

2006 Total Station Survey

MANUFACTURER/DISTRIBUTOR	FOIF	FOIF	FOIF	FOIF	FOIF	Laser Technology Inc.	Laser Technology Inc.
MODEL/family/series	RTS238/538	OTS632/635	RTS632/635	OTS702/703/705	RTS702/703/705	MapStar CM LPS	MapStar AE LPS
Variants possible for base model (See 'Other Variations' section below)	[1]	[1]	[1]	OTS712/715	RTS712/713/715		
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained	Self contained	Self contained	Self contained	Self contained	Modular [1]	Modular [6]
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Infrared (phase shift)	Reflectorless (phase shift)	Infrared (phase shift)	Reflectorless (phase shift)	Infrared (phase shift)	Pulse laser	Pulse laser
Range (normal conditions), in hundreds of meters: single/triple prism	18/25	[2]	18/25	[2]	18/25	6/6	6/6
EDM Accuracy , Standard Deviation	3mm+2ppm	3mm+3ppm	3mm+2ppm	3mm+3ppm	2mm+2ppm	50mm + 50ppm	50mm + 50ppm
Displayed Resolution , mm-(single/tracking)	1/10	1/10	1/10	1/10	1/10	10	10
Measuring Time , sec.: single reading/tracking	3/1	1.2/0.5	3/1	1.2/0.5	1.7/0.7	0.5/0.5	0.5/0.5
Displays Stake-Out Information	Yes	Yes	Yes	Yes	Yes	No	No
Other Distance Measuring Features:	Coaxial	[11]	Coaxial	[11]	Coaxial	[2]	[2]
Theodolite Component							
Telescope (type & magnification)	Erect 30X	Erect 30X	Erect 30X	Erect 30X	Erect 30X	1-4X zoom	1-4X zoom
Field of View, degrees & minutes	1 deg. 20 min.	1 deg. 20 min.	1 deg. 20 min.	1 deg. 20 min.	1 deg. 20 min.	7-30	7-30
Minimum Focusing Distance, meters	1.8 m	1.7 m	1.8 m	1.7 m	1.2 m	0.1	0.1
Tilt Range (360 deg if fully transitable)/w. elbow	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	180	180
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	[3]	[3]	[3]	[3]	[3]	1080	360
Smallest Unit Displayed	1s	1s	1s	0.5s	0.5s	36	36
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dual-Axis Compensation	Single-axis	Single-axis	Single-axis	Yes	Yes	Yes	No
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	Yes	Yes	N/A	No
Stores Trunnion Axis Correction	No	N/A	N/A	N/A	N/A	N/A	No
Reads Left or Right	Yes	Yes	Yes	Yes	Yes	N/A	Yes
Selectable Display Resolution- Range of Values	[4]	[4]	[4]	[4]	[4]	No	No
Plate Vial Sensitivity per 2mm	30 mm	30 mm	30 mm	30 mm	30 mm		
Other Features	[5]	[5]	[5]		Absolute reading	[3][4]	[3]
ADVANCED FEATURES							
Target Tracking (active/passive)	N/A	N/A	N/A	N/A	N/A		
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	N/A	N/A	N/A	N/A		
Distance at which robotic total station can be controlled from rod	N/A	N/A	N/A	N/A	N/A		
Number of speeds on servo-driven	N/A	N/A	N/A	N/A	N/A		
Range to 90% Kodak grey card	N/A	60m	N/A	60 m	N/A		
Range to 18% Kodak grey card	N/A	N/A	N/A	N/A	N/A		
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Both	Both	Both	Both	Both	Menu	Menu
Alphanumeric Keyboard	N/A	Yes	Yes	Yes	Yes	No	No
Separate Numeric Key Pad	N/A	N/A	N/A	N/A	N/A	No	No
Electronic Leveling	Yes	Yes	Yes	Yes	Yes	No	No
Out-of-Level Warning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Optical Plummet in Alidade, Magnification	Yes, 3X	Yes, 3X	Yes, 3X	Yes, 3X	Yes, 3X	No	No
Circular Vial Sensitivity per 2mm	8'	8'	8'	8'	8'		
Detachable Tribrach	Yes	Yes	Yes	Yes	Yes	Optional	Optional
Leveling Base Plummet, Type	[10]	[10]	[10]	[10]	[10]	Optical	Optical
Data Collector:							
On-Board, External, Both	Onboard	Onboard	Onboard	Onboard	Onboard	External	External
Point Capacity (X, Y, Z, Pt No., Code)	8000	8000	8000	[8]	[8]	10,000	10,000
Programmable	N/A	N/A	N/A	N/A	N/A	Yes	Yes
Price, if optional	N/A	N/A	N/A	N/A	N/A	Varies	Varies
On-Board Intelligence							
Height Transfer	Yes	Yes	Yes	Yes	Yes	No	No
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	Yes	Yes	Yes	Yes	Yes	No	No
Setting Out - 2D / 3D	Yes	Yes	Yes	Yes	Yes	No	No
Reference Lines	Yes	Yes	Yes	Yes	Yes	No	No
Automatic Highway Layout - 2D / 3D	Yes	Yes	Yes	Yes	Yes	No	No
Remote Object Height	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	Yes	Yes	Yes	Yes	Yes	No	No
Traverse Checking	Yes	Yes	Yes	Yes	Yes	No	No
Angle Sets	Yes	Yes	Yes	Yes	Yes	No	No
Custom Applications Programs (by user or mfr for user):	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	Cube/centric	[12]	Cube/centric	[12]	Cube/centric	Cube/rect	Cube/rect
Rodperson Self-Aligning Aid	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Features:	[6]	[6]	[6]	[13]	[13]	[5]	[5]
BATTERY (built in/removable):	Removable	Removable	Removable	Removable	Removable	Disposable	Disposable
Type (Gel-Cell, NiCd)	NiMH	NiMH	NiMH	Lithium	Li-ion	4-AA Alkaline or NiCd	2-AA & 2-C Alkaline or NiCd
Hours Continuous Use (One EDM Meas. Per 30 sec)	10	10	10	12.5	12.5	15	7
Weight (lbs.)	0.44	0.44	0.44	0.4	0.4	0.4	0.5
CHARGER:							
Hours to Recharge	3.5	3.5	3.5	3	3	N/A	N/A
Overcharge Protection	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Battery Weight (lbs.)	0.44	0.44	0.44	0.4	0.4	N/A	N/A
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.	11.7	11.7	11.7	14.4	14.4	3.0	5
WARRANTY , Months	12	12	12	12	12	12	12
DATE OF INTRODUCTION: Month and Year	Mar-02	Aug-04	Aug-04	May-06	May-06	Mar-98	Apr-00
Other variations possible within this series	[7]	[7]	[7]	[9]	[9]		
Additional notes							

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MANUFACTURER/DISTRIBUTOR	Laser Technology Inc.	Leica Geosystems Inc.	Leica Geosystems Inc.	Leica Geosystems Inc.	Leica Geosystems Inc.	Leica Geosystems Inc.	Leica Geosystems Inc.
MODEL/family/series	TruPulse CM LPS	TPS400 Basic Series	TPS700Auto Performance Series	TPS800 Performance Series	TPS1200 Professional Series	Leica Builder	System 2000
Variants possible for base model (See 'Other Variations' section below)		Reflectorless	[5]	Reflectorless	[9]	[17]	TCA2003/TC2003
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Modular [1]	Total station, coaxial EDM	Total station, coaxial EDM	Total station, coaxial EDM	Total station, coaxial EDM	Total station, coaxial EDM	Total station, coaxial EDM
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Pulse laser	Infrared, phase shift	Infrared, phase shift	Infrared, phase shift	Infrared, phase shift	Reflectorless, phase shift	Infrared
Range (normal conditions), in hundreds of meters: single/triple prism	10/10	35/54	35/54	35/54	[10]	2.5/ N/A	25/35
EDM Accuracy , Standard Deviation	30 cm	2mm+2ppm	2mm+2ppm	2mm+2ppm	2mm+2ppm	3mm+2ppm	1mm+1ppm
Displayed Resolution , mm-(single/tracking)	100/100	0.000	0	0.000	0.000	1 mm	0.01 mm
Measuring Time , sec.: single reading/tracking	0.5/0.2	0.3	0.3	0.3	0.8/0.15	< 2.0/ 1.0	3.0/0.3
Displays Stake-Out Information	No	Yes	Yes	Yes	Yes	Yes	Numerical values
Other Distance Measuring Features:	[2]	[1]	[1]	[1]	[11]	[18]	
Theodolite Component							
Telescope (type & magnification)	7X	30X	30X	30X	30X	30X	Erect 30X
Field of View, degrees & minutes	6-16	1deg.30 min.	1deg.30 min.	1deg.30 min.	1d30' / 2.7m at 100 m	1 deg.30 min.	1 deg.33 min.
Minimum Focusing Distance, meters	10	1.7	1.7	1.7	1.7 to infinity	1.7 m	1.7 m
Tilt Range (360 deg if fully transitable)/w. elbow	180	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	1080	2	2	2	1	6	0.5
Smallest Unit Displayed	36	1	1	1	1	1	0.1
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dual-Axis Compensation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Stores Trunnion Axis Correction	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Reads Left or Right	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Selectable Display Resolution- Range of Values	No	Yes	Yes	Yes	Yes	Yes	Yes
Plate Vial Sensitivity per 2mm		6'	6'	6'	6'	6'	4'
Other Features	[3][4]	Continuous angle measurement	[6]	[8]	[12]	Endless drives	
ADVANCED FEATURES							
Target Tracking (active/passive)		N/A	Passive	N/A	[13]	Passive	[13]
Robotic search control (user definable, search window, controllable from rod, etc.)		N/A	N/A	N/A	[14]	N/A	[23]
Distance at which robotic total station can be controlled from rod		N/A	N/A	N/A	800 m	N/A	[24]
Number of speeds on servo-driven		N/A	N/A	2	2	N/A	Max speed: 45 deg/sec
Range to 90% Kodak grey card		500 m	500 m	500 m	500 m	80 m	N/A
Range to 18% Kodak grey card		300 m	300 m	300 m	300 m	50 m	N/A
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Menu	Both	Both	Both	Both	Both	Both
Alphanumeric Keyboard	No	Yes	Yes	Yes	Yes	No	Yes
Separate Numeric Key Pad	No	No	Yes	Yes	Yes	No	No
Electronic Leveling	No	Yes	Yes	Yes	Yes	Yes	Yes
Out-of-Level Warning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Optical Plummet in Alidade, Magnification	No	Laser plummet	Laser plummet	Laser plummet	Laser plummet	Laser plummet	Laser plummet
Circular Vial Sensitivity per 2mm		6'	6'	6'	6'	6'	4'
Detachable Tribrach	Optional	Yes	Yes	Yes	Yes	Yes	Yes
Leveling Base Plummet, Type	Optional	Laser plummet	Laser plummet	Laser plummet	Laser plummet	Laser plummet	Laser plummet
Data Collector:							
On-Board, External, Both	External	Both	Both	Both	Both	Both	Both
Point Capacity (X, Y, Z, Pt No., Code)	10,000	10,000 records	> 8,000 records	> 10,000 records	1,750 data records per MB	10,000 datablocks	36,000
Programmable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Price, if optional	Varies	[2]	[2]	[2]	[2]	[2]	[2]
On-Board Intelligence							
Height Transfer	No	Yes	Yes	Yes	Yes	Yes	Yes
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	No	Yes	Yes	Yes	Yes	Yes	Yes
Setting Out - 2D / 3D	No	Yes	Yes	Yes	Yes	Yes	Yes
Reference Lines	No	Yes	Yes	Yes	Yes	Yes	Yes
Automatic Highway Layout - 2D / 3D	No	No	No	Yes (2D)	Yes	No	No
Remote Object Height	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	No	Yes	Yes	Yes	Yes	Yes	Yes
Traverse Checking	No	No	Yes	No	Yes	No	Yes
Angle Sets	No	Yes	Yes	No	Yes	Yes	Yes
Custom Applications Programs (by user or mfr for user):	Yes	Yes	Yes	Yes	Yes	No	Yes
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	Cube/rect	Cube/centric	Cube/centric	Cube/centric	Cube/centric	[19]	Cube/centric
Rodperson Self-Aligning Aid	N/A	Optional	Yes	Yes	Yes	No	Yes
Other Features:	[5]	[3]	[7]	[7]	[15]	[20]	[25]
BATTERY (built in/removable):	Disposable [8]	Removable	Removable	Removable	Removable	Removable	Removable
Type (Gel-Cell, NiCd)	4 AA (Alkaline, NiCd or Li) or 2 CRV3	NiMH	NiMH	NiMH	Li-ion	Alkaline (optional NiMH)	NiMH
Hours Continuous Use (One EDM Meas. Per 30 sec)	15 to 30	6	4	6	[16]	[21]	[26]
Weight (lbs.)	0.4	0.25	0.25	0.25	0.44	7.28 - 8.82	0.66
CHARGER:							
Hours to Recharge		2	2	2	1.5 (quick charge)	2	2
Overcharge Protection		Yes	Yes	Yes	Yes	Yes	Yes
Battery Weight (lbs.)		0.25	0.25	0.25	0.44	0.44	0.66
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.	2.0	9	11.9	11.9	12.75	7.28 - 8.82	19.2
WARRANTY , Months	12	12	12	12	12	12	12
DATE OF INTRODUCTION: Month and Year	Jan-06	Jan-99	Jan-00	Oct-04	Feb-04	Oct-05	Jun-95
Other variations possible within this series	[7]	[4]		Reflectorless	Integrated dual-frequency GPS	[22]	
Additional notes							

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MANUFACTURER/DISTRIBUTOR	Nikon/TDS	Nikon/TDS	Nikon/TDS	Northwest Instrument Inc.	Northwest Instrument Inc.	Northwest Instrument Inc.	Northwest Instrument Inc.
MODEL/family/series	NPL-302 Series	DTM-302 Series	DTM-502 Series	NTDM05	NTDM10	NTDM5B	NTDM103
Variants possible for base model (See 'Other Variations' section below)	NPL-362/352/332	DTM-362/352/332	DTM-552/532/522				
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained	Self contained	Self contained	Self contained	Self contained	Self contained	Self contained
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Reflectorless (pulse laser)	Infrared	Infrared	Infrared/used with prism	Infrared	Infrared	Infrared
Range (normal conditions), in hundreds of meters: single/triple prism	50 / N/A	20/26	24/31	15/20	15/20	10/3000	single/3000 ft
EDM Accuracy , Standard Deviation	3mm+2ppm	3mm+2ppm	2mm+2ppm	±(5mm+3ppm@D)	±(5mm+5ppm@D)	5±5ppm	3mm+5ppm
Displayed Resolution , mm-(single/tracking)	1/10	1/10	0.1mm/1mm	1 mm	1/10	1 mm	1/10
Measuring Time , sec.: single reading/tracking	1.3/0.5	1.6/1.0	1.0/0.5	3/1	3/1	3/1.5	1.5/1
Displays Stake-Out Information	Yes	Yes	Yes		Yes	Yes	Yes
Other Distance Measuring Features:	[1]	[6]	[11]	Atmospheric correction	Continues every 3 seconds		
Theodolite Component							
Telescope (type & magnification)	Concentric 26X	Concentric 33X	Concentric 33X	Erect 30X	Erect 30X	Erect 30X	Erect 30X
Field of View, degrees & minutes	1-30'	1-20'	1-20'	1deg.30 min.	1deg.30 min.	1deg.30 min.	1deg.30 min.
Minimum Focusing Distance, meters	1.6 m	1.3	1.3	1 m	1 m	1.3 m	1.3
Tilt Range (360 deg if fully transitable)/w. elbow	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	3/5/5	3/5/5	1	5	10	5	10
Smallest Unit Displayed	1	1	1	1 - 5	5 or 10 selectable	1	1
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	N/A	Yes	N/A	Yes
Dual-Axis Compensation	Yes [2]	Yes [7]	Yes	[7]	No	N/A	N/A
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	N/A	Yes	N/A	N/A
Stores Trunnion Axis Correction	Yes	Yes	Yes	N/A	No	N/A	N/A
Reads Left or Right	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selectable Display Resolution- Range of Values	1	1	1	Yes, 1 - 5	5 - 10	1 and 5	5 and 10
Plate Vial Sensitivity per 2mm	30	30	30	30	30	30	30
Other Features	[3]	[8]	[12]	[1]	[1]		
ADVANCED FEATURES							
Target Tracking (active/passive)	N/A	N/A	N/A	Passive	N/A	N/A	N/A
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance at which robotic total station can be controlled from rod	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of speeds on servo-driven	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Range to 90% Kodak grey card	210 m	N/A	N/A	N/A	N/A	N/A	N/A
Range to 18% Kodak grey card	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Both	Both	Both	Command	Command	Menu	Menu
Alphanumeric Keyboard	Yes	Yes	Yes	N/A	N/A	Yes	N/A
Separate Numeric Key Pad	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Electronic Leveling	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Out-of-Level Warning	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Optical Plummet in Alidade, Magnification	Yes/3x	Yes/3x	Yes/3x	3X	Yes/3X	3X	Yes/3X
Circular Vial Sensitivity per 2mm	10'	10'	10'	8'/2 mm	8'	8'	8'
Detachable Tribach	Yes	Yes	Yes	Detachable tribach	Yes	Yes	Yes
Leveling Base Plummet, Type	Optional OP, 3 pin tribach	Optional OP, 3 pin tribach.	Optional OP, 3 pin tribach.	3 leveling screws	3 leveling screws	Spindle	OP 3 pin tribach
Data Collector:							
On-Board, External, Both	Both	Both	Both	Onboard	N/A	N/A	N/A
Point Capacity (X, Y, Z, Pt No., Code)	10,000	10,000	10,000	9000 XY	N/A	N/A	N/A
Programmable	No	No	No	N/A	N/A	N/A	N/A
Price, if optional	Included	Included	Included		N/A	N/A	N/A
On-Board Intelligence							
Height Transfer	Yes	Yes	Yes	N/A	No	Yes	Yes
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	Yes	Yes	Yes	N/A	No	Yes	N/A
Setting Out - 2D / 3D	Yes	Yes	Yes	N/A	No		N/A
Reference Lines	Yes	Yes	Yes	N/A	No	Yes	N/A
Automatic Highway Layout - 2D / 3D	No	No	No	N/A	No		N/A
Remote Object Height	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	Yes	Yes	Yes	Yes	No	Yes	N/A
Traverse Checking	No	No	No	NA	No	Yes	N/A
Angle Sets	Yes	Yes	Yes	Yes	No	Yes	N/A
Custom Applications Programs (by user or mfr for user):	No	No	No	By mfr. for user	No		N/A
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes		N/A
Type of Prism (cube/rect) and target (centric/eccentric) Required:	Cube/centric	Cube/centric	Cube/centric	Cube	Cubic	Cube prism	Cube/rect
Rodperson Self-Aligning Aid	No	No	Yes [13]	N/A		N/A	N/A
Other Features:	[4]	[9]	[14]		[4]		
BATTERY (built in/removable):	Removable	Removable	Removable	Removable	Removable	Removable	Removable
Type (Gel-Cell, NiCd)	NiMH	NiMH	NiMH	NiMH	NiMH	NiCd	NiMH
Hours Continuous Use (One EDM Meas. Per 30 sec)	16	27	24	8	8	6	6
Weight (lbs.)	0.9	0.9	1.3	0.6 kg		0.5 kg	0.75
CHARGER:							
Hours to Recharge	2	2	2	3.5	3	3	4
Overcharge Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Weight (lbs.)	0.9	0.9	1.3	0.6 kg	0.76 lbs	0.5 kg	0.75
WEIGHT OF INSTRUMENT (incl. EDM, tribach, battery, etc.), lbs.	12.1/12.1/11.7	11.7/11.7/11.5	12.1	6.5 kg	6.5 kg	6 kg	6
WARRANTY , Months	24	24	24	24	24	24	24
DATE OF INTRODUCTION: Month and Year	Feb-03	Dec-02	Oct-02	Nov-02	Jan-01	2002	Oct-04
Other variations possible within this series	N/A	N/A		[2]	[5]		
Additional notes	[5]	[10]	[15]	[3]	[6]		

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MANUFACTURER/DISTRIBUTOR	Pentax / Western Latitudes	Pentax / Western Latitudes	Pentax / Western Latitudes	SOKKIA	SOKKIA	SOKKIA	SOKKIA
MODEL/family/series	R-300NX Series	R-300EX Series	R-326EX	Series 030R	Series 130R	Series 230RMC	Series 10
Variants possible for base model (See 'Other Variations' section below)	[11]	[13]		SET1030/2030/ 3030R3	[7]	SET3230RMC/SE T4230RMC	SET210/310/510/ T610
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained	Self contained	Self contained	Self contained	Self contained EDM	Self contained EDM	Self contained
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Reflectorless (phase shift)	Visible laser (phase shift)	Visible laser (phase shift)	[1]	[1]	[11]	[19]
Range (normal conditions), in hundreds of meters: single/triple prism	34/45, 34/45, 30/40, 30/40	34/45, 34/45, 30/40, 30/40	20/28	50/60	50/60	50/60	27/35
EDM Accuracy, Standard Deviation	±2mm+2ppm	±2mm + 2ppm [9]	±(3mm+2ppm)	±(2 + 2ppm x D) mm	±(2+2ppmxD)mm	±(2+2ppm)xD	±(2+2ppm x D) mm
Displayed Resolution, mm-(single/tracking)	1/10	1/10	1/10	0.0001m / 0.01m	0.0001m / 0.001m	0.001m / 0.01m	0.001 m / 0.01 m
Measuring Time, sec.: single reading/tracking	1.2/0.4	1.2/0.4	1.5/0.4	[2]	[2]	[12]	[20]
Displays Stake-Out Information	Yes	Yes	Yes	Yes, graphic & numeric	Yes, graphic & numeric	Yes, graphic & numeric	S, V, Hdist, and coord
Other Distance Measuring Features:	[3][4]	[3][4]	[3][4]	[3]	[3]	[3]	[21]
Theodolite Component							
Telescope (type & magnification)	30X	30X	30X	Coaxial fully transiting 30X	Coaxial fully transiting 30X	Coaxial 30X	Coaxial 30X
Field of View, degrees & minutes	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.
Minimum Focusing Distance, meters	1	1	1	1.3 m	1.3 m	1.3 m	1.0 m
Tilt Range (360 deg if fully transitable)/w. elbow	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.	360 deg.
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	2 / 3 / 5	2/3/5	6	1, 2, 3 & 5	1, 2, 3 & 5	3 & 5	2, 3, 5 & 6
Smallest Unit Displayed	1	1	1	0.5	0.5 sec	1 sec	1 sec
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dual-Axis Compensation	Yes [10]	Yes [10]	Yes	Yes, H and V	Yes, H and V	Yes, H and V	Yes, H and V
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stores Trunnion Axis Correction	Yes/Yes/No/No	Yes/Yes/No/No	No	Yes	Yes	Yes	Yes
Reads Left or Right	Yes	Yes	Yes	Yes	Both	Yes	Yes, selectable
Selectable Display Resolution- Range of Values	Yes, 1 - 5	Yes, 1 - 5	Yes, 1 - 5	0.5 / 1 (SET11030R) 1 / 5	0.5 / 1 (SET1130R) 1 / 5	1 sec / 5 sec	1 sec / 5 sec
Plate Vial Sensitivity per 2mm	30	30	30	30	20 (1130R) / 30	30	30 sec
Other Features	[5]	[5]		[33]	[33]	Auto-indexing	[33]
ADVANCED FEATURES							
Target Tracking (active/passive)	N/A	N/A	N/A	N/A	N/A	Active target capture	N/A
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	N/A	N/A	N/A	N/A	Remote selectable search window	N/A
Distance at which robotic total station can be controlled from rod	N/A	N/A	N/A	N/A	N/A	[13]	N/A
Number of speeds on servo-driven	N/A	N/A	N/A	N/A	N/A	[14]	N/A
Range to 90% Kodak grey card	200 m	N/A	N/A	0.3-350 m (R3); 0.3-200 m (R)	0.3-350 m (R3); 0.3-150 m (R)	0.3 - 350 m	N/A
Range to 18% Kodak grey card	150 m	N/A	N/A	170 m (R3); 100 m (R)	170 m (R3); 80 m (R)	170 m	N/A
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Both	Both	Both	Both	Menu driven softkeys	Menu driven softkeys	Menu
Alphanumeric Keyboard	Yes	Yes	Yes	Yes	Optional SF14 remote keypad	No	[22]
Separate Numeric Key Pad	Yes	Yes	Yes	No	Yes	Yes, single	[22]
Electronic Leveling	Yes, graphic & numeric	Yes, graphic & numeric	Yes, graphic & numeric	Yes, graphic & numeric	Yes, graphic & numeric	Yes, graphic & numeric	[23]
Out-of-Level Warning	Yes	Yes	Yes	Yes	Yes, visual and audible	Yes, including remotely	±3 min [24]
Optical Plummet in Alidade, Magnification	Laser/optional 3x optical	Laser/optional 3x optical	Laser/optional 3x optical	Yes, 3x	Yes, 3x	3x	Yes, 3x
Circular Vial Sensitivity per 2mm	8'	8'	8'	10'	10'	10 min	10 min
Detachable Tribrach	Yes/Yes/Yes/No	Yes/Yes/Yes/No/Yes	Yes	Yes	Yes	Yes	Yes
Leveling Base Plummet, Type	[1]	[1]	3 pin	Optical plummet tribrach	Optical plummet tribrach	Optical plummet tribrach	Optical plummet tribrach
Data Collector:							
On-Board, External, Both	Both [9]	Both [9]	Both	Onboard	Both [8]	Both	Both, RS232C port available
Point Capacity (X, Y, Z, Pt No., Code)	18,600 [8]	20,000 [8]	12,000	10,000 internal [4]	10,000 internal	10,000 internal	10,000 internal
Programmable	No	No	No	User-selectable menus	User-defined menu softkeys		User-defined menu softkeys
Price, if optional	Included	Included	Included			Varies	
On-Board Intelligence							
Height Transfer	No	No	No	Yes	Yes	Yes	Yes
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Setting Out - 2D / 3D	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reference Lines	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automatic Highway Layout - 2D / 3D	No	No	No	Yes	No	On D.C.	No
Remote Object Height	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	Yes	Yes	Yes	Yes	No	On D.C.	No
Traverse Checking	No	No	No	Yes	No	On D.C.	No
Angle Sets	Yes	Yes	Yes	Yes	No	On D.C.	No
Custom Applications Programs (by user or mfr for user):	No	No	No	Available from mfr.	Mfr. available		
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	[6]	[6]	[12]	[5]	[5]	[15]	Cube/reflective target sheet
Rodperson Self-Aligning Aid	No	No	No	Factory option guidelight	Factory option guidelight	Yes [16]	N/A
Other Features:	[7]	[7]		CF card reader standard	[9]	[17]	Factory option CF card reader
BATTERY (built in/removable):	Removable	Removable	Removable	Removable (2 each provided)	Removable (2 each provided)	Removable	Removable
Type (Gel-Cell, NiCd)	NiMH	NiMH	NiMH	NiMH	NiMH	NiMH	Li-ion
Hours Continuous Use (One EDM Meas. Per 30 sec)	5	5	5	5	6.5	3.5	7.5
Weight (lbs.)	0.75	0.75	0.75	12.4	12.3	15.4	11.4
CHARGER:							
Hours to Recharge	3	3	3	< 2	Approx 70 min.	< 2	Approx 70 min.
Overcharge Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Weight (lbs.)	0.75	0.75	0.75	0.4	0.4	0.4	0.2
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.	12.6	12.6	12.6	12.9	12.7	15.4	11.4
WARRANTY, Months	[2]	[2]	[2]	24	24	24	24
DATE OF INTRODUCTION: Month and Year	Mar-05	Mar-05	Mar-05	Oct-03	Jan-04	Apr-05	Feb-02
Other variations possible within this series							[25]
Additional notes				[6]	[10]	[18]	[26]

2006 Total Station Survey

MANUFACTURER/DISTRIBUTOR	SOKKIA	SOKKIA	SOUTH	SOUTH	SOUTH	SOUTH	Spectra Precision/TDS
MODEL/family/series	Series 30R	Series 30RK	NTS-320 Series	NTS-350 Series	NTS-350R Series	NTS-660 Series	Focus 10
Variants possible for base model (See 'Other Variations' section below)	[27]	[31]	NTS-322/ NTS-325	NTS-352/ NTS-355		NTS-662/ NTS-665	Focus 10 - 1.5/3/5
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained EDM	Self contained EDM	Self contained	Self contained	Self contained	Self contained	Self contained
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	[28]	[28]	Infrared	Infrared	Reflectorless (pulsed laser)	Infrared	Reflectorless (pulsed laser)
Range (normal conditions), in hundreds of meters: single/triple prism	50/60	50/60	18/26	18/26	18/30	18/26	55/55
EDM Accuracy , Standard Deviation	±(2+2ppm)xD	±(2+2ppm)xD	3+2ppm	2mm+2ppm	±(2+2ppm)	2+2ppm	(3mm+3ppm)
Displayed Resolution , mm-(single/tracking)	0.001 m / 0.01 m	0.001m / 0.01m	1/10	1/10		1/10	Varies: 0.1 to 1/10
Measuring Time , sec.: single reading/tracking	[29]	[29]	3/1	3/1	<1.8/<1.4	3/1	Varies: 3 to 7/0.4
Displays Stake-Out Information	Yes, graphic & numeric	Yes, graphic & numeric	Yes	Yes	Available	Yes	Yes
Other Distance Measuring Features:	[3]	[3]	N/A	N/A	Available	N/A	Reflectorless
Theodolite Component							
Telescope (type & magnification)	Coaxial 30X (26X SET630R)	Coaxial 30X (26X SET630RK)	30X	30X	30X	30X	Coaxial 26X
Field of View, degrees & minutes	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	5 deg.	1 deg. 30 min.	1 deg. 30 min.
Minimum Focusing Distance, meters	1.3 m	1.3 m	1.0	1.0	1.3 m	1.0	1.7
Tilt Range (360 deg if fully transitable)/w. elbow	360 deg.	360 deg.	360 deg.	360 deg.		360 deg.	345
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	2, 3, 5 & 6	2, 3, 5 & 6	2/5	2/5	2/5	2/5	1.5/3/5
Smallest Unit Displayed	1 sec	1	2/5	2	1/5	2/5	1
Orientation to Zero or Any Value After Pointing Telescope	Both	Both	Yes	Yes		Yes	Yes
Dual-Axis Compensation	Yes, H and V	Yes, H and V	One-axis compensation	One-axis compensation	Single-axis only	Yes	Yes
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Stores Trunnion Axis Correction	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Reads Left or Right	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Selectable Display Resolution- Range of Values	1sec / 5sec	1sec / 5sec	Yes	Yes	N/A	Yes	1/2
Plate Vial Sensitivity per 2mm	30	30	30	30	30	30	6
Other Features	[33]	[33]	N/A	N/A		N/A	Electronic circles
ADVANCED FEATURES							
Target Tracking (active/passive)	N/A	N/A	N/A	N/A	passive	N/A	N/A
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Distance at which robotic total station can be controlled from rod	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of speeds on servo-driven	N/A	N/A	N/A	N/A	N/A	N/A	4
Range to 90% Kodak grey card	0.3-350 m (R3); 0.3-200 m (R)	0.3-350 m (R3); 0.3-200 m (R)	N/A	N/A	N/A	N/A	600 m
Range to 18% Kodak grey card	170 m (R3); 100 m (R)	170 m (R3); 100 m (R)	N/A	N/A	N/A	N/A	200 m
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Menu	Menu	Menu	Menu	Menu	Both	Both
Alphanumeric Keyboard	[22]	[22]	Yes, dual sides	Yes, dual sides	Available	Yes, dual sides	Yes
Separate Numeric Key Pad	[22]	Yes, dual	N/A	Yes	N/A	Yes	Yes
Electronic Leveling	Yes, graphic & numeric	Yes, graphic & numeric	N/A	Yes	N/A	Yes	Yes
Out-of-Level Warning	Yes	Yes	N/A	Yes	Available	Yes	Yes
Optical Plummet in Alidade, Magnification	3x	3x	Yes/3X	Yes/3X	3x	Yes/3X	No
Circular Vial Sensitivity per 2mm	10 min	10 min	8'	8'	8'	8'	8'
Detachable Tribrach	Yes	Yes	Yes	Yes	Available	Yes	Yes
Leveling Base Plummet, Type	Optical plummet tribrach	Optical plummet tribrach	Optical plummet tribrach	Optical plummet tribrach	N/A	Optical plummet tribrach	Yes, Spectra 3-pin
Data Collector:							
On-Board, External, Both	Both [8]	Both, RS-232C interface	Both	Both	External	Both	External
Point Capacity (X, Y, Z, Pt No., Code)	10,000 internal, optional CF card	10,000 internal, optional CF card	8000	8000	Available	40000	>10,000
Programmable	User-defined menu softkeys	User-defined menu softkeys	Yes	Yes	N/A	Yes	N/A
Price, if optional			Contact distributors	Contact distributors	Contact distributors	Contact distributors	N/A
On-Board Intelligence							
Height Transfer	Yes	Yes	Yes	Yes	Available	Yes	No
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Available	Yes	No
Resection / free station	Yes	Yes	Yes	Yes	Available	Yes	No
Setting Out - 2D / 3D	Yes	Yes	Yes	Yes	2D	Yes	No
Reference Lines	Yes	Yes	Yes	Yes	Available	Yes	No
Automatic Highway Layout - 2D / 3D	No	No	Yes	Yes	2D	Yes	No
Remote Object Height	Yes	Yes	Yes	Yes	Available	Yes	No
Station & Offset	No	No	Yes	Yes	Available	Yes	No
Traverse Checking	Yes	Yes	Yes	Yes	Available	Yes	No
Angle Sets	No	No	Yes	Yes	Available	Yes	No
Custom Applications Programs (by user or mfr for user):	Mfr. available	Mfr. available	Yes	No	N/A	Yes	No
Firmware Upgradable	Yes	Yes	Yes	Yes	Available	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	[15]	[15]	Cube/centric	Cube/centric	Rect; centric	Cube/centric	Cube/centric
Rodperson Self-Aligning Aid	Factory option guidelight	Factory option guidelight	N/A	Yes		N/A	No
Other Features:	Factory option CF card reader	Factory option CF card reader	N/A			N/A	Self leveling
BATTERY (built in/removable):	Removable	Removable	Removable	Removable	Removable	Removable	[1]
Type (Gel-Cell, NiCd)	Li-ion	Li-ion	NiMH	NiMH	NiMH	NiMH	NiMH
Hours Continuous Use (One EDM Meas. Per 30 sec)	7	7	8	8	8	8	8+
Weight (lbs.)	12.2	12.2	0.6 kg	0.6 kg	6 kg	0.6 kg	0.4 (internal)
CHARGER:							
Hours to Recharge	< 2	< 2	2	2	3	2	< 2
Overcharge Protection	Yes	Yes	Yes	Yes	Available	Yes	Yes
Battery Weight (lbs.)	0.2	0.2	0.6 kg	0.6 kg	0.6 kg	0.6 kg	0.9 (internal)
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.	12.2	12.2	6.5 kg	9.5 kg	6 kg	9.5 kg	16.5
WARRANTY , Months	24	24	24	24	24	24	12
DATE OF INTRODUCTION: Month and Year	Feb-04 (R3); Sep-02 (R)	Oct-05	Nov-02	Sep-03	Jan-06	Mar-04	Oct-05
Other variations possible within this series							
Additional notes	[30]	[32]					[2]

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MANUFACTURER/DISTRIBUTOR	Topcon	Topcon	Topcon	Topcon	Topcon	Topcon	Topcon
MODEL/family/series	GTS-230W Series	GTS-820 Series	GTS-720 Series	CTS 3000 Series	GPT-3000W Series	GPT-3000LW Series	GPT-8200 Series
Variants possible for base model (See 'Other Variations' section below)	4	3	4	2 D 05,07	4, D	4	4, M
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained	[3]	Self contained	Self contained	Self contained	Self contained	[3]
DISTANCE MEASURING COMPONENT							
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Infrared	Infrared	Infrared	Infrared, pulse laser	Infrared, pulse laser	Infrared, pulse laser	Infrared, pulse laser
Range (normal conditions), in hundreds of meters: single/triple prism	30/40	22/28	30/40	30/40	30/40	30	70/100
EDM Accuracy , Standard Deviation	2mm+2ppm	2mm+2ppm	2mm+2ppm	3mm+2ppm	3mm+2ppm	3mm+2ppm	2mm+2ppm
Displayed Resolution , mm-(single/tracking)	0.2mm	10mm	1/10	1/10	1/10	0.2mm/1mm	0.2mm/1mm
Measuring Time , sec.: single reading/tracking	0.4	0.3	0.4	0.3	0.3	1.2/0.3	0.3
Displays Stake-Out Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Distance Measuring Features:		Yes		Prismless to 250 m	Prismless to 250 m	Long range reflectorless	Prismless to 1200 m
Theodolite Component							
Telescope (type & magnification)	30X	30X	30X	30X	30X	30X	30X
Field of View, degrees & minutes	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.
Minimum Focusing Distance, meters	1.3	1.3	1.3	0.9	0.9	0.9	1.3
Tilt Range (360 deg if fully transitable)/w. elbow	360 degrees/45 to 90	360 degrees/45 to 90	360 degrees/45 to 90	360 degrees/45 to 90	360 deg/45 to 90	360 deg.	360 degrees/45 to 90
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	3	1	1	5	2	2, 3, 5, 7	1, 2, 3 and 5
Smallest Unit Displayed	1	0.5	0.5	1	1	1 sec	0.5
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dual-Axis Compensation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Angle Measuring Features:							
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stores Trunnion Axis Correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reads Left or Right	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selectable Display Resolution- Range of Values	Yes, 1	0.5	Yes, 0.5	Yes, 1	Yes, 1	Yes	Yes
Plate Vial Sensitivity per 2mm	30	30	30	30	30	30	30
Other Features			Quad index encoders	Quad index encoders	Quad index encoders	Quad index encoders	
ADVANCED FEATURES							
Target Tracking (active/passive)	N/A	CCD Array	N/A	N/A	N/A	N/A	CCD array, standard prism
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	RC-2II Quick-Lock System	N/A	N/A	N/A	N/A	RC-2IIW Quick Lock
Distance at which robotic total station can be controlled from rod	N/A	800 m	N/A	N/A	N/A	N/A	800 m
Number of speeds on servo-driven	N/A	7 speed	N/A	N/A	N/A	N/A	7 speed
Range to 90% Kodak grey card	N/A	N/A	N/A	250 m	250 m	1200 m	1200 m
Range to 18% Kodak grey card	N/A	N/A	N/A			600 m	600 m
MISCELLANEOUS							
User Interface:							
Operation: Menu, Command, Both	Menu	Both	Both	Menu	Menu	Menu	Both
Alphanumeric Keyboard	Yes, external DK-7	Yes, dual/single side	Yes	Yes, external DK-7	Yes, external DK-7	Yes, external	Yes, dual side
Separate Numeric Key Pad	Yes, external DK-7	Yes, dual/single side	Yes	Yes, external DK-7	Yes, external DK-7	Yes	Yes, dual side
Electronic Leveling	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Out-of-Level Warning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Optical Plummet in Alidade, Magnification	Yes	Yes/3X	OP (standard)/3X	Yes/3X as option	Yes/3X as option	Yes/3X	Yes/3X
Circular Vial Sensitivity per 2mm	10'	10'	10'	10'	10'	10'	10'
Detachable Tribrach	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leveling Base Plummet, Type	Laser/detachable	[4]	Laser (option)/detachable	[7]	[7]	[7]	OP (standard)
Data Collector:							
On-Board, External, Both	Both [1]	Both	Both	Both	Both	Both	Both
Point Capacity (X, Y, Z, Pt No., Code)	16,000	8,000	Internal/CF card memory	16,000	16,000	16,000	8000
Programmable	No	Yes	Yes	No	No	Yes	Yes
Price, if optional		TopSurv, TDS, Carlson					Program dependent
On-Board Intelligence							
Height Transfer	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Setting Out - 2D / 3D	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reference Lines	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automatic Highway Layout - 2D / 3D	Yes, external	Yes	Yes	Yes, external	Yes, external	Yes	Yes
Remote Object Height	Yes, external	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	Yes, external	Yes	Yes	Yes, external	Yes, external	Yes	Yes
Traverse Checking	Yes, external	Yes	Yes	Yes, external	Yes, external	Yes	Yes
Angle Sets	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Custom Applications Programs (by user or mfr for user):	No	Yes	Yes	No	No	Yes	Yes
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric
Rodperson Self-Aligning Aid	Yes	Yes	Yes	Yes	Yes	Yes	Yes, RC-2IIW
Other Features:	[1]	Fully robotic	Windows CE Net 4.2 OS	Expanded keyboard	Bluetooth wireless	Bluetooth wireless	Fully Robotic
BATTERY (built in/removable):	Yes	Yes	Onboard/removable	Removable	Yes	Built-in/removable	Integrated, removable
Type (Gel-Cell, NiCd)	NiMH	NiMH	Li-ion	NiMH	NiMH	Li-ion	NiMH
Hours Continuous Use (One EDM Meas. Per 30 sec)	10	3.5	7.5	4.5	4.5	4.5	4
Weight (lbs.)			0.4	7.5	7.5	0.7	0.9 x 2
CHARGER:							
Hours to Recharge	1.5	2	4	1.5	1.5	1.8	Approx. 2.5
Overcharge Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Weight (lbs.)	1.8	2.2	0.3	0.7	0.7	0.3	0.9
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.		17	13.6	11	11	11.4	17
WARRANTY , Months	24	24	24	24	24	24	24
DATE OF INTRODUCTION: Month and Year	Jun-03	Jan-04	Jan-04	Jan-06	Dec-03	Jan-05	Jul-04
Other variations possible within this series		[5]		CTS 3005; CTS 3007			[5]
Additional notes	[2]		[6]	[8][9]	[8]	[10]	

2006 Total Station Survey

MANUFACTURER/DISTRIBUTOR	Topcon	Topcon	Trimble	Trimble	Trimble	Trimble	Trimble	Trimble
MODEL/family/series	GPT-7000 Series	GPT-7000i	3600 Series	5600 DR Standard	5600 DR200+	ATS [13]	Trimble S6	Trimble M3
Variants possible for base model (See 'Other Variations' section below)	4	4	3600 DR, 3600 DR Arctic	[4]	[4]	[4]	[4]	
CONFIGURATION: [Self Contained or Modular (Separate EDM Unit)]	Self contained	Self contained	Self contained	Self contained	Self contained	Self contained	Self contained, coaxial	Self contained
DISTANCE MEASURING COMPONENT								
Type (Infrared, Laser, Phase Comparison, Pulse, etc.)	Infrared, pulse laser	Infrared, pulse laser	[1]	Phase shift laser diode	[10]	Infrared	[14]	[21]
Range (normal conditions), in hundreds of meters: single/triple prism	30/40	30/40	50/70	30/75	55/55	20/28	25/55	50/
EDM Accuracy , Standard Deviation	2mm+2ppm	2mm+2ppm	[2]	[2]	±(3mm+3ppm)	±(3mm+2ppm)	±(3mm+3ppm)	±(3mm+3ppm)
Displayed Resolution , mm-(single/tracking)	0.2mm/1mm	1mm/0.2mm	0.1 mm	[5]	[5]	1/10	[15]	1/1m
Measuring Time , sec.: single reading/tracking	1.2/0.3	1.2/0.3	< 2.0/<0.4	2.0/0.5	Varies: 3 to 7/0.4	3.5/0.4	1.2/0.4	[22]
Displays Stake-Out Information	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Distance Measuring Features:	Yes	Built-in digital imaging	Trigger key, laser pointer	Surface scanning, monitoring	Surface scanning, monitoring	[11]	Coaxial laser pointer	Focus beam system
Theodolite Component								
Telescope (type & magnification)	30X	[11]	Coaxial 30X	Coaxial 26X [6]	Coaxial 26X [6]	Coaxial 26X [6]	Coaxial 30X	Concentric 26X
Field of View, degrees & minutes	1 deg. 30 min.	1 deg. 30 min.	1 deg. 22 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.	1 deg. 30 min.
Minimum Focusing Distance, meters	1.3	1.3	1.5 m	1.7 m	1.7 m	1.7 m	1.5 m	1.6 m
Tilt Range (360 deg if fully transitable)/w. elbow	360 deg.	360 deg.	360° / (-55° / +90)	345° / (-60° / +75°)	345° / (-60° / +75°)	345° / (-60° / +75)	360 deg.	360 deg.
Angle accuracy, arc-seconds [Std dev of a direction, dir and rev (DIN Spec. 18723)]	1, 2, 3, 5	1, 2, 3, 5	Varies: 1.5, 2, 3, 5	Varies: 1, 2, 3, 5	Varies: 1, 2, 3, 5	Varies: 1, 2, 3, 5	Varies: 1, 2, 3, 5	3, 5
Smallest Unit Displayed	0.5 sec	0.5 sec	0.1	0.1	0.1	0.1	0.1	1.0
Orientation to Zero or Any Value After Pointing Telescope	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dual-Axis Compensation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Angle Measuring Features:								
Stores Collimation and Vertical Index Corrections	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stores Trunnion Axis Correction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reads Left or Right	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selectable Display Resolution- Range of Values	Yes	Yes	1	0.1	0.1	0.1	0.1	1/5/10
Plate Vial Sensitivity per 2mm	30	Yes	30	6	6	6	6	30
Other Features	Quad index encoders	Quad index encoders		Electronic circles	Electronic circles	Synchronized angles/distances	SurePoint [16]	N/A
ADVANCED FEATURES								
Target Tracking (active/passive)	N/A	N/A	N/A	Active	Active	Active, multiple target ID	MultiTrack [17]	N/A
Robotic search control (user definable, search window, controllable from rod, etc.)	N/A	N/A	N/A	Yes/Yes/Yes/Map	Yes/Yes/Yes/Map	Yes/Yes/Yes/Map	Yes/Yes/Yes/Map	N/A
Distance at which robotic total station can be controlled from rod	N/A	N/A	N/A	Up to 1200 m	Up to 1200 m	Up to 1200 m	700 m	N/A
Number of speeds on servo-driven	N/A	N/A	N/A	4	4	4	MagDrive [18]	N/A
Range to 90% Kodak grey card	250 m	250 m	120 m	70 m	DR200+ >600 m	N/A	>800 m	210 m
Range to 18% Kodak grey card			80 m	50 m	DR200+ >200 m	N/A	>300 m	85 m
MISCELLANEOUS								
User Interface:								
Operation: Menu, Command, Both	Both	Both, Win CE onboard	Menu	Both	Both	Both	Both	Menu
Alphanumeric Keyboard	Yes, Win CE touchscreen	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Separate Numeric Key Pad	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Electronic Leveling	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Out-of-Level Warning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Optical Plummet in Alidade, Magnification	Yes/3X	Yes/3X	Yes/2.4X	No	No	No	Yes/2.3X	Yes/3X
Circular Vial Sensitivity per 2mm	10'	10'	8'	8'	8'	8'	8'	10'
Detachable Tribrach	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leveling Base Plummet, Type	Laser option/detachable	Detachable	Trimble 3-pin or DIN	Yes/Trimble 3-pin	Yes/Trimble 3-pin	Yes/Trimble 3-pin	Optical/laser optional	[23]
Data Collector:								
On-Board, External, Both	Both, Win CE onboard	Both, Win CE onboard	Both	Both	Both	Both	Both	Both
Point Capacity (X, Y, Z, Pt No., Code)	>100,000	>100,000	>10,000	>10,000	>10,000	>10,000	256 MB onboard	10,000
Programmable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Price, if optional			Varies, contact distributor	Varies, contact distributor	Varies, contact distributor	Varies, contact distributor	Varies, contact distributor	Included
On-Board Intelligence								
Height Transfer	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Missing Line (Tie Distance)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resection / free station	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Setting Out - 2D / 3D	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reference Lines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Automatic Highway Layout - 2D / 3D	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Remote Object Height	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Station & Offset	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Traverse Checking	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Angle Sets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Custom Applications Programs (by user or mfr for user):	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Firmware Upgradable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Prism (cube/rect) and target (centric/eccentric) Required:	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric	Cube/centric
Rodperson Self-Aligning Aid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Other Features:	Color Win CE touchscreen	Built-in digital imaging	TDS onboard (optional)	Surface scanning, monitoring	Surface scanning, monitoring	[12]	[19]	[24]
BATTERY (built in/removable):	Built-in/removable	Removable	[25]	[25]	[25]	[25]	[25]	Removable
Type (Gel-Cell, NiCd)	Li-ion	Li-ion	NiMH	NiMH	NiMH	NiMH	Li-ion	NiMH
Hours Continuous Use (One EDM Meas. Per 30 sec)	7.5	7.5	8	[7]	[7]	[7]		15
Weight (lbs.)	0.4	0.4	Internal battery 1.0 lbs	Internal battery 0.9 lbs	Internal battery 0.9 lbs	Internal battery 0.9 lbs	0.77	11.2
CHARGER:								
Hours to Recharge	4	4	5	< 2	< 2	< 2	3	2
Overcharge Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery Weight (lbs.)	0.3	0.3	Internal battery 1.0 lbs	Internal battery 0.9 lbs	Internal battery 0.9 lbs	Internal battery 0.9 lbs	0.77	0.9
WEIGHT OF INSTRUMENT (incl. EDM, tribrach, battery, etc.), lbs.	13.6	13.8	12	[8]	[8]	18 lbs (excl. battery)	< 11.6	12.1
WARRANTY , Months	24	24	24	24	24	24	24	24
DATE OF INTRODUCTION: Month and Year	Jul-04	Jan-05	Feb-01	Oct-02	Feb-01/Oct-02	Feb-01	Jan-05	Oct-05
Other variations possible within this series			[3]	Upgradeable [9]	Upgradeable [9]	Upgradeable [9]	Upgradeable [9]	N/A
Additional notes		[12]						

POB does not assume responsibility for any errors or omissions that may be contained within the survey.

FOIF

1. OTS600 series, reflectorless EDM and alphanumeric keyboard; OTS700 series, reflectorless EDM, alphanumeric keyboard, USB interface, GUI and touch screen; OTS710 series applied absolute encoder. RTS238/538 series, infrared EDM and function keyboard; RTS600 series, infrared EDM and alphanumeric keyboard; RTS700 series, infrared EDM, alphanumeric keyboard, USB interface, GUI and touch screen; RTS710 series applied absolute encoder.
2. Reflectorless: 1 to 60 m; Reflective sheet/30mmx30mm: 1 to 500 m; Reflective sheet/60mmx60mm: 1 to 700m; Mini-prism: 1 to 1200 m; Single prism: 1 to 5000 m.
3. RTS238, OTS632, RTS632, RTS702/712 and OTS702/712 angle accuracy: 2s. RTS538, OTS635, RTS635, RTS705/715 and OTS705/715 angle accuracy: 5s. RTS703/713, OTS703/713 angle accuracy: 3s.
4. 360 degree, 400 gon and 6400 mil selectable. Mini-reading: degree: 1"/5"/10"; gon: 0.2 mgon, 1 mgon, 2 mgon; mil: 0.02 mil/0.05 mil.
5. Waterproof to IP4.
6. Temperature unit: C and F selectable. Atmospheric pressure unit: hpa, mmHg, inch-Hg selectable.
7. File management function; the internal memory can record 8 jobs.
8. 16 MB internal memory, USB or RS-232C selectable.
9. Special charger and car lighter socket charger selectable. Graphic user interface, touchscreen display.
10. OP (standard) / LP (Option).
11. Visible laser pointer, coaxial.
12. Cube/centric or reflective sheet.
13. Professional road survey program.

LTI

1. Separate compass unit.
2. On-board display of HD,VD.
3. Another angle-measuring feature is aiming function.
4. Another feature is declination setting.
5. Prisms or reflectors are not required but are available as options.
6. Separate angle encoder unit.
7. AE can be substituted for CM for increased HA accuracy.
8. Or optional re-chargeable.

Leica Geosystems

1. Reflectorless, visible laser pointer.
2. Contact your nearest Leica Geosystems representative for a personalized quote: www.leicageosystems.com.
3. Onboard application programs/onboard construction specific applications.
4. Onboard data collection, Off-board data collector.
5. Reflectorless, motorized, automatic target recognition.
6. Automated sets of angles, field calibration, electronic compensation.
7. Small, lightweight, easy to use.
8. Field calibration, electronic compensation, continuous angle measurement.
9. Robotic, reflectorless, motorized, automatic target recognition, PowerSearch.
10. > 10,000 m to single prism.
11. Reflectorless EDM, visible laser pointer, standard mode, fast mode, tracking mode, averaging mode.
12. PowerSearch, auto prism finding, auto angle sets, motorized stakeout, automatic target recognition.
13. Passive, automatic targeting and tracking.
14. PowerSearch, joystick, user definable, compass, working area.
15. Robotic / long range reflectorless/ Smart-station ready.
16. > 8 hrs (PowerSearch / robotic / ATR) internal battery.
17. Builder T100/T200; Builder R100/R200; Builder R100M/R200M.
18. Reflectorless, laser pointer (dot size = 10mm x 20mm @ 50 m).
19. CPR105 flat prism, zero offset.
20. No experience required. Fast, simple layouts.
21. Alkaline: 6-8 h; NiMH: 6-8 h.
22. Onboard data collection, offboard data collector.
23. User-definable joystick, controllable from rod.
24. ATR: 1000 m / LOCK: 500 m.
25. Endless drives/robotic/long range reflectorless.
26. 600 angular and distance observations.

Nikon/TDS

1. Non-prism 1.6 m to 210 m (Nikon exclusive focused beam system).

2. Single axis on NPL-332 model.
3. NPL-362/352 has dual horizontal angle encoders. NPL-332 has single only.
4. Custom code list, quick code system, vertical and sloped plane, offset programs, advanced stakeout.
5. The NPL-302 Series features Nikon's exclusive focused beam non-prism EDM. This unique system minimizes signals from targets out of focus. The reticle clearly shows the measuring beam location. Provides positive target identification in non-prism applications.
6. Distance averaging and PPM adjustment.
7. Single axis on DTM-332.
8. DTM-362/352 has dual horizontal angle encoders. DTM-332 has single only.
9. Custom code list, quick code system, vertical and sloped plane, offset programs, advanced stakeout.
10. All models are IPX6 waterproof construction and feature easy-to-use, powerful onboard collection and stakeout functions. The DTM-332 has F1 only display and single axis compensation.
11. 1.0 sec initial measurement at full 2mm+2ppm accuracy.
12. Patented digital diametric detection for horizontal and vertical angles.
13. Lumi-guide with distance control.
14. Advanced onboard collection and stakeout system.
15. Advanced onboard system features multiple jobs (32), control jobs, custom codelist, quick code system, offset programs, vertical and sloped plane, curve staking, and F1/F2 averaging.

Northwest

1. 360 deg, 400 gon or 6400 mil selectable.
2. NTDM05B: a basic model without vertical compensation.
3. Northwest NTDM05 is one level up from NTDM10 introduced in 2001. Additional features include: RS-232C data port, internal memory and vertical compensation, etc.
4. Stakeout by distance and coordinates.
5. NTDM05, 5" unit with data port and vertical compensation.
6. An accurate, reliable and economical measurement tool for contractors on jobs related to stakeout, distance control and alignment.

2006 Total Station Survey Notes

Especially for those who do not need or cannot afford a high-priced, full-featured total station.

7. One-axis compensation optional.

Pentax/Western Latitudes

1. 3 pin / 3 pin / 3 pin / fixed.
2. Electronics 24, optical/mechanical limited lifetime.
3. All units have automatic atmospheric corrections (temp/pres/PPM).
4. Visible laser, feet and inches.
5. Diametric detection - H&V, dual speed tangent on 2&3" models, auto focus.
6. Target, sheet or prism-centric.
7. Dual keyboards on 2"; optional on others.
8. R-322NX, 323NX - 18,600 points. R-325NX, 315NX - 16,000 points.
9. Date clock included for data collection.
10. Tri-axis compensation on R-322NX/EX, R-323NX/EX.
11. R-322NX/R-323NX/R-325NX/R-315NX.
12. Sheet/centric or cube/centric.
13. R-322EX/R-323EX/R-325EX/R-315EX.

Sokkia

1. RED-tech II InfraRed and visible phase shift reflectorless.
2. 1.3 (initial 2.6) / 0.3 (initial 1.6).
3. Prism, reflective sheet and reflectorless capable.
4. CF card slot available.
5. Cube, centric, reflective sheet or reflectorless.
6. The Series 030R includes complete SDR Expert Data Collection software onboard.
7. SET1130R3 / SET2130R3 / SET3130R3 / SET4130R3.
8. RS-232C and Bluetooth Interface.
9. Wireless SF14 remote keypad interface.
10. The Series 130R3 now includes Bluetooth wireless technology. Keyboard includes additional direct function keys.
11. RED-tech II Reflectorless Phase Shift.
12. 0.9 (initial 1.7) / 0.3 (initial 1.4).
13. 350 m capture, 800 m autopoint, 1200 m servo.
14. 16 steps; 5 internal 11 external.
15. Corner cube, reflective sheet or reflectorless.
16. Two-color with two flash patterns.
17. Automatic or user-selectable directional aid on rod.
18. The Series 230RMC is an "on-demand"

robotic system with reflectorless technology and passive target auto-location.

19. Modulated near infrared phase shift.
20. 1.6 (initial 2.8) / 0.3 (initial 1.8).
21. Displays m/ft/in, fine, rapid, tracking, AVG.
22. Optional wireless keyboard SF14.
23. Dual-axis, graphic and numeric display.
24. Displays out of level warning.
25. SET610, 26X telescope and single keyboard.
26. The SET10 Series is rated IP66 waterproof and dustproof. The SET10 can be used with the SF14 wireless keyboard and optional Compact Flash card slot.
27. SET230R3 / SET330R3 / SET530R3 / SET630R.
28. RED-tech II reflectorless phase shift.
29. 0.9 (initial 1.7) / 0.3 (initial 1.4).
30. The Series 30R now incorporates Bluetooth wireless technology and is rated IP66 waterproof and dustproof.
31. SET230RK3 / SET330RK3 / SET530RK3.
32. The Series 30RK includes an illuminated numeric keypad, unique to this class of product, on an IP66 water and dust proof chassis.
33. Sokkia-patented absolute encoders.

Spectra Precision

1. Internal (removable) and external.
2. Servomotor-driven, reflectorless total station.

Topcon

1. Supports wireless communications (Bluetooth).
2. Waterproof and dustproof to IP66.
3. Self contained, coaxial measurement.
4. OP (standard) / LP (option).
5. Unit can be upgraded to fully robotic by adding external comm link and data collector.
6. Total station w/ Windows CE operating system. Waterproof and dustproof to specification IP54.
7. Laser (standard) / OP (optional).
8. Instruments are 100% waterproof and dustproof to IP66 specification.
9. Expanded alpha/numeric keyboard.
10. Instruments are 100% waterproof.
11. 30X telescope up to 60X digital zoom.
12. The GPT-7000i is the world's first electronic total station to incorporate digital imaging technology.

Trimble

1. DR (reflectorless) phase comparison.
2. Varies: $\pm(1\text{mm}+1\text{ppm})$ or $\pm(2\text{mm}+2\text{ppm})$.
3. Various control units and application software to suit specific market and user application. Internal laser plummet.
4. Servo (base model), autolock, robotic.
5. Varies: 0.1 mm to 1 mm / 10 mm.
6. 30X magnification optional.
7. 3 hrs servo with Internal battery.
8. Depends on configuration < 16.5 lbs.
9. Compatible with leading data collectors for servo, autolock and robotic operation.
10. Long-range, reflectorless pulse laser diode.
11. Synchronized /1 to 6Hz / low latency.
12. Optimized for 3D machine control.
13. The ATS is optimized for 3D machine control applications, but equally well suited for the measurement needs of today's contractor. High measurement rate (1-6Hz), low latency, synchronized angle and distance measurements and multiple target ID are all standard features. Target ID enables the ATS to differentiate between four different targets, ensuring only the intended target is tracked.
14. DR300+ long range reflectorless pulse.
15. Varies: 0.1 to 100 mm / 0.1 to 100 mm.
16. SurePoint accuracy assurance guards against the sinkage, vibration and handling that can affect an instrument after setup. SurePoint automatic pointing correction monitors and corrects the effects of trunnion axis collimation and mis-levelment so that users can measure with speed and confidence.
17. MultiTrack combines passive prism tracking with active Target ID to provide exceptional flexibility and performance. The instrument will lock and track a wide variety of targets and conventional prisms to exceptional range. The active Target ID ensures that the correct target is located.
18. MagDrive servo technology provides exceptional speed and control. The instrument can be automatically positioned in less than 3 seconds. Servo knobs are configured to provide 5 servo speeds.
19. Surface scanning, continuous topo.
20. 6 hrs servo with internal battery.
21. Reflectorless pulse laser, Class 1, completely eyesafe.
22. 1.6/0.6 prism mode, 1.6/0.8 non-prism.
23. Optional op, 3-pin tribrach.
24. The Trimble M3 features a focus beam non-prism EDM. This unique system minimizes signal return from targets out of focus. The reticle clearly shows the measuring beam location. This system is unmatched in its ability to provide positive target identification in non-prism applications. Also features new onboard software for a wide variety of surveying applications.
25. Internal removable & external.