

# Geospatial GNSS Systems

# GNSS Solutions Designed with the Surveyor in Mind



## POWERFUL TECHNOLOGY YOU CAN DEPEND ON...NO MATTER WHAT THE CHALLENGE

Whether you are climbing over rough terrain to collect topographic data, racing to finish an as-built before nightfall, or staking out a road under the relentless summer sun, Trimble offers a complete portfolio of GNSS solutions to help you conquer your survey challenges.

Trimble offers survey professionals the GNSS options they require. Whether you need the cable-free convenience provided by Trimble integrated systems, the flexibility of Trimble modular systems, or the simplicity of handheld point measurement, Trimble has a solution for you.

Simply choose the system configuration and level of GNSS support that best fits your application and business needs.

## ENABLING YOU TO BE THE BEST

Through every stage of your surveying project, Trimble solutions ensure you are working at optimal efficiency with the utmost confidence in your work:

- ▶ Experience productivity that goes beyond having the best GNSS technology on the market
- ▶ Collect more data in less time via comprehensive GNSS support and an abundance of powerful features, including Trimble HD-GNSS and Trimble 360 technologies
- ▶ Reduce rework with quality control features, such as Trimble® SurePoint™ technology
- ▶ Easy-to-use field solutions allow you to get the most out of your GNSS system



## Industry-leading GNSS Solutions

Backed by a legacy of GNSS technology leadership and surveying expertise, Trimble provides surveyors with reliable, innovative GNSS survey solutions that meet their distinct requirements. For more than 30 years, Trimble has been setting the standard when it comes to positioning technology—and that tradition continues today and into the future.



### INTEGRATED SURVEYING SOLUTIONS

Combine Trimble surveying technologies to accomplish more in the field. Trimble GNSS receivers integrate seamlessly with the full suite of Trimble survey systems. Whether you are staking out with your optical total station or documenting the job site with the Trimble V10 imaging rover, all Trimble survey solutions integrate seamlessly both in the field and back in the office through Trimble Business Center office software.

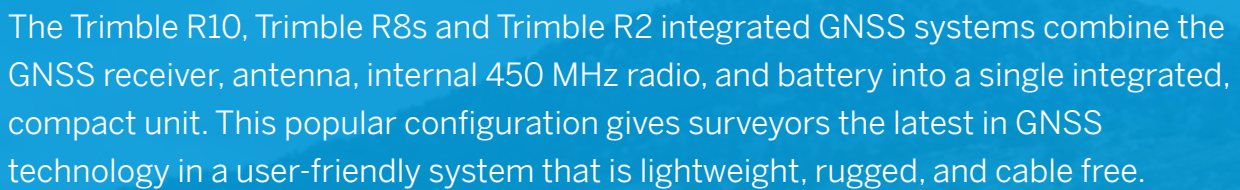
### GNSS SYSTEMS FOR ALL YOUR APPLICATION NEEDS

Built on a foundation of established and durable hardware, customizable software, and services, Trimble surveying systems are designed to support a range of surveying applications including:

- ▶ Architecture
- ▶ Cadastral & Boundary Surveying
- ▶ Geodetic & Control Surveying
- ▶ Land Seismic, Exploration, and Natural Resources
- ▶ Land Surveying
- ▶ Mining
- ▶ Utilities & Transportation
- ▶ GIS Field Data Collection



# Integrated GNSS Systems



The Trimble R10, Trimble R8s and Trimble R2 integrated GNSS systems combine the GNSS receiver, antenna, internal 450 MHz radio, and battery into a single integrated, compact unit. This popular configuration gives surveyors the latest in GNSS technology in a user-friendly system that is lightweight, rugged, and cable free.

## ADVANCED SURVEY TECHNOLOGIES

For more than 30 years, Trimble has developed GNSS technologies that advance the capabilities of the surveyor, enabling efficient and accurate data capture in the field.

The Trimble HD-GNSS processing engine provides a more accurate assessment of error estimates than traditional GNSS processing engines, especially in challenging environments. Markedly reduced convergence times as well as high position and precision reliability enable surveyors to collect measurements with confidence.

Integrated into the R10 receiver, Trimble SurePoint technology means you'll get faster measurements, increased accuracy, and greater quality control. The

Trimble controller displays an electronic bubble so all the measurement information is in one convenient place. The system can also compensate for up to 15° of pole tilt so you can easily measure points that were previously inaccessible.

Never be interrupted again by connection outages. Leveraging a worldwide network of Trimble GNSS reference stations and satellite data links, Trimble xFill in the R10 and R9s seamlessly fills in for gaps in your RTK or VRS correction stream for connection outages of up to five minutes at a time. In combination with a CenterPoint RTX subscription, survey level precisions are maintained for an infinite duration.



## POWERFUL PROCESSING SOFTWARE

### Trimble Business Center Office Software

Back in the office, seamlessly transfer your field data to Trimble Business Center. Edit, process, adjust, and quality check collected data with confidence. Select a Trimble Business software edition based on what level of data processing is needed. Add on valuable modules like Advanced Drafting or Photogrammetry if you are integrating with the Trimble V10.

No matter what Trimble solution you use in the field, you can trust that Trimble Business Center office software will help you generate industry leading deliverables.



# Integrated GNSS Systems



## TRIMBLE R10

### Productivity Beyond GNSS.

Designed to help surveying professionals work more effectively, the Trimble R10 represents the next generation of GNSS surveying. With powerful technologies that go beyond comprehensive GNSS support, the Trimble R10 enables the surveyor to collect more reliable data—no matter what the job.

- ▶ Cutting edge Trimble HD-GNSS processing engine enables surveyors to measure points more quickly
- ▶ SurePoint technology fully compensates for pole tilt. Conveniently measure points that were otherwise inaccessible with complete quality assurance
- ▶ Trimble xFill™ technology provides less downtime in the field, with continuous RTK coverage during connection outages from an RTK base station or VRS™ network
- ▶ Powerful 440-channel solution with Trimble 360 technology delivers the most advanced satellite tracking
- ▶ Trimble CenterPoint® RTX correction service delivers GNSS corrections via satellite or internet connection for unprecedented speed and accuracy for a PPP solution
- ▶ Ergonomic design for easier and more comfortable handling
- ▶ Integrates seamlessly with V10 imaging rover and S-Series total station positioning sensors
- ▶ Pair with Trimble Access™ software and the TSC3 controller, Tablet, Slate or Trimble CU for the most powerful solution on the market

## TRIMBLE R8s

### Configured for Today. Scalable for Tomorrow

The Trimble R8s GNSS receiver is a flexible, scalable system that offers all of the features and benefits you expect, in one customizable system. Simply select a configuration based on how the receiver will be used in the field, whether it is for static GNSS surveys with postprocessing of GNSS raw data in the office, or the receiver being used as a base station or rover receiver, or a combination of both base and rover. After you've selected a configuration level, additional individual features can be added to further extend the receiver functionality. Each Trimble R8s receiver comes with:

- ▶ Powerful 440 channel solution with Trimble 360 technology that delivers the most advanced satellite tracking
- ▶ Comprehensive support for all existing and planned GNSS constellations and augmentation systems
- ▶ Flexible wireless communication options for connecting to the controller
- ▶ Simple integration with Trimble total stations and the Trimble V10 imaging rover
- ▶ Compatibility with Trimble Access field software on the Trimble TSC3, Trimble Tablet, Trimble CU or Slate for an industry-leading field solution
- ▶ Easy to use Trimble DL data logging Android app for a convenient way to start a postprocessing workflow



## TRIMBLE R2

### The Versatile Receiver that Works as Hard as You Do

With its trusted Trimble technology and compact, durable design, the Trimble R2 GNSS receiver lets you work the way you want. It gives you the flexibility to configure a solution based on the accuracy and performance level that suits your application. It's the smart, easy-to-use solution for geospatial applications, ranging from pole-based stakeouts to surveying on roads, in mines or on construction sites, and much more.

The Trimble R2 GNSS receiver:

- ▶ Enables you to select submeter to centimeter level positioning accuracy
- ▶ Delivers maximum data quality via its Trimble Maxwell™ 6 chip with 220 channels and leading GNSS technology
- ▶ Supports multiple satellite constellations and correction sources either via network connection or satellite (L-Band) for accurate data at any location
- ▶ Includes Trimble RTX correction services providing highly accurate positions anywhere without the need for a base station or VRS network
- ▶ One-button start up and compact, streamlined design enable quick setup, whether it's mounted on a pole, in a backpack or on a vehicle

## TRIMBLE R1

### Transforming Smart Devices into High-Accuracy Data Collectors

Ideal for GIS workflows, the Trimble R1 is a rugged, compact GNSS receiver that provides professional-grade positioning information to any connected mobile device using Bluetooth® connectivity. No matter what smart device you choose—from iOS to Android—for collecting GIS data, inspecting, or managing assets, the Trimble R1 lets you achieve a greater level of reliable spatial accuracy than your current smartphone or tablet is able to provide on its own.

- ▶ Sub-meter positioning accuracy with optional Trimble ViewPoint RTX™ corrections service over the internet or satellite, even in remote locations
- ▶ Pocket-sized and lightweight, it can be carried in a vest pocket or clipped on a belt when not in use
- ▶ Bluetooth connectivity ensures streamlined, cable-free operation for easy use and mobility in the field
- ▶ Supports multiple satellite constellations and a range of correction services, including SBAS, VRS, and RTX, for global coverage
- ▶ Compatible with a variety of professional handhelds and consumer smart devices to ensure current technology investments are maximized

# Modular Trimble GNSS System



## TRIMBLE R9s

### Scalable, Configurable, Connected

The Trimble R9s receiver enables you take the best of Trimble GNSS technology anywhere you want to go.

- ▶ Scalable options and operation modes lets you choose the right receiver for your application
- ▶ Multiple ways to configure the receiver including a Web User Interface via Ethernet, using Trimble Access, or using the front panel faceplate
- ▶ Configuration upgrades available now or down the road ensure your receiver will last well into the future
- ▶ Ability to send or receive RTK corrections via Ethernet connection

### The Total Modular Solution

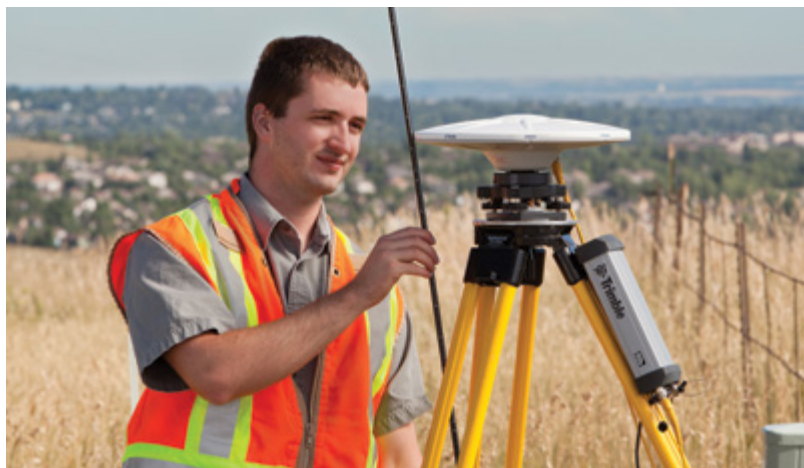
The Trimble R9s receiver offers advanced GNSS support in a modular design that employs an external GNSS antenna for greater freedom to adapt depending on the application.

- ▶ Advanced 440-channel system with Trimble 360 satellite tracking technology
- ▶ Provides the flexibility to be used on the pole or as a base station with an internal UHF radio or external high power UHF radio
- ▶ Partner with Trimble Access and the TSC3 controller or Trimble Tablet for the optimal field solution

### Comprehensive GNSS Modularity

The Trimble R9s is a GNSS receiver designed to provide surveyors with maximum functionality and flexibility. The Trimble technologies provided in the R9s receiver are a unique and comprehensive combination.

- ▶ Trimble CenterPoint® RTX correction service, Trimble xFill and Trimble 360 technologies are all integrated into this modular receiver system
- ▶ The Trimble R9s receiver supports a wide range of high-accuracy positioning modes, including mobile field base station or an RTK and RTX rover with markedly reduced convergence times





# Field Solutions



## UNLOCK THE POTENTIAL OF YOUR TRIMBLE GNSS SYSTEMS

Trimble provides surveyors with a complete approach to managing fieldwork. Trimble Field Solutions achieve faster time-to-deliverable and improve your competitive edge with increased productivity and easy access into new, specialized applications.

## TRIMBLE ACCESS FIELD SOFTWARE

Trimble Access software offers numerous features and capabilities to greatly improve your efficiency. Streamlined workflows—such as Roads, Monitoring, Mines, and Tunnels—guide crews through common project types and allows crews to get the job done faster with less distractions. Trimble Access workflows can also be customized to fit your needs.

## TRIMBLE CONTROLLERS

Trimble controllers—including the Tablet, TSC3, Trimble CU and Slate—support the unique ways you need to work. Setup and data delivery is fast and streamlined thanks to an intuitive Windows based interface and a range of connectivity and communication options. Perform calculations, generate reports on your Trimble controller, and easily send and receive files via the Internet—all while still in the field. If you are collecting static GNSS raw data for postprocessing purposes, the Trimble DL app provides a simple and easy to use mobile interface for Android smartphones and tablets.

## TRIMBLE CENTERPOINT RTX AND XFILL

CenterPoint RTX provides accuracy better than 4 cm (1.5") via satellite or cellular. No other satellite delivered correction service performs better.



Powered by Trimble RTX technology, Trimble xFill provides seamless, centimeter-level back-up corrections via satellite if RTK or VRS signal source is interrupted.

With these services from Trimble, you can survey longer and in previously inaccessible places. Go further than just GNSS.

# Field Solutions



## TRIMBLE GEO 7X

### Providing Options for Your Choice of Workflow

The rugged Trimble Geo7X handheld with the software that is right for your application is a complete solution for surveyors and engineers, designed to make both high-accuracy surveying and handheld point measurement easier, more efficient, and more flexible.

- ▶ Dedicated network rover solution suitable for all your surveying needs
- ▶ Detachable rangefinder accessory—simply point and shoot to get a position
- ▶ Can be mounted on a survey rod with an external antenna for survey-grade accuracy. Off the rod, seamlessly switch to its integrated antenna for handheld point measurement with easy access to features such as the integrated camera
- ▶ Trimble Access field software provides a familiar, easy-to-use interface that will ensure instant real-time productivity or will help you collect GNSS data for postprocessing in the Trimble Business Center software





## TRIMBLE V10 IMAGING ROVER

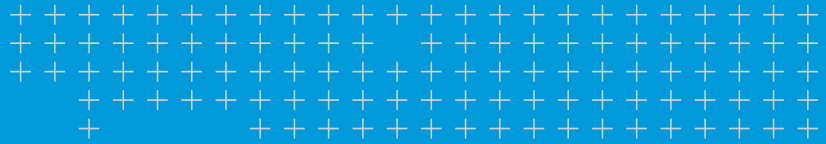
### Point Clouds from Pictures







The Trimble V10 imaging rover with Trimble VISION™ technology is an integrated camera system that precisely captures a 60 MP, 360-degree digital panoramas for efficient visual documentation and measurement of the surrounding environment. The Trimble V10 enables you to capture more critical information that can be transformed into enhanced, rich geospatial deliverables.

- ▶ A total of 12 calibrated cameras—seven panorama and five downward-looking—provide complete site documentation that can be used to make photogrammetric measurements
- ▶ Capture panoramas, review images and store observations using Trimble Access field software
- ▶ In the field, use the Trimble V10 imaging rover to visually observe and capture the entire job site. In the office, Trimble Business Center offers close-range photogrammetry tools to perform survey-grade

measurement of imaged features and prepare rich deliverables

- ▶ Export collected images into SketchUp® Pro to create robust 3D models of buildings, bridges and a variety of other objects
- ▶ Integrates seamlessly with the Trimble R10 and R8s GNSS receivers or Trimble S-Series total station, or it can be used without a positioning receiver



	Integrated Systems				Modular System	Handheld System
	Trimble R10 	Trimble R8s 	Trimble R2 	Trimble R1 	Trimble R9s 	Geo7X 
GNSS Surveying	Real-Time (RTK/VRS/RTX) and Postprocessed	Real-Time (RTK/VRS) and Postprocessed	Real-Time (RTK/VRS/RTX) and Postprocessed	Real-time (RTK/VRS) and Postprocessed	Real-Time (RTK/VRS/RTX) and Postprocessed	Real-time (RTK/VRS) and Postprocessed
Tracking Technology	Trimble 360	Trimble 360	R-Track™	R-Track	Trimble 360	R-Track
Channels	440	440	220	44	440	220
Solution Type	HD-GNSS	Fixed/Float	Fixed/Float	Fixed/Float	Fixed/Float	Fixed/Float
xFill	Yes	No	No	No	Yes	No
RTX	Yes	No	Yes	Yes	Yes	No
Surepoint	Yes	No	No	No	No	No
UHF Radio	Receive & Transmit <sup>1</sup>	Receive & Transmit <sup>1</sup>	Receive	No	Receive & Transmit <sup>1</sup>	No
Cellular	Yes	Yes <sup>1</sup>	External	External	External	Yes
WiFi	Yes	No	Yes	No	No <sup>2</sup>	Yes
Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes
Memory	4 GB	56 MB	48 MB	No	52 MB & External <sup>3</sup>	4 GB
Antenna	Integrated	Integrated	Integrated	Integrated	External	Integrated & External
Camera	No	No	No	No	No	5 MP
Web Interface	Yes	Yes	Yes	No	Yes	No
Integrated Surveying	Yes	Yes	Yes	No	Yes	No
GPS	Yes	Yes	Yes	Yes	Yes	Yes
GLONASS	Yes	Yes <sup>1</sup>	Yes	Yes	Yes <sup>1</sup>	Yes
Galileo	Yes	Yes <sup>1</sup>	Yes	Yes	Yes <sup>1</sup>	No
BeiDou	Yes	Yes <sup>1</sup>	Yes	Yes	Yes <sup>1</sup>	No
BeiDou-only RTK/PP	Yes	Yes	Yes	No	Yes	No
SBAS	Yes	Yes	Yes	Yes	Yes	Yes
Battery	Single, removable	Single, removable	Single, removable	Single, Internal	Single, Internal	Single, removable
Field Solution	Trimble Access (Tablet, TSC3, Slate <sup>1</sup> , or Trimble CU), Trimble DL App (Android Devices)	Trimble Access (Tablet, TSC3, Slate, or Trimble CU), Trimble DL App (Android Devices)	Windows, iOS & Android smart devices, Trimble handhelds, TerraSync, TerraFlex, GPS Pathfinder Office, Trimble Positions	Windows, iOS & Android smart devices, Trimble handhelds, TerraSync, TerraFlex, GPS Pathfinder Office, Trimble Positions	Trimble Access (Tablet, TSC3, Slate, or Trimble CU), Trimble DL App (Android Devices), Front Panel	Trimble Access (on board)

1. Based on Configuration
2. Ethernet Port
3. USB Drive or External Hard Drive

Contact your local Trimble Authorized Distribution Partner for more information

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