CONTROLMASTER®

SMART AUTOMATION & CONTROL TECHNOLOGY **BY RCT**

GUIDING THE WAY TO INFINITE POSSIBILITIES...

AUTOMATION & CONTROL SOLUTIONS FOR SURFACE MINING

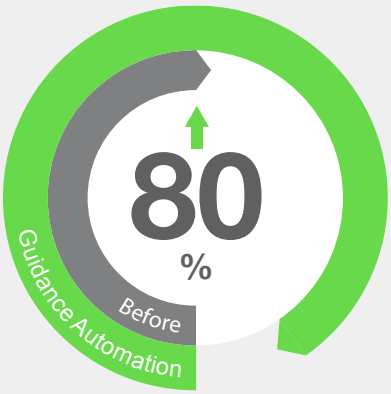
rct-global.com

“More than 5 million operating hours of Guidance Automation

RCT’s ControlMaster® solutions are setting the benchmark for productivity and safety on a global scale; empowering clients to improve efficiencies and effortlessly meet production targets. Our Automation and Control range is versatile enough to cater to specific requirements; ranging from the automation of a single machine, to a fully autonomous fleet and beyond with RCT’s Infinite!

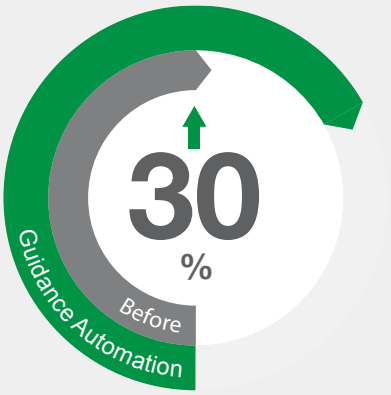
Profit

- Increased run time
- More buckets
- Reduce machine damage
- Eliminate unplanned downtime
- Less wear and tear
- Fuel efficiency



Safety

- Operator health
- Easy-to-use
- Avoid accidents
- Improved working conditions
- Reduce fatigue
- Anti-collision intelligence



Productivity

- Multiple machines
- Faster tramming
- Hot seat transition
- Remove disparity between operators
- Improve overall efficiency
- Faster cycle times

**based on feedback from customers using Guidance automation system – Profit: 50% increased revenue | Safety: 80% safety increase due to reduction in accidents and equipment damage | Productivity: 30% improvement based on increased operations hours, minimised downtime and faster cycle times.*

Proven technology – no lost-time injuries and the longest operating hours in the market!”

The ControlMaster® range is fully scalable, permitting upgrades from a Line-of-Sight solution through to a fully autonomous fleet. In addition, RCT's Automation path allows the combination of all the latest technology available to deliver the full solution including: Automation, Traffic Management, Integration, and much more thanks to RCT's Infinite!

Remote

Line-of-Sight and Teleremote improve safety by removing the operator from the cab of a mobile machine and allow operators to control a machine via remote control from a secure location.

refer to page 4 and 5

Guidance

Let the machine take control to reach greater tramming speeds and diminish disparity between operators to increase production and reduce damage experienced during manual operation with cutting edge autonomous technology.

Guidance Expand gives additional options to further enhance Guidance to suit specific mine requirements.

refer to page 6 and 7

Infinite

Stay at the forefront with the latest in technological advancements with Infinite. Infinite combines all the latest technology available to deliver the full mining solution including Automation, Traffic Management, Telematics, Network, People and Asset Tracking, Integration, and much more…

refer to page 8

Line-of-Sight

Entry level option: allows operators to remotely control machines while providing a safer working environment.

Entry level option for companies considering transitioning to automation.

Allows operators to remotely control machines while providing a safer working environment.

Benefits

- Allows operators to work at a safe distance from hazardous work areas
- Reduces operator fatigue
- Improves operator safety in high risk working conditions
- Prevents repetitive stress injuries

Features

- Heavy duty and ergonomic for operator comfort
- Protected Internal Antenna
- Detailed colour graphical display using internationally recognised symbols
- Smaller and more compact
- Light weight
- International frequency compliant
- 16 hour continuous operation lithium Ion battery
- Operating voltage 12 to 16 V
- Water proof rating (ATX IP65) (MTX IP67)
- Heavy duty impact and dust sealed casing
- Adaptable across all machine types

Remote Control Options

ATX2200

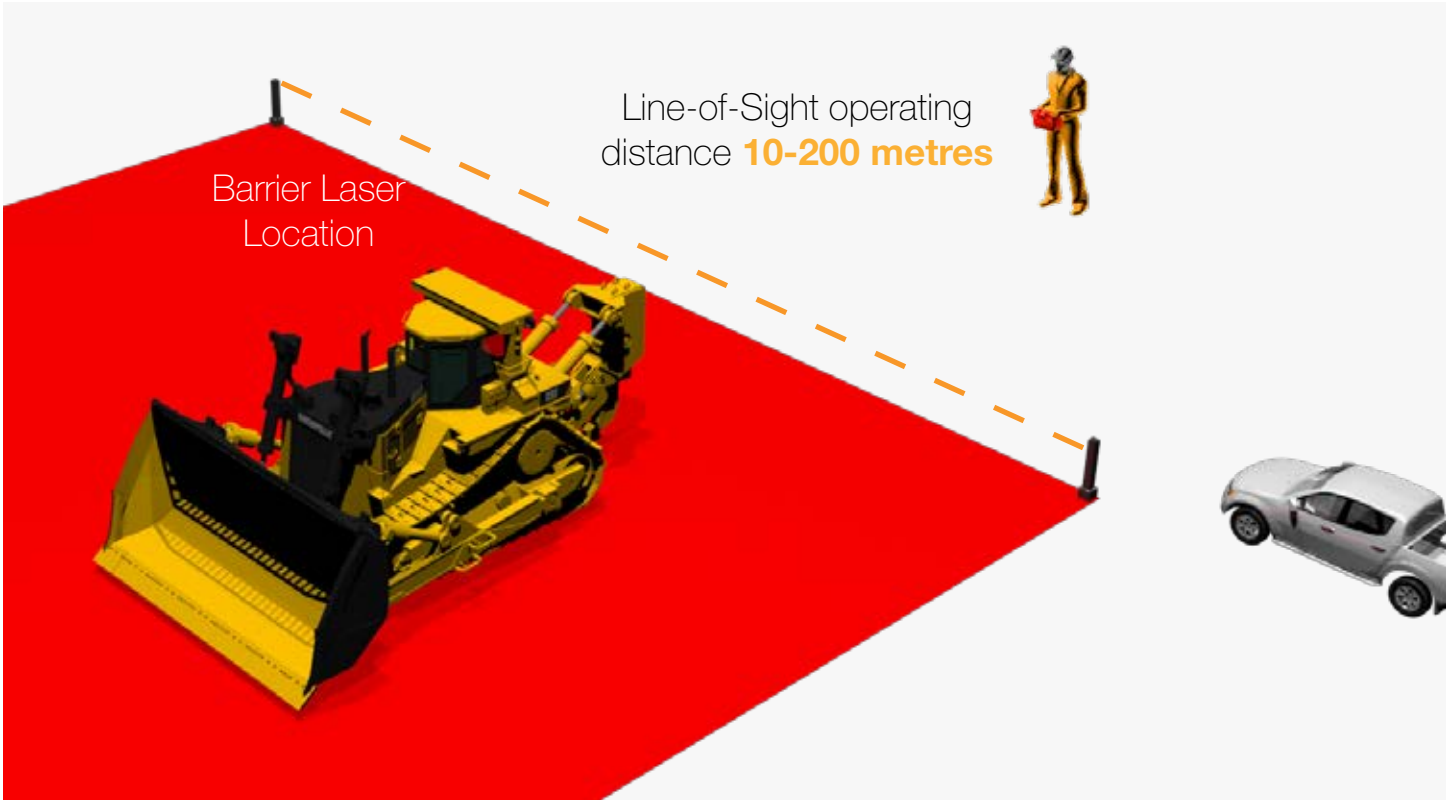
RCT's most powerful remote control unit. The ATX2200 can be used in Line-of-Sight, Teleremote and Guidance applications. It can be used on all mining machines – regardless of type, brand, and age and supplied to all mining regions globally.

ATX1000

Built for Line-of-Sight operation only, the ATX1000 can be supplied into all mining regions globally, and used on all mobile mining and industrial machines – regardless of type, brand, and year. The ATX1000 has all the same rugged design features as the ATX2200.

MTX1000

Uses the same proven operating system as the ControlMaster® ATX's and packages it into our smallest and lightest remote control option – weighing in at less than 2kg! The MTX is ideal for short-term Line-of-Sight applications, and is suitable for all mining and industrial applications globally for both surface and underground machines.



Teleremote

Relocates the operators to a secure location where they can control the machine via remote with the help of multiple cameras and sensors.

Removes the operator from the hazardous area and relocates them to a secure and protected location where they can control the machine via remote with the help of multiple cameras and sensors.

RCT understands that every mine site is different. Therefore we have multiple options for relocating operators to a safe location to ensure we can meet site's specific needs.

Benefits

- Improved operator conditions and safety
- Greater productivity gains for long term remote operations because mining is continuous
- The operator works from a safe location, protected from the outside elements.
- Modular – Teleremote equipment is added to existing remote control machines

Features

- Climate control
- Air filtration management
- Diesel powered generator
- Auxiliary power management systems
- Ergonomically designed operator console and chair
- Vision monitors and vision management system
- Window treatments
- IP, fibre optic and mesh communication
- Network ready
- PPE Storage
- Fridge
- Sound system
- Site specific requirements. i.e., decals, lighting and fire extinguishers

Remote Control Options

CONTROL CENTRE

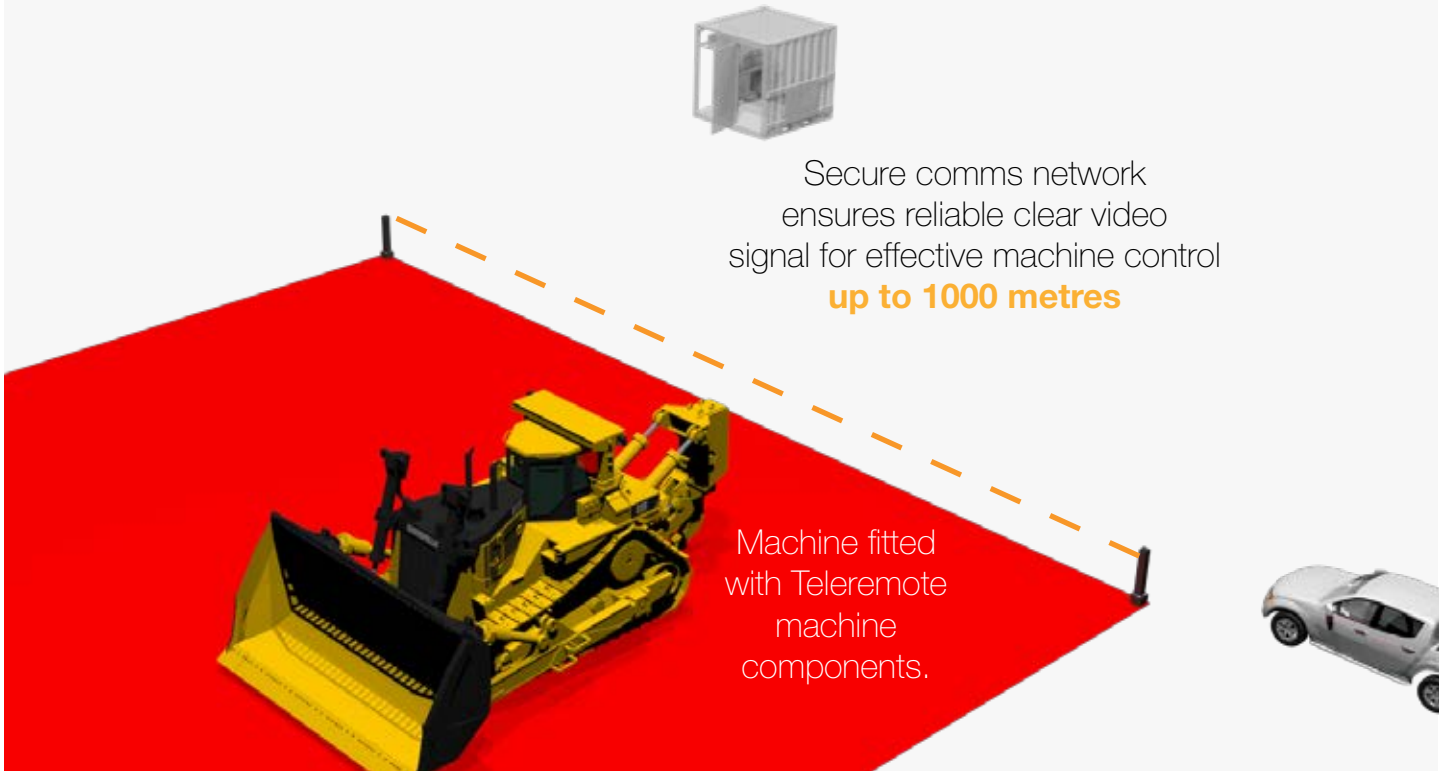
Strong steel exterior, which can withstand the harshest of mining conditions.

TRAILER CABIN

When added with vision technology the Trailer Cabin permits to control a mobile equipment with the use of screens placed in front of the operator.

MOBILE STATION

Can be placed in your mobile unit (truck, van, etc)



Guidance

The automation solution guiding the way to the future of mining.
Eliminate machine damage, tram faster & increase overall production.

Automation Centre

RCT offers numerous options when it comes to Automation Centres; from customised solutions to prefabricated rooms, surface solutions and more.

Driverless technology

Guidance Driverless technology delivers consistent machine operation and cycle times by significantly reducing damage and unplanned downtime caused by a machine impacting with surrounding infrastructure.

Greater speeds, consistent high production and less damage ensures KPI's targets are met every time.

Point-to-Point

The award winning Point-to-Point solution is the ultimate underground automation mining solution. The operator simply pushes a button and machine navigates itself to the destination; steering, braking, and speed are automatically controlled. The system utilises laser technology to ensure the machine remains on the centre of the drive, avoiding walls and other major obstacles.

Enables a machine to travel between waypoints to ensure faster cycle times and eliminate machine damage.

G-Dash

G-Dash further empowers Guidance operators with real-time information to make smarter decisions. This feature offers operators a graphical representation, conveniently and clearly displayed on a separate designated display.

- Machine speed
- Machine RPM
- Machine gear
- Machine direction
- Laser degradation
- Signal strength
- Guidance enabled
- Pitch and roll
- Full bucket feedback

Laser Guard

The best safety management device for Automation & Control operation areas.

The Laser Guard machine containment system prevents driverless machines from leaving the operations area and restricts personnel from entering. This safety device is the preferred safety system used with all ControlMaster® solutions.

FMS (ready)

Relevant fleet data delivered to any smart mobile device. The Guidance solution comes EarthTrack® Fleet Management ready!

Guidance Expand

The additional options to further enhance Guidance to suit specific mine requirements.

Select

Allows an operator to switch from controlling one machine to another from the one operator station.

Control

Take full advantage of RCT's Smart Technology and drive profits even higher by implementing RCT's multi machine solution.

Allows one operator to control multiple machines on site; delivering better visibility of the work area, maximum operator comfort and safety, all while lowering operating costs.

AutoNav

Simply choose where you want the machine to travel, and it will navigate the drive itself to multiple locations.

AutoDump

This completes the automation cycle to unlock productivity gains never seen before. Utilising physical waypoints and odometry, it trains the loader to dump into a stockpile, fixed point, ore pass or even a truck.

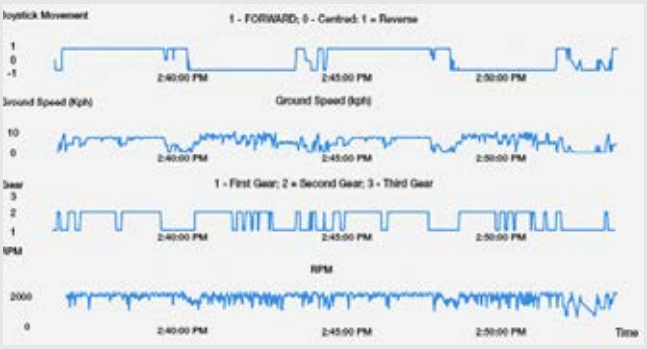
DigAssist

Will ensure the operator is in the optimal position for the ideal dig, ensuring their bucket is filled on the first time, every time!

G-Data

Provides relevant Guidance data.

Machine diagnostics and production-related data are gathered and displayed via EarthTrack® reporting to empower mine site's to make informed decisions.



Infinite

Guiding the way to Infinite possibilities…
We have the remote control solution for you!

Stay at the forefront with the latest in technological advancements with Infinite. Infinite combines all the latest technology available to deliver the full mining solution including Automation, Traffic Management, Telematics, Network, People and Asset Tracking, Integration, and much more…

Guidance Automation

- Automation Centre
- Driverless Technology
- Point-to-Point
- G-Dash
- Laser Guard
- FMS (ready)

Guidance Expand

- Select (multiple machine selection)
- Control (multiple machine control)
- AutoNav (multiple point to multiple point)
- AutoDump (autonomous loading and dumping)
- DigAssist (measure optimal bucket load)
- G-Data (machine and production data)
- Network solutions to suit mine site's needs ranging from analogue to fully digitised.

Integration

Bring together all existing and new systems for a streamline solution.

Protection Systems

Protect equipment and people across operations.

Traffic Management

Optimise fleet operation across any site.

Fleet Management

Make informed decisions to manage fleet performance efficiently.

Communications

Network solutions to suit mine site's needs ranging from analogue to fully digitised.

Solutions for ALL mobile machines

"No 1 – Machine Automation Solution
Hundreds of systems delivered worldwide"

The initial spend on the implementation of RCT's Automation and Control solutions for machines is outweighed by the increase in bottom line profit.

- Attain maximum production from your mine
- Ensure the safety of operators at all times
- Achieve optimal performance of your fleet
- Get more value from your mine

RCT's packages
are customisable
for ANY make
or model of machine.

RCT has provided remote control solutions to all of the machines listed below.

Loaders

Caterpillar:	950B, 980C, 980F, 980G, 980H, 988G, 988F, 994, IT14B, TH63, R1300, R1300G, R1500, R1600, R1600G, R1700, R1700G, R2800, R2900, R2900G, R2900G EXTRA
Sandvik Toro:	006, 0010, 0011, 1400, T150D, T151, T151D, T301, T350, T400, T500CD, T500DL, T501, T650, T650DL, LH514, LH517, LH621, T150D, LH410
Wagner:	ST2, ST2-D, ST3.5, ST6C, ST6C-11, ST7.5, ST8B, ST710, ST1030, ST1520, ST1800
Eimco:	913
JCI:	JCI100
Komatsu:	WA470-1, WA470-2, WA470-5
MIM UGL:	UGL

Dozers

Caterpillar:	D5H, D6T, D8R, D8T, D9H, D10, D10N, D10R, D10T, D11N, D11R, D11T
Komatsu:	D275AX-5. D375, D575A, D575A-2, D575A-3, D475A-5E0, WD600

Drills

Gardner Denver: MK10

Tamrock:	MONOMATIC LLSBRv
Atlas Copco:	SIMBA, Cubex
Sandvik:	COMMANDO 300DC, TAMROCK LLSBR

Excavators

Caterpillar:	320, 325, 345, TRAC 360, 390D
Komatsu:	PC120, PC150, PC170, PC400, PC450
Hitachi:	EX1200
Liebherr:	R920

Surface Drills

Terex: SKSS16

Rock Breakers

Transminn

Teledyne

Trucks

Caterpillar: 793C, AD30, AD45

Skid Steer Loaders

Toyota:	SDK5, 4SDK8
ASV Skid Steer:	RC30, RC50
Terex:	PT70, PT80

Other Machines

MIM Road Oiler ADT

Furnace Stoking Car

Concrete Pump Roboshot

Caustic Scroll Mudmaster

Caterpillar Tele-Handler

SUPPORT

On demand after-sales service, product support, maintenance and skills training

71 countries worldwide

RCT is a full service company, offering clients the complete package with all its proprietary products. Including: skills training, parts, technical and customer service support.

- OEM maintenance agreement
- Auditing and installation
- Operational servicing
- Preventive maintenance
- Customised servicing schedule
- Servicing documentation
- Operator and maintenance training
- Service exchange equipment

Training courses

Get the most from your investment with RCT's comprehensive range of training courses to suit the solution and requirements.

- Trained personnel can better use, maintain and service remote and Teleremote equipment
- Knowledgeable personnel can minimise equipment downtime by diagnosing and fixing a problem more efficiently
- Allows mine sites to be more self-sufficient

PROJECTS

The following is a sample of projects that demonstrate the outcomes experienced with RCT's solutions.

Alliance Resources' River View Coal USA

Solutions: ContolMaster® Line-of-Sight

Outcome: RCT's solution eliminated potential risks as operators can now carry out their job without having to physically sit in the dozer to operate it – avoiding unstable areas and adhering to MSHA's new regulation.

Codelco's Andina Mine Chile

Solutions: ControlMaster® Teleremote

Outcome: The simplicity of using the Teleremote system has been highly praised; the easy transition from actually physically driving the machine, to operating it from a safe cabin; feeling safe at work and not having to endure the sometimes brutal Chilean weather, is priceless for the operators.

Alrosa's Udachny Open Pit Mine Siberia

Solutions: ControlMaster® Teleremote

Outcome: The installation of an Operator Control Station allows operators to control the loader and trucks simultaneously from a safe and more productive environment, keeping the operator away from danger with greater overall visibility through RCT's Vision System.

Rio Tinto's Bingham Canyon Mine USA

Solutions: ControlMaster® Line-of-Sight

Outcome: RCT was able to design and manufacture 3 dozer remote interfaces and 4 remote kits to suit the Caterpillar D8T dozers used at the mine site together with spare remotes and support parts, prepare the necessary documentation and ship the equipment, all in a very small time frame.

Roy Hill Project Australia

Solutions: ControlMaster® Teleremote

Outcome: Roy Hill's multi-billion-dollar iron ore project was home to the first dynamic, multiple Geofence package to have been successfully interfaced to fixed and mobile asset elements, including two D11T CAT dozers equipped with RCT's ControlMaster® Teleremote solutions within the boundaries of a Coarse Ore Stockpile. RCT is proud to have played a big part in this momentous achievement.

Testimonials

"We've increased operation to 22 hours out of 24!"

"We have improved production per shift"

"Increased mechanical utilisation by between 25% - 50%"

"A decrease from 2 hours to minutes during the day/night equipment operator shift change over as no underground travel time was required"

"Saved 1-1.5 hours per blast downtime as the operator does not need to move to a safe location and then wait for the dust to clear"

"We were changing a window in the cab every 2 to 3 days, now we are lucky to change one a month"

"It has made my life very easy as downtime has been near to none"

"We don't require as many of our staff underground improving our production and meeting our KPI's"

"Results have shown a return on investment can be achieved in a very short period of time"

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