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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Original Version – Preliminary	Jun 2000
1.0	Update to revision 0.1 including September 27, 2000 modification note, RS-232 specifications and tables, block diagrams & LED update. Coincides with 7700FC firmware/image release 1.0	Jun 2001
1.1	Added Frame Controller configuration guidelines.	Jul 2001
1.2	Updated Frame Controller Block Diagram	Aug 2001
1.2.1	Minor updates to improve document clarity	Oct 2001
1.3	Added section on 7700FC Image Upgrade Procedure	Jan 2002
1.3.1	Minor update to section reference	Apr 2002
1.3.2	Minor correction to section 7.1.6, step 6	Jul 2002
1.4.0	Support for ftp upgrades and Frame MIB; new rear plate assembly	Aug 2002
1.4.1	Minor corrections to sections 6.1.1 and 8	Mar 2004
1.4.2	Added rear plate installation drawings	Sep 2004
1.4.3	Updated Firmware upgrade instructions in section 7	Dec 2004
1.4.4	Safety precautions re battery replacement added	Apr 2005
1.4.5	Minor typographical errors fixed	Aug 2005
1.4.6	Added Ethernet Crossover cable instructions	Aug 2006
1.4.7	Updated the frame controller upgrade instructions in section 7 Changed “route” to “gateway” throughout manual Included info on disabling the DHCP in section 6.2.1	Nov 2006
1.4.8	Added additional warning for disposal of Lithium battery	Mar 2007
1.4.9	Fixed formatting and typos	Dec 2007
1.5	Added information regarding FC Upgrade Setup option on the card edge	Dec 2010
1.6	Corrections made throughout manual	Dec 2010
1.7	Correction made in “Connecting the Computer to the Card Edge Serial Port” section	Dec 2012

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1. OVERVIEW

The 7700FC Frame Controller card provides a single point of access to communicate with VistaLINK® enabled 7700 series cards. The 7700FC provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 7700FC handles all SNMP communications between the frame (7700FR-C) and the network manager (NMS), and serves as a gateway to individual cards in the frame. The 7700FC also provides a RS-232 serial port for customer configurations.

Features:

- Complies with IEEE 802.3 100Base-TX and 10Base-T Ethernet standards
- 100 Mbps Fast Ethernet or 10 Mbps Ethernet data transfer, selected by auto-negotiation
- Full duplex or half-duplex operation, selected by auto negotiation
- RJ-45 connector for network cable connection
- RS-232 serial control port for configuration
- Front panel LEDs indicate module fault, microprocessor state, activity and link status
- Rear panel LEDs indicate Ethernet link, activity and speed
- Supports “ftp” upgrades for frame-wide firmware upgrades (product specific)
- Provides frame/chassis status information through enabled hardware via VistaLINK® including power supply status, frame status, card insertion/removal counters, 7700FC software version number, and LED control

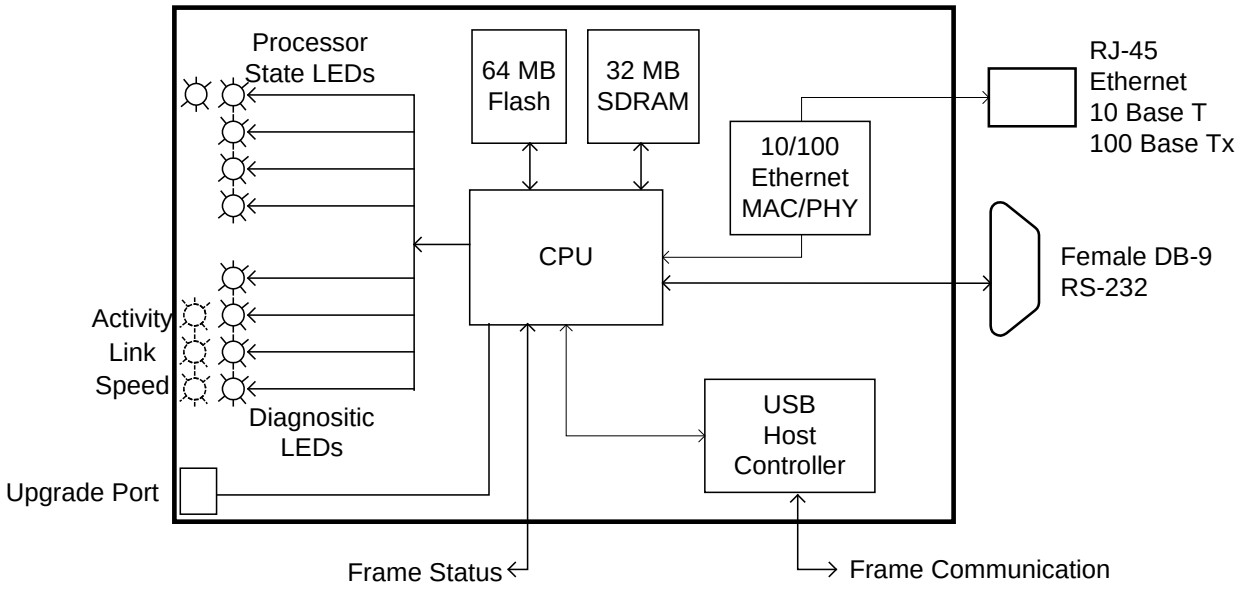


Figure 1-1: 7700FC Block Diagram

2. INSTALLATION

The 7700FC Frame Controller module can only be installed into 7700FR-C frames that have been fitted with the proper module interconnect circuit board. These frames have an 'L' shaped cover plate installed, adjacent to the IEC power inlet connector as shown in Figure 2-1. If your frame does not have this L shaped cover plate then the 7700FC Frame controller card cannot be installed in this frame.

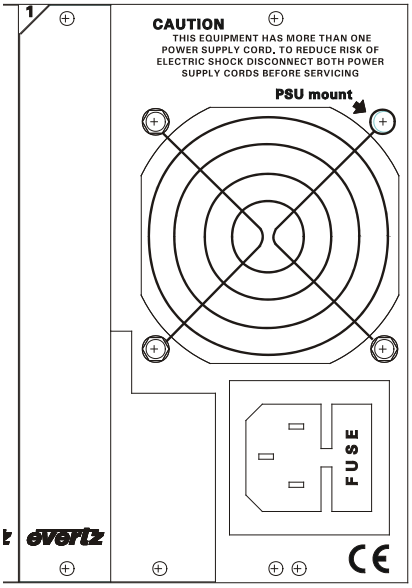
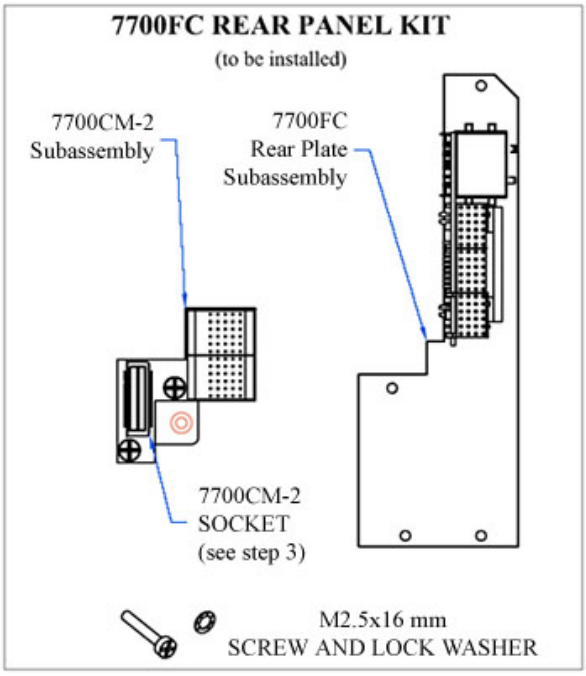


Figure 2-1: 7700FR-C Rear Panel with Cover Plate Installed

2.1. INSTALLING THE MODULE REAR PLATE



The 7700FC rear panel kit consists of a screw and lock washer, and two sub-assemblies, the 7700CM-2 connector module and the 7700FC rear panel plate which houses the appropriate connectors for the module. To install the 7700FC rear panel kit, locate slot 1 at the right side of the frame's rear panel. Remove the filler plates from the slot as shown in step 1 of Figure 2-2.

Install the 7700CM-2 subassembly first. Remove the screw PART 1 as shown in Step 2. Carefully align the 7700CM-2 socket with the frame header and press firmly into place as shown in step 3. Secure the 7700CM-2 sub-assembly with the M2.5x16 mm screw and M2.5 lock washer as shown in Step 4.

Orient the 7700FC plate so that the labeling is visible when the plate is installed (see Step 5). Loosely fasten the plate to the extrusions using the mounting screws you removed in Step 1. You will tighten the screws after the main module is installed.

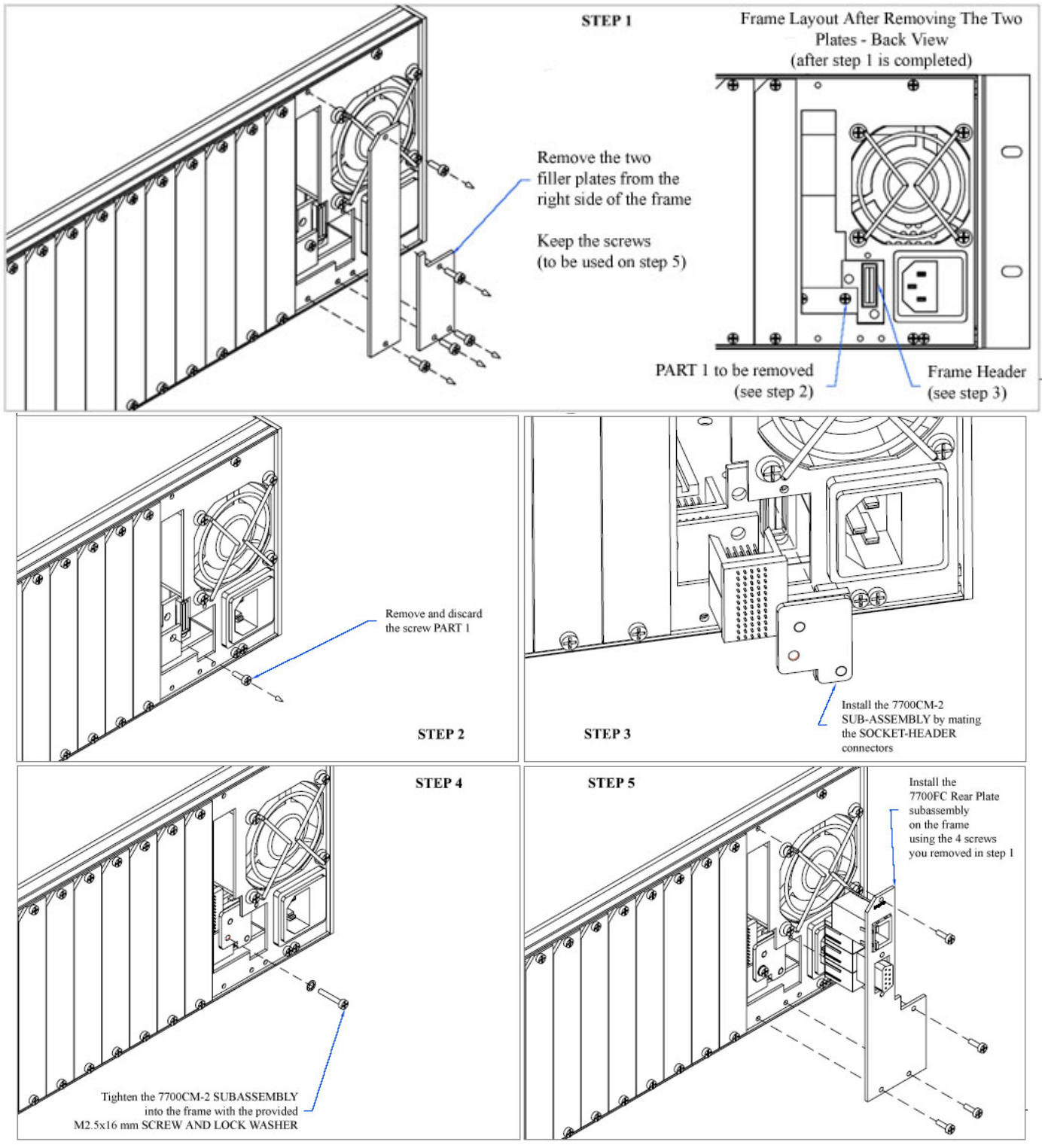


Figure 2-2: 7700FR-C Rear Panel Kit Installation

2.2. INSTALLING AND REMOVING THE MODULE

In order to insert or remove modules you will have to open the front panel. Turn the two captive screws located on the front panel counter clockwise several turns until they release completely from the front extrusions. Carefully lower the front panel door so that the front edge of the door is lower than the rear of the door.

To install the frame controller module, orient the module vertically such that the white card ejector is on the bottom. Align the card with the card guide corresponding to the slot number where you installed the rear panel plate. Carefully slide the module into the frame and press it completely into the rear panel connectors. Make sure that the connectors are fully seated in the rear panel. When this is done, close the front panel and then tighten the screws that hold the rear panel in place.

To remove the frame controller module, press the card ejector down to release the module from the back panel connectors. Grasp the card using the card ejector and pull the module out from the frame. As the card ejector goes past the front extrusion, you will have to pull it with slightly more force. Carefully place the module in a safe place, free from static discharge.

2.3. REAR PANEL CONNECTIONS

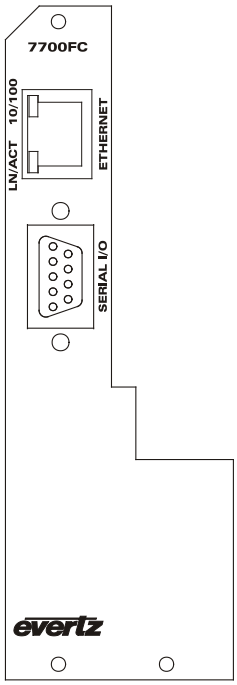
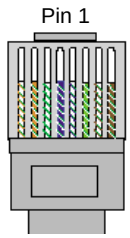


Figure 2-3: 7700FC Rear Panel

2.3.1. Ethernet Connection

The 7700FC is designed to be used with either 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) also known as *Fast Ethernet*, twisted pair Ethernet cabling systems. When connecting for 10Base-T systems, category 3, 4, or 5 UTP cable as well as EIA/TIA – 568 100Ω STP cable may be used. When connecting for 100Base-TX systems, category 5 UTP cable is required. The cable must be "straight-through" with a RJ-45 connector at each end (See Table 2-1). Make the network connection by plugging one end of the cable into the RJ-45 receptacle of the 7700FC and the other end into a port of the supporting hub. When connecting a 7700FC directly to the Ethernet port on a computer you will have to use a "crossover" cable as shown in Figure 2-4.

The straight-through RJ-45 cable can be purchased or can be constructed using the pinout information in Table 2-1. A colour code wiring table is provided in Table 2-1 for the current RJ-45 standards (AT&T 258A or EIA/TIA 258B colour coding shown). Also refer to the notes following the table for additional wiring guide information.



Pin #	Signal	EIA/TIA 568A	AT&T 258A or EIA/TIA 568B	10BaseT or 100BaseT
1	Transmit +	White/Green	White/Orange	X
2	Transmit –	Green/White or White	Orange/White or Orange	X
3	Receive +	White/Orange	White/Green	X
4	N/A	Blue/White or Blue	Blue/White or Blue	Not used (required)
5	N/A	White/Blue	White/Blue	Not used (required)
6	Receive –	Orange/White or Orange	Green/White or Green	X
7	N/A	White/Brown	White/Brown	Not used (required)
8	N/A	Brown/White or Brown	Brown/White or Brown	Not used (required)

Table 2-1: Standard RJ45 Wiring Colour Codes for "Straight Through" Cables

Note the following cabling information for this wiring guide:

- Only two pairs of wires are used in the 8-pin RJ-45 connector to carry Ethernet signals
- Even though pins 4, 5, 7 and 8 are not used, it is mandatory that they be present in the cable
- 10BaseT and 100BaseT use the same pins, a crossover cable made for one will also work with the other
- Pairs may be solid colours and not have a stripe
- Category 5 cable must use Category 5 rated connectors

The maximum cable run between the 7700FC and the supporting hub is 300 ft (**100 m**). The maximum combined cable run between any two end points (i.e. 7700FC and PC/laptop via network hub) is 675 feet (205 m).

Devices on the Ethernet network continually monitor the receive data path for activity as a means of checking that the link is working correctly. When the network is idle, the devices also send a link test signal to one another to verify link integrity. The 7700FC rear panel is fitted with two LEDs to monitor the Ethernet connection.

10/100: This Amber LED is ON when a 100Base-TX link is last detected. The LED is OFF when a 10Base-T link is last detected (the LINK LED is ON). Upon power-up the LED is OFF as the last detected rate is not known and therefore defaults to the 10Base-T state until rate detection is completed.

LN/ACT: This dual purpose Green LED indicates that the 7700FC has established a valid linkage to its hub, whether the 7700FC is sending or receiving data. This LED will be ON when the 7700FC has established a good link to its supporting hub. This gives you a good indication that the segment is wired correctly. The LED will BLINK when the 7700FC is sending or receiving data. The LED will be OFF if there is no valid connection.

If you are building a "crossover" cable you must wire it according to Figure 2-4:

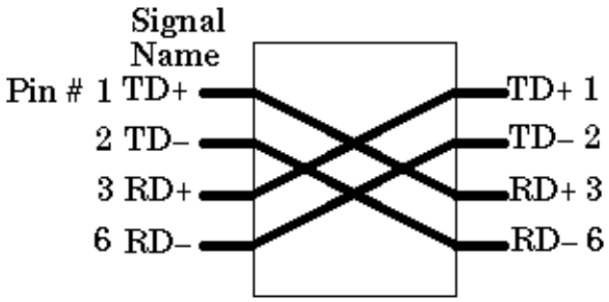


Figure 2-4: Crossover Cable Wiring Diagram

2.3.2. Serial I/O Connections

SERIAL I/O: A 9 pin female 'D' connector for connection to a computer. Currently this port is not used.

Pin #	Name	Description
1	GND	Chassis ground
2	Tx	RS-232 Transmit Output
3	Rx	RS-232 Receive Input
4		
5	Sig Gnd	RS-232 Signal Ground
6		
7	RTS	RS-232 RTS Input
8	CTS	RS-232 CTS Output
9		

Table 2-2: Serial I/O Connector Pin Definitions

2.4. REPLACING THE BATTERY

The Frame Controller is fitted with a 3V Lithium battery type CR2032. This battery is used to power non-volatile memory of some of the frame controller's parameters while power is removed from the frame. Before attempting to change the battery remove power from the 7700FC card.

CAUTION
Danger of explosion if battery is incorrectly replaced
Replace only with the same or equivalent type

CAUTION
Danger of explosion if battery is exposed to excessive heat such as direct sunlight, fire, etc.

2.4.1. Safety Guidelines and Precautions Concerning the Use of 3V Lithium Batteries

Please observe the following warnings strictly. If misused, the batteries may explode or leak, causing injury or damage to the equipment.

- The batteries must be inserted into the equipment with the correct polarity (+ and -)
- Do not attempt to revive used batteries by heating, charging or other means
- Do not dispose of batteries in fire. Do not dismantle batteries
- Do not short circuit batteries
- Do not expose batteries to high temperatures, moisture or direct sunlight
- Do not place batteries on a conductive surface (anti-static work mat, packaging bag or form trays) as it can cause the battery to short

3. SPECIFICATIONS

3.1. ETHERNET

Network Type: Fast Ethernet 100 Base-TX IEEE 802.3u standard for 100 Mbps baseband CSMA/CD local area network
Ethernet 10 Base-T IEEE 802.3 standard for 10 Mbps baseband CSMA/CD local area network
Connector: RJ-45

3.2. SERIAL I/O

Standard: RS-232
Connector: Female DB-9
Baud Rate: 57600
Format: 8 bits, no parity, 2 stop bits, no flow control

3.3. ELECTRICAL

Voltage: + 12VDC
Power: 7 Watts
EMI/RFI: Complies with FCC Part 15
Class A and EU EMC directive

3.4. PHYSICAL

7700FR-C frame mounting:
Number of slots: 1 (must be in slot 1 of 7700FR-C)

4. STATUS LEDS

The location of the status LEDs is shown in Figure 4-1:

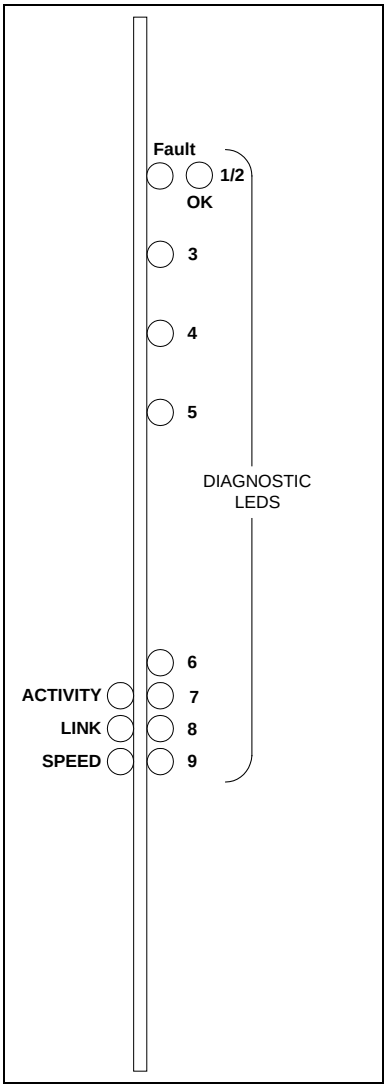


Figure 4-1: 7700FC Status LED Location

4.1. MODULE STATUS LEDS

The Frame MIB allows the user to enable/control LEDs 1 thru 9:

MODULE STATUS (1/2): Upon power-up, and if disabled through the Frame MIB, only LED 2 will be ON ("green") when the module is operating properly. When both LEDs 1 and 2 are enabled through the Frame MIB (VistaLINK®), both will flash alternatively.

DIAGNOSTIC LEDs: When LEDs 3 through 9 are enabled, they will start flashing as defined through the Frame MIB.

4.2. ETHERNET STATUS LEDS

4.2.1. Card Edge Ethernet LEDs

There are three red LEDs on the front card edge, which provide Ethernet connection status at a glance.

ACTIVITY: This LED will BLINK when the 7700FC is sending or receiving data.

LINK: This LED will be ON when the 7700FC has established a good link to its supporting hub. This indicates that the segment is wired correctly.

SPEED: This LED is ON when a 100Base-TX link is last detected. The LED is OFF when a 10Base-T link is last detected (the LINK LED is ON). Upon power-up, this LED is OFF as the last detected rate is not known and therefore defaults to 10Base-T state until rate detection is completed.

5. JUMPERS

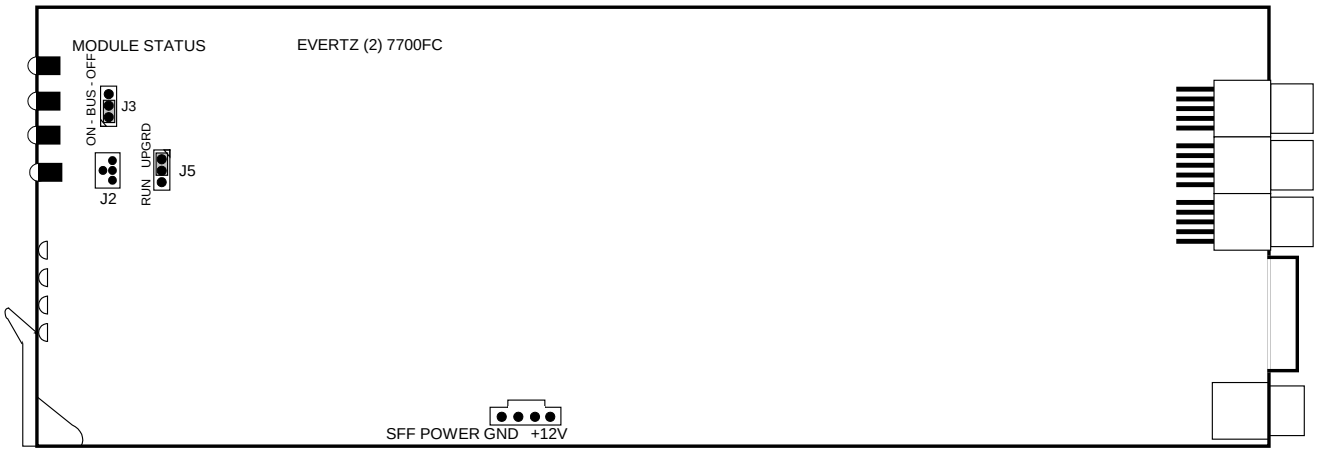


Figure 5-1 : Location of Jumpers

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

BUS: The BUS jumper J3 located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR-C frame's global status bus.

To monitor faults on this module with the frame status indicators (on the Power Supply FRAME STATUS LEDs and on the Frame's Fault Tally output) install this jumper in the On position. (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 J5 located behind the serial port header J2 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* section 7 for more information.

6. CONFIGURING THE FRAME CONTROLLER

The 7700FC Frame Controller is configured by connecting its serial port to a computer running a readily available terminal program such as HyperTerminal. The following procedure will guide you through each step of the configuration process.

You will need the following equipment in order to configure the 7700FC Frame Controller:

- PC with available communications port. The communication speed is 57600 baud, therefore a 486 PC or better with a 16550 UART based communications port is recommended.
- "Straight-thru" serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male)
- Terminal program such as HyperTerminal
- Special upgrade cable supplied with the 7700FR frame. This cable is normally in the vinyl pouch at the front of this manual. (Evertz part #WA S76).

6.1. ESTABLISHING COMMUNICATION WITH THE FRAME CONTROLLER

6.1.1. Connecting the Computer to the Card Edge Serial Port

Connect the 7700 serial upgrade cable to the 2x3 header (J2) at the front edge of the 7700FC card. Note that pins 1 and 5 on the header should be removed and pins 1 and 5 on the cable connector should also be plugged. If the cable is not keyed, make sure that you install it so that the cable is away from the front of the frame when the module is installed (i.e. so that it passes over the full length of the card). Pin 6 of the ribbon cable is brown and will be facing the edge of the module with the card ejector when the cable is correctly installed.

7700FC End			PC End	
2 row X 3 pin Berg	**Pin**	**6 Conductor Ribbon Cable**	**9 pin D Female**	**Pin**
Key	1	Blue		1
Rx	2	Green	Tx	2
Tx	3	Yellow	Rx	3
Tx Gnd	4	Orange	Gnd	5
Key	5	Red		
---	6	Brown		

Table 6-1: 7700 Upgrade Cable (WA-S76)

6.1.2. Terminal Program Setup

1. Start the terminal program and configure the port settings of the terminal program as follows:

Baud	**57600**
Data bits	**8**
Parity	**no**
Stop bits	**2**
Flow Control	**no**

2. Install the 7700FC card into the frame. After the card powers up and the boot-up messages are finished, a "login" prompt will appear in the terminal window. (For future reference 7700FC software version information is displayed prior to the "login" prompt and should be quoted to Service staff when required.)

For example:

```
Kernel Build Date   : Jul 17 2002 09:52:05
Software            : v2.01 Build 3
Tag                 : fc_release-2-01-b3
Software Build Date : Jul 30 2002 13:47:25
Wed Feb 21 16:44:00 PST 2001


NetBSD/evertz (fc-default) (tty00)

login:
```

3. If the prompt does not appear, the following is a list of possible reasons for failed communications:

- Defective 7700 Serial Upgrade cable.
- Wrong communications port selected in the terminal program.
- Improper port settings in the terminal program. (Refer to step 2 for settings).

4. At the "login" prompt, enter:
- "**customer**" for user name <Enter>
- "**customer**" for password <Enter>

NOTE - Neither username nor password can be modified at the time of this manual revision release.

5. A menu for Network, SNMP and FC Upgrade Setup Configuration appears and is detailed in the next section.

6.2. CONFIGURING THE NETWORK SETTINGS

From main menu, three selections are available - *Network Setup*, *SNMP Setup and FC Upgrade Setup*.
- *Network Setup* is used to set network IP addresses as well as broadcasting and routing instructions
- *SNMP Setup* is used to identify up to ten trap destination IP addresses.
- *FC Upgrade Setup* is used to allow or deny remote FC upgrades.

```
**** Main Menu ****
<1> Network Setup
<2> SNMP Setup
<3> FC Upgrade Setup

<X> Exit
<W> Exit without saving to flash
>
```

To choose one of the menu choices, enter the letter or number shown on the left and then press <Enter>. If you choose menu item 1 or 2 or 3 you will be presented with an additional menu. Choose menu items on these sub menus in the same way or press X to return to the main menu.

6.2.1. Network Setup

The *Network Setup* menu has six network parameters that need to be configured. If the network is using a **DHCP** server, set the ***DHCP*** parameter to *yes* before proceeding to change the other parameters. When the **DHCP** setting is set to *yes*, the *IP Address, Netmask, Gateway,* and *Broadcast* addresses are automatically assigned and their corresponding menu items are disabled.

If the network is not using a DHCP server, set the *DHCP* parameter to *No* before proceeding to change the *IP Address, Netmask, Gateway,* and *Broadcast* addresses.

The following screen displays the network settings on the 7700FC frame controller.

```
**** Network Setup ****

(1) Use DHCP [N]
(2) Hostname [fc-default]
(3) IP Address [192.168.1.187]
(4) Netmask [255.255.255.0]
(5) Gateway [192.168.1.1]
(6) Broadcast [192.168.1.255]

(X) Exit
>
```

The DHCP mode should be disabled before proceeding with the 7700FC Frame Controller upgrade, which is outlined in section 7.3.7. In order to successfully upgrade the device, select No [N] when prompted for DHCP mode, as shown in the above network setup screen. If the DHCP is enabled you will be unable to proceed further with the upgrade. See section 7.3.7 for instructions on upgrading the 7700FC Frame Controller.

The chart below gives a brief description of each menu item and what the parameter does. To choose one of the menu choices, enter the letter or number shown on the left and then press <Enter>. You will be prompted to enter the required parameter value. When you are done configuring the *Network Setup* menu items press X to return to the main menu. If you are unclear about how to configure your network, consult your network administrator.

Use DHCP	This setting allows the Frame Controller to **be** automatically **assigned an** IP address for the parameters **below** from a DHCP server during boot-up. If you are not running a DHCP server, set this parameter to "No" first before making any changes to other parameters.
Hostname	A user-configurable 7700FC identifier. This menu item can be used to name the specific frame, service or location of the 7700FC.
IP Address	This control sets the unique IP address of the 7700FC within the network. 192.168.1.XXX is an example of an IP address in a private (internal) network. If connecting multiple frames (each with its own frame controller), take care not to use the same IP address for each.
Netmask	This menu item defines the "subnet mask" of the network. Specifically, this parameter outlines all the IP addresses that can communicate with the 7700FC. This parameter can be set to 255.255.255.0 for a private network.
Gateway	This item identifies the IP address of the "gateway" (in previous versions of the software, "gateway" is referred to as "**route**"). In its simplest sense the gateway is a **device that routes packets to different networks. If configured, the IP address of the gateway must reside in the frame controller local subnet that was defined by the subnet mask**. In a private network, this gateway could be identified as 192.168.1.1. **Power cycle required after gateway change.**
Broadcast	This menu item sets the "broadcast" IP address. For example, in a private network **with a subnet mask configured as 255.255.255.0.** This parameter can be set to 192.168.1.255

To communicate beyond the private (internal) network and into the internet, all messages must be relayed via the gateway (firewall). As a result, the firewall must be configured separately by the end-user to facilitate communication. Consult your network administrator if establishing a communication link beyond the private network.

For convenience and future reference, a chart is provided below to record IP **configuration** for this SNMP network. (Additional blank charts have also been added at the end of this manual.)

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	

Once the *Network Setup* parameters have been configured, exit the *Network Setup* by pressing X then <Enter>. Proceed to the *SNMP Setup* menu option by entering 2 then <Enter> at the Main Menu prompt.

6.2.2. SNMP Setup

In the *SNMP Setup* menu, three parameters are configured:

Read Community String	Factory default "public" (No changes required. However, if these settings are changed, the manager must have the identical settings. Otherwise no communication will occur between the 7700FC and manager.)
Read/Write Community String	Factory default "private" (No changes required. However, if these settings are changed, the manager must have the identical settings. Otherwise no communication will occur between the 7700FC and manager.)
Trap Setup	This menu item identifies the destination IP addresses (**SNMP Trap Handlers**) to which TRAPS are sent via SNMP. A maximum of ten IP addresses may be entered.

Once the *SNMP Setup* parameters have been configured, exit *SNMP Setup* by pressing `X` then `<Enter>`.

6.2.2.1. Community Strings

Community Strings are considered as "passwords" within SNMP, controlling the ability to read ("GET") and/or read/write ("SET") values to a specific destination. "GET" and "SET" messages include the community strings within their **PDU (protocol data units)**. By factory default, community strings are set to "public" and "private", respectively. If these settings are changed, the SNMP manager's community string must agree with the "SET" string. Otherwise no communication will occur between the 7700FC and manager.

For example:

```
**** SNMP Setup ****
<1> Read Community String          [public]
<2> Read/Write Community String    [private]
<3> Trap Setup

<X> Exit
>
```

6.2.2.2. Trap Setup

"Trap Setup" allows the user to **define** IP addresses **of the trap listeners for when the asynchronous fault messages are sent**. A maximum of ten IP addresses can be stored in the Frame Controller. After selecting "Add…" or "Remove…" IP addresses are entered one at a time.

Add Trap Destinations	Add a SNMP **trap server** IP address to the TRAP distribution list.
Remove Trap Destinations	Remove a SNMP **trap server** IP address from the TRAP distribution list. For example, selecting this option reveals the list of IP addresses with the prompt to remove one from the list: Trap #1: 192.168.1.76 Trap #2: 192.168.8.140 Remove trap # > 2
Show All Trap Destinations	Displays a list of all entered SNMP **trap server** IP addresses. For example: Trap #1: 192.168.1.76 Trap #2: 192.168.8.140 Trap #3: 192.168.8.112

Once the *SNMP Setup* parameters have been configured, exit the *SNMP Setup* by pressing X then <Enter>. Proceed to the *FC Upgrade Setup* menu option by entering 3 then <Enter> at the Main Menu prompt.

6.2.3. FC Upgrade Setup

In the "FC Upgrade Setup" menu, one parameter is configured. This menu option is only available from 3.06 Build 1 of 7700FC firmware onwards.

Remote Upgrade Permission	Factory default "ALLOW". This control has two settings: ALLOW & DENY. If set to "ALLOW", remote FC upgrades are allowed. If set to "DENY", remote FC upgrades are denied.

6.2.3.1. Remote Upgrade Permission

Choose option <1> to enter the "Remote Upgrade Permission" menu. At this stage, entering 'A' or 'a' will set the control to allow remote upgrades. If 'D' or 'd' is entered, then remote FC upgrade will be denied.

Once the *FC Upgrade Setup* parameter has been configured, exit *FC Upgrade Setup* by pressing X then <Enter>.

For example:

```
**** FC Upgrade Setup ****
 <1> Remote Upgrade Permission   [ALLOW]

 <X> Exit
>1

FC Remote Upgrade Configuration.  Enter:
  A to ALLOW remote FC upgrade
  D to DENY  remote FC upgrade
>
```

6.2.4. Exiting the Setup Menu

From the *Main Menu*, press X to save the configuration to memory. After 30 seconds, a successful save of the configuration is acknowledged with a "Commit successful" statement, and the user is returned to the "login" prompt.

For example: (after pressing X<enter>)

```
**** Main Menu ****
<1> Network Setup
<2> SNMP Setup
<3> FC Upgrade Setup

<X> Exit
<W> Exit without saving to flash
X
Please wait 30 seconds to save settings to flash…
Commit successful.

NetBSD/evertz <fc-default>
login:
```

Press W if you made an error during configuration and want to exit the setup menu without saving the new settings. In either case you will return to the "login:" prompt.

```
**** Main Menu ****
<1> Network Setup
<2> SNMP Setup
<3> FC Upgrade Setup

<X> Exit
<W> Exit without saving to flash
W

NetBSD/evertz <fc-default>
login:
```

At this point, the serial connector can be removed from the Frame Controller and the terminal program closed. An SNMP manager using the previously specified IP can now be initiated.

7. UPGRADING THE FRAME CONTROLLER IMAGE VISTALINK®

7.1. PROCEDURES FOR UPGRADING THE FRAME CONTROLLER IMAGE VISTALINK®

The 7700FC Frame Controller facilitates communication between the SNMP-enabled (VistaLINK®) cards, residing in a frame and the SNMP Manager (VistaLINK® PRO). Frequently, new cards or new features for existing cards are added to the VistaLINK® product family. In both cases, a new Management Information Base ("MIB") exists. Subsequently, the 7700FC should also be upgraded with the latest information ("image") to maintain the most up-to-date monitoring and control capabilities.

The 7700FC Frame Controller image can be upgraded by two different procedures, which are outlined in sections 7.2 and 7.3. Using the procedures outlined in sections 7.1.1 and 7.1.2 determine which procedure is needed based on the following criteria:

The two criteria are:

1. 7700FC Image is "fc_release-2-19-b1" or greater.
2. 7700FC Boot version is "Revision 2.0 Build 12".

If both the criteria are met, then the 7700FC Frame Controller can be upgraded using the **Remote Upgrade** procedure outlined in section 7.2. If both of the criteria are not met then you will have to use the **Serial Card Edge Upgrade** procedure outlined in section 7.3.

7.1.1. Determining 7700FC Image Using VistaLINK®

To determine the 7700FC Image version with VistaLINK®

1. Start a VistaLINK® Pro client and login using the Administrator user account (VLPRO-C does not use login accounts).
2. Expose the 7700FC in the hardware tree using 'Add/Update Frame' and collapsing the nodes in the tree appropriately.
3. Use the right-click mouse button on the 'FC' in the tree and select 'View configuration'.
4. Select the 'Software Status' tab in the configuration view.
5. Compare the 'Tag Name' with criteria 1 in section 7.1.

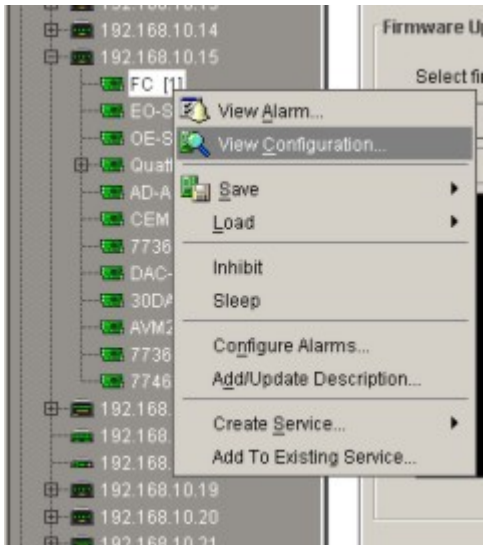


Figure 7-1: FC shown in the Hardware Tree

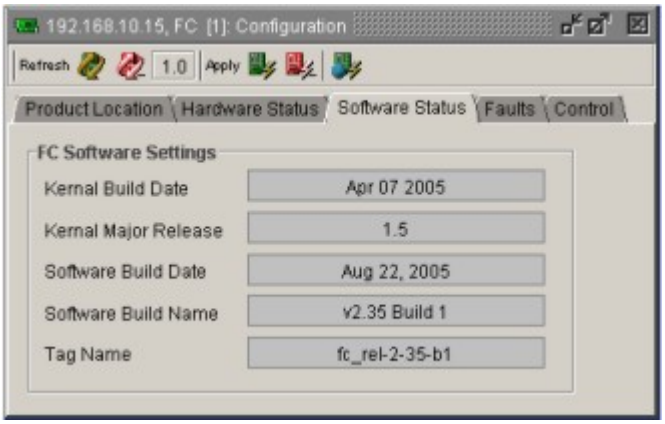


Figure 7-2: Software Status Tab for the FC Configuration View

7.1.2. Determining fcboot Version

7.1.2.1. Connecting the Computer to the Card Edge Serial Port

You will need the following equipment in order to connect to the serial port on the 7700FC Frame Controller.

- PC with available communications port. The communication speed is 57600 baud, therefore a 486 PC or better with a 165500 UART based communications port is recommended
- "Straight-thru" serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male)
- Terminal program such as HyperTerminal
- Special upgrade cable supplied with the 7700FR frame. This cable is normally in the vinyl pouch at the front of the 7700FR manual binder. (Evertz part #WA S76)

Connect the 7700PB serial upgrade cable to the 2x3 header (J2) at the front edge of the 7700FC card. Note that pins 1 and 5 on the header should be removed and pins 1 and 5 on the cable connector should also be plugged. If the cable is not keyed, make sure that you install it so that the cable is away from the front of the frame when the module is installed (i.e. so that it passes over the full length of the card). Pin 1 of the ribbon cable is brown and will be facing the edge of the module with the card ejector when the cable is correctly installed.

Start the terminal program and configure the port settings of the terminal program as follows:

Baud	**57600**
Data bits	**8**
Parity	**No**
Stop bits	**2**
Flow Control	**No**

7.1.2.2. Viewing Startup Information

1. Once HyperTerminal is connected, insert the 7700FC VistaLINK® Frame Controller in its slot.
2. 7700FC booting information will then be sent to the HyperTerminal window. Wait for the card to finish booting (it will stop at a login screen).
3. Scroll to the top of the window to display the following screen in HyperTerminal.

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 9.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER ABSENT
RUNNING 6C0000

>> NetBSD/evertz 7700FC Boot, Revision 2.0 Build 12
>> (rjalali@brain, Fri Nov  5 10:33:15 EST 2004)
```

If you do not see the boot up messages check to make sure you have the correct COM Port specified in HyperTerminal, and the status bar at the bottom of the HyperTerminal screen shows that it is connected.

4. Make note of the 7700FC Boot revision (as shown in **bold** above) and compare it with criteria 2 in section 7.1.

7.2. REMOTE UPGRADE PROCEDURE USING VistaLINK®

To perform the remote upgrade for the 7700FC VistaLINK® Frame Controller you will need the following setup:

- A working install of a VistaLINK® Pro client or VLPRO-C that's version 10.0.7 or greater.
- A downloaded and unzipped FC image file (.bin file) from http://www.evertz.com

The DHCP mode should be disabled before proceeding with the 7700FC Frame Controller upgrade. To disable your DHCP refer to section 6.2.1.

7.2.1. Downloading the 7700FC Frame Controller Image

1. Download the image file "7700FC Image File" from the Evertz web site (www.evertz.com – Downloads > Firmware Downloads link > Type "7700FC" in the Model search and press "Go".). Save the file to the hard drive.
2. Unzip the downloaded file and store the .bin file in a selected sub-directory. Record the location of the stored file.

7.2.2. Upgrading the Frame Controller Image using VistaLINK®

1. Start a VistaLINK® PRO client and login using the Administrator user account (VLPRO-C does not use login accounts).
2. Expose the 7700FC in the hardware tree using 'Add/Update Frame' and collapsing the nodes in the tree appropriately.
3. Use the right-click mouse button on the '7700FC' in the tree and select 'View Configuration…' option.
4. Select the 'Control' tab in the configuration view.
5. Click the 'Browse' button to select the unzipped 7700FC Image .bin file, which was downloaded in section 7.2.1.

When upgrading the FC Image file, ensure that you select the extracted .bin file and NOT the entire .zip file,

6. Click the Upgrade button and wait for the upload to complete. This will take approximately 5 to 10 minutes depending on network traffic.
7. Upon completion, the 7700FC module will reboot automatically and return online in normal "run" mode.

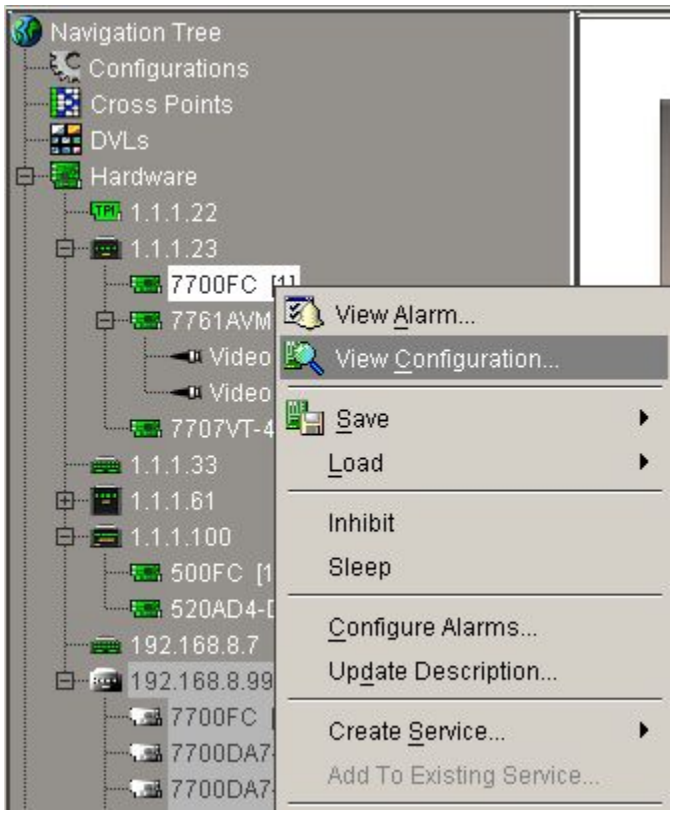


Figure 7-3: FC shown in the Hardware Tree

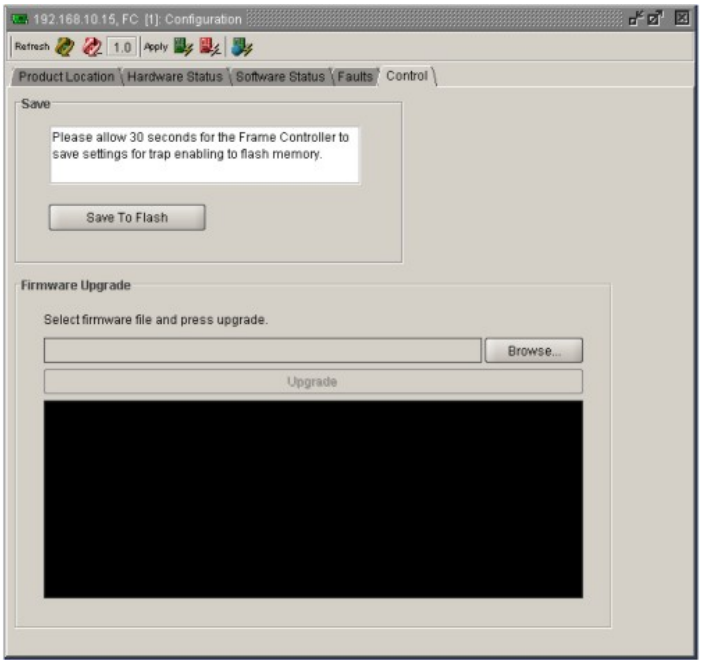


Figure 7-4: Control Tab for the FC Configuration View

If for any reason the upload is interrupted, you must execute the procedures outlined in sections 7.3.4, 7.3.5 and 7.3.7, as you will be unable to complete the procedure outlined in section 7.2.

7.3. SERIAL CARD EDGE UPGRADE PROCEDURE

The 7700FC Frame Controller image is upgraded by following the procedure outlined in this section.

Throughout the upgrade instructions, when you are prompted to type commands using HyperTerminal, the following conventions apply.

Do not type the quotation marks “”
<space> means to press the space bar
<Enter> means to press the “Enter” key
<Ctrl-x> means to press and hold the “Ctrl” key and press the “x” key

7.3.1. Downloading Upgrade Files

1. Download the boot loader “7700FC Boot Loader”, upgrade program “7700FC Upgrade” and the image file ”7700FC Image File” from the web site (www.evertz.com – Downloads > Firmware Downloads link > Type “7700FC” in the Model search and press “Go”.). Save the files to the hard drive.
2. Unzip the downloaded files and store them in a selected sub-directory. Record the location of the stored files.

7.3.2. Linking the Frame Controller to the Network Adapter

Connect a “straight-thru” Cat5 Ethernet cable with RJ-45 connectors, between the PC’s network Ethernet card and a network hub; and a second “straight-thru” Cat5 Ethernet cable between the hub and the rear plate of the 7700FC VistaLINK® Frame Controller. A “cross-over” cable directly connecting the PC’s Ethernet adapter to the 7700FC Frame Controller’s rear plate can be substituted for the two straight-thru Ethernet cables and hub. (See section 2.1)

7.3.3. Connecting the Computer to the Card Edge Serial Port

Refer to section 7.1.2.1 for instructions on connecting the computer to the card edge serial port and configuring the terminal software.

7.3.4. Setting the 7700FC Frame Controller to Upgrade Mode

The *UPGRADE* jumper J5 located at the front of the module is used when “image” upgrades are being done to the 7700FC Frame Controller module. For normal operation the jumper is set in the *RUN* position. To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J5 into the *UPGRADE* position. See Figure 5-1 for jumper locations on the 7700FC Frame Controller card.

7.3.5. Viewing Startup Information

- Once HyperTerminal is connected, insert the 7700FC VistaLINK® Frame Controller into its slot.
- 7700FC booting information will then be sent to the HyperTerminal window. After the card powers up the "upload" message is displayed.

For example:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
```

If you do not see the boot up messages check to make sure you have the correct COM Port specified in HyperTerminal, and the status bar at the bottom of the HyperTerminal screen shows that it is connected.

7.3.6. Upgrading the 7700FC Boot Loader

1. At the "Upload Main Program" prompt, send the boot loader program (fcboot_2v0_012.bin) that was downloaded in section 7.3.1 to the 7700FC using Xmodem protocol. This is done by selecting "Send file…" from the "Transfer" drop-down menu in the HyperTerminal window. Upon selecting this option, the following screen is displayed:

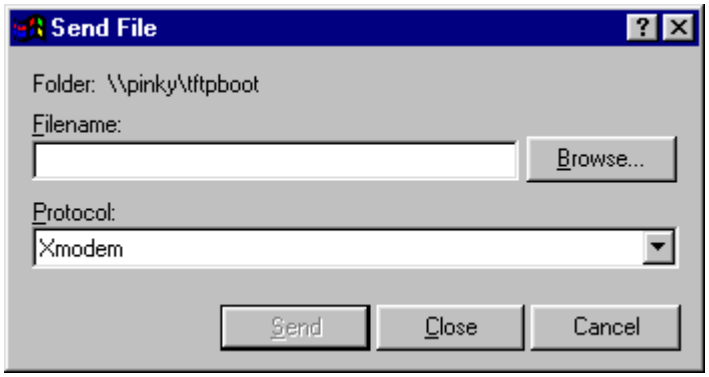


Figure 7-5: Send File Window

The "Folder" header describes the folder location of the previously downloaded Upgrade Program. To change the location/name of the file, use the "Browse…" button to locate and select the correct file. Make sure the Protocol is set to "Xmodem" and press the "Send" button to send the file.

Upon completion the card will continue to reboot. After the card reboots you can scroll to the top of the HyperTerminal buffer and the following information will be displayed:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
□□□B□B0□□B□B0□
UPLOAD OKAY
RUNNING 6C0000


>> NetBSD/evertz 7700FC Boot, Revision 2.0 Build 12
>> (rjalali@brain, Fri Nov  5 10:33:15 EST 2004)  >
```

7.3.7. Upgrading the 7700FC Frame Controller

1. Pull the card out of the slot and then reinsert it back into the frame. After the card powers up and the "Upload Main Program" message is displayed, press <Ctrl-x> five (5) times. This action temporarily postpones the "upgrade" procedure. The following information is displayed on the screen:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
UPLOAD CANCELLED
ENTERING COMMAND LOOP
```

2. At the prompt ">", type "upgrade<space>–u<Enter>" The following is displayed on the screen:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
□□□□B□B0□□B□B0□
UPLOAD CANCELLED
ENTERING COMMAND LOOP
> upgrade –u
UPLOAD UPGRADE PROGRAM
```

3. Using the procedure outlined in section 7.3.6 send the Upgrade program to the 7700FC (upgrade_0v0_24.bin - that was downloaded in section 7.3.1). Upon completion of this step, the following information will be displayed on the screen:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
□□□B□B0□□B□B0□
UPLOAD CANCELLED
ENTERING COMMAND LOOP
> upgrade –u
UPLOAD UPGRADE PROGRAM
□□
UPLOAD OKAY
>
```

4. At the prompt, type "boot<space>upgrade"<Enter>. The following information is displayed on the screen:

```
EVERTZ 7700FC BOOT MONITOR.
MON8240 1.1 BUILD 4.
COPYRIGHT 2000 EVERTZ MICROSYSTEMS LTD.  ALL RIGHTS RESERVED.
UPGRADE JUMPER PRESENT
UPLOAD MAIN PROGRAM
□□□B□B0□□B□B0□
UPLOAD CANCELLED
ENTERING COMMAND LOOP
> upgrade -u
UPLOAD UPGRADE PROGRAM
□□
UPLOAD OKAY
> boot upgrade
RUNNING 14B4

7700FC BOOT SOFTWARE
0.00 build 10 (2001 Nov 27 11:25:08)
total memory = 33554432 bytes
available memory = 32133120 bytes
PCI: 33 MHz, bus: 100 MHz, core: 200 MHz, tb: 25 MHz
PCI: 30000 ps, bus: 10000 ps, core: 5000 ps, tb: 40000 ps
ip address: 192.168.1.187, netmask: 255.255.255.0, gateway: 192.168.1.1
```

The IP address, netmask and gateway information is extracted from the 7700FC configuration information as entered in the previous section. This IP address should be recorded as it is used for 7700FC Frame Controller image upgrading, as per the next instruction.

If the IP address, netmask and gateway are set to 0.0.0.0, this indicates that the 7700FC card is operating in DHCP mode. You will have to turn off DHCP mode and enter a static IP address and netmask using the procedure shown in section 6.2.1.

5. Using the "Run…" command in the "Start" menu, or opening a Command Prompt (MS-DOS) window, type "ftp 192.168.1.187<Enter>" (or similar IP address from the previous instruction, as displayed). This will open an MS-DOS FTP window. Note that the PC, used for entering commands and storing the downloaded image file, and 7700FC must be configured to operate on the same LAN. For example the IP address of the PC and Frame Controller should be on 192.168.1.x with "x" being a unique address identifier for the PC and the 7700FC Frame Controller
   - Do not enter a name for "User" when prompted (leave the field blank). Press <Enter>.
   - Do not enter a name for "Password" when prompted (leave the field blank). Press <Enter>.

6. At the "ftp>" prompt, type:

put<space>"[dir]\XvY_Z_7700FC.bin"<space>image<Enter>

Add the full path name (directory location) of the downloaded 7700FC Image file in place of [dir] in the above entry. If there are spaces in the path name they must be surrounded by quotations. Note that "X", "Y" and "Z" are FC image release version numbers as identified in the downloaded file name. The file will take approximately 5 to 10 minutes to upload.

- Upon successful command entry, the MS-DOS window will display “200 PORT command successful” and “150 Opening data connection” messages.
- The top-most LED pair (1/2) on the 7700FC Frame Controller card edge will be RED during the “image” upload process.
- After several minutes of “image” upload, the MS-DOS window will display “226 Transfer complete” and “ftp:…(adding statistics about the ftp procedure)”
- The top-most LED pair (1/2) on the 7700FC Frame Controller card edge will be GREEN once the “image” upload process is complete.

7. Upon completion of the upload, the MS-DOS window/program should be terminated by closing the window. Remove the 7700FC from the frame, remove the 7700 upgrade cable and reposition the UPGRADE jumper to RUN mode. The 7700FC has been upgraded with the latest image and can now be reinserted into the frame to resume normal operation.

8. UPGRADING MODULE FIRMWARE THROUGH THE 7700FC FRAME CONTROLLER

The 7700FC Frame Controller facilitates module firmware upgrades of VistaLINK® enabled products through an FTP upgrade procedure. To enable module firmware upgrades:

1. Ensure that you have an upgradeable copy of the module's firmware stored on the connected PC. If you do not have the latest firmware, please visit www.evertz.com for latest posted firmware.
2. Set the module (to be upgraded with firmware from #1) jumper to "upgrade" mode and insert it into the frame.
3. Open a MS-DOS prompt. Type "ftp<space>aaa.bbb.ccc.ddd", where "aaa.bbb.ccc.ddd" is the IP address of the 7700FC (see section 6) residing in the frame with the module awaiting firmware upgrade. For example, 192.168.1.100 is the IP address of the 7700FC and subsequently the command at the prompt is "ftp<space>192.168.1.100"
4. Enter "customer" for both "User" and "Password" prompts.
5. At the "ftp>" prompt type "dir<Enter>" for a listing of modules within the specified frame. Depending on the modules in the connected frame, information similar to that shown below will be displayed on your screen.

```
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for 'ls'.
Slot05    QUATTRO                uevgen1
Slot08    CDM                     uevgen0
Slot10    VAR                           uevgen2
Slot12    VAT                           uevgen3
Slot14    DFU                           udfu0
QUATTRO       Upgrade all     QUATTROs
CDM           Upgrade all     CDMs
VAR           Upgrade all     VARs
VAT           Upgrade all     VATs
DFU           Upgrade all    DFUs
```

6. "DFU" will identify the module slated for firmware upgrade and will also identify the slot in which that module resides. For example, in the above listing, the module in slot 14 can now be upgraded.
7. At the "ftp>" prompt type "bin<Enter>"
8. Type: put<space><<firmwarelocation>>.bin<space>DFU<Enter>

   This command sends the upgrade image to all cards in upgrade mode within the frame. (Note: In steps 8 and 9, <<firmwarelocation>> should be replaced with the specific directory where the upgrade file is saved with a file name such as "c:\avm-2-05-030".)

9. To upgrade a particular module within the frame, at the "ftp>" prompt
   - Type: cd<space>Slotxx<Enter> (where "xx" is the specific slot number in the frame)
   - Type: put<space><<firmwarelocation>>.bin<space>app<Enter>

   This command sends the upgrade image only to the card in the specified slot number. Once the upgrade is completed, to return to the list view, type "cd<space>..<Enter>" at the ftp> prompt, then follow from step 5.

Additional IP Address Tables

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	

Frame Controller Parameters	IP Address
Hostname	
IP Address	
Netmask	
Gateway	
Broadcast	