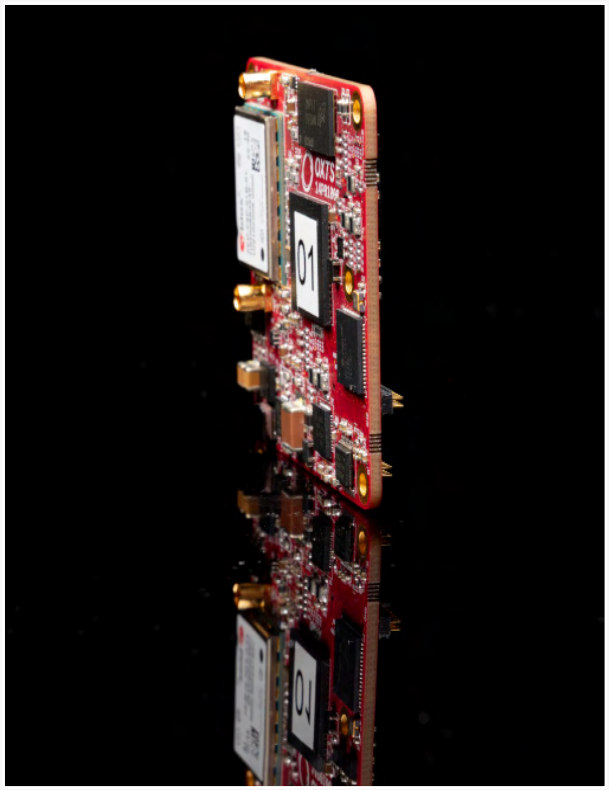
OXTS

xRED

Combining two survey-grade GNSS receivers and OXTS' latest IMU10 inertial technology, the xRED is engineered to be the GNSS/INS component for any product that needs accurate localisation, even in harsh 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

Compact. Light.

Measuring just 53.6 x 50.6 x 9.5 mm and weighing only 20 grams, the xRED is suitable for land and air-based applications.

Ready for wherever your customers go.

- OXTS' latest IMU10 technology sets a new benchmark for inertial measurement price and performance.
- Quad-constellation GNSS support (GPS, Galileo, BeiDou and GLONASS) maximises RTK satellite coverage along their route.
- OXTS gx/ix tight-coupling algorithms provide enhanced multipath rejection in urban canyons and faster RTK reacquisition after temporary, complete outages.
- 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 makes it simple to obtain GNSS corrections.
- 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.
- Single- and dual-antenna support provides flexibility in mechanical integration to best fit the application.

Specification at a glance:

20g
mass

0.025 km/h
velocity

0.21 m
position after 60 secs GNSS outage (PP)

0.01°
roll and pitch

0.04°
true heading

Why choose the xRED?

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
+ Outputs real-time data at 100 Hz (250 Hz optional) via ethernet and serial

Low dynamics warm up

+ The xRED gets to specification within three minutes of low dynamics movement.
+ Increases flight time efficiency for aerial applications and eliminates space requirements for land-based warm-ups.

Post-processing tools included

+ Avoid the hassle of selling third-party subscriptions with your product with OXTS software suite, NAVsuite, included free-of-charge.
+ NAVsuite contains the essential applications your customers could need for device configuration, real-time monitoring, post-processing and data visualisation.

ITAR-free: no export licence requirements

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

Tailored to your needs

+ Optimise your unit cost to include only the functionality you need.
+ Use as a second-source option with no minimum order quantity and volume discounts available.
+ Add additional functionality and firmware upgrades to your xREDs in the field with remote upgrades.

Options:

+ ISO17025-accredited calibration
  Confirms the IMU in your xRED is performing to specification with tracability certification.
+ LiDAR boresight calibration and georeferencing
  Aligns and combines data from the xRED and LiDAR into a georeferenced pointcloud.
+ Network DGNSS
  Enables GNSS corrections to be sent and received over ethernet.
+ Precision Time Protocol (PTP)
  Synchronises all devices in your system to a single clock.
+ Raw data streaming
  Simplify post-processing workflows by streaming raw data files directly to another storage device in real-time via ethernet UDP stream.
+ LiDAR Inertial Odometry (LIO)
  Fuse LiDAR and OXTS INS data in post-process to significantly reduce position drift.
+ Generic logging
  Log data from any other sensors and devices to the xREDs 32 GB internal storage via ethernet UDP stream.

Technical specification

Model	xRED
Positioning	GPS L1, L2C (QZSS) GLONASS L1, L2 BeiDou B1, B22 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 [2]			Post-process [2]			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	53.6 x 50.6 x 9.5 mm
Mass	20 g
Input voltage	5 - 60 V dc
Power consumption	4 W
Internal storage	32 GB
Onboard data-logging rate	8 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 x1
Serial/CAN	1 x RS2321 1 x TTL
Digital I/O	Quadrature wheelspeed input PPS input/output Trigger input/output [x4]

Environmental characteristics

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

[1] With differential corrections and DMI input
[2] With two-meter antenna separation
[3] At 50 km/h

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