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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Version	Jan 05
1.0	First release – minor typographical errors fixed, reformatting	Aug 05
1.1	Added LNB Current Limit	Apr 06
1.2	Removed DIP switches from 7702 Illustration, corrected –L version	Jun 07
1.3	Updated specs	April 09

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1.   OVERVIEW

The 7702 and 7703 series RF Active Splitters provide inexpensive amplification and distribution of RF signals from 10 MHz to 2.15GHz in 1x4 or 1x8 configuration (DA4 or DA8 in part number). The operating frequency range is 10MHz to 2.15GHz for both IF and L-Band satellite signal distribution and amplification. On the 7703 versions, optional LNB power is available at the input port with selection of either +13 or +17VDC and built in current limiting (350 mA). For this option, the operating frequency range is limited to the L-Band, 950-2150MHz.

The 7703 series modules provide the same functionality as the 7702 series modules and also have integrated VistaLINK® technology for remote monitoring and configuration via SNMP protocol.

All cards are designed to be housed in either the 7700FR-C 3RU frame, the 7701FR 1RU frame or the S7701FR single module enclosure. The DA4 (1x4) versions occupy a single slot and the DA8 (1x8) versions occupy two slots in the 15 slot 3RU frame. All versions each occupy one card slot in the 3 slot 1RU frame.

Features:
- Low Noise amplification and distribution of RF signals from 10MHz to 2.15GHz
- Wide dynamic range (-10 to –60 dBm)
- Manual gain mode with adjustable output gain of –14 to +14dB on 7703 versions and 0dB on 7702 versions
- Protocol independent – transmits all modulation formats
- Independent isolated output drivers to ensure no cross channel loading effects (i.e. no need to terminate unused outputs)
- Input RF signal strength indication LEDs
- Fully hot swappable from front of frame
- Optional LNB power (at +13 or +17Vdc with built in current limiting (350 mA)) into RF input cable for L-Band operation only.
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®. (7703 versions only)
- VistaLINK® capability is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame. (7703 versions only)
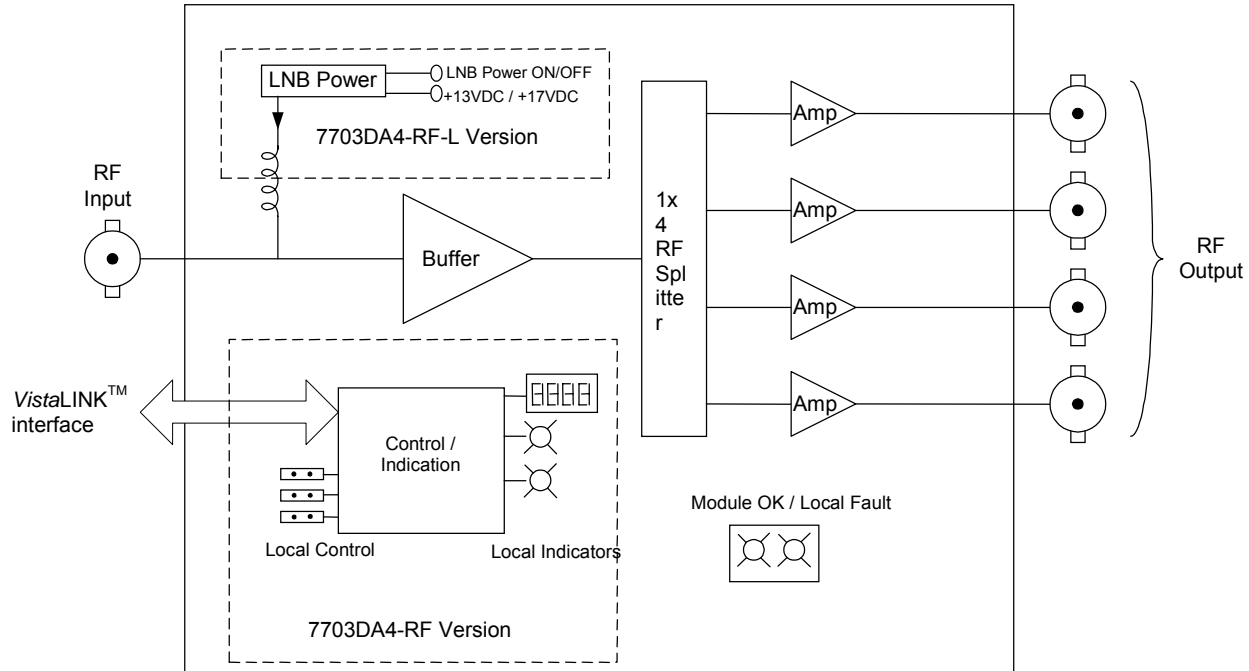
Figure 1-1: 7702&7703DA4-RF Block Diagram
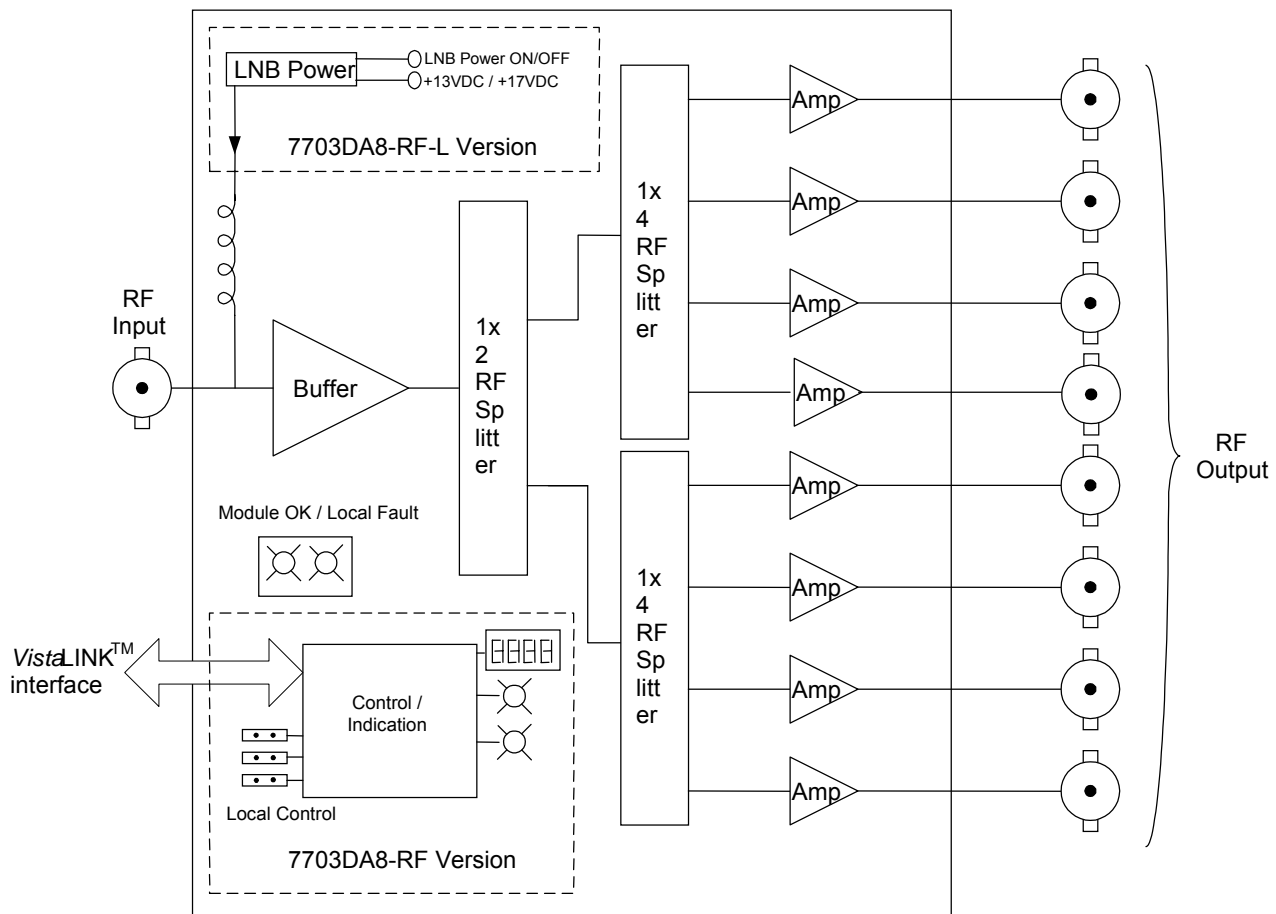
Figure 1-2: 7702 & 7703DA8-RF Block Diagram

2. INSTALLATION

The 7702/7703DA4-RF active splitters come with a companion rear plate that has 5 BNC type 75Ω connectors (F type connectors are optional). The 7702/7703DA8-RF active splitters come with a companion rear plate that has 9 BNC type 75Ω connectors (F type connectors are optional). For information on mounting the rear plate and inserting the module into the frame see the 7700FR manual.
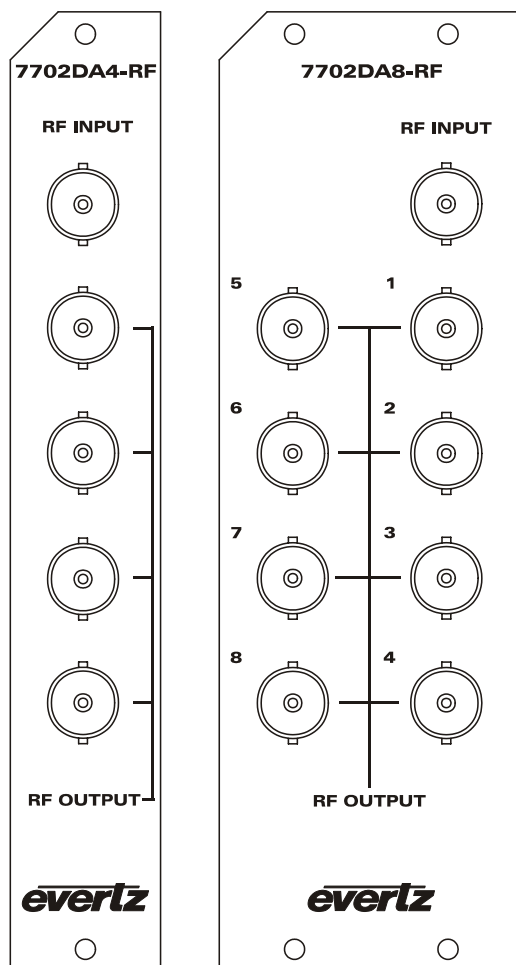
Figure 2-1: Rear Panels

RF INPUT: Input BNC type (F type optional) connector for satellite IF or L-Band RF signals. This signal can be an analog signal with frequency from 10MHz to 2.15GHz, with any modulation format.

RF OUTPUT: Four (DA4) or eight (DA8) BNC (F type optional) connectors with amplified outputs for signal distribution. This signal can be an analog signal with frequency from 10MHz to 2.15GHz, with any modulation format.

3. SPECIFICATIONS

3.1. RF INPUT - 7702DA4-RF / 7702DA8-RF

Number of Inputs:	1
Connector:	BNC (75Ω), F type optional
I/O Impedance:	75Ω
Input Frequency Range:	10MHz – 2.15GHz
Input Power Range:	-10 to –60 dBm
Return Loss:	> 12 dB
LNB Power (-L version):	+13/+17 VDC (user selectable), 350 mA current limit

3.2. RF OUTPUTS - 7702DA4-RF / 7702DA8-RF

Number of Outputs:

7702DA4–RF:	4	
7702DA8–RF:	8	
Connector:	F type (75Ω), BNC optional	
Gain:	0dB	
I/O Impedance:	75Ω	
Signal to Noise:	> 55dB	
Intermodulation Products:	< -50dBc	
Return Loss:	10MHz to 2150MHz:	> 15 dB
Frequency Response:	10MHz to 2.15GHz:	< ±1.5dB
Isolation:	10MHz to 350MHz:	> 15dB
	350MHz to 2.15GHz:	> 20dB

3.3. RF INPUT - 7703DA4-RF / 7703DA8-RF

Number of Outputs:	1
Connector:	F type (75Ω), BNC optional
I/O Impedance:	75Ω
Input Frequency Range:	
Standard:	10MHz – 2.15GHz
-L option:	950MHz- 2.15GHz
Input Power Range:	-10 to –60 dBm
Return Loss:	> 12 dB

3.4.   RF OUTPUTS - 7703DA4-RF / 7703DA8-RF

Number of Outputs
    7703DA4–RF: 4
    7703DA8–RF: 8
Connector: F type (75Ω), BNC optional
Gain: -8 to +14dB (L-Band)
          -17 to +12dB (IF band)
I/O Impedance: 75Ω
Signal to Noise: > 55dB (@ -20dBm input power)
Intermodulation Products: < -50dBc (@ -20dBm input power)
Return Loss: 10MHz to 2150MHz: > 15 dB
Frequency Response: 10MHz to 2.15GHz: < ±1.5dB
Isolation (Output to Output)
          10MHz to 350MHz: > 15dB
          350MHz to 2.15GHz: > 20dB

3.5.   ELECTRICAL

Voltage: + 12VDC
Power: 6 Watts (7702DA4–RF)
          12 Watts (7702DA8–RF)

3.6.   PHYSICAL

7700FR-C frame mounting:
Number of slots:
    DA4–RF versions: 1
    DA8–RF versions: 2

7701FR frame mounting:
Number of slots: 1 (all versions)

Stand Alone Enclosure:
    Dimensions: 14 " L x 4.5 " W x 1.9 " H
          (355 mm L x 114 mm W x 48 mm H)
    Weight: approx. 1.5 lbs. (0.7 kg) (7702DA4–RF)
          approx. 3 lbs. (1.4 kg) (7702DA8–RF)

4. STATUS INDICATORS AND DISPLAY

4.1. CARD EDGE LEDS

There are two large LEDs at the top of all the DA-RF modules that indicate general module status:

MODULE OK   This Green LED will be On when the module is operating properly.

LOCAL FAULT   This Red LED will be On when there is a fault in the module power supply.

On the 7703 versions there are seven small LEDs on the edge of the cards below the two large LEDs that indicate the RF input and output threshold alarms.

RF INPUT HIGH: This Red LED will be On when there is a RF input signal that is above the upper threshold.

RF INPUT OK: This Green LED will be On when there is a RF input signal that is within the lower and upper thresholds.

RF INPUT LOW: This Yellow LED will be ON when there is a RF input signal that is below the lower threshold.

RF OUTPUT HIGH: This Red LED will be On when there is a RF output signal that is above the upper threshold.

RF OUTPUT OK: This Green LED will be On when there is a RF output signal that is within the lower and upper thresholds.

RF OUTPUT LOW: This Yellow LED will be ON when there is a RF output signal that is below the lower threshold.

4.2. DOT-MATRIX DISPLAY (7703 VERSIONS ONLY)

Additional signal and status monitoring and control over the card's parameters is provided via the 4-digit alphanumeric display located on the card edge. To select one of two menu display modes, press the toggle switch. To go to the sub-menu press the pushbutton once and press the toggle switch to select the sub-menu. When in a particular display mode, press the pushbutton to display the value and use the toggle switch to change values (if applicable) and to see what status is being displayed for the particular menu item. The following display messages indicate what is being displayed. The details of each of the displays are described in section 4.2.1. The indentation indicates the menu items available at each level.

`OK`

    `MON`

        `TYPE` Displays the operating frequency range
                `IF`   Indicates IF operating frequency range
                `LBND` Indicates L-Band operating frequency range

        `GAIN` Displays the gain setting in manual mode only
                `+14..-8dB`   L-Band
                `+12..-17dB` IF band

        `IN`   Displays the RF input level and the upper and lower threshold
                `INPL` Indicates the monitored RF input level
                `UPPR` Indicates the upper RF input threshold level
                `LWR`   Indicates the lower RF input threshold level

        `OUT`   Displays the RF output level and the upper and lower threshold
                `OUTL` Indicates the monitored RF input level
                `UPPR` Indicates the upper RF input threshold level
                `LWR`   Indicates the lower RF input threshold level

        `LNB`   Monitor status of LNB settings
                `LNBE` Indicates the enable status of LNB
                      `ON / OFF`
                `LNBV` Indicates the LNB voltage status
                      `HIGH / LOW / OFF`

    `SET`

        `GAIN` Sets the operating gain mode
                `+14..-8dB`   L-Band
                `+12..-17dB` IF band

        `IN`   Sets the input level threshold
                `UPPR` Sets the upper input RF threshold level
                      `-17..-29dBm` L-Band
                      `-10..-32dBm` IF band
                `LWR`   Sets the lower input RF threshold level
                      `-30..-70dBm` L-Band
                      `-33..-53dBm` IF band

        `OUT`   Sets the output level threshold
                `UPPR` Sets the upper output RF threshold level
                      `-4..-26dBm` L-Band
                      `-12..-26dBm` IF band
                `LWR`   Sets the lower output RF threshold level
                      `-27..-57dBm` L-Band
                      `-12..-40dBm` IF band

        `LNB`   Resets LNB after over current condition

4.2.1. Indication of Cable Short Condition (-L version only)

The 7703DA4/8-RF detects a cable short on the input cable when the LNB is enabled. In this case, the bottom LED will blink on and off and the display will show OVL for overload condition. This can be corrected by entering the menu SET / LNB and performing a reset. This resets the current monitoring circuit.

4.2.2. Displaying the RF Power Input Level

The 7703DA4/8-RF detects the input RF power input level and displays this on the four-digit card edge display. By entering the MON menu and then selecting IN from the next menu level and INPL from the next level, the input RF power level in dBm will be displayed.

4.2.3. Setting the Gain

To adjust the gain, enter the menu setting SET / GAIN. Here a range of values will be given for the gain settings. The current gain is displayed on the screen and does not require pressing the pushbutton to select.

4.2.4. Setting the Threshold Levels

The input RF level thresholds can be set by entering into the menu structure SET / IN / UPPR and SET / IN / LWR.   Toggling the switch will move through a range of values in 1dBm increments. Hitting the pushbutton will select the displayed value.   In manual gain mode, the input threshold levels can be selected but the output level thresholds are determined by the gain setting and the input threshold levels. The output threshold levels are determined as follows:

OUTPUT UPPER THRESHOLD=INPUT UPPER THRESHOLD + GAIN SETTING
OUTPUT LOWER THRESHOLD=INPUT LOWER THRESHOLD + GAIN SETTING

For example, if the gain is set to +10dB, and the input lower threshold is –20dBm and the input upper threshold is –5dBm, then the output thresholds will be:
OUTPUT UPPER THRESHOLD = -5dBm + 10dB = +5dBm
OUTPUT LOWER THRESHOLD = -20dBm + 10dB = -10dBm
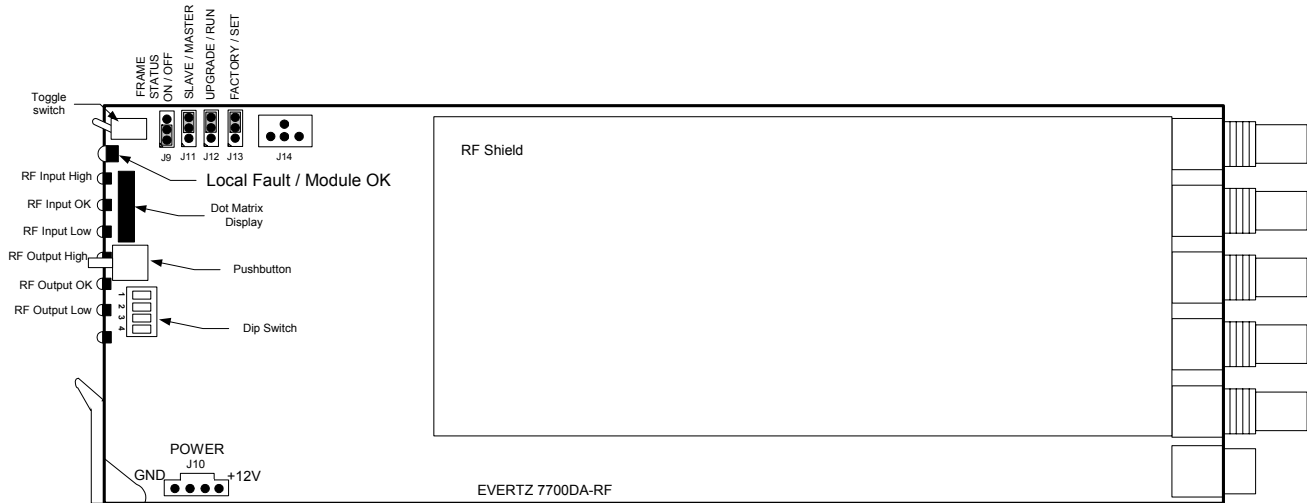
5. JUMPERS AND USER ADJUSTMENTS

Figure 5-1: Jumper/LED Locations for Rev 1 7703DA4/8-RF Cards
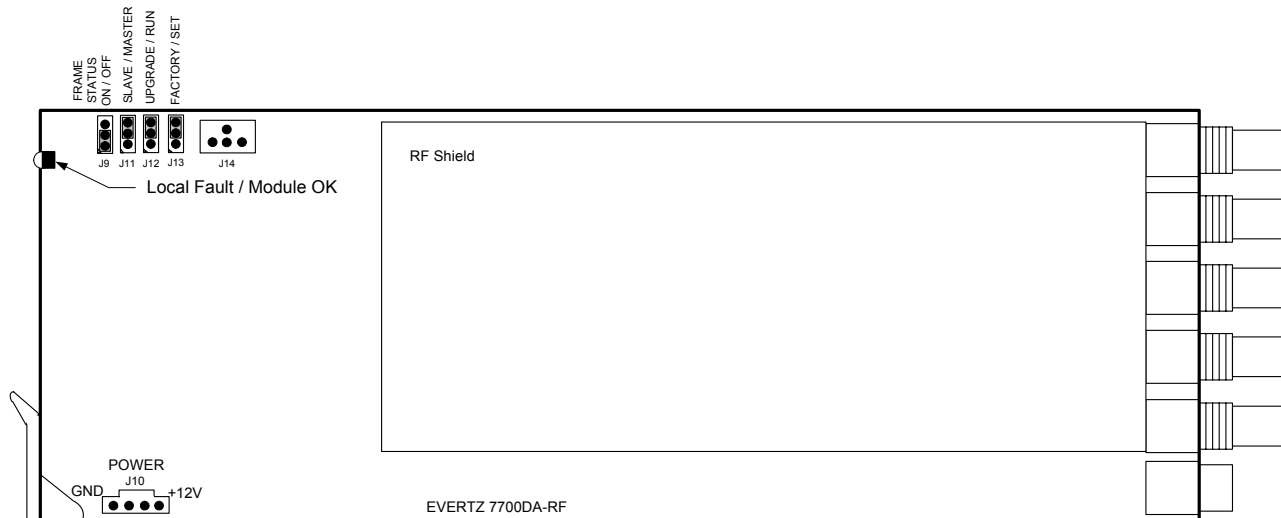
Figure 5-2: Jumper / LED Locations for Rev 1 7702DA4/8-RF Cards

5.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper J9, located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

FRAME STATUS: To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. On Rev 1 and A boards install the jumper. (default)

When this jumper is installed in the Off position local faults on this module will not be monitored.

5.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE   The UPGRADE jumper J12 is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* chapter in the front of the manual binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move the UPGRADE jumper into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto the SERIAL header J14 at the card edge. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter of this manual. Once the upgrade is completed, remove the module from the frame, move the UPGRADE jumper into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

5.3. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE *VISTA*LINK® INTERFACE - 7703 VERSIONS

The MASTER/SLAVE jumper J11 selects whether the module will be controlled from the local user controls or through the *Vista*LINK® interface.

MASTER/SLAVE   When this jumper is installed in the MASTER position, the card functions are controlled through the local controls.

When this jumper is installed in the SLAVE position, the card functions are controlled through the *Vista*LINK® interface.

5.4. ENABLING LNB VOLTAGE ON THE INPUT CONNECTOR AND SELECTING LNB VOLTAGE LEVEL (-L VERSION ONLY)

Dip Switch 3 enables the LNB DC bias on the input connector. When Dip switch 3 is ON (down, towards PCB), the LNB voltage is enabled. When this switch is up, the LNB bias is off.

To set the LNB voltage level to +17V, set dip switch 2 ON (down). The LNB voltage level is +13V when this switch is OFF (up).

To check the status of the LNB, use the MON / LNB items in the card edge display menu as per section 4.2 of this manual.

5.5. SELECTING IF OR L-BAND OPERATION FOR STANDARD 7703 CARDS (WITHOUT LNB POWER)

Dip Switch 1 selects either IF (10-200MHz) or L-Band (950-2150MHz) operation. When this switch is in the on (down) position, the card operates in the IF frequency range. If this switch is off (up), then the card operates in the L-Band frequency range. This adjusts the power monitoring system for the desired frequency range.

6.   *VISTA*LINK® REMOTE MONITORING/CONTROL - 7703 VERSIONS

6.1.   WHAT IS *VISTA*LINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz *Vista*LINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK™ enabled fiber optic products.

2. Managed devices (such as 7703DA4/8-RF cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC *Vista*LINK™ frame controller module, which serves as the Agent.

3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *Vista*LINK® network, see the 7700FC Frame Controller chapter.

6.2.   *VISTA*LINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the *Vista*LINK® interface.

Parameter	Description
Input Level	A range of values describing received RF power at the input.
LNB Enable Status (7703DA4/8-RF-L version only)	Indicates whether LNB is enabled or disabled.
LNB Voltage Status (7703DA4/8-RF-L version only)	Indicates voltage level of LNB (high or low).
Card type	Indicates the type of card: 7703DA4-RF, 7703DA4-RF-L, 7703DA8-RF, 7703DA8-RF-L.
Operating Frequency Band	Indicates the set frequency band of operating – L-Band or IF.

Table 6-1: *Vista*LINK® Monitored Parameters

6.3. *VISTA*LINK® CONTROLLED PARAMETERS

The following parameter can be remotely controlled through the *Vista*LINK® interface.

Parameter	Description
Input Power Upper Threshold	Sets value of the Input Upper RF Threshold.
Input Power Lower Threshold	Sets value of the Input Lower RF Threshold.
Output Power Upper Threshold	Sets value of the Output Upper RF threshold.
Output Power Lower Threshold	Sets value of the Output Lower RF threshold.
Gain	Sets the Gain level.

Table 6-2: *Vista*LINK® Controlled Parameters

6.4. *VISTA*LINK® TRAPS

The following traps can be controlled through the *Vista*LINK® interface. Each trap will indicate a fault condition when its value is True.

Trap	Description for True Condition
InputPowerHigh	Input power is above the threshold.
InputPowerLow	Input power is below the threshold.
OutputPowerHigh	Output power is above the threshold.
OutputPowerLow	Output power is below the threshold.
LNBPowerShort	Short on LNB DC supply (for -L version only).

Table 6-3: *Vista*LINK® Traps