



Komatsu

Technology

LEADERSHIP
TECHNOLOGY
INNOVATION

KOMATSU

Driven by your success

LEADERSHIP TECHNOLOGY

ASSET MANAGEMENT



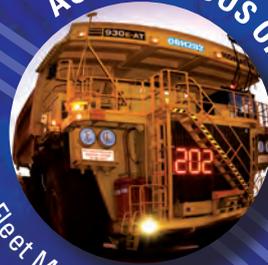
- Remote Monitoring Options •

INNOVATION AND TECHNOLOGY



- Komatsu Hybrid Technology •

AUTONOMOUS OPERATIONS



- Fleet Management •

ELECTRIC POWER TECHNOLOGY



- Low-Carbon Options •

Komatsu prides itself on being the leader in technological development and of great innovative ideas that benefit how you operate and control your business.

GY
INNOVATION

Komatsu Technology

Komatsu is actively engaged in Research and Development (R&D) activities for new technologies, new products and new services, consistent with our commitment to provide 'Quality and Reliability'.

With an annual investment in R&D of over \$AUD620 million our focus is on safety, productivity and the environment.

These technology advances will deliver true value to your operation. It is proven technology, that is working for your peers and your competitors, and is available for your operation today.

From autonomous trucks and other remote-control mining and construction equipment, to highly fuel-efficient hybrid excavators and dump trucks, to state-of-the-art remote monitoring systems, Komatsu's technology advances have a clear customer focus.

Our aim is to increase productivity, reduce the cost of machine ownership and cut fuel and consumables costs – while all the time ensuring safety is at the forefront of everything we do.

Komatsu has an integrated approach of research, development and design. This approach ensures that the technology advances developed in one industry sector flow through to other sectors – benefitting all our customers.

Whether you're a mining company moving millions of tonnes of material a year, a contractor in a major metropolitan region, a remote-area council, or an owner-operator with a single machine, Komatsu's technology advances are here now to benefit your operation.

SERVICE & SUPPORT



• My Komatsu • R&M Care •

THE FUTURE



LEADING THE WAY IN AUTONOMOUS HAULAGE SYSTEMS REMOTE VEHICLE CONTROLLED EQUIPMENT



Komatsu leads the way in Autonomous Haulage Systems (AHS) in the mining industry.

In early 2005, its FrontRunner autonomous truck system went into operation at the Codelco Radomiro Tomic mine in Chile.

In 2011, Komatsu Ltd and Rio Tinto signed an Memorandum of Understanding in regards to the large scale implementation of the Komatsu Autonomous Haulage System (AHS).

The deal will see the deployment of at least 150 Komatsu AHS mining trucks into Rio Tinto's Iron Ore Pilbara operations in Western Australia by the end of 2015, with the initial deployment commencing in 2012.

Rio Tinto has been testing Komatsu AHS trucks, the world's first commercial autonomous mining haulage system, in the Pilbara since December 2008. During the trials the AHS technology demonstrated clear value to the business especially in the areas of health, safety and productivity

What are the advantages of an AHS Operation?

Each autonomous dump truck is equipped with vehicle controllers, GPS system, an obstacle detection system and navigates using a wireless network system. These features allow the dump truck to safely operate throughout a complex load, haul and dump cycle.

Autonomous, or remote control operations of heavy equipment offer numerous advantages to customers. These include:

- » **Increased site safety:** Whether in the equipment itself or in site vehicles, the combination of sophisticated detection and collision avoidance systems means far fewer people around large fast-moving equipment.
- » **Increased equipment utilisation:** Autonomous machines work consistently throughout a full shift, with no stopping for breaks.
- » **Lower consumables and maintenance costs:** Autonomous machines operate to their optimum speeds and capabilities, tyre life can be extended, while drivetrain component wear and tear is reduced.

INCREASE SAFETY WITH KOMATSU TECHNOLOGY

Komatsu technology can increase safety in your mining, quarrying or construction operation through our automated speed zones and collision-avoidance systems.

Location-sensing equipment ensures that equipment is automatically slowed below preset limits as mobile machinery approaches potential danger zones, including intersections, loading and dumping areas, workshops or crib areas.

It can also be used to limit speeds on downhill runs, so that machinery never gets out of control or is operated at excessive or unsafe speeds.

In-built collision-avoidance systems fitted to heavy equipment, along with ancillary equipment including foreman's vehicles, service trucks and crew transporters, eliminate the chances for accidents when small vehicles are operating around large pieces of mobile mining and construction equipment.

What are the advantages for your operation?

- » Reduced risk of accidents.
- » Constant monitoring of equipment and vehicle location.
- » Improved safety culture.
- » Reduced management time spent on "near-miss" and accident reporting.



KOMATSU HYBRID TECHNOLOGY SHOWING THE WAY TO A LOW-CARBON FUTURE

Innovative Komatsu technology has been developed to dramatically reduce customer fuel consumption in a range of equipment to suit many varying industry sectors.

Komatsu changed the face of the earthmoving equipment industry with the launch of the world’s most technologically advanced earthmoving machine – the groundbreaking Hybrid Excavator. As the world’s first commercially produced Hybrid earthmoving machines, the 20 tonne HB205-1 and HB215LC-1 Excavators combine a state-of-the-art energy recovery system with a smaller-capacity diesel engine, making the Hybrid Excavator the most environmentally sustainable machine in its class.

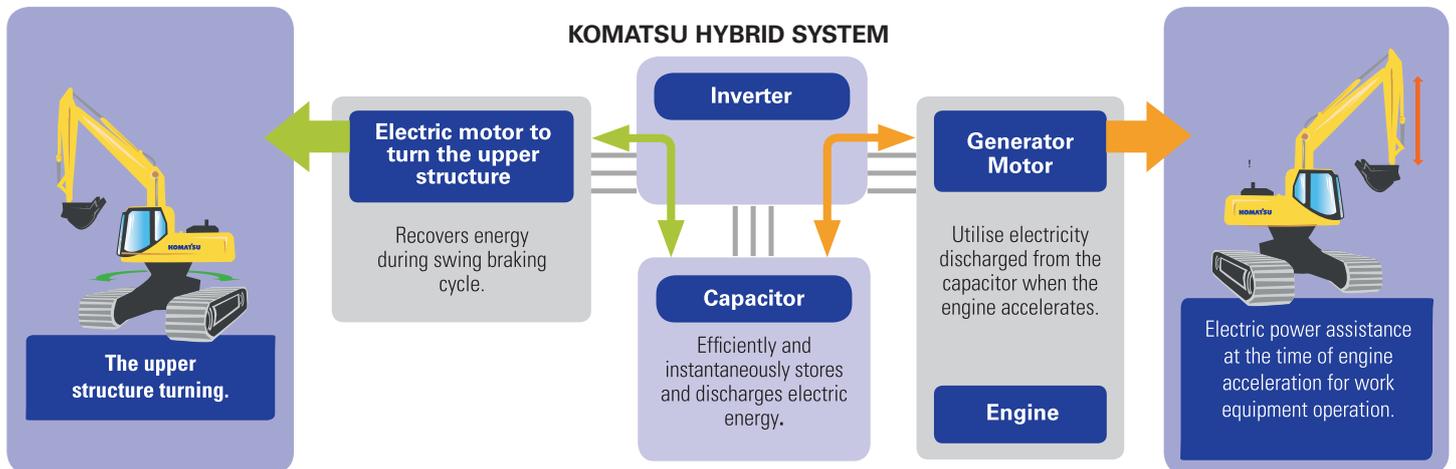
It has been met with critical acclaim in overseas markets that the Komatsu Hybrid technology has demonstrated an overall reduction in fuel consumption by up to 41 per cent compared with conventional equivalents. The regenerative-hybrid system also significantly reduces CO₂ emissions.

Komatsu has since extended this technology to the 35 tonne Excavator class and has now released the HB335LC-1. Our Hybrid boasts leading technology, with currently over 2000 Komatsu Hybrid Excavators operating around the world. Since the initial launch of this technology, our Hybrid machines have logged well over 1,000,000 hours globally.

What are the advantages for your operation?

- » Significantly lower fuel bills, with 20–40% lower fuel consumption.
- » Reduction in CO₂ emissions
- » Lower engine wear and tear (as diesel engines do not have to work so hard).
- » Increased productivity.
- » Increasing customer demand for suppliers to use more fuel-efficient or “low-carbon” equipment.
- » Environmentally sustainable machines

OUTLINE OF KOMATSU HYBRID SYSTEM



KOMATSU ELECTRIC POWER TECHNOLOGY LOW CARBON OPTIONS FOR MINING

Komatsu's investment in fuel-saving technology is also extending to augmenting or even replacing diesel power with electric power.

Komatsu 730E-8 and 860E-1K trucks are now available with a "trolley-assist" option. This proven system, already used in South Africa, incorporates a pantograph unit on the cabin roof connecting to overhead wires, to supplement the trucks diesel engines.

This technology can deliver fuel savings of up to 30%, along with reduced engine and component wear and tear. It is available as an off-the-shelf option for these trucks.

At the top end of Komatsu's mining shovel range, we have developed an electric-power PC8000 which will put out zero emissions, and dramatically cut fuel costs.

What are the advantages for your operation?

- » Significantly lower fuel burn.
- » Reduced "carbon taxes" as Carbon Pollution Reduction Scheme comes into operation.
- » Lower engine wear and tear (as diesel engines do not have to work so hard).
- » Increased productivity.



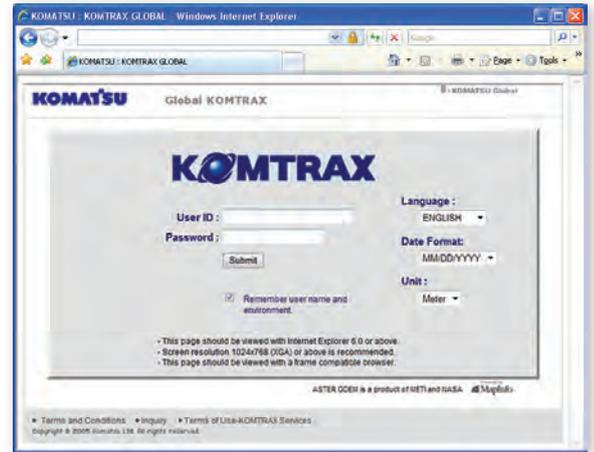
KOMATSU KOMTRAX TECHNOLOGY REMOTE MONITORING FOR YOUR CONSTRUCTION EQUIPMENT



Komatsu's KOMTRAX remote monitoring system has taken equipment management to a whole new level.

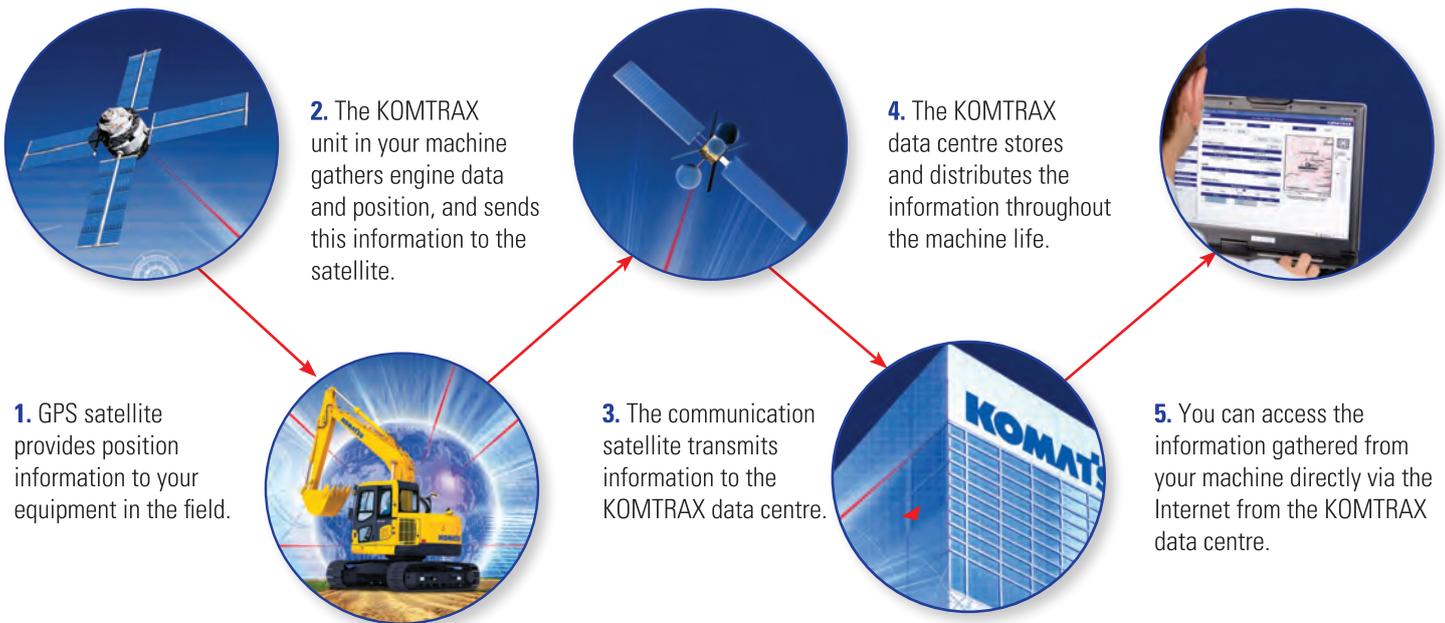
KOMTRAX is a complimentary web-based system for Komatsu construction and utility machines that allows both Komatsu and a machine owner to monitor all aspects of machine performance and condition. It not only provides early warning of potential issues or problems, but also poor or incorrect operator practices and procedures.

In addition, KOMTRAX provides an on-going record of when and where a machine is working, allowing continuous monitoring of working hours.



KOMTRAX can be easily accessed through a generic web browser.

HOW DOES KOMTRAX WORK?



WHAT ARE THE ADVANTAGES FOR YOUR OPERATION?

- » **Reduced maintenance costs:**
Continuous monitoring of machine condition and performance ensures any abnormal readings can be addressed before they result in unscheduled downtime.
- » **Safer operations:**
Poor or incorrect operator practices (excessive speed, traversing side-slopes) are highlighted, allowing additional training.
- » **Lower operating costs:**
Continuous monitoring of operating practices and machine settings allows fine-tuning of operator procedures (use of "power mode" in light or medium conditions).
- » **Eliminate unauthorised use:**
Remote location capability identifies if a machine is being used where it shouldn't or inappropriately.
- » **Accurately log machine hours:**
Know if your machines are actually working, or simply sitting there idling.
- » **Geofencing:**
Restrict machine operations to within set area.
- » **Control working hours:**
Restrict machine operations to within certain hours (for example, 7am to 5pm weekdays) to prevent unauthorised use outside of a working day or specified shifts.



KOMATSU KOMTRAX PLUS TECHNOLOGY: REMOTE MONITORING FOR YOUR MINING EQUIPMENT

Komatsu's KOMTRAX Plus (formerly VHMS) allows customers to monitor the health of major components using telemetry technology (satellite) on equipped Komatsu mining class machines. This system enables the remote reporting of the machine's condition to help reduce repair costs and maintain optimal machine availability by helping to prevent unscheduled downtime.

KOMTRAX Plus enables customers to download their machine data via the Internet and review the information using a secure website called "Equipment Care". KOMTRAX Plus reports vital information in several key areas so that their operating conditions can be monitored including: trends, fault and event codes that are displayed on the machine's monitor panel are recorded for future reference, engine performance, fault analysis, and machine operation history.

What are the advantages for your operation?

- » **Complimentary system**
- » **Reduced maintenance costs:** Continuous monitoring of machine condition and performance ensures any abnormal readings can be addressed before they result in unscheduled downtime.
- » **Safer operations:** Poor or incorrect operator practices (excessive speed etc) are highlighted, allowing additional training.
- » **Lower operating costs:** Continuous monitoring of operating practices and machine settings allows fine-tuning of operator procedures.
- » **Manage Fuel usage**
- » **Accurately log machine hours:** Know if your machines are actually Working or accumulated hours.

KOMATSU **CONDITION MONITORING** SERVICE AND SUPPORT

Condition Monitoring is the management of a machines health by using preventative maintenance tools and techniques to achieve maximum machine productivity. Using KOWA (Komatsu Oil and Wear Analysis), our most common Condition Monitoring tool, we are able to accurately detect trend changes or contaminant problems in your lubricants, coolant and grease using our high technology laboratories. This preventative diagnostic process, when combined with your scheduled maintenance, helps avoid expensive and unscheduled catastrophic failures.

ACCESSING YOUR **KOMATSU** DATA AND ANALYSIS

myKomatsu is our online portal that provides customers with access to their KOWA data and reports. This service allows you to browse your full sample history and results, as well as providing other online tools to help you better view and understand your data. Access to this information helps customers to better identify problems and manage machine performance. You can also download or email all your reports from a single location.

What are the advantages for your operation?

- » Instantly see your oil sample results in a detailed report
- » Available at a time that suits you, 24 hours 7 days a week
- » Complimentary service

Above: The myKomatsu interface



R&M CARE CONSTANTLY MONITORING

R+M Care uses the latest CRM (Customer Relationships Management) technology to take all the worry out of maintaining your Komatsu equipment in top condition.

R+M Care is the Komatsu system designed to manage various types of machine maintenance contracts and agreements in both the Construction and Mining sectors, providing Life Cycle Costs and Machine Key Performance Indicator reports.

R+M Care provides an excellent interface for machine quality control analysis, supporting other Komatsu service technologies and provides detailed reporting to both Komatsu and to customers.

Komatsu R+M Care is integrated with our KOMTRAX and KOMTRAX Plus remote services, to constantly monitor the service meter readings of machines.

Features of R+M Care

- » **PLANNING:** R+M Care allows both long and short term levels of planning, with simplified plan adjustments using optional on-screen Gantt Chart displays with drag and drop functionality
- » **ANALYSER:** Analysis functions in R+M Care offers real-time and detailed analysis of both machine downtime and machine repair and maintenance costs.
- » **CONTRACT MANAGEMENT:** Contract management is one of the R+M Care systems key features, with reporting available at many levels. Customer, Contract, Model, Fleet and Individual machine performance results can be seen in various text and chart type reports at the click of a button
- » **KPI (DASHBOARD):** The Dashboard provides a highly visible display of machine and contract KPI's over a wide range of viewing parameters



KOMATSU TECHNOLOGY

IN THE FUTURE

KOMATSU

Driven by your success

Australia: 1300 566 287 | www.komatsu.com.au
New Zealand: 0800 566 287 | www.komatsu.co.nz
New Caledonia: 43 53 06

Form No:ZESB099300