

Advanced Technology

Providing new value based on optical technology

We have been introducing game-changing products in the field of surveying and ophthalmic instruments for 89 years since its foundation.

Since the mid-1990s, various M&As and alliances with overseas companies have taken place to acquire various technologies. We provide leading-edge and unique products and solutions such as automation of construction process, automation of farm operations, and eye disease screening in familiar places other than ophthalmology (offered in countries excluding Japan) through the integration of proprietary developed technologies and newly acquired ones. We are highly acclaimed with advanced technologies.

In order to achieve our mission to solve societal challenges in healthcare, agriculture and infrastructure, we will continue to push the envelope and develop disruptive technology.

GNSS (Global Navigation Satellite System) technology

Our proprietary Vanguard Technology™ reliably captures signals from all positioning satellites. This includes not only GPS and GLONASS, but also QZSS and Galileo and others. In order to realize high-speed and high-precision positioning, it is equipped with a 452 channel reception capability, enabling highly sensitive and stable reception. With positioning accuracy of several millimeters, it is widely used not only for surveying but also for civil engineering and IT agriculture.



Optical sensing/ Applied optics

The distance measurement technology used in surveying instruments realizes accurate measurement to the millimeter, by precisely measuring the time of the laser beam transmitted back and forth to an object. This technology provides highly accurate 3D position measurement. In addition, the noncontact measurement of crop growth using spectroscopic technology controls the amount of fertilizer applied in real time. This technology is a driving force of IT Agriculture which optimizes crop growth and quality.

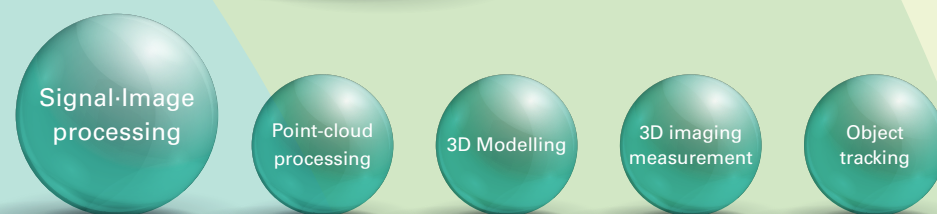
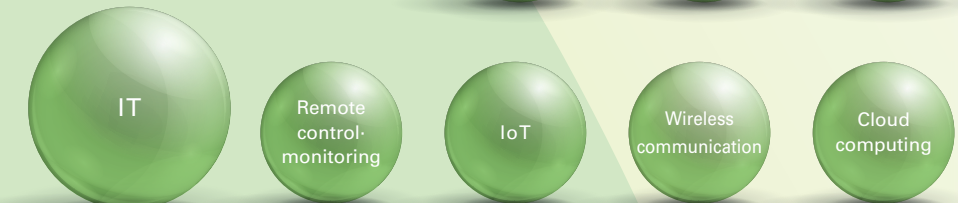


New value creation "Sensor to AI"

While AI, or artificial intelligence, is attracting worldwide attention, we are developing technology based on integrating high-performance sensors with AI. Using our core optical technology, the high-performance sensor suppresses noise and fluctuations in real world data, enabling stable and highly accurate information collection. The ability to develop "Sensors and AI" as a single unit is unique to Topcon.

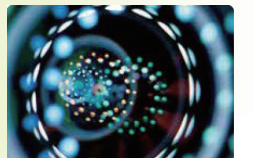


learn more



Optical design

We possess lens design and thin-film technology, which are the backbone of sensing technology for "Sensor to AI". Our optical design optimizes the entire optical measurement system. We leverage special thin film coating technology, mass production technology, and special processing technology to create highly advanced optical sensors.



Control technology

Combining high-precision 3D position measurement technology and precision hydraulic control technology enables automatic control of construction machine blades and buckets to match 3D design data. In the field of IT agriculture, the combination of location information and electric steering makes it possible for farming machinery to run automatically, and greatly increases the efficiency of farm operations.

Thorough examination of 3D fundus

3D OCT (Optical Coherence Tomography) is the culmination of optical sensing, optometry, and image processing technologies, and we were the first in the world to bring this to market. In addition to conventional fundus camera functions, we have developed a new technology that instantly reflects the microscopic 3D structure of the fundus, opening a new era in ophthalmic examination and diagnosis. Some of the models can capture high-resolution images of not only the retina but also the vitreous body and choroid, and is widely used for research on the degree of disease progression and disease mechanism.

