

## Instruction Manual

# Model 4117-14 Block Up/Downconverter Weather Resistant Unit

August 2011, Rev. G



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# INSTRUCTION MANUAL

## MODEL 4117-14 BlockUp/Downconverter

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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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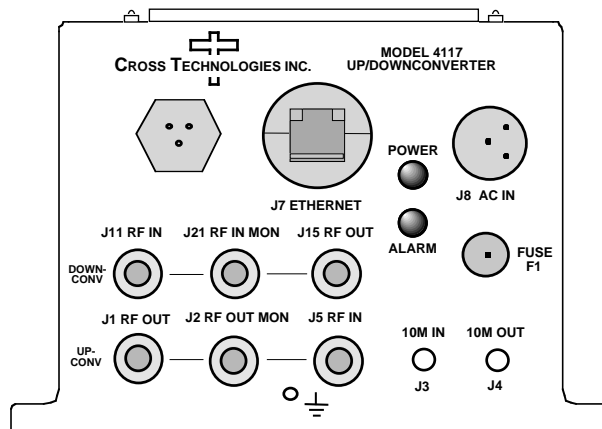
# MODEL 4117-14 Block Up/Downconverter, Weather Resistant\*

## 1.0 General

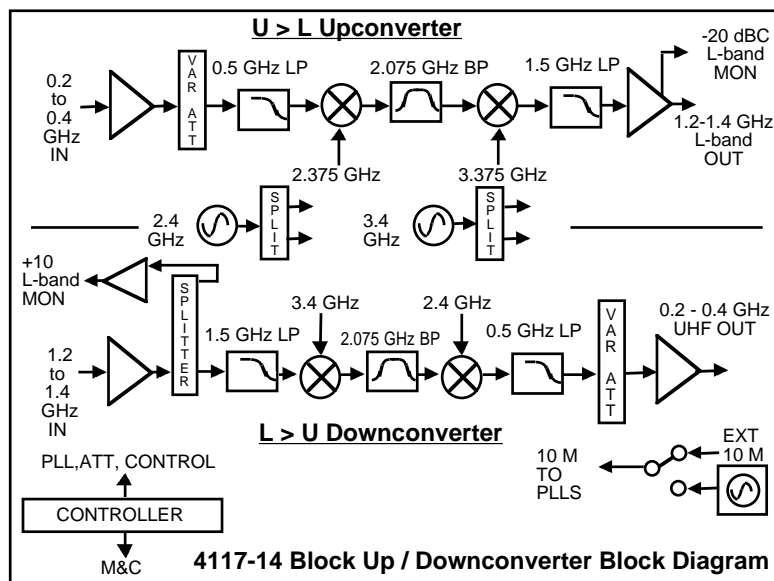
### 1.1 Equipment Description

The 4117-14 Block Up, Downconverter converts a 0.2 - 0.4 GHz block to 1.2 - 1.4 GHz and a 1.2 - 1.4 GHz block to 0.2 - 0.4 GHz. Front panel LEDs provide indication of DC Power, and PLL Alarms. The maximum gain is +30 dB for the Up and Downconverter. Connectors are Type N female for the UHF, L-band and L-band Monitor and SMA female for the external reference input. Gain, and internal 10 MHz frequency are controlled by the Ethernet M&C. In AUTO, the 10 MHz reference stays in external if the external level is in the +2 to +8 dBm range. The 4117-14 is powered by a 100-240  $\pm$  10% power supply, and is mounted in a 8" W X 6" H X 16" D Weather Resistant\* Enclosure.

**NOTE:** \*Weather Resistant enclosures are designed to be water resistant for installation in an outdoor enclosure/antenna hut OR mounted outdoors on an antenna assembly at their specified temperature ranges. They are designed to be located "out in the elements" (water, sleet, snow, etc.) but they are *not* designed to be "submerged under" water. If an extended temperature range is required, there is an **Extended Temperature** option (**Option W21**; -30°C to +60°C) available at an additional cost. Contact Cross for quote.



**FIGURE 1.0** Model 4117-14 Block Up/Downconverter Front Panel



**FIGURE 2.0** Model 4117-14 Block Up/Downconverter Block Diagram

## 1.2 Technical Characteristics

**TABLE 1.0 4117-14 Block Up/Downconverter Specifications\*\***

EQUIPMENT SPECIFICATIONS*		
Input Characteristics	UP, UHF, L	DOWN, L, UHF
Impedance/Return Loss	50Ω/14 dB	50Ω/14 dB
Frequency	0.2 to 0.4 GHz	1.2 - 1.4 GHz
Noise Figure, Max.	20 dB max gain	15 dB max gain
Input Level range	-40 to -25 dBm	-50 to -30 dBm
Output Characteristics		
Impedance/Return Loss	50 Ω /14 dB	50 Ω /14 dB
Frequency (GHz)	1.2 - 1.4 GHz	0.2 - 0.4
Output Level Range	-15 to 0 dBm	-20 to 0 dBm
1 dB comp, max gain	+10 dBm	+10 dBm
Monitor Level	-20 dBC OUT	+10 dB IN
Mute @ 0 dBm out	>60 dB	N/A
Channel Characteristics		
Gain, max. at Fc	+30 ±3 dB	+30 ±3 dB
Gain, range, 0.5dB steps	+30 to 0 dB	+30 to 0 dB
Image Rejection	> 55 dB, min	> 50 dB, min
Spurious, Inband, sig. rel.	<-55 dBC, 0dBm	<-50 dBC, 0dBm
Spurious, Inband, sig. ind.	<-60 dBm	<-60 dBm
Spurious, Out of band	<-55dBm 1 - 1.6 GHz out	<-45dBm 0.1-0.6 GHz out
Intermod - 2 carriers 4MHz space @ -10dBm	<-50 dBC	<-50 dBC
Frequency Resp. band	±2 dB	±2 dB
Frequency Resp. 40 MHz	± 0.5 dB	± 0.5 dB
Frequency Sense	Non-inverting	Non-inverting
Downconverter 2nd Harm		
≥ -40 dBC @ max. input level		.2-.4 GHz out

### LO Characteristics

LO Frequency See Block Diagram, Translation is fixed  
 Frequency Accuracy ± 0.05 ppm max. over temp internal reference; ext. ref. input  
 10 MHz Level In Input = +2 dBm to +8 dB in, 50 ohms

Phase Noise @ F (Hz)>	100	1K	10K	100K	1M
dBC/Hz	-70	-80	-85	-100	-110

### Controls, Indicators

Gain, Band, 10M Freq. Gain and internal 10 MHz frequency via Ethernet M&C or Status/Control Connector.  
 PLL Alarm Red LED, External Contact Closure  
 Power Green LED

### Other

L-band/UHF/Monitor Port Connectors Type N (female), 50Ω  
 10 MHz Connector SMA (female), 50Ω  
 Ethernet Connector Standard RJ45 Weather Resistant\* Ethernet Connector  
 Size 8"W X 6"H X 16"D Weather Resistant\* Enclosure  
 Power 100-240 ±10% VAC, 47 - 63 Hz, 25 watts max./ FCI Clipper Series CL1M1102 Connector

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

## 2.0 Installation

The 4117-14 Block Up/Downconverter consists of a 8”W X 6”H X 16”D Weather Resistant\* enclosure. A switching,  $\pm 12$ , +24, +5 VDC power supply provides power for the internal assemblies. The 4117-14 can be secured to a mounting plate using the 4 holes on the bottom of the front and rear panels. See Figure 2.5 for mounting dimensions.



**Figure 3.0: Model 4117-14 Up/Downconverter Front Panel**

### 2.0.1 Connection to AC Input Power

The 4117-14 utilizes a pre-assembled AC power input cable as described below.

<b>4117-14 Mating Input Connector</b>	
<b>FCI Clipper Series, CL1M1102 and crimp pins</b>	
<b>Pin</b>	<b>Input Connector Pin Description</b>
1	100-240 $\pm 10\%$ VAC, 47-63 Hz, 20 watts max.
2	Neutral
3	Ground

## **2.1 ETHERNET Interface Installation and Operation**

The 4117-14 frequency converter is equipped with a 10/100 Base-T compatible Ethernet interface for control and monitoring of its operating parameters. An HTML script interface allows the user to monitor and control the converter using a standard web browser. SNMP (Simple Network Management Protocol) is also supported. Contact Cross Technologies for the SNMP MIB file.

### **2.1.1 Methods of Connection**

#### **Directly Connected to a PC:**

For control from a local PC, attach the 4117-14's Ethernet port to the Ethernet network connector on the PC using a crossover RJ-45 cable.

#### **LAN Connection**

For LAN connections, attach the 4117-14 Ethernet port to the LAN using a normal RJ-45 cable. Use any PC on the LAN to connect to the 4117-14.

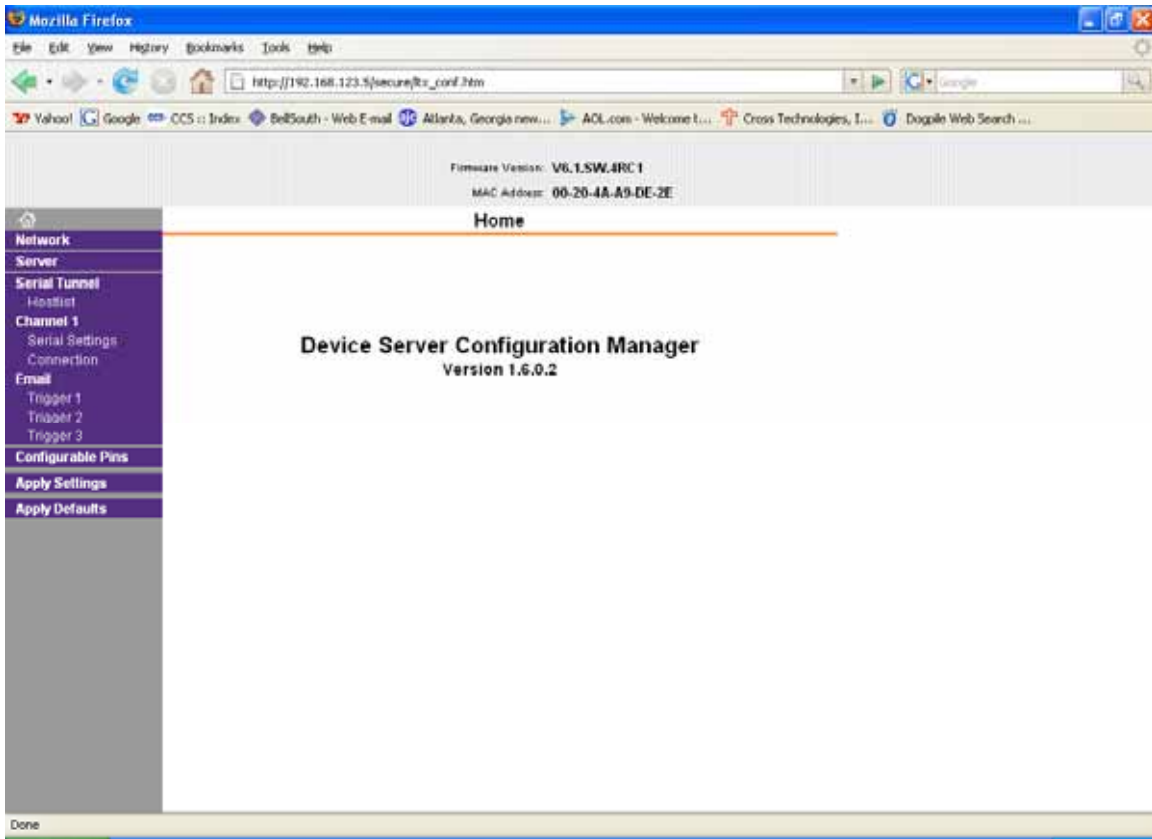
### **2.1.2 Ethernet Configuration**

Each 4117-14 must be configured with an appropriate IP address, Netmask, and Gateway assigned by your network manager. The 4117-14 is set at the factory with a static address that is written on a tag attached to the unit. The device server in the 4117-14 has a built in HTTP based configuration manager that is used to configure network settings. To access the configuration manager open a web browser and enter the IP address of the 4117-14 in the browser's address field. The window shown in Figure 4-A will appear. As delivered, there is no password set. Choose your user name and password here or leave those fields blank and click OK to proceed to the configuration manager web page.

**NOTE: The default, Factory Set IP Address is: 192.168.123.2**



**Figure 4-A: Password Screen**



**Figure 4-B: Configuration Manager Screen**

In the left frame of the configuration manager click on Network to display the Network Settings screen. Enter the IP address, Subnet mask, and Gateway address with delimiter dots (example: 192.168.192.47). Click apply settings in the left frame to apply the new settings in the network device.

### 2.1.3 Web page M & C

Enter the following address in a web browser to access the M & C Web page:  
http://<ip address of 41xx>/serial/0/setup.htm where <ip address> is the IP address of the unit. Figure 4-C shows the web page from a model 4117-14 frequency converter.

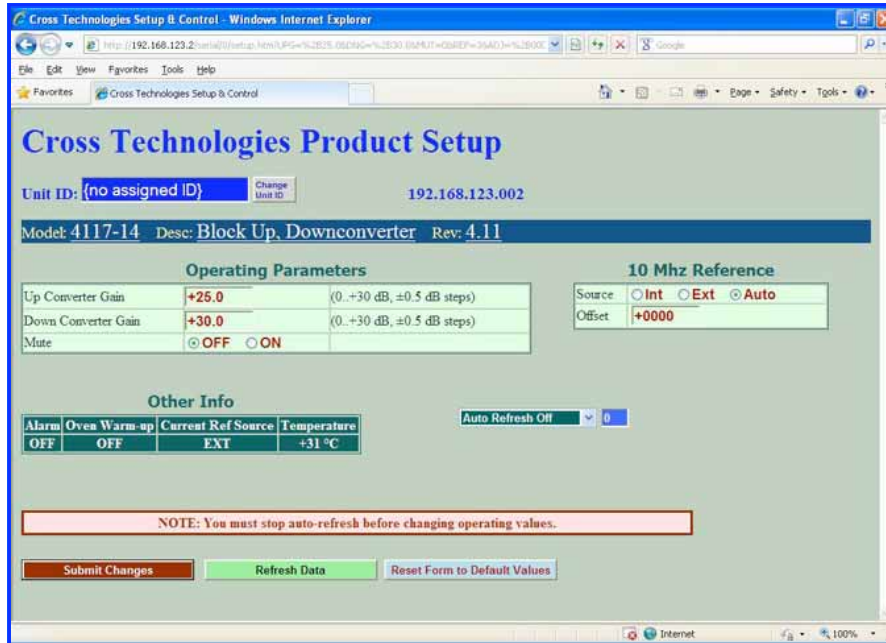
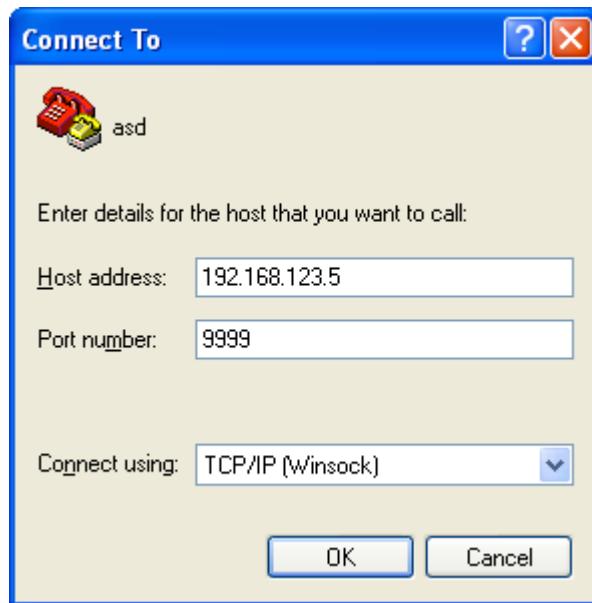


Figure 4-C: Model 4117-14 Web page

### 2.1.4 SNMP Configuration

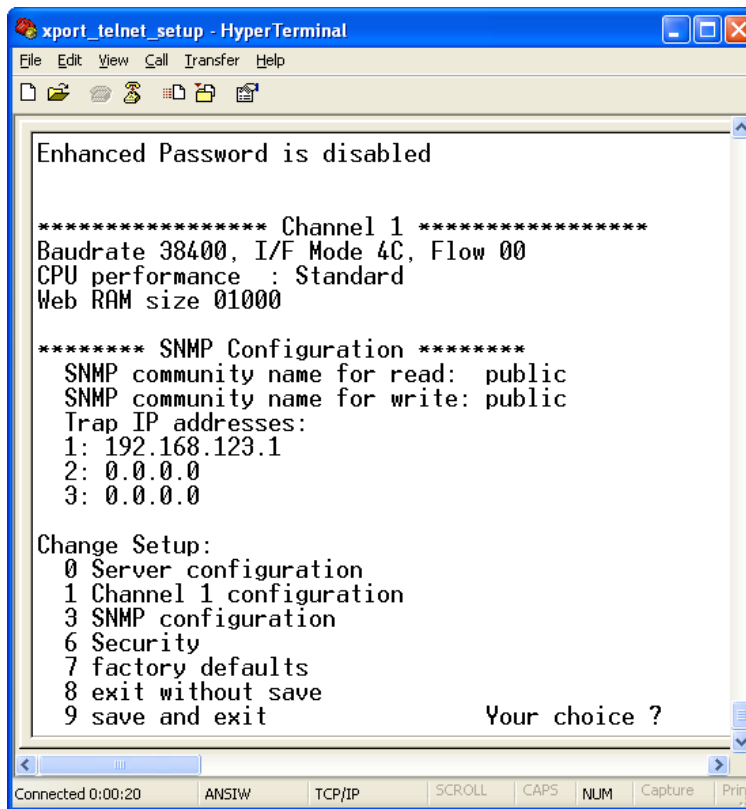
Setting of SNMP parameters such as Community Write and Community Read strings requires a *Telnet*<sup>®</sup> connection to port 9999. The following instructions explain how to establish such a *Telnet*<sup>®</sup> connection using Windows XP's Hyper Terminal utility .

Start the Hyper Terminal application and select “New Connection” from the “File” drop down menu. The next screen is a “Connect To” dialog box. Select TCP/IP (Winsock) from the “Connect” using drop down menu. Enter the IP address of the 4117-14 in the “Host Address:” field and 9999 in the “Port Number” field. Figure 4-D shows an example of the Hyper Terminal settings required to access the SNMP configuration menu.



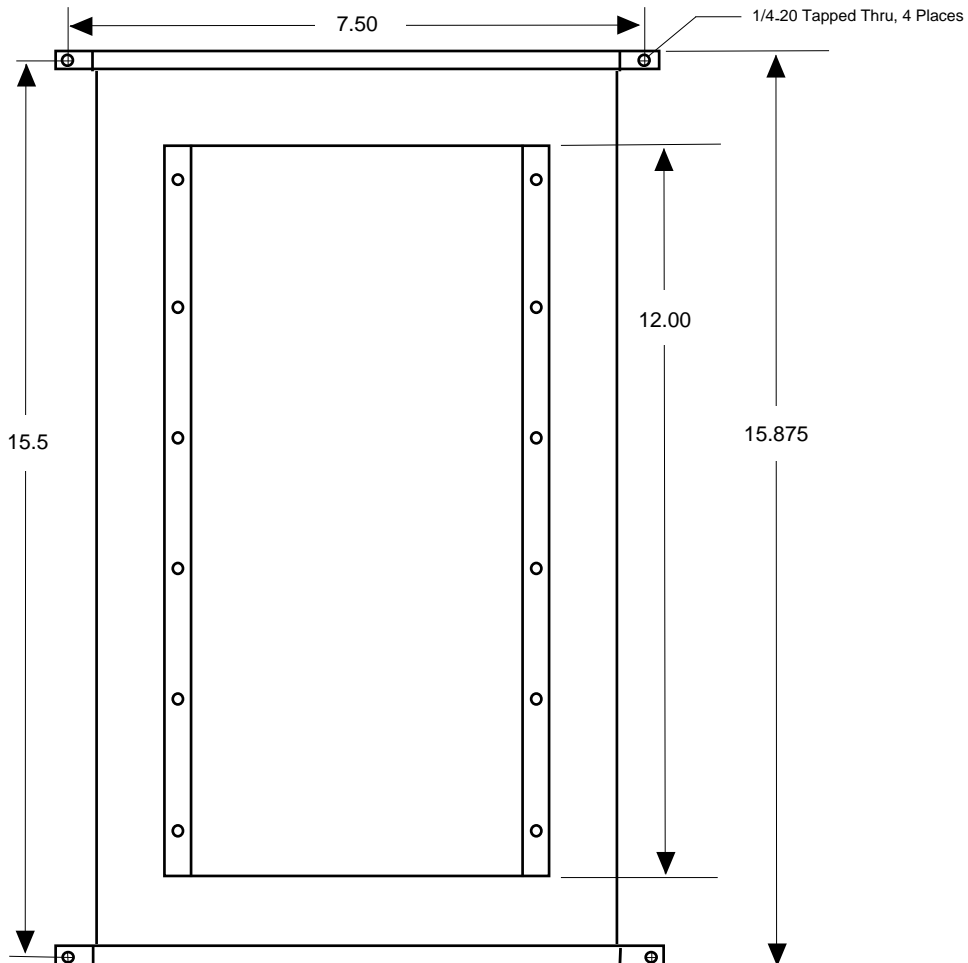
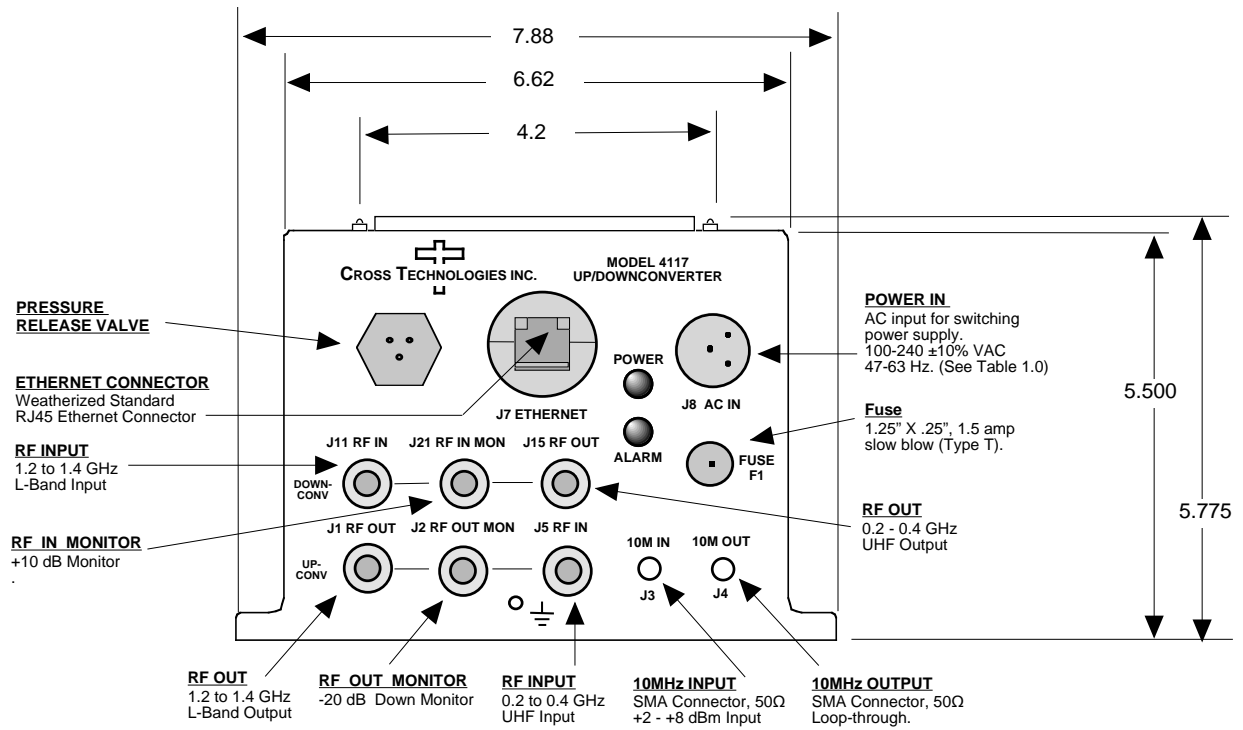
**Figure 4-D: Telnet® Settings in Hyper Terminal**

Once the *Telnet*® connection is established you will be prompted to “Press Enter for Setup Mode.” Press enter and a menu of device server configuration options will appear (see Figure 4-E). Select menu item 3, “SNMP configuration.” You will be prompted to enter SNMP community read and write strings. After setting your desired community strings you will be prompted to “Enter IP addresses for SNMP traps:” You must enter at least one and up to four IP addresses of SNMP managers that will access the unit. This is required even though SNMP traps are not implemented. The unit will not process SNMP SET and GET requests from an SNMP manager unless the IP address associated with that manager is entered in the device server.



**Figure 4-E: Device Server Configuration Menu**

**Figure 2.2** Shows front panel input and output connections, top view and baseplate mounting dimensions.



## **2.3 Physical Interface**

All 411xx units provide a 10/100 Base-T Ethernet port. This port is available when the unit is installed and powered up. Commands may be sent at any time and they will be processed in the order that they are received. The Ethernet signals connect through a standard RJ45 connector.

## **2.4 Installation/Operation**

### **Installing and Operating the 4117-14 Block Up/Downconverter**

1. Connect a -40 dBm to -15 dBm signal to UHF INPUT of the upconverter, (Figure 2.2).
2. Connect the upconverter's L-BAND OUTPUT, to the external equipment.
3. Connect a -50 dBm to -30 dBm signal to the L-BAND input of the downconverter
4. Connect the downconverter's UHF output to the external equipment.
5. Connect 100-240  $\pm$ 10% VAC, 47 - 63 Hz to AC In connector on the front panel.
6. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
7. Set the upconverter's gain from 0 to 30 dB, insuring that the output level is always in the range of -15 to 0 dBm.
8. Set the downconverter's gain from 0 to 30 dB, insuring the output level is in the -20 to 0 dBm range.
9. Select either INT (for internal 10 MHz ref), AUTO (for internal 10 MHz ref UNLESS an external 10 MHz, +2 to +8 dBm signal is connected to J3), or EXT (for external 10 MHz, +2 to +8 dBm ref that is inserted at J3).
10. Check that a 10 MHz signal is present at the 10 MHz REF OUTPUT at the same level as the input.
11. AC Fuse - The fuse is a 1.25" x .25" - 1.5 amp (slow blow) and is inserted in the fuse F1 position.

**NOTE:** If a fuse continues to open, the power supply is most likely defective.

#### **NOTE: Planning Ethernet Access**

It is recommended that IP knowledgeable customer personnel be consulted as a resource in the installation and use of the Ethernet access features of the Cross Technologies product.



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