



WNISAT-1

The World's First Commercial Microsatellite Owned by a Private Company

WNISAT-1 is a 10 Kg microsatellite built with the purpose of monitoring sea ice in the Arctic Sea. It is equipped with cameras with the spectral bands of blue, green, red and near infrared; it also carries a laser to study the density variations of greenhouse gases.

The missions based on optical and laser observations have now been substituted with another mission. Using WNISAT-1's onboard magnetometer, Weathernews observes the effects of solar weather on the Earth's magnetic field. This is in support of aircraft flying in the arctic region, the part of the world most sensitive to these effects. Together with weather data, this information can help improve the efficiency and safety of such flights.

CAMERA LASER BUS LAUNCH



WNISAT-1 is equipped with optical cameras to monitor sea ice. The required ground resolution was as low as 500m, and we pursued very low cost by composing them of lens modules and image sensors built for terrestrial applications. We confirmed the tolerance against space environment through various environmental tests. The camera for near-infrared band will be used to distinguish clouds from ice, both of which look the same in the visible wavelengths.

Spectral Bands	Blue	(440-500nm)
	Green	(500-580nm)
	Red	(580-700nm)
	Near Infrared	(750-1000nm)
Ground Resolution	500m	
Capture Area	500 × 500 km ²	



WNISAT-1 also carries a laser module for conducting a secondary experimental mission. The module consists of two different lasers: the energy of one of the lasers is absorbed by CO₂ in the atmosphere, while that of the other is not. By measuring two lights on the ground and comparing their signal intensity, we can estimate the density of CO₂ in the atmosphere. Although those data are not accurate enough to be analyzed scientifically, they will encourage general public to have interest in satellite and climate change.

Dimensions	270 × 270 × 270 mm (excluding protrusions)
Mass	10.1 Kg
Communication	Uplink: UHF 9.6 Kbps
	Downlink: UHF 38.4 Kbps
Generated Power	12.6 W
Attitude Control	Three-axis control (0.1° pointing accuracy)

Launch Date and Time	November 21, 2013 4:10:11 PM (Japan Standard Time)
Launch Vehicle	Dnepr Rocket
Launch Site	Yasny Launch Base, Russia
Orbit	Sun-synchronous, 600 Km altitude, 10:30 LTDN