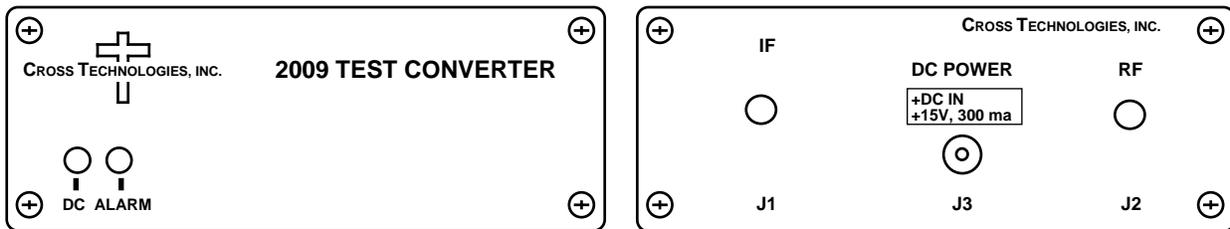


Instruction Manual

Model 2009-8487P Up/Down Converter

November 2013, Rev. A



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INSTRUCTION MANUAL

MODEL 2009-8487P Up/DownConverter

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WARRANTY - The following warranty applies to all Cross Technologies, Inc. products.

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Model 2009-8487P Up/DownConverter

1.0 General

1.1 Equipment Description

The 2009-8487P Up/DownConverter, for loop-back applications, converts a 8.487 GHz signal to or from 67 MHz with a low side local oscillator (LO) (non-inverted spectrum). Featuring low phase noise and high stability, this unit is used to down convert “clean” (having only this frequency) 8.487 GHz signal to 67 MHz or up convert 67 MHz to 8.487 GHz for test purposes. A synthesized local oscillator (LO) of 8.420 GHz converts the 8.487 GHz signal to 67 MHz when used as a Downconverter and the 67 MHz signal to 8.487 GHz when used as a Upconverter with a nominal gain of -15dB. Connectors are SMA (female) for the 67 MHz IF and the RF ports. Front panel LEDs light when DC power is applied (green) and when a PLL alarm occurs (red). The unit is powered by a 120 ±10% VAC wall mount power supply (**suffix P**) and other power supply options are available (**option P4 or option -C**). The 2009 can be mounted on an 1.75” X 19” rack mount panel (**option R**).

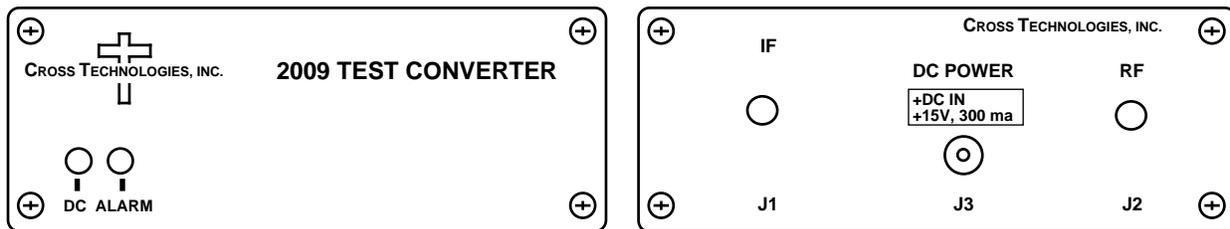


FIGURE 1.1 Front and Rear Panels

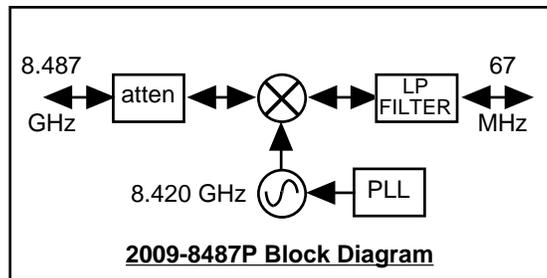


FIGURE 1.2 Block Diagram

1.2 Technical Characteristics

TABLE 1.1 Model 2009-8487P Equipment Specifications*

EQUIPMENT SPECIFICATIONS*

RF Characteristics

Impedance / Return Loss	50Ω / 12 db
Frequency	8487 MHz ± 20 MHz
Level, In, Downconverter	-30 to -5 dBm
Level, Out, Upconverter	-30 to -20 dBm
Input 1 dB compression	+5 dBm

IF Characteristics

Impedance / Return Loss	50Ω / 12 db
Frequency	67 MHz ± 20 MHz
Level, In, Upconverter	-15 to -5 dBm
Level, Out, Downconverter	-45 to -20 dBm

Channel Characteristics

Gain at band center	-15 dB ±2 dB
Spurious Response	<-40 dBC, ± 20 MHz of the center frequency
Spectrum Sense	Non-inverting
Frequency Response	± 0.5 dB, ± 20 MHz of the center frequency

Synthesizer Characteristics

Frequency Accuracy	± 2.5 ppm maximum
--------------------	-------------------

Phase Noise @ Freq	10Hz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-70	-75	-80	-95	-110

Indicators

DC Power	Green LED
Alarm	Red LED

Other

RF Connector	SMA (female), 50Ω
IF Connector	SMA (female), 50Ω
Size, Bench Top	4.7" wide X 1.75" high X 6.5" deep
Size, Rack Mount (-R)	19 inch standard chassis 1.75" high X 7.0" deep (optional)
Power	120 ±10% VAC Wall Power Supply providing +15 to +18 VDC

Options

-C	No Power Supply. Use with Cross 2000-01 Power Supply
-P4	100-240 ± 10% VAC Wall Power Supply
-R	1RU Rack Mounting

*+10°C to +40°C; 2 km maximum elevation; 90% maximum humidity; Specifications subject to change without notice

2.0 Installation

2.1 Mechanical

The 2009-8487P is packaged in an aluminum extrusion. The **-R option** is mounted on a 1 3/4" X 19" panel that can be mounted to a rack using the 4 holes at the ends (See Figure 2.1).

2.1.1 Cleaning Instructions

Wipe the exterior with a dry, soft cloth. Use no detergent or cleaning chemicals.

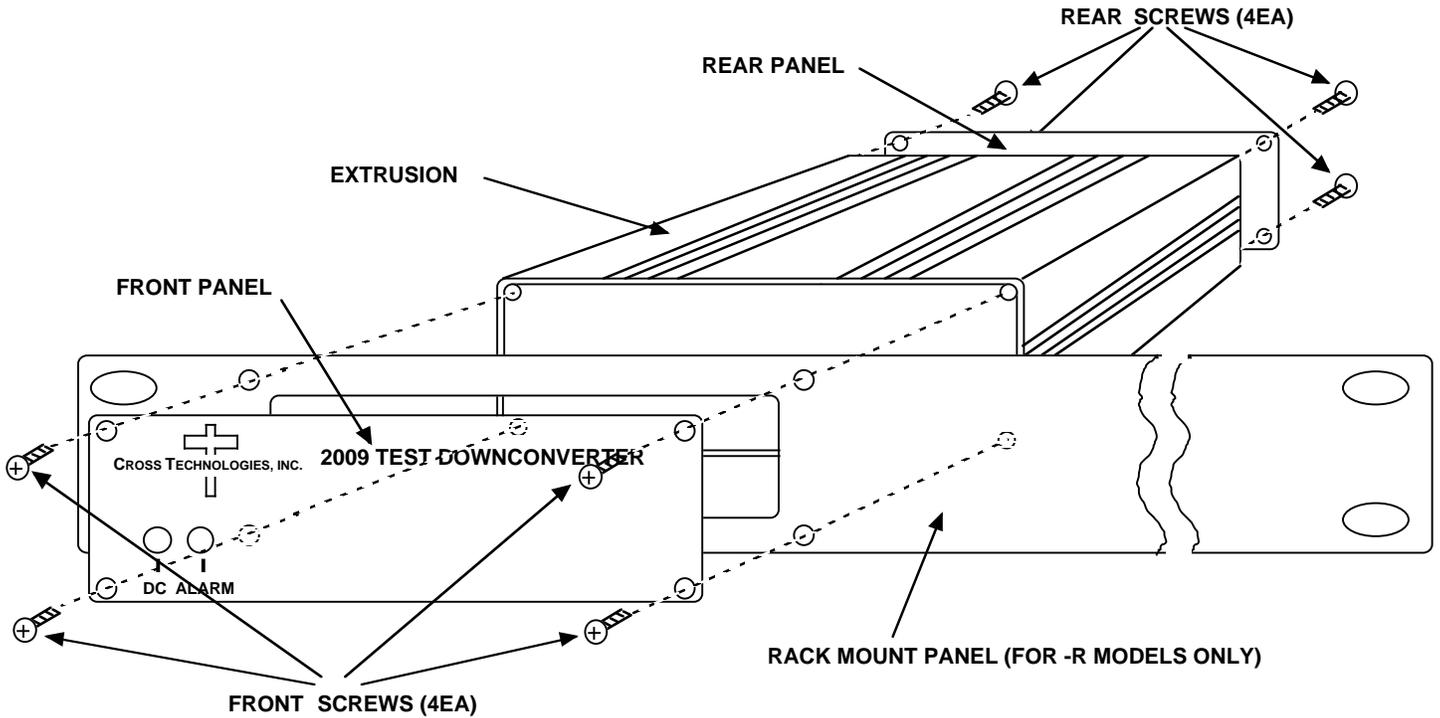


FIGURE 2.1 Model 2009-8487P Assembly (-R option shown)

2.2 Indicators

Figure 2.2 shows front panel indicators.

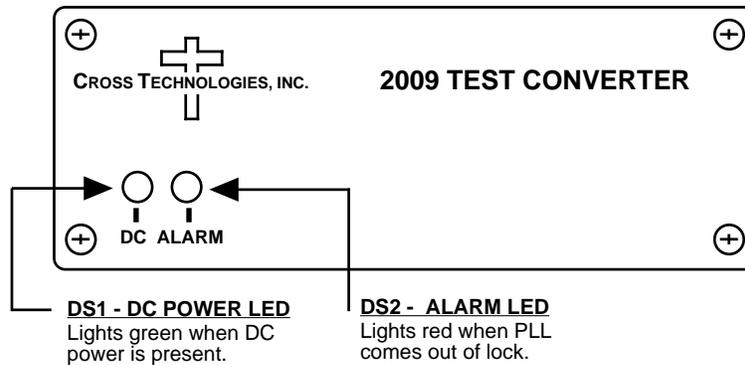


FIGURE 2.2 Model 2009-8487P Front Panel Indicators

2.3 Input / Output Signals

Figure 2.3 shows the input and output signals to the 2009-8487P.

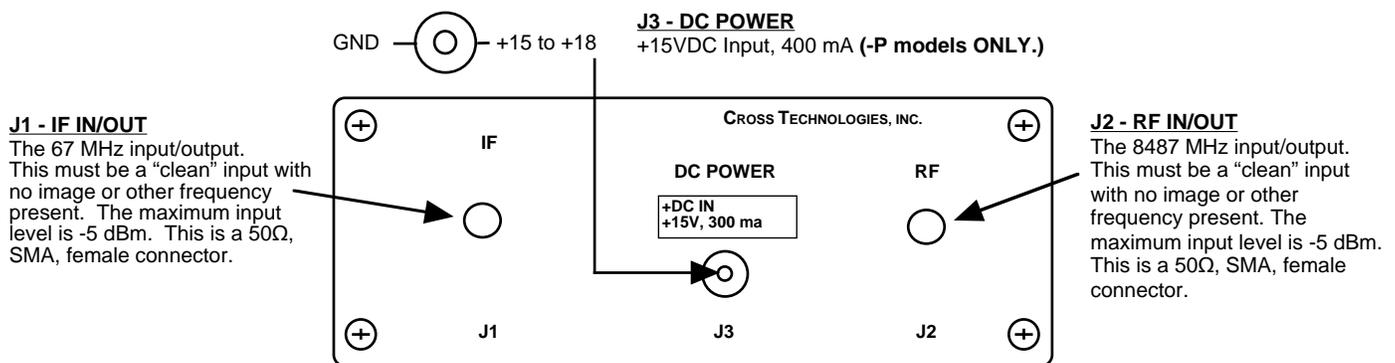


FIGURE 2.3 Model 2009-8487P Rear Panel Inputs and Outputs

2.4 Accessing the PC Card

There are NO USER JUMPERS or other on-card controls. ALTHOUGH IT IS NOT RECOMMENDED AND MAY VOID THE WARRANTY the following shows how to remove the printed circuit board (PCB) from the extrusion:

1. **Always remove power** when installing or removing the PCB from the extrusion.
2. Remove four (4) **rear panel screws** (see Figure 2.1).
3. **Gently** pull the rear panel and PCB assembly completely out of the extrusion.
4. To install the PCB, **gently** push the rear panel and PCB assembly completely into the extrusion (make sure the shield goes in the lower channel and the PCB in the next channel above that) and that the front panel indicators line up with the front panel holes.
5. Install four (4) **rear panel screws**.

2.5 Installation / Operation

2.5.1 Installing and Operating the 2009-8487P

1. For Option **-P** models, connect one end of the Wall Power Supply to the 2009-8487P DC Power In, J3, and the other end to 115 VAC, 60 Hz (Figure 2.3).
2. Connect a -5 dBm, maximum, signal to IF IN, J1 or RF IN, J2 (Figure 2.3).
3. Connect the IF OUT, J2, to the receiver under test (Figure 2.3).
4. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).

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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