E2M Technologies B.V. is a leading specialist in the development and production of electric motion- and control loading systems for a wide variety of simulation applications.

E2M specializes in the design of electric subsystems for simulators, the areas of expertise of E2M include hardware design of actuators and platforms, system design conforming to all applicable standards, state of the art software development including class-leading motion cueing and extremely straight forward host interfacing.

Since the start of the company in 2009, E2M has developed and produced more than 20 different electric motion systems, ranging in payload from 500kg to over 20,000kg, which are setting new standards with regards to reliability, motion quality, diagnostics and cueing. 24/7 support is available for the aircraft simulator products.

E2M offers excellent flexibility, responsiveness and support. Numerous renowned references are available on request to testify about our customer oriented attitude. E2M motion systems are used worldwide for applications ranging from small driving simulators and entertainment systems to certified commercial- and military full flight simulators for helicopters and fixed-wing aircrafts.

*ISO 9001:2008 certified company*
MOTION SYSTEMS

eM6-1400-14000, eM6-1400-8000
2nd generation electric motion system for full flight simulators up to level D, with better reliability, best in class motion quality, advanced cueing- and diagnostics software.
• gross moving load: 14.000kg or 8.000kg
• stroke: 1430mm
• choice of mechanical interfaces
• different snubber options available
• compliant with worldwide level D standards, including ICAO 9625 level VI

eM6-1000-8000
Featuring the same technologies as the 1400 system, but with a shortened stroke, the eM6-1000-8000 is designed for full flight simulators up to level D.
• gross moving load: 8.000kg
• stroke: 1.050mm
• choice of mechanical interfaces
• compliant with worldwide simulator standards, including ICAO 9625 level VI

eM6-900-20000-CCT, eM6-900-30000-CCT, eM6-400-12000-CCT
The new standard for motion-based Cabin Emergency Evacuation Trainers. With 6 degrees of freedom, E2M electric motion systems provide better cueing fidelity for more realistic training.
• gross moving load: 12t, 20t or 30t
• stroke: 400mm (12t) and 900mm (20t, 30t)
• redundant safety features
• optional lightweight cabin structure interface frame
• low maintenance, low energy consumption, easy installation
• advanced eCue Creator software for drive file generation
MOTION SYSTEMS

**eM6-720-4000**

With its compact actuators, longer stroke and increased payload, the eM6-720-4000 offers more flexibility for a wide variety of applications.
- gross moving load: 4.000kg
- stroke: 720mm
- fully electric motion system
- advanced cueing- and diagnostics software
- application examples: (armoured) vehicle simulators, flight training devices, full flight simulators

**eM6-640-3000**

The most versatile motion system in its price range, with worldwide installations in large quantities. The external pneumatic weight compensation system increases the gross moving load to 3.000kg.
- gross moving load: 3.000kg
- stroke: 640mm
- 3 external pneumatic cylinders to compensate for the static weight
- shipped fully assembled (fits a standard shipping container)
- application examples: railway simulators, driving trainers (car, truck, military vehicles, etc), entertainment

**eM6-640-1800**

Simple, robust and proven to be very reliable, the eM6-640-1800 has been the standard choice for numerous applications since the start of E2M Technologies.
- gross moving load: 1.800kg (optional upgrade to 2.200kg)
- stroke: 640mm
- shipped fully assembled (fits a standard shipping container)
- application examples: driving trainers (car, truck, military vehicles, etc), entertainment, (high-speed) naval vessels, emergency evacuation trainers, entertainment
MOTION SYSTEMS

**eM6-400-1500**
Low-cost, small 6-DOF motion system for both professional- and entertainment applications.
- gross moving load: 1.500kg
- stroke: 400mm
- shipped fully assembled
- application examples: driving trainers, entertainment, general R&D

**eM6-300-1800**
Using the robust actuators of the eM6-640-1800, but with a shortened stroke, the eM6-300-1800 is commonly used for applications that demand a high dynamic response, such as multi-axis test platforms and low-cost helicopter simulators.
- gross moving load: 1.800kg
- stroke: 300mm
- shipped fully assembled
- application examples: helicopter training, test systems, tank gunner trainers

**eM6-300-1500**
The smallest E2M electric motion system with linear actuators, with a settled height of only 0.71m. The perfect form, fit and function alternative for the popular small systems from Moog.
- gross moving load: 1.500kg
- stroke: 300mm
- shipped fully assembled
- application examples: (mobile) driving trainers, entertainment, medical rehabilitation, general R&D
MOTION SYSTEMS

**eM6-ROT-1000**
Extremely compact 6-DOF electric motion system through the use of a patented curved push-pull arrangement.
- gross moving load: 1.000kg
- settled height of only 385mm
- shipped fully assembled
- application examples: simulators with limited available room space, mining- and construction equipment simulators, mobile simulator systems

**eM3-ROT-800**
Compact and low-cost 3-DOF motion system providing heave, roll and pitch movement for a wide range of simulator applications.
- gross moving load: 800kg
- 3-DOF: heave, pitch and roll
- shipped fully assembled
- application examples: mining- and construction equipment simulators, entertainment, mobile simulator systems

**eM3-ROT-1500-HF**
High frequency 3-DOF cockpit shaker for helicopter simulation. Can be used stand-alone, or integrated with an E2M level D motion system.
- gross moving load: 1.500kg
- up to 35Hz frequency performance
- 3-DOF: surge, sway and heave
- software supports cross coupling reduction
- flexible design (platform height can easily be changed as per customer requirements)
- application examples: high fidelity helicopter pilot training
MOTION SYSTEMS

**eM3-300-3000**

Specifically designed for railway simulator systems, the eM3-300-3000 provides subtle pitch, roll and heave cues to any cabin mounted on the moving frame.

- gross moving load: 3.000kg
- actuator stroke: 300mm
- pneumatic weight compensation system with external cylinders
- low profile design for easy entrance to cabin and for use in rooms with a standard ceiling height

**eM5-300-3000**

Based on the eM3-300-3000, the eM5-300-3000 provides additional surge and sway motion cues.

- gross moving load: 3.000kg
- actuator stroke: 300mm
- pneumatic weight compensation system with external cylinders
- low profile design for easy entrance to cabin and for use in rooms with a standard ceiling height
- rail-based surge movement for smooth low frequency surge cues

**eM4-640-3000**

Designed for the demanding requirements of the entertainment industry, the eM4-640-3000 motion system uses the proven 640mm stroke actuators and a weight compensation system with external pneumatic cylinders.

- gross moving load: 3.000kg
- actuator stroke: 640mm
- low maintenance design
- pitch, roll, heave, surge
- high throughput of people, as no moving access bridge is required
- advanced eCue Creator software for ride file generation
- SMPTE synchronization functionality
## CONTROL LOADING SYSTEMS

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Description</th>
<th>Specifications</th>
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| **eF-DD-F-200** | High performance, direct-drive actuator for smooth force feedback on the primary flight controls of level D full flight simulators. | - continuous torque of 200Nm  
- maximum velocity of 720°/s |
| **eF-GD-F-130** | Very smooth, low-ratio geared actuator providing dynamic force feedback on the flight controls of fixed- and rotary wing flight simulators. | - continuous torque of 130Nm  
- maximum velocity of 1.000°/s |
| **eF-GD-100/200** | Compact and cost-effective geared actuators for both primary and secondary flight controls. | - continuous torque up to 200Nm  
- maximum velocity up to 1.000°/s |
| **eF-DD(M)-20/50/130** | Most economical series of direct-drive actuators for primary and secondary flight controls, available in 3 different sizes and optional multi-turn functionality for stabilizer trim and steering wheel applications. | - available with 20Nm, 50Nm and 130Nm continuous torque  
- maximum velocity up to 4.500°/s |
SOFTWARE

E2M uses a single software- and hardware controller for all motion-, vibration- and control loading systems. The servo drives and peripheral hardware are interfaced with the real time controller using the industry standard EtherCAT network technology. The digital information on this network is fully integrated into the controller code resulting in excellent diagnostics capabilities. The Linux based real time operating system runs on an industrial PC with a multi-core CPU. Data files are easily accessible through a Windows PC running E2M diagnostics software, connected to the controller through a standard Ethernet connection. This configuration also allows for remote troubleshooting and support.

Features:

• Single binary controller solution for motion-, control loading- and vibration systems, or a combination thereof
• Advanced motion cueing model with the patented Direct Workspace Management adaptive washout
• Configurable special effect database (periodic, random and time based signals)
• Generic and vehicle-specific control loading software models
• Model development toolkit with support for Matlab Simulink
• User configurable, UDP Ethernet based and auto connecting host interface
• User friendly API for host interface development, including example C++ code and real time emulator
• Detailed text based error messages in multiple languages, including values of relevant signals
• Extensive product support features such as automated HTML documentation generation, parameter database, signal recording, signal playback signal generators, automatic tests, logging and user configurable control panels
SOFTWARE

COMMANDER

Access to all controller parameters, signal commands and states.
• Connects to any E2M real time controller through Ethernet
• Access to all controller parameters, signals and commands
• User templates to customize layout and content of the screens
• Configurable control panel
• Important controls always visible
• Error message reporting

EGRAPH

Plotting tool for signal recording files.
• User templates to customize layout and content of the screens
• Pan and zoom functions
• Indicates error events and error messages
• Statistical data analysis functions
ECUE CREATOR

User tool for creating motion profiles for pre-defined motion applications such as Cabin Crew training, component testing and entertainment rides.

- Load video files and synchronize the motion profile with the video
- Create named time marks for easy navigation through the profile
- Editing of the profile using smoothed sine, spline and scale functions
- Special effects (random, periodic and time based)
- Filtering and limiting for a specific E2M motion system
- Direct control function for development and immediate playback
- SMPTE synchronization functionality
Head office:
Pedro de Medinalaan 17
1086 XP Amsterdam
The Netherlands
Phone: +31 (0)20 7070901
www.e2mtechnologies.eu
info@e2mtechnologies.eu

USA office:
1000 Atlantic Ave.
Suite 109, Alameda CA 94501
U.S.A.
Phone: +1 510 368 5560
www.e2mtechnologies.com
info@e2mtechnologies.com

Not all systems produced by E2M are listed in this brochure. Please contact E2M if you have specific requirements.