CAMERA TRACKING

Advanced solutions for every production

For virtual studio and augmented reality productions to look authentic, accurate camera tracking is essential. That's why studios around the world turn to Avid, the world leader and patent holder for the majority of all virtual studio and camera tracking technologies. From our cost-effective Pattern Recognition system and opto-mechanical sensors, to our next-generation Xync 2.0 infrared camera tracking system, we offer a variety of solutions to meet any production need and budget.

GAIN TOTAL FREEDOM OF MOVEMENT

Avid offers a new extremely flexible infrared-based tracking system that provides unmatched performance and accuracy for live studio productions. Bundled with Maestro™ | Virtual Set, it enables you to freely move a camera anywhere within your virtual or conventional studio—without limits—and track every move with precision. Even with multicamera productions. From low-angle shots, 360-degree pans, and close-ups, to crane movement shots and handheld camera shots while zooming in or out, your possibilities are endless.

Xync 2.0 supports a wide variety of broadcast cameras, lenses, and tripods, so you can easily integrate multiple camera configurations without reliance on third-party technologies. With its 360-degree shooting range, Xync 2.0 also supports an unlimited number of pedestal, dolly, handheld, steady-cam, and crane-mounted cameras, giving you great flexibility—and freedom of movement—within your environment.

And it's incredibly reliable too. Its fully redundant architecture minimizes any single point of failure. To generate sufficient tracking information, only three light sources out of the total 16 available on each target need to be seen by two ceiling-mounted surveillance cameras. And it delivers dependable performance no matter how high or low the ceiling.

Xync processes all tracking information from all camera parameters in real time, including the XYZ position, zoom, tilt, pan, focus, and roll settings. Using a series of sophisticated algorithms, it analyzes the data, determines the value of each variable, and feeds the tracking data directly to your Maestro | Virtual Set system—all in real time—for the most fluid motion and accuracy.

GET SIMPLE, MOUNT—FREE CAMERA TRACKING

Our Pattern Recognition grid system is the most cost-effective tracking solution available, making it an ideal entry-level system. And it's also a great fit for budget-minded studios with a relatively large number of cameras.

Using proprietary algorithms, the system works by extracting a camera's position, orientation, and field of view directly from the video signal. It's an easy addition to any existing video environment, as it works with all types of studio cameras and lenses, and supports multicamera productions, as well as PAL, NTSC, SD, and HD formats.

The system employs traditional blue or green screen chroma key techniques, but with the addition of grid lines of a similar blue or green hue on top of the backdrop. The High Digital Video Processor (HDVP) processes the video signal from your studio camera, calculating its orientation, position, and zoom. The data is then streamed through the network to the Avid® HDVG+ real-time graphics rendering platform, which renders the background graphics according to the tracking data. The pattern lines are completely removed in the chroma keying process. And only a small portion of the grid needs to be visible to the camera to generate precise camera tracking, identifying the camera's pan, tilt, roll, and field of view.

Because no physical devices are mounted onto the studio cameras, system setup is extremely simple. Just mount the grid to the blue or green box wall (choose from three grid sizes or get one customized), and the Pattern Recognition algorithm automatically extracts the camera parameters. Your virtual studio is ready to go on air in a matter of seconds

TRACK PAN AND TILT WITH OPTO-MECHANICAL SENSORS

Mounted on a pedestal or tripod, our opto-mechanical sensor heads offer an extremely precise and high-resolution solution for fixed-position camera shots. Each sensor retrieves the pan and tilt parameters of a camera's movement, allowing for a 360-degree shooting range. Zoom and focus tracking data is derived from both analog and digital lenses, while maintaining support for all types of lenses.

Our unique sensor technology enables an instant calibration process for camera positioning. During the initial setup, a few reference points are marked and stored, enabling production to operate continuously while the tracking data is retrieved. The system's high accuracy is achieved by sampling over 1,000,000 reads per 360 degrees, enabling you to frame extreme close-up shots—even with long distances and fast camera movements.

Because the sensors can transmit the camera's tracking data information in several ways, they increase your studio and field capabilities. Whether you want to use the camera audio channel, saving the burden and costs involved in laying additional cables between your studio and control room, or Ethernet to send the tracking data on the same system network, this solution will greatly increase your efficiency.

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Camera Tracking—Advanced solutions for every production need

BOOST YOUR POSSIBILITIES BY COMBINING SYSTEMS

While you can use any Avid camera tracking system on its own, pairing two solutions together will increase your capabilities. For example, using opto-mechanical sensor heads with a Pattern Recognition grid system extends your tracking coverage options, which would not be available if you used only the grid.

One of the biggest advantages of combining systems is that you can greatly reduce the time required to calibrate a sensor-based camera system prior to each production. Combine the Pattern Recognition grid with a sensor head, and the calibration process becomes immediate and easy. That's because the camera position is generated by simply having the Pattern Recognition grid in the camera's field of view, from which the camera's exact X, Y, Z, pan, tilt, and roll parameters can be extracted.

When using Pattern Recognition, a small portion of the grid panel should be visible at all times. Adding a sensor head enables you to pan away from the grid—or zoom in very closely—by simply switching from grid to sensor-based tracking in your Maestro | Virtual Set system. This gives you greater flexibility in choosing shots for a production.

CALIBRATE YOUR LENS—OR NOT

Our virtual studio and augmented reality systems support most commonly used camera lenses in the field—whether ENG, box, digital, or analog. In addition, we offer a library of predefined lens calibration files, so there's no need to calibrate your lenses initially. That said, you can calibrate any lens for your specific requirements.

Lenses of the same type usually have very similar calibration curves, however, the values can differ. Our lens calibration process takes into account both lens calibration and aberration to ensure precise and accurate tracking. This enables you to calibrate a given type of lens once and reuse the calibration results for other lenses of the same type.

EXTEND YOUR TRACKING CAPABILITIES

Not only can you use Avid tracking solutions together, you can also integrate them with our connectivity partners' systems, extending your tracking options to include encoded cranes, manual and robotic pedestals, and other devices. Use our solutions with gear from Vinten, Vinten Radamec, Shotoku, Telemetrics, Mo-Sys, Thoma, General Lift, Ross Video, Kronomav, Egripment, Stype GRIP, TechnoDolly, and many other partners.

Our solutions easily integrate with all "sensorized" crane systems, giving you great flexibility. These include camera cranes that have been modified to include sensors, such as rigs from Egripment, Stype GRIP, and General Lift, and cranes specifically designed for virtual studio orientation, with built-in encoders, including Mo-Sys, Technocrane, and Shotoku systems.

Our tracking systems also integrate with all manual and robotic pedestals available in the market today, giving you extremely precise tracking and endless possibilities. These lightweight, motorized camera pedestals feature built-in encoders that measure the movement of the pedestal in the studio through manual or remote (robotic) control. This combination provides precise, real-time electronic positioning over the floor and in elevation.

You can also pair our solutions with Ncam, which provides complete position and rotation information, plus focal length and focus. Ncam uses industry-standard protocols that are compatible with any virtual reality and augmented reality graphics system. Simply transfer tracking data over the Free-D protocol to your Avid TrackingSet system and render engine to match the camera's movement with the graphics inside or outside of your studio.

And together with Kronomav's new protocol and our VR/AR systems, Avid gives broadcasters the ability to track movement on a straight or curved line within the studio using the K2 robotized curved dolly system. With this partnership, you can create richer productions, with endless possibilities for both virtual studios and immersive graphics in your real one.

REMOTELY CONTROL YOUR VIRTUAL STUDIO

Production efficiency is one of the key advantages that virtual studio production has over conventional sets. Because our tracking solutions integrate and interact seamlessly with a wide range of robotic cameras, remote controlled sensor based heads, robotic cranes, and pedestals, all you need is a single operator to run the entire production, providing huge cost savings.

Integrate a robotic camera to remotely pan, tilt, zoom, and focus. Mount tracking heads on a tracked rail—whether horizontal or vertical, straight or curved, or a combination—to incorporate dolly and up/down camera movements. And increase your production capabilities by enabling remote controlled cameras to be part of your virtual studio solution.

Camera Tracking—Advanced solutions for every production need

FEATURE	PATTERN RECOGNITION	OPTO-MECHANICAL SENSOR	PATTERN RECOGNITION WITH OPTO-MECHANICAL SENSORS	XYNC 2.0
Method of tracking	Image processing	Sensors	Image processing and sensors	Infrared
Number of cameras supported	Unlimited	Unlimited	Unlimited	Unlimited
Delay	3 frames	2 frames	3 frames	2 frames
Camera mounting	Pedestal	Pedestal	Pedestal	Pedestal, handheld, crane
Direction of shooting	Requires at least 30% of the grid to be visible	360 degrees	360 degrees	360 degrees
X, Y, Z camera position	Yes	No	Yes, off air	Yes
Dolly support	Only when used with CamTrack	No	No	Yes
Zoom	Yes (with limitations)	Yes	Yes	Yes
Tilt	Yes (while at least 30% of the frame is grid)	Yes	Yes	Yes
Pan	Yes (while at least 30% of the frame is grid)	Yes	Yes	Yes
Focus	Yes (with limitations)	Yes	Yes	Yes
Roll	Yes	No	No	Yes

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