



iTrack

# PRECISE POSITION TRACKING SYSTEM

HIGH PERFORMANCE AD-HOC POSITIONING & NAVIGATION CONTROL SYSTEM



The Local Positioning & Tracking System (LPTS) allows the user to rapidly setup an ad-hoc accurate 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:

- ◆ Ad-hoc precise positioning suited for aerospace maintenance, ship-building, etc.
- ◆ Complete stand-alone position tracking system without the need for GPS input.
- ◆ Full self-configuration and calibration in several minutes.
- ◆ 2D and 3D tracking capability
- ◆ Minimum of 3 beacons in range for 2D tracking
- ◆ Easy-to-use graphical user interface
- ◆ Application tailored ASCII interface protocol for user-defined applications.
- ◆ User configurable preference for accuracy vs. Conversion time.
- ◆ Can augment existing positioning systems. E.g. which use GPS or Laser.
- ◆ Convenient motion tracking feedback with visual (multi-color LEDs) and audio cues.

The Precise Positioning system is a high performance position tracking system for ad-hoc applications where centimeter-accurate positioning in space is required. The system utilizes discrete RF-based range measurement technology from Time Domain Corporation, in combination with three-dimensional motion capture sensors including accelerometers, gyroscopic sensors, electronic compass, etc. The system is highly robust against RF multipath error, making it the system of choice for indoor or cluttered environments. With the ability to detect line-of-sight measurements, the system can further optimize performance, matching accuracy that would normally require laser-based position tracking installations.

The technology is best suitable for slow-moving or quasi stationary measurements, like manufacturing and maintenance of large vehicles, but can be optimized for tracking motion through space, with additional motion information inputs from the moving target object.

The TNS-400 includes a number of beacons—dependent on the application—and one or more tracking modules. The tracking system is ideally suited for portable and ad-hoc applications. The beacons can be deployed on stand-alone tripods (available as a system option) or can be mounted in the operat-

ing environment. The system calibrates and configures fully automatically, eliminating the need for tedious measurements and data entry. This prevents potential human error and allows for the average user to deploy the system in matter of minutes.

The TM-400 tracking module includes the onboard motion sensors and the processing power to compute the position tracking information. There is no need for a central computer, wireless network, or additional cables to operate the system. The TM-400 communicates the tracking data through a USB interface, which also provides the power to operate.

The system has the ability to provide tracking data relative to any object in the tracking environment. To do so, the user will mark two reference points on the object to establish the relative reference frame, which then is used as the basis for tracking.

iTrack provides a Graphical User Interface software GeoPathMaker™ to operate the system and conduct most tracking operations. The intuitive ASCII-based interface protocol allows for easy implementation of any user host application is desired.



The optional features of the TM-400 allow for interfacing through CAN bus for vehicle tracking and navigation, and for wireless interfacing through 802.11. These features make the TM-400 ideally suitable for implementation in any tracking environment and application.

Applications include personnel tracking, autonomous vehicle guidance, reference marker registration, equipment utilization, etc. Dynamic tracking of parts, tools, robot positions, AGVs and ship models in water tanks. Handheld large volume inspection in automotive (engineering lab, racing workshop), aerospace and other industries like casting and turbine blade production. Automatic annotation of handheld measurements with positional information.

In order to optimize performance for the user's specific needs, the iTrack team will assist the customer in defining performance specifications and requirements. We will then provide engineering support to develop an application-specific Software Integration Package (SIP), which guarantees that the system meets the client's needs.

iTrack's commitment to satisfied customers includes continued assistance and support, at any desired level. Our long-term warranty and service packages guarantee that the technology remains up to date and at top performance.

The technology is protected under patents 8010133, 7403783 and 7403783, and applications 20110313716, 20080234930 and WO/2005/08102A1.



### Specifications:

◆ Personnel Tracking Module weight	0.25 lbs (ex. Battery)
◆ Beacon weight	5 lbs
◆ Power consumption	5 W
◆ Robotic Module size	5" x 5" x 2.5"
◆ Robotic Module weight	1.5 lbs
◆ Personnel Tracking size	2.25" x 3.75" x 0.5"
◆ Beacon size	7.25" x 4.75" x 2.25"
◆ Update rate	50 Hz
◆ Horizontal accuracy	± 1"
◆ Vertical accuracy	± 4'
◆ Rotational accuracy	± 5 deg
◆ Frequency of Operation	3—6 GHz
◆ Temperature range	-40—70 °C
◆ Operator Interface	Windows XP or Vista

### Benefits:

- ◆ Accurate real-time position measurement without the need for measuring tape.
- ◆ 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 too complicated to control manually through an operator control interface, that are mundane and repetitive, that require fast and precise vehicle positioning, 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.
- ◆ Marking and tracking reference locations on randomly orientated objects in the tracking space.

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