON	E1 timeslot 31 ACTIVE	

TABLE A-5, Setting E1 timeslot 24-31

A-6. DSW5 Setting T1 Time Slot 0-7 Data or Voice

DSW5	STATE	FUNCTION	COMMENT
-1	OFF	T1 timeslot 0 is DATA channel	
	ON	T1 timeslot 0 is VOICE channel	
-2	OFF	T1 timeslot 1 is DATA channel	
	ON	T1 timeslot 1 is VOICE channel	
-3	OFF	T1 timeslot 2 is DATA channel	
	ON	T1 timeslot 2 is VOICE channel	
-4	OFF	T1 timeslot 3 is DATA channel	
	ON	T1 timeslot 3 is VOICE channel	
-5	OFF	T1 timeslot 4 is DATA channel	
	ON	T1 timeslot 4 is VOICE channel	
-6	OFF	T1 timeslot 5 is DATA channel	
	ON	T1 timeslot 5 is VOICE channel	
-7	OFF	T1 timeslot 6 is DATA channel	
	ON	T1 timeslot 6 is VOICE channel	
-8	OFF	T1 timeslot 7 is DATA channel	
	ON	T1 timeslot 7 is VOICE channel	

TABLE A-6, Setting T1 timeslot 0-7

A-7. DSW6 Setting T1 Time Slot 8-15 Data or Voice

DSW6	STATE	FUNCTION	COMMENT
-1	OFF	T1 timeslot 8 is DATA channel	
	ON	T1 timeslot 8 is VOICE channel	
-2	OFF	T1 timeslot 9 is DATA channel	
	ON	T1 timeslot 9 is VOICE channel	
-3	OFF	T1 timeslot 10 is DATA channel	
	ON	T1 timeslot 10 is VOICE channel	
-4	OFF	T1 timeslot 11 is DATA channel	
	ON	T1 timeslot 11 is VOICE channel	
-5	OFF	T1 timeslot 12 is DATA channel	
	ON	T1 timeslot 12 is VOICE channel	
-6	OFF	T1 timeslot 13 is DATA channel	
	ON	T1 timeslot 13 is VOICE channel	
-7	OFF	T1 timeslot 14 is DATA channel	
	ON	T1 timeslot 14 is VOICE channel	
-8	OFF	T1 timeslot 15 is DATA channel	
	ON	T1 timeslot 15 is VOICE channel	

TABLE A-7, Setting T1 timeslot 8-15

A-8. DSW7 Setting T1 Time Slot 16-23 Data or Voice

DSW7	STATE	FUNCTION	COMMENT
-1	OFF	T1 timeslot 16 is DATA channel	
	ON	T1 timeslot 16 is VOICE channel	
-2	OFF	T1 timeslot 17 is DATA channel	
	ON	T1 timeslot 17 is VOICE channel	
-3	OFF	T1 timeslot 18 is DATA channel	
	ON	T1 timeslot 18 is VOICE channel	
-4	OFF	T1 timeslot 19 is DATA channel	
	ON	T1 timeslot 19 is VOICE channel	
-5	OFF	T1 timeslot 20 is DATA channel	
	ON	T1 timeslot 20 is VOICE channel	
-6	OFF	T1 timeslot 21 is DATA channel	
	ON	T1 timeslot 21 is VOICE channel	
-7	OFF	T1 timeslot 22 is DATA channel	
	ON	T1 timeslot 22 is VOICE channel	
-8	OFF	T1 timeslot 23 is DATA channel	
	ON	T1 timeslot 23 is VOICE channel	

TABLE A-8, Setting T1 timeslot 16-23

A-9. DSW8 Setting T1 Parameters

DSW8	STATE			FUNCTION	COMMENT
-1	OFF			T1 line code select: B8ZS	
	ON			T1 line code select: AMI	
-2	OFF			T1 frame format select: SF(D4)	
	ON			T1 frame format select: ESF	
-3,-4,-5	-3	-4	-5	T1 line driving select	
	OFF	OFF	OFF	DSX-1 0 to 133 feet / CSU 0dB	
	ON	OFF	OFF	DSX-1 133 to 266 feet	
	OFF	ON	OFF	DSX-1 266 to 399 feet	
	ON	ON	OFF	DSX-1 399 to 533 feet	
	OFF	OFF	ON	DSX-1 533 to 655 feet	
	ON	OFF	ON	CSU –7.5dB	
	OFF	ON	ON	CSU –15dB	
	ON	ON	ON	CSU –22.5dB	
-6	OFF			T1 jitter DISABLE	
	ON			T1 jitter ENABLE	
-7	OFF			T1 jitter place in RECEIVE side	
	ON			T1 jitter place in TRANSMIT side	
-8				Reserved	

TABLE A-9, Setting T1 parameter

A-10. DSW9 Setting E1 Parameters

DSW9	STATE					FUNCTION	COMMENT
-1	OFF					T1 signal DISABLE	
	ON					T1 signal ENABLE	
-2	OFF					E1 CRC4 OFF	
	ON					E1 CRC4 ON	
-3	OFF					E1 frame format select: CCS(PCM31)	
	ON					E1 frame format select: CAS(PCM30)	
-4,-5,-6,-7,-8	-4	-5	-6	-7	-8	E1 line impedance select:	
	OFF	OFF	OFF	ON	ON	75 Ohm	
	ON	ON	ON	OFF	OFF	120 Ohm	

TABLE A-10, Setting E1 parameter

A-11. DSW10 Setting Timing Source and E1 Parameters

DSW10	STATE			FUNCTION	COMMENT
-1,-2,-3	-1	-2	-3	Timing source select	
	OFF	OFF	OFF	Transparent	
	ON	OFF	OFF	E1 side recovery	
	OFF	ON	OFF	Internal oscillator 2048Khz	
	ON	ON	OFF	External 2048Khz	
	OFF	OFF	ON	Loop back	
	ON	OFF	ON	T1 side recovery	
	OFF	ON	ON	Internal oscillator 1544Khz	
	ON	ON	ON	External 1544Khz	
-4	OFF			Signaling bit A not inverted	
	ON			Signaling bit A inverted	
-5	OFF			Signaling bit B not inverted	
	ON			Signaling bit B inverted	
-6	OFF			Signaling bit C not inverted	
	ON			Signaling bit C inverted	
-7	OFF			Signaling bit D not inverted	
	ON			Signaling bit D inverted	
-8	OFF			Set by DIPSW	
	ON			Set by terminal (RS-232)	

TABLE A-11, Setting timing source and E1 parameter

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B-1 RJ-45 connector

The pin assignment for the RJ-45 connector is as follows:

Pin:	Function:
4	TTIP (Transmit data out)
5	TRING (Transmit data out)
1	RTIP (Receive data in)
2	RRING (Receive data in)

Table B-1 RJ-45 connector pin allocation

DB15 Female Connector (**old model**)

The pin assignment for the DB15 connector is as follows:

Pin:	Function:
1	TTIP (Transmit data out)
9	TRING (Transmit data out)
3	RTIP (Receive data in)
11	RRING (Receive data in)

B-2 E1 BNC connectors

Conn.	Pin	Designation	Direction	Function
TX	Center	TTIP	From FTEC	Transmit data
	Sleeve	TRING	< -- >	Signal return
RX	Center	RTIP	To FTEC	Receive data
	Sleeve	RRING	< -- >	Signal return

Table B-2 E1 BNC connector pin allocation

B-3 T1 BANTAM connectors

Conn.	Pin	Designation	Direction	Function
TX	Tip	TTIP	From FTEC	Transmit data
	Ring	TRING	< -- >	Signal return
RX	Tip	RTIP	To FTEC	Receive data
	Ring	RRING	< -- >	Signal return

Table B-3 T1 BANTAM connector pin allocation

Appendix C: Rack Mounting Instructions

All rack mount series units may be placed in a stand EIA 19 inch rack occupying one unit space by means of the optional rack mounting adapter kit. Units may be mounted singularly or in pairs side-by-side.

Single unit mounting kit:

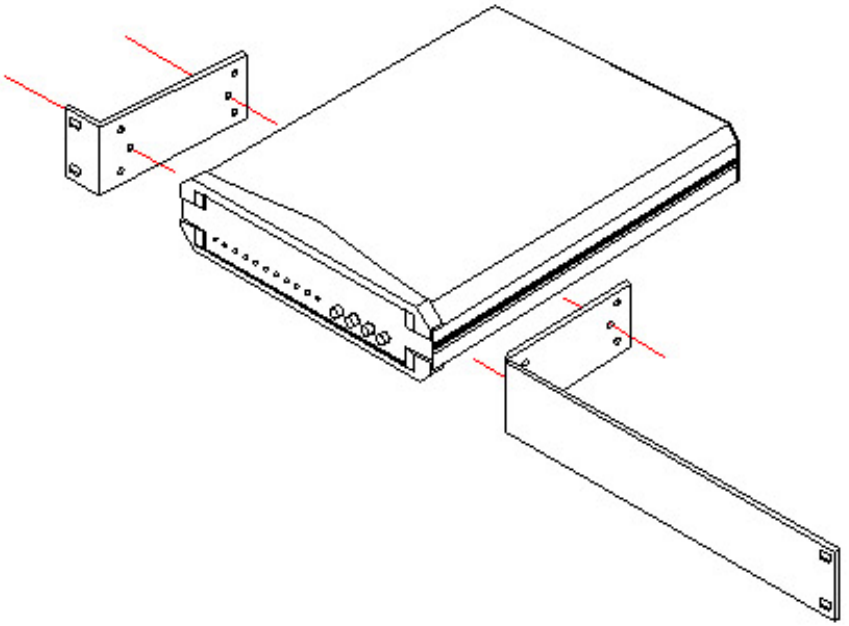

Figure C-1. Single Unit Rack Mount

Using the four (4) supplied self-tapping sheet metal screws, attach the brackets to the main unit. The unit may be mounted on the left side (as shown) or on the right side at your discretion.

Dual Unit Mounting Kit:

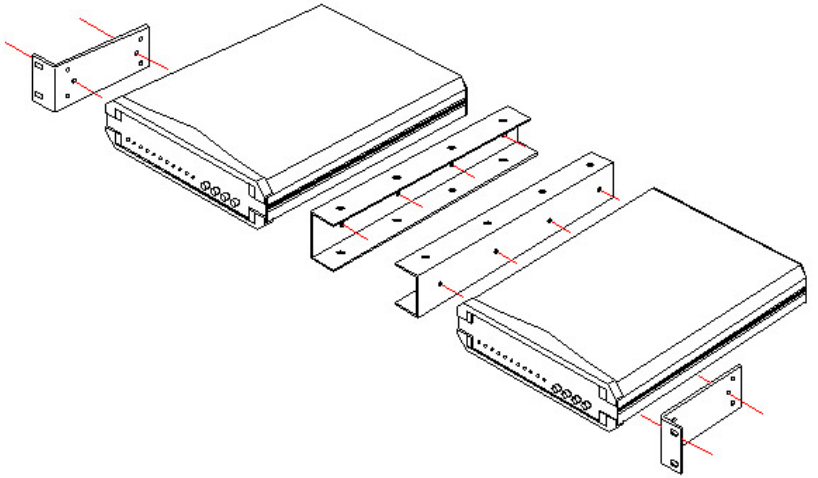

Figure C-2. Dual Unit Rack Mount

Attach the brackets as shown with the supplied self-tapping sheet metal screws. Refer to the drawing below for unit connection.

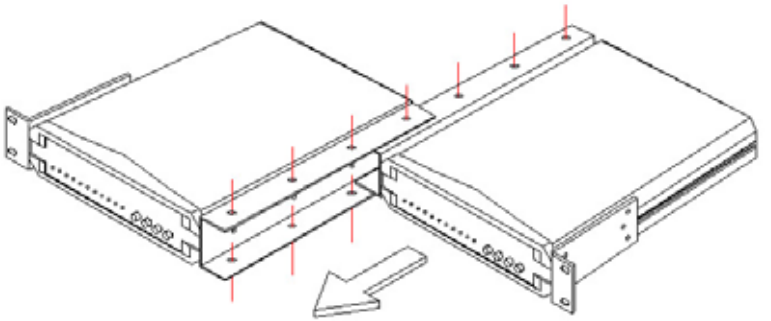

Figure C-3. Dual Unit Detail

Slide the units together as shown above and attach the screws. Mount the assembly in the rack as usual, using the rack supplied mounting screws.

Appendix D: DIP Switch Setting Quick Reference

1. Alarm Responses Feature on FTEC with G.802 Function.

If **Loss Of Signal is received on E1**, the FTEC will **transmit Remote Alarm Indication (RAI) on E1** and **AIS on T1**.

If **Loss Of Signal is received on T1**, the FTEC will **transmit AIS on E1** and **no response on T1**.

As follows:

Received impairment	Alarm Responses
E1 RX: Loss Of Signal	E1 TX will transmit: RAI
	T1 TX will transmit: AIS
T1 RX: Loss Of Signal	E1 TX will transmit: AIS
	T1 TX will transmit: normal

2. Power On Self Test

The new version of the FTEC will check all of the DIP switch settings after power on. The "FAIL" LED will flash if an error combination is found in the settings of the DIP switches. The user may easily identify the setting mistakes on the board by watching the LED indicators as follows:

"SIG LOSS" LED lights: The number of active timeslots is not equal to 24.

"SYNC LOSS" LED lights: The E1 is set to CAS mode (DSW9-2 ON), but the E1 TS16 is set to active (DSW3-1 ON).

"BPV" LED lights: The E1 is set to CCS mode (DSW9-1 ON), but T1 signaling is set to enable (DSW9-1 ON).

"AIS" LED lights: The G.802 function is set to enable (DSW8-8 ON), but one of following setting errors has occurred: 1) wrong number of active timeslot. 2) some timeslot is set to voice mode. 3) T1 signaling mode is set to enable (DSW9-1 ON).

"SLIP" LED lights: U1 EPLD is the wrong version.

"YELLOW ALARM" LED lights: U4 EPLD is the wrong version.

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Technical Inquiry Form

Attn : Technical Support Division

From Company: _____

Name: _____

Tel: ( ) _____

Fax:( ) _____

■ **MODEL:** □ **G703-FTEC/AC**

□ **G703-FTEC/DC**

ACTIVITY: As attached in DIP switch setting table

■ **SYS CONFIGURATION:**

■ **Question:**

Technical Inquiry Form

MODEL No.: □ G703-FTEC/AC (100~240VAC)

□ G703-FTEC/DC (–24V ~ –48VDC)

Please fill in the configuration settings with '✓' marks into the following table. Send it to us by fax, and we will reply to you immediately.

	FUNCTION	Parameter	Your setting	Suggested
	System Parameter			
	Master Timing	Transparent		
		E1 side recovery		
		Internal 2048K		
		External 2048K		
		Loop back		
		T1 side recovery		
		Internal 1544K		
		External 1544K		
	E1 Line			
	Frame	CCS		
		CAS		
	CRC-4	OFF		
		ON		
	IMPEDANCE	75		
		120		
	G.802	Enable		
		Disable		
	T1 Line			
	Frame	SF(D4)		
		ESF		
	Code	B8ZS		
		AMI		
	Drive	CSU 0dB DSX-1 0~133 feet		
		DSX-1 134~266 feet		
		DSX-1 267~399 feet		
		DSX-1 400~533 feet		
		CSU –7.5dB		
		CSU –15dB		
		CSU –22.5dB		
	Signaling	Enable		
		Disable		
	Timeslot (0~31)			
	All timeslots	Active		
		Inactive		
	Signaling Invert			
	Which signal	A		
		B		
		C		
		D		

Technical Inquiry Form

	FUNCTION			
		Parameter	Your setting	Suggested
	Signaling Mode			
		According to DSW10-4,5,6&7		
		T1 E&M to E1 MCF R2		
		According to Signaling Table A (Please refer the next page)		
	Channel Type			
		Channel #1 (Data or Voice)		
		Channel #2 (Data or Voice)		
		Channel #3 (Data or Voice)		
		Channel #4 (Data or Voice)		
		Channel #5 (Data or Voice)		
		Channel #6 (Data or Voice)		
		Channel #7 (Data or Voice)		
		Channel #8 (Data or Voice)		
		Channel #9 (Data or Voice)		
		Channel #10 (Data or Voice)		
		Channel #11 (Data or Voice)		
		Channel #12 (Data or Voice)		
		Channel #13 (Data or Voice)		
		Channel #14 (Data or Voice)		
		Channel #15 (Data or Voice)		
		Channel #16 (Data or Voice)		
		Channel #17 (Data or Voice)		
		Channel #18 (Data or Voice)		
		Channel #19 (Data or Voice)		
		Channel #20 (Data or Voice)		
		Channel #21 (Data or Voice)		
		Channel #22 (Data or Voice)		
		Channel #23 (Data or Voice)		
		Channel #24 (Data or Voice)		
	Testing Mode Function			
	T1 Local Loopback	Disable		
		Enable		
	T1 Remote Loopback	Disable		
		Enable		
	E1 Local Loopback	Disable		
		Enable		
	E1 Remote Loopback	Disable		
		Enable		

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