Motion hexapods catalog
Welcome

Welcome to SYMETRIE! In browsing this catalogue, you will find the best possible dynamic solutions to cater to your demanding applications.

Always looking to increase the performance of our hexapods, our growing team works hand in hand to integrate the latest available technology.

This is why SYMETRIE is first and foremost a R&D company. Thanks to our experience providing hexapods for industry and research laboratories, we will be able to quickly answer your needs.

Olivier Lapierre & Thierry Roux
Co-founders, CEO & CTO

Contents

| SYMETRIE company                        | 3 |
| A promising experience and vision       | 4 |
| Hexapod technology                     | 6 |
| Overview of the product range           | 7 |
| Some applications                       | 8 |
| NOTUS hexapod                          | 10 |
| MISTRAL hexapod                        | 12 |
| SIROCCO hexapod                        | 14 |
| AQUILON hexapod                        | 16 |
| A worldwide presence                   | 18 |

SYMETRIE company

Design department

SYMETRIE's engineering office consists of mechanical, electronic and software engineers. Our R&D department is continuously seeking for improvement, with a major effort on control software.

Workshops

All our hexapods and controllers are assembled in our mechanical and electronic workshops using standardized procedures.

Clean room

In our ISO 7 (class 10000) clean room, we mount the hexapods for applications which are sensible to environmental contamination, such as optics, space or particle accelerators. In a clean room, the concentration of particles is controlled and minimized.

Metrology laboratory

To demonstrate high precision performances, SYMETRIE is equipped with a wide range of metrology tools: laser interferometers, laser trackers, coordinate measuring machine (CMM), electronic inclinometers, capacitive sensors.
A promising experience and vision

SYMETRIE’s trusted R&D skills led to the birth of the positioning and motion hexapods

SYMETRIE was created in 2001 with the hexapod technology as a baseline. This innovative system was quickly spotted by the highest research institutions which asked SYMETRIE for a high precision hexapod to position the target of the Megajoule Laser, a high energy inertial confinement fusion device in France.

The following contracts, still more ambitious, trusted the company to add dynamic motion capabilities to its hexapods systems. SYMETRIE succeeded once again in delivering up to 1g acceleration to slosh 10 ton liquid gas tanks for maritime transportation.

Innovation is a key factor of our development. Our R&D department works every day to improve our technologies and control systems using the latest generation components and techniques for higher quality products.

The acquired experience and trust built among a nascent network of customers were the beginning of an involvement in a wide array of technological projects, such as the Gaia satellite and the James Webb Space Telescope among others.

Innovation is a key factor of our development. Our R&D department works every day to improve our technologies and control systems using the latest generation components and techniques for higher quality products.

From standard hexapods to custom designs

To cater to your needs in the smoothest way, SYMETRIE offers a range of turnkey hexapods.

■ Better price and lead time: We look forward to offering hexapods which have already been designed.
■ Ease project definition: Offering a coherent range where the hexapods differentiate between each other with unique features allows you to easier select and understand the capabilities that you will get.

SYMETRIE remains a trustworthy designer for customized solutions and can provide custom designs in a short time thanks to an in-house software enabling to quickly create a hexapod geometry with respect to the customer’s input parameters.

With more than 10 years hexapod background, SYMETRIE is experienced in choosing and using the most adapted technologies in terms of motors, encoders, joints... according to the customer’s application.

Our roots: metrology specialists with innovative minds

The two co-founders of SYMETRIE, Olivier Lapierre and Thierry Roux, were previously working for LNE, the French national metrology and testing laboratory. Specialized in dimensional metrology, they were looking for an innovative and efficient 6 DOF measurement system to quickly calibrate machine-tools and thought of the hexapod as a perfect solution.

The dimensional metrology grain remains running through the veins of SYMETRIE at each one of its footsteps. Thanks to an experienced metrology staff, SYMETRIE knows how to qualify and test the hexapods before delivery to validate conformity.
Hexapod technology

6 Degrees Of Freedom

A hexapod is a parallel kinematic structure composed of a mobile platform linked to a fixed platform with 6 actuators. This design allows to move an object placed on the mobile platform with 6 DOF (Degrees Of Freedom). In other words, the hexapod can move an object along the 3 translations (Tx, Ty, Tz) and the 3 rotations (Rx, Ry, Rz); any combination is possible.

Configurable pivot point

In order to orientate the mobile platform in the desired way, a 3D rotation center has to be defined. This point is not limited to the center of the mobile platform and can be placed wherever the user needs it to be.

Overview of the product range

<table>
<thead>
<tr>
<th>Name</th>
<th>Payload</th>
<th>Linear travel range</th>
<th>Angular travel range</th>
<th>Speed</th>
<th>Height at midrange</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTUS P</td>
<td>200 kg</td>
<td>± 250 mm</td>
<td>± 20°</td>
<td>800 mm/s</td>
<td>1.10 m</td>
</tr>
<tr>
<td>NOTUS V</td>
<td>100 kg</td>
<td>± 250 mm</td>
<td>± 20°</td>
<td>1 200 mm/s</td>
<td>1.10 m</td>
</tr>
<tr>
<td>MISTRAL 600P</td>
<td>1 000 kg</td>
<td>± 400 mm</td>
<td>± 30°</td>
<td>1 000 mm/s</td>
<td>1.44 m</td>
</tr>
<tr>
<td>MISTRAL 600V</td>
<td>500 kg</td>
<td>± 400 mm</td>
<td>± 30°</td>
<td>1 200 mm/s</td>
<td>1.44 m</td>
</tr>
<tr>
<td>MISTRAL 800P</td>
<td>1 000 kg</td>
<td>± 460 mm</td>
<td>± 30°</td>
<td>1 000 mm/s</td>
<td>1.77 m</td>
</tr>
<tr>
<td>MISTRAL 800V</td>
<td>500 kg</td>
<td>± 460 mm</td>
<td>± 30°</td>
<td>1 200 mm/s</td>
<td>1.77 m</td>
</tr>
<tr>
<td>SIROCCO</td>
<td>2 000 kg</td>
<td>± 600 mm</td>
<td>± 40°</td>
<td>2 500 m/s</td>
<td>2.85 m</td>
</tr>
<tr>
<td>AQUILON</td>
<td>6 000 kg</td>
<td>± 800 mm</td>
<td>± 40°</td>
<td>1 800 m/s</td>
<td>3.31 m</td>
</tr>
</tbody>
</table>
Some applications

Motor bench
This engine test bench allows to realize de-oiling and dewetting tests by simulating the inclination of the vehicle.
A major French car manufacturers trusted our hexapods to simulate a vehicle movement, in order to reproduce real conditions in factory.
The hexapod can support up to 500 kg equipment load with angles of +/-51° in roll and pitch.
After equipping the bench, the user launches a series of automatic tests in order to acquire the various engine parameters (temperature, pressure, etc.) according to the different degrees of freedom.

Motion sensor testing
This hexapod has been designed for the control and qualification of high precision inertial motion units.
For this IMU manufacturer, we have integrated a measuring octopod to the hexapod.
This specific assembly allows the qualification and control of the inertial units during various experiments.
This hexapod is adapted to carry out tests embedded in vehicles. Moreover, a servo-control can be carried out thanks to the information coming from the IMU.

Antenna testing
Hexapods are used by the R&D departments developing SATCOM antennas in order to test the stabilization performances of the antennas motorized systems.
These antennas are later installed on boats, trucks or any other kind of vehicles, so the motorization needs to be adjusted in order to enable the highest communication performances between the antenna and the satellite.
These hexapods can be prepared for outdoor and sometimes integrate an extra Rz rotation in the mobile platform to be able to simulate the U-turn of a boat for example.

Boat simulation
Here, NOTUS hexapod is simulating a boat deck agitated by the swell, on which a helicopter is trying to land.
This system is installed inside a wind tunnel at a research centre in Canada.
Thanks to this hexapod they recreate outdoor conditions in an indoor test centre, allowing more specific tests to be carried out while limiting costs.

Sloshing
GazTransport & Technigaz designs containment systems for the transport of LNG (Liquefied Natural Gas). The temperature of LNG is -163°C during transportation so the tanks have to be well isolated to limit LNG evaporation.
GTT is using several dynamic hexapods from SYMETRIE to simulate the impact of sea voyages on their cryogenic membranes. The effects of sloshing, which is the movement of a liquid inside a moving tank, need to be studied by GTT in order to correctly define the width of the membranes and to reinforce them intelligently.
Hexapods have allowed GTT to make great progress in understanding the phenomenon of liquid movements.

Wave basin
A wave basin is a research facility for testing ships and offshore structures in the most realistic conditions.
Hexapods are used by maritime laboratories that study the hydrodynamic effects of swell, the phenomena of sloshing or cavitation for example. Wave basins are used by a diversity of naval actors, such as ships and propellers designers, renewable marine energies (floating wind turbines) and offshore (floating production units, anchored or articulated).
The hexapod is attached downwards to a trolley, which moves along the basin. The mobile platform of the hexapod moves the ship model or any other tested component to reproduce the hydrodynamics effects of the swell.
The hexapod is prepared for the maritime environment and the fixed platform is reinforced for upside down use.

Some applications

Wave basin
A wave basin is a research facility for testing ships and offshore structures in the most realistic conditions.
Hexapods are used by maritime laboratories that study the hydrodynamic effects of swell, the phenomena of sloshing or cavitation for example. Wave basins are used by a diversity of naval actors, such as ships and propellers designers, renewable marine energies (floating wind turbines) and offshore (floating production units, anchored or articulated).
The hexapod is attached downwards to a trolley, which moves along the basin. The mobile platform of the hexapod moves the ship model or any other tested component to reproduce the hydrodynamics effects of the swell.
The hexapod is prepared for the maritime environment and the fixed platform is reinforced for upside down use.
NOTUS hexapod

Dynamic compact hexapod

---

KEY FEATURES

- Payload capacity 200 kg
- Linear travel range ± 250 mm
- Angular travel range ± 25°
- Compact

APPLICATIONS

- Motion simulator
- Naval
- Swell simulator
- Biomedical
- Defense
- Optics

---

NOTUS enables testing the gyroscopic platform of a cold atom gravimeter that will be later installed on a ship by ONERA. The hexapod reproduces the swell motions and the ship vibrations.

NOTUS hexapod allows to test the stabilization system of a camera that can be later installed on a tank, a truck or a boat.

NOTUS hexapod helps to characterize and calibrate electro-optics gimbals that will be later installed on helicopters.

NOTUS hexapod helps to characterize and calibrate electro-optics gimbals that will be later installed on helicopters.

---

### KEY FEATURES

- Payload capacity 200 kg for 200 kg payload
- Linear travel range ± 250 mm ± 250
- Angular travel range ± 25° ± 25
- Compact

### APPLICATIONS

- Motion simulator for 200 kg payload
- Naval for 100 kg payload
- Swell simulator for 200 kg payload
- Biomedical for 100 kg payload
- Defense
- Optics

### Mechanical properties

- Payload capacity (kg) 200
- Vertical orientation only 100
- Motor type Brushless
- Brushless

### Miscellaneous

- Operating temperature range (°C) 0 to + 50
- 0 to + 50
- Size mobile platform (mm) Ø 660
- Ø 660
- Height in middle position (mm) ~1 080
- ~1 080
- Mass (kg) ~120
- ~120
- Cable length (m) 7
- 7
- Options
  - IP 64 motor protection
  - Acquisition and storage of motions
  - API
  - Customized platform design

### Controller

- Interface Ethernet
- Power supply 400 VAC (three-phase) / 16 A / 50-60 Hz

---

The performances are specified for single axis motions, with all other axes at midrange and for a rotation center in the middle of the mobile platform.
**MISTRAL hexapod**

**Dynamic hexapod for motion**

**APPLICATIONS**
- Motion simulator
- High payload positioner
- Driving simulator
- Swell simulator

**KEY FEATURES**
- Payload capacity up to 1 ton
- Linear travel range ± 460 mm
- Angular travel range ± 30°

**MISTRAL hexapod**

- Reproduces ship motions to test the stabilization performances of large maritime SATCOM antennas.
- Orientation a ship model in a wave basin to reproduce maritime conditions and test the shipbuilding techniques.
- Simulates the motion of a floating gas production unit to characterize hydrodynamic effects of the swell on the chemical reactions in a gas deacidification column.

**These tests allow to improve performance and robustness of the processing units.**

**MISTRAL 600**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MISTRAL 600</th>
<th>MISTRAL 800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload capacity (kg) (vertical orientation only)</td>
<td>1 000</td>
<td>500</td>
</tr>
<tr>
<td>Motor type</td>
<td>Brushless</td>
<td>Brushless</td>
</tr>
<tr>
<td>Operating temperature range (°C)</td>
<td>0 to + 50</td>
<td>0 to + 50</td>
</tr>
<tr>
<td>Size mobile platform (mm)</td>
<td>Ø 1 386</td>
<td>Ø 1 386</td>
</tr>
<tr>
<td>Height in middle position (mm)</td>
<td>~ 1 440</td>
<td>~ 1 765</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>~ 400</td>
<td>~ 450</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 64 motor protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition and storage of motions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>API</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customized platform design</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controller</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Ethernet</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>400 VAC (three-phase) / 16 A / 50-60 Hz</td>
<td></td>
</tr>
</tbody>
</table>

**The performances are specified for single axis motions, with all other axes at midrange and for a rotation center in the middle of the mobile platform.**

---

**MISTRAL hexapod**

- Motion and positioning:
  - Travel range $T_x, T_y$ (mm): ± 400
  - Travel range $T_z$ (mm): ± 300
  - Travel range $R_x, R_y$ (deg): ± 90
  - Travel range $R_z$ (deg): ± 40
  - Speed $T_x, T_y$ (mm/s): 1,000
  - Speed $T_z$ (mm/s): 600
  - Speed $R_x, R_y$ (°/s): 50
  - Speed $R_z$ (°/s): 70
  - Acceleration $T_x, T_y$ (mm/s²): 5,000
  - Acceleration $T_z$ (mm/s²): 6,000
  - Acceleration $R_x, R_y$ (°/s²): 500
  - Acceleration $R_z$ (°/s²): 700

**Mechanical properties**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MISTRAL 600</th>
<th>MISTRAL 800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload capacity (kg)</td>
<td>1 000</td>
<td>500</td>
</tr>
<tr>
<td>Motor type</td>
<td>Brushless</td>
<td>Brushless</td>
</tr>
<tr>
<td>Operating temperature range (°C)</td>
<td>0 to + 50</td>
<td>0 to + 50</td>
</tr>
<tr>
<td>Size mobile platform (mm)</td>
<td>Ø 1 386</td>
<td>Ø 1 386</td>
</tr>
<tr>
<td>Height in middle position (mm)</td>
<td>~ 1 440</td>
<td>~ 1 765</td>
</tr>
<tr>
<td>Mass (kg)</td>
<td>~ 400</td>
<td>~ 450</td>
</tr>
<tr>
<td>Cable length (m)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 64 motor protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition and storage of motions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>API</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customized platform design</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controller</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Ethernet</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>400 VAC (three-phase) / 16 A / 50-60 Hz</td>
<td></td>
</tr>
</tbody>
</table>

---

**MISTRAL hexapod in middle position**

- The surfer can practice various wave situations played by the Simusurf hexapod and improve his gestures through practice and analysis by recording his movements with additional sensors.
- Simusurf Hexapod can be used as a discovery and learning tool for the casual surfer or as a performance and training tool for the professional surfer.

---

**Credits:**
- Thales Communications & Security
- Total
- Ifremer
- I2M-ENSAM
SIROCCO hexapod
Dynamic hexapod with high amplitude

KEY FEATURES
- Payload capacity 2 tons
- Linear travel range ± 600 mm
- Angular travel range ± 40°

APPLICATIONS
- Motion simulator
- High payloads positioner
- Vehicle simulator
- Swell simulator

GTT designs cryogenic membrane containment systems used in the shipbuilding industry for the transport of liquid natural gas (LNG). SIROCCO hexapod allows GTT laboratories to study the impact of moving liquid, also called sloshing, on their insulation.

DCNS uses SIROCCO hexapods as submarine simulators for training purposes to reproduce the emergency situations that submarine crews might encounter during a mission.

FMC Technologies uses two SIROCCO XL hexapods to test a ¼ scale LNG loading arm. These hexapods simulate the swell motion to qualify the loading arm that will connect a gas carrier to an offshore gas production factory. One hexapod simulates the gas carrier, the other the offshore factory.

<table>
<thead>
<tr>
<th>SIROCCO</th>
<th>Motion and positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Travel range Tx, Ty (mm)</td>
</tr>
<tr>
<td></td>
<td>Travel range Tz (mm)</td>
</tr>
<tr>
<td></td>
<td>Travel range Rx, Ry, Rz (deg)</td>
</tr>
<tr>
<td></td>
<td>Speed Tx, Ty (mm/s)</td>
</tr>
<tr>
<td></td>
<td>Speed Tz (mm/s)</td>
</tr>
<tr>
<td></td>
<td>Speed Rx, Ry (°/s)</td>
</tr>
<tr>
<td></td>
<td>Speed Rz (°/s)</td>
</tr>
<tr>
<td></td>
<td>Acceleration Tx, Ty, Tz (mm/s²)</td>
</tr>
<tr>
<td></td>
<td>Acceleration Rx, Ry, Rz (°/s²)</td>
</tr>
<tr>
<td></td>
<td>Acceleration Rz (°/s²)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIROCCO</th>
<th>Mechanical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Payload capacity (kg) (vertical orientation only)</td>
</tr>
<tr>
<td></td>
<td>Motor type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIROCCO</th>
<th>Miscellaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operating temperature range (°C)</td>
</tr>
<tr>
<td></td>
<td>Size mobile platform (mm)</td>
</tr>
<tr>
<td></td>
<td>Height in middle position (mm)</td>
</tr>
<tr>
<td></td>
<td>Mass (kg)</td>
</tr>
<tr>
<td></td>
<td>Cable length (m)</td>
</tr>
<tr>
<td></td>
<td>Options</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
</tr>
<tr>
<td>Power supply</td>
</tr>
</tbody>
</table>

The performances are specified for single axis motions, with all other axes at midrange and for a rotation center in the middle of the mobile platform.

The performances are specified for single axis motions, with all other axes at midrange and for a rotation center in the middle of the mobile platform.

---

GTT uses SIROCCO hexapods as submarine simulators for training purposes to reproduce the emergency situations that submarine crews might encounter during a mission.

DCNS uses SIROCCO hexapods as submarine simulators for training purposes to reproduce the emergency situations that submarine crews might encounter during a mission.

FMC Technologies uses two SIROCCO XL hexapods to test a ¼ scale LNG loading arm. These hexapods simulate the swell motion to qualify the loading arm that will connect a gas carrier to an offshore gas production factory. One hexapod simulates the gas carrier, the other the offshore factory.
AQUILON hexapod

Dynamic hexapod with very high amplitude

**KEY FEATURES**

- Payload capacity 6 tons
- Linear travel range ± 800 mm
- Angular travel range ± 40°

**APPLICATIONS**

- Motion simulator
- Heavy payload positioner
- Swell simulator

**AQUILON**

**Motion and positioning**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel range Tx, Ty (mm)</td>
<td>± 800</td>
</tr>
<tr>
<td>Travel range Tz (mm)</td>
<td>± 650</td>
</tr>
<tr>
<td>Travel range Rx, Ry, Rz (deg)</td>
<td>± 40</td>
</tr>
<tr>
<td>Speed Tx, Ty (mm/s)</td>
<td>± 1 800</td>
</tr>
<tr>
<td>Speed Tz (mm/s)</td>
<td>± 1 600</td>
</tr>
<tr>
<td>Speed Rx, Ry (°/s)</td>
<td>± 200</td>
</tr>
<tr>
<td>Speed Rz (°/s)</td>
<td>± 100</td>
</tr>
<tr>
<td>Acceleration Tx, Ty, Tz (mm/s²)</td>
<td>± 7 000</td>
</tr>
<tr>
<td>Acceleration Rx, Ry (°/s²)</td>
<td>1 200</td>
</tr>
<tr>
<td>Acceleration Rz (°/s²)</td>
<td>600</td>
</tr>
</tbody>
</table>

**Mechanical properties**

- Payload capacity (kg) (vertical orientation only) 6 000
- Motor type Brushless

**Miscellaneous**

- Operating temperature range (°C) 0 to + 50
- Size mobile platform (mm) Ø 2 100
- Height in middle position (mm) ~ 3 311
- Mass (kg) ~ 3 000
- Cable length (m) 15
- Options IP 64 motor protection
- ATEX compatibility
- Acquisition and storage of motions
- API
- Customized platform design

**Controller**

- Interface Ethernet
- Power supply 380 VAC (three-phase) / 250 A

The performances are specified for single axis motions, with all other axes at midrange and for a rotation center in the middle of the mobile platform.
A worldwide presence

Symetrie Hexapods

Our hexapods all over the world
HOW TO CONTACT US

**SYMETRIE headquarters**
10, Allee Charles Babbage  
30035 Nimes Cedex 1  
FRANCE  
Phone: +33 (4) 66 29 43 88  
Email: info@symetrie.fr  
www.symetrie.fr

**Canada and USA**

**Laserand**  
177 Mount Vernon ave.  
Montreal, QC, H8R 1K2 - Canada  
Phone: +1 (514) 452-4693  
Email: sales@laserand.com  
www.laserand.com

**India**

**SM Creative Electronics Limited**  
10, Electronic City, Sector 18  
Gurgaon 122015 Haryana - India  
Contact: Parveen Garg  
Phone: +91 124 4909850  
Email: parveengarg@smcel.com; smcel@smcel.com  
www.smcelindia.com

**Japan**

**TOKYO INSTRUMENTS, INC.**  
6-18-14 Nishikasai, Edogawa-ku,  
Tokyo 134-0088 - Japan  
Phone: +81 3 3686 4711  
Email: sales@tokyoinst.co.jp  
www.tokyoinst.co.jp

**Singapore**

**Simple Technologies Private Limited**  
10 Anson Road  
#26-04 International Plaza 079903 - Singapore  
Contact: Anthony Tan  
Phone: +65 91691025  
Email: sgmanage@simplesg.com  
www.simplesg.com

**Taiwan**

**Titan Electro-Optics Co., Ltd.**  
14Fl., No. 19-11, San Chung Road  
Taipei, 115 - Taiwan, R.O.C.  
Contact: Garmar Pan  
Phone: +886-2-2655 2200 Ext 158  
Email: garmar-pan@teo.com.tw; sales@teo.com.tw  
www.teo.com.tw

**China**

**Motionsmart Precision Technology Co., Ltd**  
Building No. 3-3207F,  
No. 200 Zhangheng Rd.,  
Pudong, Shanghai 201204 - China  
Phone: +86 21-68370027  
Email: info@motionsmart.cn  
www.motionsmart.cn

**Israel**

**Etgar Engineering**  
12 Hagefen st.  
Har Adar 9083600 - Israel  
Contact: Akiva Goren  
Phone: +972 52 47 3 5233  
Email: gorenak@netvision.net.il

**Japan**

**TOKYO INSTRUMENTS, INC.**  
6-18-14 Nishikasai, Edogawa-ku,  
Tokyo 134-0088 - Japan  
Phone: +81 3 3686 4711  
Email: sales@tokyoinst.co.jp  
www.tokyoinst.co.jp

**Singapore**

**Simple Technologies Private Limited**  
10 Anson Road  
#26-04 International Plaza 079903 - Singapore  
Contact: Anthony Tan  
Phone: +65 91691025  
Email: sgmanage@simplesg.com  
www.simplesg.com

**Taiwan**

**Titan Electro-Optics Co., Ltd.**  
14Fl., No. 19-11, San Chung Road  
Taipei, 115 - Taiwan, R.O.C.  
Contact: Garmar Pan  
Phone: +886-2-2655 2200 Ext 158  
Email: garmar-pan@teo.com.tw; sales@teo.com.tw  
www.teo.com.tw

**USA**

**Axiom Optics**  
444 Somerville Ave  
Somerville, MA 02143 - USA  
Phone: +1 (617) 401-2198  
Email: info@axiomoptics.com  
www.axiomoptics.com

**Russia, Belarus, Armenia and Kazakhstan**

**CDP Systems Corp.**  
53 Leninsky Prospect  
119991 Moscow - Russian Federation  
Phone: +7 (499) 132 6911  
Email: mfirdus@sci.lebedev.ru  
www.cdpsystems.com

**South Korea**

**Limotion Systems**  
SJ18 1023-24Ho 10F 45, Jojeong-daero,  
Hanam-si, Gyeonggi-do,  
Republic of Korea 12918  
Contact: Taeyang Heo  
Phone: +82-2-430-9433  
Email: tyheo@limotionsystems.com  
www.limotionsystems.com

**Taiwan**

**Titan Electro-Optics Co., Ltd.**  
14Fl., No. 19-11, San Chung Road  
Taipei, 115 - Taiwan, R.O.C.  
Contact: Garmar Pan  
Phone: +886-2-2655 2200 Ext 158  
Email: garmar-pan@teo.com.tw; sales@teo.com.tw  
www.teo.com.tw

**USA**

**Axiom Optics**  
444 Somerville Ave  
Somerville, MA 02143 - USA  
Phone: +1 (617) 401-2198  
Email: info@axiomoptics.com  
www.axiomoptics.com