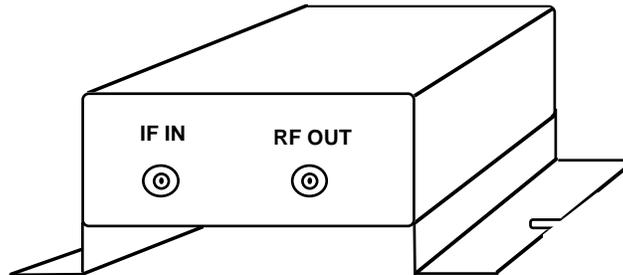


# Instruction Manual

# Model 2006-04 Upconverter

October 2013, Rev. C



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# INSTRUCTION MANUAL

## 2006-04 UP CONVERTER

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

All Cross Technologies, Inc. products are warranted against defective materials and workmanship for a period of one year after shipment to customer. Cross Technologies, Inc.'s obligation under this warranty is limited to repairing or, at Cross Technologies, Inc.' option, replacing parts, subassemblies, or entire assemblies. Cross Technologies, Inc. shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are not other warranties, express or implied, except as stated herein.



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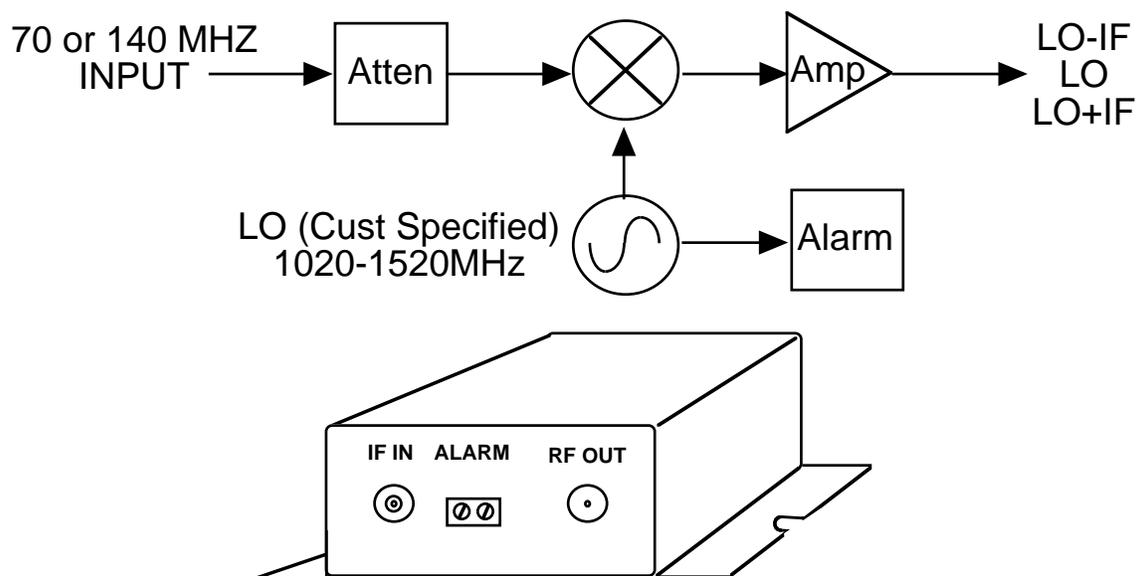
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# 2006-04 UP CONVERTER

## 1.0 General

### 1.1 Equipment Description

The 2006-04, for loop-back applications, converts a 70 or 140 MHz IF signal to frequencies determined by a customer specified LO from 1020 to 1520 MHz. The IF input is attenuated and then mixed with a customer specified LO from 1020 to 1520 MHz. The 2006-04's frequency can be changed by replacing the controller IC. The mixer output goes to the output amplifier. A green LED indicates the presence of DC power. An alarm is indicated through an open collector output to ground at the alarm terminal block when PLL is not locked. Power is provided by the LNB voltage from the receiver under test and connectors are BNC female for the 70 MHz input and F, female for the RF output. **Option -P** includes a wall power supply for 115 VAC, 60 Hz. **Option -P4** includes a wall power supply that covers 100-240  $\pm$ 10% VAC, 47-63 Hz. Specify US, EUR, AUS, or UK plug for **option -P4**. **Option -C** allows for power to come from a customer supplied wall mount power supply (unregulated +15VDC min, +18VDC max, center pin positive, 2.5mm jack).



**FIGURE 1.1 2006-04 Upconverter  
Block Diagram and Chassis**

## 1.2 Technical Characteristics

**TABLE 1.0 2006-04 UP CONVERTER SPECIFICATIONS\***

### **Input Characteristics**

Input Impedance/RL	75 $\Omega$ /15 dB
Frequency	70 or 140 MHz center
Input Level Range	-10 dBm to -20 dBm
Input 1dB/3RD ORDER	0 / +10 dBm

### **Output Characteristics**

Impedance/RL	75 $\Omega$ /12 dB
Frequency , LO	1020-1520 fixed
Frequency , OUTPUT	LO-IF, LO, LO+IF
Level, with -10 dBm in	-15 dBm

### **Channel Characteristics**

Gain	-5 $\pm$ 3 dBm
Spurious Response	NA; output not filtered
Frequency Response	$\pm$ 1 dB, over $\pm$ 20 MHz; $\pm$ 0.5 dB, any 10 MHz

### **Synthesizer Characteristics**

Frequency Accuracy	$\pm$ 25 kHz max
Phase Noise(dBC/Hz)	$\leq$ -80, 10 kHz; $\leq$ -90, 100 kHz; $\leq$ -100, 1 MHz
Frequency Selection	NONE: Fixed tuned

### **Indicators**

DC Power	Green LED
PLL Alarm	Terminal Block (open collector to ground, min sink current = 16ma)

### **Other**

RF Connector	Type F (female)
IF Connector	BNC (female)
Size	3.4"W x 1.2"H x 4.0"D
Power	+14 to +20 VDC, 150 ma on RF IN from LNB
Power (option -P)	+15 VDC min, 150 ma, 115 VAC wall pwr supply
Power (option -P4)	100-240 $\pm$ 10% VAC, 47-63Hz wall ps (US, EUR, AUS, UK)
Power (option -C)	unregulated +15VDC min, +18VDC max, center pin positive, 2.5mm jack

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\*+10°C to +40°C; 2000 meters max elevation; 80% max humidity; Pollution Degree 2;

Specifications subject to change without notice.

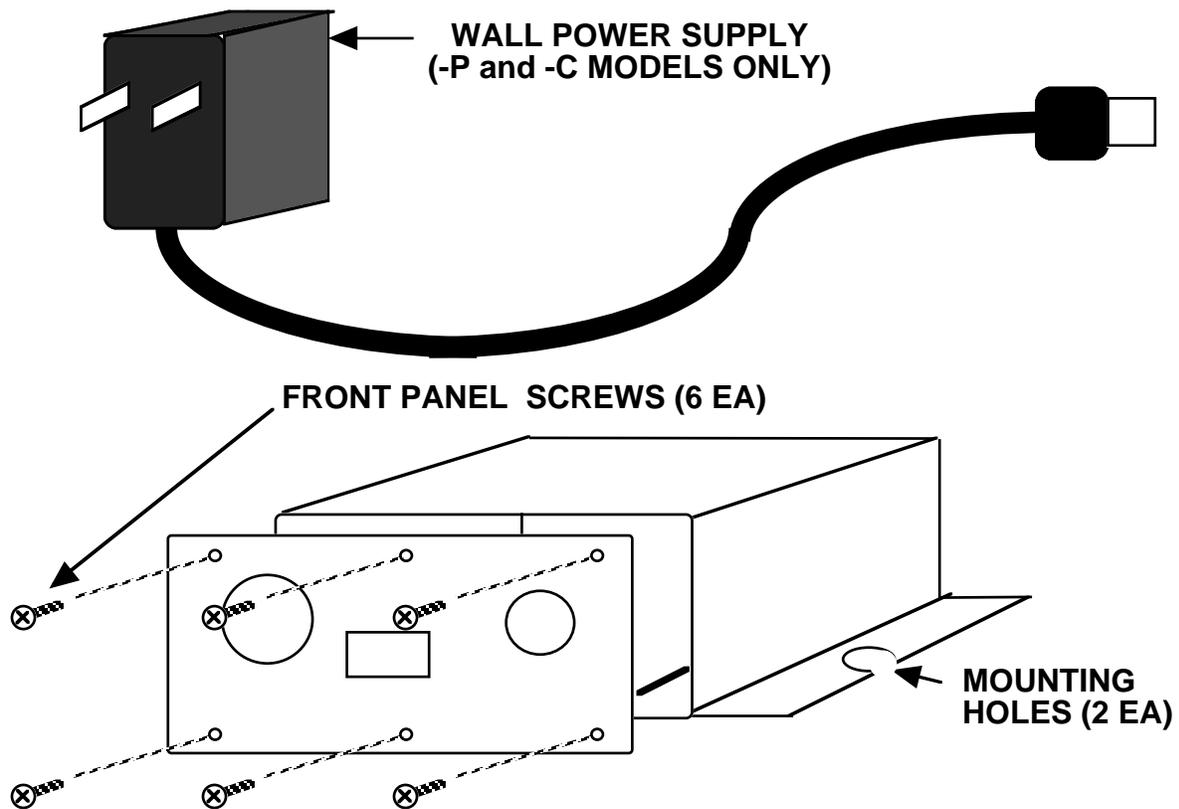
## 2.0 Installation

### 2.1 Mechanical

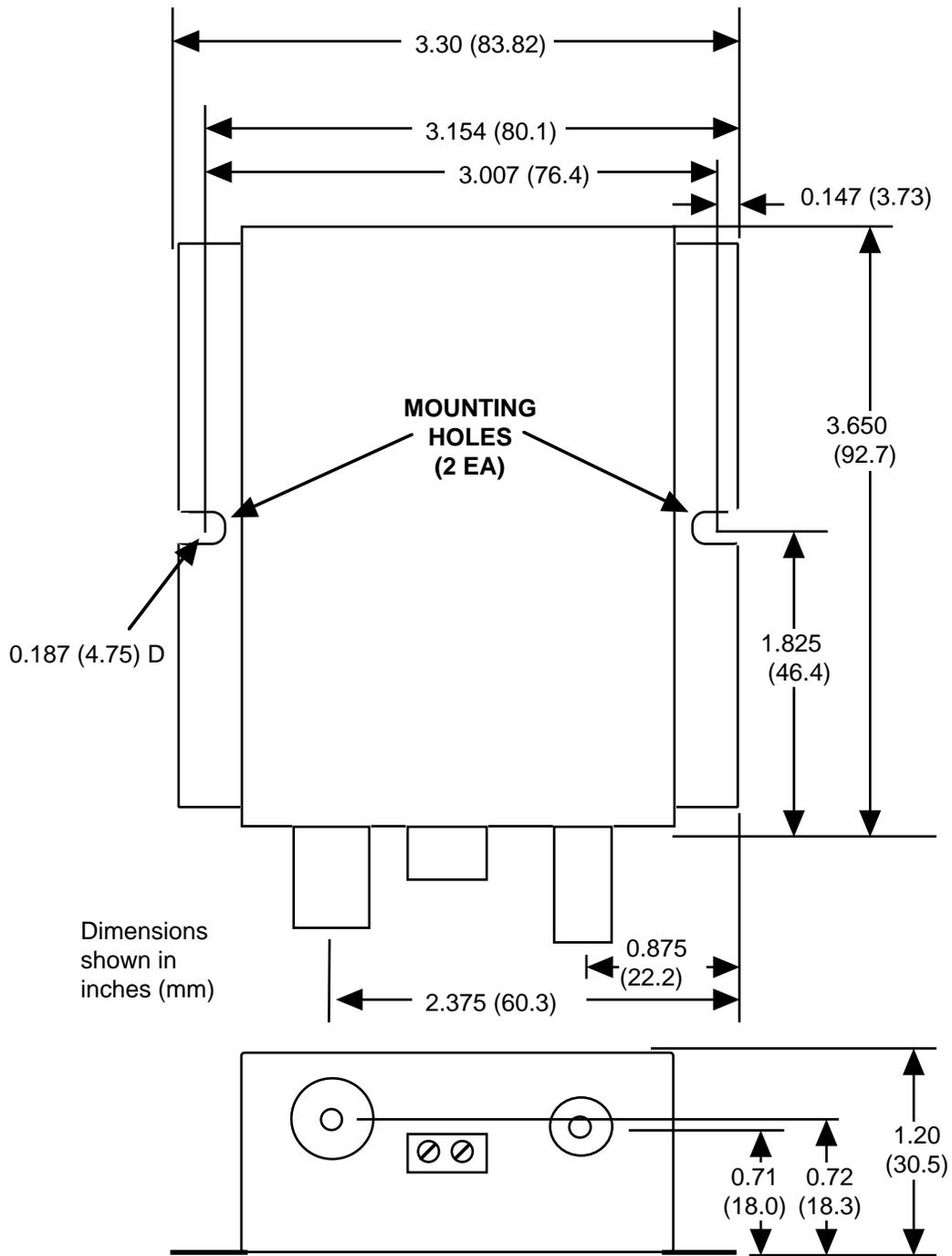
The 2006-04 is packaged in an aluminum chassis. The unit can be mounted to a panel using the 2 holes at the bottom side flange. The unit derives +DC (+14 to +20 VDC) from the RF out center conductor (from the LNB) or +15 VDC from a wall mount power supply for the -P, -P4, and -C models. (See Figure 2.1 and Figure 2.2).

#### 2.1.1 Cleaning Instructions

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



**FIGURE 2.1 2006-04 Assembly Drawing**



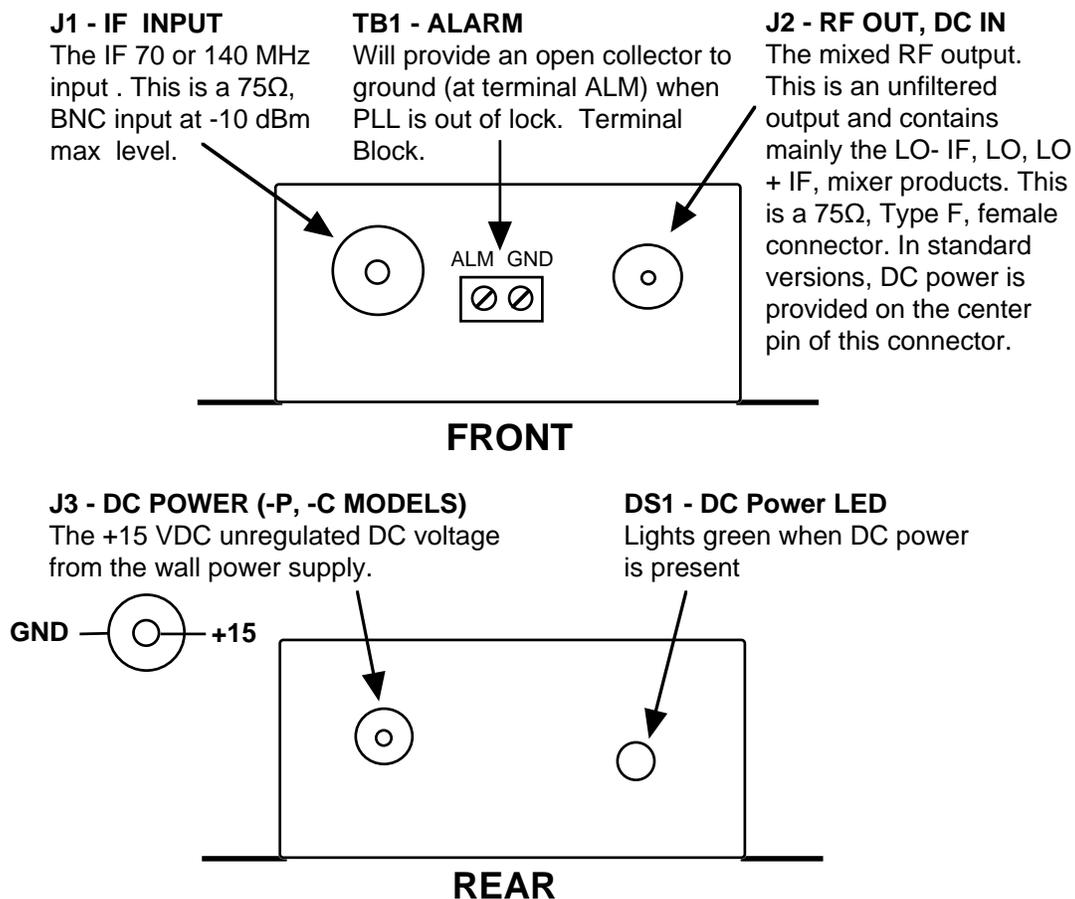
**FIGURE 2.2 2006-04 Package Dimensions**

## 2.2 Controls and Indicators

There are no controls. A green LED indicates presence of DC power and a terminal block indicates a PLL alarm with an open collector to ground at the ALM terminal (Figure 2.3).

## 2.3 Input / Output Signals

Figure 2.3 shows the input and output signals to the 2006-04.



**Figure 2.3 2006-04 Input, Output, Alarm Power LED, External DC In (-P, -C Options)**

## **2.4 Installation / Operation**

### **2.4.1 Installing and Operating the 2006-04**

- 1.) Secure the 2006-04 to a panel using the two bottom mounting holes (see Figure 2.1 and Figure 2.2)
- 2.) Be sure the receiver LNB voltage to power the 2006-04, is +14 to +20 VDC on the RF center conductor. The -P and -C models receive unregulated +15 VDC from a wall power supply provided either by Cross Technologies (-P) or by the customer (-C).
- 3.) Observe that the green power LED (DS1) is illuminated.
- 4.) Connect -10 dBm (maximum) signal to IF In, J1 (Figure 2.3).
- 5.) Connect the RF OUT, J2, to the receiver under test.

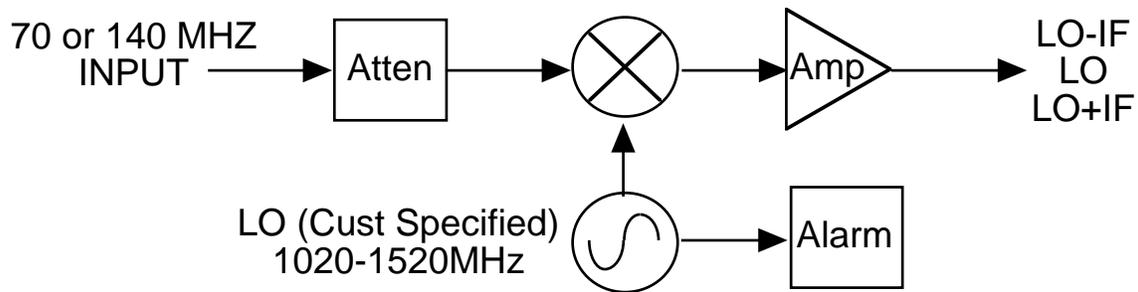
### **2.4.2 LO and IF for the 2006-04**

The 2006-04 LO is customer specified from 1020 to 1520 MHz as noted on the top decal and has a LO-IF, LO, and LO+IF output.

### 3.0 Circuit Description

#### 3.1 Block Diagram Description - 2006-04 (Figure 3.1)

The 70 or 140 MHz input goes to an attenuator. The signal then goes to a mixer which receives the LO generated by the VCO and provides the  $LO \pm IF$  and LO unfiltered output. This signal next goes to an amplifier and a 50 to 75 ohm output matching pad. Commands for the phase lock loop IC are provided serially from the microcontroller which determines the frequency of the LO. A 25 MHz crystal provides the reference frequency for the synthesizer IC.



**FIGURE 3.1 Block Diagram**

## 4.0 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 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 servicable 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 RE-INSTALLED** prior to Top Cover screw replacement. **FAILURE TO DO** this may cause **INGRESS** and/or **EGRESS** emission problems.



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