OXTS

NAVIGATE ANYWHERE, INNOVATE EVERYWHERE.

Navigation solutions for all environments.

OXTS.COM

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WITH OXTS YOU'RE IN THE RIGHT PLACE

In our conversations with organisations and professionals that work with localisation data, we're hearing that demand is growing for increasingly accurate data, in greater volumes, in more environments, while being conscious of budget restraints.

In that kind of scenario, your navigation solution needs to not only be robust enough for the environment you're in, but scalable enough for you to deploy on as many platforms as your business needs.

If you're also facing these challenges, we can help. If you need to know where your platform is, which way it's facing, and how it's moving – especially if you have a fleet of platforms you need to outfit – our inertial navigation solutions enable you to create a high-performing system that's commercially viable.

Our inertial navigation system (INS) technology uses advanced sensor fusion algorithms and sophisticated calibration techniques to deliver highly accurate and robust localisation data using smaller, lighter, and more economical sensors than Fiber Optic Gyroscopes (FOG) or Ring Laser Gyroscopes (RLG).

WHAT WE DO

THREE STEPS TO ROBUST LOCALISATION

With 25 years of experience working in inertial and GNSS navigation, our localisation solutions have been carefully designed to deliver the best balance of accuracy, robustness, and value for our customers. Here's how they work:

The inertial data

We start with a steady stream of 6-axis acceleration and angular rate data. This high-rate, environment-agnostic data is the ideal foundation for a navigation solution that delivers great performance anywhere.

Advanced calibration techniques

Every OxTS INS is individually calibrated using advanced techniques that ensure our devices all give identical and high-quality performance. This means:

Our INS will outperform cheaper sensors.

Our INS can hold its own against more expensive sensors.

You can scale up your operations without having to worry about variable performance between individual INS devices.

Sensor fusion

Our INS uses specialised algorithms to not only get more accuracy from GNSS sensors than others can, but also to take data from a wide range of sensors. We can take data from LiDAR, cameras, wheel speed sensors, and many more, and feed them into our INS to create a highly robust localisation solution where any weaknesses in one sensor are compensated for by a different sensor. As a result, you achieve high accuracy more economically than if you used high-end inertial sensors.

OUR INS DEVICES

There are three components to your OxTS INS:

1.

The INS itself - we have a variety of models, each with its own standout characteristics.

2.

The feature bundles – these unlock the capabilities you need for your work. We have feature bundles designed for various applications, or you can build your own.

3.

The software – this includes our free NAVsuite, as well as various specialist applications for specific workflows and integrations with key tools.

Whatever setup you choose, you get the following:

Internal or external data logging: log your data however works best for your project.

Ethernet interface: high-speed data transfer between your INS and external data loggers or other sensors.

CAN interface: directly feed data from your INS via the CAN bus to an external data logger or other device. *

Dual-antenna capabilities: every INS we make supports dual antennas, so you can maximise heading performance wherever you are and regardless of your vehicle's movement.

Quad-constellation GNSS: Automatically use data from GPS, GLONASS, Galileo and BeiDou GNSS constellations for maximum coverage and accuracy.

ITAR-free: you can ship your INS anywhere you want with no export license requirements. Perfect for scaling up operations to tackle new countries or continents.

Quick warmup: OxTS INS devices don't need lots of space or time to warm up. Just three minutes of low-dynamics movement can be enough, so you can get testing faster.

*please note that the xNAV650 does not support CAN. If you need a SWaP-constrained base model with CAN, check out the AV200.

OUR LOCALISATION SOLUTIONS

TECH SPEC

RT3000 v4

Maximum performance in any environment.

Combining survey-grade GNSS positioning with OxTS' MEMS-based IMU10 technology, the RT3000 v4 is a commercially viable alternative to FOG-navigation systems. Able to operate in even the harshest GNSS conditions, and with ISO17025 calibration available, the RT3000 v4 is the one for you if you need centimetre-level accuracy, even in the harshest environments.

What makes the RT3000 v4 special?

+ Centimetre-level accuracy in any environment
+ Our most advanced technology
+ The benchmark system for Euro NCAP safety ratings

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading	Position after 60s GNSS outage (post-process)
Specification	0.01m	0.01°	0.025km/h	0.04°	0.21m

TECH SPEC

RT3000 DO-160 v4

An INS for the harshest environments.

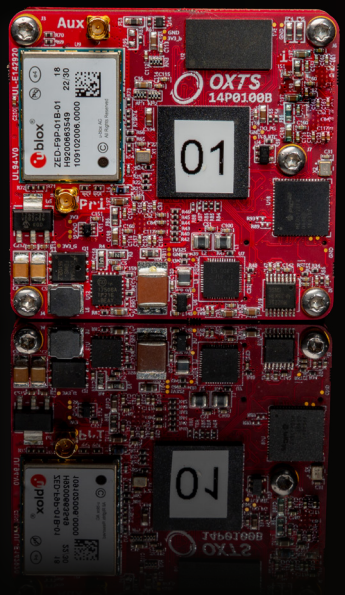
The RT3000 DO-160 v4 offers the same accuracy and navigation robustness as our flagship INS, the RT3000 v4 – but comes in a low SWaP DO-160 certified enclosure. If you're working in inhospitable environments, the RT3000 DO-160 v4 will deliver robust localisation.

What makes the RT3000 DO-160 v4 special?

+ A cost-effective alternative to FOG IMUs
+ Proven to provide RT3000 DO-160 protection in a wide range of environments

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading	Position after 60s GNSS outage (post-process)
Specification	0.01m	0.01°	0.025km/h	0.04°	0.21m



TECH SPEC

xRED3000

Tiny, light, and designed for integrating into systems.

Combining two survey-grade GNSS receivers and OxTS' latest IMU10 inertial technology, the xRED3000 is able to provide accurate localisation even in harsh environments. Plus, because it's a board set INS, it gives you flexibility in how you integrate it into your project.

What makes the xRED3000 special?

+ Unhoused PCB for integration into SWaP-constrained platforms
+ High performance in a tiny package
+ Scalable for fleet integrations

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading	Position after 60s GNSS outage (post-process)
Specification	0.01m	0.02°	0.05km/h	0.05°	0.5m

TECH SPEC

RT1003 v2

Economy meets performance.

Cutting-edge IMU technology combines with RTK GNSS to provide accurate and dependable position, velocity, and orientation measurements. Plus, with ISO17025 calibration available and an IP65 casing, the RT1003 is the workhorse that can handle all but the most demanding of localisation challenges.

What makes the RT1003 v2 special?

+ Balanced performance and affordability
+ IP65 rated for solid robustness
+ ISO17025 calibration available

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading	Position after 60s GNSS outage (post-process)
Specification	0.02m	0.05°	0.1km/h	0.1°	0.71m

TECH SPEC

xNAV650/AV200

Compact meets accurate.

The xNAV650 and AV200 offer the same powerful performance, even in harsh GNSS environments. At 130g, both are ideal for SWaP-constrained payloads, and the AV200's CAN interface is perfect for anyone working on a project using the CAN bus.

What makes them special?

+ Ideal for SWaP-constrained payloads
+ Ethernet and CAN output (AV200)
+ Ethernet and Serial output (xNAV650)
+ Scalable pricing designed for high-volume projects

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading	Position after 60s GNSS outage (post-process)
Specification	0.02m	0.05°	0.1km/h	0.1°	0.71m

OUR FEATURE BUNDLES

When budgets are constrained, you only want to pay for features you'll actually need – with the option to expand those capabilities in the future if you need to.

Every OxTS INS includes a standard set of features that enable it to operate. On top of those, you can add individual features to build a navigation solution designed for your specific use case, or choose one our pre-configured feature bundles.

THE BASE BUNDLE

Included as standard with any OxTS INS, the base bundle gives you all the features your INS needs to operate, integrate with your other systems, and output data for monitoring or processing.

Local coordinate output enables you to output navigation data as displacement from an origin point in a local co-ordinate grid.

Wheelspeed sensor input allows you to improve navigation accuracy with a wheelspeed sensor.

Real-time navigation output for applications requiring real-time data.

gx/ix tight-coupling compatibility enables you to achieve DGPS levels of accuracy in urban canyons using our unique gx/ix tight-coupling algorithms for improved accuracy.

Embedded NTRIP makes it easier to get real time RTK corrections for your INS when in the field.

Generic Aiding Interface gives you powerful sensor fusion capabilities for sensor redundancy and increased navigation accuracy.

+ ADDITIONAL FEATURES

On top of the base bundle, you can add specific functionality to your INS depending on the application. Some of our most exciting features include:

+ **Full gx/ix tight-coupling** boosts the power of our unique processing algorithm to give you RTK accuracy levels even in urban canyons.

+ **OxTS LIO** enables you to use LiDAR data to improve the accuracy of your navigation data in post-process – which can then be used to further improve pointcloud accuracy.

+ **PTP synchronisation** synchronises all your devices in your system to a single clock, which can be translated to GPS time if required.

+ **RT-Range**, our industry-leading V2V and V2L testing solution.

+ **Robot interface** enables the INS to communicate with driving robots.

+ **Hot Start initialisation** enables your INS to initialise while stationary, even without a GNSS signal.

+ **External raw data logging** allows you to collect large survey datasets without being limited by the INS' internal storage.

+ **OxTS Georeferencer** enables you to create georeferenced pointclouds and to use our boresight calibration tool to remove blurring and double vision in that pointcloud.

+ **UCOM** gives you more control over your data outputs to simplify your architecture, increase safety, and more.

+ **gPTP synchronisation** allows you to synchronise over gPTP, for even greater system flexibility.

SPECIALIST BUNDLES

Building on our experience working with thousands of professionals using localisation technology, we've bundled our more specialised features together for specific applications including:

+ Groundtruthing

+ ADAS testing

+ Autonomous Mobile Robotics

+ Mapping

+ LiDAR mapping

For a full list of our feature bundles, please contact us on info@oxts.com.

ADAS testing bundle

This bundle optimises your GNSS/INS for ADAS testing, including vehicle-to-vehicle and vehicle-to-load testing via RT-Range.

RT-Range

GNSS corrections over UDP

Robotic ADAS testing bundle

This bundle builds on the ADAS testing bundle by enabling your GNSS/INS to communicate with driving robots, including steering robots and robotic platforms carrying soft targets.

RT-Range

GNSS corrections over UDP

The Autonomy bundle

This bundle optimises your INS for use in autonomous vehicles and mobile robot, focusing on sensor fusion, robust navigation, and simple initialisation.

- **PTP and gPTP synchronisation**
- **Full gx/ix Tight Coupling**
- **Hot Start initialisation**
- **UCOM**

The LiDAR mapping bundle

This bundle enhances our mapping bundle with additional features designed to georeference data from a LiDAR scanner.

- **OxTS Georeferencer**
- **OxTS LIO**

The Mapping bundle

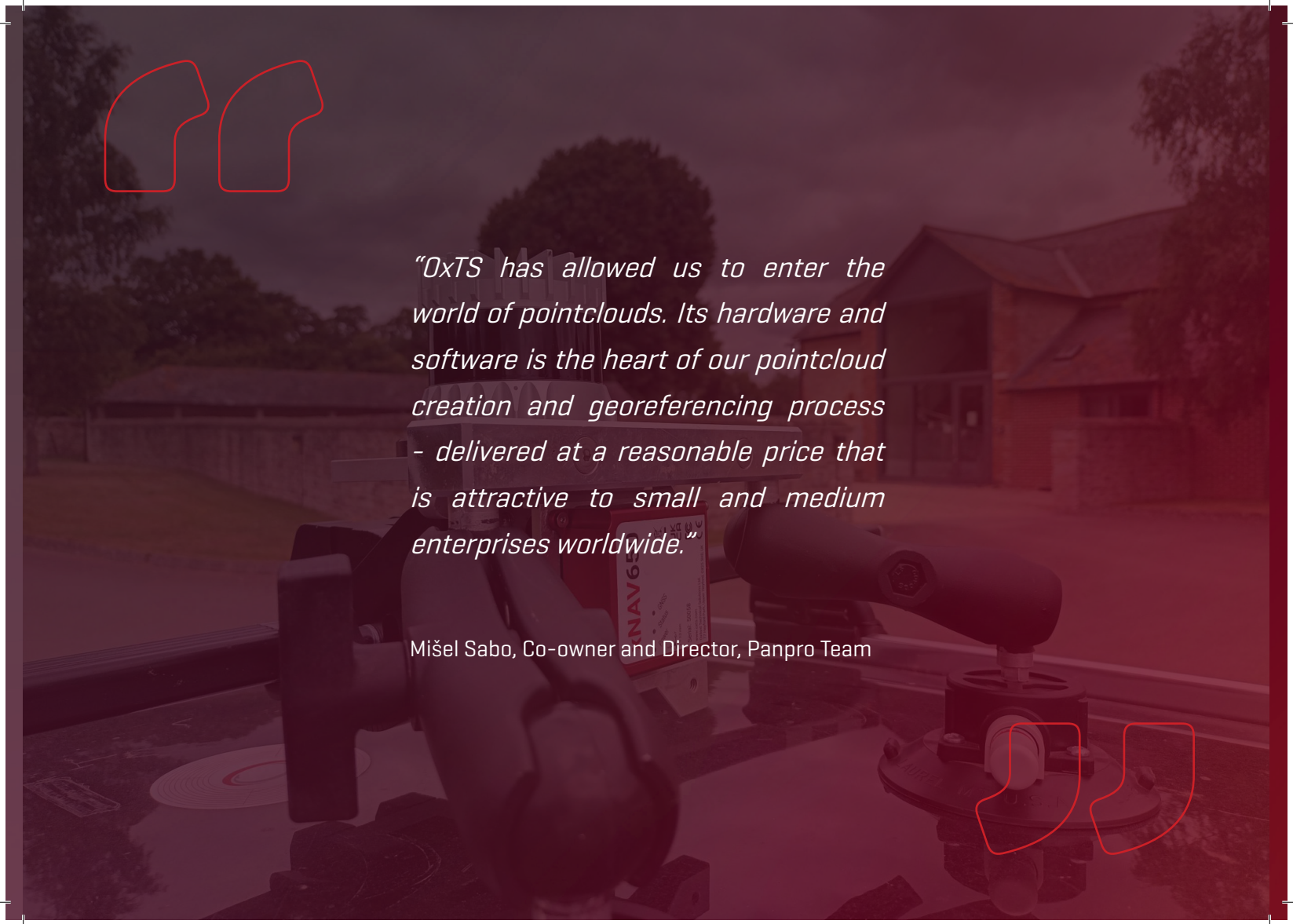
This bundle gives you all the features you need for georeferencing activities that don't use a LiDAR sensor.

- **PTP and gPTP synchronisation**
- **Full gx/ix Tight Coupling**
- **External raw data logging**

The Open Road Testing bundle

This bundle provides additional features designed specifically for ground truthing activities on the open road, enabling you to handle GNSS-poor environments and synchronise multiple sensors for the best data possible.

CAN Acquisition · **Full gx/ix Tight Coupling** · **PTP and gPTP synchronisation** · **External raw data logging**



"OxTS has allowed us to enter the world of pointclouds. Its hardware and software is the heart of our pointcloud creation and georeferencing process - delivered at a reasonable price that is attractive to small and medium enterprises worldwide."

Mišel Sabo, Co-owner and Director, Panpro Team

SOFTWARE

OUR SOFTWARE AND INTEGRATIONS

The INS is only part of the story.

Whatever project you're working on, our software will help you get the most out of your INS with the least hassle. We've also developed integrations with other key technology providers in your space, so that all the different parts of your localisation solution work in harmony.

NAVsuite

Free software to configure your INS and manage your data.

NAVsuite is included with every INS purchase for free. It contains everything you need to get up and running with your OxTS INS, and to monitor, process, and display the raw data your INS records. The applications within NAVsuite include:

+ **NAVconfig:** configure all your OxTS devices, and create and store multiple configuration files for quick and easy config changes.

+ **NAVdisplay:** view your navigation data in real time, across multiple devices, with ready-made or custom templates to show you exactly the data you need.

+ **NAVsolve:** powerful post-processing software that lets you extract the data you need, add differential corrections to measurements, and improve accuracy with our forwards/backwards processing algorithm and gx/ix solution.

+ **NAVgraph:** your data, but on a graph. NAVgraph is designed to preserve system performance even when displaying large datasets with multiple measurements.

+ **NAVbase:** configure your OxTS RT-Base S or GPS-Base.

COMMAND LINE

When you need what our software does, but you don't need another application in your toolchain, our command line packages are there for you.

+ All the functionality of our software as an executable accessed by the command line.

+ Perfect for integrating OxTS software into your existing workflows and building automated workflows.

+ Command line is available for NAVsolve, OxTS Georeferencer, and OxTS LIO.

NAV SDK

Build custom applications that can display OxTS navigation data.

If you're already building custom software as part of your project, NAV SDK gives you the ability to display your INS data in that application.

gx/ix TIGHT-COUPLING PROCESSING

Enhanced urban position accuracy, in real-time and post-process.

Accurate navigation data is notoriously hard to get in urban areas. gx/ix tight-coupling uses a unique GNSS processing engine and GNSS/IMU tight-coupling to combat the problem.

+ Use GNSS data even when fewer than four satellites are available to greatly reduce position drift.

+ Reduce time to RTK reacquisition by using IMU data to reduce the GNSS search area after a satellite outage ends.

+ Intelligently switch between your GNSS receiver's RTK engine and OxTS' gxRTK engine to preserve position accuracy for longer.

+ Add up to 255 base station correction files per processing run to achieve centimetre-level accuracy in post-process.

SOFTWARE

RT-RANGE

V2V and V2L testing made more accurate and more simple.

The RT-Range Suite gives you all the tools needed to create ADAS test scenarios, monitor the data in real time, and post-process it to give you all the information you need to be compliant with Euro NCAP, IIHS, and other testing standards.

Key features:

+ Independently configure up to 12 sensors on your vehicle, and monitor four moving and/or fixed targets, to run complex scenarios in real time.

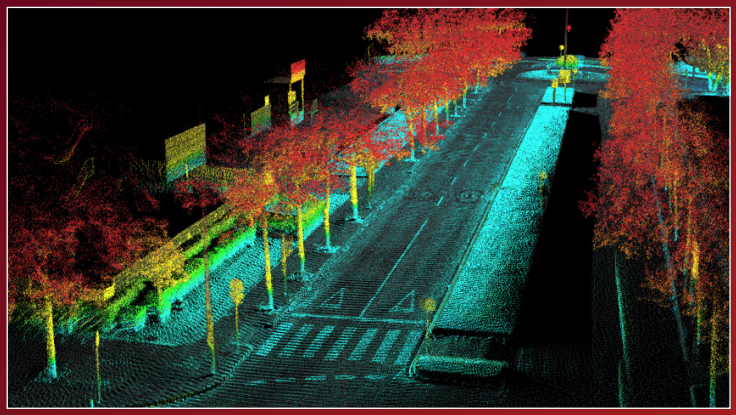
+ View data in real time, including hunter and target vehicle positions and how they interact with your targets. Log data internally, or output via CAN and ethernet in real time for external logging.

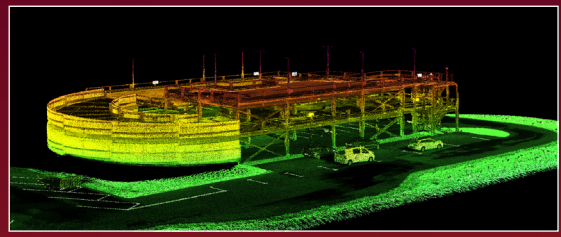
+ Create outlines of objects, vehicles and targets using 24 measurable points for deep insight into tests.

OxTS GEOREFERENCER

Georeference pointcloud data while reducing blurriness and double vision.

Designed specifically for surveyors and mobile mappers, OxTS Georeferencer makes it simple to create georeferenced pointclouds that are crystal clear and highly accurate, using navigation data from ANY INS device.





Key features:

+ Simple drag-and-drop interface outputs .LAS, .LAZ, and .PCD files for use in a range of pointcloud viewer applications.

+ Boresight calibration tool coordinates the LiDAR and INS frames to eliminate blurring and double vision, giving you higher-quality pointclouds.

+ See below for a list of compatible LiDAR scanners:

- Velodyne
- Hesai
- Ouster
- Livox
- RoboSense
- Riegl
- Z+F

OXTS LIO

Sensor fusion reduces IMU drift by up to 75%.

A specialist implementation of our GAD interface, OxTS LiDAR Inertial Odometry (LIO) uses data from any compatible LiDAR scanner to constrain position drift and improve the accuracy of INS location data in urban canyons. It can even provide centimetre-level accuracy in underground car parks.

Key features:

+ Dramatically improve position accuracy in urban canyons and car parks using an automotive-grade LiDAR scanner.
+ The navigation data from OxTS LIO can be used to improve position accuracy for a variety of applications, including georeferencing pointclouds.
+ Compatible with all OxTS INS devices. See below for list of compatible LiDAR scanners.

- Velodyne
- Hesai
- Ouster
- Livox
- RoboSense
- Riegl
- Z+F

OXTS ROS DRIVERS

Seamless integration with ROS networks.

To support our customers developing autonomous mobile robots, we have developed and maintain our own ROS 2 driver to ensure that the data from your OxTS INS can be used by your wider ROS network. A ROS 1 driver, developed by Dataspeed Inc., is also available.

OXTS GAD SDK

Sophisticated sensor fusion made simple.

The OxTS GAD SDK enables you to use the OxTS GAD Interface to feed additional sensor data into your OxTS navigation engine, improving performance in areas where it is difficult to obtain consistent, uninterrupted GNSS signal.

Key features:

+ Configure updates from all your external sensors.
+ Set variance levels, lever arms, and navigation frames to ensure your data synchronises perfectly.
+ Available in C++ and Python.

NVIDIA DRIVE OS PLUG-IN

The NVIDIA DRIVE® NCOM plug-in is a tool developed by OxTS that gives DRIVE Linux users access, via DriveWorks, to GNSS and IMU measurements provided by a wide range of OxTS inertial navigation systems. The data is used as a groundtruth for localisation validation of sensors and your perception stack, as well as full vehicle localisation.

Key features:

+ All data available over Ethernet in real time.
+ Convert NCOM log files into DriveWorks compatible logs for future replay.
+ Combine the most advanced automotive AI platform with industry-leading localisation accuracy and scalability.

DRIVING ROBOT INTEGRATIONS

OxTS devices provide accurate, real-time navigation data to a number of leading brands of driving robots, test targets, and control systems. Our integrations provide seamless connectivity between test vehicles and targets, enable you to reliably run complex scenarios with multiple moving targets, and provide a common configuration and management interface for your robots and your INS. OxTS has integrations with:

+ AB Dynamics

+ Humanetics

+ 4A

VEHICLE-IN-THE-LOOP INTEGRATION (VIL)

Create a best-in-class vehicle-in-the-loop (VIL) setup to keep pace with the testing requirements of Euro NCAP and GSR 2 using our integration with IHG CarMaker.

+ Provide IGH CarMaker with real-time vehicle dynamics information using our INS technology.

+ Ensure your VIL setup uses the same technology and data as your test track and real-world tests for ultimate ease of use and data comparison.

+ Ideal for OEMs building in-house VIL testing capabilities, or for Tier 1 providers building an outsourced VIL solution that's easy for customers to work with.

POZYX 2GAD

Precise position in GNSS-denied spaces.
Seamless transition to GNSS and back.

Pozyx 2GAD is an ultra-wideband indoor positioning solution that provides your INS with highly accurate position data in GNSS-denied spaces. Fully compatible with driving robots and our RT-range solution, the applications for Pozyx 2GAD are many and varied. And, with seamless transition from GNSS position to Pozyx position, it's flexible enough for any application.

Key features:

+ Indoor ADAS testing (compatible with RT-Range)
+ Indoor autonomous robot navigation
+ Any application where the vehicle or platform is moving between indoor and outdoor spaces

Technical specification

	Horizontal Position	Roll & Pitch	Velocity	True Heading
Specification	0.035m	0.04°	0.3km/h	0.3°

ACCESSORIES FOR EVERY LOCALISATION ACTIVITY

The INS does a lot of the work in your localisation solution – but it's not the only bit of kit you need.

OxTS offers a full range of additional hardware to help make your work easier – whatever you're doing.

+ GPS-Base

A completely mobile base station for transmitting differential corrections to your vehicles, so you can achieve RTK accuracy.

+ RT-Base S

Similar to the GPS-Base, but in a self-contained weatherproof case for added versatility and robustness.

+ RT-XLAN

High-performance WLAN vehicle-to-vehicle communication over 1km. Essential for ensuring hunter and target vehicles can communicate with each other.

+ RT-Strut

Correctly mount your GNSS/INS and additional devices in your vehicle in minutes, to ensure that the only movement you record is from the vehicle itself. Plus, an extended length version is available for taller vehicles.

+ Dual Antenna Roof Mount

Rigid pre-set antenna separation mount for puck or pinwheel antennas ensures maximum heading accuracy, even at low speeds. Can be used on most roof types including glass, aluminium, composite and nonplanar.

+ RT-Backpack

A backpack containing a RT-XLAN and a battery capable of powering that and an INS for 5 hours, the RT-Backpack is designed to track the position of pedestrians, cyclists, and motorcyclists. Just add an RT and you're ready to go.

+ Survey Trolley

Easily create scenarios that require accurate lane measurements such as automated lane keep systems. Designed to eliminate multipath errors, and includes software to create straight and curved lane lines for use in the RT-Range Suite.

+ Boresight Calibration Targets

Make boresight calibration quicker and easier with these targets.

OXTS SUPPORT

Help for you and your team.

We offer in-country support across the globe via our offices and channel partners, and remote support for all our customers, providing assistance with anything from advice to troubleshooting.

WHERE WE OPERATE

Wherever you are, if you need an OxTS product, someone will be able to help you.

We're headquartered in Oxfordshire in the UK, where all our products are made (though because they are ITAR-free, it's easy for us or you to ship them anywhere in the world).

We offer in-country support in the UK, Germany, the US and China – and both our UK and German offices can perform ISO17025 calibrations.

Beyond that, we have partners on every major continent, ready to assist with whatever you need.


United States
Portland, OR
United States
Detroit
United Kingdom
Oxfordshire
Germany
Augsburg
China
Shanghai

OXTS

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