

# BSM AUTO ALIGNMENT

## CAMERA BASED ALIGNMENT OF WARPING AND BLENDING OF PROJECTED IMAGES

### PERFECTLY CALIBRATED PROJECTION SYSTEM

In projection systems with multiple projectors it is hard or sometimes even impossible to manually adjust warping and blending parameters to create a seamless looking image. Furthermore, this system has to be maintained during operation to keep the image quality good what means your customer would need technicians with very high skills and again, keeping this system aligned manually is sometimes impossible.

Special projection scenarios like "Domes" need content mapping and advanced parameters like the head position of the visitors – which has effect on the way the content must be mapped and warped to the screen surface. And very high resolution content beyond 4K must be cropped into pieces and then correctly displayed on each projector.

### WARPING, BLENDING, MASKING, SLICING

The BSM AUTO ALIGNMENT software takes care of all these tasks. The only additional hardware you need to install is a number of digital photo cameras that are able to "see" the screen surface. They can be located anywhere, either on top of the screen or integrated – there are no restrictions or limitations. For a typical "dome" shape screen you will need 3 cameras.

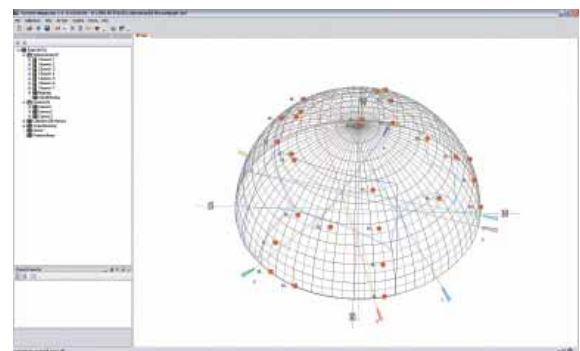
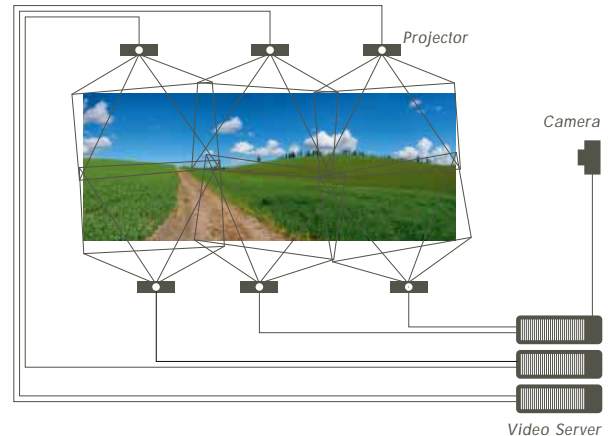
### CURVED, SPHERICAL, DOME, 360° – ANY SHAPE OF SCREEN

The projection system must be constructed in the software first. The plan includes the screen (can be of any shape), projectors and cameras. If everything would have been built the way it was planned, you would have an aligned picture already after this construction phase – but this is theory. In fact, all buildings have tolerances and that's where the camera based auto alignment starts its work: several test images are projected on each projector and the cameras take pictures of them. The software analyses the offset and wrong warping of the projected images and perfectly adjusts warping and blending to have a seamless image on the screen shape. The normal "onsite" setup time of a 16 channel dome is less than a day.

### RE-ALIGN BY PRESSING A BUTTON

Since all projected images and big screen structures tend to move due to thermal influences, the picture in a dome must be calibrated from time to time. Dependent on the quality needs, the calibration can be done by simply pressing a button, even every day. This assures that all projected pixels match to each other and guarantees a perfectly aligned image during all time of operation.

The BSM AUTO ALIGNMENT software is developed by FRAUNHOFER FIRST institute. It is perfectly integrated into the BSM HD server platform and available now.



## ORDERING CODES

### BSM ALIGNMENT CAM

Alignment Camera must see projection surface.  
Multiple Cameras can be used. F.E. usually 3 in Domes

### BSM ALIGN/STORE/ENCODE

Storage Server for Autoalignment Software, Encoding and Content Distribution

### BSM ALIGNMENT INITIAL

Initial Costs (for Planing etc.)

### BSM ALIGNMENT PER CHANNEL

Software per Channel Costs