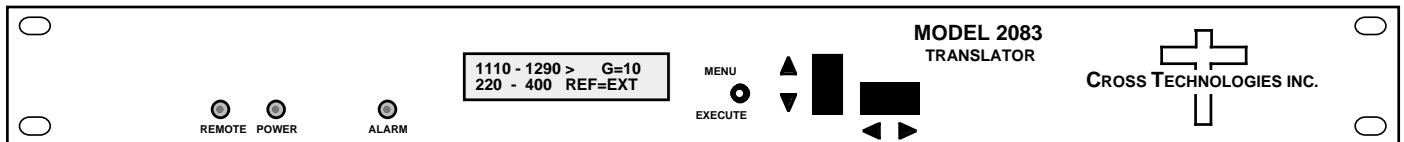


Instruction Manual

Model 2083-1304

Block L to UHF Translator

May 2021, Rev. 0



Data, drawings, and other material contained herein are proprietary to Cross Technologies, Inc., but may be reproduced or duplicated without the prior permission of Cross Technologies, Inc. for purposes of operating the equipment. Printed in USA.

When ordering parts from Cross Technologies, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.



6170 Shiloh Road
Alpharetta, Georgia 30005

(770) 886-8005
FAX (770) 886-7964
Toll Free 888-900-5588

WEB www.crosstechnologies.com
E-MAIL info@crosstechnologies.com

INSTRUCTION MANUAL

MODEL 2083-1304 L-UHF Translator

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
Warranty	2
1.0 General	3
1.1 Equipment Description	3
1.2 Technical Characteristics	4
1.3 Monitor & Control Interface	6
2.0 Installation	9
2.1 Mechanical	9
2.2 Rear I/O's	10
2.3 Front Panel Controls, Indicators	10
2.4 Installation/Operation	11
2.5 Menu Settings	13
3.0 Environmental Use Information	17

WARRANTY - The following warranty applies to all Cross Technologies, Inc. products.

All Cross Technologies, Inc. products are warranted against defective materials and workmanship for a period of one year after shipment to customer. Cross Technologies, Inc.'s obligation under this warranty is limited to repairing or, at Cross Technologies, Inc.'s option, replacing parts, subassemblies, or entire assemblies. Cross Technologies, Inc. shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are not other warranties, express or implied, except as stated herein.



6170 Shiloh Road
Alpharetta, Georgia 30005

(770) 886-8005
FAX (770) 886-7964
Toll Free 888-900-5588

WEB www.crosstechnologies.com
E-MAIL info@crosstechnologies.com

MODEL 2083-1304 L to UHF Translator

1.0 General

1.1 Equipment Description

The 2083-1304 Block L to UHF Translator converts a 1110-1290 MHz block to 220-400 MHz block with no spectrum inversion, low group delay and flat frequency response. The 1110-1290 MHz input is mixed with synthesized local oscillator (LO) signals, first to 2070 MHz center frequency and finally to the 220-400 MHz block output. Multi-function switches select the gain and internal or external 10 MHz. The input frequency band, output frequency band, internal or external reference, and gain (0 to +20 dB, selectable in 1 dB steps) settings appear on the LCD display. Front panel LEDs provide indication of DC power (green), PLL alarm (red), and remote operation (yellow). Remote operation allows setting the overall gain and 10 MHz reference. Connectors are BNC female for RF input and output and for the external 10 MHz reference (+3± 3 dBm in). It is powered by a 100-240 ±10% VAC, 47-63 HZ input power supply and in a 1 3/4" X 19" X 16" rack mount chassis.

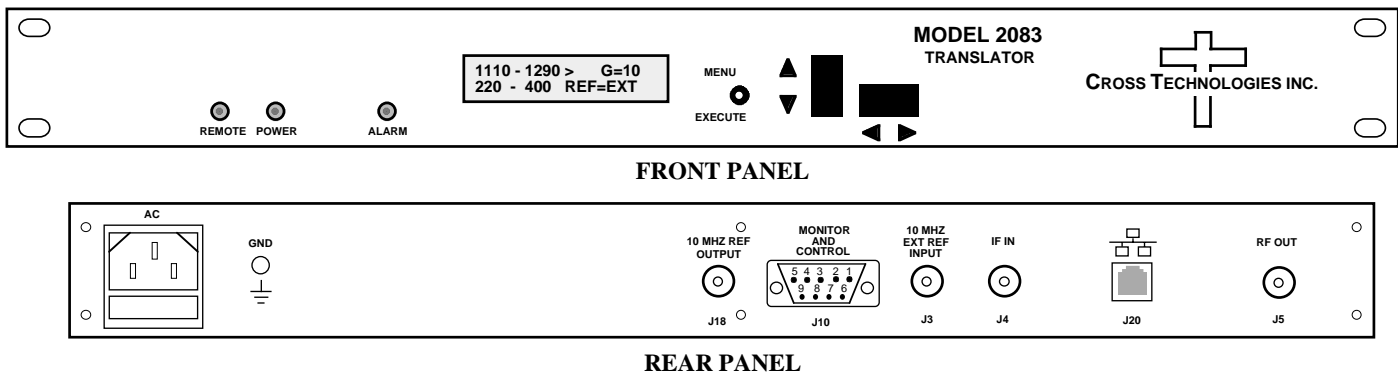


FIGURE 1.1 2083-1304 Front and Rear Panels

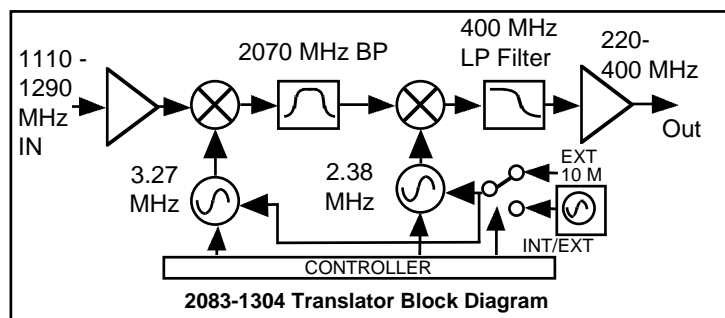


FIGURE 1.2 2083-1304 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2083-1304 Translator Specifications*					
Input Characteristics					
Input Impedance/RL	50Ω / 12 dB				
Frequency	1110 - 1290 MHz				
Input Level	-30 to -10 dBm				
Input, maximum no damage	+15 dBm				
Output Characteristics					
Impedance/RL	50Ω / 12 dB				
Frequency	1110 - 1290 MHz				
Output Level, Range	-30 to -10 dBm				
Output 1 dB Compression	0 dBm				
Channel Characteristics					
Gain at F_c	0 to +20 ±2 dB, Selectable in 1 ± 1 dB steps				
Frequency Response	±1.5 dB, 180 MHz bandwidth; ± 0.5 dB, any 40 MHz Increment				
Intermodulation	<-45 dBC for two carriers at F_c ±2 MHz, each at -15 dBm out, max. Gain				
Spurious, In Band	>45 dBC signal dependent or independent at -10 dBm out, max. Gain				
Spurious, Out of Band	<-50 dBm, 0.1- 0.21 and 0.41 - 1.5 GHz				
Frequency Sense	Non-inverting				
Synthesizer Characteristics					
Frequency Accuracy	±1.0 ppm maximum over temperature (±0.01 ppm, Option H)				
Reference	10 MHz Internal; Internal/External				
Frequency Step	None, Fixed Frequency Translation				
10 MHz Level (In or Out)	3 dBm, ±3 dB, 75 ohms				
Phase Noise @ F(Hz) >	100 MHz	1 kHz	10 kHz	100 kHz	1 MHz
dBC/Hz	-65	-70	-80	-90	-110
Controls, Indicators					
Gain Selection	Direct Readout LCD; Manual or Remote Selection				
Power; Alarm; Remote	Green LED; Red LED; Yellow LED				
Remote	RS232C, 9600 baud (RS485, Ethernet Optional)				
Other					
RF In/RF Out Connector	BNC (Female), 50Ω				
10 MHz Connector (In & Out)	BNC (Female), 75Ω, works with 50 or 75 ohms				
Alarm / Remote Connector	DB9; No or NC contact closure on Alarm				
Size	19 inch, 1 RU Standard Chassis 1.75" high x 16.0" deep				
Power	100-240 ±10% VAC, 47- 63 Hz, 30 watts maximum				
*+10 to +40 degrees C; Specifications subject to change without notice					2021 Cross

Continued on page 5...

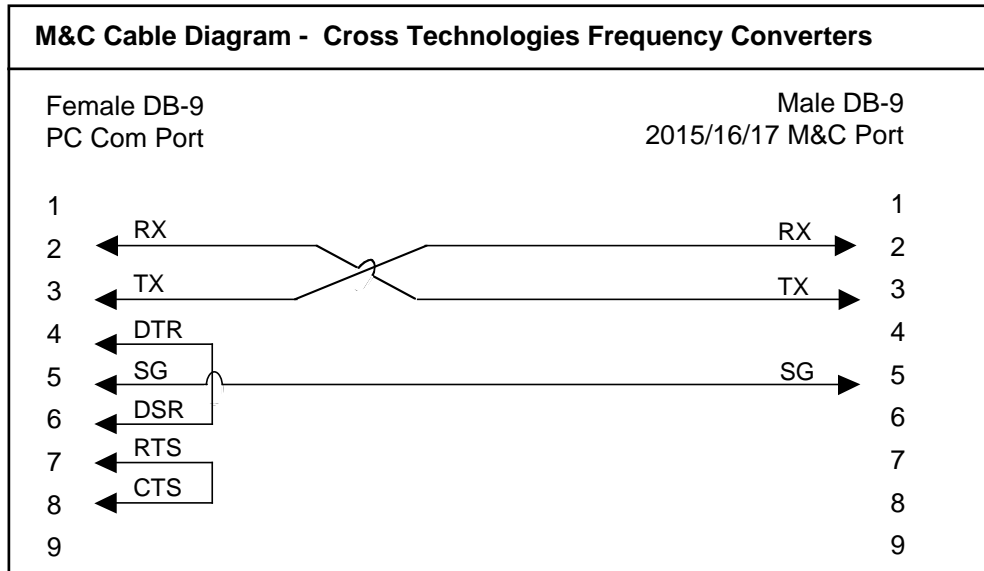
Continued from page 4...

Available Options	
H -	High Stability (± 0.01 ppm) Internal Reference
Comm. Interface/Standard RS232	
Q -	RS485 Remote Interface
W8 -	Ethernet; with Web Browser
W18 -	Ethernet; with Web Browser and SNMP
W28 -	Ethernet; with TCP/IP, Telnet
W828 -	W8 + W18 + W28
Connectors / Impedance	
B -	75 Ω BNC (RF), 75 Ω BNC (IF)
C -	50 Ω BNC (RF), 75 Ω BNC (IF)
Contact Cross Technologies for other options.	
2016 Cross Technologies, Inc.	

1.3 Monitor and Control Interface

A) Remote serial interface

Protocol: RS-232C, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.
(RS-232C, RS-422, or RS-485 - **option Q**)



Connector: Rear panel, DB-9 male

J10 Pinouts (RS-232C/422/485)	
Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

B) Status Requests - Table 1.1 lists the status requests for the 2083-1304 and briefly describes them.

* PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.

TABLE 1.1 2083-1304 Status Requests		
Command	Syntax *	Description
Alarm & Reference State	{aaSA}	Returns {aaSAxy} where: <ul style="list-style-type: none"> • X = 0 if no summary alarm, X=1 summary alarm • Y = 0 if unit is using internal 10MHz reference, • Y = 1 if unit is using external 10MHz reference,
10 MHz Reference Status (option -E1 only)	{aaSE}	Returns {aaSEx} where: <ul style="list-style-type: none"> • X = 1 if Internal 10MHz reference is selected • X = 2 if External 10MHz reference is selected • X = 3 if Auto 10MHz reference is selected (option -E1 only)
IP Address (W8, W18, W28 only)	{aaSi}	Returns {aaSixx.xxx.xxx.xxx} where: <ul style="list-style-type: none"> • x...x is the IP address
Subnet mask(W8, W18, W28 only)	{aaSs}	Returns {aaSsxx.xxx.xxx.xxx} where: <ul style="list-style-type: none"> • x...x is the subnet mask volume
Unit ID	{aaSU}	Returns {aaSUx...x} where: <ul style="list-style-type: none"> • x...x is the unit ID character string
Product Info	{aaSV}	Returns {aaSU2083-xxxx ver y.yy} where: <p>2083-xxxx is the model with options yyy is the firmware Rev.</p>
Get Gain Status	{aaSG}	Returns {aaSGxx} where: <p>xx = Gain (0 to 20 in 1 dB steps)</p>
Get External Reference Status	{aaSE}	Returns {aaSEx} where: <ul style="list-style-type: none"> • x = 0 if internal reference • x = 1 if external reference
Get Alarm Status	{aaSA}	Returns {aaSAx} where: <ul style="list-style-type: none"> • x = 0 if no alarm • x = 1 if alarm

C) Commands

Table 1.2 lists the commands for the 2083-1304 and briefly describes them.

After a command is sent the 2083 sends a return ">" indicating the command has been received and executed.

General Command Format - The general command format is {CND...}, where:

{ = start byte

C = 1 character, either C (command) or S (status)

N = 1 character command or status request

D = 1 character or more of data (depends on command)

} = stop byte

* PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.

Table 1.2 2083-1304 Commands		
Command	Syntax*	Description
Set Gain	{aaCGxx}	where : • xx = 2 characters • Range: 0 to +20 (0 dB to 20 dB, in 1 dB steps)
Enable External 10MHz	{aaCEx}	where x = : • 0 to select Internal 10MHz reference • 1 to select External 10MHz referece
Enable Remote	#	Just # sign
Disable Remote	{aaCRO}	{CR and zero}
Unit ID	{aaCU}x...x	Sets the unit ID character string to the value x...x (16 character max.)

2.0 Installation

2.1 Mechanical

The 2083-1304 consists of one RF/Controller PCB housed in a 1 RU (1 3/4 inch high) by 16 inch deep chassis. A switching, ± 12 , +24, +5 VDC power supply provides power for the assemblies. The 2083-1304 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2083-1304 is assembled.

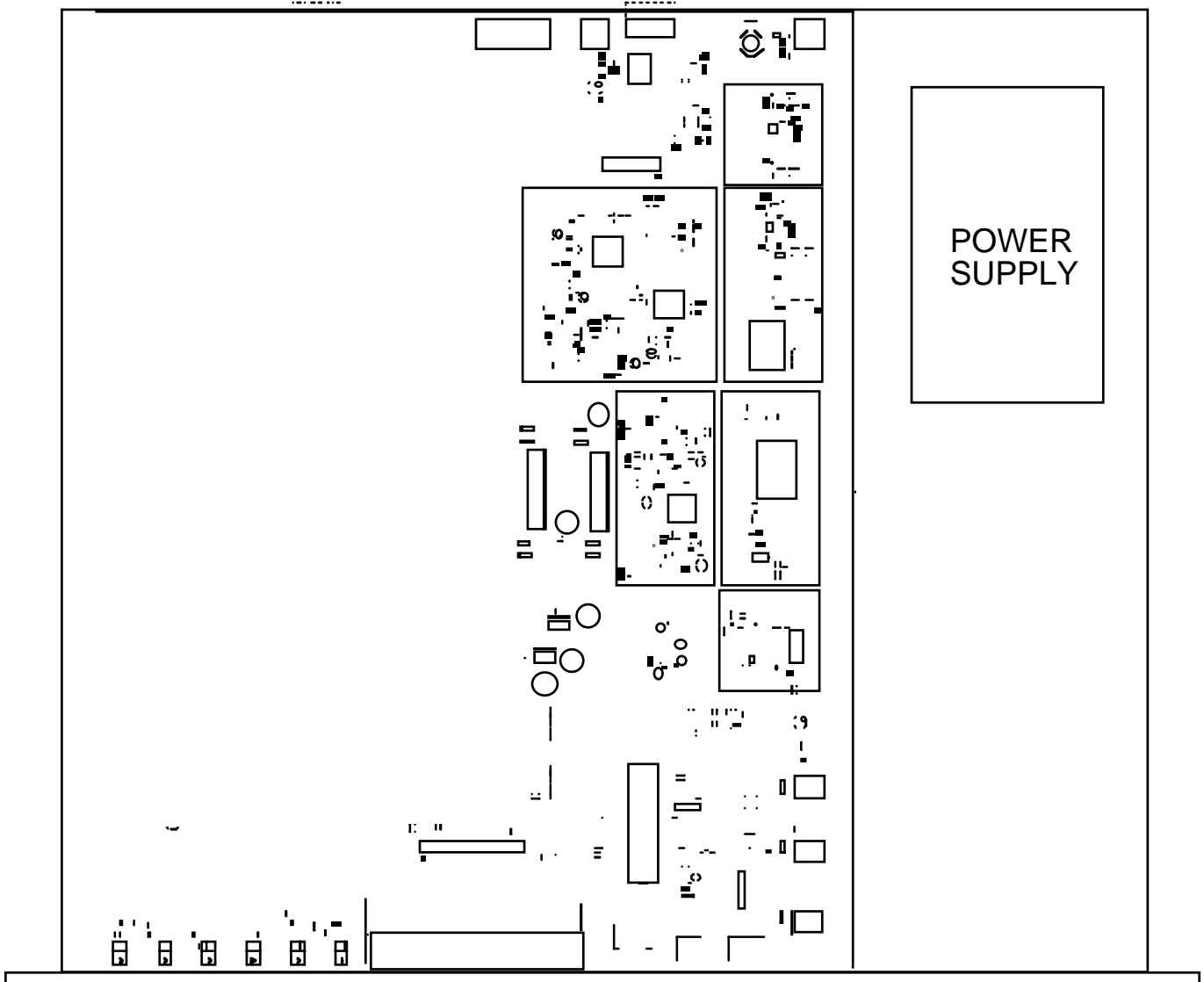


FIGURE 2.0 2083-1304 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

Figure 2.1 shows the input and output connectors on the rear panel.

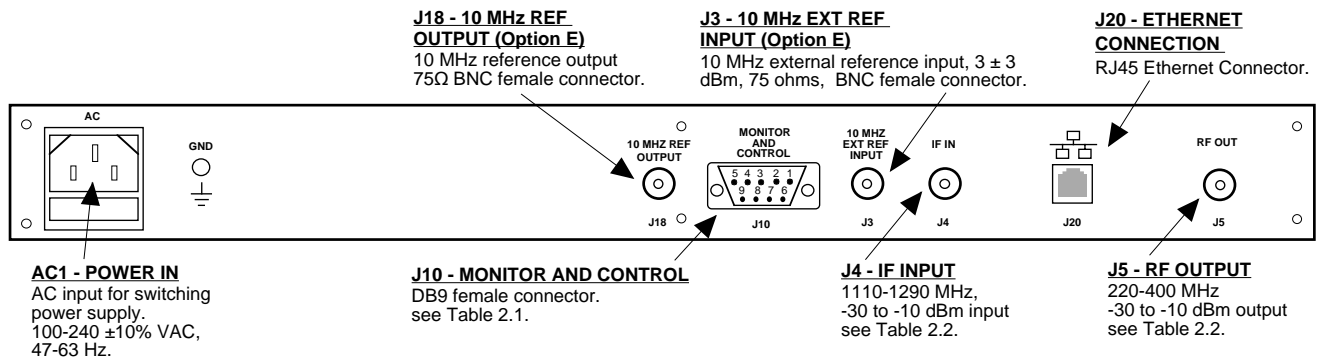


FIGURE 2.1 2083-1304 Rear Panel I/O's

TABLE 2.1 J10 Pinouts*	
Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

TABLE 2.2 Input/Output Connector Options		
Option	Input	Output
B	BNC, 75Ω	BNC, 75Ω
C	BNC, 50Ω	BNC, 75Ω

*Remote Serial Interface

Interface: DB-9 Male
Protocol: RS-232C (RS-232C/422/485,
Option Q), 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit.

2.3 Front Panel Controls and Indicators

Figure 2.2 shows the front panel controls and indicators.

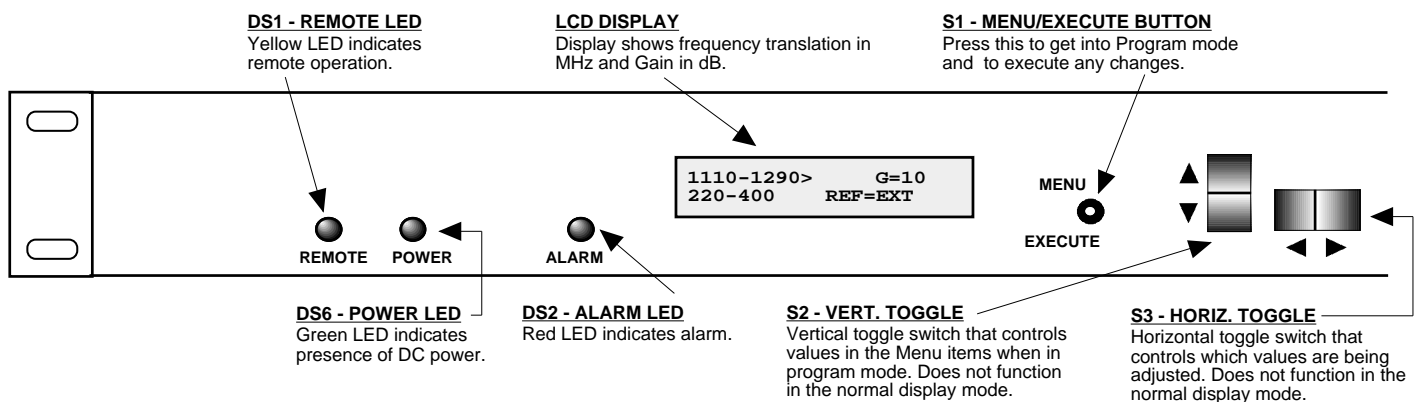


FIGURE 2.2 2083-1304 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2083-1304, Frequency Translator Section

1. Connect a -30 dBm to -10 dBm signal to IF IN, J2 (Figure 2.1)
2. Connect the RF OUT, J5, to the external equipment
3. Connect 100-240 \pm 10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Set the gain for 0 to +20 dB. Make sure the output stays within -30 to -10 dBm with the gain selected and the input level provided. (See Section 2.5 Menu Settings).
5. Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
6. AC Fuse - The fuse is a 5 mm X 20 mm, 2 amp slow blow (Type T) and is inserted in the far slot in the drawer below the AC input as shown in Figure 2.3. There is a spare fuse in the near slot.
If a fuse continues to open, the power supply is most likely defective.

2.4.2 External 10 MHz Reference Operation

The External Reference Option is required if the unit is to synch to a 10 MHz reference from an *external* source. The unit will still have an internal 10 MHz reference as a ‘back-up’ should the external reference be removed or fail. Described below are the two (2), 10 MHz External Reference Options, Option E & E1.

Option E

Internal Reference Mode

When the internal reference mode is selected, the unit's internal 10 MHz reference will become the ‘primary’ source and the unit’s synthesizers will lock to this internal 10 MHz reference. The unit will ignore any external 10 MHz signal present on the external reference input (J13). The unit will also buffer the internal 10 MHz signal and provide it on the Reference Out connector (J14) at +3 dBm, +/- 3 dB.

External Reference Mode

When the external reference mode is selected, the external 10 MHz reference (received on J13) will become the ‘primary’ source and the unit’s synthesizers will lock to this external 10 MHz reference. The unit *must* have a 10 MHz signal connected to the external reference input (J13) on the rear panel. The external 10 MHz signal must be +3 dBm, +/- 3 dB. The unit will also buffer the external 10 MHz signal and provide it on the Reference Out connector (J14) at +3 dBm, +/- 3 dB.

NOTE: There is no “auto-detect” capability in Option E. [See Option E1 below if this capability is required.] If the External Reference Mode is selected and the external reference fails or is removed, the unit will ALARM, but it will NOT automatically switch to the internal reference. The user will be required to manually select Internal Reference Mode (via the front panel LCD or Remote M&C) for the *internal* 10 MHz reference to become the ‘primary’ source for the unit.

Once the external 10 MHz reference is restored (on J13), the user must again manually (via the front panel LCD or Remote M&C) reselect External Reference Mode for the *external* 10 MHz reference to become the ‘primary’ source.

L-band units with option E also have the ability to ‘insert’ the (internal or external) 10 MHz signal that has been buffered (as described above) on the center pin of the L-band (RF) connector(s).

Option E1

Units with option E1 operate as described above but also have an Auto mode. When in auto mode the unit will detect and select the external 10 MHz signal if it is present and at least +3 dBm. If the external 10 MHz signal falls below 1 dBm (+/- 1 dB) the unit will automatically switch to the internal 10 MHz reference. The reference out connector (J14) provides a buffered rendition of the selected 10 MHz signal at +3 dBm, +/- 3 dB.

Units with option E1 do not have the ability to insert a buffered rendition of the selected 10 MHz signal on the center pin of the (RF) connector.

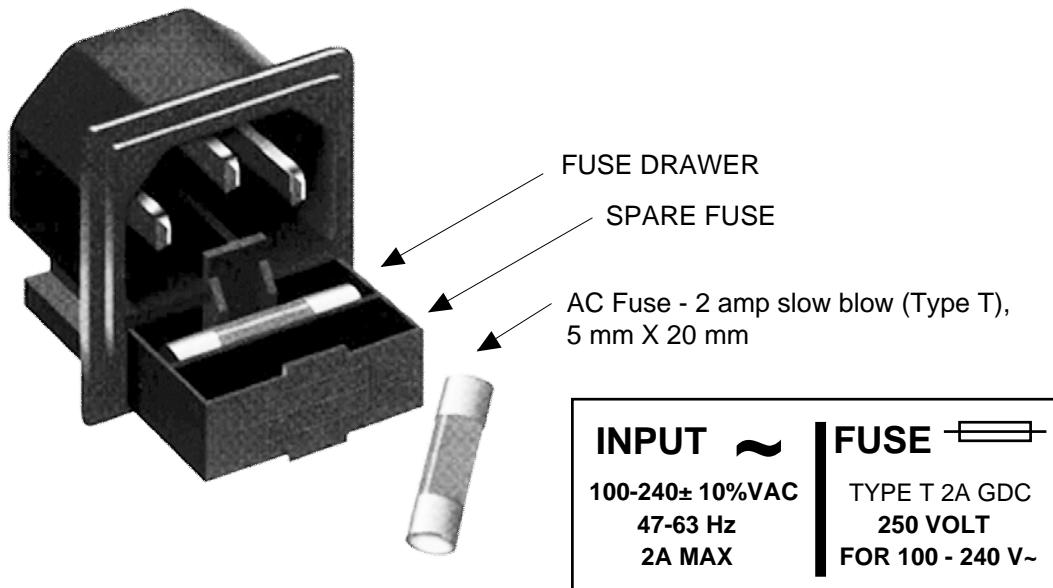


FIGURE 2.3 Fuse Location and Spare Fuse

2.5 Menu Settings

2.5.1 Functions

This section describes operation of the front panel controls. There are three operator switches, the LCD display and alarm indicator LEDs. All functions for the equipment are controlled by these components. The functions are (see Figure 2.4):

Power Up

Normal Display

- Menu 1** Gain (0 to +20, 1dB steps)
- Menu 2** Set Unit to Remote Operation
- Menu 3** Set Remote (Option Q, Option W8, Option W18, or Option W28)
- Menu 4** Select 10 MHz Reference (Option -E)

Save Menu When “R” is selected in any above menu, or when the end is reached (after Menu 8)

Alarm indications appear on the LEDs (see Figure 2.2).

All program changes must start with the operation of the Menu/Execute switch and must also end with the operation of the Menu/Execute switch verified by the “Save Settings?” Menu. If this sequence is not followed, none of the changes will take effect. If programming is initiated and no operator action takes place for approximately 30 seconds (before the final press of the Menu/Execute switch) the display will revert to its previous status and you will need to start over.

2.5.2. Power On Settings

NOTE: THE LAST STATUS OF A UNIT IS RETAINED EVEN WHEN POWER IS REMOVED. WHEN POWER IS RESTORED, THE UNIT WILL RETURN TO IT'S PREVIOUS SETTINGS.

When power is first applied, the LCD display goes through three steps.

1. The LCD goes black to show all segments are functioning.
2. The Model and Software version will be displayed.

```
2083-1304E1W8  
Rev. 1.00
```

3. The present frequency and gain of the upconverter is shown.

```
1110-1290    G=10  
220-400     REF=EXT
```

The unit is now operational and ready for any changes the operator may desire.

2.5.3 Control Switches

1. Menu/Execute - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.
2. Horizontal Switch - This switch is mounted so its movement is horizontal and moves the cursor left or right.
3. Vertical Switch - This switch is mounted so its movement is vertical and has two functions:
 - a. During gain changes, the vertical movement will raise or lower the number in the direction of the arrows.
 - b. For other functions such Remote on/off, the vertical switch will alternately turn the function on or off regardless of the direction operated.

2.5.4 Gain Changes

When you get to this menu note that the gain changes will be made as you make them but if you do not wish to save the changes you have made, scroll to “**R**” and push the menu/Execute switch and select “**NO**” in the “**SAVE SETTINGS?**” window or **do not press the Menu/Execute switch**; simply do nothing for approximately 30 seconds, and the system will return to the normal operating mode.

NOTE: CHANGES TAKE PLACE ON GAIN IMMEDIATELY BUT DO NOT GET SAVED UNTIL YOU GO TO THE SAVE MENU AND INDICATE YOU WANT TO SAVE THE CHANGES.

Press the Up/Down switch to change the gain in 1 or 10 dB steps and then push the Menu/Execute switch to get to the Gain setting:

G= + <u>1</u> 0	R
-----------------	---

By using the horizontal rocker switch the cursor can be moved left or right.

G= +1 <u>0</u>	R
----------------	---

Pressing the Up/Down switch down will toggle the display digit selected until you have the desired gain.

NOTE: THE GAIN WILL BE CHANGED AS YOU ADJUST THE NUMBERS. HOWEVER, THE VALUE WILL NOT BE STORED UNTIL YOU INDICATE YES IN THE SAVE SETTINGS WINDOW. DO NOT SET A GAIN THAT WOULD EXCEED -10 dBm OR HAVE LESS THAN -30 dBm OUTPUT LEVEL.

When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to “**R**”, push the Menu/Execute switch to get to:

SAVE SETTINGS?	<u>Y</u> N
----------------	------------

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.

Figure 2.4 gives the menu items and how to make changes

2.5.5 Alarm Indications

An alarm condition will occur if any local oscillator phase lock loop (PLL) comes out of lock. The Remote LED will light when you select the Remote mode.

2.5.6 Menu Display & Sequences (Option E1)

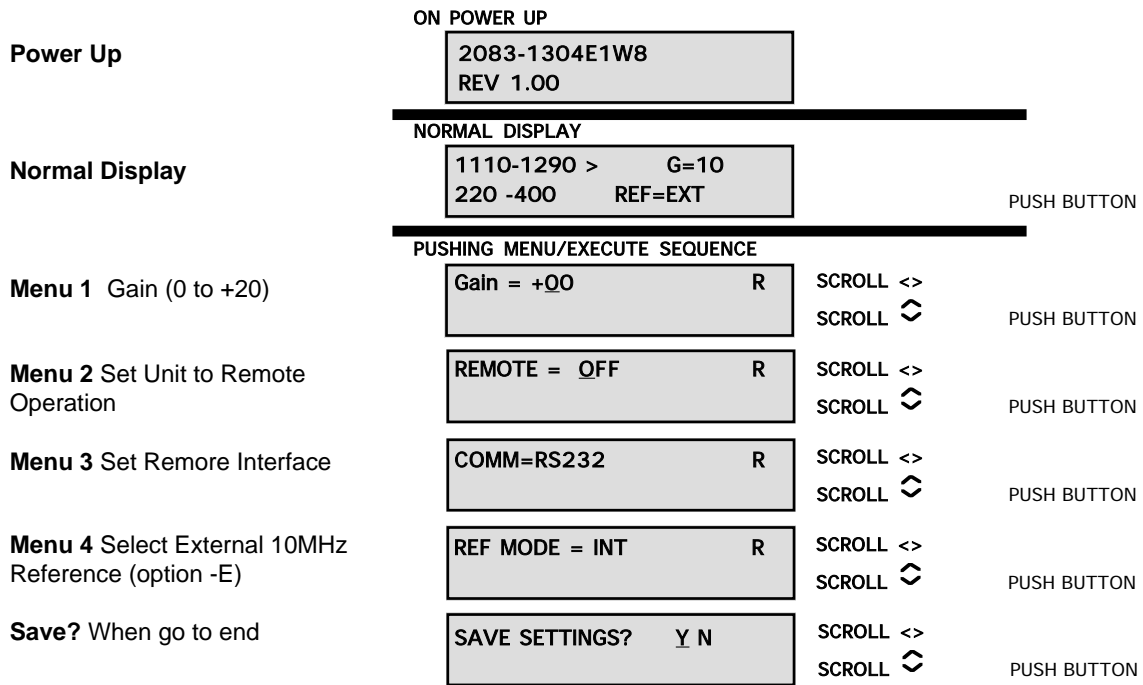
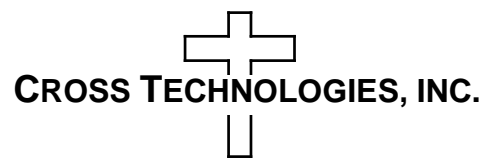


FIGURE 2.4 Menu Display and Sequences

3.0 Environmental Use Information

- A. Rack-Mounting** - To mount this equipment in a rack, please refer to the installation instructions located in the user manual furnished by the manufacturer of your equipment rack.
- B. Mechanical Loading** - Mounting of equipment in a rack should be such that a hazardous condition does not exist due to uneven weight distribution.
- C. Elevated Operating Ambient Temperature** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra (Maximum Recommended Ambient Temperature).
- D. Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Additional space between units may be required.
- E. Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits could have on over current protection and supply wiring. Appropriate consideration of equipment name plate rating should be used when addressing this concern.
- F. Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connection to the Branch (use of power strips).
- G. Top Cover** - There are no serviceable parts inside the product so, the Top Cover should not be removed. If the Top Cover is removed the ground strap and associated screw **MUST BE REINSTALLED** prior to Top Cover screw replacement. **FAILURE TO DO** this may cause **INGRESS** and/or **EGRESS** emission problems.



6170 Shiloh Road
Alpharetta, Georgia 30005

(770) 886-8005
FAX (770) 886-7964
Toll Free 888-900-5588

WEB www.crosstechnologies.com
E-MAIL info@crosstechnologies.com

Printed in USA