
TOPCON

Topcon
Machine Control
Portfolio

Version 2.0

Digitization of construction.
Technology and workflows
to improve Infrastructure.

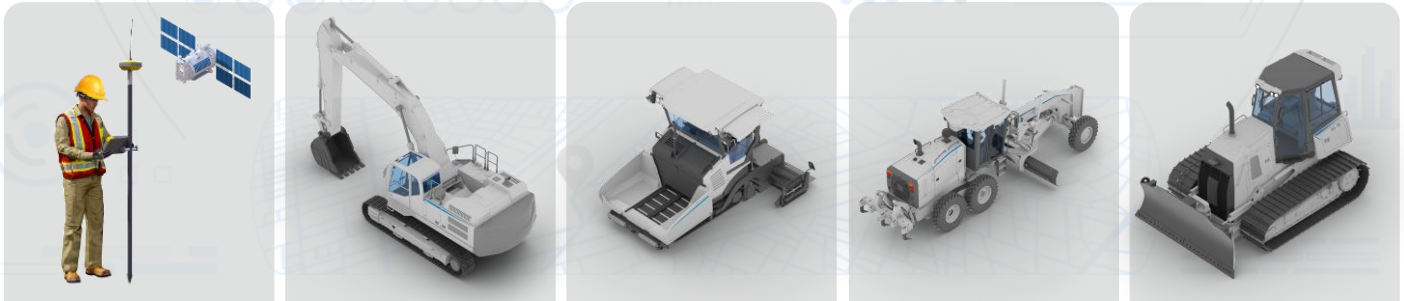
May 2024

The latest innovation in **Machine Control** by Topcon

- Multi-constellation, wired and wireless GNSS sensors
- Scalable Capabilities
- Greater accuracy across operating conditions
- Modular Components
- LPS and 2D Options

MC-X Platform

MC-X Concept



MC-X Platform – What does it offer?

Multi-constellation, wired and wireless GNSS sensors

New receivers track all major constellations, including BeiDou and Galileo.

Modular Components

Built as a modular platform, MC-X can scale as you need, and as additional equipment is added.

Greater accuracy across operating conditions

Advanced processing allows higher speeds and greater accuracy, a wider range of operating conditions and higher reliability.

Scalable Capabilities

Use the same components for a wider range of applications depending upon the configuration, including 2D indicate or automatic, indicate-only 3D and full-auto 3D.

MC-X Platform – Why everything is new?

Platform Upgrade

Replaced obsolete hardware components to bring them up to modern environmental, electrical and safety standards.

Renewed communication systems

Replaced obsolete on-board communication systems with modern CAN bus technology.

Multi-constellation

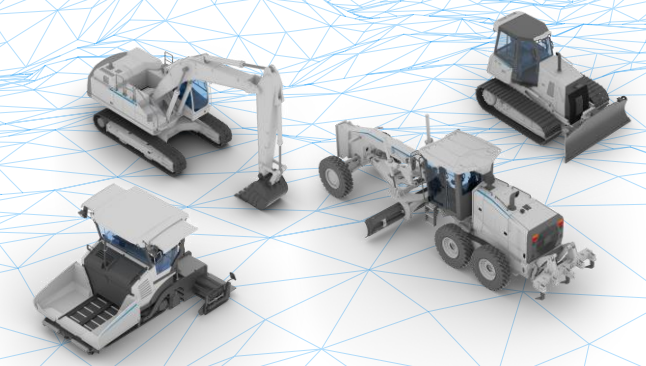
Support for all GNSS constellations, now with full access to GPS, Glonass, Galileo, BeiDou, QZSS.

MC-X Product lines

MC-X Platform

MC-Max

- Scalable
- Indicate and Automatic
- For all machine types



Software

3D-MC – Pocket 3D

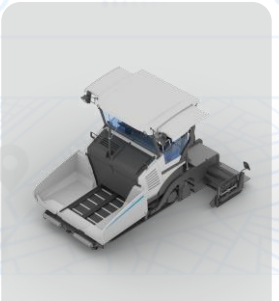
MC-Mobile

- Workflow-based
- Measure, Design, Build
- Indicate
- Mini-Ex, Excavator, CTL and SSL

MC-X Platform

Components





Controllers and Communication

MC-X1
Controller

MC-X1 is an ECU with high-processing power capable of simple slope control and 2D to fully automatic 3D control. The MC-X1 provides ultimate flexibility including Bluetooth communication.

UR-1
UHF/FH915 Radio

External radio with internal UHF and FH915 capabilities.

SL-25
4G Internet

The SL-25 represents the next generation of Sitelink modem and is ideal for network corrections such as Topnet Live. The unit utilizes the same housing as the MC-X1 and will be introduced with 4G capabilities*.

MC-X3
Controller, UHF Radio, 4G Internet

MC-X3 is an ECU with a powerful processor capable of simple slope control and 2D to fully automatic 3D control. It also houses integrated UHF, spread spectrum, Bluetooth and cellular communications*.

*Cellular services may require an additional fee.

Machine Control Displays

GX-55
6,5 Inch - Windows

GX-75
10,4 Inch - Windows

GX-90
10,4 Inch - Linux

Available Soon

GNSS-Receivers

GR-i3
GNSS Receiver

GPS, Glonass, Galileo, BeiDou, QZSS
Modular to combine it with additional sensors or to mount it on a range pole

GR-i3F
GNSS Receiver

GR-i3 with fixed holder
to use on machines

Topcon GNSS Technology

GPS, Glonass, Galileo, BeiDou, QZSS

GR-i3 Scalable

GR-i3
with mount

GR-i3
with **RP-i3**

GR-i3
with **PZS-i3**

GR-i3
with **RP-i3** and **PZS-i3**

Sensors

TS-i4

- Inertial Measurement Unit
- Detecting changes in pitch, roll, and yaw
- Used for all machines except rollers

RS-1

- Rotation sensor
- Measures the rotation of the blade
- Used for motor graders

WS-i3

- Wire sensor
- Measures the vertical movement of the side blade (milling machines) or screed width (paver)
- Used for cold milling machines and asphalt pavers

ST-2+, ST-3

- Sonic Trackers
- Measures the distance to a surface, string line or curb
- Used for dozers, motor graders, CTL´s/SSL´s and asphalt pavers

To cover all 2D and 3D applications on all machine types

TOPCON

MC-X Platform

MC-Max Earthmoving




MC-Max Excavator – LPS

The A7R prism is available for LPS-only machines.

The RP-i3 is also available for LPS machine control.

Robotic total station or LN-150 Layout Navigator to position the machine on the jobsite.

The 3D LPS solution can be easily configured for GNSS. The A7R can be removed and replaced with the GR-i3F on the mast. Additionally, the RP-i3 prism can be combined with the GR-i3 for GNSS capability.

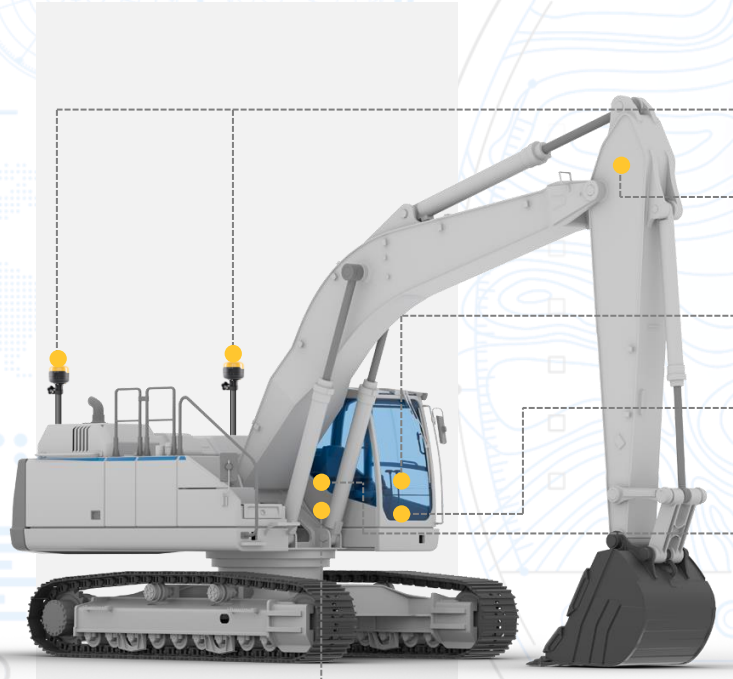
Compact, safety-certified valve controller and optional joystick (required for semi-automatic control) with user configurable buttons.

The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

MC-X1 control unit is the heart of machine control. Through data processing from different sensors (positioning data, IMU data), the MC-X1 is capable of everything from simple slope control and 2D to fully automatic 3D control.

2D components may be used in conjunction with LPS machine files and configurations. Additionally, the 2D sensors may be used without 3D elevation sensors for 2D-only applications.

MC-Max Excavator – GNSS



GR-i3/F supports multiple constellations.

Compact, safety-certified valve controller and optional joystick (required for semi-automatic control) with user configurable buttons.

MC-X1 control unit is the heart of machine control. Through data processing from different sensors (positioning data, IMU data), the MC-X1 is capable of everything from simple slope control and 2D to fully automatic 3D control.

The UR-1 radio can communicate via UHF/915 SS with local base stations. With the 4G-modem SL-25, network corrections can be used.

MC-Max excavator system utilizes TS-i4 sensors. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

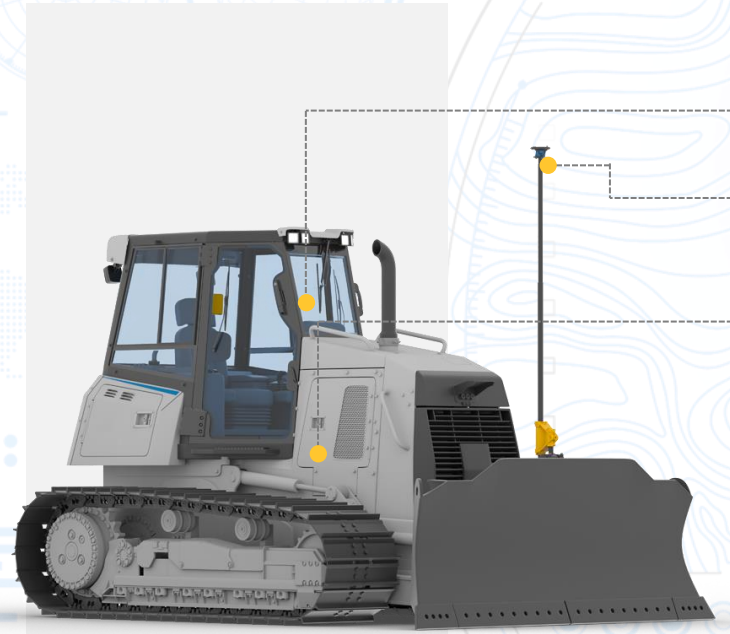
The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

2D components may be used in conjunction with GNSS machine files and configurations. Additionally, the 2D sensors may be used without 3D elevation sensors for 2D-only applications.

Topnet Live

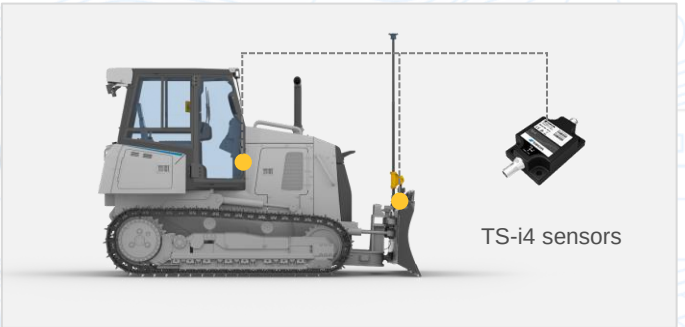
Topnet Live provides a wide range of global GNSS correction services, with a variety of subscription packages.

MC-Max Dozer – LPS

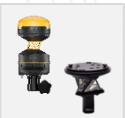


The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.



TS-i4 sensors

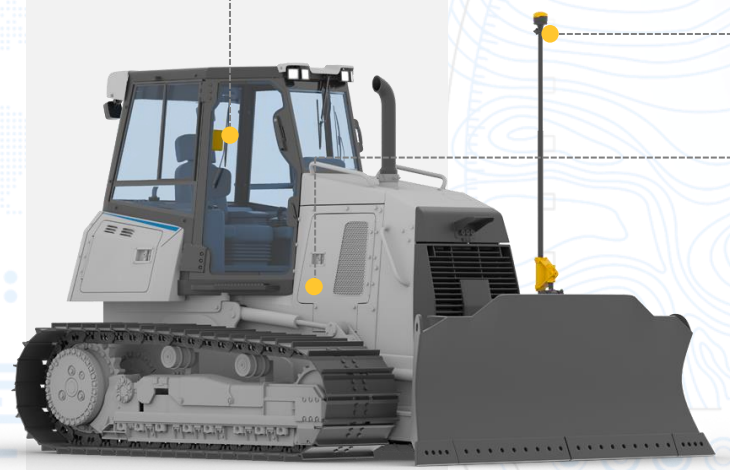


The RP-i3 or A7R prism is available for LPS-only machines.

The 3D LPS solution can be easily configured for GNSS. The A7R can be removed and replaced with the GR-i3F on the mast. Additionally, the RP-i3 prism can be combined with the GR-i3 for GNSS capability.

Robotic total station or LN-150 Layout Navigator to position the machine on the jobsite.

MC-Max Dozer – GNSS



The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

GR-i3/F supports multiple constellations.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

TS-i4 sensors

Topnet Live

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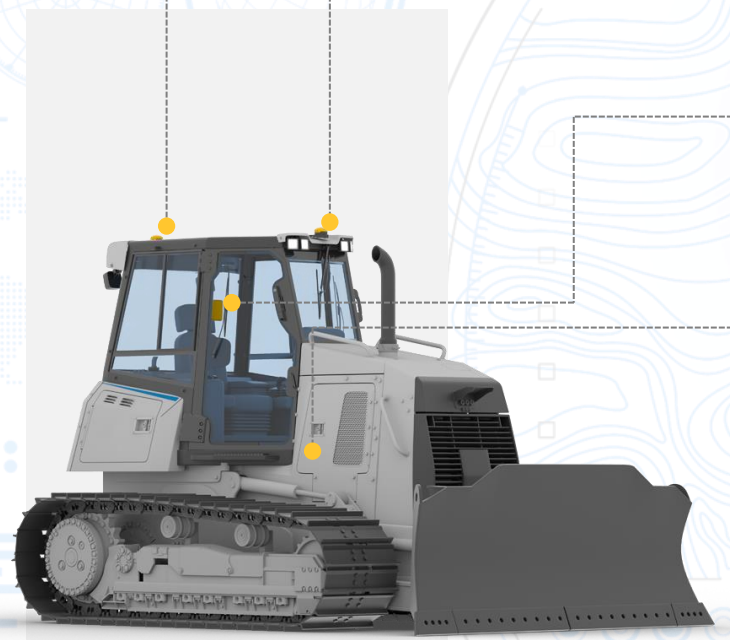
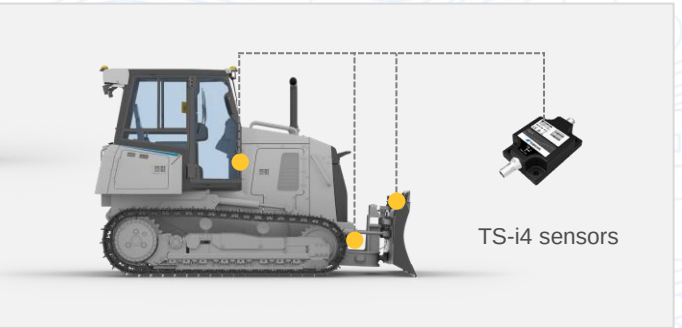
MC-Max Dozer – Mastless GNSS



The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.



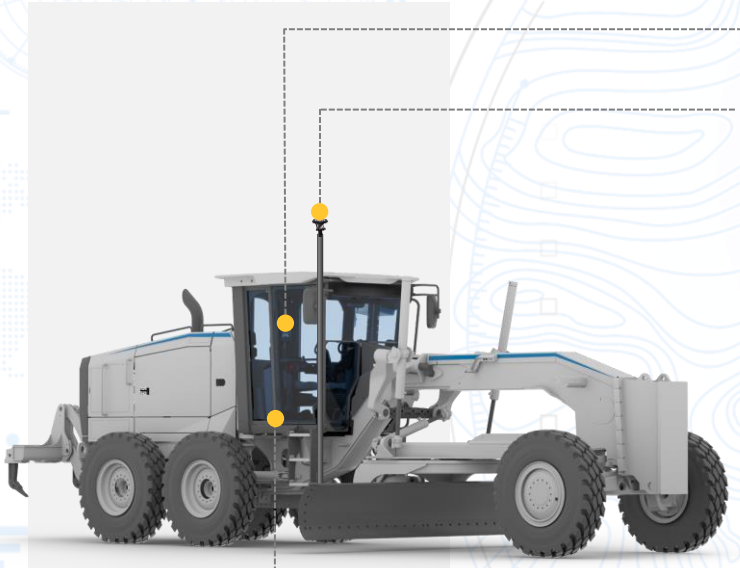
TS-i4 sensors

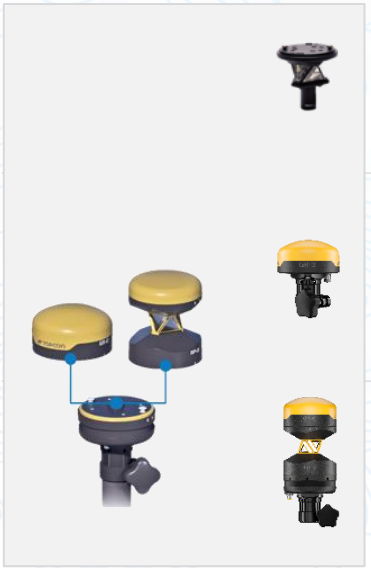
GR-i3/F supports multiple constellations.

Topnet Live

Topnet Live provides a wide range of global GNSS correction services, with a variety of subscription packages.

MC-Max Grader – LPS





The A7R prism is available for LPS-only machines.

The 3D LPS solution can be easily configured for GNSS. The A7R can be removed and replaced with the GR-i3/F on the mast.

The RP-i3 is also available for LPS machine control.

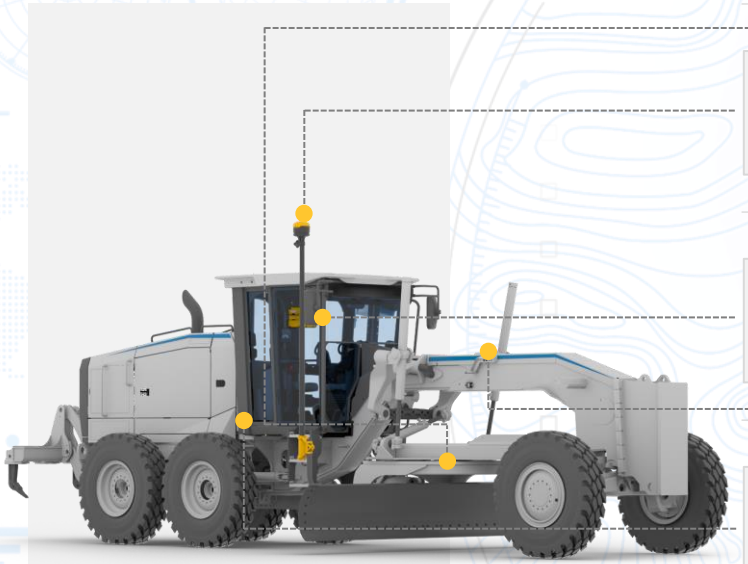
The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

Robotic total station or LN-150 Layout Navigator to position the machine on the jobsite.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

2D components may be used in conjunction with LPS machine files and configurations. Additionally, the 2D sensors may be used without 3D elevation sensors for 2D-only applications.

MC-Max Grader – GNSS



GR-i3/F supports multiple constellations. With a GR-i3 easy switch between mmGPS, LPS or GNSS.

The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

The RS-1 rotation sensor measures the rotation of the blade.

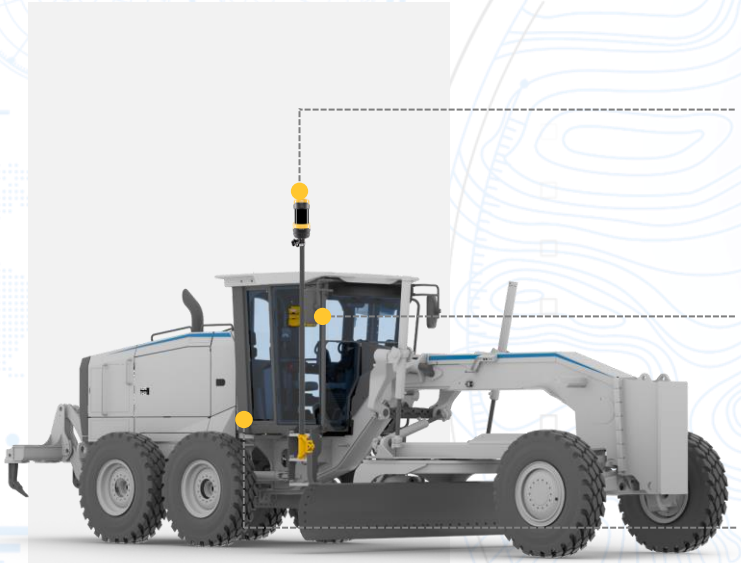
MC-Max Grader system utilizes TS-i4 sensors. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

2D components may be used in conjunction with GNSS machine files and configurations. Additionally, the 2D sensors may be used without 3D elevation sensors for 2D-only applications.

Topnet Live

Topnet Live provides a wide range of global GNSS correction services, with a variety of subscription packages.

MC-Max Grader – Millimeter GPS



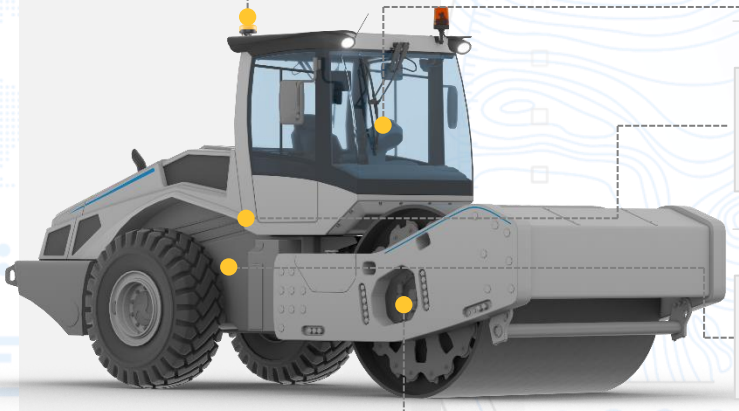
The Millimeter GPS solution is configurable with the vibration mount, PZS-i3 and GR-i3 on the mast.
In addition, a RP-i3 can be mounted for LPS usage.

The bright and robust GX-Series delivers a brand-new experience for modern machine control.
The 3D-MC software on the GX-Series provides real-time position and project design information,
with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations
and a cell modem to communicate with 4G networks.

2D components may be used in conjunction with GNSS machine files and configurations.
Additionally, the 2D sensors may be used without 3D elevation sensors for 2D-only applications.

Intelligent Soil Compaction

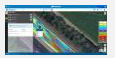


In Development

GR-i3/F supports multiple constellations.

MC-X1 control unit is the heart of machine control and can process the data from the compaction sensor.

The UR-1 radio can communicate via UHF/915 SS with local base stations. With the 4G-modem SL-25, network corrections can be used.



An active Sitelink connection is required for Intelligent Compaction.

The bright and robust Android Tablet CT8X2 is used for compaction. The 3D-MC software on the tablet provides real-time position and project design information as well pass count and stiffness information in real-time.

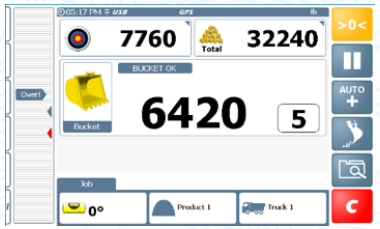
The compaction sensor is used to continuously measure and evaluate the frequency spectrum of the drum vibration.

Topnet Live

Topnet Live provides a wide range of global GNSS correction services, with a variety of subscription packages.

Mobile Weighing systems

Sitelink3D



- Highly accurate and easy to use
- Reduce vehicle movement, fuel usage and machine & tire wear
- Accurate loads first time
- Safety first. No more overload
- Live and dynamic weighing capability
- Accurate record keeping and reporting
- Ticket printing and reporting

OIML

MID
Measuring Instrument Directive
2014/32/UE

NMi

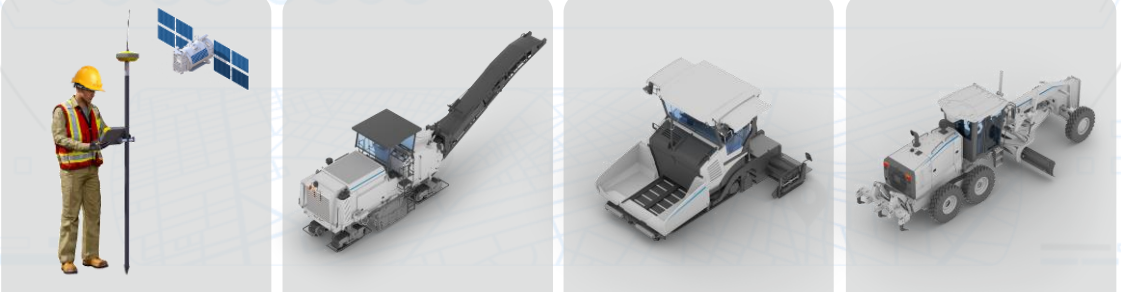
4G

UK CA

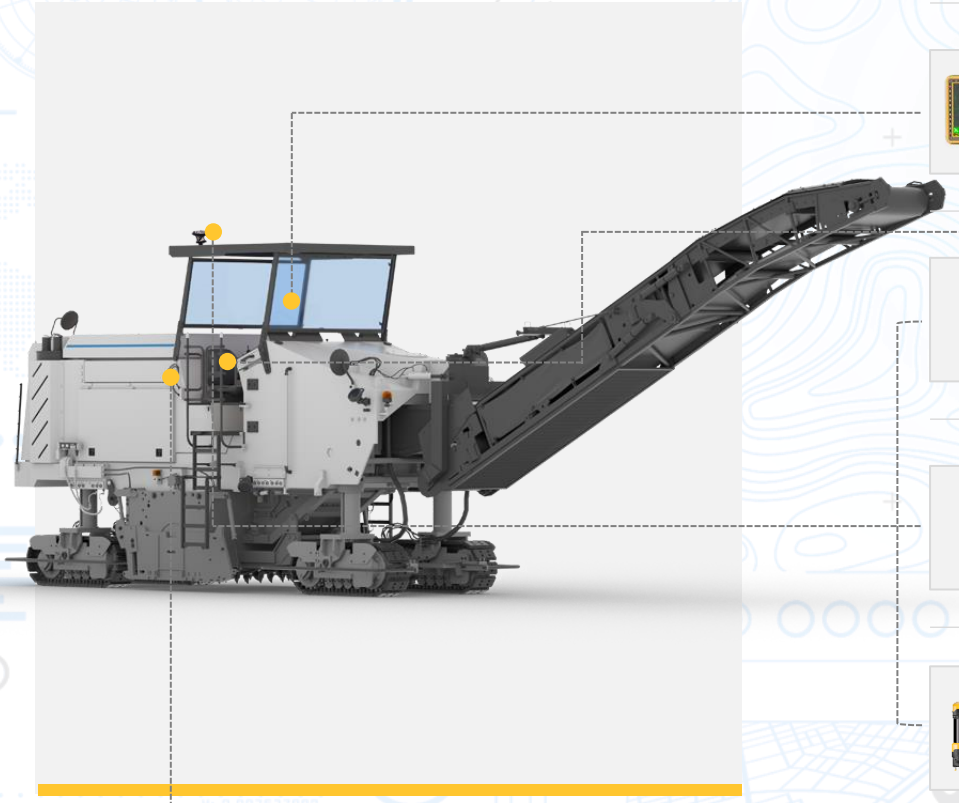
International Organization of Legal Metrology and Nmi Metrology & Gaming Ltd. Certifications apply to LM-100 only

MC-X Platform

MC-Max Road Construction



MC-Max Milling Machine – LPS



The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The A7R prism is available for LPS-only machines.

The RP-i3 is also available for LPS machine control.

The RP-i3 prism can be replaced or combined with the GR-i3 + PZS-i3 for mmGPS capability.

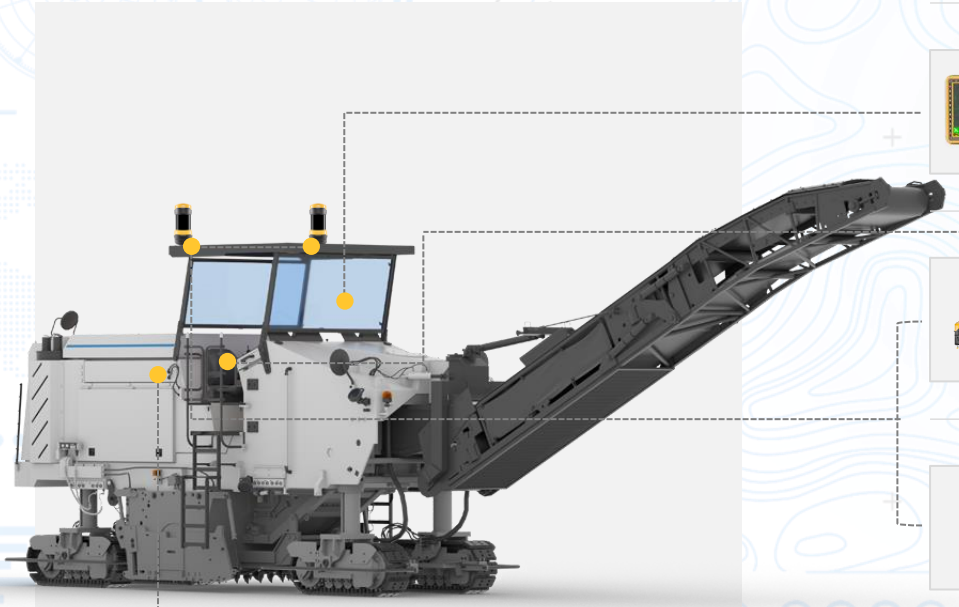
Robotic total station to position the machine on the jobsite.

MC-Max Milling machines system utilizes TS-i4 sensors to measure the body cross slope. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

LPS milling is suitable for urban areas, tunnels, under bridges, wooded areas, or any other locations without satellite coverage. For this configuration you should plan for at least 3 total stations.

MC-Max Milling Machine – Single / Dual Millimeter GPS



The bright and robust GX-55 delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-55 provides real-time position and project design information, with integrated grade indicator LEDs.

The Millimeter GPS solution is available as Single or Dual solution. It´s configurable with the PZS-i3 and GR-i3 on the mast.

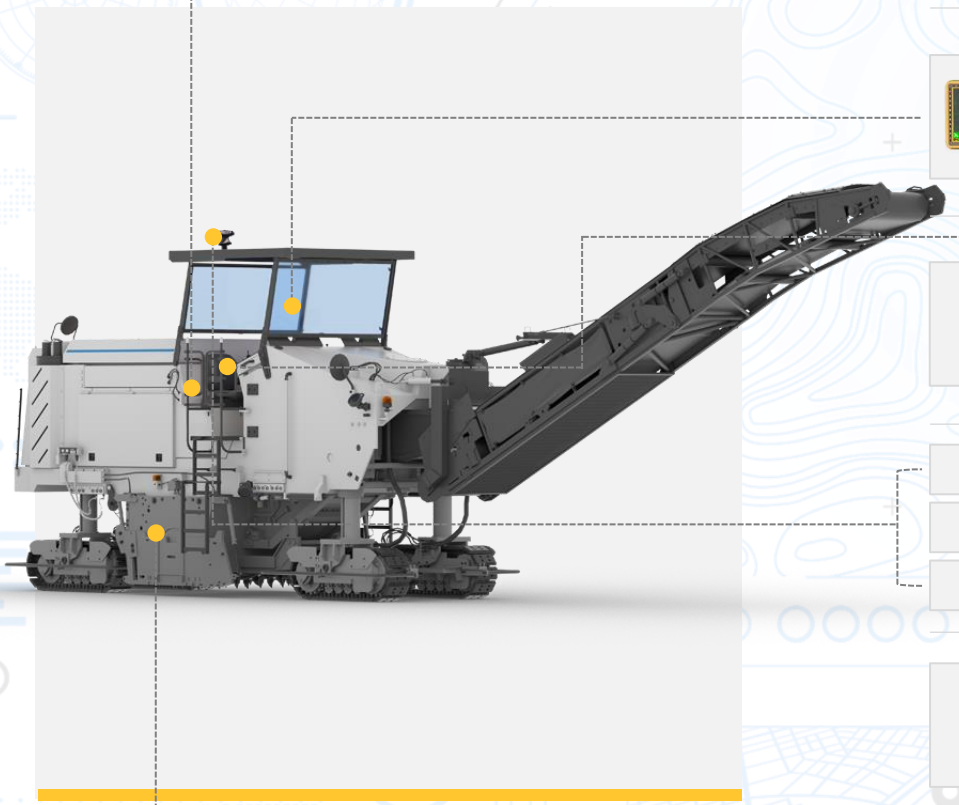
The PZS-i3 can be combined with the RP-i3 for LPS configuration.

MC-Max Milling machines system utilizes TS-i4 sensors to measure the body cross slope. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

mmGPS is suitable for open areas with satellite coverage. For this configuration you should plan for at least 3 zone lasers (LZ-T5) to allow constant milling.

MC-Max Milling Machine – RD-MC LPS



The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

Robotic total station to position the machine on the jobsite.

MC-Max Milling machines system utilizes TS-i4 sensors to measure the body cross slope. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

The A7R prism is available for LPS-only machines.

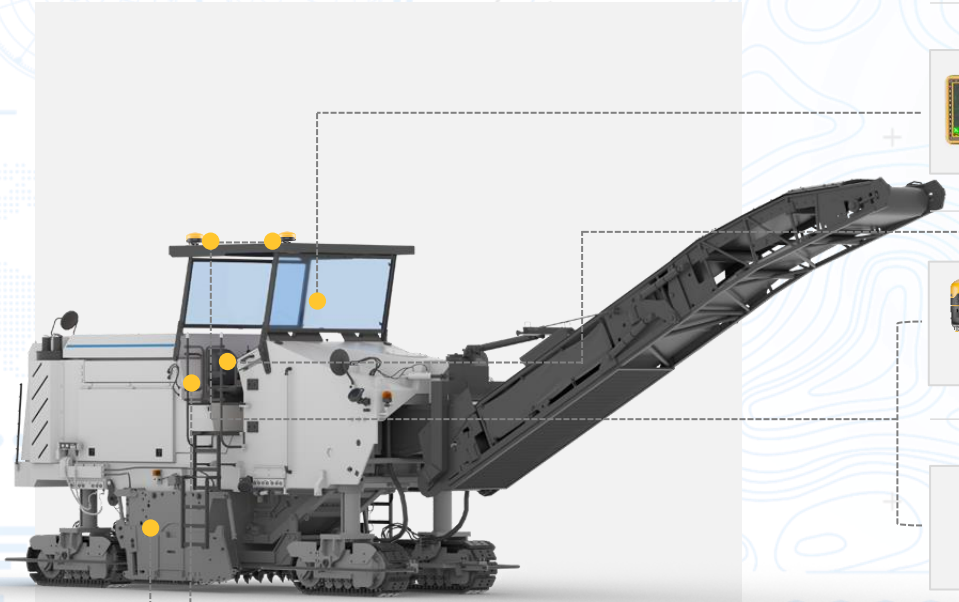
The RP-i3 is also available for LPS machine control.

The RP-i3 can be combined with a GR-i3 for RD-MC GNSS solution. In this case a second GR-i3/F is required.

For Generic installations, the WS-i3 Wire sensor must be mounted on the side blades.

LPS milling is suitable for urban areas, tunnels, under bridges, wooded areas, or any other locations without satellite coverage. For this configuration you should plan for at least 3 total stations to allow constant milling. This system is for variable depth milling.

MC-Max Milling Machine – RD-MC GNSS



The bright and robust GX-Series delivers a brand-new experience for modern machine control. The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

RD-MC allows you to mill without any optical components - the most effective variant and unique to Topcon. The prerequisite is an accurate mesh of the existing surface. This system is for variable depth milling.

GR-i3/F supports multiple constellations.

MC-Max Milling machines system utilizes TS-i4 sensors to measure the body cross slope. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

The GR-i3 can be combined with a RP-i3 for LPS solution.

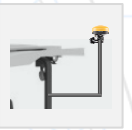
The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

For Generic installations, the WS-i3 Wire sensor must be mounted on the side blades.

MC-Max Asphalt Paver – Single LPS

Recommend up to a max. screed width of 6.5 – 7 meter / 21 – 23 ft

The bright and robust GX-Series delivers a brand-new experience for modern machine control.
The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.



The LPS solution can get combined with an additional GR-i3/F to steer the driving direction of the paver (currently only for Voegele paver with Navitronic Plus).

The vibration pole will be mounted at the tow arm of the screed.
For Generic installations, a TS-i4 must be mounted on the mast.

Robotic total station or LN-150 Layout Navigator to position the machine on the jobsite.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

Single LPS paving is suitable for urban areas, tunnels, under bridges, wooded areas, or any other locations without satellite coverage. For this configuration you should plan for at least 3 total stations to allow constant paving.

The A7R prism is available for LPS-only machines.

The RP-i3 can also be used in lieu of A7R prism.

The RP-i3 prism can be replaced or combined with the GR-i3 + PZS-i3 for mmGPS capability.

MC-Max Asphalt Paver – Single Millimeter GPS

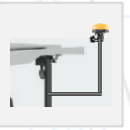
Recommend up to a max. screed width of 6.5 – 7 meter / 21 – 23 ft

The bright and robust GX-Series delivers a brand-new experience for modern machine control.
The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

The Millimeter GPS solution is available as Single or Dual solution. It´s configurable with the PZS-i3 and GR-i3 on the mast.

The PZS-i3 can be combined with the RP-i3 for LPS configuration.



The single mmGPS solution can get combined with an additional GR-i3/F to steer the driving direction of the paver (currently only for Voegele paver with Navitronic Plus).

The vibration pole will be mounted at the tow arm of the screed. For Generic installations, a TS-i4 must be mounted on the mast.

mmGPS is suitable for open areas with satellite coverage. For this configuration you should plan for at least 3 zone lasers (LZ-T5) to allow constant paving.

MC-Max Asphalt Paver – Dual Millimeter GPS

The bright and robust GX-Series delivers a brand-new experience for modern machine control.
The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

The Millimeter GPS solution is available as Single or Dual solution.
It´s configurable with the PZS-i3 and GR-i3 on the mast.

The PZS-i3 can be combined with the RP-i3 for LPS configuration.

The vibration pole will be mounted at the tow arm of the screed. For Generic installations, a TS-i4 must be mounted on each mast.

mmGPS is suitable for open areas with satellite coverage. For this configuration you should plan for at least 3 zone lasers (LZ-T5) to allow constant paving.

MC-Max Asphalt Paver – RD-MC

The bright and robust GX-Series delivers a brand-new experience for modern machine control.
The 3D-MC software on the GX-Series provides real-time position and project design information, with integrated grade indicator LEDs.

Robotic total station or LN-150 Layout Navigator to position the machine on the jobsite.

MC-Max Asphalt pavers RD-MC machines system utilizes TS-i4 sensors to measure the body cross slope. TS-i4 sensors are IMUs that are not affected when starting, stopping or turning.

Sonic trackers measures the distance to the surface to calculate the variable paving thickness.

The MC-X3 control unit includes a radio to communicate with local base stations and a cell modem to communicate with 4G networks.

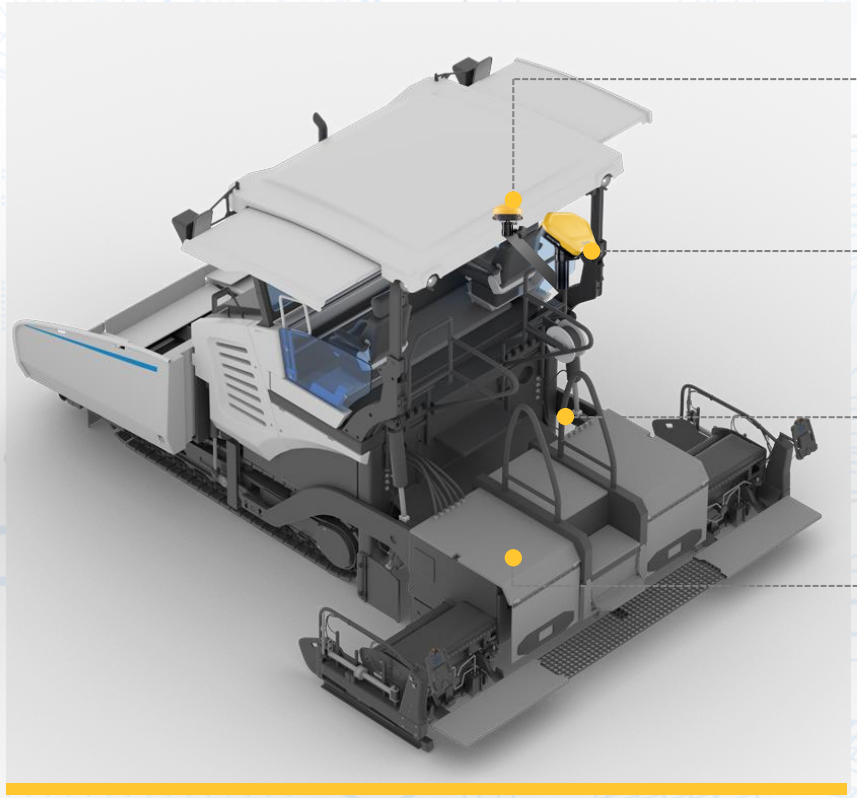
RD-MC allows you to pave without any optical components - the most effective variant and unique to Topcon. The prerequisite is an accurate mesh of the existing surface. This system is for variable thickness paving without milling or after variable depth milling for thickness paving only.

GR-i3/F supports multiple constellations.

The A7R prism is available for LPS-only machines.

Additionally, the RP-i3 prism can be combined with the GR-i3 for easy switch between GNSS and LPS.

Thermal Mapper



GR-i3/F supports multiple constellations.

The TH-M1 is a thermal imaging camera measures and documents continuously the asphalt temperature behind the screed during the whole paving process.

The TH-M1 data gets recorded in real time on the bright and robust FC-6000A Android tablet.

WS-i3 measures screed width in real time.

Pavelink Web allows access to the TH-M1 data.

Intelligent Asphalt Compaction

In Development

GR-i3/F supports multiple constellations.

MC-X1 control unit is the heart of machine control and can process the data from the temperature compaction sensors.

The UR-1 radio can communicate via UHF/915 SS with local base stations. With the 4G-modem SL-25, network corrections can be used.
.

An active Sitelink connection is required for Intelligent Compaction.

The compaction sensor is used to continuously measure and evaluate the frequency spectrum of the drum vibration.

The bright and robust Android Tablet CT8X2 is used for compaction. The 3D-MC software on the tablet provides real-time position and project design information as well pass count and stiffness information in real-time.

The temperature sensor measures the surface temperature of the asphalt in front of and behind the roller.

MC-Mobile

System Overview





MC-Mobile for Compact machines

1

TS-i4
TS-i4 sensors measure body cross slope and are IMUs that are not affected when starting, stopping or turning.

2

MC-X1
A high-powered ECU capable of simple slope control and 2D to fully automatic 3D control.

3

Portable and affordable Android tablet*
Android wireless operator tablet for machine operation and survey.

4

LN-150
LPS optical positioning with mm-level precision.

5

GR-i3/F or Prism
GNSS or LPS positioning sensors.

* Cedar CT8X2

MC-Mobile Solution for Mini excavators

Portable and affordable Android tablet* – Android wireless operator tablet for machine operation and survey.

TS-i4 – TS-i4 sensors measure body cross slope and are IMUs that are not affected when starting, stopping or turning.

2x GR-i3/F or Prism – GNSS or LPS positioning sensors.

MC-X1 – A high-powered ECU capable of simple slope control and 2D to fully automatic 3D control.

LN-150 with Prism or GR-i3 on pole – LPS optical positioning with mm-level precision.

LS-B20W laser receiver – 2D elevation positioning sensors

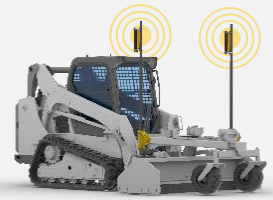
* Cedar CT8X2

MC-Mobile for Compact Track Loaders

Common for all configurations

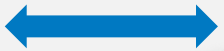



2D Positioning with Laser




3D Positioning with LPS


3D Positioning with dual or single GNSS


MC-Mobile Solution for Compact Track Loaders

Portable and affordable Android tablet* – Android wireless operator tablet for machine operation and survey.

TS-i4 – TS-i4 sensors measure body cross slope and are IMUs that are not affected when starting, stopping or turning.

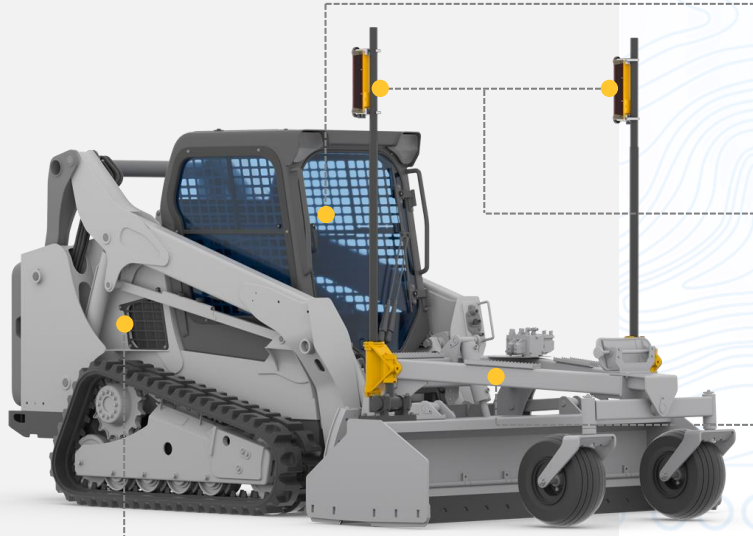
2x GR-i3/F or Prism – GNSS or LPS positioning sensors.

MC-X1 – A high-powered ECU capable of simple slope control and 2D to fully automatic 3D control.

LN-150 with Prism or GR-i3 on pole – LPS optical positioning with mm-level precision.

* Cedar CT8X2

2D-MC Solution for Compact Track Loaders



Portable and affordable Android tablet* – Android wireless operator tablet for machine operation and survey.

Rotating Laser – Any rotating laser can be used to establish a reference elevation.

LS-B200/W – 2D laser receivers. Can be a singular receiver for grade or dual receiver configuration for grade and slope.

TS-i3D – TS-i3D sensors measure body cross and main fall slope and are IMUs that are not affected when starting, stopping or turning.

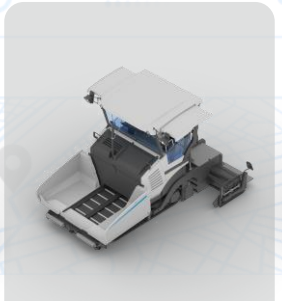
MC-X1 – A high-powered ECU capable of simple slope control and 2D to fully automatic 3D control.

* Cedar CT8X2

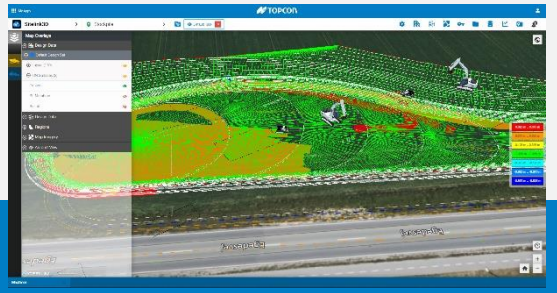
Site Management & Data Automations

Overview





Sitelink3D Site Management

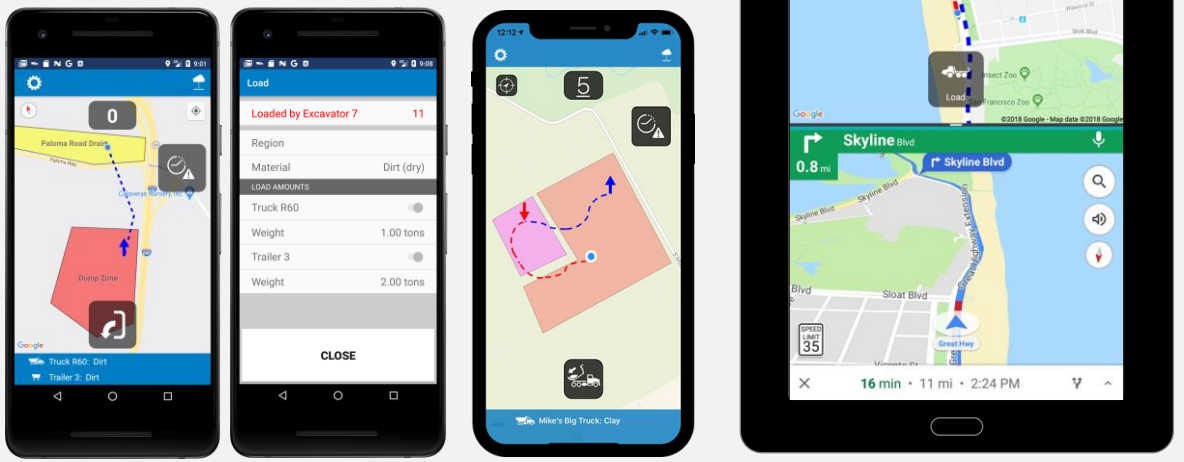


- Data exchange office - site
- Remote control of MC displays
- Tasks
- Documentation
- Earth moving
- Compaction

- **New: Sitelink3D Exchange**
- **New: Sitelink3D Insights**
- Automatic data synchronization
- Hauling
- Mobile Weighing
- Data conversion (dwg, dxf, LandXML, …)

Haul Truck Mobile App

Sitelink3D



Sitelink3D

Download on the App Store

GET IT ON Google Play

- Real-time documentation for accounting and billing
- No additional hardware needed
- Keep mass balance up to date

Mobile Weighing systems

- In combination with LM- and LX-100
- Load it once, load it right:
  Avoid penalties and serious accidents
- Keep mass balance up to date
- Real-time performance updates
- Real-time documentation
  for accounting and billing

TOPCON

Pavelink

Accuracy · Optimization · Costs · Time

For your paving processes and logistics

Pavelink Functionalities and Benefits

With Pavelink plan and real-time monitor asphalt logistics based on key factors:

Asphalt plant

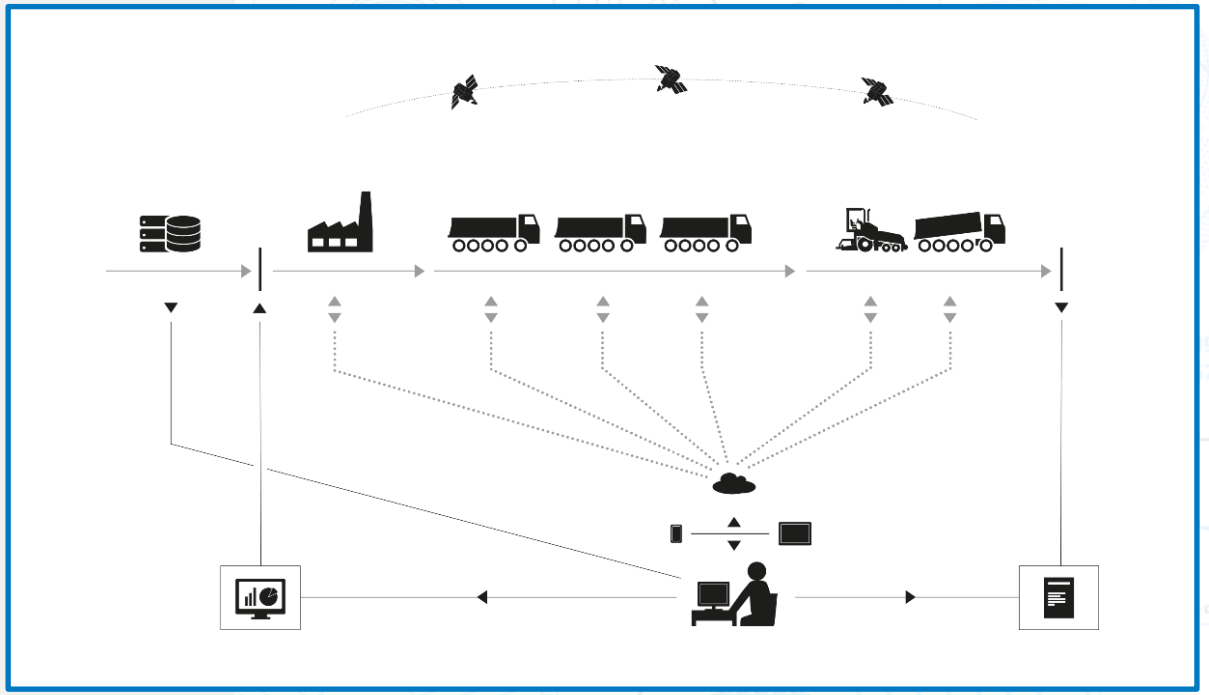
- Capacity, Mixture, Temperature, Volume

Logistics

- Distance, Available truck routes, Departure/ETA times

On Site

- Location, Paver, Screed Width, Consumption, Temperature



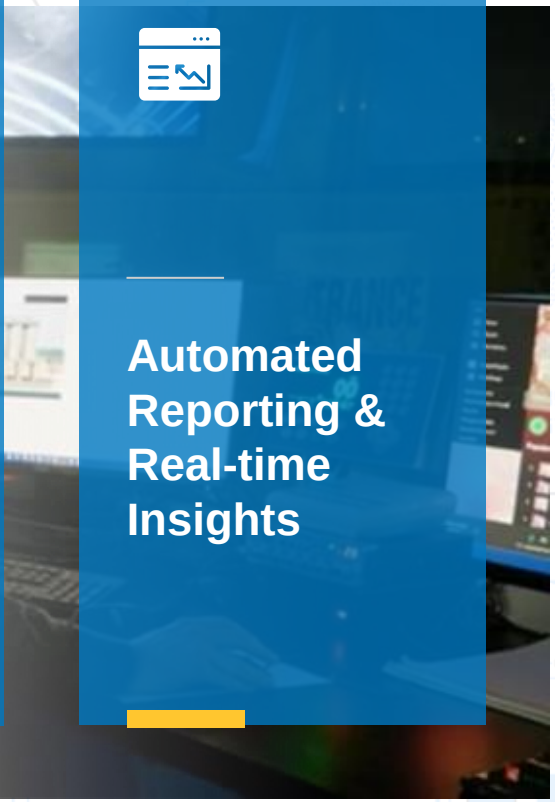
Data Automations

Aptix™

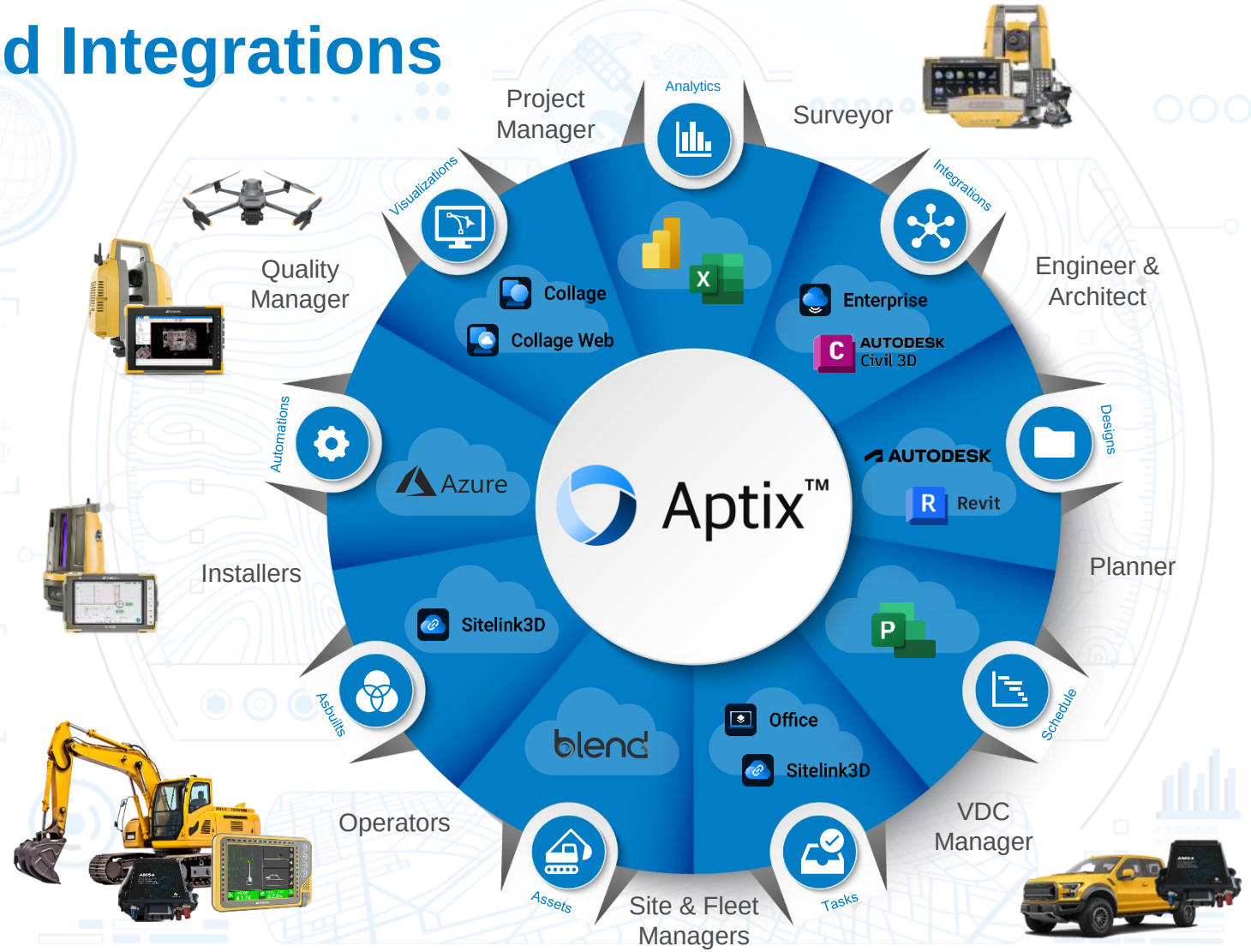
Centralized Integrations & Project Data Management

Earthwork Coordination & Asset Tracking

Automated Reporting & Real-time Insights



Centralized Integrations



Always One Step Ahead