

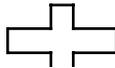
# **INSTRUCTION MANUAL**

## **MODEL 2087 Downconverter**

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First Edition	<b>October 2002</b>	<b>Rev 0</b>
	<b>February 2003</b>	<b>Rev A</b>
	<b>May 2005</b>	<b>Rev B</b>



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# INSTRUCTION MANUAL

## MODEL 2087 Downconverter

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# MODEL 2087 DOWNCONVERTER

## 1.0 General

### 1.1 Equipment Description

The 2087-XXX Downconverter converts an X.XX GHz L-Band signal (0.95-1.75 GHz) to IF with no spectrum inversion, low group delay, and flat frequency response. The L-Band input is mixed with a fixed frequency local oscillator (LO) signal to 70 or 140 MHz (specified by the customer). The L-Band frequency is fixed and specified by the customer. A green front panel LED lights when DC power is applied and a red LED lights if the phase lock loop for the LO is in alarm. Connectors are BNC female for the IF output and Type F female for the RF input. Power is provided by a  $120 \pm 10\%$  VAC, 60Hz, wall mount power supply. The 2087 Downconverter is housed in a 4.7" wide X 1.75" high X 12.5" deep aluminum chassis. The 2087 has the option to be mounted on an 1 3/4" X 19" rack mount panel (**option -R**). The 2087 can also be powered by the 2000-01 switching power supply using **option -C** which includes no power supply. **Option -A** includes automatic gain control (AGC) for a -25 to -65 dBm input range, an AGC/MGC switch, MGC adjust, and AGC gain monitor. **Option -S** provides a SAW IF filter.

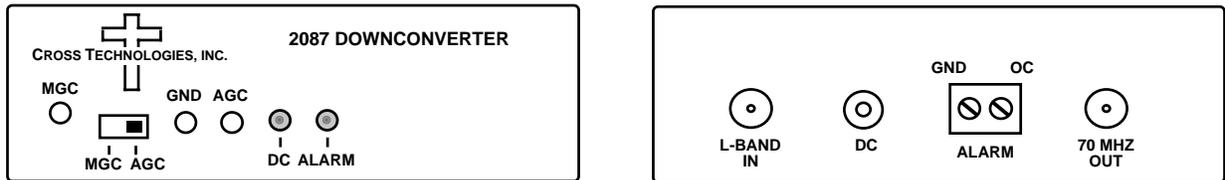


FIGURE 1.1 2087 Downconverter Front and Rear Panels (with SAW and AGC options)

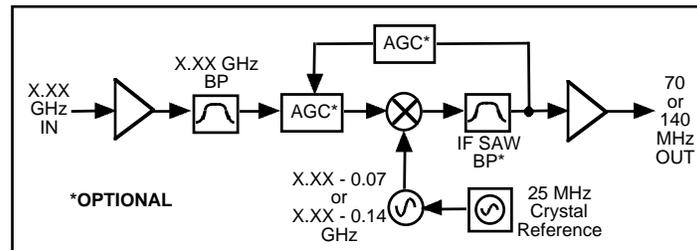


FIGURE 1.2 2087 Downconverter Block Diagram

## 1.2 Technical Characteristics

### EQUIPMENT SPECIFICATIONS\*

#### Input Characteristics

Input Impedance/RL	75 $\Omega$ /12 dB
Frequency	Fixed frequency in the 0.95-1.75 GHz band
Input Level range	-10 to -20 dBm (-25 to -65 dBm, <b>option -A</b> )
Input 1 dB compression	0 dBm

#### Output Characteristics

Impedance/RL	75 $\Omega$ /18 dB
Frequency	70 or 140 MHz (customer specified)
Level	-10 to -20 dBm (-25 dBm, <b>option -A</b> )

#### Channel Characteristics

Gain	0 $\pm$ 1.0 dB (0 to +40 dB, AGC, <b>option -A</b> )
Spurious Response	<-45 dBC
Image Rejection	> 45 dB
Frequency Response	$\pm$ 0.5 dB, 36 MHz BW or determined by SAW IF filter ( <b>option -S</b> )
Group Delay, max	0.01 ns/MHz <sup>2</sup> parabolic; 0.03 ns/MHz linear; 1 ns ripple or determined by SAW IF filter ( <b>option -S</b> )

#### Synthesizer Characteristics

Frequency Accuracy	$\pm$ 25 kHz max over temp
Phase Noise (dBC/Hz)	$\leq$ -70 @ 1 kHz; $\leq$ -80 @ 10 kHz; $\leq$ -95 @ 100 kHz; $\leq$ -110 @ 1 MHz

#### Controls/Indicators

MGC/AGC select	Toggle switch ( <b>option -A</b> )
MGC adjust	Multi-turn potentiometer ( <b>option -A</b> )
AGC Voltage/Gain	Test points ( <b>option -A</b> )
DC Power	Green LED
PLL Alarm	Red LED; open collector output

#### Other

RF Connector	Type F (female)
IF Connector	BNC (female)
Size, Bench Top	4.7" wide X 1.75" high X 12.5" deep
Size, Rack Mount (-R)	19 inch standard chassis 1.75"high X 13.0" deep (Optional)
Power	120 $\pm$ 10% VAC, 60Hz, 20 watts max, wall mount power supply

#### Options

-R	Rack mount
-C	No power supply (use with Model 2000-01 Power Supply)
-S	SAW IF filter; 36 MHz unless otherwise specified by customer
-A	Automatic Gain Control (AGC) for -25 to -65 dBm input range
Call for frequencies	

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

## 2.0 Installation

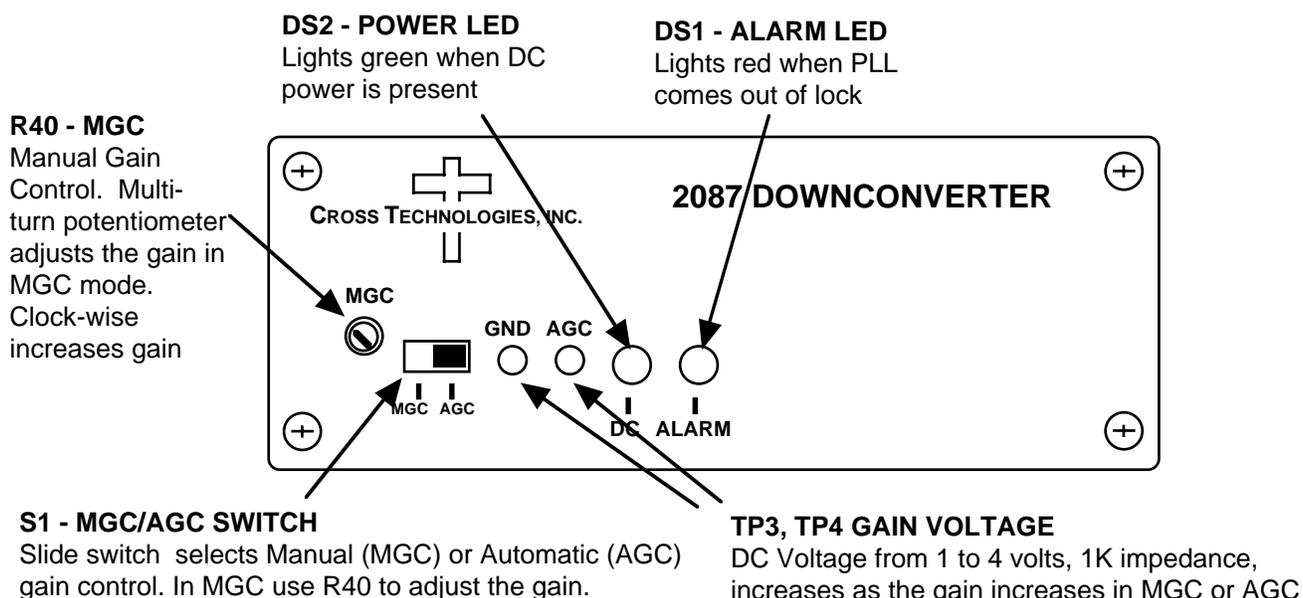
### 2.1 Mechanical

The 2087 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. The 2087 derives  $\pm 15$  VDC from the wall power supply. See Figure 2.3.

#### 2.1.1 Cleaning Instructions

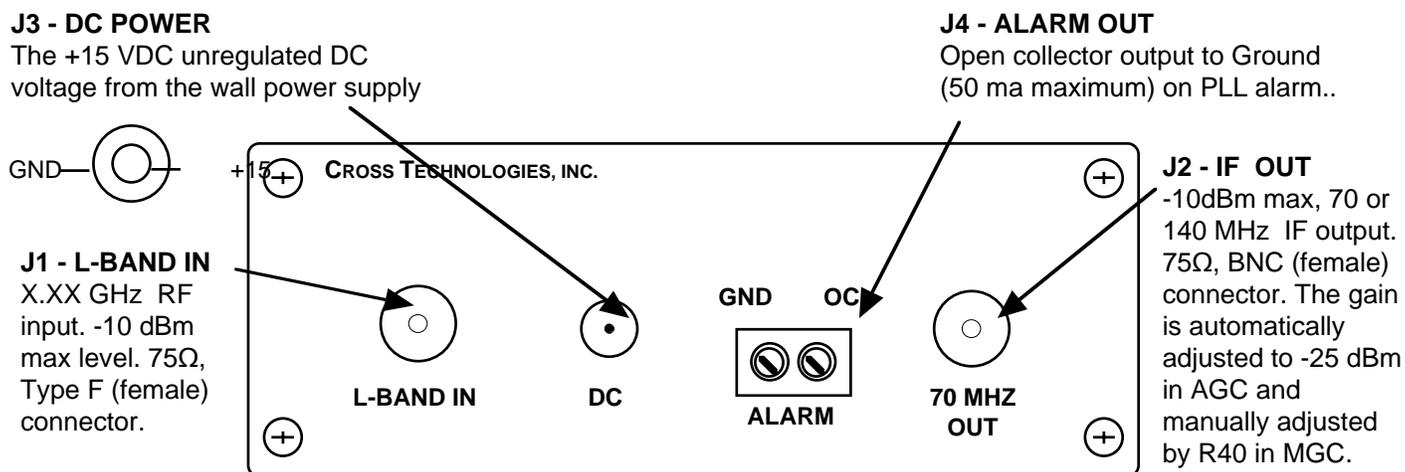
Wipe the exterior with a dry, soft cloth. Use no detergent or cleaning chemicals.

### 2.2 Indicators - Figure 2.1 shows front panel controls and indicators.



**FIGURE 2.1 2087 Front Panel Indicators**

### 2.3 Input / Output Signals - Figure 2.2 shows the input and output signals to the 2087.

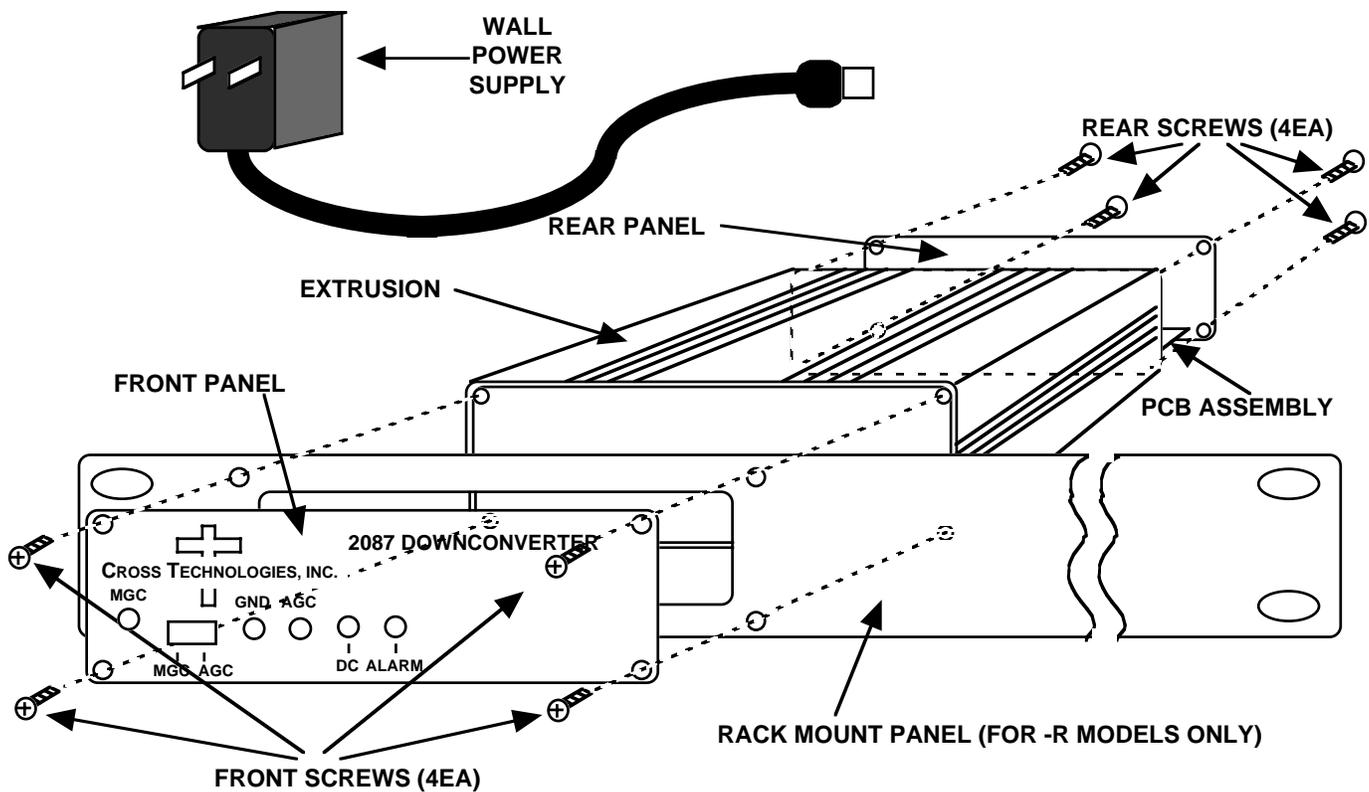


**FIGURE 2.2 2087 Rear Panel Inputs and Outputs**

## 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 2.3).
- 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 in the extrusion and that the front panel controls go through the front panel holes.
- 5.) Install four (4) **rear panel screws**.



**FIGURE 2.3 2087 Assembly**

## **2.5 Installation / Operation**

### **2.5.1 Installing and Operating The 2087**

- 1.) Connect the wall power supply to J2 and the wall power supply to 115 VAC, 60 Hz (Figure 2.2)
- 2.) Be sure DS1 (green, DC Power) is on and DS2 (red, PLL Alarm) is off (Figure 2.1).
- 3.) For option -A models, select either manual or automatic gain control (MGC or AGC) using switch S1 (Figure 2.1).
- 4.) Connect a -10dBm, maximum, signal to L-BAND IN, J1 (Figure 2.2) (-25 dBm max for option -A models).
- 5.) Connect the IF OUT, J3, to the desired device (Figure 2.2).
- 6.) For option -A models, when in MGC mode adjust the gain for the desired output level using R40 (Figure 2.1).