



iTrack

# AUTONOMOUS VEHICLE CONTROLLER

PERSONNEL TRACKING AND ROBOTIC NAVIGATION



**The Local Positioning & Tracking System (LPTS) allows the user to rapidly setup a precise position tracking system in an environment where GPS is unavailable or unreliable. The LPTS provides solutions for personnel tracking and for autonomous robotic localization/navigation.**

## Features:

- ◆ Complete stand-alone position tracking system without the need for GPS input.
- ◆ Full self-configuration in less than 5 seconds
- ◆ Infinite scalability
- ◆ Positioning off other moving targets
- ◆ 2D and 3D tracking capability
- ◆ Minimum of 2 beacons in range for 2D tracking
- ◆ Easy-to-use graphical user interface
- ◆ Personnel tracking and autonomous robotic navigation with one single system
- ◆ Can augment existing positioning systems. E.g. which use GPS or Laser.

JADI's Autonomous Vehicle Controller (AVC) is an innovative navigation and guidance product that delivers autonomous capability to mobile robots. Our versatile AVC can be interfaced with most existing unmanned and manned vehicles. The AVC provides functionality for a robot to do waypoint or target following, collect situational awareness for obstacle avoidance, and provides a high-level interface with a human operator.

Our AVC incorporates most essential functions required for unmanned guided vehicles (UGV). It interfaces to global and proximity sensors and to an on-board sensor network. This enables the AVC to perform sensor fusion, perceive its surrounding environment, modify path/motion planning and adaptively control the vehicle as it interacts with control and guidance commands from human operators.

JADI's AVC features an embedded wireless network (IEEE 802.11), GPS,

CAN networks, multiple serial and parallel communication ports, and an inertial measurement unit. The AVC uses the latest generation 32-bit PowerPC processor to execute the autonomous robotic functions. Its design utilizes off-the-shelf components proven in the automotive environment. The JADI AVC is compliant with the Microsoft Robotics Studio (MSRS) architecture which enables it to be compatible with MSRS supported systems.

JADI provides a full system solution for autonomous guidance of robotic vehicles. This system includes our AVC, our reconfigurable ultra-wideband (UWB) local positioning system (LPS), a global positioning system (GPS), and JADI's GeoPath-Maker™ trajectory planning tool. This versatile and comprehensive system provides both indoor and outdoor guidance solutions for most autonomous robotic applications.

JADI's Autonomous Vehicle Con-

troller provides autonomous control to drive-by-wire vehicle platforms. The system provides for positioning through the LPTS and takes additional sensor inputs from the vehicle and inertial sensors into account to navigate the vehicle.

Multiple standard communication interfaces are available to integrate an AVC on an existing platform.

Tracking information can be provided in either GPS coordinates or local GPS-independent coordinates.

Typical applications of the AVC are defined by trajectories and optional object avoidance or collision avoidance schemes.

The user interaction with the system takes place through iTrack's GeoPathMaker® software.



### Specifications:

◆ Robotic Module weight	1.5 lbs
◆ Personnel Tracking Module weight	0.25 lbs (ex. Battery)
◆ Beacon weight	5 lbs
◆ Power consumption	1 W
◆ Robotic Module size	5" x 5" x 2.5"
◆ Personnel Tracking size	2.25" x 3.75" x 0.5"
◆ Beacon size	7.25" x 4.75" x 2.25"
◆ Update rate	20 Hz
◆ Horizontal accuracy	± 4"
◆ Vertical accuracy	± 1'
◆ Directional accuracy	± 5 deg
◆ Frequency of Operation	6.1—6.6 GHz
◆ Temperature range	-40—70 °C
◆ Operator Interface	Windows XP or Vista

### Benefits:

- ◆ Ability to track first responders in a hostile environment without the need for existing infra-structure or elaborate system setup.
- ◆ Replacement of personnel by autonomous robotic systems for certain tasks that are mundane and repetitive, or that are hazardous.
- ◆ Semi-autonomous operation for tele-operated robots. For example: 1) autonomously bringing a robot to and from a stand-off vehicle checkpoint; 2) autonomously tracking a manually driven trajectory back to the operator location.
- ◆ Situational awareness within the commanding vehicles. I.e. the crew of a Striker vehicle can track precise relative location of dismounted warriors and autonomous robots to the vehicle.

## iTrack, LLC

2200 North Squirrel Road  
Rochester, MI 48309

<http://www.itrack-llc.com>

Contact: Jerry Atkinson  
Phone: 248-648-4777  
Fax: 248-648-4799  
[jerry.atkinson@itrack-llc.com](mailto:jerry.atkinson@itrack-llc.com)