

CONNECTIVITY—IN THE

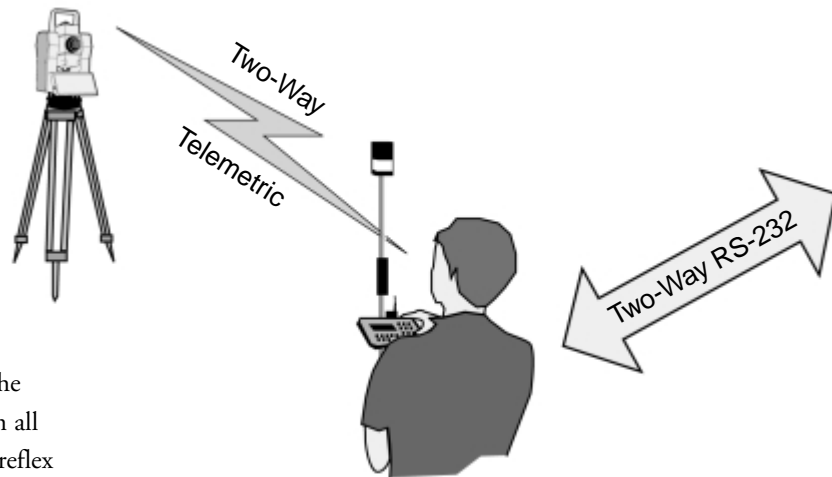
TRIMBLE INTEGRATED SURVEYING— WE SPEAK YOUR LANGUAGE!

Imagine what your productivity could be if you could carry a single tool in your shirt pocket that would:

- control your conventional and robotic survey total stations
- bring all the design data from the office to your total station(s) in the field
- make it easier and faster to do every part of a project in the field
- save all the job data in a single file and easily download it into a single office software package
- operate in your own language

You could be instantly more productive. Instantly more competitive. Instantly better at what you do.

That tool is available today as part of the Trimble Toolbox: the Geodimeter Control Unit. It speaks the language of the Trimble 3600 and 5600 Total Stations, in all modes of operation from manual, direct reflex (DR), through servo, Autolock, and robotic.



That's Trimble Integrated Surveying!

FIELD AND IN THE OFFICE

SEAMLESS DATA FLOW AND INTEGRATION IN THE OFFICE

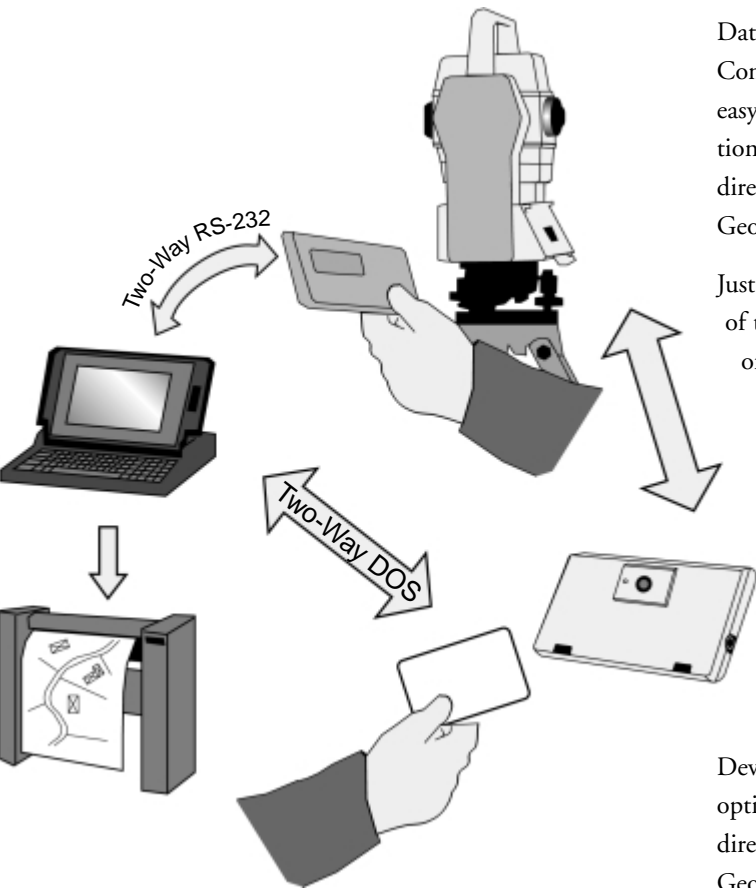
Integration of survey data has never been so easy. The advanced interoperability features of the Geodimeter Control Unit make working with survey data simple and efficient.

Data communications between the Geodimeter Control Unit and your office computer are fast and easy over a standard RS-232C two-way serial connection. Using simple commands, you can communicate directly with the Trimble instrument or the Geodimeter Control Unit.

Just bring the control unit back to the office at the end of the job and transfer all the data directly to your office computer. Trimble office software supports many native data formats of popular survey, design and GIS packages. An efficient two-way data flow also means that data can be imported easily from survey, design or GIS software to be uploaded to the Geodimeter Control Unit software prior to fieldwork.

You can directly transfer your field data to Trimble Terramodel® 3D land design and visualization software. In addition, for AutoCAD Land Development Desktop users with the Autodesk Survey option, the embedded Trimble Link™ module allows direct data transfer between their software and the Geodimeter Control Unit software.

You can use the control unit's memory in the same way as a diskette or hard disk. There are commands for generating file directories, transferring data between the memory unit and a computer, displaying available memory capacity, and erasing files in the control unit.



THE GEODIMETER CONTROL UNIT

The Geodimeter Control Unit is your interface to faster, better surveying. It provides the tools and the memory to make all your surveying jobs easier and more productive.

The Geodimeter Control Unit is everything you want your data collector to be:

Powerful. You can have memory enough for 1,000, 5,000, or 8,000 points. Critical information—angles, time, signal strength, battery status, alignment—is displayed in real-time. And outstanding search capability gives you automatic search, advanced lock-on, and reference control in robotic mode.

The memory is divided into two separate files: the Job file and the Area file. All field data is stored in the Job file (measurements, date, time, operator, ect.). The Area file contains your known points and coordinates. Each file is fully flexible with respect to number and size and automatically adapts to allow the amount of data you store. The only limitation is the total storage capacity available in the memory.

Ergonomic. The large, clear display (20 characters per row) is easy to read in any environment. The large keys are clearly labeled and are easy to operate even when you're wearing gloves. Servo keys provide fast action: switch circle; horizontal, vertical, and 3D positioning. Clear and simple menus let you switch quickly between functional programs that are tailored to top performance for any surveying task.

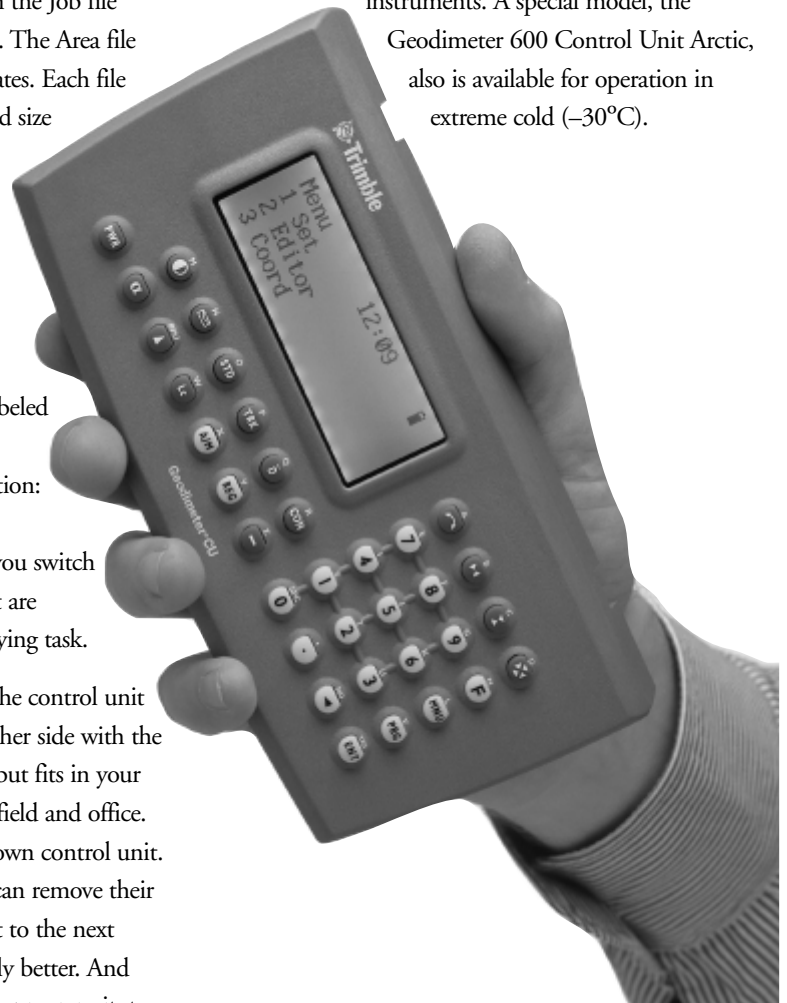
Removable and portable for flexibility. The control unit easily attaches to your total station (on either side with the addition of a second mounting bracket), but fits in your pocket for convenient transport between field and office. You can equip each survey team with its own control unit. When one team finishes surveying, they can remove their control unit and turn over the instrument to the next team. Instrument utilization is significantly better. And you don't need access to the instrument to program it, to check your data or transfer the data to and from a PC—you only need the control unit.

Rugged. The Geodimeter Control Unit is built especially for the tough surveying environment. It easily fits in your pocket and weighs just 270 grams (9.52 ounces), so it doesn't load you down during a long day.

Models

The Geodimeter Control Unit is available in two series. The units use the same software and function identically, but differ slightly in their physical configuration. Each series is available with numeric-only or alphanumeric displays.

- Geodimeter Control Unit for Trimble 5600 instruments.
- Geodimeter Control Unit for Trimble 3600 and 600 instruments. A special model, the Geodimeter 600 Control Unit Arctic, also is available for operation in extreme cold (-30°C).



CONTROL

Trimble Geodimeter Control Unit software makes establishing control for your survey easier than ever, with built-in features that eliminate guesswork and tedious repetitive measurements, lead you straight through the process, and ensure accuracy for your survey.

Establishing a Station

The StnEst program is the foundation for all field calculation programs in which you are required to orient yourself in current coordinate systems. It lets you jump between different field calculation programs without renewing your station establishment. You can establish a station either on a known point or as a free station.

Known Station—To establish your instrument on a known point, you need only give the point number of the station point and reference object. The instrument automatically calculates bearing and distance, and asks if you'll need to measure heights. A new capability—Known Station Plus—makes it possible to establish a known station by using up to ten reference objects.

Free Station—Free station establishment allows you maximum freedom in choosing a location. You can set up the instrument anywhere, providing you can see from two to ten known points. The more points the more reliable the result.

```
STD P20 12:28*
N :42613.147
E :54285.243
S_dev: 2.468
```

```
STD P20 12:28*
S_devX:613.147
S_devY:285.243
SF =1.00000
```

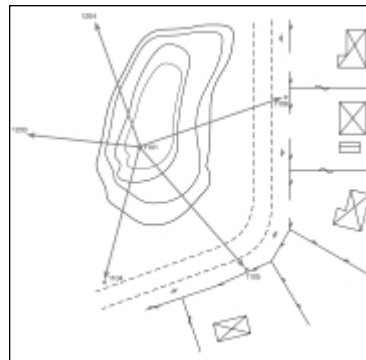


Control Angle Measurement Plus

With either a servo or a robotic total station, this program makes your job significantly faster and simpler by reducing time-consuming and physically tiring searching and aiming towards different objects. You just find the targets once and the program does the rest. It performs angle measurements using automatic repeating in face 1 and face 2, and automatically calculates the mean value of station data.

```
Point1 P32 12:28*
Diff Hr: 0.0011
Diff Vr: 0.0004
Diff Sd: 0.00
```

```
Point2 P32 12:28*
Diff Hr: 0.0010
Diff Vr: 0.0004
Diff Sd: 0.00
```

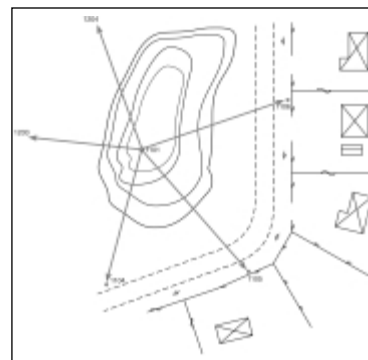


For robotic instruments (equipped with Autolock™ and using RMT reflectors on the points to be measured), the new **automatic angle measurement** feature lets your

instrument do all the work while you stand and watch. Just specify the required standard deviation and the sets of angles to be measured. Automatic angle measurement copes with up to 10 points with up to 20 angle sets at each point, as well as distance measurement in both face 1 and face 2.

Determining Elevations

Elevation can be determined quickly and easily by measuring against one or more known points whose heights are known. The instrument then automatically calculates either its absolute elevation or the ground point elevation



MEASUREMENT

In so many ways, the Geodimeter Control Unit software helps you get the results you need in the fastest possible way and enables you to tap all the benefits of robotic surveying.

Collecting Details

User Defined Sequences (UDS) save you work by adapting the measuring system to your own way of working—establishing a "measurement protocol" which matches your own measuring routines, instead of the other way around.

You can create your own labels in your own language, directly from the keyboard—anyone who can fill in an ordinary measurement protocol can create a UDS.

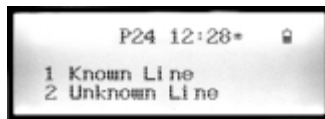
Measurement and registration can be done in less than 2 seconds per point. Pressing just one key stores point number, point code, signal height, horizontal angle, vertical angle and slope distance.

Identifying Objects

Use your own point code list, which you can easily enter in the control unit. When you enter a point code during surveying, its corresponding text is shown automatically on the display. The point code list holds up to 250 point codes of up to 16 numeric and alphanumeric characters.

Reference Lines

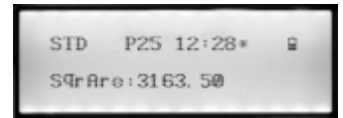
You can set out or measure any point along or parallel with a known or unknown reference line.



If you have two points with known coordinates, RefLine automatically uses the line between these points as the reference line. If the reference line is unknown, the operator can define the reference line by measuring two points. The program automatically creates a reference line between these points in a local coordinate system with its origin at the first measured point.

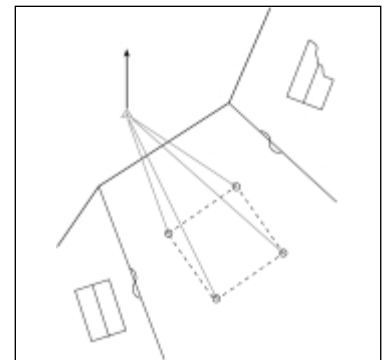
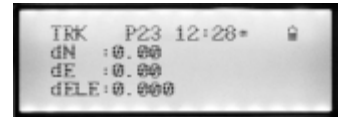
Area and Volume

Area/VolCalc is a program that calculates the surface and volume between points that have been measured. The surface to be calculated may either include all points in a Job file or consist of a number of selected points. The more points that are included, the more exact the result.



Automatic Check

To confirm that a point is staked out correctly, the point's number, code, ΔX , ΔY , and ΔZ are stored automatically; the original coordinates are compared with the result of the staking out operation. you get direct confirmation in the field that your steakout is correct.



Pcod-list

- 1 Tp
- 2 trig
- 3 BM
- 4 SpotH.
- 5 Track
- 6 fence
- 7 building
- 8 Contour
- 9 Tree
- 10 Road
- 11 road sign
- 12 El. post
- 13 Tel. post
- 14 Lamp post
- .
- .
- .
- 250

Pcode = 6

ENT

Pcode = Fence

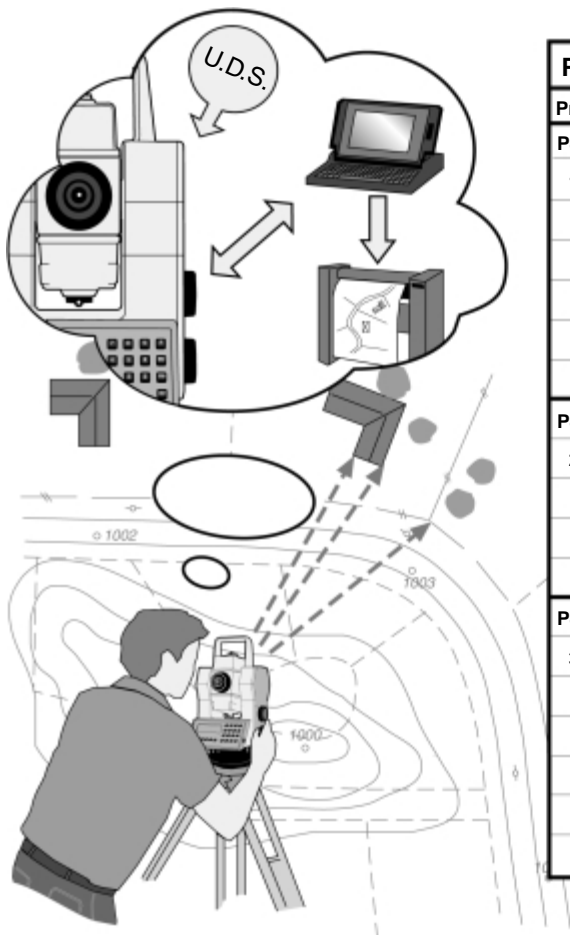
Distance between Two Points

The system provides rapid and easy calculation of distance, height difference, and slope (percent) between two points where sight between the points is blocked. It can be used to:

- Calculate distance, height difference and slope (percent) between two points
- Check boundaries
- Check distance between points that have been set out
- Check slopes of embankments, ditches, etc.
- Calculate bearing between the points

Measure to an Obstructed Point

You can easily determine the location of an obstructed point by measuring towards two prisms mounted on a range pole. This is very useful when measuring points that are obstructed by buildings or heavy shrubbery, or are located in manholes.



Surveying with the Geodimeter Control Unit

1. Start the survey by establishing a station (known station, unknown station, or free station).
2. Select a UDS (user-definable sequence) Program (1–19)
3. Survey the details needed.
4. Use the editor if stored data needs to be changed.
5. Download your data directly to Trimble office software or to the AutoCAD Land Develop Desktop, and produce the survey model drawing.

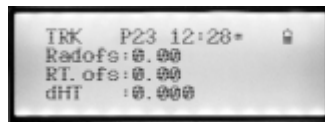
Program Generation Form				
Prg.	Prg.	Label	Type	Remarks
P40				
1	Date	51	0	
	Time	52	0	
	Operator	53	3	
	Temp	56	3	
	Press	74	3	
	End	79	6	End of prg.
P40	Stn	2	1	
2	IH	3	1	
	Ref. Obj.	62	1	
	HA Ref.	21	1	
	End	79	7	Link to next
P40	Pno	5	4	program
3	Pcode	4	3	
	SH	6	3	
	HA	7	0	
	VA	8	0	
	SD	9	0	
	End	79	5	Loop to Pno

STAKEOUT

Even a small saving in time per point makes a big difference when you're dealing with setting out large numbers of points. The Geodimeter Control Unit software saves you time at every step—and saves steps too.

Stakeout

The SetOut program provides two different methods for staking out and, if desired, an automatic check of the point staked out. Whichever method you choose, the program gives you automatic countdown to zero in three dimensions. When the display shows that bearing, distance and height equal zero, the rodman is at the point to be staked.



You store the point numbers and coordinates of the points to be set out. In the field, you need only enter the point number; the instrument automatically calculates the setting out data.

COGO

The COGO package makes it possible to make calculations in the field of typical surveying tasks including:

- Intersection between lines
- Offset intersection
- Offset intersection through points
- Right angle intersection
- Calculate points on a curve
- Curve intersection
- Perpendicular offset
- Compute the center of a circle
- Station and offset
- Bearing and distance

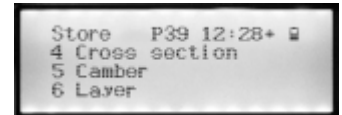
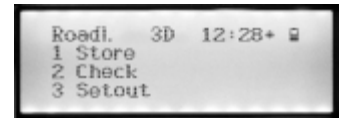
You can set out the results of your calculations directly or store them for later use in the Setting Out program.

Roadline 3D

RoadLine3D is an all-inclusive program that gives you completely new capabilities for setting out and measuring roadlines in three dimensions. The program takes full advantage of your robotic total station—you have full control of surveying and setting out at the prism, while the instrument works as an unmanned surveying robot.

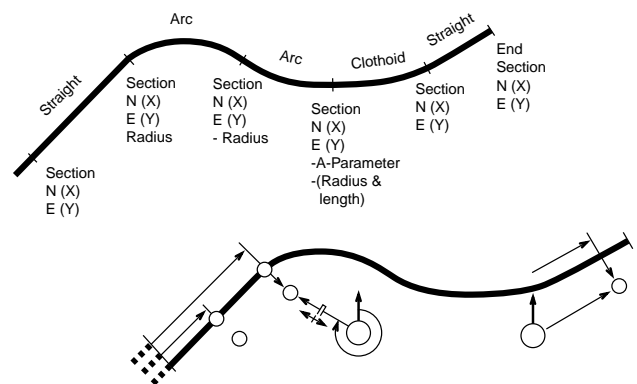
Simply enter the road geometry from your roadway plans or select your alignment from the Terramodel software—no calculations are needed in advance. The program can handle horizontal and vertical elements, cross-sections, tangents, curves and spirals. Just enter the station and

coordinates at the beginning and end of each element. For vertical alignment, enter elevations at the centerline along with the station and vertical curve data.



The cross-section (template) portion of Roadline 3D offers numerous built-in functions to address layers, slope staking, transitions and super elevations (camber). The program automatically checks whether the geometry is correct for the data stored for the horizontal and vertical alignments, and displays any errors.

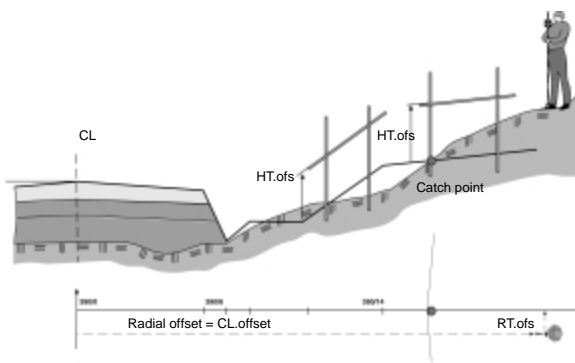
Only breakpoints need to be stored



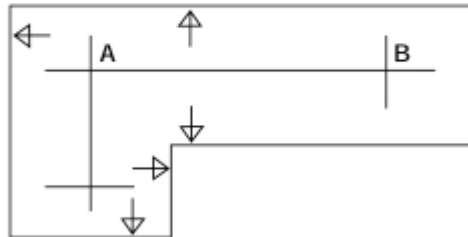
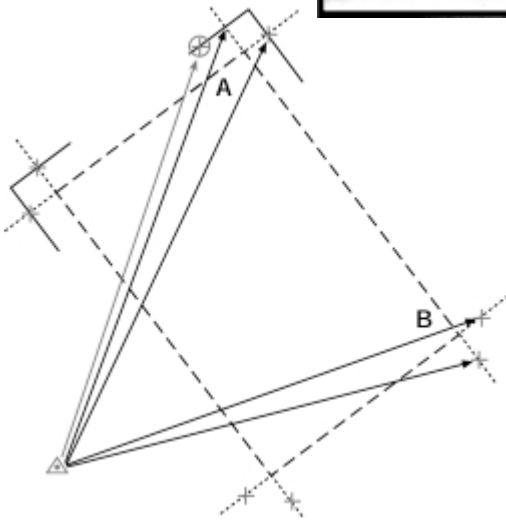
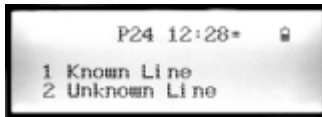
Stake out by keying in Station and offset

Choose your method. You can use either the conventional stakeout method or the radial/right angle method. Whichever you choose, you need only enter the station and center-line offset. The program calculates and provides stakeout data for the first point to be staked in less than two seconds! And it follows a rational pattern in determining the next points to speed movement between the points.

Slope staking. This feature makes it easy to set out the angle of a slope. You can also state a "vertical offset" in order to obtain a countdown to zero on your setting out point.



Using a reference line. Whether you are using a known reference line (between two points whose coordinates are known) or an unknown reference line (created by the program), any point along or parallel with the reference line can be set out by keying in either radial offset, radial angle offset, or the coordinates. The program calculates the bearing and distance to the point to be set out.



STAKING OUT WITH THE GEODIMETER CONTROL UNIT

1. Upload design data from the Terramodel or other Trimble office software.
2. Establish instrument position and orientation using Program 20, Station Establishment.
3. Select any of the stakeout programs.
4. Select a point to stake out.
5. Just walk, and follow the instructions, radial and right-angle offset, until both values are 0 related to the current line of sight between the target and instrument.
6. When on target, press Measure to record the as-staked position.
7. Before moving, select the next point to be staked. The information displayed (offset and Rt offset) will inform you how to get to the next point.

For example, Radial Offset = -45ft., Rt Offset = -30ft.: simply walk 45 feet towards the instrument and then 30 feet to the left and you will be close. Fine-adjust until the values are 0. Stake the point and repeat. Use Tracklight™ to help keeping on line.

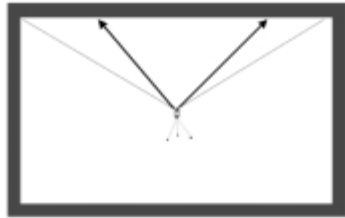
8. When finished, transfer the as-built data to Terramodel or Trimble Geomatics Office™ software for a quality check.

EXTRA CAPABILITIES

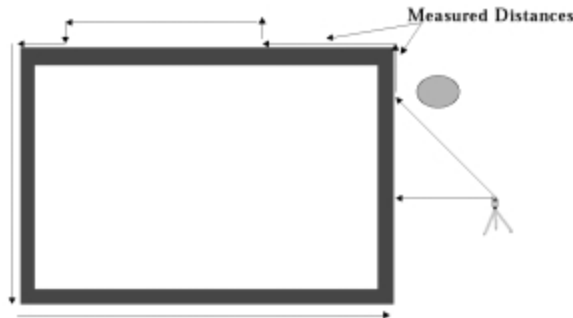
Direct Reflex (DR) Support Tools

Used with your Trimble 3600 DR or 5600DR 200+ Total Station, the Geodimeter Control Unit software helps you to make the following difficult measurements quickly and easily:

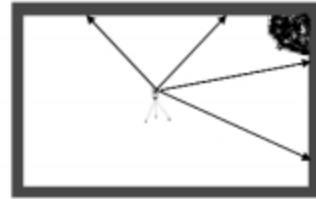
Corner—measure inner and outer corners on a structure by taking two measurements to the wall and then aiming to the corner.



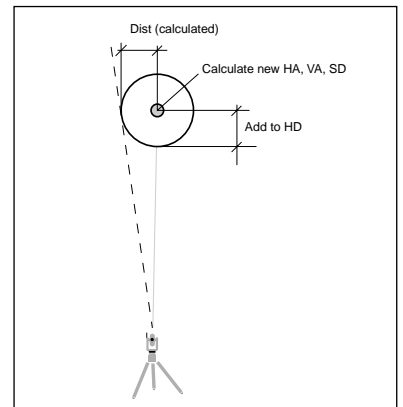
Distance—avoid frequent instrument moves when an object is partially obstructed by taking two measurements toward the wall of the object and add a tape-measured distance to the corner; data is automatically calculated to the corner.



Intersection—if an inner corner is hidden, simply take two measurements towards each wall; raw data and/or coordinates are calculated to the "hidden" point.



Eccentric object—normally you want the center point when you measure a lamp post, trees, etc. The Eccentric Object program automatically calculates the center of the object being measured and displays its diameter. This means that all important information can be determined from behind the instrument—there is no need to "visit" the object to get the information.



Surface—the Surface program automatically scans a rock face or a façade. You only need to define the surface by measuring towards three points and keying in the grid. Information about the number of points to be measured and an estimated time to complete the measurement is displayed. The user has a choice between automatic or manual measurement. Typical automatic applications are rock faces or stockpiles of material (such as gravel). The manual option can be used if details of a façade are to be measured.

CONCLUSION—THE GEODIMETER CONTROL UNIT

Today's land surveyors and engineers demand productivity, flexibility and quality in their surveying tools. The Geodimeter Control Unit delivers all this and more with Trimble/Geodimeter conventional and robotic total stations.

- Seamless data flow between a variety of instruments in a single file with easy export/import to office software systems,
- Powerful features that make every job faster, easier, and better,
- Simple operating methods that you can tailor to the way you like to work.
- Easy portability between the office and the field instruments and back again.

The Geodimeter Control Unit is a powerful addition to the Trimble Toolbox of Integrated Surveying™ devices.

For more information, contact your nearest Trimble Distributor or Trimble Office shown on the rear cover.

Visitors are always welcome to the Trimble web site at <http://www.trimble.com>

GEODIMETER CONTROL UNIT TECHNICAL CHARACTERISTICS

Size:	170 mm x 90 mm x 2.20 mm (6.69" x 3.54" x 0.79")
Weight:	(Numeric): 170g (9.52 oz.) (Alphanumeric): 290g (10.23 oz.)
Power	
Internal:	12V (supplied by instrument)
External:	110–230V (power supply) or external battery
Power	
consumption:	80 mA
Memory:	1000-, 5000-, or 8000-point capacities
Communications:	RS-232 two-way communications
Display:	4-row LCD; 20 characters with illumination
Keyboard:	(Numeric): 22 keys. (Alphanumeric): 33 keys
Temperature:	
Operating:	–20°C to +50°C (–5°F to +122°F)
Storage:	–40°C to +70°C (–40°F to +158°F)
Humidity:	100%
Water	
resistance:	IPX3
Shock:	1.5 meters on hard surface
Certification:	CE mark approval
Languages:	English, German, French, Spanish, Italian, Swedish, Finnish, Norwegian, Danish, Turkish, Russian, Japanese (sim- plified)

Note: all data applies to both numeric and alphanumeric models unless separately indicated.



Trimble Navigation Limited
Engineering and Construction
5475 Kellenburger Road
Dayton, Ohio 45424-1099
(800) 538-7800
(937) 233-8921
(937) 233-9441 Fax
www.trimble.com

Trimble GmbH
Am Prime Parc 11
D - 65479 Raunheim
Germany
+49 6142 2100-0
+49 6142 2100 220 Fax

Trimble Navigation
Singapore PTE Limited
80 Marine Parade Road
#22-06, Parkway Parade
Singapore 449269
+65 348 2212
+65 348 2232 Fax



YOUR LOCAL TRIMBLE OFFICE OR REPRESENTATIVE