COLOR FIELD SEQUENTIAL SCAN CONVERTER

SynchroMaster®100HD

A helmet-mounted display from n-Vision, Inc. The SynchroMaster 100HD provides the color field sequential signal for its miniature CRTs.

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 SynchroMaster100HD 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 SynchroMaster100HD solves both problems. In addition, the SynchroMaster100HD 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 SynchroMaster100HD first converts the Y, P_R, P_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_R, P_B format.

Interlace / Non-interlace Modes

In addition to color field sequential conversion, the SynchroMaster100HD will perform interlace to non-interlace and non-interlace to interlace conversion for RGB signals.
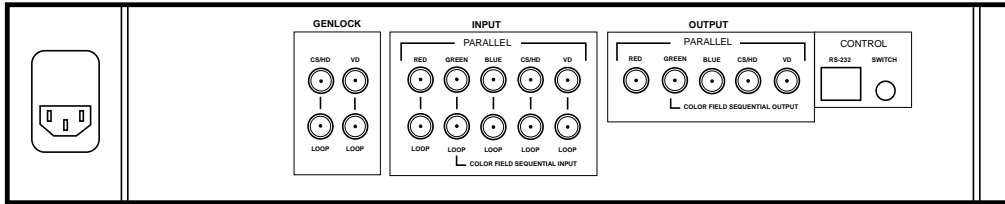
SynchroMaster100HD Back Panel

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 SynchroMaster100HD 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