# Trimble AX940

## GNSS TRIPLE FREQUENCY SMART ANTENNA WITH MSS BAND DEMODULATOR FOR PRECISE POSITIONING APPLICATIONS

### MULTI CONSTELLATION GNSS

The Trimble AX940 supports both triple frequency for the GPS and GLONASS constellations plus dual frequency from BeiDou and Galileo. As the number of satellites in the constellations grows the AX940 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK initializations for 1–2 centimeter positioning. For applications that do not require centimeter accuracy, the AX940 delivers high accuracy GNSS, DGNSS positions in the most challenging environments such as urban canyons. Different configurations of the module are available. These include everything from a DGPS L1 unit all the way to a four constellation, triple frequency RTK unit. Choose the receiver that suits your application and price point. All features are password-upgradeable, allowing functionality to be upgraded as your requirements change.

With the option of utilizing OmniSTAR or RTX services, the AX940 delivers varying levels of performance down to centimeter-level without the use of a base station.

### TRIMBLE MAXWELL™ 7 TECHNOLOGY

Industry professionals trust Trimble embedded positioning technologies as the core of their precision applications. With the latest Trimble Maxwell™ 7 Technology, the AX940 provides assurance of long-term future-proofing and trouble-free operation. Moving the industry forward, the Trimble AX940 redefines high performance positioning:

- 336 Tracking Channels
- Trimble Everest Plus multipath mitigation
- Advanced RF Spectrum Monitoring and Analysis
- Proven low-elevation tracking technology

### FLEXIBLE INTERFACING

The Trimble AX940 was designed for easy integration and rugged dependability. Customers benefit from the Ethernet connectivity available on the board, allowing high speed data transfer and configuration via standard web browsers. CAN, USB and RS-232 are also supported. Just like other Trimble embedded technologies, easy-to-use software commands simplify integration and reduce development times. An intuitive 3D interactive graphical web page allows easy input of lever arms.

### RUGGED PACKAGE

The unit comes in an environmentally sealed enclosure that is very easy to install. The unit is rigorously tested to perform in harsh environmental conditions with the reliability you expect from Trimble.

## Key Features

- Trimble Maxwell™ 7 Technology
- 336 Channels for multi-constellation GNSS support
- Trimble RTX and OmniSTAR Support
- Rugged IP67 Smart Antenna
- Compact design for mobile applications
- Flexible RS232, USB and Ethernet interfacing
- Centimeter-level position accuracy
- Advanced RF Spectrum Monitoring

DATASHEET

# Trimble AX940 Smart Antenna

## TECHNICAL SPECIFICATIONS[1]

- Trimble Maxwell™ 7 Technology
- 336 Tracking Channels:
  - GPS: L1 C/A, L2E, L2C, L5
  - BeiDou: B1, B2
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[2]
  - Galileo[3]: E1, E5A, E5B, E5AltBOC
  - IRNSS: L5
  - QZSS: L1 C/A, L1 SAIF, L2C, L5, LEX
  - SBAS: L1 C/A, L5
  - MSS L-Band: OmniSTAR, Trimble RTX
- High precision multiple correlator for GNSS pseudorange measurements
- Trimble Everest Plus multipath mitigation
- Advanced RF Spectrum Monitoring and Analysis
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation and high dynamic response
- Very low noise GNSS carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Proven Trimble low elevation tracking technology
- Reference outputs/inputs
  - CMR, CMR+, sCMRx, RTCM 3.0, 3.1[4], 3.2
- Navigation Outputs:
  - ASCII: NMEA-0183 GSV, AVR, RMC, HDT, VGK, VHD, ROT, GGK, GGA, GSA, ZDA, VTG, GST, PJT,PJK, BPQ, GLL, GRS, GBS and Binary: Trimble GSOF, NMEA2000
- 1 Pulse Per Second Output
- Event Marker Input Support
- Supports Fault Detection & Exclusion (FDE), Receiver Autonomous Integrity Monitoring (RAIM)

## COMMUNICATION

- 1 USB 2.0 Device port
- 1 LAN Ethernet port:
  - Supports links to 10BaseT/100BaseT auto-negotiate networks
  - All functions are performed through a single IP address simultaneously—including web GUI access and raw data streaming
  - Network Protocols supported:
    - > HTTP (web GUI)
    - > NTP Server
    - > NMEA, GSOF, CMR over TCP/IP or UDP
    - > NTripCaster, NTripServer, NTripClient
    - > mDNS/uPnP Service discovery
    - > Dynamic DNS
    - > eMail alerts
    - > Network link to Google Earth
    - > Support for external modems via PPP
    - > RDNIS Support
- 2 x RS232 ports:
  - Baud rates up to 460,800
- 1 CAN Port
- Control Software:
  - HTML web browser, Internet Explorer, Firefox, Safari, Opera, Google Chrome

## PERFORMANCE SPECIFICATIONS

Time to First Fix (TTFF)[5]
- Cold Start[6] . . . <60 seconds
- Warm Start[7] . . . <30 seconds
- Signal Re-acquisition . . . <5 seconds

Velocity Accuracy[8,9]
- Horizontal . . . 0.007 m/sec
- Vertical . . . 0.020 m/sec

Maximum acceleration GNSS tracking . . . +/- 11g

Maximum Operating Limits[10]
- Velocity . . . 515 m/sec
- Altitude . . . 18,000 m

RTK initialization time[8] . . . typically <10 seconds

RTK initialization reliability[8] . . . >99.9%

Position Latency[11] . . . <20ms

Maximum Position/Attitude Update Rate . . . 50 Hz

## PHYSICAL AND ELECTRICAL CHARACTERISTICS

Size . . . 221 mm x 210 mm x 52 mm

Power . . . 9 VDC to 30 VDC
Typical 3.0 W (L1/L2 GPS + L1/L2 GLONASS)

Weight . . . 0.66 kg

Connectors
- I/O . . . 26-pin Tyco SUPERSEAL

## ENVIRONMENTAL CHARACTERISTICS[12]

Temperature
- Operating . . . –40 °C to +70 °C
- Storage . . . –40 °C to +85 °C

Vibration . . . 9.8 gRMS operating

Mechanical shock . . . MIL810D
±40 g 10ms operating
±75 g 6ms survival

Operating Humidity . . . 5% to 95% R.H. non-condensing, at +60 °C

IP Rating . . . IP67

## ORDERING INFORMATION

Module Part Number . . . 129400-XX

Module . . . Trimble AX940 GNSS available in a variety of configurations from L1 SBAS upwards

1 Trimble AX940 is available in a variety of software configurations. Specifications shown reflect full capability.
2 There is no public GLONASS L3 CDMA. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible.
3 Developed under a License of the European Union and the European Space Agency.
4 Input only network correction
5 Typical observed values.
6 No previous satellite (ephemerides / almanac) or position (approximate position or time) information.
7 Ephemerides and last used position known
8 May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
9 1 sigma level add 1 ppm for RTK position accuracies.
10 As required by the U.S. Department of Commerce to comply with export licensing restrictions.
11 At maximum output rate.
12 Dependent on appropriate mounting design.
13 Also available in configurations with RTK accuracies limited to 10 and 30 centimeters.
14 Trimble RTX and OmniSTAR accuracies depend on correction service chosen.

## POSITIONING SPECIFICATIONS[8,9,13,14]

| | Autonomous | SBAS | DGNSS | RTK |
|---|---|---|---|---|
| **No GNSS Outages** | | | | |
| Position (m) | 1.00 (H) 1.50 (V) | 0.50 (H) 0.85 (V) | 0.25 (H) 0.50 (V) | 0.008 (H) 0.015 (V) |
| Roll/Pitch (deg) | N/A | N/A | N/A | N/A |
| Heading (deg) | N/A | N/A | N/A | N/A |

Specifications subject to change without notice.

Contact your local dealer today



TRIMBLE
Integrated Technologies
510 DeGuigne Drive
Sunnyvale, CA 94085
Americas & Asia-Pacific
Europe/EMEA

Email: sales-intech@trimble.com