SMART CONSTRUCTION

Connect your Jobsite – Komatsu Digital Transformation

Work Smarter Not Harder

Digitally transform your jobsite into a highly collaborative, sustainable, and safer environment where machines, humans, products, applications and IoT devices connect

Smart Construction

As technology has continued to enable other industries to accelerate innovation, it has revealed opportunities and potential in construction that were not possible just a few years ago. Now, our industry is on the cusp of rapid change and innovation – where advanced automation and integrated technologies intersect to maximise optimisation.

Digital transformation

Imagine digital transformation of the job site. Smart Construction has a vision to make this transformation more efficient and more profitable. Construction isn't just excavators and dozers. It includes planning, reporting, logistics and much more. So we found it was important to support our customers through the whole process, from bidding to the final hand-off and reporting. Let's build and create value together.

Suite of solutions

Construction has evolved over the years. Smart Construction is here to offer interconnectivity and streamline the construction process. Komatsu Smart Construction offers a suite of products, services, consultants and digital solutions. We are partnering with leading companies to provide next generation technologies to develop the job site of the future, now.

Through technology and Smart Construction solutions we are creating new ways to enhance value at your job site, our Smart Construction Technology Consultants and Technology Advisors are ready to work together, creating new value, connecting your job site.

Connect your job site, your machines, your people, for a safer more productive job site

Our vision

Increased collaboration involves interacting with more stakeholders, complex systems and new challenges. We have a vision to improve operations across all steps of the construction process and project lifecycle up and down the value chain.

Real data, real insights, real decisions, Smart Construction makes oversights a thing of the past.

Transform your job sites with advanced automation

Have you ever watched your construction crews, surrounded by modern equipment, begin a job by pounding a wooden stake into the ground and think, “Isn’t there a better way?” There is, and it’s available to you right now.

Using Komatsu’s innovative intelligent Machine Control (iMC) 2.0 machines, you can program 3D design data directly into your machines. Your operators — even those with less experience — can work with utmost efficiency, guided by sophisticated automation. You can be confident you’re getting the most from your machines, your crew and your carefully designed plan.

intelligent Machine Control

intelligent Machine Control is based on Komatsu’s unique sensor package, including stroke sensing hydraulic cylinders, IMU sensors, and multi-constellation GNSS antennas. It utilises 3D design data loaded in the control box to accurately check its position against the target surface. If the bucket hits the target surface, it is semi-automatically limited to minimise over-excavation. If the operator turns off Auto mode, the machine can be operated with highly accurate, responsive machine guidance (indicative only).

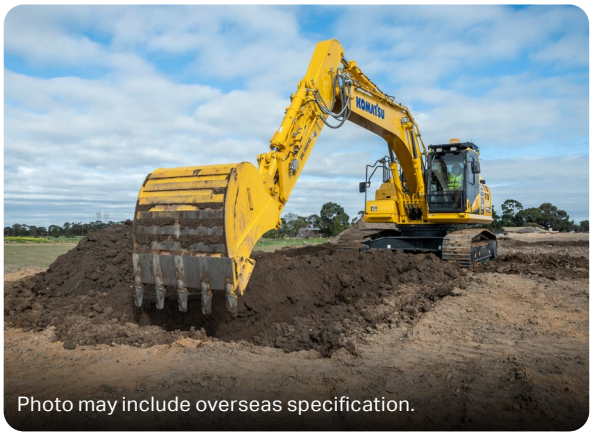


Photo may include overseas specification.

iMC 2.0 picture shown. standard machine may be different.

intelligent MACHINE CONTROL 2.0

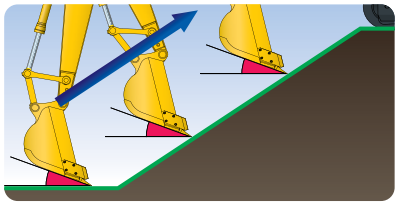
- Get new operators up to speed quickly
- Go from mass excavation to finished grading faster than ever
- Fully integrate 3D design data into your machines
- Empower operators to work efficiently, pass after pass

Excavators

Improved Work Accuracy

The bucket edge/tip position is instantly displayed on the control box, eliminating the wait time for display on the monitor during construction. The large and easy-to-view control box displays information clearly, aiding in highly accurate work. With manual operation and conventional machine guidance, grade quality and excavation accuracy relies heavily on the skillset of the operator. With the intelligent Machine Control excavator, the bucket is automatically limited to follow the target grade without over-excavating.

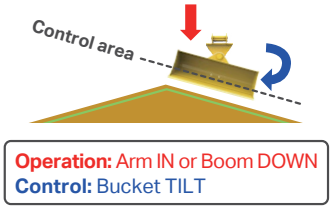
NEW



Bucket angle hold control

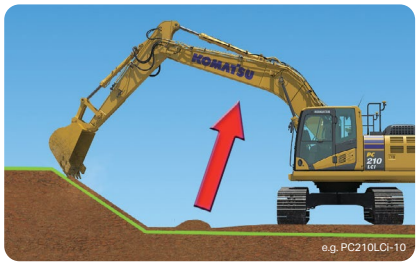
Operator sets desired bucket angle and the system automatically maintains bucket angle throughout the grading pass. Angle hold control increases ease of operation and improves final grading accuracy.

NEW



Auto-tilt attachment control

Automatically tilts bucket to design surface and returns it to horizontal to unload. Using auto tilt control with the existing minimum distance control and auto grade assist makes complex grading quicker and easier.



Auto grade assist

With the auto grade assist function, the operator moves the arm while the boom adjusts the bucket height automatically, tracing the target surface and minimising digging too deep. This allows the operator to perform rough digging without worrying about the design surface, and to perform fine digging by operating the arm lever only. The working range is extended by holding the lever to move the boom downward.

Auto stop control

During boom or bucket operation, the work equipment automatically stops when the bucket edge reaches the design surface, thus minimising damage to the design surface.

Minimum distance control

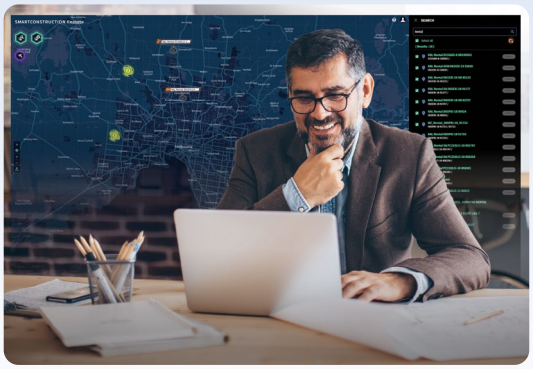
The intelligent Machine Control excavator controls the bucket by automatically selecting the point on the bucket closest to the target surface. Should the machine not be facing a sloped surface at a right angle, it will still follow the target surface and minimise digging below it.

Standard local options providing first 12 months support:

(includes: standard 3G/4G modem with DATA & SIM, industry leading ICT machine OEM service support agreement with iMC 2.0)

Remote control
Assist the operator by taking control of their GNSS equipment in real-time.

File transfer history
Overview of when, and which, files have been transferred.



Remote view
Real-time remote image of the GNSS equipment.

Office to machine transfer
Send the latest design files from the office to your machines.

Machine to office transfer
Download files that have been collected on your system (survey results, as-built data, etc.)

Offline file transfer
Machine offline? No issue. Files are stored in cloud, operator will see updated model at machine switch on.

Batch file transfer
Send files to multiple machines in one click.

Just as technology has transformed global business, intelligent Machine Control can help you quickly transform your construction job sites into highly efficient, highly productive operations. Contact your regional Technology Advisor or Sales Representative.

iMC equipped Excavators

Excavator	Weight	HP	Bucket capacity
PC210LCi-11	23,313-24,440 kg	123 kW / 165 HP @ 2000 rpm	0.50 – 1.20 m^3
PC290LCi-11	29,800 – 31,210 kg	147kW / 196 HP @ 2050 rpm	0.43 – 1.39m^3
PC360LCi-11	35,600-36,200 kg	192kW / 257HP @ 1950rpm	0.53 – 1.80m^3

Standard iMC specification included	iMC 1.0	iMC 2.0
3G/4G Modem (remote / network)	✓	✓
DUHF II and Network Antenna	✓	✓
Auto-Tilt Attachment (IMU Kit)		✓
DUHF II-Digital UHF II Radio Board	✓	✓
SC Service Level Agreement	✓	✓
Bucket Angle Hold		✓

Working smarter in every way

Benefits of iMC 2.0

Up to 30% savings

Save money

Frees GPS Dozer from need to achieve final grade so it can work elsewhere on the site.

Up to 63% improvement

Save time

Reduce staking, grading and inspection with 3D design data and semi-automatic grading.

Up to 56% improvement

Less time grade checking

Monitor performance and stay on grade from the cab: operators spend time working, not grade checking.

Up to 33% improvement

Improve accuracy

Continuously monitor grade and semi-automatics to dig precisely to grade.

Up to 47% reduction

Reduce base aggregate

Greatly reduce over-digging and the amount of costly base aggregate needed for applications like utilities.

**All savings, improvements, and reductions are compared to traditional grading methods.*

Dozers

Next Generation Intelligence

Improved machine efficiency for work ranging from heavy dozing to finish grading with intelligent Machine Control technologies.

NEW **Lift layer control**
Realises consistent lift layers with automatic control.

NEW **Quick surface creation**
Makes design data by easy operation.

UPGRADE **Proactive dozing control**
Cut & carry work smooth as if performed by experienced operator.

NEW **Tilt steering control**
Relieves operator of correction operation toward target point.

NEW **Adopts two antennas supporting multiple GNSS***
Improved reliability in work accuracy due to stable receiving of satellite signals.

*Global Navigation Satellite System.

Standard intelligent machine control
Standard factory installed integrated 3D GNSS intelligent machine control system.

No cables
No coiled cables between machine and blade.

No climbing
GNSS antenna and mast removed from blade.

No connections
No daily connections required between machine and blade.

Improved machine control
Up to 8% more efficient dozer operation than comparable aftermarket machine control systems in start to finish grading tests.

Innovative
Automated blade control from rough dozing to finish grade.

Integrated
Standard factory installed machine control system.

Intelligent
New dozing mode, load control performance features.

Reliability

For higher reliability and durability
ICT* system installed as standard before shipment

*Information and Communication Technology.

KOMPLIMENTARY MAINTENANCE

intelligent MACHINE CONTROL 2.0

Equipment (standard and / or optional) complete or partial component can be changed from factory without prior notice.

Tilt steering control

The blade automatically tilts under a heavy load to maintain a straight line of travel, optimising productivity throughout each pass and reducing operator fatigue.

Auto/manual switch

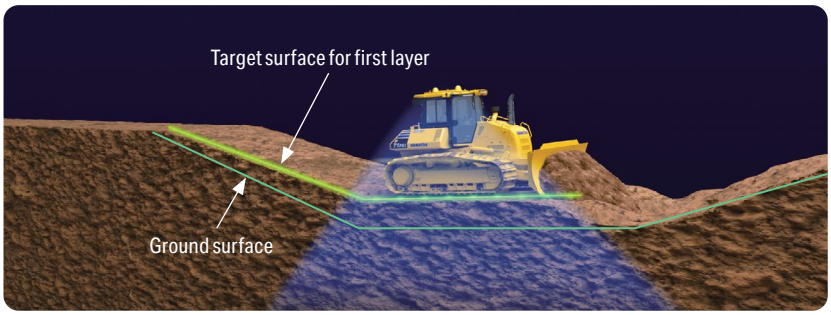
A conveniently located On/Off switch giving the operator control of when iMC 2.0 is active.

Quick surface creation

Designed to simplify in-field surface creation within the control box, allowing for more utilisation of iMC 2.0.

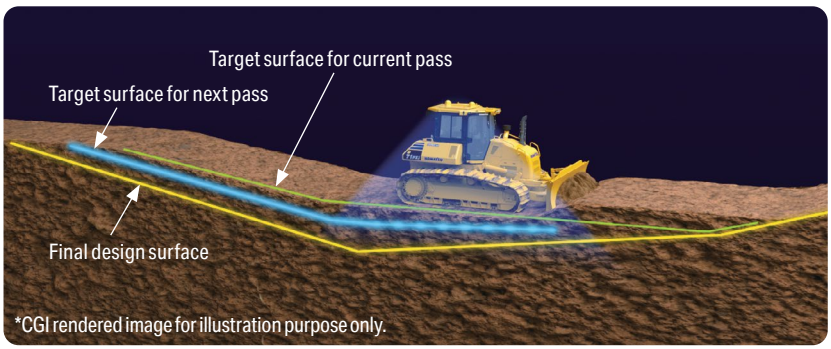
Lift layer control

Optimise earthwork productivity and maintain compaction quality by automatically controlling lifts to the desired heights with respect to the mapped terrain. Excess fill is eliminated as automatic blade control will follow finish surface once lifts have reached finish grade.



Proactive dozing control

Operator can utilise automatic blade control from rough grading to finish grading work. Proactive dozing control understands the terrain in the path of each cut, maximises the blade load throughout the pass, regardless of the terrain ahead, and achieves productivity similar to that of an experienced operator.



iMC Equipped Dozers

Dozer	Weight	HP*	Bucket capacity
D61EXi-24	18,540 kg	168 HP, 127 kW @ 2,200 rpm	3.4 m^3
D61PXi-24	19,580 kg	168 HP, 127 kW @ 2,200 rpm	3.81 m^3
D65EXi-18	23,373 kg	217 HP, 164 kW @ 1,950 rpm	5.6 m^3
D65PXi-18	24,293 kg	217 HP, 164 kW @ 1,950 rpm	5.58 m^3
D71EXi-24	22,700 kg	237 HP, 179 kW @ 2,100 rpm	4.42 m^3
D71PXi-24	23,200 kg	237 HP, 179 kW @ 2,100 rpm	4.65 m^3
D71PXi-24 Wide	24,000 kg	237 HP, 179 kW @ 2,100 rpm	5.02 m^3
D85EXi-18	32,020 kg	246 HP, 199 kW @ 1,900 rpm	7.2 m^3
D85PXi-18	33,090 kg	246 HP, 199 kW @ 1,900 rpm	5.89 m^3
D155AXi-8	41,100 kg	380HP, 268 kw @ 1,900 rpm	9.4m^3

Note: * SAE J1995

Retrofit Kit:
Connect your standard machines

Smart Construction Retrofit Kit provides ICT functionality to an existing hydraulic excavator. Being equipped with the kit allows the use of the following functions, enabling conventional machines to perform digital construction.

What functions are included?

- 3D machine guidance is a function to acquire the machine location information by GNSS and provide a cab tablet device with the difference between design data of the construction area and location of the bucket edge.
- Payload Metre is a function to measure the weight of soil loaded in the bucket of the hydraulic excavator.
- Acquire 3D construction data: while operating on a project using 3D digital design, as constructed information is collected from the machine. Which can be visualised in Smart Construction Dashboard, allowing automatic updating of the design surface. Change in topography can also be visualised on the in cabin RFK screen using SC Pilot application.

3DMG and Pilot Tablet

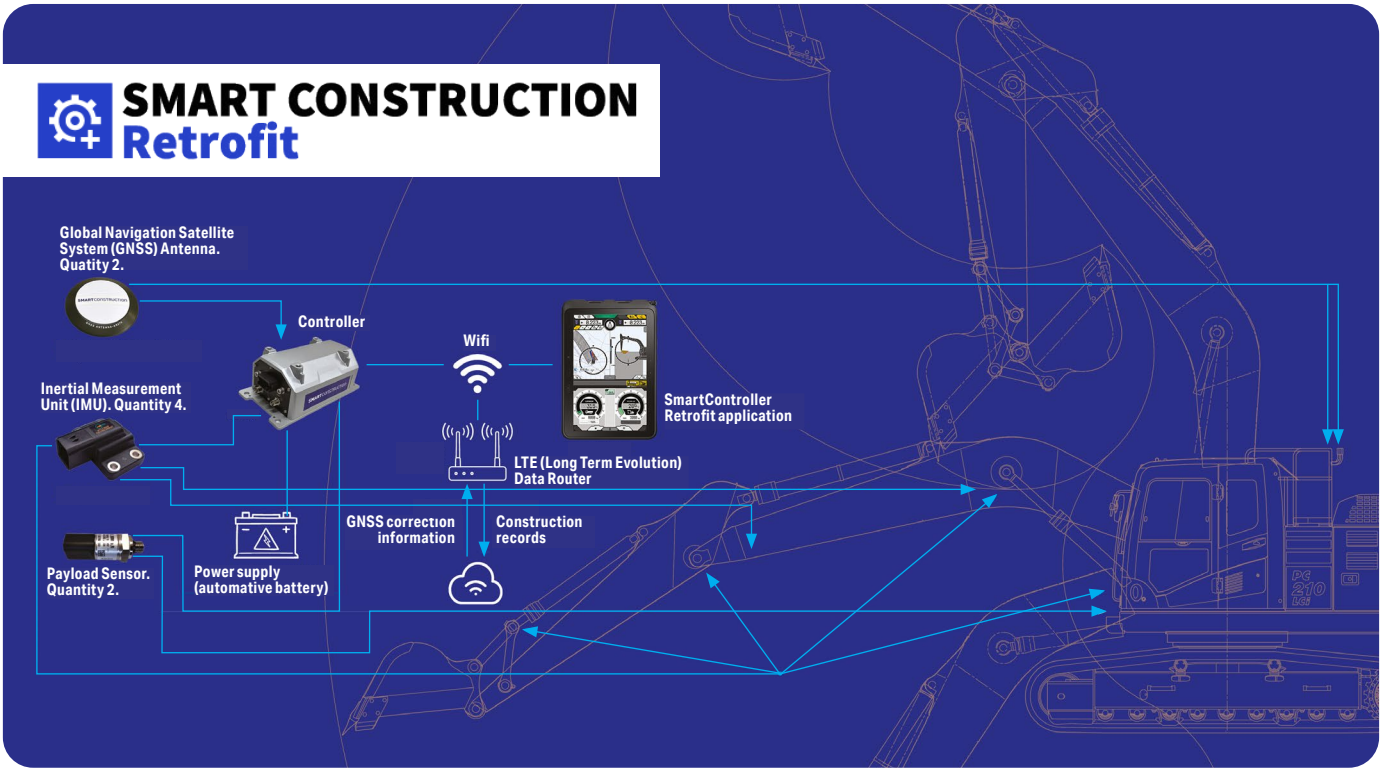
3D Machine Guidance
Multi-Constellation GNSS
Display Cut/Fill of 3D design data
Create simple In-field design data

Payload Metre

Optimise your loads
Prevent overloading
Accurate dynamic loading
Payload history reporting

Pilot WEB and Device Application

Create projects
Register machines and attachments
Acquire as-constructed machine data
Transfer 3D design data from multiple formats
Remote access to RFK device
User friendly operator interface



KOMATSU PRODUCTS		KOMATSU
Model	Model Series	3DMG + Payload
PC130–PC138	STD / LC	✓
PC160–PC170	STD / LC	✓
PC200–PC210	STD / LC	✓
PC220–PC240	STD / LC	✓
PC270–PC290	STD / LC	✓
PC300-PC360	STD / LC	✓

***Note:** For installation and information on other OEM RFK and Payload opportunities please contact your Komatsu representative

Every Day Drone (EDD): Smart Construction Edge and Drone

Rapid processing of drone data to create a 3D terrain map before leaving the jobsite.

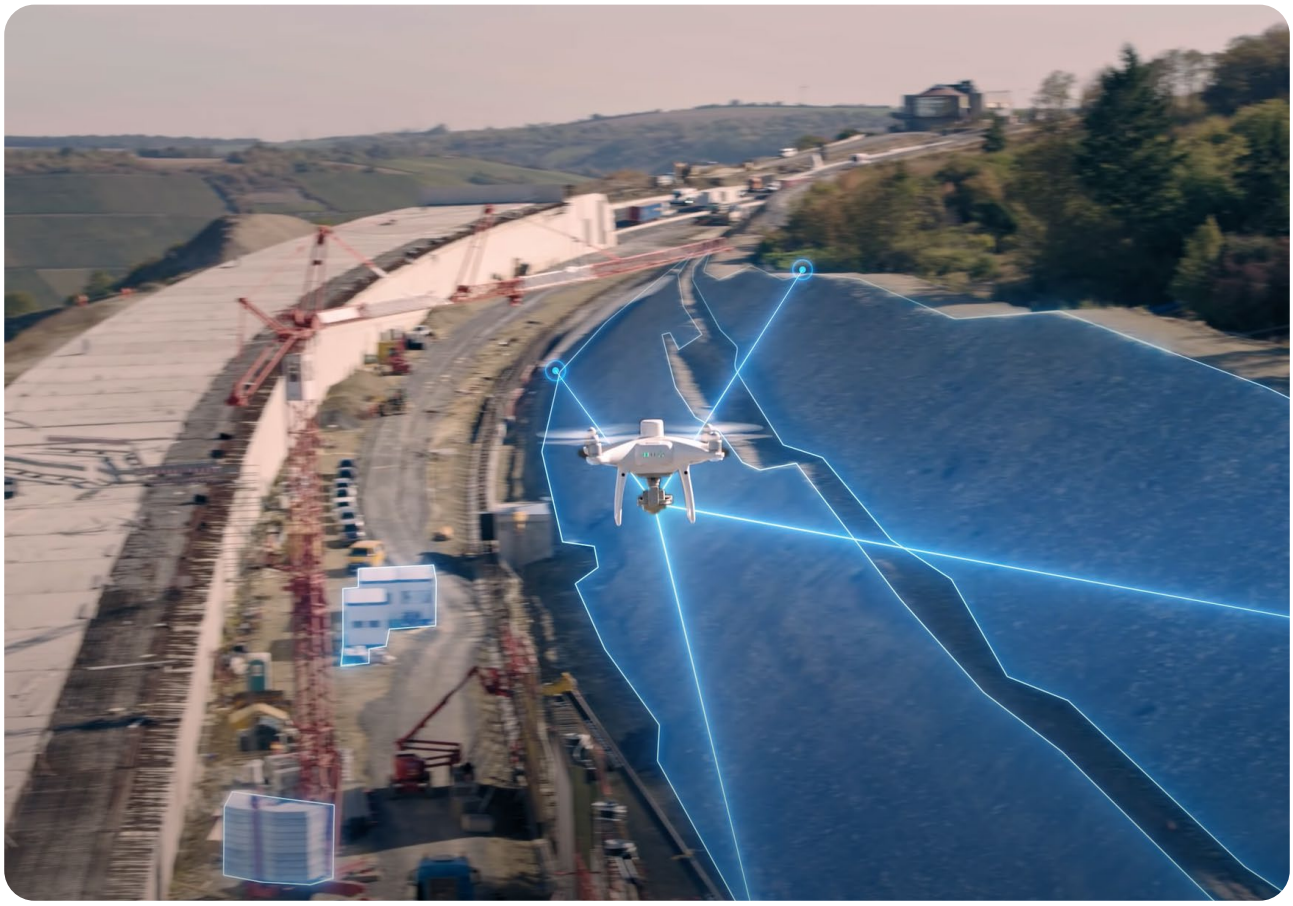
- Faster than any other processing method
- Fully integrated and automated workflow
- Cost-effective solution. The more you fly, the cheaper each flight becomes

Overview

Fly at your convenience to get quick, accurate mapping of your job sites.

A high precision drone can be 50% faster than a walking survey, and its boots never get muddy.

Drone mapping helps with planning, sends accurate topography measurement data as you progress and gives you information that can turn into efficiencies when it comes to quicker and better reporting. Rapid processing of drone data to create a 3D terrain map, without leaving the jobsite.



Features and Benefits

Easier and faster surveys

Capture accurate quantities for production tracking and billing from the air in as little as 30 minutes* without ground control points. Visualised seamlessly into Smart Construction Dashboard or other survey software when you need it.

*For an average site size of 16 Hectares.

Unlimited tracking potential

Fly as much as you want to track your production. Drone and Edge enables you to gather and analyse data throughout each phase of your project. Measure daily, weekly or when it makes sense for your operations.

Limit downtime

No need to completely stop your production with a drone flight. Unlike the downtime that comes with a walking survey, production disruptions are limited since flights are high above your ground activities.

Operational cost savings

Drone survey and processing with EDD can be completed at a fraction of the time and cost than traditional survey methods. Speed up your topographic surveys and extensive processing time.

Enhance your team's capabilities

Elevate your survey teams to new levels of clarity by integrating frequent aerial mappings into your workflow. Drone surveys incorporate hundreds of thousands of points instead of hundreds of points with traditional surveys.

View your job site progress from the sky

With capabilities to take 4K video and still photos for project progress tracking, time lapse media, asset inspection and marketing collateral.

Rapid in-field drone data

Edge technology allows you to quickly validate and process your drone data, without the need for internet connectivity.

Validate your drone data before leaving site

Avoid next day disappointment by using Edge technology to validate, check and adjust you drone data in the field.

Unlimited processing on Edge

Process as many drone datasets as needed at no additional cost.

Main Features

1. Turn your Phantom4RTK into an RTK (Real Time Kinematic) drone connecting to Edge **or fly in PPK (Post Processing Kinematic)** mode
2. Edge hardware is the most efficient data output in the market. **Usable data under 30min is possible**
3. Edge is a GNSS (Global Navigation Satellite System) base station and processing unit **All In One** providing drone data extremely fast in the field.
4. **Easily** setup the Edge on a known, or unknown point by self positioning using Network Correction
5. Process your data with **Projection Geoid** or use a **Localisation**.
6. Include GCP's (Ground Control Points) to improve **accuracy**
7. Use the **SMART "Checker"** function to adjust the point cloud for optimum accuracy improvement.
8. Edge is **integrated** into Smart Construction Dashboard (refer to Smart Construction Dashboard page 20) workflow using IoT
9. Automate your processed data by uploading it **seamlessly** to Smart Construction Dashboard
10. Automatic **Object Remove** function gets rid of trees, machinery buildings and objects.

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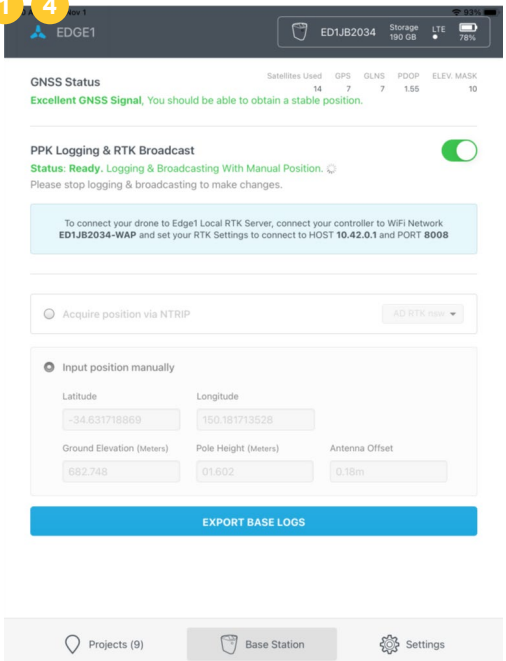

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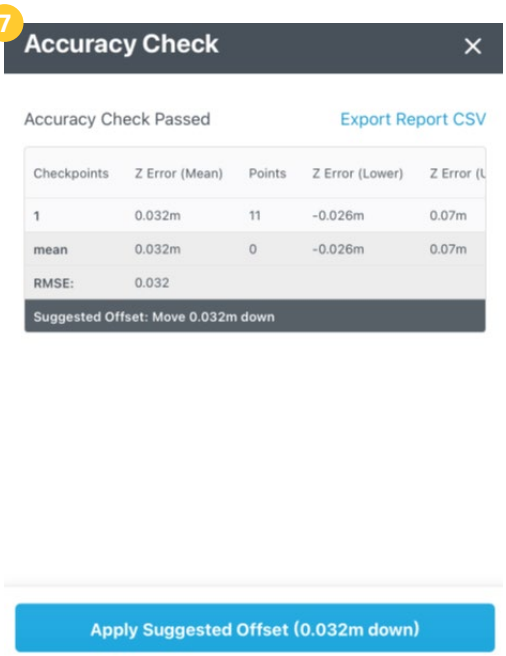
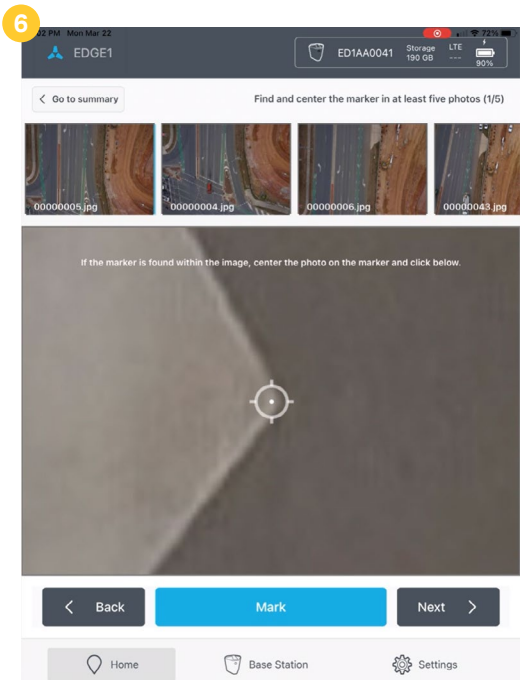
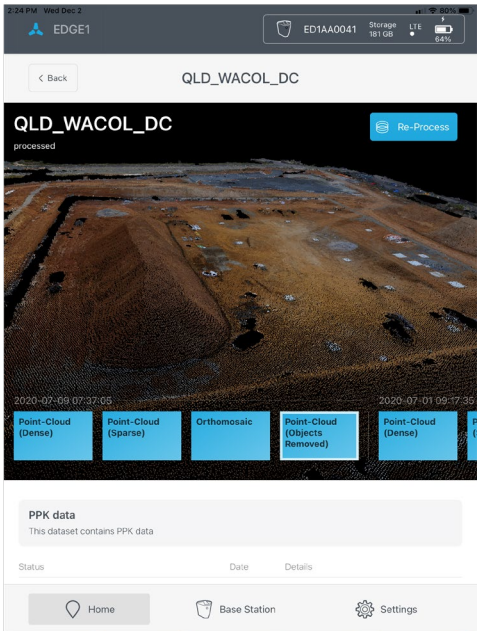


2

Setting*	200 Photos	500 Photos	1000 Photos
Low/Low	4 minutes	10 minutes	17 minutes
Standard/Standard	9 minutes	20 minutes	31 minutes
High/High	34 minutes	57 minutes	105 minutes

*Point Cloud processing time





Processing Settings

Quality

— Draft
— Standard
— High

Vertical off-set

— Automatic or manual
— Accuracy check function & report

Point Cloud Density

— Low (4pts/m2)
— Medium (16pts/m2)
— High (64pts/m2)

Outputs

— Point cloud (.las or .txt)
— 3D Mesh (.obs)
— Orthophoto (.tiff)
— Object Removed (.las)

Specifications

Phantom 4 RTK (DJI)

— Multi Satellite Constellation
— Approx. 30min flight time per battery
— 20MP Camera
— Obstacle avoidance
— PPK & RTK
— Sub 2kg

Edge2.5

— Multi GNSS (GPS, Glonass, BeiDou, Gallileo)
— SfM Processing (images processing)
— 256 SSD Storage
— LTE Modem
— Wifi
— P4rtk Compatible

Connectivity

- Smart Construction Dashboard
- Seamless upload 3D terrain data to Smart Construction Dashboard by a press of a button

Dashboard

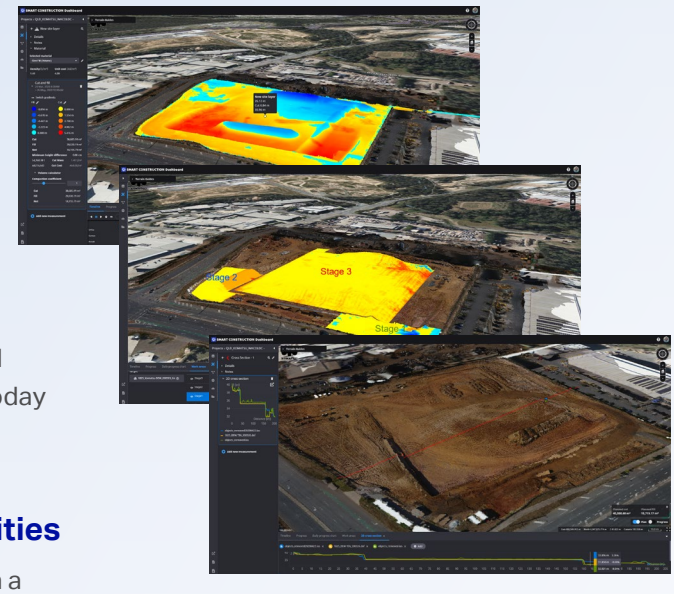
Your future awaits

Visualise your data and know where you are today to measure, make decisions on where you want to be tomorrow. Combine 3D design data with aerial mapping and Smart Construction retrofit machine and intelligent machine data to confirm quantities and progress each day with Komatsu Smart Construction Dashboard.

Graphically visualise and analyse design, drone and machine data to boost your productivity and decision making.

- 3D visualisation of your jobsite – easy to use and understand.
- Get an instant progress update whenever you need it.
- 360 view on all processes, past and present.
- Cloud solution, accessible from computers and compatible devices

Features and Benefits



Gain greater project clarity

Visualise your job site in 3D with design data, aerial mapping (drone) data and machine as-built data all in one easy-to-integrate location.

Choose what to measure

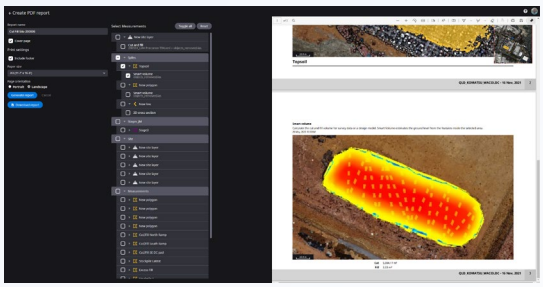
Easily quantify volumetric production measurements for the whole site or defined areas of interest: initial survey vs. design, today vs. design vs. design, or comparing any day in-between.

Quickly measure stockpile quantities

Users can make stockpile measurements in a snap for material quantities, reporting volumes, tonnage, and even assign costs to material.

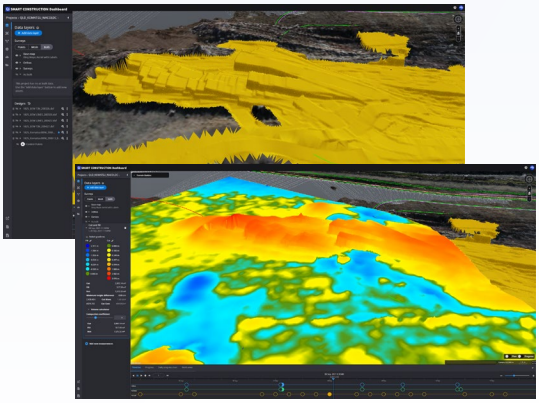
Collaborate in the portal and offline

Easily generate industry-standard cut/fill colour mappings for staff to visualise material movements, creating standardised reports for download, email or print. Invite multiple users and set their user access permission.



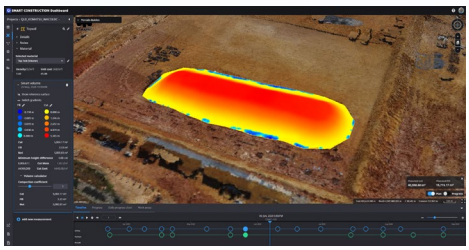
Reimagine the possible

Know how much material you're moving between flights by using your machine's as-built data. Visualise your site progress. No need to clean up all your data to make it usable.



Watch your site progress with timeline

Functions, including playback, for the wholesite. Investigate more deeply with cross sections and individual measurements.

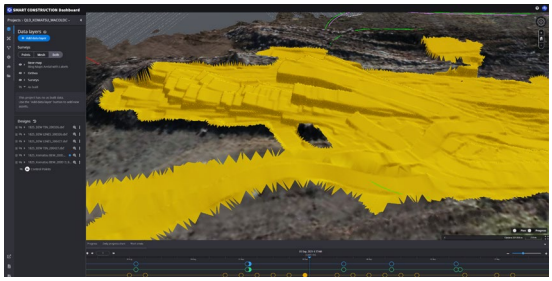


Compatible file formats

- Survey data (.las, .laz, .xml, .txt, .csv)
- As-Constructed (.las, .laz, .txt, .csv)
- DTM/DSM (.tiff, .tif)
- Design (.dxf, .xml, .ttm, .svd, .dsz, .tp3, .tn3)
- Linework (.svl, .dsz, .tp3, .dxf, .xml)
- Ortho (.tiff, .tif)
- Vector overlay (.czml, .json, .geojson, .kml, .kmz)

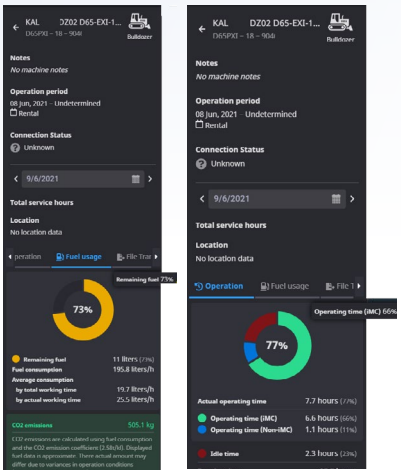
As-Built / As Constructed data

- Komatsu iMC (Auto) Dozer & Excavator
- Smart Construction Retrofit kit (Auto) Excavator



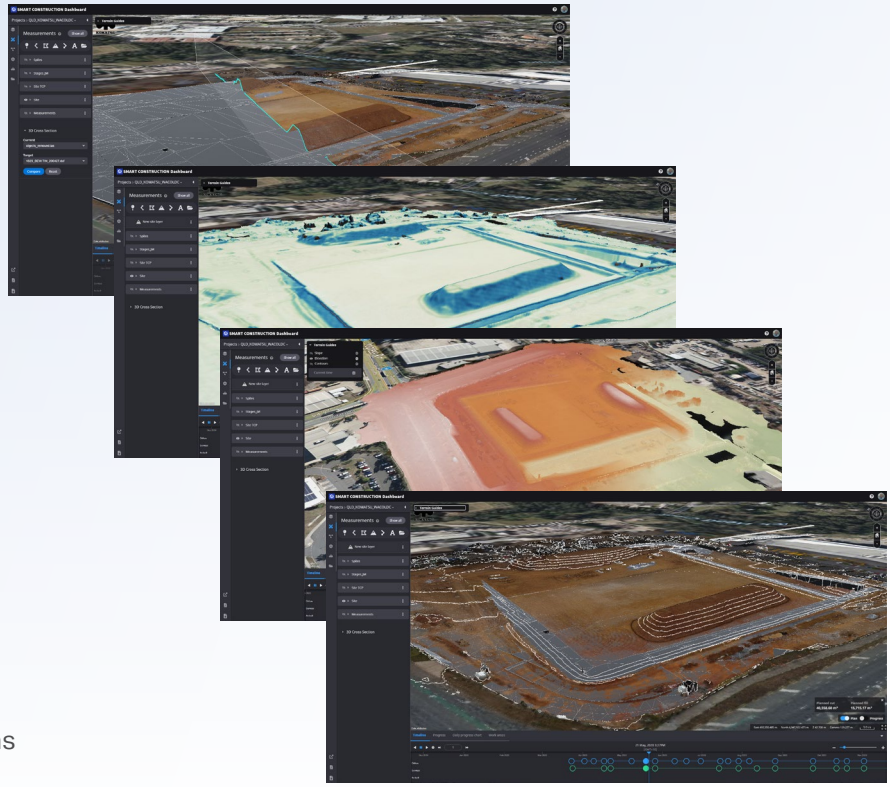
KOMTRAX Data

- Machine health
- Machine usage status
- CO_2 emissions



Measurements

- Cut and fill volume
- Progress
- Workzone monitoring
- Reference volume
- Smart volume
- Slope
- Elevation
- Surface area
- Annotation
- 2D and 3D cross sections



User Access Permission

- Manage (Complete access to jobsite and all Dashboard functions)
- Measure (Can access, view, perform measurements and download jobsite data)
- View (Can access and view jobsite data and site progress information)
- None (Can access and view jobsite data)

Connectivity

Smart Construction Edge

Get 3D terrain data processed by Smart Construction Edge

Smart Construction Retrofit Kit (Excavator)

Get As-Built/As-Constructed data from Smart Construction Retrofit Kit

Komatsu iMC1.0 and iMC2.0

(Dozer and Excavator)
Get As-Built/As-Constructed data from Komatsu iMC1.0 and iMC2.0

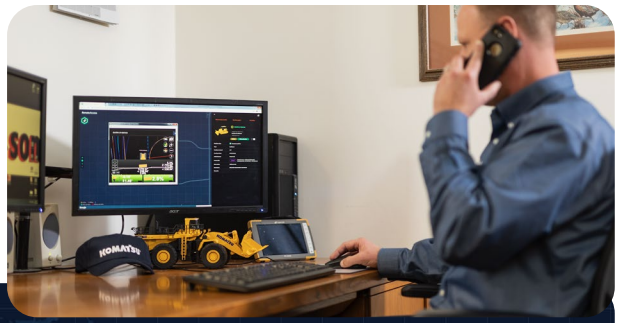
Remote

Send new design data to machines in the field, or remotely support operators, without traveling to the jobsite.

- A new design can be implemented on-site just minutes after its release
- Remotely help new or experienced operators with the training and the support they need
- Supports a mixed fleet of machinery brands and devices
- Save countless hours and kilometres of travel each year

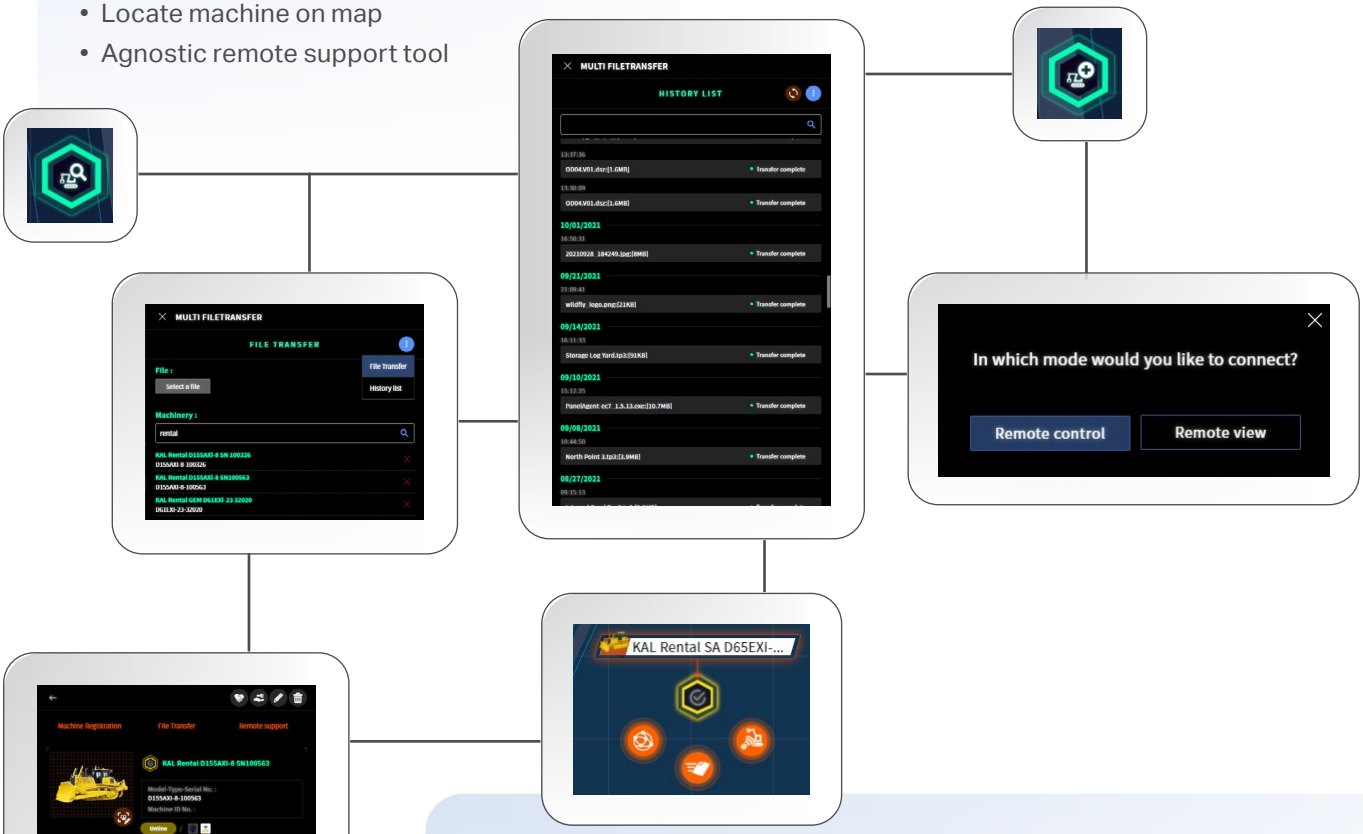
Overview

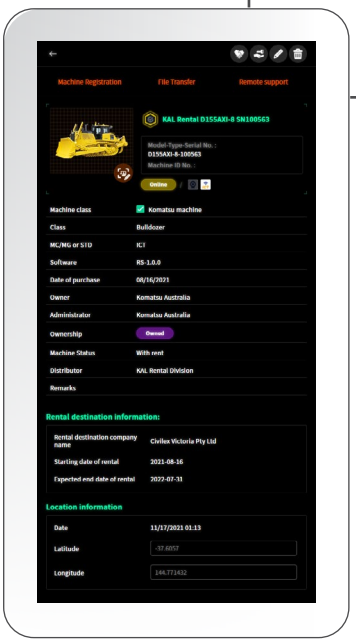
Work shouldn't stop just because you're not on-site. Remotely send files from your office to target machines, easily search all connected assets or login to a machine and see exactly what your operator is seeing with Komatsu Smart Construction Remote.



Features and Benefits

- Remotely push new designs to machines
- Send batch files to multiple machines
- Machine off file transfer capability (72Hrs)
- File transfer history
- Monitor and support operators
- Remotely download files from machines
- Locate machine on map
- Agnostic remote support tool

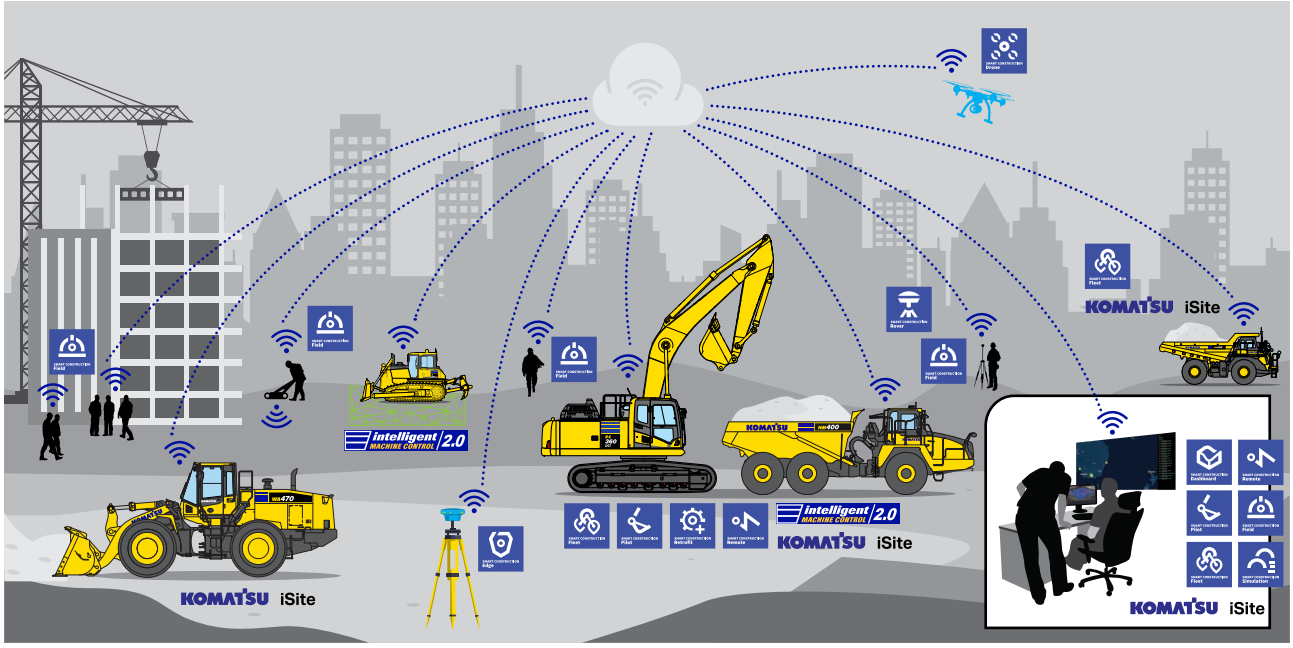


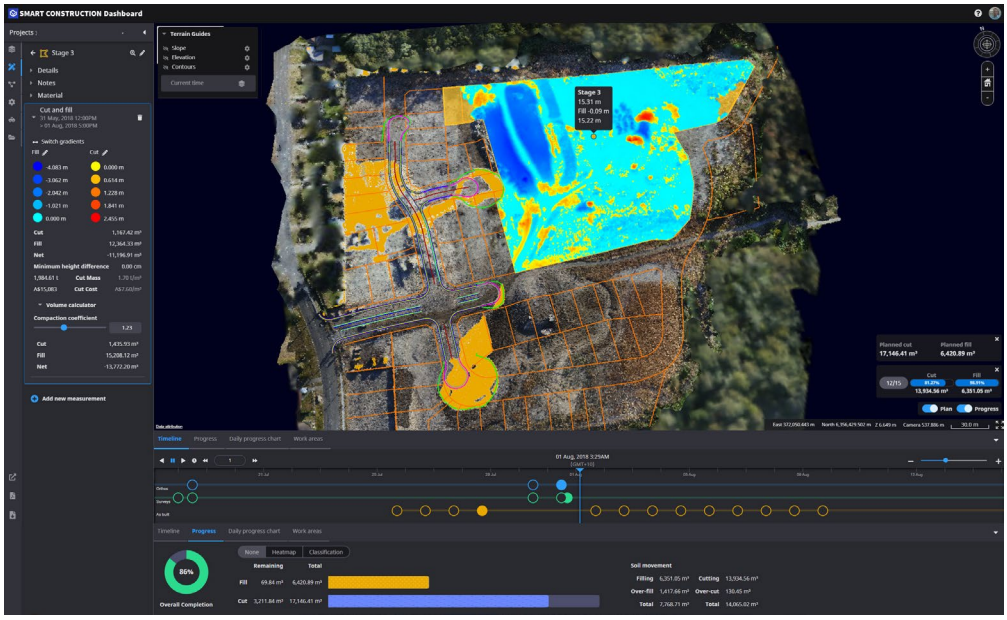


Device	Remote View	Remote Control	File Transfer	Permission Required	Pointer Visable
GX60	✓	✓	✓	✓	
GX55	✓	✓	✓	✓	
GX75	✓	✓	✓	✓	
FC5000	✓	✓	✓	✓	
Trimble EW TD520	✓	✗	✓	✓	✓
CAT NEXT-GEN	✓	✗	✓	✓	✓
Retro Fit Kit Tablet	✓	✗	✓	✓	✓

Smart Construction Connects Site

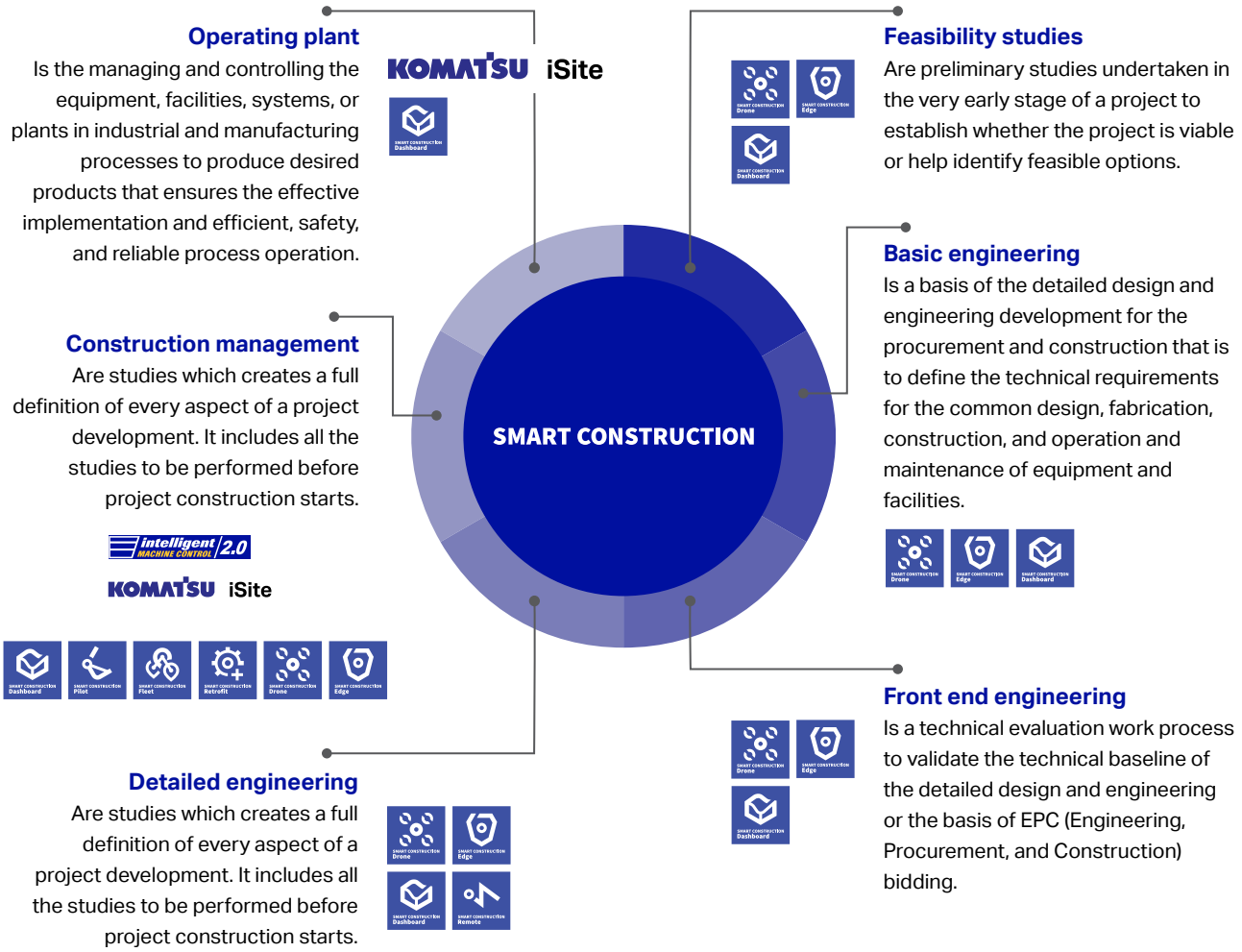
Smart Construction connects humans, machines and materials on site with hardware and software. Digitally transform the site into a highly collaborative, sustainable and safer environment where your data comes together providing valuable insights for your site or project.

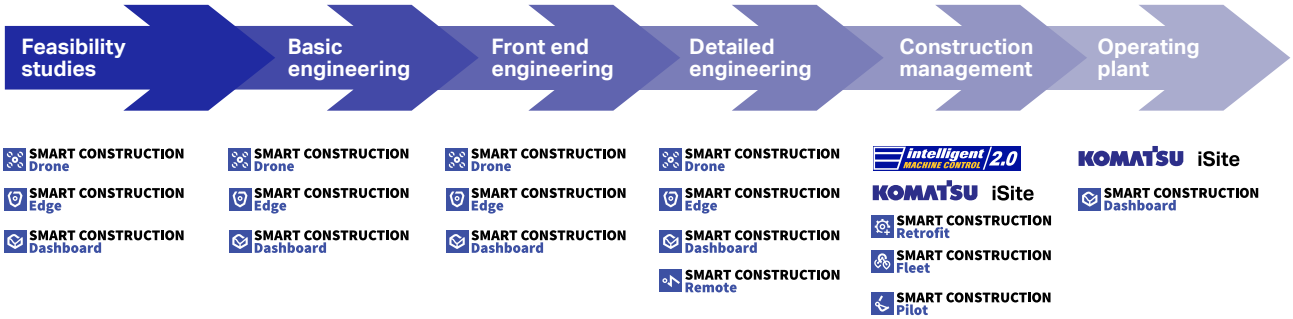




Project Lifecycle

Project lifecycle





Bundle packages

Creating value together connecting equipment, technologies and personnel you need to get the job done, Komatsu supports:

Smart Construction Solutions

Machine and Hardware	Machine and Software Applications
Easily apply advanced automation technology to your jobsite intelligent MACHINE CONTROL 2.0	Visualise your project data for actionable results SMART CONSTRUCTION Dashboard
Retofit 3D machine guidance and Payload SMART CONSTRUCTION Retrofit	Smart Construction Retrofit file and data management SMART CONSTRUCTION Pilot
Industry first on site drone data processing unit SMART CONSTRUCTION Edge	Stay connected to your machines and survey devices SMART CONSTRUCTION Remote
Accurately survey your job site, in less time SMART CONSTRUCTION Drone	**Services and Training**
	AaaS – Aerial Survey as a Service
	iMC 2.0 operator training and coaching – **available**
	SC RFK operator training and coaching – **available**
Advanced Quarry and Construction Fleet Management KOMATSU iSite	Digital site solution operator training and coaching – **available**
	Best practice site setup for machine control – **available**
	Fleet managerment training for Komatsu iSite – **available**
	Site readiness investigation survey – Komatsu iSite – **available**

Bundles and Packages

Bundles can be sold individually, with new equipment sales, used equipment sales and through Komatsu rental to meet your project or site requirements.

Bundles and Package – Available

Pk No.	Package name	Inclusions	Payment method
1	**Integrated Package**	iMC & SC Remote	Hardware sale / **Subscription [SaaS]
2	**Guidance & Payload Package:**	Smart Construction Retrofit [RFK] & Smart Construction Remote	Hardware sale / **Subscription [SaaS]
3	**Survey & Digital Jobsite Package**	EDD Fullkit & SC Dashboard (RB)	Hardware sale / **Subscription [SaaS]
4	**Processing & Digital Jobsite Package**	Smart Construction Edge only & Smart Construction Dashboard (RB)	Hardware sale / **Subscription [SaaS]
5	**Guidance Digital Jobsite Package**	Smart Construction RFK & Smart Construction Dashboard (RB)	Hardware sale / **Subscription [SaaS]
6	**Connected Construction Site Package**	EDD, Smart Construction RFK & Smart Construction Dashboard (RB)	Hardware sale / **Subscription [SaaS]
7	**Service Package**	Drone as a service	Quotes on request [Hectare rates apply]
8	**Quarry & Construction Fleet Management Package**	Komatsu iSite Fleet Management Solution	Hardware sale / **Subscription [SaaS]
9	**SC Construction Digital Jobsite Package**	3DMG, Payload, SC Dashboard, SC Remote, SC Fleet, SC Pilot	Hardware sale / **Subscription [SaaS]
10	**SC Digital Jobsite Optimum Package**	3DMG or IMC 2.0, Payload, SC Dashboard, SC Remote, SC Fleet, SC Pilot, SC CTA	Hardware sale / **Subscription [SaaS] / Daily CTA Rate

Service Offering – Available

Srv No.	Service name	Inclusions	Payment method
1	**Customer Technology Advisor on hand**	SC CTA can be hired for per day for you company or project technology advice	Daily Rate
2	**Dedicated Customer Technology Advisor – Silver**	You are assigned a SC CTA for 1 day per month dedicated to your company or project	Daily Rate – minimum 1 year/12 day service agreement
3	**Integrated Customer Technology Advisor – Gold**	You are assigned an SC CTA for 1 day per fortnight dedicated to your company or project	Daily Rate – minimum 1 year/25 day service agreement
4	**Integrated Customer Technology Advisor – Platinum**	You are assigned an SC CTA for 1 day per week dedicated to your company or project	Daily Rate – minimum 1 year/50 day service agreement
5	**Bespoke Customer Technology Advisor**	Flexible dedicated service contracts for SC CTA beyond 50 days per year.	Daily Rate

SC Smart Construction

EDD EDD defintion: Everday Drone excludes SC Drone and SC Edge solutions

RB Rental Bundle: Avalible with Komatsu Rental Machines offer includes applicable standard machine or iMC 2.0 – **Subject to availability**

CTA SC CTA: Smart Construcion Customer Technology Advisor – **daily rate**

Learn more about Smart Construction by contacting your local Komatsu representative or visit:
https://komatsu.com.au/Innovation/smart-construction

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