Instruction Manual

Model 3116-T71-184

Multi-Band Translator

May 2016,   Rev. B

B3 12.75>11.70 GHz
G=10.0 Ref=INT

MENU

EXECUTE

REMOTE POWER MUTE ALARM

MODEL 3116
MULTI-BAND TRANSLATOR

CROSS TECHNOLOGIES INC.

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MODEL 3116-T71-184 Multi-Band Translator

1.0 General

1.1 Equipment Description

The 3116-T71-184 Translator converts one of five input RF bands to one of five output RF bands in seven unique combinations. The RF to RF gain is +20 dB, maximum. Connectors are SMA female for the RF Out, RF In and RF In Monitor and BNC female for the external reference input and reference output. Front panel LEDs provide indication of Remote Operation, DC Power, Mute, and PLL Alarm. Gain, band select, and internal/external/Auto reference selection are controlled by front panel switches or remote selection (Ethernet M&C or via the RS-232C/485 Monitor and Control connector) and are viewable on the LCD Display. In AUTO, the 10 MHz reference stays in external if the external level is in the +2 to +8 dBm range. The 3116 is powered by a 100-240 ± 10% VAC power supply, and housed in a 1RU rack mount chassis, 1.75" H X 19.0" W X 19.0" deep.
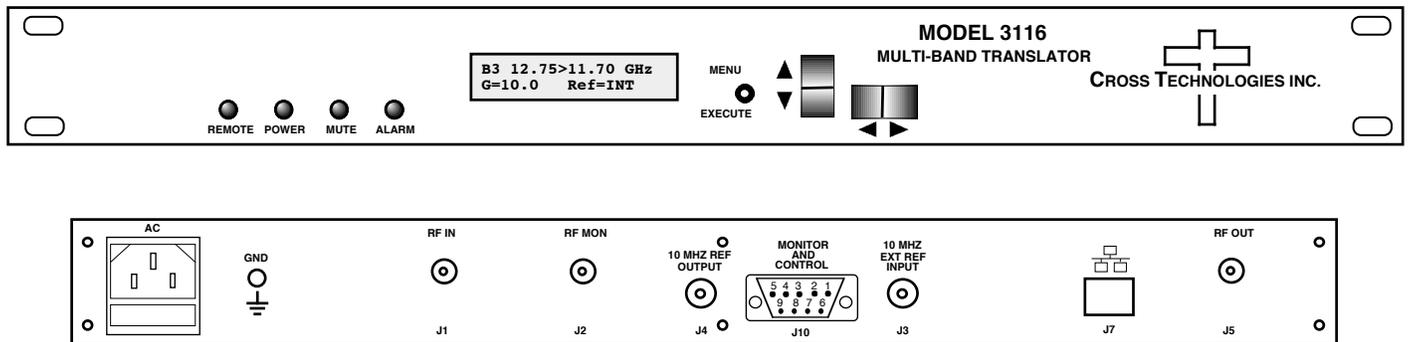
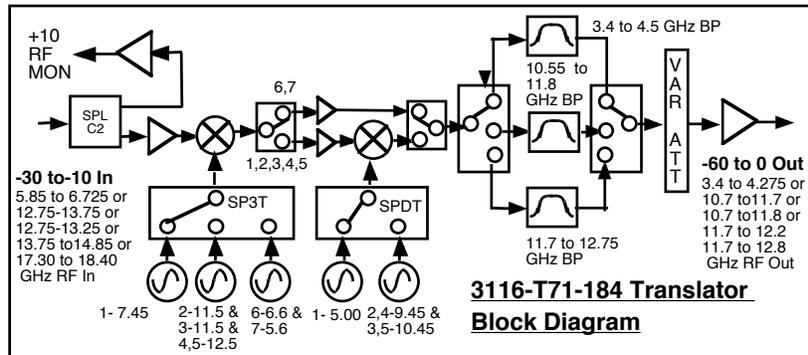**Figure 1.   Model 3116-T71-184 Multi-Band Translator, Front & Rear Panels**

FIGURE 1.A   Model 3116-T71-184 Multi-Band Translator Block Diagram

1.2   Technical Characteristics

TABLE 1.0	3116-T71-184 Multi-Band Translator Specifications*
Input Characteristics	
Impedance/Return Loss	50Ω/12 dB minimum, 14 dB typical
Frequency (GHz)	See Band Chart Below
Noise Figure, Maximum	20 dBm at maximum gain (G_{max})
Input Level Range	-30 to -10 dBm
Non-Damage input	0 dBm @ maximum gain
Output Characteristics	
Impedance/Return Loss	50Ω / 10 dB minimum, 14 dB typical
Frequency (GHz)	See Band Chart Below
Output Level Range	-60 to 0 dBm
Output 1 dB Compression	+8 dBm minimum @ maximum gain
Mute	>60 dB from 0 dBm unmuted output (RF Monitor not muted)
Channel Characteristics	
Gain at F_C	+20 ±3 dB maximum, (+20 to -40 dB variable in 1 ±1 dB steps)
Input to Output Isolation	>45 dB, minimum; (at maximum gain and 0 dBm out)
Spurious, Inband	> 40 dBC Signal Dependent, <-50 dBm signal indep.; -10 dBm in, 0 dBm output
Spurious, Out of Band	<-50 dBm, Signal independent; fc ± 2GHz
Spurious, LO	<-25 dBm, measured at Output, at Maximum Gain
Intermod 2 Tone	>45 dBC (>50 dBC typical) for two carriers at 4 MHz spacing, each at -7 dBm out, (G_{max})
Frequency Response	± 2 dB, over RF Band; ± 0.5 dB, 40 MHz BW
Frequency Sense	Non-Inverting
LO Characteristics	
LO Frequency	Band Specific
Frequency Accuracy	± 0.05 ppm maximum over temp internal reference.; external reference input
10 MHz Level In/Mon	Input = +2 to +8 dBm in; Monitor Output = Input Level ±1.0 dB, 50 ohms

Phase Noise @ Frequency	100 MHz	1kHz	10kHz*	100kHz	1MHz
Specification dBC/Hz	-65	-75	-80	-95	-110

Band Chart - Frequencies, Translations				
BAND NUMBER	IN RANGE (GHz)	OUT RANGE (GHz)	TRANSILATE (GHz)	
1	5.85 - 6.725	3.4 - 4.275	2.45	
2	12.75 - 13.75	10.7 - 11.7	2.05	
3	12.75 - 13.25	11.7 - 12.2	1.05	
4	13.75 - 14.85	10.7 - 11.8	3.05	
5	13.75 - 14.85	11.7 - 12.8	2.05	
6	17.3 - 18.4	10.7 - 11.8	6.6	
7	17.3 - 18.4	11.7 - 12.8	5.6	

1.2 Technical Specifications continued from page 4...

Controls, Indicators	
Gain, Band, 10M Frequency	Direct readout LCD; Pushbutton Switches or via Ethernet M&C or Monitor and Control Connector.
PLL Alarm	Red LED; External Contact Closure
Remote, Power, Mute	Yellow LED, Green LED, Yellow LED
Other	
RF In/RF Out Monitor Connector	SMA (female), 50Ω
10 MHz Connectors	BNC (female), 50Ω; Works with 75Ω
Monitor/Control Connector	RS232C/485, DB9, Female; Ethernet, w/Web Browser & SNMP user interfaces RJ45, Female.
Size	1RU Rack Mount Chassis 1.75" high x 19.0" wide x 19" deep
Power	100-240 ±10% VAC, 47- 63 Hz, 25 watts maximum

* +0 to +50 degrees C Operating; -30 to +60 degrees C Non-operating; 95% relative humidity, non-condensing.
  Specifications subject to change without notice.   © Cross Technologies, Inc. 2015

1.3 Monitor & Control Interface

The following tables summarize the commands and status queries applicable to the
3116-T71-184 Multi-Band Translator.

* PLEASE NOTE: The two character {aa} prefix, shown in the table below, is present ONLY when RS485 is selected.

Table 2.0   Model 3116-T71-184 M&C Commands

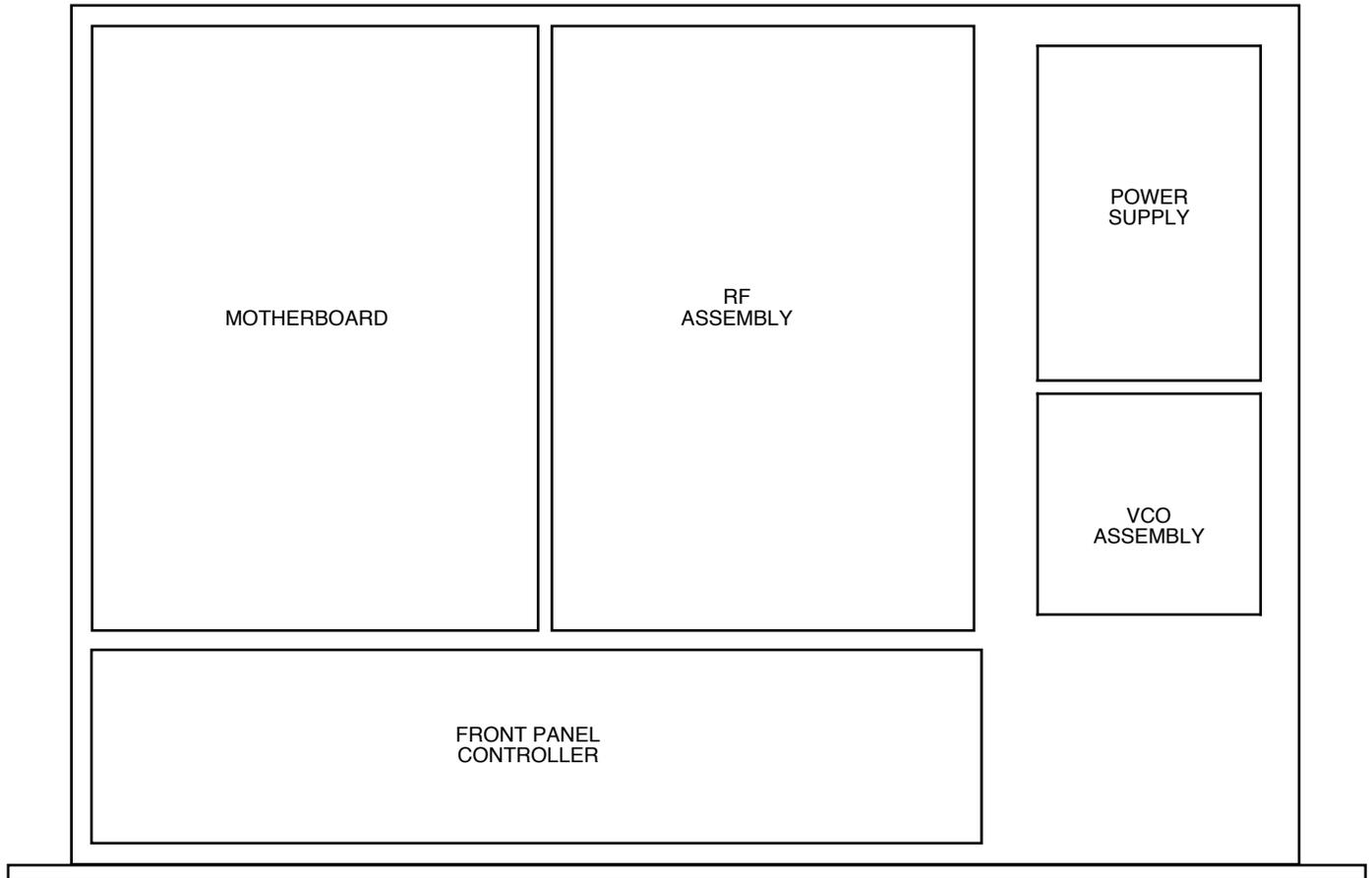| Table 2.0: Model 3116-T71-184 M&C Commands		
Command	**Syntax**	**Description**
Set Frequency Band	{aaCBx}	x = 1 to select band 1: in = (5.85 to 6.725 GHz) out = (3.4 to 4.275 GHz)
		x = 2 to select band 2: in = (12.75 to 13.75 GHz) out = (10.7 to 11.7 GHz)
		x = 3 to select band 3: in = (12.75 to 13.25 GHz) out = (11.7 to 12.2 GHz)
		x = 4 to select band 4: in = (13.75 to 14.85 GHz) out = (10.7 to 11.8 GHz)
		x = 5 to select band 5: in = (13.75 to 14.85 GHz) Out = (11.7 to 12.8 GHz)
		x = 6 to select band 6: in = (17.3 to 18.4 GHz) Out = (10.7 to 11.8 GHz)
		x = 7 to select band 7: in = (17.3 to 18.4 GHz) Out = (11.7 to 12.8 GHz)
Set Gain	{aaCGxxx}	where:
		xxx = 3 characters
		Range: +20 to -40 dB variable in 1±1 dB steps
Set Mute	{aaCMx}	where:
		x = 1 to mute the output
		x = 0 to unmute the output
Set External Reference	{aaCEx}	where:
		x = 1 to select internal reference
		x = 2 to select external reference
		x = 3 for auto-select
Set Reference Offset	{aaCOxxxxx}	where:
		-2000 ≤ xxxxx ≤ +2000

Table 2.0   Model 3116-T71-184 M&C Commands (continued)

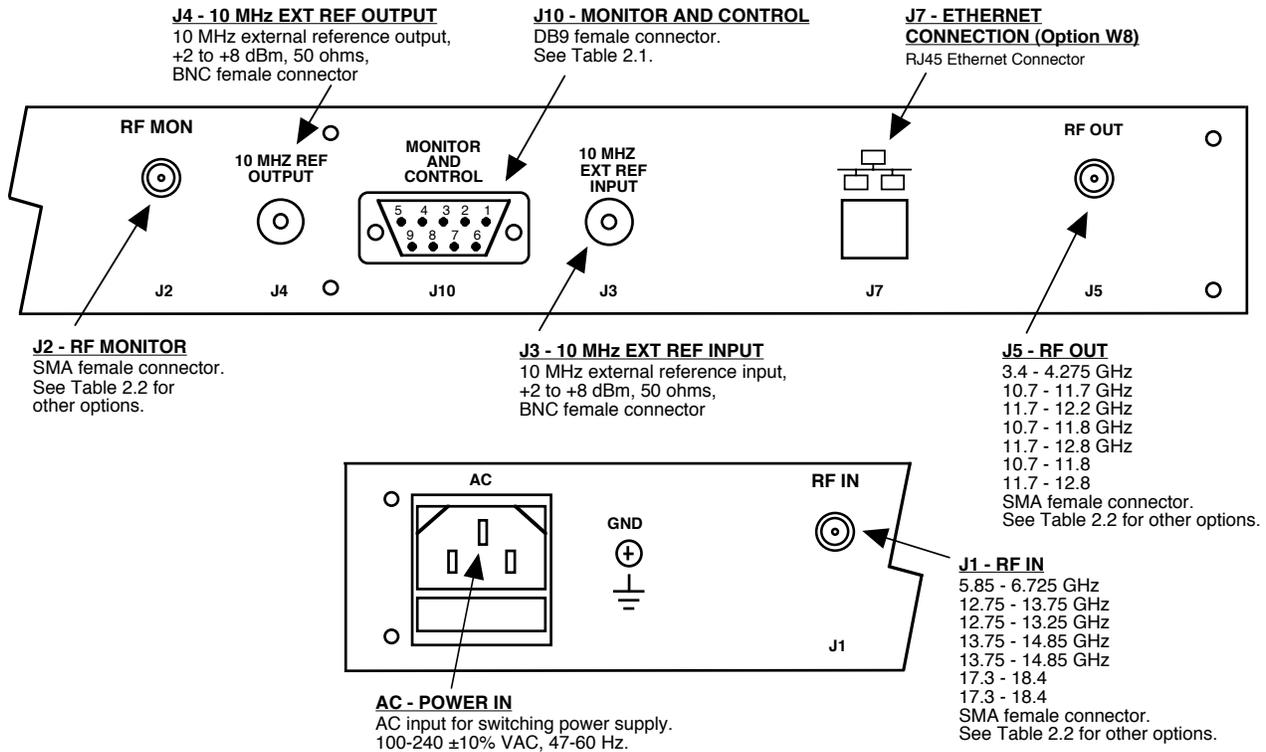| Table 2.0: Model 3116-T71-184 M&C Commands (continued)		
Command	**Syntax**	**Description**
Frequency Band	{aaSB}	Returns {aaSBx} where:
		x = 1 to select band 1: in = (5.85 to 6.725 GHz) out = (3.4 to 4.275 GHz)
		x = 2 to select band 2: in = (12.75 to 13.75 GHz) out = (10.7 to 11.7 MHz)
		x = 3 to select band 3: in = (12.75 to 13.25 GHz) out = (11.7 to 12.2 MHz)
		x = 4 to select band 4: in = (13.75 to 14.85 GHz) out = (10.7 to 11.8 GHz)
		x = 5 to select band 5: in = (13.75 to 14.85 GHz) Out = (11.7 to 12.8 GHz)
		x = 6 to select band 6: in = (17.3 to 18.4 GHz) Out = (10.7 to 11.8 MHz)
		x = 7 to select band 7: in = (17.3 to 18.4 GHz) Out = (11.7 to 12.8 GHz)
Gain	{aaSG}	Returns {aaSGxxx} where:
		xxx = 3 characters
		Range: (+20 to -40 dB variable in 1±1 dB steps)
10 MHz reference	{aaSE}	Returns {aaSEx} where:
		x = 1 if Internal 10 MHz reference is selected
		x = 2 if External 10 MHz reference is selected
		x = 3 if in auto-select mode
Unit Status	{aaSA}	Returns {aaSAwxyz} where:
		w = 0 if no summary alarm, w = 1 if summary alarm x = 0 if unit is using internal 10 MHz ref, x = 1 if unit is using external reference y = 0 oven warm-up is off y = 1 oven warm-up is on z = 0 mute is off z = 1 mute is on
Reference Offset	{aaSO}	Returns {aaSOxxxxx} where:
		xxxxx is a signed number representing the ref. offset value
Model and firmware revision	{aaSV}	returns {aaSVxxxxxxxxyyyy} where:
		xxxxxxxx = unit model number
		yyyy = unit firmware rev.

2.0 Installation

2.1 Mechanical - The 3116-T71-184 Multi-Band Translator consists of a controller board and RF plate assembly. A switching ± 12, +24, +5 VDC power supply provides power for the assemblies. The 3116-T71-184 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 3116-T71-184 is assembled.

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌──────────────┐        ┌───────────┐     │
│  │              │  │              │        │           │     │
│  │              │  │              │        │  POWER    │     │
│  │              │  │              │        │  SUPPLY   │     │
│  │              │  │              │        │           │     │
│  │ MOTHERBOARD  │  │     RF       │        └───────────┘     │
│  │              │  │  ASSEMBLY    │        ┌───────────┐     │
│  │              │  │              │        │           │     │
│  │              │  │              │        │   VCO     │     │
│  │              │  │              │        │ ASSEMBLY  │     │
│  │              │  │              │        │           │     │
│  └──────────────┘  └──────────────┘        └───────────┘     │
│  ┌────────────────────────────────────┐                     │
│  │          FRONT PANEL                │                     │
│  │          CONTROLLER                 │                     │
│  └────────────────────────────────────┘                     │
└─────────────────────────────────────────────────────────────┘
```

FIGURE 2.0   3116-T71-184 Mechanical Assembly

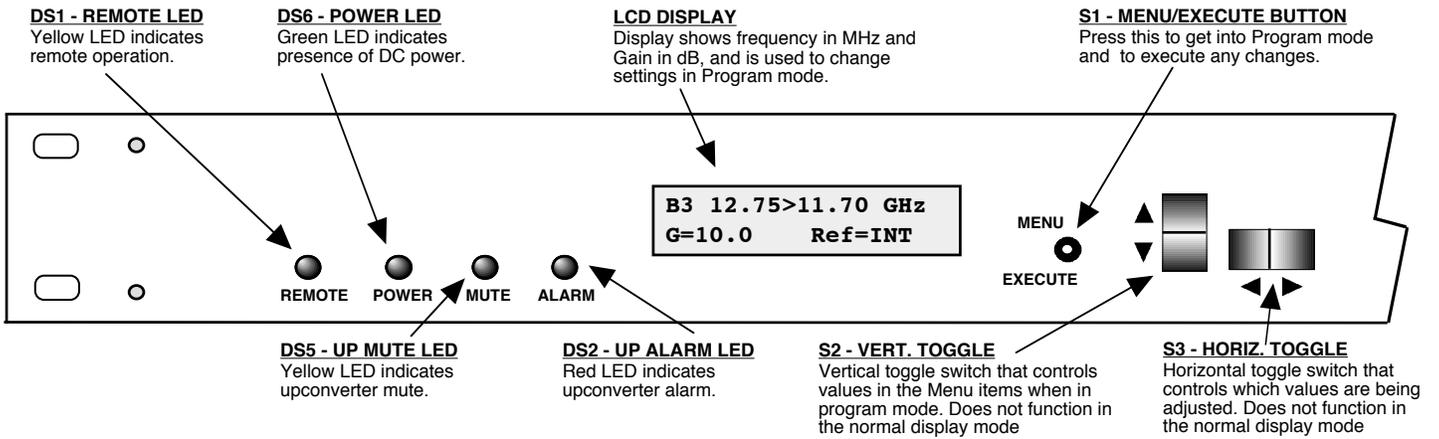## 2.2 Rear Panel Input / Output Signals - Figure 2.2 shows the input and output connectors on the rear panel.

J4 - 10 MHz EXT REF OUTPUT
10 MHz external reference output,
+2 to +8 dBm, 50 ohms,
BNC female connector

J10 - MONITOR AND CONTROL
DB9 female connector.
See Table 2.1.

**J7 - ETHERNET
CONNECTION (Option W8)**
RJ45 Ethernet Connector

J2 - RF MONITOR
SMA female connector.
See Table 2.2 for
other options.

J3 - 10 MHz EXT REF INPUT
10 MHz external reference input,
+2 to +8 dBm, 50 ohms,
BNC female connector

J5 - RF OUT
3.4 - 4.275 GHz
10.7 - 11.7 GHz
11.7 - 12.2 GHz
10.7 - 11.8 GHz
11.7 - 12.8 GHz
10.7 - 11.8
11.7 - 12.8
SMA female connector.
See Table 2.2 for other options.

J1 - RF IN
5.85 - 6.725 GHz
12.75 - 13.75 GHz
12.75 - 13.25 GHz
13.75 - 14.85 GHz
13.75 - 14.85 GHz
17.3 - 18.4
17.3 - 18.4
SMA female connector.
See Table 2.2 for other options.

AC - POWER IN
AC input for switching power supply.
100-240 ±10% VAC, 47-60 Hz.

FIGURE 2.2   3116-T71-184 Rear Panel Inputs and Outputs

TABLE 2.1 J10 Pinouts (RS-232C/422/485*)

Pin	Function
1	Rx-
2	Rx+ (RS-232C)
3	Tx+ (RS-232C)
4	Tx-
5	GND
6	Alarm Relay: Common
7	Alarm Relay: Normally Open
8	Not Used
9	Alarm Relay: Normally Closed

TABLE 2.2 IF/RF Connector Options

Option	IF	RF
STD	BNC, 50Ω	Type N, 50Ω
-S	BNC, 50Ω	SMA, 50Ω
-N	BNC, 75Ω	Type N, 50Ω

*Interface: DB-9 Female
 Protocol: RS485, RS422, or RS232C (selectable),
 9600 baud rate, no parity, 8 data bits, 1 start bit, 1 stop bit

2.3 Front Panel Controls and Indicators - Figure 2.3 shows the front panel controls and indicators.
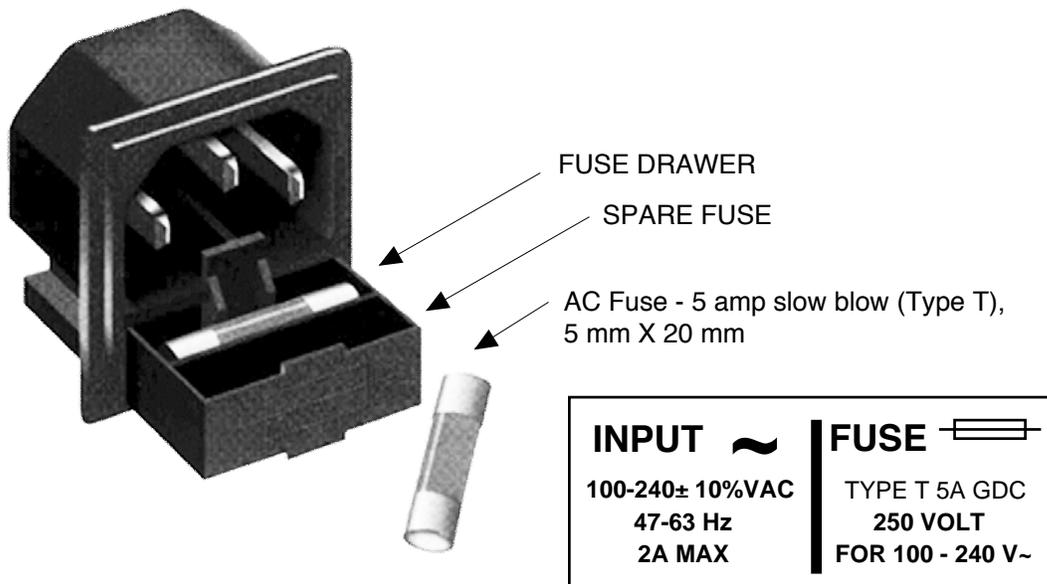
DS1 - REMOTE LED
Yellow LED indicates remote operation.

DS6 - POWER LED
Green LED indicates presence of DC power.

LCD DISPLAY
Display shows frequency in MHz and Gain in dB, and is used to change settings in Program mode.

S1 - MENU/EXECUTE BUTTON
Press this to get into Program mode and to execute any changes.

```
B3 12.75>11.70 GHz
G=10.0    Ref=INT
```

MENU

EXECUTE

REMOTE   POWER   MUTE   ALARM

DS5 - UP MUTE LED
Yellow LED indicates upconverter mute.

DS2 - UP ALARM LED
Red LED indicates upconverter alarm.

S2 - VERT. TOGGLE
Vertical toggle switch that controls values in the Menu items when in program mode. Does not function in the normal display mode

S3 - HORIZ. TOGGLE
Horizontal toggle switch that controls which values are being adjusted. Does not function in the normal display mode

FIGURE 2.3 3116-T71-184 Front Panel Controls and Indicators

2.4 Installation/Operation

 Installing and Operating the 3116-T71-184 Multi-Band 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 ±10% VAC, 47 - 63 Hz to AC connector to the front panel.

4. Be sure DS6 (green, DC Power) is on and DS2 (red, Alarm) is off (Figure 2.3).

5. Set the gain so that the output level is always within the range of +20 to -40 dB (See Table 2.0).

6. Select either INT (for internal 10 MHz ref), or EXT (for external 10 MHz, +2 to +8 dBm reference that is inserted at J2).

7. AC Fuse **-** The fuse is a 1A/250V 1.25" x .25" (slow blow) and is inserted in the fuse F1 position.

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

FUSE DRAWER

SPARE FUSE

AC Fuse - 5 amp slow blow (Type T),
5 mm X 20 mm

INPUT ∿	FUSE ▭
100-240± 10%VAC	TYPE T 5A GDC
47-63 Hz	**250 VOLT**
2A MAX	**FOR 100 - 240 V∿**

FIGURE 2.4   Fuse Location and Spare Fuse

2.5 ETHERNET Interface Installation and Operation

The 3116-T71-184 Multi-Band 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.

2.5.1 Methods of Connection

Directly Connected to a PC:

For control from a local PC, attach the 3116-T71-184's Ethernet port to the Ethernet network connector on the PC using a crossover RJ-45 cable.

LAN Connection

For LAN connections, attach the 3116-T71-184 Ethernet port to the LAN using a normal RJ-45 cable.
Use any PC on the LAN to connect to the 3116-T71-184.

2.5.2 Ethernet Configuration

Each 3116-T71-184 must be configured with an appropriate IP address, Netmask, and Gateway assigned by your network manager. The 3116-T71-184 is set at the factory with a static address that is written on a tag attached to the unit. The device server in the 3116-T71-184 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 3116-T71-184 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.
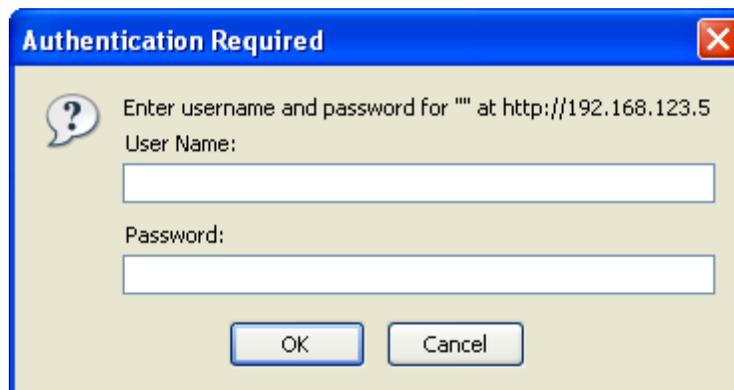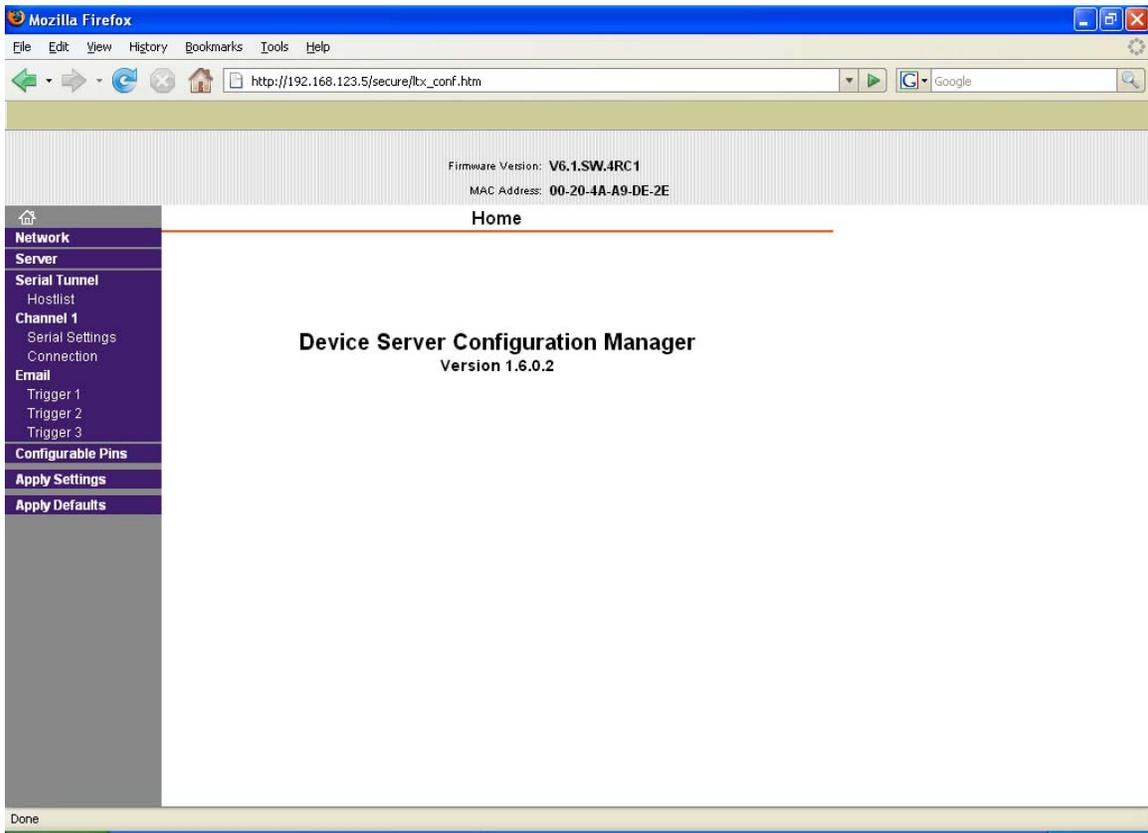

Figure 2-A: Password Screen

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).

2.5.3 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 (page 13) shows the product setup web page from a model 3116-T71-184 frequency converter.

Figure 2-C: Model 3116-T71-184 Product Setup Web Page

2.5.4 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" drop down menu. Enter the IP address of the 3116-T71-184 in the "Host address:" field and 9999 in the "Port number" field. Figure 2-D shows an example of the Hyper Terminal settings required to access the SNMP configuration menu.
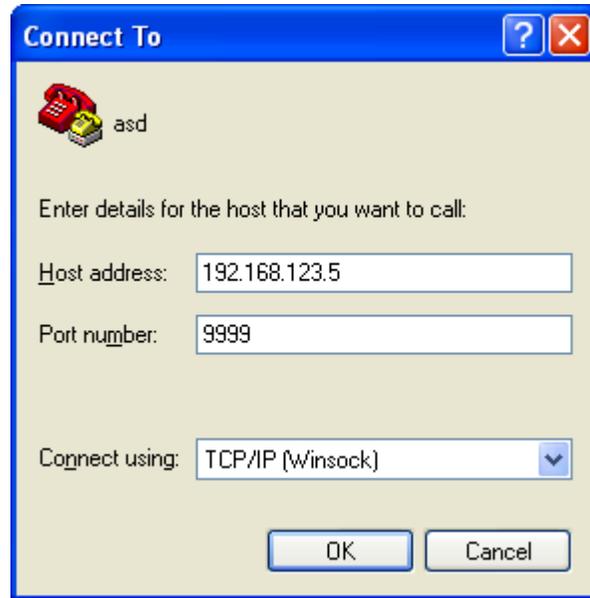
Figure 2-D: Telnet Settings in Hyper Terminal

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 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-E: Device Server Configuration Menu

2.6 Menu Settings

2.6.1 Functions - This section describes operation of the front panel controls. There are three operator switches, the LCD display and alarm indicator LEDs. All functions for the equipment are controlled by these components. The functions are (see Figure 2.3):

Power Up
Normal Display

Menu 1	Frequency Band (1 to 8)
Menu 2	Gain in dB (-40 to +20 dB in 0.5 dB steps)
Menu 3	Mute TX Signal
Menu 4	Set Frequency Offset
Menu 5	Select 10 MHz Reference (Internal, External, Auto)
Menu 6	Set Reference Frequency Offset
Menu 7	Set Secondary Communications Interface **(Option Q)**
Menu 8	Display Interior Temperature
Save Menu	When "R" is selected in any of the above menus or when operator reaches the end.

Alarm indications appear on the LEDs (See figure 2.3).

All program changes must start with the operation of the Menu/Execute switch and must also end with the operation of the Menu/Execute switch verified by the "Save Settings?" Menu. If this sequence is not followed, none of the changes will take effect.   If programming is initiated and no operator action takes place for approximately 12 seconds, (before the final press of the Menu/Execute switch), the display will revert to its previous status and you will need to start over.

2.6.2. Power On Settings

NOTE: The last status of a unit is retained even when power is removed.
When power is restored, the unit will return to it's previous settings.
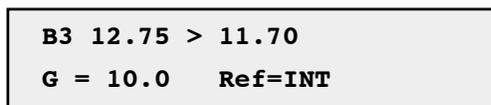When power is first applied, the LCD display goes through three steps.
      1. The LCD goes black to show all segments are functioning.
      2. The software version will be displayed.

```
 REV 1.OO

```

3. The present band, gain, 10 MHz reference and output frequency range are shown.

```
 B3 12.75 > 11.70
 G = 10.0   Ref=INT
```

The unit is now operational and ready for any changes the operator may desire.

2.6.3 Control Switches

1. <u>Menu/Execute</u> - Any change to the programming of the unit must be initiated by pressing the Menu/Execute switch and completed by pressing the Menu/Execute switch.

2. <u>Horizontal Switch</u> - This switch is mounted so its movement is horizontal and moves the cursor left or right.

3. <u>Vertical Switch</u> - This switch is mounted so its movement is vertical and has two functions:
   A. During frequency, gain changes, the vertical movement will raise or lower the number in the direction of the arrows.
   B. For other functions such as Mute on/off, the vertical switch will alternately turn the function on or off regardless of the direction operated.

2.6.4 Band Changes

At any time during the modification process, if you have made a mistake and do not wish to save the changes you have made, **do not press the Menu/Execute switch**; simply do nothing for approximately 30 seconds, and the system will return to the normal operating mode or scroll to **"R"** and push the menu/Execute switch and select **"NO"** in the **"SAVE SETTINGS?"** window.

To change the BAND:
Operate the Menu/Execute switch until you get to the menu item you want to change see Figure 2.5 for the sequence of menu options. The following display is for changing the upconverter's frequency load:

```
BAND = 3
```

Pressing the Up/Down switch down will select available frequency bands.

NOTE: CHANGES DO NOT TAKE PLACE ON BAND UNTIL YOU GO TO THE SAVE MENU AND INDICATE YOU WANT TO SAVE THE CHANGES.
When the display indicates the value desired you can push the Menu/Execute switch to the next item:

```
GAIN = +10                R
```

OR you can scroll to "R", push the Menu/Execute switch to get to:

```
SAVE SETTINGS?    Y N
```

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.
Pushing the Menu/Execute switch then takes you to the default display:
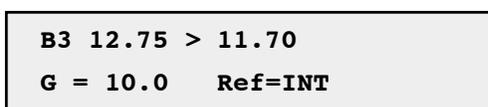
```
B3 12.75 > 11.70
G = 10.0   Ref=INT
```

Figure 2.5 shows all the menu items and how to make changes.

2.6.5 Gain Changes

When you get to this menu note that the gain changes will be made as you make them but if you do not wish to save the changes you have made, scroll to **"R"** and push the menu/Execute switch and select **"NO"** in the **"SAVE SETTINGS?"** window or **do not press the Menu/Execute switch**; simply do nothing for approximately 30 seconds and the system will return to the normal operating mode.

<u>NOTE</u>: CHANGES TAKE PLACE ON LEVEL AND GAIN IMMEDIATELY BUT DO NOT GET SAVED UNTIL YOU GO TO THE SAVE MENU AND INDICATE YOU WANT TO SAVE THE CHANGES.

Press the Up/Down switch to change the level in 1 dB steps and then push the Menu/Execute switch to get to the Gain setting:

```
GAIN = +10              R

```

Press the Up/Down switch to change the gain in 1 or 10 dB steps:

```
GAIN = +11              R

```

By using the horizontal rocker switch the cursor can be moved left or right. Pressing the Up/Down switch down will toggle the display digit selected until you have the desired gain.

When the display indicates the value desired you can push the Menu/Execute switch to the next item OR you can scroll to "R", push the Menu/Execute switch to get to:

```
SAVE SETTINGS?    Y N

```

Selecting **Y** will save the new settings. Selecting **N** will revert to the previous settings.
Pushing the Menu/Execute switch then takes you to:

```
B3 12.75 > 11.70
G = 10.0   Ref=INT
```

Figure 2.5 gives the menu items and how to make changes.

2.6.6 Alarm Indications

An alarm condition will occur if the local oscillator phase lock loop (PLL) comes out of lock. The Mute LED will light if you select to mute the Tx Signal and the Remote LED will light when you select the Remote mode.

```
                              ON POWER UP
  Power Up                    ┌──────────────────────────┐
                              │ FPC              4.00    │
                              │ Load Settings...         │
                              └──────────────────────────┘

                              NORMAL DISPLAY
  Normal Display              ┌──────────────────────────┐
                              │ B3 12.75 > 11.70         │
                              │ G = 10.0   Ref=INT       │     PUSH BUTTON
                              └──────────────────────────┘

                              PUSHING MENU/EXECUTE SEQUENCE
  Menu 1 Set Band             ┌──────────────────────────┐   SCROLL <>
                              │ BAND = 3              R   │   SCROLL ⇕        PUSH BUTTON
                              └──────────────────────────┘

  Menu 2 Set Gain (-40 to +20 dB)  ┌─────────────────────┐   SCROLL <>
                              │ G = +10               R   │   SCROLL ⇕        PUSH BUTTON
                              └──────────────────────────┘

  Menu 3 Mute TX signal       ┌──────────────────────────┐   SCROLL <>
                              │ MUTE OFF              R   │   SCROLL ⇕        PUSH BUTTON
                              └──────────────────────────┘

  Menu 4 Select 10 MHz        ┌──────────────────────────┐   SCROLL <>
  Reference Mode              │ REF MODE = INT        R   │   SCROLL ⇕        PUSH BUTTON
  (Internal, External, Auto)  └──────────────────────────┘

                              ┌──────────────────────────┐   SCROLL <>
  Menu 5 Reference            │ REF OS =   +0000      R   │   SCROLL ⇕        PUSH BUTTON
  Frequency Offset            └──────────────────────────┘

  Menu 6 Select Secondary     ┌──────────────────────────┐   SCROLL <>
  Communications Interface    │ COMM INTERFACE        R   │   SCROLL ⇕        PUSH BUTTON
  (Option Q)                  │ RS232                    │
                              └──────────────────────────┘

  Menu 7 Interior Temperature ┌──────────────────────────┐   SCROLL <>
                              │ TEMP = +30C           R   │   SCROLL ⇕        PUSH BUTTON
                              └──────────────────────────┘

  Save Settings? At the end or┌──────────────────────────┐
  when "R" is selected from any of│ SAVE SETTINGS?   Y N │   SCROLL <>       PUSH BUTTON
  the above menus             └──────────────────────────┘
```

FIGURE 2.5   Menu Display and Sequence

3.0 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 multiunit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, consideration should be given to Tmra (Maximum Recommended Ambient Temperature).

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 units 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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Printed in USA