

Z-Sensor

12-Channel, Dual-Frequency Performance Delivers RTK Results at the Centimeter-Level

- Highly reliable centimeter positions
- High update rates and low latency
- Ideal for machine control applications



The world-class Z-12™ receiver is the accepted benchmark for top-quality dual-frequency GPS receiver technology. Now, Thales Navigation has adapted the proven performance of the Z-12 receiver onto a single board, incorporating an optional spread spectrum radio that mounts directly to the board. The GPS receiver and radio are integrated in a compact, rugged housing. The winning result is the new Z-Sensor™, an economical receiver that delivers improved performance in a small, lightweight, power-efficient package.

The Z-Tracking Advantage

The Z-Sensor incorporates our patented Z-Tracking™ technology to mitigate the effects of Anti-Spoofing (encryption of the P-code) and provide dual-frequency performance. The unit provides up to a 13dB signal-to-noise ratio advantage over competing technologies, allowing users the ability to track weaker satellite signals. The result is reliable, cm-level positions you can count on for all of your high-productivity GPS applications.

The Z-Sensor has been designed specifically for real-time applications requiring high accuracy, high update rates, and low latency. It is intended for use in a variety of applications including construction, machine control, vehicle guidance, precision naviga-

tion, as well as land or offshore surveying.

Special Features Boost Capabilities

The new Z-Sensor builds upon the industry-leading performance parameters set by the Z-12, offering demonstrated resistance to jamming from outside radio sources. In fact, independent tests have shown that the Z-12 provides anti-jamming capability that is virtually unmatched by other dual-frequency receivers.

Centimeter accuracy requires a datalink between the base and remote receivers. The Z-Sensor system includes an optional built-in spread spectrum radio receiver designed especially for this purpose. For base stations, an external spread-spectrum radio transmitter is also available. These radios, using the 902 to 928 MHz frequencies, are license-free in the United States and in many other countries.

The Worldwide Standard in Base Station Technology

In global base station technology, the Z-12 receiver sets the standard. Chosen by the United States and Canadian Coast Guards, as well as many other similar organizations, the unit provides safe, reliable and accurate data. In fact, it is the preferred GPS base station for users worldwide.

The Z-Sensor generates RTCM differential

corrections, RTK data, and RTCM RTK data – compatible with any RTK remote station conforming to the internationally-recognized RTCM standard. So, you can operate Differential GPS (DGPS) and RTK remote units simultaneously with the same base station. In addition, you're not tied down with any proprietary formats. Because the Z-Sensor uses the RTCM standard, you can purchase remote receivers of your choice without having to change your base station.

Use It as a Base or Remote

The Z-Sensor is available in two distinct configurations: base or remote. The remote unit includes everything required for remote RTK operation in the standard configuration, and features RTK update rates at up to 10Hz. A remote Z-Sensor can also be upgraded to include base station capability.

Take it for a Test Drive

Use the Z-Sensor Development Kit to perform a comprehensive test-drive. The complete system contains a Z-Sensor GPS receiver, power supply, ready-made interface cables, antenna, manuals, as well as Windows®-based Evaluate™ and Mission Planner software. Evaluate provides visual displays of satellite information such as SNR, receiver position and velocity, as well as data logging and analysis. Evaluate also communicates directly with the receiver so that you can easily set up a Z-Sensor remote or base station for RTK operation.

Z-Sensor Specifications

Standard Features

Base and Remote

- 36-channel, all-in-view parallel tracking
- 12 channels L1 C/A code and carrier tracking
- 12 channels L1 P-code and full wave length carrier tracking
- 12 channels L2 P-code and full wave length carrier tracking
- Z-tracking
- Real-time data output (code and carrier)
- NMEA V2.3
- 1PPS timing signal (5V TTL)
- 10 Hz raw data output (code and carrier)
- Enhanced strobe correlator (advanced multipath mitigation for both code and carrier phase)
- 1 year warranty
- 1 year free technical support

Remote Features

- RTK remote mode
- User selectable update rate up to 10Hz
- Less than 30ms position latency
- Differential and RTK support for RTCM V2.2 reception of Message Types 1, 2, 3, 6, 9, 16, 18, 19, 20, 21, 22, as well as Ashtech Compact RTK binary format
- Event marker

Base Station Features

- RTK base mode
- Differential and RTK base support for RTCM V2.2 Message Types 1, 2, 3, 6, 16, 18, 19, 20, 21, 22, as well as Ashtech Compact RTK binary format
- Point-positioning mode (automatic averaging)
- Remote monitoring
- User-defined coordinate system

Real-Time Position Accuracy¹

Autonomous²

Horizontal 3.0 m (CEP)

Synchronized RTK

Horizontal 1.0 cm (CEP)

Maximum position update rate: 1 Hz

Position latency equal to the base station data link latency +250ms

Fast RTK

Horizontal 2.0 cm (CEP)

Maximum position update rate: 10 Hz

< 30 ms position latency

Velocity Accuracy¹ (knots)

0.1 (95%)

Stated accuracy occurs with a high speed datalink, such as the internal radio. Fast RTK accuracy will degrade with a slower data-link.

Synchronized RTK accuracy will not degrade with a slower data-link.

RTK on-the-fly initialization: Greater than 99.9% reliability.

Initialization times as low as 10 seconds following the acquisition of P-code for 8 or more satellites.

Communications

- 3 bi-directional RS-232 serial ports
- 1 internal port for internal radio

Technical Specifications

Environmental/Physical

- Operating Temp: -30°C to +55°C
- Storage Temp: -40°C to +80°C
- Power Consumption: 7.5 W
- Input Voltage: 10-28 VDC
- Size: 2.3" H x 6.8" W x 8.6" D
- Connector: DB25 (compatible with the GG24™ and G12™ Sensors)
- Weight: 3.75 lbs.
- Humidity: 100% condensing
- Vibration: Meets MIL spec 810E for shock, vibration, acceleration
- Speed (max): 1,000 knots
- Altitude (max): 60,000 ft.

Options

- External reference frequency input
- Internal spread spectrum radio

Data-link Requirement

- Minimum datalink rate: 600 bps (using Ashtech Compact RTK message, generated once every 5 seconds, 12 satellites in view)

For optimal performance, it is recommended to send RTK messages once every second.

Z-Sensor Development Kit

Development Kit includes Z-Sensor receiver, antenna, power supply, cables, manuals, Evaluate software™/manual, Mission Planning™ software/manual.

¹ Accuracy and TTFF specs. based on tests conducted in California. Differential tests performed using Ashtech Z-Sensor™ base station with Geodetic antenna and Z-Sensor remote with Geodetic antenna (Marine IV antenna for TTFF). Antenna benchmark locations determined using CORS sites Point Blunt (PBL1) and Pigeon Point (PPT1). Tests at different locations under different conditions may produce different results.

Position accuracy specifications are for horizontal positioning. Vertical error is typically <2 times horizontal error.

²Real-time position accuracies obtained with SA off. With SA on, accuracy of autonomous positioning may degrade up to 100 meters (95%) as specified by the U.S. Department of Defense.

Specifications are subject to change without notice.

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