Instruction Manual

Model 3116-T71
Multi-Band, Block Translator

October 2015,   Rev. C

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┌─────────────────────────────────────────────────────────────────────────┐
│  ○   ○                                           MODEL 3116              ○  ○ │
│                  ┌─────────────────────┐      MULTI-BAND TRANSLATOR          │
│                  │ B1   5.850 -> 3.400 GHz│  MENU   ▲                         │
│                  │ G=10    TRANS= 2.050 GHz│    ○                  ✝          │
│  ○   ○   ○   ○   └─────────────────────┘  EXECUTE ▼           CROSS TECHNOLOGIES INC. │
│  REMOTE POWER MUTE ALARM                         ◄ ►                        │
└─────────────────────────────────────────────────────────────────────────┘
```
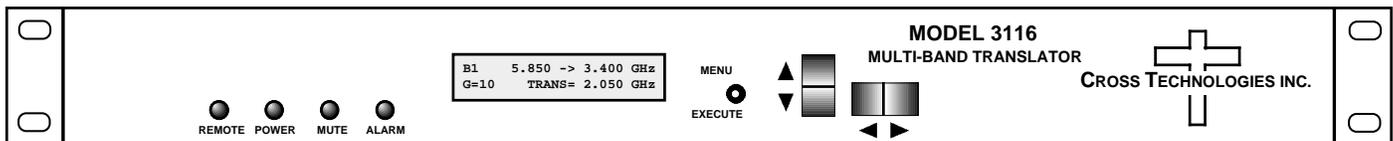
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✝

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INSTRUCTION MANUAL

MODEL 3116-T71 Multi-Band, Block Translator

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MODEL 3116-T71 Multi-Band, Block Translator

1.0 General

1.1 Equipment Description

The 3116-T71 Translator converts one of four input RF bands to one of four output RF bands in seven different translations. Front panel LEDs provide indication of DC Power, Remote, Mute and PLL Alarm. 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. In AUTO, the 10 MHz reference switches to internal when the external is below +1 dBm. Gain, band, LO frequency and internal 10 MHz frequency are controlled by the Ethernet M&C or the Monitor/Control connector. The 3116-T71 is powered by a 100-240 ±10% VAC power supply and is in a 1.75" X 19" X 19" rack mount chassis.
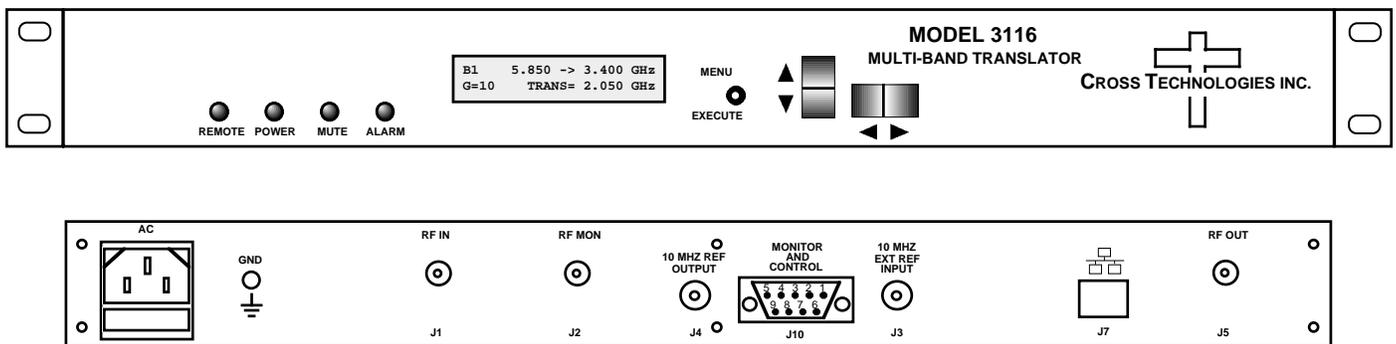

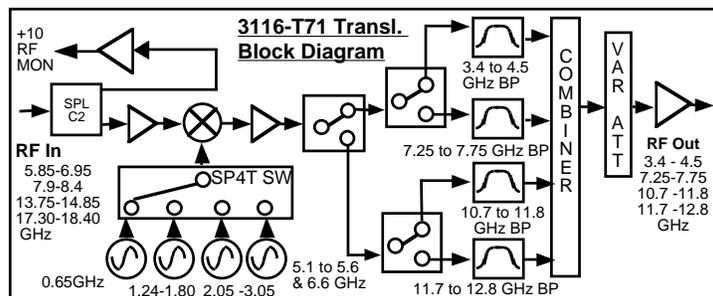**Figure 1   Model 3116-T71 Multi-Band Block Translator, Front & Rear Panels**

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

1.2 Technical Characteristics
TABLE 1.0 3116-T71 Multi-Band, Block Translator*

Input Characteristics

Impedance/Return Loss	50 Ω /12 dB, 14 dB typical
Frequency	See Band Chart below
Noise Figure, max.	20 dB at max. gain
Input Level	-30 to -10 dBm

Output Characteristics

Impedance/Return Loss	50 Ω/10 dB, 14 dB typical (see Table 2.5.1 for connector options)
Frequency (GHz)	See Band Chart below
Output Level Range	-60 to 0 dBm
Output 1dB Compression	+8 dBm, +10 typical

Channel Characteristics

Gain, maximum	+20 dB, ±3 dB
Gain Range; Steps	+20 to -40 dB;
Input to Output Isolation, Min.	> 45 dBC, (> 60 typical)
Spurious, Inband, @ Level	> 40 dBC, except 25 dBC (>30 dBC typical) @ -10 dBm in where harmonics of LO falls in-band (See Band Chart below).
Spurious, LO, Out of band	< -60 dBm
2 tone @ -20 dBm in each	> 45 dBC, 50 typical
Frequency Response, band	± 2 dB
Frequency Response, 40 MHz	± 0.5 dB
Frequency Sense	Non-inverting

LO Characteristics

LO Frequency	Band Specific
Frequency Accuracy	±0.01 ppm max. over temp internal reference; external reference input

Phase Noise @ F (Hz)>	100	1K	10K	100K	1M
dBC/Hz	70	80	See Band Chart	100	110

10 MHz Level	+5 dBm ± 3 dB; Manual Local/Remote; Auto, Switches to internal when the external falls below +1 dBm

Controls, Indicators

Gain, Band, 10M Freq.	Gain, band select, and internal 10 MHz frequency via Ethernet M&C or Monitor/Control connector.
PLL Alarm	Red LED, External contact closure
Power	Green LED
Remote	Ethernet and RS232C, 9600 baud (RS485 Optional)

Other

RF In, Mon. Connector	SMA (female), 50Ω
RF Out Connector	SMA (female), 50Ω
10 MHz Connectors	BNC (female), 75Ω; Works with 50Ω
Monitor/Control Connector	Ethernet, RJ45; Female; RS232C, DB9, Female
Size	19 inch, 1RU standard chassis, 1.75" high x 19.0" deep
Power	100-240 ±10% VAC, 47 - 63 Hz, 30 watts max.

BAND CHART-Frequencies, Translations, Phase Noise, Spurs

BAND	IN RANGE	OUT RANGE	LO	LO	LO STEP	PH NOISE	In-Band Fixed Spurs
NO.	(GHz)	(GHz)	(GHz)	RANGE (GHz)	(MHz)	@ 10 kHz	(25dBC @-10 In; 5dBC @ -30 In)
1	5.85-6.95	3.4-4.5	2.45	2.05-3.05	1	85dBC	2.05 to 2.25, Carrier related 20 dBC
2	7.90-8.40	7.25-7.75	0.65	0.65	FIXED	85dBC	None
3	13.75-14.85	10.7-11.8	3.05	2.05-3.05	1	85dBC	2.14 to 2.36; 2.675 to 2.95
4	13.75-14.85	11.7-12.8	2.05	2.05-3.05	1	85dBC	2.05 to 2.1;2.34 to 2.565;2.925 to 3.05
5	13.75-14.85	11.7-12.8	1.5	1.24-1.80	1	85dBC	1.24 to 1.40 ;1.5 to 1.6 ; 1.75 to 1.8
6	17.3-18.4	10.7-11.8	6.6	6.6	FIXED	85 dBC	None
7	17.3-18.4	11.7-12.8	5.6	5.1-5.6	5	85 dBC*	None

* 5 MHz steps; >75 dBC for 1 MHz steps

*+10 to +40 degrees C Operating; -30 to +60 degrees C Non-operating; 95% Relative humidity, non-condensing;
Specifications subject to change without notice.

1.3 Monitor & Control Interface

The following tables summarize the commands and status queries applicable to the
3116-T71 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 M&C Commands

Table 2.0: Model 3116-T71 M&C Commands		
Command	**Syntax**	**Description**
Set Frequency Band	{aaCBx}	x = 1 to select band 1: in = (5.85 to 6.95 GHz) out = (3400 to 4500 MHz)
		x = 2 to select band 2: in = (7.90 to 8.40 GHz) out = (7250 to 7750 MHz)
		x = 3 to select band 3: in = (13.75 to 14.85 GHz) out = (10700 to 11800 MHz)
		x = 4 to select band 4: in = (13.75 to 14.85 GHz) out = (11700 to 12800 MHz)
		x = 5 to select band 5: in = (13.75 to 14.85 GHz) Out = (11700 to 12800 MHz)
		x = 6 to select band 6: in = (17.3 to 18.4 GHz) Out = (10700 to 11800 MHz)
		x = 7 to select band 7: in = (17.3 to 18.4 GHz) Out = (11700 to 12800 MHz)
Set Gain	{aaCGxxxx}	where:
		xxxx = 4 characters
		Range: -40 to +20 in 0.5 dB steps (e.g., +115 = 11.5dB)
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
Set Frequency Offset	{aaCFxxxxx}	where:
(NOTE: applies to currently selected band)		-400 ≤ xxxxx ≤ 600 for band 1
		xxxxx = 0 for band 2
		-1000 ≤ xxxxx ≤ 0 for band 3
		0 ≤ xxxxx ≤ 1000 for band 4
		-260 ≤ xxxxx ≤ 300 for band 5
		xxxxx = 0 for band 6
		-500 ≤ xxxxx ≤ 0 for band 7

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

Table 2.0: Model 3116-T71 M&C Commands (continued)		
Command	**Syntax**	**Description**
Frequency Band	{aaSB}	Returns {aaSBx} where:
		x = 1 to select band 1: in = (5.85 to 6.95 GHz) out = (3400 to 4500 MHz)
		x = 2 to select band 2: in = (7.90 to 8.40 GHz) out = (7250 to 7750 MHz)
		x = 3 to select band 3: in = (13.75 to 14.85 GHz) out = (10700 to 11800 MHz)
		x = 4 to select band 4: in = (13.75 to 14.85 GHz) out = (11700 to 12800 MHz)
		x = 5 to select band 5: in = (13.75 to 14.85 GHz) Out = (11700 to 12800 MHz)
		x = 6 to select band 6: in = (17.3 to 18.4 GHz) Out = (10700 to 11800 MHz)
		x = 7 to select band 7: in = (17.3 to 18.4 GHz) Out = (11700 to 12800 MHz)
Gain	{aaSG}	Returns {aaSGxxxx} where:
		xxxx = 4 characters
		Range: (-40 to +20 in 0.5 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
Frequency Offset	{aaSF}	Returns {aaSFxxxxx} where:
		xxxxx is a signed number representing the frequency 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 Multi-Band Block 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 can be secured to a rack using the 4 holes on the front panel. Figure 2.0 shows how the 3116-T71 is assembled.
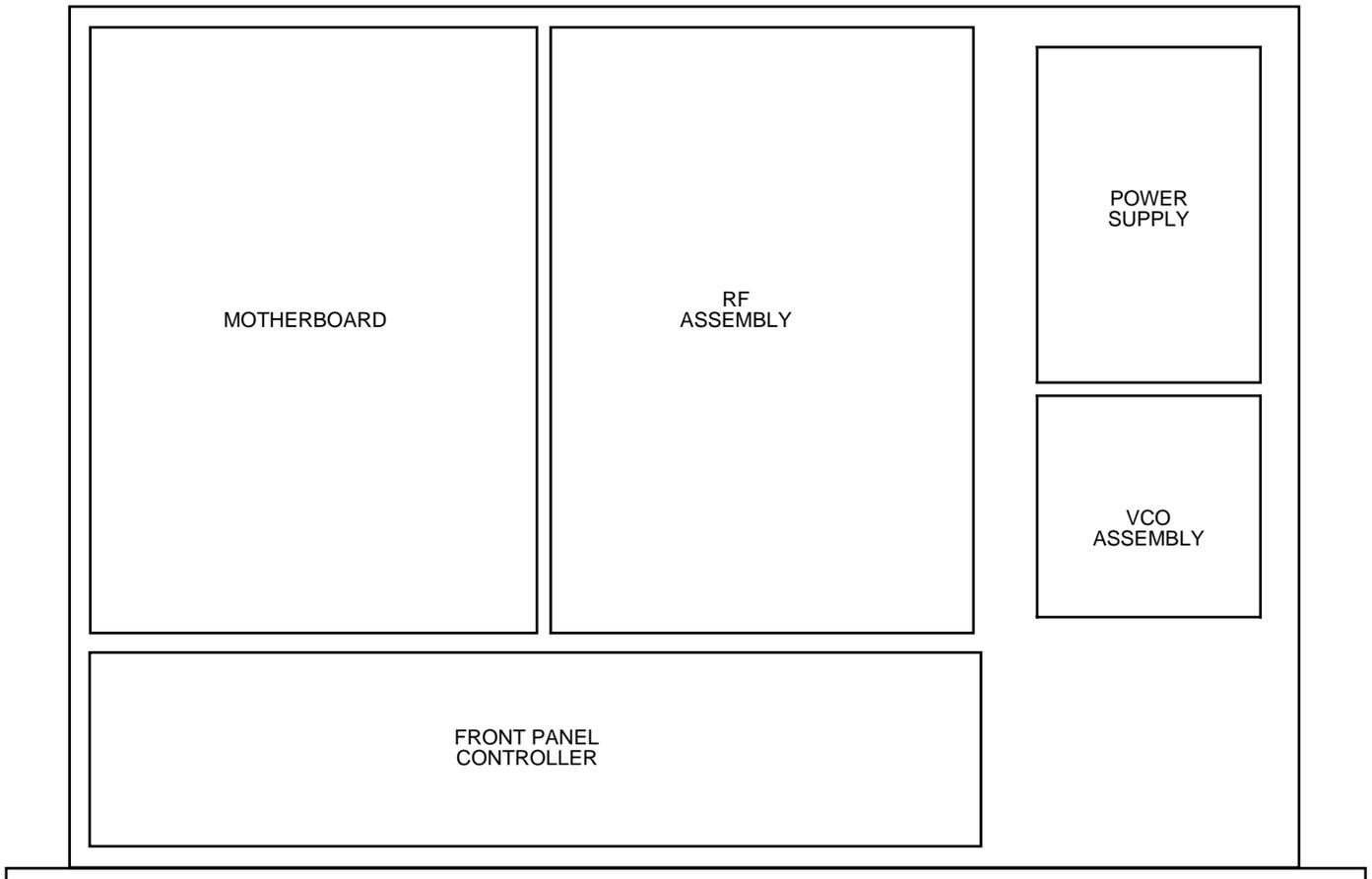


```
┌──────────────────────────────────────────────────────┐
│  ┌──────────────┐ ┌──────────────┐  ┌──────────┐      │
│  │              │ │              │  │          │      │
│  │              │ │              │  │  POWER   │      │
│  │              │ │              │  │  SUPPLY  │      │
│  │   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

FIGURE 2.0 3116-T71 Mechanical Assembly

2.2 Rear Panel Input / Output Signals - Figure 2.2 shows the input and output connectors on the rear panel.
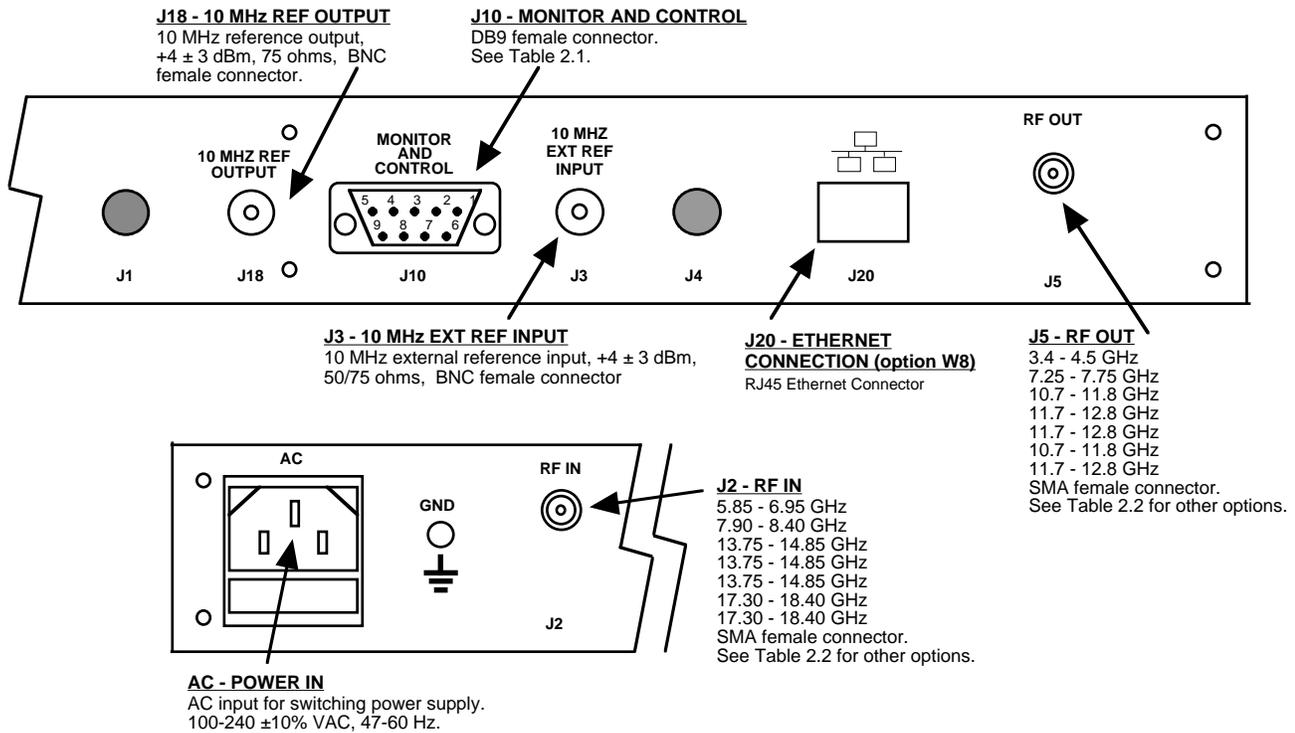
J18 - 10 MHz REF OUTPUT
10 MHz reference output,
+4 ± 3 dBm, 75 ohms, BNC
female connector.

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

J3 - 10 MHz EXT REF INPUT
10 MHz external reference input, +4 ± 3 dBm,
50/75 ohms, BNC female connector

J20 - ETHERNET CONNECTION (option W8)
RJ45 Ethernet Connector

J5 - RF OUT
3.4 - 4.5 GHz
7.25 - 7.75 GHz
10.7 - 11.8 GHz
11.7 - 12.8 GHz
11.7 - 12.8 GHz
10.7 - 11.8 GHz
11.7 - 12.8 GHz
SMA female connector.
See Table 2.2 for other options.

J2 - RF IN
5.85 - 6.95 GHz
7.90 - 8.40 GHz
13.75 - 14.85 GHz
13.75 - 14.85 GHz
13.75 - 14.85 GHz
17.30 - 18.40 GHz
17.30 - 18.40 GHz
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 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.

```
B1   5.850 -> 3.400 GHz
G=10 TRANS = 2.050 GHz
```

MENU

EXECUTE

REMOTE   POWER   MUTE   ALARM

DS5 - UP MUTE LED
Red 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 Front Panel Controls and Indicators

2.4 Installation/Operation

Installing and Operating the 3116-T71 Multi-Band Block Translator:

1. Connect a -30 dBm to -10 dBm signal to RF IN (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 0 to -60 dBm (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. <u>AC Fuse</u> **-** 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~
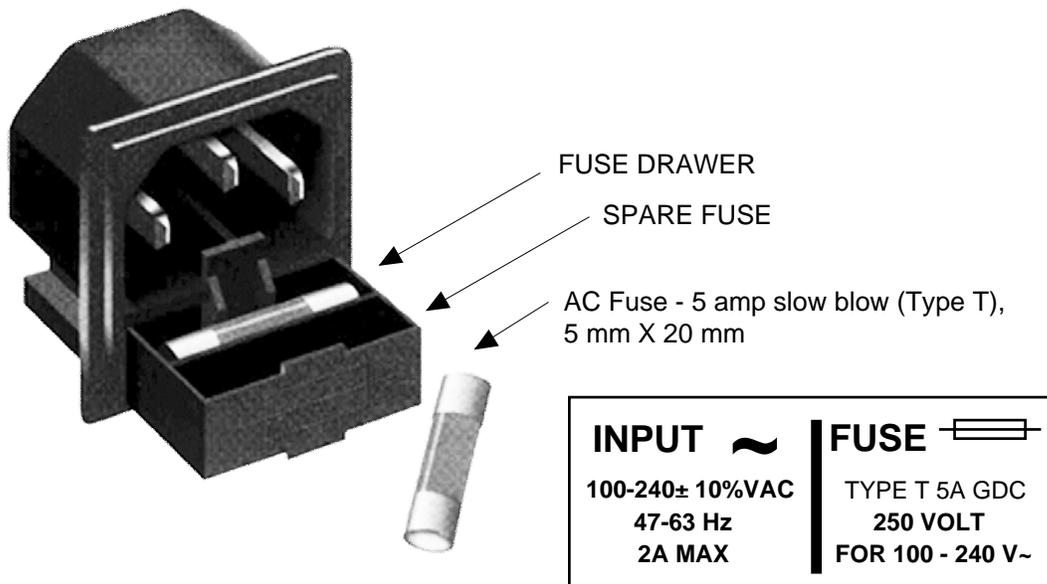
FIGURE 2.4 Fuse Location and Spare Fuse

2.5 ETHERNET Interface Installation and Operation

The 3116-T71 Multi-Band Block 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'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 Ethernet port to the LAN using a normal RJ-45 cable.
Use any PC on the LAN to connect to the 3116-T71.

2.5.2 Ethernet Configuration

Each 3116-T71 must be configured with an appropriate IP address, Netmask, and Gateway assigned by your network manager. The 3116-T71 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 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 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.
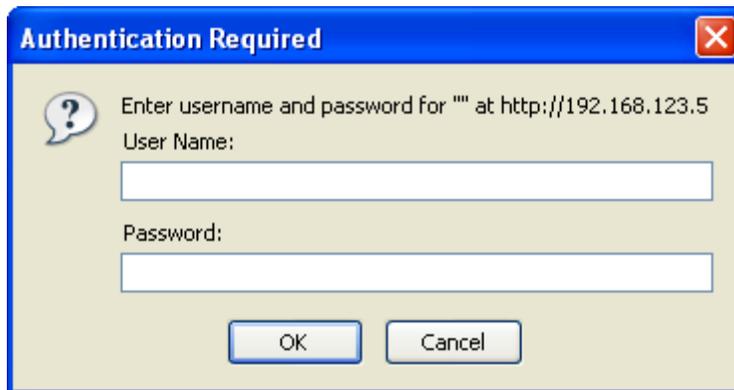
Figure 2-A: Password Screen
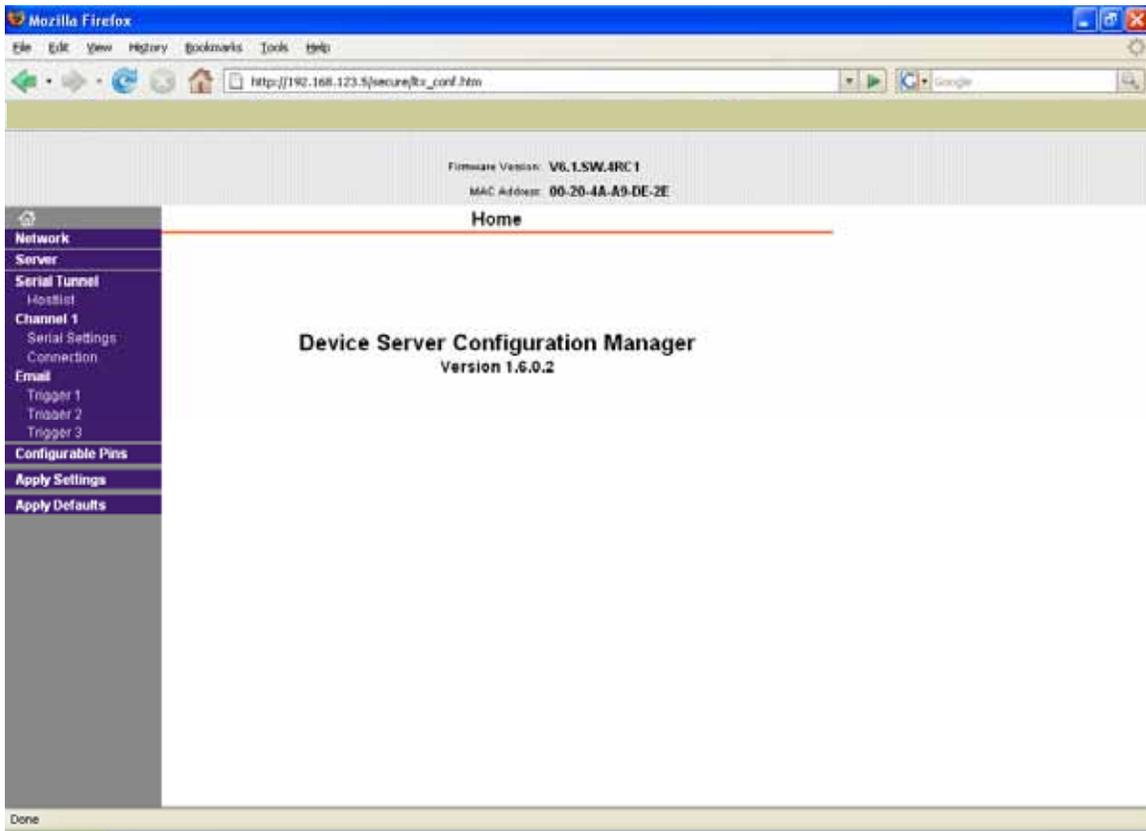
Figure 2-B: Configuration Manager Screen

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 frequency converter.

Figure 2-C: Model 3116-T71 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 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.
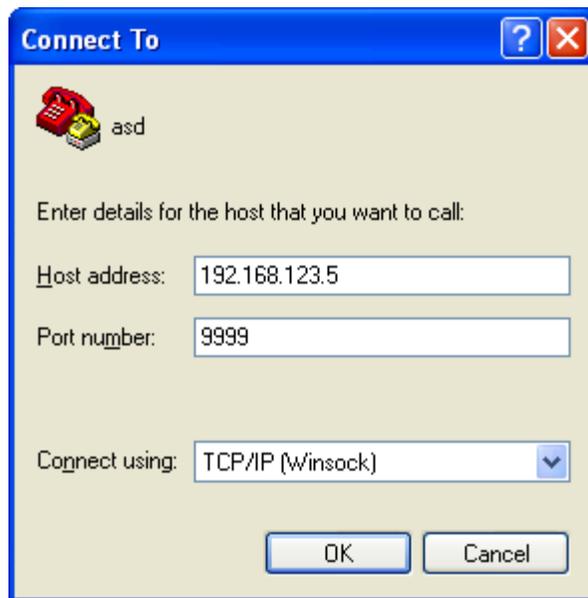
Figure 2-D: Telnet Settings in Hyper Terminal

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

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 ?

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 7)
> **Menu 2**   Gain in dB (-40 to +20 dB in 1.0 dB steps)
> **Menu 3**   Mute TX Signal
> **Menu 4**   Set Frequency Translation
> **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.
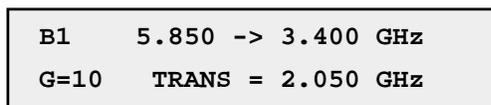When power is first applied, the LCD display goes through three steps.
      1. The LCD goes black to show all segments are functioning.
      2. The software version will be displayed.

```
 REV 1.00

```

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

```
 B1    5.850 -> 3.400 GHz

 G=10   TRANS = 2.050 GHz
```

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:

```
B1     5.850 -> 3.400 GHz

G=10   TRANS = 2.050 GHz
```

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:

```
B1    5.850 -> 3.400 GHz
G=10   TRANS = 2.050 GHz
```

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.

Power Up

ON POWER UP

```
FPC              4.00
Load Settings...
```

Normal Display

NORMAL DISPLAY

```
B1   5.850 -> 3.400 GHz
G=10  TRANS = 2.050 GHz
```
PUSH BUTTON

PUSHING MENU/EXECUTE SEQUENCE

Menu 1 Set Band

```
BAND = 3            R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 2 Set Gain (-40 to +20 dB)

```
G = +10             R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 3 Mute TX signal

```
MUTE OFF            R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 4 Frequency Offset

```
FREQ OS = +0000     R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 5 Select 10 MHz
Reference Mode
(Internal, External, Auto)

```
REF MODE = INT      R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 6 Reference
Frequency Offset

```
REF OS =   +0000    R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 7 Select Secondary
Communications Interface
(Option Q)

```
COMM INTERFACE      R
RS232
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Menu 8 Interior Temperature

```
TEMP = +30C         R
```
SCROLL <>
SCROLL ⌄
PUSH BUTTON

Save Settings? At the end or
when "R" is selected from any of
the above menus

```
SAVE SETTINGS?  Y N
```
SCROLL <>
PUSH BUTTON

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 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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