SMARTCONSTRUCTION

Work Smarter. Not Harder.
“Smart Construction” is a service that incorporates the worksite into the IoT (Internet of Things), organically connecting everything present on the site, and enabling its “visualisation” in 3D.

We believe construction machinery manufacturers must not only provide worksites with construction machinery equipped with the latest technology, but must also provide the systems to make maximum use of this construction machinery.

From the point of view of the customer, we not only provide construction using ICT construction machinery, but also provide the solutions to issues in relation to following construction process, management and on-site daily data collection.

By automatically removing obstacles such as man-made objects and trees from the point cloud data measured by unmanned aerial vehicles (drones etc.), or 3D laser survey scanners, the current land topography can be seen with high precision 3D data.

It is also possible to see 3D design data using PCs, smartphones and tablets, which have no CAD software installed. Even when the customer cannot make their design drawings in 3D (top view, transverse view, longitudinal view), they can create 3D data and then register it with the Smart Construction Cloud.

Note: Design changes can also be implemented by the customer survey or engineering team and upload to the construction machinery.

Customers are assured that unexpected changes are also immediately updated into the latest design data by the support centre, and the data is then transferred to the construction machinery.
Calculate precise construction areas using the difference between the initial survey data and the 3D design data. In addition to checking embankment and excavation areas in 3D, their respective soil volumes can also be checked.

Automatic calculation of embankment and excavation soil volumes (soil volume calculation is by mesh method).

Display the construction area in 3D (yellow: embankment, blue: excavation).

Display embankment height etc. in colour.

3D design data can be transferred from the Smart Construction Cloud to ICT construction machinery. Even if there are unexpected design changes, instant update is possible by registering the latest data and transferring it to the ICT construction machinery.

3D point cloud data, measured using the "coordinate data from cutting edges", and "stereo cameras" mounted on operating ICT construction machinery, generates the latest topographical data for display in 3D.

Operational data from ICT construction machinery is transferred to the Smartconstruction Cloud in real time, reflecting the daily progress of construction. Progress charts show earth-cut parts and embankment parts in different colours, for 2D or 3D displays, and it is possible to confirm progress along arbitrary cross sections.

By checking the latest 3D topographic data against the initial survey data and the 3D design data, you can confirm the state of the construction progress "visually".
SMARTCONSTRUCTION

It is possible to calculate yields by maintaining and managing unified initial survey data, 3D design data, mid-construction topographical data, and finished form data.

- Initial survey data
  - Traditional Instrument Survey
  - Drone
  - 3D laser scanner

- 3D data on finished form sections
  - Cutting edge
  - Stereo camera
  - Track footprint

- Smart Construction Support Centre

Please contact the “Smart Construction Support Centre” if you have any questions or inquiries regarding construction with ICT construction machinery. Experienced operators will provide prompt and in-depth customer support.

- Construction locations for ICT construction machinery
  - Automatic acquisition of ICT construction machinery cutting edge coordinate data

- Construction locations with non-ICT construction machinery and construction locations manned by individual persons
  - Stereo camera measurements
  - Custom measurements by customers

- Customer
  - All 3D data can be downloaded

- Construction progress confirmation screen

- Full support of construction using ICT construction machinery

SMART CONSTRUCTION

MATERIAL YIELD CALCULATIONS

Calculating yields

- Initial survey data
  - Traditional Instrument Survey
  - Drone
  - 3D laser scanner

- 3D data on finished form sections
  - Cutting edge
  - Stereo camera
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- Full support of construction using ICT construction machinery

SMART CONSTRUCTION SUPPORT CENTRE

For example, when...

- Operation of Smart Construction
  - Viewing not possible
  - File upload not possible
  - Account unlocking not possible

- ICT construction machinery in operation
  - Monitor operation not understood
  - Cutting edge coordinates do not match

- Changing design data
  - When making design changes, complete drawing data cannot be modified
  - Cannot upload changed data to the Smart Construction cloud

- GNSS connection
  - Cannot connect to satellite
  - Connection breaks off easily

SMART CONSTRUCTION

Support Centre

+61 2 9795 8755
INTRODUCING… INTELLIGENT MACHINE CONTROL

Komatsu’s innovative INTELLIGENT MACHINE CONTROL (iMC) technology solutions are making our customers more productive today… and into the future. Adding Komatsu iMC machines and solutions to your fleet is a formula for unmatched productivity improvement.

WHY INTELLIGENT MACHINE CONTROL?

At Komatsu, we have a long history of introducing market-leading technology and innovation to the industries we serve. Understanding the needs of our customers, we are constantly working towards enhancing and improving their productivity— including meeting the challenge of the ever-growing demand for skilled machine operators. Skills shortages, along with demands for increased construction site productivity, finite resources and project management pressures are key factors behind the development of Komatsu’s iMC technology, which is driving our SMARTCONSTRUCTION philosophy.

iMC – NEXT GENERATION MACHINE CONTROL

Komatsu’s exclusive iMC concept is designed to let operators focus on moving material efficiently—from bulk excavation to final trim—without having to worry about over-excavation or damaging the target surface—and resulting in significant improvements in efficiency and productivity compared with conventional construction processes. Currently covering a range of four dozers and one excavator, each model in Komatsu’s iMC range incorporates as standard a factory-installed fully integrated 3D GNSS (Global Navigation Satellite System) machine control system.

NEXT GENERATION INTELLIGENCE

- **Innovative** Automated blade/bucket control, from bulk excavation to final grades
- **Integrated** Fully factory installed Komatsu machine control system, with all components highly secure from damage, vandalism and theft
- **Intelligent** Multiple automated dozing modes as well as auto grade assist, auto stop control and minimum distance control for the excavator, so jobs are finished faster, more accurately and with minimal rework

FACTORY-INTEGRATED SENSOR PACKAGE

Conventional “bolt-on” machine control components are replaced with fully integrated factory-installed GNSS antennas, enhanced inertial measuring unit (IMU+) and stroke sensing hydraulic cylinders. This assures Komatsu reliability, durability and quality.

GNSS ANTENNAS

Komatsu’s exclusive cab-top (iDozer) and handrail mounted (excavator) GNSS antennas greatly reduces the risk of damage, theft or vandalism associated with conventional blade and counterweight mounted antennas and cables—and ensures greater accuracy through more stable GNSS antenna positioning.

ENHANCED INERTIAL MEASURING UNIT

Komatsu’s chassis-mounted enhanced inertial measuring unit (IMU+) measures machine pitch and roll to enable precision work equipment control, even when working on slopes.

STROKE-SENSING CYLINDERS

Another Komatsu exclusive, robust stroke sensing hydraulic cylinders use proven sensor technologies for accurate finish grade performance. Stroke-sensing cylinders allow the iMC system to constantly track the angle and location of the blade or bucket edge.

BENEFITS:

- Complete bulk dozing and excavation, along with grading and final trim operations faster and to closer tolerances
- Fewer passes to finish grade or excavation profiles
- More efficient machine use: Less rework — dig or grade it once and move on
- Greatly decrease times for staking, survey and even final inspection through having 3D design data held within machine
- Complete multiple tasks with one machine
- Lower machine operating costs and whole-of-life costs
- Better material yields
- Reduced fuel consumption
- Improved operator performance
- Greater machine availability and uptime
- Simple operation for all operators and experience levels
**INTELLIGENT DOZERS**

**OPERATING WEIGHTS**
- **D61EXi-23/-24**: 19,647kg/D61PXi-23/-24: 20,527kg Includes Rippers
- **D61EXi-18/-23**: 22,730kg/D61PXi-18/-24: 24,980kg Includes Rippers
- **D55EXi-18/-23**: 33,420kg/D55PXi-18/-24: 35,110kg Rippers EXi only
- **D155AXi-8**: 44,560kg Includes Rippers

**ENGINE**
- **D61EXi/PXi-23**: 125kW (168HP) @2200rpm Tier 4 Interim
- **D61EXi/PXi-24**: 127kW (170HP) @ 2200rpm Tier 4 Final
- **D65EXi/PXi-18**: 162kW (217HP) @1950rpm Tier 4 Final
- **D85EXi/PXi-18**: 197kW (264HP) @1900rpm Tier 4 Final

**FACTORY INTEGRATED iMC COMPONENTS**
- GNSS Receiver UHF Digital II
- Enhanced Inertial Measuring IMU+
- Cab Mounted GNSS Antenna Integrated (Roof)
- Machine Control Monitor Komatsu GX-60
- Stroke Sensing Cylinders (with Reset Sensor) Tilt/Lift/Angle

**BLADE OPTIONS**
- **D61EXi/PPXi-23**: Power Angle Tilt (PAT)
- **D61EXi/PPXi-24**: Power Angle Tilt (PAT)
- **D55EXi**: Sigmadozer/D55PXi: PAT
- **D55EXi**: Sigmadozer/D55PXi: Straight
- **D155AXi-8**: Sigmadozer

**INTELLIGENT EXCAVATOR**

**OPERATING WEIGHTS**
- **PC210LCi-10**: 23,990kg Heavy Counter Weight & OPG
- **PC360LCi-11**: 36,960kg Quick Hitch & SF Tilting Bucket

**ARM BOOM SPECS**
- **PC210LCi-10**: ARM - 2900 (6000) - 5700
- **PC360LCi-11**: ARM - 3200 (6000) - 6500

**ENGINE**
- **PC210LCi-10**: 123kW (165HP) Tier 4 Interim
- **PC360LCi-11**: 202kW (271HP) Tier 4 Final

**FACTORY INTEGRATED iMC COMPONENTS**
- GNSS Receiver UHF Digital II
- Komatsu Enhanced Inertial Measuring IMU
- Cab Mounted GNSS Antenna Handrail Mounted
- Machine Control Monitor Komatsu HMI X-31
- Stroke Sensing Cylinders (with Reset Sensors) Boom/Arm/Bucket
- Network Modem T-Link / SL100
- Tilting Attachment (Hitch/Bucket) Option

**BUCKET OPTIONS**
- **PC210LCi-10**: 450GP, 600GP, 1200GP, 1800 Tilting SF
- **PC360LCi-11**: 650GP, 1300GP, 1500GP, 1700GP SF , 2200, SF Tilting 2000mm

**SMARTCONSTRUCTION**

- **No cables** No coiled cables between machine and blade
- **No climbing** Integrated GNSS antenna and masts removed from blade
- **No connections** No daily connections required between machine and work implements

Contact Komatsu for more detailed information

- **Projection** The work is automated to limit the bucket from digging beyond the target surface
- **Precision** Auto grade assist provides for finish grade accuracy with its ability to precisely trace the design surface
- **Performance** No worry digging means you can improve speed and cycle times due to our innovative auto stop feature that prevents operator over dig
- **Production** Protection, precision and performance is your formula for increased production versus conventional machine guidance

Contact Komatsu for more detailed information

» No cables
No coiled cables between machine and blade

» No climbing
Integrated GNSS antenna and masts removed from blade

» No connections
No daily connections required between machine and work implements
FEATURES AND BENEFITS

» Drone capability enhances Komatsu Australia’s total site solution business to our customers. It delivers quick, reliable and accurate survey for all earthmoving, quarry and mining applications, adding value to our integrated iMC operations.
» Record current as-built data, plus cut and fill volume reporting
» Capable of working alongside Komatsu AHS (Autonomous Haulage Systems)
» Enhances Komatsu Australia’s expert optimum fleet recommendation team in the field
» Total end to end solution for our customers now, tomorrow and in the future
» The Explore 1 and Edge 1 high precision package allows for both precision 3D mapping and on site point cloud data processing without the requirement of ground control points.

EXPLORE 1 DRONE

High precision drone delivers centimetre-level accuracy and high resolution imagery for daily updates on constructions progress.

BENEFITS

• High precision without Ground Control Points
• Site coordinate localisation
• Dual camera (20MP high speed shutter mapping camera and gimballed inspection camera)
• 2x faster 3D mapping than other systems (2 photos/second)
• L1/L2 receiver GNSS rover

EDGE 1 BASE STATION

Process high accuracy point clouds in remote areas without internet connection Edge 1 gives you on the edge processing.

BENEFITS

• 3.2cm accurate 3D point clouds
• Automatic data offload from drone
• Local structure from motion processing
• Use either physical base station or connect to network

KEY FEATURES

• LTE-enabled data upload
• Local photogrammetry processing
• Direct data upload to cloud
• Advanced data port processing tools including automated DTM generation, and object detection
• Hosting deep learning model for AU
• L1/L2 receiver GNSS rover

FOR MORE INFORMATION
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