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HDCC-200A (OP-47/WST) Multi-Function Card

Multi-Purpose Closed Caption Card: Inserter, Decoder, Bridger, Monitor, and Transcoder

Applications Guide

Software Version: V2.34
PIC Code Version: V1.09

Part Number 821048, Revision A

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Customer Support

Wohler Technologies, Inc.
31055 Huntwood Avenue
Hayward, CA 94544
www.wohler.com

Phone: 510-870-0810
FAX: 510-870-0811
US Toll Free: 1-888-596-4537
(1-888-5-WOHLER)
Web: www.wohler.com
Sales: sales@wohler.com
Support: support@wohler.com

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Last Update

January 11, 2011

Applications

Introduction

Overview

This chapter describes how to use both channels of the HDCC-200A for the same function, as well as to use multiple functions simultaneously.

Topics

Switch Interrelationships

As discussed in Chapter 1 (Table 1–1 on page 19 in particular) you will typcially use SW1 for encoding and decoding and SW2 for transcoding. However, you may want to use your HDCC-200A to do multiple (different) tasks simultaneously or, the same task on both channels simultaneously. And since the HDCC-200A is a two-channel card, it's only a matter of setting both of the switches to their correct values. Table 5–1 on page 93 (end of this chapter) summarizes the relationship between the two switches.

Important: This chapter assumes that you have downloaded and installed both the Newfor Test and the Calisto Lite applications. If not, refer to Chapter 3 on page 49 and Chapter 4 on page 63 respectively, to download and insrall these applications before continuing on with this chapter.

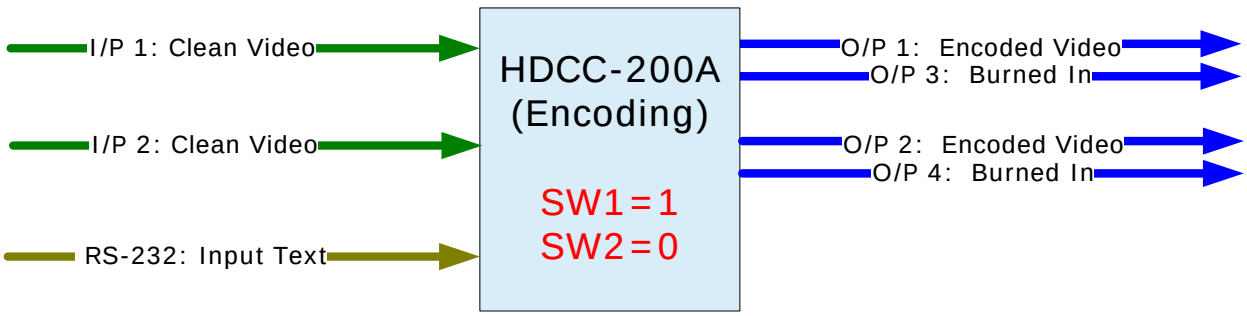
Multi-Channel Encoding

Not only can you encode both channels simultaneously, you can also *replace* existing closed captions on a video stream with new ones using the HDCC-200A card.

Encoding Both Channels from One Text Source

This example is similar to the one in Encoding Only on page 19; but here we have added the second channel.

Figure 5–1 Multi-Channel Encoding - One Source



Example: This example demonstrates the single-source mult-channel encoding feature.

I/P 1: Input clean video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream.

O/P 2: (Optional) Connect output for encoded video stream.

O/P 3: Monitor the burned-in caption text.

O/P 4: Monitor the burned-in caption text.

Serial: Input closed caption text.

Ethernet: N/A

1. Connect clean video sources to I/P 1 and to I/P 2.
2. (Optional) Connect output cables to O/P 1 and O/P 2.
3. Connect your monitors to O/P 3 and O/P 4.
4. Connect a data source for closed captioned text to the serial port.
5. Set SW 1 to 1.
6. Set SW 2 to 0.
7. Launch the Newfor Test application and verify you are using the correct baud rate and com port to communicate with the HDCC-200A card.
8. Type your test text into the Newfor Test text area, and press **Start Sequence**.

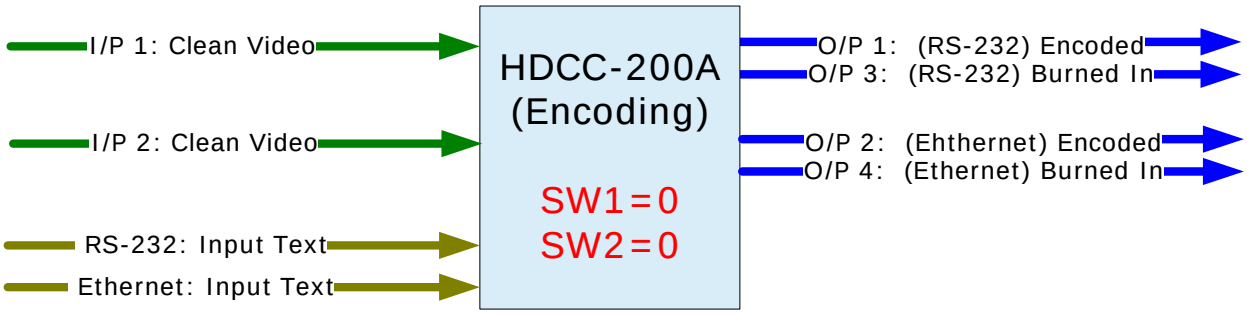
Once the HDCC-200A card auto-detects both the video streams and the closed caption text coming in from the serial port, it will begin to encode the video streams and then send the composite (encoded) data streams to O/P 1 and O/P 2 and the burned-in data streams to O/P 3 and O/P 4.

Note that because both video streams are encoded with the same source text, both of the monitors (each connected to a different O/P connector) will display identical content.

Encoding Each Channel from Separate Text Sources

This example is similar to the one in Encoding Only on page 19; but here we have added the second channel.

Figure 5–2 Multi-Channel Encoding - Two Sources



Example: This example demonstrates the single-source mult-channel encoding feature.

I/P 1: Input clean video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream.

O/P 2: (Optional) Connect output for encoded video stream.

O/P 3: Monitor the burned-in caption text.

O/P 4: Monitor the burned-in caption text.

Serial: Input closed caption text.

Ethernet: Input closed caption text, (preferably different from that on the serial port).

1. Connect clean video sources to I/P 1 and I/P 2.
2. (Optional) Connect output cables to O/P 1 and O/P 2.
3. Connect your monitors to O/P 3 and O/P 4.
4. Connect a different data source to the Ethernet port.

   Note: To use the Ethernet port as a virtual serial port, refer to Appendix B: Creating a Virtual Serial Connection on page 121 to download, install, and configure the Ethernet connectivity application.

5. Connect a data source for closed captioned text to the serial port.

6. Set SW 1 to 0.

7. Set SW 2 to 0.

8. Launch the Newfor Test application and verify you are using the correct baud rate and com port to communicate with the HDCC-200A card.

   Note: If your PC or laptop has both a serial and an Ethernet port, you can launch a second instance of the Newfor Test application on the same computer.

9. Type your test text into the first Newfor Test text area and press **Start Sequence**.

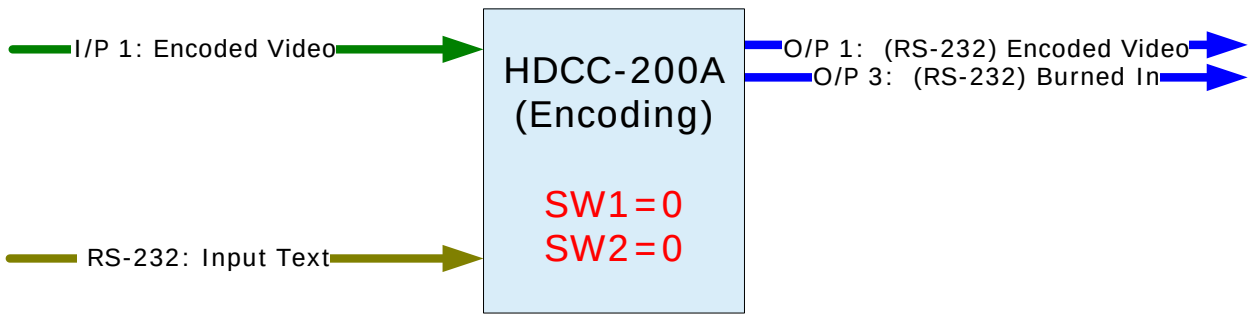
10. Type some different text into the second Newfor Test text area and press **Start Sequence**.

Once the HDCC-200A card auto-detects both the video streams and the closed caption text inputs, it will begin to encode I/P 1 with the text coming from the serial port, and I/P 2 with the text coming from the Ethernet (virtual serial) port. O/P 3 will display the burned-in data stream from I/P 1 and O/P 4 will display the burned-in data stream from I/P 2. Note that because both video streams are encoded with different text sources, the monitors should display different content.

Replacing Captions

Using the encoding function of the HDCC-200A, you can also *replace* the existing captions on a video stream with captions from a new text source.

Figure 5–3 Replacing Existing Captions



Example: This simple example demonstrates the replacement feature.

I/P 1: Input embedded video stream.

I/P 2: NC

O/P 1: (Optional) Connect output for encoded video stream.

O/P 2: NC

O/P 3: Monitor the burned-in caption text.

O/P 4: NC

Serial: Input closed caption text.

Ethernet: NC

1. Connect an encoded (text-embedded) video source to I/P 1.
2. (Optional) Connect an output cable to O/P 1.
3. Connect your monitor to O/P 3.
4. Connect a data source for closed captioned text to the serial port.
5. Set SW 1 to 0.
6. Set SW 2 to 0.
7. Launch the Newfor Test application and verify you are using the correct baud rate and com port to communicate with the HDCC-200A card.
8. Type your test text into the Newfor Test text area, and then click **Start Sequence**.

Once the HDCC-200A card auto-detects both the video stream and the closed caption text, it will begin to remove the existing captions from the video stream and then replace them with the text from the source connected to the serial port. The new composite (encoded) data stream will appear on O/P 1 and the burned-in data stream will appear on O/P 3.

You can also perform this function with both channels by attaching another encoded video stream to I/P 2, and using either the same source from the serial port, or a different source from the Ethernet port to replace the I/P 2 captions.

Multi-Channel Decoding

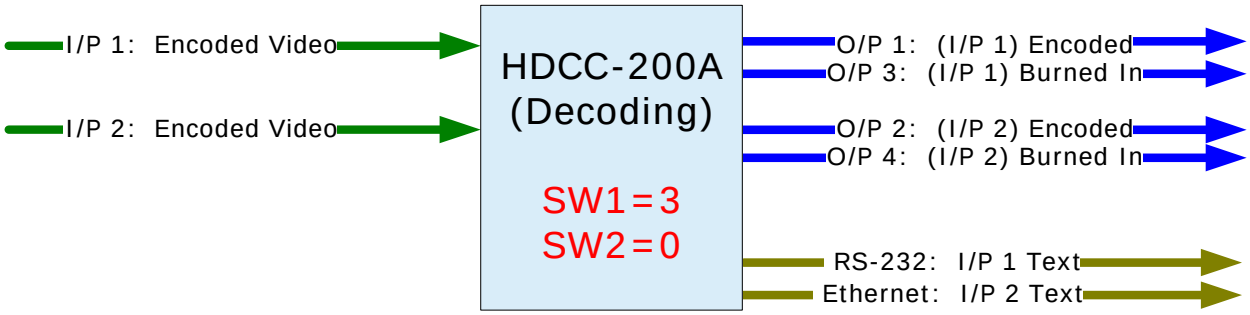
Because the HDCC-200A is a true, dual-channel card, it can simultaneously decode both channels.

Decoding Both Channels to One Port

While the HDCC-200A cannot decode both channels to a single port (either the Ethernet port or the serial port) you can display the text data from each input on O/P 3 and O/P 4 if you have them connected to video monitors.

Decoding Each Channel to Different Ports

Figure 5–4 Multi-Channel Decoding - Different Analyzers



Example: This example demonstrates decoding on both channels.

I/P 1: Input embedded video stream.

I/P 2: Input embedded video stream.

O/P 1: (Optional) Connect output for encoded video stream (I/P 1).

O/P 2: (Optional) Connect output for encoded video stream (I/P 2).

O/P 3: Monitor the burned-in caption text from I/P 1.

O/P 4: Monitor the burned-in caption text from I/P 2.

Serial: *Receive* closed caption text from I/P 1.

Ethernet: *Receive* closed caption text from I/P 2.

1. Connect a clean video source to I/P 1.
2. (Optional) Connect the output cable to O/P 1.
3. Connect your monitor to O/P 3.
4. Connect your second monitor to O/P 4.
5. Connect a data source for closed captioned text to the RS-232 port.
6. Connect a second data source to the Ethernet port.
7. Set SW 1 to 3.
8. Set SW 2 to 0.
9. Launch the Calisto Lite application and verify you are using the correct baud rate (3.4k) and com port to communicate with the HDCC-200A card.

   Note: If your PC or laptop has both a serial and an Ethernet port, you can launch two instances of Calisto Lite to view the decoded text from each port.

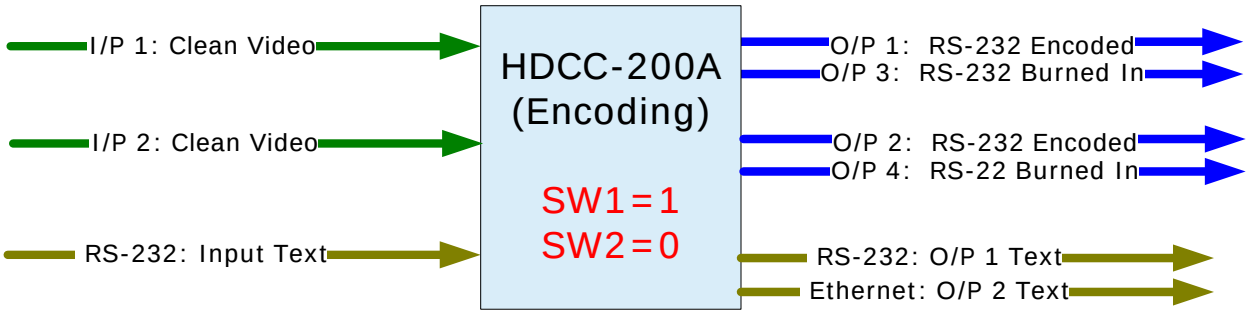
Once the HDCC-200A card auto-detects both the video streams, it will begin to copy the existing captions from the video stream on I/P 1 and then send them to the source connected to the serial port. Likewise, the text from I/P 2 will appear on the Ethernet port.

Multi-Channel Encoding and Decoding

Because the HDCC-200A is a true, dual-channel card, it can simultaneously encode and decode one or both channels.

Encoding Both Channels from One Source and Decoding Both Channels to Separate Ports

Figure 5–5 Encoding and Decoding - One Text Source



Important: For all SW 1 values that support encoding and decoding on the same port (either serial or virtual serial) you must remember to set the baud rate for your laptop application to 38.4k baud.

Example: This example demonstrates both the multi-channel and multi-function use of the HDCC-200A.

I/P 1: Input clean video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream (I/P 1).

O/P 2: (Optional) Connect output for encoded video stream (I/P 2).

O/P 3: Monitor the burned-in caption text from I/P 1.

O/P 4: Monitor the burned-in caption text from I/P 2.

Serial: Send closed caption text to I/P 1 and
Receive closed caption text from I/P 1.

Ethernet: Receive closed caption text from I/P 2.

1. Connect clean video sources to I/P 1 and I/P 2.
2. (Optional) Connect output cablesto O/P 1 and O/P 2.
3. Connect your monitors to O/P 3 and O/P 4.
4. Connect a data source for closed captioned text to the RS-232 port.

Note: To use the Ethernet port as a virtual serial port, refer to Appendix B: Creating a Virtual Serial Connection on page 121 to download, install, and configure the Ethernet connectivity application, if you have not already done so.

5. Set SW 1 to 3.
6. Set SW 2 to 0.
7. Launch the Newfor Test application and verify that you have connected to the HDCC-200A using the correct com port at the correct baud rate.
8. Type your sample text in the text area of the application, and press the **Start Sequence**.
9. Launch the Calisto Lite application and verify you are using the correct baud rate (3.4k) and com port to communicate with the HDCC-200A card.

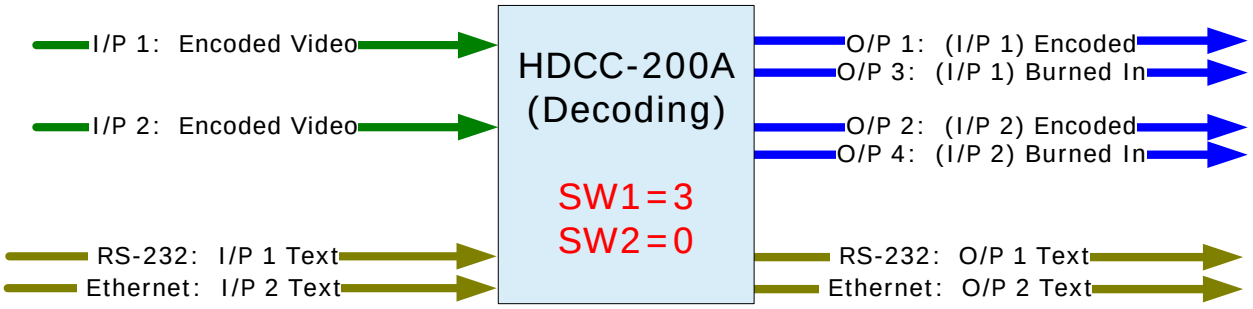
   Note: If your PC or laptop has both a serial and an Ethernet port, you can launch two instances of Calisto Lite to view the decoded text from each port.

Once the HDCC-200A card auto-detects both the video stream and the closed caption text, it will begin to encode the video and then send the composite data stream to O/P 1 and O/P 2 and the burned in video to O/P 3 and O/P 4. The serial port will operate in both directions: input to the serial port will be encoded as closed caption data; output from the serial port will show closed caption data decoded from the output.

Encoding Each Channel from Separate Sources and Decoding Both Channels to Separate Ports

In this example, we've added another closed captioned text source for I/P 2.

Figure 5–6 Encoding and Decoding - Two Text Sources



Important: For all SW 1 values that support encoding and decoding on the same port (either serial or virtual serial) you must remember to set the baud rate for your laptop application to 38.4k baud.

Example: This simple example demonstrates the encoding and the decoding features.

I/P 1: Input clean video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream (I/P 1).

O/P 2: (Optional) Connect output for encoded video stream (I/P 2).

O/P 3: Monitor the burned-in caption text from I/P 1.

O/P 4: Monitor the burned-in caption text from I/P 2.

Serial: Send closed caption text to I/P 1 and
Receive closed caption text from I/P 1.

Ethernet: Send closed caption text to I/P 1 and
Receive closed caption text from I/P 1.

1. Connect clean video sources to I/P 1 and I/P 2.
2. (Optional) Connect output cables to O/P 1 and O/P 2.
3. Connect your monitors to O/P 3 and O/P 4.
4. Connect a data source for closed captioned text to the Ethernet port.
5. Connect a data source for closed captioned text to the RS-232 port.
6. Set SW 1 to 3.

7. Set SW 2 to 0.

8. Launch the Newfor Test application and verify that you have connected to the HDCC-200A using the correct com port at the correct baud rate.

9. Type your sample text in the text area of the application, and press the **Start Sequence**.

10. Launch the Calisto Lite application and verify you are using the correct baud rate (3.4k) and com port to communicate with the HDCC-200A card.

    Note: If your PC or laptop has both a serial and an Ethernet port, you can launch two instances of Calisto Lite to view the decoded text from each port.

Once the HDCC-200A card auto-detects both the video stream and the closed caption text, it will begin to encode the video and then send the composite data stream to O/P 1 and the burned in video to O/P 3. The serial port will operate in both directions: input to the serial port will be encoded as closed caption data; output from the serial port will show closed caption data decoded from the output. When operating a single channel, the input and output data of the serial port will be identical. See Multi-Channel Decoding on page 83 for more information.

Transcoding Multi-Functions

Transcoding and Decoding

Note: It is not necessary to match the resolutions and/or refresh rates when using multiple inputs, with one exception: when transcoding, the target video stream must match or be faster than the source video stream. For example, you can transcode from a HD-50Hz to a HD-60Hz signal but not the other way around.

Just as you can encode and decode simultaneously, you can also decode while transcoding. During transcoding the embedded text is copied from one video stream to another. As in decoding, the text is also output through both the Ethernet and serial ports for analysis in Callisto Lite.

Example: This simple example demonstrates the encoding and the decoding features.

I/P 1: Input encoded video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream (I/P 1).

O/P 2: (Optional) Connect output for encoded video stream (I/P 2).

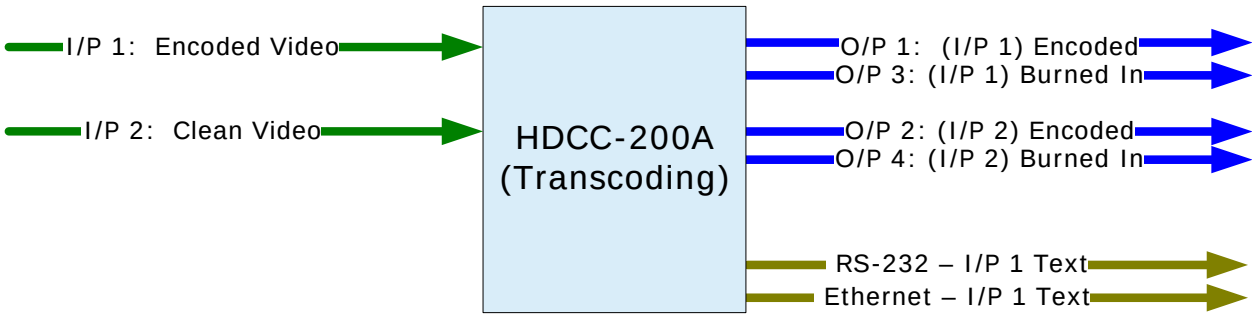
O/P 3: Monitor the burned-in caption text from I/P 1.

O/P 4: Monitor the burned-in caption text from I/P 2.

Serial: Receive closed caption text from I/P 1.

Ethernet: Receive closed caption text from I/P 2.

Figure 5–7 Transcoding and Decoding Both Channels



1. Connect the encoded video signal to I/P 1.
2. Connect the clean video signals to I/P 2.
3. (Optional) Connect the output cables to O/P 1 and O/P 2.
4. Connect monitor cables to O/P 3 and/or O/P 4.
5. Connect a data source for closed captioned text to the Ethernet port.
6. Connect a data source for closed captioned text to the RS-232 port.
7. Set SW 2 to 2.
8. Set SW 1 to A.

9. Type your sample text in the text area of the application, and press the **Start Sequence**.

10. Launch the Calisto Lite application and verify you are using the correct baud rate (3.4k) and com port to communicate with the HDCC-200A card.

Once the HDCC-200A card auto-detects both the video streams, it will begin to transcode I/P 1 to I/P 2 and then send the composite data stream to the output ports and the text from I/P 1 to the serial and the text from I/P 2 to the Ethernet port.

Interrupting Transcoding to Encode (While also Decoding)

During transcoding the embedded text is copied from one video stream to another. During a transcode session, you can set the HDCC-200A to interrupt with an encode session thereby replacing the text from the source video stream with the text from either the serial or the Ethernet ports. This feature is especially useful for emergency broadcasts during regular programming.

Figure 5–8 Transcoding to Encoding - Before

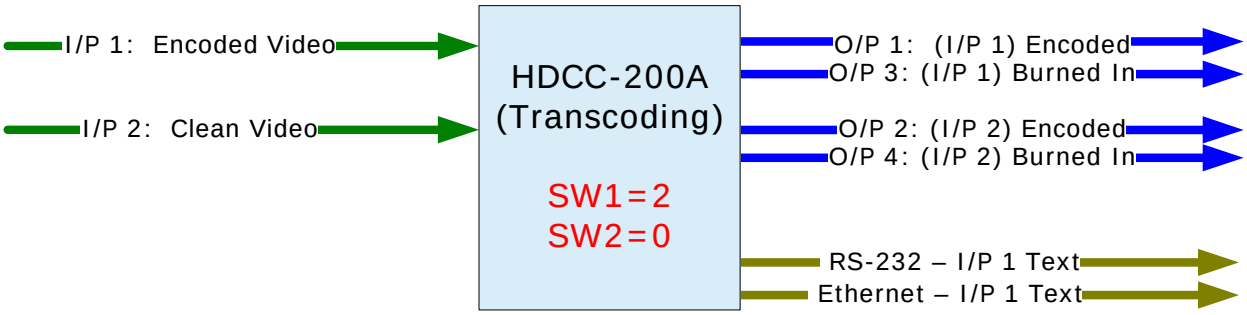
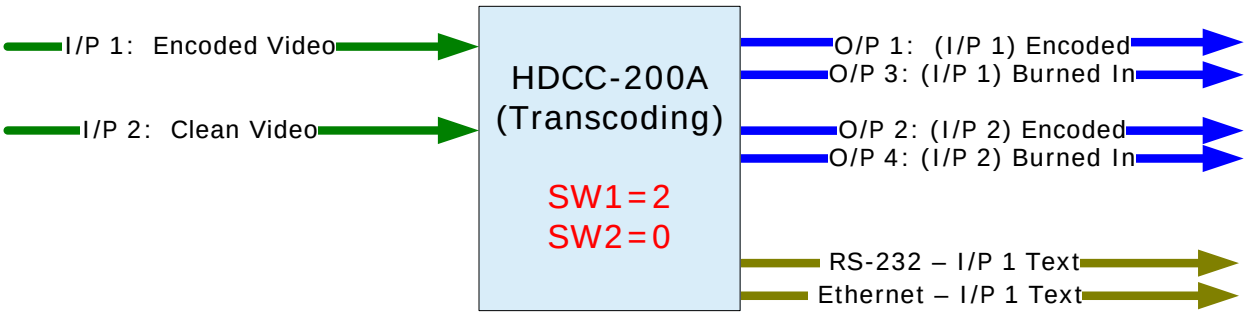


Figure 5–9 Transcoding to Encoding - After



Example: This simple example demonstrates the encoding and the decoding features.

I/P 1: Input clean video stream.

I/P 2: Input clean video stream.

O/P 1: (Optional) Connect output for encoded video stream (I/P 1).

O/P 2: (Optional) Connect output for encoded video stream (I/P 2).

O/P 3: Monitor the burned-in caption text from I/P 1.

O/P 4: Monitor the burned-in caption text from I/P 2.

Serial: Send closed caption text to I/P 1 and
Receive closed caption text from I/P 1.

Ethernet: Send closed caption text to I/P 1 and
Receive closed caption text from I/P 1.

Setting Up the Transcode

1. Connect the encoded video signal to I/P 1.
2. Connect the clean video signals to I/P 2.
3. (Optional) Connect the output cables to O/P 1 and O/P 2.
4. Connect monitor cables to O/P 3 and/or O/P 4.
5. Optional: To capture/analyze the text, connect the PC to the serial port in the adaptor.

   Note: To use the Ethernet port as a virtual serial port, refer to Appendix B: Creating a Virtual Serial Connection on page 121 to download, install, and configure the Ethernet connectivity application.

6. Set SW 2 to 2 to transcode.
7. Set SW 1 to 4.
8. Type your sample text in the text area of the application, and press the **Start Sequence**.
9. Launch the Calisto Lite application and verify you are using the correct baud rate (3.4k) and com port to communicate with the HDCC-200A card.

Note: If your PC or laptop has both a serial and an Ethernet port, you can launch two instances of Calisto Lite to view the decoded text from each port.

Once the HDCC-200A card auto-detects both the video streams, it should begin to transcode them and then send the composite data stream to the output ports and the text to the serial and Ethernet ports.

Setting Up the Encode

1. Launch the Newfor Test application and verify that you have connected to the HDCC-200A using the correct com port at the correct baud rate.

2. Type your sample text in the text area of the application, and press the **Start Sequence**.

   Note: It is not necessary to change SW1. The input text from the serial port will automatically superscede the text being transcoded from I/P 1.

3. Verify (using either the Calisto Lite application or the monitors) that the new text is appearing in the video.

4. When the encode session is complete, close the Newfor Test application to resume the transcode operation.

Multi-Function Summary

Table 5–1 on page 93 summarizes the relationships between switches when you want to decode while transcoding, and/or interrupt the transcoding with encoding. Note the video inputs (I/P 1 and I/P 2) are always configured for transcoding. The data on the outputs and on the Ethernet and serial ports is determined by the switch settings.

Table 5–1 Switch Settings for Multi-Function Use

SW2	SW1	Input Jacks		Outputs				Input		Output	
		I/P 1	I/P 2	O/P 1	O/P 2	O/P 3	O/P 4	Serial	Ethernet	Serial	Ethernet
1	0	Video + Text	Clean Video	I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	NC	
1	1			I/P 1 Video + Serial Text	I/P 2 Video + Serial Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Serial Text Burned In	Input Text to I/P 1 and I/P 2	NC		
1	2			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2		
1	3			I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	Output Text from I/P 1	Output Text from I/P 2
1	4			I/P 1 Video + Serial Text	I/P 2 Video + Serial Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Serial Text Burned In	Input Text to I/P 1 and I/P 2		Output Text from I/P 1 and I/P 2	
1	5			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2	Output Text from I/P 1 and I/P 2	
1	6			I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	Output Text from from I/P 2	
1	7			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2	Output Text from I/P 1	

Table 5–1 Switch Settings for Multi-Function Use

SW2	SW1	Input Jacks		Outputs				Input		Output	
		I/P 1	I/P 2	O/P 1	O/P 2	O/P 3	O/P 4	Serial	Ethernet	Serial	Ethernet
1	8	Video + Text	Clean Video	I/P 1 Video + I/P 2 Text	I/P 2 Video + Original Text	I/P 1 Video + I/P 2 Text Burned In	I/P 2 Video + Original Text Burned In	NC		Output Text from I/P 2	
1	9			I/P 1 Video + I/P 2 Text	I/P 2 Video + Original Text	I/P 1 Video + I/P 2 Text Burned In	I/P 2 Video + Original Text Burned In			Output Text from I/P 1	
2	0	Video + Text	Clean Video	I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	NC	
2	1			I/P 1 Video + Serial Text	I/P 2 Video + Serial Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Serial Text Burned In	Input Text to I/P 1 and I/P 2	NC		
2	2			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2		
2	3			I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	Output Text from I/P 1	I/P 1 Video + Serial Text
2	4			I/P 1 Video + Serial Text	I/P 2 Video + Serial Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Serial Text Burned In	Input Text to I/P 1 and I/P 2		Output Text from I/P 1 and I/P 2	I/P 1 Video + Serial Text
2	5			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2	Output Text from I/P 1 and I/P 2	I/P 1 Video + Ethernet Text

Table 5–1 Switch Settings for Multi-Function Use

SW2	SW1	Input Jacks		Outputs				Input		Output	
		I/P 1	I/P 2	O/P 1	O/P 2	O/P 3	O/P 4	Serial	Ethernet	Serial	Ethernet
2	6	Video + Text	Clean Video	I/P 1 Video + Serial Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Serial Text Burned In	I/P 2 Video + Ethernet Text Burned In	Input Text to I/P 1	Input Text to I/P 2	Output Text from from I/P 2	I/P 1 Video + Serial Text
2	7			I/P 1 Video + Ethernet Text	I/P 2 Video + Ethernet Text	I/P 1 Video + Ethernet Text Burned In	I/P 2 Video + Ethernet Text Burned In	NC	Input Text to I/P 1 and I/P 2	Output Text from I/P 1	I/P 1 Video + Ethernet Text
2	8			I/P 1 Video + I/P 2 Text	I/P 2 Video + Original Text	I/P 1 Video + I/P 2 Text Burned In	I/P 2 Video + Original Text Burned In	NC		Output Text from I/P 2	
2	9			I/P 1 Video + I/P 2 Text	I/P 2 Video + Original Text	I/P 1 Video + I/P 2 Text Burned In	I/P 2 Video + Original Text Burned In			Output Text from I/P 1	