

InMotion Simulation



InMotion Simulation Uses Galil Motion Controllers



Ever wondered how nerve-wracking it must feel like to be in the middle of an 8.2 magnitude earthquake, or imagined how exhilarating it would be to experience a 5D ride that swiftly tilts a motion platform in three axes while getting blasted with water and air.

These are just a few of the scenarios that InMotion Simulation in Prescott, AZ can re-create in a virtual reality format. Founded in 2003 by Mark Barry, the company has custom designed and built hundreds of high-fidelity motion simulators for a variety of industries including the military, entertainment, museums, academia, Hollywood and flight training.

Products include electric 2- and 3-Degrees of Freedom (DOF) platforms that handle up to 4,000 pound payloads, and hydraulic 6-DOF platforms for payloads up to 30,000 pounds.

“The precise, real-time responsiveness, lack of latency, and motion of the simulator is critical to our ability to replicate as close to reality as possible the action of flight simulation, for example, or the sensation of a race car moving at 200 mph. In every case, the motion platform must work correctly and safely, every time,” Barry added.

“That is why we specified Galil motion controllers to play the key role in handling the pitching, rolling, yawing, heaving, swaying and surging action of our simulators. Cost, performance and low latency were the main deciding factors. Another key factor was how easy it is to program the controller. We evaluated other controllers, but Galil won hands down and we have been using them since I started the business. Every simulator of ours around the world that you see will have a Galil controller.”

The 2-DOF and 3-DOF platforms incorporate Galil’s

The DMC-2123 and DMC-2133 provide precise, real-time responsiveness for simulations.

DMC-2123 2-axis and DMC-2133 3-axis controllers, respectively. For more advanced 6-DOF systems, Galil’s DMC-4060 6-axis controller is used. All feature Ethernet connectivity and PID compensation with velocity and acceleration feed forward.

According to Barry, programming the Galil controllers is “straight forward with easy-to-read documentation and plenty of functionality.” Galil controllers use two-letter, English-like commands such as “AC” for acceleration and “SP” for speed. Further examples include the Pole command (PL) which provides a low pass filter to keep the motion

smooth, and the Define Position (DP) command used to zero the system for accurate position reference.

InMotion Simulation uses its proprietary motion cueing software to send motion commands on-the-fly to the Galil controller which provides a point-to-point position tracking mode. The software also enables customers to easily adjust or customize the multiple functions of the motion platform through the graphical user interface (GUI), including gain, damping, acceleration, deceleration, and velocity. For safety, Barry uses Galil’s digital inputs for emergency stops. Customers can also set the automated limits of the simulator, and can even revert to manual control.

To date, InMotion Simulation has hundreds of simulators operating worldwide in museums, trade shows, training and research facilities, universities, military bases, and more.

Some are replicating the sensation of helming a military gun ship or a race car, while others are training military personnel, testing antennas and bringing high adventure 5D theaters to movie and thrill ride enthusiasts. Some are training future aviators while others are putting Navy trainees behind a .50 caliber machine gun on gunships.

“Another cool project was for a space shuttle simulator used on the British reality television show ‘Space Cadets.’ Contestants were filmed for a week living on what they thought was a real space shuttle. They were told they were really going to be flying in space, and they believed it. Of course, they were only in a simulator—using a Galil controller.” Barry said. ■

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