COMBATING THE CBRNE THREAT

By Kim Monti, Senior Product Manager and Rob Birmingham, Director, U.S. Government Programs

Highly-trained response teams operate in dynamic and challenging urban, rural, or wilderness environments. Above all, they must successfully locate, isolate, and interrogate CBRNe threats to keep personnel and civilians out of harm's way and protect vital physical assets.

When responding to CBRNe threats anywhere in the world, these teams require physically rugged, reliable equipment with adaptive capabilities. The challenge of keeping responders safe during potential CBRNe threats even in extreme climate conditions has been met by integrating ground robots with response teams. The 510 PackBot equipped with the CBRNe sensor suite provides the team with real-time situational and incident data.

Multi-Capability Experience

With more than 20 years developing practical robots for defense and industrial applications, Endeavor Robotics™ (formerly known as iRobot® Defense & Security) has delivered more than 6,000 mobile robots to 42 nations and greater than 100 law enforcement agencies, emergency and hazardous material responders worldwide.

The PackBot's mission-critical mobility, maneuverability, and sustainability capabilities have been confirmed by user acceptance ratings and mission feedback that cites the system's key features and benefits.

510 PackBot CBRNe fills the technology gap of keeping responders at a safe standoff distance yet getting real-time situational information on hazards and infrastructure.

The robotic system operates in extreme environmental and weather conditions and provides operators with current meteorological data.

The PackBot's modular manipulator arm hosts multiple positions for sensor attachment, as well as disrupter attachment, aiming and remote firing; the arm has a 30-lb. lift capacity and the ability to view objects up to 90 in. above ground level. The chassis can be quickly outfitted with a large variety of payloads while maintaining full mobility on steep stairs and challenging outdoor terrain.

PackBot has been delivered worldwide and been credited with saving and protecting countless lives while performing CBRNe, EOD/IED, ISR, and numerous other tactical missions. It has also increased safety, improving efficiency and protecting responders and soldiers, the public, the environment and critical assets from damage or destruction.

International Presence

More than 4,000 PackBots have been delivered to military CBRNe, EOD, civil defense, industrial and power generation teams worldwide. All systems have provided customers with pathways for service and upgrade to insure maximized robot deployment and capability.

The 510 PackBot is one of the most successful battle-tested robots in the world with the broadest, multi-market application. It leverages the battle-tested rugged platform's performance history with seamless integration of a suite of CBRNe sensors to increase responder's safe-distance from danger while gathering actionable intelligence, and protecting responders, workers, the public, and the environment.


(510 PackBot)

Inherent in the current robot design are eight different ports for data and power transmission. The highly adaptable CBRNe platform, provides for each customer's integration of the sensors, tools and other accessories. Responders may integrate a wide variety of sensors to configure a customizable sensor suite.

As an example, our most current configuration includes integrated sensor systems that reliably detect, log, alert, and report on Chemical Warfare Agents, Toxic Industrial Chemicals, Volatile Gases, Explosives, Radiation, and more.

Multi-Purpose Robot

The 510 PackBot also accepts an optional payload for displaying satellite images of the robot's location and travel path, complete with distance and GPS coordinates. This capability allows capturing high-resolution images of hazards, marking points of interest on the map, and correlating with sensor data.

The sensors integration is facilitated by Endeavor Robotics developed software to process sensor data, provide power and supports mounting sensors in multiple locations for customized configuration.

As an example of its versatility, the 510 PackBot has performed in the following adverse environments:

- Military tasks: supporting peacekeeping missions in Afghanistan and Iraq
- Disaster support: performing investigation and surveillance inside the highly radioactive environment of the nuclear facilities of Fukushima Daiichi
- Acts of terror: on-site exploration for survivors at Ground Zero post 9/11
- Threat response: reconnaissance, recognition and assessments the 2013 Boston Marathon bombing
- Law enforcement: day-to-day "mobile" support for perpetrators and victims of theft, kidnapping, illegal drugs and other contraband
- Domestic security: support of Brazil major events, including FIFA Confederation Cup, the 2014 World Cup, and upcoming 2016 Olympics
- Industrial: investigation and sampling performed in high radiation and corrosive hazardous chemical environments. ■



110 FirstLook: The 110 FirstLook is light, small and stores in a compact load-out. The robot weighs 5 pounds and is 10 inches long, 9 inches wide and 4 inches tall. It can survive 16 foot drops onto concrete and is waterproof up to 3 feet. Maneuverable in a variety of environments, FirstLook climbs obstacles up to 7 inches high, overcomes curbs, turns in place and self-rights when flipped over.

310 SUGV: The portable 310 SUGV can be easily carried and deployed from a pack. The robot weights 30 pounds and can be made to fit into packs with 9 inch by 28 inch clearances. Equipped with wide-angle color, IR and zoom cameras, SUGV can maintain on-task and on mission for up to four hours. The SUGV manipulator can lift as much as 15 pounds and also supports numerous disruptor solutions.

510 PackBot: The man-transportable PackBot, deployable in less than two minutes, can reach speeds of up to 5.8 mph, overcome stairs, obstacles and debris, supports numerous disruptors and a broad array of sensors that deliver predictable intelligence in real-time. PackBot climbs grades up to 60 degrees, is submersible in three feet of water and is operational in all weather environments. The game-style controller makes the robot easy to use.

710 Kobra: The 710 Kobra can reach as high as eleven feet, easily climb stairs, fit through doorways or down aisle-ways and deploy from the back of a standard SUV. Able to reach speeds of 8 mph while carrying 150-pound payloads, the 710 Kobra maintains mobility on rough terrain in all weather conditions.