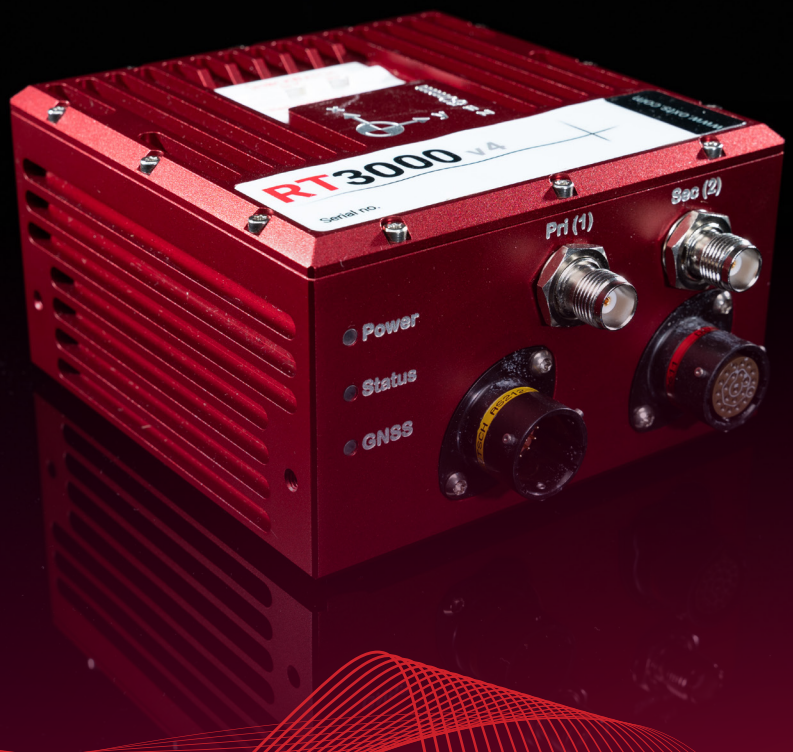


DATASHEET

RT3000 v4

For when where matters most.

Combining survey-grade GNSS positioning with OxTS' best ever inertial measurement unit, the RT3000 v4 offers a robust, out-of-the-box navigation solution for uninterrupted position, orientation and motion data in all environments.

Key features:
+ Reliable real-time data
+ ITAR-free; no export licence required
+ Three-minute, low-dynamics warm-up
+ Tailored to your needs
+ Free of charge post-processing tools

OXTS

When where matters most...

... the industry relies on the RT3000 as its key source for accurate position, orientation, and dynamics data.

First released in 2002, the RT3000 was adopted by automotive engineers looking for cost-effective, real-time navigation data when they had little room for error.

Fast forward over two decades and nearly every vehicle model sold globally has been tested using an RT3000 during development. The ubiquity of the RT3000 attracted attention from other fields.

In the last 10 years, many geospatial specialists have placed the RT3000 at the heart of their mobile mapping systems and a number of autonomous platform prototypes have begun their path to production navigated by its robust output.

Now into its fourth generation, the RT3000 builds on its reputation for high-end navigation performance without the high-end price tag for when where matters most.

Specification at a glance:

0.01 m
horizontal position

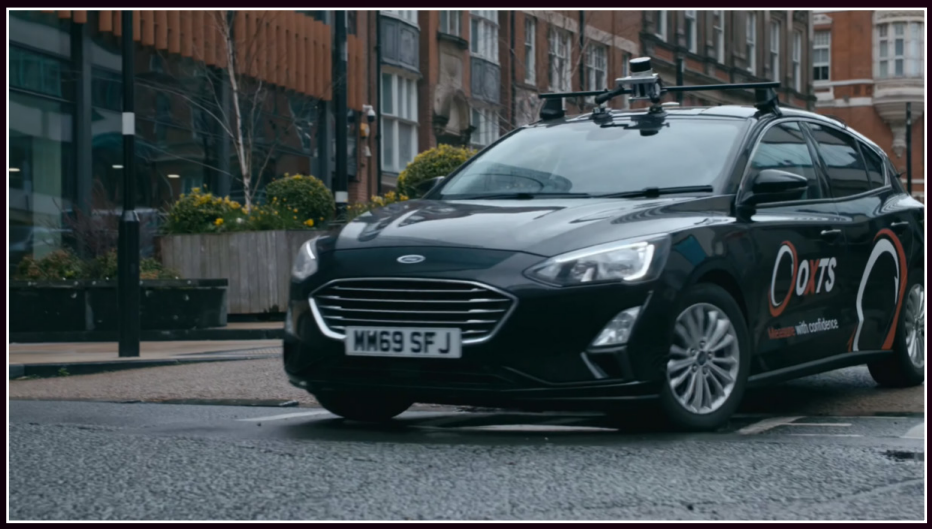
0.01°
roll and pitch

0.025 km/h
velocity

0.04°
true heading

0.05°
slip angle

0.21 m
position after 60 secs GNSS outage (PP)



Ready for the harshest GNSS environments

+ *Quad-constellation GNSS support* (GPS, Galileo, BeiDou and GLONASS) maximises satellite coverage along your route.
+ OxTS *gx/ix tight-coupling* algorithms provide enhanced multipath rejection in urban canyons and faster RTK reacquisition after temporary, complete outages.
+ *Advanced vehicle model* algorithms constrain navigation output to those which match the motion profile of land-based vehicles, such as no rotation on the spot, to filter out erroneous sensor data.
+ *Wheel Speed Odometer* interface reduces position drift by aiding the navigation engine with real-time velocity inputs.
+ OxTS *LiDAR Inertial Odometry (LIO)* post-processing software reduces drift by aiding the navigation engine with velocity and angular rate updates from a LiDAR.
+ Embedded NTRIP client and PPP support provide flexibilty in your GNSS correction source.

Why choose the RT3000 v4?

ITAR-free: no export licence requirements

+ Ship your RT3000 v4 globally without requiring export licences.
+ The RT3000 v4 leverages advancements in OxTS' navigation engine to achieve a new level of performance using components that are not subject to export control.

Low dynamics warm up

+ The RT3000 v4 gets to specification within three minutes of low dynamics movement - removing the common inconvenience of time and space required for high dynamics manoeuvres before each data collection.

Post-processing tools included

+ Avoid the hassle of software subscriptions with OxTS software suite, NAVsuite, included free-of-charge.
+ NAVsuite contains all of the applications you need for device configuration, real-time monitoring, post-processing and data visualisation.

Reliable, real-time data

+ Combines two survey-grade GNSS receivers with OxTS' latest IMU10 inertial technology to deliver uninterrupted position, orientation and dynamics in all environments.
+ The RT3000 v4 outputs real-time data at 100 Hz (250 Hz optional) via ethernet, serial and CAN.
+ All data is logged to the 32 GB internal storage.

Tailored to your needs

+ Make the most of your budget by tailoring your RT3000 v4 to include only the functionality you need.
+ Add additional functionality to your RT3000 v4 as your requirements change with remote upgrades.

Options:

+ ISO17025-accredited calibration
  Confirms the IMU in your RT3000 v4 is performing to specification with tracability certification.
+ RT-Range
  Calculates real-time vehicle-to-vehicle and vehicle-to-lane measurements.
+ CAN acquisition
  Logs CAN data from other devices, or the vehicle, to the internal 32 GB storage.
+ LiDAR boresight calibration and georeferencing
  Aligns and combines data from the RT3000 v4 and LiDAR into a georeferenced pointcloud.
+ Precision Time Protocol (PTP)
  Synchronises all devices in your system to a single clock.
+ TerraStar support
  GNSS corrections service that does not rely on communications infrastructure.
+ Network DGNSS
  Enables GNSS corrections to be sent and received over ethernet.
+ LiDAR Inertial Odometry (LIO)
  Fuse LiDAR and OxTS INS data in post-process to significantly reduce position drift.

Technical specification

Model	RT3000 v4
Positioning	GPS L1, L2 GLONASS L1, L2 BeiDou B1, B2 Galileo E1, E5
Single/Dual Antenna?	Both
ITAR-free?	Yes

Performance specification with GNSS [1]

	RTK	Post-Process
X,Y Position (CEP)	0.010 m	0.010 m
Altitude (RMS)	0.012 m	0.012 m
Velocity (RMS)	0.025 km/h	0.025 km/h
Roll & Pitch (1σ)	0.010 °	0.010 °
True Heading (1σ) [2]	0.040 °	0.040 °
Slip angle (1σ) [3]	0.050 °	0.050 °

Performance specification without GNSS (RMS)

	Real-time [1]			Post-process [1]			Post-process with OxTS LIO		
	10 s	30 s	60 s	10 s	30 s	60 s	10 s	30 s	60 s
X,Y Position (m)	0.20	0.55	1.10	0.07	0.25	0.50	0.040	0.110	0.210
Altitude (m)	0.10	0.30	0.50	0.04	0.12	0.25	0.035	0.064	0.106
Velocity (m/s)	0.04	0.05	0.07	0.02	0.04	0.05	0.010	0.017	0.023
Roll & Pitch (deg)	0.02	0.025	0.03	0.01	0.016	0.02	0.008	0.015	0.019
True Heading (deg)	0.05	0.09	0.12	0.04	0.05	0.07	0.045	0.093	0.134

Physical characteristics

Dimensions	120 x 120 x 71 mm
Mass	690 g
Input voltage	10 - 48 V dc
Power consumption	6 W
Internal storage	32 GB
Onboard data-logging rate	3 MB/s

OxTS IMU10 sensors

Type	Accelerometers	Gyros
Technology	MEMS	MEMS
Range	8 g	490 °/s
Bias stability	0.005 mg	0.8 °/hr
Scale factor (1σ)	0.02 %	0.08 %
Random walk	0.012 m/s/√hr	0.12 °/√hr
Axis alignment	< 0.01 °	< 0.05 °

Interfaces

Ethernet	10/100 Base-T [x3]
Serial/CAN	Configurable RS232 or CAN-FD
Serial	RS232 + power for serial radio
Digital I/O	Quadrature wheelspeed input PPS input/output Trigger input/output [x2]

Environmental characteristics

Operating temperature	-40° to 70° C
Vibration	0.1g/Hz 5-500 Hz
Shock survival	100 g, 11 ms
Environmental protection	IP65

[1] With differential corrections and DMI input

[2] With two-meter antenna separation

[3] At 50 km/h

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