Nikon

TOTAL STATION

DTM-501 SERIES

DTM-551/531/521

Nothing outperforms Nikon's DTM-501 Series — featuring the world's fastest measurement time.

With the release of the new DTM-501 Series, Nikon has positively improved upon its highly regarded predecessor, the DTM-500 Series. Realizing a faster EDM and incorporating new software tools, these total stations deliver unbeatable accuracy, speed and ease of use in a quality Nikon instrument designed for the harshest of field environments.

Dawn till dusk with one battery

Main features

- Faster initial distance measurement of only 1 sec., with 0.5-sec. updates in TRK mode and 1.0-sec. updates in MSR mode
- Higher distance accuracy of ±(2 + 2ppm x D)mm in MSR mode and ±(4 + 2ppm x D)mm in TRK mode
- Higher distance resolution of 0.1mm in MSR mode (1mm in TRK mode)
- Nitride-finished steel horizontal-axis with a zero-clearance ball bearing design for high angle stability and DIN 1" accuracy with 0.5" reading (DTM-551)
- Lighter weight of 5.5kg/12.1 lbs., including battery
- Longer battery life of 10.5 hrs. continuous distance/angle measurement, or 24 hrs. with one distance measurement every 30 sec.
- Ergonomic keyboard design with direct numeric input and unique function keys suited to field use
- Convenient alphanumeric code input methods
- Compact and handy display of necessary information
- 100% software resume function
- IPX4 all-weather construction
- Lumi-Guide with Right/Left and In/Out distance information
- Compact, high-quality telescope incorporating a newly developed powerful and stable EDM
- Powerful and practical on-board programs

Long battery life

A single BC-80 clip-on battery provides approximately 10.5 hrs. of continuous distance/angle measurement, or 24 hrs. of one measurement every 30 sec., which means an entire day's work can be performed without having to change the battery. The lower power consumption pattern of the DTM-501 Series also minimizes memory effect on the battery.

Newly designed compact, stable telescope

Nikon's unique optical system has been further improved for even clearer sighting in all conditions, for example oblique or low-light situations. The new telescope employs a unique linear focusing mechanism that improves focusing at both short and long distances. The focusing knob has also been newly designed to improve ergonomics and operational feeling.

New LLV (Low Light Visible) green color

To increase on-site safety and identification of the instrument, the new LLV green color was chosen for the DTM-501 Series.

Accurate and stable angle measurement

The DTM-501 Series uses a nitride-finished steel horizontal-axis with a zero-clearance ball bearing, introduced in Nikon's top-of-the-line Field Station DTM-800 Series, so accuracy of angle measurements is improved and stability under all field conditions is maintained.

Faster, more accurate distance measurement

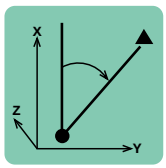
Digitization and clever integration of electronic parts in the DTM-501 Series have resulted in a compact and lightweight EDM that boasts an initial distance measurement speed of just 1.0 sec. Accuracy of ±(2 + 2ppm x D)mm in MSR mode and ±(4 + 2ppm x D)mm in TRK mode is assured, and distance can be displayed in either 0.1mm or 1mm resolution. New multiple-reflection-correction software means that measurements taken using reflector sheets are as fast and accurate as those taken with glass prisms.

Large LCD and ergonomic keyboard

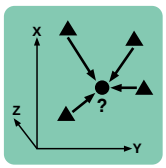
The keyboard arrangement is ergonomically and logically designed for easy operation and efficiency in field situations. The keyboard materials have been strictly reviewed and selected for heavy use in harsh environments. The DTM-501's full-cursor keys, menu key, mode key, and HOT key provide easy access to job managing operations, frequently adjusted settings, view/edit of data and a variety of timesaving feature code input methods such as Quick Codes and a stack of previously input codes. The full numeric keyboard is essential for convenient input of angle and target.

Compact and lightweight, with IPX4 all-weather construction

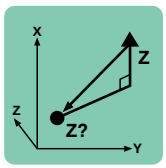
New advanced technologies include a lightweight EDM and a lightweight long-life battery. The DTM-501 weighs only 5.5kg/12.1 lbs. with its battery and is water-resistant to IPX4 standards, which state: "Water splashed against the enclosure from any direction must produce no harmful effects."



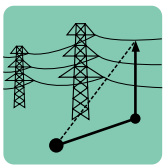
Known station



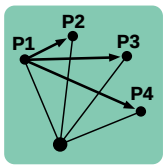
Resection



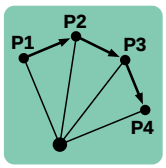
Remote benchmark



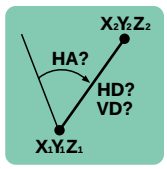
REM



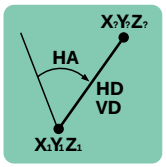
RDM-radial



RDM-continuous



Cogo-HD+HA



Cogo-Pt-Pt

DTM-501 menu tree

Basic measurement screen
- MSR
- DSP
- TRK
- ANG
- HOT
- RDM
- REM
- STN
- S-O
- LG (Lumi-Guide)

Menu key
1. Job manager
2. Cogo
3. Settings
4. Data view/edit
5. Communications
6. Time & date
7. Calibration
8. Note

Cogo menu
1. Point to point inverse
2. Area and perimeter
3. HA+HD
4. Input

ANG
1. 0-set
2. Manual input
3. Hold
4. Repeat angle measurement

RDM (remote distance measurement)
1. Radial
2. Continuous

REM (remote elevation measurement)

Station setup
1. Known station setup
2. Resection
3. Quick station setup
4. Remote benchmark
5. Backsight check

Stakeout
1. Angle & distance
2. Coordinate
3. 2-point reference line
4. 2-point reference plane
5. 3-point reference plane
6. Arc reference line

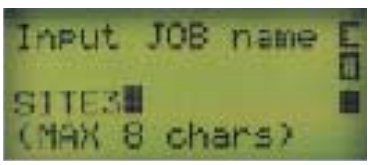
HOT key
1. Height of target
2. Temperature & pressure
3. Measurement mode setting
4. Leveling check
5. Quick Code edit
6. Quick Code mode setting

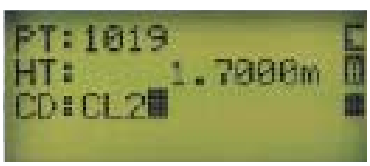
Measurement home base

Essential operations such as STN setup, MSR/TRK measurement, DSP change, and S-O can be quickly and easily selected thanks to clear function names printed directly on the keys.

Easier to record data

Recorded data can be stored for up to eight separate jobs. Data in a job file can easily be checked, edited, deleted,





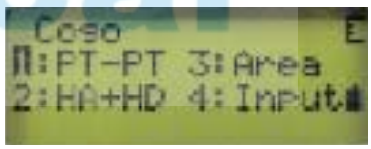
input and searched directly on the instrument. Also, survey control point coordinates can be stored in a job file that is accessible from other jobs. Up to 8,000 points can be stored in memory.

Easy input of feature codes

Various code input methods have been implemented on the DTM-501, greatly improving convenience and efficiency when recording many points in the field. In addition to direct code input and a stack of previously used codes, Quick Codes can be set up for 10 'one touch' keys, and a user-defined code list can be created. Quick Codes work by assigning frequently used codes to numeric keys 0 through 9. Once the desired codes are set, simply aim at the target and press one of the preset keys to measure and record a point with full coding.

On-board COGO calculation

The DTM-501 Series provides on-board coordinate geometric calculations, including area and perimeter.



F1/F2 averaged measurement

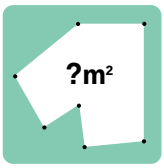
F1/F2 measurements can be taken to improve accuracy, with both the raw measurements and the averaged record stored for later reference.

Multiple resection

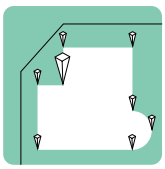
Instrument XYZ position and orientation is calculated by the Least Squares method after measuring to a minimum of 2 and a maximum of 10 known points. Measurements can consist of any combination of F1/F2 averaged shots, angle only shots, or full distance shots. Any measured point can be selected as the backsight.

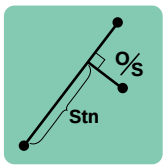
Fast, on-site setting change capability

Some settings are changed frequently in the field. With the unique HOT key and the MSR/TRK key, settings can be quickly changed without interrupting work flow.

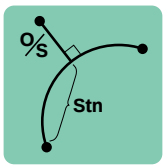


Area calculation


Stakeout

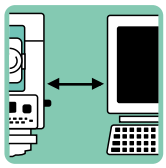


2-point reference line



ARC reference line

Job manager


Data communication

Quick Code

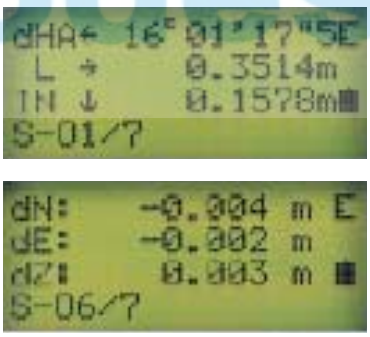
F1/F2 measurement

Switching/configurable displays

By simply pressing the DSP key, the measured data displayed is scrolled through various standard sets that suit different field requirements. Because the display can be switched before, during and after a measurement, it is not necessary to select your desired display before measuring. Some measurement and stakeout screens are user-configurable to suit operator preferences.

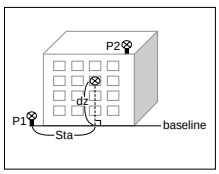
Stakeout

Stakeout can be performed by specifying point name, point code, radius from the instrument, or by manually keying in either coordinate or distance and angle information.

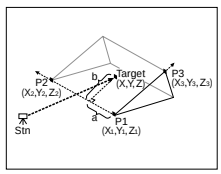


Powerful measurement functions

- 2-point reference line
- 2-point vertical reference plane
- 3-point sloped reference plane
- Arc reference line



2-point vertical reference plane

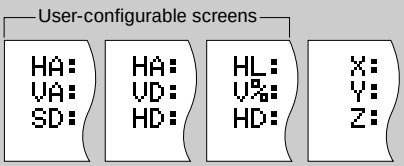


3-point sloped reference plane

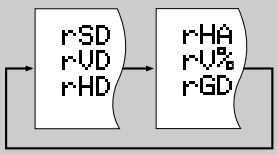
These versatile applications allow direct measurement to remote lines and surfaces such as roads, fences, building walls and industrial surfaces and can be used for data collection or stakeout. The points that define lines and surfaces can be predefined or measured in the field, and the measured results can be stored as both raw data and notes showing the line and offset information.

Clear status indication

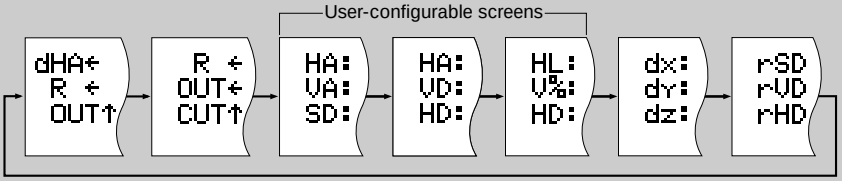
The vertical status bar clearly displays the EDM return signal level, cursor input mode and remaining battery level.



In basic measurement screen



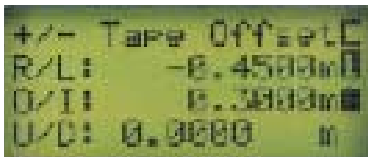
In RDM (remote distance measurement) screen



In stakeout screen

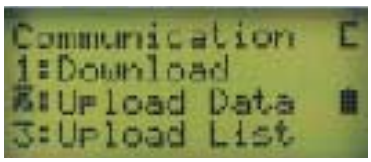
Offset measurement

Taped offset measurement is available on board, as well as dynamic horizontal angle offset.



Downloading and uploading of data

Data can be downloaded and uploaded to a PC with readily available standard communications software. The user's



personal code list can also be uploaded. Flexible formats are supported for both uploading and downloading, thus communication with third party PC software can be performed with fewer steps. Of course, Nikon's own TransIt™ transfer and conversion software is also available.

User-definable upload

Operators can define coordinate data "order of upload" to match the source data.

Feet/inches input and display

Numeric input and display in feet and inches are available for greater user flexibility.

Optional TransIt™ Data Transfer and Conversion Software

TransIt™ is a Microsoft Windows® based software application that is used with Nikon Field Stations, Total Stations and other third party PC software. TransIt™ supports download/upload between PCs and Nikon Field Stations and Total Stations, view/edit of data, coordinate recalculations and complete support for all units and corrections.

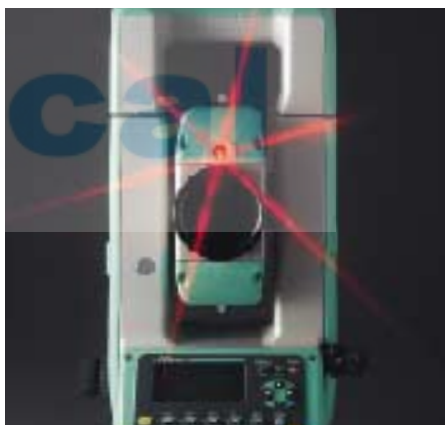
Supported Nikon Field Stations, Total Stations and Data Recorder:
DTM-800 Series, DTM-700 Series, DTM-500 Series, DTM-400 Series, DTM-310, DTM-300 Series and Data Recorder DR-48

Supported import file formats:
DTM-800 Series, DTM-700 Series, AP-800/700 Database, Nikon Raw, ASCII coordinate (comma/space delimited; 2D & 3D), DTM-500 Series, DTM-400 Series, DTM-310, DTM-300 Series and DR-48

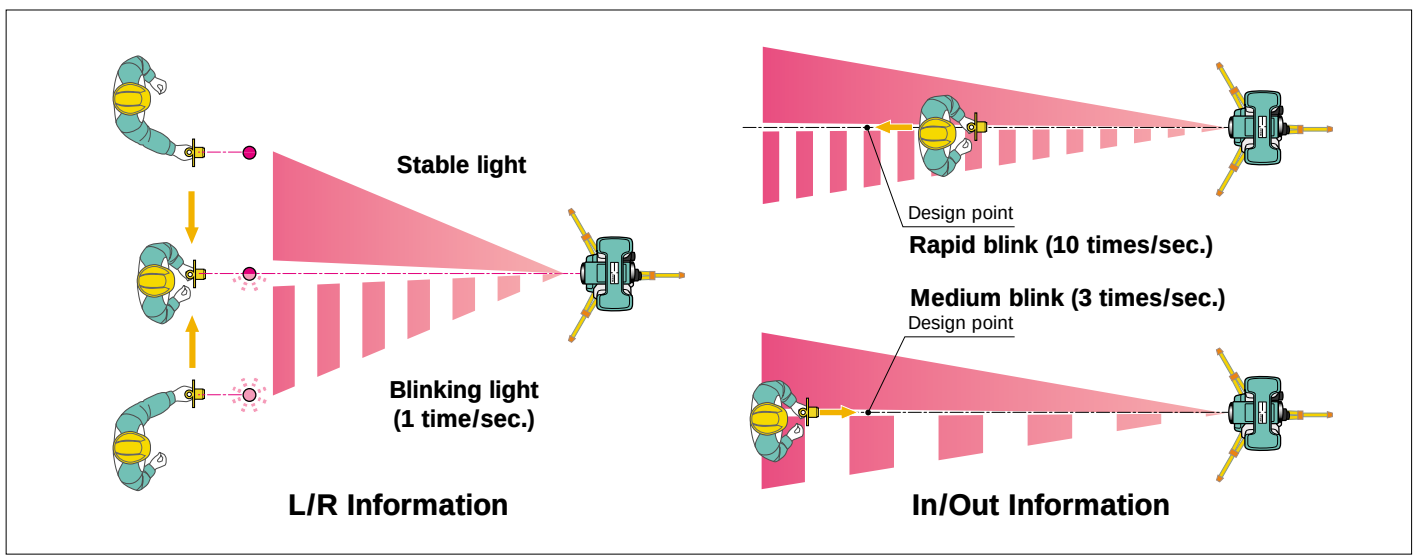
Supported export file format:
DTM-800 Series, DTM-700 Series, AP-800/700 Database, Nikon Raw, ASCII coordinate (comma/space delimited; 2D & 3D), DXF and SDR-2x

Lumi-Guide

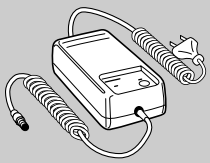
All DTM-501 Series models feature Nikon's unique Lumi-Guide red tracking light above the telescope objective lens. The Lumi-Guide emits two visible beams of coherent red light, one steady and one blinking, enabling the rodman to locate the correct line quickly and easily by finding the position where both are visible.
Further, during stakeout the blinking rate changes to indicate if the rodman needs to 'come' or 'go' to reach the design position. In addition to indicating the stakeout direction, the Lumi-Guide can be used as a convenient signal to the rodman, assists in one-man clearing of lines and works as a prism illuminator in night surveying.



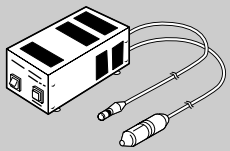
Increase setting out efficiency with Lumi-Guide



System diagram



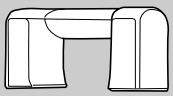
115V, 220/240V Quick Charger,
Q-75U (115V), Q-75E (220/240V)



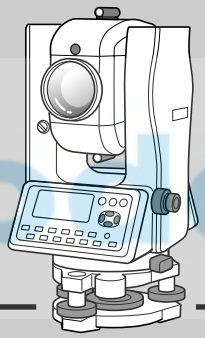
Quick Charger Q-70C (12V-DC, cigarette lighter charger. Fully discharged BC-80 battery requires more than one charge)

Tubular Compass Adapter T

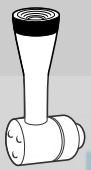
Tubular Compass



Clip-On Ni-MH Battery BC-80



DTM-501 Series



Diagonal Eyepiece

Low-Power Eyepiece (21x)

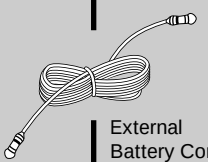
High-Power Eyepiece (41x)

Zenith Prism

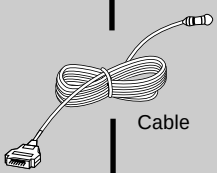
Solar Prism

Solar Filter

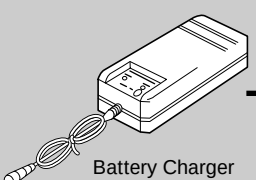
Solar Reticle



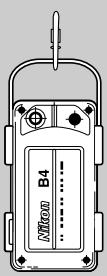
External Battery Cord Type B4-1



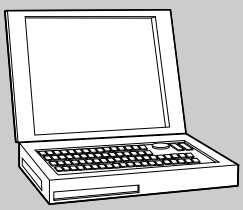
Cable



Battery Charger Type Q-B4U/B4E (with Power Cord)



External Ni-Cd Battery Type B4E



PC*

** not Nikon product*

Specifications

		DTM-551	DTM-531	DTM-521
Telescope	Tube length	158mm/6.22 in.		
	Image	Erect		
	Effective diameter of objective	45mm/1.77 in. (EDM: 50mm/1.97 in.)		
	Magnification	33x (21x/41x with optional eyepieces)		
	Field of view	1°20' (2.3m at 100m/2.3 ft. at 100 ft.)		
	Resolving power	2.5"		
	Minimum focusing distance	1.3m/4.26 ft.		
	Reticle illumination	Provided (3 steps)		
Distance measurement	Under good conditions	(no haze with visibility over 40km/25 miles)		
	With reflector sheet	5 to 100m/16.4 to 328.1 ft.		
	With mini prism	1,100m/3,600 ft.		
	With single prism	2,700m/8,900 ft.		
	With triple prisms	3,600m/11,800 ft.		
	With nine prisms	4,400m/14,400 ft.		
	Under normal conditions	(ordinary haze with visibility about 20km/12.5 miles)		
	With reflector sheet	5 to 100m/16.4 to 328.1 ft.		
	With mini prism	950m/3,100 ft.		
	With single prism	2,400m/7,900 ft.		
	With triple prisms	3,100m/10,200 ft.		
	With nine prisms	3,700m/12,100 ft.		
Readout display		9999.9999m/29999.999 ft.		
Accuracy	MSR mode	±(2 + 2ppm x D)mm		
	TRK mode	±(4 + 2ppm x D)mm		
Least count	MSR mode	0.1mm/1mm, 0.001 ft./0.002 ft. selectable		
	TRK mode	1mm/10mm, 0.002 ft./0.02 ft. selectable		
Measuring intervals	MSR mode	1.0 sec. (initial 1.0 sec.)		
	TRK mode	0.5 sec. (initial 1.0 sec.)		
Ambient temperature range		–20°C to 50°C/–4°F to 122°F		
Atmospheric correction	Temperature range	–40°C to 60°C/–40°F to 140°F		
	Barometric pressure	400 to 999mhg/533 to 1332hpa/15.8 to 39.3 in.hg		
	Prism offset correction	–999 to 999		
Angle measurement	Reading system	Photoelectric detection by incremental encoder (diametrical detection for H/V circles)		
	Circular diameter	79mm		
	Minimum increment			
	(Degree)	0.5"/1"	1"/5"	
	(Gon)	0.1mgon/0.2mgon	0.2mgon/1mgon*	
	(MIL6400)	0.002mil/0.005mil	0.005mil/0.02mil	
	Accuracy (horizontal and vertical)	1"/0.3mgon	2"/0.5mgon	3"/1mgon
		(Standard deviation on DIN18723)		
Dual-axis compensator	Method	Liquid-electric detection		
	Compensation range	±3'		
	Setting accuracy	±1"		
Lumi-Guide	Working range	100m/330 ft.		
	Positioning accuracy	Within approx. 6cm/2.4 in. at 100m/330 ft.		
Level vials	Sensitivity of plate level vial	20"/2mm	30"/2mm	
	Sensitivity of circular level vial	10'/2mm		
Optical plummet	Image	Erect		
	Magnification	3x		
	Field of view	5°		
	Focusing range	0.5m/1.6 ft. to ∞		
Display	Type	Dot-matrix LCD (16 characters x 4 lines) on both sides		
Point memory	Raw/coordinates	8,000 points		
Dimensions (W x D x H) (approx.)		166 x 156 x 365mm/6.5 x 6.1 x 14.4 in.		
Weight (approx.)	Main unit (without battery)	4.9kg/10.8 lbs.		
	BC-80 clip-on battery	0.6kg/1.3 lbs.		
	Plastic carrying case	4.0kg/8.8 lbs.		
Clip-on Ni-MH battery BC-80	Output voltage	7.2V DC		
	Operating time	Approx. 10.5 hours (continuous distance/angle measurement)		
		Approx. 24 hours (distance/angle measurement every 30 seconds)		
		Approx. 30 hours (angle measurement)		
Quick charger Q-75U/E (Q-75U for 115V, Q-75E for 220/240V)				
	Recharging time	Approx. 2.0 hours for full recharge		
	Discharging time	Approx. 7.5 hours		
Quick charger Q-70C (12V-DC, cigarette lighter charger)				
	Recharging time	Approx. 2.0 hours (fully discharged BC-80 requires more than one charge)		

*0.1mgon/0.2mgon available as a manufacturer's option

The export of these products (DTM-501 series and battery chargers Q-75U/E) is controlled by Japanese Foreign Exchange and Foreign Trade Law and International export control regime. They shall not be exported without authorization from the appropriate governmental authorities. Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. March 2001

ISO 9001 Certified

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