Developing State-of-the-Art Technology in Anticipation of Society's Needs

We always respond to our customers' global needs and help them find solutions with our technology.

In order to coexist and evolve with the Earth, technology must be kind to people and nature, and furthermore, have power to create the future.

We look to the wisdom of our predecessors, open our hearts and challenge ourselves to even greater technological development.

Ranging from technological development necessary for the space age, which has already begun, to technological development of everyday products, we will respond with flexible ideas and solid know-how.

Company Profile

TAMAGAWA SEIKI CO., LTD.

- **Date of Establishment**
  March 3, 1938

- **Headquarters**
  1879 Oyasumi, Iida, Nagano Pref.
  395-8515 Japan

- **Executive**
  Board Chairman & CEO Hiroyuki Hagimoto (Ph.D., in Mechanical Eng.g.)
  President & COO Shigeo Seki
  Senior Managing Director Hideo Kumagai (Ph.D., in Electrical Eng.g.)
  Managing Director Hiroshi Hagimoto
  Managing Director Masashi Uryu
  Managing Director Hiroshi Kushihara
  Managing Director Kazuyuki Miyazawa
  Managing Director Tadanori Matsuo
  Director Mamoru Tsukada
  Auditing Director Toshiaki Ito

TAMAGAWA TRADING CO., LTD.

- **Executive**
  Board Chairman & CEO Hiroyuki Hagimoto (Ph.D., in Mechanical Eng.g.)
  President & COO Shigeo Seki
  Managing Director Yasuo Hagimoto
  Director Masahiro Shiozawa
  Auditing Director Toshiaki Ito

- **Main Products**
  Contract manufacturing, Sales and service of servo components (encoder, resolver, rate sensor, gyro, AC servomotor, LVDT etc.)
  motor driver, controller, robot, IMU, automatic control equipment and (bio) research reagents.

Associated Banks
Sumitomo Mitsui Banking Corporation
MUFG Bank, Ltd.
Mizuho Bank, Ltd.
The Hachijuni Bank Ltd.

Group Company
Tamagawa Hightech Corporation
Tamagawa Microtep Co., Ltd.
Tamagawa Seiki Electronics Co., Ltd.
Tamagawa Logistics Co., Ltd.
TAMAGAWA MOTORTRONICS CO., LTD.
TAMAGAWA HONGKONG LIMITED
Tamagawa TECHNOCREATION CO., LTD.
TAMAGAWA MOBILE EQUIPMENT CO., LTD.
TAMAGAWA AERO SYSTEMS CO., LTD.
Tamagawa Seiki Suzhou Co., Ltd.
Tamagawa Links Co., Ltd.
Tamagawa Sky Precision Co., Ltd.
Tamagawa Parts Manufacturing Co., Ltd.
Tamagawa Europe GmbH
TAICANG TAMAGAWA TRADING CO., LTD.
From Sensor to Systems

MOTORTRONICS®

<table>
<thead>
<tr>
<th>Motor (Sensor) Technology</th>
<th>Electronics Technology</th>
<th>Precision Machinery Technology</th>
</tr>
</thead>
</table>

The trademark “MOTORTRONICS” is a compound term derived from the words “motor”, “electronics” and ‘mechanics’.

Used as the generic name of Tamagawa Seiki products, the name indicates how we integrate advanced technologies of motors, sensors, electronics and precision machinery in a balanced way.

Tamagawa Seiki applies the concept of MOTORTRONICS to the development and manufacture of all kinds of automated systems for Amusement Applications (AA), Car Applications (CA), Defense Applications (DA), Factory Applications (FA) and Science Applications (SA).

Since our founding, for eight decades, we have constantly been at the frontier of angular accuracy in sensing technologies.

The principles underlying what we attempt to achieve can be compared to the capabilities of the human body; sensor technologies are like the nervous system, electronics is like the brain, and precision machine technology like the body tissue. Also our software technology enhances the total function.

Driving Forward the Frontiers of Technology

Tamagawa Seiki is a leading manufacturer of 2-dimensional position/angle sensors, angle / angular velocity sensors in 3-dimensional space, and servo components.

Throughout its history, Tamagawa Seiki has succeeded in manufacturing products with the most accurate angular control possible at the time.

This attitude will continue, even if it takes more than 10 years to improve the accuracy by 1 digit.

Concept of Angles (angles given in the order of seconds)

<table>
<thead>
<tr>
<th>α</th>
<th>Angle</th>
<th>λ : Distance equivalent to human height</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000arc sec (2.8degrees)</td>
<td>35m</td>
<td></td>
</tr>
<tr>
<td>1000arc sec (0.28degrees)</td>
<td>350m</td>
<td></td>
</tr>
<tr>
<td>100arc sec (0.028degrees)</td>
<td>3.5km</td>
<td></td>
</tr>
<tr>
<td>1arc sec</td>
<td>35km (Tokyo-Hachioji) (Iida-Ina)</td>
<td></td>
</tr>
<tr>
<td>0.1arc sec</td>
<td>350km (Tokyo-Kyoto)</td>
<td></td>
</tr>
<tr>
<td>0.01arc sec</td>
<td>3500km (to Synchronous Satellite)</td>
<td></td>
</tr>
</tbody>
</table>
Business Summary
Tamagawa Seiki started its business form developing defense-related products. Sticking to the accuracy and quality of products with the highly reliable technology that we cultivated there, we are working on the development of new technologies and products.

Aviation, Space & Defense-Related Products

Main Products:
- Angular velocity sensors and systems
  Gyros
  Rate gyro (mechanical type)
  Gas rate sensors
  Fiber optical gyro
  Ring laser gyro
  MEMS gyro
  Inertial measurement equipment
  Attitude heading reference system
  Accelerometers, Inclinometers
  Servo accelerometers
- Aviation instruments
  Torque, Servo motor, LVDT, RVDT, Resolver
  Power supply (Rectifier, AC/DC, DC/DC)
  Engine indicators and instruments
  Aircraft indicators and instruments
  Electric actuators and other instruments
  Pump
  Valve

Special instruments
- S/D, D/S Signal converters
- Missile control devices
- Rocket management systems (RMS)
- Surveillance Camera System
- Slip ring
- Optical measurement equipment
- Position detectors
- Trackballs
- Throttle lever

Overhaul of equipment listed above

Motors and Sensors for Outer Space
- Reaction wheel
- Brushless synchros and resolvers
  Encoders
  Brushless DC motors / Resolvers (geared)
  Brushless DC motors / Encoders
  Stepmotors (geared)
  Actuators
  Vacuum equipment
  Ground test equipment
  Mechanical units for space instrum

These products play an active role in 5 different application fields.
**Servo Components**

**Main Products:**
- AC servomotors
- Step motors (2-phase / 5-phase)
- Step motor encoders
- DC motors
- DC motor encoders
- Optical Rotary encoders (Absolute / Incremental)
- Magnetic encoders
- LVDTs / RVDTs
- Synchrons and resolvers
- Brushless resolver “Smartsyn”
- VR type resolvers “Singlsyn”
- Multi-pole & speed synchrons and resolvers
- MEMS gyros

**System equipments**

**Main Products:**
- Iron and steel equipment
- Water treatment equipment
- Vehicle equipment
- Ship related equipment
- Peripheral equipment for semiconductor manufacture
- Machine tool components
- Logistics related equipment
- Applied optics equipment
- Medical care equipment
- Spatial stability equipment
- Test and inspection equipment
- Smart Cam System
- Servo drivers and controllers
- Trackballs
- Teaching aids
- Leisure equipment
- Inertial measurement Unit
- Magnetic nanoparticles
- FG beads
- Synchro transmitters
- ATLAS-eye system
- Tri - Axis Inertial Measurement Unit
- Under Ground Navigator [TUG-NAV]
- SV-NET Servo System
- Smart Cam System

**Quality Policy**
The tenacious commitment to the quality makes it possible to make things in the unit of “seconds”.

**Action Guidelines**
Provide Products & Services that are Safe and Reliable to our Customers

*“Each one promises Quality without the compromise”*

- We will assure the quality, cost and delivery of products by processing ourselves.
- We will execute exactly to conform to the requirements of customers and operate the quality management system, as well as being compliant.
- We will aim to continuously improve the validity and efficiency of the quality management system to increase its performance.
- We will set quality targets every year and maintain efforts to keep them in TQM activities.

**Environment Policy**
We are promoting consideration to the environment from the viewpoint of CSR.

Based on corporate philosophy of “Striving to build an industry ready for the 21st century through creative business activities, contributing to the economic revitalization of communities”, as Tamagawa Seiki we make improving the environment a part of every step we take.
Tamagawa Network
Tamagawa Seiki has developed production and sales bases in different areas of Japan as well as in the world to respond flexibly to various customer needs.

Network in Japan

Headquarters / First Plant / Spacelronics Laboratory
- Occupied area: 38,200m²
- Building space: 29,460m²

Second Plant / Commercial Aircraft Group / Spacelronics Laboratory / Motortronics Laboratory
- Occupied area: 44,000m²
- Building space: 23,250m²

Third Plant
- Occupied area: 35,400m²
- Building space: 10,400m²

Matsukawa Town, Nagano Prefecture

Iida City, Nagano Prefecture

Third Plant

Kisarazu City, Chiba Prefecture

Tamagawa Sky Precision Co., Ltd.

Osaka Office

Chiba Office

Kirishima City, Kagoshima Prefecture

TAMAGAWA AERO SYSTEMS Kagoshima Satellite

Oita-ku, Tokyo

Tokyo Office

TAMAGAWA TRADING CO., LTD.

Representative office in Taiwan:
- 436 So-Ai 3rd Road, Kaohsiung City 813 Taiwan, R.O.C.
- PHONE: +886-922-0214-645
- MOBILE PHONE: +886-922-0214-645
- FAX: +886-7-3502257

TAMAGAWA SEIKI CO., LTD.

Headquarters :
- 1579 Ohyasumi, Iida, Nagano Pref. 395-8515 Japan
- PHONE: +81-265-21-1800
- FAX: +81-265-21-1861

Tokyo Office:
- 3-19-9 Shinjuku, Ohta-ku, Tokyo 144-0054 Japan
- PHONE: +81-3-3738-3133
- FAX: +81-3-3738-3134

TAMAGAWA HONG KONG LIMITED

Unit 1010 10/F., Tower 3 Enterprise Square, No.9 Shoung Yuet Road, Kowloon Bay, Hong Kong
- PHONE: +852 2753 9868
- FAX: +852 2753 9869

Tamagawa Seiki Suzhou Co., Ltd.

Ning Sanhe Road, Laodu Town Taiyang City, Jiangsu Province China
- PHONE: +86-512-53200791
- FAX: +86-512-53200786

Tamagawa Europe GmbH

Magirus-Deutz-Str. 14, 89077 Ulm Germany
- PHONE: +49 731 96 33 89 52
- FAX: +49 731 96 33 89 57