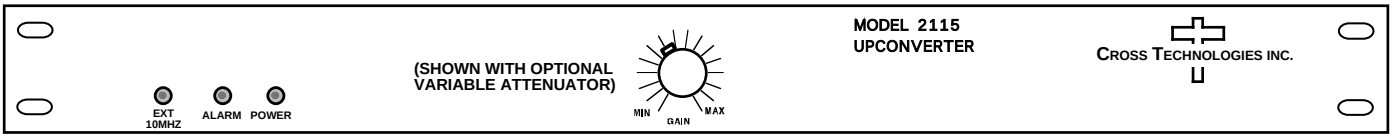
Instruction Manual

Model 2115-114
Block Upconverter

November 2014, Rev. C



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 2115-114 Block Upconverter

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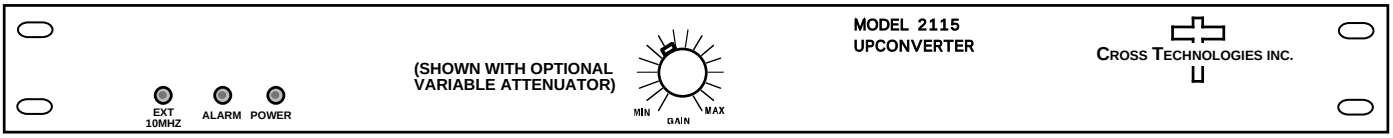
MODEL 2115-114 Block Upconverter

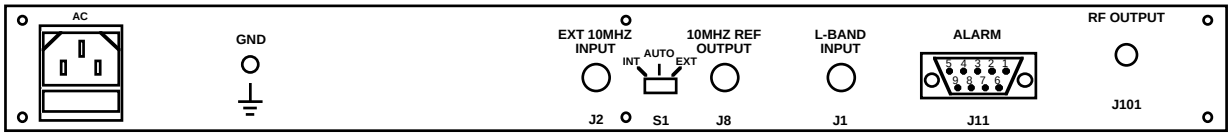
1.0 General

1.1 Equipment Description

The 2115-114 Block Upconverter converts 0.95 - 1.75 GHz to 11.45 - 12.25 GHz with a local oscillator at 10.5 GHz. Front panel LEDs provide indication of DC Power, External 10 MHz, and PLL Alarm. The L-band to RF gain is +20 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 ± 3 dB, 10MHz reference signal is connected to the external reference input. The 2115 is powered by a 100-240 ±10% VAC power supply, and mounted in a 1 3/4" X 19" X 14" rack mount chassis.



FRONT PANEL - (Shown with Variable Attenuator Option -VA)



REAR PANEL

FIGURE 1.1 Front and Rear Panels

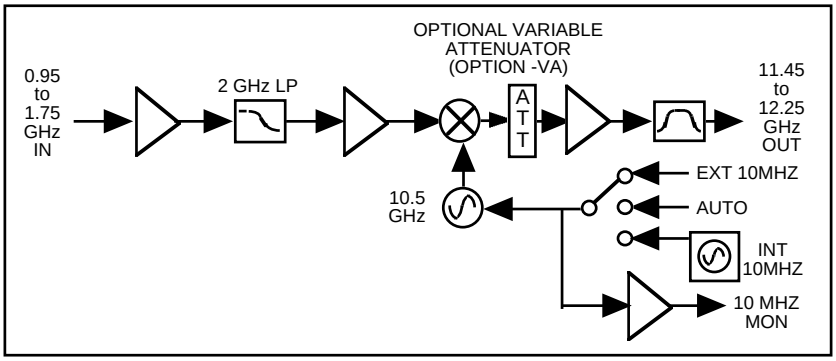


FIGURE 1.2 Model 2115-114 Upconverter Block Diagram

1.2 Technical Characteristics

TABLE 1.0 2115-114 Upconverter Specifications*

Input Characteristics

Impedance/Return Loss	50 Ω /14 dB (see TABLE 2.2 for connector options)
Frequency	0.95 to 1.75 GHz
Noise Figure, max.	20 dB, max gain
Input Level	-40 to -25 dBm
Input 1dB Compression	-15 dBm

Output Characteristics

Impedance/Return Loss	50 Ω/14 dB (see TABLE 2.2 for connector options)
Frequency	11.45 to 12.25 GHz
Output Level Range	-20 to -5 dBm
Output 1dB Compression	+5 dBm

Channel Characteristics

Gain	+20 ±1 dB, (+20 to +5 dB variable with Variable Attenuator Option)
Image Rejection	> 60 dB
Spurious, Inband	Signal related < -60 dBC, -5 dBm out: Signal independent <-60 dBm
Spurious, Out of Band	< -50 dBm
Intermodulation	< -50 dBC for two carriers each at -10 dBm out
Frequency Response	±1 dB, 11.45 to 12.25 GHz; ± 0.5 dB, 40 MHz BW
Frequency Sense	Non-inverting

LO Characteristics

LO Frequency	10.5 GHz
Frequency Accuracy	± 0.01 ppm max over temp internal reference; external ref. input
10 MHz Level	+3 dBm ± 3 dB, 75 ohms, External In or 10MHz Out

Phase Noise @ Freq	100 Hz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-70	-77	-85	-100	-110

Controls, Indicators

Attenuator Option -VA	Provides +20 to +5 dB variable gain via front panel potentiometer
Ext 10 MHz	Yellow LED, Indicates Ext 10 MHz reference is selected (rear panel DPDT Switch)
PLL Alarm	Red LED, External contact closure
Power	Green LED

Other

RF Connector	SMA 50Ω female (see TABLE 2.2 for other options)
L-Band Connector	BNC 50Ω, female (see TABLE 2.2 for other options)
10 MHz Connectors	BNC (female) 75Ω connector; Works with 50Ω or 75Ω.
Alarm Connector	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 2115-114 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 2115-114 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 2115-114 is assembled.

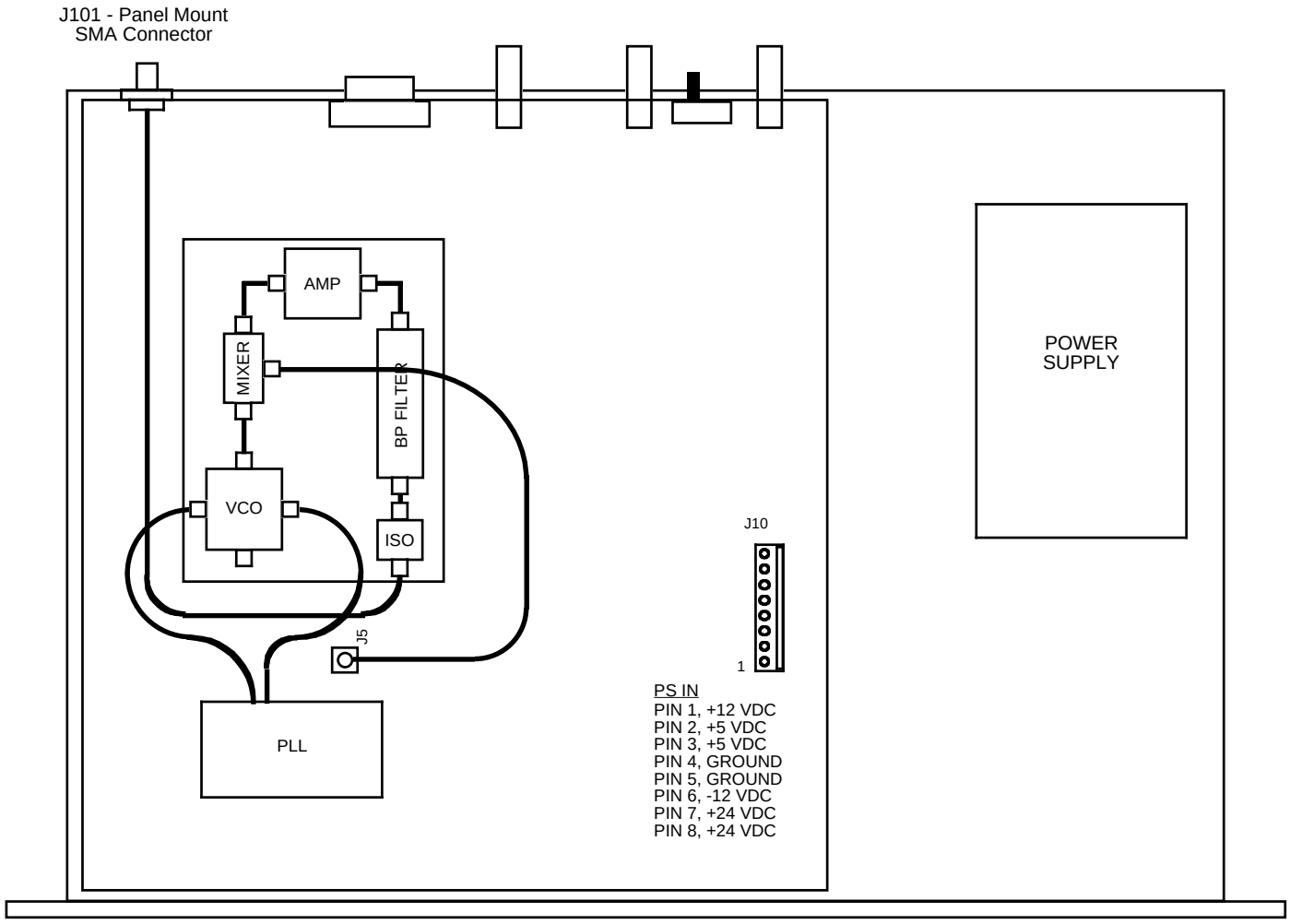


FIGURE 2.0 2115-114 Mechanical Assembly

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

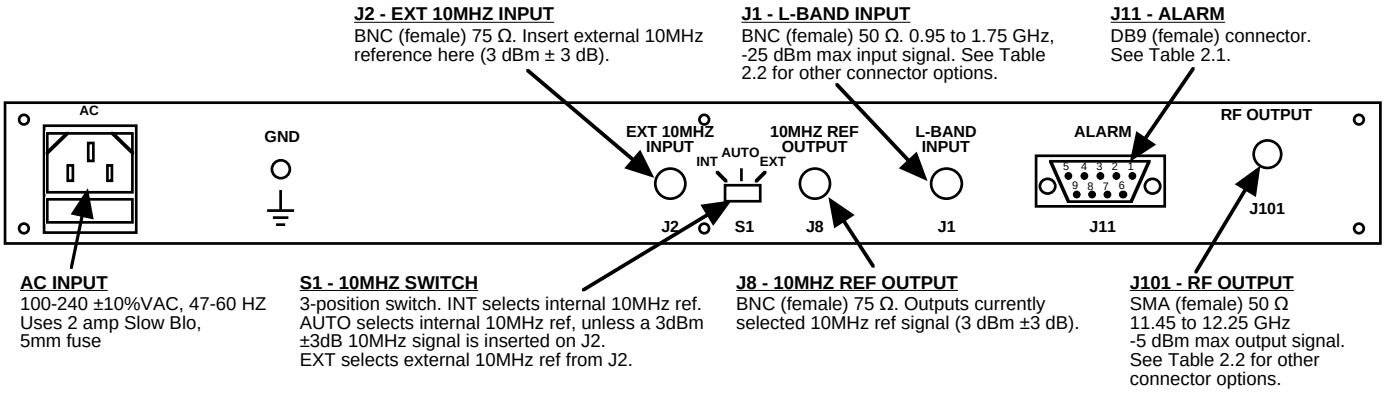


FIGURE 2.1 2115-114 Rear Panel I/O's

TABLE 2.1 J11 Pinouts (DB9)

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

TABLE 2.2 Connector Options

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 -The following are the front panel indicators.

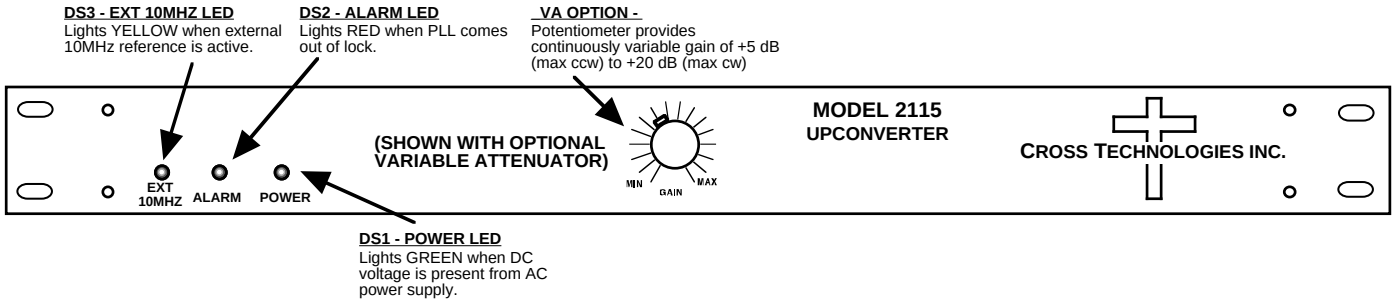


FIGURE 2.2 2115-114 Front Panel Controls and Indicators

2.4 Installation / Operation

2.4.1 Installing and Operating the 2115-114 Upconverter

1. Connect a -40 dBm to -25 dBm signal to L-BAND INPUT, J1 (Figure 2.1).
2. Connect the RF OUTPUT, J101, to the external equipment.
3. Connect 100-240 ±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. For Option -VA, adjust front panel potentiometer to get desired gain.
6. Select either INT (for internal 10MHz ref), AUTO (for internal 10MHz ref UNLESS a 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).
7. 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).
8. Check that a 10MHz, +3 dBm ±3 dB signal is present at the 10MHZ REF OUTPUT (J8) (Figure 2.1).
9. 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.

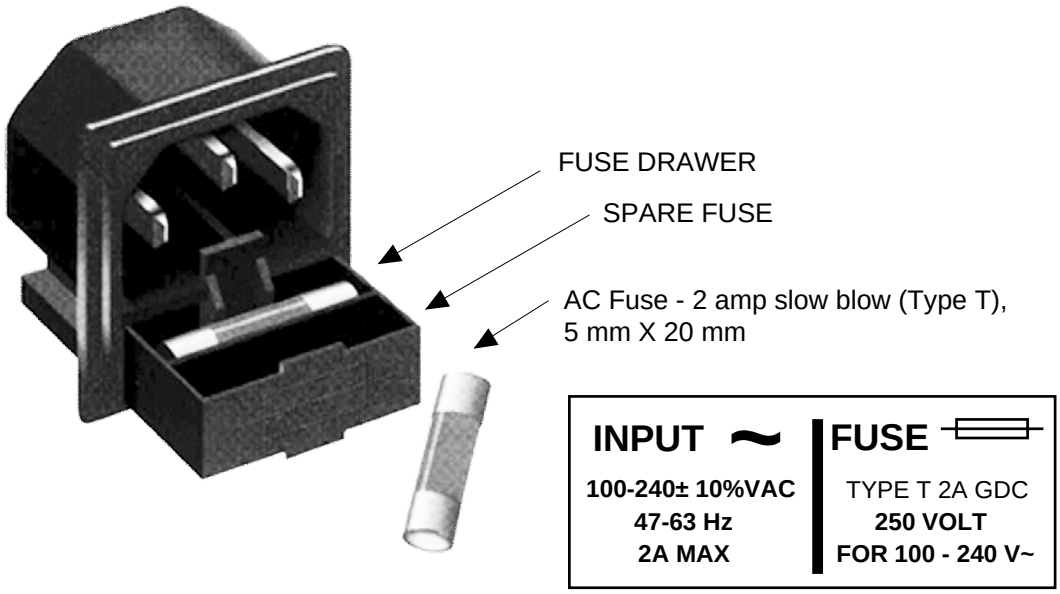


FIGURE 2.3 Fuse Location and Spare Fuse

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.

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