

No Need to Choose Between Manned, Unmanned, Company Says

Need a manned vehicle? Need an unmanned vehicle?

As long as you have a steering wheel Kairos Autonomi says you can have both.

The Salt Lake City-based company has developed a robotic device called Pronto4 that can be strapped on any vehicle or vessel with a steering wheel to make it unmanned and useable in hostile territory.

"We can put it on anything that has a steering wheel. There really is nothing that needs to be unique about the kit except the steering modules," said Thomas Glover, the company's communications and marketing manager.

The cost of the product is far cheaper than manufacturing a complete robotic vehicle for use at the battlefield, for example, and it can be adapted in many different ways for commercial and military use, according to Glover.

Glover says a patent is pending for the device, which costs about \$28,500 for a kit that weighs less than 100 pounds and is useable in many environments. The company is working with other companies that may be interested in partnering to distribute Pronto4.

The device is easily handled by a driver. Tapping the brake returns the vehicle to manual mode, just like cruise control, and it eliminates the need for special training. Glover says Pronto4 can use an existing vehicle supply chain. The kit can be taken into the field and deployed in less than four hours and can be used by civilian police, homeland security and the military, he said.

"It's still a new way of thinking for people. The market is coming to realize that with a remote-operated unmanned system, you can still drive away in the vehicle," Glover says.

Pronto4 can communicate in a tele-operational mode in a wired or wireless mode over almost any media. In tele-operations the command to move comes from the outside. In the semi-autonomous operations, the authorization to move comes from the outside, but the command to move comes from another local computer.

"Multiple factors make the Pronto4 desirable to the military — the small size, low cost and flexibility in being applied to any vehicle or vessel with a steering wheel are few," says George A. Takachi Jr., president and chief technology officer of Kairos Autonomi.

Glover said the Pronto4 is adaptable to SUVs, sedans or a minivan, the kind of vehicles that are used for covert operations in Iraq or Afghanistan. It has not yet been used in any theater, according to Glover. And while it has been tested on minivans, sedans and trucks, it has not been tested on a Hummer.

"We do have some groups using it, people interested in driving vehicles for mine and counter-mine and to use it for covert operations," Glover said.

"The market is just beginning to realize that optionally unmanned systems and strap-on autonomy technology are significantly more affordable than purpose-built autonomous systems and much more immediately fieldable," Takachi says.

By using existing training and supply chains, they create immediately available "flexible solutions to real-time problems

facing today's military."

Pronto4 runs on Windows XP, an open architecture Windows-based system. The system is able to adapt to different kinds of communications systems, Grover says.

He also says the company is working on developing a manipulator arm that hooks into a hitch of a remote vehicle. A customer could drive the vehicle out to where it needs to be and use the remote arm at the site.

DesignJug created Kairos Autonomi last year, spinning off the Pronto4 technology used in DesignJug's 2005 entry into DARPA's Grand Challenge unmanned vehicle race. DesignJug's entry, Team Juggernaut, made it into the National Qualification Event but not the final. The team returned to the Nevada desert course a month later and ran 63 miles of it before a vehicle mechanical problem, unrelated to the Pronto4, halted the test run.

DesignJug plans to again use Pronto4 to compete in this year's Grand Challenge, which will simulate military resupply missions in a mock urban area, including traffic. Two other teams, from Brigham Young University and the University of Utah, also will use the Pronto4 system in their Grand Challenge vehicles. The competition, named Urban Challenge, is set for Nov. 3 at a location to be announced Aug. 10.

DOD Awards Funds for Unmanned Research

Universities examining unmanned vehicle systems were among 36 academic institutions awarded \$207 million over the next five years by the U.S. Defense Department for basic research.

The Massachusetts Institute of Technology is heading up research into human-robot interactions in "urban military domains". The project title is "cognitively compatible and collaboratively balanced human-robot teaming in urban military domains."

The University of Notre Dame is heading up research in the same overall category, focusing on "effective human-robot interaction under time pressure through robust natural language dialogue and dynamic autonomy." Both efforts are funded by the Office of Naval Research (ONR).

Boston University is heading up research into "behavioral dynamics in the cooperative control of mixed human/robotic teams."

Brown University and the University of Michigan are heading research into biologically inspired flight for micro air vehicles, with UM looking into "anisotropic flexible wing for optimal flapping flight. Both projects were funded by the Air Force Office of Scientific Research (AFOSR).



Kairos Autonomi's Pronto4 system fitted to a Jeep.