)eyevis

HIGH-END LED-DLP®-PROJECTORS
PERFECT VISUAL SOLUTIONS

)espSERIES
EYEVIS PROJECTOR LINE

espSERIES AND openWARP[2]
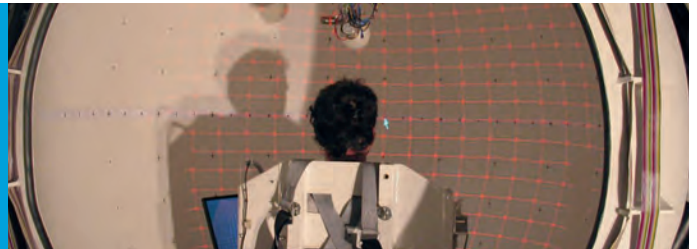# – DEVELOPED FOR DEMANDING APPLICATIONS:

SIMULATION
(DRIVING SIMULATORS, FLIGHT SIMULATORS,
SHIP SIMULATORS, TOWER SIMULATORS)

DESIGN
(AUTOMOTIVE, ARCHITECTURE, COMPUTER
AIDED DESIGN)

RESEARCH AND EDUCATION

INDUSTRIAL TRAINING APPLICATIONS

MILITARY TRAINING APPLICATIONS

) **esp**SERIES
EYEVIS PROJECTOR LINE

) **open**WARP²
EYEVIS IMAGE PROCESSING LINE

Product Versions:
- ESP-LXT: XGA (1024 × 768 Px)
- ESP-LSXT+: SXGA+ (1400 × 1050 Px)
- ESP-LUXT: UXGA (1600 × 1200 Px)
- ESP-LHD: Full HD (1920 × 1080 Px)
- ESP-LWXT: WUXGA (1920 × 1200 Px)
- ESP-LWQX: WQXGA (2560 × 1600 Px)

Product Versions:
- openWARP²: Single-Channel DVI Warping and Blending Unit
- openWARP²-LC: Single-Channel DVI Blending Unit

CUTTING-EDGE QUALITY PRODUCTS
HIGH-END LED-LIT DLP®-PROJECTORS FROM EYEVIS

DLP®-PROJECTORS WITH LED LIGHT SOURCE

eyevis' espSERIES offers a wide range of projectors with different resolutions. The projectors are based on Texas Instruments' DLP®-technology and use high-quality long-life LEDs as illuminant for the projection. eyevis is considered a pioneer in the industry both for the use of DLP®-technology and the implementation of light emitting diodes in projection systems.

The devices from the espSERIES were developed for the demanding use in simulations, but can of course be installed in various other applications that require best product reliability and images of the highest quality. Their robust design with a stable metal housing and their diversity of installation possibilities enables a highly flexible use of the projectors. Thanks to a cooling system which can be operated irrespective of its position and the solid workmanship of all integrated components, the projectors can be used in any orientation and even in vibrating environments or motion simulators.

Through optional modifications of the projectors they can be optimized for the operation in night-vision simulations or for their application in multi-channel projections.

REAL-TIME IMAGE CORRECTIONS FOR MULTI-CHANNEL PROJECTION-SYSTEMS
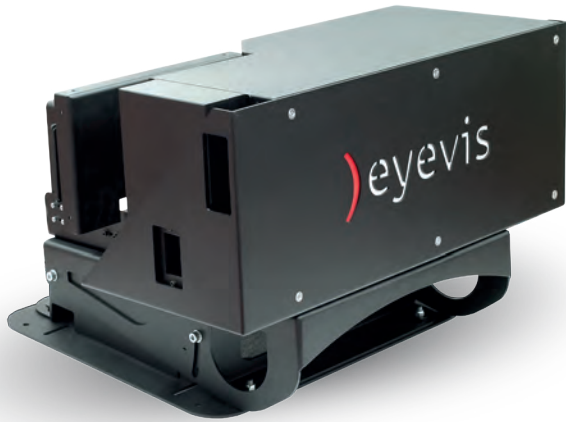
The second generation of our professional eyevis technology for warping, blending and color-correcting. Any visual content can be projected in various ways on random surfaces with the any projection device. It does not matter whether the area projected on is flat, bent or even wavy – the projection will be perfect and absolutely sharp as if the surface was flat.

The system corrects the projection for a perfect picture in high resolution and in real time. The extremely fast image processing of openWARP² is predestined for the use in delicate, high quality and time-critical simulation systems. A completely new and revised system architecture and an even more efficient Warp-Core technology enable image corrections of the highest quality. openWARP² can be integrated in any system environments without further efforts. Comprehensive tools for the correction of brightness and colors, color-shading, alpha masks and pixel-accurate blending once again enhance the functionalities of the system and make it the perfect solution achieve perfect results with multi-channel-projections.

openWARP² is the only device on the market that allows uploading and performing geometrical corrections within a single frame in real-time which makes it a first choice for effective and interactive simulations with tracking systems.

)espSERIES
EYEVIS PROJECTOR LINE

LENS OPTIONS FOR OUR espSERIES AT A GLANCE*

1.48:1 TELE ANGLE ESP-OPT-110-300	1.13:1 STANDARD ANGLE ESP-OPT-110-223	0.8:1 WIDE ANGLE ESP-OPT-110-170	0.65:1 ULTRA WIDE ANGLE ESP-OPT-110-144	FISHEYE LENS ESP-OPT-110-FE SPECIAL LENS	0.50:1 ULTRA WIDE ANGLE ESP-OPT-110-100	90° DOME LENS ESP-OPT-110-100-DOME SPECIAL LENS

* Throw Ratios based on use with WQXGA projector

TECHNOLOGICAL ADVANTAGES OF OUR LENSES

We provide a wide range of high-quality lenses for our projectors to suit the devices to the requirements of any application.

- All components made of stable metal
- Side-focus and centre-focus adjustment possibilities
- High-quality screw connections instead of snapping mechanism
- Lens Shift

TECHNOLOGICAL ADVANTAGES OF LED-BASED SYSTEMS

- Less optical components, hence a more direct and more precise light path (no UV filters, no color wheels)
- Higher RGB frequency
- No diffusing light inside the projection engine
- Enhanced color spaced compared with lamp-based systems
- Long life-time of the LED illuminants (>60.000 h in 24/7 operation)

These benefits result in an improved brilliance and quality of the projected images, without hotspots on the projection surface, less power consumption and reduced thermal load, and less complex adjustments of the overall system.

IINDIVIDUAL SUPPORT FOR THE DEVELOPMENT OF PROJECTS DESIGNS

PROJECT EXAMPLE: RESEARCH SIMULATOR IN TORONTO WITH 6× WUXGA LED-PROJECTORS FROM OUR espSERIES

**1. IDEA**   **2. DESIGN**   **3. ANALYSIS AND CALIBRATION**   **4. SIMULATOR**
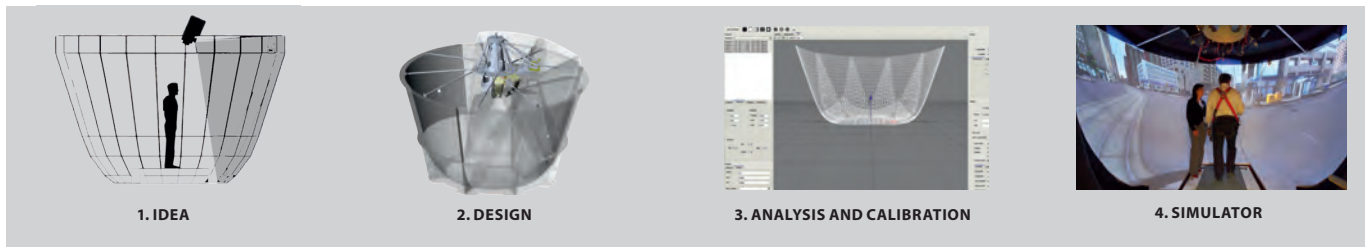
ACCESSORIES FOR COMPLETE SYSTEMS

- Cables and systems for signal transmission and distribution (high quality optical fibre systems, signal splitters, etc.)
- Mounting products (e.g. 6-axis adjustment mount for projectors)
- Mechanic hard-edge blending masks
- Customized projector mounts

ADVANTAGES OF OUR ESP-1000-PROJECTORS

- Cost-efficient and resource-conserving operation
- Cooling system adjusts to temperature of LEDs and ambience
- Infinitely dimmable, image information remains unaltered and in full color depth
- Operable irrespective of its position (portrait, landscape, any other orientation)
- Complete encapsulation prevents light leakage
- High-frequency LED control prevents "rainbow effects" and other image artefacts (e.g. multiple images)
- Integrated early detection of malfunctions guarantees highest availability
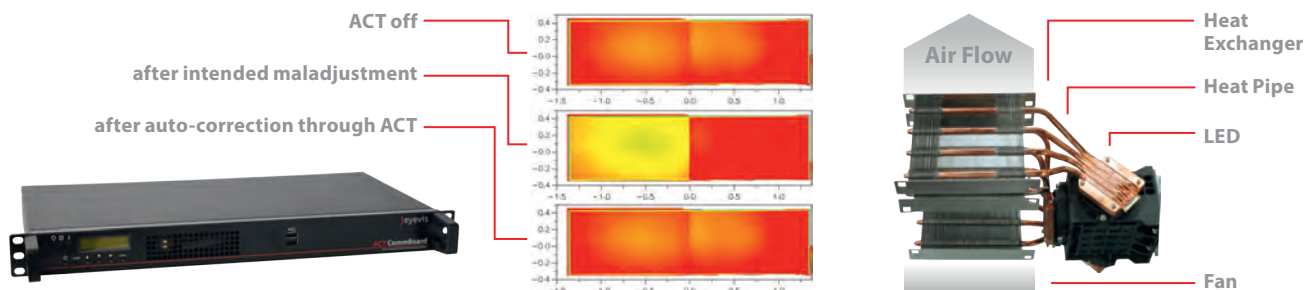- Simple protocol to control the devices
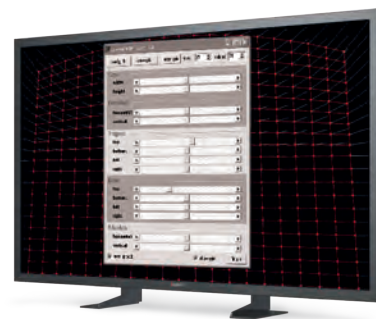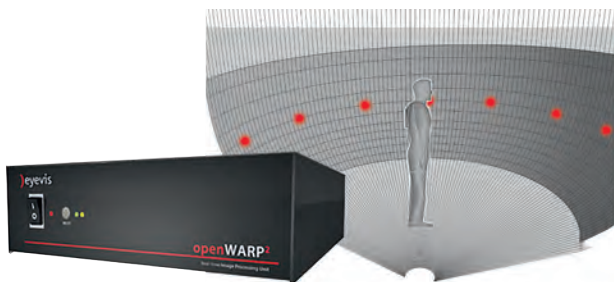
SINGLE-CHANNEL & MULTI-CHANNEL SYSTEMS

openWARP[2] is a first choice solution to improve individual projectors, stereo projections or combined multi-channel projections. With openWARP[2] you can realise any image distortion, as well as color and brightness corrections. The device provides a real-time mode that enables image distortions without delay. This allows the set-up of highly dynamic applications in which the distortion of the projected images needs to be adjusted to changing projection conditions in real-time. The configuration is transmitted to the device via USB. The optional communication board provides an additional interface for serial or network connections.

COMFORTABLE IMAGE WARPING & BLENDING

The innovative system architecture and a revised warp-core technology enable image corrections of the highest quality. Thanks to the implemented "resolution-pass-through" technology the device can be integrated in any system environment without further resolution-related adjustments. Comprehensive possibilities for color corrections, and brightness settings enable a perfect alignment of projectors in multi-channel installations. Color shading, alpha masks and pixel-accurate blending further enhance the functionalities of the device and make it the perfect tool to achieve perfect results in systems using a multitude of projectors.

ACT off

after intended maladjustment

after auto-correction through ACT

Air Flow

Heat Exchanger

Heat Pipe

LED

Fan

AUTO-COLOR-TRACKING-COLOR-MANAGEMENT AND HEATPIPE COOLING SYSTEM

eyevis' new LED technology provides lasting color fidelity and extended color adjustment possibilities. The newly developed Auto-Color-Tracking option is an tool that allows for completely automatic adjustment and alignment of all projectors in a multi-channel projections system.

Brightness adjustment is performed directly through the LEDs which does not affect the color depth of the presented image and guarantees stable image quality. For numerous projectors in a multi-channel projections system, the measurement is performed individually for each projector. The values of each device are automatically adjusted. This allows for consistent and homogeneous presentation of brightness and colors throughout the entire surface of projection. The application of the innovative heatpipe cooling system ensures highly dynamic, fast and efficient heat dissipation. The cooling system can be run in any position, even in vibrating surroundings. It is maintenance-free and contains no toxic liquids.

The sensor of the three-channel, permanent control of the LED-temperature sits directly at the LED. In the unlikely event of cooling system failure or if the ambient temperature should exceed permissible values, the system automatically reduces the performance of the LEDs. Thereby the information of the projected image is maintained.

TECHNICAL SPECIFICATIONS ESP-1000 SERIES*

	ESP-LXT-1000	ESP-LSXT+-1000	ESP-LHD-1000	ESP-LWXT-1000	ESP-LWQX-1000
Technology:	Professional Single-Chip DLP® Projector				
Resolution:	XGA (1024 × 768 / 4:3)	SXGA+ (1400 × 1050 / 4:3)	HD (1920 × 1080 / 16:9)	WUXGA (1920 × 1200 / 16:10)	WQXGA (2560 × 1600 / 16:10)
Brightness:	Up to 800-1000 Lumen (depending on projector version and individual settings)				
Contrast:	Up to 1800:1 (depending on projector version)				
Color Depth:	30-bit RGB	30-bit RGB	30-bit RGB	30-bit RGB	30-bit RGB
Processing Latency:	~8.5 ms	~8.5 ms	~8.5 ms	~8.5 ms	~8.5 ms
Focus:	Focus, manual lens shift (option)				
LED Life-Time:	> 60,000 hours	> 60,000 hours	> 60,000 hours	> 60,000 hours	> 60,000 hours
CONNECTORS					
Signal Input:	1× DVI-Single Link	1× DVI-Single Link	1× DVI-Single Link	1× DVI-Single Link	1× DVI-Dual Link
Communication:	2× RS232 (In / Out)	2× RS232 (In / Out)	2× RS232 (In / Out)	2× RS232 (In / Out)	2× RJ-45 Serial (In / Out)
MECHANICAL					
Dimensions w/o Optics: (W×H×D)	617 × 288 × 257 mm	617 × 288 × 257 mm	617 × 288 × 257 mm	617 × 288 × 257 mm	617 × 288 × 257 mm
Weight w/o Optics:	14.5 kg	14.5 kg	14.5 kg	14.5 kg	14.5 kg
ELECTRICAL					
Power Supply:	Nominal Operation: 5A, ~100 – 240 V, 50 – 60 Hz				
Power Consumption:	max. 250 W @ 100 V, ~2.7 A, 50 Hz; ~1.2 A, 240 V, 50 Hz				
OTHER					
Accessories:	2 metre power cord, eyeDevice Setup Software, EC-LControl Color Adjustment Software, product documentation				
STANDARD LENSES (OTHER SPECIAL LENSES AVAILABLE ON REQUEST)					
EYE-ESP-OPT-110-144 (LS)					
Throw Ratio:	0.94:1 (XGA)	0.69:1 (SXGA+)	0.65:1 (1080p)	0.65:1 (WUXGA)	0.69:1 (WQXGA)
EYE-ESP-OPT-110-170 (LS)					
Throw Ratio:	1.16:1 (XGA)	0.84:1 (SXGA+)	0.8:1 (1080p)	0.8:1 (WUXGA)	0.82:1 (WQXGA)
EYE-ESP-OPT-110-223					
Throw Ratio:	1.67:1 (XGA)	1.2:1 (SXGA+)	1.13:1 (1080p)	1.13:1 (WUXGA)	1.21:1 (WQXGA)
EYE-ESP-OPT-110-300					
Throw Ratio:	–	1.57:1 (SXGA+)	1.48:1 (1080p)	1.48:1 (WUXGA)	–

* The projectors are available with additional resolutions (e.g. UXGA with 1600×1200 pixels and SXGA with 1280×1024 pixels)

AT A GLANCE
THE ADVANTAGES OF THE EYEVIS espSERIES

DLP®-TECHNOLOGY
The projectors from the espSERIES are based on Texas Instruments' DLP®-technology. eyevis is considered a pioneer in the application of this technology.

LED-LIT PROJECTION TECHNOLOGY
The projectors use single Cluster-LEDs for the primary colors red, green and blue. This leads to long-term stable brightness and more vivid colors compared with lamp-based projectors.

AUTO-COLOR ADJUSTMENT
The optional Auto-Color-Tracking guarantees uniform representation of brightness and colors on all projectors in a multi-channel installation.

OUTSTANDING IMAGE QUALITY
The combination of innovative Cluster-LED-illuminants and DLP®-technology provides brilliant colors, impressive black values and in this way best image quality for any light condition.

PERFECTLY ROBUST AND RELIABLE
Highest-quality components, user-friendly handling and stable metal design allow the use of our projectors in the most sophisticated fields of applications.

ENVIRONMENT-FRIENDLY CONCEPT
The LED-illuminants and the heatpipe-based cooling system contain no toxic liquids. Low power consumption additionally increases the environment-friendliness of the projectors.

THE ADVANTAGES OF THE EYEVIS openWARP²

HIGH-QUALITY IMAGE CORRECTIONS
The innovative system architecture and a highly efficient warp-core technology result in high-quality image corrections and shortest processing times with the possibility for real-time adjustments.

MULTI-CHANNEL PROJECTIONS
The cascadable openWARP² units are a first choice for the optimization of colors, geometry and brightness for individual projectors, stereo-projections or combined multi-projection systems.

RESOLUTION-PASS-THROUGH
Thanks to the innovative "resolution-pass-through" technology, the device can be easily integrated into any system environment without the necessity to configure the desired resolution.

COMPREHENSIVE GEOMETRY SETTINGS
Projections on surfaces of any shape can be easily realised. For the adjustment of distortions there are various possibilities and interfaces available.

PAY-PER-CHANNEL-SOLUTION
With our cost-effective openWARP² the customer pays only for the number of channels he really needs. In addition, openWARP² provides much more flexible possibilities compared with solutions embedded in projectors or image generators.

ROTATION OPTION
With the optional Rotation-Upgrade it is possible to add an image rotation of 90° to the features of the device. Of course, all other features for geometry correction, bezel elimination, blending and color correction are also available.

TECHNICAL SPECIFICATIONS openWARP²

Product Type	Single-Channel DVI Warping and Blending Unit		Color Correction	Gamma Correction, Color Transformation and Color Shading
Input / Output	Single-Link DVI-D for Resolutions up to WUXGA (1920×1200@60Hz) or 2k (2048×1080@60Hz)		Blending & Masking	Unrestricted Blending and Alpha-Masking
			Geometry Corrections	High precision Geometry Correction (2 times 5th Order Polynomial)
Resolution Detection	"Resolution-pass-through" technology (automatic resolution configuration)		Processing	Advanced Filter Kernel for High-Quality Image Processing
Bandwidth	max. 165MHz Pixel Clock		Warping	Interactive and Real-Time Image Warping
Communication	USB-RS232 to control PC or RS232 / LAN with additional Communication Board		Weight	1.25 kgs
Image Processing Latency	Low Latency (less than ¼ frame)		Dimensions (W×H×D)	21.0 × 7.0 × 25.4 cm

WORLDWIDE SUPPORT
WE ARE AT YOUR SERVICE

The high quality of our products is backed up by the outstanding quality of our service technicians and the support we offer to our customers. Apart from regular repairs in-house or on-site, the supply of original spare parts and maintenance works on demand, we offer a range of service level agreements that ensure highest availability of your system.

Our experience shows that preventive maintenance and active support return the investment by leading to optimal system availability, the productivity of the system is guaranteed and operating costs can be reduced. Regular maintenance is a prerequisite for stable, trouble-free operation of your eyevis system. Therefore eyevis offers maintenance contracts that are tailored to the needs of your installation.

Updated information on our projects and products with many photos as well as the possibility of communicating with other interested customers can also be found at:

- twitter.com/eyevis
- www.facebook.com/eyevis
- www.linkedin.com/companies/eyevis

Scan the QR code and visit our website to find more detailed information on all of our products and services, download brochures and data sheets, or watch the product videos.