Closed Caption Analysis Using the CMA 1820
Sencore has recently introduced a revolutionary new product option for its CMA 1820 Compressed Media Analyzer that allows users to peer deep inside encoded closed captions in a transport stream. Never before has this level of visibility and analysis been available in such an easy-to-use package. With the recent increased government scrutiny and fines for caption problems, having a tool like this can help a user avoid the problems in the first place or find them quickly when they do happen.

The CMA 1820, with the closed caption analysis option, allows users to parse, display, and analyze CEA-608 (NTSC) or CEA-708 (DTVCC) captions, including the extended data service (XDS) carried within 608. With the appropriate video CODEC options, the CMA 1820 supports all the caption formats carried in MPEG-2, H.264, and VC-1 video. Also included is full support for the SCTE20 and SCTE21 cable caption standards.

When analyzing these captions, the CMA 1820 provides a number of different ways to look at the captions. The text can be overlaid on the video as it would be by a television set, it can be displayed frame by frame with the control codes, or it can be viewed in its original structure within the picture header. All of these displays allow the user to view every aspect of the captions and quickly determine a root cause for problems.

Here is a step-by-step guide to analyzing captions with the CMA 1820:

1. Open a captured transport stream file with the CMA 1820. Once the file is loaded, click on the appropriate Video PID carrying the captions to be analyzed.

2. When the parsing of the TS and the video is complete. Any errors associated with the captions will be displayed in the message window at the bottom of the screen.
3. Selecting the Tools and then Settings menu from the Menu bar, the analysis and display can be configured. The Standard Selection selects which caption type is overlaid on the video. Whichever type of caption that is selected for display will be highlighted in blue in the caption analysis tab. The other settings configure the characteristics of the caption decoding.

4. Ensure that the Video Analysis tab is selected in the middle of the screen and then also select the Captions tab on the right side of the screen.
5. The Caption tab will display the types of captions that have been found in the stream. The CMA 1820 allows a single type to be viewed in this pane or two types to be viewed on top of each other to allow comparisons. Select the captions type(s) to be analyzed using the check boxes at the top of the pane.

6. The detected caption services are displayed in the caption pane. For 608, the user can select any of the caption, text or XDS services that are available. For 708, the service and window can be selected.

7. Navigate through the video frames using the frame navigation tools to view the captions associated with each frame in both the caption tab and overlaid on the main picture display. The play button can be used to automatically page through the video frames as fast as possible. The scroll bar or go to features can also be used to quickly navigate to other frames.
8. For 608 and SCTE20 captions, the user can select the view the front or back caption buffers at any given position in the frame order. The user can also select whether to just view the caption text or also see the caption control elements by using the Char. only check box. The attributes for each frames captions are displayed in the Attributes section of the window.

9. For 708 captions the user is also able to select whether to see the caption text only or to also show the control elements. The attributes are displayed at the bottom of the window and the radio buttons can be used to navigate between the window definitions, window attributes, pen, and synchronization.
10. Detailed syntax of the captions embedded in the video can be displayed using the Syntax Analysis tab.

11. Finally, a log file is created for all the parsed 608, 708, and SCTE20 captions. This can be accessed by clicking on the Open Log Files button by the CMA 1820 menu bar. These display all the caption information that was retrieved from the file.