Trimble S6 Total Station: The System

1. What is the new Trimble S6 Total Station?

The Trimble® S6 Total Station is the new gold standard for optical total stations. It is a totally new system developed from the ground up using advanced technologies found nowhere else on the market. Trimble's 40 years of experience in optical measuring systems and its core of professional surveyors have combined to produce an optical surveying system that provides unmatched speed and accuracy. Together with Trimble's popular options for survey application software and the Integrated Surveying capability of the Trimble CU with the Trimble S6 and GPS, the system re-defines flexibility, reliability, and most importantly, productivity.

2. What are the most exciting features in the new Trimble S6 Total Station?

The Trimble S6 represents the very latest in optical total station technology. The most exciting features include:

- MagDrive™ servo technology: Trimble's fully integrated servo and angle system. This revolutionary new servo system is based on a direct drive and nearly silent frictionless electromagnetic technique. It provides unparalleled speed and accuracy.
- MultiTrack™ prism technology: MultiTrack combines the ability to lock and track prisms with an active Target ID to provide exceptional flexibility and performance. The benefit? Your customers can choose.
- SurePoint™ accuracy assurance: A Trimble exclusive, SurePoint ensures that the instrument stays where you aim it, eliminating concerns about onboard button pushing, wind, or high vibration. It can even correct for unstable instrument setups. SurePoint includes advanced error compensation to ensure that accurate measurements are obtained, reducing the need for costly re-measurement.
- Trimble Direct Reflex (DR) EDM technology: DR provides long-range accurate measurements without the need for prisms to a variety of objects. The ability to safely measure wherever and whenever with confidence.
- The Trimble CU Controller: The new controller provides one user interface with seamless interaction and data flow for both GPS and Conventional surveying. Trimble Integrated Surveying offers a choice of software and data collectors, all providing complete integration between optical/GPS sensors.

- Upgradeability: The Trimble S6 system is fully upgradeable from Servo to Autolock™ to Robotic. “Buy the instrument you need now and upgrade as your needs change.” This flexibility protects your customer’s investment.
- Servo focus: The focus screw is located on the side of the instrument to improve the working environment for the operator and provide fast, easy and convenient focusing. The system uses an electric servomotor inside the telescope to position the focusing lens.
- Target ID: Part of MultiTrack™ prism technology, the Target ID is an active search aid that emits an infrared signal that the instrument uses to ensure that the passive tracking system is locked on to the correct target. It can operate on 8 different channels so an instrument is capable of identifying up to 8 unique targets on the same site.
- Coaxial telescope/EDM/tracker/laser pointer: a fully coaxial measuring and tracking system for measuring confidence. The point measured is the same as the point to which the instrument is aimed, manually or by Autolock™.
- Internal battery and intelligent charger: an internal battery means shorter setup times and no hassle carrying external power supplies. The batteries contain the latest in Lithium Ion smart battery technology. One internal battery will provide a full day of normal operation. The intelligent system charger can also charge Trimble GPS batteries.

To find out more about these and other features in the new Trimble S6 visit www.trimble.com .

3. Why is Trimble now also offering Autolock to prisms as well as an active Target ID?

We want to give our customers a choice! As part of Trimble’s MultiTrack prism technology, the Autolock function in the Trimble S6 provides the capability to lock onto and track a prism.

The Trimble S6 has been developed using the same tracking principle as the Trimble 5600. The main difference between the two systems is that the active LED component has been integrated into the Trimble S6 instrument. This integration allows the Trimble S6 to lock and track prisms directly.

Since the principle of Autolock® function was adopted from the Trimble 5600, the reliability and robustness of that instrument has been retained. The additional control provided by integrating the active component into the instrument has enabled the performance to be matched. The integration with MagDrive servo technology also allows the Trimble S6 with Autolock™ to provide faster tracking and measurement update rates.

By allowing customers to lock and track prism directly, we’re giving our customers much greater flexibility. The Trimble 5600 instruments were designed to lock onto and track an “active” target that incorporated a built-in LED diode. Using an active target system provides a reliable and robust method for correctly identifying and tracking a target. However, applications such as monitoring surveys often require the instrument to be able to lock onto conventional prisms directly. Traditional prism tracking systems are generally limited by range and tracking reliability. However, they do provide the user with the additional flexibility of being able to use a variety of target types.

4. Can the Trimble S6 track as reliably as a Trimble 5600?

Yes. Since the overall principles of Autolock have been adopted from the Trimble 5600, the reliability and robustness has been retained. Extensive tests indicate that the Trimble S6 tracks a prism directly at least as well as the Trimble 5600 tracks an active target.

5. What is the Target ID and how it used by MultiTrack?

Trimble's Target ID is an accessory that is available with Trimble S6 Robotic instruments. It is an active search aid that emits an infrared signal that the instrument uses to ensure that the Autolock system is locked on to the correct target. It is especially useful in highly reflective environments or on job sites where multiple prisms are visible.

The Target ID can operate on eight different channels so an instrument is capable of identifying up to eight unique targets on the same site. Even with several Trimble S6 crews on a single site, you will always be able to acquire and track the correct prism every time. The speed of the instrument together with the complementing tracking technologies provides a new level of system intelligence that ensures reliable performance in all conditions.

6. Is it possible to upgrade to Autolock or Robotic in the future if I don't know exactly which system to buy now?

Yes. Just like the Trimble 5600 systems, the Trimble S6 Total Station is fully upgradeable from Servo to Autolock to Robotic.

7. Can I use my existing Trimble controller with the Trimble S6?

The TSCe and Trimble Recon controllers can be used with the Trimble S6. They must be running the appropriate version of your choice of Trimble field software. They connect to the instrument via the foot connector on the right (labeled "COM") at the base of the instrument.

The Trimble S6 is not supported by the ACU controller.

8. Can I use my existing Trimble GeoRadio with the Trimble S6?

No. The Trimble S6 Robotic Total Station has a new internal radio and the new rover radio is integrated into the Robotic holder for the Trimble CU. The Trimble S6 external remote radio is required when using the TSCe or Trimble Recon for robotic surveying.

9. What type of cable is needed to connect a Trimble S6 to my Trimble TSCe or Trimble Recon?

Trimble provides the special cables needed to connect the Hirose USB port on the Trimble S6 to these handheld controllers.

10. Do I need new batteries and charging system for the Trimble S6?

Yes. The Trimble S6 uses a new power concept that employs the latest in Li-Ion smart battery technology. The Trimble S6 battery has been specifically designed for use in the Trimble S6, with features including:

- long operation time
- accurate charge level indicator
- operation in various temperature ranges
- rugged design
- one battery for the instrument and all accessories

The battery can be used to power the instrument from either the internal battery compartment in the side of the instrument, or externally when attached to the Trimble S6 Multi-Battery Adapter.

A new integrated charger has been developed that charges both the new Trimble S6 Li-Ion smart batteries and also your existing Trimble 5700/R7 and 5800/R8 Lithium Ion batteries in a single unit. This revolutionary new charger is capable of holding five batteries at once.

11. Can I use my Geodimeter 600 or Trimble 5500/5600 system power supplies and batteries with the Trimble S6?

No. Differences in power management mean you cannot use Geodimeter 600 or Trimble 5500/5600 system power supplies and batteries with the Trimble S6 system.

The Trimble S6 Instrument

12. There are no clamps on the tangent drives. How do I keep the instrument pointing in the desired direction?

This is part of Trimble's unique SurePoint technology. Using a function of MagDrive servo technology, the Trimble S6 constantly and actively maintains its current pointing. This ensures that once you point the instrument it will stay pointed in that direction until you move it on purpose. SurePoint constantly monitors and corrects for small movements (jitter) caused by wind or vibration. It can even correct for slight misleveling caused by sinking tripod legs.

13. Is the Trimble S6 instrument compatible with my existing tribrachs and prisms?

Yes. The Trimble S6 is compatible with all your existing total station tribrachs and prisms. The Trimble S6 with Autolock will work with any prism. However, to ensure the best accuracy and reliability of the system, we recommend that you use accessories available with the Trimble S6.

14. Why has the focus adjustment been placed on the side cover of the instrument?

The Trimble S6 focus adjustment uses an electric servo motor to position the focusing lens, not the older manual mechanism. This servo focus makes it possible to place the focus control in a more convenient and ergonomic position.

Placing the focus adjustment screw on the side cover provides more space behind the instrument when focusing. You don't have to hold the eyepiece with your hand while sighting through the telescope. Placing the focusing control close to the horizontal and vertical adjustment screws and the trigger key gives you full control over the instrument when sighting through the telescope. When working from behind the instrument, you can point, focus and measure with just one hand.

15. Why are there two 6-pin connectors at the base of the instrument?

The connector on the right (labeled "COM") provides data communications and power. The connector on the left (labeled "12 V") is for power only. The Trimble S6 communicates using the USB protocol, and a special cable is used for connection to a RS232 data collector.

16. Why does the Trimble S6 use USB communications?

USB is a universally accepted standard for connecting peripheral devices and for data exchange. The Trimble S6 uses USB for internal and USB OTG (On the Go) for external communications. USB and USB OTG communications provide rapid data flow while consuming less power than normal RS232 communications. These benefits ensure that the Trimble S6 provides fast, efficient, and reliable data flow while using less power than other instruments.

17. When I rotate the telescope vertically, sometimes I notice a small movement in the horizontal axis. What is the instrument doing?

Trimble's unique SurePoint is doing exactly what it should.

Typically, a surveyor working with a conventional total station cannot extend a vertical line up or down using the vertical control knob without the horizontal angle changing. To achieve a true vertical line, he or she must adjust the horizontal angle. Only a perfectly leveled total station with all axes in perfect adjustment could possibly provide this capability.

However, the SurePoint technology in the Trimble S6 provides this capability and more. It uses compensation and error information to automatically adjust the horizontal angle and aim to a fixed value when the vertical control knob is turned. This is why you might see some small horizontal movement of the MagDrive servos when you rotate the telescope vertically. Trimble's SurePoint technology enables you to extend a perfect vertical line, or set out a horizontal line on both sides of the instrument, simply by turning the vertical control knob.

18. How do I turn the instrument on and off when the Trimble CU is attached?

When the Trimble CU is attached the to the instrument, press either the green power button on the Trimble CU or the trigger button on the side of the instrument to turn the system on.

To turn the system off when the Trimble CU is attached to the instrument, press the green power button on the Trimble CU or press and hold the trigger button on the side of the instrument for three seconds.

The system also has a standby mode to conserve battery power and enable a faster system restart. When the system is turned off using the methods described in the paragraph above, the system's default behavior is to enter standby mode (the system can also be configured to shut down immediately). When in this state, the system will automatically turn itself completely off after a period of time that is configurable in the Trimble CU operating system control panels. When the instrument is in standby mode, the Trimble CU can connect to the instrument remotely via the integrated radio in the Trimble Robotic Holder.

19. How do I turn the instrument on and off when the Trimble CU is not attached?

When the Trimble CU is not attached to the instrument, press the trigger button on the side of the instrument to turn the system on.

To turn the system off when the Trimble CU is not attached to the instrument, press and hold the trigger button on the side of the instrument for three seconds.

20. What does the green light on the side of the instrument indicate?

The green light in the trigger key on the side of the instrument indicates the status of the instrument. Details are in the following table.

Green Light	Instrument Status
On (solid)	On
On (flashing)	Standby mode
Off	Off

21. Why does the instrument rotate so freely when I switch it off?

When switched off, the MagDrive servos release their 'grip' on the instrument. There is no friction or other clamping system. When power is switched on, the MagDrive servos are engaged and hold the instrument in its current position.

22. What is the function of the Face 2 display?

The Face 2 display has been designed to provide users who are required to measure on both faces with an efficient and effective display and keyboard. The Face 2 display provides the essential information required to perform Face 2 measurements.

When the Trimble CU is not attached, the Face 2 display can be used to level the instrument, configure the instrument radio and perform a number of instrument calibration and adjustment routines.

23. What is the small round window under the objective lens on the front of the telescope?

This window contains the Tracklight.

The laser pointer for Trimble S6 is standard on all instruments, and is coaxial with the tracker and the EDM. The laser pointer is Laser Class 2, which is fully eye safe. The system is safe even if the laser pointer beam is reflected back into the telescope from a prism. Special optics in the telescope filter out almost all of the reflected laser beam, thereby ensuring safe and comfortable operation.

Trimble S6 Total Station: Trimble CU Controller

24. What is the new Trimble CU?

The Trimble CU Controller is a rugged detachable control unit that incorporates a sophisticated color touch-screen display, 400 MHz Intel X-Scale processor, 256 MB of memory and Bluetooth technology to interface with a range of Trimble controllers and sensors. It has a 19-button keyboard with a 4-way arrow key and popular cell phone style text entry. It runs on version 4.2 of the Windows CE .Net operating system that has been modified for the Trimble CU. Together with your choice of Trimble field software, the Trimble CU provides a reliable new platform for data collection and transfer.

25. Why doesn't the Trimble CU have an internal battery?

The Trimble CU is designed to be used only when attached to either a Trimble S6 instrument, Trimble Robotic Holder, Trimble GPS Holder or Trimble Docking Station, all of which supply power to the Trimble CU. This ensures that your data is always safe from corruption due to low battery levels. The Trimble CU does contain a small suspend battery that maintains suspend mode for a maximum configurable time of up to five hours before the system safely shuts down. The suspend function means you do not need to restart the Windows CE .Net operating system every time you start the system. You cannot run the Trimble CU from the suspend battery.

26. Can I use the Trimble CU with Trimble GPS to perform Integrated Surveying?

Yes. The Trimble CU can be used with the Trimble R7/5700 and Trimble R8/5800 GPS systems. With its integrated Bluetooth data link, the Trimble CU is an excellent choice for use with Trimble 5800 and Trimble R8 GPS receivers.

27. Can I use the Trimble CU with my Trimble 5500/5600 or 3000 total stations?

No. The Trimble CU is designed for the Trimble S6 only. It is not intended for use with any other series of optical total stations.

28. Why are there different Trimble CU holders for Robotic and GPS?

The Trimble Robotic Holder contains the integrated radio required for communicating with the Trimble S6 when working in Robotic mode. The Trimble GPS Holder does not have an integrated radio; it is intended for use with GPS only. You can use the Trimble Robotic Holder with GPS since the integrated radio is automatically switched off when the Trimble CU connects to a Trimble GPS receiver.

29. Can I use the radio integrated into the Trimble Robotic Holder as a GPS data link?

No. The radio integrated into the Trimble Robotic Holder is for communicating with the Trimble S6 only. You can use the Trimble Robotic Holder for GPS, but a separate GPS data link is also required.

30. Can I use the Trimble CU with third-party sensors?

No. The Trimble CU is designed for use with the Trimble S6 and Trimble R7/5700 and Trimble R8/5800 GPS systems only. Trimble offers other data collectors that support a wide range of third party sensors.

31. What survey application software is available on the Trimble CU?

A variety of Trimble field software is available on the Trimble CU. Contact your local Trimble sales representative for information on what is available in your region.

32. The Trimble CU has Bluetooth, so what other Trimble devices that have Bluetooth can I connect to?

You can use Bluetooth to connect to the Trimble R8/5800 GPS system to have a true cable-free rover when running RTK GPS. You can also use Bluetooth to connect to cell phones for VRS and RTK surveys. Files can be transferred via Bluetooth with a TSCe (with BlueCap) and the Trimble ACU. Bluetooth can also be used to connect to an office computer for upload / download of data.

33. There are no connectors on the Trimble CU. How can I connect it to my PC for data transfer?

The Trimble CU connects to your PC via the Trimble Docking Station included in the box with the Trimble CU. When your Trimble Docking Station is connected to a power source and to your PC via the provided USB cable, you can use Microsoft ActiveSync® to connect the Trimble CU to your desktop for data transfer.

34. Is there a portable memory solution so I can take data to and from the Trimble CU while it remains productive in the field?

Yes. When the Trimble CU is attached to the office docking station, Robotic holder or GPS holder, you can connect a compact flash card reader or USB memory stick to that device. The portable memory solution will then appear as an extra drive in the Windows CE .Net operating system running on the Trimble CU. You can then transfer data to and from the portable memory.

Trimble offers a range of portable USB memory devices that are compatible with the Trimble CU.

35. Does the Trimble CU run the Pocket PC operating system?

The Trimble CU operates using the Windows CE .Net operating system from which Pocket PC is based. To use Pocket PC the controller must satisfy a hardware criteria defined by Microsoft. The Trimble CU was not designed to satisfy this criteria as some of the items would have caused an adverse impact on the size and usability of the controller.

Trimble S6 Total Station: Service and Repair

36. When will my service department receive training?

A service training schedule has been created. Service providers will be notified of the schedule by their regional Trimble Service Manager.

37. What special tools will be needed to service the Trimble S6?

A list of the service tools needed will be available in the service manuals.

Trimble S6 Total Station: Miscellaneous

38. Will the Trimble 5500/5600, 3000, and ATS total stations now be phased out?

The Trimble 5500/5600, 3000, and ATS total stations and all of their accessories will continue to be available for purchase.

39. Will I need a new version of office software to work with the Trimble S6?

No. The current versions of the various Trimble office software packages will support the Trimble S6. However, before using your Trimble S6 instrument with your office software, you will need to run the office software update that is available on the field software CD. See the instructions on the field software CD for more information.

40. What is the policy for ordering dealer systems for the Trimble S6 System and what do the systems contain?

The standard policy applies. Contact your local sales manager for more information. To simplify things, Trimble has defined a standard demonstration system for purchase by authorized Trimble dealers. The contents of the standard dealer system are outlined in the following table:

Configuration	Description
S6332200	Instrument – Trimble S6 3" Robotic Total Station, DR300+, w/ Laser Pointer
S1001	CU – Trimble CU with Survey Controller Software Kit Configuration contains a Trimble CU with docking station and required accessories
SLSU-S2003	Robotic Standard Target Kit Configuration contains 360° prism, Target ID, and required accessories
SLSU-S2005	Robotic Power Kit Configuration contains a Trimble Battery System Charger with required accessories
SLSU-S2006	Robotic Holder including built-in 2.4 GHz radio-modem for US/Europe and ROW. Configuration contains Trimble Robotic Holder, field transport case, and required accessories
5103007	Trimble Standard Rod Rod with graduations for use with Trimble S6 360° prism

No changes to the systems are permitted. If you wish to purchase a different configuration for your demonstrations, then you must enter an order in the normal manner. Your Trimble regional sales manager can assist.

41. If an order is already in the system for another Trimble total station, can it be changed to a Trimble S6?

If you have an existing order and wish to receive a Trimble S6 instead of a Trimble 5600, you must contact your Trimble regional sales manager. Existing orders will not be changed, and equivalent Trimble S6 models will not automatically be substituted for 5600 orders. It may be possible to cancel your 5600 order and enter a new order for a Trimble S6.