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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Nov 09
1.1	Added note in Installation section	Aug 13

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1. OVERVIEW

The 7702(3)DA4A-RF, 7702(3)DA8A-RF, and 7702(3)DA16-RF 1 x 4, 1 x 8, and 1 x 16 Active Splitters provide amplification and distribution of RF signals from 40MHz to 3GHz. They handle any RF input modulation format and provide 4, 8, or 16 isolated outputs for further signal distribution. Typical applications include amplification and distribution of 950MHz-2150MHz L-Band and 70MHz-140MHz IF signals.

The 7702 card versions are simple, unity-gain (zero loss), single-input active splitters. The 7703 versions add adjustable gain/attenuation, monitoring of RF input power and card status and control of gain/attenuation is provided remotely via VistaLINK® capability on the 7703 versions. Optional LNB power is available at the input connector on the 7703 versions.

The 7702DA4A-RF & 7703DA4A-RF occupy one card slot and can be housed in a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 15 modules, a 350FR which holds up to 7 modules or a standalone enclosure which holds 1 module. The 7702DA8A-RF, 7702DA16-RF, 7703DA8A-RF & 7703DA16-RF occupy two card slots and can be housed in either a 1RU frame which holds up to 3 modules, a 3RU frame which holds up to 7 modules, a 350FR which holds up to 3 modules or a standalone enclosure which holds 1 module.

Features:

- Low noise amplification and distribution of RF signals from 40MHz to 3GHz
- Wideband frequency response for use with L-Band, 70/140MHz IF and off-air DTV signals
- Wide dynamic range (-10 to -60dBm)
- Adjustable output gain of -10dB to +20dB on 7703 versions
- AGC mode with adjustable target level on 7703 versions
- Fixed gain of 0dB on 7702 versions
- Protocol independent - handles all modulation formats
- Input RF signal strength and LNB current monitoring indication on 7703 versions
- Fully hot-swappable from front of frame
- Optional LNB power (@ +13 or +17V DC with built-in current limiting) and 22kHz (for LO control) on 7703 versions
- 7703-LNB versions include LNB current monitoring with adjustable alarm thresholds for early warning of LNB failure
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK® on 7703 versions.
- VistaLINK® capability is available when 7703 modules are used with the 3RU 7800FR frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

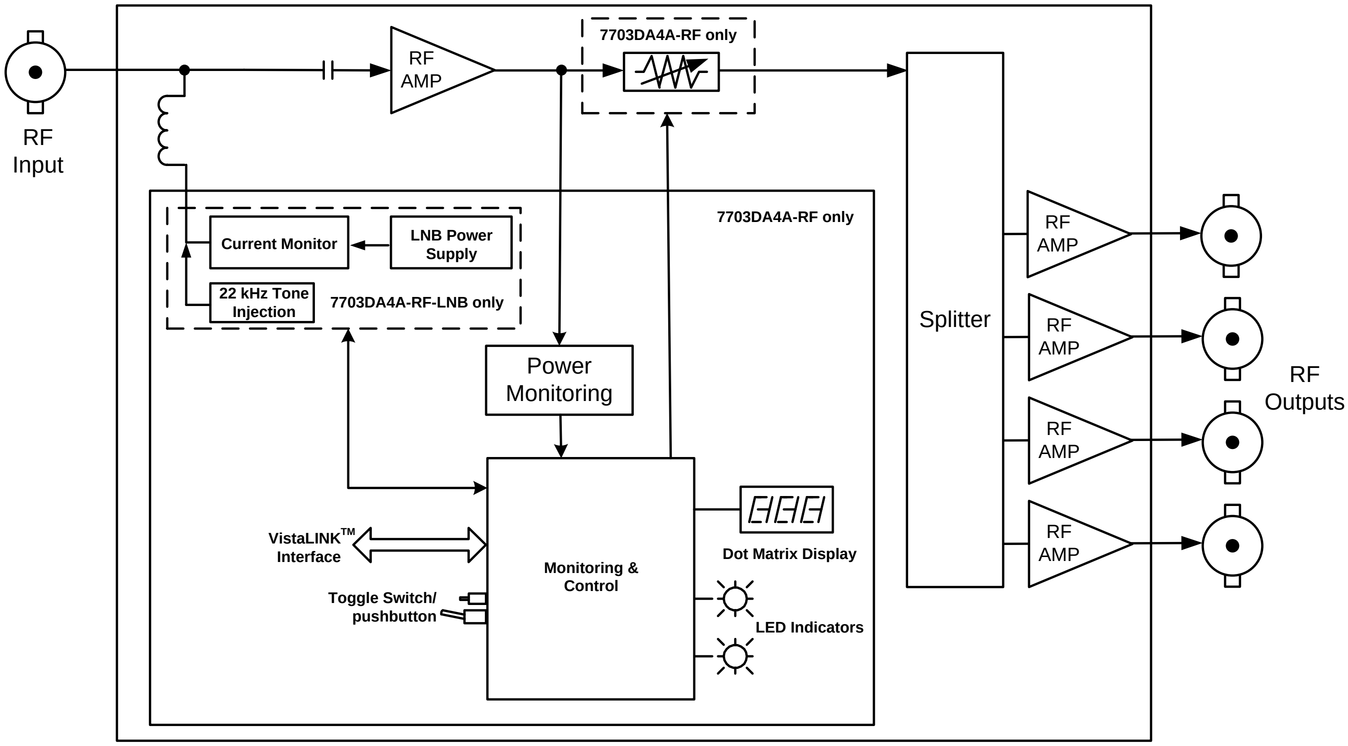

Figure 1-1: 7702(3)DA4A-RF Block Diagram

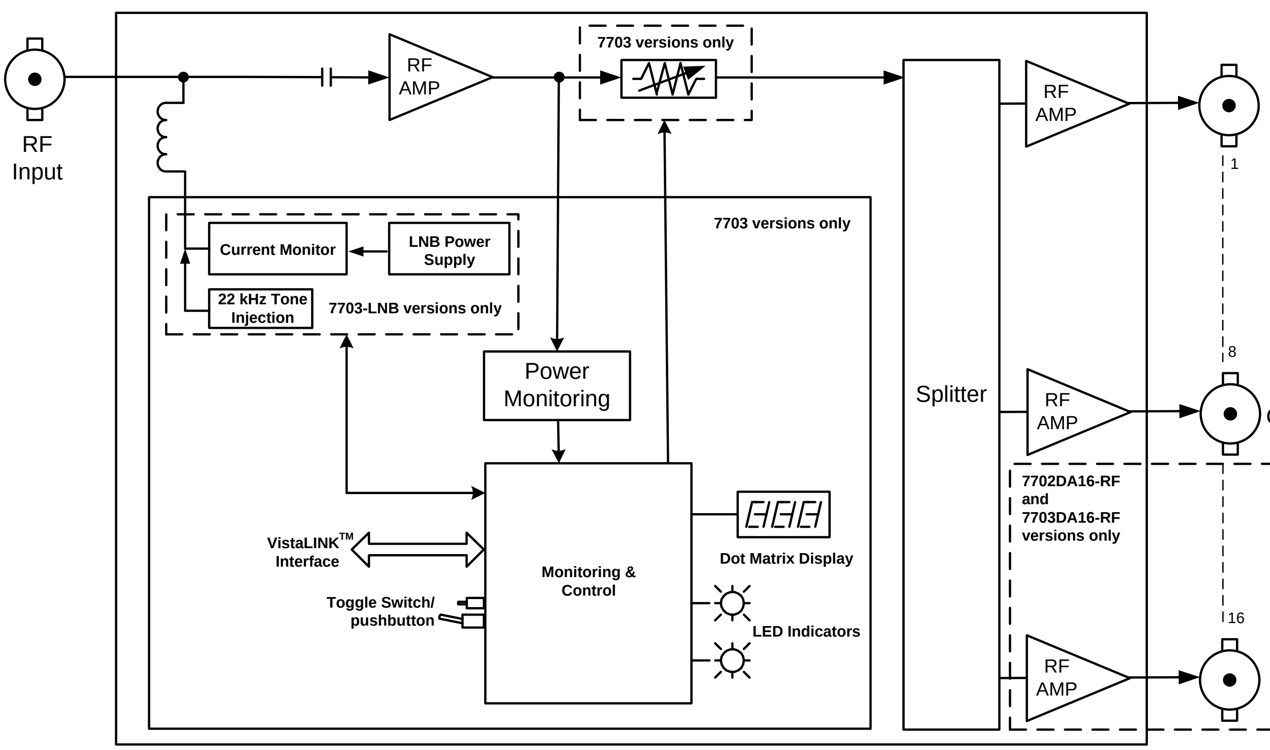

Figure 1-2: 7702(3)DA8A-RF & 7702(3)DA16-RF Block Diagram

2. INSTALLATION

The 7702/7703DA4A-RF active splitters come with a companion rear plate that has 5 BNC type 75Ω connectors (F type connectors are optional). The 7702/7703DA8A-RF active splitters come with a companion rear plate that has 9 BNC type 75Ω connectors (F type connectors are optional). The 7702/7703DA16-RF active splitters come with a companion rear plate that has 17 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.

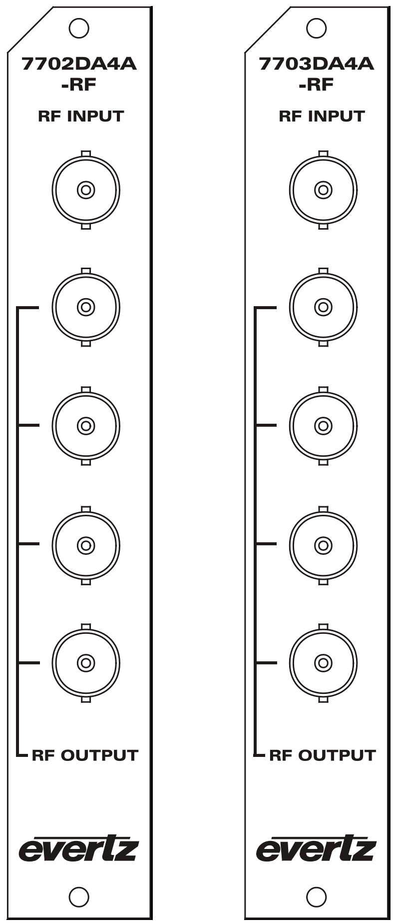

Figure 2-1: 7702(3)DA4A-RF Rear Panels

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 40MHz to 3GHz, with any modulation format.

The RF input is protected to the same degree as other professional RF devices, and will withstand a degree of ESD from handling, etc. Regardless, proper precautions should be taken during handling, such as the use of static bags and wrist straps. The input is not protected against lightning or other coupling of large energy spikes. If the installation is such that the RF input may be susceptible to spikes (e.g. direct connection to the antenna/LNB) then appropriate supplemental surge protection should be installed (e.g. Polyphaser).

RF OUTPUT: Four (DA4A) BNC (F type optional) connectors with amplified outputs for signal distribution. This signal can be an analog signal with frequency from 40MHz to 3GHz, with any modulation format.

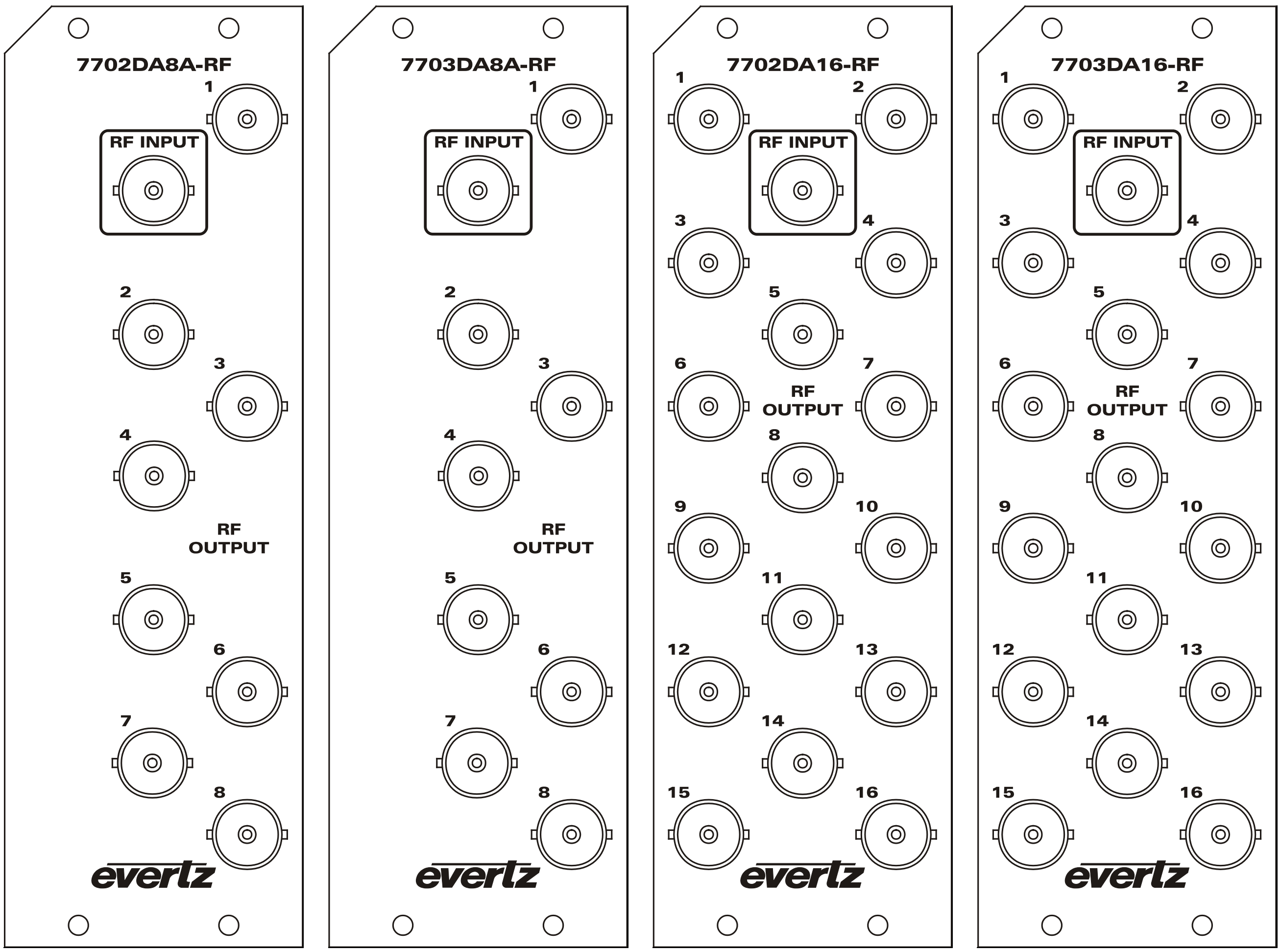

Figure 2-2: 7702(3)DA8A-RF & 7702(3)DA16-RF Rear Panels

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 40MHz to 3GHz, with any modulation format.

RF OUTPUT: Eight (DA8A) or sixteen (DA16) BNC (F type optional) connectors with amplified outputs for signal distribution. This signal can be an analog signal with frequency from 40MHz to 3GHz, with any modulation format.

3. SPECIFICATIONS

3.1. RF INPUT

Connector:	1 BNC per IEC 61169-8 Annex A 2 (F-Type and SMA optional)
I/O Impedance:	75Ω (50Ω optional)
Return Loss:	> 13 dB
Input Frequency Range:	40MHz – 3GHz
Input Power Range:	-10 to –60 dBm
LNB Power:	+13/+17 VDC selectable
Current Limit:	400mA
LO Control:	22KHz on/off

3.2. RF OUTPUTS

Number of Outputs:	
7702(3)DA4A–RF:	4
7702(3)DA8A–RF:	8
7702(3)DA16–RF:	16
Connector:	BNC per IEC 61169-8 Annex A (F-Type and SMA optional)
I/O Impedance:	75Ω (50Ω optional)
Return Loss:	> 15 dB
Gain:	
7702 Versions:	0dB ± 2dB
7703 Versions:	-10dB to +20dB in 1/2 dB steps
Intermodulation Products:	< -50dBc (@ -10dBm input power and 0dB gain)
Frequency Response:	
7702(3)DA4A–RF:	40MHz - 200MHz ± 0.25dB 50MHz - 850MHz ± 0.25dB 850MHz -2250MHz± 0.5dB 40MHz - 3GHz ± 0.75dB
7702(3)DA8A–RF/ 7702(3)DA16–RF:	± 1.5dB
Isolation (Output to Output):	> 40 dB

3.3. ELECTRICAL

Voltage:	+ 12V DC
Power:	6 Watts (not including LNB power)

3.4. PHYSICAL

7700FR-C frame mounting:

Number of slots:	
7702(3)DA4A–RF:	1
7702(3)DA8A–RF/ DA16-RF:	2

4. STATUS INDICATORS AND DISPLAY

4.1. CARD EDGE LEDS

There are two large LEDs at the top of all the 7702(3)DA4A/8A/16-RF(-LNB) 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 (e.g. blown fuse).

On the 7703 versions there are 5 small LEDs on the edge of the cards below the two large LEDs that indicate the RF input and output threshold alarms as well as AGC and LNB indications.

LED	Indication	Function
RF INPUT	**HIGH**	This Red LED will be On when there is a RF input signal that is above the upper threshold.
	OK	This Green LED will be On when there is a RF input signal that is within the lower and upper thresholds.
	LOW	This Yellow LED will be ON when there is a RF input signal that is below the lower threshold.

AGC	**RED**	AGC is on but unable to maintain output power setting.
	GREEN	AGC is on and can maintain output power setting.
	OFF	AGC is off (manual mode).

LNB	**RED**	LNB Short (fault).
	GREEN	LNB OK (no short).
	OFF	LNB OFF.

4.2. DOT-MATRIX DISPLAY (7703 VERSIONS ONLY)

Additional signal and status monitoring and control over the card's parameters are 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. Table 4-1 provides a quick reference to the display menu structure.

Level 1	Level 2	Level 3	Level 4	Level 5
DEFD Selection	**BACK**			
	CTRL	**BACK**		
		RFTH	LWR	0 to -60 dBm Default -60 dBm
			UPPR	0 to -60 dBm Default 0 dBm
		MODE	AGC	
			MAN (default)	
		GAIN (visible in manual mode only)	-10 to 20dB default: 0dB	
		OUTL (visible in AGC mode only)	0 to -50dBm default: -20dBm	
		LNBV (visible only for -LNB versions)	17V	
			13V	
			OFF (default)	
		22KT (visible only for -LNB versions)	ON	
			OFF (default, also can only be off if LNBV is off)	
		LNTH (visible only for -LNB versions)	LWR	0 to 500mA default = 0
			UPPR	0 to 500mA default = 500
		DEFD	Fault status(default)	
			PWR	
			MODE	
			GAIN	
			OUTL	
			LNBV (-LNB only)	
			22KT (-LNB only)	
			LNBC (-LNB only)	
		DISP	HORZ	
			VERT (default)	
	STAT	**BACK**		
		PWR	0 to -60dBm	
		RFTH	LWR	0 to -60 dBm
			UPPR	0 to -60 dBm
		MODE	AGC	
			MAN	
		GAIN (visible in manual mode only)	-10 to 20dB	
		OUTL (visible in AGC mode only)	0 to -50dBm	

		LNBV (visible only for - LNB versions)	17V	
			13V	
			OFF	
		22KT (visible only for - LNB versions)	ON	
			OFF	
		LNBC (visible only for - LNB versions)	0 to 500mA	
		LNTH (visible only for - LNB versions)	LWR	0 to 500mA
			UPPR	0 to 500mA
		VER	Firmware version	

Table 4-1: Card Edge Menu Structure

4.2.1. RF Threshold Levels

The input RF level thresholds can be set by entering into the *RFTH* menu. From here, the user can select either the *LWR* or *UPPR* option. Toggling the switch will move through a range of values in 1dBm increments. Hitting the pushbutton will select the displayed value.

CTRL
RFTH
LWR / UPPR
0 to -60dBm

LWR Sets the lower RF threshold level. Default of -60dBm.
UPPR Sets the upper RF threshold level. Default of 0 dBm.

0 to -60dBm RF threshold range (in dBm units).

4.2.2. Setting the Mode

To adjust the gain mode, enter the *Mode* menu setting. In AGC mode, the card will automatically apply up to 20dB of gain or 10dB of attenuation to the input signal in order to maintain the AGC target output level (see section 4.2.4 for information on setting this level). In manual gain control mode, the output level will be offset from the input level by the amount of applied gain/attenuation (see section 4.2.3 for information on setting the gain).

CTRL
MODE
AGC
MAN

AGC Enables Automatic Gain Control mode.
MAN Enables manual control. (default)

4.2.3. Setting the Gain

CTRL
GAIN
-10 to 20 dB

Sets the fixed amount of applied gain. Visible in manual mode only.

-10 to 20 dB RF Gain range (in dB units). Default of 0 dB.

4.2.4. AGC RF Output Target Level

Menu	Description
CTRL / *OUTL* / *0 to -50dBm*	Sets the RF output power target in AGC mode. Visible in AGC mode only. *0 to -50dBm* RF output power range. Default of -20dBm.

4.2.5. LNB Voltage Level

Menu	Description
CTRL / *LNBV* / *18V*, *13V*, *OFF*	Sets the LNB output voltage. Visible on -LNB versions only. *18V* Sets the LNB output voltage to 18 volts. *13V* Sets the LNB output voltage to 13 volts. *OFF* Disables the LNB output voltage.

4.2.6. 22KHz Tone

Menu	Description
CTRL / *22KT* / *ON*, *OFF*	Enables the 22KHz tone for LNB LO control on the RF Input. Visible on -LNB versions only. The default setting is *OFF*. *ON* Enables the 22KHz tone. *OFF* Disables the 22KHz tone.

4.2.7. LNB Current Threshold Levels

Menu	Description
CTRL / *LNTH* / *LWR / UPPR* / *0 to 500mA*	*LWR* Sets the low LNB current alarm threshold. Default of 0. *UPPR* Sets the high LNB current alarm threshold. Default of 500. *0 to 500mA* RF threshold range.

4.2.8. Default Card-Edge Display

This allows the user to select which operating condition will be the top-level item on the dot-matrix display. The default is NORM, which displays "OK" as long as local power to the board is available. The table below provides a list of alternate parameters.

Menu	Parameter	Description
CTRL / *DEFD*	*NORM*	Local power status
	PWR	Measured RF Input power
	MODE	Gain mode
	GAIN	Gain setting (manual mode only)
	OUTL	AGC output level setting (AGC mode only)
	LNBV	LNB voltage setting
	22KT	22kHz tone setting
	LNBC	Measured LNB current

4.2.9. Setting the Display Orientation

The *DISP* option allows the user to set a horizontal or vertical orientation for the card edge display. To set the display orientation, select the *CTRL* menu item in the first menu level, then use the toggle switch to show the *DISP* menu selection and use the pushbutton to select it. Use the toggle switch to change between *HORZ* and *VERT*. Press the push button to make your selection.

Menu		
CTRL / *DISP* / *HORZ*, *VERT*	*HORZ*	Horizontal display used when the module is housed in the one-rack unit 7701FR frame or the stand-alone enclosure.
	VERT	Vertical display used when the module is housed in the three-rack unit 7700FR frame.

4.2.10. Displaying the RF Input Power

The 7703DA4A/8A/16-RF detects the RF input power level and displays this on the four-digit card edge display.

Menu		
STAT / *PWR* / *0 to -60dBm*	Displays the RF input power level.	
	0 to -60dBm	RF input power range (in dBm units).

4.2.11. Displaying the RF Threshold

Menu		
STAT / *RFTH* / *LWR / UPPR* / *0 to -60dBm*	*LWR*	Indicates the low RF alarm threshold level.
	UPPR	Indicates the high RF alarm threshold level.
	0 to -60dBm	RF threshold range (in dBm units).

4.2.12. Displaying the Gain Mode Setting

Menu	
STAT / *MODE* / *AGC*, *MAN*	Indicates whether the gain mode setting is in AGC or manual.

4.2.13. Displaying the Gain Setting

Menu		
STAT / *GAIN* / *-10 to 20 dB*	Indicates the amount of gain applied to the input signal.	
	-10 to 20 dB	RF Gain range (in dB units).

4.2.14. Displaying the AGC RF Output Level

CTRL / *OUTL* / *0 to -50dBm*	Indicates the RF output power target in AGC mode. Visible in AGC mode only. *0 to -50dBm* RF output power range. Default of -20dBm.

4.2.15. Displaying the LNB Voltage Level

STAT / *LNBV* / *18V*, *13V*, *OFF*	Indicates the LNB output voltage. *18V* Sets the LNB output voltage to 18 volts. *13V* Sets the LNB output voltage to 13 volts. *OFF* Disables the LNB output voltage.

4.2.16. 22KHz Tone Status

CTRL / *22KT* / *ON*, *OFF*	Indicates whether the 22KHz tone on LNB output is enabled or disabled. *ON* 22KHz tone is enabled. *OFF* 22KHz tone is disabled.

4.2.17. Displaying the LNB Current

STAT / *LNBC* / *0 to 500A*	Indicates the LNB current. Visible for -LNB versions only. *0 to 500A* RF current range.

4.2.18. Displaying the LNB Current Threshold Level

STAT / *LNTH* / *LWR / UPPR* / *0 to 500A*	*LWR* Indicates the lower RF threshold level. *UPPR* Indicates the upper RF threshold level. *0 to 500A* RF threshold range.

4.2.19. Displaying the Firmware Version

The *VER* display shows the firmware version and build number of the 7703DA4A/8A/16-RF firmware. The message will scroll across the display.

For example: *VER 1.0 BLD 067*

5. JUMPERS AND USER ADJUSTMENTS

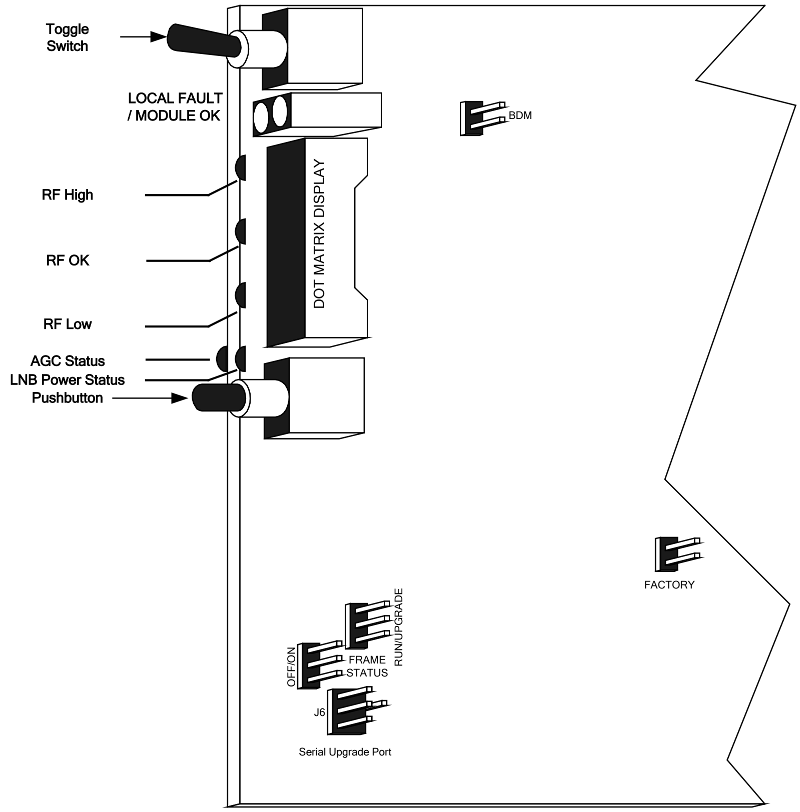

Figure 5-1: Jumper / LED Locations

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 VISTALINK® INTERFACE - 7703 VERSIONS

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

5.4. FACTORY AND BDM JUMPERS

When shipped from the Evertz facility, the FACTORY and BDM jumpers will not be installed. These jumpers ***should not*** be installed for any reason. If jumpers are on these positions they should be removed.

6. VISTALINK® REMOTE MONITORING/CONTROL - 7703 VERSIONS

6.1. WHAT IS VISTALINK®?

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 VistaLINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK® enabled fiber optic products.

2. Managed devices (such as 7703DA4A/8A/16-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 VistaLINK® 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 VistaLINK® network, see the 7700FC Frame Controller chapter.

6.2. VISTALINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface.

Parameter	Description
RF Input Power	A range of values describing received RF power at the input.
RF Input Power Threshold	A range of values indicating the lower/upper RF threshold levels.
Gain Mode	Indicates RF mode setting.
RF Gain	A range of values indicating RF gain setting.
RF Output Level	A range of values indicating RF power target setting.
LNB Voltage Level	Indicates LNB voltage levels.
22KHz Tone	Indicates the on/off status of the 22KHz tone.
LNB Current	A range of values indicating the LNB current.
LNB Current Threshold	A range of values indicating the LNB current threshold.
Firmware Version	Displays firmware version number.

Table 6-1: VistaLINK® Monitored Parameters

6.3. VISTALINK® CONTROLLED PARAMETERS

The following parameter can be remotely controlled through the VistaLINK® interface.

Parameter	Description
RF Threshold	Sets the value of the input upper/lower thresholds.
Mode	Set the mode level.
Gain	Set the gain level.
OUTL	Sets the RF power target level.
LNBV	Sets the LNB voltage level.
22KT	Enables the 22KHz tone.
LNTH	Sets the LNB threshold level.
DISP	Sets the horizontal/vertical display orientation.

Table 6-2: VistaLINK® Controlled Parameters

6.4. VISTALINK® TRAPS

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

Trap	Description
RF Input Power High	Input power is above the threshold.
RF Input Power Low	Input power is below the threshold.
AGC Out of Range	AGC is out of range.
LNB Short	Short on LNB DC supply (for -L version only).
LNB Current High	LNB current is above the threshold.
LNB Current Low	LNB current is below the threshold.

Table 6-3: VistaLINK® Traps