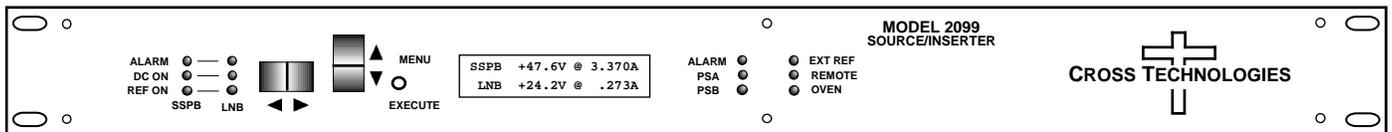


Instruction Manual

Model 2099-2448

10 MHz Source/Inserter, Redundant Power

December 2015, Rev. A



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INSTRUCTION MANUAL

MODEL 2099-2448 10MHz Source/Inserter, Redundant Power

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Model 2099-2448

10MHz, 24V, and 48V Source/Inserter, Redundant Power

1.0 General

1.1 Equipment Description

The 2099-2448 10 MHz Source/Inserter is a 10 MHz, ± 0.01 ppm oven controlled crystal oscillator (OCXO) with circuitry to insert the 10MHz signal and DC voltage on L-band lines for an LNB and SSPB. Multi-function switches select LNB and SSPB DC Power, internal or External (Option -E) 10 MHz, and insertion of 10 MHz on the L-band lines. LEDs indicate DC power (green), Reference insertion (green), alarm (red), remote operation (yellow), and OCXO oven warm-up (yellow). The External Reference option (-E) provides an external reference input which can be used to lock the internal 10 MHz source to a high stability external frequency reference or it may be inserted directly into the L-Band lines. For SSPB power, the user can switch between +24VDC @ 2.5A or +48VDC @ 4.2A DC insertion. Remote control allows remote configuration of front panel commands and monitoring LNB and SSPB voltage and current. Parameter selection and LNB and SSPB voltage and current appear on the LCD display. Connectors are BNC female for RF and 10 MHz input and output signals. Redundant AC power is 100-240 $\pm 10\%$ VAC, 47-63 Hz. The chassis is 1 RU, 12" deep.

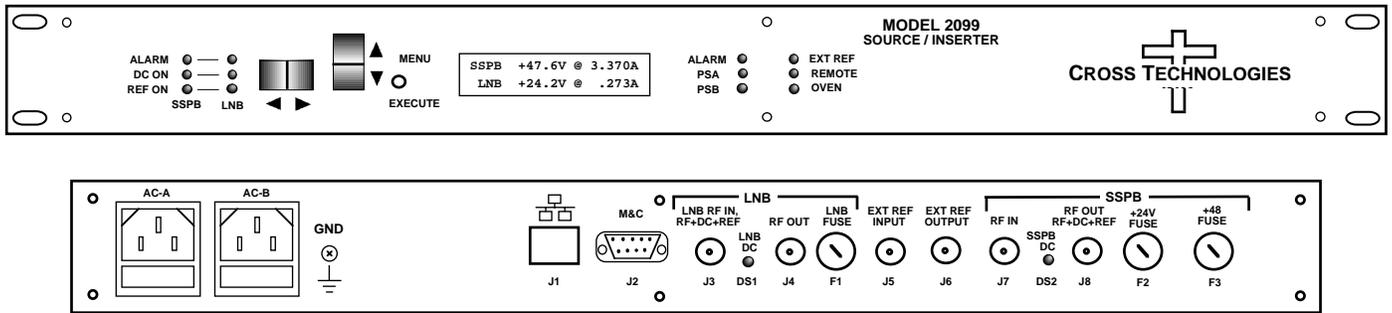


FIGURE 1.1 Model 2099-2448 Front and Rear Panels

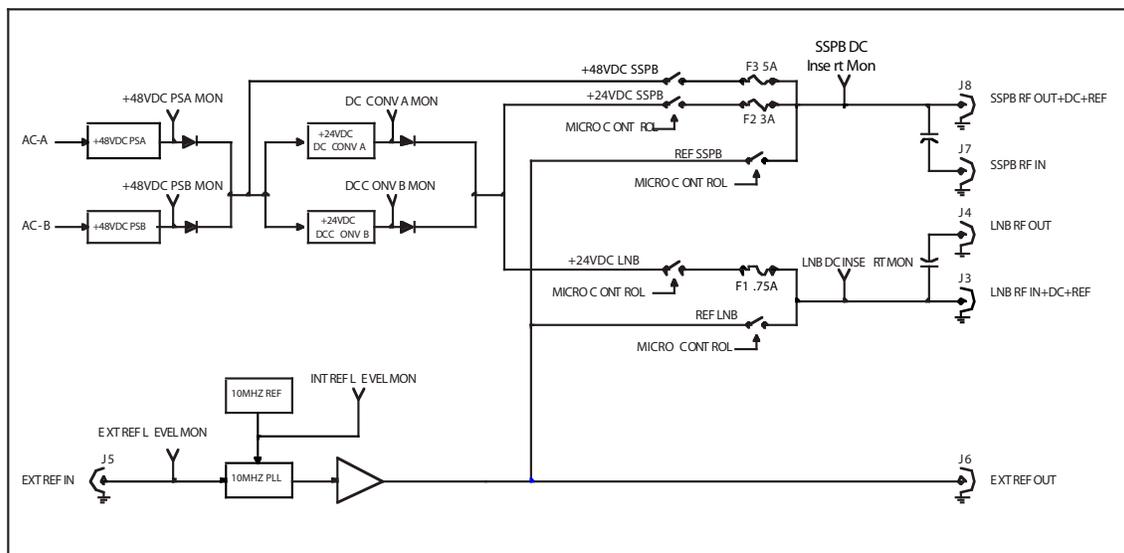


FIGURE 1.2 Model 2099-2448 10MHz Source/Inserter Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2099-2448 10MHz Source/Insert*

TABLE 1.0 2099-2448 Source Insert*				
10 MHz Reference		L-Band Insertion		
Output Characteristics (on L-Band RF)		RF Input/Output Characteristics		
Level	+2 dBm ±2 dB (Option W65; ± 10 dBm)	Frequency	950 to 2150 MHz & 10MHz	
Harmonics	< -30 dBC, < -40 dBC Typ.	Impedance	50Ω	
Level to non-insert end	< -20 dBm, < -30 dBm Typ.	Return Loss	> 12 dB, 0.95 to 1.5 GHz > 10 dB, 1.5 to 2.15 GHz	
Input/Output Characteristics (on BNC Connectors)		Insertion Loss	< 1dB, 0.95 to 1.5 GHz < 2 dB, 1.5 to 2.15 GHz	
Impedance, Return Loss	50Ω / 75Ω, 14 dB	Frequency Response	±1.0 dB, 950 to 2150 MHz; ±0.5 dB, 36 MHz BW	
Level	+3 dBm ± 3 dB (Option W65 +3 dBm max.)	SSPB1, SSPB2 DC Power Characteristics		
Harmonics (Output)	< -30 dBC, < -40 dBC Typ.	Voltage/Current SSPB	+24 ±2 VDC, 2.5 A, max. OR +48 ±4 VDC, 4.2 A, max.	
Oscillator		Voltage/Current LNB	+24 ±2 VDC, 0.5 A, max.	
Stability	± 0.01 ppm max. over temp	Load Regulation	±5 %	
Aging, per day	± 0.001 ppm			
Aging, per year	± 0.1 ppm			
Warm Up, 4 Minutes	± 0.1 ppm			
Warm Up, 1 Hour	± 0.01 ppm			
Tuning Adjust	± 0.5 ppm			
Phase Noise @ Frequency	10 Hz	100 Hz	1 kHz	10 kHz
dBC/Hz	110	140	149	149
Chassis / Other				
Control Indicators				
Internal/External 10 MHz Select	FP Switch or M&C Select; External Yellow LED			
10 MHz Insert Select	FP Switch or M&C Select; Green LED			
SSPB, LNB Insert	FP Switch or M&C Select; Green, Rear Yellow LED			
SSPB, LNB Volts and Amps	Front Panel Display and M&C			
Power, Alarm, Reference	Green LED, Red LED, Green LED			
Oven, External Reference, Remote	Yellow LED, Yellow LED, Yellow LED			
Other				
RF Connectors	BNC, 50Ω (female)			
10 MHz Connectors	BNC, 50 (female) (Works for 50Ω or 75Ω)			
Alarm/Remote Connector	DB9 (female) - NO or NC Closure on Alarm			
Size	19 inch, 1 RU Chassis, 1.75" High X 112.0" Deep			
Power, Redundant Standard	100 - 240 ±10% VAC, 47 - 63 Hz, 300 watts maximum			
*10°C to 40°C; Specifications subject to change without notice			© Cross Technologies, Inc. 2015	

Technical Characteristics continued on page 5...

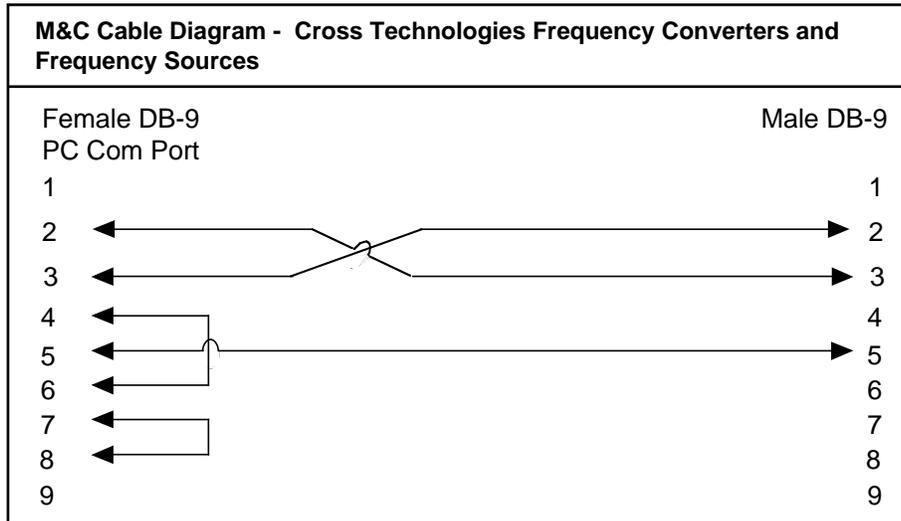
1.2 Technical Characteristics continued...

Options	
- E	External 10 MHz Reference, Auto Detect and Restore
- W65	10 MHz Reference Power Adjust on L-Band Insertion
Common 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
- F	75Ω F-Type
- NN	50Ω N-Type
*10°C to 40°C; Specifications subject to change without notice.	
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1.3 Monitor and Control Interface

A) Remote serial interface

Protocol: RS-232C/422/485, 9600 baud rate, no parity, 8 data bits, 1 start bit, and 1 stop bit.



Connector: Rear panel, DB-9 female

J19 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 2099-2448 10MHz Source/Inserter 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 2099-2448 Status Requests		
Command	Syntax*	Description
Get Selected SSPB Voltage	{aaSV}	Returns {aaSVxx}
		where: xx = 24 if +24 VDC is selected.
		xx = 48 if +48 VDC is selected.
Get SSPB DC Voltage Insert State	{aaSS}	returns {aaSSx}
		where: x = 1 if DC voltage is inserted on the SSPB loop through.
		x = 0 if DC voltage is disabled on the SSPB loop through.
Get SSPB 10MHz Reference Insert State	{aaSD}	returns {aaSDx}
		where: x = 1 if the 10 MHz reference is inserted on the SSPB loop through.
		x = 0 if the 10 MHz reference is disabled on the SSPB loop through.
Get LNB DC Voltage Insert State	{aaSL}	returns {aaSLx}
		where: x = 1 if DC voltage is inserted on the LNB loop through.
		x = 0 if DC voltage is disabled on the LNB loop through.
Get LNB 10 MHz Reference Insert State	{aaSB}	returns {aaSBx}
		where: x = 1 if the 10 MHz reference is inserted on the LNB loop through.
		x = 0 if the 10 MHz reference is disabled on the LNB loop through.
Get SSPB Inserted Voltage and Current	{aaSJ}	returns {aaSJxxxxx.yyyyy}
		where: xxxxx = Measured DC voltage inserted on the SSPB loop through.
		where: yyyyy = Measured DC current inserted on the SSPB loop through.
Get LNB Inserted Voltage and Current	{aaSK}	returns {aaSKxxxxx.yyyyy}
		where: xxxxx = Measured DC voltage inserted on the LNB loop through.
		where: yyyyy = Measured DC current inserted on the LNB loop through.
Get 10 MHz Reference Operating Mode	{aaSM}	returns {aaSMx}
		where: x = 1 if the mode is Internal Reference.
		x = 2 if the mode is External Pass.
		x = 3 if the mode is External Pass Auto.
		x = 4 if the mode is External Lock.
		x = 5 if the mode is External Lock Auto.
Get IP Address	{aaSi}	returns {aaSixxx.xxx.xxx.xxx}
		where xxx.xxx.xxx.xxx = IP address
Get Subnet Mask	{aaSs}	returns {aSsxxx.xxx.xxx.xxx}
		where xxx.xxx.xxx.xxx = subnet mask
Get Alarm Status	{aaSA}	returns {SAabc}
		where a = SSPB Alarm State (0 for alarm off; 1 for alarm on)
		b = LNB alarm state (0 for alarm off; 1 for alarm on)
		c = Summary alarm state (0 for alarm off; 1 for alarm on)

Status Request continued on page 8....

B) Status Request continued from page 7...

Table 1.1 2099-2448 Status Requests Continued...		
Command	Syntax*	Description
Get all monitored statuses	{aaSa}	returns {Sabcdehijklmn}
		where:
		b = DC CONV A status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		c = DC CONV B status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		d = +48V PSA status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		e = +48V PSB status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		f = SSPB V status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		g = SSPB I status (0 = ok, 1 = current too high)
		h = LNB V status (0 = ok, 1 = voltage too high, 2 = voltage too low)
		i = LNB I status (0 = ok, 1 = current too high)
		j = Internal Reference Mode status(0 = ok, 1 = internal reference low and Internal Reference Mode is selected)
		k = External Reference Mode status(0 = ok, 1 = external reference low and External Pass Reference Mode is selected)
		l = External Pass Auto Reference Mode status(0 = ok, 1 = external reference low and External Pass Auto Reference Mode is selected)
		m = External Lock Reference Mode status (0 = ok, 1 = external reference low, 2 = pll cannot lock)
		n = External Lock Auto Reference Mode(0 = ok, 1 = external reference low, 2 = pll cannot lock)
Get product/model info	{aaSv}	returns {Sv2099-2448y..yverZZZZ}
		where 2412-x02 = product model where x is the number of channels
		y..y = list of options, if any
		"ver" = separates model & options from firmware version
		ZZZZ = firmware version (e.g., 4.00)
Get SSPB Reference Level (Option W65)	{aaSW}	returns {aaSWxxx}
		where xxx = Power level of the internal 10 MHz reference that is inserted on the SSPB loop through.
Get SSPB Reference Gain (Option W65)	{aaSX}	returns {aaSXxxx}
		where xxx = Power gain of the external 10 MHz reference that is inserted on the SSPB loop through.
Get LNB Reference Level (Option W65)	{aaSY}	returns {aaSYxxx}
		where xxx = Power level of the internal 10 MHz reference that is inserted on the LNB loop through.
Get LNB Reference Gain (Option W65)	{aaSZ}	returns {aaSZxxx}
		where xxx = Power gain of the external 10 MHz reference that is inserted on the LNB loop through.

C) Commands

Table 1.2 lists the commands for the 2099-2448 10MHz Source/Inserter and briefly describes them. After a command is sent the 2099-2448 10MHz Source/Inserter sends a return ">" indicating the command has been received and executed.

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

- { = start byte
- aa = address (RS-485 only **option -Q**)
- C = 1 character, either C (command) or S (status)
- N = 1-digit command or status number, 1 through 9
- 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 2099-2448 Commands		
Command	Syntax*	Description
Set SSPB Voltage	{aaCVxx}	where: xx = DC voltage available for inserting on the SSPB RF loop through. There are two valid values, either 24 or 48. example: {CV48} sets the SSPB voltage to +48 VDC. note: When the SSPB voltage changes the SSPB DC insert will automatically turn off to safeguard any external equipment. The SSPB DC insert will have to be set to on after any SSPB voltage change.
Set SSPB DC Voltage Insert	{aaCSx}	where: x = 1 to enable DC Voltage on the SSPB loop through. x = 0 to disable DC Voltage on the SSPB loop through.
Set SSPB 10 MHz Reference Insert	{aaCDx}	where: x = 1 to enable the 10 MHz reference on the SSPB loop through. x = 0 to disable the 10 MHz reference on the SSPB loop through.
Set LNB DC Voltage Insert	{aaCLx}	where: x = 1 to enable DC Voltage on the LNB loop through. x = 0 to disable DC Voltage on the LNB loop through.
Set LNB 10 MHz Reference Insert	{aaCBx}	the LNB x = 0 to disable the 10 MHz reference on the LNB loop through.
Set 10 MHz Reference Operating Mode	{aaCMx}	where: x = 1 to set the mode to Internal Reference. <i>(Option E)</i> x = 2 to set the mode to External Pass. x = 3 to set the mode to External Pass Auto. x = 4 to set the mode to External Lock. x = 5 to set the mode to External Lock Auto.
Clear Fault (External Lock Auto Mode)	{aaCFx}	where : x = 1 to clear a FAULT condition.
Set SSPB 10 MHz Reference Insert Level	{aaCWxxx}	where: xxx = Power level of the internal 10 MHz reference that is inserted <i>(Option W65)</i> on the SSPB loop through. The valid range is +10 to -10 dBm.
Set SSPB 10 MHz Reference Insert Gain	{aaCXxxx}	where: xxx = Gain of the external 10 MHz reference that is inserted <i>(Option W65)</i> on the SSPB loop through. The valid range is +10 to -10 dB.
Set LNB 10 MHz Reference Insert Level	{aaCYxxx}	where: xxx = Power level of the internal 10 MHz reference that is inserted <i>(Option W65)</i> on the LNB loop through. The valid range is +10 to -10 dBm.
Set LNB 10 MHz Reference Insert Gain	{aaCZxxx}	where: xxx = Gain of the external 10 MHz reference that is inserted <i>(Option W65)</i> on the LNB loop through. The valid range is +10 to -10 dB.

2.0 Installation

2.1 Mechanical

The 2099-2448 10MHz Source/Inserter consists of one RF PCB housed in a 1 RU (1 3/4 inch high) by 12 inch deep chassis. Redundant switching, ± 12 , +24, +5 VDC power supplies provides power for the assemblies. The 2099-2448 10MHz Source/Inserter can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2099-2448 10MHz Source/Inserter is assembled.

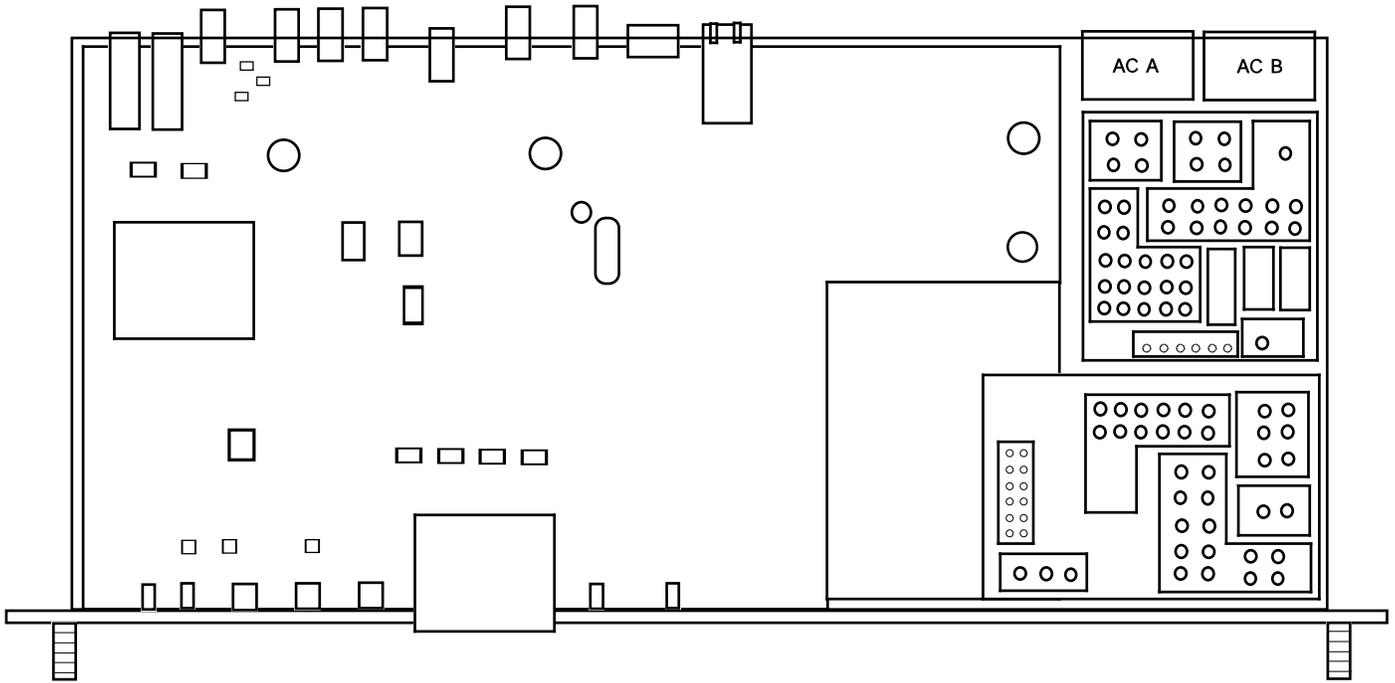


FIGURE 2.0 2099-2448 10MHz Source/Inserter Mechanical Assembly

2.2 Rear Panel Output Signals - Figure 2.1 shows the input and output connectors on the rear panel.

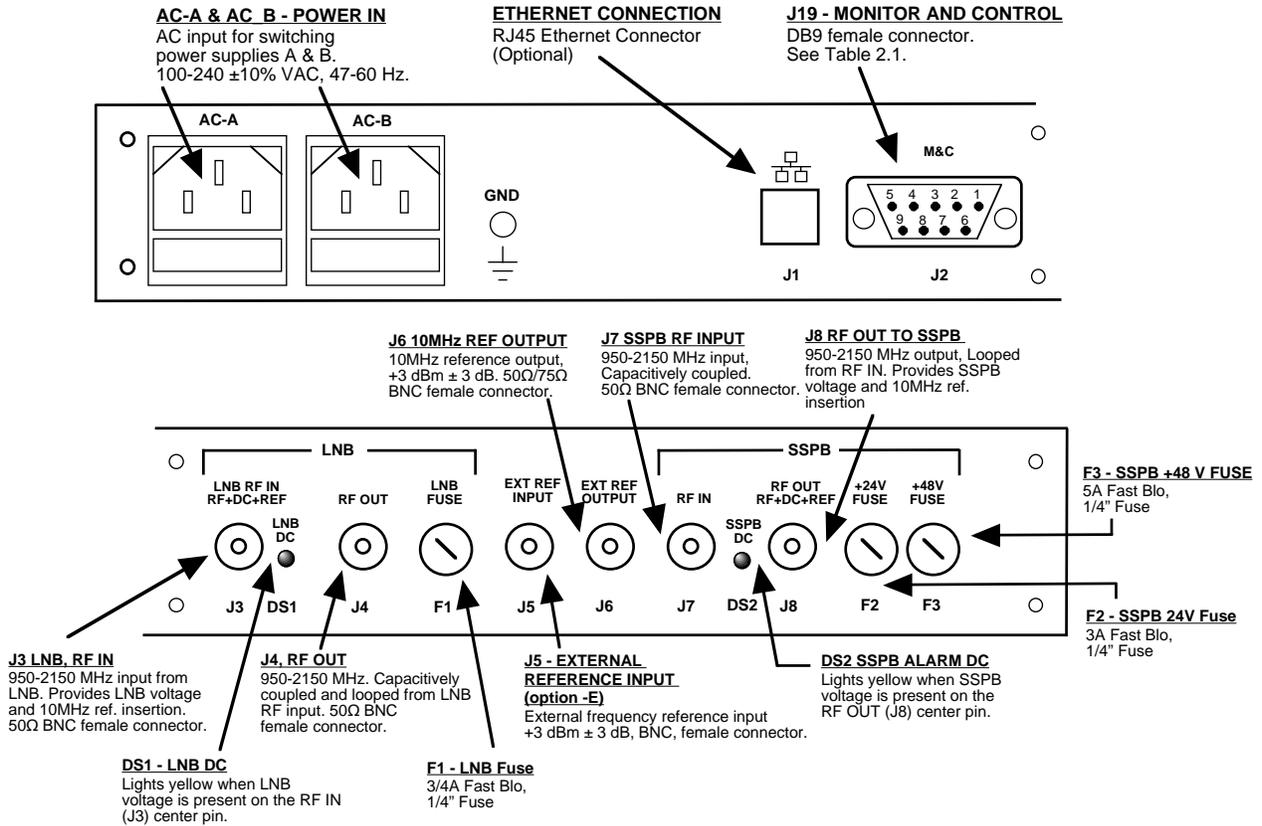


FIGURE 2.1 2099-2448 Rear Panel Outputs

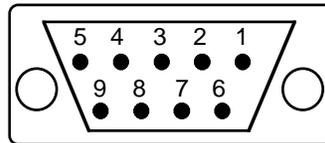


TABLE 2.1 J19 Pinouts (DB9)

Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Open=ALARM
8	Not Used
9	Alarm Relay: Closed=ALARM

2.3 Front Panel Indicators -The following are the front panel indicators.

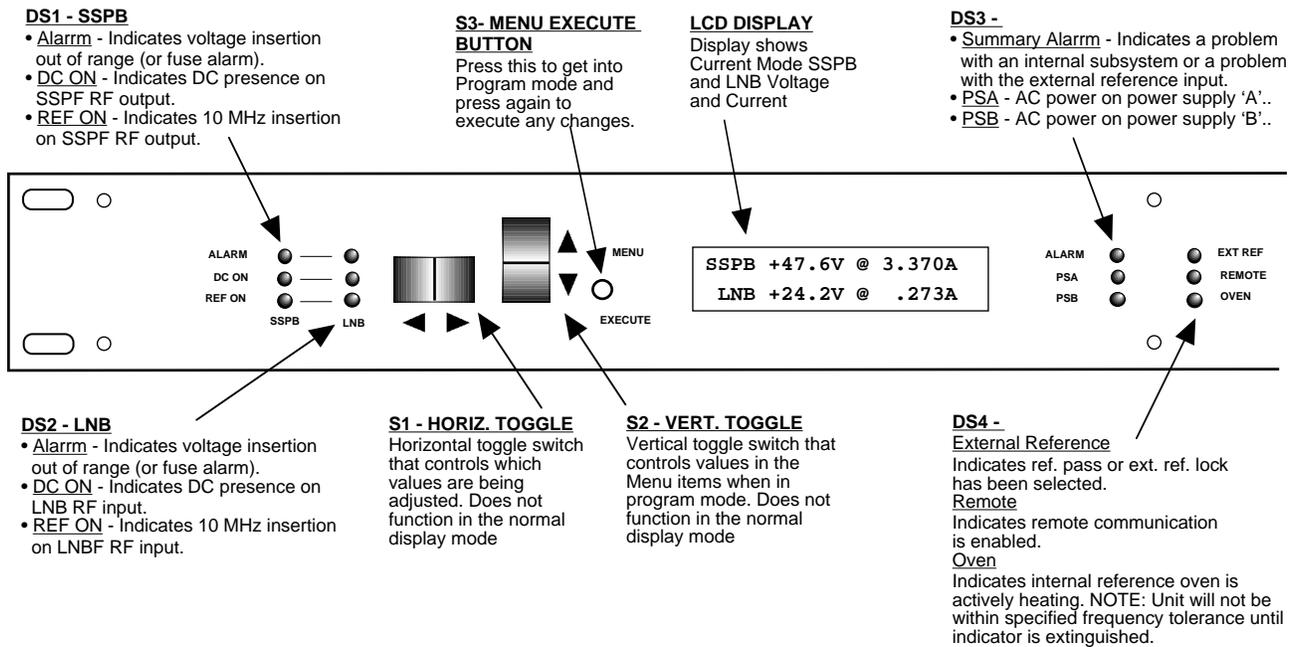


FIGURE 2.2 2099-2448 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2099-2448 10MHz Source/Inserter

1. **PLEASE NOTE: Unit must have 1 RU Air Space above and 1 RU Air Space below.**
2. Connect 100-240 \pm 10% VAC, 47-63 Hz to AC1 and AC2 connectors (Figure 2.1).
3. Be sure DS1 and DS2 LEDs (green, POWER) are on (Figure 2.2).
4. Be sure DS6 (red, ALARM) is off and/or contact closure at DB9 ALARM connector, J19, to occur to insure that the unit is not in an alarm condition.
5. Wait for DS4 LED (yellow, OVEN) to go off to insure that the oscillator oven is stabilized.
6. (option -E only) Choose one of the five (5) modes (Internal, Ext Pass, Ext Pass Auto, Ext Lock, or Ext Lock Auto) in which to operate the unit.
7. Set desired internal reference output level or pass-through gain, if applicable (option -E only).
8. Connect J1 thru J4 (REFERENCE OUTPUTS) to desired equipment (Figure 2.1).
9. Monitor reference output signal with J14 (MONITOR) (Figure 2.2).
10. **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.
11. **AC FUSE** - The fuse is a 5 mm x 20 mm, 5 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.

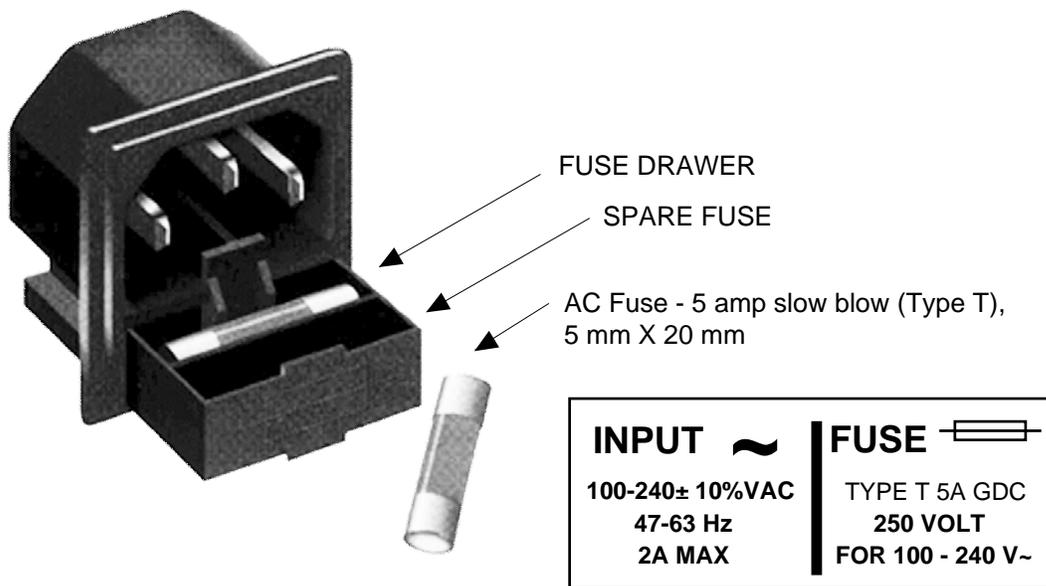


FIGURE 2.3 Fuse Location and Spare Fuse

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.** Select Reference Mode
- Menu 2.** Select SSPB DC Voltage
- Menu 3.** Select SSPB DC insert On/Off
- Menu 4.** Select SSPB reference insert On/Off
- Menu 4 a.** SSPB Reference Level (Option -W65)
- Menu 4 b.** SSPB Reference Gain (Option -W65)
- Menu 5** Select LNB DC insert On/Off
- Menu 6** Select LNB Reference insert On/Off
- Menu 6 a.** LNB Reference Level (Option -W65)
- Menu 6 b.** LNB Reference Gain (Option -W65)
- Menu 7** Adjust Internal Reference Frequency Offset
- Menu 8** Select Remote Operation On/Off
- Menu 9** Select Remote Interface On/Off
- Menu 10** Select RS485 Address
- Menu 11** Measured 48 VDC From Power Supplies A&B
- Menu 12** Measured 24 VDC From DC to DC Converters

Save Menu When “R” is selected from any above menu or at the end

Alarm indications appear on the LED (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. No program changes will be evident until they are verified at the “**SAVE SETTINGS?**” Menu.

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 software version will be displayed.

2099-2448W28 4.0

3. The present LNB and SSPB inserted voltage and current are shown.

SSPB +47.6 @ 3.03708A LNB +24.2V @ .237A

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 will toggle settings such as ON/OFF and RS232/422/485. In the case of the LEVEL setting, the vertical switch will increase or decrease the digit that is selected (within the limits of operation).

Power Up 1: (Units with ethernet option)	ON POWER UP (1)		<div style="border: 1px solid black; padding: 2px;"> === IP Addr === 192.168.123.002 </div>			
Power Up 2:	ON POWER UP (2)		<div style="border: 1px solid black; padding: 2px;"> 2099-2448W28 4.0 </div>			
Normal Display	NORMAL DISPLAY		<div style="border: 1px solid black; padding: 2px;"> SSPB +47.6V @ 3.3708A LNB +24.2V @ .273A </div>		PUSH BUTTON	
	PUSHING MENU/EXECUTE SEQUENCE					
Menu 1 Reference Mode Select	REF MODE =	R	SCROLL <>	INTERNAL	SCROLL ⇅	PUSH BUTTON
Menu 2 Select SSPB DC Voltage	SSPB DC VOLTS =	R	SCROLL <>	±48	SCROLL ⇅	PUSH BUTTON
Menu 3 Select SSPB DC Insert On/Off	SSPB ±48 VDC	R	SCROLL <>	INSERT OFF	SCROLL ⇅	PUSH BUTTON
Menu 4 Select SSPB Reference Insert On/Off	SSPB REFERENCE	R	SCROLL <>	INSERT = ON	SCROLL ⇅	PUSH BUTTON
Menu 4a Adjust SSPB Reference Level	SSPB REFERENCE	R	SCROLL <>	LEVEL = +10	SCROLL ⇅	PUSH BUTTON
Menu 4b Adjust SSPB Reference Gain	SSPB REFERENCE	R	SCROLL <>	GAIN = +09	SCROLL ⇅	PUSH BUTTON
Menu 5 Select LNB DC Insert On/Off	LNB +24 VDC	R	SCROLL <>	INSERT = OFF	SCROLL ⇅	PUSH BUTTON
Menu 6 Select LNB Reference Insert On/Off	LNB REFERENCE	R	SCROLL <>	INSERT = ON	SCROLL ⇅	PUSH BUTTON
Menu 6a Adjust LNB Reference Level	LNB REFERENCE	R	SCROLL <>	LEVEL = +10	SCROLL ⇅	PUSH BUTTON
Menu 6b Adjust LNB Reference Gain	LNB REFERENCE	R	SCROLL <>	GAIN = +09	SCROLL ⇅	PUSH BUTTON
Menu 7 Adjust Internal Reference Frequency Offset	INTERN FREQ	R	SCROLL <>	OFFSET = +0000	SCROLL ⇅	PUSH BUTTON
Menu 8 Select Remote Operation On/Off	REMOTE ON	R	SCROLL <>		SCROLL ⇅	PUSH BUTTON
Menu 9 Select Remote Interface On/Off	INTERFACE	R	SCROLL <>	RS232	SCROLL ⇅	PUSH BUTTON
Menu10 Set RS485 Address	RS485 ADDRESS =	R	SCROLL <>	00	SCROLL ⇅	PUSH BUTTON
Menu11 Measured 48 VDC From Power Supplies A&B	+48V PSA=	R	SCROLL <>	+49.2 VDC	SCROLL ⇅	PUSH BUTTON
	+48V PSB=	R	SCROLL <>	+49.0 VDC	SCROLL ⇅	PUSH BUTTON
Menu12 Measured 24 VDC From DC to DC Converters A&B	DC CONV A=	R	SCROLL <>	+24.9VDC	SCROLL ⇅	PUSH BUTTON
	DC CONV B=	R	SCROLL <>	+25.1VDC	SCROLL ⇅	PUSH BUTTON
Save? When "R" is selected from any above menu or at the end	SAVE SETTINGS?	YN	SCROLL <>		SCROLL ⇅	PUSH BUTTON

(NOTE: See next page for possible alarm conditions)

Figure 2.4 Menu Display and Sequence

Alarm Conditions

If any alarm is on then the status of nine possible alarm conditions will be displayed at the end of the menu.

	Normal (No Alarm Condition)	Alarm Condition
STATUS 1:	PSA 48V ok	PSA 48V high PSA 48V low
STATUS 2:	PSB 48V ok	PSB 48V high PSB 48V low
STATUS 3:	DC Conv A ok	DC conv a high DC conv a low
STATUS 4:	DC Conv B ok	DC conv b high DC conv b low
STATUS 5:	SSPB V Insert ok SSPB V Insert off	SSPB v insert high SSPB v insert low
STATUS 6:	SSPB i Insert ok SSPB i Insert off	SSPB i insert high SSPB i insert low
STATUS 7:	LNB v Insert ok LNB v Insert off	LNB v insert high LNB v insert low
STATUS 8:	LNB I Insert ok LNB I Insert off	LNB v insert high LNB v insert low
STATUS 9:	Reference ok	Internal Ref low External Ref low Ref PLL Not Locked

3.0 Alarm Operations

SSPB Power Supply Alarms

1. DC CONV A (SSPB V2A Monitor)

This is the +24V DC voltage from DC to DC converter A. The summary alarm indicator and contact closure will be set if this voltage is greater than 26V or less than 23V.

2. DC CONV B (SSPB V2B Monitor)

This is the +24V DC voltage from DC to DC converter B. The summary alarm indicator and contact closure will be set if this voltage is greater than 26V or less than 23V.

3. +48V PSA (SSPB V1A Monitor)

This is the +48V DC voltage from power supply A. The summary alarm indicator and contact closure will be set if this voltage is greater than 53V or less than 46V. The unit's Power Supply A AC input must be detected before this voltage is monitored for alarm purposes.

4. +48V PSB (SSPB V1B Monitor)

This is the +48V DC voltage from power supply B. The summary alarm indicator and contact closure will be set if this voltage is greater than 53V or less than 46V. The unit's Power Supply B AC input must be detected before this voltage is monitored for alarm purposes.

5. SSPB V Monitor

This is the DC voltage that is inserted at the SSPB RF loop through. The SSPB alarm indicator and alarm contact closure will be set if the selected voltage (either +24V or +48V) is too high or too low. If +24V is selected then the unit will alarm if the voltage is greater than 26V or less than 23V. If +48V is selected then the unit will alarm if the voltage is greater than 53V or less than 46V.

6. SSPB I Monitor

This is the current that is measured at the SSPB RF loop through. The SSPB alarm indicator and alarm contact closure will be set if the current is greater than 4.8 Amps @ +48V or if the current is greater than 2.875 Amps @ +24v.

LNB Power Supply Alarms

1. LNB V Monitor

This is the DC voltage that is inserted at the LNB RF loop through. The summary alarm indicator and contact closure will be set if the voltage is greater than 26V or less than 22V.

2. LNB I Monitor

This is the current that is measured at the LNB RF loop through. The summary alarm indicator and contact closure will be set if the current is greater than 600 milliamps.

10 MHz Reference Alarms

1. Internal Reference Mode

The summary alarm indicator and contact closure will be set if the internal reference is not detected by the internal reference power detector. The external reference indicator will always be off in this mode.

2. External Pass Reference Mode

The summary alarm indicator and contact closure will be set if the external reference power is less than -5 dBm, +/- 1 dBm. The external reference indicator will always be on in this mode.

3. External Pass Auto Reference Mode

The summary alarm indicator and contact closure will be set if the external reference power is less than -5 dBm, +/- 1 dBm. The external reference indicator will always be on in this mode.

4. External Lock Reference Mode

The summary alarm indicator and contact closure will be set if the external reference power is less than -5dBm , +/- 1 dBm. The summary alarm indicator and contact closure will be set if the internal reference cannot lock to the external reference. The external reference indicator will always be on in this mode.

5. External Lock Auto Reference Mode

The summary alarm indicator and contact closure will be set if the external reference power is less than -5dBm, +/- 1 dBm. The summary alarm indicator and contact closure will be set if the internal reference cannot lock to the external reference. The external reference indicator will always be on in this mode.

4.0 Model 2099-2448 Option W65:

L-Band Inserted 10 MHz Reference Power Adjustment

Option W65 allows the user to independently adjust the power of the 10 MHz signal that is inserted on both (LNB and SSPB) L-band loop-throughs. **NOTE:** The maximum 10 MHz input power is +3 dBm when Option W65 is installed.

There are two methods available for adjusting the power of the 10 MHz signal inserted onto the L-band Loop-throughs.

- 1). If the user has selected the internal 10 MHz reference as the source, the user may adjust the output power LEVEL from -10 to +10 dBm.
- 2). If the user has selected the external 10 MHz reference as the source [i.e., 10 MHz from the external reference input (J5)] then the user may adjust the GAIN from -10 to +10 dB from the input level point to the insertion point. Eg., if the external 10 MHz reference input is +2 dBm and the GAIN is set to +4 dB then the inserted 10 MHz reference power is +6 dBm.

If the Reference Mode is set to INTERNAL, EXT LOCK, or EXT LOCK AUTO then the front panel menu will allow the user to adjust the inserted reference LEVEL from -10 to +10 dBm. The Remote M&C commands to perform these settings are ” {CW} “ (Set SSPB 10 MHz Reference Insert Level) and ” {CY}” (Set LNB 10 MHz Reference Insert Level).

If the Reference Mode is set to EXT PASS or EXT PASS AUTO then the front panel menu will allow the user to adjust the inserted reference GAIN. The Remote M&C commands to perform these settings are ” {CX} “ (Set SSPB 10 MHz Reference Insert Gain) and ” {CZ}” (Set LNB 10 MHz Reference Insert Gain).

5.0 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 T_{mra} .
- 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 unit 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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