

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	Carlson Software	Carlson Software	MicroSurvey Software Inc.	Prosurv LLC	Prosurv LLC	Prosurv LLC
MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)	Same	Same	Same	Same	Same	Same
PRODUCT NAME OR MODEL NUMBER	Carlson SurvCE	Carlson Tsunami	FieldGenius 2004	Prosurv CE Data Collection	Prosurv PC	Prosurv CE
SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)	\$995 - \$2995	\$2495	\$595 - \$1995	\$395/\$595/\$795	\$395/\$595/\$795	\$149
-Technical support	A	A	B, \$99.50 per year	B [3]	B, 90 days free	B, 15 days free
-Warranty (months)	N/A	N/A	N/A	[4]	90 day free upgrades	1 year free upgrades
-Money-back guarantee (months)	1	1	1			
<b>PLATFORM &amp; INSTRUMENTS</b>						
-Name/model of handheld computer or onboard total station	Windows CE computers	[1]	Windows CE computers	[5]	Windows PC or laptop	Pocket PCs [101]
-Operating Systems:						
Windows systems (specify)	CE	Windows 98 or higher	CE	CE.net/CE 3.0	98/Me/2000/XP	Mobile 2003/CE.net
Other (specify)						Pocket PC 2002
-Minimum RAM required (if optional/adjustable on above device)	32 Mb	64 Mb	32 Mb	64 Mb	64 Mb	64 Mb
-Minimum screen size required	N/A	N/A	240 x 320/320 x 240	[6]	Any	240 x 320
-Color display support? (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
-Laser rangefinders? If yes, # of brands.	No	No	Yes, 2			
-Digital levels? If yes, # of brands.	No	No		3	Yes, 3	Add on (3)
-Total stations? If yes, # of brands.	Yes, all	Yes, all major brands	Yes, all major brands	10	Yes, 10	8
-Robotic total stations? If yes, # of brands.	Yes, all	Yes, all major brands	Yes, all major brands	2	Yes, 1	Pending
-GPS receivers (non-RTK)? If yes, # of brands.	No	Yes, all major brands	Yes, all major brands		No	0
-GPS receivers (RTK)? If yes, # of brands.	Yes, all	Yes, all major brands	Yes, all major brands		No	0
-Other instruments? Describe.					Leica Robotic w/ PowerSearch	
<b>MEASUREMENT SETUP</b>						
-Set All Instrument Parameters?	Yes	Yes	Yes	Yes [7]	Yes [7]	Yes [7]
-Set All Measurement Parameters?	Yes	Yes	Yes	Yes [8]	Yes [8]	Yes [8]
-Set up and Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes [9]	Yes [9]	Yes [9]
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	Yes	Yes	Yes	Yes [10]	Yes [10]	Yes [10]
<b>DATA STORAGE AND COLLECTION</b>						
-Maximum number of point measurements that can be stored as raw or coordinates with point number and description	Unlimited	Unlimited	Unlimited	40,000 points per job	30,000 per job	15,000 per job
-Stores multiple jobs? If yes, # of jobs? (N/#/Unlimited)	Yes	Unlimited	Unlimited	Yes, unlimited	Unlimited	Unlimited
-Record descriptive notes?	Yes	Yes	Yes	Yes [11]	Yes [11]	Yes [11]
-Record point code (not number)?	Yes	Yes	Yes	Yes [12]	Yes [12]	Yes [12]
-Alphanumeric identification of points?	Yes	Yes	Yes	[13]	[13]	[13]
-Record height of instrument? (Y/N/Automatically)	Yes		Yes	Automatically	Automatically	Automatically
-Record height of target? (Y/N/Automatically)	Yes		Yes	Automatically	Automatically	Automatically
-Slope dist/horiz & vert/zen angle?	Yes	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>						
-Manual Data Entry?	Yes	Yes	Yes	Yes [14]	Yes [14]	Yes [14]
-Coordinate Editing?	Yes	Yes	Yes	Yes [15]	Yes [15]	Yes [15]
-Coordinate/Descriptor searching?	Yes	Yes	Yes	Yes [16]	Yes [16]	Yes [16]
-Erase and/or Edit Data?	Yes	Yes	Yes	Yes [17]	Yes [17]	Yes [17]
-Angles Direct and Reversed?	Yes	Yes	Yes	Yes [18]	Yes [18]	Yes [18]
-Automated Plot Codes (linework)?	Yes	Yes	Yes	Yes [19]	Yes [19]	Yes [19]
-Time Stamping of Data?	Yes	Yes	Yes	Yes [20]	Yes [20]	Yes [20]
<b>DATA AUTOMATION</b>						
-Point Code?	Yes	Yes	Yes	Yes [21]	Yes [21]	Yes [21]
-Point Number + 1?	Yes	Yes	Yes	Yes [22]	Yes [22]	Yes [22]
-Alphanumeric + 1?	Yes	Yes	Yes	No	No	No
-Height of Target?	Yes	Yes	Yes	Yes, all routines	Yes, all	Yes, all
<b>FEATURES</b>						
-Angle calculator?	Yes	Yes	Yes	Yes [23]	Yes [23]	Yes [23]
-COGO Functions?	Yes	Yes	Yes	[24]	[24]	Yes [53]
-Traverse Computations?	Yes	Yes	Yes	Yes [25]	Yes [25]	Yes [25]
-Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes	Yes
-Topography?	Yes	Yes	Yes	Yes [26]	Yes [26]	Yes [26]
-Stakeout?	Yes	Yes	Yes	Yes [27]	Yes [27]	Yes [27]
-Radial stakeout?	Yes	Yes	Yes	[28]	[28]	[28]
-Stake to a Line?	Yes	Yes	Yes	Yes [29]	Yes [29]	Yes [29]
-Stakeout of alignments based on templates?	Yes	Yes	Yes	Yes [30]	Yes [30]	No
-Offset Stake?	Yes	Yes	Yes	Yes [31]	Yes [31]	Yes [54]
-Slope Stake?	Yes	Yes	Yes	Yes [32]	Yes [32]	Yes [55]
-Inverse?	Yes	Yes	Yes	[33]	[33]	Yes [56]
-Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes [34]	Yes [34]	Yes [34]
-Multiple point least squares resection?	Yes	Yes	Yes	Yes [35]	Yes [35]	No
-Remote Elevation?	Yes	Yes	Yes	Yes [36]	Yes [36]	Yes
-Calculate Coordinates?	Yes	Yes	Yes	Yes [37]	Yes [37]	Yes
-Store Coordinates?	Yes	Yes	Yes	Yes [38]	Yes [38]	Yes
-Display Raw Data?	Yes	Yes	Yes	[39]	[39]	No [57]
-Collimation Correction?	Yes	Yes	No	Yes	Yes	Yes
-Cut/Fill Data Storage/Display?	Yes	Yes	Yes	Yes [40]	Yes [40]	Yes [40]
-DTM Surface Area Cut/Fill?	Yes	Yes	Yes	No	No	No
-Volume Calculations?	No	Yes	Yes	Yes, automated	Yes, automated	No
-Leveling Routines?	Yes	Yes	No	Yes [41]	Yes [41]	Yes [58]
-Can Data Collector Provide CSV/ASCII File export?	Yes	Yes	Yes	Yes [42]	Yes [42]	Yes [42]
-Send Data Direct to a Printer?	Yes	Yes	No	No [43]	[43]	No
<b>INTERACTIVE MAP</b>						
-View data point map?	Yes	Yes	Yes	[44]	[44]	[44]
-View point codes/names?	Yes	Yes	Yes	[45]	[45]	[45]
-Pan/Zoom map?	Yes	Yes	Yes	Yes [46]	Yes, RT Pan [46]	Yes [46]
-Graphically select point for stakeout, COGO, editing, etc.?	Yes	Yes	Yes	Yes [47]	Yes [47]	Yes [47]
-View background map? (DXF, etc.)	Yes	DWG (native)	Yes	No	Import tiff	
-Support user-selected display of multiple layers?	Yes	Yes	Yes	Yes [48]	Yes [48]	Yes [48]
-Layer visibility thresholds based on zoom?	Yes	Yes	Yes	Yes [49]	Yes [49]	Yes [49]
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>						
-Does the software support import or manual entry of road alignments?	Yes	Yes	Yes	Yes [50]	Yes, both [50]	[58]
-Describe other Special Features			[2]	[51]	[60]	[61]
-Foreign languages supported? (specify)			No			[62]
-Describe						
<b>READER SERVICE NUMBER</b>	1	2	3	4	5	6

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	RAMSS Inc.	RAMSS Inc.	RAMSS Inc.	SMI	SMI	SMI
<b>MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)</b>	Same	Same	Same			
<b>PRODUCT NAME OR MODEL NUMBER</b>	Student Cogo	SiteStake	Party Chief Advanced COGO & Collection	Construction	Construction with GPS/Robotic	Data Collection
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>	\$149	\$249	\$598	\$1600	\$2600	\$700
- Technical support	A, 12	A	A	B, C	B, C	B, C
- Warranty (months)	12	12	12	12	12	12
- Money-back guarantee (months)	1	1	1	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>						
- Name/model of handheld computer or onboard total station	HP48GX	HP48GX	HP48GX	[63]	[63]	[63]
- Operating Systems:						
Windows systems (specify)				[64]	[64]	[64]
Other (specify)				N/A	N/A	
- Minimum RAM required (if optional/adjustable on above device)	N/A	N/A	128K	32 Mb	32 Mb	32 Mb
- Minimum screen size required	N/A	N/A	N/A	N/A	N/A	N/A
- Color display support? (Y/N)	N	N	N	Yes	Yes	Yes
- Laser rangefinders? If yes, # of brands.	No	1	1	Yes, 4	Yes, 4	Yes, 4
- Digital levels? If yes, # of brands.	No	0	0	Yes, 3	Yes, 3	Yes, 3
- Total stations? If yes, # of brands.	No	7	7	Yes, 11	Yes, 11	Yes, 11
- Robotic total stations? If yes, # of brands.	No	0	1	No	Yes, 5	No
- GPS receivers (non-RTK)? If yes, # of brands.	No	0	0	No	Yes, GGA	No
- GPS receivers (RTK)? If yes, # of brands.	No	0	0	No	Yes, 5	No
- Other instruments? Describe.						
<b>MEASUREMENT SETUP</b>						
- Set All Instrument Parameters?	No	Yes	Yes	Yes	Yes	Yes
- Set All Measurement Parameters?	Yes	Yes	Yes	Yes	Yes	Yes
- Set up and Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes	Yes
- Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	No	No	No	Yes, macros	Yes, macros	Yes, macros
<b>DATA STORAGE AND COLLECTION</b>						
- Maximum number of point measurements that can be stored as raw or coordinates with point number and description	2000	2000	24000	9600 per 1 Mb	9600 per 1 Mb	9600 per 1 Mb
- Stores multiple jobs? If yes, # of jobs? (N/#/Unlimited)	Unlimited	Unlimited	240	Yes, unlimited	Yes, unlimited	Yes, unlimited
- Record descriptive notes?	Yes	Yes	Yes	Yes	Yes	Yes
- Record point code (not number)?	No	No	Yes	Yes	Yes	Yes
- Alphanumeric identification of points?	No	No	No	No	No	No
- Record height of instrument? (Y/N/Automatically)				Yes	Yes	Yes
- Record height of target? (Y/N/Automatically)				Yes	Yes	Yes
- Slope dist/horiz & vert/zen angle?	Yes	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>						
- Manual Data Entry?	Yes	Yes	Yes	Yes	Yes	Yes
- Coordinate Editing?	Yes	Yes	Yes	Yes	Yes	Yes
- Coordinate/Descriptor searching?	No	No	No	Yes	Yes	Yes
- Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes	Yes
- Angles Direct and Reversed?	No	No	Yes	Yes	Yes	Yes
- Automated Plot Codes (linework)?	No	No	Yes	Yes	Yes	Yes
- Time Stamping of Data?	No	No	No	Yes	Yes	Yes
<b>DATA AUTOMATION</b>						
- Point Code?	No	No	Yes	Yes	Yes	Yes
- Point Number + 1?	Yes	Yes	Yes	Yes	Yes	Yes
- Alphanumeric + 1?	No	No	Yes	No	No	No
- Height of Target?	Yes	Yes	Yes	Yes	Yes	Yes
<b>FEATURES</b>						
- Angle calculator?	Yes	Yes	Yes	Yes	Yes	Yes
- COGO Functions?	Yes	Yes	Yes	Yes	Yes	Yes
- Traverse Computations?	Yes	Yes	Yes	Yes	Yes	Yes
- Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes	Yes
- Topography?	No	No	Yes	Yes	Yes	Yes
- Stakeout?	Yes	Yes	Yes	Yes	Yes	Yes
- Radial stakeout?	Yes	Yes	Yes	Yes	Yes	Yes
- Stake to a Line?	Yes	Yes	Yes	Yes	Yes	Yes
- Stakeout of alignments based on templates?	No	No	Yes	Yes	Yes	No
- Offset Stake?	Yes	Yes	Yes	Yes	Yes	Yes
- Slope Stake?	No	Yes	Yes	Yes	Yes	No
- Inverse?	Yes	Yes	Yes	Yes	Yes	Yes
- Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	Yes	Yes
- Multiple point least squares resection?	No	No	No	No	No	No
- Remote Elevation?	Yes	Yes	Yes	Yes	Yes	Yes
- Calculate Coordinates?	Yes	Yes	Yes	Yes	Yes	Yes
- Store Coordinates?	Yes	Yes	Yes	Yes	Yes	Yes
- Display Raw Data?	Yes	Yes	Yes	Yes	Yes	Yes
- Collimation Correction?	No	No	No	No	No	No
- Cut/Fill Data Storage/Display?	Yes	Yes	Yes	Yes	Yes	Yes
- DTM Surface Area Cut/Fill?	No	No	No	No	No	No
- Volume Calculations?	Yes	Yes	Yes	Yes	Yes	Yes
- Leveling Routines?	Yes	Yes	Yes	Yes	Yes	Yes
- Can Data Collector Provide CSV/ASCII File export?	No	Yes	Yes	Yes	Yes	Yes
- Send Data Direct to a Printer?	Yes	Yes	Yes	Yes	Yes	Yes
<b>INTERACTIVE MAP</b>						
- View data point map?	No	No	No	Yes	Yes	Yes
- View point codes/names?	No	No	No	Pt #s	Pt #s	Pt #s
- Pan/Zoom map?	No	No	No	No	No	No
- Graphically select point for stakeout, COGO, editing, etc.?	No	No	No	No	No	No
- View background map? (DXF, etc.)	No	No	No	No	No	No
- Support user-selected display of multiple layers?	No	No	No	No	No	No
- Layer visibility thresholds based on zoom?	No	No	No	No	No	No
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>						
- Does the software support import or manual entry of road alignments?	Manual entry	Manual	Yes	Yes	Yes	No
- Describe other Special Features	[102]	[103]	Automated gradesheet [104]		[65]	
- Foreign languages supported? (specify)						
- Describe						
<b>READER SERVICE NUMBER</b>	7	8	9	10	11	12

N/A=Not Applicable

Numbers in brackets refer to notes (see page 48).

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	SMI	Sokkia	Sokkia	Sokkia	Topcon
<b>MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)</b>		Carlson Software	Same	Same	Same
<b>PRODUCT NAME OR MODEL NUMBER</b>	Data Collection with GPS/Robotic	Carlson SurvCE	SDR Level 5	PowerSet SDR	TopSURV
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>	\$1700	\$995 - \$2995	Contact Sokkia	Contact Sokkia	Contact Topcon
-Technical support	B, C	A	A, 800/255-3913	A	
-Warranty (months)	12	3	12	12	
-Money-back guarantee (months)	1	N/A	1	N/A	
<b>PLATFORM &amp; INSTRUMENTS</b>					
-Name/model of handheld computer or onboard total station	[63]	Allegro CX	[108]	PowerSet	FC-100/FC-1000
-Operating Systems:					
-Windows systems (specify)	[64]	CE.NET 4.2	CE/CE.NET		CE.NET/3.0
-Other (specify)					N/A
-Minimum RAM required (if optional/adjustable on above device)	32 Mb	64 Mb	16 Mb	DTS	64 Mb
-Minimum screen size required		320 x 240		DTS	320 x 240
-Color display support? (Y/N)	Yes	Yes	Yes	N/A	Yes
-Laser rangefinders? If yes, # of brands.	Yes, 4	4	Yes, 2	N/A	Yes
-Digital levels? If yes, # of brands.	Yes, 3	No	Yes, 3	N/A	No
-Total stations? If yes, # of brands.	Yes, 11	9	Yes, 7	N/A	Yes
-Robotic total stations? If yes, # of brands.	Yes, 5	5	Yes, 1	N/A	Yes
-GPS receivers (non-RTK)? If yes, # of brands.	Yes, GGA	8	Yes, 2	N/A	Yes
-GPS receivers (RTK)? If yes, # of brands.	Yes, 5	6	Yes, 2	N/A	Yes
-Other instruments? Describe.		[105]		N/A	mmGPS+
<b>MEASUREMENT SETUP</b>					
-Set All Instrument Parameters?	Yes	Yes	Yes	Yes	Yes
-Set All Measurement Parameters?	Yes	Yes	Yes	Yes	Yes
-Set up and Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	Yes, macros	Yes	No		Yes
<b>DATA STORAGE AND COLLECTION</b>					
-Maximum number of point measurements that can be stored as raw or coordinates with point number and description	9600 per 1 Mb	Unlimited	500,000+ [109]		Unlimited
-Stores multiple jobs? If yes, # of jobs? (N#/Unlimited)	Yes, unlimited	Unlimited	Yes	Unlimited	Unlimited
-Record descriptive notes?	Yes	Yes	Yes	Yes	Yes
-Record point code (not number)?	Yes	Yes	Yes	Yes	Yes
-Alphanumeric identification of points?	No	Yes	Yes	Yes	Yes
-Record height of instrument? (Y/N/Automatically)	Yes	Yes	Yes	Yes	Automatically
-Record height of target? (Y/N/Automatically)	Yes	Yes	Yes	Yes	Automatically
-Slope dist/horiz & vert/zen angle?	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
-Manual Data Entry?	Yes	Yes	Yes	Yes	Yes
-Coordinate Editing?	Yes	Yes	Yes	Yes	Yes
-Coordinate/Descriptor searching?	Yes	Yes	Yes	Yes	Yes
-Erase and/or Edit Data?	Yes	Yes	No	Yes, by job	Yes
-Angles Direct and Reversed?	Yes	Yes	Yes	Yes	Yes
-Automated Plot Codes (linework)?	Yes	Yes	No	Yes	Yes
-Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
-Point Code?	Yes	Yes	Yes	Yes	Yes
-Point Number + 1?	Yes	Yes	Yes	Yes	Yes
-Alphanumeric + 1?	No	Yes	Yes	Yes	Yes
-Height of Target?	Yes	Yes	Yes	Yes	Yes
<b>FEATURES</b>					
-Angle calculator?	Yes	Yes	Yes	Yes	Yes
-COGO Functions?	Yes	Yes	Yes	Yes	Yes
-Traverse Computations?	Yes	Yes	Yes	Yes	Yes
-Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes
-Topography?	Yes	Yes	Yes	Yes	Yes
-Stakeout?	Yes	Yes	Yes	Yes	Yes
-Radial stakeout?	Yes	Yes	Yes	Yes	Yes
-Stake to a Line?	Yes	Yes	Yes	Yes	Yes
-Stakeout of alignments based on templates?	No	Yes	Yes	Yes	Yes
-Offset Stake?	Yes	Yes	Yes	Yes	Yes
-Slope Stake?	No	Yes	Yes	Yes	Yes
-Inverse?	Yes	Yes	Yes	Yes	Yes
-Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	Yes
-Multiple point least squares resection?	No	Yes	Yes	Yes	Yes
-Remote Elevation?	Yes	Yes	Yes	Yes	Yes
-Calculate Coordinates?	Yes	Yes	Yes	Yes	Yes, simultaneously
-Store Coordinates?	Yes	Yes	Yes	Yes	Yes
-Display Raw Data?	Yes	Yes	Yes	Yes	Yes
-Collimation Correction?	No	Yes	Yes	Yes	Yes
-Cut/Fill Data Storage/Display?	Yes	Yes	Yes	Yes	Yes
-DTM Surface Area Cut/Fill?	No	Yes	Yes	Yes	Yes
-Volume Calculations?	Yes	Yes	Yes	Yes	Yes
-Leveling Routines?	Yes	No	Yes, With SDL30	No	No
-Can Data Collector Provide CSV/ASCII File export?	Yes	Yes	Yes, via desktop software	Yes	Yes
-Send Data Direct to a Printer?	Yes	Yes	Yes	Yes	No
<b>INTERACTIVE MAP</b>					
-View data point map?	Yes	Yes	Yes	N/A	Yes
-View point codes/names?	Pt #5	Yes	Yes	N/A	Yes
-Pan/Zoom map?	No	Yes	Yes	N/A	Yes
-Graphically select point for stakeout, COGO, editing, etc.?	No	Yes	No	N/A	Yes
-View background map? (DXF, etc.)	No	Yes	No		Nov-04
-Support user-selected display of multiple layers?	No	Yes	No		Yes
-Layer visibility thresholds based on zoom?	No	Yes	No		No
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
-Does the software support import or manual entry of road alignments?	No	Yes	Yes		Yes
-Describe other Special Features	[65]	[106][107]		[110]	Configure menus
-Foreign languages supported? (specify)		No	Yes		All major languages
-Describe					
<b>READER SERVICE NUMBER</b>	13	14	15	16	17

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	Traverse PC	Traverse PC	Trimble	Trimble	Trimble
MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)	Same	Same	Same	TDS	Same
PRODUCT NAME OR MODEL NUMBER	THH Standard	THH Professional	Geodimeter Control Unit	Trimble Survey Pro [72]	Survey Controller 10.X
SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)	\$499	\$899	Contact distributor	Contact distributor	Contact distributor
- Technical support	B, C, [66]	B, C, [66]	A	A	A
- Warranty (months)	3	3	12	12	12
- Money-back guarantee (months)	1	1			
<b>PLATFORM &amp; INSTRUMENTS</b>					
- Name/model of handheld computer or onboard total station	[67]	[67]	Geodimeter	[73]	[75]
- Operating Systems:					
- Windows systems (specify)	N/A	N/A	N/A	CE.NET	CE.NET
- Other (specify)	MS-DOS	MS-DOS	Proprietary		N/A
- Minimum RAM required (if optional/adjustable on above device)	2 Mb	2 Mb	N/A	32 Mb	N/A
- Minimum screen size required	[68]	[68]	N/A	320 x 240	N/A
- Color display support? (Y/N)	No	No	No	Yes	Yes
- Laser rangefinders? If yes, # of brands.	1	1	No	Yes, 4	Yes, 4
- Digital levels? If yes, # of brands.	No	No	No	No	No
- Total stations? If yes, # of brands.	All current	All current	Yes, 2	Yes, 8	Yes, 8 [76]
- Robotic total stations? If yes, # of brands.	No	No	Yes, 2	Yes, 5	Yes, 2
- GPS receivers (non-RTK)? If yes, # of brands.	No	No	No	Yes, 5	Yes, 1
- GPS receivers (RTK)? If yes, # of brands.	No	[70]	No	Yes, 5	Yes, 1
- Other instruments? Describe.			N/A		[77]
<b>MEASUREMENT SETUP</b>					
- Set All Instrument Parameters?	No	No	Yes	Yes	Yes
- Set All Measurement Parameters?	Yes	Yes	Yes	Yes	Yes
- Set up and Edit Point Description quick-pick lists?	Yes	Yes	No	Yes	Yes
- Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	Yes	Yes	No	Yes	Yes
<b>DATA STORAGE AND COLLECTION</b>					
- Maximum number of point measurements that can be stored as raw or coordinates with point number and description	Unlimited [69]	Unlimited [69]	5,000/50,000	[74]	Min >10,000
- Stores multiple jobs? If yes, # of jobs? (N/#/Unlimited)	Unlimited [69]	Unlimited [69]	Unlimited	Unlimited	Unlimited
- Record descriptive notes?	Yes	Yes	Yes	Yes	Yes
- Record point code (not number)?	Yes	Yes	Yes	Yes	Yes
- Alphanumeric identification of points?	Yes	Yes	Yes	Yes	Yes
- Record height of instrument? (Y/N/Automatically)	Yes	Yes	Automatically	Automatically	Yes
- Record height of target? (Y/N/Automatically)	Yes	Yes	Automatically	Automatically	Yes
- Slope dist/horiz & vert/zen angle?	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
- Manual Data Entry?	Yes	Yes	Yes	Yes	Yes
- Coordinate Editing?	Yes	Yes	Yes	Yes	Yes
- Coordinate/Descriptor searching?	No	Yes	Yes	Yes	Yes
- Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes
- Angles Direct and Reversed?	Yes	Yes	Yes	Yes	Yes
- Automated Plot Codes (linework)?	No	Yes	Yes	Yes	Yes
- Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
- Point Code?	Yes	Yes	Yes	Yes	Yes
- Point Number + 1?	Yes	Yes	Yes	Yes	Yes
- Alphanumeric + 1?	Yes	Yes	Yes	Yes	Yes
- Height of Target?	Yes	Yes	Yes	Yes	Yes
<b>FEATURES</b>					
- Angle calculator?	Yes	Yes	Yes	Yes	Yes
- COGO Functions?	Yes	Yes	Yes	Yes	Yes
- Traverse Computations?	Yes	Yes	Yes	Yes	Yes
- Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes
- Topography?	Yes	Yes	Yes	Yes	Yes
- Stakeout?	Yes	Yes	Yes	Yes	Yes
- Radial stakeout?	Yes	Yes	Yes	Yes	Yes
- Stake to a Line?	Yes	Yes	Yes	Yes	Yes
- Stakeout of alignments based on templates?	No	No	Yes	Yes	Yes
- Offset Stake?	Yes	Yes	Yes	Yes	Yes
- Slope Stake?	No	No	Yes	Yes	Yes
- Inverse?	Yes	Yes	Yes	Yes	Yes
- Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	Yes
- Multiple point least squares resection?	No	No	Yes	Yes	Yes
- Remote Elevation?	Yes	Yes	Yes	Yes	Yes
- Calculate Coordinates?	Yes	Yes	Yes	Yes, in real-time	Yes
- Store Coordinates?	Yes	Yes	Yes	Yes	Yes
- Display Raw Data?	Yes	Yes	Yes	Yes	Yes
- Collimation Correction?	No	No	Yes	Yes	Yes
- Cut/Fill Data Storage/Display?	Yes	Yes	Yes	Yes	Yes
- DTM Surface Area Cut/Fill?	No	No	No	Yes	Yes
- Volume Calculations?	No	No	Yes	Yes	No
- Leveling Routines?	No	No	Yes	Yes	No
- Can Data Collector Provide CSV/ASCII File export?	Yes	Yes	Yes	Yes	Yes
- Send Data Direct to a Printer?	Yes	Yes	No	No	No
<b>INTERACTIVE MAP</b>					
- View data point map?	Yes	Yes	No	Yes	Yes
- View point codes/names?	Yes	Yes	No	Yes	Yes
- Pan/Zoom map?	Yes	Yes	No	Yes	Yes
- Graphically select point for stakeout, COGO, editing, etc.?	No	No	No	Yes	Yes
- View background map? (DXF, etc.)	No	No	N/A	Yes	ASCII DXF
- Support user-selected display of multiple layers?	Yes	Yes	No	Yes	Yes
- Layer visibility thresholds based on zoom?	No	No	No	No	No
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
- Does the software support import or manual entry of road alignments?	No	Yes	Yes	Yes	Yes
- Describe other Special Features		Multi-layer attributing	Contact distributor	Contact distributor	Bluetooth capable
- Foreign languages supported? (specify)			[71]	Contact distributor	Yes, 10 languages [78]
- Describe			Contact distributor	Contact distributor	Contact distributor
<b>READER SERVICE NUMBER</b>	18	19	20	21	22

N/A=Not Applicable

Numbers in brackets refer to notes (see page 48).

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems
<b>MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)</b>	Same	Same	Same	Same	Same
<b>PRODUCT NAME OR MODEL NUMBER</b>	COGO for HP 48GX	Survey Standard for Windows CE	Survey Pro for Windows CE	Survey Pro Robotics/Max [83]	Survey Pro GPS/Max [83]
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>	\$159	\$1000	\$1700	\$2200/\$3300	\$2900/\$3300
-Technical support	A	A	A	A	A
-Warranty (months)	3	12	12	12	12
-Money-back guarantee (months)	1	1	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>					
-Name/model of handheld computer or onboard total station	HP 48GX	TDS Ranger/TDS Recon	TDS Ranger/TDS Recon	TDS Ranger/TDS Recon	TDS Ranger/TDS Recon
-Operating Systems:					
-Windows systems (specify)		CE.NET	CE.NET	CE.NET	CE.NET
-Other (specify)		Windows CE 3.0, 2.12	Windows CE 3.0, 2.12	Windows CE 3.0, 2.12	Windows CE 3.0, 2.12
-Minimum RAM required (if optional/adjustable on above device)	512K RAM Card	32 Mb	32 Mb	32 Mb	32 Mb
-Minimum screen size required		320 X 240	320 x 240	320 x 240	320 x 240
-Color display support? (Y/N)	No	Yes	Yes	Yes	Yes
-Laser rangefinders? If yes, # of brands.	0	4	4	4	4
-Digital levels? If yes, # of brands.	0	0	0	0	0
-Total stations? If yes, # of brands.	0	8	8	8	8
-Robotic total stations? If yes, # of brands.	0	5 [79]	5 [79]	5	5 [79]
-GPS receivers (non-RTK)? If yes, # of brands.	0	0	0	0	0
-GPS receivers (RTK)? If yes, # of brands.	0	0	0	5 [84]	5
-Other instruments? Describe.					
<b>MEASUREMENT SETUP</b>					
-Set All Instrument Parameters?		Yes	Yes	Yes	Yes
-Set All Measurement Parameters?		Yes	Yes	Yes	Yes
-Set up and Edit Point Description quick-pick lists?		Yes	Yes	Yes	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?		No	No	No	No
<b>DATA STORAGE AND COLLECTION</b>					
-Maximum number of point measurements that can be stored as raw or coordinates with point number and description	5000	[74][80][81]	[74][80][81]	[74][80][81]	[74][80][81]
-Stores multiple jobs? If yes, # of jobs? (N#/Unlimited)		Unlimited	Unlimited	Unlimited	Unlimited
-Record descriptive notes?		Yes	Yes	Yes	Yes
-Record point code (not number)?		Yes	Yes	Yes	Yes
-Alphanumeric identification of points?		Yes	Yes	Yes	Yes
-Record height of instrument? (Y/N/Automatically)		Automatically	Automatically	Automatically	Automatically
-Record height of target? (Y/N/Automatically)		Automatically	Automatically	Automatically	Automatically
-Slope dist/horiz & vert/zen angle?		Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
-Manual Data Entry?	Yes	Yes	Yes	Yes	Yes
-Coordinate Editing?	Yes	Yes	Yes	Yes	Yes
-Coordinate/Descriptor searching?		Yes	Yes	Yes	Yes
-Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes
-Angles Direct and Reversed?		Yes	Yes	Yes	Yes
-Automated Plot Codes (linework)?		Yes	Yes	Yes	Yes
-Time Stamping of Data?		Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
-Point Code?		Yes	Yes	Yes	Yes
-Point Number + 1?		Yes	Yes	Yes	Yes
-Alphanumeric + 1?		Yes	Yes	Yes	Yes
-Height of Target?		Yes	Yes	Yes	Yes
<b>FEATURES</b>					
-Angle calculator?	Yes	Yes	Yes	Yes	Yes
-COGO Functions?	Yes	Yes	Yes	Yes	Yes
-Traverse Computations?	Yes	Yes	Yes	Yes	Yes
-Backsight Selection after Traverse?		Yes	Yes	Yes	Yes
-Topography?		Yes	Yes	Yes	Yes
-Stakeout?	Yes	Yes	Yes	Yes	Yes
-Radial stakeout?	Yes	Yes	Yes	Yes	Yes
-Stake to a Line?		Yes	Yes	Yes	Yes
-Stakeout of alignments based on templates?		Yes	Yes	Yes	Yes
-Offset Stake?		No	Yes	Yes	Yes
-Slope Stake?		No	Yes	Yes	Yes
-Inverse?	Yes	Yes	Yes	Yes	Yes
-Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	Yes
-Multiple point least squares resection?		Yes	Yes	Yes	Yes
-Remote Elevation?	Yes	Yes	Yes	Yes	Yes
-Calculate Coordinates?	Yes	Yes, in real-time	Yes, in real-time	Yes, in real-time	Yes, in real-time
-Store Coordinates?	Yes	Yes	Yes	Yes	Yes
-Display Raw Data?		Yes	Yes	Yes	Yes
-Collimation Correction?		Yes	Yes	Yes	Yes
-Cut/Fill Data Storage/Display?		Yes	Yes	Yes	Yes
-DTM Surface Area Cut/Fill?		No	Yes	Yes	Yes
-Volume Calculations?	Yes	No	Yes	Yes	Yes
-Leveling Routines?	Yes	No	No	No	No
-Can Data Collector Provide CSV/ASCII File export?		Yes	Yes	Yes	Yes
-Send Data Direct to a Printer?	Yes	No	No	No	No
<b>INTERACTIVE MAP</b>					
-View data point map?		Yes	Yes	Yes	Yes
-View point codes/names?		Yes	Yes	Yes	Yes
-Pan/Zoom map?		Yes	Yes	Yes	Yes
-Graphically select point for stakeout, COGO, editing, etc.?		Yes	Yes	Yes	Yes
-View background map? (DXF, etc.)		No	No	No	No
-Support user-selected display of multiple layers?		Yes	Yes	Yes	Yes
-Layer visibility thresholds based on zoom?		No	No	No	No
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
-Does the software support import or manual entry of road alignments?		No	Yes	Yes	Yes
-Describe other Special Features		[82]	[82]	[82]	[82]
-Foreign languages supported? (specify)					
-Describe					
<b>READER SERVICE NUMBER</b>	23	24	25	26	27

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems	Tripod Data Systems
<b>MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)</b>	Same	Same	Tripod Data Systems	Same	Same
<b>PRODUCT NAME OR MODEL NUMBER</b>	Survey Standard for HP 48GX	Survey Pro for HP 48GX	Survey Standard for Pocket PC	Survey Pro for Pocket PC	Survey Pro Robotics for Pocket PC
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>	\$599	\$799	\$799	\$1299	\$1999
- Technical support	A	A	A	A	A
- Warranty (months)	3	3	12	12	12
- Money-back guarantee (months)	1	1	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>					
- Name/model of handheld computer or onboard total station	HP 48GX	HP 48GX	iPAQ 3600, 3700, 3800	iPAQ 3600, 3700, 3800	iPAQ 3600, 3700, 3800
- Operating Systems:					
- Windows systems (specify)			Pocket PC 2000, 2002	Pocket PC 2000, 2002	Pocket PC 2000, 2002
- Other (specify)					
- Minimum RAM required (if optional/adjustable on above device)	512K RAM card	512K RAM Card	32 Mb		32 Mb
- Minimum screen size required			240 x 320	240 x 320	240 x 320
- Color display support? (Y/N)	No	No	Yes	Yes	Yes
- Laser rangefinders? If yes, # of brands.	0	3	4	4	4
- Digital levels? If yes, # of brands.	0	4	0		
- Total stations? If yes, # of brands.	6	6	8	8	8
- Robotic total stations? If yes, # of brands.	0	0	5 [79]	5 [79]	5
- GPS receivers (non-RTK)? If yes, # of brands.	0	0	0	0	0
- GPS receivers (RTK)? If yes, # of brands.	0	0	0	0	0
- Other instruments? Describe.					
<b>MEASUREMENT SETUP</b>					
- Set All Instrument Parameters?	Yes	Yes	Yes	Yes	Yes
- Set All Measurement Parameters?	Yes	Yes	Yes	Yes	Yes
- Set up and Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes
- Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	No	No	No	No	No
<b>DATA STORAGE AND COLLECTION</b>					
- Maximum number of point measurements that can be stored as raw or coordinates with point number and description	5.2K/10.4K	5.2K/10.4K	[74][80][81]	[74][80][81]	[74][80][81]
- Stores multiple jobs? If yes, # of jobs? (N/#/Unlimited)	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
- Record descriptive notes?	Yes	Yes	Yes	Yes	Yes
- Record point code (not number)?	Yes	Yes	Yes	Yes	Yes
- Alphanumeric identification of points?	No	No	Yes	Yes	Yes
- Record height of instrument? (Y/N/Automatically)	Yes	Yes	Automatically	Automatically	Automatically
- Record height of target? (Y/N/Automatically)	Yes	Yes	Automatically	Automatically	Automatically
- Slope dist/horiz & vert/zen angle?	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
- Manual Data Entry?	Yes	Yes	Yes	Yes	Yes
- Coordinate Editing?	Yes	Yes	Yes	Yes	Yes
- Coordinate/Descriptor searching?	Yes	Yes	Yes	Yes	Yes
- Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes
- Angles Direct and Reversed?	Yes	Yes	Yes	Yes	Yes
- Automated Plot Codes (linework)?	Yes	Yes	Yes	Yes	Yes
- Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
- Point Code?	Yes	Yes	Yes	Yes	Yes
- Point Number + 1?	Yes	Yes	Yes	Yes	Yes
- Alphanumeric + 1?	No	No	Yes	Yes	Yes
- Height of Target?	Yes	Yes	Yes	Yes	Yes
<b>FEATURES</b>					
- Angle calculator?	Yes	Yes	Yes	Yes	Yes
- COGO Functions?	Yes	Yes	Yes	Yes	Yes
- Traverse Computations?	Yes	Yes	Yes	Yes	Yes
- Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes
- Topography?	Yes	Yes	Yes	Yes	Yes
- Stakeout?	Yes	Yes	Yes	Yes	Yes
- Radial stakeout?	Yes	Yes	Yes	Yes	Yes
- Stake to a Line?	No	Yes	Yes	Yes	Yes
- Stakeout of alignments based on templates?	No	No	No	Yes	Yes
- Offset Stake?	Yes	Yes	No [85]	Yes	Yes
- Slope Stake?	Yes	Yes	No	Yes	Yes
- Inverse?	Yes	Yes	Yes	Yes	Yes
- Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	Yes
- Multiple point least squares resection?	No	No	Yes	Yes	Yes
- Remote Elevation?	Yes	Yes	Yes	Yes	Yes
- Calculate Coordinates?	Yes	Yes	Yes, in real-time	Yes, in real-time	Yes, in real-time
- Store Coordinates?	Yes	Yes	Yes	Yes	Yes
- Display Raw Data?	Yes	Yes	Yes	Yes	Yes
- Collimation Correction?	Yes	Yes	Yes	Yes	Yes
- Cut/Fill Data Storage/Display?	Yes	Yes	Yes	Yes	Yes
- DTM Surface Area Cut/Fill?	No	No	No	Yes	Yes
- Volume Calculations?	No	No	No	Yes	Yes
- Leveling Routines?	Yes	Yes	No	No	No
- Can Data Collector Provide CSV/ASCII File export?	Yes	Yes	Yes	Yes	Yes
- Send Data Direct to a Printer?	Yes	Yes	No	No	No
<b>INTERACTIVE MAP</b>					
- View data point map?	No	No	Yes	Yes	Yes
- View point codes/names?	No	No	Yes	Yes	Yes
- Pan/Zoom map?	No	No	Yes	Yes	Yes
- Graphically select point for stakeout, COGO, editing, etc.?	No	No	Yes	Yes	Yes
- View background map? (DXF, etc.)					
- Support user-selected display of multiple layers?	No	No	Yes	Yes	Yes
- Layer visibility thresholds based on zoom?	No	No	No	No	No
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
- Does the software support import or manual entry of road alignments?	No	Yes	No	Yes	Yes
- Describe other Special Features			[82]	[86]	[86]
- Foreign languages supported? (specify)	Spanish				
- Describe				[82]	[82]
<b>READER SERVICE NUMBER</b>	28	29	30	31	32

N/A=Not Applicable

Numbers in brackets refer to notes (see page 48).

# Data Collector Software Survey

## Optical Surveying Data Collection Software

MANUFACTURER/DISTRIBUTOR	Tripod Data Systems	Western Latitudes	XYZworks	XYZworks	XYZworks
MANUFACTURER (ENTER SAME UNLESS ABOVE IS A DISTRIBUTOR)	Same	[88]	Same	Same	Same
PRODUCT NAME OR MODEL NUMBER	COGO for Pocket PC	DC-400CX	Fieldworks	Fieldworks with Fieldbook	Fieldworks w/HP iPAQ 2210
SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)	\$99	\$4475	\$995	\$1995	\$995
-Technical support	A	A	A, 30 days	A, 30 days	A, 30 days
-Warranty (months)	12	12	12	24	12
-Money-back guarantee (months)	1	1	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>					
-Name/model of handheld computer or onboard total station	Pocket PCs [87]	Allegro CX	Any Windows CE platform	XYZworks Fieldbook	iPAQ 2210 [99]
-Operating Systems:					
Windows systems (specify)	Pocket PC 2000, 2002	Windows CE.Net	CE.NET	CE	CE
Other (specify)			PocketPC		PocketPC
-Minimum RAM required (if optional/adjustable on above device)	16 Mb	64/128	32 Mb	64 Mb	64 Mb
-Minimum screen size required	240 x 320	240 x 320	240 x 320	240 x 320	240 x 320
-Color display support? (Y/N)	Yes	Yes	Yes	Yes	Yes
-Laser rangefinders? If yes, # of brands.		Yes, 2	Yes, 3	Yes, 3	Yes, 3
-Digital levels? If yes, # of brands.		No	No	No	No
-Total stations? If yes, # of brands.		All current	Yes, 9	Yes, 9	Yes, 9
-Robotic total stations? If yes, # of brands.		Yes, all current	Yes, 4	Yes, 4	Yes, 4
-GPS receivers (non-RTK)? If yes, # of brands.		Yes, all current	Yes, 6	Yes, 6	Yes, 6
-GPS receivers (RTK)? If yes, # of brands.		Yes, all current	Yes, 5	Yes, 5	Yes, 5
-Other instruments? Describe.			MDL Scanning Laser	MDL Scanning Laser	MDL Scanning Laser
<b>MEASUREMENT SETUP</b>					
-Set All Instrument Parameters?		Yes	Yes	Yes	Yes
-Set All Measurement Parameters?		Yes	Yes	Yes	Yes
-Set up and Edit Point Description quick-pick lists?		Yes	Yes	Yes	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?			Yes [89]	Yes [89]	Yes [89]
<b>DATA STORAGE AND COLLECTION</b>					
-Maximum number of point measurements that can be stored as raw or coordinates with point number and description	Memory dependent	Unlimited based on adding additional memory cards	250,000	500,000	500,000
-Stores multiple jobs? If yes, # of jobs? (N#/Unlimited)	Unlimited	Yes, unlimited	Yes, unlimited	Yes, unlimited	Yes, unlimited
-Record descriptive notes?		Yes	Yes	Yes	Yes
-Record point code (not number)?		Yes	Yes	Yes	Yes
-Alphanumeric identification of points?		Yes	No	No	No
-Record height of instrument? (Y/N/Automatically)		Yes	Yes	Yes	Yes
-Record height of target? (Y/N/Automatically)		Yes	Yes	Yes	Yes
-Slope dist/horiz & vert/zen angle?		Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
-Manual Data Entry?	Yes	Yes	Yes	Yes	Yes
-Coordinate Editing?	Yes	Yes	Yes [90]	Yes [90]	Yes [90]
-Coordinate/Descriptor searching?		Yes	No	No	No
-Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes
-Angles Direct and Reversed?		Yes	Yes	Yes	Yes
-Automated Plot Codes (linework)?		Yes	Yes	Yes, with PocketCAD	Yes
-Time Stamping of Data?		Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
-Point Code?		Yes	Yes	Yes	Yes
-Point Number + 1?		Yes	Yes	Yes	Yes
-Alphanumeric + 1?		No	No	No	No
-Height of Target?		Yes	Yes	Yes	Yes
<b>FEATURES</b>					
-Angle calculator?	Yes	Yes	Yes	Yes	Yes
-COGO Functions?	Yes	Yes	Yes [91]	Yes	Yes [91]
-Traverse Computations?	Yes	Yes	Yes	Yes	Yes [100]
-Backsight Selection after Traverse?	Yes	Yes	Yes	Yes	Yes
-Topography?	Yes	Yes	Yes	Yes	Yes
-Stakeout?	Yes	Yes	Yes	Yes	Yes
-Radial stakeout?	Yes	Yes	Yes	Yes	Yes
-Stake to a Line?		Yes	Yes	Yes	Yes
-Stakeout of alignments based on templates?		Yes	Yes	Yes	Yes
-Offset Stake?		Yes	Yes	Yes	Yes
-Slope Stake?		Yes	Yes	Yes	Yes
-Inverse?	Yes	Yes	Yes	Yes	Yes
-Standard 2 and 3 point resection?	Yes	Yes	Yes [92]	Yes [97]	Yes [92]
-Multiple point least squares resection?		Yes	No	No	No
-Remote Elevation?	Yes	Yes	Yes	Yes	Yes
-Calculate Coordinates?	Yes	Yes	Yes [90]	Yes [90]	Yes [90]
-Store Coordinates?	Yes	Yes	Yes	Yes	Yes
-Display Raw Data?		Yes	Yes [93]	Yes	Yes [93]
-Collimation Correction?		Yes	No	No	No
-Cut/Fill Data Storage/Display?		Yes	Yes	Yes	Yes
-DTM Surface Area Cut/Fill?		Yes	No	No	No
-Volume Calculations?		Yes	No	No	No
-Leveling Routines?		Yes	Yes [94]	Yes [94]	Yes [94]
-Can Data Collector Provide CSV/ASCII File export?		Yes	Yes	Yes	Yes
-Send Data Direct to a Printer?		Yes	No	No	No
<b>INTERACTIVE MAP</b>					
-View data point map?	Yes	Yes	Yes	Yes	Yes
-View point codes/names?	Yes	Yes	Yes	Yes	Yes
-Pan/Zoom map?	Yes	Yes	Yes, w/ PocketCAD [95]	Yes, w/ PocketCAD [95]	Yes, w/ PocketCAD [95]
-Graphically select point for stakeout, COGO, editing, etc.?	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-View background map? (DXF, etc.)		Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Support user-selected display of multiple layers?	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Layer visibility thresholds based on zoom?		Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
-Does the software support import or manual entry of road alignments?		Yes	Yes	Yes	Yes
-Describe other Special Features			[96]	[98]	[98]
-Foreign languages supported? (specify)		Yes	No	No	No
-Describe			English only	English only	English only
<b>READER SERVICE NUMBER</b>	33	34	35	36	37

# Data Collector Software Survey

## GPS Data Collection/Mapping Software

MANUFACTURER/DISTRIBUTOR	Carlson Software	Carlson Software	MicroSurvey Software Inc.	MicroSurvey Software Inc.	Prosurv LLC	Prosurv LLC
MANUFACTURER	Same	Same		Same	Same	Same
PRODUCT NAME OR MODEL NUMBER	Carlson SurvCE	Carlson Tsunami	FieldGenius GPS	FieldGenius 2004 GPS	Pocket Quads [6]	Prosurv Imaging [23]
SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)	\$1995 - \$2995	\$2495	\$1995	\$1190	\$150 [21]	\$150
-Technical support	A	A	A, 90 days free	B, \$99.50 per year	A, toll-free or E-mail	A, toll-free or E-mail
-Warranty (months)	N/A	N/A	1 year	N/A	1 year free upgrades	1 year free upgrades
-Money-back guarantee (months)	1	1	1	1		
<b>PLATFORM &amp; INSTRUMENTS</b>						
-Name/model of handheld computer, other (specify)	Windows CE computers	Panasonic Toughbook/similar	[1]	CE Computers	Pocket PCs [7]	PC or laptop
-Operating Systems:						
-Windows systems (specify)	CE	Windows 98 or higher	Windows CE 3.0, 2.11	CE	Mobile 2003, CE.net	Windows 98/Me/2000/XP
-Other (specify)					Pocket PC 2002	
-Minimum RAM required (if optional/adjustable on above device)	32 Mb	64 Mb	32 Mb	64 Mb	64 Mb	256 Mb
-Minimum screen resolution required (if optional/adjustable)	N/A	N/A	[2]	[2]		800 x 600
-Color display support?	Yes	Yes	Yes	Yes, optional	Yes	Yes
-Laser rangefinders? If yes, # of brands.	No	No	2	2	N/A	N/A
-Optical total stations? (If yes, # of brands.)	Yes, all major brands	Yes, all major brands	8	All common	N/A	N/A
-GPS receivers (non-RTK)? If yes, # of brands.	Yes, all major brands	Yes, all major brands	7	All common	[8]	[8]
-GPS receivers (RTK)? If yes, # of brands.	Yes, all major brands	Yes, all major brands	6	All common		
-Other instruments? Describe.						
<b>SETUP</b>						
-Set Instrument Parameters?	Yes	Yes	Yes	Yes	Yes [9]	Yes
-Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes [10]	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?	Yes	Yes	Yes	Yes	N/A	
<b>DATA STORAGE AND COLLECTION</b>						
-Maximum number of point measurements that can be stored as raw or coords with point number and description	Unlimited	Unlimited	Unlimited	Unlimited	[11]	Unlimited
-Stores Multiple Jobs? If yes, # of jobs? (N/#/Unlimited)	Yes	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
-Can the software attach external data files to the job file (types)? (e.g., comma delimited, geoid models, DTMs, DXF background maps)	Yes	Yes	Yes [3]	Yes [3]	[12]	[18]
-Enter or Capture Point Code (not number)?	Yes	Yes	No	Yes	Yes	No
-Alphanumeric Identification of Points?	Yes	Yes	Yes	Yes	Yes	No
-Enter base/rover height of bottom of antenna? (Y/N)	Yes	Yes	Yes	Yes	No	No
-Enter base/rover height of antenna phase center? (Y/N)	Yes	Yes	Yes	Yes	No	No
-Enter and determine WGS84? Lat/Long/Height	Yes	Yes	Yes	Yes	Yes	Yes
-Enter and determine geodetic coordinate? (Lat/Long/Height)	Yes	Yes	Yes	Yes	Yes	Yes
-Enter and determine local/published grid coordinates? (XYZ, NEE)	Yes	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>						
-Manual Coordinate Entry?	Yes	Yes	Yes	Yes	Yes	Yes
-Capture Descriptive Notes?	Yes	Yes	Yes	Yes	Yes [13]	Yes [24]
-Coordinate Editing?	Yes	Yes	Yes	Yes	No	No
-Coordinate / Descriptor searching?	Yes	Yes	No	Yes	Yes	Yes
-Erase and/or Edit Data?	Yes	Yes	Yes	Yes	No	Yes
-Adjustable data value limits?	Yes	Yes	No	Yes	N/A	N/A
-Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes [14]	Yes
-Automated plot codes? (linework)	Yes	Yes	Yes	Yes		N/A
<b>DATA AUTOMATION</b>						
-Point Number + 1?	Yes	Yes	Yes	Yes	Yes	Yes
-Alphanumeric + 1?	Yes	Yes	No	Yes	No	N/A
-Auto-Capture point based on time lapse?	Yes	Yes	Yes	Yes	Yes	Yes
-Auto-Capture point based on distance lapse?	Yes	Yes	Yes	Yes	Yes	Yes
<b>CALCULATIONS</b>						
-Calculate coordinates?	Yes	Yes	Yes	Yes	No [15]	Yes [25]
-Inverse?	Yes	Yes	Yes	Yes	Yes	Yes
-Calculate intersections? (bearing/bearing, distance/distance, etc.)	Yes	Yes	Yes	Yes	No [15]	Yes [26]
-Traverse computations?	Yes	Yes	Yes	Yes	No, N/A	No
-Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	No, N/A	No
-Calculate distance and azimuth between points?	Yes	Yes	Yes	Yes	Yes	Yes
-Calculate area?	Yes	Yes	Yes	Yes	No [15]	Yes
<b>NAVIGATION &amp; STAKEOUT</b>						
-Graphical navigation/stakeout?	Yes	Yes	Yes	Yes	Yes [16]	Yes
-Navigate to a stored point (waypoint)?	Yes	Yes	Yes	Yes	Yes	Yes
-Navigate to a manually-entered point?	Yes	Yes	Yes	Yes	Yes	Yes
-Stake to a line/arc?	Yes	Yes	Yes	Yes	No	No
-Stake to a point offset from a point, line or arc?	Yes	Yes	Yes	Yes	No	No
-Stake to a DTM/TIN?	Yes	Yes	Yes	Yes	No	No
-Capture lines and areas (as a single unique feature)	Yes	Yes	Yes	Yes	No	No
-Send data direct to a printer?	Yes	Yes	Yes	No	No	[27]
<b>INTERACTIVE MAP</b>						
-View data point map?	Yes	Yes	Yes	Yes	Yes	Yes
-Pan/zoom map?	Yes	Yes	Yes	Yes	Yes, pan [17]	Yes [28]
-View point codes/names?	Yes	Yes	Yes	Yes	Yes	Yes
-Graphically select point for stakeout, COGO, editing?	Yes	Yes	Yes	Yes	Yes	No, in progress
-View background map? (DXF, etc.)	Yes	Yes, DWG	Yes	Yes	Yes [18]	Yes [29]
-Support user-selected display of multiple layers?	Yes	Yes	Yes	Yes	Yes	Yes, using SETs of points
-Layer visibility thresholds based on zoom?	Yes	Yes	Yes	No	No	No
-Native (preferred) file type (.DXF, .DWG, etc.)	DXF, SHP	DWG	DXF	DXF, DBF	[19]	Geo-referenced .tif images
-Import/Export DWG file? (Y/N)	No	Yes	No	No	No	No
-Import/Export DXF file? (Y/N)	Yes	Yes	Yes	Yes, import & export	No	No
-Import/Export ASCII file? (Y/N)	Yes	Yes	Yes	Yes, import & export	Yes	Yes
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>						
-Graphical satellite display?	Yes	Yes	Yes, standard	Yes	Yes	No
-Other modules & special features:			[4]	[5]	[20]	[30]
-Describe					[22]	[31]
<b>READER SERVICE NUMBER</b>	38	39	40	41	42	43

N/A=Not Applicable

Numbers in brackets refer to notes (see page 49).

# Data Collector Software Survey

## GPS Data Collection/Mapping Software

MANUFACTURER/DISTRIBUTOR	SMI	SMI	Sokkia	Sokkia	Sokkia	Traverse PC
<b>MANUFACTURER</b>			Carlson Software	Same	Same	Same
<b>PRODUCT NAME OR MODEL NUMBER</b>	Data Collection with GPS/Robotic	Construction with GPS/Robotic	SurvCE GPS	SDR Level 5	IMap	THH Professional
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>	\$1700	\$2600	\$1995 - \$2995	Contact Sokkia	Contact Sokkia	\$899
-Technical support	B, C	B, C	A	A, 800/255-3913	A, 800/255-3913	B, C [57]
-Warranty (months)	12	12	3	12	12	3
-Money-back guarantee (months)	1	1	N/A	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>						
-Name/model of handheld computer, other (specify)	[32]	[32]	Allegro CX	[35]	[38]	[58]
-Operating Systems:						
-Windows systems (specify)	CE .Net, Pocket PC	CE .Net, Pocket PC	CE.NET 4.2	CE/CE.NET	Pocket PC 2003	N/A
-Other (specify)						MS-DOS
-Minimum RAM required (if optional/adjustable on above device)	32 MB	32 Mb	64 Mb	16 Mb		2 Mb
-Minimum screen resolution required (if optional/adjustable)			240 x 320			[59]
-Color display support?	Yes	Yes	Yes	Yes	Yes	No
-Laser rangefinders? If yes, # of brands.	Yes, 4	Yes, 4	4	Yes, 2	Yes, 6	1
-Optical total stations? (If yes, # of brands.)	Yes, 11	Yes, 11	9	Yes, 7	No	All current non-robotic
-GPS receivers (non-RTK)? If yes, # of brands.	Yes, GGA	Yes, GGA	8	Yes, 2	Yes, 13 DGPS	No
-GPS receivers (RTK)? If yes, # of brands.	Yes, 5	Yes, 5	6	Yes, 2		[60]
-Other instruments? Describe.	3 digital levels	3 digital levels	Any NMEA			
<b>SETUP</b>						
-Set Instrument Parameters?	Yes	Yes	Yes	Yes		No
-Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?				No	Yes	
<b>DATA STORAGE AND COLLECTION</b>						
-Maximum number of point measurements that can be stored as raw or coords with point number and description	9600 per 1 MB	9600 per 1 MB	Unlimited	500,000+ [36]	Unlimited w/ CF card	Unlimited [61]
-Stores Multiple Jobs? If yes, # of jobs? (N/#/Unlimited)	Yes, unlimited	Yes, unlimited	Unlimited	Yes	Yes	Unlimited [61]
-Can the software attach external data files to the job file (types)? (e.g., comma delimited, geoid models, DTMs, DXF background maps)	Yes (geoid)	Yes (geoid)	Yes	Yes	Yes	No
-Enter or Capture Point Code (not number)?	Yes	Yes	Yes	Yes	Yes	Yes
-Alphanumeric Identification of Points?	No	No	Yes	Yes	Yes	Yes
-Enter base/rover height of bottom of antenna? (Y/N)	No	No	Yes/yes	Yes	Yes	N/A
-Enter base/rover height of antenna phase center? (Y/N)	Yes	Yes	Yes/yes	Yes	Yes	N/A
-Enter and determine WGS84? Lat/Long/Height	Yes	Yes	Yes	Yes	Yes	Yes
-Enter and determine geodetic coordinate? (Lat/Long?Height)	Yes	Yes	Yes	Yes	Yes	Yes
-Enter and determine local/published grid coordinates? (XYZ, NEE)	Yes	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>						
-Manual Coordinate Entry?	Yes	Yes	Yes	Yes	Yes	Yes
-Capture Descriptive Notes?	Yes	Yes	Yes	Yes	Yes	Yes
-Coordinate Editing?	Yes	Yes	Yes	Yes	Yes	Yes
-Coordinate / Descriptor searching?	Yes	Yes	Yes	Yes	Yes	Yes
-Erase and/or Edit Data?	Yes	Yes	Yes	No	Yes	Yes
-Adjustable data value limits?	Yes	Yes	Yes	No	Yes	Yes
-Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes	Yes
-Automated plot codes? (linework)	Yes	Yes	Yes	No	Yes	Yes
<b>DATA AUTOMATION</b>						
-Point Number + 1?	Yes	Yes	Yes	Yes	Yes	Yes
-Alphanumeric + 1?	No	No	Yes	Yes	Yes	Yes
-Auto-Capture point based on time lapse?	No	No	Yes	Yes	Yes, interval	Yes
-Auto-Capture point based on distance lapse?	Yes	Yes	Yes	Yes	Yes, interval	Yes
<b>CALCULATIONS</b>						
-Calculate coordinates?	Yes	Yes	Yes	Yes	Yes	Yes
-Inverse?	Yes	Yes	Yes	Yes	Yes	Yes
-Calculate intersections? (bearing/bearing, distance/distance, etc.)	Yes	Yes	Yes	Yes	No	Yes
-Traverse computations?	Yes	Yes	Yes	Yes	No	Yes
-Standard 2 and 3 point resection?	Yes	Yes	Yes	Yes	No	Yes
-Calculate distance and azimuth between points?	Yes	Yes	Yes	Yes	Yes	Yes
-Calculate area?	Yes	Yes	Yes	Yes	Yes	Yes
<b>NAVIGATION &amp; STAKEOUT</b>						
-Graphical navigation/stakeout?	Yes	Yes	Yes	Yes	Yes	Yes
-Navigate to a stored point (waypoint)?	Yes	Yes	Yes	Yes	Yes	Yes
-Navigate to a manually-entered point?	Yes	Yes	Yes	Yes	Yes	Yes
-Stake to a line/arc?	Yes	Yes	Yes	Yes	Yes	Yes
-Stake to a point offset from a point, line or arc?	Yes	Yes	Yes	Yes	Yes	Yes
-Stake to a DTM/TIN?	No	No	Yes	Yes	Yes	No
-Capture lines and areas (as a single unique feature)	Yes	Yes	Yes	No	Yes	Yes
-Send data direct to a printer?	Yes	Yes	Yes	Yes	Yes, desktop version only	Yes
<b>INTERACTIVE MAP</b>						
-View data point map?	Yes	Yes	Yes	Yes	Yes	Yes
-Pan/zoom map?	No	No	Yes	Yes	Yes	Yes
-View point codes/names?	Pt #s	Pt #s	Yes	Yes	Yes	Yes
-Graphically select point for stakeout, COGO, editing?	No	No	Yes	No	Yes	No
-View background map? (DXF, etc.)	No	No	Yes	No	Yes	No
-Support user-selected display of multiple layers?	No	No	Yes	No	Yes	Yes
-Layer visibility thresholds based on zoom?	No	No	Yes	No	Yes	No
-Native (preferred) file type (.DXF, .DWG, etc.)	SMI	SMI	Yes	SDR Format	UDF	.TRH
-Import/Export DWG file? (Y/N)	No	No	No/no	Yes, via desktop software	No	No/no
-Import/Export DXF file? (Y/N)	Yes	Yes	Yes/yes	Yes, via desktop software	Yes	Yes/yes
-Import/Export ASCII file? (Y/N)	Yes	Yes	Yes/yes	Yes, via desktop software	Yes	Yes/yes
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>						
-Graphical satellite display?	Yes	Yes	Yes	Yes	Yes	No
-Other modules & special features:	[33]	[33]	[34]	[37]		Multi-layer attributing
-Describe						
<b>READER SERVICE NUMBER</b>	44	45	46	47	48	49

# Data Collector Software Survey

## GPS Data Collection/Mapping Software

MANUFACTURER/DISTRIBUTOR	Trimble	Tripod Data Systems	XYZworks	XYZworks	XYZworks
<b>MANUFACTURER</b>	Same	Same	Same	Same	Same
<b>PRODUCT NAME OR MODEL NUMBER</b>	TerraSync Professional	SOLO Field	Fieldworks	Fieldworks with Fieldbook	Fieldworks with HP iPAQ 4350
<b>SUGGESTED RETAIL PRICE (MSRP) (IN U.S. DOLLARS)</b>		\$1000	\$595	\$1995	\$1099
-Technical support	B	A	A, 30 days	A, 30 days	A, 30 days
-Warranty (months)	3	3	12	24	12
-Money-back guarantee (months)	0	1	1	1	1
<b>PLATFORM &amp; INSTRUMENTS</b>					
-Name/model of handheld computer, other (specify)	[39]	Any Win/Win CE	All Windows CE	XYZworks Fieldbook	4350 (works with any iPAQ)
-Operating Systems:					
-Windows systems (specify)	[40]	[42]	Windows CE	Windows CE	Windows CE
-Other (specify)			PocketPC		PocketCAD
-Minimum RAM required (if optional/adjustable on above device)	16 Mb	16 Mb	8 Mb	64 Mb	64 Mb
-Minimum screen resolution required (if optional/adjustable)	240 x 320	320x240/ 240x320	240 x 320	240 x 320	240 x 320
-Color display support?	Yes	Yes	Yes	Yes	Yes
-Laser rangefinders? If yes, # of brands.	Yes, 6	5	Yes, 3	Yes, 3	Yes, 3
-Optical total stations? (If yes, # of brands.)	No	2	Yes, 9	Yes, 9	Yes, 9
-GPS receivers (non-RTK)? If yes, # of brands.	Yes, Trimble	Unlimited	Yes, 6	Yes, 6	Yes, 6
-GPS receivers (RTK)? If yes, # of brands.	Yes, Trimble	7	Yes, 5	Yes, 4	Yes, 4
-Other instruments? Describe.	External sensors	Serial input for attributes	MDL scanning laser	MDL scanning laser	MDL scanning laser
<b>SETUP</b>					
-Set Instrument Parameters?	Yes	Yes [43]	Yes	Yes	Yes
-Edit Point Description quick-pick lists?	Yes	Yes	Yes	Yes	Yes
-Set survey style types defining various instrument, measurement and point description parameters to enable easy switching from one process or instrument to another?		Yes	Yes [49]	Yes [49]	Yes [49]
<b>DATA STORAGE AND COLLECTION</b>					
-Maximum number of point measurements that can be stored as raw or coords with point number and description	Unlimited	Dependent upon data collector storage capacity	250,000	500,000	500,000
-Stores Multiple Jobs? If yes, # of jobs? (N/#/Unlimited)	Yes, unlimited	Unlimited	Yes, unlimited	Yes, unlimited	Yes, unlimited
-Can the software attach external data files to the job file (types)? (e.g., comma delimited, geoid models, DTMs, DXF background maps)	Yes [45]	Yes [44]	Yes, with PocketCAD	Yes, with PocketCAD	Yes, w/ PocketCAD
-Enter or Capture Point Code (not number)?	Yes	Yes	Yes	Yes	Yes
-Alphanumeric Identification of Points?	Yes	Yes	No	No	No
-Enter base/rover height of bottom of antenna? (Y/N)	Yes	Yes	Yes/yes	Yes/yes	Yes/yes
-Enter base/rover height of antenna phase center? (Y/N)	Yes	Yes	Yes/yes	Yes/yes	Yes/yes
-Enter and determine WGS84? Lat/Long/Height	Yes	Yes	Yes	Yes	Yes
-Enter and determine geodetic coordinate? (Lat/Long?Height)	Yes	Yes	Yes	Yes	Yes
-Enter and determine local/published grid coordinates? (XYZ, NEE)	Yes	Yes	Yes	Yes	Yes
<b>MEASUREMENT SEQUENCES &amp; ATTRIBUTE COLLECTION</b>					
-Manual Coordinate Entry?	Yes	Yes	Yes	Yes	Yes
-Capture Descriptive Notes?	Yes	Yes	Yes	Yes	Yes
-Coordinate Editing?	No	Yes	Yes [50]	Yes [50]	Yes [50]
-Coordinate / Descriptor searching?	No	Yes, descriptor	No	No	No
-Erase and/or Edit Data?	Yes	Yes	Yes	Yes	Yes
-Adjustable data value limits?	Yes	Yes	Yes	Yes	Yes
-Time Stamping of Data?	Yes	Yes	Yes	Yes	Yes
-Automated plot codes? (linework)	Yes	Yes	Yes	Yes	Yes
<b>DATA AUTOMATION</b>					
-Point Number + 1?	Yes	Yes	Yes	Yes	Yes
-Alphanumeric + 1?	Yes	No	No	No	No
-Auto-Capture point based on time lapse?	Yes	Yes	Yes	Yes	Yes
-Auto-Capture point based on distance lapse?	Yes	Yes	Yes	No	No
<b>CALCULATIONS</b>					
-Calculate coordinates?	No	Yes	Yes [50]	Yes [50]	Yes [50]
-Inverse?	No	Yes	Yes [51]	Yes [52]	Yes [52]
-Calculate intersections? (bearing/bearing, distance/distance, etc.)	Yes	Yes	Yes	Yes	Yes
-Traverse computations?	No	Yes	Yes [53]	Yes [53]	Yes [53]
-Standard 2 and 3 point resection?	No	Yes, 2-point	Yes [54]	Yes [54]	Yes [54]
-Calculate distance and azimuth between points?	Yes	Yes	Yes	Yes	Yes
-Calculate area?	Yes	Yes	Yes	Yes	Yes
<b>NAVIGATION &amp; STAKEOUT</b>					
-Graphical navigation/stakeout?	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Navigate to a stored point (waypoint)?	Yes	Yes	Yes, via stakeout	Yes, via stakeout	Yes, via stakeout
-Navigate to a manually-entered point?	Yes	Yes	Yes, via stakeout	Yes, via stakeout	Yes, via stakeout
-Stake to a line/arc?	No	Yes	Yes	Yes	Yes
-Stake to a point offset from a point, line or arc?	No	No	Yes	Yes	Yes
-Stake to a DTM/TIN?	No	No	No	No	No
-Capture lines and areas (as a single unique feature)	Yes	Yes	No	Yes	No
-Send data direct to a printer?	No	No	No	No	No
<b>INTERACTIVE MAP</b>					
-View data point map?	Yes	Yes	Yes	Yes	Yes
-Pan/zoom map?	Yes	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-View point codes/names?	Yes	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Graphically select point for stakeout, COGO, editing?	Yes	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-View background map? (DXF, etc.)	BMP, JPEG, MrSID, TIFF	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Support user-selected display of multiple layers?	No	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Layer visibility thresholds based on zoom?	No	Yes	Yes, w/ PocketCAD	Yes, w/ PocketCAD	Yes, w/ PocketCAD
-Native (preferred) file type (.DXF, .DWG, etc.)	SSF	UDF and SHP	DWG or DGN	DWG or DGN	DWG or DGN
-Import/Export DWG file? (Y/N)	No/no	No	Yes/yes w/ PocketCAD	Yes/yes w/ PocketCAD	Yes/yes w/ PocketCAD
-Import/Export DXF file? (Y/N)	Yes/yes	Yes	Yes/yes w/ PocketCAD	Yes/yes w/ PocketCAD	Yes/yes w/ PocketCAD
-Import/Export ASCII file? (Y/N)	Yes/yes	Yes	Yes/yes	Yes/yes	Yes/yes
<b>OPTIONAL MODULES &amp; SPECIAL FEATURES</b>					
-Graphical satellite display?	Yes	Yes	Yes	Yes	Yes
-Other modules & special features:	[41]	[46]	[55][56]	[55][56]	
-Describe		[47][48]			
<b>READER SERVICE NUMBER</b>	50	51	52	53	54

N/A=Not Applicable

Numbers in brackets refer to notes (see page 49).

# 2004 Optical Surveying Data Collection Software Survey Notes

## Technical support options:

- A Unlimited free technical support.
- B Technical support available by a subscription.
- C Technical support available on a per-call basis.

Check out *POB's* annual hardware survey online at [www.pobonline.com](http://www.pobonline.com). Click on Product Surveys.

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

1. Panasonic Toughbook or similar.
2. Raw file editing, code free linework.
3. 90-day free tech support/upgrades. \$129/year after.
4. 90-day free upgrades including major.
5. Allegro CE / DAP / other Windows CE handheld PCs.
6. 320 x 240 / 240 x 320 / up to 640 x 480.
7. Enter default instrument in Defaults.txt file. Changes stored w/ each job.
8. Enter default parameters in Defaults.txt file. Changes stored w/ each job.
9. Define in Defaults.txt file. Edit in DC. Auto-store to stack. Unique for each job.
10. Each new job uses defaults, but stores all changes automatically with job when closed.
11. Complete feature code and attribute collection. Notes/codes/attributes 4096 characters each.
12. Enter or select from quick codes or entire FC list.
13. Alphanumeric point IDs have been superseded by use of attributes such as name.
14. Select manual from instrument list. All DC functions support manual entry.
15. Edit points by tapping them, or in point list. Legal audit trail of all edited coordinates.
16. Search by: P#, range N/E/Elev, text in descriptors, text in attributes.
17. Legal audit trail of deleted points and edited data.
18. D/R to any point. Traverse by closing the horizon up to 8 sets of D/R.
19. Supports control codes (begin, end, close). Real-time pt plotting & linework as you shoot.
20. Each setup stamps time/date. Also in header when exporting to .asc.
21. Repeats last code. Automated cross sectioning learns 50 codes and repeats.
22. Reset auto point by using a negative (-500).
23. Built-in calculator has 4 triangle solutions and auto-DMS conversions.
24. 40+ routines. 5 intersects. LS best fit line/curve. Trans/rotate. Prorate. Divide In/curve/section.
25. 3 Compass Rule Adj: closed, connecting, distribute plat error.
26. 8 types of shots: straight, separate <, offset, remote elev, fast trav, copy last, tree, angle.
27. 6 Staking routines: radial, stake line/curve 3D, stake alignment, 2 special slope.
28. Stake pt list (1.5,12.50), seq up/down, or SET (\*35). Auto-descr (Stake#312:Cut-2:15':Hub&Tack).
29. 3D; cut/fill based on station of shot.
30. Fully automated with templates. Or, use without templates (can give %left/right of cl).
31. Automatic in stake alignment.
32. Fully automated in stake alignment. Plus two special routines: stake catch point and slope offs.
33. 3D w/slope in DC. Tap 2 pts to inverse. 2 inverse reports, 500 pts each, save as .txt, around plat.
34. Allows averaging elevations. Computes based on both Bg/Bg and Dist/Dist intersects.
35. 13 point LS with separate angle and distance residual reports. Use any combo angles only & dist.
36. Also includes remote point that creates 3D point without needing a prism.
37. Dozens of coor calculation routines. Offset from tan, curves, spirals, buildings, or alignment.
38. Stores coordinates automatically as you shoot.
39. View raw data in DC in spreadsheet format. View by setup #. Find #/descr. 1st/last/back/next.
40. Display includes cut/fill and slope info. Auto-prompts with cut/fill; S/O; cut/fill to CL.
41. Digital leveling includes manual entry 3-wire or mid/dist; sideshots/runs with Fcodes. Auto-turn.
42. Import/export coordinate files using 18 pre-defined styles (i.e. csv) even lat/long, user-defined.
43. However 18 reports are saveable as text files. Then open with MS Word (CE) and print.
44. RT point plotting, linework as you shoot.
45. Select to show point #s, elevations, and/or descriptors. Select fonts/colors.
46. Also zoom by tapping two points on-screen.
47. Select by PickBox or rectangle. Places points into a set, then just stake the set (ie \*358).
48. By using sets. Create sets by point #, descriptor, text in attributes, more.
49. By set #. Zoom into a building or utility by set #.
50. Import SDR style alignments with H&V geo. Spirals, vertical curves. Or create H&V geometry easily.
51. Import NGS datasheets (reads .txt file/creates points), all NAD83 zones, LS 2D calibration, PD areas.
52. Not needed since point name can be stored as attribute for point & is searchable.
53. 32 functions, with 6+ command-line functions
54. I.e. 7\*9+90:10 in radial stakeout.
55. Using 3D stake to line.
56. In command line or by tapping.
57. Allows export raw data as text.
58. Add on (digital level or manual entry).
59. Manual entry of horizontal & vertical geometry.
60. Automatic download/upload with Prosurv CE device. Auto-convert files. PC jobs viewable in MS Access. PC version can restore CE raw/coor data using Prosurv CE's automatic text backup file. Leica Robotic support includes: continuous auto topo, CA stake to line, CA radial stake, auto (close horizon) traverse completion (auto wrap 8 sets of angles).
61. Bluetooth supported. iPAQ's with BT = cableless connection w/instr. Fast, robust data. Stores shots in less than one second (raw and coor data). In robotic continuous mode can store 2-3 shots per second. Robust data—all data is immediately committed to the database (raw/coor/etc). Prosurv cEZ jobs retain all data even if a soft-reset is performed while in a job. Automatic text backup (every shot) of raw data can restore raw (and coor) data in the rare case of a corrupted CE job file. Use Prosurv PC to restore or E-mail the file to Prosurv LLC for free restoration.
62. Installation guide provided in English or Spanish.
63. Allegro CX, Jett CE, other Windows CE & Pocket PC devices.
64. CE .Net, Pocket PC 2002.
65. Real-time side shot, real-time stake.
66. Thirty days of technical support included with purchase.
67. Any MS-DOS based data collector (HP200, Husky MP2500, etc.).
68. 8 rows X 40 characters.
69. Dependent on amount of memory.
70. Any that produce NEMA string.
71. Provides integrated surveying solution between conventional optical and robotic available in English, German, French, Spanish, Italian, Swedish, Finnish, Norwegian, Danish, Turkish, Russian and Japanese (simplified).
72. Or TDS Survey Pro with TSX.
73. Trimble ACU, Trimble TSCe or Trimble Recon.
74. >100,000 raw / >20,000 coordinates.
75. Trmble ACU or Trimble TSCe.
76. Conventional, servo and robotic total station.
77. Cellular modem for Internet/E-mail.
78. English, Spanish, French, German, Italian, Portuguese, Swedish, Japanese, simplified Chinese, Korean.
79. Survey Pro Robotics or Survey Pro Max is needed to get the full benefit of the robotic capabilities.
80. 10,000 to 20,000 coordinates per job is possible, depending on allocated RAM, linework settings, other software concurrently running, etc.
81. Storing raw data affects the amount of points that can be stored on the CF card, but has a miniscule effect on how large a job file can grow and still be loaded (opened).
82. Ability to capture point name, point description and feature attributes.
83. For Windows CE.
84. Survey Pro Max is needed to use GPS receivers.
85. Can perform "stake to line and offset" and "stake to curve and offset."
86. 3D DTM view and DTM stakeout.
87. iPAQ 3600, 3700, 3800 and other brands/models with StrongArm processor and CF slot.
88. Western Latitudes is the exclusive distributor of Pentax in the United States.
89. User definable descriptor files.
90. Also rotate, translate and scale.
91. Traverse, inverse, B-B, B-D, D-D, curve computations.
92. Free station with precision display.
93. Can transfer in TDS, SMI, SDR and Maptech formats.
94. Integrates level notes with your total station and GPS.
95. The addition of PocketCad allows users to take DWG or DGN files to the field and interactively work in collect, cogo and stakeout with full screen graphics. Demo available at [www.xyworks.com](http://www.xyworks.com).
96. Complete manual online within the program.
97. Includes 2 pt free station with precision display.
98. Complete manual within program accessed with the "Help" key.
99. Works with any iPAQ.
100. Closure with angle balance and compass adjustment.
101. HP iPAQ, Dell Axim, others.
102. Intersections, vertical curves, complete 3D radial stakeout from horizontal/vertical alignments.
103. SiteStake includes all features of Student Cogo plus the ability to interface with total stations, import/export ASCII and slope stake.
104. Includes all features of SiteStake plus ability to store raw data, use typical sections for stakeout and record stakeout activity to a gradesheet.
105. Manual entry mode included.
106. Instrument profiles for easy setup.
107. Software sold in four modules; total station, GPS, robotic and complete. Roading module can be added to any other module.
108. Allegro/JETT ce/HP 2200/DAP 5320/SDR8100.
109. Only limited by memory size.
110. Legal audit trail of deleted points and edited data.

# 2004 GPS Data Collection/Mapping Software Survey Notes

1. Panasonic, DAP, Symbol, Ranger, Husky, Allegro.
2. 240 x 320 or 320 x 240.
3. DTM, DXF, Geoid Models.
4. Other features: mission planning, worldwide datum conversion, positioning thresholds, stakeout, user and equipment profiles.
5. Feature code/Attribute collection.
6. Includes Prosurv Imaging.
7. HP iPAQ, Dell Axim, others.
8. Any GPS receiver with NMEA data output.
9. Baud Rate/Com Port defaults.
10. User-defined drop-down list.
11. Limited only by storage memory.
12. Live tracking of GPS displayed on 7.5' USGS Quad maps (also 1:100,000 and 1:250,000 scale maps).
13. Annotations by tapping a point on the screen. Captures GPS location, tapped coordinate and text.
14. Automatic when collecting GPS points by interval.
15. Use Prosurv Imaging (included).
16. Navigate to/from a point by N/E, Az & Dist, or Bg & Dist.
17. Zoom out easily by switching to 1:100,000 or 1:250,000 scale map.
18. USGS Topo Quad Maps (7.5', 1:100,000, or 1:250,000).
19. Use Prosurv Imaging to prepare and compress .tif files into .png files.
20. Work in any NAD83 SPC or UTM zone; auto-center on GPS.
21. Price includes Prosurv Imaging which is used to prepare quads for use by Pocket Quads, and much more.
22. Prosurv Pocket Quads allows users to view and use USGS quad maps on a Pocket PC. The real-time live tracking capability switches quads automatically as users walk or drive. The compressed .png images allow storage of 170 full-size USGS 7.5' quads on a single 512 Mb CF card. Or, an entire state's 1:100,000 and 1:250,000 scale maps along with dozens of 1:24,000 scale maps can be stored on a single 1 Gb CF card. Prosurv sells the All Topo Maps State sets by iGage Mapping Corporation to offer a complete package of mapping software and quad sheets.
23. Includes Pocket Quads.
24. Tap anywhere on the image to place text. Save as new image.
25. Full command-line cogo including midpoint and Prorate.
26. Plus dual-offset and known offset.
27. Print images at any scale. Auto-fit to page or print viewable area.
28. Full pan/zoom with mouse wheel zoom capability.
29. The main purpose of Prosurv Imaging is to display and use USGS topo maps.
30. Batch process dozens of USGS quads for use by Pocket Quads.
31. Create search points (UTM or SP's in any zone, not just the image's zone) just by clicking on the image. Enter metes/bounds descriptions using the command line cogo. Divide sections automatically into aliquot parts. Compute pre-determined areas. Import/export points. Print portions of or full-size maps at any scale. Draw text, lines, polygons, freehand anywhere on the screen and save as a new drawing. Has auto-scale factor and convergence calculations built-in, used when computing by Bg/Dist and inversing. Built in NADCON conversion allows work in any NAD27 or NAD83 SPC or UTM zone even if quad image is in a different datum or zone. Import NGS datasheets (creates 1 point for each DS). Import GCDB flat files (BLM section corner DB files). Fully integrated live-tracking GPS in real-time on quads, with auto-switching of quad images. Capture GPS points by time or distance intervals. Compute search points, then upload them into Pocket Quads for stakeout. Prepares 1:24,000 1:100,000 or 1:250,000 quad maps for use by Pocket Quads by slicing and compressing the maps automatically (about 1/10 the original file size using a lossless compression, meaning no loss of image data).
32. Allegro CX, Jett CE, other Windows & Pocket PC devices.
33. Real-time side shot, real-time stake.
34. CAD screen for in the field data editing. SurvCE GPS includes total station interface; robotic and roading modules can be added at any time.
35. Allegro/JETT ce/HP 2200/DAP 5320/SDR8100.
36. Only limited by memory.
37. Calibration/Mix total stations with RTK data. Roading with RTK.
38. HP iPAQ/Allegro/JETT ce/DAP CE5320/Recon/SDR8100.
39. Supports a variety of hardware platforms.
40. 95, 98, Me, NT, 2000, XP. CE HPC2000 & Pocket PC.
41. The TerraSync software is a flexible GIS data collection and data maintenance tool that runs on Trimble's GeoExplorer CE series handhelds, the GIS TSCe field device or any Windows CE field computer.
42. Windows 9X/2000/NT/XP/CE/.NET.
43. Select from list, baud rate, parity, stop bits, flow.
44. Basemaps, images, OLE objects.
45. File attributes attached to features. These can be any type of file.
46. Grid generation, geo-coding, topology, connectivity, hyperlinks, scripting, comm. module, redline.
47. Digitizing, multiple lines and areas simultaneously, continuously updated map display, GPS offsets.
48. Thematic display (basemaps and collected data), raw data logging, customizable

toolbars and menus, business rules, link to 3rd party software, custom forms, measure tool, direct export from data collector (SHP, DXF, ASCII). No office software is required. Basemap formats supported are: SHP, DXF, DGN, MIF. Background image formats supported are: TIF, JPG, DOQ.

49. User definable descriptor files.
50. Also rotate, translate and scale.
51. Also autoinverse from any point.
52. Also autoinverse from any base point.
53. Closure with angle balance and compass adjustment.
54. Free station with precision display.
55. Localization, translation, rotation and scaling routines. Includes state plane zones.
56. The addition of PocketCAD allows users to take DWG or DGN files to the field and interactively work in collect, cogo and stakeout with full screen graphics. Demo available at [www.xyzworks.com](http://www.xyzworks.com).
57. Thirty days of technical support included with purchase.
58. Any MS-DOS based data collector (HP200, Husky MP2500, etc.).
59. 8 rows X 40 characters.
60. Any that produce NEMA string.
61. Dependent on amount of memory.

## Participating Companies:

**Carlson Software**  
[www.carlsonsw.com](http://www.carlsonsw.com)

**SMI (Eagle Point)**  
[www.eaglepoint.com](http://www.eaglepoint.com)

**Trimble**  
[www.trimble.com](http://www.trimble.com)

**MicroSurvey Software**  
[www.microsurvey.com](http://www.microsurvey.com)

**SOKKIA**  
[www.sokkia.com](http://www.sokkia.com)

**Tripod Data Systems**  
[www.tdsway.com](http://www.tdsway.com)

**Prosurv LLC**  
[www.prosurv.com](http://www.prosurv.com)

**Topcon**  
[www.topconpositioning.com](http://www.topconpositioning.com)

**Western Latitudes**  
[www.westernlatitudes.com](http://www.westernlatitudes.com)

**RAMSS Inc.**  
[www.ramss.com](http://www.ramss.com)

**Traverse PC**  
[www.traverse-pc.com](http://www.traverse-pc.com)

**XYZworks**  
[www.xyzworks.com](http://www.xyzworks.com)

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