

# Measure, design and build with one solution

MC-Mobile



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MACHINE  
CONTROL

INTRODUCING  
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## More than machine control

All the power of machine control, now simplified

Measure | Design | Build





# What is machine control

The power of 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.





# 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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# Introducing MC-Mobile

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# Machine control made around real jobs

MC-Mobile

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 gyrodraft, 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 Layout Navigator 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

**Layout Navigator**  
LPS 3D optical positioning with mm-level precision

5

**GR-i3 or Prism**  
GNSS or LPS for machine control or on the pole

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# MC-Mobile solution for mini-excavator



\* Cedar CT8X2



**MC-Mobile works with all major manufacturers of Mini-Excavators**  
Caterpillar • Kubota • Bobcat • John Deere • Takeuchi • And more



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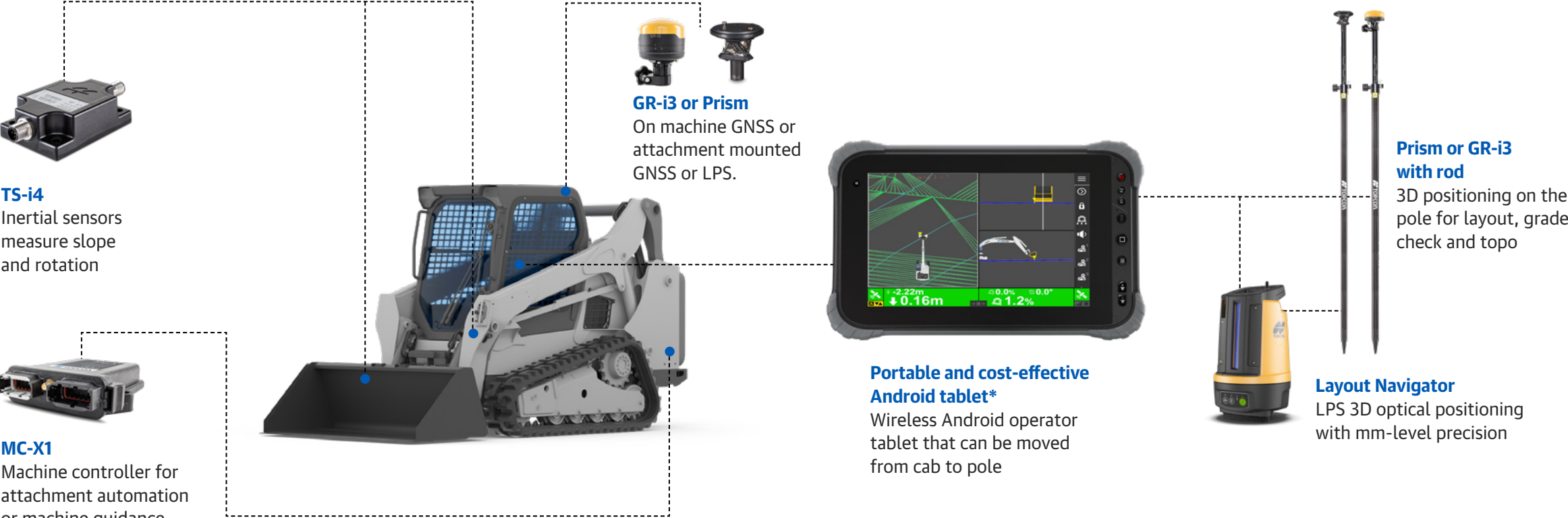
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# MC-Mobile solution for compact track or skid steer loaders



\* Cedar CT8X2


**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
 

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# 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 Layout Navigator 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



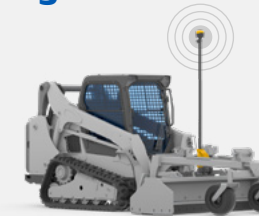
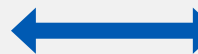
Automatically control specific attachments with horizontal and vertical position

### 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



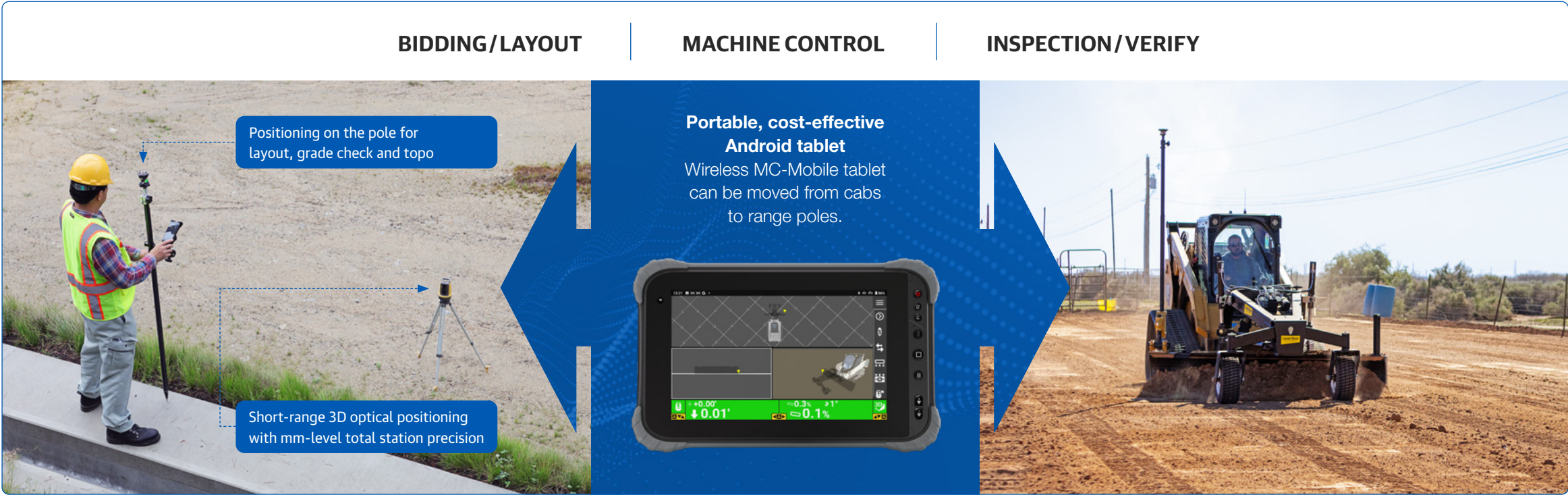
Automatically control specific attachments with horizontal and vertical position



# MC-Mobile - integrated survey and machine control

## A simplified workflow

- Do your layout with a Layout Navigator 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 Layout Navigator 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





# Power meets flexibility

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## 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.

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# 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





# 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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## Empowering Your Work

As a worldwide leading developer and manufacturer of precision positioning workflow solutions, we help the people who build and feed the world work smarter and faster.

The technology we provide brings increased accuracy, saves time, boosts productivity and efficiency, and lowers expenses, all resulting in greater profitability for you.

Seemingly impossible jobs can be possible because we empower you to do more with less. Projects can be completed with fewer skilled workers with less re-work.

SPEED TO MARKET | GLOBAL NETWORK | EXPERIENCED OEM TEAM

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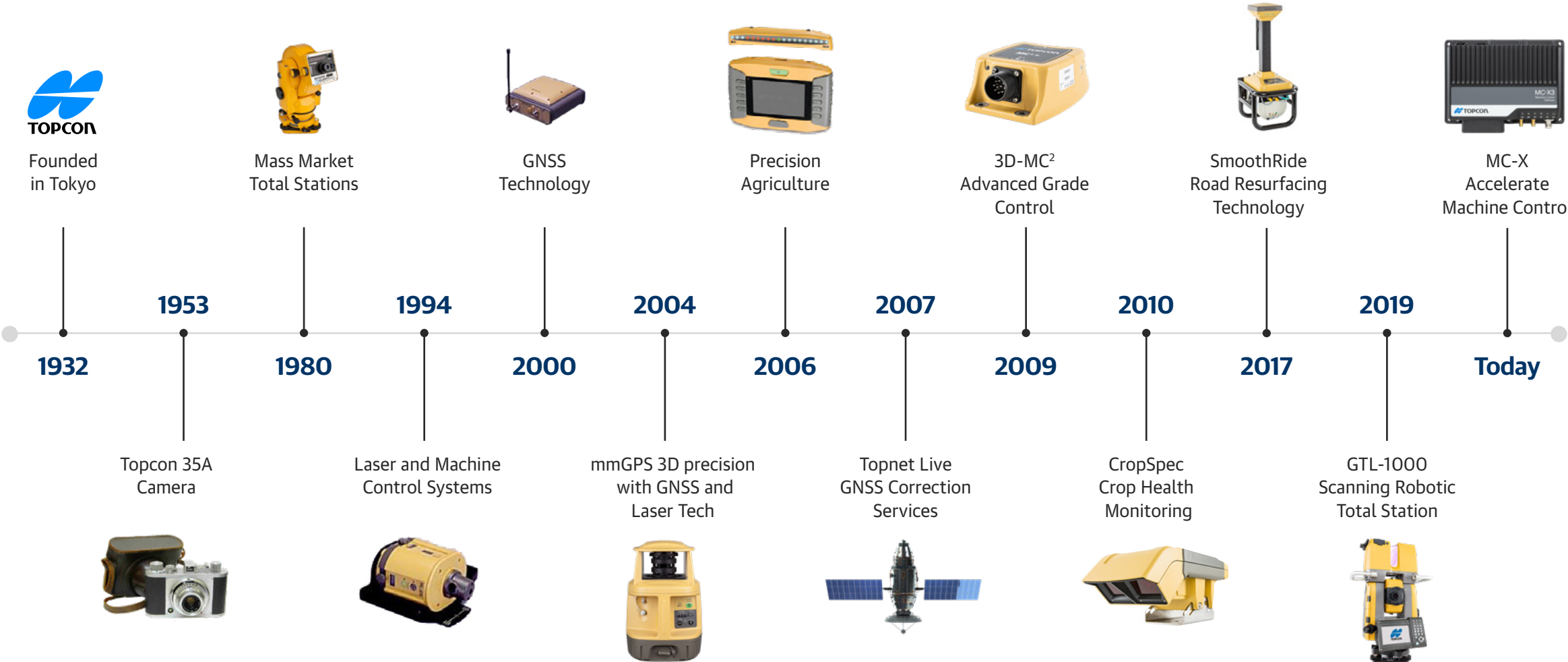
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# A History of Topcon Corporation in Agriculture



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# Unleash Your Potential

We provide innovative yet intuitive solutions that integrate high-precision measurement technology, software, and data for the construction, surveying, and agriculture industries. By embracing our solutions, our customers can:

- Accelerate infrastructure creation and repairs, ensuring safety and cost-effectiveness
- Efficiently gather and handle vast amounts of data, reducing field time
- Maximize crop yields and returns, all while minimizing environmental impact and preserving natural resources.

We're here to make complex tasks easier - so you can work smarter, not harder.



Topcon Training Center,  
*Livermore, CA*

Topcon Technology  
Roadshow Truck

Topcon Positioning Systems  
Headquarters, *Livermore, CA*

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4900+ Employees | nearly 3500 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 be your partner every step of the way.



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## Topcon Training Center Concordia, Italy

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 on-site 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.

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## Topcon Training Center Livermore, California

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 and 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.



Training Center

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