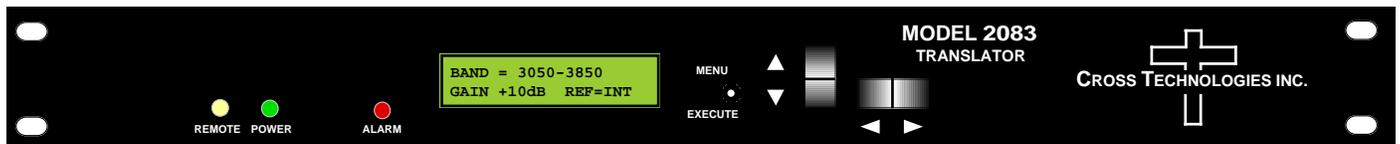


# Instruction Manual

# Model 2083-5018# Block Translator

April 2015, Rev. A



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.

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](http://www.crosstechnologies.com)  
E-MAIL [info@crosstechnologies.com](mailto:info@crosstechnologies.com)

# INSTRUCTION MANUAL

## MODEL 2083-5018# Block Translator

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
Warranty	2
<b>1.0 General</b>	<b>3</b>
1.1 Equipment Description	3
1.2 Technical Characteristics	4
1.3 Monitor & Control Interface	5
<b>2.0 Installation</b>	<b>8</b>
2.1 Mechanical	8
2.2 Rear I/O's	9
2.3 Front Panel Controls, Indicators	9
2.4 Operation	10
2.5 Menu Settings	11
<b>3.0 Environmental Use Information</b>	<b>16</b>

**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

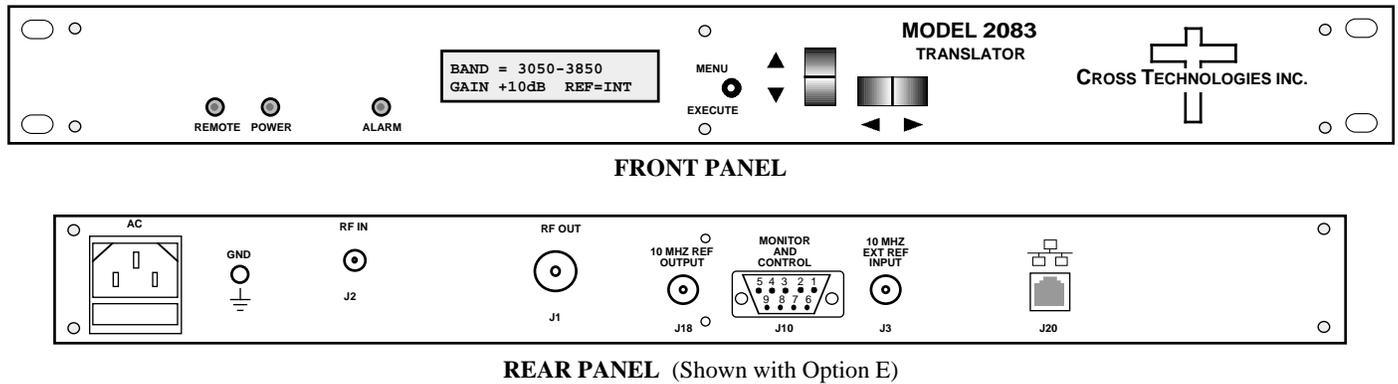
WEB [www.crosstechnologies.com](http://www.crosstechnologies.com)  
E-MAIL [info@crosstechnologies.com](mailto:info@crosstechnologies.com)

# MODEL 2083-5018# Block Translator

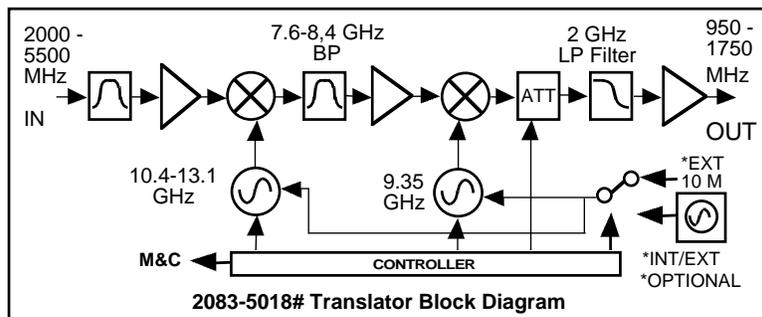
## 1.0 General

### 1.1 Equipment Description

**2083-5018# Block Translator** - The 2083-5018# Block Translator converts a 800 MHz block in the 2000-5500 MHz input to the 950-1750 MHz block with no spectrum inversion, low group delay and flat frequency response. The 2000-5500 MHz input is filtered and translated to the 950-1750 MHz block output using dual conversion. The gain can be set for 0 to +30 dB, in  $1 \pm 1$  dB steps. Multifunction switches select the Gain and the input band 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 SMA female for RF input and N female for the RF output and BNC female for the external 10 MHz reference input and 10 MHz reference output. The 10 MHz output connector contains either the internal or external 10 MHz reference signal. The unit is powered by a 100-240  $\pm 10\%$  VAC, 47-63 HZ input power supply and housed in a 1 3/4" X 19" X 16" rack mount chassis.



**FIGURE 1.1 2083-5018# Front and Rear Panels**



**FIGURE 1.2 2083-5018# Block Translator, Block Diagram**

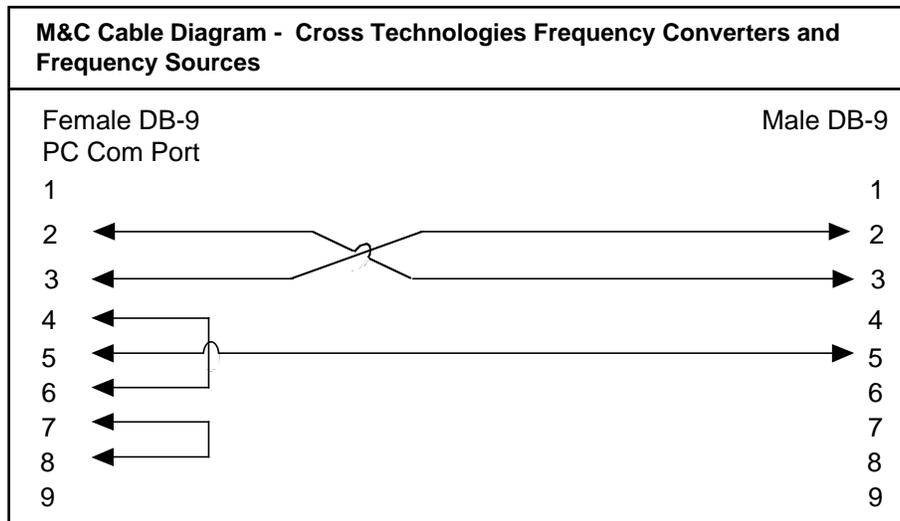
## 1.2 Technical Characteristics

<b>TABLE 1.0 2083-5018# Block Translator Specifications*</b>					
<b>Input Characteristics</b>					
Input Impedance/RL	50Ω/14 dB				
Frequency	2000 - 5500 MHz				
Input Level	-20 to -50 dBm				
Input, maximum no damage	+10 dBm				
<b>Output Characteristics</b>					
Impedance/RL	50Ω / 14 dB				
Frequency	950 - 1750 MHz				
Output Level	0 to -30 dBm				
Output 1 dB Compression	+10 dBm at maximum gain				
<b>Channel Characteristics</b>					
Gain, Maximum, Range	+30 dB, ±2 dB, adjustable from 0 to +30 dB in 1 ±1 dB steps				
Frequency Response	±1.5 dB, 800 MHz bandwidth; ±0.5 dB, 36 MHz increment				
Spurious, Inband dependent	< -50 dBC (<-55 typical) in band, signal dep., 950-1750 MHz out, at max. gain				
Spurious, Inband independent	< -55 dBC (<-60 typical) in band, signal indep., 950-1750 MHz out, at max. gain				
Group Delay, Maximum	0.015 ns/MHz <sup>2</sup> , Parabolic, 0.03ns/MHz, Linear, 1 ns ripple, 36 MHz BW				
Frequency Sense	Non-inverting				
<b>Synthesizer Characteristics</b>					
Frequency Stability	±0.01 ppm internal reference; external reference input				
Frequency Step	10 MHz minimum for Fc of 2.4 - 5.1 GHz				
10 MHz In/Out Level	3 dBm ± 3 dB				
<b>Phase Noise @ F(Hz) &gt;</b>	100 MHz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-60	-70	-80	-90	-100
<b>Controls, Indicators</b>					
Input Band Frequency	Direct Readout LCD, Manual or Remote Selection				
Gain	Direct Readout LCD, Manual or Remote Selection				
Power, Alarm, Remote	Green LED; Red LED; Yellow LED				
Remote	RS232C, 9600 baud, W8, W18, W28 Ethernet, Optional				
<b>Other</b>					
RF In/RF Out Connector	SMA (female) / N (female)				
10 MHz Connectors	BNC (female); 75Ω, works with 50 or 75 ohms				
Alarm/Remote Connector	DB9 (female); 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				
<b>Available Options</b>					
W31 -	External Temperature 0C to +50C				
<b>Communication Interface</b>					
Q -	Standard/RS232				
Q -	RS485 Remote Interface				
W8 -	Ethernet with Web Browser Interface				
W18 -	Ethernet with Web Browser Interface and SNMP				
W28 -	Ethernet with TCP/IP, Telnet®				
<b>Contact Cross Technologies for other options.</b>					
*+10°C to +40°C; Specifications subject to change without notice.				© 2014 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 2083-5018# 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.

<b>TABLE 1.1 2083-5018# Status Requests</b>		
<b>Command</b>	<b>Syntax *</b>	<b>Description</b>
Input Frequency Band	{aaSF}	Returns {aaSFxxxx} where: <ul style="list-style-type: none"> <li>• xxxx = the center frequency of the input band</li> </ul>
Output Gain	{aaSG}	Returns {aaSGxxx} where: <ul style="list-style-type: none"> <li>• xxx = RF gain in dB range: 0 to +30</li> </ul>
Alarm Status	{aaSA}	Returns {aaSAx} where: <ul style="list-style-type: none"> <li>• x = 1 if summary alarm. 0 if no alarm</li> </ul>
Model Number & Rev.	{aaSV}	Returns {aaSV2083-5018#x.xx} where: <ul style="list-style-type: none"> <li>• x.xx is the unit's firmware version.</li> </ul>
10 MHz Reference Mode	{aaSE}	Returns {aaSEx} where: <ul style="list-style-type: none"> <li>• x = 0 if Internal Reference Mode is selected</li> <li>• x = 1 if External Reference Mode is selected</li> </ul>

### C) Commands

Table 1.2 lists the commands for the 2083-5018# 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

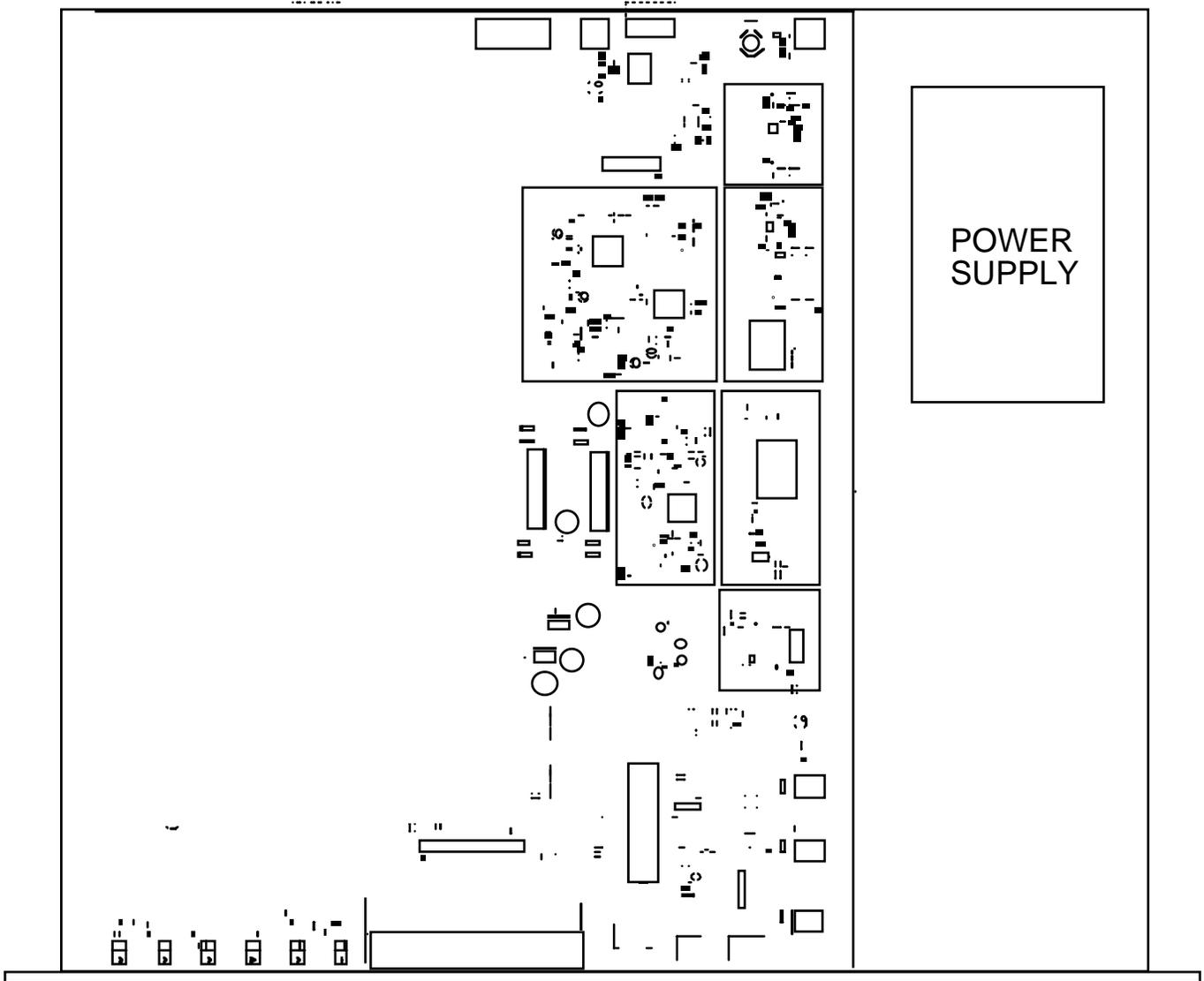
\* PLEASE NOTE: The two character {aa}(00-31) prefix, in the table below, should be used ONLY when RS-485, (OPTION-Q), is selected.

Table 1.2 2083-5018# Commands		
Set Input Frequency Band	{aaCFxxx}	where: <ul style="list-style-type: none"> <li>• xxx = center frequency of input band</li> <li>range = 2400 to 5100 MHz in 10 MHz steps</li> <li>example: {CF3100} sets the input frequency band to 2700 to 3500 MHz</li> </ul>
Set Output Gain	{aaCGxxx}	where : <ul style="list-style-type: none"> <li>• xxx = 0 to +30 in 1dB steps</li> </ul>
Set Remote On	#	Just # sign
Set Remote Off	{aaCRO}	
Set 10 MHz Reference Mode	{aaCEx}	where : <ul style="list-style-type: none"> <li>• x = 0 to Select Internal Reference Mode</li> <li>• x = 1 to Select External Reference Mode</li> </ul>

## 2.0 Installation

### 2.1 Mechanical

The 2083-5018# consists of one RF/Controller PCB housed in a 1 3/4" X 19" X 16" rack mount chassis. A switching,  $\pm 12$ , +24, +5 VDC power supply provides power for the assemblies. The 2083-5018# can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2083-5018# is assembled.



**FIGURE 2.0 2083-5018# Mechanical Assembly**

## 2.2 Rear Panel Input/Output Signals

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

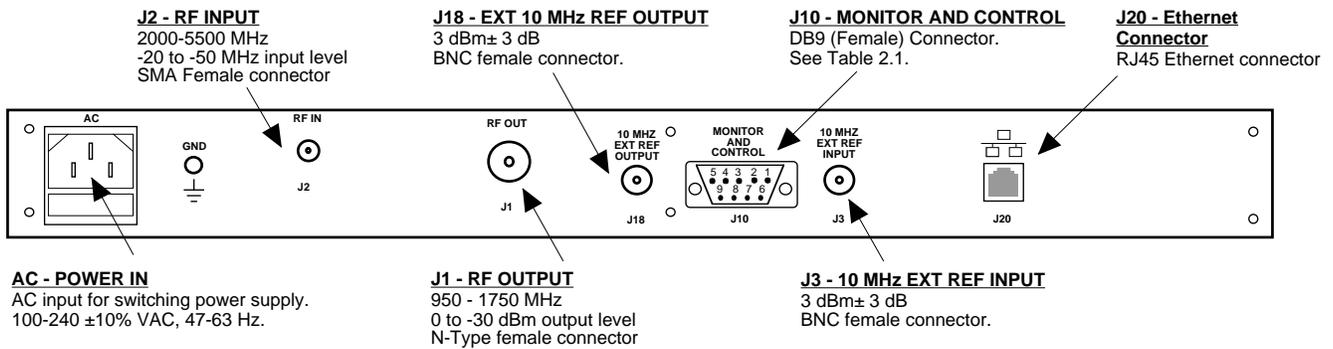


FIGURE 2.1 2083-5018# Rear Panel I/O's

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

### \*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.

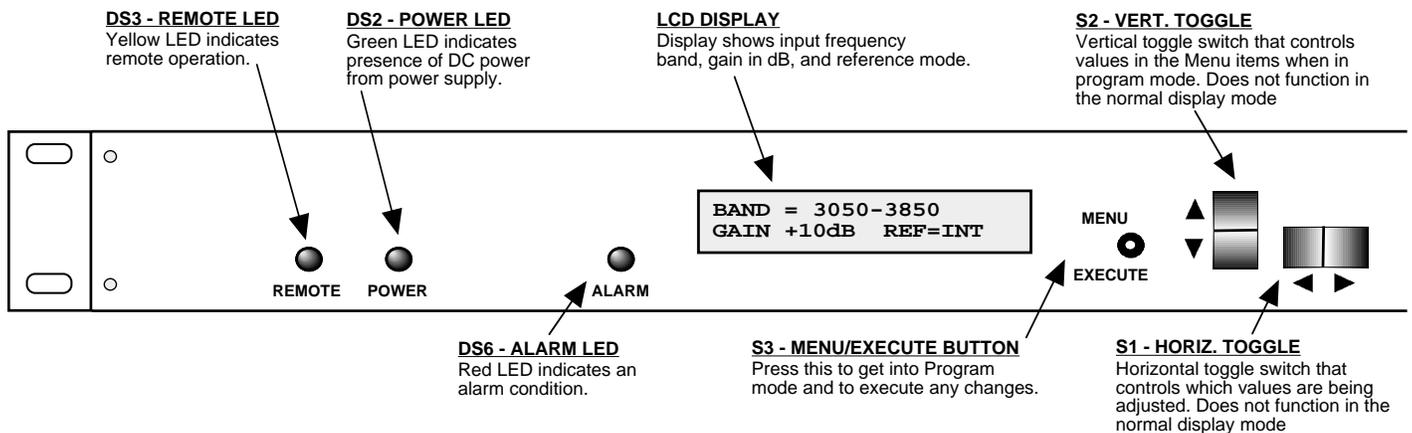


FIGURE 2.2 2083-5018# Front Panel Controls and Indicators

## 2.4 Installation / Operation

### 2.4.1 Installing and Operating the 2083-5018#, Frequency Translator Section

1. Connect a -20 dBm to -50 dBm signal to RF IN, J2 (Figure 2.1)
2. Connect the RF OUT, J1, 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 the desired output level. Make sure the output stays within 0 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.

NOTE: If a fuse continues to open, the power supply is most likely defective.

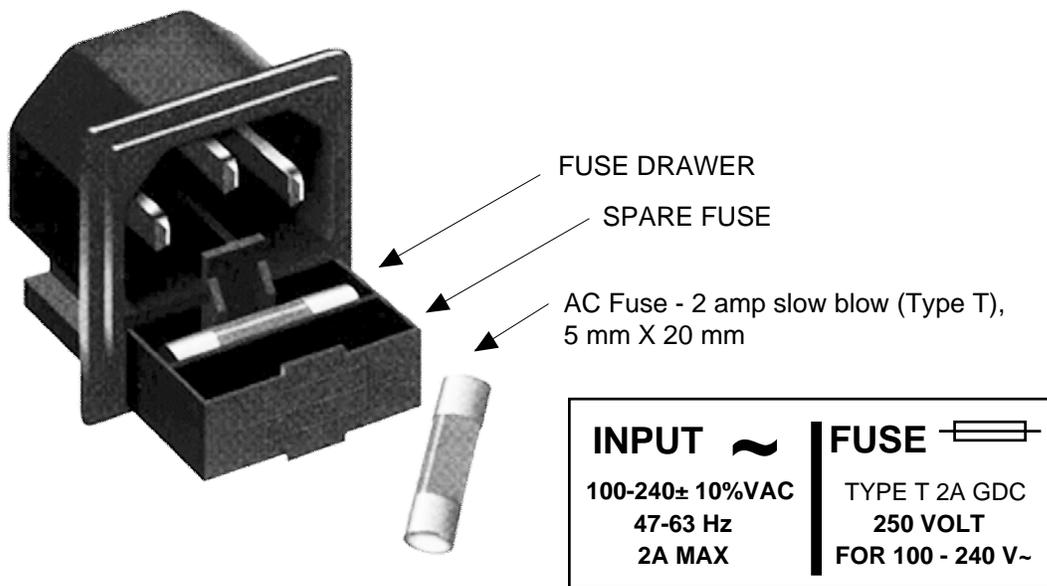


FIGURE 2.3 Fuse Location and Spare Fuse

## 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 Input Frequency Band
- Menu 2** Set Gain
- Menu 3** Set 10 MHz Reference Mode
- Menu 4** Set Remote
- Menu 5** Set Remote Interface (Option Q only)
- Menu 6** 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.**

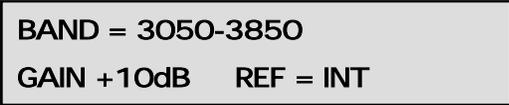
When power is first applied, the LCD display goes through three steps.

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



2083-5018#  
Rev. 1.00

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



BAND = 3050-3850  
GAIN +10dB REF = INT

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 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 Save Settings Menu:

<b>GAIN =            +10            R</b>
---

**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 0 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:

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

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 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,  $\pm 3$ dB. 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.

	ON POWER UP		
<b>Power Up</b>	2083-218# REV 1.00		
	NORMAL DISPLAY		
<b>Normal Display</b>	BAND = 3050-3850 GAIN +10dB REF = INT		PUSH BUTTON
	PUSHING MENU/EXECUTE SEQUENCE		
<b>Menu 1</b> Set Input Frequency Band	INPUT FREQUENCY = R 95 <u>0</u> - 1550	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Menu 2</b> Set Gain	GAIN = +1 <u>0</u> R	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Menu 3</b> Set 10 MHz Reference Mode	REF MODE = INT R	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Menu 4</b> Set Remote	REMOTE = ON R	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Menu 5</b> Set Remote Interface (Option -Q only)	INTERFACE = RS232 R	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Menu 6</b> Set RS485 Address (Option -Q only)	RS485 ADDRESS = 00 R	SCROLL <> SCROLL ↻	PUSH BUTTON
<b>Save?</b> When go to end	SAVE SETTINGS? <u>Y</u> N	SCROLL <> SCROLL ↻	PUSH BUTTON

**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.
- 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](http://www.crosstechnologies.com)  
E-MAIL [info@crosstechnologies.com](mailto:info@crosstechnologies.com)

Printed in USA