TechnicalNotes

Asset Surveyor Software

AN ACCURATE AND POWERFUL GIS DATA COLLECTION AND UPDATE TOOL FOR THE RUGGED TSC1 DATALOGGER

It's a complex and fast-paced world. Having accurate and up-to-date information at your fingertips has never been more important. Asset Surveyor® software, developed by industry pioneer Trimble, works with your Geographic Information System (GIS) to quickly and easily collect and verify the information you need to make important decisions.

This powerful field software is part of a system that includes the GPS Pathfinder® Office software, a GPS Pathfinder receiver and the rugged TSC1™ datalogger. With an easy-to-use graphical interface, navigation capabilities, and seamless data flow between the field and the GIS, Asset Surveyor software makes it easy to collect and update large amounts of data in a cost-effective manner.

Trimble

TRIMBLE TECHNOLOGY MEETS YOUR NEEDS

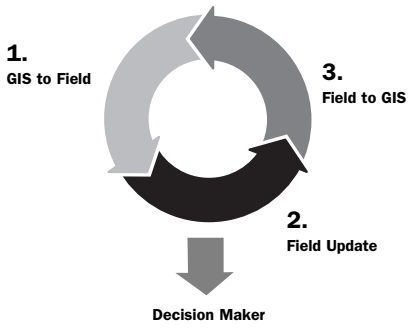
Why GPS?

GPS technology is fast and accurate and, without doubt, the most cost-effective method of providing position data for features in a GIS database. The Global Positioning System (GPS) is a worldwide navigation and positioning system that makes it possible to collect data virtually any time or any place in the world with a common standard of accuracy and dependability. Powerful GPS receivers, such as the Trimble GPS Pathfinder Power, Pro XR and Pro XRS, used in conjunction with a variety of real-time differential correction sources, can provide on-the-spot data accurate to less than a meter.

Why Asset Surveyor Software?

Asset Surveyor software gives you the power of advanced Trimble GPS technology. In 1987, Trimble pioneered the introduction and use of GPS/GIS data collection systems. Since then, GPS has become the premier tool for providing position information.

Trimble has continued to lead the way. In 1999, the company pioneered a new concept of GPS/GIS data maintenance. Advanced GPS technology enables you to relocate features graphically; to verify and update their positions and attributes; to add new features; and to integrate the changes into your GIS database.



Asset Surveyor software is a key component of this advanced GPS/GIS data maintenance system. This software is the result of many years of experience building GPS tools for those who manage GIS databases. This includes users such as utility and natural resource-based industries; as well as federal, state and local governments and agencies. Asset Surveyor software can be used to locate and collect data on property boundaries; infrastructure such as power lines, roads, and buildings; and natural features such as streams, soil types or vegetation cover. The software is also ideal for research uses.

Utilities and governments use GIS information to plan and implement maintenance, new construction and repairs. The result is improved service quality and reduced cost. Government and private agencies use GIS information to manage and protect resources—whether for maximum yield, for maximum profit, or for multiple use. Accurate information helps ensure sound policy and decision making.

ASSET SURVEYOR BENEFITS AND ADVANTAGES

Accurate Data Collection Collect accurate position and attribute data for point, line and area features and take existing GIS data to the field for verification and update to ensure accuracy. Accurate data is critical for effective decision making.

Easy To Learn and Use Easy-to-understand screens and status displays provide intuitive operation and make it simple to record and update data. True multitasking lets you work on a number of tasks at the same time. For instance, you can simultaneously navigate, collect data and monitor satellite status.

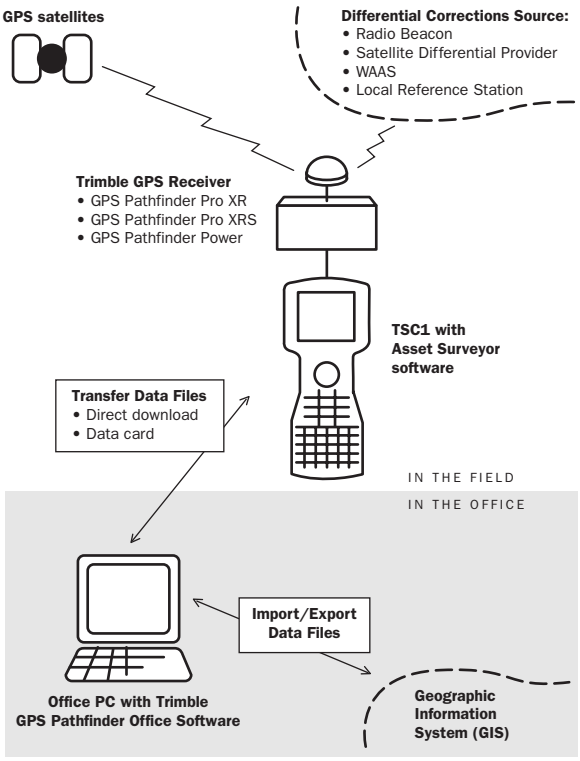
Fast and Flexible Data Collection Numerous built-in features ensure fast efficient data collection. The ability to create a data dictionary and to predefine attributes in a menu (or as time, data or numeric fields) helps crews quickly collect the right data.

Rugged Data Collector for the Field The TSC1 datalogger is an advanced hand-held computer developed and built by Trimble for tough field conditions.

Fully Compatible with GIS Field-collected data can be seamlessly exported to the GIS. Use of a data dictionary to structure data collection ensures that field data matches and is fully compatible with the GIS.

THE TRIMBLE GPS PATHFINDER SYSTEM

Trimble Asset Surveyor software is part of a specialized system designed to maximize data-management capabilities and options. Components of this system include a Trimble GPS Pathfinder receiver, the PC-based GPS Pathfinder Office software, the rugged TSC1 datalogger and your own geographic information system (GIS).



The Trimble Asset Surveyor software runs on the advanced TSC1 datalogger. This software allows the data collector to communicate with a GPS Pathfinder receiver that receives information from GPS satellites. Asset Surveyor software can be used to update existing GIS data, collect data for a GIS or spatial database, or to navigate in the field.

The TSC1 Datalogger

This cutting-edge computer was designed for tough field use. It is rugged and easy to use.

• ***The unit is ergonomically designed*** with a 54-key alphanumeric keyboard and sensible key spacing. It can be easily operated with one hand—even when wearing gloves.

• ***A large graphical display*** ensures readability in all weather and accommodates real-time maps.

• ***A fingertip controlled multidirectional selection key*** makes it easy to move through the system.

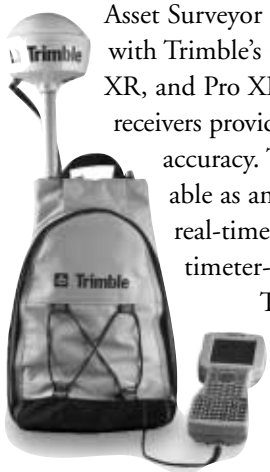
• ***An extended temperature range*** ensures rapid screen response and a crisp display even under the most extreme temperatures.

• ***Flexible data storage*** accommodates a wide range of jobs. Internal protected RAM can store a full day's worth of data. For bigger jobs, a PC card slot provides the option to store large quantities of data that can be easily transferred to the office PC.

GPS Pathfinder Office Software

Trimble GPS Pathfinder Office software is the vital link between field data collection and your GIS. It includes the tools you need to build and maintain your GIS or spatial database. Use it to prepare and plan your GIS data collection and maintenance project, to process data, and to export the data to the GIS.

GPS Pathfinder Receivers



Asset Surveyor software is designed for use with Trimble's GPS Pathfinder Power, Pro XR, and Pro XRS receivers. These powerful receivers provide unequaled flexibility and accuracy. The software is also available as an option for survey-grade, real-time kinematictic (RTK) centimeter-level data collection using Trimble's GPS Total Station® system receivers.

USING ASSET SURVEYOR SOFTWARE

Data Collection

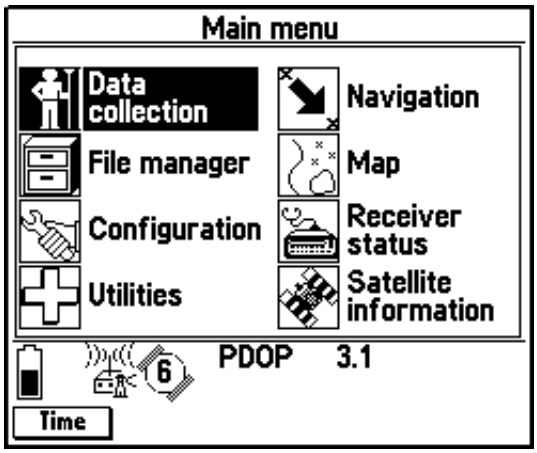
To collect new data, transfer a list of features and attributes you plan to collect in the field—called a data dictionary—from GPS Pathfinder Office software to the Asset Surveyor software. In the field, use this data dictionary and the TSC1 datalogger to collect and store GPS positions and attribute data. Back in the office, transfer the collected data to the GPS Pathfinder Office software for postprocessing and output to a wide range of GIS packages.

Maintaining GIS Data

To update existing position and attribute data, use GPS Pathfinder Office software to import data from your GIS and to create a file for use in the field. In the field, use the Asset Surveyor software to relocate each feature, and if necessary, to add a new GPS-derived position. Changes are automatically marked. In the office, seamlessly transfer the collected information to the GPS Pathfinder Office software for postprocessing and export back to your GIS.

Easy-to-Use Graphical Interface

Designed for use under challenging field conditions, the Asset Surveyor software program structure is extremely easy to learn and use, and the graphic display is uncluttered and easy to read.

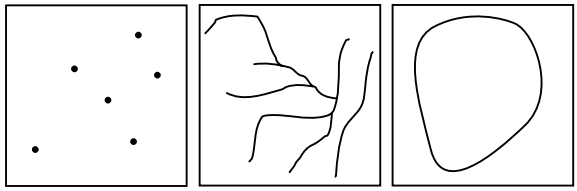


Data Dictionary

A data dictionary is a list of features and attributes that you plan to collect in the field. Data dictionaries speed data collection and ensure that data is consistent with your needs—even if it is being collected by more than one person. A data dictionary also ensures seamless transfer of data to and from the GIS.

Features and Attributes

In general, features are things that you want to identify, describe, and locate. Asset Surveyor software allows you to identify three types of features. The way GPS data is collected differs for each type of feature.



Points	Lines	Areas
• Road signs	• Streams	• Parks
• Power poles	• Roads	• Wetlands
• Accident sites	• Pipelines	• Forestlands

For **point features,** GPS positions are collected and averaged as you stand at the feature.

For **line features,** GPS positions are recorded periodically as you move along the feature. You can configure the system to record positions at certain time intervals, or to average a number of positions to get a more accurate node position. These positions are joined to form a line.

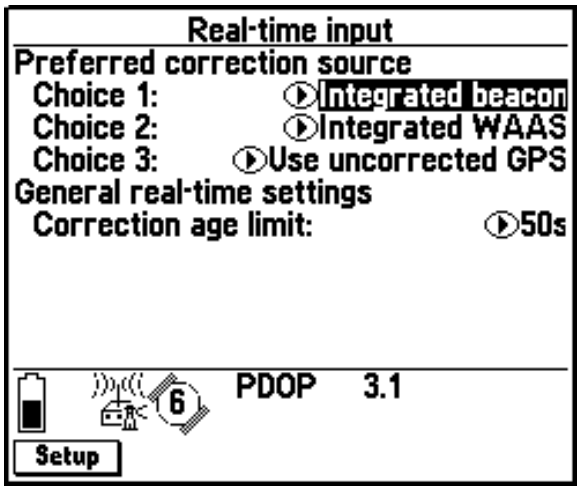
For **area features,** GPS positions are recorded periodically as you move around the edges of the site. These positions are connected to form the boundary of an area.

BEFORE YOU LEAVE THE OFFICE

To make the most of your time in the field, it's important to perform several tasks in the office.

• **Use GPS Pathfinder Office software:** For data collection, identify the features and assets you want to record and create a data dictionary to structure data collection. And for data maintenance, transfer existing files from your GIS for updating.

• **Use Asset Surveyor software:** To configure settings to ensure that data you collect is accurate and that you can work effectively in the field. Some settings affect the quality and usability of GPS positions logged by Asset Surveyor software. Others affect the way the data is displayed.



Differential GPS (DGPS)

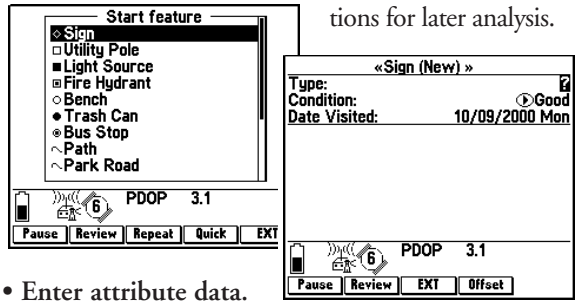
A GPS position is subject to a number of errors that interfere with accuracy. Differences in the timing devices in the satellite, orbit errors, the earth's atmosphere, and receiver noise are just a few of the things that can reduce accuracy. Luckily, these errors can be removed by a process called differential correction. This correction can be done in the field in real time. Real-time DGPS uses a telemetry link between the base station and the roving GPS receiver. It allows you to easily relocate features, verify data, and make decisions in the field. Data can also be corrected after the data is collected—this is called postprocessed DGPS. Postprocessing is easy and is often used to further improve the accuracy of real-time DGPS data.

IN THE FIELD

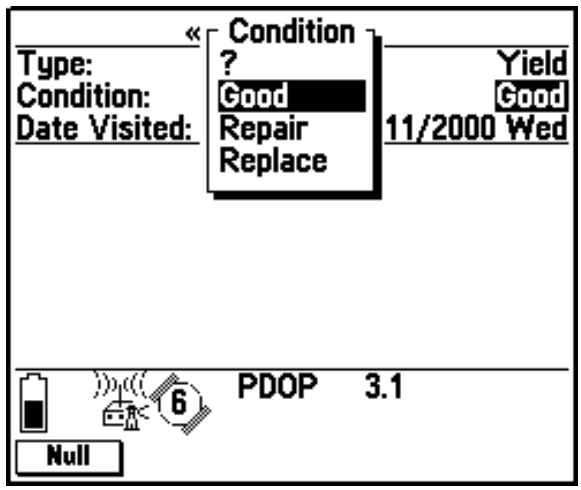
Collect New Data

• **Create a new data file and assign a data dictionary to it.** The software stores your collected data in a data file and the data dictionary prompts you for information about each feature.

• **Collect feature data.** The screen will display a list of features in the dictionary. Pick the feature you plan to collect from the list. GPS positions are automatically logged at the specified logging rate. Digital data from external sensors such as laser rangefinders, tree calipers, or flow meters can be stored with GPS positions for later analysis.



• **Enter attribute data.** After you select a feature, you will be prompted to enter the attributes you wish to record. Use the ergonomic keypad or custom-defined lists. (By predefining features and attributes you can save field time and ensure that multiple operators collect consistent information.)

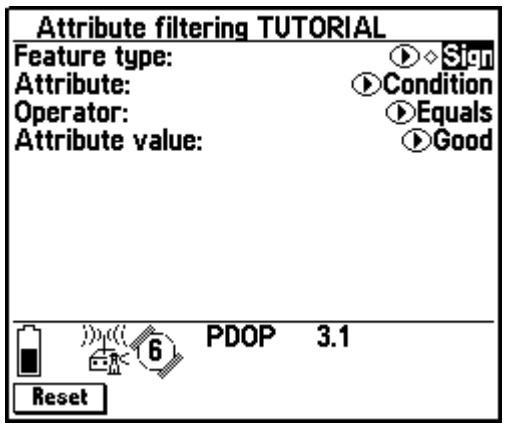


• **Check on system status.** A GPS status line lets you quickly control GPS parameters and vary GPS sensitivity and logging rate to ensure the best results for current conditions.

Update GIS Data

- **Export existing data files that you wish to update from the GIS to the Asset Surveyor software.** Use Asset Surveyor to ready these files for field use.

- **Sort data** chronologically, by feature type, or by distance from your current location to help you identify those features that need updating. You can also use the filter and search functions to find only a certain feature or features with a certain attribute, such as all park benches that need repainting, or one with a unique ID.

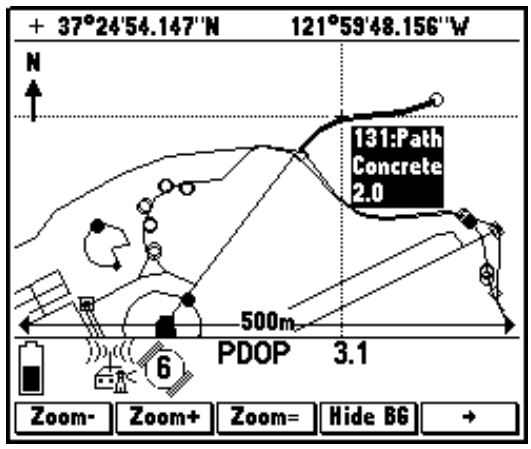


- **Use the map display to navigate** to a feature. The map display also allows you to show other useful information such as a street map to aid navigation and to provide confirmation that you are updating the correct feature.

- **Update information** by simply keying in the new information or selecting the correct value from the predefined list. The feature is automatically marked as updated. You can also collect information on new features, delete a feature, or record a new GPS position for a feature that lacks one or has an inaccurate one.

Display Maps

Asset Surveyor software allows you to display a map of the data file you are working on.



You can also display a background map and navigation information. A single keystroke lets you pan and zoom the map to meet your needs.

For easy use, the map can display several layers of information. These include features, between-feature GPS positions, background data and a GPS trail. For example, you are able to display a map that shows only those features that match a chosen criteria—say all park benches that need repainting. This simplifies the relocation of features for data verification and update.

Coordinate Systems

Coordinate systems are used to convert GPS data, which is collected on a curved grid, to a form in which it can be used on the planar grid typically used in a GIS. These systems differ by regions because the earth is not perfectly round.

Asset Surveyor software is predefined with over 40 national coordinate systems and hundreds of datum transformations. You can also create your own coordinate systems using the GPS Pathfinder Office software and transfer them to the datalogger.

ASSET SURVEYOR TIME-SAVING TOOLS

Make fieldwork easier and faster

Simultaneous tasking allows you to have a number of tasks operating at the same time. You can easily move between options without closing any open screens. The ***Next*** key allows you to move quickly back and forth between open screens. The ***Menu*** key takes you back to the main menu (and other operations) with a single touch. Not sure how to do something? Simply press the ***Help*** key.

Softkeys (F1 to F5) just below the screen provide fast access to important tasks. Key function varies, depending on where you are in the system. Current functions are displayed on the screen directly above the five keys.

When collecting similar data on a sequence of features (such as power poles) you can use the ***Repeat*** option to automatically repeat data. The ***Nest*** option lets you easily capture a point feature (such as a gate) located within an area or line feature (such as a road). For more accurate vertexes in line and area features (for example, the corners of a tree stand or field) use the averaging function to record and average a number of positions for the point. If GPS position requirements don't have to be exact, ***Quickmarking*** allows you to collect a large number of point features very quickly. The ***Pause/Resume*** option allows you to stop recording GPS data on a specific feature to go around an obstacle or to take a break.

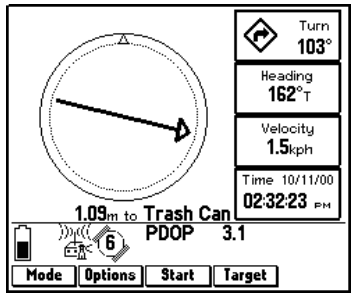
When a feature can't be easily or safely reached—such as a treetop or cliff—you can manually specify an ***Offset*** or use a laser rangefinder to automatically measure one.

To review and edit collected data, use the ***Review*** option. The ***Filter*** option allows you to quickly identify all of the features in a file that meet certain criteria. Use the ***Sort*** option to sort entries by time, feature, update, deletion, and distance. ***Search*** allows to you to quickly locate features by specifying an attribute value.

Navigate

Asset Surveyor software makes it possible to navigate to a target location, such as a previously mapped feature. The software offers two navigation options—dial and road.

The dial screen displays the current direction of travel and the bearing you should take to reach a chosen feature. Other information such as velocity and estimated time to target is displayed on the edge of the screen. When you get close to the target, the dial screen will automatically switch to a bulls-eye view that clearly shows you when you have reached the target. This allows you to navigate to features that are not visible—such as a buried survey stake.



BACK IN THE OFFICE

Transfer Data

Transfer data to the GPS Pathfinder Office software. You can download data directly from the TSC1 datalogger or via a PCMCIA data card.

Review, Edit, and Process Data

GPS Pathfinder Office software includes a Batch Processor that allows you to seamlessly automate all the repetitive tasks of downloading, differentially correcting, and exporting the data to your GIS or CAD system. In addition to standard differential correction, Asset Surveyor enables you to collect real-time GPS data in the field so you can easily navigate, and also collect raw GPS data for later processing in the office for higher accuracy. It is also possible to collect carrier phase information to achieve decimeter and even centimeter levels of accuracy.

CONCLUSION

Asset Surveyor software is the ideal tool for accurate and cost-effective data collection and update. Part of the powerful GPS Pathfinder system, this user-friendly software is loaded with time-saving tools and capabilities allowing you to handle big jobs. So whether you are collecting new data or updating existing data, with Trimble's Asset Surveyor software you are sure of always having accurate and up-to-date GIS data for your decision making.

To learn more about Trimble's GPS Asset Surveyor software, check out our worldwide web site at www.trimble.com/gis or call your local Trimble representative.

TSC1 TECHNICAL SPECIFICATIONS

Memory
2 MB available flash data storage
Memory extensions through user-accessible, industry standard ATA PC card

Communications
2 RS-232 serial ports, up to 38400 baud

Size
267 mm x 117 mm x 42 mm (10.5" x 4.6" x 1.65")

Weight
800 g (28 oz.) including rechargeable Lithium ion battery

Power (Internal)
Lithium Ion rechargeable battery (supplied) or standard 9-volt alkaline or lithium batteries

Power (External)
10 to 20 VDC supplied to either serial port connector, power consumption less than 1 W

Display
240 x 200 extended-temperature graphics STN LCD display with integrated backlight

Keyboard
54 keys with alphanumeric, function and softkey

Operating Temperature
–30° C to +65° C (–22° F to +149° F)

Storage Temperature
–30° C to +80° C (–22° F to +176° F)

Humidity
100%, fully sealed against sand, dust and moisture, buoyant, waterproof against accidental immersion

Shock
Withstands 1.5 m drop onto a hard surface

Certification
FCC class B and CE Mark approval

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