BSM AND MEDIA BASED ATTRACTIONS
A „SEAMLESS“ STORY

BSM provides an incredible range of products: perfect video playback, well-thought-out media workflow, camera based calibration system, outstanding show programming possibilities, a digital signage solution AND this is all monitored through a local or web based monitoring server: we believe this is the most versatile solution available from a single vendor in the market. Find below some relevant facts about our products.

VIDEO SERVERS
The BSM U-CF series is a complete range of Video servers with up to twelve synchronous running HD/2K/4K+ video channels. All servers support uncompressed 4:4:4 video playback in RGB mode with up to 30 Bits color depth, perfect linear video playback in 2D, 3D, with up to 120 FPS and beyond 4K resolution per output. Up to 64K x 64K content resolution can be processed in the media workflow. The units can run standalone or can play synchronous to timecode – that way any number of playback channels can be perfectly synced. The GL option adds genlock inputs to the servers to have pixel synchronous video outputs. All units support image warping and blending. They also support up and down scaling to any resolution. The complete range of audio options is available: Analog, ADAT, MADI, AES, Cobranet, AVB and Dante – with up to 256 channels 48KHz or 128/96KHz.
All BSM video servers are operating with an embedded operating system, which is write protected to ensure proper operation over years. The PLUS series has redundant power supplies and redundant fans.

MEDIA WORKFLOW
BSM covers the complete media workflow from simple single channel playback up to any multichannel, multiple server system content distribution. Huge projects demand true flexibility during their content creation and content loading phase. Content creators want to quickly swap content on a “per frame” or “shot” basis and want to provide shots in different resolutions, i.e. they start with low res shots and step by step exchange shots with high res content. The BSM Media Manager and server system is capable of handling such complex workflows. It allows creating playlists on a “per frame” basis: single frames can be replaced or the movie can be organized in shots. Content providers can update single frame or shots if needed. It even supports versioning and the quick switch from one to another version of a shot. It is perfectly prepared for truly demanding projects.

A lot of discussion is going on about pre-slicing content or not, here is the answer: sometimes it is better to pre-slice, sometimes not. If you have 20 x 4K blended panorama projectors it would be useless or even impossible to store the 80K image on all playback servers. If you have some 2K projectors showing all a part of one 4K image on one machine, it is more convenient to play it directly. BSM supports both methods and in both cases the quality of the image is not reduced or changed in any way.
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EFFECTS AND LIGHT
Most media based attractions require running effects synchronous to video playback. BSM created a truly incredible solution called Conductor Pro and with the BSM PRO I-O hardware controllers nearly anything can be controlled. F.e. pneumatic motion platforms, but also hydraulic or electromechanical platforms which require update rates up to 1000 commands a second can be controlled. Motion Seats with all their effects - DMX or analog controlled - and also most advanced “connected” seats with addressable “per seat” effects, Artnet or DMX controlled lights: Conductor Pro can be used to control nearly any equipment.

SHOW PROGRAMMING
Conductor Pro provides an easy to use interface and supports various different programming interfaces like, keyboard, mouse, joystick, midi faders with force feedback and game controllers. Any slider or button of the interfaces can be mapped to any recording channel and output and programming can be done in realtime. Conductor Pro can also control a BSM video server cluster during programming. With an incredible speed and accuracy the server system will follow drags of the locator in Conductor Pro, giving the creatives and programmers the power to quickly seek, play and adjust motion or effects while seeing media playing on the screen.

LIGHT DESK INTEGRATION
A lot of media based attractions include complex light shows usually created by light designers on their favorite tool: the light desk. BSM seamlessly integrates the light desk by timecode into the system. Light designers can concentrate on light programming, media will follow their timecode. Once light programming is done, the light show is recorded through Artnet in Conductor Pro. Any number of Artnet universes can be recorded at once. Those recorded shows can then be located in Conductor Pro – parallel to motion and other effects – and will be sent out perfectly synchronous to video playback. Any limits? At the time this document was written, the most complex show that BSM is aware of included around 900 control channels and 16 recorded Artnet Universes – so close to 10000 channels in total. And it was far below Conductor Pro’s performance limits.

STANDALONE SHOW CONTROLLER
All BSM PRO I-O show controller can operate “live” - controlled from a computer or a video server. Some controllers, so called “Show Commanders” can play out shows from a flash card. Conductor Pro can be used to create shows and dump them on the flash card. The show can consist of audio, DMX or other I/Os and can simply run in loop or can be triggered by an external contact or an UDP command. Simple scenes of a dark ride or preshow elements can be realized with such standalone controllers.
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CAMERA BASED AUTO ALIGNMENT 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. Due to thermal drifts of projectors and structures, such systems have to be readjusted during operation to keep the image quality at a constant, perfect level. BSM provides an optional camera based calibration system that ensures perfect image quality, especially for warped and blended projections. Any complex screen and projector layout can be realized. The numbers of cameras is theoretically not limited. Different to other vendors, the cameras can be installed anywhere “hidden” in the attraction - the only precondition is that all cameras in total “see” the entire screen surface. Also different to other vendors, the BSM Alignment System guarantees to always map a specific pixel of the content to a defined position on the screen to ensure to f.e. perfectly hit nozzles of a special effect or the screen border. In addition, the calibration system also seamlessly integrates in the media workflow if slicing of media is required.

OPERATION AND MONITORING
BSM developed some unique tools for monitoring the correct operation of an attraction. One of the most popular is the “dual use” of the cameras of the camera based auto alignment system: during normal operation, cameras are used to stream a video over to a BSM Monitoring Server that presents those videos and additional health, quality of service and status information of the video servers on a split screen. Videos of observation cameras, a timecode display and other elements can be included on the overview. Events can be defined to send out email notifications, f.e. if contact to a video server is lost or if its status is faulty. That way, the operator always has an insight view of what is going on in the attraction.

DIGITAL SIGNAGE
Beside our video servers, that focus perfect video playback, BSM also provides a Digital Signage solution that allows simple and easy content creation for single screens. Videos, Slideshows, Tickers and other elements can be placed in regions of the screen and content can be scheduled by time. Push content can be triggered by a control system. It allows you to use a screen for showing f.e. next show times or advertisements and trigger certain messages based on the show time. Content can be quickly replaced which might be an option of the client to add custom announcements.

REFERENCE PROJECTS
BSM products are used in a lot of “world’s largest” and “world’s first” projects. Please refer to our webpage for more information.