

Measure, design and build with one solution

MC-Mobile



ACCELERATE
MACHINE
CONTROL

INTRODUCING
MC-MOBILE

EXPLAINING
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ABOUT
TOPCON

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More than machine control

All the power of machine control, now simplified

Measure | Design | Build



The power of machine control

What is machine control

Machine control technology is revolutionizing the construction industry, from excavators that can prevent overdigging to dozers with automated blades. But what exactly is machine control? How does this technology work? What is the value of it?

Simply put, machine control hardware and software were developed to determine a machine's current position on the earth and compare it with the desired design surface. Using data from satellites or total stations and 3D models, the technology allows machine operators to accurately position machinery, check grade, automate equipment functions and collect data for improved decision-making and planning.

Through the use of various positioning sensors and a display, machine control gives operators a clear reference between the position of the machine bucket or blade and the design surface.

Evolution of machine control

Used by the construction industry in earthmoving equipment since the late 1990s, the technology allows you to make decisions based on data, rather than relying solely on the skill and experience of the operator. As a result, machine control effectively increases operators' productivity and accuracy.

Thanks to the machine control's improved accuracy and enhanced performance, using the technology in excavators, dozers and graders saves operators time, and reduces costs and fuel. Through the use of this intuitive software, operators can bring standard site positioning solutions and different machine types together, with the flexibility to integrate total stations or GNSS with their equipment

Before its adoption operators had to manually check grade and position machinery themselves – a process that was less accurate, more time-consuming and held higher safety risks.

Once 2D and 3D technology began to develop, so too did early machine control technology. Providing operators with access to simple visual guides, this early technology often used indicate systems to demonstrate how deep to cut and allowed operators to maintain grade while manually controlling the dozer's or grader's blade and the excavator's bucket.



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The machine control advantage to stay competitive

Fast forward to the present day, and the construction industry is facing some significant evolution. Modular and prefab construction business, for instance, is amid a multi-year expansion.

It is no secret there is a lack of fresh talent entering the industry.

Should this trend continue, the industry will be left with a shortage of experienced and reliable operators, greatly impacting the quality and timelines of projects. To meet construction targets and tackle the skills gap head-on, contractors are turning toward automated machine control to improve their workflow.



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Machine control made accessible

Our latest leap, MC-Mobile, makes machine control accessible to any contractor - big or small, commercial or residential.

We accomplished this by:

- Designing our user and product interfaces based on real-world applications - customer needs and feedback
- Making it useful on a full range of machines and applications
- Realizing lower costs by using fewer, portable components
- Advancing processing power to increase speed, accuracy, versatility and reliability
- Simplifying the user experience so it is easier to learn and improve productivity

With the introduction of our MC-Mobile solution, we are unlocking the digital construction site for contractors that want the power of machine control, without being overwhelmed by unnecessary capabilities.



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Machine control made around real jobs

We have developed the MC-Mobile solution based on our deep experience in the industry and understanding of the technology. We have refined our greatest machine control technology to be the ideal companion for medium and small jobsite projects.

We know that out in the field, many tight spaces are difficult to grade with dozers or motor graders, and these spaces slow down productivity. Typically, these spaces are the ends and edges, like the driveway entrances, building pad ends and corners, cycle tracks and box culverts.

At the same time, transitioning from public roadways to jobsite, or vice versa with a machine can provide you with added value, especially where the jobsite ties into a public roadway.

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Machine control from start to finish

MC-Mobile solutions are the perfect fit for many job-site tasks, including fine grading, custom landscapes, berms, swales and utility. With MC-Mobile all these tasks can be verified and recorded for proof of completion requirements.

MC-Mobile allows you to perform a broad set of tasks for the execution phase, perfect for the general earthmoving and excavation contractors.

	Residential development	Small Municipal and Government Projects	Commercial Warehousing Lots
Excavating	•	•	•
Rough Grading	•	•	•
Finish Grading (Sidewalks, Driveways and House Pads)	•		
Finish Grading (Developments)		•	
Finish Grading (Ends and Edges)	•		•

Contractors that are growing their business and expanding their fleet of compact equipment benefit through increased capability and productivity that can expand to larger jobsites.



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Digitize your jobsites

While digital plans are the industry norm for larger projects, many contractors still use physical drawings to inform their work. They spend a good chunk of the day at the hood of their pickup truck with their plans. They pull a ruler across it and mark it up. With MC-Mobile, contractors can easily do that digitally. Their position on a three-dimensional job site can be represented digitally in 2D form.

It's mind-blowing how much MC-Mobile can change the whole picture, and it becomes more and more powerful as you move and can see yourself in relation to things without pulling a tape. The digital representations provided by MC-Mobile allow contractors to visualize buildings and designs better before they are built. This provides a consistent advantage in terms of better planning and resource management – people, material, equipment and time.



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The contractors' biggest asset

Because MC-Mobile gives contractors machine control technology in a simple, easy-to-use way, it can transform the contractor's business in three key ways:

- Productivity – Operators can create and modify designs immediately in their machines with highly accurate measurements for their work without waiting for surveyors to perform layout or quality checks. This means they can start working – and move through stages – faster.
- Do it once, do it right – Working digitally, and having the ability to continually take measurements and check grades, levels and areas means that contractors work more accurately, leading to less rework and better margins.
- Workforce/Labor – MC-Mobile simplifies processes so that operators can perform the function that would normally require greater or different skill sets. With highly skilled labor in high demand, this solves the workforce problem for operators, allowing them to find capable employees more easily.



Machine control's power to improve a business

Fewer workers to complete the same jobs

 **Cut construction costs**

Complete inspections as you work

 **Shorten construction timelines**

Improve accuracy and minimize error

 **Reduce material waste**

Win more contracts

 **Increase competitiveness**



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MC-Mobile explained

Components, setup, use cases

Measure | Design | Build

Platform modular components overview



Powerful control unit

The heart of MC-Mobile is the control unit.

The powerful MC-X1 ECU is capable of processing everything from simple slope control to 3D positioning.

The MC-X1 provides ultimate flexibility.



Precise angle measurement

The TS-i4 Inertial Measurement Units (IMUs) take state-of-the-art micro electromechanical system (MEMS) technology and package it in a compact, ruggedized sensor for mounting on the machine body, blade, bucket or grading attachment.

Since TS-i4s have such small gyrodrift, they can be used for precise blade-yaw, body- and boom-swing estimation.



Rugged wireless display

MC-Mobile tablet can be easily moved from machine to machine and from machine to range-pole.



Layout reinvented

The LN-150 takes you from scaling paper plans and tape measures into digital layout and construction verification workflows.

This tool is easy to learn and easy to use, letting you automate and execute layout and construction verification processes for increased productivity, accuracy and bottom-line savings.

MC-Mobile solution for compact equipment



1

TS-i4

Inertial sensors measure slope and rotation

2

MC-X1

Machine controller for attachment automation or machine guidance

3

Portable and cost-effective Android tablet*

Wireless Android operator tablet that can be moved from cab to pole

4

LN-150

LPS 3D optical positioning with mm-level precision

5

GR-i3 or Prism

GNSS or LPS for machine control or on the pole

MC-Mobile solution for mini-excavator



MC-Mobile works with all major manufacturers of Mini-Excavators

Caterpillar • Kubota • Bobcat • John Deere • Takeuchi • And more



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MC-Mobile solution for compact track or skid steer loaders



MC-Mobile works with all major manufacturers and major attachments for your compact track or skid steer loaders

Caterpillar • Kubota • Bobcat • John Deere • Takeuchi • Level Best • SharpGrade • And more



MC-Mobile flexible configurations that grow with the customer

Common for all configurations



Body sensor for pitch and roll of machine:
Indication of slope.
Grade simple slopes with a bucket or blade



Add laser and receivers to attachment

Add LN-150 and Prism to Attachment

Add 2x GR-i3 GNSS to cab

Add 1x GR-i3 GNSS to attachment

2D Positioning with Laser



Automatic Elevation and slope control for specific attachments

3D Positioning with LPS



Automatically control specific attachments with horizontal and vertical position

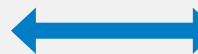
3D Positioning with dual or single GNSS



3D Indicate positioning for Buckets and PAT (Dozer) blades



Use either one of these systems or combine them

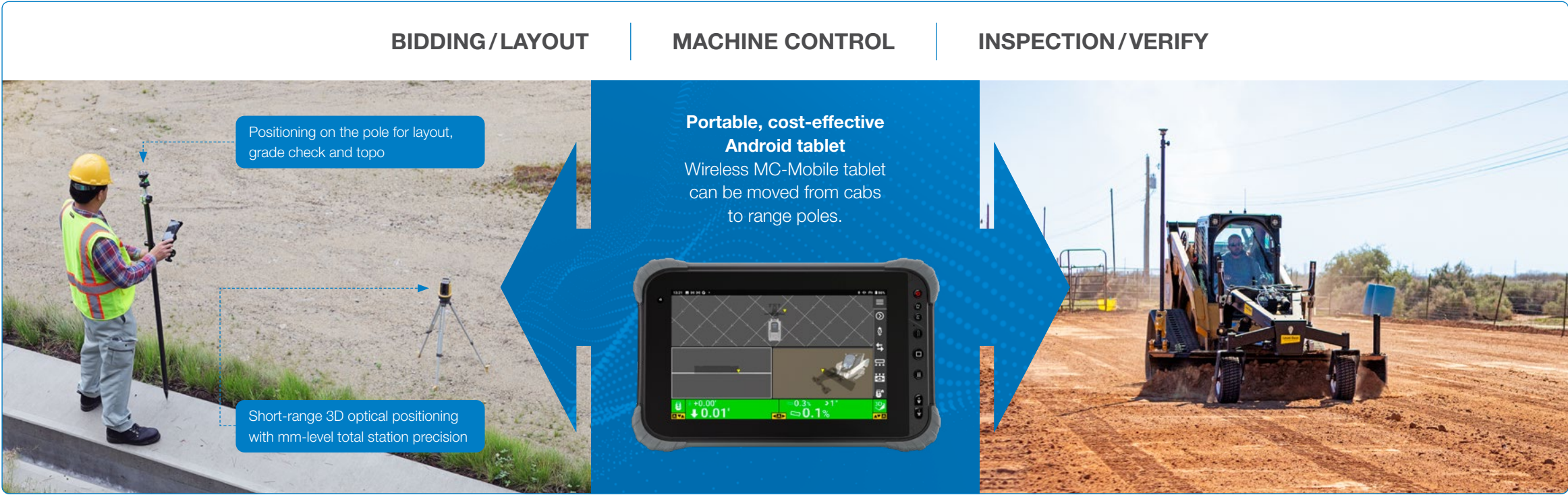


Automatically control specific attachments with horizontal and vertical position

MC-Mobile – integrated survey and machine control

A simplified workflow

- Do your layout with a LN-150 and a prism or with a GNSS receiver and the MC-Mobile tablet
- Check results or upload designs directly through the rugged device
- Use the same GNSS receiver or LN-150 and tablet to control your machine
- Leverage the power of machine control for improved productivity and greater accuracy
- Perform your inspection/verify (as-built and grade checking)
- Do it once, do it right



Small earthmoving

MC-Mobile is ideal for small earthmoving projects. The system provides the advantages of a surveying solution with a machine control system.

- The operator can check the horizontal position and height on the display while operating the excavator
- Finish stakes aren't necessary because the MC-Mobile system displays the finish grades of the excavation



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Parking lot + curb construction

For parking lot and curb construction, the operator can run the track loader or skid steer while checking the grade, slope and area on a tablet.

- Operators select benchmarks or other known fixed elevations and create a design surface or features such as sidewalks and curbs
- The same operator then constructs the base course with crushed stone to the finish level



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Civil

Because MC-Mobile displays an excavation line, the operator does not need other visual indicators. It's easy to create design data for civil engineering projects.

- Shaping a berm: A single operator can shape a berm or shoulder without a string line using MC-Mobile
- One operator can easily dig a culvert using MC-Mobile
- The design can be created with a straight line set to a predefined slope or grade



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Custom Landscape

A system that combines the advantages of layout and machine control, MC-Mobile is ideal for professional landscapers. With the full integration of digital plans and drawings, professional landscapers can get updated plans immediately in their machine, and highly accurate measurements on their work.

- Create new drainage systems in the field
- Design and create both residential and commercial gardens
- Design and sculpt custom landscapes features
- Install a driveway, sidewalk or pathway
- Visualize proposed designs before construction and modify them in real-time



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Power meets flexibility

Ease of use across applications makes machine control a reality for contractors

Because MC-Mobile delivers modular components, the solution can create value through an entire operation with even a single operator.

Click on the boxes to see more details.

Why MC-Mobile?



MC-Mobile empowers contractors to increase their self-performing abilities.



Same reliable accuracy as high-end solutions*



Can be used with smaller machines



3 systems in 1 (measure, design and build)



Easy setup without localization



Scalable and easily upgradable



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*compared to equivalent existing Topcon products.

Flexible solutions



MC-Mobile Portable indicate functionality

A simplified workflow that enhances compact equipment owners capabilities to Measure, Design and Build effectively and efficiently



MC-Max Full functions and automatic

A full featured, high-end solution for full size machines that increases the performance of the machine and its operator.



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About Topcon

Our technology can improve your workflows for increased productivity and profitability while reducing rework and waste.

Information for OEM



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Trust Topcon

We are 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 technology and ultimately drive your customers' productivity – along with your market share – to ever higher levels.

SPEED TO MARKET | GLOBAL NETWORK | EXPERIENCED OEM TEAM

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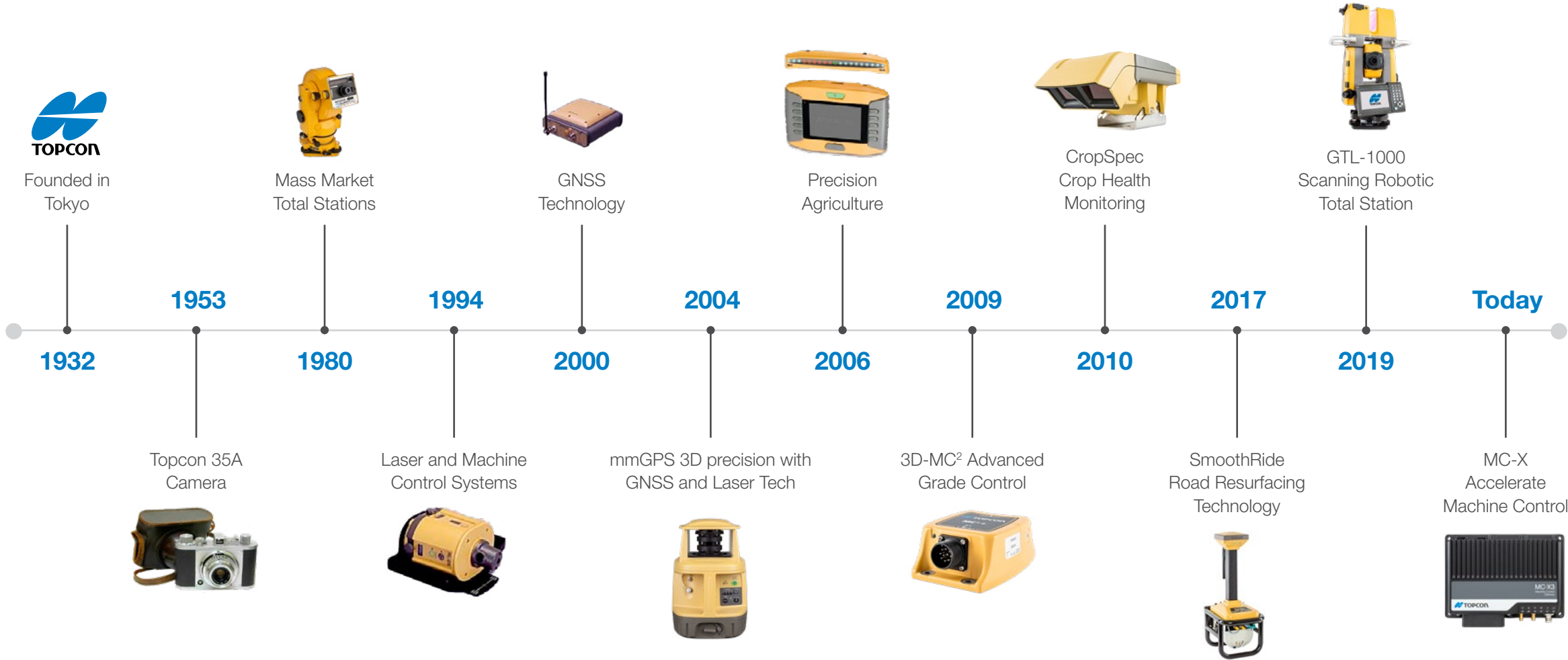
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A History of Topcon Corporation

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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, we remain independent. We have the freedom to develop technologies that best fit your unique 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. Our experience helps simplify and shorten the design process, allowing you to go to market with your product faster – and with the utmost confidence.



Topcon Training Center,
Livermore, CA

Topcon Technology
Roadshow Truck

Topcon Positioning Systems Headquarters,
Livermore, CA

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4900+ Employees | 2150+ Patents

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 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 will be your partner every step of the way.

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