Always One Step Ahead

Topcon GNSS for OEM

Global Mobile Positioning for System Integrators

Supporting tomorrow's designs, today

Take your accuracy and performance to new levels with the next generation of GNSS technologies. Topcon provides core GNSS technologies to support custom applications, along with rugged enclosures and a full range of GNSS antennas and telemetry.

Hardware and Boards

Future-proof signal tracking

Antennas and Receivers

Advanced technology to manage constellations and signals

GNSS Correction Services

Fast, stable, and reliable positioning

Precision navigation, guidance, automation and asset management

Topcon has the OEM technology for reliable precision in a multitude of applications and environments.

Advanced satellite positioning technology

Adding Topcon OEM GNSS satellite positioning technology to your high-performance customer solutions and systems can expand the available range of functionality, applications and markets. Feature-rich technology enables our products, and yours. As the original pioneer of dual-constellation and G3 triple-constellation integration, Topcon continues to deliver sophisticated GNSS receiver technology and designs.

Integrated, cutting-edge technology

Use Topcon technologies to support your application development. From GNSS sensors, to antennas and data links, we have solutions that offer a competitive edge. Our R&D commitment has resulted in developing embedded algorithms and receiver design to ensure robust GNSS technology offerings in the market today.

The final product can be greater than the sum of the parts. With our team of integration experts, we can ensure you get both the technology for your success and also the support required to achieve your integration goals.

Superior performance and support

Drive superior performance and support application development with Topcon technologies. Our advanced satellite positioning technology includes GNSS sensors, antennas and data links, and telematics applications to hone your competitive edge.

With our 24/7 focus on perfecting the ever-changing future of positioning technology, we will put you on the growth side of the market share equation.

We strive to create products and technologies that strip away the complexities and intimidation of precision measurement, imaging, automation and workflows. We take pride in being a pioneer developer of 3D machine control and integrated GNSS receivers, and in our 80+ years of experience creating optical measurement systems. Our success is largely due to the attention we place on making it almost effortless for customers to quickly realize benefits – and more than that, making them eager to find ways to expand those benefits throughout their companies.

Automation technologies into your product line

Speed-to-market is critical to the success of your product but exceeding your customers' expectations is what builds market share. More than ever, today's expectations are focused on automation. Your competitors may already have an automation program – internally or with a partner. So the pressure is always on to do more than simply keep pace, but to win the race and grow your market share. Your customer is trusting that the product he selects can produce at a high level. His future depends on his equipment – your equipment – being turn-key ready to connect. Topcon systems and components provide your engineering team with the flexibility to quickly implement advanced automation technologies in your product line, right now.

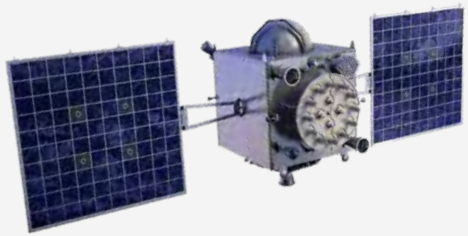
Innovative independence

A core principle at Topcon is to remain fully independent. It's the only way to ensure our innovation is always focused on the needs of our end users – your customers.
Rather than tie ourselves to one OEM partner, we are committed to maintaining the complete freedom to develop new and improved positioning innovations for any company's unique automation project. Our unlimited independence requires us to always stay at the forefront of technological breakthroughs, while ultimately providing you with the power to uniquely implement our technology to grow your business.

Topcon Delivers

GNSS Receivers, GIS, GPS + Reference Station System, Machine Control System, Precision Agriculture, Asset Management System

Technology Strategy | Product & System Design | OEM Components | Global Perspective



Technology Strategy

Our engineers and OEM leaders work with your executive teams to develop strategies that leverage our decades of experience in technology development and product design in combination with end-user insight and market analysis. The result is a customized plan for integrating our technologies into your current and future equipment.

Product & System Design

Topcon prides itself in mapping out designs and products that fill important technological needs for our customers and close the technology gaps in your equipment. Our engineering team brings global experience to the design process. We work closely with manufacturers' product development teams to integrate automated technologies into both new and established equipment lines.

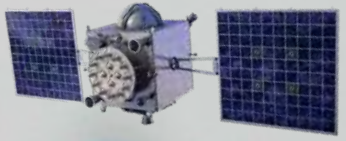
OEM Components

Not every company is in need of a fully customized product solution. Your equipment design may be best served with one of Topcon's proven positioning components. We offer a wide variety of rugged, high-performance GNSS boards, receivers, antennas, telematics modules, and an array of sensors and measuring devices.

Global Perspective

Our research and engineering centers span the globe, providing an added appreciation for the fact that one size never fits all. This core element of our development projects is a key strength that adds great value for our OEM partners. We know our needs aren't exactly your needs, and that your needs have global variants. That's business as usual for us.

Boards and Hardware
Antenna and Receivers

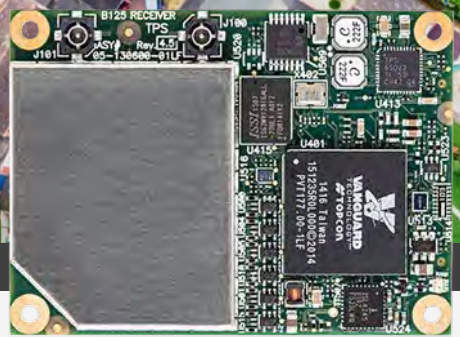





B111 OEM GNSS Receiver Board

Ultra-compact, with future-proof GNSS tracking

The B111 is an ultra-compact precise positioning solution providing scalable positioning from sub-meter DGPS to sub-centimeter RTK, with dual-frequency code/carrier tracking of GPS, GLONASS, BeiDou, Galileo, QZSS and SBAS.



B125 OEM GNSS Receiver Board

A compact, multi-constellation GNSS board loaded with functionality

The B125 packs in future-proof tracking of GPS, GLONASS, Galileo and BeiDou signals with the ability to perform centimeter-level RTK positioning all while being remotely accessed over Ethernet. The B125 GNSS receiver board is an ultra-compact positioning engine capable of providing scalable positioning from sub-meter DGPS positioning to sub-centimeter RTK positioning. Low power consumption, comprehensive communication interfaces and peripheral support make the B125 extremely flexible and easy to integrate into any precise positioning application.

B210 OEM GNSS Receiver Board

Ultra-compact, with future-proof GNSS tracking

The B210 is a highly versatile receiver board with powerful Vanguard Technology that provides high-accuracy VHD heading determination as well as centimeter-level RTK positioning for even the most demanding of positioning applications. Future-proofing is assured with tracking of GPS, GLONASS, Galileo and BeiDou.

PN-A5 Semi-hemispherical GNSS Antenna

Pin-based, ground plane dome antenna

The PN-A5 combines a full-spectrum antenna element for highly sensitive and stable full wave signal tracking with a unique convex impedance ground plane that provides improved multipath mitigation and minimum signal loss. The robust system is fully environmentally sealed and can be fitted with an optional anti-snow dome.

CR-G5 Choke-Ring GNSS antenna

Designed for all CORS environments

The CR-G5-C is a choke ring antenna with cavity filter based on Topcon's TA-5 full spectrum GNSS antenna element. The TA-5 antenna element utilizes an array of vertical convex dipoles. This antenna provides full wave tracking technology for existing and future GNSS signals. The antenna addresses the evolving requirements for reference networks and infrastructure monitoring applications. If you are establishing a new CORS network or upgrading an existing service, the CR-G5 is the perfect antenna for all high accuracy 24/7 GNSS signal reception requirements.

MR-2 Modular OEM GNSS Receiver

RTK positioning and heading determination

The MR-2 is a rugged, modular GNSS receiver designed for harsh environments, with IP67-rated dust and water protection and mil-spec shock and vibration tolerance. It features tracking of signals from all current constellations, with support for dual antennas and simultaneous RTK positioning and heading determination. With 8GB of internal storage and a variety of communications options, the versatile MR-2 is ideal for integration into a wide variety of unmanned platforms.

NET-G5 Reference Station Receiver

Multi-constellation signal tracking

The NET-G5 receiver is designed to provide superior tracking of all constellations and signals for network reference stations. With 452 channels for multifrequency tracking of all current and future GNSS signals, the NET-G5 is ideal for delivering GNSS referencing for land surveying, topography and utilities applications. The receiver can be accessed via Ethernet, Wi-Fi or Bluetooth as well as serial or USB, and offers a flexible and intuitive web-based user interface.

G5-A1 Geodetic Campaign Antenna

Economical, high-performance full wave antenna

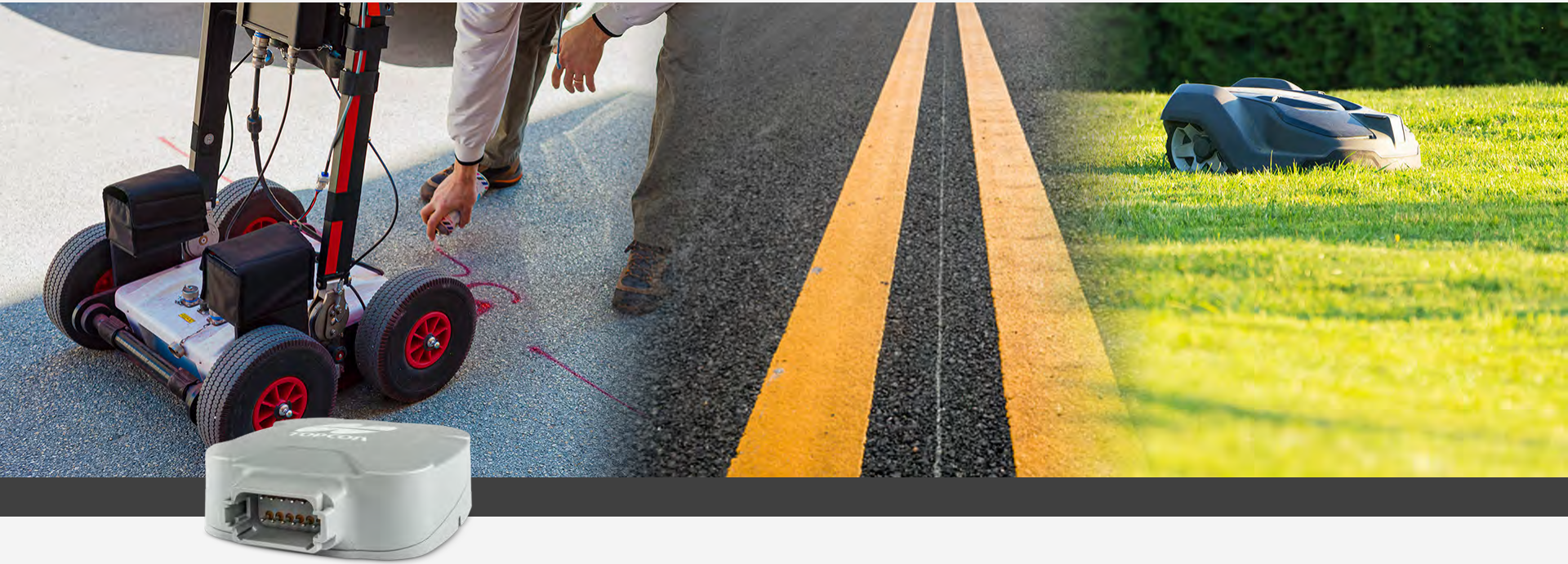
The G5-A1 is an entry-level full wave, zero-centered geodetic reference station antenna that is ideal for portable surveying and topography requirements, paired with modular base receivers in an existing network. Designed to provide highly efficient multipath reduction, it can track all current and future GNSS signals.

PG-F1 Antenna

High Precision Full Wave GNSS Antenna

The PG-F1 is a Topcon full wave antenna that provides reliable solutions by tracking GPS, GLONASS, BeiDou, Galileo, QZSS, SBAS and L-Band satellites.

PG-F1 is compact and features an ultra-rugged design with integrated ground plane.



AGM-1 OEM Integrated Receiver

Next generation positioning data and manual guidance

Built upon time- and field-proven capabilities, the AGM-1 provides reliable positioning data as well as flexible manual guidance in a compact and durable form for virtually any machine type, make and model.
The AGM-1 has been designed to provide scalable accuracy, both autonomous and SBAS – Satellite-based Augmentation Systems (WAAS, EGNOS, and MSAS). The AGM-1 is also equipped with TruPass™ advanced positioning technology for higher, more stable pass-to-pass accuracies in dynamic applications.

Strategic Planning | Product Design | Manufacturing Services | Support

TOPCON

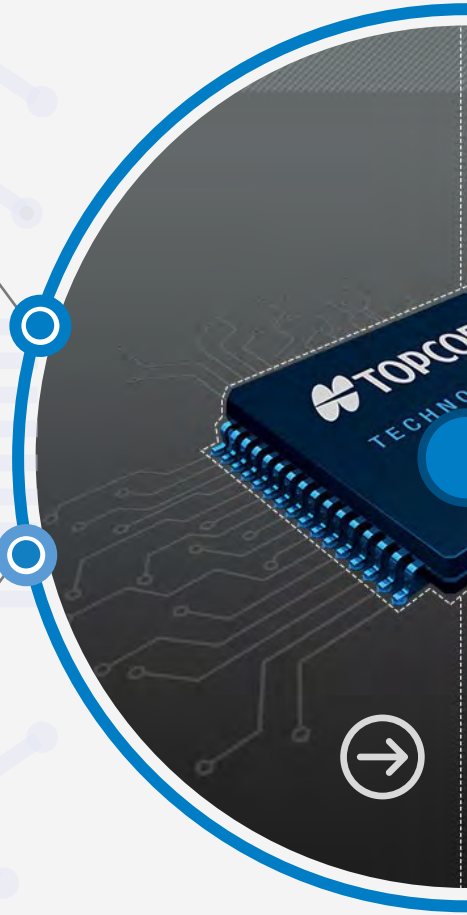
Inter-Connected Workflow: Design-to-finish

Onboarding Developing Delivery

Design, change, execution and control are seamlessly connected and carried out instantly.

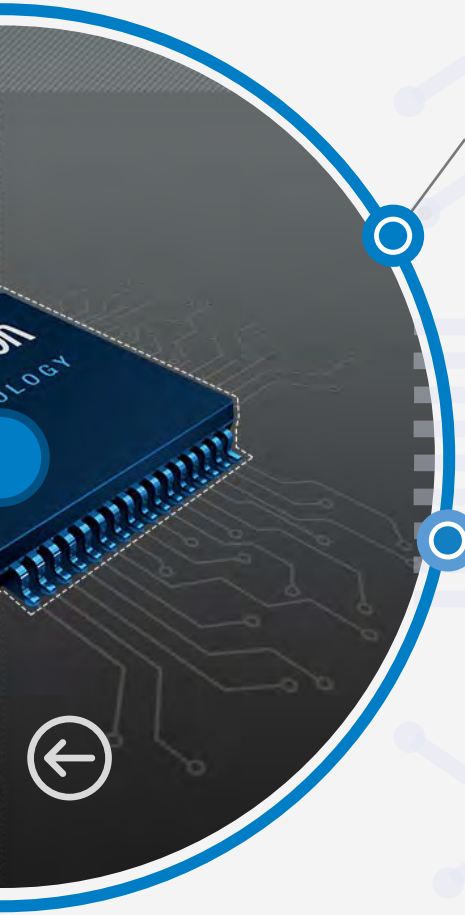
Strategic Planning

Any new product development requires a strategic foundation. Working closely with your executive team and product managers, our engineers and OEM experts draw on previous experience to provide unequaled insight into the future of automation technology for your business growth. The goal is to provide you with a game plan, and the pieces, for a differentiated product line that offers a competitive advantage.



Product Design

With technical teams located on four continents, Topcon can literally work around the clock to help our partners develop automated equipment solutions. Our experts collaborate closely with your engineers, taking your new or established strategic equipment plans and transforming them into equipment ready for the future – all the while advising you of the right path for your equipment on the rapidly developing road to automation.



Manufacturing Services

Topcon is dedicated to ensuring the smooth implementation of our technology into your production processes. Or, depending on your needs, we're always receptive to handling the component manufacturing on your behalf. Our technology and services are completely scalable to meet your demands for competitive advantage and business performance.

Support

Topcon is committed to keeping your customers' equipment functioning at the highest level, so we offer several ongoing support options well beyond prototyping and production project phases. MyTopcon provides comprehensive online training, firmware and software updates, and more, on a mobile-friendly site. Our global technical centers ensure personalized support can be available no matter where your manufacturing operations exist. Depending on the engagement, end-users may also be directly supported by our network of technical experts.

TopNETlive

Global GNSS Correction Service

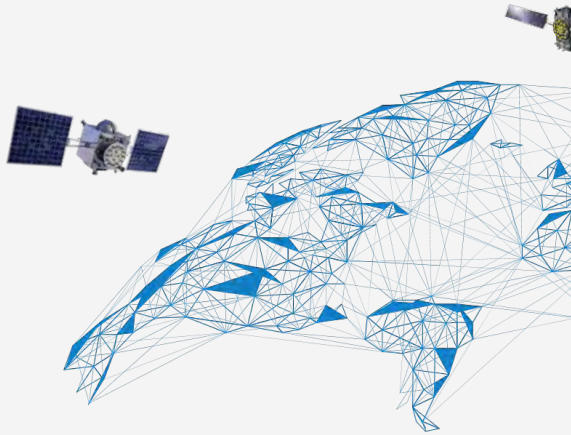
TopNET*live* is a real-time GNSS correction service delivering high quality data to GNSS receivers used for surveying, construction, GIS, mapping, OEM, system integrators and agricultural applications on a worldwide scale. Fully interoperable with all makes of network capable rovers, subscriptions are made easily available through the TopNET*live* website.

Topcon Positioning Group operates and monitors all TopNET*live* networks. Topcon's geodetic specialists and professional standards ensure high quality correction data is globally delivered to each GNSS receiver.

Technology Overview

In order to provide precise positioning accuracy, 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* is Topcon's GNSS correction service and consists of the reference station network, the correction calculation software and the correction broadcast service.



Real-Time Kinematic (RTK)

Real-Time Kinematic (RTK) is a positioning method to enhance the precision of position data derived from satellite-based positioning systems. RTK works through a network of stations covering local countries. Single Base RTK provides fast and accurate correction from one specific or nearest reference station. Network RTK delivers the correction from a number of stations in a local network of reference stations.

Precise Point Positioning (PPP)

Precise Point Positioning (PPP) is a positioning method to calculate precise positions up to few centimeter level using a single receiver in a global reference framework. PPP delivers great accuracy with slower start-up speed, but provides service anywhere on the planet, independent of local networks.

Constant Coverage

Both types of networks offer advantages and disadvantages. That is why Topcon designed and developed a service to provide its customer access to both systems simultaneously, even switching between automatically as reception changes. This means the customer always has the best of both systems and a truly global service.

The Topcon reference station network uses all four GNSS

	RTK	PPP
+	▪ Provides survey-grade accuracy ▪ Quick start-up	▪ Global coverage ▪ Seamless coverage – just one subscription required
-	▪ Requires dense local network ▪ Requires individual subscriptions to each network	▪ Less accurate than RTK ▪ Slower start-up than RTK

Full-Constellation Service

satellite systems: GPS, GLONASS, Galileo and BeiDou. This ensures the best accuracy and reliability, often referred to as a full-constellation service.

Broadcasting

The TopNET*live* correction service is broadcast to customer receivers in two ways:

- NTRIP – The internet, typically using a mobile phone SIM card data link.
- L-Band – Direct communication from a satellite.

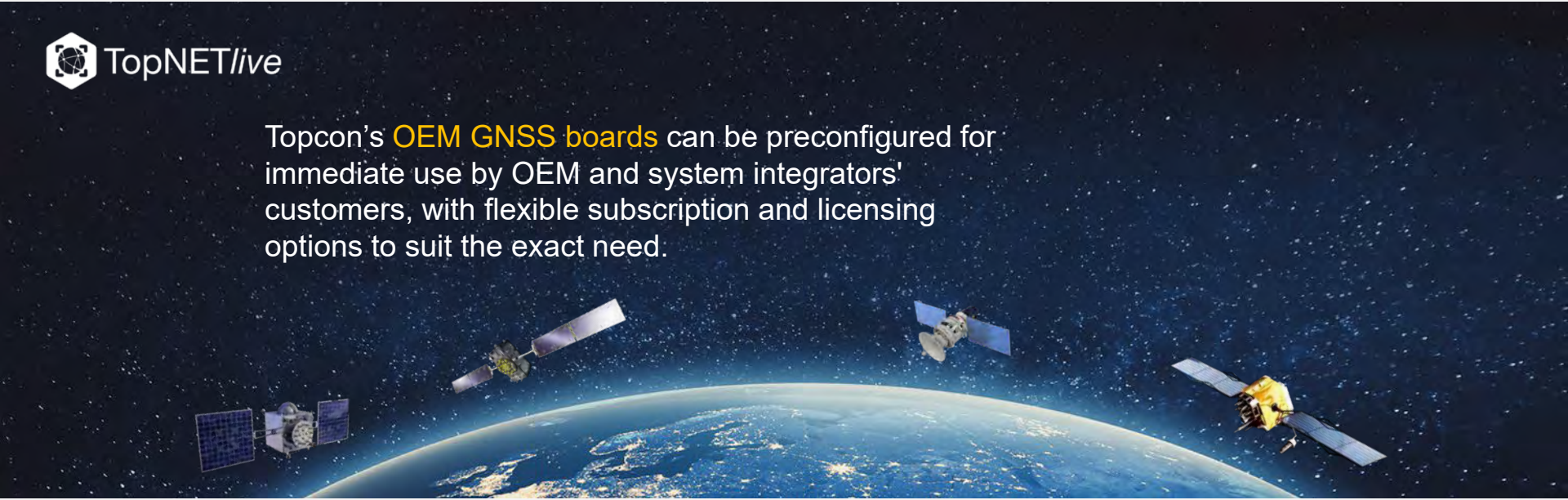
Customers have both options and can use whichever is most convenient.

Data Services

As an additional service, the raw data (RINEX) from the networks is available to download. There is also an on-line correction processing service for specialist applications.

TopNET*live*

Topcon's OEM GNSS boards can be preconfigured for immediate use by OEM and system integrators' customers, with flexible subscription and licensing options to suit the exact need.



Why TopNET*live*

TopNET*live* is a truly global solution, providing correction service anywhere with the combination of global PPP and local NRTK networks. NRTK networks are operated by Topcon and its partners to provide coverage in all major regions of the world. Customers can have a single subscription that provides borderless service which automatically switches between NRTK networks. TopNET*live* is managed by Topcon's own network and geodesy experts, which ensures a precise and reliable always-on service. The entire solution is designed to be scalable, so system integrators do not need to limit locations or numbers of customers.

TopNET*live*

Skybridge

SkyBridge allows subscribers to combine RTK and PPP correction services

Realpoint

Provides greater accuracy and quick start-up time

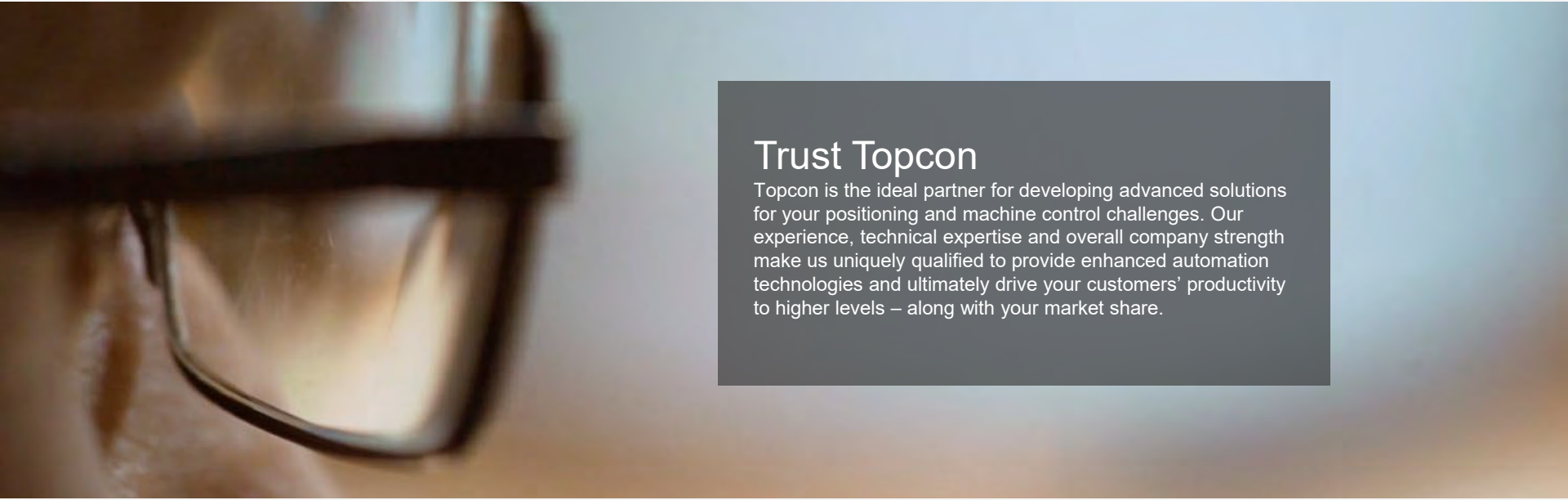
Starpoint

Provides the service anywhere on the planet, independent of local networks

Topcon manages, operates and monitors all reference networks.

TopNETlive

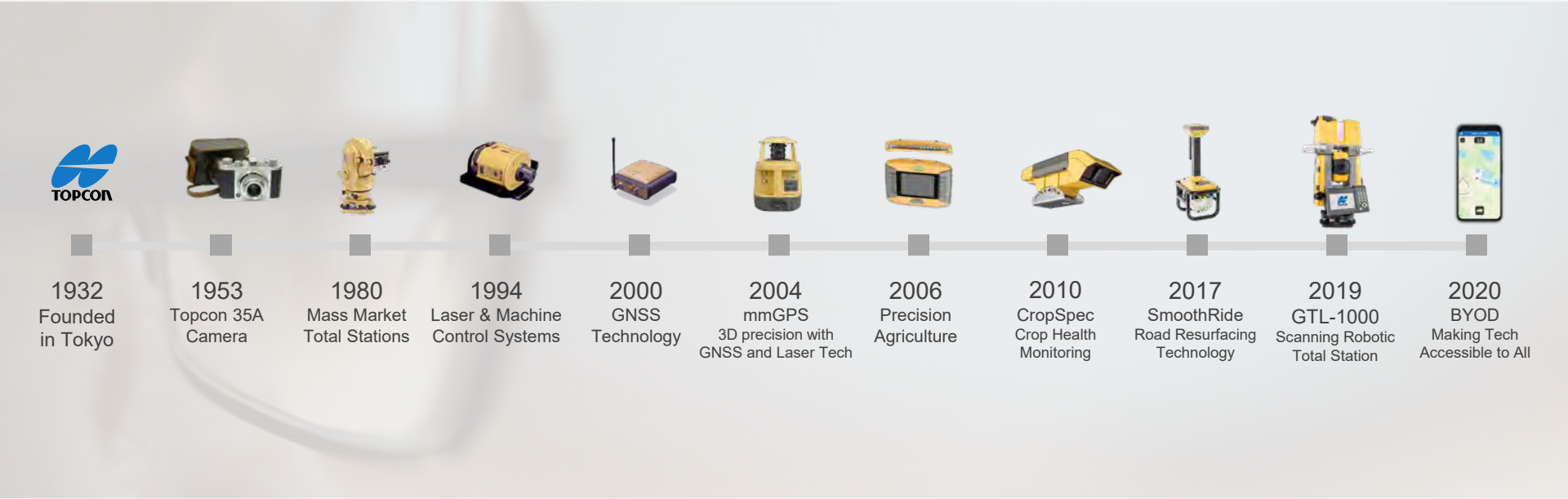
	Realpoint	Starpoint	Skybridge
Correction Type / Delivery	RTK with NTRIP	PPP with L-Band	RTK with Starpoint backup
Coverage	Local	Global	Global
Accuracy	2 cm	4-10 cm	2-4 cm
Initialization Time	Seconds	10-30 mins	Seconds
Applications	Surveying, Construction, Machine Control, Agriculture, OEM, Industrial IOT and Autonomous Robotics	Machine Control, Agriculture, OEM, Surveying in Remote Areas, Automotive, Industrial IOT and Autonomous Robotics	Surveying, Construction, Machine Control, Agriculture



Trust Topcon

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

Independent Solutions | Speed To Market | Global Network | Experienced OEM Team



Topcon Corporation

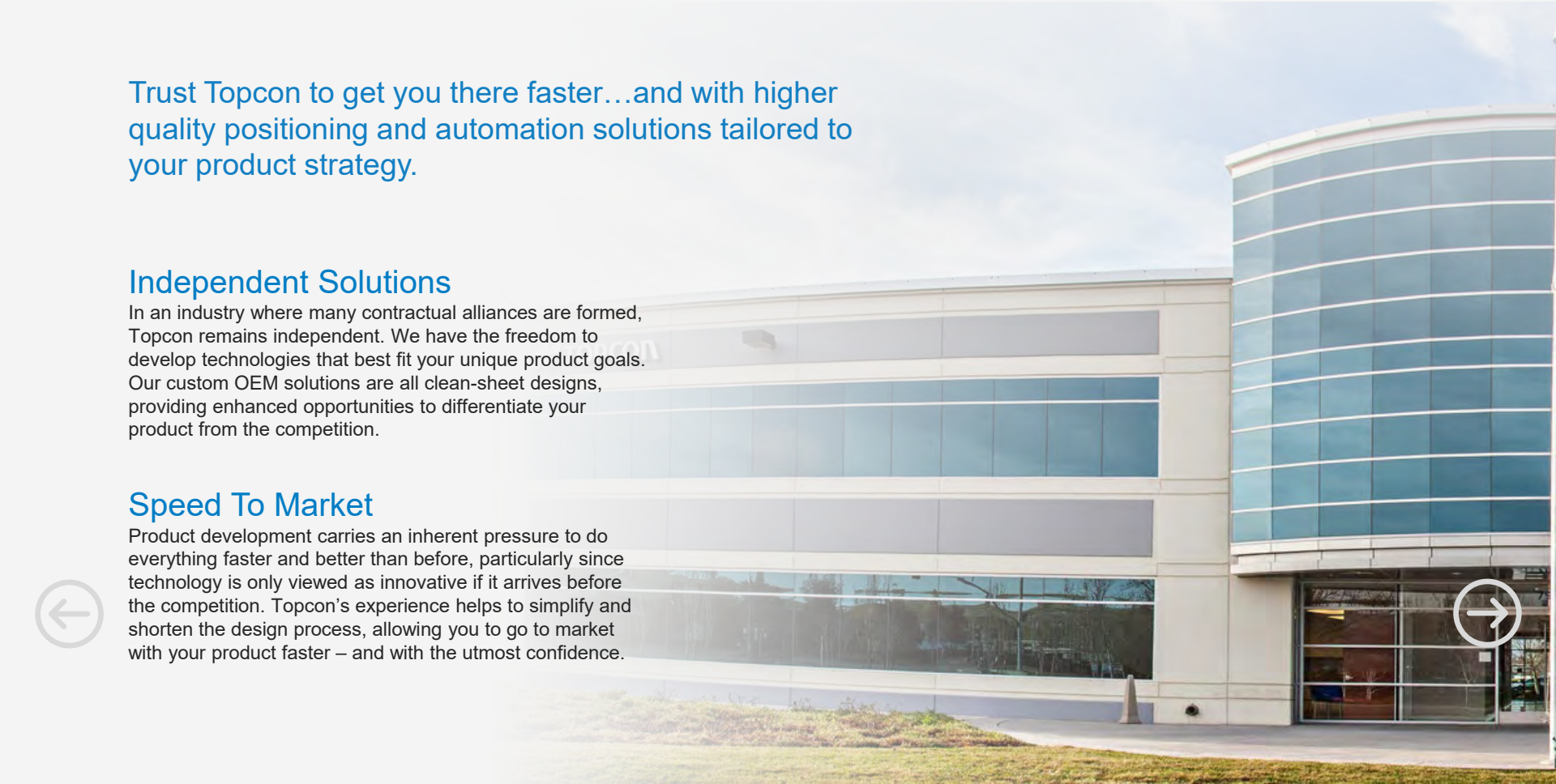
Trust Topcon to get you there faster…and with higher quality positioning and automation solutions tailored to your product strategy.

Independent Solutions

In an industry where many contractual alliances are formed, 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 enhanced 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.



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.

TOPCON Training Center

Topcon Training Center, Concordia provides facilities and advanced equipment for testing and training purposes. The training programs offered have been developed to provide advanced knowledge of Topcon GNSS technology, correction services as well as to improve operators' skills and expertise in ICT-aided construction and agriculture.
The campus covers an area of approximately 135,000 square meters of which 24,000 square meters are dedicated to machine control and precision agriculture testing. The center has classroom facilities onsite accommodating 200+ participants for seminars and coursework ranging from basic to advanced.
Conveniently located in Northern Italy, the Topcon Training Center, Concordia is just an hour away from major Italian airports in the region.

TOPCON

Training Center

Topcon Training Center, Livermore is a dedicated space to train our customers, dealers, and Topcon employees on all construction and geopositioning-related products. With nearly six acres, the facility boasts two classrooms, outdoor theatre-style seating for live demonstrations and training, an equipment garage for hands-on installation training. The training facility plans to train up to 2,000 participants annually.
Topcon has designed the training center to simulate live applications that take place on a typical construction site which provides the participants with a fully immersive experience and a heavy focus on job site workflow. An added use of this facility, Topcon offers select OEM prospects the opportunity to fly in their VIPs for a complete workflow demonstration of our products including a hands-on experience.
Livermore is located in northern California and is easily accessed from San Francisco and Oakland airports.

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