

## Smear Reduction Module (LSR)

### WHY IS LSR NEEDED?

All visual display system technologies have visual artifacts, or perceptual features that would not be present in a naturally-viewed scene. The characteristics of certain light-valve technologies, specifically Liquid Crystal Display (LCD) and Liquid Crystal on Silicon (LCoS), exhibit a blurring artifact with image motion.

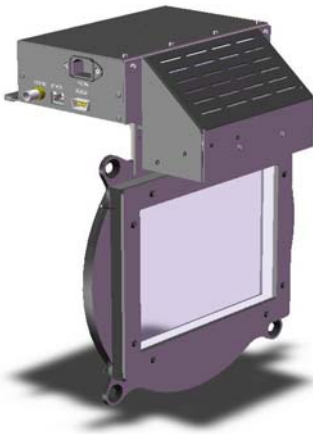
LCoS technology benefits such as brightness, ultra-high resolution and low maintenance costs for simulator applications have been the major attractions of this technology. The biggest drawback is a blurring or smear artifact associated with image motion when used for real-time training and simulation.



The blur results when the observer's eyes track or follow the apparent motion of the image. The continuous illumination of the pixel on LCoS/LCD systems, while the eye is in motion, results in a blurring or smearing of the light on the retina. The latency, or image hold time, is the main cause of blur in displays when the content in the image is moving.

### THE SOLUTION

Working with SONY Japan VDC DS engineers came to the conclusion that active shuttering was a real solution to reduce the blur inherent in LCoS projectors.



After months of studies and component selection, VDC Display Systems has developed a LCoS Smear Reduction LSR<sup>®</sup> Module that substantially improves the visual resolution of the projected image. This is achieved by eliminating the main causes of motion blur by optically chopping the projected image reducing the exposure time. This virtually eliminates the Motion Induced (MI) Artifacts that are the result of the combination of the slower response time and sample-and-hold drive characteristics of many LCoS/LCD projectors.

The LSR<sup>®</sup> Module is incorporated with the SONY SRX S105 projector and leaves the VDC factory with preset values determined adequate for the majority of today's simulators.

For very demanding applications the LSR<sup>®</sup> Module can be controlled via Ethernet from a PC connection via a user friendly web page interface that allows users to control all parameters of the LSR<sup>®</sup> Module based on the unique requirements.

## THE COMPONENTS

The LSR Module consists of a custom designed LC shutter mounted in front of the projection lens of the SONY SRX S105 8.8 Mpixels projector but it can also be integrated with other similar LCD/LCoS projectors.



### Optics

- High definition Fast LC Shutter
- Maximum 80% transmission "on state"
- Minimum 5% transmission at Max duty cycle

### Inputs/Outputs

- Built-in V Sync input with Smartlock™ processing circuitry
- Built-in Ethernet port for computer control
- Optical shutter driver port

### Control Features

- Menu driven interface with on-screen help
- Built-in pre set timing
- Programmable Events and Real Time Clock
- Auto power-up after interruption
- Internal frequency generator

### Maximum Operating

- Temperature: 5° to 35° (32°F to 95°F)
- Altitude: 0 to 3000 m (0 to 10,000 ft)
- Humidity: 10 to 90 % non-condensing
- Storage Temperature: -5° to 45°C (-24°F to 113°F)

### Power Requirements

- 90 VAC to 264 VAC universal input
- Power 50 watts maximum
- Line frequency 50 to 60 Hz nominal
- Power factor corrected

### Regulatory Approvals

- Pending

### Supplied Accessories

- Control software
- 6' AC line cord

Due to continual improvement, specifications are subject to change without notice