

# Instruction Manual

# Model 4116-T24 Translator, UHF to UHF Weather Resistant Unit

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6170 Shiloh Road

Alpharetta, Georgia 30005

(770) 886-8005 • FAX (770) 886-7964 • Toll Free 888-900-5588

WEB [www.crosstechnologies.com](http://www.crosstechnologies.com)

E-MAIL [info@crosstechnologies.com](mailto:info@crosstechnologies.com)

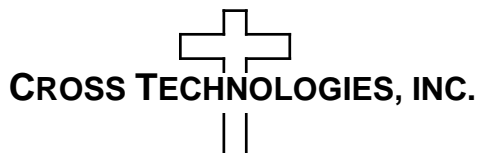
# INSTRUCTION MANUAL

## MODEL 4116-T24 Translator, UHF to UHF

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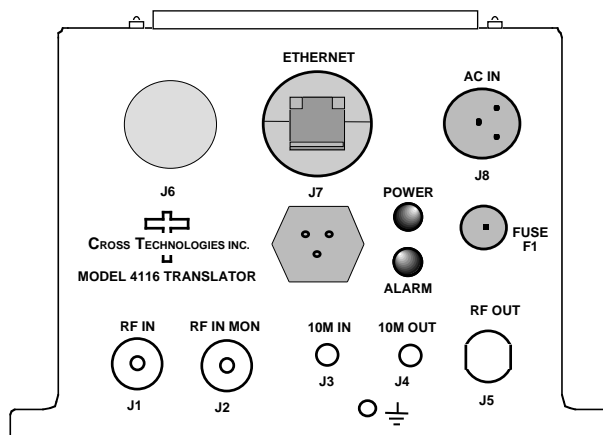
# MODEL 4116-T24 Translator, UHF to UHF, Weather Resistant\*

## 1.0 General

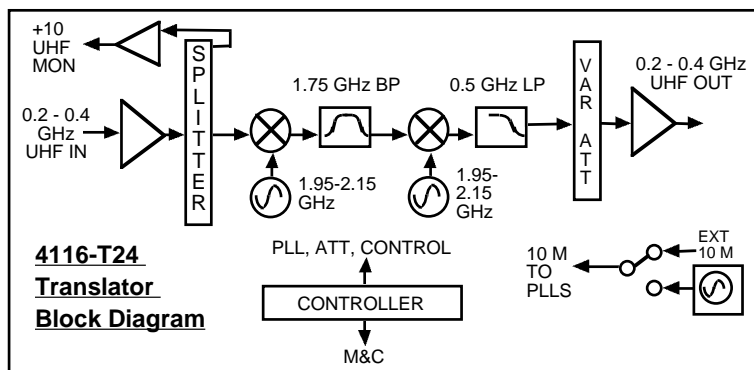
### 1.1 Equipment Description

The 4116-T24 Translator converts a 20 MHz bandwidth signal from the UHF input band (0.2 to 0.4 GHz) to a 20 MHz bandwidth signal on the UHF output band (0.2 to 0.4 GHz), in 0.1 MHz steps. Front panel LEDs provide indication of DC Power, and PLL Alarm. The UHF to UHF gain is +20 dB, maximum. Connectors are Type N female for the UHF out, UHF in and UHF in Monitor and SMA female for the external 10 MHz reference input. Gain, band select, mute, and internal 10 MHz frequency are controlled by the M&C (Ethernet and/or Status/Control). In AUTO, the 10 MHz reference stays in external if the external level is in the +2 to +8 dBm range. The 4116 is powered by a 100-240 ± 10% VAC power supply, and 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.



**Model 4116-T24 Multi-Band Block Translator Front Panel**



**FIGURE 1 Model 4116-T24 Multi-Band Block Translator Block Diagram**

## 1.2 Technical Characteristics

**TABLE 1.0 4116-T24 Translator, UHF to UHF Specifications\*\***

### Input Characteristics

Impedance/Return Loss	50Ω /14 dB
Frequency	0.2 to 0.4 GHz
Noise Figure, max.	20 dB, max. gain
Input Level	-30 to -10 dBm

### Output Characteristics

Impedance/Return Loss	50Ω/14 dB, Mute & Unmute
Frequency	0.2 to 0.4 GHz
Output Level Range	-60 to 0 dBm
Output 1dB Compression	+10 dBm, max. gain
Mute @ max. output level	>60 dB @ dBm output

### Channel Characteristics

Gain	+20 ±5 dB max., (+20 to -40 dB variable in 1 dB steps)
Input to Output Isolation	> 45 dB, min., at +20 dB gain
Spurious, Inband	<-40 dBC in band, -15 to 0 dBm out, <-50 dBC, typical; $F_{in} \neq F_{out}$
Spurious, LO	<-60 dBm LO
Intermodulation	<-50 dBC for two carriers at 4 MHz spacing, each at -5 dBm out
Frequency Response	±2 dB, over UHF band; ± 0.5 dB, 20 MHz BW
Frequency Sense	Non-inverting

### LO Characteristics

LO Step Size	0.1 MHz, input and output selection; $F_{in} \neq F_{out}$
Frequency Accuracy	± 0.05 ppm max. over temp. internal reference; ext. ref. input
10 MHz Level	Input= +2 dBm to +8 dBm in. Monitor Output = Input Level ± 1.0 dB, 50Ω

Phase Noise @ F (Hz)>	100	1K	10K	100K	1M
dBc/Hz	-70	-75	-85	-100	-110

### Controls, Indicators

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

### Other

UHF In, Mon. Connector	Type N (female), 50Ω
UHF Out Connector	Type N (female), 50Ω
M&C Connector(s)	Status/Control Connector MS3112F-18P Weatherized Connector; Ethernet Connector Standard RJ45 Weatherized Connector
10 MHz connectors	SMA (female), 50Ω
Size	8" Wide X 6" High X 16" Deep 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 4116-T24 Translator consists of a 8” Wide X 6” High X 16” Deep Weather Resistant\* enclosure. A switching,  $\pm 12$ , +24, +5 VDC power supply provides power for the internal assemblies. The 4116-T24 can be secured to a mounting plate using the 4 holes on the bottom of the front and rear panel. See Figure 2.2. for mounting dimensions.



### 2.0.1 Connection to AC Input Power

The 4116-T24 utilizes a pre-assembled AC power input cable as described below.

4116-T24 Mating Input Connector	
FCI Clipper Series, CL1M1102 and crimp pins	
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 4116-T24 Translator 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 4116-T24's Ethernet port to the Ethernet network connector on the PC using a crossover RJ-45 cable.

#### **LAN Connection**

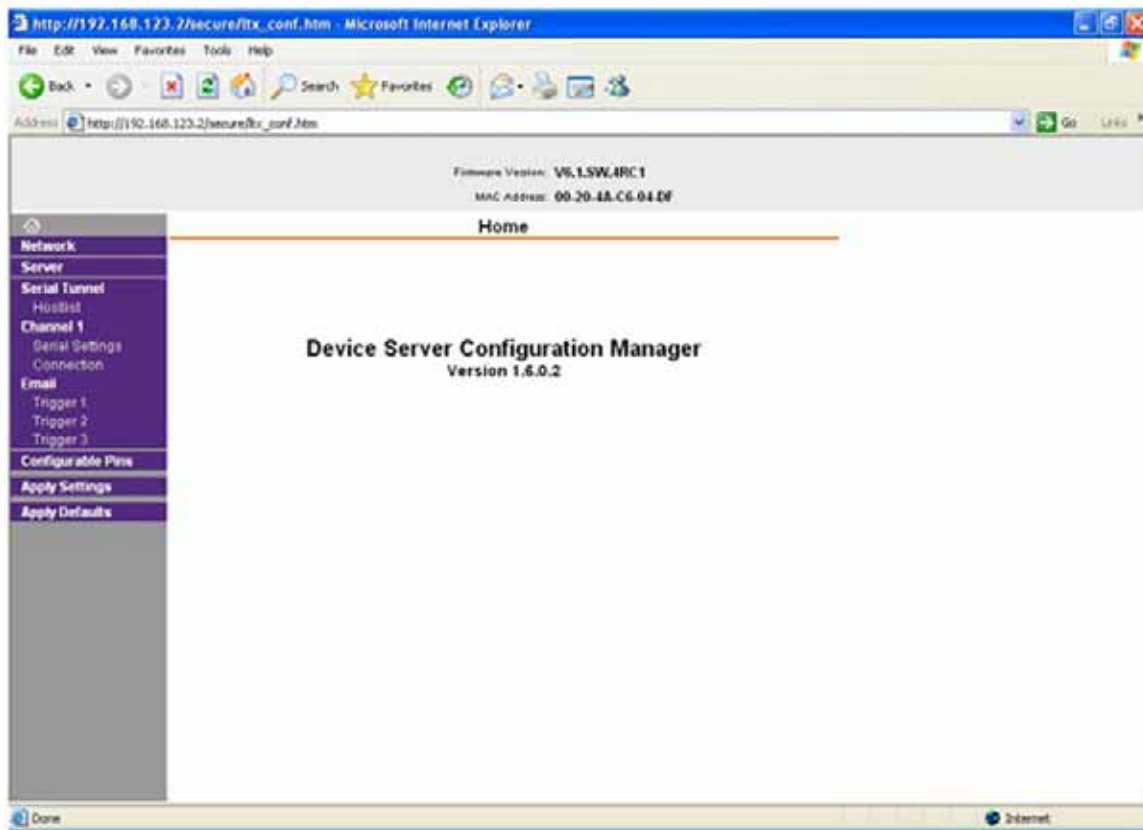
For LAN connections, attach the 4116-T24 Ethernet port to the LAN using a normal RJ-45 cable. Use any PC on the LAN to connect to the 4116-T24.

### **2.1.2 Ethernet Configuration**

Each 4116-T24 must be configured with an appropriate IP address, Netmask, and Gateway assigned by your network manager. The 4116-T24 is set at the factory with a static address that is written on a tag attached to the unit. The device server in the 4116-T24 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 4116-T24 in the browser's address field. The window shown in Figure 2-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 webpage.



**Figure 2-A Password Screen**

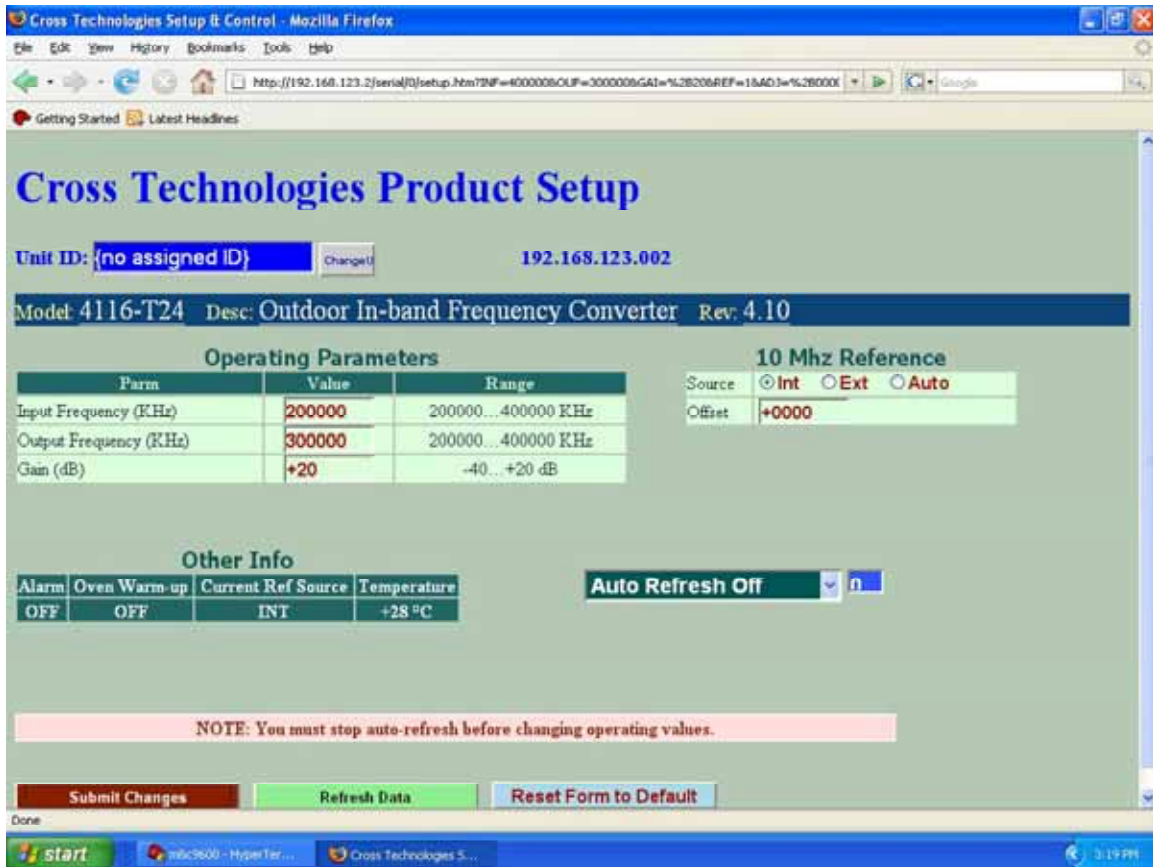


**Figure 2-B Configuration Manager Screen**

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 Webpage M & C**

Enter the following address in a web browser to access the M & C webpage:  
<http://<ip address of 41xx>/serial/0/setup.htm> where <ip address> is the IP address of the unit.

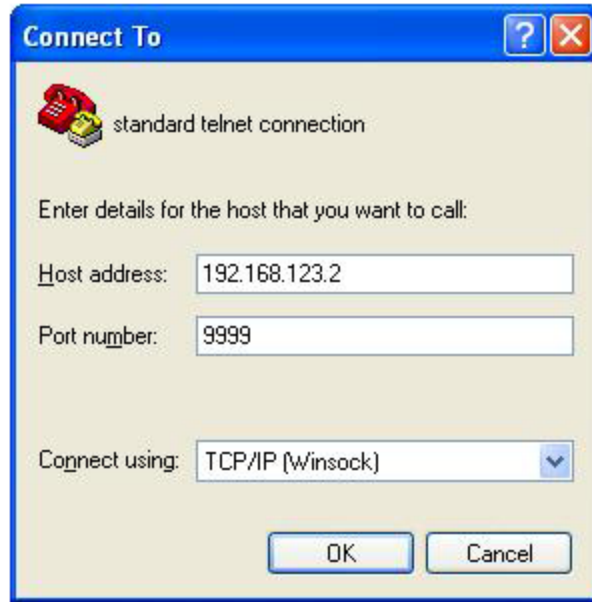


**Figure 2-C: Model 4116-T24 Webpage**

### 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 .

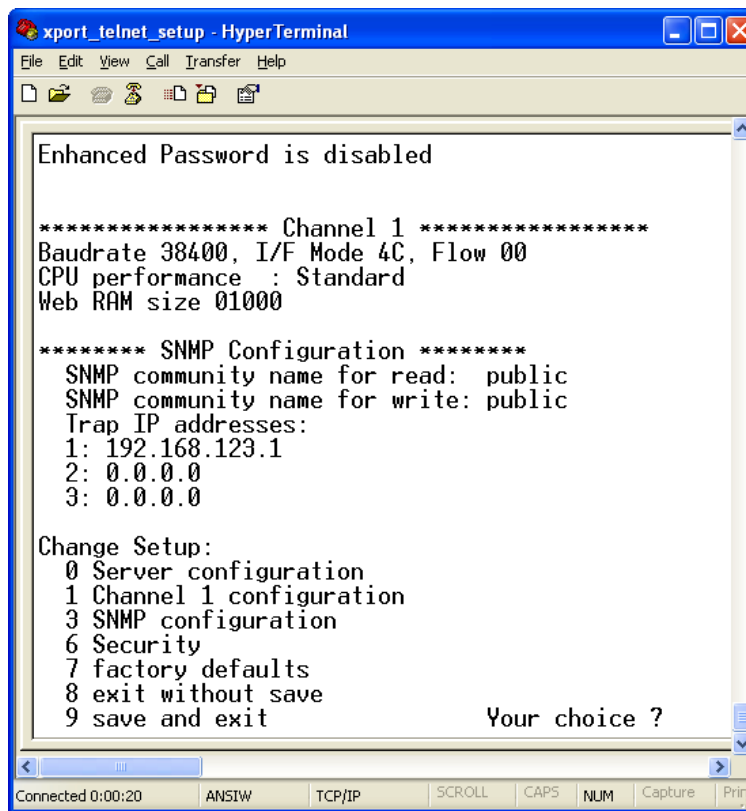
Start the Hyper Terminal application and select “New Connection” from the “File” drop down menu. The next screen is a “Connect To” dialog box. Select TCP/IP (Winsock) from the “Connect” drop down menu. Enter the IP address of the 4116-T24 in the “Host address:” field and 9999 in the “Port number” field. Figure 2-E shows an example of the Hyper Terminal settings required to access the SNMP configuration menu.



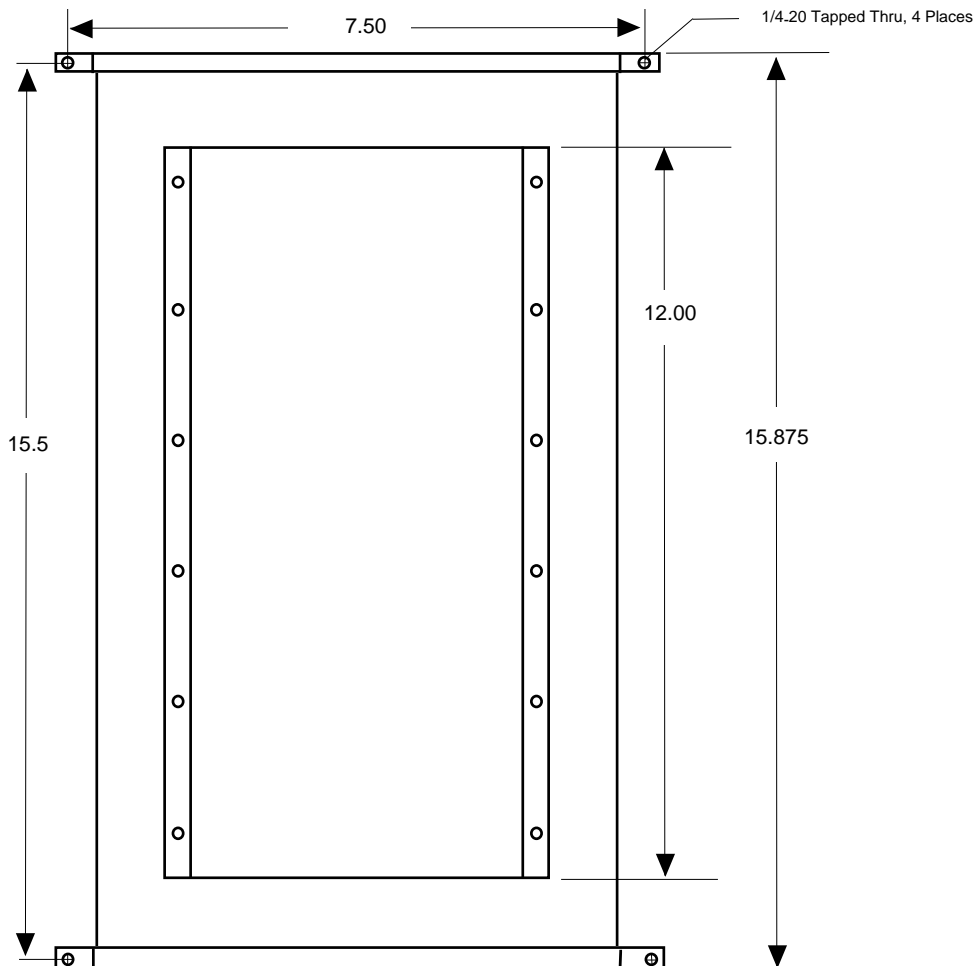
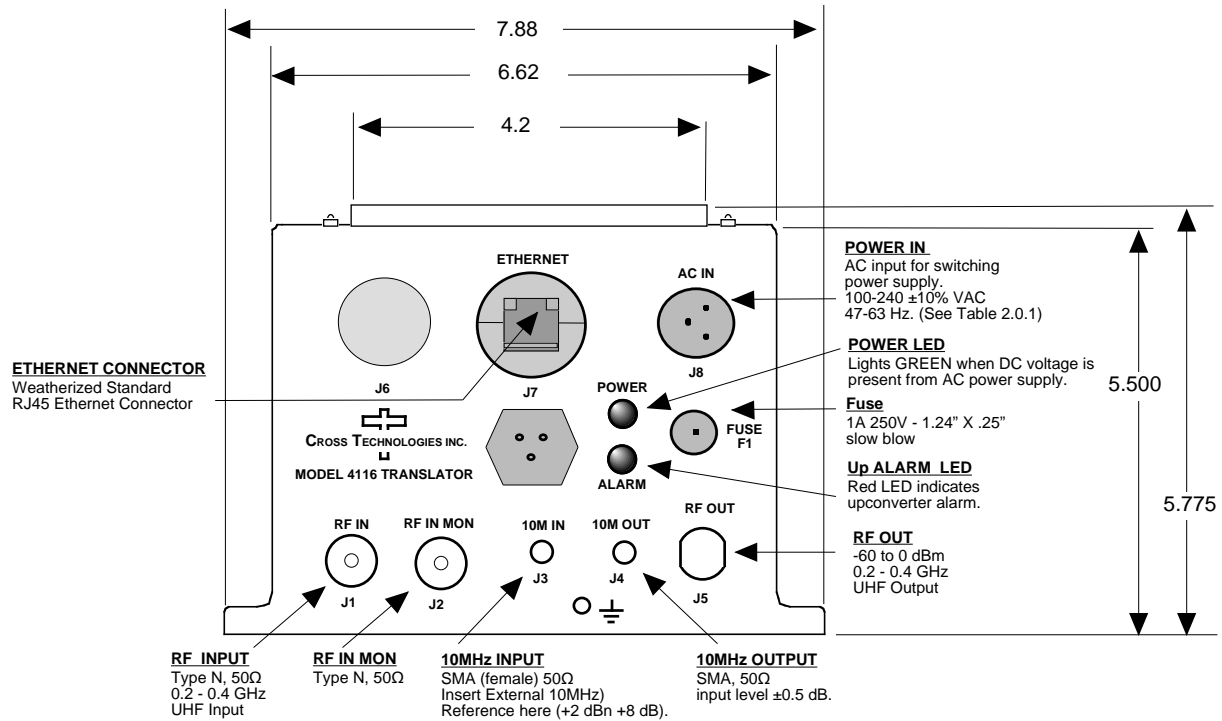
**Figure 2-E: Telnet® Settings in Hyper Terminal**

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 2-F). 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 2-F: Device Server Configuration Menu**



2.2 **Outline Drawing** shows the input and output connection on the front panel and top view of the 4116-T24.



## 2.3 Physical Interface

All 4115 and 4116 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 a multipurpose MS3116, 18 pin connector as shown in Figure 2.5. The Ethernet signals connect via a standard RJ45 connector.

**Table 2.5.1: Monitor and Control Connector**

<b>Monitor and Control Connector Pinout</b>	
<b>Mating connector part number MS3116F14-18P</b>	
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 4116-T24 Translator**

1. Connect a -30 dBm to -10 dBm signal to L-BAND INPUT, (Figure 2.2).
2. Connect the RF OUTPUT, to the external equipment.
3. Connect 100-240  $\pm$ 10% VAC, 47 - 63 Hz to AC connector to the front panel.
4. Be sure DS1 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.2).
5. Set the gain insuring that the output level is always in the range of +20 to -40 dB.
6. Select either INT (for internal 10 MHz ref), AUTO (for internal 10 MHz ref UNLESS a external 10 MHz, +2 to +8 dBm signal is connected to J2), or EXT (for external 10 MHz, +2 to +8 dBm ref that is inserted at J2) via Ethernet or serial command.
7. Check that a 10 MHz, signal is present at the 10 MHz REF OUTPUT at the same level as the input,  $\pm$ 0.5 dB (J4 - Figure 2.2).
8. 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.



6170 Shiloh Road  
Alpharetta, Georgia 30005

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Toll Free 888-900-5588

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E-MAIL [info@crosstechnologies.com](mailto:info@crosstechnologies.com)

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