

ONE ROBOT

UNLIMITED POSSIBILITIES

iRobot® 510 PackBot®

The modular, configurable,
multi-mission robot



iRobot®

ADAPTABLE EXPANDABLE MODULAR

Making A Difference

Proven Success

The iRobot 510 PackBot is one of the most successful battle-tested robots in the world. Fielded with military and civil defense forces around the globe, 510 PackBot performs search, reconnaissance, bomb disposal and other dangerous missions while keeping warfighters and first responders out of harm's way. More than 3,600 PackBot robots have been delivered to military and civil defense forces worldwide.

Modular Design

Powered by iRobot® Aware® 2 robot intelligence software, 510 PackBot is a modular, mission-configurable robot that performs a broad range of missions. The robot's modular design also enables ease of use, improved mission execution and flexible expansion. 510 PackBot is quickly reconfigured based on the needs of the mission and the robot operator's preferences.

Unlimited Expansion

510 PackBot accommodates a wide range of payloads and sensors, including a variety of manipulators, and easily adapts to the ever-changing requirements of bomb identification and other life-threatening missions.



One robot, many missions

- Explosive Ordnance Disposal
- Explosives Detection
- HazMat Detection
- Surveillance / Reconnaissance
- Checkpoint, Vehicle and Personnel Inspections
- Building and Route Clearance
- Emergency First Response

iRobot 510 PackBot

Multi-mission flexibility and unlimited customization options on a proven chassis

PackBot easily climbs stairs, rolls over rubble and navigates narrow, twisting passages with sure-footed efficiency. The robot traverses rock, mud, snow and other tough terrain at speeds of up to 5.8 miles per hour and climbs grades up to 60 degrees.

Operator Control Unit (OCU)

The rugged, lightweight 15" Amrel laptop OCU is easy to use and makes it easy to operate the robot.

The OCU features a graphical user interface with several highlights that increase ease-of-use and significantly reduce training time. Pre-set poses, available at the touch of a button, enable fast positioning of the robot. Plus, the robot operator always sees the operating environment and knows the position of the robot, thanks to on-screen views of real-time video from multiple high resolution cameras and 3-D graphics showing the robot's orientation.

The OCU is battery powered and can also be used with a supplementary power supply. The battery life of the robot and the OCU are displayed on screen at all times, allowing for easy monitoring.

Hand controllers

Modeled after video game-style controllers, PackBot's hand controllers make the robot easier to use, resulting in less training time and faster operations in the field.

Communications

PackBot accommodates a variety of plug-and-play communications modules, including a 2.4 GHz radio, a 4.9 GHz radio and a fiber optic spooler.

Manipulators

Strong and dexterous manipulators enable the robot to lift and carry a variety of objects and allow for precision targeting and placement of disruptors and other tools.

iRobot® Aware® 2 robot intelligence software

Aware 2, the premier deployment-grade robot intelligence software, enables plug-and-play integration and fast and easy robot operations in the field. PackBot's digital architecture, powered by Aware 2, accommodates a wide variety of interchangeable payloads that enable multiple missions. Each of the eight payload ports is equipped with state-of-the-art electronics, including Ethernet, USB, power and two video channels. The robot can be reconfigured quickly, based on the needs of the mission and the operator's preferences.



for EOD Technicians

Ultimate protection for IED disposal

510 PackBot for EOD Technicians quickly adapts to a variety of IED and conventional ordnance missions:

- Explosive Ordnance Disposal
- Explosives Detection
- Surveillance / Reconnaissance
- Building and Route Clearance
- Checkpoint, Vehicle and Personnel Inspections
- Emergency First Response

Key features

Advanced Manipulator

The strong and dexterous manipulator lifts up to 30 pounds with the arm in a compact position, picks up objects as small as a quarter and grips and opens a doorknob. The turret rotates 360 degrees, allowing for precision targeting and placement of disruptors.

Multiple Cameras

A pan-tilt-zoom camera with 312x zoom enables optimal surveillance, even in low light. A drive camera allows for forward, rear, upward and downward views. Two arm cameras provide enhanced views for manipulation and operation.

Secure Firing Key

The digital firing key stores unique encrypted codes that prevent unauthorized use of the firing system.

for HazMat Technicians

Comprehensive HazMat detection

510 PackBot for HazMat Technicians detects and identifies dangerous chemical, radiological and organic compounds, providing warfighters with critical information on a range of missions:

- HazMat Detection
- Explosive Ordnance Disposal
- Explosives Detection
- Surveillance / Reconnaissance
- Building and Route Clearance
- Checkpoint, Vehicle and Personnel Inspections
- Emergency First Response

Key features

Gas Detection Meter

A combination of a PID (Photoionization Detector) and a confined space monitor, the gas meter detects oxygen, combustible gases, volatile organic compounds, carbon monoxide, hydrogen sulfide, sulfur dioxide, nitric oxide, nitrogen dioxide, chlorine, hydrogen cyanide, ammonia and phosphine. From Rae Systems.

Chemical Warfare Agent Detector

Constantly samples the air for traces of nerve, blister, toxic industrial compounds, blood and choking agents. From Smiths Detection.

Gamma Radiation Detector

Provides real-time constant sampling and alerts for gamma radiation. From Canberra.

for Combat Engineers

Specialized IED inspection

510 PackBot for Combat Engineers provides military and civil defense engineers with a single, advanced solution for multiple missions:

- Explosive Ordnance Disposal
- Explosives Detection
- Surveillance / Reconnaissance
- Building and Route Clearance
- Checkpoint, Vehicle and Personnel Inspections
- Emergency First Response

Key features

Ordnance Lift System

Rear-mounted system digs around, moves and carries objects as large as 155 mm shells that weigh as much as 100 pounds.

Flipper Tool Bar

The expandable toolbar includes a customizable suite of combat engineer tools, including wire cutters, a spade, a rake and other hardened tools that make it easier to identify and overcome obstacles.

Thermal Camera

Infrared technology provides superior images in complete darkness, smoke and common battlefield obscurants, providing situational awareness in challenging environments.



for First Responders

Safer civil defense operations

510 PackBot for First Responders provides SWAT teams, bomb squads and other emergency personnel with situational awareness in dangerous scenarios:

- Explosive Ordnance Disposal
- Explosives Detection
- Surveillance / Reconnaissance
- Building and Route Clearance
- Checkpoint, Vehicle and Personnel Inspections
- Emergency First Response

Key features

Disrupter Flexibility

PackBot accommodates a variety of non-lethal disruptors, including the PAN™, Proparms, Chemring and PeraDis®.

PackBot for First Responders is available from the U.S. General Services Administration.



for Armed Forces

Fast tactical maneuvers

510 PackBot for Infantry Troops easily adapts to the ever-changing requirements of bomb identification and other life-threatening infantry missions:

- Explosive Ordnance Disposal
- Explosives Detection
- Surveillance / Reconnaissance
- Building and Route Clearance
- Checkpoint, Vehicle and Personnel Inspections
- Emergency First Response

Key features

Small Arm Manipulator

Designed for explosive hazard identification and disposal, the Small Arm Manipulator extends 39.5 inches (100 cm) and has a lifting capacity of 15 pounds with the arm in a compact position.

Camera Arm

The Camera Arm automatically follows the gripper on the manipulator, providing close-up images that enable the fast, precise and safe inspection and removal of suspicious objects.

Enhanced Awareness Payload

The Enhanced Awareness Payload includes a wide-angle drive camera, two-way audio, white and infrared illumination and an extra accessory port.



User Assist Package (UAP)

The UAP adds semi-autonomous capabilities to 510 PackBot.

The UAP makes it faster and easier to use the robot and safer for the operator.

Robot capabilities

The UAP adds semi-autonomous capabilities to PackBot:

Retro-traverse

If communications are disrupted, the robot automatically retraces its approach path to restore them.

Self-righting

If the robot is flipped over, it automatically rights itself and continues the mission.

Heading hold

The robot maintains a constant heading set by the operator, automatically adjusting for bumps, debris and other obstacles.

OCU capabilities

The UAP includes operational improvements for the OCU:

GPS mapping

The OCU displays a satellite image of the robot's location and travel path, including stand-off distance, current GPS position and points of interest indicated by the robot operator.

Custom poses

The operator can create, name and save manipulator arm poses in the OCU and use them on subsequent missions at the touch of a button.

Gripper force meter

An OCU icon shows the relative gripping force, helping the operator determine that the robot has successfully grasped an object of interest.

Precise positioning

The operator can move the robot's gripper and camera head in a smooth, natural and continuous motion.

Keyboard shortcuts

The operator has the option to control the robot using keyboard shortcuts on the OCU, instead of the hand controller, for faster operations.

Image capture

The operator can save high resolution images from video feeds and screenshots on the OCU for post-mission analysis.

510 PackBot – Details and Specifications

PackBot 510 chassis

- On-board computer with overheat protection
- 8 payload bays
- Global Positioning System (GPS)
- Compass
- Accelerometers
- Inclinometer
- Dismounted firing circuit
- QuickClamp Fireset and auxiliary port
- Rugged, sealed hard case
- Users manual and documentation

Speed

Up to 5.8 mph (9.3 kph)

Height

7" (17.8 cm) with no payload or manipulator

Width

16" (40.6 cm) without flippers
20.5" (52.1 cm) with flippers

Length

27" (68.6 cm) with flippers stowed
35" (88.9 cm) with flippers extended

Weight

About 24 lbs (10.89 kg) without batteries

Operator Control Unit (OCU)

Size

11.6" L x 13.3" W x 2.5" H
(29.5 cm L x 33.8 cm W x 6.35 cm H)

Weight

11.85 lbs (5.38 kg) laptop only, not including hand controller, radio module or antenna
15.45 lbs (7.01 kg) includes hand controller, radio module antenna and wall charger

Environmental

All-weather operation

Screen

- 15.1" (38.1 cm) XGA (1024 x 768 resolution) anti-reflective TFT LCD
- Multi-image display with full screen option
- 3-D active model of robot
- Auxiliary USB, Ethernet, video output
- Image capture capability
- Gauge display of battery power
- Gauge display of fiber
- Gauge display of communications signal strength

Power Sources

- Removable 11.1V/7200mAh lithium-ion battery
- AC adaptor (90V-240V) with 50/60Hz input

Hand controllers

- 2 hand controllers

Communications

- Digital radio – 2.4 GHz or 4.9 GHz
- Two-way audio
- Headphone with microphone
- Multiple high resolution cameras

Batteries, cradles and chargers

PackBot is powered by two BB-2590/U lithium-ion rechargeable batteries, providing more than 4 hours of continuous runtime on one charge – up to 10 miles of travel. (A set of spare batteries is also included.)

- 4 BB-2590/U lithium-ion rechargeable batteries
- 2 BB-2590 battery cradles
- Battery charger

Accessories

Manipulator 1.0 (510 3-Link Arm)

- Multiple pre-set positions
- Targeting-head tracking gripper
- 8 independent degrees of freedom
 - Shoulder Rotation: 360° Continuous
 - Shoulder Pivot: 220°
 - Elbow 1 Pivot: 340°
 - Elbow 2 Pivot: 340°
 - Gripper Rotation: 360° Continuous
 - Gripper Open and Close: 180°
 - Head Rotation/Pan: 360° Continuous
 - Head Tilt: 220°

Extension

73.5" (187 cm)

Lifting capacity

10 lbs (4.54 kg) at full extension
30 lbs (13.61 kg) at close-in position

Weight

20.55 lbs (9.32 kg)

Small Arm Manipulator (SAM)

- Multiple pre-set positions
- Targeting-head tracking gripper
- 4 independent degrees of freedom
 - Shoulder Pivot: 185°
 - Elbow Pivot: 335°
 - Gripper Rotation: 360° Continuous
 - Gripper Open and Close: 180°

Extension

39.5" (100 cm)

Lifting capacity

5 lbs (2.27 kg) at full extension
15 lbs (6.80 kg) at close-in position

Weight

8.2 lbs (3.72 kg)

Camera Arm (CAM)

- Multiple pre-set positions
- Targeting-head tracking gripper
- 3 independent degrees of freedom
 - Shoulder Pivot: 185°
 - Head Rotation/Pan: 360° Continuous
 - Head Tilt: 220°

Extension

23.5" (60 cm)

Weight

5.75 lbs (2.61 kg)

► **For more information, an accessories catalog, a demonstration or a quote, contact iRobot.**

iRobot designs and builds robots that make a difference on the land and in the water. Founded in 1990, iRobot has two decades of experience at the forefront of the global robot industry.

iRobot's government and industrial robots provide enhanced situational awareness, reduce risk and increase mission success.

As a leader in the global robot industry, iRobot remains committed to providing platforms for invention and discovery, developing key partnerships to foster technological exploration and building robots that improve the quality of life and safety standards worldwide.

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