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Xintekvideo SDI-900MX Color Corrector

by Ken James

Xintekvideo, formally Intelvideo, has a product line that includes several low priced good quality conversion and processing devices. The 1 RU SDI-900MX color corrector/video processor is one of their most popular offerings. It did not take me long to understand why the device sells as well as it does. My demonstration unit came configured for both analog NTSC and 270 Mbps serial digital operation.

It doesn't take a lot of imagination to come up with a wide range of applications for this processor. These might include, but are certainly not limited to:

- Optimizing video for downstream compression
- Matching colors on non-standard display devices
- Analog to digital and digital to analog conversion, including analog decoding and encoding.

The Xintekvideo SDI-900MX color corrector undergoing evaluation in the author's testing laboratory.

FEATURES

The SDI-900MX is loaded with front panel switches and controls. Located on the left, the power rocker switch, and easily visible LED "power on" indicator, activate the system. The unit that I received for this review included the capability to store and recall up to 400 panel adjustment configurations. Note that the 400 preset functionality is an option on the SDI-900; the basic configuration provides seven presets. Several switches and buttons are dedicated to this function. There is a source selection switch for delegating control between preset storing/recalling and the front panel controls. A "press-to-store" button activates the storage function and a thumbwheel switch assembly delegates the specific storage location.

A processor-enable switch selects between "bypass" and "enable" modes. In "bypass" mode, the active video portion is bypassed, while the blanking portion of the video is always processed.

Primary color correction is controlled via potentiometers with unity detents. The adjustments provide individual pedestal and gain controls for the red, green and blue content of the processed signal.

A noise reduction function is activated by a three-position toggle switch with off/auto/on positions. In the "on" position, two screwdriver adjustments are activated for setting the luminance and chrominance noise reduction levels.

Luminance processing adjustments control brightness, gamma curve selection and a high-frequency boost function.

Processor I/O connections are located on the rear of the frame. An easily accessed AC mains fuse is located next to the IEC power connection. I was a bit disappointed to find that there was no power cord retention capability associated with the connector. A looping SDI digital input and a terminating NTSC input comprise the system inputs. Analog NTSC/SDI digital input selection is accomplished with a rear-mounted toggle switch. Two processed SDI outputs and a simultaneous analog output round off the system outputs.

I like quiet and was glad to find that the frame has no cooling fans. The system boasts a power consumption of only about 10 VA and doesn't generate enough heat to require fans.

FAST FACTS

Application
Professional video color correction

Key Features
Up to 400 preset memories
Analog and Digital I/O
Variable or automatic noise reduction
Direct and independent front panel controls for each function

Price
$2,295 as configured

Contact
Xintekvideo Inc.
203-348-9229
www.xintekvideo.com

IN USE

Test equipment used in connection with the processor evaluation included the following:

- Tektronix 1750 waveform/vector monitor
- Sencore VG-91 video generator
- Sencore PR-570 variable voltage isolation transformer
- VHS tape machine
- DVD player
- Pioneer LD-S2 laser disk player
- B&W CCD camera
- Color CCD camera
- Satellite television demodulator

During input testing, I set the color corrector's RGB controls to their detent positions, set unity gain for gamma and turned off the HF boost and noise reduction.

The SDI-900 cleanly and easily processed the timebase-stable demodulated satellite TV video. I then tried the processor with NTSC video from my laser disk player. The laser disk time-base errors were greater than the satellite video, but still very small. Again, the system easily decoded and processed the video. I knew the laser disk itself contained a VIRS test alignment signal on line 17 and was surprised to see that the output of the processor did not contain this signal in either the bypass or enabled mode. After some additional checking, I determined the processor "enable" switch only enabled active video processing. A portion of the H and V blanking area was always processed. This processing added setup and removed video from lines 10 through 19. Lines 20 and 21 were always passed without processing, allowing closed captioning to get through the system. Next in line was the DVD player, which, as expected, worked fine in active video, and blanked lines 10 through 19. Non-timebase-corrected VHS video was the last source to be tested. I was curious to see how the color-under, non-SCH phased video would affect the processor. Head switching on my machine occurs about seven lines into active video and contains about four µsec of skew (about the width of a horizontal sync pulse). As might be expected, this was enough to confuse the sync separation circuits and caused excessive tearing of the video in both "bypass" and "enable" modes.

With no input, the processor produced a color black output. I fed it a black and white camera signal (with no color burst) and, as expected, the system inserted new blanking with burst.

Next, test signals from the video generator were used to determine the processor clipping levels. I used a super black signal and quickly determined that anything below zero IRE blanking level was being clipped at blanking. Luminance levels up to 110 percent passed without any issues and the negative-going chrominance information from SMPTE bars passed perfectly.

For my last test of this nature, I tried switching back and forth between two stable, but asynchronous, signals. As expected, it took several frames to reacquire lock after the making the switch. With a clean upstream vertical interval switch, the system worked flawlessly.

When supplied with a stable SDI signal the system also worked flawlessly.

I used a multiburst signal to check luminance response. It was flat all the way to highest burst at 4.5 MHz. Modulated equal amplitude color bars were used to check the chrominance decoder frequency response. A small chroma vector amplitude change was noticed when switching between proc-on and bypass modes. The amplitude change occurred almost exactly 180 degrees from the burst vector and was unrelated to pedestal and gain settings.

I fed the unit SMPTE bars and observed the output on the Tektronix 1750 vector display. The pedestal and gain adjustments for red, green and blue worked exactly as expected.

My next bit of evaluation centered on the SDI-900's noise reduction capability.

Using a 2/3-inch single chip color camera in a low light condition, I was able to simulate grain noise. The luminance noise reduction circuit worked very well at reducing the graininess in the image to the extent that it was almost unnoticeable. However, the low light condition did not produce much chroma from the camera, thus it was difficult to test the chrominance noise reduction capabilities. The automatic setting functioned without introducing any noticeable smear, while greatly reducing the luminance noise.

I moved on to the high frequency boost adjustment. The boost curve started at a relatively low frequency and increased as the frequency increased. Be careful of excessive boost and lots of high frequency energy in the video signal or clipping can occur.

The unit has six selectable gamma curves. They easily compensated for different types of display devices.

The brightness adjustment was perfectly calibrated in the detent position, and as anticipated, moved the video signal on a DC pedestal.

I tried saving and recalling presets with the device and found that it was a simple and straightforward task.

As with most processing gear placed in the signal chain these days, electrical length is a concern. I'm pleased to report that the Xintekvideo has a very short electrical length—about 3 µsec—thus eliminating any possibility of audio lip-sync problems.

The SDI-900 generates so little heat that cooling fans aren't necessary. With 117 VAC applied, current consumption measured about 100 ma. This current draw remained fairly constant as I varied the line voltage from 80 to 140 V.

SUMMARY

Adding remote control capabilities would make the system more flexible. Deploy the unit in the equipment room, route inputs and outputs through the station router and you have an excellent and cost-effective processor for anything that has to pass through the system.

I was very pleased with the unit. The SDI-900 offers an excellent cost performance ratio. ■

Ken James is a video engineer with over 30 years experience. He spent most of his career in Grass Valley, Calif. before retiring to Montana. He remains active in video technology. He may be contacted at kenjames@blackfoot.net.