

Instruction Manual

Model 4117-14

Block Up/Downconverter

Weather Resistant Unit

March 2017, Rev. J



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INSTRUCTION MANUAL

MODEL 4117-14 Block Up/Downconverter

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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.

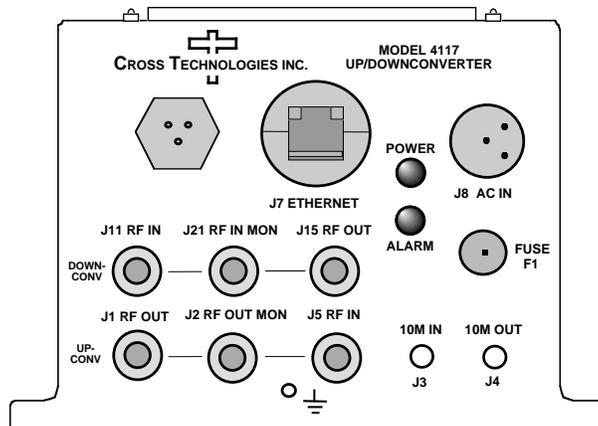


FIGURE 1.0 Model 4117-14 Block Up/Downconverter Front Panel

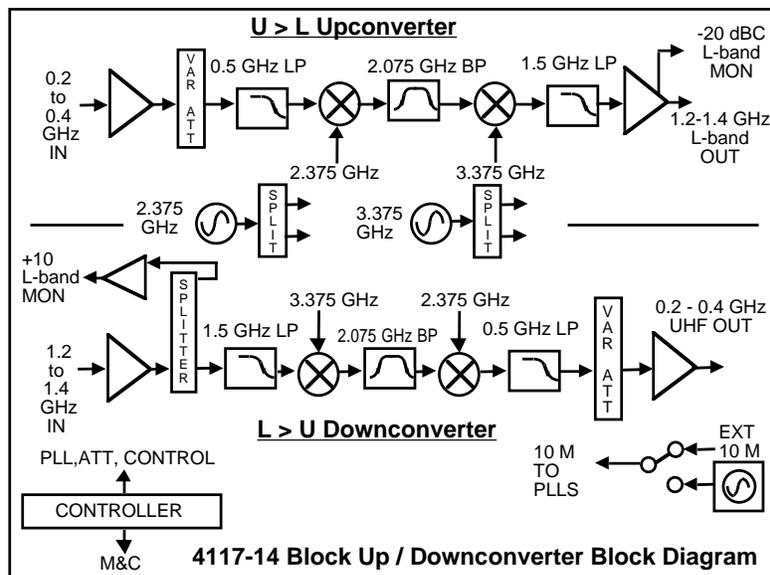


FIGURE 2.0 Model 4117-14 Block Up/Downconverter Block Diagram

1.2 Technical Characteristics

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

UPCONVERTER		DOWNCONVERTER			
Input Characteristics (UHF, L)		Input Characteristics (L, UHF)			
Impedance/Return Loss	50Ω / 14 dB	Impedance/Return Loss	50Ω / 14 dB		
Frequency	0.2 to 0.4 GHz	Frequency	1.2 - 1.4 GHz		
Noise Figure Maximum	20 dB maximum gain	Noise Figure Maximum	15 dB maximum gain		
Input Level Range	-40 to -25 dBm	Input Level Range	-50 to -30 dBm		
Maximum Input No Damage	0 dBm	Maximum Input No Damage	0 dBm		
Output Characteristics (UHF, L)		Output Characteristics (L, UHF)			
Impedance/Return Loss	50Ω / 14 dB	Impedance/Return Loss	50Ω / 14 dB		
Frequency (GHz)	1.2 - 1.4 GHz	Frequency (GHz)	0.2 - 0.4 GHz		
Output Level Range	-15 to 0 dBm	Output Level Range	-20 to 0 dBm		
Output 1 dB comp. max. gain	+10 dBm	Output 1 dB comp. max. gain	+10 dBm		
Monitor Level	-20±3 dBC OUT	Monitor Level	+10±3 dBC IN		
Mute @ 0 dBm out	> 60 dB	Mute @ 0 dBm out	N/A		
Channel Characteristics		Channel Characteristics			
Gain, max. at Fc	+30 ±3 dB	Gain, max. at Fc	+30 ±3 dB		
Gain, range, 0.5±0.5 dB steps	+30 to 0 dB	Gain, range, 0.5±0.5 dB steps	+30 to 0 dB		
Image Rejection	> 55 dB, minimum	Image Rejection	> 50 dB, minimum		
Spurious, Inband, sig. rel.	> 50 dBC, 0 dBm	Spurious, Inband, sig. rel.	> 50 dBC, 0 dBm		
Spurious, Inband, sig. ind.	> -55 dBm	Spurious, Inband, sig. ind.	> 55 dBm		
Spurious, Out of Band	< -50 dBm 1 - 1.6 GHz Out	Spurious, Out of Band	< -45 dBm 0.1 - 0.6 GHz Out		
Intermod - 2 carriers 4 MHz Space @ -10 dBm	<-50 dBC	Intermod - 2 carriers 4 MHz Space @ -10 dBm	< -50 dBC		
Frequency Resp. Band	±2 dB	Frequency Resp. Band	±2 dB		
Frequency Resp. 40 MHz	±0.5 dB	Frequency Resp. 40 MHz	±0.5 dB		
Frequency Sense	Non-inverting	Frequency Sense	Non-inverting		
Downconverter 2nd Harm					
≥ -40 dBc @ 0 dBm out	.2 - .4 GHz out				
Upconverter and Downconverter					
LO Characteristics					
LO Frequency	See Block Diagram, Translation is fixed				
Frequency Accuracy	± 0.05 ppm maximum over temp internal reference; external reference input				
10 MHz Level In	Input = +2 dBm to + 8 dB in, 50 ohms				
Phase Noise @ Frequency (Hz) >	100 MHz	1kHz	10kHz	100kHz	1MHz
dBC/Hz	-70	-80	-85	-100	-110

1.2 Technical Characteristics (continued on page 5)

1.2 Technical Characteristics (continued from page 4)

TABLE 1.0 2017-0416 Up/Downconverter Specifications* continued...

Controls, Indicators	
Gain, Band, 10M Frequency	Gain & internal 10 MHz frequency via Ethernet M&C of 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
Weather Resistant* Connectors	<p>Status/Control Connector, MS3112E14-18S; Mating Cable Connector MS3116F14-18P. Ethernet Connector, RJF21B; Mating Cable Connector, RJF6G; Cable interface, Standard RJ45. AC Input Connector, Clipper Series, CL1M1102, Mating Cable Connector, CL1F1101. (Unless otherwise specified, the mating connector is provided preassembled onto a standard NEMA 5-15 U.S. power cord.)</p>
Size	8" Wide x 6" High x 16" Deep Weather Resistant Enclosure
Power	100-24 ±10% VAC, 47-63 Hz, 25 watts maximum
*10°C to 40°C; Specifications subject to change without notice.	
Cross Technologies, Inc. 2017	

***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.

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, ± 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.

4117-14 Power Input Connector, FCI Clipper Series, CL1M1102 & Crimp Pins	
Mating Connector, Clipper Series, CL1F1101 and Crimp Pins	
and CL101021 Backshell	
Pin	Input Connector Pin Description
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

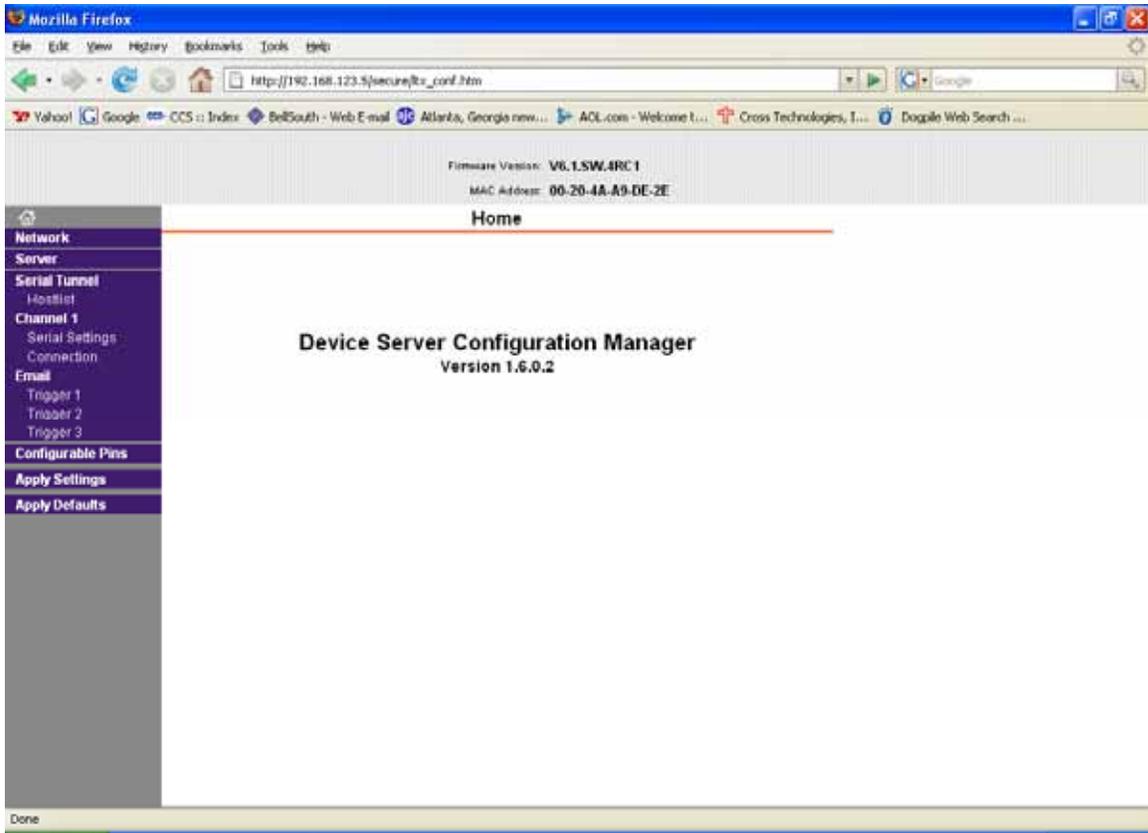


Figure 4-B: Configuration Manager Screen

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.

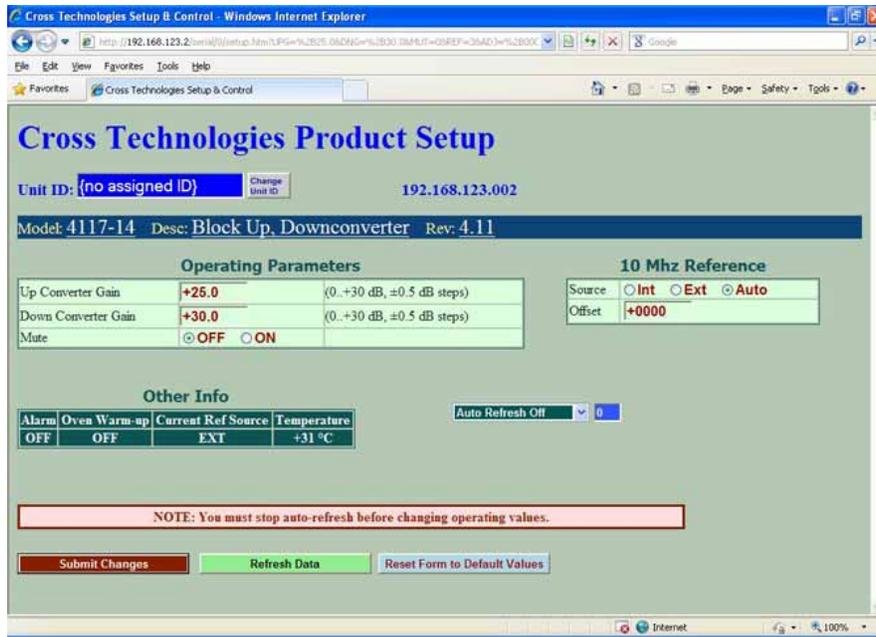


Figure 4-C: Model 4117-14 Web page

2.1.4 SNMP Configuration

Setting of SNMP parameters such as Community Write and Community Read strings requires a *Telnet*[®] connection to port 9999. The following instructions explain how to establish such a *Telnet*[®] 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.

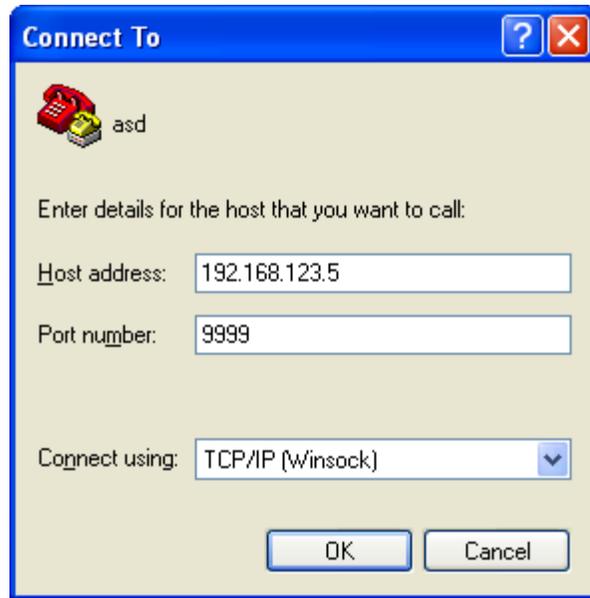


Figure 4-D: Telnet® Settings in Hyper Terminal

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.

```
xport_telnet_setup - HyperTerminal
File Edit View Call Transfer Help
Enhanced Password is disabled

***** Channel 1 *****
Baudrate 38400, I/F Mode 4C, Flow 00
CPU performance : Standard
Web RAM size 01000

***** SNMP Configuration *****
SNMP community name for read: public
SNMP community name for write: public
Trap IP addresses:
1: 192.168.123.1
2: 0.0.0.0
3: 0.0.0.0

Change Setup:
0 Server configuration
1 Channel 1 configuration
3 SNMP configuration
6 Security
7 factory defaults
8 exit without save
9 save and exit

Your choice ?

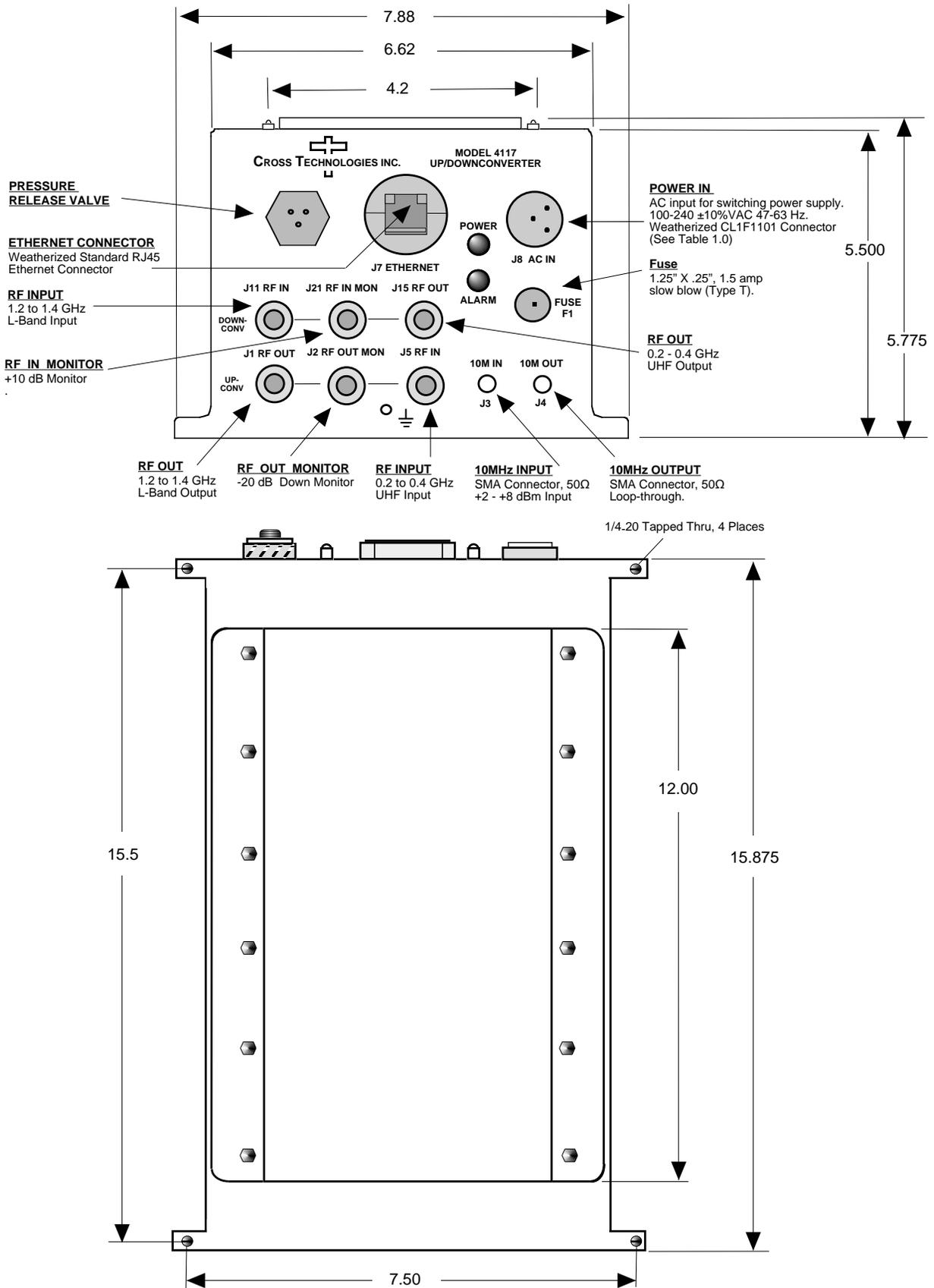
Connected 0:00:20 ANSIW TCP/IP SCROLL CAPS NUM Capture Print
```

Figure 4-E: Device Server Configuration Menu

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.

Figure 2.2 Shows front panel input and output connections, top view and base plate mounting dimensions.



2.3 Physical Interface

All 411x units provide a RS232/RS422/RS485 interface port and a 10/100 Base-T Ethernet port. Both ports are available when the unit is installed and powered up. Commands may be sent to either port at any time and they will be processed in the order that they are received. The RS232/RS422/RS485 signals connect via an 18-pin, MS3112E14-18S connector. The Ethernet signals connect via a standard RJ45 connector, Part #RJF6G.

Monitor and Control Connector

Monitor and Control Connector Pinout	
Connector part number	MS3112E14-18S
Mating Cable Connector part number	MS3116F14-18P
Pin	Signal Description
A	Chassis Ground
N	Summary Alarm Normally Closed
P	Summary Alarm Common
R	Summary Alarm Normally Open
E	RS422/RS485 Data Out-
F	Signal Ground
C	RS422/RS485 Data In-
D	RS422/RS485 Data Out+, RS232 Data Out
B	RS422/RS485 Data In+, RS232 Data In

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. Using the pre-assembled AC power input cable (furnished), connect 100-240 \pm 10% VAC, 47 - 63 Hz to AC IN connector on the front panel.
6. If a custom length power cable must be made, refer to description below for connections.*
7. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
8. 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.
9. Set the downconverter's gain from 0 to 30 dB, insuring the output level is in the -20 to 0 dBm range.
10. 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).
11. Check that a 10 MHz signal is present at the 10 MHz REF OUTPUT at the same level as the input.
12. **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.

CAUTION: When checking or replacing the fuse, do not over tighten the fuse holder cap. This can displace the cap's O-ring and the weatherproof seal will be lost.

2.5 Installation/Operation

The 4117-14 is furnished with a pre-assembled AC power input cable as described below.

4117-14 AC Power Input Connections	
Connector, Clipper Series, CL1M1102 and crimp pins	
Mating Connector, Clipper Series, CL1F1101 and crimp pins	
Pin	Input Connector Pin Description
1	100-240 \pm 10% VAC, 47-63 Hz, 20 watts max.
2	Neutral
3	Ground

Unless otherwise specified, the mating connector is provided reassembled onto a standard NEMA 5-15P U.S. power cord.



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