



Always One Step Ahead





Telecommunications

Internet of Things

Accurate Positioning

Why Topcon



Topnet Live

Internet
of Things



Accurate Positioning Services

For Telecommunications Companies and IoT Devices



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Topnet Live

Expand Your Vision of What's Possible

Topcon delivers advanced positioning, navigation and timing solutions for telecommunications companies. Bring highly accurate Topcon GNSS correction services to Internet of Things (IoT) devices to enhance your competitive advantage.



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Enhanced Accuracy for Your Customers

IoT devices require precise positioning. GNSS corrections services provide greater accuracy than standard GNSS.

Extend your expertise

Collaborate with experts from Topcon, an industry leader with more than 20 years of experience in GNSS integration and testing.





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The Business Opportunity

For Telecommunications Companies





Telecom Services

The telecommunications sector has seen exceptional growth in data services through the upgrade of broadband cellular network technologies and the introduction of smart devices.

Advances in technology have opened the doors to new types of services for you and your clients. These services require massive use of data, analytics and AI. The telecom sector has

become key to driving business success in a multitude of industries.

With the introduction of always-on and always-connected technologies, the sector has the opportunity to introduce new profitable business scenarios, with huge impact on markets.





Telecom Companies

The telecommunications sector mainly focuses on wireless communication through the design and delivery of mobile equipment and the definition of data services.



Mobile Communications – Mobile Data

Instant communication is now possible, regardless of location or time zone, and without the use of any physical connection. Mobile technology has unleashed new business opportunities and boosted growth and cost savings for the global economy. The telecommunications sector invests significant resources in the design and development of mobile devices and services to establish two-way radio telecommunication over a cellular network of base stations. Today, the industry is at the brink of a technological breakthrough.





Positioning Data Connectivity



The introduction of devices connected through the Internet of Things creates an opportunity for powerful synergy between the telecommunication industry and the IoT markets. These markets focus on interconnected devices. Connectivity and positioning are key to their success. Today, Topcon is thrilled to offer telecommunications companies the ability to bundle high-speed connectivity and highly accurate positioning.



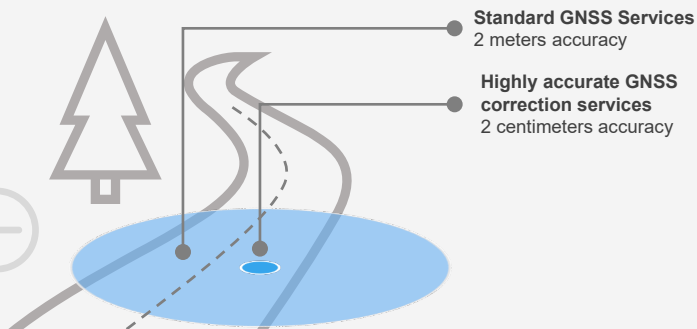
Positioning services

You likely already employ GNSS technologies to provide positioning, navigation and timing (PNT) data. PNT services reliant upon this data now have much greater accuracy. Whereas standard GNSS can provide 2-meter accuracy, Topcon GNSS correction services can offer up to 2-centimeter accuracy, greatly expanding the possibility of new services for your customers. With more precise positioning, IoT devices will perform better, with a sizable return in terms of time and costs.



Smart Infrastructure

Precise positioning is essential for transportation, safety and resource management (e.g. positioning of people and devices, and tracking solutions – including the deployment of local geofences to notify movement away from the perimeter).



Which lane am I driving in?



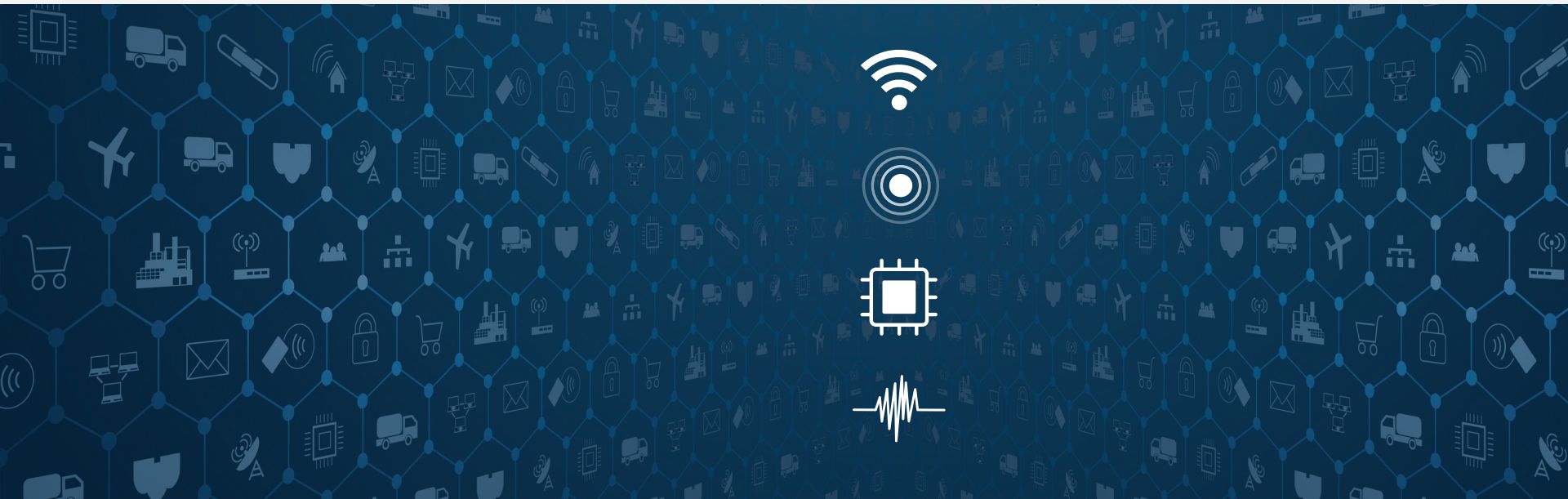


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Internet of Things

Enhancing Positioning of IoT Devices





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Internet of Things Devices

To seize on the immense opportunity created by the Internet of Things requires a radical mindset shift. You must examine products beyond their physical form, also consider their “digital twin.” Through connectivity and positioning, the continuous stream of collected data provides a digital representation of products in real time.

For example, Original Equipment Manufacturer (OEM) customers will know how their products have been used. The

more the environment is connected, the greater the chance to perform deep analytics and discover reliable information models. Through digital twins, it is possible to visualize updated representations of products’ position, performance and conditions. You can determine whether they were altered or if they malfunction in a specific environment.





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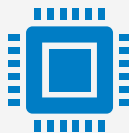
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Topcon GNSS Boards: Smart Connected Products

Through smart, connected products like GNSS Boards, you can use information about product usage and customer preferences to better understand – and improve – their experience. Understanding where a customer could benefit from additional product functionalities or tailored services can inform product design and manufacturing and prevent customer defection. Centimeter-level positioning will provide improved analytics and innovative tracking solutions, allowing for more precise customer segmentation.



Topcon OEM Hardware components

Smart, Connected Products can provide enhanced positioning, navigation and timing with Topcon GNSS Boards.





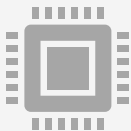
IoT and Telecommunications



By adopting IoT technologies, the telecommunication sector will create new value through data. IoT devices will bring the sector closer to machine-to-machine connections.

And telecommunication companies like yours will benefit from rolling out new applications with superior functionalities for uninterrupted services.

This scenario would reshape current business models, for instance, by empowering companies with the option of product-as-a-service business models.





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GNSS Correction Services for IoT Devices



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GNSS Correction Services and Hardware

Improve Your Data Services With Precise Positioning

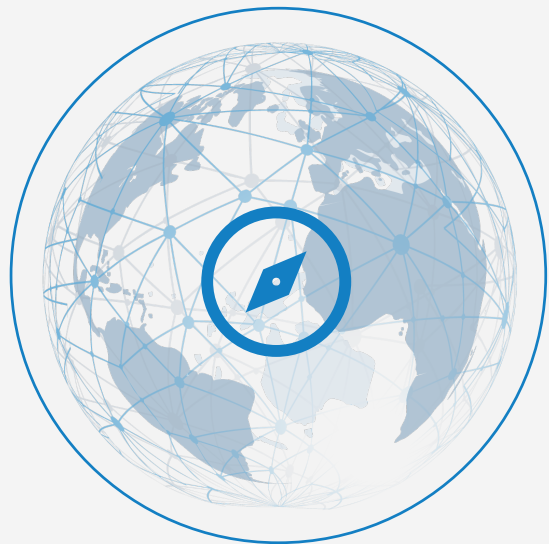
Collaboration between the telecommunication sector and internet-based real-time technologies can shape a cyber-physical system that offers a unified and multifaceted set of services.

Each piece of the process chain can be monitored and compared to others to understand how assets are working together, and their status, energy consumption and

performance in a specific environment. Accurate Positioning, Navigation and Timing (PNT) are driving factors of success. And GNSS technology is a key enabler for this paradigm shift.

Topnet Live is a real-time GNSS correction service delivering high-quality data to GNSS receivers.





Positioning, Navigation and Timing

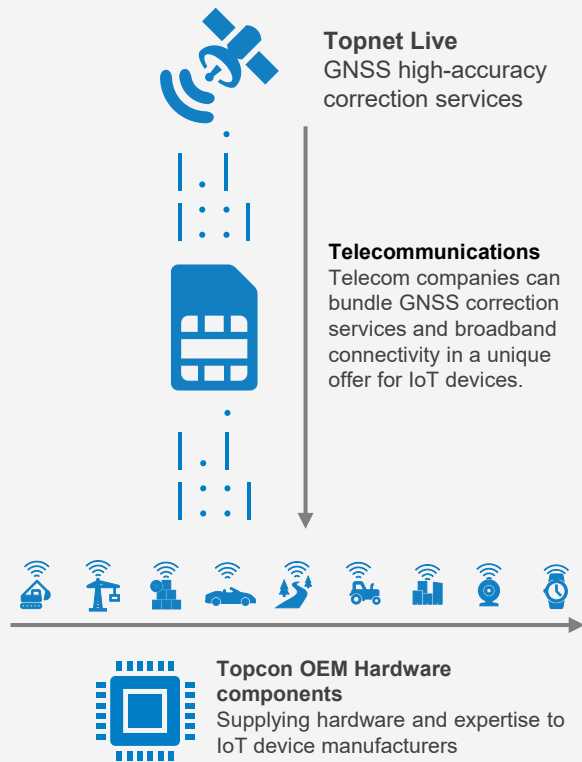
Positioning is the capability to accurately and precisely determine an asset's location through satellite navigation system with global coverage (GNSS). IoT devices are usually equipped with 2-meter accuracy GNSS receivers. Topcon GNSS correction services can provide up to 2-centimeter accuracy to the IoT devices. This would improve the navigation system by optimizing orientation, route-planning and geo-fencing. The Coordinated Universal Time (UTC), based on the uniform atomic time scale International Atomic Time (TAI), would ensure the most accurate timing in the world.



GNSS Correction Services

To provide precise positioning, a GNSS receiver needs to compensate for inaccuracies caused by satellite constellations, receiver hardware and atmospheric conditions. These inaccuracies can be calculated by a network of fixed reference stations that constantly receive GNSS data. This correction information is then broadcast to GNSS receivers as a correction service. Topnet Live provides high-quality data to GNSS receivers.





GNSS Correction Services

- 2-centimeter accuracy with improved positioning, navigation and timing
- Enhanced geo-marketing activities. Consumer behavior is processed and combined with positioning data to provide targeted and preference-based offers.
- Advanced route planning and turn-by-turn systems to monitor users' performance and status
- Enhanced applications for safety, monitoring, health and impairment services

GNSS Receiver Hardware

- Topcon has over 20 years of experience in hardware design and development.
- With more than 2,000 patents, Topcon designs and develops technology for a broad set of application fields (infrastructure, construction, agriculture, survey, monitoring, logistics and more).
- Topcon can assist any manufacturer, no matter where they are located, with fully integrated machine automation solutions.
- We can provide everything you need to test your device with Topcon hardware onboard.





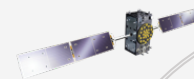
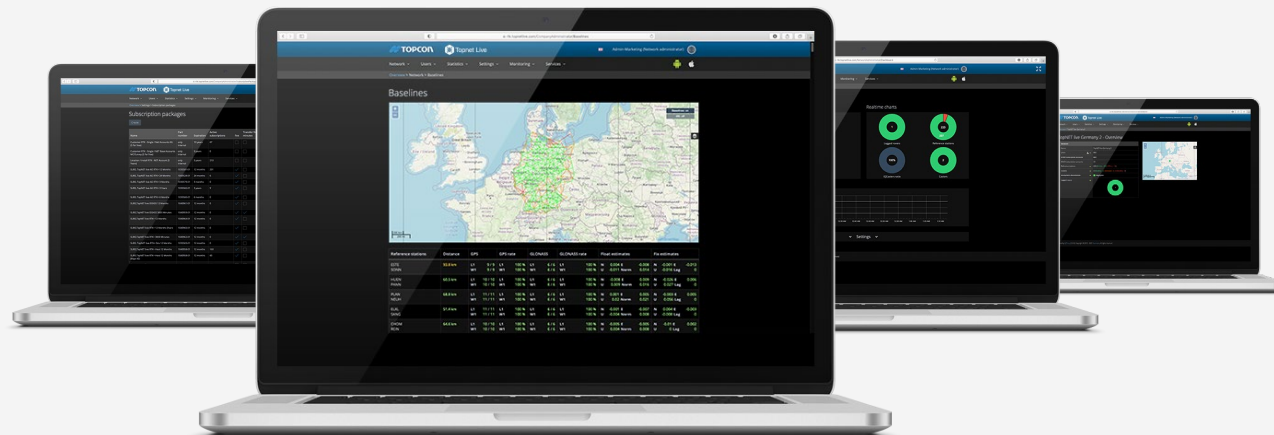
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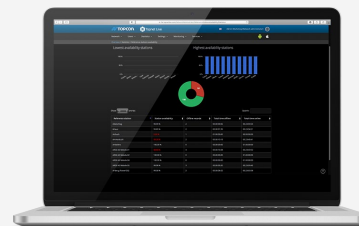
Why Topcon

TOPCON



One App to manage all correction types.

Topnet Live management portal is the all-in-one App that allows you to monitor, manage and upgrade your GNSS correction services and subscriptions.



One app for all types of users and subscriptions

- Web-based
- iOS/android support
- Multiple languages
- User profiles: authority and access
- Dashboard overviews



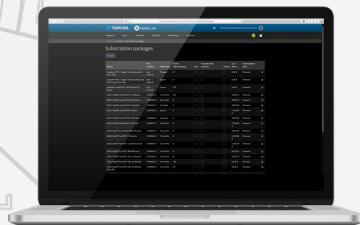


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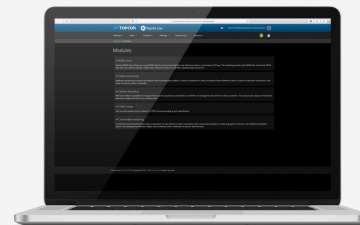
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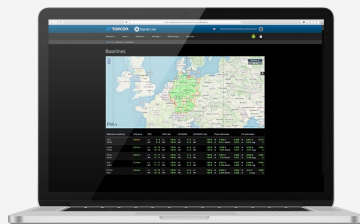
Manage complex subscriptions with ease. Ideal for resellers and OEMs

- Complex Subscription Management
- Manage pool subs shared between accounts
- Manage resellers and sub-dealers



Be futureproof. Ready for all current technology, and future developments

- NTRIP/L-Band
- RINEX
- Online processing
- Skybridge



Have full control over your subscription, at your fingertips

SUBSCRIPTION MANAGEMENT

- Dealers, companies or individual users can be managed
- Create subscription types that suit any business needs and pricing models



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Why Topcon

Topcon is the trusted partner for developing advanced solutions for your positioning and machine control challenges. Our decades of experience, technical expertise and reputation make us uniquely qualified to provide enhanced automation technologies and ultimately drive your customers' productivity – along with your market share – to higher levels.



Independent Solutions

Speed To Market | Global Network | Experienced OEM Team





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1932
Founded
in Tokyo



1953
Topcon 35A
Camera



1980
Mass Market
Total Stations



1994
Laser & Machine
Control Systems



2000
GNSS
Technology



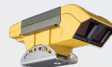
2004
mmGPS
3D precision with
GNSS and Laser Tech



2006
Precision
Agriculture



2009
3D-MC²
Advanced
Grade Control



2010
CropSpec
Crop Health
Monitoring



2017
SmoothRide
Road Resurfacing
Technology



2019
GTL-1000
Scanning Robotic
Total Station



2020
BYOD
Making Tech
Accessible to All



Topcon Corporation

A History



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Trust Topcon to get you there faster with high-quality positioning and automation solutions tailored to your product strategy.

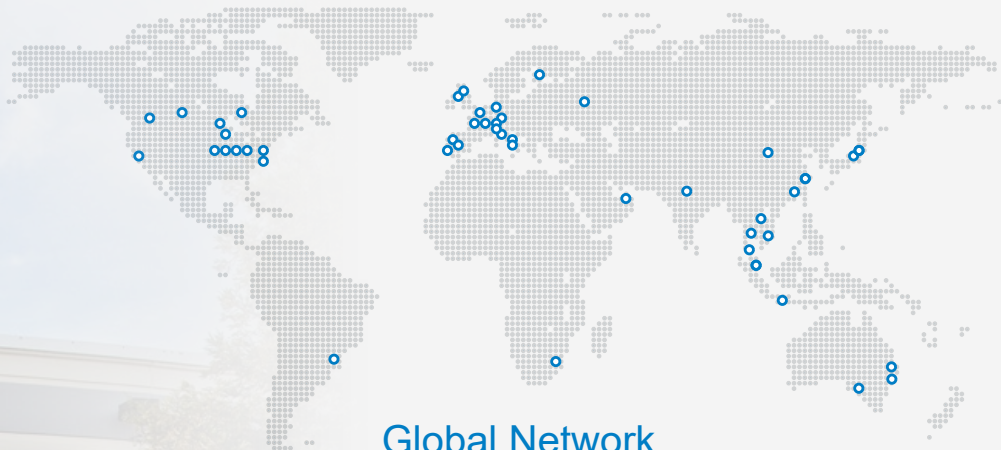
Independent Solutions

In an industry with many contractual alliances, Topcon remains independent. We have the freedom to develop technologies that best fit your unique product goals. Our custom OEM solutions are all clean-sheet designs, providing more opportunities to differentiate your product from the competition.

Speed To Market

Product development carries an inherent pressure to do everything faster and better than before, particularly since technology is only viewed as innovative if it arrives before the competition. Topcon's experience helps to simplify and shorten the design process, allowing you to go to market with your product faster – and with the utmost confidence.



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Global Network

With an extensive worldwide network of corporate offices, R&D centers and technical groups, we have an unmatched capability to assist any manufacturer, no matter where they are located, with fully integrated machine automation solutions. This also positions us to create programs to assist and support your dealer networks, directly or through extensive training programs.

Experienced OEM Team

Our experienced OEM team knows what questions need to be answered first and the potential pitfalls to be avoided along the way. Their first objective is to make sure our technology is the right fit for your application, and then to be your partner every step of the way.





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