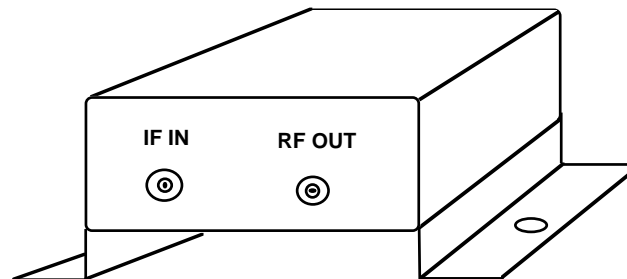


## Instruction Manual

# Model 2006-01 Upconverter

October 2013, Rev. B



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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 2006-01 Upconverter**

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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.'s 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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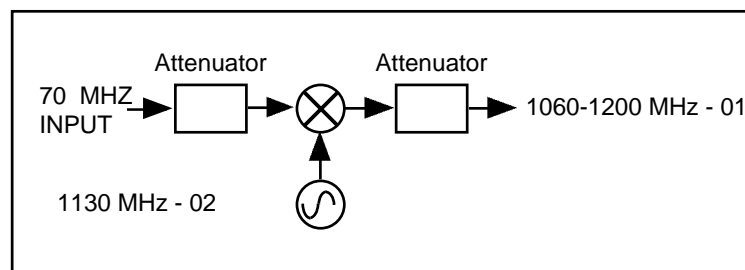
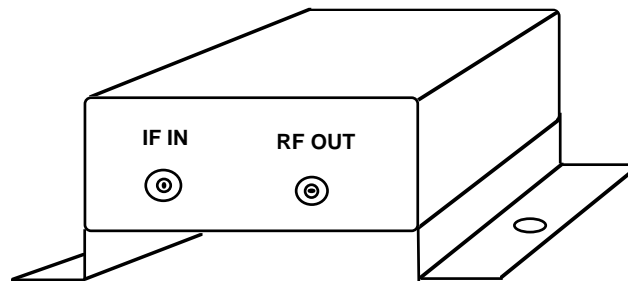
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## MODEL 2015-05 Upconverter

### 1.0 General

#### 1.1 Equipment Description

The Model 2006-01 1.2 GHz Upconverter, for loop-back applications, converts a 70 MHz IF signal to 1200 MHz (Ku) and 1060 MHz (C). The 70 MHz carrier input is mixed with a 1130 MHz local oscillator (LO) signal for the 2006-01. The mixer output is applied to the output attenuator providing a nominal gain of -25dB. A green LED indicates the presence of DC power. 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.



2006-01 Upconverter Block Diagram

## 1.2 Technical Characteristics

**TABLE 1.0 2006-01 Upconverter Specifications\***

<b>Input Characteristics</b>	<b>2006-01</b>
Input Impedance/RL	75 $\Omega$ /10db
Frequency	70 MHz center
Input Level, maximum	-10 dBm
Input 1dB/3RD ORDER	0 / +10 dBm
<b>Output Characteristics</b>	
Impedance/RL	75 $\Omega$ /8db
Frequency , LO	1130 MHz, fixed
Frequency , Ku	1200 MHz
Frequency , C	1060 MHz
Level, with -10dBm in	-35 $\pm$ 5 dBm,
<b>Channel Characteristics</b>	
Gain	-25dB $\pm$ 5 dB
Spurious Response	NA; output not filtered
Frequency Response	$\pm$ 0.7 dB, 10 MHz increment
<b>Synthesizer Characteristics</b>	
Frequency Accuracy	$\pm$ 100 kHz max
Phase Noise, Suitable for;	128 kB/s QPSK,1/2 FEC
Frequency Selection	NONE: Fixed tuned
DC Power	Green LED
<b>Other</b>	
RF, IF Connectors	F, female, BNC, female
Size	3.4" wide X 1.5" high X 4.0" deep
Power	+14 to +20 VDC, 150 ma on RF In;
RF Connections	Installation Category I
Main Supply	Installation Category II

---

\*+10 to +40 degrees C; 2000 meters max elevation; 80% max humidity; Pollution Degree 2;  
Specifications subject to change without notice.

## 2.0 Installation

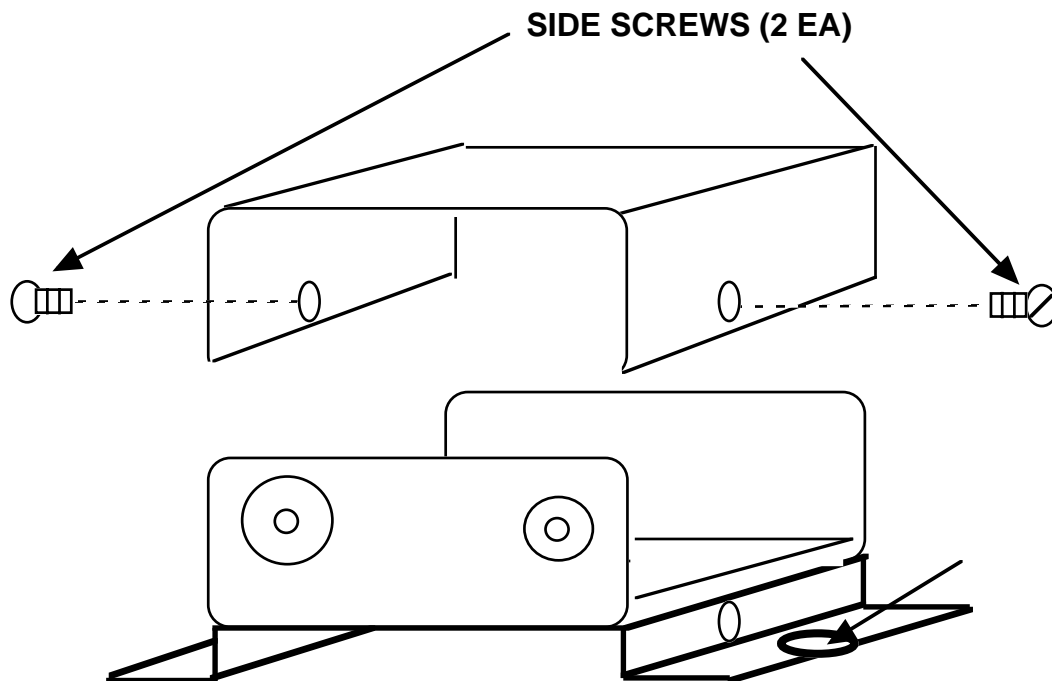
### 2.1 Mechanical -

The 2006-01 is packaged in an aluminum chassis. The unit can be mounted to a panel using the 2 holes at the bottom. The unit derives +DC (+14 to +20 VDC) from the RF out center conductor. (See Figure 2.1 and Figure 2.2).

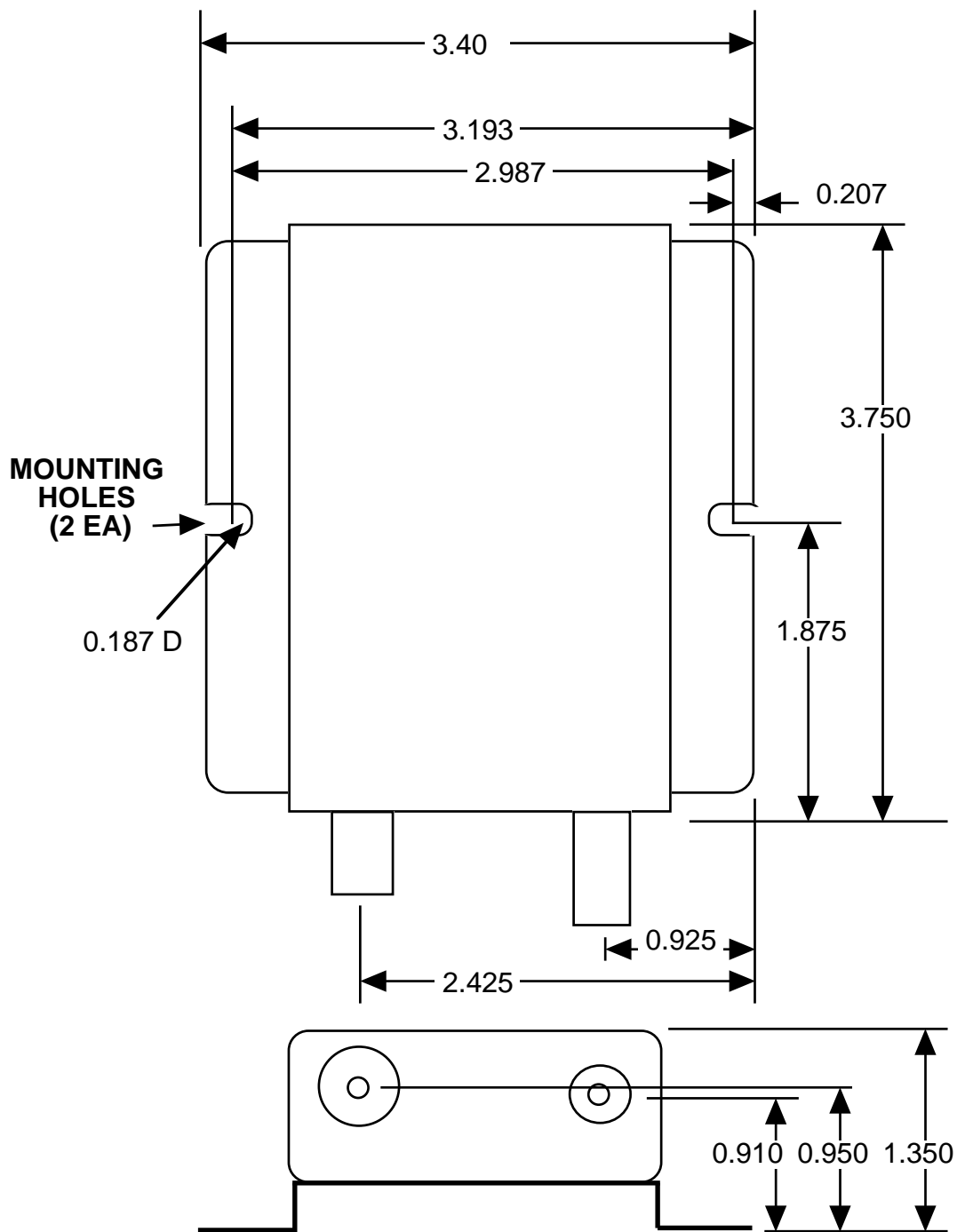
**2.1.1 Cleaning Instructions** - Wipe the exterior with a dry, soft cloth. Use no detergent or cleaning chemicals.

**2.2 Controls and Indicators** - There are no controls. A green LED indicates presence of DC power (Figure 2.3).

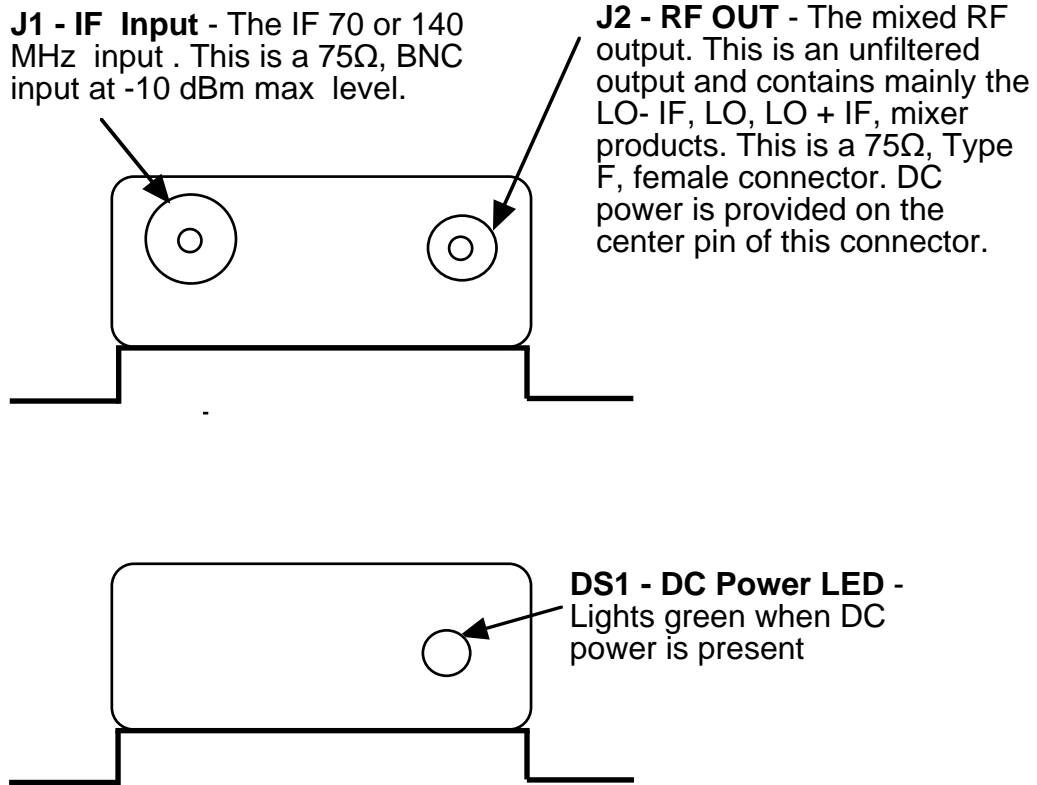
**2.3 Input / Output Signals** - Figure 2.3 shows the input and output signals to the 2006-01.



**FIGURE 2.1 2006-01 Mechanical Assembly**



**FIGURE 2.2 2006-01 Package Dimensions**



**FIGURE 2.3 2006-01 Input, Output, Power LED**

## 2.4 Installation / Operation

### 2.4.1 Installing and Operating the 2006-01 -

- 1.) Secure the 2006-01 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 2006-01, is +14 to +20 VDC on the RF center conductor.
- 3.) Observe that green power LED (DS1) is illuminated.
- 4.) Connect a -10dBm (max.) 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 2006-01** - The **2006-01** frequency is determined by controller U3. The frequency displayed on the label is the LO frequency. The desired output frequency with 70 or 140 MHz IF center frequency input is the LO + or - 70 or 140 MHz as desired. Contact the factory for information on changing frequency by replacing the controller, U3.

## 3.0 Circuit Description

**3.1 Block Diagram Description - 2006-01 (Figure 3.1)** - The 70 or 140 MHz input (J1) signal first goes to capacitor C8 and then to the 75 to 50 ohm matching attenuator, R4, R6. The signal then goes to mixer A1 which receives the LO generated by VCO A2 and provides the LO  $\pm$  IF and LO unfiltered output. This signal next goes through 6 dB attenuator R7, R13, R17 and then to the 50 to 75 ohm matching attenuator R1, R5. Commands for the phase lock loop IC, U4, are provided serially from microcontroller U3 which determines the frequency of the LO. Crystal oscillator A3 provides the 25 MHz reference frequency for the synthesizer U4. Q1 provides low noise regulated voltages for PLL IC U4 and loop amplifier U2.



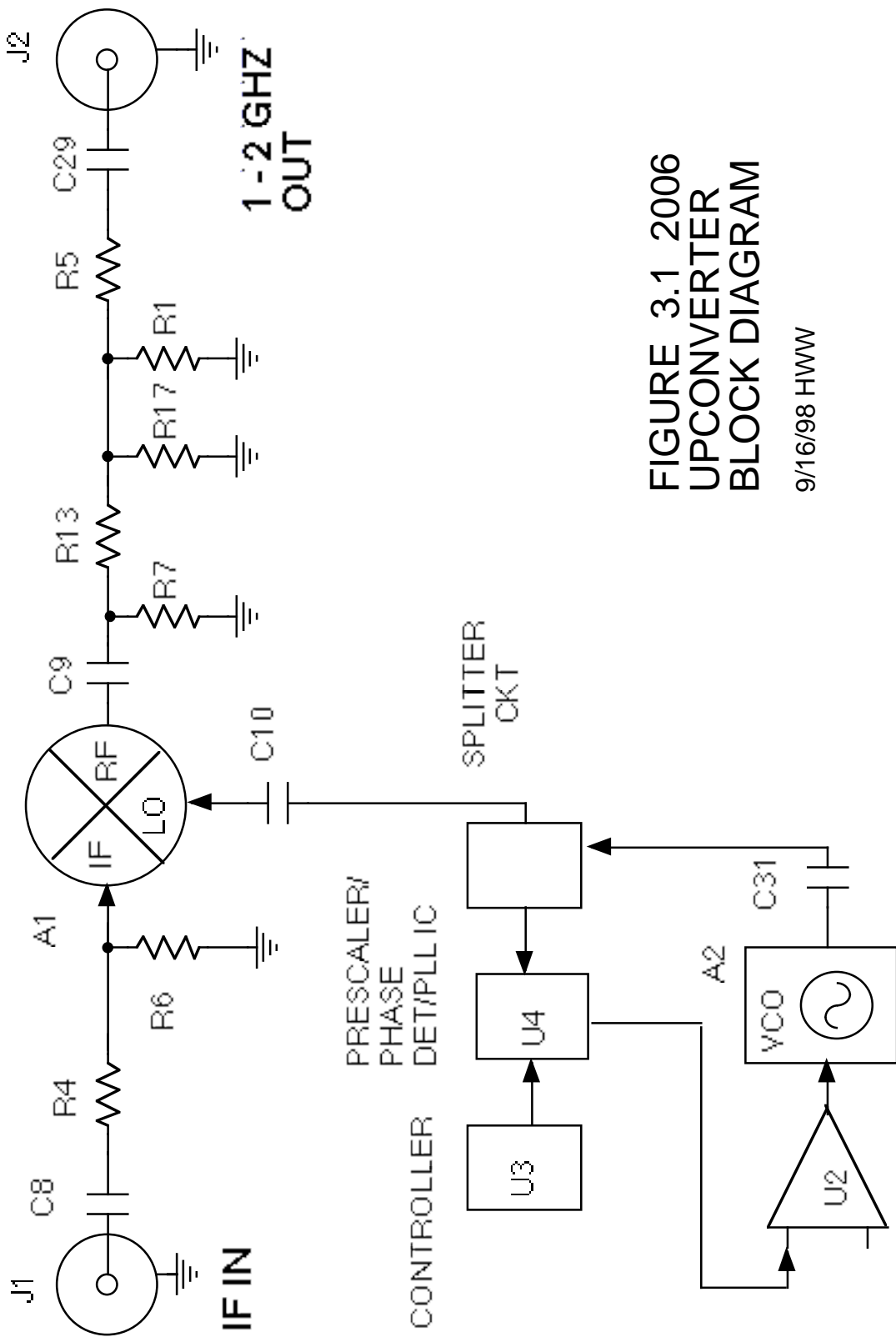


FIGURE 3.1 2006  
UPCONVERTER  
BLOCK DIAGRAM

9/16/98 HWW

## 4.0 Compliance Section

### 4.1 FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### INFORMATION TO USER

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### SPECIAL ACCESSORIES

Cables to be used with this equipment must be 75 ohm RG59 or better in order to ensure compliance, and it is the responsibility of the user to provide and use those components and accessories.

### 4.2 Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 Canada.

### 4.3 UL

This product has earned the UL Listing Mark for Canada and the United States.

### 3.4 Declaration of Conformity

## EN DECLARATION OF CONFORMITY

Manufacturer -

**CROSS TECHNOLOGIES INC.**  
6170 Shiloh Road  
Alpharetta, Georgia 30005


declares under our sole responsibility that the upconverters,  
Models 2006-01 and 2006-01

to which this declaration relates are in conformity with the following standards or other normative documents  
EN55011:1991 +A1:1997 +A2:1996 and EN50082-1:1992

following the provisions of EMC 89/336/EEC Directive in accordance with CE marking requirements and  
EN61010-1:1993 +A2:1995 according to the general product safety directive 92/59/EEC.

CROSS TECHNOLOGIES INC., 10/27/99

Heinz Wegener, President



## 5.0 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 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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