

Aiming to become an environmentally friendly  
and customer-trusted company

Vol. **29**

2022. Sep.

# TAMAGAWA NEWS

New product  
**FOG & MEMS combined IMU**



Waterproof Type

Sensortronics Workshop

Renewal of FG beads Website

*Tamagawa*

# FOG & MEMS combined IMU



Introducing a new waterproof type high-precision IMU

The IMU, which meets the IP65 waterproofing standard, was added to the line-up with high accuracy.

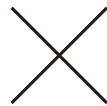
It can also be measured on roofs of outdoor construction equipment, agricultural machinery, and automobiles, as well as on unmanned transport vehicles, drones, and ships.

FOG & MEMS combined IMU is a three-axis gyro (i-FOG on the Z axis and MEMS gyro on the X and Y axes) with accelerometer, which detects angular velocity and acceleration, and calculates the attitude angle (roll angle and pitch angle) and azimuth angle.

It can also be used as a composite navigation device using information such as position and speed input from the external GNSS receiver. This is an inertia measurement device that realizes the precision required for automatic operation.



**Optical fiber gyro i-FOG**  
Azimuth accuracy **0.1°/h**



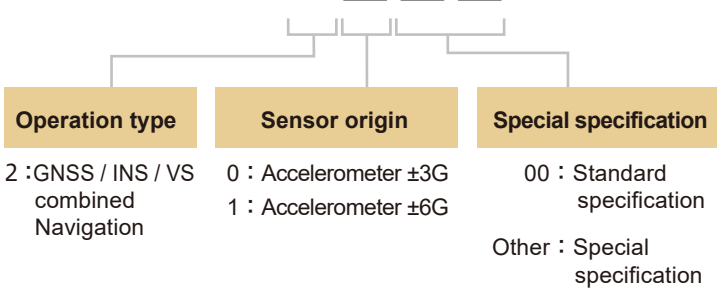
**MEMS IMU**  
Attitude angle accuracy **0.1°**



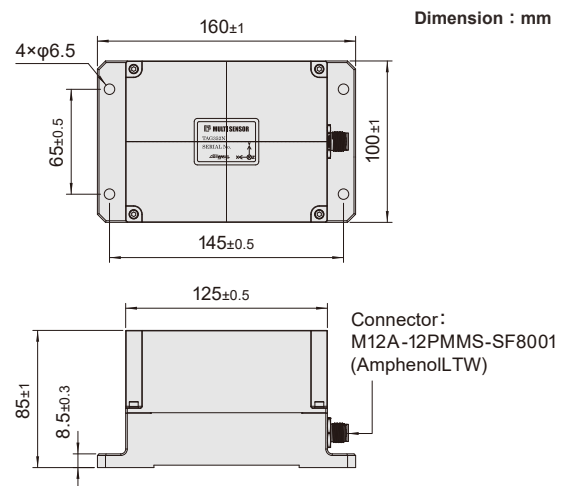
**WATER PROOF**

## Part number

**TAG352N 2 □ □ □**



## Outline drawing



## Main Specification Table

FOG & MEMS combined IMU

Item	Specification
Type / Part Number	TAG352N2□□□
Operation Mode	GNSS/INS/VS
Size	160×100×H85mm (Waterproof IP65)
Mass	1500g Max
Power Supply Voltage	9~28V DC
Communication Interface	RS232/CAN
Output Data	Acceleration (X, Y, Z)
Angular Velocity	±200 deg/s
Acceleration	±3G / ±6G

Item	Specification
Angular Velocity Bias	Z-axis: 0.1 deg/h rms
	X, Y-axis: 0.2 deg/s rms
Acceleration Bias	5mG rms
Operating Temp. Range	-20 ~60°C
Bandwidth	20Hz
Output Cycle	RS232C: 50Hz
	CAN: 50Hz
Accessory	(sold separately) Communication cable : Type / Part Number EU8971N1001

# Sensortronics Workshop

Sensortronics Research Laboratories held a workshop for customers who are involved in our developing products (see below), with the aim of publicizing the product to the market.

In addition to product presentations, we prepared demonstration machines using each product item, and provided an opportunity to discuss new technologies with participants while explaining how to use them and how they are operating.

Through this research workshop, we will promote the development of products that meet the market needs.



Explanation of operation status by demonstration machine



Presentation of Products

## Number of events

First: March 29-30th, 2022

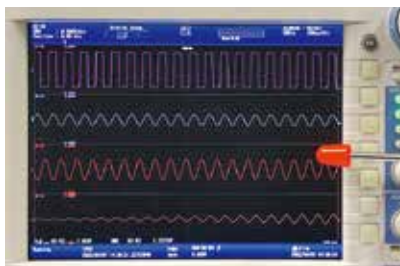
Second: June 14-15th, 2022

Third: August 25-26th, 2022

## Product items introduced at the workshop

### 1. High-precision resolver system "Doublsyn® /VRDC®"

High-precision motion control is possible. It also contributes to the reduction of motor size and redundancy.



Explain the noise resistance and redundancy of Doublsyn



Doublsyn

VRDC

### 2. Magnetostrictive Torque Sensor "Trqsyn®"

Direct torque feeling is realized because the shaft distortion is directly detected without contact.



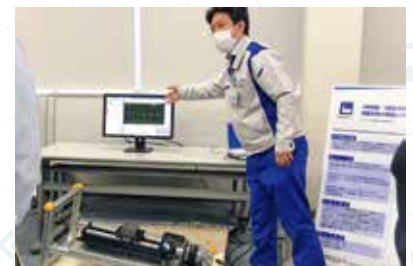
Explanation of torque ripple detection and control of motor shaft for EV drive using a demonstration machine



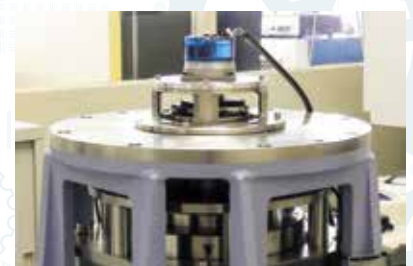
Trqsyn

### 3. Optical encoder

The encoder for speed output contributes to improved settling time and speed ripple.



Demonstration using speed output-compatible encoder



Introduction to Angle Calibration Equipment

# FG beads website Renewal

In July 2022, we renewed our website dedicated to FG beads, magnetic beads for protein purification.

We have completely redesigned the design and structure of our website, which is easier for customers to view and use, by adding a search function that enables smooth transition to the desired information. We have also made improvements to make it easier to see from a wide range of devices, including smartphones and tablets.

We will continue to enhance the content and create easier and convenient sites. Please take a look at them.

## Ease of selecting products

You can search for the best FG beads from a variety of requests, including your research objectives and research results (papers).

▼ Product search list

Search from application/  
fixed object

Search for papers

Search for functional groups

The diagram illustrates the 'Product Search' interface. It shows a search form with filters for 'From Bead Size', 'From Application', 'From Ligand to be immobilized on FG beads', 'From Functional Group of FG Beads', and 'From Paper'. Orange boxes highlight these filters, with lines pointing to corresponding search results: 'Search from application/fixed object' (showing a bead product), 'Search for papers' (showing a research paper), and 'Search for functional groups' (showing a bead product).

"I don't know how to use it," or "What should I do in this situation?"

## Smooth resolution of customer questions

The FAQ, thesis, and technical information pages are equipped with functions that enable searching by category or keyword to help customers solve their problems smoothly. For further information, please feel free to contact us via the Contact Form.

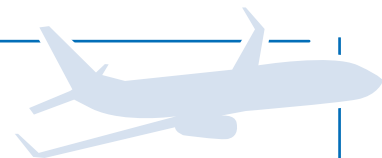
The screenshot shows the 'FAQ' page. At the top, there are two search filters: 'Narrow down from the experiential process' and 'Narrow down from beads products'. Below these are several categories of questions, such as 'Immobilization of FG Beads', 'Immobilization of Proteins', 'Elution of Beads', and 'Immobilization of Beads'.

## Renewal The FG beads website

The screenshot shows the homepage of the FG beads website. It features a navigation bar, a hero section with 'FG beads' and product images, an 'About FG beads' section with 'What are FG beads?', 'Classification Examples', and 'History', a 'Product Search' section with various filters, a 'What's New' section with 'News', a 'Campaign' section with a 'Linking page', a 'Product List' section with a grid of products, and a 'Contact Us' section with a contact form and a 'Send Message' button. The footer includes 'FG beads' and various links.



<https://fgb.tamagawa-seiki.com/english>



## 01

### Acquisition of Boeing Premier Bidder Program certification

We have acquired Boeing's Boeing Premier Bidder Program certification.

The purpose of this program is to certify Boeing's commercial aircraft and global service suppliers who are consistently performing well. The purpose of the program is to strengthen the integrity of Boeing's projects, including the safety and quality of products supplied to Boeing, compliance with delivery deadlines, and to strengthen Boeing's comprehensive capabilities as a supplier.

About 140 companies out of more than



10,000 suppliers around the world have been certified this time, and Tamagawa Seiki has won the award for the second time since 2020.

With the program's accreditation, we are positioned as an important partner in Boeing's bidding process for the project, and Boeing's supply chain.

Invitations to meetings attended by key division leaders are expected to help expand transactions with Boeing.

Since 2013, as a Tier 1 supplier, we have

received orders for two projects (products), including the Angle Sensor Unit for Flight Control of the Aircraft. Recently, we have received the third project and selected as the supplier of the landing gear control lever module for Boeing 737MAX.

Through the approval of the Boeing Premier Bidder Program, we aim to strengthen our relationships with Boeing and win new projects. At the same time, we will work hard as a leading supplier in the advancing electric aircraft industry.



## 02

### EUROSATORY 2022



The International Ground Defense Equipment Exhibition (Eurosatory) was held for five days from June 13 to 17, 2022 at the Nord Villepinte Exhibition Center in Paris, France. The exhibition was the first overseas exhibition of defense equipment made by us, although in the form of a video exhibition, was held at the booth of Japan's Acquisition, Technology & Logistics Agency (ATLA).

This exhibition is one of the largest equipment exhibitions in the world. According to the organizer's announcement, there were 1,743 exhibitors from 62 countries and



▲ Tamagawa Seiki exhibition area

national-level pavilions from 39 countries. 62,000 visitors from abroad, 250 delegations from 96 countries and 560 international journalists attended.

This was the third time for ATLA to participate in the exhibition, following the exhibitions in 2016 and 2018. We participated in the exhibition in the form of an exhibit that did not require an exhibition or an explanatory staff, partly because of the corona disaster.

Particularly for the exhibition of ground defense equipment, we showcased the motors, power controllers, resolvers for periscopes, and resolvers for transmissions

installed in the 10-type tanks operated by the GSDF.

In addition to images and features of each product, this video also contains a full view of the first plant, which was taken by a drone, and a winding process, a high-precision angle calibrator, and others. This content highlights the craftsmanship technologies backed by history and our stance on angular accuracy.

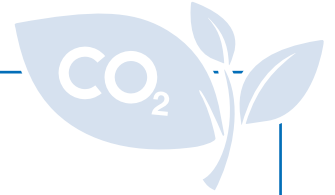
Unfortunately, we were unable to hear the voices of visitors, but we are convinced that our craftsmanship impressed visitors. We will continue to promote the overseas deployment of defense equipment with the support of ATLA.



▲ From the introductory video



▲ Scene of the venue



## 03

### Toward the Realization of Environmental Initiatives "Carbon Neutral"

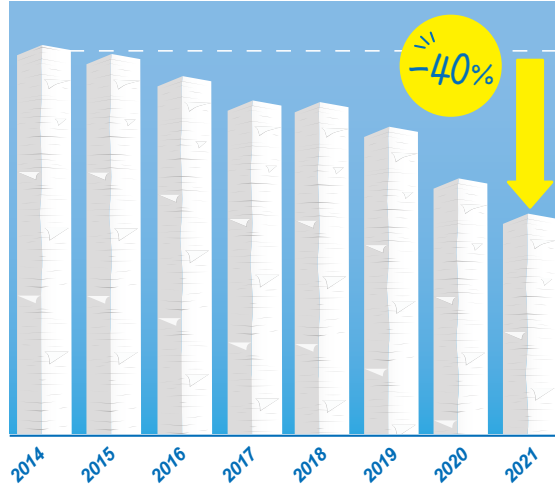
"Paperless", which digitizes paper documents, is one of the themes that we are focusing on.

Paperless management aims to reduce paper consumption and ultimately conserve forest resources and achieve carbon neutrality by eliminating waste through standardization and streamlining of operations. Paper documents are convenient, but they are not only expensive for paper, printing, and distribution, but also expensive and time consuming, such as printing and bundling.

In addition, the more paper, the more space you need to store the paper, and the more time and effort you need to find the paper you want in the file.

Previously, we used to use a lot of paper because our business was centered on paper. However, in 2014, we began paperless activities that can be carried out by each and every employee, including the use of both sides of the paper and N-up. Currently, we are working on introducing

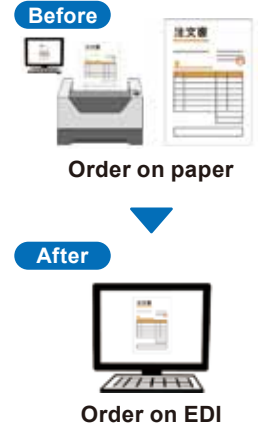
#### ■ Trends in paper purchase volume



electronic approval, tableting on-site drawings, and digitizing process forms. We were able to reduce paper purchases by 40% compared to fiscal 2014. With the advancement of paperless operations, the use of more data-based informa-

#### ■ Paperless example

Paperless by EDI started by our group companies



tion is increasing, and this has the effect of speeding up decision-making and strengthening information security. We are still in the midst of this process, but we will continue to work toward paperless operations.

## 04

### Introduction of new employees



Three new employees joined Tamagawa Trading Co., Ltd. from April 1. Thank you for your attention.



International Marketing Sales Section

#### Eshan Malinda

I am responsible for Southeast Asia and South Asia. I don't have any acquaintances in Japan, but I would like to work hard and go on to the next stage, no matter how hard it may be.



International Aviation Marketing Sales Department

#### Taiga Nozue

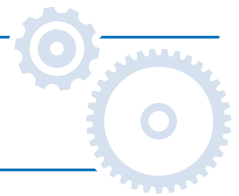
I'm in charge of customers related to civil aviation organizations in Europe and the United States. I would like to unite my efforts and work together to achieve the goals of the Longitudinal Cooperation.



Nishi-Kanto Office, Iida Branch Office

#### Shunsuke Kimura

I am responsible for private-sector customers in Nagano Prefecture. As a salesperson, I would like to make an effort to capture the hearts of customers during each encounter.



In December 2021, we opened the Honorary Chairman's Hall "Seikeikan". It was named from the stone (stone of rest and contemplation) that the founder of Hiroichi Hagimoto sat down in the pine forest near the hall in his late years to meditate on our future while listening to Matsukawa's wisdom.

The hall is adjacent to the south side of the 1st and 2nd History Halls, which exhibit the history of Tamagawa Seiki since its founding. In addition to the office of Honorary Chairman, Hiroyuki Hagimoto, the hall holds more than 60 notebooks, albums and various materials, which contain daily events since joining the company.

In spring, Takato Kohigan Sakura(cherry blossoms) bloom beautifully, and you can see spectacular spring scenery from the window on the south side of the archive room.



## Anan Town 阿南町

Tour Minami Shinshu

vol. 3

### Introducing the food and culture of local areas around Tamagawa Seiki

Anan Town is situated at the southernmost end of Nagano Prefecture and it is a town where a variety of traditional performing arts and festivals have been handed down in a rich natural environment.



#### 01. Plentiful souvenir at the Michi-no-Eki (Roadside Station) "Shinshu Niino Sengokudaira KURA".



If you go south down Anan town on Route 151, you will pass a mountain road and climb uphill. Once you come uphill you can see the Michi-no-Eki, Sengokudaira KURA, which stretches to the front of you.

It is located at an altitude of 800 meters, it sells local agricultural products and processed goods that take advantage of the cold climate. In particular, the famous Large Gohei Mochi has a total length of 22 cm, and the flavor of the sauce grilled with charcoal makes it popular with visitors.

#### Refresh at "Anan Hotspring Kajika no Yu"

You can enjoy five kinds of hot water baths, which are Nagano Prefecture's largest public bathhouses, and open-air baths.

In addition to hot springs, there are a pottery experience hall, campsite, and large cottages adjacent to each other, which heals everyday tiredness in a space surrounded by nature.



#### 03. Enjoying Japanese culture with Intangible Cultural Properties: Waseda Puppet



Joruri puppet theater, which is dedicated to the Waseda Shrine in Anan town, is registered as an Intangible Folk Cultural Properties of Japan. "Sanbanso" is a puppet theater performed at the worship hall on the 4th Sunday of August, in which mothers with infants who are visiting the gods for the first time and go up to the shrine and pray for their children's good health. Mother and

Joruri puppets face the gods and never show their backs. Full of the spirit of service to God, it is worth seeing.



#### My Home Town Anan

Along Route 151, Anan Town is rich in nature and a city of mystery that cherishes its ancient tradition.

As is said to be the festival trail, the town is an attractive place to continue the traditional festival, including the Niino Snow Festival, Bon Festival dance and the Wago Nenbutsu folk dance.

The recommended spot is Kajika hotspring, which is surrounded by nature. It is notable for a day when you soak in a spacious bathtub and spend your time healing from fatigue. We would be very grateful if you would visit Anan town.



Nishi-Kanto Office,  
East Japan Sales Department,  
from Anan Town

Noboru Muramatsu

The cover  
of  
this edition

## Toyama-go, Iida City : The tug of war against the thief of the pass

On the 4th Sunday of October, in Toyama-go, the "Tug of War" is held at Hyogoshi-toge Pass, which crosses the border between Shizuoka and Nagano prefectures. The Shinshu Army is from Minami-Shinano, Iida City, while the Enshu Army is from Misakubo-cho, Hamamatsu City, Shizuoka Prefecture. And the winners can move the boundary of the prefecture about 1 m to the contrary side. This is one of the famous autumn Shinshu Festival which is known nationwide.

(This prefectural border is determined by the event and is not an official prefectural border by the government)



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