Using Embedded Group Control in NV8500 Routers

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Summary

This document describes embedded group control, and its use, in NV8500 routers under a NV9000 family control system configured with NV9000-SE Utilities.

This document presents specific tasks to perform when you are configuring the router (in MRC), general guidelines for configuring the NV9000 system (in NV9000-SE Utilities), and instructions for operators using NV96xx control panels.

Introduction

SDI video signals can carry up to 16 audio channels. We say the channels are *embedded* in the video. The channels are organized into 4 groups of 4 channels each.

An NV8500 router can force embedded audio channels to be null at output. If all 4 channels of an embedded audio group are null, the group is null too. That is,

If a single channel is null, the output's embedder inserts silence for that channel.

If all 4 channels of an audio group are null, the embedder will omit the group from its outgoing data stream.

Routing null sources to an output is under operator control (or under control of automation).

Three conditions are required for the router to be able to do this:

- In MRC, you must define a "null audio source" for the router's synchronous audio level.
- The NV9000 configuration must define sources and destinations with 17 levels (video plus 16 audio channels) and must, in other aspects, support audio breakaway and destination locks on selected audio levels.
- An operator must perform takes of the designated null source to the selected audio channels of the intended destination.

The "null audio source" can be any of the inputs in a synchronous audio partition of the router. It is advisable to use either a port number of one of a disembedder card's unused video ports (one where the video port number is a multiple of 9) or a port in an input slot having no input card.

A port designated as the "null audio source" cannot also be used as a normal audio source.

Theory

Under normal circumstances, an output card's embedder will detect whether there is audio present on each of its 16 audio inputs and will emit silence for individual channels that have no audio. EGC (embedded group control) is not required for this.

EGC is a requirement if the router is to omit embedder groups from output. The router's control card examines, at each take, which audio channels use the null source, and causes the output card's embedder to set a bit for each null audio channel.

The control card, of itself, cannot determine whether an audio channel has no audio. Therefore, the artifice of a defined "null source" is required so that the control card can specify to the output card's embedder which of the 16 bits to set.

The embedder determines from the bits whether the 4 channels of a group are all null and if so, omits the group entirely from the output.

EGC Setup

The configuration of the NV8500 router (in MRC) must provide a null source.

The NV9000 configuration (in NV9000-SE Utilities) must define sources and destinations (and a level set) that has 1 video level and 16 audio levels.

The NV9000 system must include at least one control panel (such as the NV9601 or NV9640) that supports breakaway.

In MRC

The configuration of the NV8500 router (in MRC) must provide a null source.

▲ The router must have at least one disembedder (input) card and at least one embedder (output) card.

Follow these guidelines:

1 Choose a non-existent audio port that will be the "null" source.

This can be one of the audio ports on the 9th connector of a disembedder card. Or it can be an audio port of any empty input slot (that is designated a disembedder slot in MRC.) Note that unspecified slots in MRC are treated as if they were standard card slots. You must not use a standard card slot.

2 Go to the router levels page.

In the natural course of configuring the router, you will have defined a 'Synchronous Audio' level.

Enter the audio port number for the null source in the null source field of this level.

▲ The null source must be in the range of the *controller* inputs. The controller inputs might or might not be the same as the physical inputs.

In NV9000-SE Utilities

The NV9000 configuration (in NV9000-SE Utilities) must define sources and destinations (and a level set) that has 1 video level and 16 audio levels.

Follow these guidelines:

1 Define the router, specifying its video and audio partitions (physical levels).

2 Define virtual levels for the 16 embedded audio channels.

3 Define a level set that includes a video level and the 16 audio levels.

4 Define source and destination devices that include those levels.

Among the sources defined will be the null source.

5 Define panel configurations that allow viewing and selection and deselection of 16 audio levels.

At Control Panels

▲ The name of the null source port must be conveyed to panel operators.

The NV9000 system must include at least one control panel (such as the NV9601 or NV9640) that supports breakaway.

To route the null audio source to individual output audio channels.

1 Select the destination. Select a source or sources for the non-null audio.

2 Select just the audio channels that are to receive the null audio.

3 Select the null source for those channels.

Caveats

The use of embedded group control is not compatible with DHP.

The null source must be a disembedder source. The null source should also be a non-existent source.

If a null source is routed to a MADI output, the take is rejected.

The null source must exist within the 'Synchronous Audio' partition boundary.

The null source port number is referenced by operators as the "logical" port number (or the *controller* port number as it is called in MRC). This is particularly important when partitions are 0-based.

Only NV8500 family routers (at firmware version 3.1.2 or later) support embedded group control.

Router levels that are not 'Synchronous Audio' do not support null audio sources.