

### KEY FEATURES

Proven GNSS technology from Trimble

440 channels for unmatched GNSS tracking performance

Bluetooth®, Ethernet, Serial and USB support

Large capacity internal memory plus external USB device logging capability

Convenient front panel display and configuration

Power over Ethernet (PoE) technology

Eight independent logging sessions

Multiple data file formats

Integrated battery which can act as a primary power source or as an uninterrupted power supply (UPS) backup

Powerful remote configuration and access



The Trimble NetR9 Global Navigation Satellite System (GNSS) reference receiver series consists of full-feature, top-of-the-line receivers designed to provide network operators with maximum features and functionality from a single receiver platform.

Utilizing the proven Trimble R-Track™ technology in combination with two Trimble Maxwell™ 6 chipsets, the Trimble NetR9 reference receiver offers an industry-leading 440 channels for unmatched GNSS multi-constellation tracking performance. With the world's GNSS in constant development, the Trimble NetR9 reference receiver provides the operator with the assurance that it has the capability to grow with the industry, both today, and well into the future.

The Trimble NetR9 reference receiver supports a wide range of satellite signals, including GPS L1, L2, L5 and GLONASS L1/L2 signals. In addition, Trimble is committed to the next generation of modernized GNSS configurations by providing Galileo-compatible products. In support of this plan, the new Trimble NetR9 reference receiver is capable of tracking the experimental GIOVE-A and GIOVE-B test satellites for signal evaluation and test purposes<sup>1,2</sup>.

The Trimble NetR9 reference receiver supports the new CMRx communications protocol, which provides unprecedented correction compression for optimized bandwidth and full utilization of all satellites in view. This gives you the most reliable positioning performance.

The Trimble NetR9 reference receiver's compact form factor, low power consumption and powerful network capabilities make for an ideal combination supporting a wide range of applications. A few specific examples include high-accuracy positioning as part of a Trimble VRS™ network, as a mobile field base station for Real-Time Kinematic (RTK) applications, for atmospheric research, as a Continuously Operating Reference Station (CORS), as a field campaign receiver for post-processing applications, and as support for Differential Global Positioning System (DGPS) MSK beacons. In addition, the Trimble NetR9 reference receiver can also be used for monitoring the integrity of VRS networks as well as physical infrastructure such as oil platforms, mines, dams, bridges, or other natural and manmade objects when precise deformation is crucial.

The rugged Trimble NetR9 reference receiver is a top-notch device that offers the latest in GNSS technology. It has physical memory built into the circuit board, providing a high level of data protection, an integrated battery for up to 15 hours of operating time and is tested

to IP67 and MIL-STD 810F for environmental protection. When it comes to logging data for any type of post-processing work, the Trimble NetR9 reference receiver excels. And, with an internal storage of eight gigabytes, along with support of external USB logging devices, the Trimble NetR9 reference receiver offers unparalleled storage capacity. In addition, the Trimble NetR9 reference receiver can log data at rates up to 50 Hz in a wide range of dissemination formats, including TO2, RINEX, BINEX and Google Earth files. When these are factored together with FTP and Email Push technology, you can achieve an uncompromised blend of functionality and efficiency.

The Trimble NetR9 reference receiver comes with powerful built-in remote management. Utilizing Internet Protocol (IP) as the primary communications mechanism, the familiar Trimble Infrastructure web user interface provides full receiver status, configuration, firmware updates and data access, and supports a variety of security levels and access control. Furthermore, the receiver supports Email Alerts so the operator knows exactly what is taking place at the receiver. For simple hands-on configuration, the Trimble NetR9 reference receiver offers a seven-button, two-line display and status information so that performing in-field configuration is practically effortless. Best of all, no handhelds are required to get this job done.

Available in three configurations, including the NetR9 Ti-1 (full feature), along with the Ti-2 and Ti-3 (both are fully upgradable), the NetR9 provides the most flexible receiver platform offered to date. And, with the NetR9 receiver platform's robust functionality, you can trust Trimble to provide the very latest technology in the GNSS industry to help position your way into the future.

**1. Galileo Commercial Authorization:**  
Receiver technology having Galileo capability to operate in the Galileo frequency bands and using information from the Galileo system for future operational satellites is restricted in the publicly available Galileo Open Service Signal-In-Space Interface Control Document (GAL OS SIS ICD) and requires commercial authorization for use. Receiver technology that tracks the GIOVE-A and GIOVE-B test satellites uses information that is unrestricted in the public domain in the GIOVE A + B Navigation Signals-In-Space Interface Control Document. Receiver technology having developmental GIOVE-A and B capability is intended for signal evaluation and test purposes.

**2. For more information about Trimble and GNSS modernization, please visit [http://www.trimble.com/srv\\_new\\_era.shtml](http://www.trimble.com/srv_new_era.shtml).**

## SATELLITE TRACKING

- Two advanced Trimble Maxwell 6 GNSS chipsets for a total of 440 channels
- Trimble EVEREST™ multipath signal rejection
- Trimble R-Track™ technology
- High precision multiple correlator for GNSS pseudorange measurements
- 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
- Signal-to-noise ratios reported in dB-Hz
- Proven Trimble low elevation tracking technology
- Current satellite signals tracked simultaneously:
  - GPS: L1 C/A, L2C, L2E (Trimble method for tracking L2P), L5
  - GLONASS: L1 C/A and unencrypted P code, L2 C/A<sup>2</sup> and unencrypted P code
  - Galileo GIOVE-A and GIOVE-B
  - SBAS: L1 C/A, L5 supporting WAAS, EGNOS and MSAS
  - L-Band OmniSTAR VBS, HP and XP

## POSITIONING PERFORMANCE

### Code Differential GNSS Positioning<sup>3</sup>

Horizontal . . . . .	0.25 m + 1 ppm RMS
Vertical . . . . .	0.50 m + 1 ppm RMS
WAAS differential positioning accuracy <sup>4</sup> . . . . .	typically <5 m 3DRMS

### Static GNSS Surveying<sup>2</sup>

#### Baseline <30 km

Horizontal . . . . .	3 mm + 0.1 ppm RMS
Vertical . . . . .	4 mm + 0.4 ppm RMS

#### Baseline >30 km

Horizontal . . . . .	4 mm + 0 ppm RMS
Vertical . . . . .	9 mm + 0 ppm RMS

### Real Time Kinematic Surveying<sup>3,5</sup>

#### Single Baseline <30 km

Horizontal . . . . .	8 mm + 1 ppm RMS
Vertical . . . . .	15 mm + 1 ppm RMS

#### Networked RTK<sup>6</sup>

Horizontal . . . . .	8 mm + 0.5 ppm RMS
Vertical . . . . .	15 mm + 0.5 ppm RMS
Initialization time . . . . .	typically <10 seconds
Initialization reliability . . . . .	typically >99.9%

## COMMUNICATION

- Serial Ports
  - One D9 Male, EIA-574 RS-232/V.24 Full 9 wire serial
  - One Lemo 7 pin Oshell, 3 wire serial with power input, 1 PPS output and event input
  - One Mini B USB 5 pin; supports Device and Host mode operations
- Bluetooth<sup>7</sup>
  - Integrated 2.4 GHz Bluetooth; supports 3 simultaneous connections
- Ethernet
  - Integrated RJ45 jack
  - Full-duplex, auto-negotiate 100Base-T
  - Power over Ethernet (PoE) support with a Class 3 PoE supply
  - HTTP, HTTPS, TCP/IP, UDP, FTP, NTRIP Caster, NTRIP Server, NTRIP Client
  - Proxy server support
  - Routing table support
  - NTP Server, NTP Client support
  - UPnP and Zeroconf support
  - Email Alerts and File Push

## DATA LOGGING

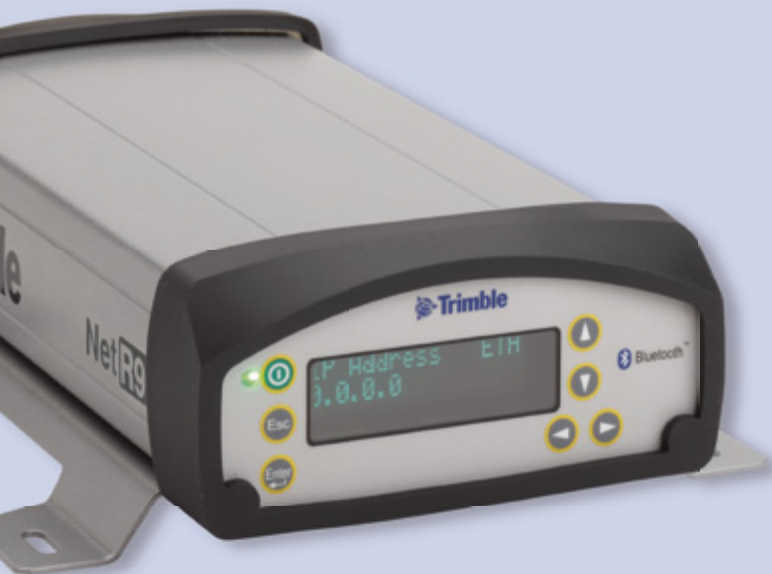
Storage Capacity	
Onboard memory . . . . .	8 GB
External memory <sup>8</sup> . . . . .	greater than 1 TB
Maximum logging rate . . . . .	50 Hz
File durations . . . . .	5 minutes to continuous
Storage sessions . . . . .	8 concurrent independent sessions with dedicated memory pooling and ring buffers
File formats . . . . .	T02, RINEX v2.11, RINEX v3.0, BINEX, Google Earth KMZ
File naming options . . . . .	multiple
Data retrieval and transfer . . . . .	HTTP, FTP Server, USB, FTP Push and Email Push
Events . . . . .	definable file protection on events

## PHYSICAL SPECIFICATIONS

Dimensions (L x W x H) . . . . .	26.5 cm x 13.0 cm x 5.5 cm (10.43 in x 5.12 in x 2.16 in)
Weight . . . . .	1.75 kg (3.85 lb)

## INPUT/OUTPUT FORMATS

- Correction Formats:
  - CMR, CMR+, CMRx, RTCM 2.1, RTCM 2.2, RTCM 2.3, RTCM 3.0, RTCM 3.1
- Observables:
  - RT17, RT27, BINEX, RTCM 3.x
- Position/Status I/O:
  - NMEA-0183 v2.30, GSOF
- Up to 50 Hz Output
- 10 MHz External Frequency Input
  - Normal input level 0 to +13 dBm
  - Maximum input level +17 dBm, ±35 V DC
  - Input impedance 50 Ohms @ 10 MHz; DC blocked
- 1 PPS Output
- Event Input
- Met/Tilt Sensor Support



## ENVIRONMENT

Rated to	IP67 and MIL-STD 810F
Operating temperature <sup>9</sup>	–40 °C to +65 °C (–40 °F to +149 °F)
Storage temperature	–40 °C to +80 °C (–40 °F to +176 °F)
Humidity	100% condensing
Shock	Survival: Non-operating 75 g, 6 mS; Operating: to 25 g, 10 ms, sawtooth; designed to survive a 1 m drop onto hard surface
Vibration	Operating: 7.5 Hz to 350 Hz 0.015 g <sup>2</sup> /Hz, 350 Hz to 500 Hz 0.006 g <sup>2</sup> /Hz –6dB/Octave; Non-Operating: 10 Hz to 300 Hz 0.04 g <sup>2</sup> /Hz 300 Hz to 1000 Hz –6 dB/Octave
Ingress protection	tested to IP67; waterproof for temporary immersion to a depth of 1 m (3.28 ft); dustproof

## USER INTERFACE

- **Front Panel Display**
  - 2-line x 16-character vacuum fluorescent display
  - Advanced power saving modes
  - Escape and Enter key for menu navigation
  - 4 arrow keys (up, down, left and right) for scrolling and data entry
  - Power button and indication LED
- **Web User Interface**
  - Secure
  - Allows remote configuration, data retrieval and firmware updates
- **Programmatic Interface**
  - Allows for open, non-proprietary access, control and configuration

## ANTENNA SUPPORT

Output voltage	5.0 V DC nominal
Maximum output current	150 mA
Maximum cable loss	12 dB
Recommended antennas	Trimble Zephyr Geodetic™ 2, Trimble GNSS Choke Ring

## SECURITY

- Optional HTTP login
- HTTPS
- Real-time stream authentication
- Programmatic interface authentication
- NTRIP

## ELECTRICAL

- Power over Ethernet (PoE) 802.3af; requires a Class 3 PoE supply
- 9.5 V DC to 28 V DC input on Lemo port
  - User-configurable power-on voltage
  - User-configurable power-down voltage
- Integrated internal battery 7.4 V, 7800 mA-hr, Li-Ion; 15 hours of continuous operation, dependent on user settings
- Internal battery operates as a UPS in the event of power source outage
- Seamless switching between external/internal power sources
- Internal battery will charge from external power source when input voltage is >12 V DC
- Integrated charging circuitry
- Power consumption 3.8 W nominal, dependent on user settings

## REGULATORY COMPLIANCE

- RoHS
- China RoHS
- FCC Part 15.247 FCC certifications
- Class B Device FCC Part 15 and ICES-003 compliance
- RSS-310 and RSS-210 Industry Canada compliance
- CE mark compliance
- C-Tick mark compliance
- UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Li-Ion battery)
- UN ST/SG/AC.10.27/Add. 2 (Li-Ion battery)
- WEEE

<sup>1</sup> NetR9 available in three configurations: Ti-1, Ti-2 and Ti-3. Specifications shown reflect full features and capability of Ti-1 model. Please consult your local distributor for additional information.

<sup>2</sup> L2 CIA on GLONASS-M satellites.

<sup>3</sup> Accuracy may be subject to degradation by multipath interference, obstructions, satellite geometry and atmospheric conditions. Always follow recommended survey practices.

<sup>4</sup> Depends on WAAS/EGNOS system performance.

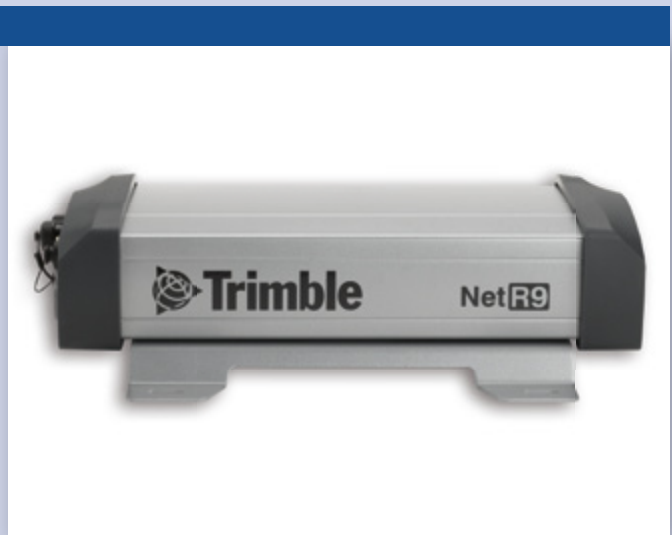
<sup>5</sup> NetR9 limited to 1,000 m RTK baseline length.

<sup>6</sup> Networked RTK PPM values are referenced to the closest physical base station.

<sup>7</sup> Bluetooth type approvals are country specific. Contact your local authorized Trimble distribution partner for more information.

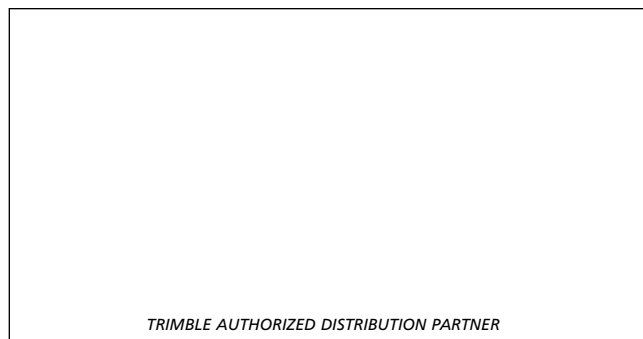
<sup>8</sup> USB device minimum recommended specification must support USB 2.0 Hi-Speed with a minimum write speed of 6 Mbps. Solid state drives recommended for optimal performance.

<sup>9</sup> The internal battery will operate from –20 °C to +50 °C (–4 °F to +122 °F). The internal battery charger will operate from 0 °C to 40 °C (32 °F to 104 °F).





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