

INSTRUCTION MANUAL

MODEL 2116-137 Block Downconverter

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**CROSS TECHNOLOGIES, INC.
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**

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MODEL 2116-137 Block Downconverter

1.0 General

1.1 Equipment Description

The 2116-137 Downconverter converts 13.75 - 14.5 GHz to 0.95 - 1.7 GHz with a local oscillator at 12.8 GHz. Front panel LEDs provide indication of DC Power, External 10 MHz, and PLL Alarm. The gain is +35 dB. Connectors are SMA female for the RF and BNC female for the L-Band and external reference input and reference output. A three-way switch controls which 10 MHz reference is being used. In the INT position, the internal reference is used, in the EXT position, the external reference is used, and in the AUTO position, the internal reference is used unless a +3 dBm \pm 3 dB, 10MHz reference signal is connected to the external reference input. The 2116 is powered by a 100-240 \pm 10% VAC power supply, and mounted in a 1 3/4" X 19" X 14" rack mount chassis.

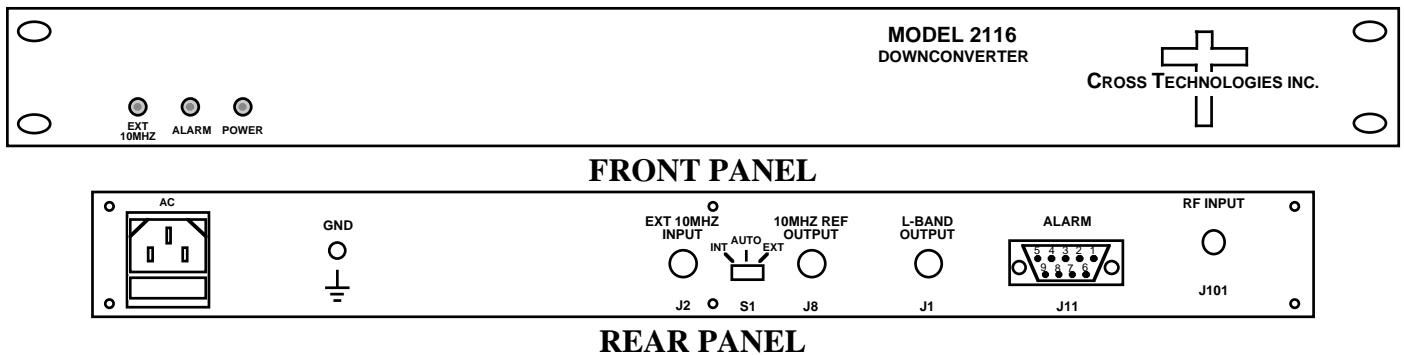


FIGURE 1.1 Model 2116-137 Front and Rear Panels

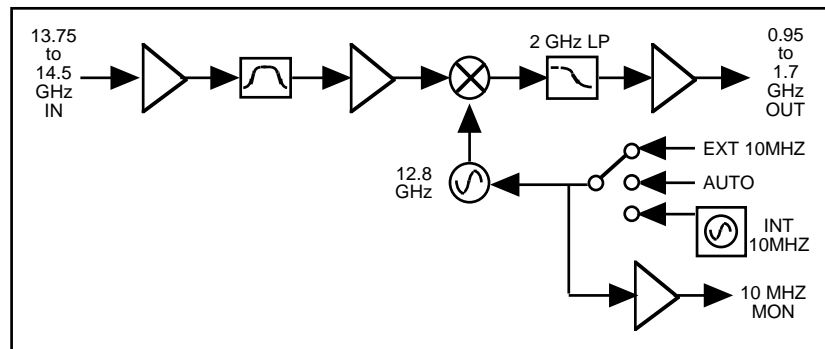


FIGURE 1.2 Model 2116-137 Downconverter Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2116-137 Downconverter Specifications*

Input Characteristics

Impedance/Return Loss	50Ω /14 dB (see TABLE 2.2 for connector options)
Frequency	13.75 to 14.5 GHz
Noise Figure, max.	20 dB, max gain
Input Level	-55 to -35 dBm
Input 1dB Compression	-25 dBm

Output Characteristics

Impedance/Return Loss	50Ω /14 dB (see TABLE 2.2 for connector options)
Frequency	0.95 to 1.7 GHz
Output Level Range	-20 to 0 dBm
Output 1dB Compression	+10 dBm

Channel Characteristics

Gain	+35 dB ± 2 dB
Image Rejection	>60 dB, min.
Spurious, In Band	SIGNAL RELATED <-60 dBC (0 dBm output level) SIGNAL INDEPENDENT <-60 dBm
Spurious, Out of Band	<-50 dBm
Intermodulation	<-55 dBC for two carriers each at -10 dBm out
Frequency Response	±1.5 dB, 0.95 to 1.7 GHz out; ± 0.5 dB, 40 MHz BW
Frequency Sense	Non-inverting

LO Characteristics

LO Frequency	12.8 GHz
Frequency Accuracy	± 0.01 ppm max over temp internal reference
10 MHz In/Out Level	+3 dBm ± 3 dB
Phase Noise	@ Freq 100Hz 1kHz 10kHz 100kHz 1MHz
	dBc/Hz < -70 < -80 < -85 < -100 < -110

Controls, Indicators

Ext 10 MHz	Yellow LED, Indicates Ext 10 MHz reference is active
Power	Green LED
PLL Alarm	Red LED, External contact closure

Other

RF Connector	SMA (female) (see TABLE 2.2 for other options)
L-Band Connector	BNC (female) (see TABLE 2.2 for other options)
10 MHz Connectors	BNC (female) 75Ω connector; Works with 50Ω or 75Ω.
Connector, Alarm	DB9, female - NO or NC contact closure on Alarm
Size	19 inch, 1RU standard chassis 1.75"high X 14.0" deep
Power	100-240 ±10% VAC, 47-63 Hz, 25 watts max

Options

Connector options	see TABLE 2.2
-------------------	---------------

*+10°C to +40°C; Specifications subject to change without notice.

2.0 Installation

2.1 Mechanical

The 2116-137 consists of a PCB and an RF assembly housed in a 1 RU (1 3/4 inch high) by 12 inch deep chassis. A switching, ± 12 , +24, +5 VDC power supply provides power for the assemblies. The 2116-137 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2116-137 is assembled.

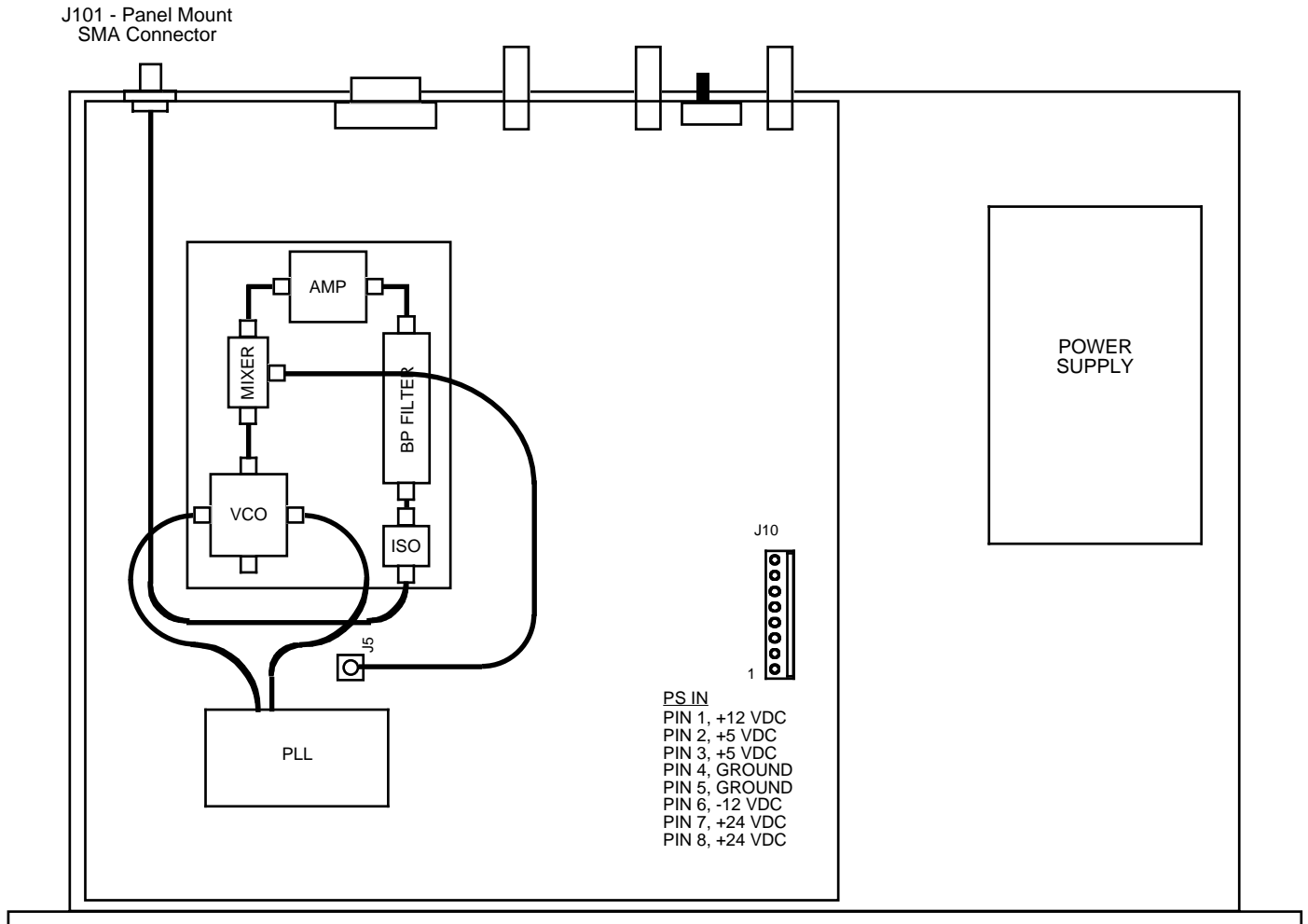


FIGURE 2.0 2116-137 Mechanical Assembly

2.2 Rear Panel Input/Output Signals

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

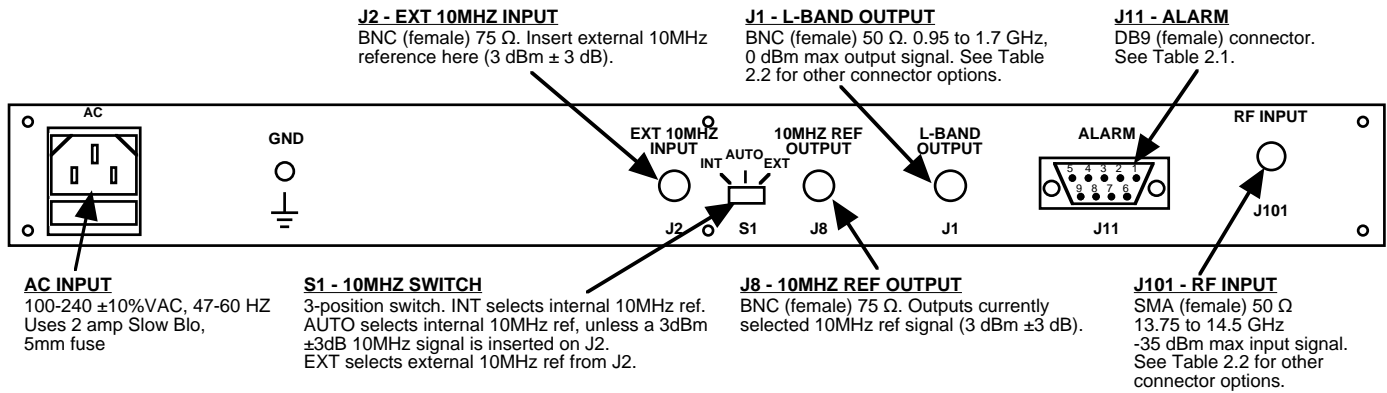


FIGURE 2.1 2116-137 Rear Panel I/O's

Pin	Function
1	Not Used
2	Not Used
3	Not Used
4	Not Used
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

Option	RF	L-Band
STD	SMA, 50Ω	BNC, 50Ω
M	Type N, 50Ω	BNC, 50Ω
N	Type N, 50Ω	BNC, 75Ω
NF	Type N, 50Ω	Type F, 75Ω
NN	Type N, 50Ω	Type N, 50Ω
S7	SMA, 50Ω	BNC, 75Ω
SF	SMA, 50Ω	Type F, 75Ω
SN	SMA, 50Ω	Type N, 50Ω
SS	SMA, 50Ω	SMA, 50Ω

2.3 Front Panel Indicators

Figure 2.2 shows the front panel indicators.

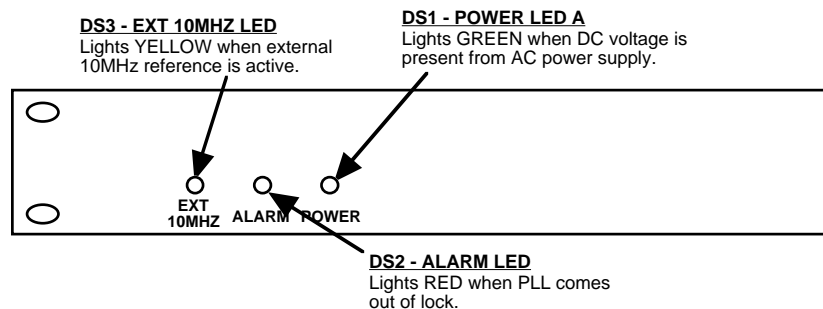


FIGURE 2.2 2116-137 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2116-137 Downconverter

1. Connect a -55 dBm to -35 dBm signal to RF INPUT, J101 (Figure 2.1).
2. Connect the L-BAND OUTPUT, J1, to the external equipment.
3. Connect 100-240 \pm 10% VAC, 47 - 63 Hz to AC connector on the back panel.
4. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
5. Select either INT (for internal 10MHz ref), AUTO (for internal 10MHz ref UNLESS an external 10MHz, 3 dBm signal is connected to J2), or EXT (for external 10MHz, 3 dBm ref that is inserted at J2) on rear panel switch S1 (Figure 2.1).
6. If EXT is selected or AUTO is selected and there is a 10MHz, 3 dBm signal at J2, check that DS3 (yellow, Ext 10MHZ) is on (Figure 2.2).
7. Check that a 10MHz, 3 dBm \pm 3 dB signal is present at the 10MHZ REF OUTPUT (J8) (Figure 2.1).
8. 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.

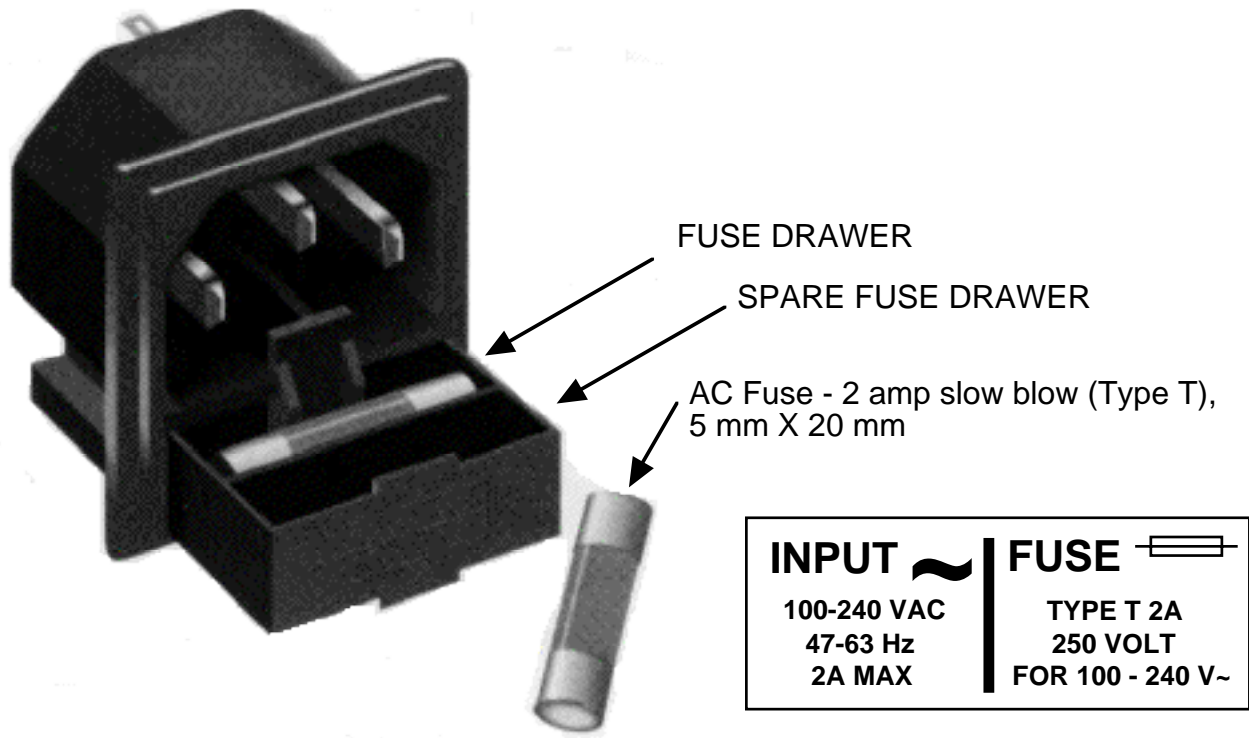


FIGURE 2.3 Fuse Location and Spare Fuse

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