IntelliTrak™ Systems
User Manual

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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Nov 2010
2.0	Added VANC carriage functionality, and updated drawings and descriptions Firmware version 1.0b754; VLPro Product Version 156	Sept 2011

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1. IntelliTrak™ OVERVIEW

Even the simplest of processing equipment can inadvertently introduce enough video and/or audio delay resulting in discernable lip sync error. Evertz® has solved the lip sync puzzle with IntelliTrak® which has been designed to reliably measure lip sync error within the broadcast chain.

IntelliTrak® applies Evertz® fingerprinting technology derived from the video and audio signals at any two positions in the chain and compares these fingerprints within the VistaLINK® Network Management software to accurately report the detected lip sync error. Unlike other solutions on the market, IntelliTrak® does not inject any noise or watermarking into the signal, thereby offering a fully non-instrusive solution to be used on real signals in real time.

This award winning solution supports many different video formats including SD, HD, 3G and audio formats including multichannel PCM and Dolby encoded audio. These technologies can be integrated with many Evertz® products, thereby offering the most flexibility and increasing the return on investment. IntelliTrak® is VistaLINK® capable, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) providing the flexibility to manage operations, including signal monitoring and module configuration from SNMP capable control systems (Manager or NMS).

1.1. SYSTEM DESCRIPTION

IntelliTrak™ technology resides on 7800IDA8-3G modules with the +IT option. Figure 1-1 shows a simple setup of an IntelliTrak™ system. The 7800IDA8-3G+IT receives the video signal with embedded audio, analyzes it and creates a 'signature' or 'fingerprint' of the data, which it then streams (via the 7700FC) to a VistaLINK® server. It streams via UDP on port 5003, and consists of a very small amount of data (approximately 100 bytes every two seconds). VistaLINK® Pro then takes the data from any two points, and calculates the lip sync value between them. This value is stored in the server, and can be graphed, displayed on a VLPro page, or exported to a text file for further analysis and processing.

In cases where IP data transport is not possible (such as a remote facility or truck), the IntelliTrak data packet can be embedded in the VANC of the first card, and de-embedded and sent to the VistaLINK server by the second card. This is shown in Figure XXX. The VANC packet and be set with a custom DID, SDID and line number to allow for maximum flexibility.

<u>**Minimum Equipment Needed:**</u>

The following list outlines the minimum requirements:
- VLPro Server and Client (version 10.6 or above)
- One frame with a 7700FC frame controller and two 7800IDA8-3G+IT modules
- Live signal with moving video and audio
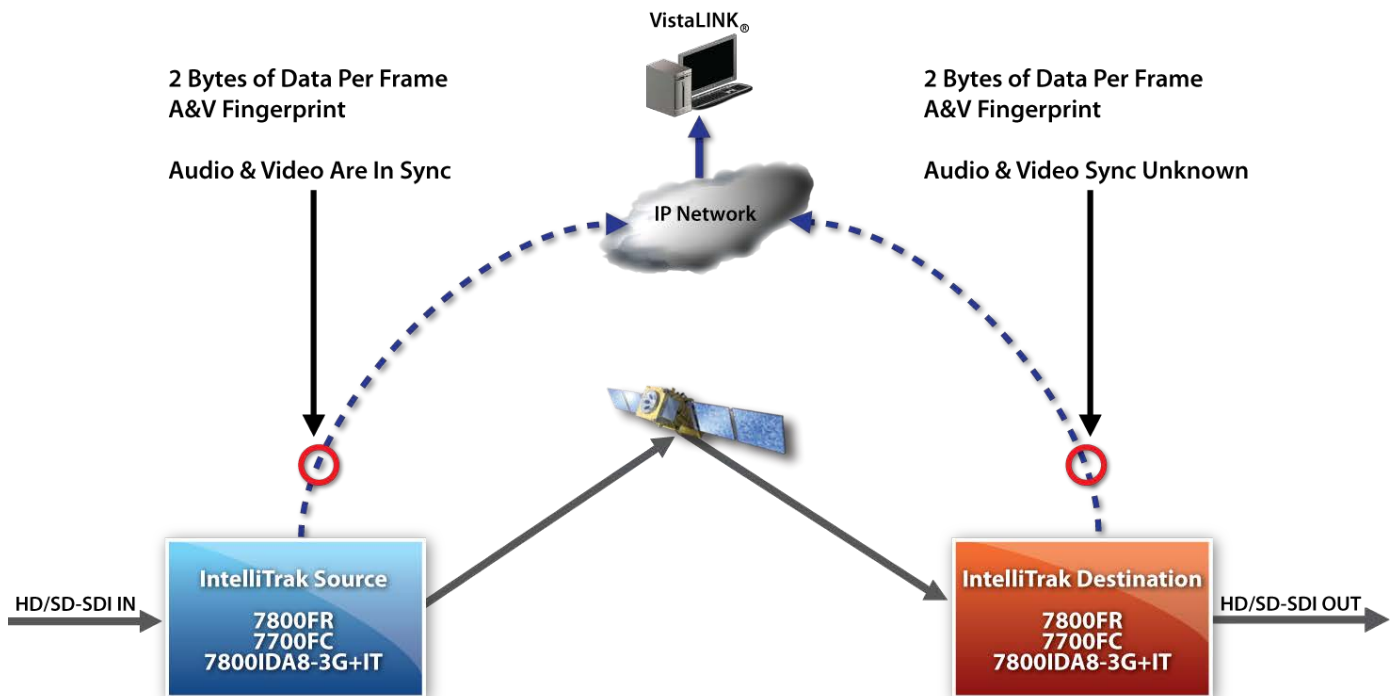
Figure 1-1: IntelliTrak™ System Diagram – Source IP Delivery
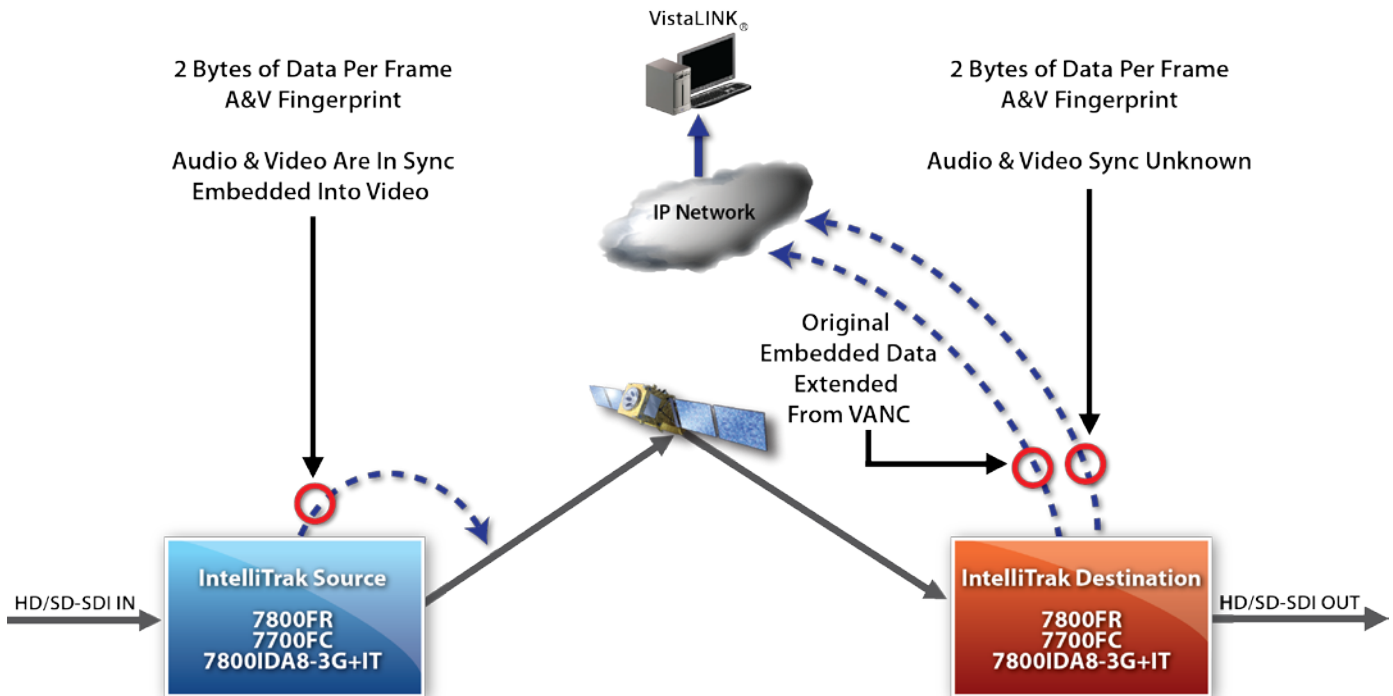
Figure 1-2: IntelliTrak™ System Diagram – Source VANC Delivery

2. SPECIFICATIONS

Video: 525i, 720p and 1080i at 59.94 Hz
              625i, 720p and 1080 at 50 Hz

Audio: Up to three channels of audio (usually L, R and C)
              PCM, Dolby AC3-E or Dolby E
              (must be the same format at both measurement points)

Delay: Can track lip sync with up to 10 seconds of latency between the signals

3. IntelliTrak™ SETUP

3.1. INITIAL VISTALINK SETUP

1. Open VLPro Server and Client version (minimum of version 10.6).

2. In the VLPro Client, go to the 'Tree' menu and select 'Properties'. In the 'Tree Properties' window, ensure there is a checkmark beside the 'Data Store' node (as shown below in Figure 3-1).

Figure 3-1: Tree Properties

3. In the VLPro navigation window, ensure that the 7800IDA8-3G+IT modules are displayed under the IP address of the frame controller for which frame they are in.

3.2. SOURCE CARD INTELLITRAK DELIVERY OVER IP

This method describes how to set up IntelliTrak when the source 7800IDA8-3G+IT module is delivering its IntelliTrak data to the VistaLINK server over IP. If the source does not have an IP connection available to the VistaLINK server, then it must be delivered through a VANC packet and the method described in section 3.3 must be used.

1. Open the configuration of the first 7800IDA8-3G, and go to the 'IntelliTrak™ Configuration' page (as shown below in Figure 3-2).
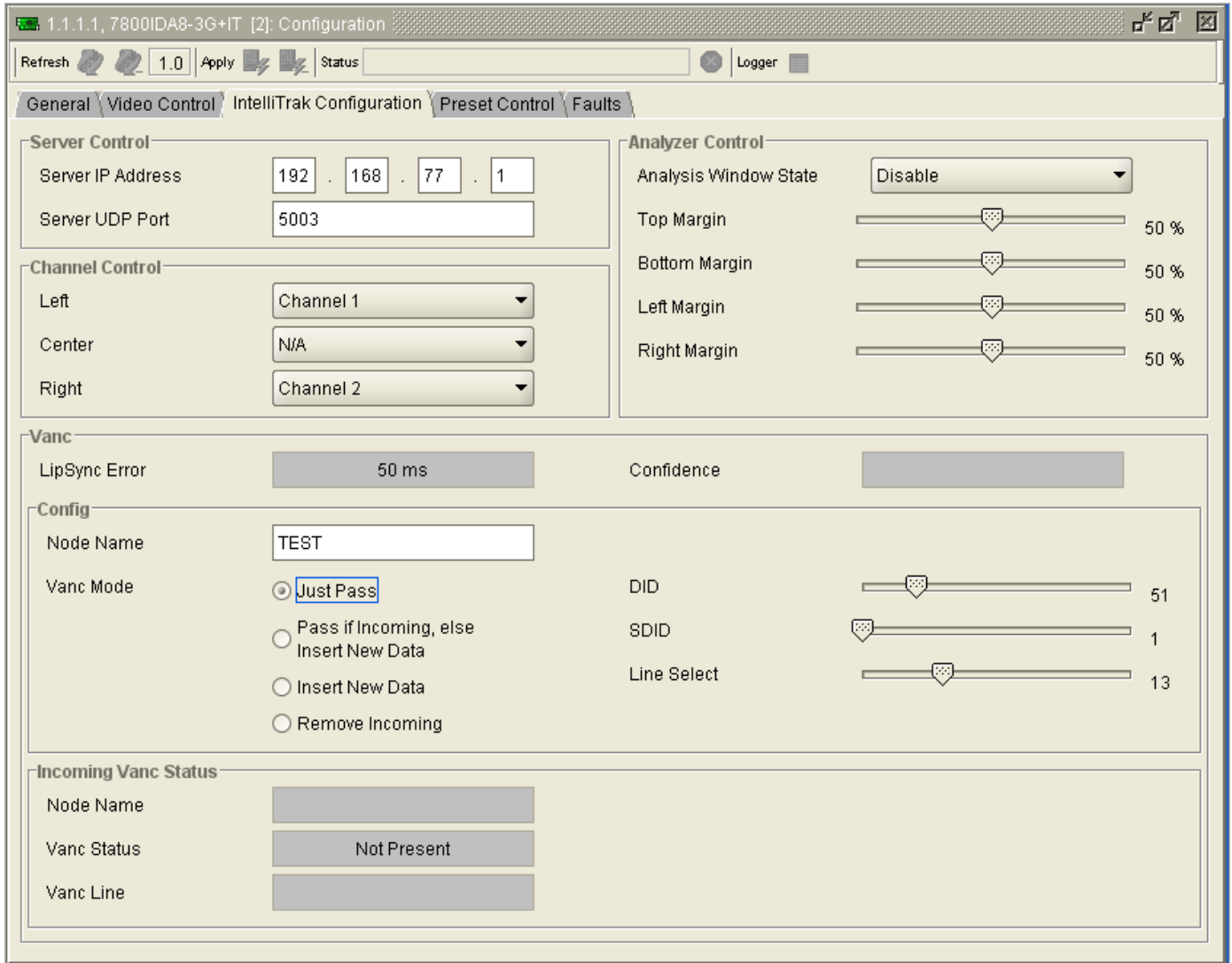

Figure 3-2: IntelliTrak™ Configuration Tab

2. In the 'Server IP Address' fields, enter the IP address of the VLPro Server.

3. Under 'Channel Control', select the audio channels that you wish to monitor.

4. Apply the changes and close the configuration view.

5. Open the second 7800IDA8-3G+IT, and repeat steps 4 to 7.

6. Under the Navigation Tree, right-click on the Data Store item and select 'New' (as shown below in Figure 3-3).
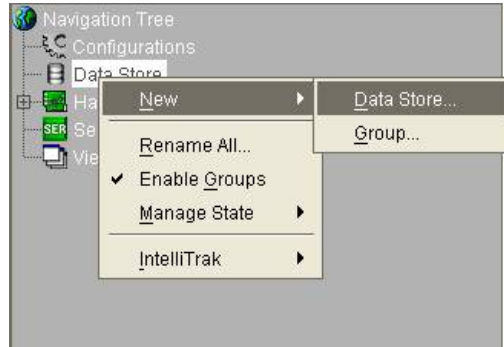

Figure 3-3: Navigation Tree

7. When the 'Data Store' window appears, select 'IntelliTrak' as the **Data Store Type**. There is a 'Source' and 'Destination' box under the IntelliTrak Hardware section (as shown below in Figure 3-5). In the Hardware tree, click and drag the 'Local IT' node (see Figure 3-5) from the first 7800IDA8-3G+IT into the 'Source Box' and then click and drag the 'Local IT' node from the second 7800IDA8-3G+IT into the 'Destination Box'. Select 'Save', and then 'Close'.
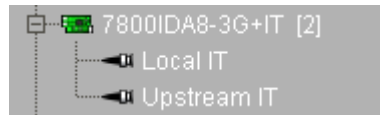

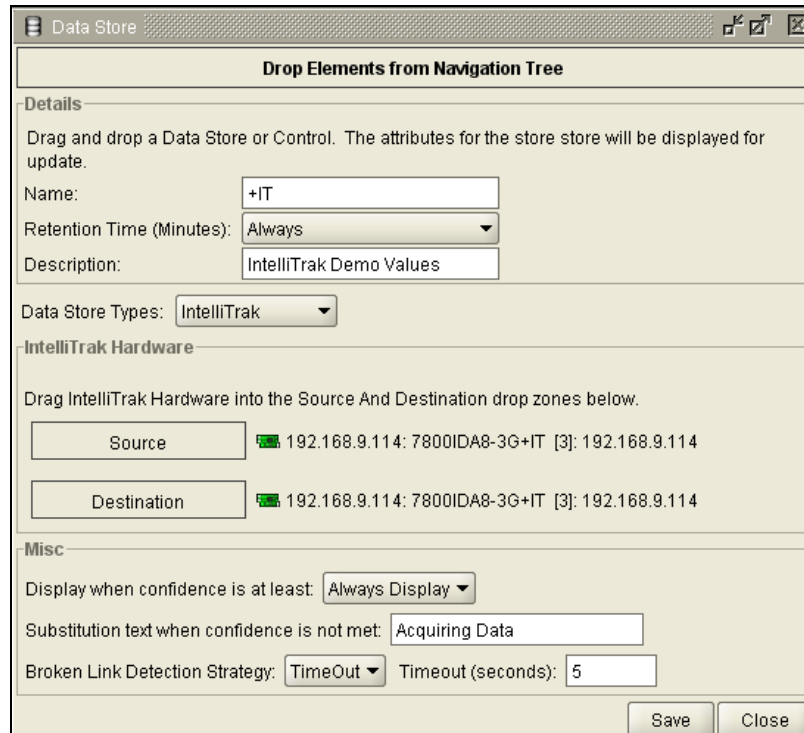**Figure 3-4: 7800IDA8-3G+IT Hardware Nodes**

Figure 3-5: Data Store

8. Under the Navigation Tree, right-click on the item +IT, and select 'View' (as shown below in Figure 3-6). Data collected by IntelliTrak™ will be shown here. The lip sync value is given first, in milliseconds, followed by a 'confidence measurement' which is given in brackets.

Date	Time	Value
2009-09-23	11:47:30	33.1 ms (9)
2009-09-23	11:47:28	33.1 ms (9)
2009-09-23	11:47:26	33.1 ms (9)
2009-09-23	11:47:24	33.1 ms (8)
2009-09-23	11:47:22	33.1 ms (7)
2009-09-23	11:47:20	33.1 ms (6)
2009-09-23	11:47:18	33.1 ms (5)
2009-09-23	11:47:16	33.1 ms (4)
2009-09-23	11:47:14	33.0 ms (3)
2009-09-23	11:47:12	33.0 ms (2)
2009-09-23	11:47:10	33.0 ms (1)
2009-09-23	11:47:08	33.0 ms (0)
2009-09-23	11:47:06	33.0 ms (1)

Data Store — Drop Data Stores from Navigation Tree — +IT

Date Range — Start: Unbound — End: Unbound — Reset

Viewed/Total Records: 159 — Max Viewed: 200 — Export...

Close

Figure 3-6: Collected Data

3.3. SOURCE CARD INTELLITRAK DELIVERY OVER VANC

This method describes how to setup IntelliTrak when the source 7800IDA8-3G+IT module is delivering its IntelliTrak data to the VistaLINK server over VANC. This method is used if the source does not have an IP connection available to the VistaLINK server, or in other circumstances (such as storing the video content and IntelliTrak data to a server for future playout).

1. Open the configuration of the first 7800IDA8-3G, and go to the 'IntelliTrak™ Configuration' page (as shown below in Figure 3-7).
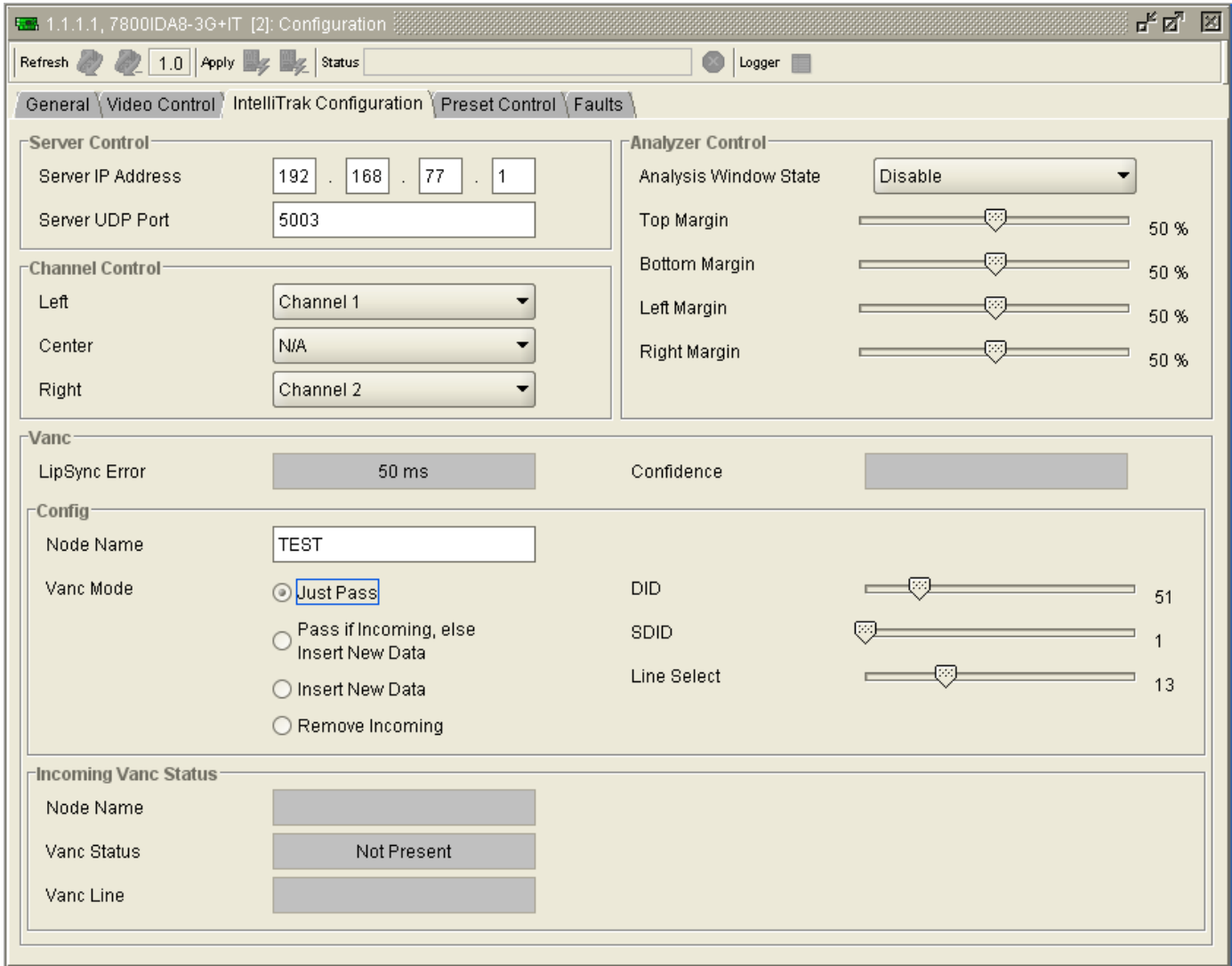

Figure 3-7: IntelliTrak™ Configuration Tab

2. Under 'Channel Control', select the audio channels that you wish to monitor.

3. Under 'Node Name', give a descriptive name for this card (i.e. 'PLAYOUT1').

4. Set the 'DID', 'SDID' and 'Line Select' to a desired combination. Please Note: This may depend on transmission equipment downstream (such as encoders, decoders etc).

5. Set the VANC mode to a desired operation. This is usually 'Insert New Data', however, it can be one of the other operations depending on the complexity of the system.

6. Apply the changes and close the configuration view.

7. Open the second 7800IDA8-3G+IT, and repeat steps 2, 4 and 5.

8. In the 'Server IP Address' fields, enter the IP address of the VLPro Server.

9. Apply the changes and close the configuration view.

10. Under the Navigation Tree, right-click on the Data Store item and select 'New' (as shown below in Figure 3-8).
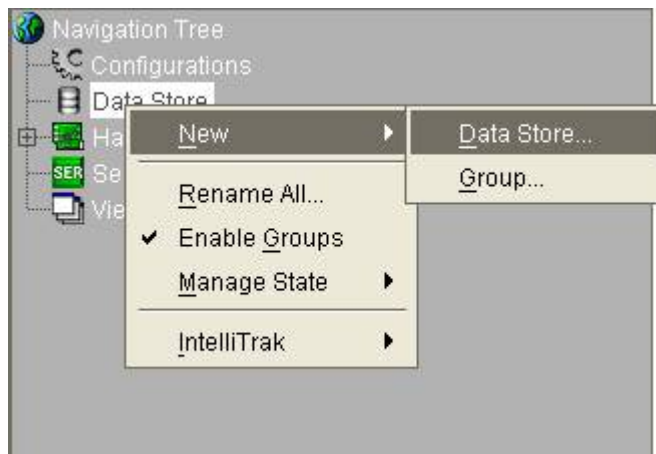

Figure 3-8: Navigation Tree

11. When the 'Data Store' window appears, select 'IntelliTrak' as the **Data Store Type**. There is a 'Source' and 'Destination' box under the IntelliTrak Hardware section (as shown below in Figure 3-9). In the Hardware tree, click and drag the 'Upstream IT' node (see Figure 3-9) from the second 7800IDA8-3G+IT into the 'Source Box' and then click and drag the 'Local IT' node from the second 7800IDA8-3G+IT into the 'Destination Box'. Select 'Save', and then 'Close'.
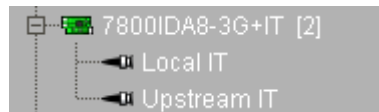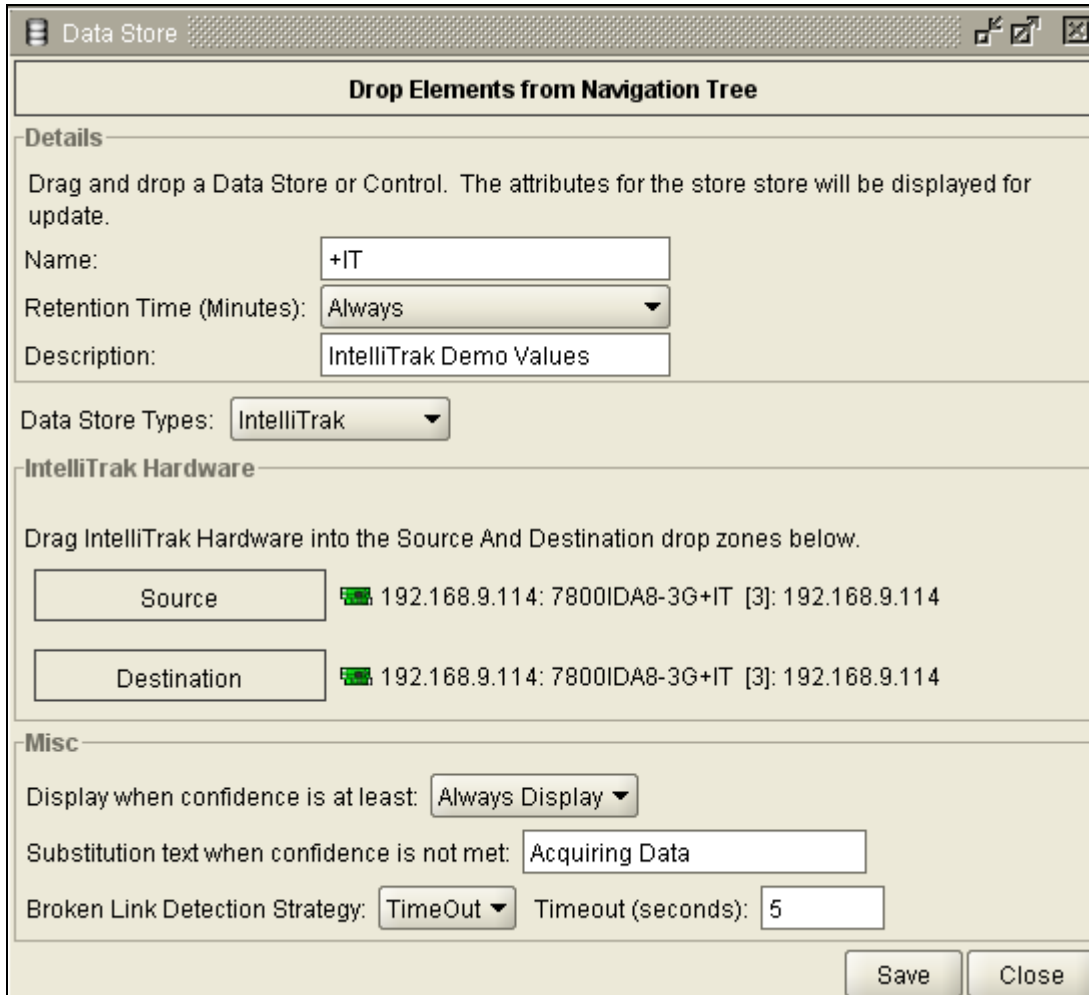

Figure 3-9: 7800IDA8-3G+IT Hardware Nodes

Figure 3-10: Data Store

12. Under the Navigation Tree, right-click on the item +IT, and select 'View' (as shown below in Figure 3-11). Data collected by IntelliTrak™ will be shown here. The lip sync value is given first, in milliseconds, followed by a 'confidence measurement' which is given in brackets.

Date	Time	Value
2009-09-23	11:47:30	33.1 ms (9)
2009-09-23	11:47:28	33.1 ms (9)
2009-09-23	11:47:26	33.1 ms (9)
2009-09-23	11:47:24	33.1 ms (8)
2009-09-23	11:47:22	33.1 ms (7)
2009-09-23	11:47:20	33.1 ms (6)
2009-09-23	11:47:18	33.1 ms (5)
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2009-09-23	11:47:12	33.0 ms (2)
2009-09-23	11:47:10	33.0 ms (1)
2009-09-23	11:47:08	33.0 ms (0)
2009-09-23	11:47:06	33.0 ms (1)

Date Range

Start: Unbound [...] End: Unbound [...] [Reset]

Viewed/Total Records: [159] Max Viewed: [200] [Export...]

[Close]

Figure 3-11: Collected Data

3.4. TIPS AND TRICKS

The **Data Store** will log values of lipsync measurements between two 7800IDA8-3G+IT modules. The Data Store can be linked to a graph on the Graphics View, and will graph the measurements over-time.

The confidence measurement is from 0-9, with 0 being no confidence and 9 being full confidence. This gives an indication of how accurate the lipsync measurement is. If the value is low, this is due to a recent video or audio change, or the video and/or audio being affected by processing (mpeg compression/decompression, Dolby encode/decode etc). A confidence threshold can be set In the Data Store setup,

The content needs to be real video and audio. Test pattern and tones will not work with the system. If you apply these, you will see either a confidence of zero or unpredictable results.

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