NEON Squad Tracker

GPS-Denied Location

NEON® Squad Tracker is a low SWaP, GPS-denied navigation solution for dismounted warfighters. Squad Tracker provides ubiquitous location, tracking and mapping for personnel operating in areas where GPS is unavailable, in a solution easily integrated into military position, navigation, and timing (PNT) architectures.

- Sensor fusion for dismount personnel
- Flexible 3rd party constraint processing
- Integrates with resilient PNT sources
- Warfighter map/waypoint check-in
- UWB ranging and constraint sharing
- Operation indoor, underground, and outdoors
- API delivers warfighter location, motion, gait
- ATAK and Nett Warrior Plug-Ins*

Accurate location information is critical for enabling improved navigation, situational awareness, targeting, and mapping. GPS-may be denied in triple canopy, urban canyons or indoor and subterranean environments, and can be easily jammed or spoofed.

NEON Squad Tracker uses a suite of patented algorithms to opportunistically fuse inertial sensor data, GPS (including resilient GPS sources), warfighter waypoint check-in), and ultrawideband shared constraints and "dropped beacons", along with position location information from third party systems sources (psueodolite, satellite, etc.) to deliver reliable GPS-denied location.

Squad Tracker is deployed as an Android location service with a small, body worn tracking unit. Squad Tracker is easily integrated as a subsystem of an overall PNT architecture that extends operations when dismounted personnel are operating in naturally or intentionally denied environments.

Key Features

Low SWaP Sensor Fusion

Android-based NEON Location Service delivers real-time 3D location (X, Y, Z), timestamp and error bound estimates.

Flexible Constraint Processing

Constraint filter supports resilient GPS sources as well as Gaussian and non-Gaussian 3rd party constraints through API

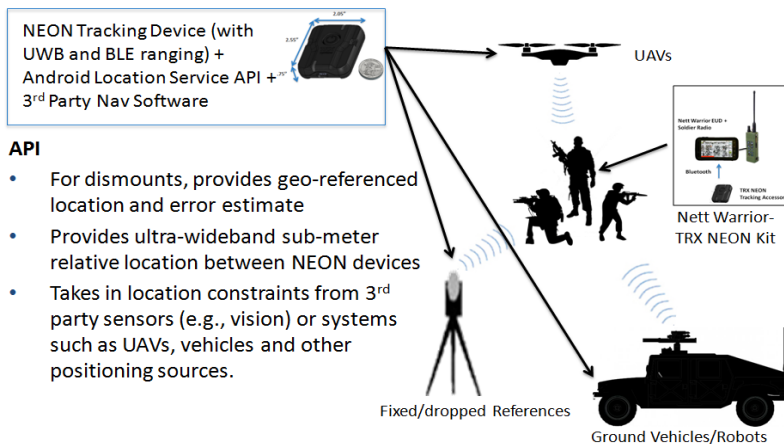### Precise Detail on Movement and Activity

Enables real-time classification of soldier activity and status.

API For Simple Integration

Interface for third party developed applications provides real-time user context and location.

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NEON Squad Tracker can be easily integrated with and accepts many different location inputs including:

- ❖ An internal/external GPS or SAASM GPS
- ❖ A user/soldier location correction via the user interface
- ❖ A dropped UWB NEON beacon
- ❖ Shared PLI information from a nearby soldier
- ❖ An external PLI source (via API)

NEON Tracking Device (with UWB and BLE ranging) + Android Location Service API + 3rd Party Nav Software

API

- For dismounts, provides geo-referenced location and error estimate
- Provides ultra-wideband sub-meter relative location between NEON devices
- Takes in location constraints from 3rd party sensors (e.g., vision) or systems such as UAVs, vehicles and other positioning sources.

UAVs

Nett Warrior EUD + Soldier Radio

Bluetooth

TRX NEON Tracking Accessory

Nett Warrior-TRX NEON Kit

Fixed/dropped References

Ground Vehicles/Robots

Technical Data

NEON® Tracking/Anchor Units

Dimensions (H x W x D)	52 x 66 x 19 mm (2.1 x 2.6 x 0.75 in)
Operating Temperature	-20 to 60 °C (-4 to 140 °F)
Battery*	Lithium Polymer
	BLE (TU8B): 8-10 hours
*(Can also connect to soldier power)	UWB (TU8U): 6-8 hours
Android connection	Bluetooth or USB

NEON Performance/Accuracy (typical)

Horizontal Error**	5-10 meters or better (Indoor)
	5-20 meters (Outdoor GPS-denied)
Vertical Error**	+/-1 meter (Indoor)
UWB LOS Ranging Error	<1 meter (TU8U)

**Location accuracy is affected by precision of initialization, frequency of user check-ins, sensor integrity, UWB/BLE ranging and map information. Outdoor, accuracy degrades with time and distance traveled.

Multi-Purpose NEON Tracking/Anchor Units include temperature compensated gyroscopes, accelerometers, magnetic field sensors, and a barometric pressure sensor. Model TU8B supports BLE ranging; Model TU8U supports BLE and UWB ranging.

NEON Location Service API   Mobile Applications

NEON Device Library
Navigation Engine and Sensor Hub Software

Mobile or Wearable Device Sensors

NEON Location Technology

The NEON Location Service leverages TRX's patented sensor fusion and constraint algorithms and software to deliver real-time location for dismount personnel within GPS-denied areas.

The intelligence of the sensor fusion portion of the NEON software lies in part in its ability to isolate and select the areas in which a sensor's estimates are most accurate while eliminating the rest. This makes it possible use low SWaP sensors and at the same time extend the periods between receipt of location constraints.

The constraint engine implements corrections and accepts constraints to reinitialize the solution so that sensors inherently subject to inertial drift, magnetic interference and other errors can effectively deliver GPS-denied location for a wide variety of use cases. Warfighter map/waypoint check-ins, UWB range input, and third party position/location input are all accepted as navigation constraints.