Trimble UAS1

DUAL-FREQUENCY RECEIVER INTEGRATED WITH TRIMBLE RTX AND OMNISTAR SUPPORT FOR UAV / UAS APPLICATIONS

MULTI CONSTELLATION / MULTI FREQUENCY GNSS

The Trimble® UAS1 supports dual-frequency from GPS, GLONASS, and Galileo constellations. As the number of satellites in the constellations grow, the UAS1 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK and RTX initializations for centimeter-level positioning. For UAV / UAS applications that do not require centimeter-level accuracy, the UAS1 contains an advanced Kalman filter PVT engine that delivers high accuracy GNSS, DGNSS positions in the most challenging environments.

COMPACT DESIGN

The Trimble UAS1 GNSS receiver module has been designed for UAV / UAS applications requiring centimeter-level accuracy in a very small package. Mobile platforms can now embed proven Trimble RTK technology using a shielded module with a 71 mm x 46 mm x 13 mm form factor. The Trimble UAS1 design is compact with an MB-Two footprint and has a rugged, high-vibe latched connector that is tested to Trimble's highest quality standards.

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 UAS1 provides assurance of long-term future-proofing and trouble-free operation. Moving the UAV / UAS industry forward, the Trimble UAS1 redefines high performance positioning:
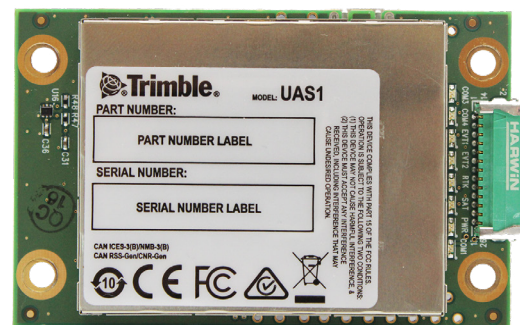
- ▶ 336 Tracking Channels
- ▶ Trimble Everest Plus multipath mitigation
- ▶ Advanced RF Spectrum Monitoring and Analysis
- ▶ Proven low-elevation tracking technology

RUGGED INTERFACING

The Trimble UAS1 was designed for easy integration and rugged dependability. Customers benefit from flexible interfacing over USB and RS232. Just like other Trimble embedded technologies, easy to use software commands simplify integration and reduce development times.

Key Features

- ▶ Compact design for UAV / UAS applications
- ▶ Power input range 7 - 60VDC
- ▶ Rugged latched connector for I/O
- ▶ Industry standard camera hot-shoe circuit
- ▶ CAN bus integrated
- ▶ LED indicators for status checks
- ▶ Trimble RTX and OmniSTAR Support
- ▶ EMI shielded GNSS module
- ▶ Centimeter-level position accuracy
- ▶ Advanced RF spectrum monitoring
- ▶ Data logging enabled
- ▶ Flexible interfacing over RS232 and USB

Trimble UAS1 Antenna

TECHNICAL SPECIFICATIONS
- Trimble Maxwell™ 7 Technology
- 336 Tracking Channels:
  - GPS: L1 C/A, L2E, L2C
  - BeiDou: B1 (Only available with upgrade)
  - GLONASS: L1 C/A, L2 C/A
  - Galileo[2]: E1
  - QZSS: L1 C/A, L1 == SAIF, L2C
  - SBAS: L1 C/A,
  - OmniSTAR and 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 inputs:
  - Inputs: CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 2.3, 3.0, 3.112, 3.2
  - Outputs: Available for purchase through upgrade
- 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)
- Data Logging
  - Internal memory: 50MB

COMMUNICATION
- 1 USB 2.0 Device port with RNDIS support
- 2 x Events
- 2 x TTL serial ports
- 1 x RS232 serial ports
- 1 x Camera hot-shoe interface
- Control Software:
  - HTML web browser, Internet Explorer, Firefox, Safari, Opera, Google Chrome over RNDIS via USB receptacle
- 1 CAN Port

PERFORMANCE SPECIFICATIONS
Time to First Fix (TTFF)[7]
- Cold Start[8] . . . . <45 seconds
- Warm Start[9] . . . . <30 seconds
- Signal Re-acquisition . . . .<2 seconds

Velocity Accuracy[3,4]
- Horizontal 0.007m/sec
- Vertical. 0.020m/sec

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

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

RTK initialization time[3] . . . . typically <8 seconds

RTK initialization reliability[3] . . . .>99.9%
- Position Latency[5] . . . .<20ms

Maximum Position/Attitude Update Rate 50Hz

PHYSICAL AND ELECTRICAL CHARACTERISTICS
Size. . . . . .71 mm x 46 mm x 13 mm

Power. . . . . .7 - 60VDC

Weight 45g

Connectors
- I/O . . . . Harwin Gecko 26-pin Latched
- GNSS Antenna . . . . .MMCX Male receptacle

Antenna LNA Power Input
- Input voltage . . . . 3.3VDC to 5VDC
- Maximum current. 400mA

Minimum required LNA Gain. . . . . +32.0dB

ENVIRONMENTAL CHARACTERISTICS[10]
Temperature
- Operating . . . .−40 °C to +75 °C
- Storage . . . . −55 °C to +75 °C

Vibration . . . . MIL810F, tailored
Random 6.2gRMS operating
Random 8gRMS survival

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

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

ORDERING INFORMATION
Part Number 117283-02

Pigtail Cable Part Number 118425-00

1   Trimble UAS1 is available in a rover configuration suited for the unmanned applications. Optional upgrades are available for purchase.
2   Developed under a License of the European Union and the European Space Agency.
3   May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
4   1 sigma level, when using Trimble approved antennas, add 1 ppm to RTK Position accuracies.
5   At maximum output rate.
6   GPS only and depends on SBAS System performance. FAA WAAS accuracy specifications are <5 m 3DRMS.
7   Typical observed values.
8   No previous satellite (ephemerides / almanac) or position (approximate position or time) information.
9   Ephemerides and last used position known
10 As required by the U.S. Department of Commerce to comply with export licensing restrictions.
11 Dependent on appropriate mounting/enclosure design.
12 Input only network correction
13 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.
14 Trimble RTX and OmniSTAR accuracies depend on correction service chosen. Trimble CenterPoint RTX provides <2cm RMS horizontal accuracy with an initialization less than 15 minutes.
15 Default configuration RTK accuracy is limited to 10 centimeters, 1 centimeter upgrade available for purchase.

Specifications subject to change without notice.

POSITIONING SPECIFICATIONS [3,4,14,15]

	Autonomous	SBAS	DGNSS	RTK
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)

Contact your local Trimble Authorized Distribution Partner for more information

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