

COMMAND

REMOTE CONTROL FOR CONSTRUCTION



CAT[®]

CAT[®] COMMAND REMOTE CONTROL

SAFE. EFFICIENT. PRODUCTIVE.

Operating near cliff faces or high walls. Working on unstable surfaces or steep slopes. Moving hazardous materials. Any of these situations can put operators at risk. Even traveling to a remote jobsite poses its own safety issues. Cat[®] Command helps address all of these challenges by enabling equipment operators to work outside the machine.



IN THE FIELD OR OFF-SITE

COMMAND HELPS OPERATORS WORK SAFELY

It's a sophisticated remote control system that takes operators off the machine and away from potential dangers when working with hazardous materials or in unsafe conditions. Plus, it maintains the option to utilize other advanced control technologies such as Cat Grade, Payload, Detect and other machine specific Assist features.

Once operators become familiar with the feel of the remote control system, they can operate as efficiently, accurately, and confidently as in the cab. In fact, because they experience dramatically less noise and no vibration, operators can work efficiently for longer periods of time with less fatigue.

TWO SYSTEMS TO MATCH JOB NEEDS

CAT COMMAND CONSOLE

Portable, lightweight system allows the user to work outside of the cab while remaining on site and in direct visual contact with the machine.

- + Ideal for short-term and emergency use.
- + Requires no on-site communications infrastructure.



Console Versions Vary by Equipment Type



CAT COMMAND STATION

Enables the operator to work remotely in a seated indoor “virtual cab” located on site or many miles away.

- + Helps reduce operator fatigue with a comfortable working environment.
- + High quality video delivers a clear view of the work area.



SAFETY FIRST

Allows operators to work away from hazardous conditions, dust, noise, and vibration. Eliminates risk of an operator being injured climbing on or off the machine.

SIMPLE TO OPERATE

Easy to learn and use. Common jobs like trenching and foundation work in hazardous areas become safer for operators – without sacrificing control or accuracy.

INCREASE PRODUCTIVITY

Restart production immediately following disruptive processes - such as blasting. Decrease downtime with quick shift changes and reduce fatigue by eliminating the effects of vibration, noise, and rough terrain.





REMOTE CONTROL CONSOLE

LINE-OF-SIGHT OPERATION

LINE-OF-SIGHT

- + Remote control functions deliver smooth and precise machine control.
- + Provides line-of-sight operation from up to 400 meters (1,312 ft) away.
- + Utilizes a secured 2.4 GHz radio connection.*
- + Up to 10 hours of continuous operating time when fully charged.
- + The machine will shut down if the controller is tipped more than 45 degrees; this feature was designed in the case of the operator tripping or falling.



Excavator Console

CAT COMMAND CONSOLE

- + Operator inputs are sent to the machine via a dedicated radio transmitter/receiver link for real-time implement control.
- + Ergonomic controls provide complete access to all machine functions.
- + Integrated electronics provide nearly the same response as if operating from the cab.
- + Console LED display delivers comprehensive equipment status information.
- + Console comes with batteries, charger, and shoulder harness.

* Some regions allow 900 MHz connections, consult your Cat Dealer for details.

REMOTE OPERATING STATION

NON-LINE-OF-SIGHT OPERATION



- + Ergonomic layout, universal controls and familiar machine displays allow for easy access to machine functions.
- + Controls deliver virtually the same response time as in the cab, maintaining precise control of all machine applications.
- + Reduce operator fatigue and improve productivity by eliminating the effects of machine vibration, sound and excessive site conditions.
- + Operators can switch between machines, changing jobsite locations with virtually no downtime.
- + Make it possible for operators with medical restrictions or physical disabilities to work remotely.
- + Enables trainers to stand beside an operator without noise or movement.

DISPLAY OPTIONS



STANDARD

- + Television Size: 43-50" (110 cm-130 cm)
- + Secondary Site Television Size: 43-50" (110 cm-130 cm)
- + Touch Screen Size: 22" (56 cm)



OPTIONAL

- Includes Standard Components Plus:
- + Tertiary Television Size: 43-50" (110 cm-130 cm)
- + Secondary Touch Screen Size 22" (56 cm)



CONFIGURABLE

- Includes Optional Components Plus:
- + Television Wall Mount

STATION CONTROLS



PEDALS

- + Adjustment Range: 3" (7.5 cm)

JOYSTICKS

- + Adjustment Range: 7" (17.5 cm)
- + ISO/SAE Pattern Configurable

SEAT

- + Adjustment Range: 9" (23 cm)
- + Recline Adjustment Range: 35°
- + Lumbar Adjustments: Five Positions
- + Headrest: Adjustable
- + Seat Material: Cloth
- + Operator Presence Switch

SWITCHES

- + Station Power
- + Park Lock
- + Implement Lock
- + Remote Shutdown Switch

STORAGE

- + Mouse Pad Area
- + Keyboard Shelf
- + Two Cup Holders
- + Storage Tray
- + Cell Phone/Tablet Holder

COMMAND REMOTE CONTROL

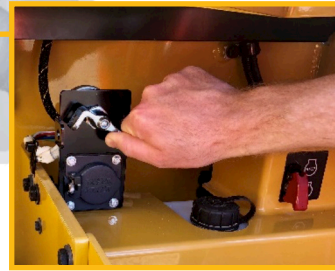
HOW IT WORKS

Dealer installed Command base and vision kits include hardware components such as indicator lights, receivers, harnesses, cameras, and mounting hardware kits are machine-specific. Command kits are designed to fully integrate with the machine's electronic and hydraulic systems for quick response and smooth control.

BLUE Remote Control Active
GREEN Manual Control Active (RC Off)
RED Remote Control Stop

Mode Indicator Light Status*

REMOTE CONTROL BASE KIT (CONSOLE & STATION)



Manual to Remote Operation Switch



Command Cameras & Mode Indicator Lights

REMOTE CONTROL VISION KIT (STATION ONLY)

NOTE: Wheel loader kits shown for illustration purposes, Command kits are machine specific.

* Excavators are equipped with an additional amber indicator light that is not currently utilized.

The Cat Command system requires a wireless network to communicate with all remote-controlled machines. The network design will vary depending on your job site requirements and the system you use, whether a Console or a Station. While a simple line-of-sight network will suffice for the Command Console, the Command Station may require a more sophisticated network and more advanced planning.

To ensure the successful deployment of Command, your Cat dealer has a multi-step commissioning process that includes the following steps:

- + **Machine Application Review** - Determines requirements to implement Cat Command for each machine.
- + **Site Application Review** - Identifies jobsite application, task, and production needs that can utilize Command technology.
- + **Wireless Site Survey** - Provides an understanding of the available wireless spectrum at the jobsite.
- + **End-to-End Network Design Review** - Confirms all network infrastructure and security requirements have been identified and planned for.
- + **Training Assessment** - Identifies all user roles and prepares them to utilize Command prior to deployment.

NETWORK CONFIGURATION OPTIONS

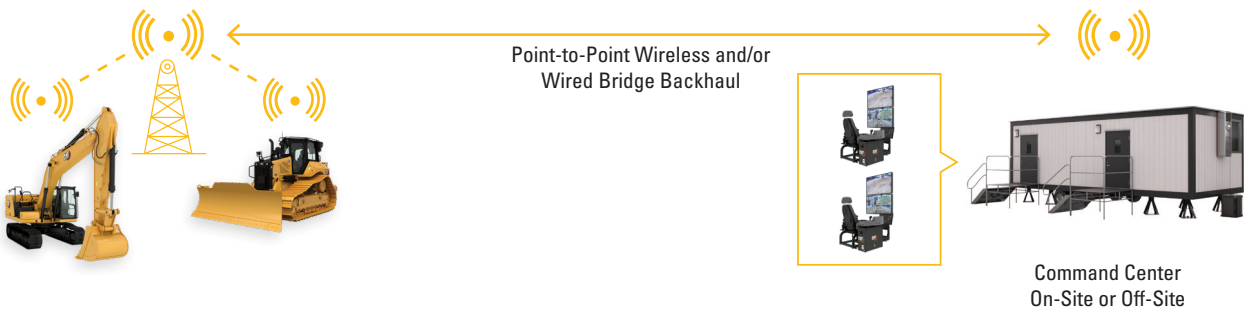
LINE-OF-SIGHT



POINT-TO-POINT



SINGLE ACCESS POINT



MULTIPLE ACCESS POINT/ROAMING





FULLY INTEGRATED SOLUTION

UNIQUE CAT REMOTE CONTROL BENEFITS

Unlike other remote control systems, Cat Command Console and Cat Command Station controls are fully integrated with the machine's electronic and hydraulic systems.

- + Maintain smooth, precise control from a safe location.
- + Select and activate machine features from the Command Station like an operator would in the machine: Grade, Payload, Assist, E-Fence, and more.
- + Switch between Command machines and change jobsite locations with virtually no downtime utilizing a Command Station.

COMMAND ADVANTAGE

RETAIN MACHINE EASE OF USE TECHNOLOGIES

Caterpillar's Ease of Use (EOU) technologies help operators control the machine more efficiently, improve accuracy, and enhance productivity. From intuitive controls to automated systems, EOU technologies maximize productivity while minimizing the learning curve.

The Cat Command system is fully integrated into the machine controls, including EOU technologies, allowing Command Station operators to retain all machine features. Command Console users may have some operator assist feature limitations; refer to the operation and maintenance manual for specifics.*

Ease of Use technologies vary by machine type. Some of the features include, but are not limited to:



EXCAVATORS

- Auto Heavy Lift** - Detects when a heavy load is present and automatically increases hydraulic lifting pressure by 8%.
- Cab Avoidance** - A safety feature within E-Fence that helps to eliminate the chance of an attachment striking the cab.
- Cat Grade** - Helps operators of varied skill levels hit target grade faster and more accurately.
- Cat Payload** - Provides on-the-go weighing to help operators hit exact targets every time and avoid overloading, under loading, or mis-loading materials.
- E-Fence** - Automatically stops excavator motion using predefined boundaries to avoid hazards – above, below, front, left & right swing.
- Lift Assist** - A safety feature that helps operators avoid tipping. Visual and auditory alerts warn operators when a load is over the safe working range limit.
- Smart Mode** - Automatically adjusts engine and hydraulic power to meet work demand with maximum fuel efficiency.
- Work Tool Recognition** - The Cat PL161 is a Bluetooth device that provides attachment location and enables automatic work tool identification.



DOZERS

- AutoCarry** - Automates blade lift to help get more consistent blade loads with each pass and reduce track slip.
- Blade Load Monitor** - Actively monitors machine load and track slip to help reach optimal pushing capacity.
- Cat Grade** - Get better accuracy, less rework, and lower costs in rough, fine and finish grade applications.
- Eco Modes** - Optimizes engine speed while maintaining ground speed and power to save fuel in lighter blade load applications like finish grading.
- Slope Assist** - Automatically maintains set blade position without a GPS signal – no additional hardware or software needed.
- Stable Blade** - Seamlessly works with operator inputs to help reduce imperfections and produce a smoother surface.
- Steer Assist** - Helps reduce operator fatigue by automatically maintaining straight travel with light loads on flat ground and side slopes.
- Traction Control** - Automatically reduces track slippage with no operator interaction, resulting in less ground disturbance and fewer passes.

* Operator assist features for the Command Console are not available in the Europe, Australia, and New Zealand.



WHEEL LOADERS

- Advanced Rimpull** - Controls machine torque to reduce unnecessary tire spin and tire wear in poor or slick ground conditions.
- Autodig** - Allows the operator to fully automate bucket loading to improve fill factors and loading time.
- Auto Set Tires** - Aids operators with proper digging technique by detecting pile engagement to reduce tire slip for longer tire life.
- Auxiliary Flow** - Allows operators to customize the auxiliary flow needed to run a hydro-mechanical tool and enable Continuous Flow for attachments.
- Cat Payload** - Provides on-the-go weighing to help operators hit exact targets every time and avoid overloading, under loading, or mis-loading materials.
- Engine Idle Shutdown** - Automatic system that significantly reduces idle time, overall operating hours, and fuel consumption.
- Machine Speed Limit** - Allows operators to control the machines top speed which helps save fuel by limiting runout speed in load and carry applications.
- Programmable Kickouts** - Automates repetitive tilt, lower and lift functions to reduce operator fatigue, resulting in higher efficiency for greater productivity.





ALL STOP TRANSMITTER

SAFETY STOP SWITCH FOR REMOTE CONTROLLED MACHINES

The All Stop / Autonomous Stop (A-Stop) system provides a way to remotely stop a Command equipped machine. The A-Stop radio communication system consists of an A-Stop receiver installed on the machine and a handheld transmitter. The handheld A-Stop transmitter is designed for personnel working in areas with Command controlled machinery. When activated, all machines within range of an A-Stop transmitter will come to a controlled stop.

A-STOP RESET

Used to stop transmitting a continuous signal. Command machines that enter into range after the Reset has been activated will not be stopped.

SYSTEM TEST

Used to initiate an A-Stop system test between the transmitter and any A-Stop equipped Command machine within range of the transmitter.

ALARM SILENCE

Used to silence the audible alarm during an A-Stop event.



A-STOP ACTIVATE

Used to continuously transmit an A-Stop radio signal to all Command machines within range. The A-Stop signal will transmit continuously until the A-Stop Reset has been pressed.

A-STOP CLEAR

Used to signal to all machines in range to exit A-Stop mode and enable normal operation. Each transmitter that has signaled an A-Stop must be cleared before any affected machine can resume operation.

A-STOP IN ACTION

SINGLE TRANSMITTER

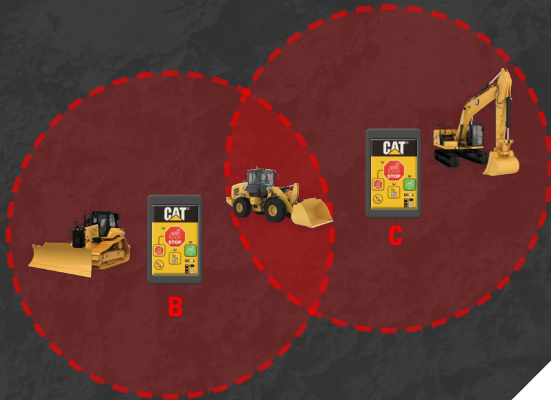
A-Stop (A) has stopped the excavator and compact track loader, however the dozer is still running as it is out of range.



MULTIPLE TRANSMITTERS

A-Stop (B) has stopped the dozer and the wheel loader. A-Stop (C) has also stopped the same wheel loader and the excavator.

For the wheel loader to resume operation, both A-Stops (B and C) will need to send a clear signal.



Maximum Operating Range
 300 m (984 ft) 868 / 919 MHz Versions
 100 m (328 ft) 992.6 MHz (Japan Only)

COMMAND IN ACTION

CUSTOMER TESTIMONIALS

“CAT COMMAND HAS TAKEN THE OPERATOR OUT OF THE DANGER ZONE.”

– STEVE SHULTZ, SUPERINTENDENT, PRESTON CONTRACTORS



Preston Contractors, a full-service construction contractor based in West Virginia (USA), is using Cat Command Consoles for dozer push outs at fine coal slurry impoundments.

Eliminating the need for people to work in potentially hazardous situations – such as working close to the water’s edge – operators now work away from the unforgiving quicksand like composition of slurry. The ability to work outside the cab and control the dozer remotely keeps operators out of the danger zone.

“WE HAD A VISION OF BEING ABLE TO MAKE A SAFER, MORE EFFICIENT, AND MORE COST-EFFECTIVE ENVIRONMENT.”

— JEFF MORTON, VICE PRESIDENT OF FINANCIAL PLANNING AND ANALYSIS, ASSOCIATED TERMINALS



Associated Terminals, a cargo handling and logistics company with facilities along the Gulf Coast of Louisiana (USA), is using Cat Command Stations to run wheel loaders and excavators.

Eliminating the need for people to work in potentially dangerous situations – such as running a machine in the cargo hold of a barge – operators now work from the company’s headquarters. They can switch between multiple machines in different locations from the same Command Station, in some cases hundreds of miles apart.



“CAT COMMAND HAS ALLOWED US TO REMOVE THE OPERATOR FROM HAZARDOUS ACTIVITIES.”

— FRANK MONTGOMERY, PRESIDENT, SAIIA

SAIIA, an industrial/heavy civil contractor in northern Alabama (USA), is using three Cat Command Stations and a Command Console around an ash pond site. The materials around these ponds can be unpredictable, especially during rainy conditions.

Operators control Cat excavators and dozers from inside a heated office trailer. Along with the comfortable work space, they appreciate not having to walk through muddy conditions or risk getting their vehicles stuck on the way to their machines.

STANDARD & OPTIONAL EQUIPMENT

Standard and Optional Equipment May Vary. Consult your Cat Dealer for Details.

COMMAND MACHINE KITS

REMOTE CONTROL BASE KIT	STANDARD	OPTIONAL
Mode Indicator Lights	●	
RC/Manual Mode Switch	●	
Electronic Control Modules, Harnesses, Brackets, Fuses, Relays	●	

REMOTE CONTROL VISION KIT	STANDARD	OPTIONAL
HD Cameras	●	
Microphone	●	
ECMs, Harnesses, Brackets	●	
Machine Radio Installation Kit	●	
Machine Radio, Antennas	○	

COMMAND STATION (NON-LINE OF SIGHT)

STATION MODULAR STRUCTURE	STANDARD	OPTIONAL
Detachable Display Mounting Mast	●	
Two-Piece Rigid Frame	●	
Detachable Cat Electronics Enclosure	●	

STATION DISPLAY SETUP	STANDARD	OPTIONAL
Machine Vision Television	○	
– Tilt Mount and Cables	○	
Operation Info Touch Screen	○	
– Dynamic Mount Arm	●	
– Cables	○	
Site Camera Television	○	
– Tilt Mount and Cables	○	
Secondary Touch Screen (Ex. Cat Payload)		○
– Dynamic Mount Arm		●
– Cables		○
Configurable 3rd Television		○
– 3rd Television Bracket		●
– Television Tilt Mount and Cables		○
Configurable	●	
– Remove Mounting Mast		
– Wall Mount Any Size TV		

SITE COMMUNICATIONS	STANDARD	OPTIONAL
Site Access Point		
– Manages Wireless Communication with the Machine	○	
Site Backhaul		
– Manages Communication between the Station and Access Point		○
Site Camera		
– Monitor Site-Level Hazards	○	

STATION CONTROLS AND ERGONOMICS	STANDARD	OPTIONAL
Pedals	●	
– Adjustment Range: 3" (7.5 cm)	●	
Joysticks	●	
– Adjustment Range: 7" (17.5 cm)	●	
Seat	●	
– Adjustment Range: 9" (23 cm)	●	
– Recline Adjustment Range: 35°	●	
– 5 Lumbar Positions	●	
– Adjustable Headrest	●	
– Cloth Seat	●	
– Operator Presence Sensor	●	
Switches	●	
– Station Power Switch (Lockable)	●	
– Park Brake Switch	●	
– Implement Lock Switch	●	
– Fire Suppression Enable Switch	●	
– Remote Shutdown Switch	●	
Storage	●	
– Mouse Pad Area	●	
– Keyboard Shelf	●	
– Two Cup Holders	●	
– Storage Tray	●	
– Phone/Tablet Holder	●	

STATION POWER AND CONNECTIVITY	STANDARD	OPTIONAL
Personal Computers	○	
– Personal Computer for Machine Vision and Interface	○	
– Personal Computer for Site Camera	○	
– Wireless Keyboard/Mouse	○	
AC-to-DC Power Supply (24VDC, 10A)	○	
AC Power Strip Extension	○	
Caterpillar Validated Ethernet Switch	○	
4 × Ethernet Cables	○	
2 × Power Cables	○	

● – Caterpillar Supplied Equipment
○ – Cat dealer or Customer Supplied Equipment

(Continued on next page)

STANDARD & OPTIONAL EQUIPMENT

Standard and Optional Equipment May Vary. Consult your Cat Dealer for Details.

COMMAND CONSOLE (LINE OF SIGHT)

STATION CONTROLS AND ERGONOMICS	STANDARD	OPTIONAL
Mode Indicator Lights	●	
RC/Manual Mode Switch	●	
Electronic Control Modules, Harnesses, Brackets, Fuses, Relays	●	
Console Control	●	
– Batteries, Charger, Shoulder Harness, RFID Chip	●	
Machine Receiver	●	
– Harness, Brackets, Hardware	●	


ALL STOP / AUTONOMOUS STOP (A-STOP)

RC SAFETY STOP SWITCH	STANDARD	OPTIONAL
Handheld Transmitter		●
Machine Receiver		●
– Harness, Brackets, Hardware		●

● – Caterpillar Supplied Equipment
○ – Cat Dealer or Customer Supplied Equipment

EQUIPMENT AVAILABILITY

Cat Command Availability May Vary by Region and Model. Consult your Cat Dealer for Details.

MACHINE PRODUCT FAMILY	COUNTRY / REGION AVAILABILITY	COMMAND CONSOLE	COMMAND STATION
 Compact Track & Skid Steer Loaders	North & South America, Japan	●	●
 Dozers	North & South America, Japan	●	●
	Europe, Australia	○	●
 Excavators	North & South America, Europe, Japan, Australia	●	●
 Wheel Loaders	North & South America	●	●
	Japan	○	○

● – Available
○ – Not Available (In Development)

For more complete information on Cat products, dealer services and industry solutions, visit us on the web at www.cat.com

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Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat dealer for available options.

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