AllTerra Gulf
Trimble Geospatial Solutions

TRANSFORMING THE WAY THE WORLD WORKS

Trimble.
Authorised Distribution Partner

www.allterragulf.com

ALLTERRA™

About AllTerra

AllTerra Gulf

AllTerra Gulf, a part of the Mohamed Abdulrahman Al-Bahar group of companies, is the Trimble's Brand involving Distributorship services featuring technology products used in the fields of mapping and surveying, and featuring subscription and consulting services using data to increase accuracy and efficiency in the fields of mapping and surveying.

At AllTerra, we pride ourselves on the quality and range of products and services we offer to our customers. We supply everything from the simplest of survey accessories through to the full range of surveying equipment, robotic total stations and GPS. Civil engineering and construction projects present many challenges for which we can offer complete solutions for surveying, monitoring, scanning, and other geo referencing tasks.

With years of experience in providing a quality service to the civil engineering, surveying and construction industries we are committed to innovating the service we can provide to our customers by adding new innovative products, solutions and services to our customers.

Sales and Rentals

We supply a wide range of instruments, accessories and consumables for measuring, surveying applications and construction. We have a large and comprehensive hire fleet, fully maintained by factory trained staff. We aim to offer a same or next day delivery service wherever requested.

Repair & Service

We have many years of experience in the supply of Trimble, Nikon, Spectra Precision and other manufacturers equipment. All our workshop staff have been factory trained at Trimble locations. We repair and service all types of equipment and provide detailed estimates for all work.

We are the Trimble Authorized Distributor in GCC for Trimble Geospatial and Trimble Geo Instruments, in addition to Trimble Heavy Highway and Heavy Construction.

Our Sister Companies

SITECH®

SITECH Gulf, being a part of the Mohamed Abdulrahman Al-Bahar group of companies, assists its valued customers in implementing the productivity gains of machine control in the U.A.E., Oman, Qatar, Bahrain and Kuwait. With a combined of **25 years** of experience in the construction industry the team offers you the best end-to-end solutions and best-in-class support you have come to expect in the region.

We will guide you on how to leverage Trimble and Caterpillar machine control systems for your entire fleet of heavy equipment along with Trimble's complete portfolio of Connected Site solutions-Site Positioning Systems, Construction Asset Management Services, construction software and powerful wireless and internet-based infrastructures.

GPS GULF POSITIONING SYSTEMS

Gulf Positioning Systems (GPS) is assisting its valued customers with the specialized Scanning and Mapping Services in the Middle East.

Our Parent Company

MOHAMED ABDULRAHMAN AL-BAHAR | **CAT®**

- More than **75 years** of experience in Middle East with offices in various GCC countries

- Operating with business model built up on trust and quality

Al-Bahar are traders of Cat® machinery, heavy equipment and power systems for a wide variety of applications, including earthmoving, building and construction, mining, road making construction, demolition, waste and scrap handling, electric power generation, marine propulsion etc.

Additionally, through our extensive line-up of materials handling equipment including Cat®, KoneCranes Lift Trucks, Terex Cranes and Atlet Warehouse Trucks, Al-Bahar extends its Machinery Trading services to an even wider variety of industries.

With a mission to strengthen market leadership by creating dynamic and profitable relationships with customers and suppliers through innovative solutions and more than 2,800 committed employees, Al-Bahar has proved to become one of the most favored and trusted companies within the Machinery Trading industry in the Middle East.

Contents

ALLTERRA™

Trimble R10

GNSS SYSTEM

Key Features

- ▶ Cutting-edge Trimble HD-GNSS processing engine
- ▶ Precise position capture with Trimble SurePoint technology
- ▶ Trimble CenterPoint RTX provides RTK level precision anywhere without the need for a base station or VRS network
- ▶ Trimble xFill technology provides RTK coverage during connection outages
- ▶ Advanced satellite tracking with Trimble 360 receiver technology
- ▶ Sleek ergonomic design for easier handling

A NEW LEVEL OF PRODUCTIVITY

Collect more accurate data faster and easier–no matter what the job or the environment, with the Trimble® R10 GNSS System. Built with powerful technologies like Trimble HD-GNSS, Trimble SurePoint™, Trimble CenterPoint™ RTX, and Trimble xFill™, integrated into a sleek design, this unique system provides Surveyors with a powerful way to increase productivity in every job, every day.

The advanced Trimble HD-GNSS processing engine provides markedly reduced convergence times as well as high position and precision reliability while reducing measurement occupation time. Transcending traditional fixed/float techniques, it provides a more accurate assessment of error estimates than traditional GNSS technology.

With this system, surveyors don't have to switch focus from the controller screen to the pole bubble to check that the pole is plumb. The Trimble controller displays an electronic bubble.

The system constantly monitors pole tilt and compensates while the point is automatically or manually measured. If a point is measured with pole tilt beyond a user-defined setting, Trimble Access™ software will give an alert and prompt the surveyor to accept or discard the point. Trimble SurePoint even uses the pole tilt as a controlling input. After a point is measured, tilting the pole causes the system to automatically prepare to measure the next point.

As insurance that all of your data is traceable, the Trimble R10 can record the pole tilt information for measured points. These records include tilt and compass data for 100% data traceability.

Powerful Trimble 360 receiver technology in the Trimble R10 supports signals from all existing and planned GNSS constellations and augmentation systems. With two integrated Trimble MaxwellTM 6 chips, the Trimble R10 offers an unparalleled 440 GNSS channels. Trimble delivers business confidence with a sound GNSS investment for today and long into the future.

Trimble CenterPoint RTX delivers RTK level precision anywhere in the world without the use of a local base station or Trimble VRS™ Network. Survey using satellite delivered, CenterPoint RTX corrections in areas where terrestrial based corrections are not available. When surveying over a great distance in a remote area, such as a pipeline or utility right of way, CenterPoint RTX eliminates the need to continuously move base stations or maintain connection to a cellular network.

Leveraging a worldwide network of Trimble GNSS reference stations and satellite datalinks, Trimble xFill seamlessly fills in for gaps in your RTK or VRS connection stream. Extend xFill indefinitely with a subscription to CenterPoint RTX.

As the smallest and lightest integrated receiver in its class, the Trimble R10 is ergonomically designed to provide the surveyor with effortless handling and operation. Designed for ease of use, the progressive design incorporates a more stable center of mass at the top of the range pole, while its sleeker, taller profile provides the durability and reliability for which Trimble is known.

The Trimble R10 receiver incorporates a quick release adaptor for simple and safe removal of the receiver from the range pole. Additionally the quick release adaptor ensures a solid, stable connection between the range pole and receiver.

An Intelligent Solution

A smart lithium-ion battery inside the Trimble R10 system   delivers extended battery life and more reliable power. A built-in LED battery status indicator allows the user to quickly check remaining battery life.

The Trimble R10 system provides a number of communications options to support any workflow. The latest mobile phone technology is built in to receive VRS corrections and connect to the Internet from the field. Access Trimble Connected Community to send or receive documents while away from the office. Using WiFi, easily connect to the Trimble R10 system using a laptop or smartphone to configure the receiver without a Trimble controller.

The Complete Solution

Bring the power and speed of the Trimble R10 system together with trusted Trimble software solutions, including Trimble Access and Trimble Business Center™.

Trimble Access field software provides specialized and customized workflows to make surveying tasks quicker and easier while enabling teams to communicate vital information between field and office in real time. Back in the office, users can seamlessly process data with Trimble Business Center software.

The R10 GNSS system, a new era of surveying productivity beyond GNSS for professional surveyors.

®Trimble®

PERFORMANCE SPECIFICATIONS

Measurements

- Measuring points sooner and faster with Trimble HD-GNSS technology
- Increased measurement productivity and traceability with Trimble SurePoint electronic tilt compensation
- Worldwide centimeter level positioning using Trimble CenterPoint RTX satellite delivered corrections
- Reduced downtime due to loss of radio signal with Trimble xFill technology
- Advanced Trimble Maxwell 6 Custom Survey GNSS chips with 440 channels
- Future-proof your investment with Trimble 360 GNSS tracking
- Satellite signals tracked simultaneously:
  - – GPS: L1C/A, L1C, L2C, L2E, L5
  - – GLONASS: L1C/A, L1P, L2C/A, L2P, L3
  - – SBAS: L1C/A, L5 (For SBAS satellites that support L5)
  - – Galileo: E1, E5a, E5B
  - – BeiDou (COMPASS): B1, B2
- CenterPoint RTX, OmniSTAR HP, XP, G2, VBS positioning
- QZSS, WAAS, EGNOS, GAGAN
- Positioning Rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz

POSITIONING PERFORMANCE[1]

Code differential GNSS positioning

Horizontal. . . . . 0.25 m + 1 ppm RMS
Vertical . . . . 0.50 m + 1 ppm RMS
SBAS differential positioning accuracy[2] . . . . typically <5 m 3DRMS

Static GNSS surveying

High-Precision Static
  Horizontal. . . . . .3 mm + 0.1 ppm RMS
  Vertical . . . . 3.5 mm + 0.4 ppm RMS
Static and Fast Static
  Horizontal. . . . . 3 mm + 0.5 ppm RMS
  Vertical . . . . 5 mm + 0.5 ppm RMS

Real Time Kinematic surveying

Single Baseline <30 km
  Horizontal. . . . . .8 mm + 1 ppm RMS
  Vertical . . . . .15 mm + 1 ppm RMS
Network RTK[3]
  Horizontal. . . . . 8 mm + 0.5 ppm RMS
  Vertical . . . . 15 mm + 0.5 ppm RMS
RTK start-up time for specified precisions[4] . . . . 2 to 8 seconds
Trimble CenterPoint RTX
  Horizontal. . . . . .4 cm
  Vertical . . . . .9 cm
  RTX convergence time for specified precisions[12]. . . . . .30 minutes or less
  RTX QuickStart convergence time for specified precisions[12]. . . . . . . 5 minutes or less
Trimble xFill[5]
  Horizontal. . . . . RTK[6] + 10 mm/minute RMS
  Vertical . . . . .RTK[6] + 20 mm/minute RMS

HARDWARE

Physical

Dimensions (W×H). . . . . 11.9 cm x 13.6 cm (4.6 in x 5.4 in)
  Weight. . . . . .1.12 kg (2.49 lb) with internal battery,
                                internal radio with UHF antenna,
            3.57 kg (7.86 lb) items above plus range pole, controller & bracket
Temperature[7]
  Operating . . . . –40° C to +65° C (–40° F to +149° F)
  Storage. . . . .–40° C to +75° C (–40° F to +167° F)
Humidity. . . . . 100%, condensing
Ingress Protection . . . . IP67 dustproof, protected from temporary
                                immersion to depth of 1 m (3.28 ft)
Shock and vibration . . . . Tested and meets the following environmental standards:
  Shock. . . . . .Non-operating: Designed to survive a 2 m (6.6 ft) pole
                    drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
  Vibration. MIL-STD-810F, FIG.514.5C-1

Electrical

- Power 11 to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)
- Rechargeable, removable 7.4 V, 3.7 Ah Lithium-ion smart battery with LED status indicators
- Power consumption is 5.1 W in RTK rover mode with internal radio[8]
- Operating times on internal battery[9]:
  - – 450 MHz and 900 MHz receive only option . . . . 5.5 hours
  - – 450 MHz and 900 MHz receive/transmit option (0.5 W). . . . . .4.5 hours
  - – 450 MHz receive/transmit option (2.0 W). . . . . .3.7 hours
  - – Cellular receive option . . . . 5.0 hours

COMMUNICATIONS AND DATA STORAGE

- Serial: 3-wire serial (7-pin Lemo)
- USB v2.0: supports data download and high speed communications
- Radio Modem: fully Integrated, sealed 450 MHz wide band receiver/transmitter with frequency range of 403 MHz to 473 MHz, support of Trimble, Pacific Crest, and SATEL radio protocols:
  - – Transmit power: 2 W
  - – Range: 3–5 km typical / 10 km optimal[10]
- Cellular: integrated, 3.5 G modem, HSDPA 7.2 Mbps (download), GPRS multi-slot class 12, EDGE multi-slot class 12, UMTS/HSDPA (WCDMA/FDD) 850/1900/2100MHz, Quad-band EGSM 850/900/1800/1900 MHz, GSM CSD, 3GPP LTE
- Bluetooth: fully integrated, fully sealed 2.4 GHz communications port (Bluetooth®)[11]
- WiFi: 802.11 b,g, access point and client mode, WPA/WPA2/WEP64/WEP128 encryption
- External communication devices for corrections supported on – Serial, USB, Ethernet, and Bluetooth ports
- Data storage: 4 GB internal memory; over three years of raw observables (approx. 1.4 MB /day), based on recording every 15 seconds from an average of 14 satellites
- CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 input and output
- 24 NMEA outputs, GSOF, RT17 and RT27 outputs

WebUI

- Offers simple configuration, operation, status, and data transfer
- Accessible via WiFi, Serial, USB, and Bluetooth

Supported Trimble Controllers

- Trimble TSC3, Trimble Slate, Trimble CU, Trimble Tablet Rugged PC

CERTIFICATIONS

FCC Part 15 (Class B device), 22, 24; R&TTE CE Mark; C-Tick, A-Tick; PTCRB; WFA

Specifications subject to change without notice.

1. Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
2. Depends on WAAS/EGNOS system performance.
3. Network RTK PPM values are referenced to the closest physical base station.
4. May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
5. Precisions are dependent on GNSS satellite availability. xFill positioning without a RTX subscription ends after 5 minutes of radio downtime. xFill positioning with a RTX subscription will continue beyond 5 minutes providing RTX has converged, with typical precisions not exceeding 6 cm horizontal, 14 cm vertical. xFill is not available in all regions, check with your local sales representative for more information.
6. RTK refers to the last reported precision before the correction source was lost and xFill started.
7. Receiver will operate normally to –40° C, internal batteries are rated to –20° C.
8. Tracking GPS, GLONASS and SBAS satellites.
9. Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used.
10. Varies with terrain and operating conditions.
11. Bluetooth type approvals are country specific.
12. Receiver convergence time varies based on GNSS constellation health, level of multipath, and proximity to obstructions such as large trees and buildings. Convergences times decrease significantly when using a "RTX Quickstart" on a previously surveyed point or a known survey control point.

ALLTERRA™

Trimble R8
GNSS SYSTEM

Key Features

- ▶ Advanced satellite tracking with Trimble 360 receiver technology
- ▶ Includes Trimble Maxwell 6 chips with 440 channels
- ▶ Unmatched GNSS tracking performance
- ▶ Web user interface and remote configuration
- ▶ Base and rover communications options to suit any application

THE INDUSTRY LEADING TOTAL GNSS SOLUTION

The Trimble® R8 GNSS system has long set the bar for advanced GNSS surveying systems. Through advanced Trimble 360 tracking technology and a comprehensive set of communication options integrated into a flexible system design, this integrated GNSS system delivers industry-leading performance. For surveyors facing demanding RTK applications, the Trimble R8 is an invaluable GNSS partner.

Future-proof your investment

Powerful Trimble 360 receiver technology integrated in the Trimble R8 supports signals from all existing and planned GNSS constellations and augmentation systems providing unmatched GNSS tracking performance. With this leading-edge technology, it is now possible for surveyors to expand the reach of their GNSS rovers into areas that were previously too obscured, such as under trees and in dense urban areas.

With two integrated Trimble Maxwell™ 6 chips, the Trimble R8 offers an unparalleled 440 GNSS channels. Also capable of tracking carrier signals from a wide range of satellite systems, including GPS, GLONASS, Galileo, BeiDou (COMPASS), and QZSS, the Trimble R8 provides a robust solution for surveyors.

The CMRx communications protocol in the Trimble R8 provides unprecedented correction compression for optimized bandwidth and full utilization all of the satellites in view, giving you the most reliable positioning performance.

Designed with the future in mind, Trimble 360 technology is optimized to receive future planned signals as the number of available satellites continues to grow. With Trimble 360 technology, the Trimble R8 delivers business confidence with a sound GNSS investment for today and long into the future.

Flexible System Design

The Trimble R8 combines the most comprehensive feature set into an integrated and flexible system design for demanding surveying applications. Connect directly to the controller, receive RTK network corrections,

and connect to the Internet via comprehensive communication options. With a built-in transmit/receive UHF radio, the Trimble R8 enables ultimate flexibility for rover or base operation. As a base station, the internal NTRIP caster provides you customized access[1] to base station corrections via the Internet.

Trimble's exclusive Web UI™ eliminates travel requirements for routine monitoring of base station receivers. Now you can assess the health and status of base receivers and perform remote configurations from the office. Likewise, you can download postprocessing data through Web UI and save additional trips out to the field.

An Industry Leading Field Solution

If you're seeking the industry leading field solution, pair the Trimble R8 GNSS receiver with one of our powerful Trimble controllers, such as the Trimble TSC3, Trimble CU or Trimble Tablet Rugged PC featuring Trimble Access™ field software. These rugged controllers bring the power of the office to the field through an intiutive Windows-based interface.

Trimble Access field software offers numerous features and capabilities to streamline the flow of everyday surveying work. 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. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, seamlessly transfer your field data using Trimble Business Center. Edit, process, and adjust collected data with confidence.

1 Cellular modem required.

◈ Trimble.

PERFORMANCE SPECIFICATIONS

Measurements
- Advanced Trimble Maxwell 6 Custom Survey GNSS chips with 440 channels
- Future-proof your investment with Trimble 360 tracking
- 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
- Satellite signals tracked simultaneously:
  - – GPS: L1C/A, L1C, L2C, L2E, L5
  - – GLONASS: L1C/A, L1P, L2C/A, L2P, L3
  - – SBAS: L1C/A, L5 (for SBAS satellites that support L5)
  - – Galileo: E1, E5A, E5B
  - – BeiDou (COMPASS): B1, B2
- SBAS: QZSS, WAAS, EGNOS, GAGAN
- Positioning rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz

POSITIONING PERFORMANCE[1]

Code differential GNSS positioning
Horizontal . . . . 0.25 m + 1 ppm RMS
Vertical . . . . 0.50 m + 1 ppm RMS
SBAS differential positioning accuracy[2] . . . . .typically <5 m 3DRMS

Static GNSS surveying
High-Precision Static
Horizontal . . . . .3 mm + 0.1 ppm RMS
Vertical . . . . 3.5 mm + 0.4 ppm RMS
Static and Fast Static
Horizontal . . . . 3 mm + 0.5 ppm RMS
Vertical . . . . 5 mm + 0.5 ppm RMS

PostProcessed Kinematic (PPK) GNSS surveying
Horizontal . . . . .8 mm + 1 ppm RMS
Vertical . . . . 15 mm + 1 ppm RMS

Real Time Kinematic surveying
Single Baseline <30 km
Horizontal . . . . .8 mm + 1 ppm RMS
Vertical . . . . 15 mm + 1 ppm RMS

Network RTK[3]
Horizontal . . . . 8 mm + 0.5 ppm RMS
Vertical . . . . 15 mm + 0.5 ppm RMS
Initialization time[4] . . . . typically <8 seconds
Initialization reliability[4] . . . . typically >99.9%

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1. Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation time appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
2. Depends on SBAS system performance.
3. Network RTK PPM values are referenced to the closest physical reference station.
4. May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
5. Receiver will operate normally to –40° C, internal batteries are rated to –20° C, optional internal cellular modem operates to -40° C.
6. Tracking GPS, GLONASS and SBAS satellites.
7. Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used. The specified operating times on an internal battery for the cellular receive option are in GSM CSD (Circuit-Switched Data) or GPRS PSD (Packet-Switched Data) mode.
8. Varies with terrain and operating conditions.
9. Bluetooth type approvals are country specific.

HARDWARE

Physical
Dimensions (W×H). . . . . .19 cm × 10.4 cm (7.5 in x 4.1 in), including connectors
Weight. . . . . .1.52 kg (3.35 lb) with internal battery, internal radio with UHF antenna
3.81 kg (8.40 lb) items above plus range pole, controller, and bracket
Temperature[5]
  Operating . . . . –40° C to +65° C (–40° F to +149° F)
  Storage. . . . .–40° C to +75° C (–40° F to +167° F)
Humidity . . . . 100%, condensing
Water/dustproof . . . . IP67 dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)
Shock and vibration . . . . Tested and meets the following environmental standards:
  Shock. .Non-operating: Designed to survive a 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
  Vibration MIL-STD-810F, FIG.514.5C-1

Electrical
- Power 11 to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)
- Rechargeable, removable 7.4 V, 2.6 Ah Lithium-Ion battery. Power consumption[6] is 3.2 W in RTK rover mode with internal radio and Bluetooth in use.
- Operating times on internal battery[7]:
  - – 450 MHz receive only option . . . . 5.0 hours
  - – 450 MHz receive/transmit option (0.5 W). . . . . 2.5 hours
  - – Cellular receive option . . . . 4.0 hours

COMMUNICATIONS AND DATA STORAGE
- Serial: 3-wire serial (7-pin Lemo) on Port 1; full RS-232 serial on Port 2 (Dsub 9 pin)
- USB v2.0: supports data download and high speed communications
- Radio modem: fully Integrated, fully sealed internal 450 MHz receiver/ transmitter option:
  - – Transmit power: 0.5 W
  - – Range[8]: 3–5 km typical / 10 km optimal
- Cellular: fully integrated, sealed internal GSM/GPRS/EDGE/UMTS/HSPA+ modem option. CSD (Circuit-Switched Data) and PSD (Packet-Switched Data) supported. Global Operation:
  - – Penta-Band UMTS/HSPA+ (850/800, 900, 1900, and 2100 MHz)
  - – Quad-Band GSM/CSD & GPRS/EDGE (850, 900, 1800, and 1900 MHz)
- Bluetooth: fully integrated, fully sealed 2.4 GHz communications port (Bluetooth®)[9]
- External communication devices for corrections supported on Serial and Bluetooth ports
- Data storage: 56 MB internal memory, 960 hours of raw observables (approx. 1.4 MB/day), based on recording every 15 sec from an average of 14 satellites

Data Formats
- CMR: CMR+, CMRx input and outputs
- RTCM: RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 input and outputs
- Other outputs: 23 NMEA outputs, GSOF, RT17 and RT27 outputs, supports BINEX and smoothed carrier

WebUI
- Offers simple configuration, operation, status, and data transfer
- Accessible via Serial and Bluetooth

Supported Trimble Controllers
- Trimble TSC3 controller, Trimble CU controller, Trimble Tablet Rugged PC

CERTIFICATIONS
FCC Part 15 (Class B device), Part 15.247 and Part 90; ICES-003, RSS-210 and RSS-119; CE Mark; C-Tick; Bluetooth EPL

Specifications subject to change without notice.

Trimble R4
GNSS SYSTEM

Key Features

► Trimble R-Track satellite tracking technology

► Includes Trimble Maxwell 6 chip with 220 channels

► Scalable from postprocessing to VRS to multi-constellation RTK configurations

► Cable-free for convenience

► Accurate, reliable and rugged system

► Trimble Slate controller

DEPENDABLE WHEN EVERY POINT COUNTS

Designed for surveyors looking for easy-to-use GNSS technology, the Trimble® R4 GNSS System performs under even the most rigorous conditions. GNSS support upgrade options, integrated Trimble R-Track™ satellite tracking technology, and a straightforward system design result in a system that is flexible, reliable, and rugged.

A Complete GNSS System

Lightweight, convenient and cable-free, the Trimble R4 GNSS system with Trimble Access™ field software provides the ease of use of an integrated receiver and everything you need to perform a basic survey campaign.

The dual-frequency antenna enhances tracking capacity and delivers sub-millimeter phase center stability for precise results in demanding conditions. Internally powered with removable batteries, this system provides a full working day of uninterrupted field operation.

Advanced Trimble R-Track Technology

The Trimble R4, powered with a Trimble Maxwell™ 6 chip with 220 channels, delivers the accuracy and reliability required for precision surveying with superior tracking and RTK performance. With GPS L2C and the Japanese QZSS support included, you can track more satellites and measure more successfully in challenging environments. L2C provides more than just additional signals – the advanced signal structure provides better strength for more reliable satellite tracking.

Trimble R-Track satellite tracking technology delivers reliable, precise positioning performance. Trimble R-Track with Signal Prediction™ compensates for intermittent or marginal RTK correction signals, enabling extended precision operation after an RTK signal is interrupted.

The CMRx communications protocol provides correction compression for optimized bandwidth and full utilization all of the satellites in view, giving you reliable positioning performance.

Choose The Level of GNSS Support You Required Today

Choose the level of GNSS support you require today with the flexible upgrade options available on the Trimble R4. Founded on proven GNSS technology, the Trimble R4 comes standard with GPS L1, L2, L2C and QZSS. Beyond this standard GNSS support, the Trimble R4 offers upgrades to GLONASS, Galileo, and BeiDou (COMPASS)—just choose what you need.

Functions as a VRS Rover, RTK Rover, or Field Base Station

Use as a lightweight rover for static surveying or RTK. The Trimble R4 is also completely compatible with Trimble VRS™ solutions, creating a VRS rover for use inside real-time networks. With a built-in 450 MHz receive-only radio or a fully integrated GSM/GPRS radio, this system can be adapted to meet a variety of needs. As a base station, the Trimble R4 with the integrated UHF transmit option is rugged, weather-resistant and compatible with a range of radio solutions.

A Dedicated, Reliable GNSS Field Solution

Pair the Trimble R4 with Trimble Access and the Trimble Slate Controller[1] for a dedicated GNSS solution that is effective for both real time and postprocessed GNSS surveys.

Powerful, connected, and compact, the Trimble Slate Controller combines the convenience and ease-ofuse of a smartphone with the durability for which Trimble is known. Its slim, ergonomic design is easy to grasp and its screen provides superior sunlight readability enabling all-day use by hard-working survey professionals.

Trimble Access field software provides specialized and customized workflows to make surveying tasks quicker and easier while enabling teams to communicate vital information between field and office in real-time.

Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, users can seamlessly process data with Trimble Business Center office software.

The Trimble R4 GNSS system – ready and reliable for your everyday surveying needs.

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1   The Trimble R4 can be used with a Trimble TSC3, Trimble CU, or Trimble Tablet Rugged PC with the purchase of an advanced data collector option.

®Trimble.

PERFORMANCE SPECIFICATIONS

Measurements
- Advanced Trimble Maxwell 6 Custom Survey GNSS chip with 220 channels
- 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
- Satellite signals tracked simultaneously:
    - GPS: L1C/A, L1C, L2C, L2E
    - GLONASS1: L1C/A, L1P, L2C/A, L2P, L3
    - SBAS: L1C/A
    - Galileo[1]: E1, E5A, E5B
    - BeiDou1 (COMPASS): B1, B2
- SBAS: QZSS, WAAS, EGNOS, GAGAN
- Positioning rates: 1 Hz, 2 Hz, 5 Hz, and 10 Hz

POSITIONING PERFORMANCE[2]

Code differential GNSS positioning
Horizontal	0.25 m + 1 ppm RMS
Vertical	0.50 m + 1 ppm RMS
SBAS differential positioning accuracy[3]	typically <5 m 3DRMS

Static GNSS surveying
High-Precision Static
Horizontal	3 mm + 0.1 ppm RMS
Vertical	3.5 mm + 0.4 ppm RMS

Static and Fast Static
Horizontal	3 mm + 0.5 ppm RMS
Vertical	5 mm + 0.5 ppm RMS

PostProcessed Kinematic (PPK) GNSS surveying
Horizontal	8 mm + 1 ppm RMS
Vertical	15 mm + 1 ppm RMS

Real Time Kinematic surveying[4]
Single Baseline <30 km
Horizontal	8 mm + 1 ppm RMS
Vertical	15 mm + 1 ppm RMS

Network RTK
Horizontal	8 mm + 0.5 ppm RMS
Vertical	15 mm + 0.5 ppm RMS
Initialization time[5]	typically <8 seconds
Initialization reliability[5]	typically >99.9%

1 Optional upgrade.
2 Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
3 Depends on SBAS system performance.
4 Network RTK PPM values are referenced to the closest physical reference station.
5 May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
6 Receiver will operate normally to –40 °C, internal batteries are rated to –20 °C, optional internal GSM modem operates to –30 °C.
7 Tracking GPS, GLONASS and SBAS satellites. Optional upgrade required for GLONASS.
8 Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used.
9 Varies with terrain and operating conditions.
10 Bluetooth type approvals are country specific.

HARDWARE

Physical
Dimensions (W×H)	19 cm × 10.2 cm (7.5 in x 4.0 in), including connectors
Weight	1.52 kg (3.35 lb) with internal battery, internal radio with UHF antenna 3.04 kg (6.70 lb) items above plus range pole, controller, and bracket

Temperature[6]
Operating	–40° C to +65° C (–40° F to +149° F)
Storage	–40° C to +75° C (–40° F to +167° F)
Humidity	100%, condensing
Water/dustproof	IP67 dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)

Shock and vibration .... Tested and meets the following environmental standards:
Shock	Non-operating: Designed to survive a 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
Vibration	MIL-STD-810F, FIG.514.5C-1

Electrical
- Power 11 V DC to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)
- Rechargeable, removable 7.4 V, 2.6 Ah Lithium-Ion battery. Power consumption[7] is 3.2 W in RTK rover mode with internal radio and Bluetooth in use.
- Operating times on internal battery[8]:
    - 450 MHz receive only option .... 5.0 hours
    - 450 MHz receive/transmit option (0.5 W) .... 2.5 hours
    - Cellular receive option .... 4.7 hours

COMMUNICATIONS AND DATA STORAGE
- Serial: 3-wire serial (7-pin Lemo) on Port 1; full RS-232 serial on Port 2 (Dsub 9 pin)
- Radio modem: fully Integrated, fully sealed internal 450 MHz receiver/ transmitter option:
    - Transmit power: 0.5 W
    - Range[8]: 3–5 km typical / 10 km optimal
- Cellular: fully integrated, sealed internal GSM/GPRS option
- Bluetooth: fully integrated, sealed 2.4 GHz communications port (Bluetooth®)[10]
- External communication devices for corrections supported on Serial and Bluetooth ports
- Data storage: 11 MB internal memory, 188.6 hours of raw observables (approx. 1.4 MB/day), based on recording every 15 seconds from an average of 14 satellites

Data Formats
- CMR: CMR+, CMRx input and outputs
- RTCM: RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1 input and outputs
- Other outputs: 23 NMEA outputs, GSOF, RT17 and RT27 outputs, supports BINEX and smoothed carrier

Supported Trimble Controllers
- Trimble TSC3 controller, Trimble CU controller, Trimble Tablet Rugged PC
- Optional[1]: Trimble TSC3 controller, Trimble CU controller, Trimble Tablet Rugged PC

CERTIFICATIONS
FCC Part 15 (Class B device), 22, 24, 90; CE Mark; C-Tick; 850/1900 MHz; Class 10 GSM/GPRS module; Bluetooth EPL

Trimble R2

GNSS RECEIVER

Key Features

▶ A professional solution for geospatial applications ranging from sub-meter to centimeter accuracies to support any GIS or survey-grade workflow

▶ Easily collect data by pairing with devices such as smartphones, tablets or Trimble handhelds using Trimble Survey and GIS software

▶ Fast to setup, easy to use, keeping you productive and focused at your task at hand

▶ Supports multiple satellite constellations and correction sources for accurate data at any location

▶ Trimble Maxwell 6 chip with 220 channels and leading GNSS technology maximizes data quality

VERSATILITY IN THE FIELD. FLEXIBILITY FOR YOUR WORKFLOW.

Work the way you want with the Trimble® R2 GNSS receiver. Using trusted Trimble technology the R2 receiver gives you the freedom to configure a solution by simply selecting the accuracy and GNSS performance to suit your application. Capable of achieving submeter to centimeter level positioning accuracy the Trimble R2 is the answer to keep you working productively in a wide range of geospatial applications, no matter what your workflow requirements are.

Whether you are performing pole-based stakeouts, surveying on roads, in mines or on construction sites, locating buried assets such as pipes and cables, capturing GIS field assets, or carrying out precision survey measurements, the versatile Trimble R2 is purpose-built for surveyors and mapping and GIS professionals alike.

Simple to setup and easy-to-use, the Trimble R2 pairs with any Trimble handheld, Trimble Access™ controller, or consumer-grade smart device across a variety of operating systems and platforms, to deliver reliable, high quality real-time data every time.

A Simple, Rugged System for Everyday Needs

Built to withstand the rigors in the field, the rugged IP65-rated Trimble R2 receiver will work as hard as you do in tough outdoor conditions. Its one-button start up and compact, streamlined form factor makes it fast to set up and can be operated either mounted on a pole, on a backpack or on a vehicle. The field-swappable battery means all day productivity with no interruptions, keeping you focused on the job at hand.

Technology to Keep you Productive

The Trimble R2 is capable of tracking the full range of GNSS satellite constellations and augmentation systems, and comes with an integrated Trimble Maxwell™ 6 chip and 220 channels to provide you with reliable accuracy and positioning performance. Achieve higher accuracy in real-time with the flexibility to choose correction sources from traditional RTK, VRS networks, to Trimble RTX™ correction services delivered by both satellite and Internet/cellular.

Trimble has evolved its Floodlight™ satellite shadow reduction technology to ensure the R2 receiver is able to provide reliable, accurate data even in difficult GNSS environments. Equipped with this advanced GNSS technology, you can achieve remarkable improvements to position availability and accuracy when heavy overhead cover, such as tree canopy and buildings, obstruct satellite signals, making even tough GIS workflows easier.

A Complete Solution

Connect the Trimble R2 receiver to your preferred controller or mobile device via a wireless Bluetooth® connection or USB cable and add proven Trimble field and office software workflows to complete the solution. Data can be collected with the customizable workflows of Trimble field software such as Trimble Access or Trimble TerraFlex™ software that allow your teams to easily collect and communicate information between the field and office in real-time. Collected data can then be processed with Trimble office software, including Trimble Business Center or TerraFlex, providing you with data rich, high-quality deliverables for your organization.

For a simple, configurable, field-to-office solution, the innovative and flexible Trimble R2 GNSS receiver enables you to work accurately and productively your way.

®Trimble.

CONFIGURATION OPTION

Type . . . . .Smart antenna
Base operation . . . . .Yes. Logging only.
Rover operation . . . . Yes
Rover position update rate . . . . 1 Hz, 2 Hz, 5 Hz
Rover operation within a VRS Now™ network . . . . Yes

MEASUREMENTS

- Advanced Trimble Maxwell 6 custom GNSS chip
- High-precision multiple correlator for L1/L2 pseudo-range measurements
- Unfiltered, unsmoothed pseudo-range measurements data for low noise, low multipath error, low-time domain correlation, and high-dynamic response
- Very low noise carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- Signal-to-noise ratios reported in dB-Hz
- Trimble EVEREST™ multipath signal rejection
- Proven Trimble low elevation tracking technology
- 220-channel GNSS
- 4-channel SBAS (WAAS/EGNOS/MSAS/GAGAN)

POSITIONING PERFORMANCE

SBAS (WAAS/EGNOS/MSAS/GAGAN) Positioning[1]

Horizontal accuracy . . . . ±0.50 m (1.6 ft)
Vertical accuracy . . . . ±0.85 m (2.8 ft)

Code Differential GPS Positioning[2]

Correction type . . . . .DGPS RTCM 2.x
Correction source . . . . IBSS
Horizontal accuracy . . . . ±(0.25 m + 1 ppm) RMS ±(0.8 ft + 1 ppm)
Vertical accuracy . . . . ±(0.50 m + 1 ppm) RMS ±(1.6 ft + 1 ppm)

Static GNSS Positioning

	Static and Fast Static
Horizontal	3 mm + 0.5 ppm RMS
Vertical	5 mm + 0.5 ppm RMS

Trimble RTX Positioning[3, 4]

	CenterPoint® RTX
Horizontal accuracy	4 cm
Vertical accuracy	9 cm
FieldPoint RTX™	10 cm Horizontal
RangePoint® RTX	30 cm Horizontal
ViewPoint RTX™	50 cm Horizontal

RTK Positioning[2]

Horizontal accuracy . . . . 10 mm + 1 ppm RMS (0.033 ft + 1 ppm RMS)
Vertical accuracy . . . . 20 mm + 1 ppm RMS (0.065 ft + 1 ppm RMS)

Network RTK[2]

Horizontal accuracy . . . . 10 mm + 0.5 ppm RMS (0.033 ft + 0.5 ppm RMS)
Vertical accuracy . . . . .20 mm + 0.5 ppm RMS (0.065 ft + 0.5 ppm RMS)

BATTERY AND POWER

Internal . . . . .Replaceable internal battery 7.4 V, 2800 mA-hr, Lithium-ion
External . .Power input on the Mini-B USB connector, non-charging as per the USB standard 10 W USB adapter

Power consumption . . . . .4.95 W (VFD 100%), 3.7 W (VFD 12.5%) at 18 V, in rover mode

Operation time on internal battery
Rover . . . . .5 hours; varies with temperature

MECHANICAL

User interface . . . . LED indicators for receiver status
On/Off key for one-button startup
Dimensions . . . . .14.0 cm (5.5 in) diameter x 11.4 cm (4.5 in) height
Weight . . . . 1.08 kg (2.38 lb) receiver only

ENVIRONMENTAL

Temperature
Operating . . . . –20 °C to +55 °C (–4 °F to +131 °F)
Storage . . . .–40 °C to +75 °C (–40 °F to +167 °F)
Humidity . . . . .100% condensing
Waterproof IP65
Pole drop . . . . Designed to survive a 2 m (6.6 ft) drop onto all faces and corners onto concrete (25C)
Shock
Non-operating . . . . To 75 g, 6 ms, saw-tooth
Operating . . . . To 40 g, 10 ms, saw-tooth
100 shock events at 2 Hz rate
Vibration . . . . MIL-STD-810G (Operating), Method 514.6, Procedure I, Category 4, Figure 514.6C-1 (Common Carrier, US Highway Truck Vibration Exposure) Total Grms levels applied are 1.95 g

INTERNAL ANTENNA

Frequency Range . . . . L1/L2 (GPS, GLONASS, Galileo, BeiDou, QZSS), MSS (RTX), L1 SBAS

COMMUNICATIONS

USB . . . . 1 USB 2.0 (Type B) device
Wi-Fi . . . . Simultaneous client and access point (AP) modes
Bluetooth wireless technology . . . . Fully-integrated, fully-sealed 2.4 GHz Bluetooth module5
Network protocols . . . . HTTP (web browser GUI); NTP Server, TCP/IP or UDP; NTRIP v1 and v2, Client mode; mDNS/uPnP service discovery; dynamic DNS; eMail alerts; network link to Google Earth; PPP and PPPoE
Supported data formats
Correction inputs . . . . CMR, CMR+™, CMRx, RTCM 2.x, RTCM 3
Correction outputs . . . . None
Data outputs . . . . .NMEA, GSOF
External GSM/GPRS modem, cell phone support
Integrated receiving radio (optional) . . . . .Integrated 450 MHz UHF Radio
Channel spacing (450 MHz) . . . . 12.5 and 25 kHz
Sensitivity (450 MHz) . . . . –103 dBm, GMSK 9600 baud 25kHz channel spacing

COMPLIANCE

FCC Part 15 Subpart B (Class B Device) and Subpart C; CAN ICES-3(B)/NMB-3(B), RSS-Gen and RSS-210; R&TTE Directive: EN 301 489-1/-3/-5/-17, EN 300 440, EN 300 328, EN 300 330, EN 60950, EN 50371; ACMA Regulatory Compliance Mark (RCM); CE mark compliance: UN ST/SG/AC.10.11/Rev. 3, Amend. 1 (Lithium-ion Battery, charger not included), UN ST/SG/AC. 10/27/Add. 2 (Lithium-ion Battery, charger not included); C-Tick; WEEE and RoHS compliant.

1　Depends on SBAS system performance.
2　Accuracy and reliability may be subject to anomalies such as multipath, obstructions, satellite geometry, interference and atmospheric conditions. Always follow recommended practices.
3　CenterPoint RTX accuracy is typically achieved within 5 minutes in select regions, and within 30 minutes worldwide. FieldPoint RTX accuracy is typically achieved within 5 minutes in select regions, and within 15 minutes worldwide. RangePoint RTX and ViewPoint RTX accuracy is typically achieved within 5 minutes worldwide.
4　Receiver accuracy and convergence time varies based on GNSS constellation health, level of multipath, and proximity to obstructions such as large trees and buildings.
5　Bluetooth type approvals are country-specific. For more information, contact your local Trimble office or representative.

Trimble NetR9
REFERENCE RECEIVER SERIES

Key Features

- 440 channels for unmatched GNSS tracking performance
- Bluetooth®, Ethernet, Serial and USB support
- Position Monitoring and Alerting functionality notifies of any change in antenna position
- Large capacity internal memory plus external USB device logging capability
- Convenient front panel display and configuration
- Power over Ethernet (PoE) technology
- Twelve 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
- Trimble RT X™ World Wide Correction Service ready

PROVEN GNSS TECHNOLOGY FROM TRIMBLE

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.

Using the latest generation of Trimble 360 receiver technology in combination with two Trimble Maxwell™ 6 chipsets, the Trimble NetR9 reference receiver offers an industryleading 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. Currently, the NetR9 platform is capable of tracking signals from GPS, GLONASS, Galileo1, Beidou, and QZSS constellations. With 440 channels, the NetR9 has the capacity to accommodate additional signals as they may become available, eliminating the need to replace hardware to keep pace with technology[2]. The Trimble NetR9 reference receiver supports the new CMRx communications protocol, which provides unprecedented GNSS correction compression for optimized bandwidth and low latency data transmission. Combined, this results in greater data throughput at a lower operating cost.

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 high-accuracy positioning applications. A few specific examples include:

- Trimble VRS™ network receiver
- Mobile field base station
- Academic research
  - Continuously Operating Reference Station (CORS)
- Field campaign receiver for post-processing applications
- Use in DGPS MSK beacon systems
- Monitoring integrity of VRS networks, along with other physical infrastructure such as oil platforms, mines, dams, bridges, or other natural and man-made objects where precise deformation is crucial

The Trimble NetR9 reference receiver has eight gigabytes of physical memory built into the circuit board, providing a high level of data protection. Additionally, the use of external USB logging devices is supported providing the Trimble NetR9 reference receiver unparalleled storage capacity and flexibility. Combined with logging of T02, RINEX, BINEX, and Google Earth formats, factored together with FTP and Email Push technology, the Trimble NetR9 achieves an uncompromised blend of functionality and efficiency.

With stringent environmental specifications and an integrated lithium-ion, the Trimble NetR9 protects to ensure no data is missed.

The integrated Li-Ion battery can power the Trimble NetR9 continuously up to 15 hours, either as a primary power source or as an emergency backup source.

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, data access, as well as a variety of security levels and access controls.

Furthermore, the receiver supports Email Alerts so the operator knows exactly what is taking place at the receiver. This includes integrated position monitoring so as to always know if your antenna has moved before it is too late.

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 upgradable configurations (NetR9 Ti-1, Ti-2, and Ti-3) along with one non-upgradable configuration (NetR9 Ti-M), the NetR9 provides the most flexible receiver platform offered to date. 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 Developed under a License of the European Union and the European Space Agency.
2. For more information about Trimble and GNSS modernization, please visit http://www.trimble.com/srv_new_era.shtml.

Trimble NetR9 REFERENCE RECEIVER SERIES

SATELLITE TRACKING
- Two advanced Trimble Maxwell 6 GNSS chipsets for a total of 440 channels
- Trimble EVEREST™ multipath signal rejection
- Trimble 360 receiver technology
- 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
- Proprietary Receiver Autonomous Integrity Monitor (RAIM) system to detect and reject degraded signals to improve position quality.
- 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 unencrypted L2P), L5; GLONASS: L1 C/A and unencrypted P code, L2 C/A and unencrypted P code; L3 CDMA2; Galileo3: L1 CBOC, E5A, E5B & E5AltBOC; Beidou4; QZSS: L1 C/A, L1C, L1 SAIF, L2C, L5, LEX5; SBAS: L1 C/A (EGNOS/MSAS), L1 C/A and L5 (WAAS/GAGAN); L-Band: OmniSTAR VBS, HP and XP; Trimble RTX World Wide Corrections

INPUT/OUTPUT FORMATS
- Correction Formats:
  – CMR, CMR+, CMRx, RTX, 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

POSITIONING PERFORMANCE[6]

Code Differential GNSS Positioning
Horizontal . . . . 0.25 m + 1 ppm RMS
Vertical . . . . 0.50 m + 1 ppm RMS
WAAS differential positioning accuracy[7]
Horizontal . . . . 0.50 m RMS
Vertical . . . . 0.85 m RMS

Static GNSS Surveying
High-accuracy static
Horizontal . . . . .3 mm + 0.1 ppm RMS
Vertical . . . . 3.5 mm + 0.4 ppm RMS
Static & Fast Static
Horizontal . . . . 3 mm + 0.5 ppm RMS
Vertical . . . . 5 mm + 0.5 ppm RMS

Real Time Kinematic Surveying[8]
Single Baseline <30 km
Horizontal . . . . .8 mm + 1 ppm RMS
Vertical . . . . .15 mm + 1 ppm RMS
Networked RT K
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 0shell, 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[9]
- 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; Position Monitoring; IP Filtering;

DATA LOGGING
Storage Capacity
Onboard memory . . . . .8 GB
External memory[10] . . . . .greater than 1 TB
Maximum logging rate . . . . .50 Hz
File durations . . . . 5 minutes to continuous
Storage sessions . . . . 12 concurrent independent sessions with dedicated memory pooling and ring buffers
File formats . . . . T02, RINEX v2.xx, RINEX v3.xx, 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
Weight . . . . 1.75 kg

ENVIRONMENT
Certification . . . . IP67 and MIL-STD 810F
Operating temperature[11] . . . . –40 °C to +65 °C
Storage temperature . . . . –40 °C to +80 °C
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: 2.6 g RMS. 7.5 Hz/0.015 g2/Hz; 350 Hz/0.015 g²/Hz; 500 Hz/0.006 g²/Hz Non-Operating: 4.3 g RMS. 10 Hz/0.04 g²/Hz; 300 Hz/0.04 g²/Hz; 1000 Hz/0.002 g²/Hz
Ingress protection . . . . 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, Trimble GNSS-Ti Choke Ring, Ag25 (for use with Ti-M variant only)

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
- nternal 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

1. N etR9 available in four configurations: Ti-1, Ti-2, Ti-3, and Ti-M. Specifications shown reflect full configuration capability. Please consult your local distributor for additional information.
2. T here is no public GLONASS L3 CDMA ICD. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible with a future generation of GLONASS satellites or signals.
3. D eveloped under a License of the European Union and the European Space Agency. 4. A t the time of this publication, no public Beidou ICD was available. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible with a future generation of Beidou satellites or signals.
5. P ilot observable.
6. A ccuracy and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hr may be required to achieve the high accuracy static specification.
7. D epends on WAAS/EGNOS system performance.
8. N etR9 limited to 1,000 m RT K baseline length. Networked RT K PPM values are referenced to the closest physical base station.
9. B luetooth type approvals are country specific. Contact your local authorized Trimble distribution partner for more information.
10. 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.
11. The internal battery will operate from –10 °C to +55 °C (14 °F to +131 °F). The internal battery charger will operate from 0 °C to 45 °C (32 °F to 113 °F). All temperatures listed reference the ambient temperature.

Specifications subject to change without notice.

ALLTERRA™

Trimble S5
TOTAL STATION

Key Features

- ▶ Everything you need to perform survey campaigns
- ▶ Measure further and faster with the Trimble DR Plus EDM
- ▶ Locate2Protect real-time equipment management
- ▶ Seamless integration with the Trimble V10 Imagine Rover and GNSS receivers
- ▶ Intuitive Trimble Access Field Software
- ▶ Trimble Business Center Office Software for quick data processing

TRUSTED PERFORMANCE

All you need to perform efficient surveying campaigns is available in the Trimble® S5 Robotic Total Station solution: An accurate and reliable instrument, DR Plus EDM, MagDrive™ technology, the popular Trimble TSC3 controller with Trimble Access™ field software and quick data processing with Trimble Business Center office software.

Trimble has been manufacturing the industry's leading robotic total stations for over a decade. You can depend on the Trimble S5 Total Station to keep you productive in the field no matter what you encounter.

Trimble Technology

The Trimble S5 Total Station is built upon proven Trimble technologies like SurePoint™, MagDrive and our DR Plus EDM, helping you work more efficiently while maintaining the highest accuracy possible. Smooth and silent, Trimble MagDrive electro-magnetic technology means fewer moving parts, which reduces servicing requirements. Trimble SurePoint ensures accurate pointing and measurements by actively correcting for unwanted movements like wind, handling, and sinkage. The Trimble DR Plus EDM allows you to measure with fewer instrument set-ups and enhance your direct reflex performance.

Manage Your Assets 24/7

Know where your total stations are 24 hours a day with Trimble Locate2Protect technology. See where your equipment is at any given time and get alerts if your instrument leaves a jobsite or experiences unexpected equipment shock or abuse.

Trimble InSphere™ Equipment Manager system lets you view usage and keep up-to-date on firmware, software and maintenance requirements. With Trimble Locate2Protect and InSphere Equipment Manager, you can rest assured knowing your equipment is up-to-date and where it should be.

Robotic and Autolock

The Trimble S5 Total Stations are available in robotic or Autolock®-only versions. The Trimble S5 robotic and Autolock versions have an optional TCU data collector with Trimble Access field software for convenient, simple operation in any environment.

Integrated Surveying

The Trimble S5 Total Station provides the foundation for Trimble's Integrated Surveying™ solutions. With Integrated Surveying, you can seamlessly integrate complementary technologies on the job site, such as Trimble GNSS receivers and optical measurements.

Powerful Field and Office Software

Choose from a variety of Trimble controllers operating the feature rich, intuitive Trimble Access field software. Streamlined workflows guide crews through common project types, helping to get the job done faster with less distractions. Trimble Access workflows can also be customized to fit your needs.

Back in the office, trust Trimble Business Center software to help you check, process and adjust your optical, leveling, and GNSS data in one software solution. No matter what Trimble instruments you use in the field, you can trust that Trimble Business Center office software will help you generate industry-leading deliverables.

Trimble S5 Configurations

EDM	Angle Accuarcy	Servo Control	Active Track
DR Plus	1", 2", 3", 5"	Robotic, Autolock	Optional

Trimble®

PERFORMANCE

Angle measurement

Sensor type . . . . Absolute encoder with diametrical reading
Accuracy (Standard deviation based on DIN 18723) . . . . 1" (0.3 mgon)
2" (0.6 mgon), 3" (1.0 mgon), or 5" (1.5 mgon)
Angle Display (least count) . . . . 0.1" (0.01 mgon)
Automatic level compensator
  Type . . . . Centered dual-axis
  Accuracy . . . . .0.5" (0.15 mgon)
  Range . . . . ± 5.4' (±100 mgon)

Distance measurement

Accuracy (ISO)
  Prism mode
    Standard[1] . . . . 1 mm + 2 ppm (0.003 ft + 2 ppm)
Accuracy (RMSE)
  Prism mode
    Standard . . . . 2 mm + 2 ppm (0.0065 ft + 2 ppm)
    Tracking . . . . 4 mm + 2 ppm (0.013 ft + 2 ppm)
  DR mode
    Standard . . . . 2 mm + 2 ppm (0.0065 ft + 2 ppm)
    Tracking . . . . 4 mm + 2 ppm (0.013 ft + 2 ppm)
    Extended Range . . . . 10 mm + 2 ppm (0.033 ft + 2 ppm)

Measuring time

Prism mode
  Standard . . . . .1.2 sec
  Tracking . . . . .0.4 sec
DR mode
  Standard . . . . 1–5 sec
  Tracking . . . . .0.4 sec

Measurement Range

Prism mode (under standard clear conditions[2,3])
  1 prism . . . . 2500 m (8202 ft)
  1 prism Long Range mode . . . . 5500 m (18,044 ft) (max. range)
  Shortest range. . . . . 0.2 m (0.65 ft)
DR mode

	Good (Good visibility, low ambient light)	Normal (Normal visibility, moderate sunlight, some heat shimmer)	Difficult (Haze, object in direct sunlight, turbulence)
White card (90% reflective)[3]	1,300 m (4,265 ft)	1,300 m (4,265 ft)	1,200 m (3,937 ft)
Gray card (18% reflective)[3]	600 m (1,969 ft)	600 m (1,969 ft)	550 m (1,804 ft)

Reflective foil 20 mm . . . . 1000 m (3280 ft
Shortest range. . . . . .1 m (3.28 ft)
DR Extended Range Mode
  White Card (90% reflective)[4] . . . . .2200 m

EDM SPECIFICATIONS

Light source. . . . . Pulsed laserdiode 905 nm, Laser class 1
Beam divergence
  Horizontal. . . . . .4 cm/100 m (0.13 ft/328 ft)
  Vertical . . . . .8 cm/100 m (0.26 ft/328 ft)

1 Standard deviation according to ISO17123-4.
2 Standard clear: No haze. Overcast or moderate sunlight with very light heat shimmer.
3 Range and accuracy depend on atmospheric conditions, size of prisms and background radiation.
4 Kodak Gray Card, Catalog number E1527795.
5 The capacity in −20 ºC (−5 ºF) is 75% of the capacity at +20 ºC (68 ºF).
6 Bluetooth type approvals are country specific. Contact your local Trimble Authorized Distribution Partner for more information.
7 Dependent on selected size of search window.
8 Solution acquisition time is dependent upon solution geometry and GPS position quality.
9 Functionality and availability dependent on region.

SYSTEM SPECIFICATIONS

Leveling

Circular level in tribrach . . . . .8'/2 mm (8'/0.007 ft)
Electronic 2-axis level in the LC-display with a resolution of . . . . 0.3" (0.1 mgon)

Servo system

MagDrive servo technology, integrated servo/angle sensor electromagnetic direct drive
Rotation speed. . . . . .115 degrees/sec (128 gon/sec)
Rotation time Face 1 to Face 2 . . . . .2.6 sec
Positioning time 180 degrees (200 gon) . . . . .2.6 sec
Clamps and slow motions . . . . Servo-driven, endless fine adjustment

Centering

Centering system . . . . .Trimble 3-pin
Optical plummet . . . . Built-in optical plummet
Magnification/shortest focusing distance. . . . . 2.3×/0.5 m–infinity (1.6 ft–infinity)

Telescope

Magnification . . . . .30×
Aperture. . . . . .40 mm (1.57 in)
Field of view at 100 m (328 ft) . . . . 2.6 m at 100 m (8.5 ft at 328 ft)
Shortest focusing distance. . . . . .1.5 m (4.92 ft)–infinity
Illuminated crosshair . . . . .Variable (10 steps)

Power supply

Internal battery . . . . Rechargeable Li-Ion battery 11.1 V, 5.0 Ah
Operating time[5]
  One internal battery. . . . . Approx. 6.5 hours
  Three internal batteries in multi-battery adapter . . . . .Approx. 20 hours
  Robotic holder with one internal battery. . . . . 13.5 hours

Weight

Instrument (Autolock). . . . . .5.4 kg (11.35 lb)
Instrument (Robotic). . . . . 5.5 kg (11.57 lb)
Trimble CU controller . . . . 0.4 kg (0.88 lb)
Tribrach. . . . . .0.7 kg (1.54 lb)
Internal battery . . . . 0.35 kg (0.77 lb)
Trunnion axis height . . . . .196 mm (7.71 in)

Other

Communication . . . . .USB, Serial, Bluetooth®[6]
Operating temperature. . . . . −20º C to +50º C (−4º F to +122º F)
Tracklight built in . . . . Not available in all models
Dust and water proofing. IP65
Humidity. . . . . .100% condensing
Laser pointer coaxial (standard) . . . . .Laser class 2
Security. . . . . Dual-layer password protection, Locate2Protect[9]

ROBOTIC SURVEYING

Autolock and Robotic Range[3]
  Passive prisms . . . . 500 m–700 m (1,640–2,297 ft)
  Trimble MultiTrack™ Target. . . . . 800 m (2,625 ft)
  Trimble Active Track 360 Target. . . . . 500 m (1,640 Ft)
Autolock pointing precision at 200 m (656 ft) (Standard deviation)[3]
  Passive prisms . . . . <2 mm (0.007 ft)
  Trimble MultiTrack Target. . . . . <2 mm (0.007 ft)
  Trimble Active Track 360 Target. . . . . <2 mm (0.007 ft)
Shortest search distance . . . . 0.2 m (0.65 ft)
Type of radio internal/external .2.4 GHz frequency-hopping, spread-spectrum radios
Search time (typical)[7]. . . . . 2–10 sec

GPS SEARCH/GEOLOCK

GPS Search/GeoLock . . . . .360 degrees (400 gon) or defined horizontal and vertical search window
Solution acquisition time[8] . . . . .15–30 sec
Target re-acquisition time . . . .<3 sec
Range. . . . . Autolock & Robotic range limits

Specifications subject to change without notice.

ALLTERRA™

Trimble S7
TOTAL STATION

THE MOST PRODUCTIVE TOTAL STATION

The Trimble® S7 Total Station combines scanning, imaging and surveying into one powerful solution. Now you only need one instrument on the job site to perform all your data capture. Create 3D models, high accuracy visual site documentation, point clouds, and more using the Trimble S7, Trimble Access™ field software and Trimble Business Center office software.

The Trimble S7 is the ultimate system for efficient surveying, allowing you to adapt to any situation and increasing your productivity in the field. The combination of SureScan, Trimble VISION™, FineLock™ and DR Plus technology, along with many other features, means you'll be able to collect data faster and more accurately than ever before.

Integrated 3D Scanning

Save time in the field and in the office with Trimble SureScan technology. Now you have the flexibility to perform feature-rich scans every day. Efficiently capture the information you need to create digital terrain models (DTMs), perform volume calculations and make topographic measurements faster than with traditional surveying methods. SureScan technology enables you to collect and process data faster by focusing on collecting the right points, not just more points.

Improved Trimble VISION Technology

Trimble VISION technology gives you the power to direct your survey with live video images on the controller as well as create a wide variety of deliverables from collected imagery. Capture measurements to prisms or reflectorless with point-and-click efficiency via video. Quickly document your site and add notes directly to the pictures in the field to ensure you never miss that critical information. Back in the office, you can use your Trimble VISION data for measurements, or to process 360-degree panoramas and high dynamic range (HDR) images for even clearer deliverables.

Superior Accuracy with Trimble DR Plus

Trimble DR Plus range measurement technology provides extended range of Direct Reflex measurement without a prism. Now you can you measure further with fewer instrument set-ups and enhance your scanning performance. Trimble DR Plus, combined with the smooth and silent MagDrive™ servo technology, creates unmatched capability for quick measurements, without compromising on accuracy.

Stay On Point

Reduce aiming error, avoid costly re-measurement and be confident in your results with Trimble SurePoint™. The Trimble S7 Total Station aims and stays on target through wind, handling, and sinkage, actively correcting for unwanted movement ensuring accurate pointing and measurement every time. With its exclusive MultiTrack™ technology and Target ID capabilities, surveyors can choose the type of target, passive or active, that best suits the job site conditions and be confident that they will find and lock to the correct target.

Manage Your Assets

Know where your total stations are 24 hours a day with Trimble Locate2Protect technology. See where your equipment is at any given time and get alerts if your instrument leaves a job site or experiences unexpected equipment shock or abuse. Trimble InSphere™ Equipment Manager lets you view usage and keep up-to-date on firmware, software and maintenance requirements. With Trimble Locate2Protect and InSphere Equipment Manager, you can rest assured knowing your equipment is up-to-date and where it should be.

Powerful Field and Office Software

Choose from a variety of Trimble controllers operating the feature rich, intuitive Trimble Access field software. Streamlined workflows like Roads, Utilities and Pipelines guide crews through common project types, helping to get the job done faster with less distractions. Trimble Access workflows can also be customized to fit your needs.

Back in the office, trust Trimble Business Center to help you check, process and adjust your optical and GNSS data in one software solution.

Trimble S7 Configurations

EDM	Angle Accuarcy	Servo Control	Trimble VISION	FineLock	Scanning
DR Plus	1", 2", 3", or 5"	Robotic or Autolock	Included	Included	Included

®Trimble

Trimble S7 TOTAL STATION

PERFORMANCE

Angle measurement
Sensor type. . . . . Absolute encoder with diametrical reading
Accuracy (Standard deviation based on DIN 18723) . . . . 1″ (0.3 mgon)
2″ (0.6 mgon), 3″ (1.0 mgon), or 5″ (1.5 mgon)
Display (least count). . . . . 0.1″ (0.01 mgon)
Automatic level compensator
Type. . . . . Centered dual-axis
Accuracy . . . . .0.5″ (0.15 mgon)
Range . . . . ± 5.4′ (±100 mgon)

Distance measurement
Accuracy (ISO)
Prism mode
Standard[1] . . . . .1 mm + 2 ppm
Accuracy (RMSE)
Prism mode
Standard . . . . 2 mm + 2 ppm
Tracking . . . . 4 mm + 2 ppm
DR mode
Standard . . . . 2 mm + 2 ppm
Tracking . . . . 4 mm + 2 ppm
Extended Range . . . . 10 mm + 2 ppm

Measuring time
Prism mode
Standard . . . . 1.2 sec
Tracking . . . . .0.4 sec
DR mode
Standard . . . . 1–5 sec
Tracking . . . . .0.4 sec

Measurement Range
Prism mode[5,6]
1 prism . . . . .2500 m
1 prism Long Range mode. . . . . 5,500 m (max. range)
Shortest range. . . . . 0.2 m
DR mode

	Good (Good visibility, low ambient light)	Normal (Normal visibility, moderate sunlight, some heat shimmer)	Difficult (Haze, object in direct sunlight, turbulence)
White card (90% reflective)[2]	1,300 m	1,300 m	1,200 m
Gray card (18% reflective)[2]	600 m	600 m	550 m

Reflective foil 20 mm. . . . . 1000 m
Shortest range. . . . . 1 m
DR Extended Range Mode
White Card (90% reflective)[3]. . . . . .2200 m

Scanning
Range[2,3]. . . . . from 1 m up to 250 m
Speed[4] . . . . .up to 15 points/sec
Minimum point spacing. . . . . 10 mm
Standard deviation. . . . . .1.5 mm @ ≤50 m
Single 3D point accuracy . . . . .10 mm @ ≤150 m

EDM SPECIFICATIONS
Light source. . . . . Pulsed laserdiode 905 nm, Laser class 1
Beam divergence
Horizontal. . . . . 2 cm/50 m
Vertical . . . . .4 cm/50 m

SYSTEM SPECIFICATIONS

Leveling
Circular level in tribrach. . . . . 8′/2 mm
Electronic 2-axis level in the LC-display with a resolution of . . . . 0.3″ (0.1 mgon)

Servo system
MagDrive servo technology, integrated servo/angle sensor electromagnetic direct drive
Rotation speed. . . . . .115 degrees/sec (128 gon/sec)
Rotation time Face 1 to Face 2 . . . . .2.6 sec
Positioning time 180 degrees (200 gon) . . . . .2.6 sec
Clamps and slow motions . . . . Servo-driven, endless fine adjustment

Centering
Centering system . . . . .Trimble 3-pin
Optical plummet . . . . Built-in optical plummet
Magnification/shortest focusing distance. 2.3×/0.5 m–infinity

Telescope
Magnification . . . . 30×
Aperture. . . . . 40 mm
Field of view at 100 m (328 ft) . . . . .2.6 m at 100 m
Shortest focusing distance. . . . . .1.5 m–infinity
Illuminated crosshair . . . . .Variable (10 steps)

Camera
Chip . . . . .Color Digital Image Sensor
Resolution . . . . 2048 x 1536 pixels
Focal length. . . . . 23 mm
Depth of field . . . . 3 m to infinity
Field of view. . . . . .16.5° x 12.3° (18.3 gon x 13.7 gon)
Digital zoom 4-step (1x, 2x, 4x, 8x)
Exposure . . . . Spot, HDR, Automatic
Brightness . . . . User-definable
Image storage . . . . Up to 2048 x 1536 pixels
File format. . . . . JPEG
Compression ratio. . . . . User-definable
Video streaming[8]. . . . . .5 frames/sec

Power supply
Internal battery . . . . Rechargeable Li-Ion battery 11.1 V, 5.0 Ah
Operating time[9]
One internal battery. . . . . Approx. 6.5 hours
Three internal batteries in multi-battery adapter . . . . .Approx. 20 hours
Robotic holder with one internal battery. . . . . .13.5 hours

Weight
Instrument. . . . . .5.4 kg
Trimble CU controller . . . . .0.4 kg
Tribrach . . . . 0.7 kg
Internal battery . . . . 0.35 kg
Trunnion axis height . . . . .196 mm

Other
Laser pointer coaxial . . . . Laser class 2
Operating temperature. . . . .–20º C to +50º C
Dust and water proofing. IP65
Communication . . . . 2.4 GHz, USB, Serial, Bluetooth®[10]
Security. . . . . Dual-layer password protection, Locate2Protect[11]

AUTOLOCK AND ROBOTIC SURVEYING
Autolock and Robotic Range[6]
Passive prisms . . . . 500 m–700 m
Trimble MultiTrack™ Target. . . . . .800 m
Trimble Active Track 360 Target. . . . . .500 m
Autolock pointing precision at 200 m (656 ft) (Standard deviation)[5]
Passive prisms . . . . <2 mm
Trimble MultiTrack Target . . . . <2 mm
Trimble Active Track 360 Target. . . . . <2 mm
Shortest search distance . . . . 0.2 m
Radio type internal/external . . . . . 2.4 GHz freq.-hopping, spread-spectrum radios
Search time (typical)[7]. . . . . 2–10 sec

FINELOCK
Pointing precision at 300 m (standard deviation)[6] . . . . <1 mm
Range to passive prisms (min–max)[6]. . . . . .20 m–700 m
Minimum spacing between prisms at 200 m . . . . .0.8 m

GPS SEARCH/GEOLOCK
GPS Search/GeoLock . . . . .360 degrees (400 gon)
or defined horizontal and vertical search window
Solution acquisition time[8]. . . . . .15–30 sec
Target re-acquisition time . . . .<3 sec
Range.. . . . . Autolock & Robotic range limits

1   Standard deviation according to ISO17123-4.
2   Target color, atmospheric conditions, and scanning angles will impact range.
3   Kodak Gray Card, Catalog number E1527795.
4   Target shape, texture, and color; grid size; and distance and angle to target; will impact speed.
5   Standard clear: No haze. Overcast or moderate sunlight with very light heat shimmer.
6   Range and accuracy depend on atmospheric conditions, size of prisms and background radiation.
7   Dependent on selected size of search window.
8   0.5 frames per second with remote operation.
9   The capacity in −20 ºC is 75% of the capacity at +20 ºC.
10 Bluetooth type approvals are country specific.
11 Functionality and availability dependent on region.
12 Solution acquisition time is dependent upon solution geometry and GPS position quality.

Specifications subject to change without notice

Trimble M3
TOTAL STATION

- ► Compact, lightweight & rugged system design
- ► Trusted and reliable mechanical technology
- ► Trimble Access field software and optional streamlined workflow modules on board
- ► Bright and colorful touchscreen QVGA display
- ► Available with choice of optical or laser plummet

ONE OF YOUR MOST RELIABLE CREW MEMBERS

Lightweight, compact and streamlined, the Trimble® M3 Total Station provides everything you need to get the job done right in demanding situations.

Trimble Access Field Software Onboard

Featuring Trimble Access™ field software, the Trimble M3 combines trusted mechanical total station reliability with the powerful, functional and modular software that modern users need today. Designed to support your everyday work, including topographic surveys, staking, control, and more; Trimble Access offers a familiar, easy-to-use interface that will ensure your instant productivity with powerful data collection and calculation tools for fast results in the field.

Streamlined Workflows for Specialized Applications

With Trimble Access onboard, users can now take advantage of optional specialized modules that help streamline common application workflows. The Trimble Access Roads module adds powerful tools to simplify road stakeout projects. The step-bystep approach guides users with minimal training, providing all the tools at your fingertips to complete a road stakeout job.

The Trimble Access Tunnels module provides an easy to follow workflow that guides users through tasks such as marking areas of under- and overbreak with the laser pointer of the Trimble M3. The graphical interface provides a clear view of as-designed versus as-built conditions.

The Trimble Access Land Seismic module is designed to simplify seismic stakeout work to increase speed and reduce errors. The easy-to-follow workflow uses common naming conventions for stakeout points and the unique bin-based navigation functionality ensures that operators get to the next stake location quickly.

Each M3 instrument comes standard with integrated wireless Bluetooth® connection. Through this connection, users can control the instrument using Trimble Access field software running on an external controller. This allows the M3 to be used seemlessly right along with other Trimble equipment on the job site.

Mechanical Expertise from the Innovation Leader

With long range Trimble DR technology, you can save time by reducing instrument setups to reach your desired measurement points. The high-accuracy EDM provides fast, reliable measurements to get your job done quickly and efficiently. Renowned Nikon optics provide proven clarity, quality and precision for improved aiming and operation.

Ergonomic controls plus an integrated screen and keyboard streamline and simplify your inputs.

With its bright, colorful QVGA touchscreen running Microsoft® Windows® Embedded CE 6.0 operating system, the Trimble M3 display optimizes the graphical-rich features of Trimble Access with improved readability and menu navigation. Graphical staking of points, lines, arcs and alignments is available with the Active Maps feature.

Designed to Keep You Moving

Due to its small and lightweight design, the Trimble M3 is quick and easy to move around the job site. Each instrument comes with the choice of internal optical or laser plummet making for convenient known point setups. The system ships in a rugged and compact hard-shell transport case so it is easy to transport to and from the job site.

With two hot-swappable, long life batteries included, the Trimble M3 is capable of up to 26 hours of continuous operation. This offers users the ability to quickly replace a battery while continuously working when power is getting low, without shutting down.

Trimble M3 DR 5" W

For users working in cold temperatures, the Trimble M3 DR 5" Winterized version is specially designed for use in low temperature conditions. When in use during extreme low temperatures, the rear display heater will switch on automatically at temperature around −15°C.
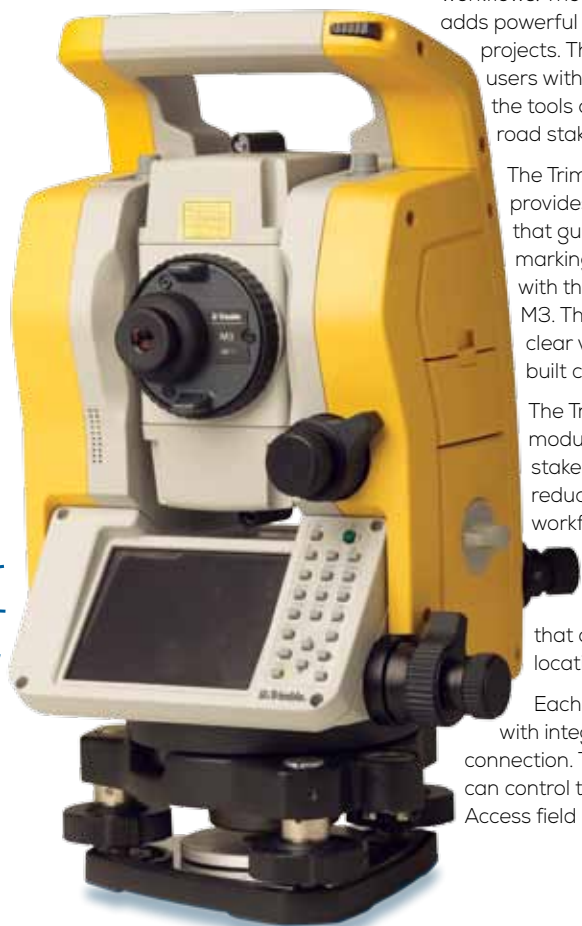
Trimble

DISTANCE MEASUREMENT

Range with specified prisms
Good conditions[1]
  With reflector sheet 5 cm x 5 cm (2 in x 2 in)
    1", 2", 3", 5"...1.5 m to 270 m
    5" Winterized ....1.5 m to 300 m
  With single prism 6.25 cm (2.5 in)
    1", 2", 3", 5" ....1.5 m to 3,000 m
    5" Winterized ....1.5 m to 5,000 m
Reflectorless mode

	Good (Good visibility, low ambient light)	Normal (Normal visibility, moderate sunlight, some heat shimmer)	Difficult (Haze, object in direct sunlight, turbulence)
1", 2", 3", 5" -KGC (18%)	350 m	250 m	200 m
1", 2", 3", 5" -KGC (90%)	500 m	400 m	250 m
5" Winterized -KGC (18%)	280 m	250 m	200 m
5" Winterized-KGC (90%)	500 m	400 m	300 m

Accuracy (Standard Deviation based on ISO 17123-4)
  Prism... ±(2+2 ppm × D) mm
  Reflectorless.. ±(3+2 ppm x D) mm
Winterized version
  Prism...±(3 + 2 ppm × D) mm (–10 °C to +40 °C)
    ±(3 + 3 ppm × D) mm (–20 °C to –10 °C, +40 °C to +50 °C)
  Reflectorless...........................±(3 + 2ppm× D) mm (–10 °C to +40 °C)
    ± (3 + 3ppm× D) mm (–20 °C to –10 °C, +40 °C to +50 °C)
Measuring interval[4]

Mode	Standard Mode	Fast Standard Mode
Prism - 1", 2", 3", 5"	1.6 s	0.8 s
Prism - 5" Winterized	1.5 s	0.8 s
Reflectorless - 1", 2", 3", 5"	2.1 s	1.2 s
Reflectorless - 5" Winterized	1.8 s	1.0 s
Least Count	**1 mm**	**10 mm**

SYSTEM SPECIFICATIONS

Angle Measurement
DIN 18723 accuracy (horizontal and vertical) .... 1", 2"/0.5 mgon,
  3"/1.0 mgon, 5"/1.5 mgon
Reading system.. Absolute encoder
Circle diameter.. 62 mm (2.4 in)
Horizontal/Vertical angle .... Diametrical
Minimum increment (Degree, Gon, MIL6400) .... Degree: 1/5/10"
  Gon: 0.2/1/2 mgon MIL6400: 0.005/0.02/0.05 mil

Telescope
Tube length .... 125 mm (4.9 in)
Image .... Erect
Magnification ....30× (18x/36x with optional eyepieces)
1", 2", 3", 5" Effective diameter of objective ....40 mm (1.6 in)
  1", 2", 3", 5" EDM diameter ....45 mm (1.8 in)
5" Winterized Effective diameter of objective ....45 mm (1.8 in)
  5" Winterized EDM diameter .... 50 mm
Field of view... 1°20'
Resolving power... .3"
Minimum focusing distance .... 1.5 m
Laser Pointer.. Coaxial Red Light

Tilt Sensor
Type .... Dual-axis
Method .... Liquid-electric detection
Compensation range... ±3.5'

Communications
Communication ports .... 1 x serial (RS-232C), 2 x USB (host and client)
Wireless communications .... Integrated Bluetooth

Power
Internal Li–ion battery (x2)
Output voltage... 3.8 V DC
Operating time[5]
  1", 2", 3", 5" . . .approx. 26 hours (distance/ angle measurement every 30 seconds)
  approx. 28 hours (continuous angle measurement)
  5" Winterized .approx. 16 hours (distance/angle measurement every 30 seconds)
  approx. 20 hours (continuous angle measurement)
Charging time, full charge .... 4 hours

GENERAL SPECIFICATIONS
Level vials
Sensitivity of Circular level vial .... 10'/2 mm
Tangent/Clamps ....Endless (1", 2",3", 5"); Clamping (1")
Display face 1 .... QVGA,16 bit color, TFT LCD, backlit (320x240 pixel)
Display face 2..................................... Backlit, graphic LCD (128x64 pixel)
Point memory................................... 128 MB RAM, 1 GB Flash Memory
Internal Plummet.................................... Optical or Class 2 Laser
Dimensions (W x D x H) ....149 mm x 145 mm x 306 mm
Weight (approx.)
  1", 2", 3", 5" Main unit...4.2 kg
  5" Winterized .... 4.1 kg
  Battery .... 0.1 kg
  Carrying case..2.3 kg

ENVIRONMENTAL
Operating temperature range .... –20 °C to +50 °C
  Winterized .... –30 °C to +50 °C
Storage temperature range .... –25 °C to +60 °C
  Winterized .... –30 °C to +60 °C
Atmospheric correction
  Temperature range .... –40 °C to +60 °C
  Barometric pressure ....400 mmHg to 999 mmHg/533 hPa to
  1,332 hPa/15.8 inHg to 39.3 inHg
Dust and water protection...IP66

CERTIFICATION
- Class B Part 15 FCC certification, CE Mark approval. C-Tick.
- Laser safety IEC 60825-1 am2:2007
- 1", 2", 3", 5" Prism mode: Class 1 laser
- 1", 2", 3", 5" Reflectorless/Laser Pointer: Class 3R laser
- 5" Winterized reflectorless / Prism mode: Class 1 laser
- 5" Winterized laser Pointer: Class 2 laser
- Laser Plummet: Class 2 laser

1   Good conditions (good visibility, overcast, twilight, low ambient light).
2   Normal conditions (normal visibility, object in the shadow, moderate ambient light).
3   Difficult conditions (haze, object in direct sunlight, high ambient light).
4   Measuring time may vary depending on measuring distance and conditions. Specification based on average of repeated measurements.
5   Battery life specification at 25 °C (77 °F). Operation times may vary depending on the condition and deterioration of the battery.

Specifications subject to change without notice.

CLASS 2 LASER PRODUCT   C € C   Bluetooth®

ALLTERRA™

Trimble DiNi
DIGITAL LEVEL

The Trimble® DiNi® Digital Level is a digital height measurement sensor from Trimble's Integrated Surveying™ portfolio of products. The Trimble DiNi is a field-proven tool designed for any job site where fast and accurate height determination is required. Use the Trimble DiNi for applications such as precise leveling of flat and sloping surfaces, establishing the vertical component of grade and ground profiles, subsidence monitoring, and establishing the vertical component of control networks.

UNEQUALLED FOR PERFORMANCE IN THE FIELD

The Trimble DiNi is designed to perform optimally every day, whatever your surveying job. It is built rugged—with a dust- and waterproof rating of IP55—to take the tough conditions of the job site in its stride. A backlight in the screen and a light in the circular bubble keep you productive even when daylight gets low.

The DiNi will operate for three days without requiring a battery change, then when it does just recharge it as you would your Trimble GNSS system battery...the batteries are the same to ensure convenience and productivity.

When a job is complete, easily transfer data from the instrument to a computer by using a USB storage device; You don't have to carry your instrument in to the office.

Easy to Learn, Easy to Use

The Trimble DiNi Digital Level demands the industry's smallest measurement field—just 30 cm of code rod. So you can measure greater change in height between the level and the rod in one setup, and save time.

Additionally, the small measurement area:

▶ reduces the number of stations needed by up to 20% because the Trimble DiNi is less impacted by a rod hidden by vegetation or hilly terrain.

▶ Makes leveling in low light conditions, for example, in tunnels, easier because only a very small part of the staff needs to be illuminated.

▶ ensures greater accuracy through less influence of refraction near the ground.

The large graphical display of the Trimble DiNi is also unique, and is complemented by the latest Trimble keyboard for easy operation. Crew members used to operating other Trimble systems will easily adapt to the Trimble DiNi.

Trimble Quality and Accuracy for Measuring with Confidence

The Trimble DiNi Digital Level is designed to support the rest of Trimble's Integrated Surveying portfolio. The Trimble DiNi interface is based on Trimble's other advanced and field-proven controllers for easy adoption of the instrument by your crews. Proven Optics by Carl Zeiss ensure the Trimble DiNi offers the highest precision and best resolution.

Measure with confidence, knowing that with the Trimble DiNi Digital Level, your crew will obtain the best quality results with the highest level of productivity.

®Trimble.

Trimble DiNi DIGITAL LEVEL

PERFORMANCE SPECIFICATIONS

Accuracy . . . . DIN 18723, standard deviation height measuring per 1 km (3280.84 ft) of double leveling

Trimble DiNi 0.3 mm per km
Electronic measurement
Invar precision bar code staff . . . . .0.3 mm (0.001 ft)
Standard bar code staff . . . . .1.0 mm (0.004 ft)
Visual measurement . . . . .1.5 mm (0.005 ft)
Distance measurement . . . . with a 20 m (65.62 ft) sighting distance
Invar precision bar code staff . . . . .20 mm (0.066 ft)
Standard bar code staff . . . . .25 mm (0.082 ft)
Visual measurements . . . . 0.2 m (0.656 ft)

Trimble DiNi 0.7 mm per km
Electronic measurement
Invar precision bar code staff . . . . 0.7 mm (0.002 ft)
Standard bar code staff . . . . .1.3 mm (0.004 ft)
Visual measurement . . . . 2.0 mm (0.007 ft)
Distance measurement . . . . with a 20 m (65.62 ft) sighting distance
Invar precision bar code staff . . . . 25 mm (0.082 ft)
Standard bar code staff . . . . .30 mm (0.098 ft)
Visual measurement . . . . 0.3 m (0.984 ft)

Range
Electronic measurement . . . . 1.5 m–100 m (4.92 ft–328.08 ft)
Visual measurement . . . . .from 1.3 m (4.265 ft)

Electronic measurement
Trimble DiNi 0.3 mm per km
Resolution height measurement . . . . 0.01 mm / 0.0001 ft / 0.0001 in
Resolution distance measurement . . . . .1 mm (0.003 ft)
Measurement time . . . . .3 s
Trimble DiNi 0.7 mm per km
Resolution height measurement . . . . 0.1 mm / 0.001 ft / 0.001 in
Resolution distance measurement . . . . 10 mm (0.033 ft)
Measurement time . . . . .2 s

Horizontal Circle
Type of graduation . . . . .400 grads and 360 deg
Graduation interval . . . . 1 grad and 1 deg
Estimation to . . . . .0.1 grad and 0.1 deg

Measurement Programs
Trimble DiNi 0.3 mm per km
Standard programs . . . . .Single measurement with and without stationing, stakeout, line leveling with intermediate sight and stakeout, line adjustment
Leveling methods[1] . . . . BF, BFFB, BFBF, BBFF, FBBF aBF, aBFFB, aBFBF, aBBFF, aFBBF
Trimble DiNi 0.7 mm per km
Standard programs . . . . Single measurement with and without stationing, stakeout, line leveling with intermediate sight and stakeout
Leveling methods . . . . BF, BFFB, aBF, aBFFB

ENVIRONMENTAL
Operating temperature . . . . –20 °C to +50 °C (–4 °F to 122 °F)
Dust- and waterproofing IP55

GENERAL SPECIFICATION

Telescope
Aperture . . . . .40 mm (0.131 ft)
Field of view at 100 m . . . . 2.2 m (7.217 ft)
Electronic measurement field . . . . 0.3 m (0.984 ft)

Magnification
Trimble DiNi 0.3 mm per km . . . . 32 x
Trimble DiNi 0.7 mm per km . . . . 26 x

Compensator
Inclination range . . . . ±15'
Setting accuracy
Trimble DiNi 0.3 mm per km . . . .±0.2"
Trimble DiNi 0.7 mm per km . . . .±0.5"
Circular level . . . . .8'/2 mm with Illumination
Display . . . . Graphical, 240 x 160 pixels, monochrome with illumination
Keyboard . . . . .19-key alpha-numeric and 4-way arrow key for navigation\

Recording
Internal memory . . . . up to 30 000 data lines
External memory . . . . .USB Flash Drive support
Data transfer . . . . .USB Interface for data transfer between DiNi and PC (means two way communication)
Real-time clock and temperature sensor
Trimble DiNi 0.3 mm per km . . . . .Recording of time or temperature
Trimble DiNi 0.7 mm per km . . . . .N.A.
Power supply
Internal battery . . . . .Li-Ion, 7.4 V / 2.4 Ah
Operating time . . . . 3 days working time without illumination
Weight (including battery) . . . . .3.5 kg (7.72 lb)

1   F = Foresight, B = Backsight, a = alternating
Certified quality in accordance with DIN ISO 9001/EN 29001.

Specifications subject to change without notice.

C E ⊙

ALLTERRA

Trimble CU
CONTROLLER

BUILT FOR THE WAY YOU WORK

Keep both hands free while behind the instrument. The Trimble® CU controller is the attachable control unit designed to combine Trimble optical and GNSS surveying systems[1]. On its Windows® Embedded operating system, the Trimble CU controller runs your choice of powerful Trimble field software[2], plus other specialized Windows software as needed.

Smart Hardware

View background maps and check work on the color graphic display for greater data control and confidence. The 1 GB of memory lets you take all your base data (point lists, background maps) into the field.

Access frequent functions via dedicated instrument control keys. Quickly select software options using the touch screen.

Integrated Bluetooth Wireless Technology

Eliminate the hassle of cables and expedite setup with integrated Bluetooth® wireless technology. When the Trimble CU controller is used on an instrument such as the Trimble R6 rover, the system is 100% cable free for speed, convenience and ease of use.

Flexible Communication Options

Choose the method of data transfer that suits your situation. Using an external modem such as a cellphone with Bluetooth, you can send and receive files over the Internet while in the field: you don't need to drive back to the office. When in the office, the Trimble CU docking station provides fast data transfer to your computer.

The Trimble CU also provides USB and serial communication options. Data can be transferred to a PC or another Trimble CU using a cable, Bluetooth, or a USB memory device.

Built for the Field Whatever the Conditions

The Trimble CU controller is rugged enough for any job in any weather. It holds an environmental rating of IP55 and operates in extreme temperatures of −30 ºC to +55 ºC. It can also withstand a pole drop of 1.0 m onto a hard surface. The display is illuminated, so you can finish any job fast even in low lighting.

The Trimble CU controller receives power from the optical instrument or the especially designed holder, which attaches to a robotic or rover pole.

One Controller, one Software, one Interface, one Job File

The Trimble CU controller is central to Integrated Surveying solutions. With Trimble Access on board you can collect GNSS and optical data in one Job file by simply switching between sensors. Standardize on one flexible controller and one interface.

When field work is complete, simply transfer the Job file to your office using the communication method that suits. A surveyor's work flow has never been easier.

1 The Trimble CU controller is designed to support Trimble's latest surveying systems, including the Trimble R10 GNSS system, and the Trimble S7 and S9 Total Stations.
2 The Trimble CU controller runs the Trimble Survey Controller™ software or Trimble Access software. In addition, a number of regional solutions are available. For more information on the field software that's best for you, talk to your local Trimble Authorized Distribution Partner.

®Trimble.

TECHNICAL SPECIFICATIONS
- • Windows Embedded CE 6.0 R3 OS
- • Windows Explorer
- • Internet Explorer
- • TrmbPad Text Editor
- • File transfer
- • Image Viewer
- • Microsoft ActiveSync®

USER INTERFACES, SOFTWARE AND RECORDING

Trimble CU Controller
Attachable
Direct. . . . . .The Trimble CU can be attached to the Trimble S5, S7 and S9 Total Stations, Robotic holder, GPS holder, or docking station

Physical
Size. . . . . .176 mm × 110 mm × 30 mm (6.9 in × 4.3 in × 1.2 in)
Weight. . . . . lb)
Memory. . . . . .128 MB SDRAM, 1 GB internal non-volatile storage memory
Processor. . . . . 624 MHz Marvell ARM920T-PXA300 CPU

Software
The Trimble CU controller runs the Trimble Survey Controller or Trimble Access software. In addition, a number of regional solutions are available. For more information on the field software that's best for you, talk to your Trimble Authorized Distribution Partner.

ENVIRONMENTAL
Temperature:
Operating temperature. . . . .–30 °C to +55 °C (–22 °F to +131 °F)
Storage temperature. . . . . –40 °C to +70 °C (–40 °F to +158 °F)
Humidity. . . . . .100% condensing MIL-STD-810F
Sand and dust . . . . Protection against wind-driven according to MIL-STD-810F, and IP5X
Wate IPX5
Drops. . . . . 5 drops from 1.0 m (3.3 ft) onto hard surface

Power
Internal . . . . .Power back-up suspend mode to preserve files
External . . . . Direct Trimble S6 Total Station, Trimble S8 Total Station, Trimble VX Spatial Station, Robotic holder, GPS holder, or docking station

Interface
Display . . . . .Color, illuminated TFT, daylight readable touch screen reflective color TFT- LCD; displayed at 320 × 240 pixels (QVGA) LED frontlight illuminated display
Keyboard . . . . 19 keys (alpha-numeric and dedicated navigation and instrument control keys) + 4-way arrow key
Audio. . . . . Integrated speaker for audio systems events, warnings and notifications
Operating system . . . . .Windows Embedded CE 6.0 R3

INPUT/OUTPUT
Data communication through Robotic holder,
GPS holder or docking station. . . . . USB, RS-232 and Bluetooth
External removable memory. . . . . .USB memory device

CERTIFICATION
Class B Part 15 FCC certification, CE Mark approval and RCM approval. Bluetooth type approvals and regulations are country specific.

Specifications subject to change without notice.

Bluetooth®

Trimble Tablet
TABLET RUGGED PC

- ▶ Fully rugged construction including Gorilla® Glass panel display
- ▶ 7 inch capacitive touch dual technology display system delivers enhanced sunlight readability
- ▶ Windows 7 Operating system brings the office to the field
- ▶ Built-In 5MP camera for unprecedented image documentation
- ▶ Integrated communication technology provides increased connectivity
- ▶ Optimized for Trimble Access field software for survey workflow support

A TABLET MADE FOR SURVEYING

Now there is no need to choose between the toughness and portability of a field controller and the operating power of a laptop—the Trimble® Tablet Rugged PC is the one controller that does it all. Designed for ease of use and high performance mobility, the rugged Trimble Tablet provides everything you expect from a tablet computer—plus the confidence that it will perform at optimum capability for surveying applications and withstand the toughest conditions. Paired with Trimble® Access™ field software, the Trimble Tablet fully supports your everyday workflows and unique requirements.

High Performance Mobility

In the field, the Microsoft® Windows 7 Professional operating system, 4 GB RAM, and 128 GB of flashbased storage onboard the Trimble Tablet allow you to run all of the applications you need to perform office work. The dual-core 1.6 GHz Intel Atom processor enables software applications to run fast and reliably. With the power and convenience to run office software while on the job site, you can check your work and deliver to clients without a trip back to the office.

Connectivity via Bluetooth®, Wi-Fi and a built-in 3.75G GSM cellular data modem enables manageable and efficient workflows from the field so you can stay connected no matter where you may be. The Trimble Tablet's ultralong-life lithium-ion battery ensures a full day of field computing and connectivity on a single charge.

Dual Technology Display System

The Trimble Tablet features a new patent-pending dual technology display system created specifically to enhance sunlight readability, as well as readability in no light at all. No matter how bright or direct the glare, the Trimble Tablet provides a clear, easy-to-read workspace.

With the multi-touch capacitive touchscreen, you can type with your fingers, stylus or capacitive gloves. Plus, you have the capability to control the size of the keyboard on the display for ease of use. Controlled zoom can optimize your experience with maps and detailed information. The responsive touch screen expedites pointing and selecting.

Increased data visualization and documentation

The 7 inch Gorilla® Glass display of the Trimble Tablet makes viewing data, maps, and applications much easier—it is like taking an office computer to the job site. Take control with full background maps and a vibrant color graphic display. The capacitive touch display also improves the viewing of photos and video captured through Trimble VISION™ technology. Greater data visualization in the field improves your ability to move fast and make the right decisions.

Unlock the full potential of applications that include highly visual data and graphic interfaces. The Trimble Tablet can run a vast range of office and field applications.

Unprecedented documentation is now in your hands. Document your job sites right from the controller using the Trimble Tablet's built-in 5MP camera with autofocus and built-in flash capabilities. Integrated GPS allows you to geo-tag each photograph accurately recording the location of each image without extra steps.

Trimble VISION technology brings the instrument telescope to your field controller. Using live video and remote control, you see what the instrument sees. High-quality video and digital zoom make it easy to identify survey targets. Collect measurements and geo-tagged images for use throughout your Trimble surveying system.

Rugged from the Inside Out

The Trimble Tablet provides exceptional versatility, efficiency, and portability. Ruggedized for any job in any weather, the Trimble Tablet holds an environmental rating of IP65 and operates in extreme temperatures of –30 °C to +60 °C (–22 °F to +144 °F). It can also withstand a pole drop of 1.22 m (4.0 ft) onto a hard surface. Worried about the screen cracking or breaking? The full-color, seven inch screen resides under a Gorilla Glass panel that is just as tough as the rest of the tablet.

⊕ Trimble.

Trimble Tablet TABLET RUGGED PC

Designed to support your daily workflows

Trimble Access field software available on the Trimble Tablet offers numerous features and capabilities to streamline the flow of everyday surveying work. 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.

Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK). The Trimble Access SDK provides software developers with the tools to customize and extend Trimble Access. Partner the Trimble Tablet with a Trimble R10, Trimble R8, or Trimble R6 GNSS receiver for a complete system solution that meets your requirements.

No matter what your job asks you to do–measure a point or produce a deliverable–you can do it on your Trimble Tablet.

Standard software
Microsoft Windows 7 Professional Operating System including:
- Internet Explorer
- Camera software with geo-tagging
- Trimble GPS information receiver control software
- User's Manual (electronic PDF)

STANDARD ACCESSORIES
- Extended battery set
- International AC charging kit
- Capacitive stylus w/tether
- Wrist strap
- Display cleaning microfiber cloth

OPTIONAL ACCESSORIES
- Vehicle charger (12 V DC–32 V DC input)
- Screen protectors with cleaning cloth
- Carrying case
- USB to serial adapter
- GPS adapter with SMA port
- External GPS antenna kit w/adapter
- Capacitive touch gloves
- Rugged USB keyboard
- Pole mount
- Trimble headset
- Tactical vehicle hard mount (dashboard)
- Light duty vehicle soft mount (window)

All standard accessories are also available to order separately.

PHYSICAL SPECIFICATIONS
Size. . . . . 246 mm x 160 mm x 40 mm (9.6 in × 6.3 in × 1.5 in)
Weight. . . . . 1.2 kg (2.6 lb), with standard battery
1.4 kg (3.0 lb), with extended battery

CERTIFICATIONS
FCC, CE, UL 60950, IC (Canada), RoHS compliant. MIL461, RSS 210, CSA, RSS CSA C22.2,IEC 60950, C-Tick Mark for Australia and New Zealand.

ENVIRONMENTAL SPECIFICATIONS
Temperature:
Operating . . . . –30 ºC to 60 ºC (–22 ºF to 144 ºF)
Storage. . . . . –40 ºC to 70 ºC (–40 ºF to 158 ºF)
Temperature shock. . . . . . . .Cycles between –30 ºC and 60 ºC (–22 ºF and 144 ºF), MIL-STD-810G, Method 503.5, Procedure I-C
Water . . . . Survives driving rain and water spray, any direction. Water Jet 6.3 mm dia. @ 2.5 m–3 m, 12.5 Liter/min, (Water jet 0.25 in dia. @ 8.2 ft–9.8 ft, 3.3 gallons/min) IEC 60529, IPx5.
Dust . . . . .Protected against dust, IEC-60529 IP6x, dust chamber with under-pressure
Drops. . . . . Survives multiple drops of 1.22m (4 ft),
MIL-STD-810G, Method 516.6, Procedure IV, Transit Drop
Humidity . . . . 90% relative humidity with temperatures between 30 ºC and 60 ºC (22 ºF and 144 ºF), MIL-STD- 810G, Method 507.5, Procedure II
Altitude. . . . . 4,572 m (15,000 ft) at 23 °C (73 °F) to 12,192 m (40,000 ft) at –30 °C (–22 °F), MIL-STD-810G, Method 500.5, Procedure I, II & III
Vibration. . . . . .General minimum integrity and loose cargo tests, MILSTD-810G, Method 514.6, Procedure I & II, Category 5
Solar Exposure. . . . . Survives prolonged UVB exposure, MIL-STD-810G, Method 505.5, Procedure II
Chemical Exposure. . . . . Resistant to mild alkaline and acid cleaning solutions, fuel hydrocarbons, alcohols and common vehicle and factory machine lubricants

ELECTRICAL SPECIFICATIONS
- Processor: 1.6 GHz, Intel Atom N2600 dual-core processor
- Memory: 4 GB DDR3 DRAM
- Storage: 128 GB SSD
- Display:
  - –– 7 in, 1024 x 600 hybrid reflective and transmissive
  - –– Sunlight-readable Gorilla Glass display
  - –– Capacitive multi-touch interface
- Battery:
  - –– Smart batteries with LED power indicators
  - –– Standard: Two 7.5 V, 3000 mAh, 22 Wh
  - –– Extended: Two 7.5 V, 6000 mAh, 45 Wh
- I/O: 3.5 mm audio jack, USB Host (2), HDMI, docking station I/O plate, DC input power
- Wireless:
  - –– Bluetooth 4.0
  - –– Wi-Fi b/g/n
  - –– WWAN: Penta-Band GSM 3.75G cellular data
- Camera/GPS/Compass/Accelerometer
  - –– 5 megapixel camera with LED flash, photo and video recording capable
  - –– GPS Receiver: 2–4 m accuracy with WAAS/SBAS correction
  - –– Integrated Electronic Compass
  - –– Integrated Accelerometer

Specifications subject to change without notice.

ALLTERRA™

Trimble TSC3
CONTROLLER

Key Features

▶ Large, bright, high-resolution screen makes instrument control easy

▶ Optimized for Trimble Access field software

▶ Fully-integrated camera, GPS navigation, and communications

▶ Improved collaboration and control through constant connectivity

The Trimble® TSC3 controller with Trimble Access™ software is a groundbreaking handheld field computing solution that streamlines the flow of everyday surveying work and the number of devices you need in the field.

A POWERFUL ENGINE FOR DRIVING TRIMBLE ACCESS SOFTWARE

Part of a trusted line of field controllers, the Trimble TSC3 controller is rugged and designed for surveyor's workflows. It performs Trimble Access operations fast and delivers ample power to run third-party applications on the Windows® platform.

Make Pictures an Essential Part of Your Workflow

With a built-in 5 MP Autofocus camera and LED flash, you can take digital photographs of your job site right from the controller. No extra devices, batteries, or file transfers are required, and images are automatically geotagged for easy identification.

Easily record the qualitative information that survey data alone can miss, such as site conditions or work progress. The benefits of including images as part of your workflow are almost limitless: from easy data handover to in-field quality assurance.

Communications that Bridge Field and Office in Real-Time

The TSC3 controller enables wireless Internet connectivity through an integrated GSM/GPRS/CDMA2 modem. This allows Trimble Access software to facilitate a constant flow of information between field and office, including real-time synchronization of field and office data with Trimble AccessSync software. You can download and upload important files any time and from anywhere, as needed. Data collection, processing, analysis, and delivery are faster and more efficient.

A wealth of communication options let you transfer critical information no matter the environment: Connect with VRS™ connections using the internal modem. Access your office network through 802.11 LAN, or USB and serial RS232 communication options.

For All of Your Surveying Applications

The rugged TSC3 controller is purpose-built to make both Integrated Surveying and Spatial Imaging jobs easier, more efficient, and more flexible:

Easy-to-Use Interface

Control your survey and verify your work on the large, bright, high-resolution LCD touchscreen. With the option of a QWERTY or conventional alpha-numeric keyboard, data entry is quick and easy.

An Internal Compass

Receive direction cues even when you are stationary or moving backwards.

Integrated GPS

Employ GPS Search on a conventional survey without an external GPS receiver. You can also navigate and find control points and other assets quickly.

Cables Eliminated

Bluetooth® wireless technology eliminates cables in surveying systems. An internal 2.4 GHz radio option is also ideal for controlling Trimble robotic systems.

Designed to Support Your Daily Workflows

Trimble Access field software available on the TSC3 controller offers numerous features and capabilities to streamline the flow of everyday surveying work. 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.

Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK). The Trimble Access SDK provides software developers with the tools to customize and extend Trimble Access.

With a bright, daylight readable display, integrated communications, and integrated survey workflows, the fully integrated TSC3 controller will make your field work more efficient.

Trimble.

Trimble TSC3 CONTROLLER

TECHNICAL SPECIFICATIONS

Standard software
- Windows Embedded Handheld 6.5 Professional operating system, including:
- SMS Text Messaging Support
- Microsoft Office Mobile:
  - Word Mobile
  - Excel Mobile
  - PowerPoint Mobile
  - Outlook Mobile
- Internet Explorer Mobile
- Notes / Tasks
- Task Manager
- Calculator
- Microsoft Pictures and Videos
- Customized Camera and Flash control including geo-tagging through Microsoft Pictures & Videos software
- Flashlight mode control application
- Calendar / Contacts
- Windows Media Player
- Messenger
- Adobe Acrobat Reader
- Trimble SatViewer (GPS interface software application)

Operating system languages options (customer provisionable):
Simplified Chinese, English, French, German, Japanese, Spanish

Trimble Field Software Solutions
The Trimble TSC3 controller runs the Trimble Access field software. In addition, a number of regional solutions are available. For more information on the field software that's best for you, contact your local Trimble authorized distribution partner.

Standard Accessories (included)
- 28.9 Wh Li-Ion battery
- International AC power supply
- Hand strap
- USB cable (mini)
- Stylus tether
- Stylus with spring tip (pkg of 2)
- Screen protectors
- Audio port dust cover
- I/O port dust covers
- Standard soft case
- Quick start guide sheet
- Radio antenna for integrated 2.4 GHz radio modem (optional)

Optional Accessories
- Deluxe carry case
- Individual battery charger
- Range pole bracket
- 12 V vehicle charging kit
- Desk docking cradle with USB host, USB client, and 10/100 Mbps Ethernet connections

All standard accessories are also available to order separately.

HARDWARE

Physical Specifications
Size. . . . . 141 mm x 278 mm x 64 mm (5.6 in x 10.9 in x 2.5 in) 80 mm (3.2 in) at handgrip
Weight. . . . . 1.04 kg (2.3 lb) including rechargeable battery 1.10 kg (2.4 lb) including rechargeable battery and optional internal 2.4 GHz radio-modem
Housing. . . . . Polycarbonate (case), Hytrel® (overmold)

ENVIRONMENTAL SPECIFICATIONS
Meets or exceeds:
Operating Temperature . . . . –30 °C to 60 °C (–22 °F to 140 °F)
Storage Temperature . . . . –40 °C to 70 °C (–40 °F to 158 °F)
Temperature shock. . . . . –35 °C/65 °C (–31 °F/149 °F)
MIL-STD-810G, Method 503.5, Procedure I
Humidity. . . . . 90%RH temp cycle –20 °C/60 °C (–4 °F/140 °F)
MIL-STD-810G, Method 507.5
Sand & dust . . . . IP6x: 8 hours of operation with blowing talcum powder (IEC-529)
Water . . . . .IPx7: Immersed in 1 m of water for 30 minutes (IEC-529)
Drop. . . . . .26 drops at room temperature from 1.22 m (4 ft) onto plywood over concrete
MIL-STD-810G, Method 516.6, Procedure IV
Vibration. . . . . General Minimum Integrity and Loose Cargo test
MIL-STD 810G, Method 514.6, Procedures I, II
Altitude. . . . . 4,572 m (15,000 ft) at 23 °C (73 °F) and 12,192m (40,000 ft.) at –30 °C (–22 °F)
MIL-STD-810G, Method 500.5, Procedures I, II, III

ELECTRICAL SPECIFICATIONS
- Processor: Texas Instrument Sitara™ 3715 series ARM® Cortex™–A8 Processor (800 MHz)
- Memory: 256 MB RAM
- Storage: 8 GB non-volatile NAND Flash onboard
- Expansion: SDHC memory slot, USB host internal embedded expansion slot (for future use)
- Batteries: 11.1 V, 2600 mAh, 28.9 Wh Li-Ion rechargeable pack
  - Battery life of 34 hours under normal operating conditions[1].
  - Full charge in 3.0 hours.
- Notification LEDs: 3 x tri-colored notification LEDs
- Display:
  - 4.2 in (107 mm) landscape VGA display, 640 x 480 pixels
  - Sunlight-readable color TFT with LED backlight, resistive touchscreen
- Keyboard:
  - Full QWERTY keypad with 10-key number pad, directional buttons, and 4 programmable buttons
  - "ABCD" style keypad option with 10-key number pad, directional buttons, and 4 programmable buttons available
- Audio: Integrated speaker and microphone with 3.5 mm stereo headset connection for audio system events, warnings, and notifications.
- I/O: USB Host (full speed), USB Client (high speed), DC power port, 9-pin serial RS-232
- Wireless:
  - Integrated Bluetooth 2.0+EDR, integrated Wi-Fi 802.11 b/g
  - Integrated quad-band GSM/GPRS/EDGE: 850/900/1800/1900 MHz
  - 2/6 Mbit/s 3G HSDPA GSM WWAN
  - Integrated 2.4 GHz frequency-hopping spread-spectrum radio modem (optional)
  - Dual band CDMA2000 in Bands BC0 and BC1 (800/900MHz)2
- Camera / GPS / Compass / Accelerometer:
  - 5 MP auto focus camera with dual white light LED flash, LED flashlight function
  - Integrated GPS (WAAS enabled)
  - Integrated compass
  - Integrated accelerometer

CERTIFICATIONS
Class B Part 15 FCC certification, CE Mark approval and C-tick approval. RoHS compliant. Bluetooth type approvals and regulations are country specific. MIL-STD-810G, IP 67, MIL-STD-461, PTCRB, GCF compliant, Wi-Fi Alliance certified, AT&T Network Compatible.
Country type certifications: USA, Canada, EU, New Zealand, Australia, Brazil.
Pending certifications: Malaysia, China (PRC), India, Japan, Republic of Korea, Russia, Taiwan, Thailand, UAE

RECYCLING INFORMATION
For product recycling instructions and more information, please go to www.trimble.com/environment/summary.html.

1 Unit is idle with backlight turned on, no radios turned on, moderate temperatures.
2 CDMA modem only supports the Verizon network (USA).

Specifications subject to change without notice.

ALLTERRA™
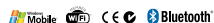
Trimble TX8
LASER SCANNER

Key Features

▶ Increase field productivity with the fastest, high resolution scans on the market

▶ Confidence in data accuracy, clarity and richness

▶ True performance in real world environments

▶ Intuitive and easy to operate

▶ Data integrates with Trimble survey instruments and Trimble Realworks software

The Trimble® TX8 laser scanner sets new standards for performance and ease of use in high-speed collection of 3D data. Using a state-of-the-art blend of speed, long range and precision, the Trimble TX8 delivers high quality results in industrial measurement, engineering, construction, forensics and other applications that require high levels of accuracy and flexibility.

A Revolution in 3D Scanning

Using Trimble's patented Lightning™ technology, the Trimble TX8 can measure one million points per second while capturing precise data over its full measurement range. Because Trimble Lightning technology is less susceptible to variation in surface types and atmospheric conditions, you can capture complete datasets from each station.

The Trimble TX8 streamlines work in the office as well. The scanner's clean, low-noise data results in less time for processing. Data from the Trimble TX8 loads directly into Trimble RealWorks® and Trimble Scan Explorer software. The Trimble TX8 paired with Trimble RealWorks also provides efficient dataflow into popular CAD programs.

High Performance for Demanding Applications

The Trimble TX8 is ideal for capturing detailed data on existing conditions. Making high-speed measurements without compromising range or precision, the Trimble TX8 delivers high-density 3D point clouds needed by design and analysis professionals.

The Trimble TX8 provides a 360 degree x317 degree field of view and captures data at one million points per second with a typical scan time of only 3 minutes. The Trimble TX8 maintains its high precision over its entire range of 120 m and is available with an optional upgrade extending the range to an impressive 340 m.

Rugged, Flexible and Easy to Use

A colour touchscreen display and one-button scanning make data capture easy and efficient. The intuitive onboard software lets you quickly manage scan resolution and define scan areas. Because you capture only the data you need, you'll save time in the field and office.

Benefit from the flexibility to operate in demanding environments and situations. With its eye-safe Class 1 non-visible laser, the Trimble TX8 is safe to use even in busy public places. The Trimble TX8 features a rugged design, IP54 environmental rating, protected mirror and ability to capture data in bright sunlight.

Designed for mobility, the Trimble TX8 weighs just 11 kg and is powered by lightweight, long-life lithium ion batteries. The wheeled transportation case conforms to requirements of most airlines for checked luggage which allows you to easily transport the Trimble TX8 between job locations.

The Total Solution

The Trimble TX8 is designed for a broad array of uses and environments. Typical applications include:

▶ Plant and industrial measurement

▶ Civil engineering

▶ Surveying

▶ Mining and quarries

▶ Building and commercial construction

▶ Architecture and design

▶ Preservation and restoration

▶ Deformation monitoring

▶ Quality control

▶ Accident investigation

With the Trimble TX8's ability to capture precise high-density 3D data combined with Trimble RealWorks software advanced modeling, analysis, and data management tools, the Trimble TX8 laser scanner is the complete scanning solution for Geospatial professionals.

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Trimble TX8 LASER SCANNER
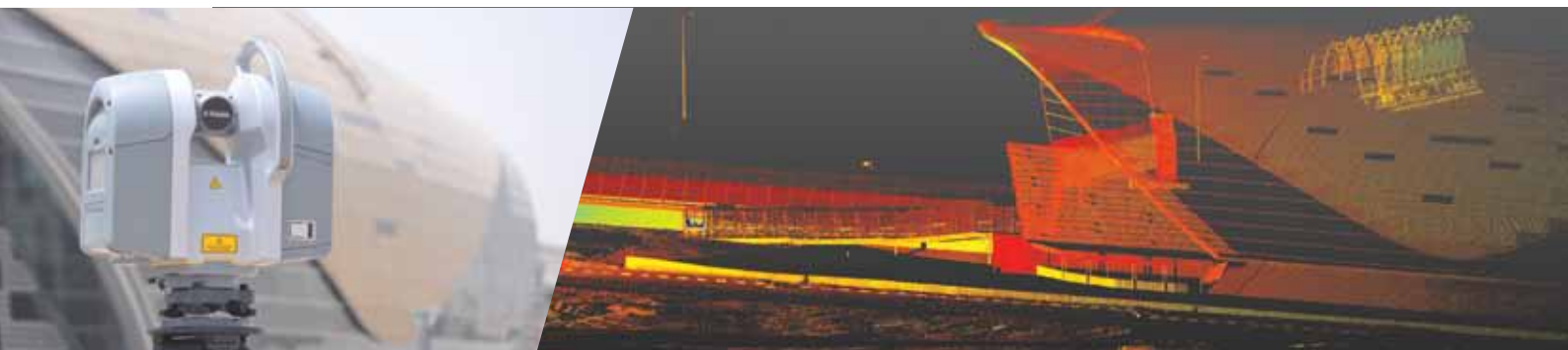
PERFORMANCE SPECIFICATIONS

Overview
Scanning principle . . . . Vertically rotating mirror on horizontally rotating base
Range principle . . . . Ultra-high speed time-of-flight powered by Trimble Lightning technology
Scanning speed . . . . 1 million pts/sec
Maximum range . . . . 120 m on most surfaces
340 m with optional upgrade
Range noise[5] . . . . ‹2 mm on most surfaces with Standard scan modes
‹1 mm with High Precision scan mode[2]

Range measurement
Laser class . . . . 1, eye safe in accordance with IEC EN60825-1
Laser wavelength . . . . 1.5 μm, invisible
Laser beam diameter . . . . .6–10–34 mm @ 10–30–100m
Minimum range . . . . 0.6 m
Max. standard range . . . . .120 m on 18–90% reflectivity
100 m on very low reflectivity (5%)
Extended range[1] . . . . 340 m
Range noise[5] . . . . ‹2 mm from 2 m to 120 m on 18–90% reflectivity in Standard modes
‹1 mm from 2 m to 80 m on 18–90% reflectivity in High Precision mode[2]
Range systematic error[5,6] . . . . ‹2 mm

Scanning
Field of view . . . . .360°x317°
Angular accuracy[5] . . . . .80 μrad

Accuracy[5] . . . . 1"
Data storage . . . . USB 3.0 Flash Drive
Remote control . . . . Operate with Windows 7 or higher PC or tablet via USB connection[4]
Colour acquisition . . . . External camera kits available for high resolution and HDR images

PHYSICAL
Dimensions . . . . 335 mm W x 386 mm H x 242 mm D
Weight . . . . 10.6 kg with tribrach and no battery; 11.0 kg with tribrach and battery
Power supply . . . . .76 mm W x 43 mm H x 130 mm D
Weight . . . . 0.66 kg
Battery dimensions . . . . 89.2 mm W x 20.1mm H x 149.1 mm D
Battery weight . . . . 0.46 kg
Power consumption . . . . 72 W
Scan time per battery . . . . ›2 hours
Instrument case . . . . .500 mm W x 366 mm H x 625 mm D

ENVIRONMENTAL
Operating temperature range (non-condensing atmosphere) . . . . −0 °C to +40 °C
Storage temperature . . . . −20 °C to +50 °C
Operating humidity range . . . . Non condensing
Lighting conditions . . . . All indoor & outdoor conditions over entire range (no lighting limitations)
Protection class IP54

Scan Parameters	Preview	Level 1	Level 2	Level 3	Extended[1]
Max range	120 m	120 m	120 m	120 m	340 m
Scan duration (minutes)[3]	01:00	02:00	03:00	10:00	20:00
Point spacing at 10 m	15.1 mm	–––	–––	–––	–––
Point spacing at 30 m	–––	22.6 mm	11.3 mm	5.7 mm	–––
Point spacing at 300 m	–––	–––	–––	–––	5.4 mm
Mirror rotating speed	60 rps	60 rps	60 rps	30 rps	16 rps
Number of points	8.7 Mpts	34 Mpts	138 Mpts	555 Mpts	312 Mpts

1 Optional upgrade increases range to 340 m.
2 Scan duration time is longer with High Precision scan mode.
3 Scan duration times for Standard scan modes.
4 Remote control requires optional Trimble TX8 USB cable PN 23704034.
5 Specification given as 1 sigma.
6 At distance of 1.5 m to 100 m for albedo ›20%.

Specifications subject to change without notice.

CLASS 1 LASER PRODUCT

OTHERS
Luminance resolution . . . . 8 bits
Leveling . . . . External bubble, onboard electronic bubble
Dual axis compensation . . . . .Selectable on/off
Resolution . . . . .0.3"
Range . . . .±10'

ALLTERRA™

Trimble MX2
MOBILE MAPPING SYSTEM

Key Features

▶ High performance laser scanner captures fully synchronized point clouds

▶ Precision positioning using tightly coupled GNSS and inertial referencing system

▶ Rugged, reliable and lightweight design with low power consumption

▶ Deploys on all sizes of on- and off-road vehicles

▶ Use with Trimble Trident software for data capture, extraction and analysis

VERSATILE MOBILE MAPPING FOR GEOSPATIAL SURVEYS

The Trimble MX2 is a vehicle-mounted mobile mapping system which combines high resolution laser scanning and precise positioning to collect geo-referenced point clouds for a wide range of requirements. The system can be rapidly deployed onto on- and off-road. vehicles of all sizes, and significantly reduces project field time and operator skill levels compared to traditional techniques. The MX2 is supplied with Trimble's proven Trident software to rapidly extract and analyze the raw data to turn it into useful geospatial intelligence.

Trimble MX2 Technology

The system has three main elements:

Sensor Head

A compact, lightweight, and rugged sensor package designed to be mounted on vehicles of all sizes. It contains one or two laser heads and a combined Trimble Applanix GNSS and inertial geo-referencing module for precise positioning. The dual head system uses a 'butterfly' LiDAR configuration to minimize shadowing. The sensor head can be rapidly installed in minutes and does not need a dedicated vehicle.

Operator Console

System control and data recording functions are provided by a ruggedized laptop PC running Trimble® Trident™ Capture software. This presents a clear, intuitive user interface, allowing the operator to rapidly set system parameters and manage data recording.

Analysis Software

To quickly transform point clouds into geospatial intelligence, the system includes the proven Trimble Trident software suite. Trident Imaging Hub is available with the system and offers robust object positioning,

measurement, and data layer creation, and is ideal for the analysis of mobile laser scanner data and geo-referenced imagery. The optional Trident Factory software enables high levels of automation and is optimized for more complex projects. For postprocessing options, the powerful Applanix POSPac MMS software is supplied.

High Productivity Capture and Analysis

Capable of collecting up to 72,000 points per second in its dual scanner configuration, the system offers high levels of accuracy due to the performance of its Trimble Applanix GNSS/inertial reference technology. The highly efficient, end-to-end workflow is based on Trimble's 'Collect, Extract, Analyze' methodology, and enables detailed 3D infrastructure geometries to be captured in a single pass and rapidly processed. The system is characterized by operational flexibility, ease-of-use, high productivity, and excellent performance—yet it offers a low cost of ownership.

Benefits

▶ Versatile system offers significant operational flexibility

▶ Outstanding performance and value with low cost of ownership

▶ Optimizes staff utilization and lowers skill requirements

▶ Reduces project timescales through fast deployment, data capture, and analysis

▶ Highly efficient, proven analysis workflows

▶ Enhances operational capabilities and expands market opportunities

Trimble MX2 Dual Head

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Trimble MX2 MOBILE MAPPING SYSTEM
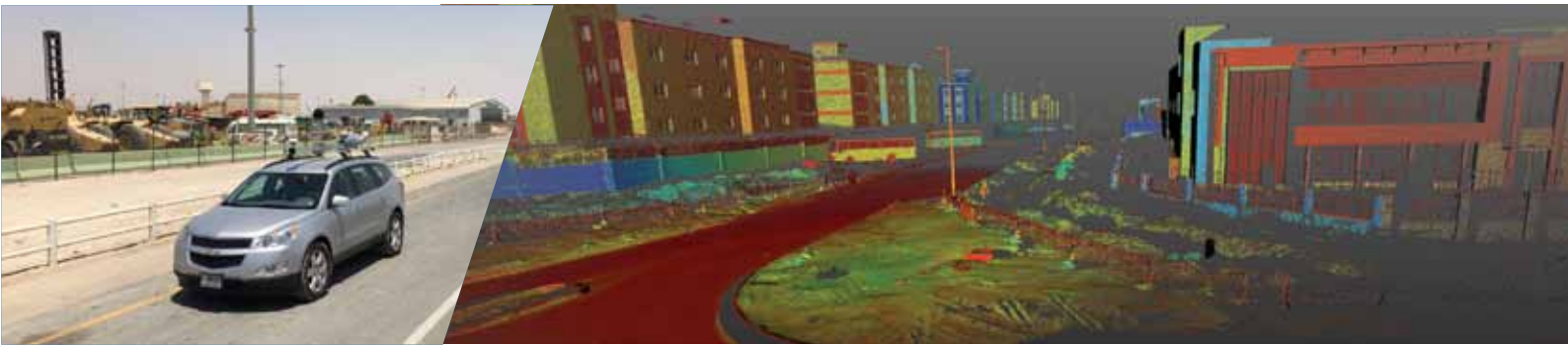
PERFORMANCE AND+SPECIFICATIONS

System
Operating temperature. . . . . –10 °C to +50 °C
Power supply . . . . .12 V DC to 32 V DC
Environmental rating IP65
Weight Single laser head . . . . 17 kg
Dual laser head . . . . 25 kg

Laser(s) sub-system
Type . . . . .Single or dual SLM-250 Class 1 lasers
Range . . . . Up to 250 m
Accuracy . . . .±1 cm at 50 m to Kodak white card5
Scanner FOV. . . . . .360 degrees
Scan rate Single laser head. . . . . 20 Hz (1200 rpm)
Dual laser head . . . . 2 x 20 Hz (1200 rpm)
Maximum effective measurement rate
  Single laser head. . . . . 36,000 points per second
  Dual laser head . . . . 72,000 points per second
Pulse rate
  Single laser head. . . . . 36 kHz
  Dual laser head . . . . 2 x 36 kHz

Positioning sub-system6 (RMS ERROR)
Type . . . . Trimble AP20 GNSS-Inertial System
Technology. . . . . .Advanced Applanix IN-Fusion™
GNSS-Inertial integration technology
# of GNSS channels 220
Inertial Measurement Unit . . . . Applanix IMU-42 (non ITAR)
with 200 Hz Data Rate
Azimuth Determination. . . . . 2 GNSS antennas, Applanix GNSS
Azimuth Measurement System tightly coupled with IMU data
Position (m):
No GNSS Outages3 1 km or
1 minute GNSS Outage3,4 . . . . .0.02 – 0.05 (Postprocessed)1;
0.02 – 0.10 (RTK)2
0.13 – 0.24 (Postprocessed)1;
0.35 – 0.69 (RTK)2
True Heading (deg):
No GNSS Outages3 1 km or 1 minute
GNSS Outage3, 4. . . . . 0.025 (Postprocessed)1; 0.050 (RTK)2
0.030 (Postprocessed)1; 0.070 (RTK)2
Options . . . . Distance Measuring Indicator (DMI)

Trident Imaging Hub
Point Cloud viewing and navigation in 3D . . . . 3D Measurements
Imaging Playback, Image and Point Cloud blending. . . . . Point Selection &
Classification Tools
Trajectory Import. . . . . Image Converter
Camera/Laser Boresight Calibration . . . . RGB Point Cloud Colorization
Target Detection/Registration . . . . .SHP/DXF Import and Export
Database connectivity. . . . . Point Cloud Export (optional by
Class) in LAS 1.1/1.2/1.4 or csv
Photogrammetric/Point Cloud Feature addition . . . . Pavement Defects Report

Trident Factory (optional)
Surface modelling. . . . . Road Modeller
(DTM, Cross sections, Profiles)
Sign and Pole Detection . . . . Horizontal/Vertical Line o f Sight
Edge Detection . . . . .Horizontal/Vertical Clearances
Centerline Detection. . . . . Land XML Export

OPTIONS

Camera Sub-system
Resolution . . . . .30 MP (5 MP x 6 sensors)
Field of View . . . . 90% of full sphere
Spherical Distance . . . . Calibrated from 2 m to infinity
Operating Temperature . . . . 0 °C to +45 °C
Power Consumption. . . . . 12 to 24 V, 13 W via GPIO
Weight. . . . . .3.0 kg
Analysis . . . . .Applanix POSPac MMS
Trimble Trident Factory
Positioning . . . . .Distance Measurement Indicator (DMI)

1   POSPac MMS.
2   Applanix IN-Fusion Inertially-Aided RTK, typical results.
3   With GAMS and 2m baseline between antennas.
4   With DMI Option.
5   1 sigma under calibration conditions.
6   Typical performance in a standard road vehicle with appropriate initialization and dynamics). Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects.

Specifications subject to change without notice.

Trimble MX7
MOBILE IMAGING SYSTEM

Key Features

▶ Versatile system offers significant operational flexibility

▶ Six 5 megapixel cameras provide rapid 360-degree image documentation

▶ Precision positioning using tightly coupled GNSS and inertial referencing system

▶ Deploys on all sizes of on- and off-road vehicles

▶ Use with Trimble Mobile Imaging Capture software and Trimble Trident office software for data capture, extraction and analysis

ENTER THE WORLD OF MOBILE IMAGING

The Trimble® MX7 Mobile Imaging System with VISION™ technology, is a vehicle-mounted photogrammetric system that makes it easy to quickly and completely capture road and site infrastructure information. Capture 360-degree, 30 megapixel geo-referenced images at highway speeds to rapidly reduce project field time. Then, use Trimble Trident office software to extract and analyze your collected data. The Trimble MX7 is the ideal solution for organizations looking to enter the world of mobile imaging with a smaller investment.

Rapid Collection of Geo-Referenced Images

Capture a 30 megapixel panoramic image of the surrounding environment in static or mobile—up to highway speed—modes with the Trimble MX7. Equipped with six, 5 megapixel cameras and Trimble Applanix GNSS and inertial geo-referencing modules, the Trimble MX7 enables you to manage assets—such as bridges, buildings, roads, highways, and power stations—and document site conditions with geo-referenced images. This compact, lightweight, and rugged sensor can be mounted on vehicles of all sizes.

System control and data recording functions

are controlled wirelessly through any WiFi enabled PC or tablet device. Trimble Mobile Imaging Software is available with the system and offers a clear, intuitive user interface—making it easy to use—allowing the operator to rapidly set system parameters and manage data recording.

Capture Now, Measure Later

Avoid site rework and benefit from increased quality control and data validation by capturing the data now and measuring later. The Trimble MX7 allows you to visually observe and capture the job site, then produce deliverables in the office later using Trimble Trident and Applanix POSPac™ MMS software. For post-processing requirements, use Trimble's powerful Applanix POSPac MMS software.

Trident Imaging Hub software is available with the system and offers robust object positioning, measurement, data layer creation, and analysis of geo-referenced imagery. This powerful software gives you the ability to extract additional data and features without having to re-visit the site.

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SOFTWARE

Trible Trident

- ► Trajectory import
- ► 360˚ imagery and vector data visualization
- ► Database connectivity
- ► GIS Layer Form creation
- ► Photogrammetric feature addition
- ► 3D measurements
- ► Attribute addition as of user selected snippets or object coding
- ► Image converter
- ► SHP/DXF import and export
- ► Export / Data conversion of MX7 data to Orbit GT and Horus

PERFORMANCE AND+SPECIFICATIONS

System

Resolution	30 MP (5 MP x 6 sensors)
Field of view	90% of full sphere
Spherical distance	Calibrated from 2 m to infinity
Operating temperature	0 °C to +35 °C
Power	12 V to 24 V DC (typical 100 W)
Weight	11.3 kg

Positioning Sub-system (RMS Error)[1]

Type	Trimble AP15 GNSS-Inertial System
Technology	Advanced Applanix IN-Fusion™ GNSS Inertial integration technology
# of GNSS channels	220
Inertial measurement unit	Applanix IMU-69 (non ITAR) with 200 Hz data rate

Position (m):
No GNSS outages[2,4]
1 km or 1 minute GNSS outage[2,4] . . . . 0.02–0.05 (post-processed)[2]
0.2–0.8 (post-processed)[2]

True Heading (deg):
No GNSS outages[2,4]
1 km or 1 minute GNSS outage[2,4] . . . . .0.08 (post-processed)[3]
0.2 (post-processed)[3]

Options

Analysis	Applanix POSPac MMS
Positioning	Distance measurement indicator (DMI)

1   Typical performance in a standard road vehicle with appropriate initialization and dynamics. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects.
2   Typical mission profile, max RMS error.
3   POSPac MMS.
4   With DMI option.

Specifications subject to change without notice.

Trimble MX8
MOBILE SPATIAL IMAGING

Key Features

- ► Fully synchronized imagery and laser scanning collection
- ► Up to 1 million points per second at highway speed
- ► Precise positioning using a tightly coupled GNSS/INS (inertial) system
- ► Efficiently manage terabytes of data
- ► use RTK, VRS or post processing
- ► Trimble Trident software to extract survey, GIS and construction deliverables

SPATIAL IMAGING AT HIGHWAY SPEEDS

The Trimble® MX8 combines premium laser scanning, positioning and imagery technologies to collect georeferenced point clouds and high-resolution imagery. Rigidly mounted and fully calibrated, the MX8 is capable of collecting over one million points per second, allowing high fidelity as-built asset and infrastructure modeling.

Trimble's market leading positioning technologies deliver extremely fast position updates (up to 200Hz) and high-accuracy results even when GNSS signals are interrupted. The scan rate and 360 degree field of view allow dense data to be collected, without gaps, from a moving vehicle at regular traffic speeds. Combined with ground control, the MX8 achieves industry-leading accuracies, allowing surveyors, engineers, and geospatial professionals to conduct projects that would be too slow, cost-prohibitive, disruptive, dangerous or simply impossible using traditional survey methods. The result is incredibly accurate and detailed 3D infrastructure geometry, captured in a single pass.

Combined with Trimble Trident Analyst productivity software, the Trimble MX8 provides a complete mobile mapping and survey workflow to help infrastructure managers plan, design, build and maintain modern infrastructure while maximizing safety and effectiveness.

Benefits

- ► Survey highways without road closures
- ► Undertake huge projects with a single vehicle
- ► Facilitate change analysis impossible using other technologies
- ► Rapidly survey hazardous areas
- ► Automated and manual feature extraction capabilities
- ► Faster, safer project execution

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PERFORMANCE AND SPECIFICATIONS

Laser Subsystem

The Trimble MX8 is available in configurations of either one or two of the following scanners:

VQ®-250 Configuration

Accuracy . . . . .10 mm[1]
Precision . . . . 5 mm[2]
Maximum effective measurement rate . . . . . . 600,000 points/second (2 x 300,000 points/second)
Line scan speed . . . . up to 200 lines/second (2 x 100 lines/second)
Echo signal intensity . . . . high resolution 16 bit intensity
Range . . . . up to 500 m @ 100 KHz (natural targets p ≥ 80%)

VQ®-450 Configuration

Accuracy . . . . 8 mm[1]
Precision . . . . 5 mm[2]
Maximum effective measurement rate . . . . . 1,100,000 points/second (2 x 550,000 points/second)
Line scan speed . . . . up to 400 lines/second (2 x 200 lines/second)
Echo signal intensity . . . . high resolution 16 bit intensity
Range . . . . up to 800 m @ 150 KHz (natural targets p ≥ 80%)

Positioning Subsystem

The Trimble MX8 is available with either Applanix POS LV420 or POS LV520.

	POS LV 4203		POS LV 5203	
	Post Processed[4]	RTK	Post Processed[4]	RTK
X,Y Position – with GPS	0.020 m	0.035 m	0.020 m	0.035 m
Z Position – with GPS	0.050 m	0.050 m	0.050 m	0.050 m
Pitch and Roll – with GPS	0.015°	0.015°	0.005°	0.008°
True Heading – with GPS	0.020°	0.020°	0.015°	0.020°
X,Y Position – with GPS Outage (1 km or 1 minute)	0.120 m	0.340 m	0.100 m	0.300 m
Z Position – with GPS Outage (1 km or 1 minute)	0.100 m	0.270 m	0.070 m	0.100 m
Pitch and Roll – with GPS Outage (1 km or 1 minute)	0.020°	0.020°	0.005°	0.008°
True Heading – with GPS Outage (1 km or 1 minute)	0.020°	0.030°	0.015°	0.020°

Imagery Subsystem

Individual camera resolution . . . . .5.0 MP
Standard system . . . . .3 x forward facing and 1 x rear pavement facing
Optional . . . . Additional 3 x rear facing cameras

System Components

• Computer System for capturing, recording and managing the vehicle trajectory, point cloud and imagery data
• Reinforced Universal Vehicle Mounting Kit (Universal Rack, Roof Bars, Connectors)
• Capture software supplied: Trimble Trident Cam Capture, Trimble Trident Laser Capture
• Vehicle positioning aid: DMI – Distance Measuring Indicator which computes wheel rotation information.
• Supports: Applanix GNSS Azimuth Measurement System (GAMS™) - dual antenna GNSS capability
• Weight (on vehicle "pod") approx. 70 kg

1   Accuracy is the degree of conformity of a measured quantity to its actual (true) value. One sigma at 50 m range under test conditions.
2   Precision or repeatability is the degree to which further measurements show the same result. One sigma at 50 m range under test conditions.
3   All accuracy values given as RMS. Assumes typical road vehicle dynamics.
4   For post processing use POSPac MMS industry-leading software for direct georeferencing of mobile mapping sensors using GNSS and inertial technology. Accuracy values quoted are for system with GNSS coverage (not during GNSS outages).

Specifications subject to change without notice.

ALLTERRA™

Trimble UX5 HP
UNMANNED AIRCRAFT SYSTEM

Key Features

► High-performance Trimble GNSS receiver with PPK technology

► 36 MP, full-frame, high resolution camera

► Orthomosaics resolution down to 1 cm and 3D models with up to 1,000 pts/m2

► Survey quality accuracy without ground control

► Fully automated Trimble Access workflows for ease of-use and safe operation

► Simple data processing with Trimble Business Center photogrammetry module

► Advanced data processing with Trimble Inpho UASMaster

HIGH PRECISION MAPPING AND SURVEYING SOLUTION

The Trimble® UX5 HP Unmanned Aircraft System (UAS) is an easy to use, fully automated, high precision system capable of capturing aerial photography with resolutions down to 1 cm. Featuring Trimble Access™ Aerial Imaging field software and Trimble Business Center office software, this complete system provides an intuitive workflow that allows you to quickly create the highest quality orthomosaics and 3D models for applications such as survey grade mapping, power line monitoring, field leveling, site and route planning, progress monitoring and asset mapping.

Superior Image Acquisition and Accuracy

The UX5 HP delivers precise data by integrating a high-performance Trimble GNSS receiver and a superior camera. Post-Processed Kinematic (PPK) GNSS technology is used to establish very accurate image locations in absolute coordinate systems, eliminating the need for ground control. As a result, less time is spent in the field and high precision results can be achieved even in the most inaccessible areas. With PPK, georeferencing aerial data is more robust and accurate than RTK, providing a superior level of reliability and accuracy. Use either your own base station or work with data from reference stations to georeference your deliverables with the highest accuracy possible.

The Trimble UX5 HP features an industry leading 36 MP full-frame sensor camera capable of capturing sharp, high resolution images. The camera achieves a leading level of image resolution—orthomosaics down to 1 cm GSD and point clouds up to several thousands points per square meter.

Configure for the Job

No one project is ever the same, that is why you can select a camera and lens combination that match your project needs. You have the flexibility to choose between a near infrared

or RGB sensor system, and a selection of lenses. The lenses include a 35 mm lens for high resolution, a 15 mm wide angle lens for increased flight coverage or a 25 mm lens delivering both resolution and increased flight coverage.

Intuitive Workflows with Trimble Access

The Trimble Access Aerial Imaging application

loaded onto the Trimble Tablet Rugged PC operates the UX5 HP and is a single software tool for planning your aerial missions, performing pre-flight checks and monitoring your flights. Now you can map corridors, cover disconnected areas in a single flight, import multiple map layers, fly irregular shaped areas and heights, plan or change multiple takeoff and landing locations during flight, and perform flight simulations to confirm the plan.

The export functionality gathers all required data into a single file that can be imported into Trimble Business Center.

Valuable Photogrammetry Deliverables

Optimized to process data from the Trimble UX5 HP, the Trimble Business Center Photogrammetry Module creates impressive deliverables. With a single drag-and-drop, imported GNSS information, base station or reference station data, and onboard images are processed in Trimble Business Center to produce a scaled orthophoto, point clouds, Triangulated Irregular Network (TIN) models and contour maps of the area flown. These can then be used in planning a project, calculating volumes, excavation planning, drainage planning and many other functions.

Alternatively, Inpho® UASMaster provides the power user or photogrammetrist with the right set of tools to use the full potential of aerial data. With feature-based seamline-finding, terrain editing capabilities, state-of-the-art DTM generation, classification and filtering, even the most challenging projects can be processed.

⊕ Trimble.

Trimble UX5 HP UNMANNED AIRCRAFT SYSTEM

PERFORMANCE SPECIFICATIONS

- Maximized image footprint without compromising resolution, obtained with a custom wide-angle lens and full frame sensor
- Maximized coverage per flight and per hour due to large image footprint, sharp turning capability and high cruise speed
- Reversed thrust technology for a short and steep landing circuit
- Powerful propulsion system for steep climbs and high altitude flights
- High airframe service life due to wing robustness and maintainability
- Short setup time with automated procedures in Trimble Access field software
- Self-check and failsafe procedures for safe operation
- One-button export to Trimble Business Center to create deliverables
- Optimized data accuracy when processed with Trimble Business Center or Trimble Inpho UASMaster
- High precision GNSS receiver to georeference deliverables accurately and easily.

HARDWARE

Type . . . . Fixed wing
Weight. . . . . .2.9 kg
Wingspan . . . . 1 m
Wing area . . . . 34 dm²
Dimensions . . . . 100 cm x 65 cm X 10.5 cm
Material . . . . EPP foam; carbon frame structure; composite elements
Propulsion .Electric pusher propeller; brushless 1400 W motor
Battery . . . . .14.8 V, 6600 mAh
Camera. . . . . 36 MP mirrorless full frame with custom 15, 25 or 35 mm lens
GNSS receiver. . . . . L1/L2 GNSS, 20 Hz (GPS, GLONASS, BeiDou, Galileo Ready)
Controller . . . . Trimble Tablet Rugged PC

ACQUISITION PERFORMANCE

Resolution (GSD) . . . . .1 cm to 25 cm
Height above take-off location (AGL) . . . . 75 m to 750 m
Absolute accuracy (no ground control points). . . . . down to 2 cm
Relative accuracy (XY/Z). . . . . 1-2x/1-5x GSD

OPERATION

Endurance[1] . . . . 35 minutes
Range[1]. . . . . .52 km (32 mi)
Cruise speed. . . . . 85 kph (53 mph)
Maximum ceiling[2]. . . . . .5000 m (16,404 ft)
Pre-flight system setup time. . . . . .5 minutes
Take off
 Type . . . . Catapult launch
 Angle. . . . . 30 degrees
Landing
 Type . . . . Belly landing
 Angle. . . . . .14 degrees
Landing space (L x W)3
 Typical . . . . .20 m x 6 m (66 ft x 20 ft)
 Recommended . . . . .50 m x 30 m (164 ft x 98 ft)
Weather limit . . . . 55 km/h (34 mph) and light rain
Communication and control frequency . . . . 2.4 GHz (FHSS)
Communication and control range.. . . . . Up to 5 km (3.10 mi)

SOFTWARE

Trimble Access Aerial Imaging application

- Project management
- Mission planning with option for multiple flights
- Automated pre-flight checks
- Automatic take off, flight and landing
- Autonomous camera triggering
- Automated fail-safe routines
- User controlled fail-safe commands
- Automated data consistency checks
- Export to Trimble Business Center, Trimble UASMaster and a generic format for image processing

AREA COVERAGE TABLE [1]

Height AGL	GSD 15 mm lens	Area/flight 15 mm lens	GSD 25 mm lens	Area/flight 25 mm lens	GSD 35 mm lens	Area/flight 35 mm lens
75 m (246 ft)	2.4 cm (0.9 in)	1.4 km2 (0.54 mi²)	1.5 cm (0.6 in)	0.8 km2 (0.31 mi²)	1.0 cm (0.4 in)	0.6 km2 (0.23 mi²)
100 m (328 ft)	3.3 cm (1.3 in)	1.9 km2 (0.73 mi²)	1.9 cm (0.7 in)	1.2 km2 (0.46 mi²)	1.4 cm (0.6 in)	0.8 km2 (0.31 mi²)
120 m (394 ft)	3.9 cm (1.5 in)	2.4 km2 (0.93 mi²)	2.3 cm (0.9 in)	1.4 km2 (0.54 mi²)	1.7 cm (0.7 in)	1.0 km2 (0.39 mi²)
150 m (492 ft)	4.9 cm (1.9 in)	3.1 km2 (1.20 mi²)	2.9 cm (1.1 in)	1.8 km2 (0.69 mi²)	2.1 cm (0.8 in)	1.2 km2 (0.46 mi²)
300 m (984 ft)	9.8 cm (3.9 in)	6.5 km2 (2.51 mi²)	5.8 cm (2.3 in)	3.7 km2 (1.43 mi²)	4.2 cm (1.7 in)	2.7 km2 (1.04 mi²)
750 m (2461 ft)	25 cm (9.8 in)	16.1 km2 (6.22 mi²)	14.6 cm (5.7 in)	9.3 km2 (3.60 mi²)	10.5 cm (4.1 in)	6.3 km2 (2.43 mi²)

[1] For a 5:1 aspect ratio of a single rectangular flight block, at 80% lateral overlap, including 5 min of traveling time from take-off to the first waypoint and from the last waypoint to the landing.

1 ISO standard atmosphere conditions.
2 Recommended; UX5-HP not tested above 5,000 m (16,404 ft).
3 1 sigma for wind <30 kph (19 mph);deterioration of the battery.

Specifications subject to change without notice. C E

ALLTERRA™

Trimble V10
IMAGING ROVER

Key Features

► 12 calibrated cameras capture 60 MP panorama for full site visualization

► Generate Survey, GIS or mapping accuracy positions

► Rapid data collection with one-button capture of panoramas

► Create 3D models, point clouds from pictures

► Seamless integration with Trimble R-series GNSS receivers or Trimble robotic total stations

► Flexible, simple processing in Trimble Business Center to generate deliverables

THE POWER OF PICTURES

The Trimble® V10 Imaging Rover with Trimble VISION™ technology is an integrated camera system that precisely captures 360-degree digital panoramic images for efficient visual documentation and measurement of the surrounding environment. Either standalone or combined with a Trimble positioning sensor, the Trimble V10 Imaging Rover provides the means to quickly capture rich data and create comprehensive deliverables. Together with Trimble Access™ field software and Trimble Business Center office software, the Trimble V10 is the complete geospatial solution.

Rapid Data Capture

The Trimble V10 featuring Trimble VISION technology allows you to capture a 60 MP panorama image with the simple push of a button. A total of 12 calibrated cameras provide complete site documentation that can be used to make photogrammetric measurements. This metric imaging functionality is ideal to perform work where there are many features to collect, or where features are complex or difficult to capture. Field work that has traditionally taken hours for data collection can now be completed in just minutes.

An easy-to-use workflow in Trimble Access field software is simple and intuitive to capture panoramas, review images and store observations. High dynamic range (HDR) imagery in the Trimble V10 and Trimble Business Center improves image quality, even when you are working in variable light conditions.

Capture Now, Measure Later

Communicate site conditions, avoid site rework and benefit from increased quality control and data validation by visually observing the site from the field and measuring in the office later. The images collected also help communicate site conditions to individuals who are not on site.

Back in the office, use the enhanced photo point measurement functionality in Trimble Business Center to measure and create points, lines, polygons and other imaging components which can be used to prepare rich deliverables for GIS, engineering and survey applications.

Point Clouds From Pictures

Using the Trimble V10, you can generate dense point clouds from terrestrial panorama data to achieve an accurate 3D representation of a site. The data can then be used for area and volume computations, linear measurement, and terrain modeling.

GNSS and Total Station Integration

The Trimble V10 seamlessly integrates with the Trimble R-series GNSS receivers, or the Trimble S-series total stations. Easily associate your collected images with positions to generate a highly accurate geospatial dataset or capture GNSS and total station data. With the existing data capture workflow in Trimble Access, add 360-degree panoramas to your dataset as needed for a complete integrated geospatial solution.

You can use the Trimble V10 without a positioning sensor to capture applications such as interior mapping, bridge inspection or other areas where positioning data is typically difficult or not necessary to obtain.

3D Models and More

The Trimble V10 with Trimble Business Center allows geospatial professionals to produce improved deliverables even faster. Data collected using the Trimble V10 makes it easier and faster to generate 3D models and images than when working with large point cloud files. Images captured with the powerful Trimble V10 Imaging Rover can be exported into SketchUp to create robust 3D models of buildings, bridges and a variety of other objects.

A Comprehensive Solution

The Trimble V10 Imaging System offers unprecedented capabilities to the geospatial professional – never before has a picture been so powerful. By leveraging Trimble VISION technology along with other Trimble hardware and software offerings, the Trimble V10 enables you to capture more critical information that can be transformed into enhanced, rich geospatial deliverables. With the Trimble V10, a picture is worth a thousand points.

®Trimble.

PANORAMA SPECIFICATIONS

Total Panorama Resolution	60 MP
High Dynamic range imagery	Yes
Exposure modes	Auto
White balance modes	Auto
Live view frame rate, normal light conditions	15 Fps
Live view frame rate, low light conditions	7.5 Fps
Resolution of each camera	5 MP
File format of images	Jpeg
File size of one panorama	10 MB–20 MB
File size of HDR Images	10 MB–20 MB
Field of view angle captured by panorama cameras	360° x 43°
Field of view angle captured by down looking cameras	210° x 57.5°
Vertical field of view	93.1°

POSITIONING PERFORMANCE

Position Accuracy (RMSE)[1, 2]

Horizontal	10 mm RMS
Vertical	7 mm RMS

HARDWARE

Physical

Diameter of V10 housing	113 mm (4.45 in)
Height of V10 housing	124 mm (4.88 in)

Weight

V10	900 g (1.98 lb)
Battery	182 g (.40 lb)
2-piece power rod with battery compartment	1.29 kg (2.85 lb)
Bipod	1.61 kg (3.55 lb)

Environmental

Temperature

Operating	–20 °C to +50 °C (–4 °F to +122 °F)
Storage	–40 °C to +70 °C (–40 °F to +158 °F)
Operating humidity	100% condensing
Dust and water protection	IP54

Shock:

Non-operating drop test	Designed to survive a 2 m (6.6 ft) pole drop onto concrete
Vertical drop onto tip of the pole	100,000 rep.@5 cm (15G) 100 rep.@30 cm (100G)
Vibration	MIL-STD-810F, FIG.514.5C-1

Electrical

Battery

Voltage, nominal	7.4 V
Capacity	3.7 Ah
Smart Battery with capacity display	Yes

Camera Operating time

with 1 Battery in normal operating mode[3]	4 h
Number of panoramas with one battery	350
Interfaces	USB Mini B, USB A

Built-in Sensors

2 axis tilt sensor range	15°
Tilt sensor accuracy using bipod	0.03°
Magnetic sensor accuracy at undisturbed surrounding	1°

CAMERAS

Panorama

Orientation	Landscape
Number of cameras	7
Field of view	57.5° (horizontal) x 43° (vertical)

Downlooking

Orientation	Portrait
Number of cameras	5
Field of view	43° (horizontal) x 57.5° (vertical)
Lens type	f-theta
Temperature compensated	Yes
Infrared blocking filter	Yes
Angle per pixel	0.39 mrad/Pix (1.33 arcmin/Pix)
Focal length	3.63 mm (0.14 in)
Depth of field	0.1 to ∞ m

Calibration of

Camera better than	1 Pix
Optical distortion, interior and exterior orientation	Yes
Stability of calibration	2 Pix
Calibration of sensors with respect to the cameras	Yes

2-PIECE POWER ROD

Hot swappable dual smart batteries	Yes
Shock absorbing tip. Shock load to user and camera reduced by factor of	4 x
Exchangeable tip	Yes
Compatible with 5/8 length extension	Yes

SUPPORTED TRIMBLE CONTROLLERS

- Trimble TSC3 and Trimble Tablet Rugged PC

ACCESSORIES

- 360-degree prism with quick release
- High-Accuracy Kit with power mount, prism base and two targets
- Trimble R-series GNSS adapters

1   The position accuracy expressed as Root Mean Square Error (RMSE) can be obtained with the following set-up conditions: Three panoramic images were taken from 3 photo stations on known locations with control point quality. Those locations had a triangular geometry with sides of 15 m, a base of 24 m, and an angle of 100°. The distance to the objects was up to 25 m resulting in intersection angles at the objects of close to 90deg. The object positions were determined with TBC photogrammetry software using manual tie points and full orientation option and then compared with the nominal object positions. Checker-board targets were used as objects. The use of the instrument is not limited to distances up to 25 m but the error increases with larger distance, smaller base length or worse geometry of the photo station locations.
2   The presence of control points visible in the panoramas and used in the photo point measurements will improve the orientation of the related photo stations both in horizontal and vertical direction, stabilize the whole bundle and result in even better horizontal and vertical accuracy.
3   Normal Operating mode is standard runtime capturing panoramas as needed, not continuously.

Specifications subject to change without notice.

ALLTERRA™

Trimble Business Center
OFFICE SOFTWARE

Key Features

A customizable user interface enhances the Trimble Business Center experience. For users who wish to maximize their efficiency, the Trimble Business Center ribbon interface makes functions easy to find and understand.

► Add frequently used functions to the quick access toolbar

► Create ribbon tabs with streamlined workflows

► Specify any website as the start page

ENABLING FIELD TO FINISH WORKFLOWS WITH CONFIDENCE

Harness the power of geospatial data reliably. Trimble® Business Center enables you to efficiently edit, process, adjust and create deliverables with confidence.

Complete Software Solution

Comprehensive workflows for Survey, GIS, and specialist service providers creating deliverables from traditional data types or expanding to the latest point cloud and imagery data from terrestrial, mobile and aerial sensors. One software does it all: eliminating historically disjointed workflows, supporting the needs and flexibility of multidisciplined businesses and reducing costs of software purchases and training.

Data Integration

Combine data from GNSS, total stations, and levels to achieve the most accurate horizontal and vertical results. Enhance visualization and data richness with points clouds, imagery, BIM and CAD models as well as PDFs to create the ultimate in complete project deliverables.

Market leading data integration allows users to easily adopt new sensor technology to respond to evolving customer needs.

Confidence Inspiring Results

TBC is loaded with all the necessary tools to control, manage and check your data – ensuring the most accurate and precise results. Don't put up with fragmented data sets or questionable data that causes costly mistakes and jeopardizes your business reputation. TBC provides the confidence to ensure every project is correct.

Rich Deliverables

TBC enables you to deliver a multitude of application based deliverables such as QA reports, surfaces, CAD plans and complex alignment/corridor designs. Strong partnerships with major CAD and GIS packages ensure that data transactions with TBC are seamless and highly productive.

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Trimble Business Center OFFICE SOFTWARE

SUPPORTED WORKFLOWS
One office software does it all.

Control Surveying
Confidently produce reliable control coordinates for the span of the entire project

- ► Create projects with a wide selection of coordinate systems and geoid models
- ► Review, edit and process GNSS, total station, and leveling observations
- ► Postprocess static GNSS data with Trimble's HD-GNSS processing engine for more reliable positions
- ► Adjust traverses and complete networks containing GNSS, total station, and leveling observations

Field to Finish
Easily create CAD-ready deliverables directly from survey data

- ► Import any existing raster and vector data for bidding estimates and project planning
- ► Process feature codes, compute volumes and automatically model terrain
- ► Create surfaces and contours from points and breaklines to accurately model terrain
- ► Plot and save your survey designs in a variety of CAD and GIS formats

GIS Feature Collection
Expand the utilization of your survey systems by creating GIS deliverables for your clients

- ► Create and manage rich feature libraries matching attribute schema, layers and symbology from GIS and CAD
- ► Process feature codes to automatically create geometry and attributes
- ► Import/Export features to a variety file formats including ESRI shape files and geodatabase XML files
- ► Directly connect to the GIS data system of record to extract schema and data enabling efficient GIS operations

Construction Staking
Ensure that your staking projects are performed correctly and recorded for verification

- ► Import road and site designs directly using variety of CAD and BIM formats
- ► Create points, lines, alignments, surfaces, and corridors to stake out with Trimble Access,

- ► machine control systems and other positioning solutions
- ► Review and report on as-staked locations from field devices

Data Prep
Make sure your data is clean, up-to-date and delivered in the right format to get the job done

- ► Import and organize CAD and PDF data
- ► Rapidly extract and digitize data from vector PDFs
- ► Elevate 2D contours, points , lines and polygons into 3D models

Drafting
Produce your final survey and roadway design plots with ease

- ► Use Dynaviews to efficiently place your model space data into plotting sheets
- ► Efficiently add dynamic labels, line and curve tables, scale bars and other map elements
- ► Automatically plot profiles and crosssections for alignment based surfaces or corridors
- ► Create 3D PDFs for easy communication and collaboration with project team members and clients

Terrestrial Photogrammetry
Measure and model from Trimble VISION images in the comfort of your office

- ► Accurately extract 3D geometry and features from images to create rich CAD and GIS deliverables
- ► Generate point clouds and surfaces for volumetrics and modeling
- ► Produce high resolution .html, Google Earth and .jpeg panoramas

Aerial Photogrammetry
Produce accurate orthomosaics and terrain models from UAS data with highly automated workflows

- ► Create high resolution point clouds, orthomosaics and elevation raster DSM/DTMs
- ► Create accurate 3D terrain models for volumetric computations and design
- ► Seamlessly integrate UAS deliverables with other surveyed data types

FLEXIBLE LICENSING OPTIONS
Whether your business requires a single license or a multi-user enterprise license, Trimble Business Center offers flexible licensing options to meet your requirements:
- USB hardware licenses for individual workstations
- Software code licenses for individual workstations and network servers

A TRIMBLE BUSINESS CENTER EDITION MATCHED TO YOUR BUSINESS REQUIREMENTS
A comprehensive and scalable toolset for every Geospatial business
- Base Edition: Supports quality-check workflows, network adjustment, feature code processing, COGO, CAD, reporting and L1 GPS processing
- Complete Edition: All of the features of the TBC Base Edition plus site calibration, full GNSS processing, surfaces, volumetrics, moreadvanced CAD, and point cloud tools
- Advanced Edition: All of the features of the Complete Edition plus moreautomated CAD, corridor/alignment design, and support for Trimble VISION terrestrial photogrammetry
- Aerial Photogrammetry Module: Data processing and deliverable production for Trimble UAS
- Advanced Drafting Module: Simplified, highly-automated plotting of survey data including sectional views
- Data Prep Module: Existing drawing cleanup and conversion of 2D drawings into actionable 3D models
- GIS Module: Seamless connection to geodatabases to integrate highaccuracy survey operations with GIS

Specifications subject to change without notice.

SYSTEM RECOMMENDATIONS
Operating system
- Microsoft Windows® 7 (64-bit version)
- Microsoft Windows 8 (64-bit version)
- Microsoft Windows 10 (64-bit version)

Processor
Recommended . . . . .Intel® Pentium® Dual-Core E2160 (1.80 GHz, 1 MB L2 Cache, 800 FSB) or better

Random Access Memory (RAM)
Minimum. . . . . .2 GB
Recommended . . . . 8 GB or greater

Hard disk
Recommended . . . . 5 GB or more
Graphics . . . . .DirectX 9 (or higher) compatible graphics card with 512 MB memory or more
Note: To display point cloud data (if applicable), graphics card must support Open GL 3.2
Monitor . . . . 1280x1024 or higher resolution with 256 or more colors (at 96 DPI)
I/O Ports. . . . . .USB 2.0 port

SUPPORTED LANGUAGES

- Chinese Simplified
- Czech
- Dutch
- English US
- English UK
- Finnish
- French
- German
- Italian
- Japanese
- Korean
- Norwegian
- Portuguese
- Russian
- Spanish
- Swedish

ALLTERRA™

Trimble 4D Control
SOFTWARE

Key Features

Software is the core of a monitoring project. It triggers alarms based on user defined thresholds as well as controls the measurements, manages data and compiles and analyzes the results. From campaign monitoring to real-time, multi-sensor operations, Trimble 4D Control can handle the challenge of complex monitoring applications.

► Advanced, easy to use functionality that fits a wide range of monitoring needs

► Built on the PIVOT™ Platform (Progressive Infrastructure via Overlaid Technology)

Trimble® 4D Control™ brings the latest technology to installations for monitoring and analysis. Trimble 4D Control provides advanced, easy to use functionality that fits a wide range of monitoring needs. Trimble 4D Control software is built on the PIVOT™ Platform (Progressive Infrastructure via Overlaid Technology) which is a building block concept developed to address the specific needs of professionals in various market segments.

Complete Sensor Management

Trimble 4D Control manages all of your sensors. In addition to optical and GNSS sensors, Trimble 4D Control supports a wide variety of seismic, metrological and geotechnical instruments. The software measures and stores the data according to schedules that you define. It manages measurement cycles, communications and the flow of incoming data.

Automated Measuring 24/7

With Trimble 4D Control you can define groups of points to be measured and scheduled for observation. For optical measurements, you can simply 'train' the system by aiming the total station to each point when setting up your project. The system then automatically measures to the points according to schedules that you have defined.

For GNSS monitoring, you can control measurement intervals, cutoff angles and other parameters used in processing the GNSS data. For maximum flexibility, Trimble 4D Control lets you choose among different GNSS processing techniques to ensure the best results for your monitoring project.

Advanced Data Analysis

Trimble 4D Control contains sophisticated tools to analyze your data. At the core are Trimble's cutting-edge algorithms for network deformation analysis. Trimble 4D Control provides detailed evaluation of your data and highlights points that are moving. You can identify random or systematic measurement errors and spot movement in your points. Trimble 4D Control helps you see cyclic movement as well as sudden or unexpected changes in your project.

With Trimble 4D Control you can define the direction of movement expected for each point. The point's motion is computed along or across this axis as well as in the vertical plane. It's a powerful tool in understanding the behavior of your monitoring project.

NEW SOFTWARE AUTOMATES THE INTERPRETATION OF RADAR IMAGES

Trimble

Web Access and Visualization of Your Monitoring Projects

Trimble 4D Web is used to analyze and visualize monitoring projects, and provides access to your monitoring system over a fast, feature-rich Web interface. Visualization tools in Trimble 4D Web provide a versatile overview of your monitoring network. Whenever you connect to the Internet, you can connect to Trimble 4D Control Web and view your project in real-time.

► Powerful map and custom views to identify sensors and measurement points. You can use aerial photos or other imagery to provide detail background information.

► Fast and easy charting lets you plot the results of individual points or sensors.

► Visualize information from monitoring sensors in chart or tabular forms.

► Link to project webcams in real time and make visual inspection from any location.

► Post and manage updates and reminder to the project log to meet stakeholders' needs.

► Set conditions and recipients for issuing alerts and messages and manage in a secure environment.

Controlled access to specified stakeholders by assigning different access levels to ensure information is available only to those who need it.

Trimble 4D Control Room Web

The Trimble 4D Control Room Web allows you to monitor Trimble 4D Control projects that belong to one or more Trimble 4D Control Web installations. This add-on to the Trimble 4D Control software shows information that is published by the individually linked Trimble 4D Web instances.

Trimble 4D Control Room Web has the following benefits:

► Seamless authentication and authorization of users registered both at Trimble 4D Control Room Web and a linked Trimble 4D Control Web installation.

► Monitoring information about the Sensor Data Flow, Existing Alarm Status, and Unacknowledged Events for each project of interest on one page.

► Map visualization of the location of different Trimble 4D Control Web installations including tooltips for further information.

► User management functionality.

Overview of Monitoring Apps

Trimble 4D Control supports various apps to enable a wide and growing range of capabilities for different monitoring requirements. Each app offers a number of modules and functionalities for specific monitoring operations such as instrument controls, data collection, data processing, data analysis and alarming. New apps can be added to existing installations at any time.

Radar
Uses pre-processed data from a radar device to calculate displacements based on radar interferograms.

High Rise
Uses GNSS and inclination sensors to monitor high-rise structures during construction and delivers precise and reliable coordinates on demand.

Seismo Geodetic
Integrates strong motion and high frequency data for the combined processing of accelerometer and GNSS data using a Kalman filter to produce high rate GNSS displacement data.

Geotechnical
Provides continuous high precision measurements and rapid updates to monitor over long distances.

Pivot RTX
Performs absolute position estimation and coordinate integrity monitoring in real-time mode using the RTX technology.

Pivot RTX-PP
Performs absolute position estimation and coordinate integrity monitoring in postprocessing mode using the RTX technology.

Integrity Manager
Provides real- time and postprocessing engines to monitor GNSS reference stations.

ALLTERRA

Trimble TDL450
RADIO

Key Features

► Easy setup and configuration even in the field

► The latest Trimble radio technology for optimal performance

► Super-rugged housing for robust reliability

Designed to support all aspects of GNSS surveying, the Trimble® TDL 450 series offers flexible configuration options and rugged reliability. This sophisticated radio modem places Trimble's newest low power data link technology in your hands. For surveyors that need to make the most of every day, the Trimble TDL 450 series is a giant step forward in radio technology.

Field Configurable and Built to Last

The Trimble TDL 450 series is an advanced, high speed, wireless UHF data radio built to endure the stresses of daily use in harsh conditions. Full metal construction provides impact and weather resistance that will keep you working with complete confidence.

The full-function user interface streamlines field configuration and troubleshooting so you can maintain maximum productivity. Adapt as conditions require: for longer baselines you can dial up the power, and when the work area is smaller, a lowerpower output extends battery life.

The Trimble TDL 450 series even provides access to diagnostic data in the field. So, you can solve signal strength challenges and make adjustments to stay more productive.

Versatility for Continuous Productivity

Easy-to-use and highly reliable, the Trimble TDL 450 series radio is capable of broadcasting, repeating and receiving real-time data used by Trimble GNSS receivers. Its compact size allows it to be easily mounted on the same tripod as the receiver or on its own tripod using mounting hardware included as standard equipment.

As a transmitter, the Trimble TDL 450 series seamlessly broadcasts corrections to radios and radio-enabled devices. Network coverage can be enhanced by the use of one or two repeaters.

As a repeater, the TDL 450 series enables you to reach inaccessible or obstructed locations due to its extended range and seamless coverage around obstacles. Because it is so versatile, one extra radio can be used as a backup or as a "spare" for multiple tasks.

Performance Features

► High Over-the-Air Link Rate:

  • 19,200 bps (both GMSK and 4FSK)

  • Supports 1 Hz RTK corrections for multiconstellation receivers

► Configurable Transmit Power:

  • Trimble TDL 450L power settings:

► 0.1 W, 0.5W, 1 W, 2W, and 4W

  • Trimble TDL 450H power settings:

► 4 user-defined power levels (2 W to 35 W)

  • Configurable from the front panel up to the maximum power output setting for your region

► Available Bandwidth:

  • 390 MHz to 430 MHz and 430 MHz to 470 MHz models

  • Designed for high performance over the entire band

► Software-controlled Channel Bandwidth:

  • Software configurable for both 12.5 kHz and 25 kHz radios

Trimble

TDL 450 L RADIO
TECHNICAL SPECIFICATIONS

General
Communication . . . . 1 RS-232 port, 115.2 kbps maximum
User Interface. . . . . .5 navigation buttons with 2-row, 16-character LCD display; English language support

Power
External . . . . 9.0 V DC to 30.0 V DC, 2 Amp maximum
During RX . . . . 0.6 W nominal @ 12.0 V DC
During TX . . . . 7 W nominal @ 12.0 V DC, 1 W RF output
13.4 W nominal @ 10.2 V DC, 4 W RF output

Modem
Link Rate/Modulation . . . . 19,200 bps/4FSK, 9600 bps/4FSK, 19,200 bps/GMSK, 16,000 bps/GMSK, 9600 bps/GMSK, 8000 bps/GMSK, 4800 bps/GMSK
Link Protocols . . . . Transparent EOT/EOC/FST, Packet-Switched, TRIMMARK™,TRIMTALK™, TT450S (HW), SATEL®
Forward Error Correction . . . . Yes

Radio
Frequency Bands . . . . 390 MHz to 430 MHz and 430 MHz to 470 MHz
Frequency Control . . . . Synthesized 6.25 kHz tuning resolution; Frequency stability ± 1 ppm; −40 °C to +85 °C
RF Transmitter Output . . . . Programmable to 0.1 W to 4 W (where permitted)
Sensitivity. . . . . −110 dBm BER 10−5
Type Certification . . . . .All models are type accepted and certified for operation in the U.S., Europe, Australia, New Zealand, Russia and Canada. TDL 450L-Korea is type certified for operation in Korea.

Environmental
Enclosure IP67
(Dustproof and watertight to depth of 1 m for 30 minutes)
Operating Temperature (receiver). . . . . −40 °C to +85 °C
Operating Temperature (transmitter) . . . . −40 °C to +65 °C
Storage Temperature . . . . −55 °C to +85 °C
Vibration MIL-STD-810F

Other
Dimensions . . . . 8.89 cm L x 4.6 cm W x 16.0 cm H
Weight . . . . .690 g
Data/Power Connector . . . . 5-pin, #1-shell LEMO
RF Connector . . . . 50 Ohm, TNC female

TDL 450 H RADIO
TECHNICAL SPECIFICATIONS

General
Communication . . . . 1 RS-232 port, 115.2 kbps maximum
User Interface . . . . .5 navigation buttons with 2-row, 16-character LCD display; English, Russian and Chinese language support

Power
External . . . . 9.0 V DC to 30.0 V DC, 15 Amp maximum
During RX . . . . 1.7 W nominal @ 12.0 V DC
During TX . . . . .130 W nominal @ 12.0 V DC, 35 W RF output
55 W nominal @ 12.0 V DC, 8 W RF output
8 W nominal @ 12.0 V DC, 1 W RF output

Modem
Link Rate/Modulation . . . . 19,200 bps/4FSK, 9600 bps/4FSK, 19,200 bps/GMSK, 6,000 bps/GMSK, 9600 bps/GMSK, 8000 bps/GMSK, 4800 bps/GMSK
Link Protocols . . . . Transparent EOT/EOC/FST, Packet-Switched, TRIMMARK™, TRIMTALK™, TT450S (HW), SATEL®
Forward Error Correction . . . . Yes

Radio
Frequency Bands . . . . 390 MHz to 430 MHz and 430 MHz to 473 MHz
Frequency Control . . . . Synthesized 6.25 kHz tuning resolution; Frequency stability ± 1 ppm −40 °C to +85 °C
RF Transmitter Output . . . . .Programmable from 2 W to 35 W (where permitted)
Sensitivity . . . . −110 dBm BER 10−5
Type Certification . . . . .All models are type accepted and certified for operation in the U.S., Europe, Australia, New Zealand, and Canada.

Environmental
Enclosure IP67
(Dustproof and watertight to depth of 1 m for 30 minutes)
Operating Temperature (receiver). . . . . −40 °C to +65 °C
Operating Temperature (transmitter) . . . . −40 °C to +65 °C
Storage Temperature . . . . −55 °C to +85 °C
Vibration MIL-STD-810F

Other
Dimensions . . . . .11.9 cm L x 8.6 cm W x 21.3 cm H with handle
Weight . . . . .1.95 kg (4.3 lb)
Data/Power Connector . . . . 5-pin, #1-shell LEMO
RF Connector . . . . 50 Ohm, TNC female

Specifications subject to change without notice.

C E 🅲

AllTerra Gulf
TRIMBLE GEOSPATIAL SOLUTIONS

TRANSFORMING THE WAY THE WORLD WORKS

Trimble GPS/GNSS Solutions

Trimble R10   Trimble R8   Trimble R4   Trimble R2   Trimble R9S   Trimble NetR9

Integrated GNSS/GPS System   **GNSS Receiver**

Trimble Optical Solutions

Trimble S5   Trimble S7   Trimble S9   Trimble M1   Trimble M3   Trimble DiNi

Robotic Total Station   **Mechanical Total Station**   **Digital Level**

Trimble Imaging Solutions

Trimble TX8   Trimble MX2   Trimble MX7   Trimble MX8   Trimble UX5 HP   Trimble V10

3D Laser   **Mobile Mapping - Imaging Systems**   **Unmanned Aerial**   **Imaging Rover**

Trimble Controllers

Trimble CU   Trimble Tablet   Trimble TSC3

Trimble Radio and Communication Solutions

Trimble TDL450 L   Trimble TDL450 H

Trimble

ALLTERRA™

About Trimble

Positioning-centric information is changing the way people, businesses and governments work throughout the world. By applying Trimble's advanced positioning solutions, productivity increases and safety improvements are being realized.

Though best known for GPS technology, Trimble integrates a wide range of positioning technologies including GPS, laser, optical and inertial technologies with application software, wireless communications, and services to provide complete commercial solutions. Its integrated solutions allow customers to collect, manage and analyze complex information faster and easier, making them more productive, efficient and profitable.

Trimble products are used in over 150 countries around the world. Employees in more than 35 countries, coupled with a highly capable network of dealers and distribution partners serve and support our customers.

For over 35 years, Trimble has created unique positioning products that help customers grow their business. Our portfolio includes over 1,100 patents and serves as the basis for the broadest positioning offerings in the industry. Trimble augments its organic product development with strategic acquisitions to bring the latest positioning technologies to a wider market.

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