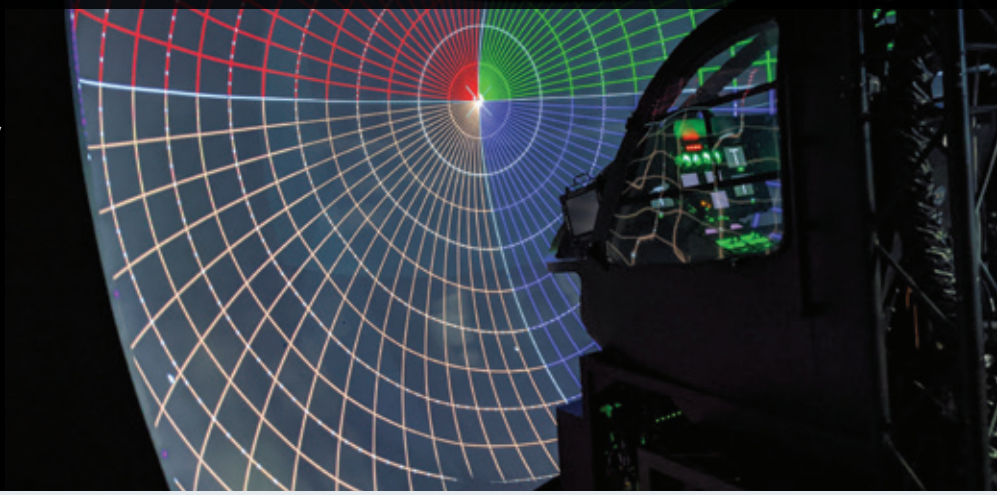
Scalable Display Manager (SDM)

Automatic, camera-based calibration for multi-projector displays

scalable DISPLAY TECHNOLOGIES

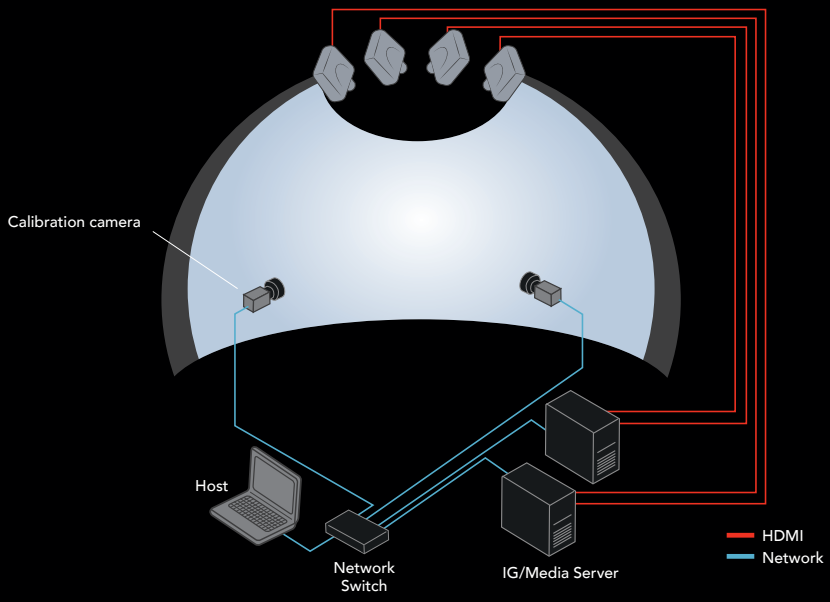
- Automatic, camera-based calibration
- Simulation-grade geometric accuracy
- Integrated with the industry's leading image generators and media servers
- Automated recalibration, one click
- A display that is always ready



Scalable Display Manager (SDM) is the flagship of the Scalable software family: automatic, camera-based calibration for multi-projector displays of any size, resolution, and geometry. SDM uses patented camera-feedback technology to measure the display, compute a precise warp and blend for every projector, and store the result in a variety of formats read directly by the industry's leading image generators, media servers, warping hardware and playback systems.

SDM was built for the environments where accuracy is not negotiable. It is deployed worldwide in defense and commercial flight simulation, driving and maritime training, and mission rehearsal systems, where trainees depend on geometrically correct out-the-window imagery. The same accuracy has made SDM the calibration standard at the top of the themed entertainment market: dark rides, planetariums, giant-screen theaters, and large-scale immersive art experiences where dozens of projectors must resolve into a single, uninterrupted image.

Alignment is not a one-time event. Projectors drift with temperature, vibration, lamp aging, and building movement. SDM's one-click recalibration returns any display to pixel-perfect condition in minutes, and scheduled calibrations can run daily or weekly with no operator present. The result is a display that is ready every morning. Without ladders, without test patterns, and without downtime.



Integration Ecosystem

SDM calibration data flows directly into the systems customers already run:

- **Image generators** for simulation and training, including Aechelon, Diamond Visionics and Unreal Engine among others.
- **Media servers** for entertainment and ProAV, including 7thSense, PIXERA, and TouchDesigner among others.
- **Warping hardware and playback -** wide set of integrations including graphics cards and direct projector upload for Barco and Norxe projectors.

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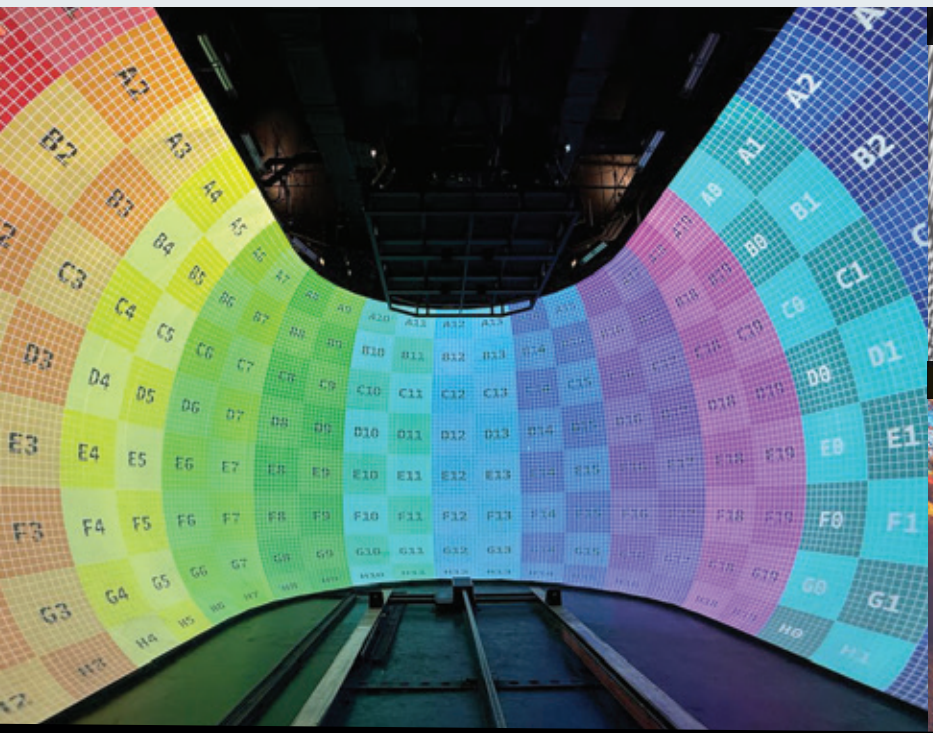
Capabilities

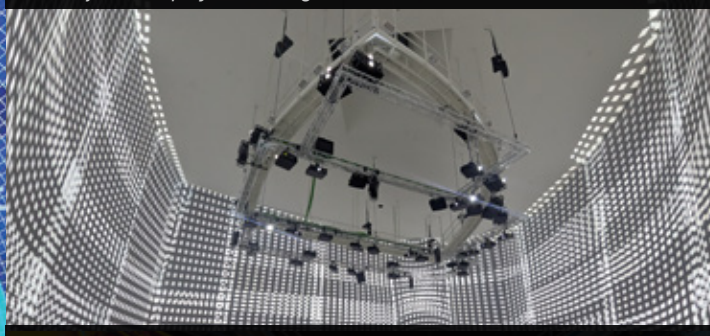
- **Any geometry.** Domes, cylinders, toruses, collimated screens, and fully custom surfaces defined by .OBJ files.
- **Unlimited scale.** No ceiling on resolution or projector count. SDM manages arrays from two projectors to the largest installations in the world.
- **Simulation-grade accuracy.** Sub-pixel geometric alignment on the geometries and tolerances required by certified training devices. Validated on deployed flight, driving, and maritime systems worldwide.
- **Frustum calculation for 3D engines.** SDM computes the viewing frustums real-time image generators need for geometrically correct perspective rendering, including multiple eyepoints and dynamic (head-tracked) eyepoint support.
- **Distributed rendering.** Native support for multi-channel, multi-machine rendering architectures.
- **Color and brightness matching.** Camera-based measurement drives per-pixel intensity and color maps for every projector. Angle of incidence and throw distance vary projector to projector on a complex screen, so brightness and color shift across the image even with identical hardware. SDM matches across that, and across mixed-age, mixed-lamp fleets, so the array reads as a single uniform image.
- **Automated recalibration**. One-click on demand, or scheduled to run unattended. Geometry recalibration completes within 60 to 90 seconds per projector.
- **Open output.** Scalable Ecosystem. Calibration results are widely integrated through Scalable SDK, so the display owner can choose the playback and rendering pipeline that best suits their budget.

Use Cases

- Flight, driving, and maritime simulation
- Training and mission rehearsal systems
- Dark rides and themed attractions
- Planetariums, domes, and giant-screen theaters
- Large-scale immersive experiences and media art installations
- Virtual production and broadcast environments
- AR/VR and visualization facilities
- Research and universities



48 Projector display before alignment



48 Projector display after alignment with Scalable Display Manager