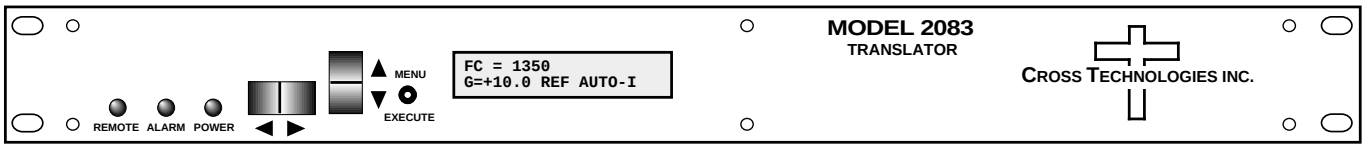
Instruction Manual

Model 2083-1919-02

Translator

June 2018, Rev. A



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

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INSTRUCTION MANUAL

MODEL 2083-1919-02 Block Translator

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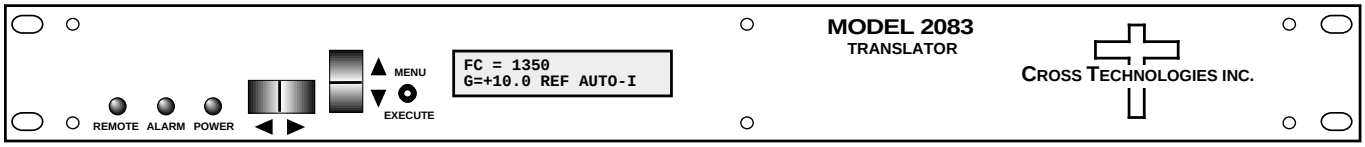
MODEL 2083-1919-02 Block Translator

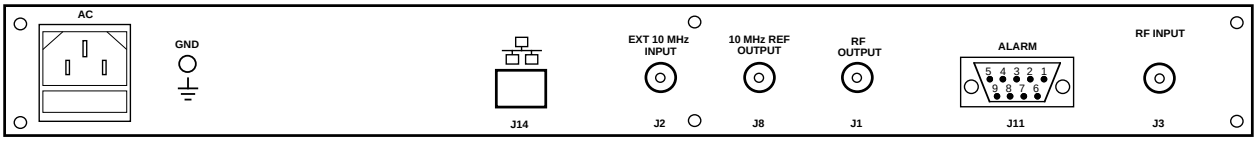
1.0 General

1.1 Equipment Description

2083-1919-02 Block Translator - The 2083-1919-02 Block Translator inverts a ± 250 MHz block in the 0.95-1.95 GHz band with low group delay and flat frequency response. The 0.95-1.95 GHz input is mixed with a synthesized local oscillator (LO) signal, first to a ± 250 MHz block at Fc center frequency with a low side LO (Fc - Fin), and then to the ± 250 MHz block with a high side LO (Fc + Fin) so the output center Frequency (Fout) is the same center frequency as the input (Fin) with spectrum inversion. The gain can be set for 0 to +30 dB in 0.5±0.5 dB increments. The output translation can be adjusted in 1 MHz steps for a 1.2 - 1.7 GHz center frequency. Multifunction switches select the Gain, the translation center frequency and internal or External 10 MHz reference which appear on the LCD display and can be adjusted remotely. Front panel LEDs provide indication of DC power (green), PLL alarm (red), and remote operation (yellow). Connectors are Type F female for RF input and output. The unit is powered by a 100-240 ±10% VAC, 47-63 HZ input power supply and housed in a 1 3/4" X 19" X 16" rack mount chassis.



FRONT PANEL - 2083-1919-02



REAR PANEL - 2083-1919-02

FIGURE 1.1 2083-1919-02 Front and Rear Panels (shown with optional Ethernet)

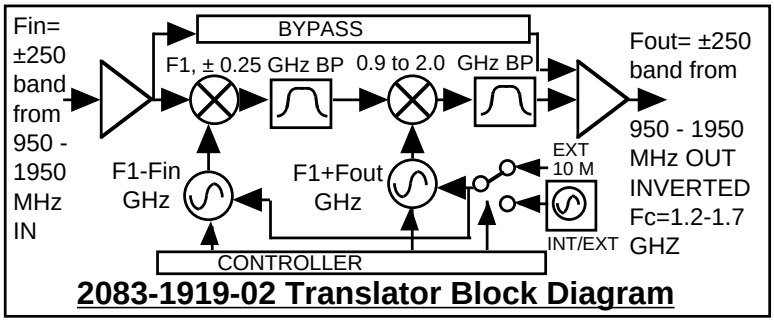


FIGURE 1.2 2083-1919-02 Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2083-1919-02 Block Translator Specifications*						
Input Characteristics						
Input Impedance/RL	75Ω / 12 dB					
Frequency	950 - 1950 MHz					
Input Composite Level	-50 to -30 dBm					
Input, maximum no damage	+10 dBm					
Output Characteristics						
Impedance/RL	75Ω / 12 dB					
Frequency	Fc = 1.2 - 1.7 GHz,±250 MHz					
Output Composite Level	-40 to -20 dBm					
Output 1 dB Compression	-20 dBm, at Maximum gain					
Channel Characteristics						
Gain	0 to +30 dB, ±2 dB, Selectable in 0.5 ± 0.5 dB steps, at Fc					
Frequency Response	±2.0 dB, ± 0.25 GHz bandwith; ± 0.5 dB, any 40 MHz Increment					
Spurious, In Band	<50 dBC in band, signal dependent and signal independent; See NOTE 1*					
Spurious, Out of Band	<-30 dBC, 0.5 - 0.94 GHz and 1.96 - 2.5 GHz; See NOTE 1*					
Frequency Sense	Inverting					
*NOTE 1: dBc is relative to the COMPOSITE Output Level						
Synthesizer Characteristics						
Translation; Accuracy	±0.0 1 ppm					
Reference	10 MHz Internal; Internal/External Selection					
Frequency Step	1 MHz; Fin = Fout Center Frequency Adjustment, 1.2 - 1.7 GHz					
Phase Noise @ F(Hz) >	100 MHz	1 kHz	10 kHz	100 kHz	1 MHz	
dBC/Hz	-70	-70	-80	-90	-100	
Controls, Indicators						
Frequency Translation	Direct Readout LCD; Manual or Remote Selection					
Gain (MGC)	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	Type F (Female)					
Alarm / Remote Connector	DB9; No or NC contact closure on Alarm					
Size	19 inch, 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					2017 Cross Technologies, Inc.	

Continued on page 5...

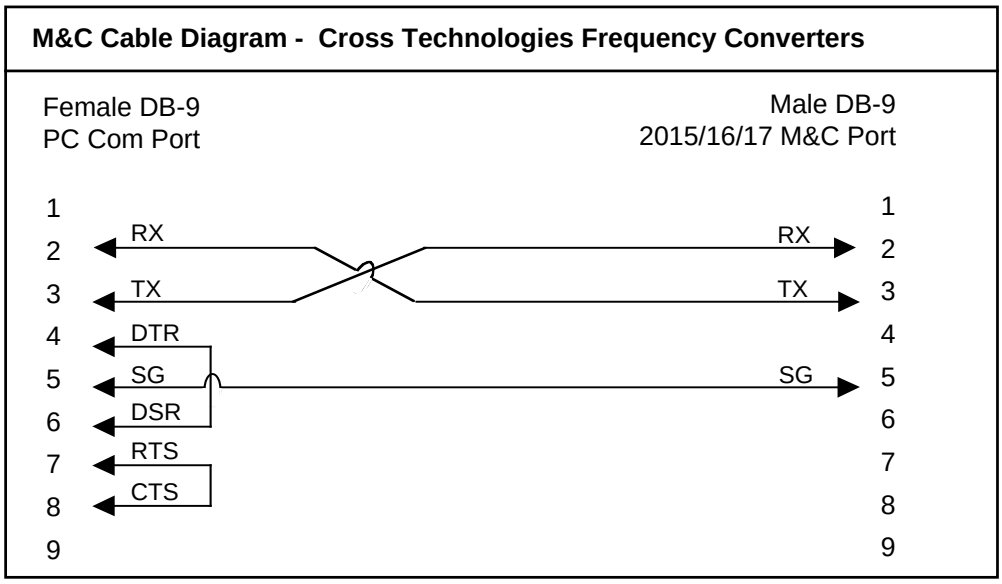
Continued from page 4...

Available Options	
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
Connectors / Impedance	
B -	75Ω BNC (RF IN), 75Ω BNC (RF OUT)
D -	50Ω BNC (RF IN), 50Ω BNC (RF OUT)
NN -	50Ω N (RF IN), 50Ω N (RF OUT)
Contact Cross Technologies for other options.	2017 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 2083-1919--02 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 2083-1919-02 Status Requests

Command	Syntax *	Description
Input Frequency	{aaSK}	Returns {aaSKxxxx} where:
		• xxxx is the input center frequency.
		Example: If xxxx is 1242, then the input center frequency is 1242 MHz.
Output Frequency	{aaSF}	Returns {aaSFxxxx} where:
		• xxxx is the output center frequency.
		Example: If xxxx is 1242, then the output center frequency is 1242 MHz.
Tuning Mode	{aaSM}	Returns {aaSMx} where:
		• x = 0 in Independent Input/Output Frequency Tuning mode
		• x = 1 if in Tracking mode (Frequency Out = Frequency In).
Gain	{aaSG}	Returns {aaSGxxx} where:
		• xxx = RF gain in dB range: -100 to 200
		example: if xxx=155 then the unit's gain is set to 15.5 dB.
Spectrum Invert/Bypass mode	{aaSB}	Returns {aaSBx} where:
		• x = 0 if Spectrum Inversion is bypassed
		• x = 1 if Spectrum Invert is enabled.
Alarm Status	{aaSA}	Returns {aaSAx} where:
		• x = 1 if summary alarm, 0 if normal
Model Number & Rev.	{aaSV}	Returns {aaSV2083-1919-02x.xx} or {aaSV2083-1919-02 x.xx} where:
		• x.xx is the unit's firmware version.
10 MHz Reference Mode	{aaSE}	Returns {aaSEx} where:
		• x = 0 if Internal Reference Mode is selected
		• x = 1 if External Reference Mode is selected
		• x = 2 if Auto Reference Mode is selected
10 MHz Reference Status	{aaSI}	Returns {aaSIx} where:
		• x = 0 if Internal Reference is active
		• x = 1 if External Reference is active

C) Commands

Table 1.2 lists the commands for the 2083-1919-02 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 2083-1919-02 Commands

Command	Syntax*	Description
Set Input Frequency	{aaCKxxx}	where :
		• xxx = 1200 - 1700, 1 MHz Steps
Set Output Frequency	{aaCFxxx}	where :
		• xxx = 1200 -1700, 1 MHz Steps
Set Tuning Mode	{aaCMx}	where :
		• x = 0 for independent Input/Output Frequency Tuning
		• x = 1 for Tracking Mode (Frequency Out = Frequency In)
Set Gain	{aaCGxxx}	where :
		• xxx = 100 to 200 (-10.0 to 20.0 dB in 0.5 dB steps)
		example: {CG155} sets the gain to 15.5 dB steps)
Set Spectrum Invert/Bypass	{aaCBx}	where:
		• x = 0 to bypass spectrum inversion
		• x = 1 to enable spectrum inversion
		Note: When Spectrum Invert is bypassed the input signal is routed
		through the attenuator, then directly out. Therefore frequency
		tuning is not available in this mode.
Set Remote On	#	Just # sign
Set Remote Off	{aaCRO}	
Set 10 MHz Reference Mode	{aaCEx}	where :
		• x = 0 to Select Internal Reference Mode
		• x = 1 to Select External Reference Mode
		• x = 2 to Select Auto Reference Mode

2.0 Installation

2.1 Mechanical

The 2083-1919-02 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 2083-1919-02 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2083-1919-02 is assembled.

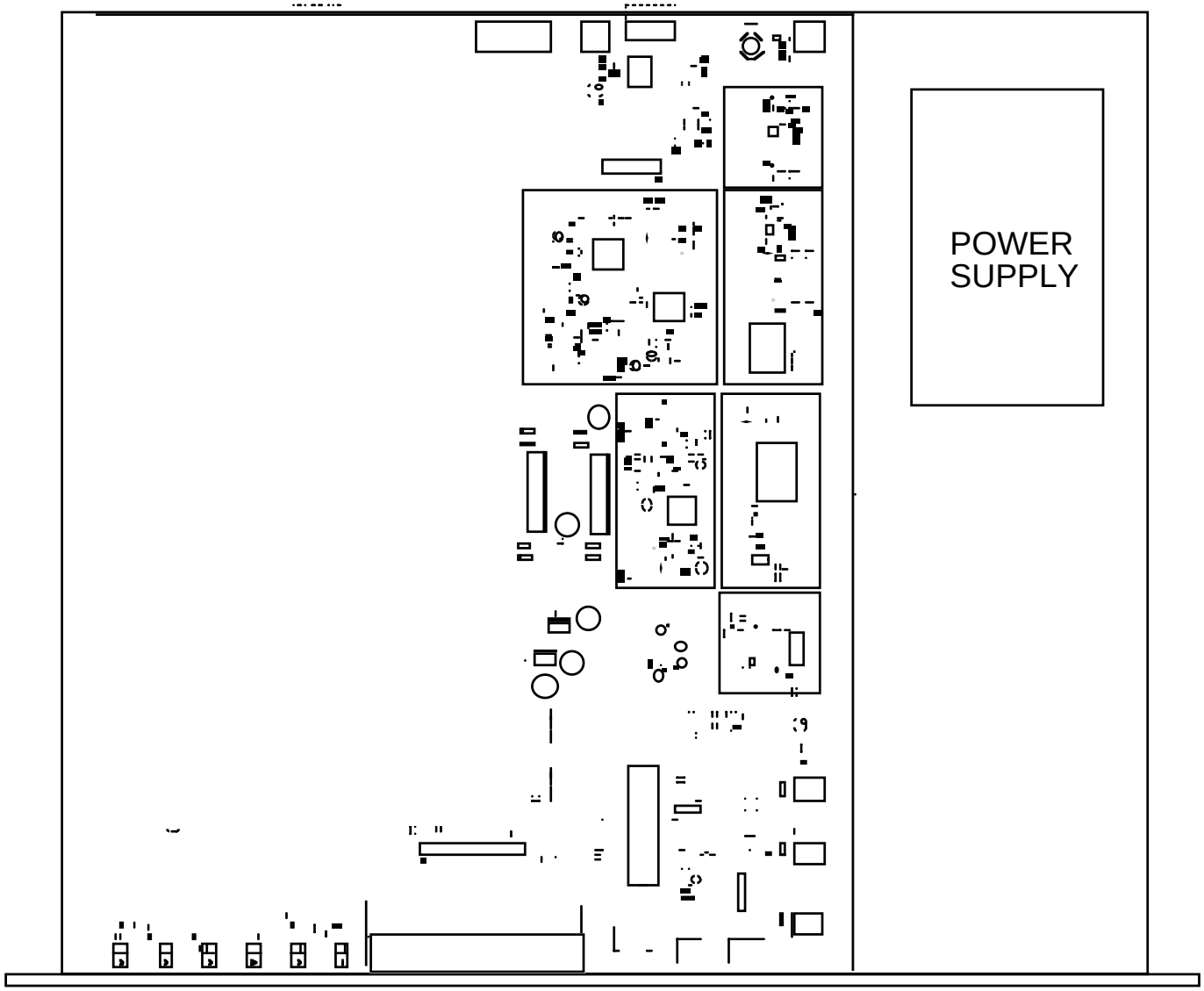


FIGURE 2.0 2083-1919-02 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

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

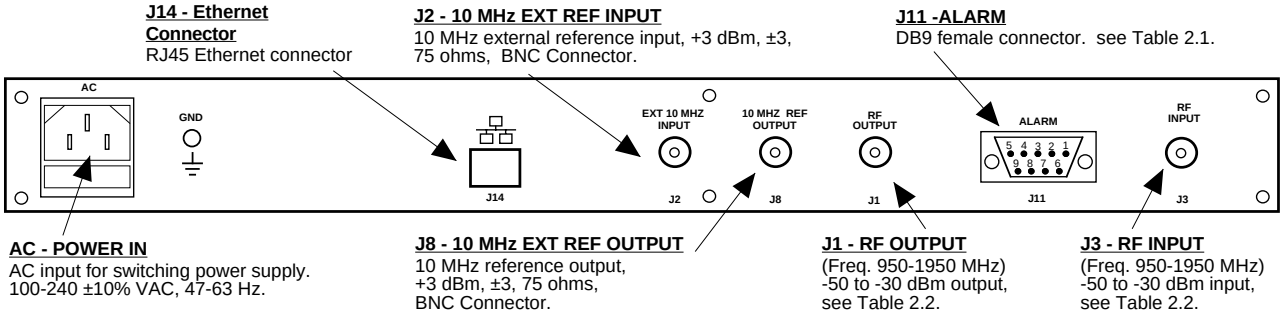


FIGURE 2.1 2083-1919-02 Rear Panel I/O's

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
D	BNC, 50Ω	BNC, 50Ω
NN	N, 50Ω	N, 50Ω

***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.

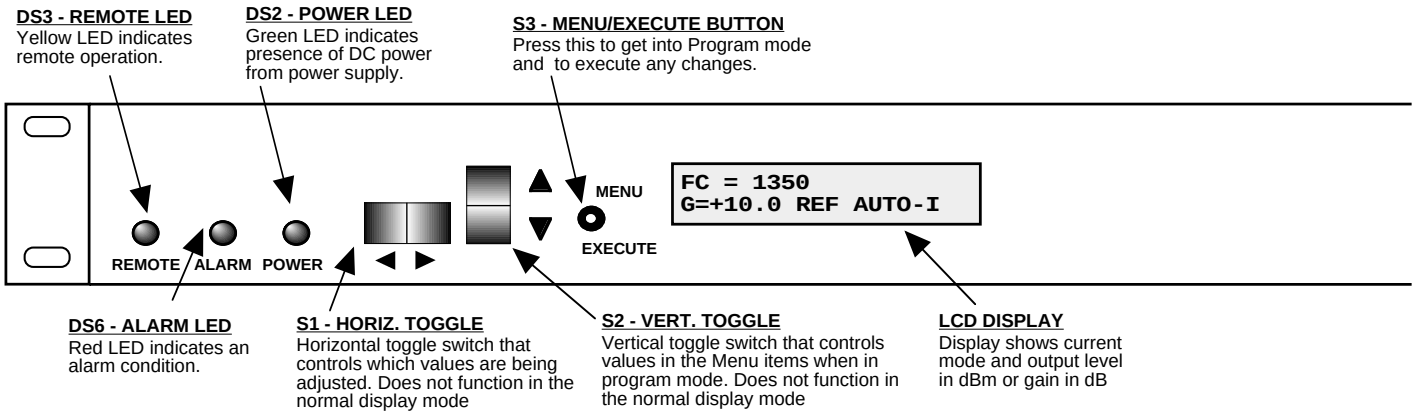


FIGURE 2.2 2083-1919-02 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2083-1919-02, Frequency Translator Section

1. Connect a -50 dBm to -30 dBm signal to RF IN, J3 (Figure 2.1)
2. Connect the RF OUT, J1, to the external equipment
3. Connect 100-240 ±10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Set the gain for -10 to +20 dB. Make sure the output stays within -50 to -30 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.

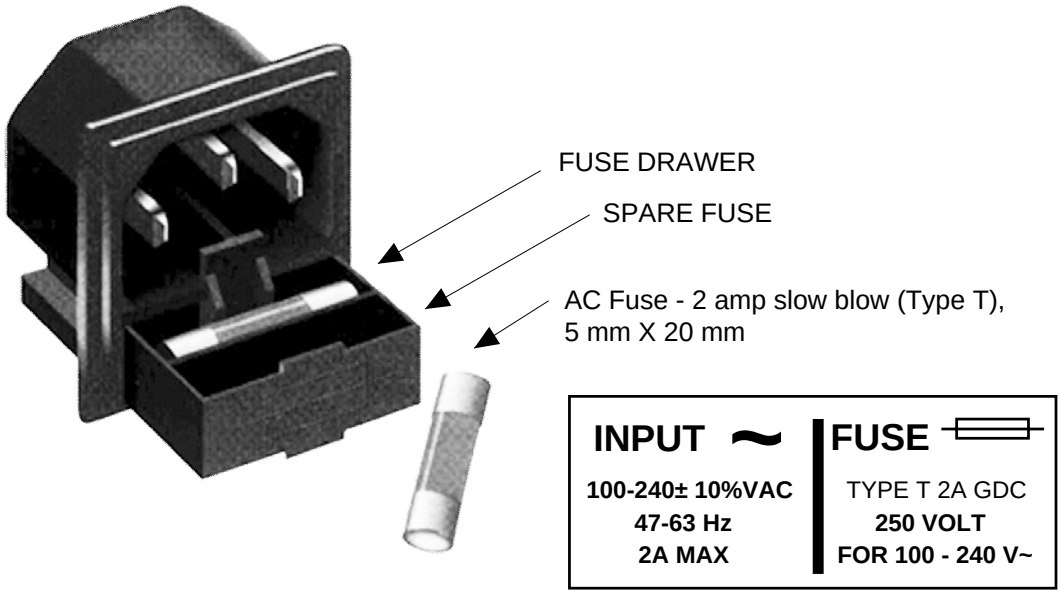


FIGURE 2.3 Fuse Location and Spare Fuse

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	Set Spectrum Invert/Bypass
Menu 2	Set Tuning Mode
Menu 3	Set Frequency In
Menu 4	Set Frequency Out
Menu 5	Set Gain
Menu 6	Set Reference Mode
Menu 7	Set Remote
Menu 8	Set Remoe Interface (Option Q only)
Menu 9	Set RS-485 Address (Option Q only)
Save Menu	When “R” is selected from any above menu or at the end.

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

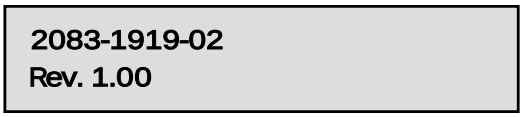
All program changes must start with the operation of the Menu/Execute switch and must also end with the operation of the Menu/Execute switch verified by the “Save Settings?” Menu. If this sequence is not followed, none of the changes will take effect. If programming is initiated and no operator action 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 OPERATING PARAMETERS OF A UNIT ARE 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.



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

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

2.5.3 Control Switches

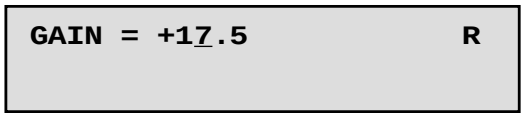
1. Menu/Execute - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.
2. Horizontal Switch - This switch is mounted so its movement is horizontal and moves the display cursor left or right.
3. Vertical Switch - 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/Level Changes

When you get to this menu note that 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: THE GAIN WILL CHANGE 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 -20 dBm OR HAVE LESS THAN -50 dBm OUTPUT LEVEL.

Press the Up/Down switch to change the gain in 0.5, 1, or 10 dB steps and then push the Menu/Execute switch to get to the Save Settings Menu:



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:

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

Figure 2.5 (page 12) gives the menu items and how to make changes.

2.5.6 10 MHz Reference Mode Operation

Internal Mode: The unit uses its own built-in 10 MHz OCXO. The Internal Reference is present on the Reference Output Connector, J8. REF = INT appears on the front panel display.

External Mode: The unit uses a 10 MHz Reference that is connected to the External Reference Input, J2. REF = EXT appears on the front panel display. The External 10 MHz Reference level must be +3dBm, ±3dB. If the External 10 MHz signal does not meet the unit's specified parameters then the unit will not function properly. The External Reference is present on the Reference Output connector, J8.

Auto Mode: The unit defaults to the External 10 MHz Reference as long as the level meets the +3dBm, ±3dB specification. REF = AUTO - E appears on the front panel display where the -E indicates that the unit is using the External 10 MHz Reference. The External Reference is present on the Reference Output connector, J8.

If the external 10 MHz Reference signal level is less than -1dBm, the unit switches to Internal 10 MHz Reference. REF = AUTO -I appears on the front panel display where -I indicates that the unit is using the Internal 10 MHz Reference. The Internal 10 MHz Reference is present on the reference output connector, J8.

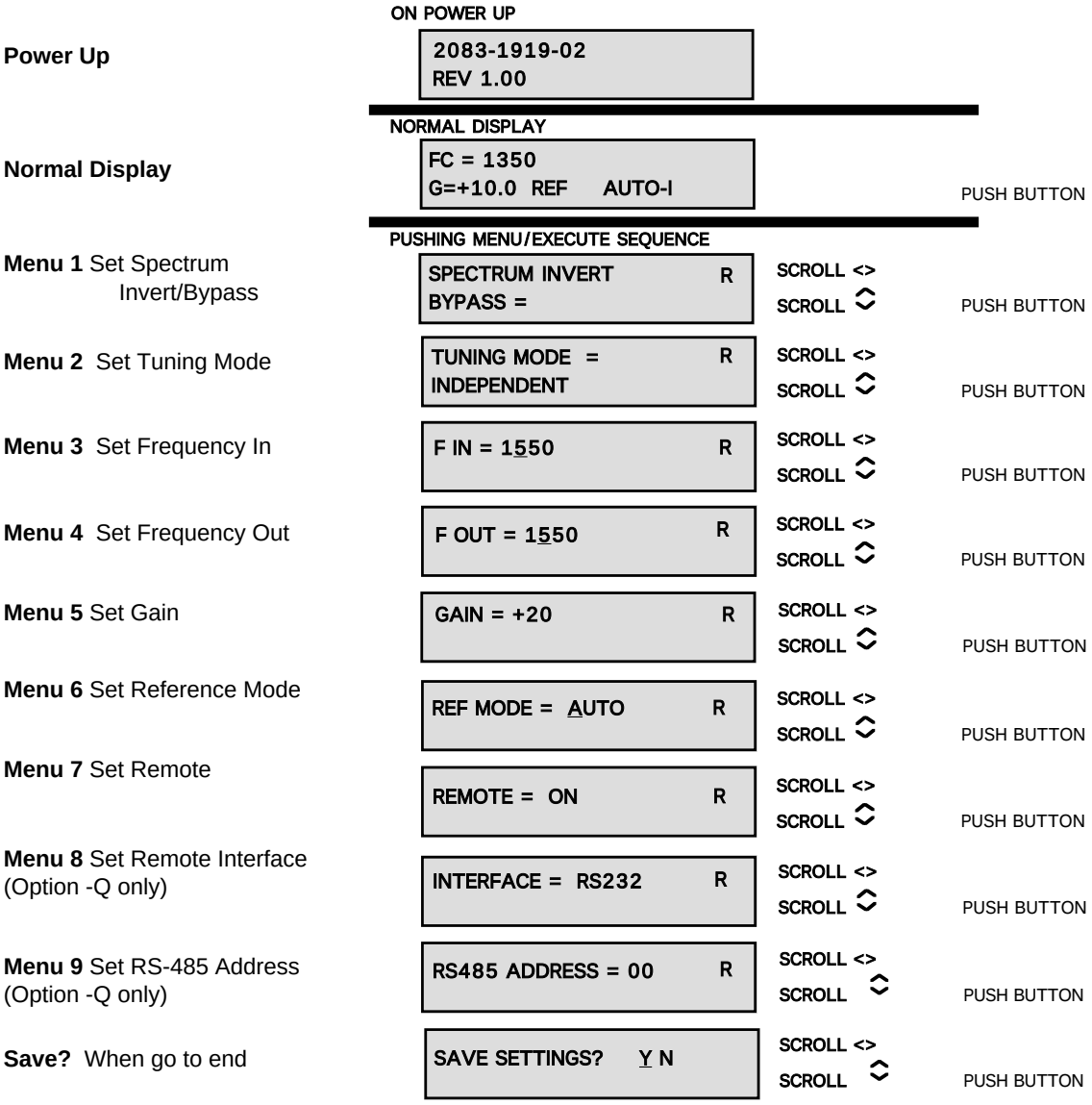


FIGURE 2.4 Menu Display and Sequences

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.

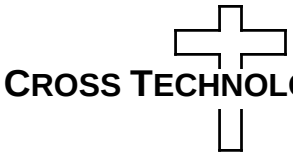
C. **Elevated Operating Ambient Temperature** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra (Maximum Recommended Ambient Temperature).

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.



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