

December 14, 2021

ACSL Ltd.

ACSL releases Small Aerial Photography Drone “SOTEN”, and initiated taking orders

ACSL Ltd. (Edogawa Ward, Tokyo; Satoshi Washiya, President and COO, hereafter ACSL) released small aerial photography drone "SOTEN" and its optional accessories on December 7, 2012. The drone is targeted for government procurement, and the company has started to take orders.



1. Development Background

Industrial drones are attracting attention as one of the robotics technologies to solve various social problems associated with the declining birthrate and aging population in Japan. Drones are expected to be more and more closely related to our daily lives in the future for applications such as infrastructure inspection, on-site survey and search during disasters, logistics, and agriculture.

Against this backdrop, in September 2020, the government announced a policy of "limiting procurement to security-guaranteed drones" and "promptly replacing existing drones"^{※1}, and demand for drones with high security is increasing.

ACSL Ltd. has developed a secure small aerial drone "SOTEN" to prevent leakage, extraction, and hijacking, and to enable safe and secure use of drones in all industrial applications. The goal of "SOTEN" is to nurture domestic drone component manufacturers as well as protect domestic technologies both in developing and application use of drones.

※1 "Policy on the Procurement of Unmanned Aircraft by Government Agencies, etc." September 14, 2020 Liaison Conference of Relevant Government Agencies on Small Unmanned Aircraft

2. Product name "SOTEN"

The drone was named "SOTEN" to contribute to the industrial revolution of the sky. "SOTEN" translate to "Sky in Spring" in Japanese, and represents the image of flying freely in the sky, a space with infinite possibilities.



3. Features of SOTEN

SOTEN is an outcome of a national project, " Technical Base Development for Secure and Reliable Drones" by the New Energy and Industrial Technology Development Organization (NEDO), which aims to develop high-performance, high-security small drones. SOTEN is the first drone to reach mass production, utilizing the results of the Japanese government's support for its development.

Feature1. "Protecting Technology" with secure domestic drones

Security measures based on ISO 15408 have been implemented to prevent data leakage and extraction, and to resist drone hijacking. Major components of the aircraft are either domestically produced or procured from highly reliable overseas sources, and security is enhanced by encrypting communication and shooting data, and protecting acquired data in the domestic cloud.



※2 International Standards for Computer Security

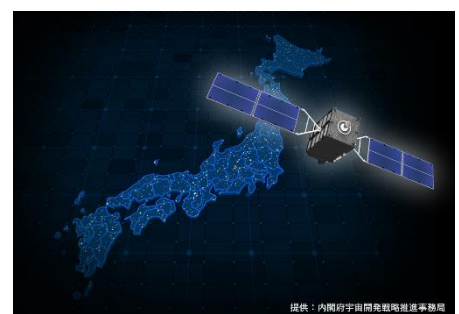
Feature2. Cameras that can be switched with a single touch

By adopting a one-touch camera switching system, a first for a small aerial drone, it is possible to provide a wide range of camera options. In addition to the standard camera, the camera can be interchanged with an infrared camera + visible camera, a multispectral camera, and an optical zoom camera (under development).



Feature3. Drones with the flight performance required in the real world

With a maximum airspeed of 15 m/s, it is resistant to wind and can be used safely in harsh environments such as during disasters. It is also equipped with SLAS/SBAS (Sub-meter Class Positioning Augmentation Service of the Quasi-Zenith Satellite System MICHIBIKI), which can provide more accurate positioning information in Japan, enabling safer takeoffs and landings in situations where accurate positioning information is needed, such as disaster investigations.

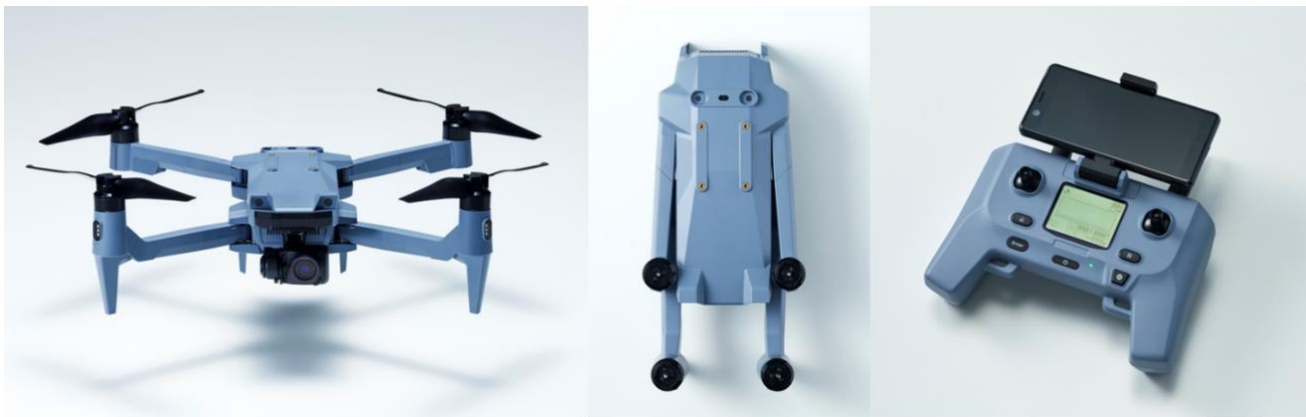


Feature4. Wide scalability, including closed network LTE communication and offline-capable maps

With the use of LTE communication, it will be possible to control drones via the Internet, which will enable unaided, unobstructed flights (Level 3) by automatic flight in remote areas such as mountainous regions and inside plants. The use of offline maps allows the drone to fly automatically by displaying offline maps on the base station application on the control side, even in environments where the Internet is not available. We are also developing a mount for attaching a camera to the top of the aircraft, which will enable us to capture images of infrastructure facilities for inspection from below.



4. Product Information



(Left) SOTEN , (Center)arm retracted, (Right) standard transmitter.

■ Product Overview

Product Name	SOTEN
Price	Open price
Size	Arm is deployed : 637mmx560mm (Propeller included) Arm is retracted : 162mmx363mm
Weight	1.7kg (Standard camera and battery included)
Maximum flight time**3	Standard battery: 22 min (With standard camera mounted, under wind speed of 8 m/s) Standard battery: 25 min (Without standard camera, under wind speed of 8 m/s) High capacity battery: 25 min (With standard camera mounted, under wind speed of 8 m/s) High capacity battery: 29 min (Without standard camera, under wind speed of 8 m/s)

Maximum transmission distance (When there are no obstacles or radio interference)	4km
Dustproof and waterproof	IP43 (With camera, gimbal, and battery installed)
Standard camera	4K video support 20 million pixels for still images
Optional cameras	Infrared + Visible camera Multispectral camera
	Optical zoom camera (under development)
Remote ID ^{※4}	Bluetooth
GNSS ^{※5}	GPS+QZSS(Quasi-Zenith Satellite MICHIBIKI) ^{※6} +GLONASS ^{※7} + SLAS/SBAS ^{※8}
Cloud	Image and video storage function Flight log storage function
Security measures	Prevention of flight log and shooting data leakage
	Encryption of communication Pairing the aircraft with the transmitter
Function	Automatic Flight Image Tracking
	Collision avoidance by three-way sensor
Airframe control protocol	Compliant with MAVLink ^{※9}
Accessory	Standard transmitter Battery
	Standard charger Secure Flight Management Cloud TM ^{※10} (3 years, 5GB)
Optional items	Smart Controller Transmitter hood
	Spare propeller Training transmitter
	Propeller guard LTE communication module
	Storage case (hard) High capacity battery (94Wh)
	Storage case (soft) Multi-mount
	Triple Charger Upper camera mount (under development)

※3 The flight time will vary depending on the environment such as temperature and the number of times the battery is used.

※4 A system that transmits identification information, such as registration symbols, and location information, etc., from a drone in flight and allows related parties to receive the information.

※5 Global Navigation Satellite System

※6 Navigation satellite systems to be made available for Japan and the Asia Pacific region

※7 Satellite positioning system operated by Russia's Space Command.

※8 Submeter Class Positioning Augmentation Service of the Quasi-Zenith Satellite System MICHIBIKI

※9 Protocols involved in sending and receiving data for communication between the drone and the ground station.

※10 A cloud service provided by NTT DoCoMo, Inc. that allows centralized web-based management of drone image uploads, flight log storage, etc. Secure Flight Management Cloud" is a trademark of NTT DOCOMO, INC.

■ Video

You can watch the introduction video of SOTEN from ACSL official Youtube.

<https://youtu.be/dLuVJibi2dw>

Attention

This document is an unofficial translation of the timely disclosure on December 14, 2021 by ACSL and this is for reference purpose only. In case of a discrepancy between the English and Japanese versions, the Japanese original shall prevail.