TABLE OF CONTENTS

Figures

Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original Version	Jun 09
1.1	New sections added	Jul 09
1.2	Added –HD Version Information	Oct 09

This page left intentionally blank

1. OVERVIEW

The StreamLINK® family of products are designed to provide the very best HD and SD-SDI signal processing that requires delivery of video and audio over IP data networks. The StreamLINK® encoding engine provides high-quality, low latency encoding at full frame for dozens of applications. Using the MPEG-2 and H.264 (MPEG-4 Part 10) encoding technology, users can extend enterprise-wide usage of video systems while taking advantage of low bandwidth encoding at high quality resolutions. The modules comes equipped with an on-board distribution amplifier, providing auto-equalization of the main input signal and four reliable reclocked outputs. The input signal is monitored in real-time for video and embedded audio presence and will provide alarming should a fault occur.

The 7700DA4-SLKE and 7700DA4-SLKE-HD is VistaLINK® capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP capable control systems (Manager or NMS). The modules occupy one card slot and can be housed in the 1RU 7701FR frame, the 3RU 7800FR frame which has a 15 slot capacity, the portable 3RU 350FR frame which has a 7 slot capacity, or a S7701FR standalone enclosure which holds a single module.

Flexibility, performance and feasibility on a single module!

Features:

- H.264 encode of SD-SDI signals with embedded audio (7700DA4-SLKE Only)
- MPEG-2 encode of HD/SD-SDI signals with embedded audio (7700DA4-SLKE-HD Only)
- High quality encoding using low bandwidth
- Built-in video distribution amplifier providing 4 reclocked outputs
- On-board signal monitoring and diagnostics
- High density approach offers 15 encoders within 3RU
- Portable or rack mounted frame assemblies
- Easy setup using web browser and SNMP control

Applications:

- In-house IPTV channel ring
- Legacy RF and QAM Replacement
- Remote confidence monitoring
- Video backhaul over IP
- Distance education
- In-facility signal distribution
- Outdoor/Field news application
- Real time surveillance

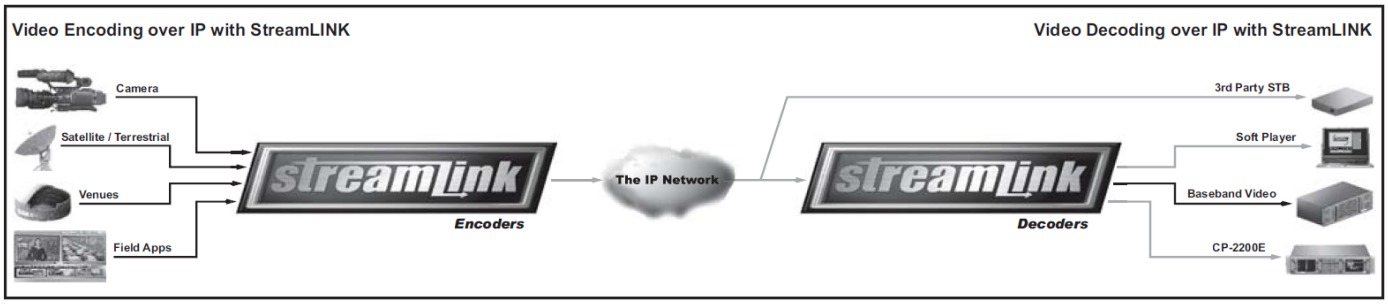


Figure 1-1: 7700DA4-SLKE & 7700DA4-SLKE-HD Block Diagram

2. INSTALLATION

The 7700DA4-SLKE and 7700DA4-SLKE-HD modules each come with a companion rear plate that occupies one slot in the frame. For information on inserting the module into the frame, see section 3 of the 7700FR chapter.

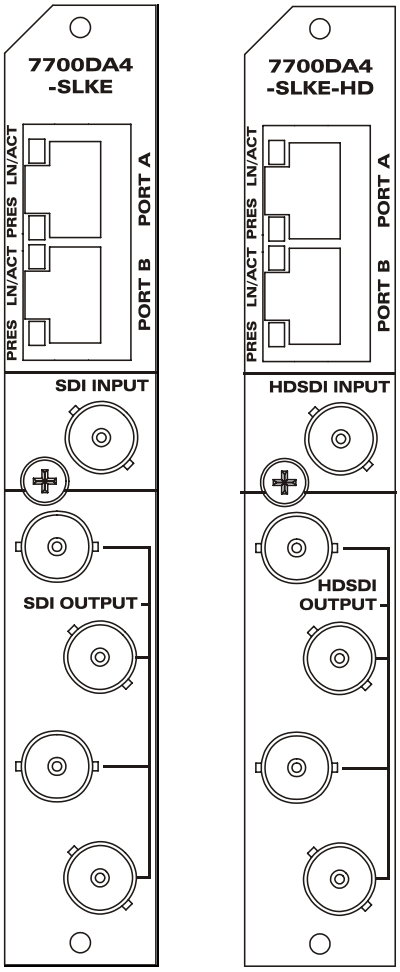


Figure 2-1: 7700DA4-SLKE & 7700DA4-SLKE-HD Rear IO Module

2.1. CONNECTIONS

2.1.1. 7700DA4-SLKE Connections

SDI INPUT: Input BNC connector for 10-bit component serial digital video signal compatible with the SMPTE 259M standard. See section 4.1 for information on selecting the correct video standard.

SDI OUTPUT: There are four BNC connectors with reclocked serial component video outputs, compatible with the SMPTE 259M standard.

ETHERNET: Port A is UNUSED. Port B is used for the output stream and to simultaneously connect to the configuration web-server on the card.

2.1.2. 7700DA4-SLKE-HD Connections

HD-SDI INPUT: Input BNC connector for 10-bit component serial digital video signal compatible with the SMPTE 259M/292M standard. See section 4.1 for information on selecting the correct video standard.

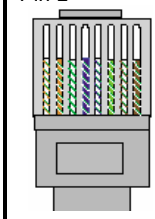
HD-SDI OUTPUT: There are four BNC connectors with reclocked serial component video outputs, compatible with the SMPTE 259M/292M standard.

ETHERNET: Port A is UNUSED. Port B is used for the output stream and to simultaneously connect to the configuration web-server on the card.

2.2. CONNECTING TO AN ETHERNET NETWORK

The 7700DA4-SLKE(-HD) 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 – 568 100 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. Create a network connection by plugging one end of the cable into the RJ-45 receptacle of the 7700DA4-SLKE(-HD) and the other end into a port of the supporting network device.

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

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 100BaseTX 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 downstream keyer and the supporting hub is 300 ft (90 m). The maximum combined cable run between any two end points (i.e. downstream keyer 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 downstream keyer rear panel is fitted with two LEDs to monitor the Ethernet connection.

PRES: This LED is ON when a 100Base-TX link is last detected. The LED is OFF when a 10Base-T link is last detected. 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 7700DA4-SLKE(-HD) has established a valid linkage to its hub, and whether the 7700DA4-SLKE(-HD) is sending or receiving data. This LED will be ON when the 7700DA4-SLKE(-HD) 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 7700DA4-SLKE(-HD) is sending or receiving data. The LED will be OFF if there is no valid connection.

3. SPECIFICATIONS

3.1. VIDEO INPUT

Number of Inputs: 1 electrical
Standard:
7700DA4-SLKE: SMPTE 259M (270Mb/s) 525i and 625i

7700DA4-SLKE-HD: SMPTE 259M (270Mb/s) 525i and 625i
SMPTE 292M (1.485Gb/s) 1080i and 720p

Connector: BNC per IEC 61169-8 annex A

Input Equalization:
SD: Automatic to 300m @ 270Mb/s with Belden 1694A or equivalent
HD: Automatic to 110m @ 1.5Gb/s with Belden 1694A or equivalent

Return Loss:
SD: >13dB up to 270MHz
HD: >10dB up to 1.6GHz

3.2. VIDEO OUTPUT

Number of Outputs: 4 electrical reclocked outputs
Connectors: BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V to ±0.5V
Rise and Fall Time: 900ps nominal (SD)
Overshoot: < 10% of amplitude
Wide Band Jitter: < 0.2 UI

3.3. NETWORK INTERFACE

Standard: IEEE 802.3U 10 Base-T and 802.3u 100 Base-TX with auto-negotiation for 10/ 100Mbps
Connector: RJ-45

3.4. NETWORK MANAGEMENT

Control: HTTP web browser
True SNMP with VistaLINK
Serial RS-232 at card edge

3.5. SIGNAL ENCODING

Video Encoding Engine:
7700DA4-SLKE: H.264/AVC
7700DA4-SLKE-HD: MPEG-2

Audio Encoding Engine:
7700DA4-SLKE: MPEG 1 L2/AC-3 Pass Thru
7700DA4-SLKE-HD: MPEG 1 L2

Traffic Shaping: Constant bit rate
GOP Structure: Various GOP sizes

Video Resolution:
7700DA4-SLKE: 525i/625i
7700DA4-SLKE-HD: 525i/625i and 1080i/720p

Recommended Bit Rate: 1 Mb/s to 6 Mb/s (SD Version Only)
8 Mb/s to 20Mb/s (HD Version Only)
Frame Encoding: IP
Frame Rate: Full frame rate
Audio Channels: 1 Stereo Pair (L/R)
Audio Output Bit Rate: Fixed 300Kb/s
Delivery: UDP Unicast/Multicast

3.6. MONITORING

Signal Detection: Video presence detection
Video standard detection
Audio presence detection
Encoder Status

Error Notification: HTTP web browser status page
SNMP trap notification
Card edge LED

3.7. ELECTRICAL

Voltage: +12V DC
Power: 13W
EMI/RFI: Complies with FCC Part 15
Class A EU EMC Directive

3.8. PHYSICAL (NUMBER OF SLOTS)

350FR-C: 1
7700FR-C: 1
7800FR: 1
7701FR: 1
S7701FR: 1

4. WEB CONFIGURATION TOOL

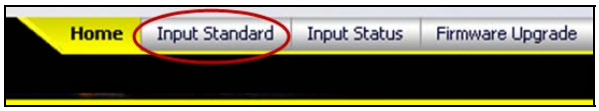
The 7700D4-SLKE web configuration tool enables the user to configure the module settings.

Using the web interface the user can change the input standard, the network configuration settings and update the firmware.

Figure 4-1: 7700DA4-SLKE Home Screen

4.1. INPUT STANDARD

Selecting the **Input Standard** button at the top of the screen reveals the **SLKE Input Standard** window.



The user can change the **Input Video Standard** to *NTSC* or *PAL* using this window.

Note: The default is 525 - this must be correct in order for the 7700DA4-SLKE to function as expected.

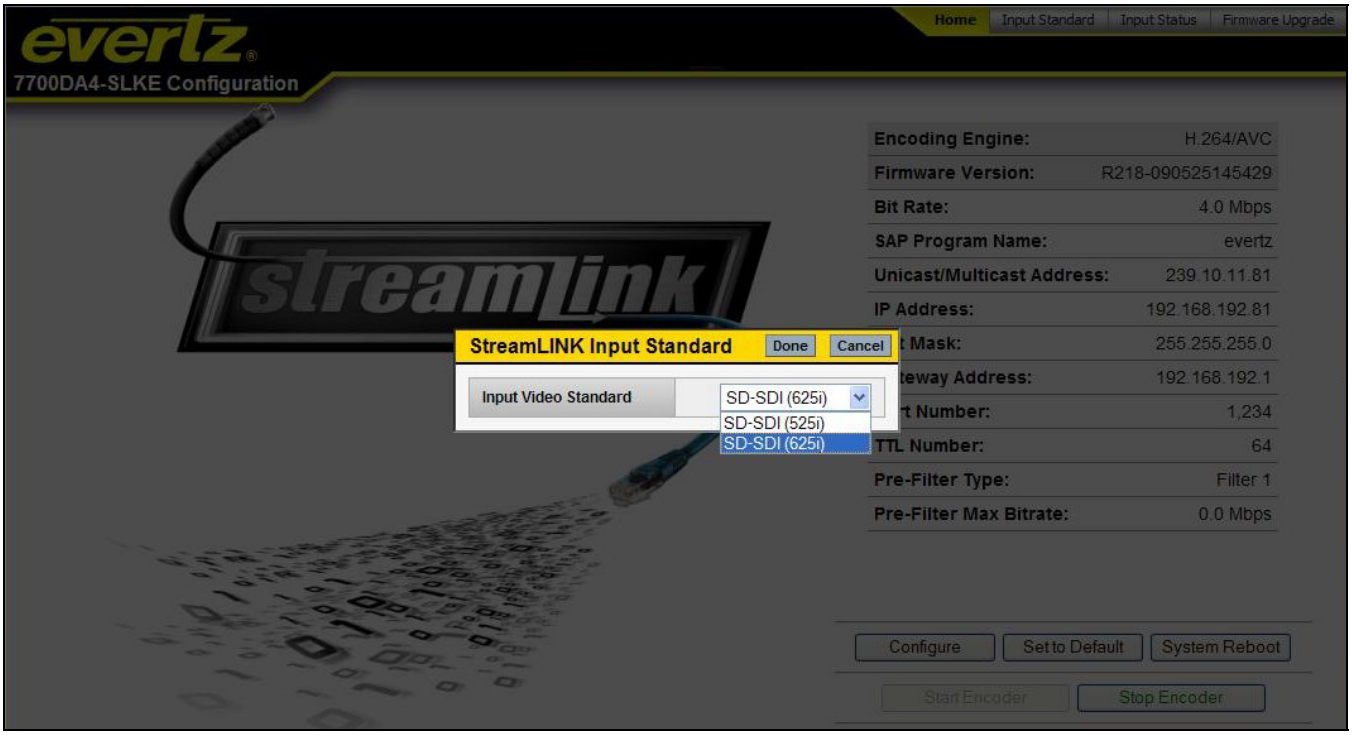


Figure 4-2: Input Standard

4.2. INPUT STATUS

To view the status of the input media, select the **Input Status** button in the top toolbar.

The **SLKE Encoder Status** dialog box will appear displaying the *Input Video Present*, the *Embedded Audio Present*, and the *Encoder Status*.

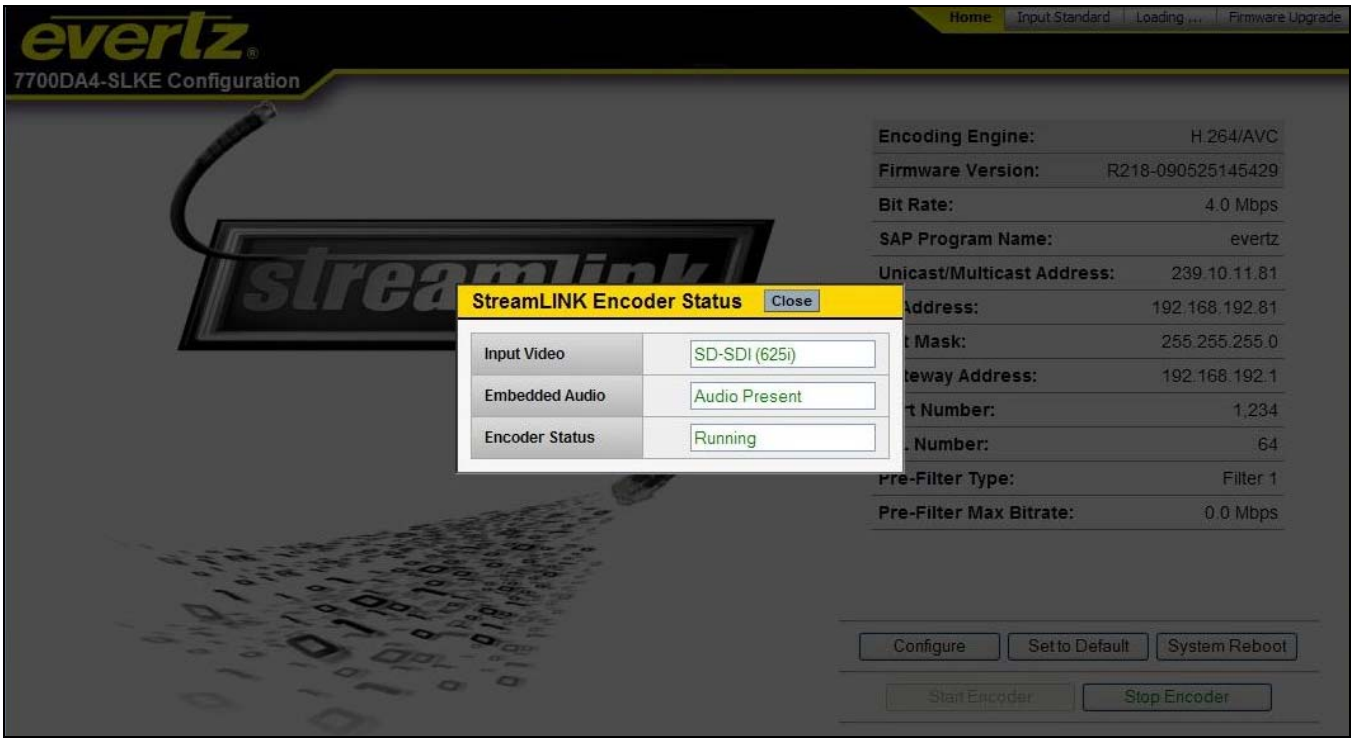


Figure 4-3: Input Status

4.3. CONFIGURATION

4.3.1. Configuration Buttons

The following configuration buttons will enable the user to change the encoder setup, set the encoder to the default settings, reset the encoder, or start and stop the encoder.

Figure 4-4: Configuration Buttons

4.3.2. Configuration Setup

Selecting the “Configure” button (see Figure 4-4) will launch a **SLKE Encoder Setup** screen, as shown in Figure 4-5. The **SLKE Encoder Setup** screen enables the user to adjust the settings of the encoder.

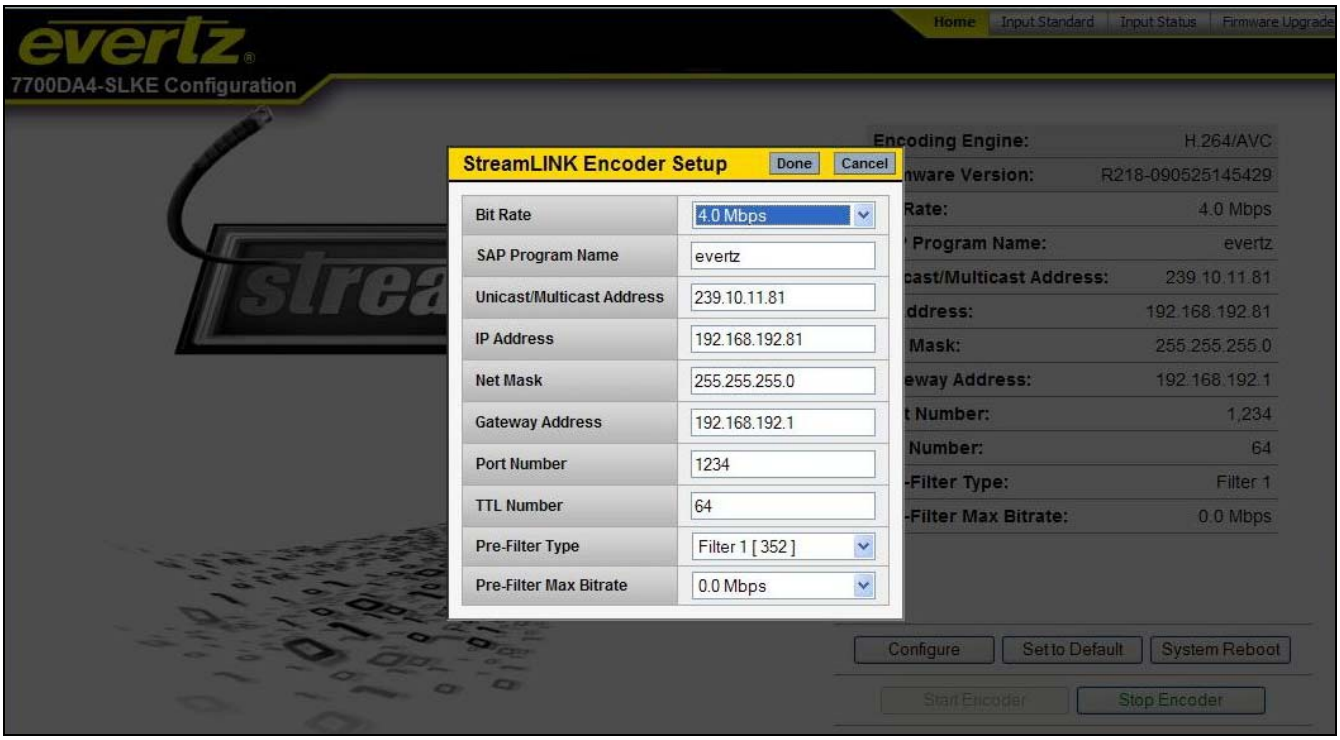


Figure 4-5: SLKE Encoder Setup

4.3.3. Configurable Items

Any changes to the following items, as detailed in section 4.3.3.1 to 4.3.3.4 will *only* take effect when the ***Done*** button is selected.

4.3.3.1. StreamLink™ Configuration

Unicast/ Multicast Address: The IP address to which a viewer will 'subscribe'.
A default Multicast Address might be: 239.0.0.17

Port Number: Port number used to view the stream.
A default *Port Number* might be: 1234

4.3.3.2. Card Configuration

IP Address: The address to connect to in order to configure the StreamLINK™ parameters. A default IP Address might be: 192.168.77.4

Note: Changing this address will immediately disconnect the internet browser connection to the *Configuration Web Server*.

Net Mask: The IP mask used for the network in use. Typically, this might be 255.255.255.0

Gateway Address: IP address to a Gateway device.

4.3.3.3. Stream Property Items

Bit Rate: The target Bit-Rate for the multicast stream.
Default is 4Mb/s. Range is 1.0Mb/s to 6.0Mb/s, in increments of 0.5Mb/s.

SAP Program Name: The name associated with the program - this is passed out using Stream Announcement Protocol (SAP).
Limit is 16 characters with no embedded spaces.

GOP Size: The size of the Group of Pictures (GOP).
Default is 30 frames. Ranging from 10 to 50, in increments of one.

TTL Number: The Time to Live (TTL) for the stream packets.
Default is 64 hops. The purpose of this is to stop an undeliverable stream packet from circulating endlessly on the network. Each hop reduces this number until it becomes zero at which time the stream packet is deleted.

4.3.3.4. Pre-Filter Type & Max Bitrate

These two items are used to reduce the bandwidth of the incoming signal **before** encoding, thus improving video quality – used especially for low value Bit-Rates.

Pre-Filter Type (PFT): There are four options available. The number inside the brackets indicates the typical target display maximum pixels per line.

Filter 1 reduces the bandwidth of the input signal the most, and *Filter 4* reduces the bandwidth the least.

Pre-Filter Max Bit-Rate (PFMBR): This is used as a threshold value to enable the *Pre-Filter Type*. The *Pre-Filter* is only enabled when the actual 'Bit-Rate' falls below this threshold value.

For example, set the *PFMBR* to '2 Mbps', and *PFT* to 'Filter 2 (480)'.
If the Bit-Rate is set to '3 Mbs', the *Pre-Filter* will be disabled; however, if the Bit-Rate is set to '1 Mbps' then the *Pre-Filter* will be enabled.

4.3.4. Set to Default Option

Selecting the **Set to Default** button will enable the user to set the encoder properties back to the factory defaults.

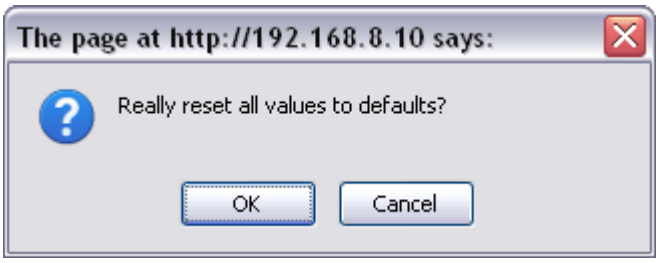


Figure 4-6: Default Dialog Box

4.3.5. SLKE Reset Option

Selecting the **SLKE Reset** button will enable the user to "soft reboot" the 7700DA4-SLKE.

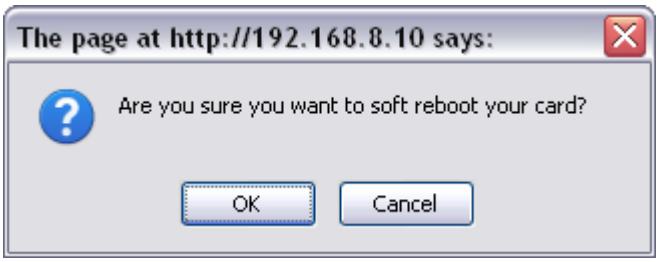


Figure 4-7: SLKE Reboot Dialog Box

4.3.6. Start / Stop Encoder Options

The *Start Encoder* and *Stop Encoder* buttons enable the user to start and stop the SLKE.

Figure 4-8: Start/Stop Encoder Buttons

4.4. UPGRADING THE FIRMWARE

To upgrade a firmware file, select the **Firmware Upgrade** button in the top tool bar. The **Evertz 7700DA4-SLKx Firmware Upgrade** screen will appear, as shown in Figure 4-9.

To load the file, select the **Browse** button and navigate to the desired firmware file. Once the file appears in the **Get a file** field, select the **Upgrade the file** button.

Once the file is upgraded, the properties should be listed in the fields above.

To remove a file name, select the **Clear file name** button.

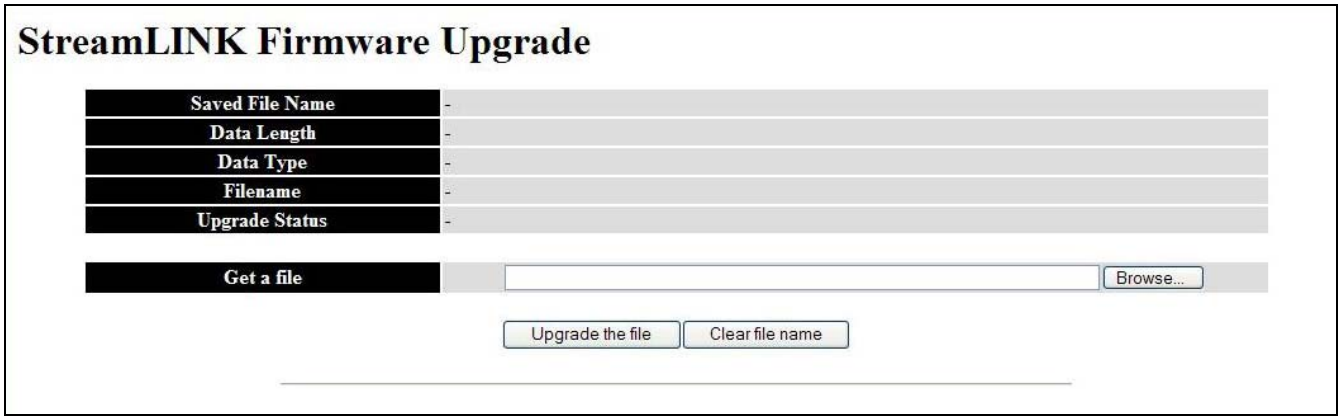


Figure 4-9: 7700DA4-SLKE Firmware Upgrade

5. STATUS LEDS

The 7700DA4-SLKE has six LED Status indicators on the front card edge to show operational status of the card at a glance.

Two large LEDs on the front of the board indicate the general health of the module.

LOCAL FAULT: This Red LED indicates poor module health and will be On during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health. It will be On when a valid input signal is present, and board power is good.

The four small LEDs, located behind the four-digit display, are currently undefined.

The rotary encoder control is currently undefined.

6. *VISTA*LINK® REMOTE MONITORING/CONTROL

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 products.

2. Managed devices (such as 7700DA4-SLKE), 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 *Vista*LINK® network, see the 7700FC Frame Controller chapter.

6.2. *VISTA*LINK® MONITORED PARAMETERS

This interface is currently undefined.

This page left intentionally blank