Many high-end virtual reality systems require a signal converter to connect their various system components.

Helmet-mounted displays that use miniature monochrome CRTs with color shutters require RGB signals in serial, i.e., the red, green and blue components of the image are applied sequentially on one wire. Computer display systems and other monitors require RGB signals in parallel, i.e., the red, green and blue components of the image are applied concurrently on three wires. To support both types of display, the signals must be converted in real time.

The SynchroMaster 100 HD is a high resolution scan converter designed to interface computers with color displays requiring color field sequential signals. The system provides bi-directional conversion between 3-wire, 4-wire or 5-wire RGB signals and a single-wire color field sequential signal.

When a computer generates standard parallel RGB signals, these signals must be converted to the color field sequential format required by the helmet-mounted display. Alternatively, when a graphics generator is designed to output a color field sequential signal, this signal must be converted for use on a normal monitor, e.g., an instructor’s station. The SynchroMaster 100 HD solves both problems. In addition, the SynchroMaster 100 HD will handle an HDTV (1125 line) signal.

Parallel-In / Serial-Out Mode

The red, green and blue components of the color-parallel input signal are digitized and written concurrently into the frame buffer. The three components of the signal are then read sequentially from the frame buffer, converted to analog form and multiplexed field-by-field into a color field sequential signal. For HDTV inputs, the SynchroMaster 100 HD first converts the Y, P_\text{r}, P_\text{b} signal components to RGB format.

Serial-In / Parallel-Out Mode

The color field sequential input signal is digitized and written in sequence into the red, green and blue sections of the frame buffer, converted to analog form and output as separate red, green and blue signals. For HDTV, the RGB signals are converted to Y, P_\text{r}, P_\text{b} format.

Interlace / Non-interlace Modes

In addition to color field sequential conversion, the SynchroMaster 100 HD will perform interlace to non-interlace and non-interlace to interlace conversion for RGB signals.
Specifications

**Video Input**
- Video Format: Non-interlaced or interlaced
- Resolution: RGB to 1280 x 1024 or HDTV (1125 lines)
- Horizontal rate: Up to 100 kHz for color-field sequential mode
- Vertical rate: Up to 210 Hz for color-field sequential mode
- Amplitude: 0.7 to 1.0 V peak to peak; white positive (75 Ω)
- Sync amplitude: 1.0 V to 5.0 V (75 Ω)
- Sync configuration: Automatic
- Sync polarity: Composite sync, H-drive and V-drive may be either polarity
- Connectors: BNC
- Maximum pixel rate: 170 MHz

**Video Output**
- Resolution: RGB to 1280 x 1024 or HDTV (1125 lines)
- Amplitude: 0.7 to 1.0 V peak to peak; white positive (75 Ω)
- Maximum pixel rate: 170 MHz

**Resolutions Supported**
The maximum resolution supported by the SynchroMaster 100HD is determined by the maximum allowable input and output pixel rates (170 MHz). Within these pixel rate restrictions, signals can be converted between interlaced and non-interlaced formats at the same resolution, e.g. the SynchroMaster 100HD can accept a non-interlaced, color-parallel input at 1280 x 1024 resolution and convert it to an interlaced color-sequential output at 1280 x 1024.

**Processing**
- Pixel depth: 24 bits (8 each for red, green and blue)

**Control Input**
- RS-232 port: (1200, 2400, 4800, 9600 baud, echo or no-echo)

**Mechanical**
- Size: 17.5" wide by 3.5" high by 18.5" deep (rack-mountable)
- Weight: 20 lbs.
- Power: 150 Watts

Specifications subject to change without notice
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