

TopSURV

Integrated Controller Software



Reference Manual



TopSURV Reference Manual

Part Number 7010-0492

Rev. H

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Preface

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Manual Conventions

This manual uses the following conventions:

Example	Explanation
File ► Exit	tap the File menu and tap Exit.
Enter	Indicates the button or key labeled Enter.
<i>Notes</i>	Indicates a field on a dialog box or screen, or a tab within a dialog box or screen.
<i>Topo</i>	Indicates the name of a dialog box or screen.



Supplementary information that can help you configure, maintain, or set up a system.



NOTICE

Supplementary information that can have an affect on system operation, system performance, measurements, personal safety.

Notes:

[illegible]

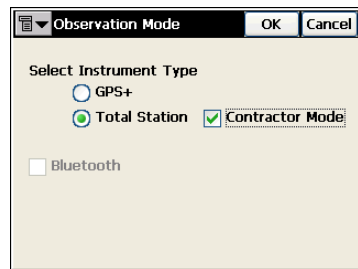
What's New with TopSURV

This chapter briefly describes new features and functions for version 6.04 of TopSURV.

Contractor Module

Contractor Module is implemented as a restricted version of the existing Total station module.

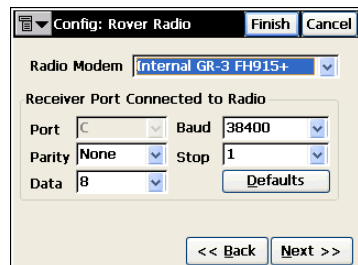
For selecting this module, see “Observation Mode” on page 2-123.



GR-3 Radios

GR-3 radios can be used in job configurations.

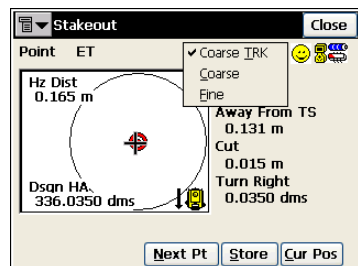
For details on this job configuration, see “GR-3 FH915+” on page 2-24.

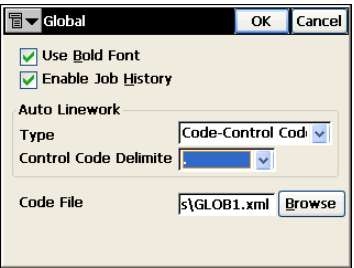
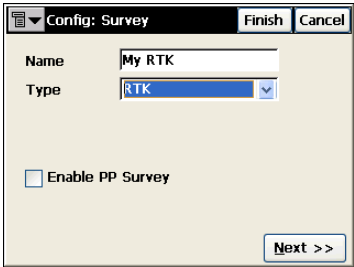
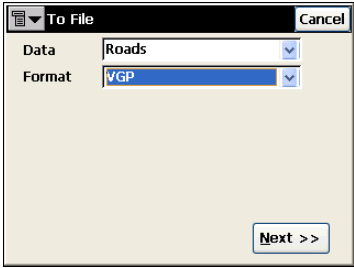
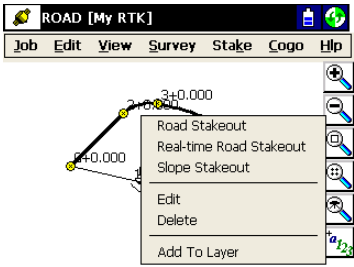


Tracking Mode for Non-motorized TS

Tracking mode for non-motorized total stations is now supported.

For details on a TS stakeout, see “TS Stakeout” on page 8-5.



<p>Global Code File</p> <p>A Global Code File can be selected to use with the currently selected Job.</p> <p>For details on the file selection, see “Global” on page 2-72.</p>	
<p>PP enabled RTK</p> <p>The PP mode for RTK can now be enabled in the survey configuration process.</p> <p>For details on this configuration, see “Config: Survey” on page 2-13.</p>	
<p>New Import/Export Functionality</p> <p>Support for Berlin Raw Data export (quality report), VGP road format export/import, and FKOF raw data export and points export/import have been added.</p> <p>For details on the import/export functions, see “Import” on page 2-86 and “Export” on page 2-105.</p>	
<p>Updates on the Main Map</p> <p>Selection of objects on the main map for editing is now available.</p> <p>For details on the map view function, see “View” on page 4-1.</p>	

Multiple Background Images

Multiple background images can be selected.

For details on selecting background images, see “Background Images” on page 4-5.

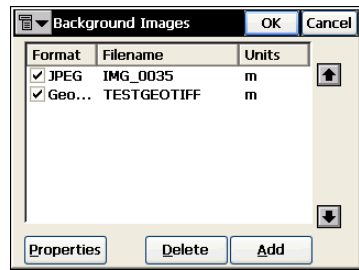
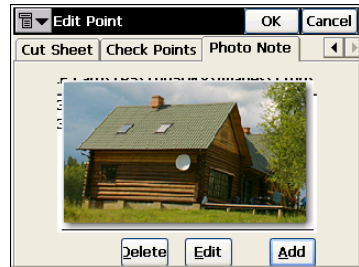
**Point Photo Notes**

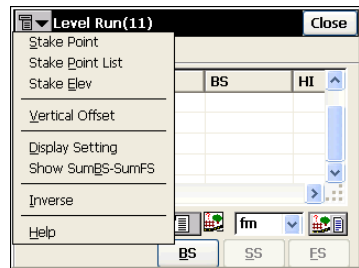
Photo Notes can be added to the point description.

For details on photo notes, see “Add (Edit) Point” on page 3-5.

**DL Stake Point, Point Lists and Elevation**

Point, Point Lists, and Elevation stake outs are now available for jobs using a digital level.

For details on digital level staking, see “DL stakeout” on page 8-10.

**Road from a Line**

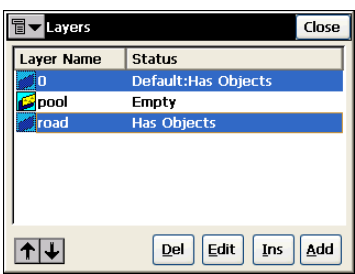
A road can be created from a line.

For details on adding roads, see “Roads” on page 3-23.



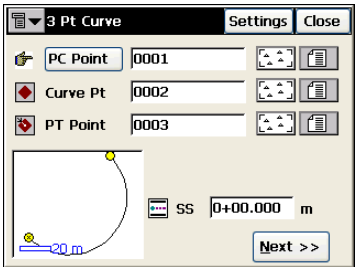
Edit Multiple Layers

Multiple layers can be turned on/off (made visible/hidden).
For details on editing layers, see “Edit Multiple Layers” on page 3-20.



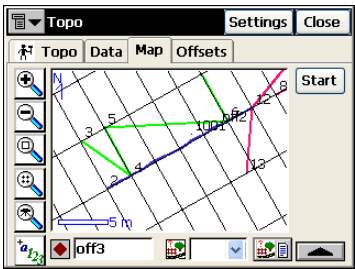
3 Pt Curve & Offsets Stakeout

Three Point Curve & Offsets stakeout is available when staking Offsets.
For details on using performing this type of stakeout, see “Three Point Curve & Offset” on page 8-36.



Grid Topo Display

A grid can be displayed on the map to help while collecting data.
For details on grid setup, see “Grid Setup” on page 5-31.



Introduction

TopSURV is Topcon's survey software available for hand-held controllers. When installed on a hand-held controller that runs the Windows® CE operating system, such as Topcon's FC-1000, FC-100 and FC-2000, TopSURV is used for:

- field data collection
- stakeout and control work

The TopSURV main screen consists of a title bar, menu bar and a work area.

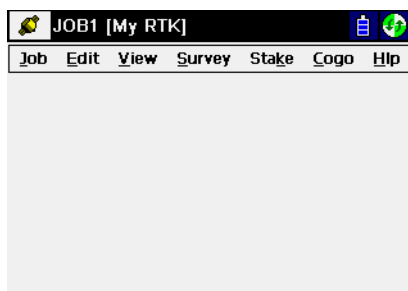


Figure 1-1. TopSURV Main Screen



NOTICE

The appearance of the screen titles and text depend upon the device being used. Most of the screen shots in this manual were taken from an FC-2000 or FC-1000 hand-held controller. A few shots were taken from an FC-100.

Title Bar

When on the main screen, the title bar displays the instrument button and the name of the job open (and the configuration name), the **Reconnect** button, as well as connection and controller power status icons.

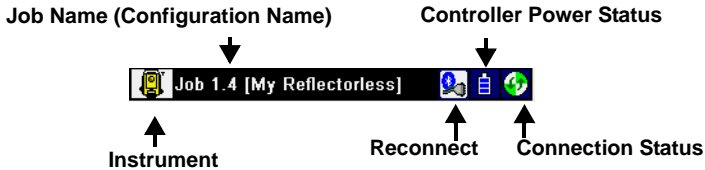


Figure 1-2. Title Bar – Main Screen

If the controller has Bluetooth® wireless technology, the **Reconnect** button appears to reflect the status of Bluetooth connection.

When within a menu option, the title bar displays the bitmap button, the name of the screen, and any system buttons required for various operations.

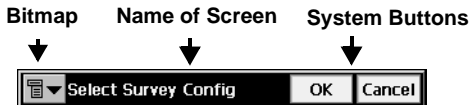


Figure 1-3. Title Bar – Menu Functions

The bitmap opens the pop-up menu containing the Help item to access the help files and some options specific for a screen open.

Menu Bar

The menu bar has seven menus used to configure and manage a survey job, and to control data.

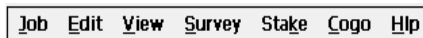


Figure 1-4. Menu Bar

See the following chapters for a description of each menu and its functions.

Security

Upon initial startup, a **Security** screen displays. TopSURV requires an access code to start. Contact a Topcon representative to acquire the necessary codes.

- **Key Value:** the device's number; given to a Topcon representative to receive activation IDs.
- **Activation IDs:** the fields in which to enter the security codes received from a Topcon representative to activate purchased modes: *TS*, *Contractor*, *Robotic*, *GPS+*, *GIS* (*RT DGPS* and *PP DGPS*), *Roads*, and *mmGPS*.

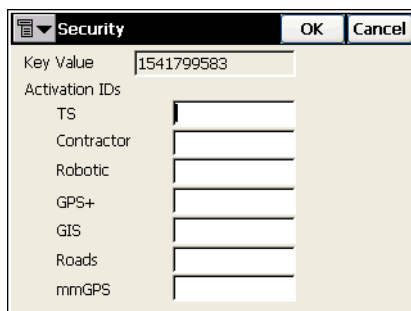


Figure 1-5. Security

To run a demo version of TopSURV, tap **OK** or **Cancel**; a confirmation message displays. Tap **OK** to confirm using Demo Mode.

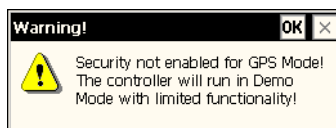


Figure 1-6. Run Demo Mode?

Notes:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Job

The Job menu includes the following menu items:

- Open
- New
- Delete
- Config
- Import
- Export
- Info
- Mode
- Exit

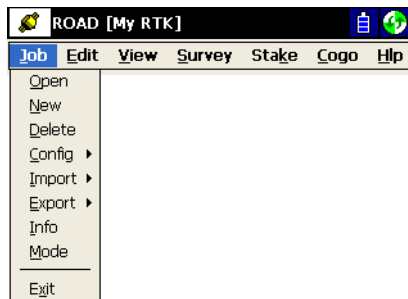


Figure 2-1. Job Menu

Open Job

To open a job, tap **Job ▶ Open**.

The *Open Job* screen can be used to select a job.

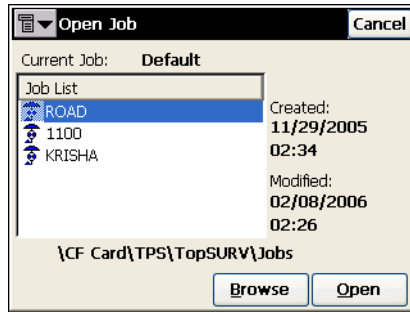



Figure 2-2. Open Job

The *Job List* field contains the names of all existing jobs created/opened using TopSURV and indicated by the icon . Initially, the *Job List* is empty.

When a job is selected in this list, the *Created* and *Modified* fields will reflect when the job was created and last modified.

- The path below the Job List shows the directory where the selected job was created.
- **Browse:** displays the screen to browse directories for selecting a job to open. Highlight the file and press **OK**.

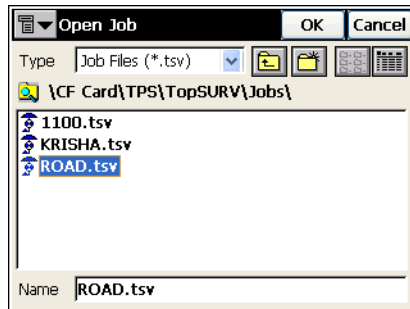


Figure 2-3. Browse Job

- **Open:** creates the chosen job current and returns to the main screen.

New Job

To open a new job, tap **Job ▶ New**.

The *New Job* screen starts the new job creation process which is performed with the help of a Wizard.

Figure 2-4. New Job

- The path displays the directory where the job will be created. By default, job files are stored in the Jobs folder in the directory where the application has been installed. Press **Browse** to change the directory.
- *Name*: the name of the new job.
- *Created By*: the name or some other identifier of the surveyor.
- *Comments*: any additional information about the project, for example, the conditions of survey.
- *Current Date*: displays the current date and time.
- **Browse**: changes the directory in which to look for a job.
- **Next**: after setting all fields of the screen, pressing this button opens the *Select Survey Config* screen.
- **Finish**: saves the information and returns to the main screen. The new job becomes the current job and uses the settings from the previously open job, unless changed.

Select Survey Configuration

The *Select Survey Config* screen is used to select a survey configuration for the job.

Survey Configuration is a set of parameters that does not depend on the job. One configuration can be used by several Jobs.

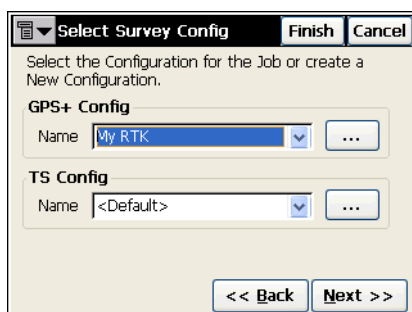



Figure 2-5. Select Survey Configuration

The description of how to work with configurations will be discussed in “Configuration” on page 2-10. Initially, TopSURV contains several pre-defined configurations: *My RTK*, *My Network RTK*, *My RT DGPS*, *My PP Static*, *My PP Kinematic* and *My PP DGPS* for GPS+ mode; *My Conventional*, *My Reflectorless*, *My Robotic* and *My Level* for TS mode.

- *GPS+ Config*: shows the GPS+ configuration for the current job. The drop-down list shows the configurations available for the GPS+ mode.
- *TS Config*: shows the total station configuration for the current job. The drop-down list shows the configurations available for the TS mode.
-  : opens the *Configurations* screen to edit a configuration (see “Configuration” on page 2-10 for details).
- **Back**: returns to the previous screen.
- **Next**: opens the *Coordinate Systems* screen
- **Finish**: saves the settings, and returns to the main screen.

Coordinate System

The *Coordinate System* screen contains coordinate system information for the new job.

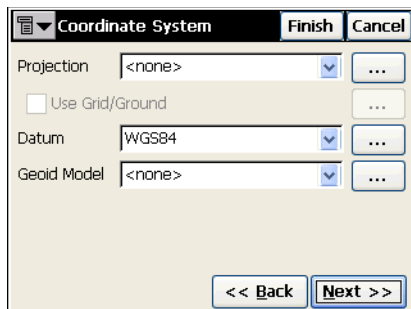






Figure 2-6. Coordinate System

- *Projection*: specifies the projection to be used. The  button opens the *Projections* screen.
- *Use Grid/Ground*: when a grid projection is selected, this box becomes available. If checked, the  button is activated to open the *Grid to Ground Param* screen.
- *Datum*: shows the datum for the selected projection. The drop-down list displays all datums pre-defined in the current version. The  button opens the *Custom Datum* screen.
- *Geoid Model*: shows the geoid selected (if any). The  button opens the *Geoids List* screen.
- **Back**: returns to the previous screen.
- **Next**: opens the *Units* screen.
- **Finish**: saves the settings, and returns to the main screen.

See “Coordinate System” on page 2-73 for working with coordinate systems.

Units

The *Units* screen displays the default units that will be used in the job.

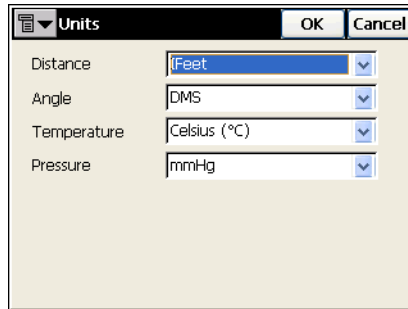


Figure 2-7. Units

- *Distance*: units of linear measurements for the job. These can be Meters; IFeet (International Feet, 1 Ifoot = 0.3048 Meters), US Feet (1 USFt = 1200/3937 Meters); IFeet and Inches, or US Feet and Inches (the latter two are calculated taking into account that 1 Foot = 12 Inches).



TIP

If the selected units are USfeet, linear values can be entered as meters, or IFeet by appending “m” or “if” to the entered value.

If the selected units are in meters, then a linear value in USFeet, or International feet can be entered by appending “f”, or “if” to the end of the entered value.

If the selected units are in IFeet, linear values can be entered in meters or USfeet by appending “m”, or “f” to the entered value. The appended characters “m”, “f”, or “if” are case insensitive. In other words, enter “M”, “F”, or “IF”.

- *Angle*: units of angle measurements and parameters. These can be *DMS* (degrees, minutes, seconds), *Grads* (Gons), *Radians* (for Cogo use only), or *Mils* (for Cogo use only). (360 degrees = 400 grads = 2π radians = 6400 mils.)

**TIP**

Azimuth and distances can be entered as two points separated by “-”, “,” or “;”. Certain angles can be entered as three points separated by “-”, “,” or “;”. For instance a value of 100-101 indicates the Azimuth or Distance from Point 100 to Point 101.

- **Temperature** (only for TS mode): units of temperature, used only for the raw measurements. These can be *Celsius (C)*, or *Fahrenheit (F)*.
- **Pressure** (only for TS mode): units of atmosphere pressure, used only for the raw measurements. These can be *mmHg*, *hPa*, *inHg* or *bbar*.
- **Back**: returns to the previous screen.
- **Next**: opens the *Display* screen.
- **Finish**: saves the settings and returns to the main screen.

Display

The *Display* screen customizes the software interface.

Display		OK	Cancel
Coord Type	Ground		
Coord Order	Northing,Easting,Elevation		
Azimuth Origin	North		
Disp Dir As	Azimuth		
Disp CL Pos As	Station		
Full Station	100.000	m	

Figure 2-8. Display

- **Coord Type**: sets the coordinate type for the coordinate system selected.
- **Coord Order**: sets the Northing/Easting order and displays the height type for the coordinate system selected.

- *Azimuth Origin*: the reference direction of azimuth.
- *Disp Dir As*: select whether to display the direction as bearing or azimuth.
- *Disp CL Pos As*: select how to display the position on the center line: as station or chainage.
- *Full Station*: available if Station selected for *Disp CL Pos As*; sets the measurement units used for the full station value and is usually 100 units.
- **Back**: returns to the previous screen.
- **Next**: opens the *Alarms* screen.
- **Finish**: saves the settings and returns to the main screen.

Alarms

The *Alarms* screen sets sound alerts for situations of low power, low memory, poor radio link, and loss of fixed/float solutions. These alarms may happen while working with the controller, GPS+ receiver, or total station.

The screenshot shows the 'Alarms' screen with a title bar containing a printer icon, the word 'Alarms', and 'Finish' and 'Cancel' buttons. Below the title bar is a checkbox labeled 'Audible Alarm'. The main area contains a table with four columns: 'Instrument', 'Controller', 'GPS+', and 'TS'. The rows are 'Power Alarm', 'Memory Alarm', 'Radio Link', and 'Fix/Float'. Each row has checkboxes in the 'Controller', 'GPS+', and 'TS' columns. At the bottom is a '<< Back' button.

Instrument	Controller	GPS+	TS
Power Alarm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Memory Alarm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radio Link	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fix/Float	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 2-9. Alarms

- *Audible Alarm*: select this field to enable audible alarms. The alert will sound automatically when an alert situation occurs.
- *Alarms*: select the alarms to sound for various instruments and situations.
- **Back**: returns to the previous screen.
- **Finish**: saves the settings and returns to the main screen.

Delete

To delete a job, tap **Job ► Delete**. The *Delete Job* screen deletes jobs. Once deleted from the Job List, the file containing the job chosen is deleted from the controller.

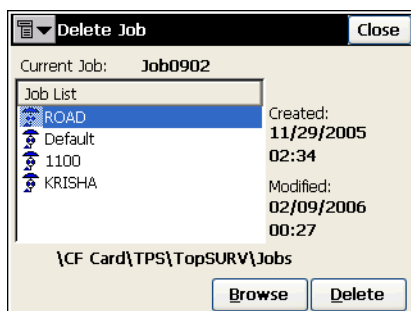


Figure 2-10. Delete Job

When a job is selected in the list, the *Created* and *Modified* fields will reflect when the job was created and last modified.

- The path under the Job List displays the directory where the selected job was created.
- **Browse:** If a job is not listed in this list, browse through the directories to select the job for deletion.
- **Delete:** deletes the job.
- **Close:** closes the screen without deleting job.

Configuration

The Config submenu changes the parameters set during Job creation.



Figure 2-11. Config Submenu

In TS mode, the Configuration functionality is restricted for the Contractor Module (for details on selecting this module, see “Mode” on page 2-123).

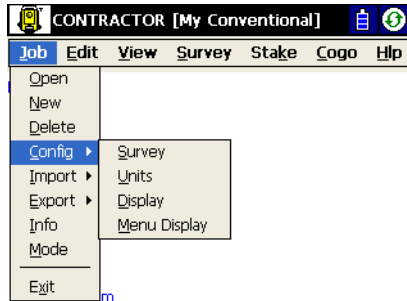


Figure 2-12. Config Submenu in the Contractor Module

The Contractor Module is designed for use by non-surveyors for Topo and Stakeout with total stations.

Survey

To configure a survey, tap **Job ▶ Config ▶ Survey**.

Select Survey Configuration

The *Select Survey Configuration* screen can also be reached using the New Job Wizard (see “New Job” on page 2-3).

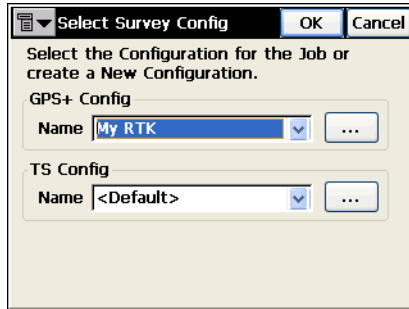



Figure 2-13. Select Survey Configuration

- *GPS+ Config*: shows the GPS+ configuration for the current job. The drop-down list shows configurations available for GPS+ mode: *My RTK*, *My Network RTK*, *My RT DGPS*, *My PP Static*, *My PP Kinematic* and *My PP DGPS*.
- *TS Config*: shows the total station configuration for the current job. The drop-down list shows configurations available for TS mode: *My Conventional*, *My Reflectorless*, *My Robotic* and *My Level*.

In the Contractor Module, only *My Conventional* and *My Reflectorless* are available.

-  : opens the **Configurations** screen for editing parameters for the configurations.
- **OK**: sets the selected configuration for the current job and returns to the main screen.

GPS+ Configuration

To configure a GPS+ survey, press the button in the *GPS+ Config* field of the *Select Survey Configuration* screen.

Configurations

The *Configurations* screen presents a list of available configurations. Editing and adding of a configuration is accomplished with the help of a Wizard.

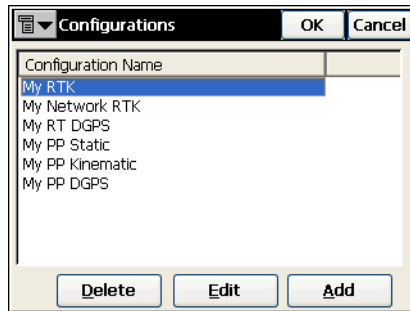


Figure 2-14. GPS+ Configurations

- **Delete:** deletes the highlighted configuration.
- **Edit:** opens the *Config: Survey* screen for changing configuration settings.
- **Add:** opens the *Config: Survey* screen for adding a new configuration.
- **OK:** returns to the *Select Survey Configuration* screen.

Config: Survey

The *Config: Survey* screen contains general settings for the configuration.

Figure 2-15. Config: Survey

- *Name*: the name of the configuration that will be displayed in the *Configurations* screen.
- *Type*: the type of the configuration; either *RTK*, *Network RTK*, *Network DGPS*, *Real Time DGPS*, *PP Static*, *PP Kinematic*, or *PP DGPS*. (“PP” means Post-Processing.)
 - RTK (Real Time Kinematic) implies, first, a pair of receivers operating simultaneously and, second, a radio link established between the two receivers. From a functional point of view, the two receivers will differ from each other. One of the receivers (usually referred to as the Base Receiver) is located at a fixed point with known coordinates. The base receiver will transmit the differential corrections to the other receiver (usually referred to as the Rover Receiver) via a radio link. To establish proper connection between the two receivers, specify necessary communication parameters first.

A mmGPS aided RTK survey uses the usual RTK GPS+ survey system, but with a wireless PZS-1 sensor at the rover to pick up the signal from the PZL-1 transmitter for accurate (millimeter) elevations.

 - Network RTK (Network Real Time Kinematic) implies the usage of either VRS (Virtual Reference Station) data or FKP

parameters (network area corrections) received from operating reference station networks.

- Real Time DGPS (Real Time Differential GPS) implies that the rover uses differentiation correction data transmitted from DGPS services.
- Network DGPS (Network Differential GPS) implies the usage of corrections received from operating differential GPS reference station networks.
- PP Static (Static Post Processing) implies two receivers that collect data at stationary locations during a long period of time. Then in the office, the software operator processes the GPS data collected in the field and calculates the relative position of the receivers. Usually it is “differential processing”, when data from two or more receivers are processed together in order to compute these receivers' relative positions. If the coordinates of one receiver are known, then the coordinates of the other can be calculated.
- PP Kinematic (Kinematic Post Processing) also implies two receivers. One is fixed, the other is moving along some trajectory. The processing of the collected data is performed later, as for the PP Static type.
- PP DGPS (Post Processing Differential GPS) implies that the raw observations made by the rover would have to be written to files as well as the differential correction data.
- *Enable PP Survey*: when the checkbox is selected, the job configuration will include parameters to enable data post processing for RTK, Network RTK, RT DGPS, and Network DGPS survey types.

If a Network RTK, Network DGPS or Real Time DGPS configuration is selected, the **Config: Survey** screen displays the following additional field (Figure 2-16 on page 2-15).

- *Corrections*: the type of correction data used. For the Network RTK configuration it can be *VRS*, *FKP*, *Single Base* or *External Config*. For the RT DGPS configuration, the correction data can be received from a *User Base*, *Beacon*, *CDGPS*, *WAAS*, *EGNOS*, *OmniSTAR-VBS* or *OmniSTAR-HP* differential services.

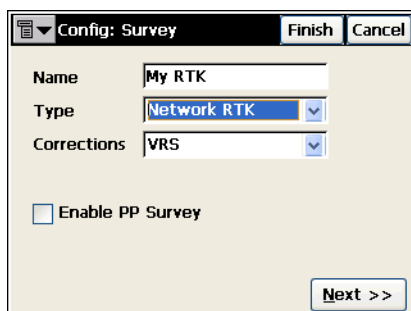


Figure 2-16. Config: Survey – Network RTK

For RTK and Real Time DGPS survey types, the bitmap on the upper-left corner displays a pop-up menu containing two items:

- *MultiPort*: enables the *MultiPort* functionality (Figure 2-17).
- *Help*: accesses the Help files.

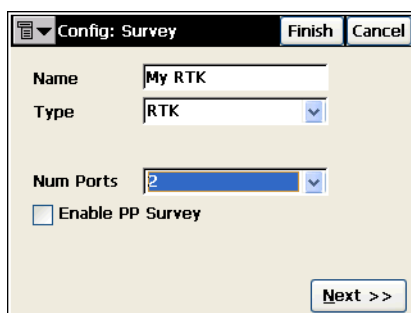


Figure 2-17. Config: Survey – MultiPort

- *Num Ports*: sets the number of ports to configure the Base/Rover to transmit/receive data from different ports.
- *Next*: opens the **Config: Base Receiver** screen. For PP enabled RTK and User Based mode in Real Time DGPS, the **Config: Base PP Setup** screen will display.

For Network RTK, Network DGPS and Real Time DGPS (except User Based mode) without post processing option, the **Config: Rover Receiver** screen displays. If PP Static survey type is selected, the **Config: Static Receiver** screen will open.

Config: Base PP Setup

If the *Enable PP Survey* option is selected in the *Config: Survey* screen for RTK and User Based mode in Real Time DGPS, the **Next** button opens the *Config: Base PP Setup* screen (Figure 2-18).

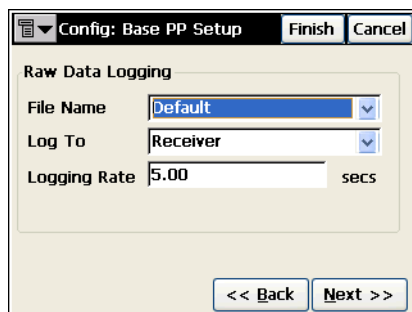


Figure 2-18. Config: Base PP Setup

- *Raw Data Logging*: the set of logging parameters; log to the receiver, set the logging rate and select if the name of the receiver file is automatically set or user-defined. In the latter case, the corresponding dialog box will be displayed at the logging start.
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Base Receiver* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen.

Config: Base (Static) Receiver

For RTK survey type

The **Config: Base Receiver** screen contains settings for configuring an RTK Base receiver.

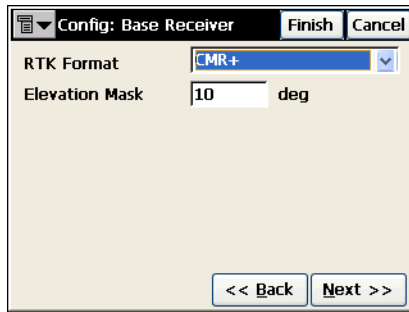


Figure 2-19. Config: Base Receiver

- **RTK Format:** the format of the base receiver differential corrections transmitted to the rover; CMR, CMR+ (default), RTCM 2.1, 2.2, 2.3, 3.0.
- **Elevation mask:** data from satellites below this elevation will not be used.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Base Radio** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen.

The bitmap on the upper-left corner displays the pop-up menu containing two items:

- **Receiver Setting:** enables turning charger mode off.
- **Help:** accesses the Help files.

For Real Time DGPS survey type (with a User Base)

The **Config: Base Receiver** screen contains the settings for configuring an RT DGPS Base receiver.

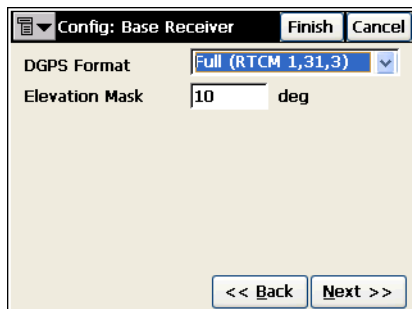


Figure 2-20. Config: Base Receiver – For Real Time DGPS

- *DGPS Format*: the format of the base receiver differential corrections transmitted to the rover; either Full (RTCM 1, 31, 3) or Partial (RTCM 9, 34, 3).
- *Elevation Mask*: data from satellites below this elevation will not be used.
- **Back**: returns to the previous screen.
- **Next**: opens the **Config: Base Radio** screen.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen.

The bitmap on the upper-left corner displays the pop-up menu containing two items:

- *Receiver Setting*: enables turning charger mode off.
- *Help*: accesses the Help files.

For PP Static, PP Kinematic, or PP DGPS survey types

The **Config: Static (Base) Receiver** screen has the same fields of parameters as for *RTK and PP* survey type except the *RTK Format* field.

Figure 2-21. Config: Static Receiver – For PP Static Survey Type

- **Back:** returns to the previous screen.
- **Next:** opens the *Static (Base) Antenna* screen.

Config: Base Radio

The **Config: Base Radio** screen contains the settings for configuring the radio modem connected to the Base receiver.

Figure 2-22. Config: Base Radio

- **Radio Modem:** the type of the modem. The list of pre-defined modem types changes its contents depending upon the job configuration chosen.

- *Receiver Port Connected to Radio*: contains the parameters for the connection port, and are specific for the connected modem. For example, Siemens cell phones need a 19200 baud rate.

NOTICE NOTICE

Internal GR-3 FH915+, Internal HiPer Lite, and Internal HiPer Lite+ FH915+ modems require a 57600 baud rate.

- **Defaults**: returns all the values in the *Receiver Port Connected to Radio* fields to defaults.
- **Next**: displays the parameters for the chosen modem. Opens the **Base Antenna** screen if the selected modem type does not require additional settings.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen. All settings will be transmitted only when using the configuration.

In Multi-Port mode (see page 2-15 for details), several *Config: Base Radio Out* screens display to configure the radio for data output.

Figure 2-23. Config: Base Radio Output

AirLink GPRS, AirLink CDMA, AirLink CDPD¹, CDMA2000, Generic, Sierra Wireless MP200 CDPD, and Internal HiPer Pro modem types do not require additional settings.

1. CDPD stands for “Cellular Digital Packet Data”. CDPD is an open packet data service, defined as an autonomous overlay network, specified for the cellular TDMA network.

For Cell Phone Modems: HiPerXT (GSM), Internal HiPer (GSM), Internal GR-3(GSM), Motorola V60 Cell Phone, Motorola V710 Cell Phone, MultiTech GSM/GPRS Modem, Siemens TC35 Modem, Siemens M20 Modem, Nextel i58sr Cell Phone, Wavecom Fastrack GSM

The **Next** button on the **Config: Base Radio** screen opens the **Base Cell Phone Params** screen.

Base Cell Phone Parameters

The **Base Cell Phone Params** screen contains a field for Base PIN input.

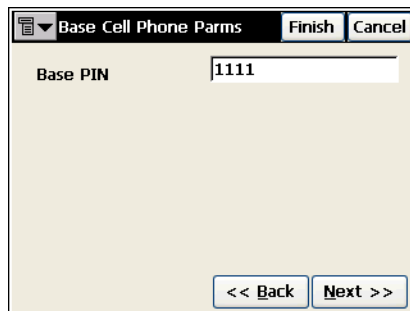


Figure 2-24. Base Cell Phone Parameters

- **Back:** returns to the previous screen.
- **Next:** opens the **Base Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For UHF Modems: *HiPerXT UHF* and *Internal Map-HP(UHF)*

The **Next** button on the **Config: Base Radio** screen opens the **UHF Modem** screen.

UHF Modem

The **UHF Modem** screen contains the parameters for UHF modem in a HiPer XT receiver.

Figure 2-25. UHF Modem

- **Protocol:** sets the protocol for data transmission:
 - TPS: uses Topcon's FCS mode to scan for the best channel to communicate on.
 - PDL: communicates with the rover PDL radio.
- **Channel:** sets the dedicated channel for the PDL protocol.
- **Power:** sets the level of power for RF transmissions: either 1W or 2W.
- **Back:** returns to the previous screen.
- **Next:** opens the **Base Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For FH915 Modem: Internal HiPer Lite

The **Next** button on the **Config: Base Radio** screen opens the **Internal HiPer Lite** screen.

Internal HiPer Lite

The **Internal HiPer Lite** screen selects the operating channel from the preset ones for the HiPer Lite internal modem.

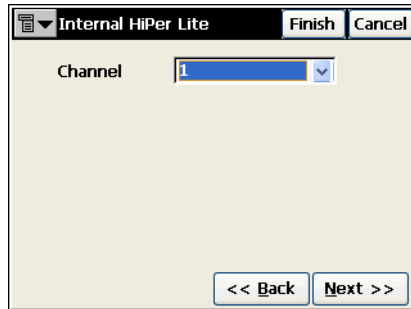


Figure 2-26. Internal Hiper Lite

- **Back:** returns to the previous screen.
- **Next:** opens the **Base Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For FH 915+ Modem: Internal HiPer Lite+ FH915+ and Internal GR-3 FH915+

The **Next** button on the **Config: Base Radio** screen opens the **GR-3 FH915+** screen.

GR-3 FH915+

The **GR-3 FH915+** screen selects the parameters for FH915+ internal modem.

Figure 2-27. Parameters for FH915+ Modem

- **Location:** selects the territory (specifically for Australia) to adjust the frequency range and RF power level for the modem.
- **Protocol:** sets the operating protocol to communicate with different types of FH915 modem at the base/rover side.
- **Channel:** selects the operating channel.
- **Back:** returns to the previous screen.
- **Next:** opens the **Base Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For Pacific Crest and Internal HiPer (Pacific Crest)

The **Next** button on the **Config: Base Radio** screen opens the **Pacific Crest Radio Parms** screen.

Pacific Crest Radio Parameters

The **Pacific Crest Radio Parms** screen sets the channel number and the sensitivity of the Radio Modem.

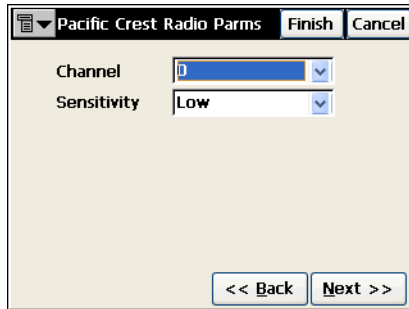


Figure 2-28. Pacific Crest Radio Parameters

- **Channel:** sets the operating channel to the radio modem.
- **Sensitivity:** selects the sensitivity level for the radio modem; either low, moderate, high, or off.
- **Back:** returns to the previous screen.
- **Next:** opens the **Base Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For Satel modems

The **Next** button on the *Config: Base Radio* screen opens the *Satel Radio Params* screen.

Satel Radio Parameters

The *Satel Radio Params* screen sets the model of the Satel radio, the channel number and the frequency of the radio.

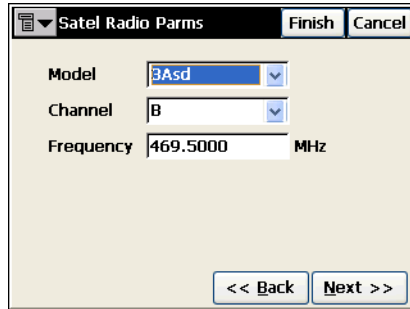


Figure 2-29. Satel Radio Parameters

- **Back:** returns to the previous screen.
- **Next:** opens the *Base Antenna* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

For AirLink CDMA (Multicast UDP)

The **Next** button on the **Config: Base Radio** screen opens the **Base Multicast Parm** screen.

Base Multicast Parameters

The **Base Multicast Parm** screen sets IP addresses for communication between the base and several rovers using the UDP protocol.

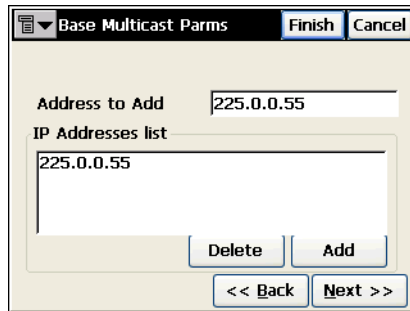


Figure 2-30. Base Multicast Parameters

- **Address to add:** the field for IP address input
- **IP addresses list:** displays all IP addresses available
- **Delete:** deletes the highlighted IP address
- **Add:** adds a new address specified in the *Address to add* field to the list of IP addresses
- **Back:** returns to the previous screen
- **Next:** opens the **Base Antenna** screen
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used

Config: Base (Static) Antenna

The *Config: Base Antenna* (*Config: Static Antenna*) screen contains settings for the antenna connected to Base.

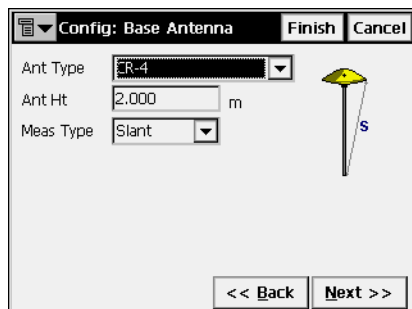


Figure 2-31. Config: Base Antenna

- *Ant Type*: the type of the Topcon antenna; either *CR-3*, *CR-3 with Cone*, *CR-4*, *CR-4 with Cone*, *GR-3*, *HiPer GD*, *HiPer GGD*, *HiPer Lite/Lite+*, *HiPer Pro*, *HiPerXT*, *HiPer+*, *Legant 2*, *Legant3 with UHF*, *Legant E*, *Legant L1*, *MapAnt B*, *MG-A1*, *MG-A2*, *MG-A5*, *Odyssey*, *PG-A1*, *PG-A1 with ground plane*, *PG-A1 with ground plane with Cone*, *PG-A2*, *PG-A5*, *Regant-DD*, *Regant-SD*, *Regency-DD*, *Regency-SD*, or *Unknown*.
- *Ant Ht*: the height of the antenna.
- *Meas Type*: the type of antenna height measurement; either *Vertical* (measuring to *ARP*, antenna reference point) or *Slant* (measuring to edge of antenna). The screen also illustrates the measurement type.
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Rover Receiver* screen. For PP enabled RTK and User Based mode in Real Time DGPS, first the *Config: Rover PP Setup* screen will display.
In the PP Static case, the *Config: Occupation Times* screen is opened.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Rover PP Setup

If the *Enable PP Survey* option is selected in the *Config: Survey* screen for RTK, Network RTK and User Based mode in Real Time DGPS, the **Next** button in the *Config: Base Antenna* screen opens the *Config: Rover PP Setup* screen.

The screenshot shows a software configuration window titled "Config: Rover PP Setup". It features a title bar with a menu icon, the window title, and "Finish" and "Cancel" buttons. The main content area is titled "Raw Data Logging" and contains four configuration items, each with a label and a dropdown menu: "File Name" (set to "Default"), "Log To" (set to "Receiver"), "Logging Rate" (set to "5.00" with a "secs" unit), and "Start Log" (set to "Manual"). At the bottom of the window are two buttons: "<< Back" and "Next >>".

Figure 2-32. Config: Rover PP Setup

- **Raw Data Logging:** the set of logging parameters; log to the receiver, set the logging rate and select if the name of the receiver file is automatically set or user-defined. In the latter case, the corresponding dialog box will be displayed at the logging start. The *Start Log* option selects whether to start logging manually or automatically as data are being collected.
- **Back:** returns to the previous screen.
- **Next:** opens the *Config: Rover Receiver* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen.

Config: Rover Receiver

For RTK survey type

The **Config: Rover Receiver** screen contains Rover settings.

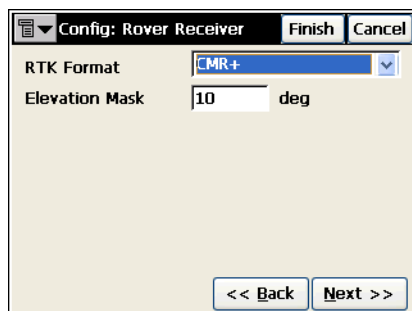


Figure 2-33. Config: Rover Receiver

- **RTK Format:** the format of the rover receiver differential corrections received from the base; either CMR, CMR+, RTCM 2.1, RTCM 2.2, RTCM 2.3, RTCM 3.0.
- **Elevation mask:** data from satellites with elevation angles below this value will not be used.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Rover Radio** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For RTK survey types, the bitmap on the upper-left corner displays the pop-up menu containing four items:

- **Output Ports:** adds the *Num Out Ports* field to the **Config: Rover Receiver** screen to set the number of ports available to output NMEA messages (Figure 2-34 on page 2-31).
- **Laser Config:** when selected, the *Laser Connect* field will appear on the **Config: Rover Receiver** screen to set the device the laser is connected to: either Receiver or Controller. The **Next** button opens the **Laser Config** screen to configure the laser device (Figure 2-39 on page 2-35).

- *RTK Protocol*: adds the option to select the protocol to receive RTK corrections (Figure 2-34):
 - *CSD Data*: through a cellular phone used as modem.
- *Help*: accesses the Help files.

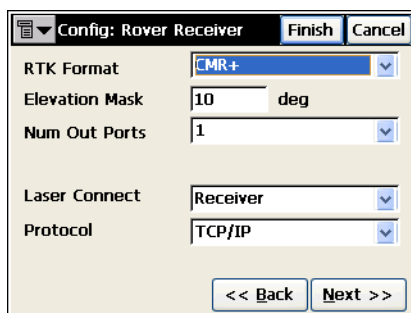


Figure 2-34. Config: Rover Receiver Options

For Network RTK and Network DGPS survey types

Select the desired correction type in the **Config: Survey** screen (Figure 2-16 on page 2-15): *VRS, FKP, Single Base* or *External Config*. The **Next** button opens the **Config: Rover Receiver** screen that contains Rover settings for the survey.

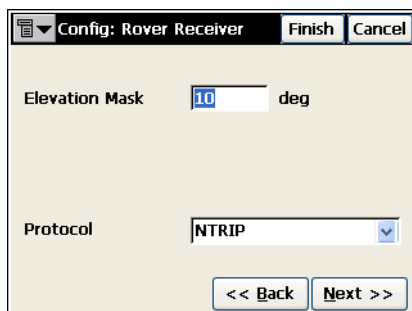


Figure 2-35. Config: Rover Receiver – For Network RTK

- *RTK Format*: the format of the rover receiver differential corrections received from the base.
- *Elevation mask*: only data from satellites with elevation angles above this value will be used.

- **Protocol:** selects the protocol to receive the RTK corrections
 - *NTRIP*: from a NTRIP Caster.
 - *TCP/IP*: through the Internet.
 - *CSD Data*: through a cellular phone used as modem.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Modem Connect** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.



TIP

Refer to the *TopSURV User's Manual* for details on configuring a Network RTK survey type using the NTRIP protocol.

For Real Time DGPS survey type

The **Config: Rover Receiver** screen has the following parameters.

Figure 2-36. Config: Rover Receiver – For Real Time DGPS

- **DGPS Format:** the format of the rover receiver differential corrections received either from the user base (RTCM 2.1, RTCM 2.2, or RTCM 2.3) or from a beacon station (in addition RTCM 3.0 can be selected). The field disappears when any other correction type is chosen on the *Config: Survey* screen.

- *Elevation mask*: data from satellites with elevation angles below this value will not be used.
- **Back**: returns to the previous screen.
- **Next**: opens either the *Config: Rover Radio*, the *Config: Beacon*, *Config: WAAS*, *CDGPS Radio*, *Config: EGNOS*, or *Config: OmniSTAR* screen depending on the correction type selected on the *Config: Survey* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

For RT DGPS survey types, the bitmap menu on the upper-left corner contains the three items.

- *Output Ports*: adds the *Num Out Ports* field to the *Config: Rover Receiver* screen to set the number of ports available to output NMEA messages (Figure 2-34 on page 2-31).
- *Laser Config*: when selected, the *Laser Connect* field will appear on the *Config: Rover Receiver* screen to set the device the laser is connected to: either *Receiver* or *Controller*. The **Next** button opens the *Laser Config* screen to configure the laser device (Figure 2-34 on page 2-31).
- *Help*: accesses the Help files.

For RTK and PP survey types

In addition to the standard *RTK* settings for the rover for and *RTK and PP* survey (see page 2-30), the **Config: Rover Receiver** screen has the settings to record data to files.

The screenshot shows a software dialog box titled "Config: Rover Receiver". It features a title bar with a menu icon, the title text, and "Finish" and "Cancel" buttons. The main area contains several settings: "RTK Format" is a dropdown menu currently set to "MR+"; "Elevation Mask" consists of a text input field containing "10" and a unit dropdown menu set to "deg". A sub-section titled "Raw Data Logging" is enclosed in a box and contains three settings: "Log To" is a dropdown menu set to "Receiver"; "Logging Rate" has a text input field with "5.00" and a unit dropdown menu set to "secs"; and "File Name" is a dropdown menu set to "Default". At the bottom of the dialog are two buttons: "<< Back" and "Next >>".

Figure 2-37. Config: Rover Receiver – For RTK and PP

- **Raw Data Logging:** the set of logging parameters; log to the receiver, set the logging rate and select if the name of the receiver file is automatically set or user-defined. In the latter case, the corresponding dialog box will be displayed at the logging start.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Rover Radio** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

For PP Kinematic or PP DGPS survey types

For *PP Kinematic* or *PP DGPS* surveys, the **Config: Rover Receiver** screen has the same parameters as for *RTK and PP* (see page 2-34) except the *RTK Format* field.

Figure 2-38. Config: Rover Receiver – For PP Kinematic and PP DGPS

- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Rover Antenna** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

Laser Config

The **Laser Config** screen contains typical laser parameters and settings.

Figure 2-39. Laser Configuration

- **Manufacturer:** selects the manufacturer of laser devices. Currently only MDL is supported.

- *Model*: the model of laser device. Currently the LaserAce 300 is only available.
- *Type*: the type of laser measurement system: either Range Finder Only or with Encoder.
- *Laser Port Settings*: the settings (port, parity, data, baud rate, the number of stop bits) for the laser device's connection port to output raw and calculated data to the peripheral device.

Config: Modem Connect

The *Config: Modem Connect* screen displays for the rover receiver configuration in the Network RTK survey.

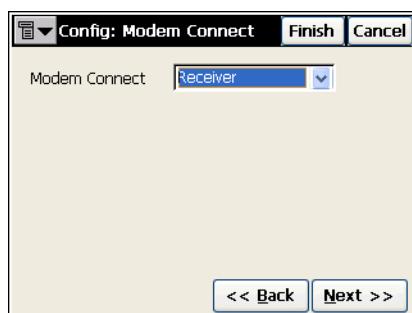


Figure 2-40. Config: Modem Connect

- *Modem Connect*: selects the device to connect the modem: either Receiver or Controller.
- **Next**: opens the *Config: Rover Radio* screen if the modem is connected to the receiver's radio port. If the modem is connected directly to the controller, the button opens the *Config: Modem Internet Info* screen.

Config: Rover Radio

The *Config: Rover Radio* screen contains parameters for the radio modem connected to the Rover receiver.

Figure 2-41. Config: Rover Radio

- **Radio Modem:** the type of modem.
- **Receiver Port Connected to Radio:** contains the parameters of the connection port.
- **Defaults:** returns all the values to defaults in the *Receiver Port connected to radio* fields.
- **Back:** returns to the previous screen.
- **Next:** displays the parameters for the chosen modem. Opens the *Rover Antenna* screen if the selected modem type does not require additional settings.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Modem parameters are the same as for the base receiver (for details, see “Config: Base Radio” on page 2-19) except as provided for cell phones.

Figure 2-42. Rover Cell Phone Parameters

- *Rover PIN*: a personal identification number for the rover.
- *Base Phone Number*: the phone number for the base.
- **Add**: adds it to the *Phone Number List*.
- **Back**: returns to the previous screen.
- **Next**: opens the *Base Antenna* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

In Multi-Port mode (see page 2-15) depending on the number of ports selected, there can be two *Config: Rover Radio* screens to configure radios for data input.

Figure 2-43. Config: Rover Radio Input

**NOTICE**

Use only one radio to receive corrections from the base.

In Output-Port mode depending on the number of output ports selected, there can be several *Config: Output Radio* screens to configure radios for NMEA data output.

Config: Output Radio

The *Config: Output Radio* screen contains parameters for the radio modem connected to the rover.

Figure 2-44. Config: Output Radio

For details, see “Config: Rover Radio” on page 2-37.

- **Next:** opens the *Config: Output NMEA* screen.

Config: Output NMEA

The *Config: Output NMEA* screen contains a list of NMEA messages, Select the types of messages to issue via the specified receiver port at the interval set in seconds.

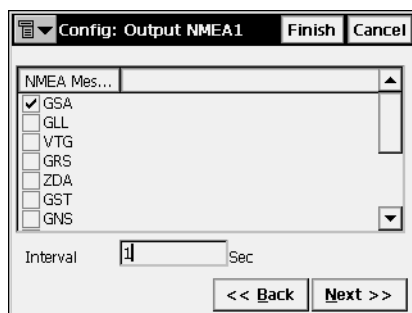


Figure 2-45. Config: Output NMEA

- *GGA* – outputs data on time, position and positioning
- *GLL* – outputs data on the current latitude/longitude and positioning state
- *GNS* – outputs data on time, position, and positioning of GPS+GLONASS (GNSS)
- *GRS* – outputs the residual error of distance, is used to support RAIM
- *GSA* – outputs the operation mode of the GNSS receiver, the satellite used for positioning, and DOP
- *GST* – outputs the statistics of position errors
- *GSV* – outputs the number of satellites, satellite number, elevation angle, azimuthal angle, and SNR
- *HDT* – outputs the direction (heading)
- *RMC* – outputs time, date, position, course and speed data provided by a GNSS navigation receiver
- *VTG* – outputs the traveling direction and velocity
- *ZDA* – outputs UTC, day, month, year, and local time zone

Config: Beacon

The *Config: Beacon* screen contains settings for a radio-beacon source of differential GPS corrections.

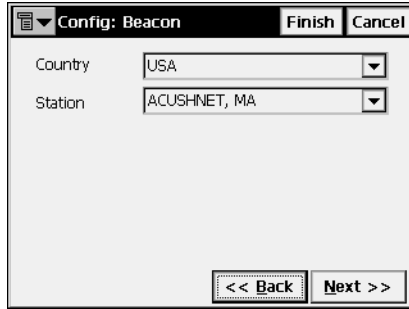


Figure 2-46. Config: Beacon

- *Country*: the country where the radio-beacon differential service is located.
- *Station*: the station that provides broadcasting differential corrections for the rover.
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Rover Antenna* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: WAAS

The **Config: WAAS** screen contains settings for the WAAS source of differential correction data.

The screenshot shows a software window titled "Config: WAAS" with "Finish" and "Cancel" buttons in the top right. The window is divided into two sections, "Channel 1" and "Channel 2". Each section contains three dropdown menus: "WAAS PRN#" (set to "None"), "GPS PRN#" (set to "12"), and "Iono Corr" (set to "Use sat only if avail"). At the bottom of the window are two buttons: "<< Back" and "Next >>".

Figure 2-47. Config: WAAS

- *Channel 1* and *Channel 2*: two receiver channels that can be allocated to WAAS satellites.
- *WAAS PRN #*: the WAAS satellite's PRN number.
- *GPS PRN #*: the GPS satellite's PRN number, which is associated with the WAAS PRN number.
- *Iono corr*: enable/disable the use of ionospheric corrections from the WAAS satellite when computing positions:
 - *None*: ionospheric corrections are not used
 - *Apply if avail*: use ionospheric corrections if available
 - *Use sat only if avail*: use only the satellites for which ionospheric corrections are available.
- **Back**: returns to the previous screen.
- **Next**: opens the **Config: Rover Antenna** screen.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

CDGPS Radio

The *CDGPS Radio* screen contains settings for the CDGPS Radio to receive differential correction data.

CDGPS Radio [Finish] [Cancel]

Radio Modem: CDGPS

Receiver Port Connected to Radio

Port: COM1 Baud: 38400

Parity: None Stop: 1

Data: 8 [Defaults]

<< Back Next >>

Figure 2-48. CDGPS Radio

- *Receiver Port Connected to Radio*: contains parameters for the connection port: port, parity, number of data bits, baud rate, and the number of stop bits.
- **Back**: returns to the previous screen.
- **Next**: opens the *Rover Antenna* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: EGNOS

The **Config: EGNOS** screen contains settings for an EGNOS source of differential correction data.

The screenshot shows a software window titled "Config: EGNOS" with "Finish" and "Cancel" buttons in the top right. The window is divided into two sections, "Channel 1" and "Channel 2". Each section contains three dropdown menus: "EGNOS PRN#" (set to "None"), "GPS PRN#" (set to "12"), and "Iono Corr" (set to "Use sat only if avail"). At the bottom of the window are two buttons: "<< Back" and "Next >>".

Figure 2-49. Config: EGNOS

- *Channel 1* and *Channel 2*: up to two receiver channels can be allocated to an EGNOS satellite.
- *EGNOS PRN #*: the EGNOS satellite's PRN number.
- *GPS PRN #*: the GPS satellite's PRN number, which is associated with the EGNOS PRN number.
- *Iono corr*: enable/disable use of ionospheric corrections from the EGNOS satellite when computing positions:
 - *None*: ionospheric corrections are not used
 - *Apply if avail*: use ionospheric corrections if available
 - *Use sat only if avail*: use only the satellites for which ionospheric corrections are available.
- **Back**: returns to the previous screen.
- **Next**: opens the **Config: Rover Antenna** screen.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

Config: OmniSTAR

The *Config: OmniSTAR* screen contains settings for an OmniSTAR source of differential correction data.

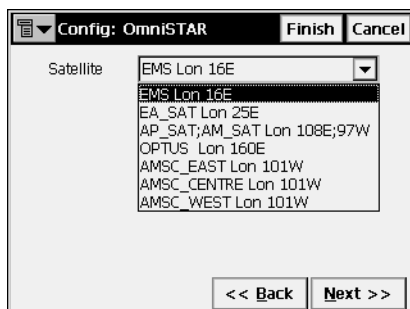


Figure 2-50. Config: OmniSTAR

- *Satellite*: the satellite that delivers differential GPS corrections.
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Rover Antenna* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Rover Antenna

The *Config: Rover Antenna* screen contains settings for the antenna connected to the Rover.

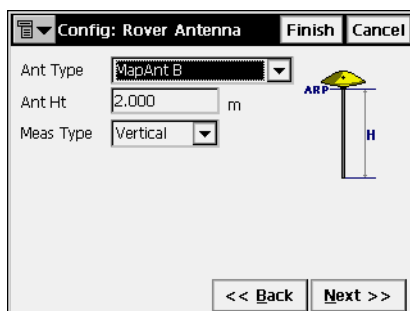


Figure 2-51. Config: Rover Antenna

- *Ant Type*: the type of the Topcon antenna.

- *Ant Ht*: the height of the antenna.
- *Meas Type*: the type of the antenna height measurement; either *Vertical* (measure to *ARP*, antenna reference point) or *Slant* (measure to edge of antenna). The screen also illustrates the measurement type.
- **Back**: returns to the previous screen.
- **Next**: opens the *mmGPS* screen for GPS RTK configurations.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

mmGPS

For mmGPS aided RTK survey types, the configuration screens are the same as for the standard RTK survey types. A mmGPS survey (RTK or Network RTK) uses the usual RTK GPS+ survey system, but with a wireless PZS-1 sensor at the rover to pick up the Lazer Zone signal from the PZL-1 transmitter for accurate (millimeter) elevations.

The *mmGPS* screen adds a millimeter GPS selection to the RTK survey being configured.

Figure 2-52. mmGPS

- *Use mmGPS*: enables using mmGPS+.
- *Receiver port*: select the port used for communication between receiver and PZS-1 sensor (typically port D).

- *Sensor Gain*: select Auto to automatically control the mmGPS receiver's detection level of the transmitter's signal.
- *Init Time Improvement*: select to use the mmGPS signal to assist in initializing the GPS receiver. This option is useful to decrease the initialization time when satellite visibility is limited (for example, tracking only four or five satellites).
- *Weighted Height*: select to combine mmGPS elevations and GPS elevations. When selected, this option will force the receiver/sensor to always consider the angle and distance when determining the elevation, then combine the two elevations accordingly. This option works well at large (300m) distances and steep angles.
- *Height Difference Limit*: sets the threshold for the difference between GPS and mmGPS+ height measurements.
- **Back**: returns to the previous screen.
- **Next**: proceeds to the ***Survey Params*** screen. For RTK, Real Time DGPS and Network RTK surveys with enabled post processing, and PP Kinematic surveys, the ***Config: Init Times*** screen is the same as the ***Config: Occupation Times*** screen for PP Static survey.
- **Finish**: saves the changes and returns to the ***Select Survey Config*** screen. All the settings will be transmitted only when the configuration is used.

Config: Initialization (Occupation) Times

The *Config: Init (Occupation) Times* screen contains timing settings for the receiver logging, used in automatic mode during a PP Static Survey, and depends upon the number of satellites available and the number of frequencies used.

The figure shows two side-by-side screenshots of configuration screens. The left screen is titled 'Config: Init Times' and the right is 'Config: Occupation Times'. Both screens have a table for setting times in minutes based on the number of satellites (Num SVs) and frequency mode (Single Freq or Dual Freq). The values in the tables are: for 4 SVs, Single Freq is 50 and Dual Freq is 20; for 5 SVs, Single Freq is 40 and Dual Freq is 15; for 6+ SVs, Single Freq is 20 and Dual Freq is 10. Navigation buttons include '<< Back', 'Next >>', 'Finish', and 'Cancel'.

Num SVs	Single Freq	Dual Freq
4	50	20
5	40	15
6+	20	10

Figure 2-53. Config: Initialization/Occupation Times

The *Config: Init (Occupation) Times* screen contains settings for RTK&PP, PP Static and PP Kinematic modes.

- *Initialization (Occupation) Times*: the times required for ambiguity resolution (that is, the time required to estimate fixed ambiguity positions).
- *Num SV*: the number of satellites.
- *Single Freq*: the default occupation time in minutes for single frequency mode for a given number of satellites.
- *Dual Freq*: the default occupation time in minutes for dual frequency mode for a given number of satellites.
- **Back**: returns to the previous screen.
- **Next**: proceeds to the next screen (PP Static: *Config: Stakeout Parms*; RTK&PP and PP Kinematic: *Config: Survey Parms*).
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Survey Parameters

The *Config: Survey Parms* screen sets the parameters used by default during the survey. These parameters can be changed with the help of the Settings button from any Survey screen in GPS+ mode.

Figure 2-54. Config: Survey Parameters

- *Solution Type*: sets the solution type for each epoch. Depending on the survey type chosen, it can be selected from “*Fix mmGPS+*”, “*Fix Only*”, “*Fix and Float mmGPS+*”, “*Fix and Float*”, “*Fix, Float, DGPS*”, “*DGPS*”, “*DGPS, Auto*”, or “*All*”.
 - *Fix mmGPS+*: positions were computed by the RTK engine using the carrier phase measurements from the base receiver and mmGPS aided rover receiver. Integer ambiguities were fixed.
 - *Fix*: positions were computed by the RTK engine using the carrier phase measurements from base and rover receivers. Integer ambiguities were fixed.
 - *Float*: positions were computed by the RTK engine using the carrier phase measurements from base and rover receivers. Integer ambiguities, however, were NOT fixed (their float estimates were used instead).
 - *DGPS*: positions were determined using only the pseudo-range measurements or carrier-phase pseudo-ranges.
 - *All*: positions were computed using all epochs accepted, including autonomous solutions.
 - *Auto*: autonomous positions when differential corrections are not available.

- The *Auto Accept* field sets parameters for automatic acceptance during a stationary survey. These are:
 - *Num Meas to Avg*: sets the number of measurements used for averaging, as needed.
 - *Precision*: sets Horizontal and Vertical precision values, if to be taken into account. If both *Precision* and *Num Meas To Avg* are checked, both these conditions must be satisfied before the coordinates are accepted.
- The *Auto Topo* field sets parameters for kinematic surveys. These are:
 - *Method*: defines the method for measuring the interval between the received epochs; by time, by horizontal distance, or by slope distance.
 - *Interval*: sets the value of this interval.

For PP Kinematic or PP DGPS, the **Config: Survey Params** screen displays the following parameters.

Figure 2-55. Config: Survey Parameters

- *Topo*: enter the number of epochs to log on each location.
- *Auto Topo*: sets the time interval between locations. Only this method is currently available.
- **Back**: returns to the previous screen.
- **Next**: opens the **Config: Stakeout Params** screen.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

Config: Stakeout Parameters

The *Config: Stakeout Params* screen sets the parameters that will be used by job during a stakeout. These parameters can be changed with the help of the **Settings** button from any Stakeout screen in GPS+ mode.

Figure 2-56. Config: Stakeout Parameters

- *Hz Dist Tolerance*: sets when the graph will switch to a bull's eye in Stakeout.
- *Reference Direction*: sets the reference direction for stakeout. The reference direction can be North, moving direction, moving direction + North, the direction to the reference point, or a reference azimuth. Moving Direction + North is similar to the Moving Direction option, but displays the North direction when the user is within 3 meters of the design point.
- The *Store Staked Point As* field sets the rule for naming staked points:
 - *Point*: sets the rule for defining names for the staked-out points (Figure 2-57 on page 2-52); either design point name, next point name, design point with a pre-defined prefix (that is, `stk_01`, where “`stk_`” is the prefix), or design point with a pre-defined suffix.

The choice of the prefix or suffix appears only when the corresponding item is chosen from the drop-down menu.

Also, a specified numerical constant can be added automatically to generate the staked point name.

Figure 2-57. Design Point Name + Constant

For instance, if the constant specified is 1000, and the design point is 100, the staked point would be named 1100 (that is, 100+1000). If the design point is alphanumeric, the constant will be appended to the name. For example, for the design point ALPHA, the corresponding staked out point will be named ALPHA1000.

- *Note*: sets the rule for setting Notes for the staked out points; either design point name, design point with a prefix, or design point with a suffix.

Also, it can be Station & Offset information.

If the Station & Offset option is activated, an edit box for entering alphanumeric prefix will appear. For the US, this prefix is “Sta”, for the international markets is “Cha”, and for the Korean/Japanese markets is “No.”. With this option activated, depending on the choice for the prefix, TopSURV will automatically generate one note for each stakeout point as: Sta5+5.5R5.0 or Cha505.5R5.0 or No.5+5.5R5.0

- **Solution Type** (for real time surveys only): defines the type of position solutions that should be used for the stakeout: *Fix Only*; *Fix and Float*; *Fix*, *Float*, *DGPS*; *DGPS*; *DGPS*, *Auto*; or *All*.
- **Back**: returns to the previous screen.
- **Next**: opens the **Config: Advanced** screen.
- **Finish**: saves the changes and returns to the **Select Survey Config** screen.

- The bitmap menu on the upper-left corner contains two items:
 - *Display*: opens the **Staked Point Icon** screen to set an icon for the staked point.
 - *Help*: accesses the Help files.

Staked Point Icon

The **Staked Point Icon** screen selects options to display the icon for the staked point on the map.

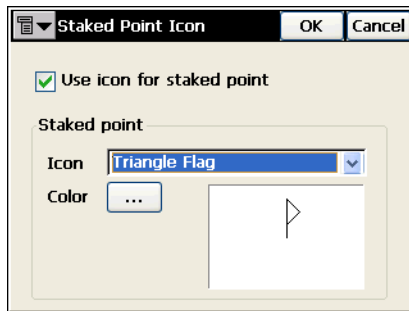


Figure 2-58. Staked Point Icon

- *Use icon for staked point*: enables display of the staked point on the map.
- *Staked point*: specifies and displays an colored icon for the staked point.
- **OK**: saves the changes and returns to the Config: **Stakeout Params** screen.

Config: Advanced

The *Config: Advanced* screen sets several additional parameters for the GPS+ mode.

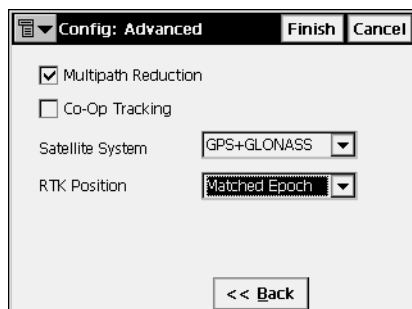


Figure 2-59. Config: Advanced

- The *Multipath reduction* is used when a signal received includes multiple reflections from nearby objects. Check the *Multipath Reduction* field to use this mode during the survey.
- *Co-Op tracking*: involves additional resources for acquisition of the signal, phase-lock and delay-lock loops.
- *Satellite system*: defines the system of satellites to use.
- *RTK Position* (only for real time surveys): selects the method of RTK corrections definition; either *Extrapolation* or *Matched Epoch* (sometimes described as asynchronous or synchronous, respectively).
- **Back**: returns to the previous screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Total Station Configuration

To configure a total station survey, press the button in the *TS Config* field of the *Select Survey Config* screen.

Configurations

For TS configurations, the *Configurations* screen presents a list of available configurations for Total Stations.

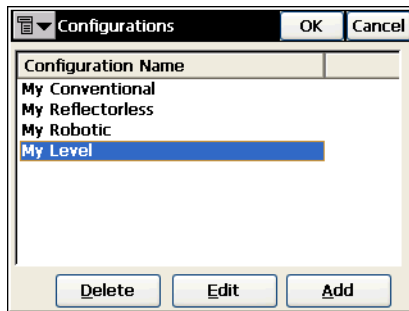


Figure 2-60. TS Configurations

- **Delete:** deletes the configuration.
- **Edit:** changes the configuration settings.
- **Add:** adds a new Configuration.
- **OK:** returns to the *Select Survey Configurations* screen.

If the Contractor Module is selected in the TS mode (see “Mode” on page 2-123), only Conventional and Reflectorless configurations are available for use by non-surveyors for topo and stakeout with total stations.

Config: Survey

The *Config: Survey* screen contains general settings for the configuration.

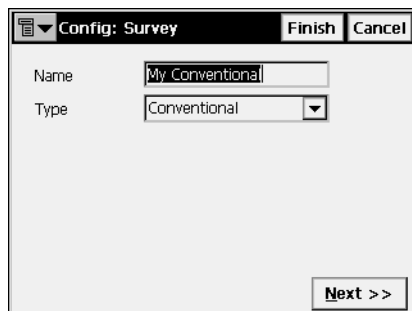


Figure 2-61. Config: Survey

- **Name:** the name of the configuration that will be displayed in the *Configurations* screen.
- **Type:** the type of the Configuration; either *Conventional*, *Reflectorless*, *Robotic*, or *Level*.
- **Next:** opens the *Config: Instrument* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Instrument

The *Config: Instrument* screen (Figure 2-62 on page 2-57) contains typical total station parameters and communication settings.

- **Manufacturer:** defines if a Topcon instrument is used. For Conventional and Reflectorless surveys also Sokkia, Nikon and Leica instruments can be defined. For survey emulation, Manual Mode can be used.
- **Model:** sets the model of the instrument, taking into account the type of the configuration. For Robotic types, only motorized models will be displayed in the drop-down menu.



Figure 2-62. Config: Instrument

Table 2-1 gives Topcon instrument models and their available functionality.

Table 2-1. Instrument Model and Available Functionality

Topcon instrument models are:	
GTS Series – Conventional	GTS 1/GTS 3 – Conventional
GTS-220 – Conventional	GRT 2000 – Conventional and Robotic
GTS-230/230W – Conventional (Bluetooth)	GPT 1000 – Reflectorless
GTS-600 – Conventional	GPT 2000 – Reflectorless
GTS-720/720W – Conventional	GPT 6000 – Reflectorless
GTS-800/810 – Conventional	GPT 3000/3000W – Reflectorless
GTS-800A/810A – Conventional and Robotic	GPT 7000/7000W – Reflectorless
GTS-820A – Conventional and Robotic	GPT 8000 – Reflectorless
AP-L1A – Conventional and Robotic	GPT 8000A/8200A – Reflectorless and Robotic
AP-L1 – Conventional and Robotic	DL-101 – Level
GMT100 – Conventional	DL-102 – Level
	DL-102C – Level
Sokkia instrument models are:	
SET3, SET4, SET5, SET300, SET400, or SET500	
Nikon instrument model are:	
DTM (SET)	
Leica instrument models are:	
TCR400 or TCR700	

- **Back:** returns to the previous screen.
- **Next:** opens the *Config: Conn Mode* screen for Total Stations and *Config: Cable* screen for Levels.

- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

In Robotic and Level mode, the bitmap on the upper-left corner of the screen displays the *Monitor* item in addition to the usual *Help* item.

Monitor Options

Selecting the *Monitor* item opens the *Monitor Options* screen to set the parameters for a Monitor survey.

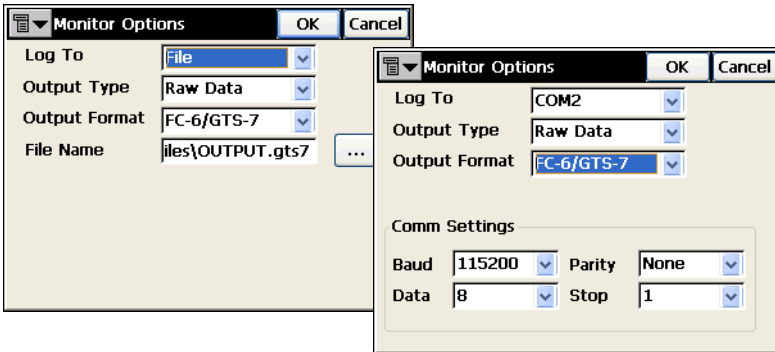


Figure 2-63. Monitor Options

- *Log To*: sets whether the data will be output to a File, COM1 port, COM2 port, Bluetooth, or None.
- *Output Type*: currently sets only the Raw data to output.
- *Output Format*: sets in which format to output the data: FC-5, FC-6/GTS-7 or GTS-6.

Available options vary depending on whether File or a COM port is selected.

- *File Name*: sets the file name.
- : browses for the destination of the file and sets the default file extension.
- *Comm Settings*: sets the communication parameters for the port.
- **OK**: saves the settings made and returns to the *Config: Instrument* screen.

Config: Connection Mode

The *Config: Conn Mode* screen selects the connection mode of the Total Station.

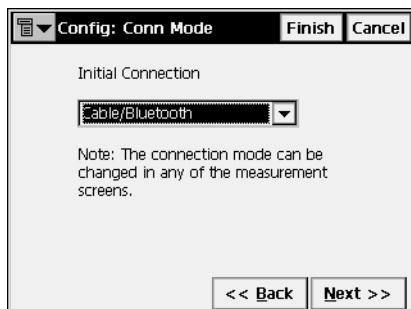


Figure 2-64. Config: Conn Mode

- *Initial Connection*: the connection mode. Depending upon the type of the instrument, it can be the following:
 - For Conventional and Reflectorless modes: *Cable/Bluetooth*
 - For Robotic (AP-L1, AP-L1A, GRT-2000): *Radios Only, Cable/Bluetooth*
 - For Robotic (GTS-800A/810A): *Radios Only, RC2 with Radios, RC2 Only, Cable/Bluetooth*
 - For Robotic (GPT-820A/8000A/8200A): *Radios Only, RC2 with Radios, RC2W with Radios, RC2 Only, RC2W Only, Cable/Bluetooth*
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Cable* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Cable

The **Config: Cable** screen contains the parameters of the cable connection.

- **Cable Comm Settings:** the parameters for the cable connection: *Baud* (baud rate), *Parity*, *Data* (number of the data bits), and *Stop* (number of the stop bits).

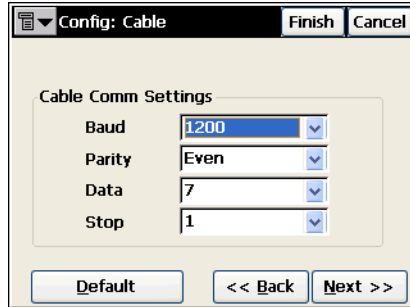


Figure 2-65. Config: Cable

- **Default:** restore settings to default values if they have been modified.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Radio** screen (for Robotic surveys), **Config: Mode** (for motorized Conventional or Reflectorless surveys), or **Config: Survey Params** (for Conventional, Reflectorless, or Level surveys).
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

Config: Radio

The *Config: Radio* screen sets the parameters of the modem connected to the total station.

The screenshot shows a software window titled "Config: Radio". At the top right are "Finish" and "Cancel" buttons. Below the title bar, there is a "Type" label and a dropdown menu currently showing "Satel". Underneath is a section titled "Radio Comm Settings" which contains four rows, each with a label and a dropdown menu: "Baud" set to "9600", "Parity" set to "None", "Data" set to "8", and "Stop" set to "1". At the bottom of the window are three buttons: "Configure Radio", "<< Back", and "Next >>".

Figure 2-66. Config: TS Radio

- **Type:** the type of the modem; either Satel or Pacific Crest.
- **Radio Comm Settings:** sets radio communication parameters: parity, number of data bits, baud rate, and the number of stop bits.
- **Configure Radio:** opens either the *Pacific Crest Radio Parm*s or *Satel Radio Parm*s screen (see “Pacific Crest Radio Parameters” on page 2-25 and “Satel Radio Parameters” on page 2-26).
- **Back:** returns to the previous screen.
- **Next:** opens the *Config: Mode* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Mode

The *Config: Mode* screen contains the parameter defining the turning ability of conventional total stations. This mode is available only for motorized instruments in Conventional and Reflectorless modes of operation.

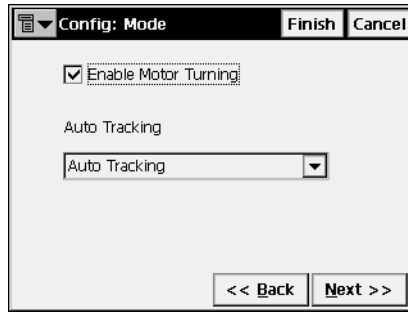


Figure 2-67. Config: Mode

Motorized total stations can support Auto Tracking and Auto Aiming mode.

Table 2-2. Motorized Total Stations

GTS-800/810 – Motorized	AP-L1 – Motorized and Auto Tracking
GTS-800A/810A/820A – Motorized and Auto Tracking/Aiming	AP-L1A – Motorized and Auto Tracking
GPT-8000 – Motorized	GRT-2000 – Motorized and Auto Tracking
GPT-8000A/8200A – Motorized and Auto Tracking/Aiming	GMT-100 – Motorized

- *Enable Motor Turning*: sets the motor to active mode.
- *Auto Tracking*: if motor turning is enabled, sets the motorized total station into remote control, or a fully automatic mode of operation.
 - The *Auto Tracking* mode causes the total station to track the reflector as the surveyor moves from point to point.
 - The *Auto Tracking/Auto Aiming* mode causes the instrument to find the prism in the pre-defined region.
 - The *No Aiming/No Tracking* mode disables the total station operation program.
- **Back**: returns to the previous screen.

- **Next:** opens the *Config: Search/Track* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

Config: Search/Track

The *Config: Search/Track* screen contains settings for the total station signal tracking in the Robotic mode. Depending on the selected total station, the parameters differ.

Figure 2-68. Config: Search/Track

- *Turning Speed:* sets the turn speed of a total station in revolutions per minute.
- *Start Search After:* sets the delay between the loss of the signal and the start of searching.
- *Pattern:* sets the program for tracking and searching.
 - *Normal* (for AP-L1A and GRT-2000) or *Pattern 1* mode searches for the prism at the point where the prism was lost. The instrument gradually searches in up and down directions, and will continue until the prism is found.
 - *High* (for AP-L1A and GRT-2000) or *Pattern 2* mode searches for the prism for a set amount of time. The instrument searches from up to down and continues until the prism is found, or after a maximum of six attempts.

Auto tracking mode changes to manual mode when the prism cannot be found within six attempts, and returns to the point where the prism was lost.¹

- *Trk Speed*: sets the speed for tracking; either slow, medium, or fast. For a GTS800a model, either Survey or Machine controlled.
- *Sensitivity*: sets the detection sensitivity of the accepted signal; either low, medium or high. This parameter is available for all instruments except GPT-8000A.
- *Track Light*: sets the light on the line of sight to be enabled or disabled.
- *Scan Range*: sets the width of the tracking signal; either narrow, middle or wide. Available only in the AP-L1A total stations.
- *Range*: sets the range of searching or tracking, in degrees, for the vertical and horizontal planes.
- **Back**: returns to the previous screen.
- **Next**: opens the *Config: Survey Parms* screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

1. For details, refer to the “Automatic Tracking Total Stations. GTS-800A Series” Instruction Manual.

Config: Survey Parameters

The *Config: Survey Params* screen contains the default parameters that will be used during the survey. They can be changed with the help of the Settings button from any Survey screen.

Figure 2-69. Config: Survey Parameters – First Screen

- *Meas Method*: sets the mode of side-shot measurements; either *Sideshot-Direct*, *Sideshot Direct/Reverse*, or *Angle/Dist Sets-Dir/Rev*. See “Observations” on page 6-13 for a description of these methods.

In the Contractor Module, the only measurement supported is *Sideshot-Direct* (Figure 2-70).

Figure 2-70. Config: Survey Parameters in the Contractor Module

- *Angle Sequence*: sets the sequence of measured angles. (Available in the *Angle/Dist Sets-Dir/Rev* mode.) Here FS is foresight point (the next occupation point), BS is backsight point (the previous occupation point), and Plunge term stands for flipping and rotating the total station telescope by 180 degrees. These are used

for the reduction of the angle errors. Possible sequences are BS/FS Plunge BS/FS; BS/FS Plunge FS/BS; FS/BS Plunge BS/FS; FS/BS Plunge FS/BS; BS Plunge BS/FS Plunge FS; or FS Plunge FS/BS Plunge BS.

- *Num Sets*: the number of measurement sets participating in the average. Here the Num Sets defaults to 1 and cannot be changed if *Sideshot-Direct* or *Sideshot Direct/Reverse* is selected in the *Meas Method* field. Selecting *Angle/Dist Sets-Dir/Rev* in the *Meas Method* field allows for NumSets to be greater than 1.
- *Tolerances*: the admissible deviation values of the horizontal and zenith angles and the distance.
- *Distance Averaging*: defines if the distance used is measured using one signal or the average of several signals.
- *Measure Reverse Dist*: enables reverse distance measurements. These are used for the reduction of the distance measurement errors.
- *Auto Advance Set*: sets the Automatic Repetition of the measurements to active mode, the survey automatically advances to the next set. This field can be enabled only for motorized surveys and only if a *Meas Method* of Angle/Dist Sets-Dir/Rev is selected.
- *Auto Accept Meas*: activates the review of automatic repetition needed to accept each measurement. This field can be enabled only for Robotic, non-RC2 surveys and only when a *Meas Method* of Angle/Dist Sets-Dir/Rev is selected
- **Next**: opens the next **Config: Survey Params** screen.
- **Finish**: saves the changes and returns to **Select Survey Config**.

The next **Config: Survey Params** screen contains the additional survey parameters.

Figure 2-71. Config: Survey Parameters – Second Screen

- **Meas Type:** sets the order and the type of the measurements in one set.
 - **HA:** horizontal angle
 - **VA:** vertical angle
 - **SD:** slope distance
 - **HD:** horizontal distance
 - **VD:** vertical distance
- **EDM mode:** determines the sensitivity to use for the distance measurements, coarse or fine.
- **Prism Constant:** the parameter of the prism, characterizing the difference between the reflection plane and the center of the prism.
- **Point Guide:** check if it is desired to operate the tracking lights.
- **Non-Prism:** check to enable the non-prism mode.
- **AutoTopo** (only for Robotic surveys): the parameters of the automatic survey. In the Contractor Module, these fields are absent.
- **Back:** returns to the previous screen.
- **Next:** opens the **Config: Stakeout Params** screen.
- **Finish:** saves the changes and returns to the **Select Survey Config** screen. All the settings will be transmitted only when the configuration is used.

Config: Stakeout Parameters

The *Config: Stakeout Params* screen sets the default stakeout parameters. These parameters can be changed using the **Settings** button from any Stakeout screen in TS mode.

Figure 2-72. Config: Stakeout Parameters

- *Hz Dist Tolerance*: sets when the graph will switch to a bull's eye in Stakeout.
- *Reference Direction*: sets the direction assumed to be the referenced one during the stakeout. For now, it can be Instrument Reference only.
- The *Store Staked Point As* field sets the rules for staked points naming. This is the only field needed for a Level survey.
 - *Point*: sets the rule for defining names for the staked-out points; either design point name, next point name, design point with a pre-defined prefix (that is, stk_01, where “stk_” is prefix), design point with a pre-defined suffix, or design point with a specified numerical constant added automatically (for details on staked point name generation, see page 2-51).
 - *Note*: sets the rule for defining Notes for the staked-out points; either *Design Point*, *Design PT Prefix*, *Design PT Suffix*, or *Station & Offset* (for details, see page 2-51).
- *Turn TS to Design Pt*: controls the way the total station turns toward the design point.
- *Search After Turn*: causes the instrument (only for motorized surveys) to search for the prism after turning to the design point.

- **Back:** returns to the previous screen.
- **Next:** opens the *Config: Miscellaneous* screen.
- **Finish:** saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.
- The bitmap menu on the upper-left corner contains two items:
 - *Display:* opens the *Staked Point Icon* screen to set an icon for the staked point like in GPS configurations (“Staked Point Icon” on page 2-53).
 - *Help:* accesses the Help files.

Config: Miscellaneous

The *Config: Miscellaneous* screen is used to customize the user interface (Figure 2-73 on page 2-70):

- *Display Coordinates after Measurement:* when checked, computed coordinates are displayed automatically after a total station measurement is performed and before the point coordinates are stored into the database.
- *Apply Earth Curvature and Refraction:* corrects the computed heights for Earth Curvature (Vertical Distance) and slope distances and vertical angles for atmospheric refraction.
- *Prompt for Rod Height:* when checked, prompts for a height of a Rod (Target) before a point is stored.
- *Prompt for BS Check:* when checked, will bring up the *Backsight Check* screen when the *Backsight Setup* screen is exited.
- *Prompt for Control Codes:* when checked, a dialog will appear to specify the control code and attribute before a surveyed point is stored.

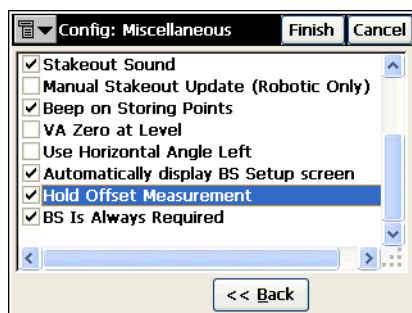


Figure 2-73. Config: Miscellaneous

- *Stakeout Sound*: makes a sound each time a point is staked-out.
- *Manual Stakeout Update (Robotic Only)*: when checked, the **Meas** button in a Stakeout screen must be pressed to make a measurement to the Robotic Total Station. When not checked the measurements are recorded continuously. This applies to the Stakeout screens only.
- *Beep on Storing Points*: beeps each time a point is stored.
- *VA Zero at Level*: if checked, vertical angle measurements are oriented to be zero at the Horizontal (“Level”) direction. If this option is unchecked, vertical angle measurements are oriented to be zero at the vertical (“Zenith”) direction (default). Only certain Total Stations allow TopSURV to set this value. For this reason, ensure that this option is set to the same value in the total station as is set in TopSURV.
- *Use Horizontal Angle Left*: if checked, the horizontal angle measurements are shown in a counter-clockwise (“Left”) direction. If this option is unchecked, the horizontal angle measurements are shown in a clockwise (“Right”) direction (default). TopSURV will automatically set the Total Station to “HR” or “HL” depending on the selection.
- *Automatically display BS Setup screen*: if checked, the **Backsight Setup** screen displays automatically when attempting to access any of the screens involving total station observations.

- *Hold Offset Measurement*: if checked, the screen to measure an offset point with the help of the selected offset tool displays automatically after each measurement.
- *BS Is Always Required*: if checked, a warning to set Backsight always displays when attempting to access any of the screens involving total station and level observations.
- **Back**: returns to the previous screen.
- **Finish**: saves the changes and returns to the *Select Survey Config* screen. All the settings will be transmitted only when the configuration is used.

For the Level survey type, the *Config: Miscellaneous* screen contains some specific user interface parameters.

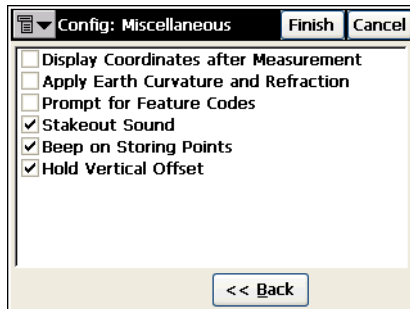


Figure 2-74. Config: Miscellaneous – Level

- *Prompt for Feature Codes*: when checked, the *Code-Attributes* dialog will appear to specify the code and attributes before a surveyed point is stored.
- *Hold Vertical Offset*: available only for the digital level, if checked, the vertical offset is added automatically to each measurement.

Global

To set general settings in TopSURV, tap **Job ► Config ► Global**.

The **Global** screen sets mode for performing linework.

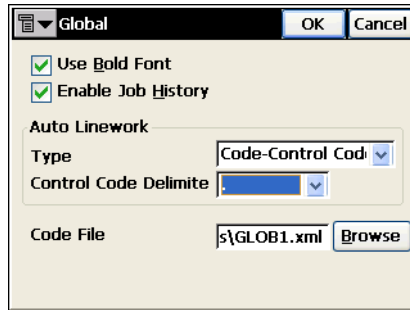


Figure 2-75. Global

- *Use Bold Font*: if checked, uses the bold font on the controller display to see more clearly.
- *Enable Job History*: if checked, saves every surveyor's operation on the job in a history file.
- *Auto Linework*: selects the type of linework to form open and closed polylines:
 - *Code-String*: all points with the same unique combination of Code and Strings are connected to form a line. This line is named as “~~~Code&String”.
 - *Point/Line/Area*: all points are selected to be a part of either points or named lines or areas (GIS mode). Areas in this mode are simply closed lines. Strings and control codes are not supported in this mode.
 - *Code-Control Code*: the control codes /BEG and /END are indicated along with codes to start and end lines. All points with the same code between and indicating the points with the /BEG and /END control codes are then connected in the measurement order to form a line. This line is named as “~~~Code&XXXXXXXX”, where the XXXXXXXX is an automatically generated number which increments for each additional line created. Strings cannot be entered in this mode at all.

- If the selected mode is either Code-String or Code-Control Code mode, then the *Control Code Delimiter* option selects a delimiter for entering control codes along with codes in a single field, separated by this delimiter.
- *Code File*: sets a Global Code file to use with the currently selected job. Use the **Browse** button to select the necessary file.
- **OK**: saves the changes and returns to the main screen.

Coordinate System

Job ▶ Config ▶ Coord Sys opens the *Coordinate System* screen. The *Coordinate System* screen contains coordinate system information for the job.

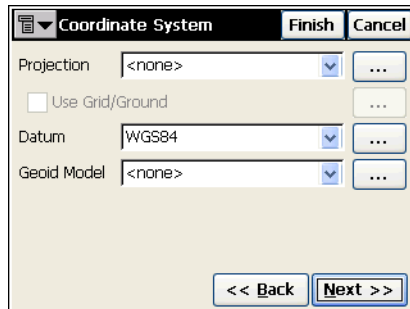





Figure 2-76. Coordinate System

- *Projection*: specifies the projection used. The  button opens the *Projections* screen where active projections can be manipulated (added from a list of pre-defined projections, deleted).
- *Use Grid/Ground*: when a grid projection is selected, this box becomes available. If checked, the  button is activated to open the *Grid to/from Ground Param* screen where transformation parameters are set to place grid coordinates to a near ground reference surface and vice versa.
- *Datum*: shows the datum for the selected projection. The drop-down list displays all datums pre-defined in the current version.

The  button opens the *Custom Datums* screen to add/edit user-defined datums.

- **Geoid Model:** shows the geoid selected (if any). The  button opens the *Geoids List* screen where geoids can be added, deleted, or their properties viewed.
- **Back:** returns to the previous screen.
- **Next:** opens the *Units* screen.
- **Finish:** saves the settings, and returns to the main screen.

Projections

The *Projections* screen contains a list of cataloged projections, that can be chosen for use in the job.

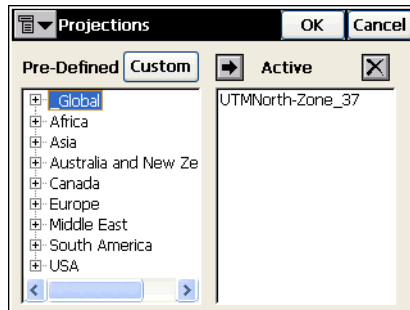




Figure 2-77. Projections

- **Pre-Defined:** contains the tree of available projections divided by regions.
- **Custom:** opens the *Custom projections* screen to add/edit user-defined projections.
- **Active:** contains the list of chosen projections (corresponds to the drop-down list in the *Projections* field of the *Coordinate System* screen). The first time the screen is opened, it is empty.
-  : selects the chosen projection in the *Pre-Defined* panel and inserts it into the *Active* panel.

-  : deletes the highlighted projection from the Active panel.
- **OK**: saves the changes and returns to the *Coordinate System* screen.

Custom Projections

The *Custom Projections* screen contains a list of custom projections (grid systems). Initially, this list is empty.

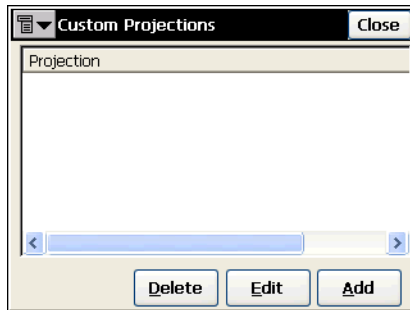



Figure 2-78. Custom Projections

- **Add**: opens the *Custom Projection* screen to enter parameters of the new custom grid system.
- **Edit**: opens the *Custom Projection* screen to edit parameters of the selected custom grid system.
- **Delete**: deletes the selected custom grid systems.

Custom Projection

The *Custom Projection* screen sets parameters for the new custom grid system.

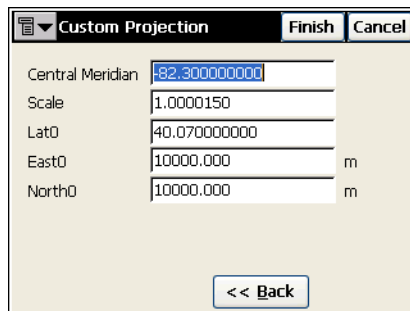
Figure 2-79. Custom Projection

- *Name*: sets the name of the new projection.
- *Type*: selects a sample projection from the list of available types:
 - *Albers Equal Area* (orthombadic) conic projection.
 - *Cassini-Soldner* cylindrical projection.
 - *Double Stereographic* conformal azimuthal projection.
 - *Lambert* conformal conic projection.
 - *Oblique Mercator* conformal cylindrical projection.
 - *Stereographic* conformal azimuthal projection.
 - *Transverse Mercator* conformal cylindrical projection.
- *Datum*: selects the datum for the projection from the list of available types.
-  : opens the *Custom Datums* screen to add/edit user-defined datums.
- *Region*: displays the region.
- *Note*: any additional information about the projection.
- **Finish**: saves the changes, closes the screen and returns to the *Custom Projection* screen.

- **Next:** opens another *Custom Projection* screen to enter the new projection specifications depending on the sample projection selected.

If the *Transverse Mercator* projection is selected as the sample, the *Custom Projection* screen displays the following fields:

- *Central Meridian:* longitude of the central meridian of a zone.
- *Scale:* scale factor on the central meridian.
- *Lat0:* latitude of the origin of the projection
- *East0:* false Easting of the origin of the projection.
- *North0:* false Northing of the origin of the projection.



The screenshot shows a dialog box titled "Custom Projection" with "Finish" and "Cancel" buttons. It contains five input fields with the following values:

Field	Value	Unit
Central Meridian	82.300000000	
Scale	1.0000150	
Lat0	40.070000000	
East0	10000.000	m
North0	10000.000	m

At the bottom is a "<< Back" button.

Figure 2-80. Custom Projection Parameters

Grid to/from Ground Parameters

A ground projection is a grid mapping projection re-scaled to convert point coordinates to another reference surface (up to average project elevation) to produce near ground values. The ground coordinates can be converted back to the grid projection.

The *Grid to/from Ground Params* screen contains the parameters of the Grid to Ground and Ground to Grid coordinate transformation.

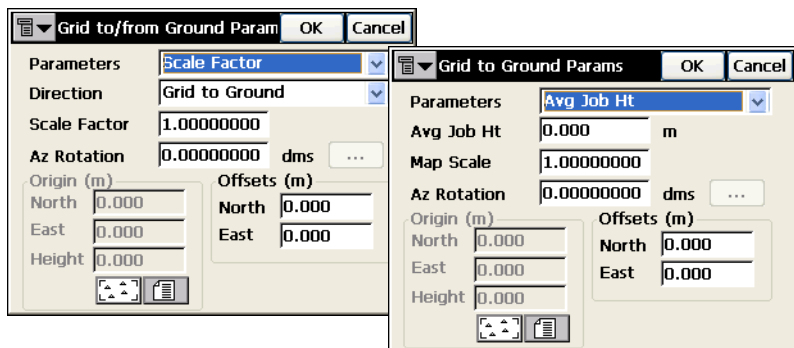


Figure 2-81. Grid to/from Ground Parameters

- *Parameters:* selects the set of parameters to perform Grid/Ground coordinate transformation: Scale Factor, Avg Job Ht or Origin Pt. The available options on the screen vary depending on the set of parameters selected.
- *Direction:* selects coordinate transformation type, either from Grid to Ground or from Ground to Grid.
- *Scale Factor:* sets the combined scale factor.
- *Az Rotation:* sets the angle between the axes of the grid and ground coordinate systems. This angle defines the reference direction for ground azimuths.
- *Avg Job Ht:* sets average job height to compute the elevation scale.
- *Map Scale:* sets the value of the zone scale factor
- *Offsets:* sets the offsets of the origin along the North and East axes to reduce ground coordinates to manageable values.

If the *Origin Pt* is selected for the coordinate transformation, the **Grid to Ground Params** screen displays the parameters to set the origin of the ground coordinates.

Figure 2-82. Grid to Ground Params

- **...** : opens the **Compute Rotation** screen to compute the Az Rotation value.
- *Origin*: sets the grid point for the ground origin. Can be selected from map, list or entered manually.
- *Ground Pt*: sets the ground coordinates for the origin.
- **OK**: saves the settings and returns to the **Coordinate System** screen.

Compute Rotation

The **Compute Rotation** screen computes azimuth rotation using ground and grid azimuths.

Figure 2-83. Compute Rotation

- *Azimuth*: sets the azimuths in the ground and grid systems.

- **Compute:** opens the *Compute Azimuth* screen to compute azimuths in the ground and grid systems respectively.
- *Rotation:* shows the azimuth rotation when this field is selected.
- **OK:** saves the results and returns to the *Grid to Ground Params* screen.

Compute Azimuth

The *Compute Azimuth* screen computes the azimuth of the direction using two points.

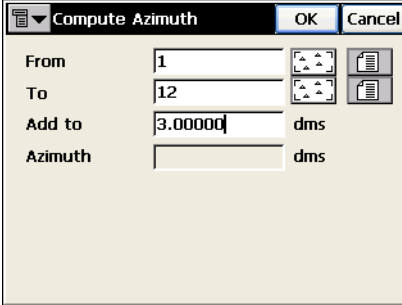


Figure 2-84. Compute Azimuth

- *From:* sets the start point for the direction.
- *To:* sets the end point for the direction.
- *Add to:* an additional value to add to the azimuth.
- **OK:** saves the results and returns to the *Compute Rotation* screen.

Custom Datums

The *Custom Datums* screen contains a list of custom datums. Initially, the list is empty.

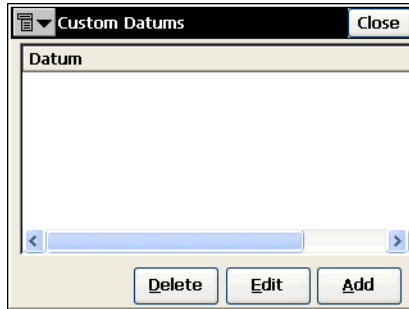


Figure 2-85. Custom Datums

- **Add:** opens the *Custom Datum* screen to enter parameters of a new custom datum.
- **Edit:** opens the *Custom Datum* screen to edit parameters of the selected custom datum.
- **Delete:** deletes the selected custom datums.

Custom Datum

The *Custom Datum* screen sets parameters of the new custom datum.

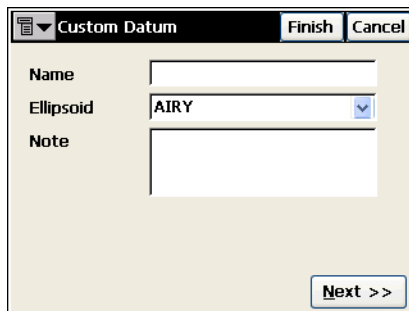


Figure 2-86. Custom Datum Name

- *Name*: sets the name of the new datum.
- *Ellipsoid*: selects the ellipsoid for the datum from the list of available types.
- *Note*: any additional information about the datum.

- **Next:** opens the next *Custom Datum* screen to set offsets, rotations and scale for the new datum.

Figure 2-87. Custom Datum Parameters

Geoid List

Geoid is a physical reference surface. Its shape reflects the distribution of mass inside the earth. Geoid undulations are important for converting GPS-derived ellipsoidal height differences to orthometric height differences.

The *Geoids List* screen contains a list of active *Geoids* available for selection.

Figure 2-88. Geoid List

- **Add:** opens the *Add Geoid* screen to add a geoid file to the list. Install the geoid file on the controller prior to adding it to the list. Some geoid files can be installed on the controller during TopSURV installation. They are provided to the user with the TopSURV installation program as '.gff' files.

- **Remove:** deletes the geoid from the list.
- **Edit:** opens the *Add Geoid* screen to change the geoid.
- **OK:** the job will refer to the selected geoid file when performing calculations.

Add Geoid

From the *Add Geoid* screen, select a Geoid file from the controller and see the boundaries of the geoid application.

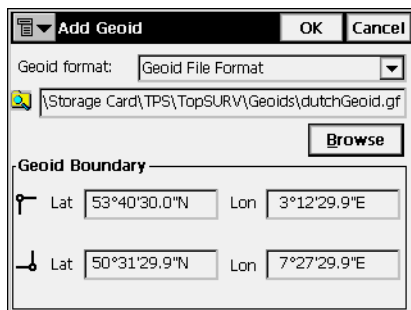





Figure 2-89. Geoid Parameters

- *Geoid Format*: the format of the geoid; either Geoid 99, Australian, Canadian 2000, Canadian 95, Geoid File Format, Mexico 97, Sweden, or Denmark.
-  : displays the directory where the geoid file is stored in the controller. Usually, the geoid files are stored in the Geoids folder in the directory where the application has been installed.
- **Browse:** opens the browse screen for choosing the geoid file from models previously downloaded to the controller. After the geoid is chosen and the **OK** button is pressed, the Geoid Boundary fields in the lower part of the *Add Geoid* screen display the coordinates of the north-west and south-east points of the geoid.
- *Geoid Boundary*: displays the boundary of the geoid application.

 : the longitude and latitude of the point that sets the north-west boundary of the geoid.

 : the longitude and latitude of the point that sets the south-east boundary of the geoid.

- **OK**: confirms the geoid selection and returns to the Geoid List screen.

After being chosen, the geoid file appears in the *Geoids List* screen.

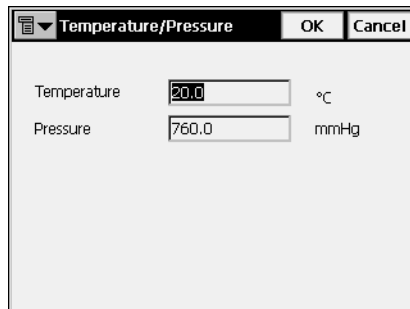
Units

Job ▶ Config ▶ Units opens the *Units* screen. For details, see “Units” on page 2-6.

Temperature/Pressure

This option is available only for Total Stations surveys.

Job ▶ Config ▶ Temp/Press opens the *Temperature/Pressure* screen to set the temperature and air pressure surrounding the total station to calculate atmospheric correction values for distances measured.



Temperature/Pressure		
Temperature	<input type="text" value="20.0"/>	°C
Pressure	<input type="text" value="760.0"/>	mmHg

Figure 2-90. Temperature/Pressure

Display

Job ▶ Config ▶ Display opens the *Display* screen. For details on this screen, see “Display” on page 2-7.

In the Contractor Module, the *Display* screen does not contain the Coordinate Type field because this module works only with ground coordinates.

Alarms

Job ▶ Config ▶ Alarms opens the *Alarms* screen. For details, see “Alarms” on page 2-8.

Menu Display

With the *Config* submenu, the appearance of the menus can also be modified. Some rarely used functions are not displayed, but can be enabled through the **Config ▶ Menu Display** submenu and the *Config Menus* screen.

Config Menu

The *Config Menus* screen displays the list of menus and submenus for each special submenu for the current job configuration.

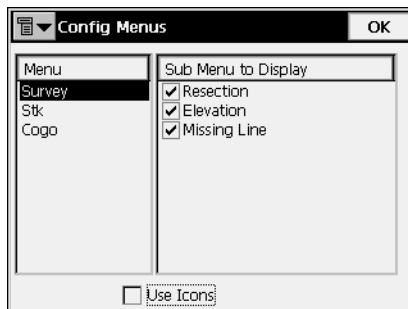


Figure 2-91. Config Menu

- *Menu*: the list of available menus.
- *Sub Menu to Display*: the list of the selected menu items available for display. Place a check mark near the item to display in the menu.
- *Use Icons*: check this box to display the menu items on the main screen as icons.

Import

To import data, tap **Job ▶ Import** (Figure 2-92).

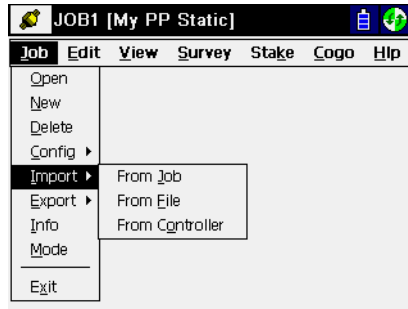


Figure 2-92. Import Submenu

The Import function is used to add points, codes and attributes, Code Libraries, Roads, Cross Section Templates, Point Lists and Localization from another job, file, or controller.

The bitmap in the upper-left corner of the screen displays the floating menu of the *Help* item.

Import From Job

To import from a job, tap **Job ▶ Import ▶ From Job**.

Select Job

The **Select Job** screen (Figure 2-93 on page 2-87) selects the job for import. **Select** launches a wizard-based import process. The wizard will guide the steps through the import process by means of the **Next** button. When at the final stage, the Next button becomes unavailable, and the Finish button will be active.

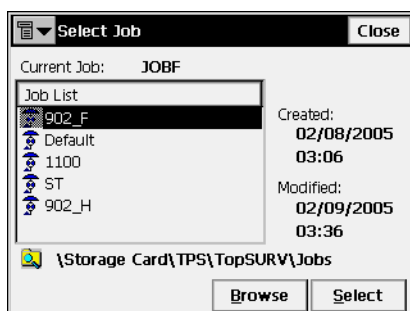


Figure 2-93. Select Job

If there is no desired job in the Job List, press the **Browse** button to select a job from the controller. The second *Select Job* screen will be opened to browse directories on the controller for a job.



Figure 2-94. Select Job

- *Name*: the name of the imported file.
- **OK**: approves the selection and opens the *Import* screen.

Import From Job

The **Import From Job** screen selects the data to import and, if necessary, filters the imported points.

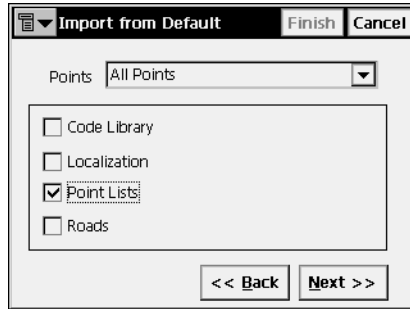


Figure 2-95. Import From Job

- **Points:** select the points for import, from the drop-down menu:
 - *All Points*
 - *By Type*
 - *By Range and Code*
 - *By Type, Range and Code*
 - *None*
- The following data can be imported along with points:
 - *Code Library*
 - *Localization*
 - *Point Lists*
 - *Roads*
- **Back:** returns to the previous screen.
- **Next:** depending on selections, opens either the **Select Point List(s) to Import** screen, or **Select Point Type(s) to Import** screen, or **Select Roads to Import** screen if only *Roads* is checked and *All points* is selected.
- **Finish:** starts the import process if only *Code Library* and/or *Localization* items are chosen and *All Points* is selected. Otherwise, the button is not available.

Select Point Type(s) to Import

The *Select Point Type(s) to Import* screen is used to select the types of points to be imported if *Code Library*, *Localization* or *Roads* are checked (if points filter by type has been enabled in the **Import From Job** screen). This can be done by placing check marks in the list, next to the desired types of points.

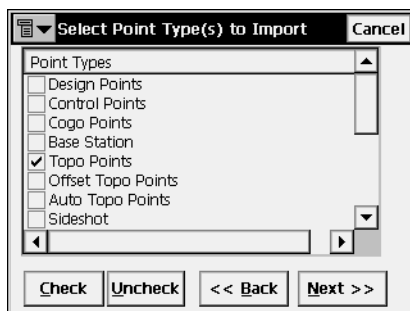


Figure 2-96. Select Point Type(s) to Import

- *Point Types*: the list of the point types. The following types are available for import:

<i>Design Points</i>	<i>Control Points</i>	<i>Cogo Points</i>
<i>Base Station</i>	<i>Topo Points</i>	<i>Offset Topo Points</i>
<i>Auto Topo Points</i>	<i>Sideshot</i>	<i>Offset</i>
<i>Remote</i>	<i>Reflectorless</i>	<i>BackSight</i>
<i>Stake Points</i>	<i>Stake Line</i>	<i>Check Points</i>
<i>Manually Typed</i>	<i>Tape Dimension</i>	

- **Check** and **Uncheck**: toggles the highlighted item(s) on or off, depending on the button being pressed. Press **Ctrl** while selecting to select more than one item.
- **Back**: returns to the previous screen.
- **Next**: opens *Points to Import* screen (if points filter by type, code and range has been enabled in the **Import From Job** screen). Otherwise, the button is not available.

Points to Import

The *Points to Import* screen filters the imported points.

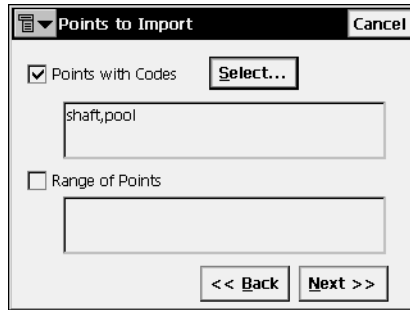


Figure 2-97. Points to Import

- *Points with Codes*: if set, all points with the selected codes will be imported.
- **Select**: opens the *Code* screen for code selection.
- *Range of Points*: select the points to import. These can be set by range (“-”, “;” or “,” can be used as a range separator) or by enumeration.
- **Back**: returns to the previous screen.
- **Next**: opens the *Select Road(s) to Import* screen (if *Roads* was checked in the *Import From Job* screen). Otherwise, the button is not available, and the **Finish** button appears to open the *Import Status* screen.

Code

The *Code* screen contains a list of available codes. All points with codes selected here will be imported.

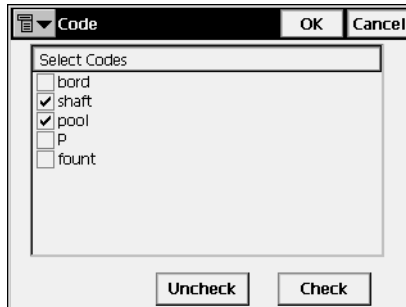


Figure 2-98. Code

- **Uncheck:** removes the mark from the highlighted code.
- **Check:** marks the highlighted entries.
- **OK:** returns to the previous screen with the codes selected.

Select Road(s) to Import

The *Select Road(s) to Import* screen selects the roads to import along with the data. Select from the *Roads* list for import by placing check marks next to them.

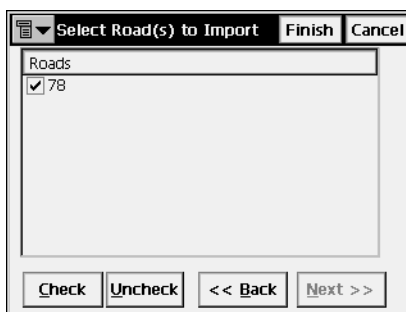


Figure 2-99. Select Road(s) to Import

- *Roads:* the list of available roads in the selected job.
- **Check** and **Uncheck:** toggles the highlighted item(s) on or off, depending on the button being pressed.

- **Back:** returns to the previous screen.
- **Finish:** starts the import process.

Select Point List(s) to Import

The *Select Point List(s) to Import* screen is used to select the point lists (if available) to import along with the data. Place the check marks to select the lists to import.

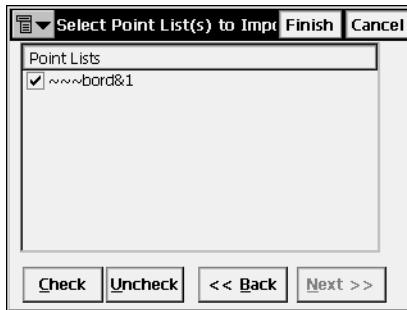


Figure 2-100. Select Point List(s) to Import

- *Point Lists:* the list of available point lists in the selected job.
- **Check** and **Uncheck:** toggles the highlighted item(s) on or off, depending upon the button being pressed.
- **Back:** returns to the previous screen.
- **Next:** is not available.
- **Finish:** starts the import process.

Import Status

The *Import Status* screen reflects the import process and contains a progress bar and a comments window. The progress bar displays the percentage of the data being imported (Figure 2-101 on page 2-93).

Press the *Close* button to return to the main screen.

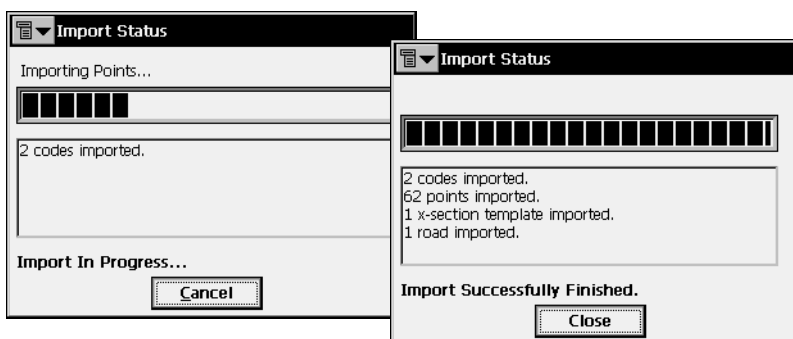


Figure 2-101. Import Status

Duplicate Objects

If the existing job contains points, roads, or point lists with the same names as the imported job, the ***Duplicate Objects*** screen appears.

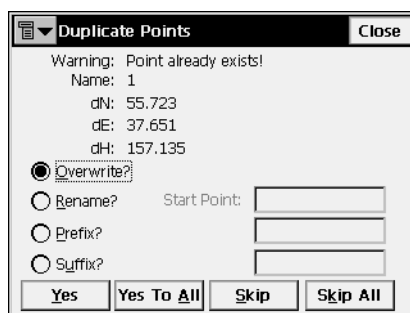


Figure 2-102. Duplicate Objects

The ***Duplicate Objects*** screen is a warning that prevents the loss of points, roads or point lists when names of these imported objects coincide with existing ones.

- ***Overwrite:*** the imported object will overwrite the existing one. If the object represents a control point, a confirmation displays that the point is deleting (Figure 2-103 on page 2-94).

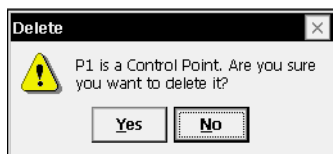


Figure 2-103. Delete Message

- **Rename:** the imported object will be renamed. The new name should be noted in the corresponding field.
- **Prefix/Suffix:** the imported object will differ from the existing object by prefix or suffix. The prefix/suffix should be noted in the corresponding field.
- **Yes:** press the button to accept the decision.
- **Yes To All:** press the button to accept the same decision for all similar cases.
- **Skip:** press the button to skip the object without importing.
- **Skip All:** press the button to skip all the objects with names that coincide with the names of existing objects, without importing.
- **Close:** disables the import process and opens the *Import Status* screen to remove all the objects already imported.

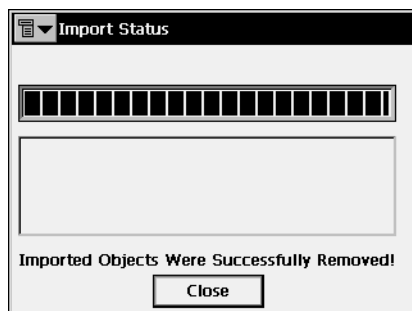


Figure 2-104. Import Status of Removing Objects

NOTICE NOTICE

*The import process cannot skip duplicate templates.
These objects must be renamed.*

Import From File

To import data from a file, tap **Job ► Import ► From File**.

From File

The **From File** screen imports points, roads, cross section templates, and localization from files with either pre-defined or custom formats. For a description of these formats, see Appendix A.

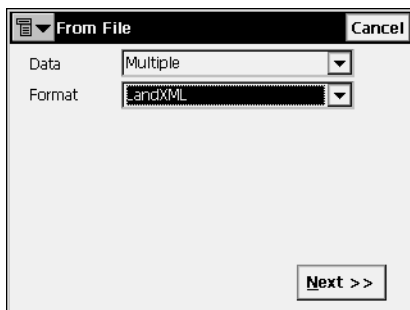


Figure 2-105. Import From File

- **Data Type:** select the data type to import from the file: *Points, Lines, Point Lists, Code Library, Roads, X-Sect Templates, Localization, Scanning Data, Surfaces (TINs), Layer States, or Multiple*.
- **Format:** select the type of the file being imported:
 - For *Points* and *Point Lists* data types: FC-4, FC-5, GTS-6, FC-6/GTS-7, GTS-7 with strings, GT, DXF, KOF, DWG, SHP, CMM, LandXML, CR5, MOSS GENIO, NEZ, NEZ with strings, Custom Format with QC info, and Text (Custom Format).
 - For *Lines* data type: DXF, DWG, SHP, and Text (Custom Format).

The TopSURV linework consists of the lines and points whereas the imported linework contains no points, it includes positions only (names will start with the question mark) (Figure 2-106 on page 2-96).

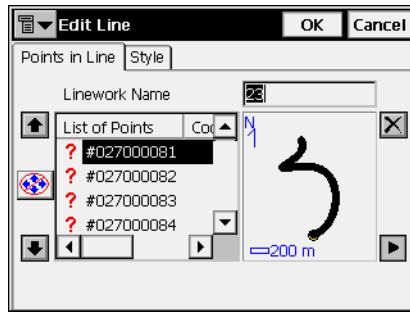


Figure 2-106. Edit Imported Linework

- For *Code Library* data type: TDD, XML, DBF.
Code Library is a set of codes with attributes used in the job. Once created, it can be saved as a file with *.tdd, *.xml, or *.dbf extensions.
- For *Roads* data type: SSS Road, TDS Road, MC Road, LandXML, TopSURV Road, CLIP, ISPOL, or VGP.
X-Sections are stored as Zones in LandXML files.
The header of the TopSURV Road format contains the starting azimuth if the Road is not a straight line.
- For *X-Sect Template* data type: SSS Template, TDS X-Section Template or TopSURV Template
- For *Localization* data type: GC3 and TDS Raw Data.
Control Points are imported together with Localization data.
- For *Scanning Data* data type: DI-3000.
Only Camera Calibration Parameters are imported from the whole set of Scanning Data.
- For *Surfaces (TINs)* data type: DXF, DWG, LandXML.
- For *Layer States* data type: LAS (AutoCAD Layer Format).
- For *Multiple* data type: LandXML, DXF, DWG, SHP, and Text (Custom Format).

TopSURV imports layers from DWG/DXF files along with the appropriate data types (Figure 2-107 on page 2-97).

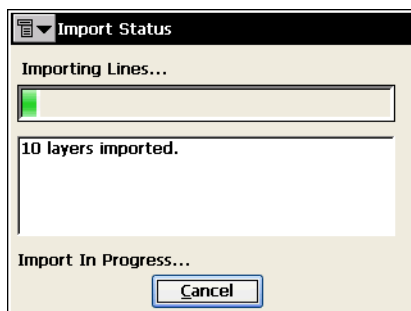


Figure 2-107. Import Layers from DWG/DXF Files



NOTICE

TopSURV only imports AutoCAD 2000 format DWG files.

For *Points* and *Point Lists* data types the **From File** screen displays additional settings.

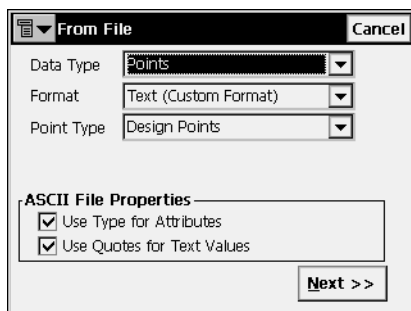


Figure 2-108. Import From Text File

- *Point Type*: the type of the imported points.
 - *Design Points*: points used as targets for stakeout.
 - *Control Points*: the points with coordinates, known from the catalog; used for localization.
 - *Topo Points*: the points collected during a stationary survey.
 - *Auto Topo Points*: the points collected during a kinematic survey.
- *ASCII File Properties*: define the conditions of the imported file interpretation. These conditions use the same type for the

attributes, and quotes for the text values. The *ASCII File Properties* field appears for a .txt imported files.

- **Next:** opens the *Import From Format* screen for the format being chosen in the *File Type* field.

Import From Format

The *Import From Format* screen browses directories from which to select the file to import data from.

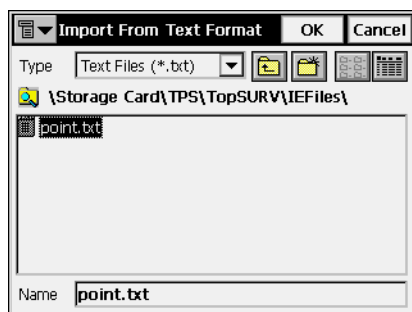


Figure 2-109. Import From Format

- *Type*: specifies the extension for the filename.
- *Name*: the name of the imported file.
- **OK**: approves the selection and opens the *Coordinate System* screen. For text file types, the *Text File Format* screen opens. For *Surfaces (TINs)* data type, **OK** opens the *Import Status* screen and starts the import process to save results into TN3 files. When *Multiple Types* data type is chosen, **OK** opens the *Import Status* screen. Then the *Import from LandXML* screen displays.

Text File Format

The *Text File Format* screen imports a file of arbitrary text format.

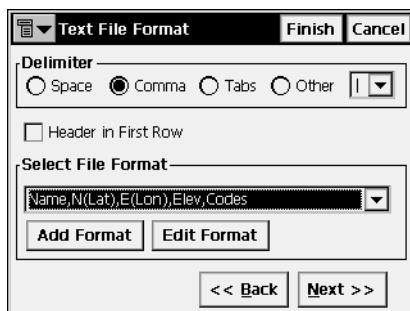


Figure 2-110. Text File Format

- **Delimiter:** sets the separator symbol between data in the import file; either a space, a comma, tabs or other (select from the list).
- **Header in First Row:** check if the text file has a header.
- **Select File Format:** sets the order of fields in the selected file.
- **Add Format:** creates a new file format with the help of the *Custom Style* screen.
- **Edit Format:** changes the selected file format with the help of the same *Custom Style* screen.
- **Back:** returns to the previous screen.
- **Next:** opens the *Coordinate System* screen.
- **Finish:** opens the *Import Status* screen and starts the import process.

Custom Style

Using the arrows, move the necessary items from the left side of the screen (the *Available* column) to the right side (the *Order* column) in the desired order.

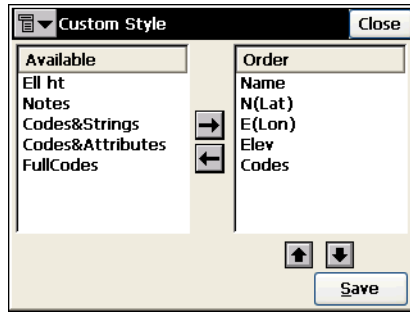


Figure 2-111. Custom Style

- **Save:** saves the File Style and returns to the *Text File Format* screen. A new string appears in the Select File Format drop-down menu.
- **Close:** returns to the previous screen.

Coordinate System

The *Coordinate System* screen is similar to that described in the section “Coordinate System” on page 2-5.

This screen contains information about the coordinate system for the imported job (Figure 2-112 on page 2-101).

The differences are:

- The Coordinate Type for the imported file can be set; either *WGS84*, *Datum*, *Grid*, or *Ground*.
- The distance units used in the file can be recalculated to *Meters*, *IFeet*, or *USFeet*.

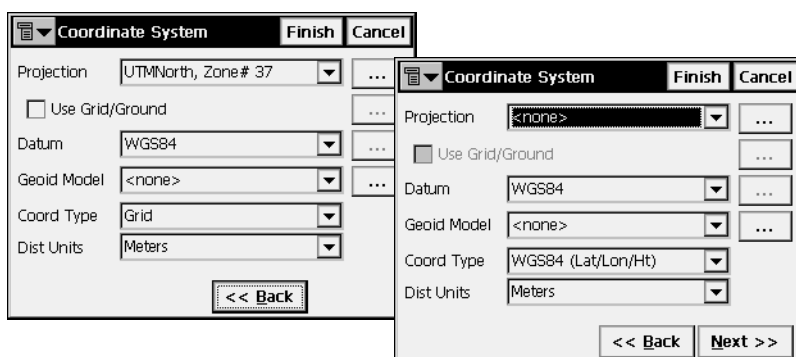


Figure 2-112. Coordinate System

- **Back:** returns to the previous screen.
- **Next:** with the type of ellipsoid coordinates chosen, opens the *Lat/Lon Record Format* screen.
- **Finish:** opens the *Import Status* screen and starts import process. (See “Import Status” on page 2-92.)

Latitude/Longitude Record Format

From the *Format (Lat/Lon)* drop-down menu in the *Lat/Lon Record Format* screen, select the desired format to represent data being imported from the file.

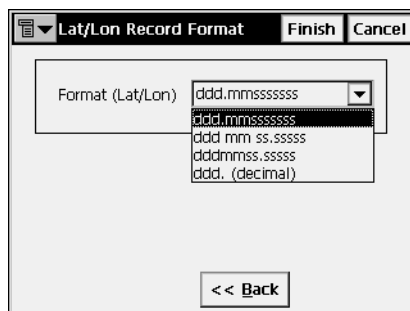


Figure 2-113. Latitude/Longitude Record Format

- **Back:** returns to the previous screen.
- **Finish:** opens the *Import Status* screen and starts import process (see “Import Status” on page 2-92.).

Import Multiple Data

For *Multiple Types* data type (see Figure 2-105 on page 2-95 for and example this data type) select the specific data group from the file to be imported. For the LandXML example: Point Lists, Parcels, Surfaces, and Alignments (Figure 2-114).

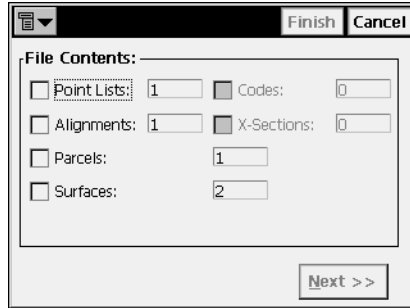


Figure 2-114. Import Multiple Data

- **Next:** becomes active after selection of a data group from the file contents, and opens the *Select Data For Import* screen.

Select Data For Import

The *Select Data For Import* screen is used to choose objects for importing from the file.

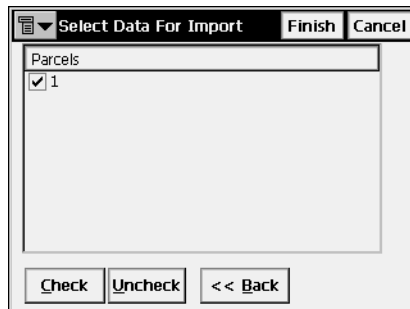


Figure 2-115. Select Data For Import

- **Objects:** the list of available objects in the selected file.
- **Check** and **Uncheck:** toggles the highlighted item(s) on or off, depending on the button being pressed.

- **Back:** returns to the previous screen.
- **Finish:** opens the *Import Status* screen and starts the import process.

Import From Controller

To import a job (or any other file) from a controller device, tap **Job ▶ Import ▶ From Controller**.

Import/Export Settings

The *Import/Export Settings* screen is used to set the Import/Export options for file interchange with another controller.

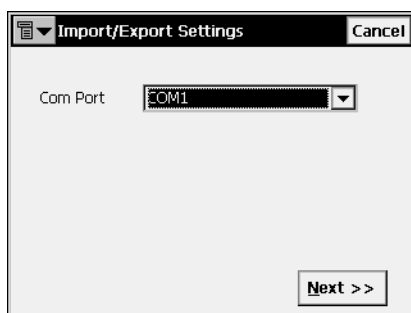


Figure 2-116. Import/Export Settings

- **Com Port:** selects the Communication port. These can be *COM1*, *COM2*, *IR Port*, or *Ethernet*. Also there can be communication via *Bluetooth*.
- **Next:** opens the *File Import Directory* screen.

File Import Directory

The *File Import Directory* screen selects the destination directory for data import.

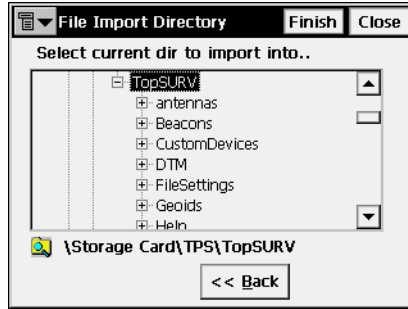


Figure 2-117. File Import Directory

- **Back:** returns to the previous screen.
- **Close:** returns to the main screen.
- **Finish:** opens the *Import File* screen reflecting status of importing the file to the chosen directory.

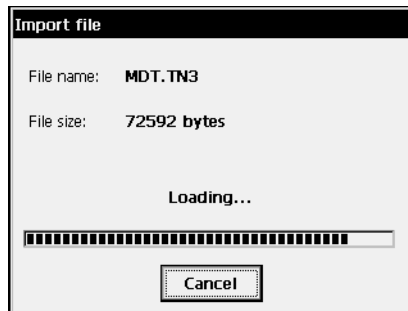


Figure 2-118. Import File

A successful completion of the file import returns to the main screen.

Export

To export data, tap **Job ▶ Export** (Figure 2-119).

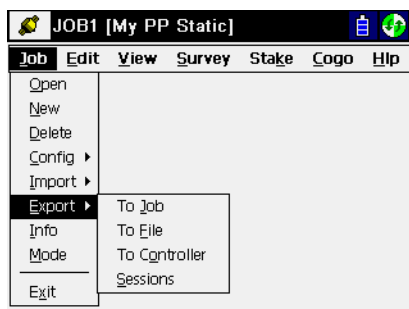


Figure 2-119. Export Submenu

The Export function is used to export points, codes and attributes, Code Libraries, Roads, Cross Section Templates, Point Lists, Localization, Road Survey and Raw Data from the current job to another job, file, controller, or session settings to the receiver.

Export to Job

To export data to a job, tap **Job ▶ Export ▶ To Job**.

Select Job

The *Select Job* screen selects the destination job to export to. If there is no desired job in the Job List, press the **Browse** button to select a job from the disk.

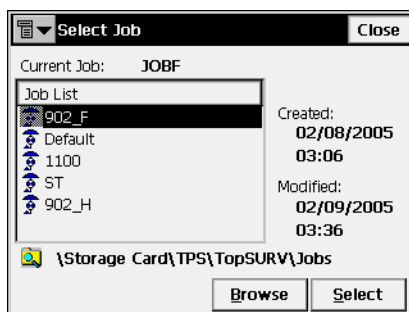


Figure 2-120. Select Job

- **Select:** starts the export process wizard. Follow the wizard's **Next** button until the **Finish** button is available.

Export To Job

The **Export To Job** screen is used to select the code library, localization parameters, roads, and/or point lists that should be exported along with the point data.



Figure 2-121. Export To Job

- **Points:** select the points for export, from the drop-down menu:
 - *All Points*
 - *By Type*
 - *By Range and Code*
 - *By Type, Range and Code*
 - *None*
- The following data can be exported along with points:
 - *Code Library*
 - *Localization*
 - *Roads*
 - *Point Lists*
- **Back:** returns to the previous screen.
- **Next:** depending on selections, opens either one of the **Select Point List(s) to Export** screens, or **Select Point Type(s) to Export** screen, or **Select Roads to Export** screen if only *Roads* is checked and *All points* is selected.
- **Finish:** starts the export process if only *Code Library* and/or *Localization* items are chosen and *All Points* is selected. Otherwise the button is not available.

Select Point Type(s) to Export

The *Select Point Type(s) to Export* screen selects the types of points to export if *Code Library*, *Localization* or *Roads* are checked (if points filter by type has been enabled in the *Export* screen). Place check marks near the desired types.

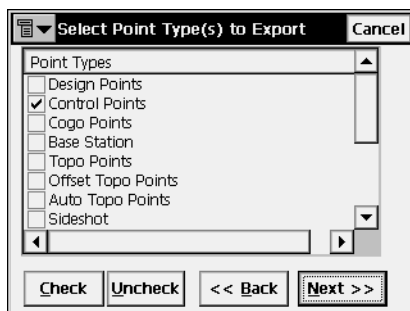


Figure 2-122. Select Point Type(s) to Export

- *Point Types*: the list of point types. The following types are available for exporting:

<i>Design Points</i>	<i>Control Points</i>	<i>Cogo Points</i>
<i>Base Station</i>	<i>Topo Points</i>	<i>Offset Topo Points</i>
<i>Auto Topo Points</i>	<i>Sideshot</i>	<i>Offset</i>
<i>Remote</i>	<i>Reflectorless</i>	<i>BackSight</i>
<i>Stake Points</i>	<i>Stake Line</i>	<i>Check Points</i>
<i>Manually Typed</i>	<i>Tape Dimension</i>	

- **Check** and **Uncheck**: toggles the highlighted item(s) on or off, depending on the button being pressed. Press **Ctrl** while selecting to select more than one item.
- **Back**: returns to the previous screen.
- **Next**: opens *Points to Export* screen (if points filter by code and range has been enabled in the *Export To Job* screen).

Points to Export

The *Points to Export* screen filters the exported points.

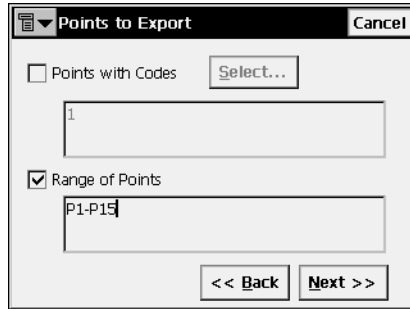


Figure 2-123. Points to Export

- *Points with Codes*: export all points with the selected codes.
- **Select**: opens the *Code* screen.
- *Range of Points*: selects the points to export. These can be set by range (“-”, “;” or “,” can be used as range separators) or by enumeration.
- **Back**: returns to the previous screen.
- **Next**: opens the *Select Road(s) to Export* screen (if *Roads* was checked in the *Export To Job* screen). Otherwise, the button is not available, and the **Finish** button appears to open the *Export Status* screen.

Code

The *Code* screen contains a list of available codes. All the points with the codes chosen here will be imported.

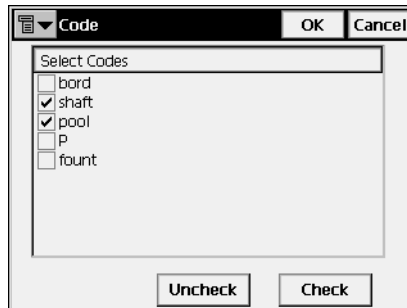


Figure 2-124. Code

- **Uncheck:** removes the mark from the highlighted code.
- **Check:** marks the highlighted entries.
- **OK:** returns to the previous screen with the codes selected.

Select Road(s) to Export

The *Select Road(s) to Export* screen selects the roads to export along with the data. Place the check marks to select the exported roads.



Figure 2-125. Select Road(s) to Export

- *Roads:* the list of available roads in the job.
- **Check** and **Uncheck:** toggles the highlighted item(s) on or off, depending upon the button being pressed.
- **Back:** returns to the previous screen.

- **Next:** is not available.
- **Finish:** opens the *Export Status* screen and starts the export process.

Select Point List(s) to Export

The *Select Point List(s) to Export* screen selects the Point Lists (if available) to export along with the data. Place check marks near the exported point lists.

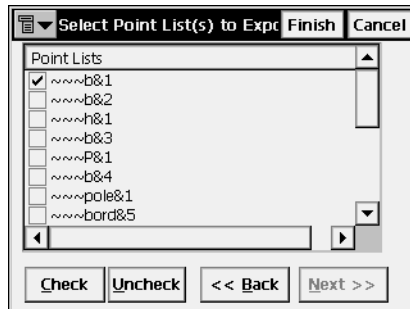


Figure 2-126. Select Point List(s) to Export

- *Point Lists*: the list of available point lists in the selected job.
- **Check** and **Uncheck**: toggles the highlighted item(s) on or off, depending upon the button being pressed.
- **Back**: returns to the previous screen.
- **Next**: is not available.
- **Finish**: opens the *Export Status* screen and starts the export process.

Export Status

The *Export Status* screen reflects the export process and contains a progress bar and a comments window. The progress bar displays the percentage of the data being exported.

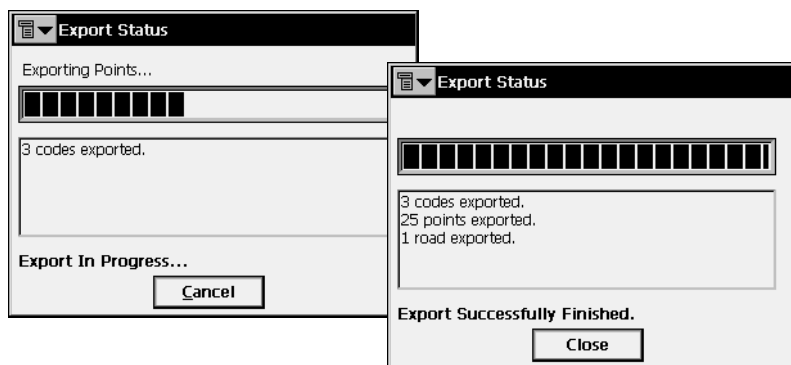


Figure 2-127. Export Status

Press the *Close* button to return to the main screen.

Duplicate Objects

If the existing job contains points, roads or point lists with the same names as the job that these are exported to, the *Duplicate Objects* screen displays.

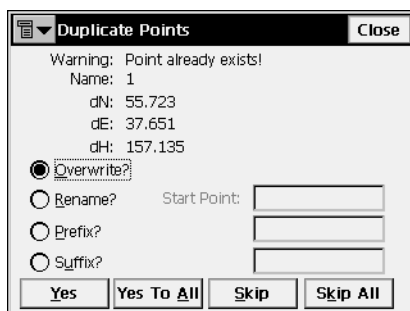


Figure 2-128. Duplicate Objects

This screen is the same as the *Duplicate Objects* screen for the import process (for details, see “Duplicate Objects” on page 2-93).

Export to File

To export data to a file, tap **Job ▶ Export ▶ To File**.

To File

The **To File** screen exports points, codes, roads, cross section templates, localization, roads survey and raw data to files with either pre-defined or custom formats. For a description of these formats, see Appendix A.

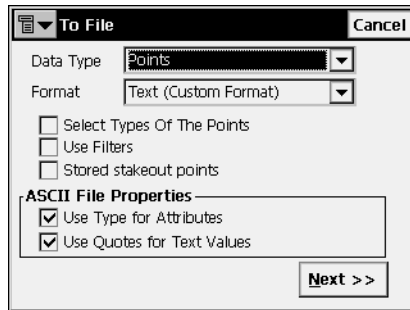


Figure 2-129. To File

- *Data Type*: select the data type to export: Points, Lines, Point Lists, Code Library, Roads, X-Sect Templates, Localization, Scanning Data, Roads Survey, Raw Data, Job History, Surfaces (TINs), Layer States, or Multiple.
- *Format*: select the file type to export data to.
 - For *Points* and *Point Lists* data type: FC-4, FC-5, GTS-6, FC-6/GTS-7, GTS-7 with strings, GT, GT-FIN, MMH360, DXF, KOF, DWG, SHP, Cut Sheet Standard, Cut Sheet User Defined, Check Sheet, PTL Sheet, CMM, LandXML, CR5, MOSS GENIO, NEZ, NEZ with strings, Text (custom format), or Custom Format with QC info.
 - For *Lines* data type: DXF, DWG, SHP, or Text (custom format).
 - For *Code Library* data type: TDD, XML, DBF.

Code Library is a set of codes with attributes used in the job. Once created, it can be saved as a file with *.tdd, *.xml, or *.dbf extensions.

- For *Roads* data type: SSS Road, TDS Road, MC Road, Land XML, TopSURV Road, CLIP, ISPOL, or VGP.
X-Sections are stored as Zones in LandXML.
The header of the TopSURV Road format contains the starting azimuth if the Road is not a straight line.
- For *X-Sect Templates* data type: SSS Template, TDS X-Section Template, or TopSURV Template.
- For *Localization*: GC3, and TDS Raw Data for GPS.
Control Points are exported together with Localization data.
- For *Roads Survey*: X-Section Surveys or Find Station Report.
- For *Raw Data*: FC-5, GTS-6, FC-6/GTS-7, LandXML, TDS Raw Data, MOSS Survey, Field Book (only to Total Station .fbk format), KOF, Berlin GNSS-Messprotocol or Berlin GNSS- Mittelwerte. If choosing LandXML or TDS Raw Data, select the type of raw data to export: *Export TS Raw Data* and/or *Export GPS Raw Data* (Figure 2-130).

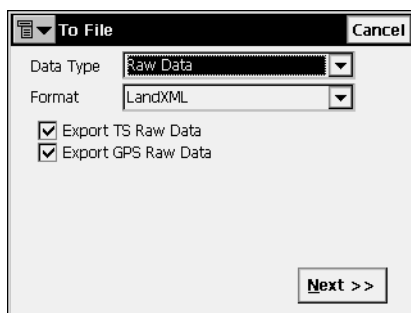


Figure 2-130. Export Raw Data To LandXML

- For *Scanning Data* type: all scanning data are exported for DI-3000.
- For *Surfaces (TINs)* data type: DXF, DWG, LandXML.
- For *Job History* data type: CSV and Report.
The Job History file is formed if the Enable Job History checkbox is selected on the **Select Survey Config** screen (see “Select Survey Configuration” on page 2-11).
- For *Layer States* data type: LAS (AutoCAD Layer Format).

- For *Multiple* data type: LandXML, DXF, DWG, SHP, and Text (Custom Format).



NOTICE

TopSURV only exports AutoCAD 2000 format DWG files.

TopSURV exports layers to DWG/DXF files along with the appropriate data types.

- *Select Types of the Points* (for *Points* and *Point Lists* data types): check this field if not all types of points should be exported.
- *Use Filters* (for *Points* and *Point Lists* data types): check this field if filters (by code and by range) should be used for exported points.
- *Stored Stakeout Points* (for *Points* and *Point Lists* data types): check to export stored points saved by stakeout process.
- *ASCII File Properties* (for *Points* and *Point Lists* data types): define the conditions of the exported file interpretation. These are the use of the same type for the attributes or not, and the use of quotes for the text values. This field appears only for the text format of the exported file.
- **Next:** opens the following screen:
 - the *Select Point Type(s) to Export* screen if *Select Types of The Points* is checked.
 - the *Points to Export* screen if *Use Filters* is checked.
 - the *Select TN3* screen if *Surfaces (TINs)* data type is chosen.
 - the *Export To File* screen in all other cases for the format chosen in the *File Type* field.

Select Point Type(s) to Export

The *Select Point Type(s) to Export* screen is similar to that described in the section “Select Point Type(s) to Export” on page 2-107, except for the behavior of the **Next** button. Here, **Next** opens the *Points to Export* screen (if *Points* data type was selected and *Use Filters* was checked in the *To File* screen) or the *Export To Format* screen.

Points to Export

The *Points to Export* screen is similar to that described in the section “Points to Export” on page 2-108, except for the behavior of the **Next** button. Here, **Next** opens the *Export To Format* screen.

Select TN3

The *Select TN3* screen is used to select a TN3 file to export data to DXF, or DWG, or LandXML files.

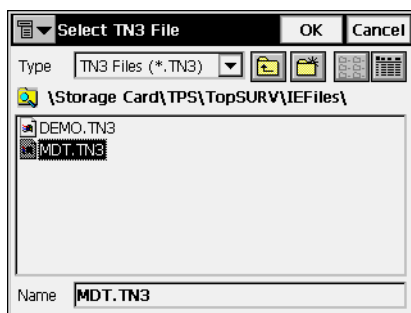


Figure 2-131. Select TN3 File

- *Type*: specifies the extension for the files being searched.
- *Name*: the name of the file whose data will be exported.
- **OK**: approves the selection and opens the *Export To Format* screen.

Export To Format

The *Export To Format* screen selects a destination directory and the name of the created file.

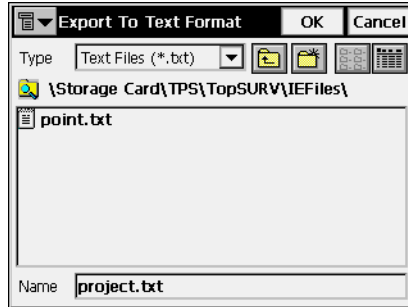


Figure 2-132. Export to Format

- *Type*: specifies the file extension.
- *Name*: the name of the created file.
- **OK**: approves the selection and opens the *Coordinate System* screen. See “Coordinate System” on page 2-100. For text file types, OK opens the *Text File Format* screen.

Text File Format

The *Text File Format* screen exports a file of arbitrary text format.

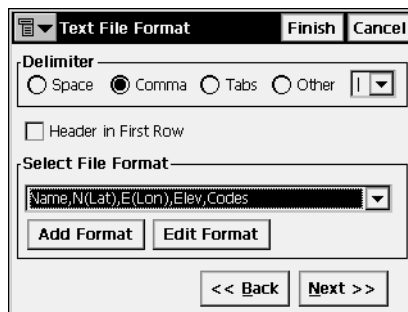


Figure 2-133. Text File Format

- *Delimiter*: selects the delimiting symbol between the data in the exported file; either space, comma, tab or other.
- *Header in First Row*: select to output a header in the file.

- **Select File Format:** sets the order of fields in the exported file.
- **Add Format:** creates a new file format with the help of the *Custom Style* screen.
- **Edit Format:** changes an existing file format with the help of the same *Custom Style* screen.
- **Back:** returns to the previous screen.
- **Next:** opens the *Coordinate System* screen. See “Coordinate System” on page 2-100.
- Press **Finish** to start the export process.

Custom Style

Using the arrows, move items from the *Available* column to the *Order* column and arrange in the desired order. If exporting GPS points to Custom Format with QC info, the information on Quality Control is available.

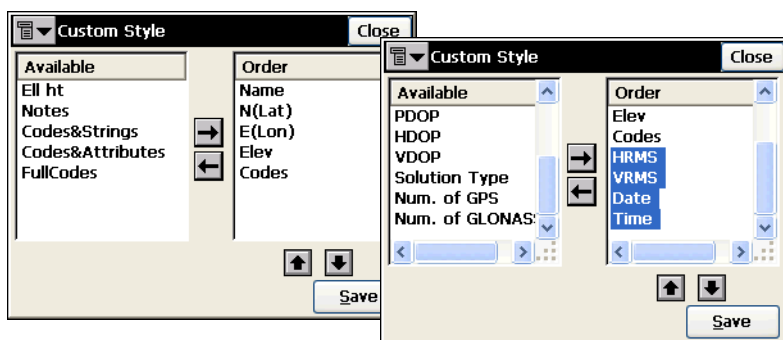


Figure 2-134. Custom Style

- **Save:** saves the File Style. A new entry appears in the Select File Style drop-down menu.
- **Close:** returns to the previous screen.

Export Multiple Data

For *Multiple* data type there is ability to choose specific data group in the job available to export. For the LandXML example: Points, Alignments, TS and GPS Raw Objects, Surfaces (Figure 2-135).

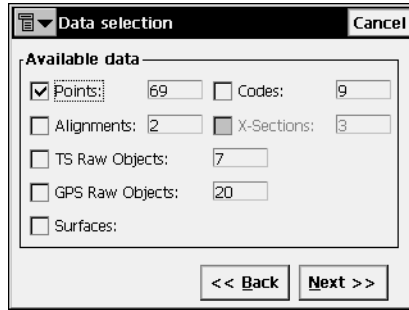


Figure 2-135. Export Multiple Data

- **Next:** depending on the data selected for export, opens the *Points Selection* screen, or the *Select Road(s) to Export* screen (see “Select Road(s) to Export” on page 2-109), or the *Export to Format* screen (see “Export To Format” on page 2-116).

Points Selection

The *Points to Export* screen filters the exported Points.

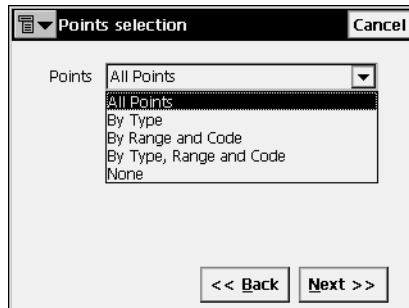


Figure 2-136. Points Selection

Export to Controller

To export a file to a controller, tap **Job ▶ Export ▶ To Controller**.

Import/Export Settings

The *Import/Export Settings* screen sets import/export options for data transfer with another controller.

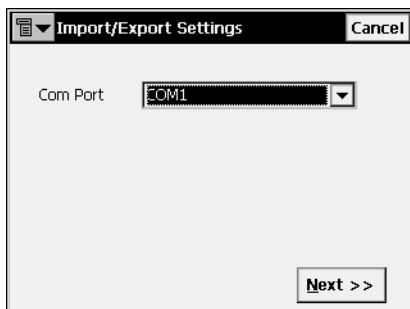


Figure 2-137. Import/Export Settings

- **Com Port:** selects the Communication port. These can be *COM1*, *COM2*, *IR Port*, *Ethernet* or *Bluetooth*.
- **Next:** opens the *Files To Export* screen.

Files To Export

The *Files To Export* screen browses directories for selecting the file to export.



Figure 2-138. Files to Export

- **Back:** returns to the previous screen.

- **Close:** returns to the main screen.
- **Finish:** opens the *Export File* screen reflecting status of exporting the file chosen (Figure 2-139).

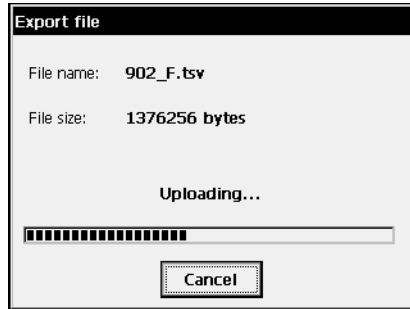


Figure 2-139. Export File

A successful completion of file export returns to the main screen.

Sessions

To export a session to the receiver, tap **Job ▶ Export ▶ Sessions**.

In the *Sessions* screen, the left panel contains a tree of the available receivers and their session plans. The right panel contains a list of sessions to export.

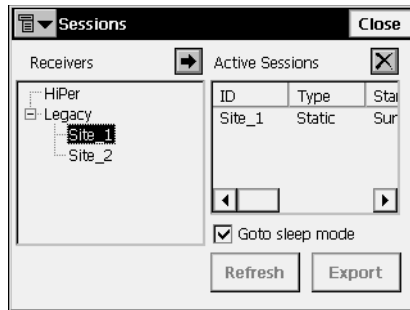




Figure 2-140. Job Sessions

-  : selects the session to export.
-  : deletes the session from the export list.
- *Goto sleep mode*: if checked, the receiver will go into sleep mode.

- **Refresh:** refreshes the export list.
- **Export:** starts the connection with the receiver.
- **Close:** closes the screen without performing export.

The bitmap in the upper left corner of the screen consists of two items:

- *Edit Session:* opens the **Sessions** screen to edit the sessions. For details see “Sessions” on page 3-49.
- *Help:* opens Help files.

Information

To get job information, tap **Job ▶ Info**.

Job Information

The **Job Info** screen contains information about the current job.

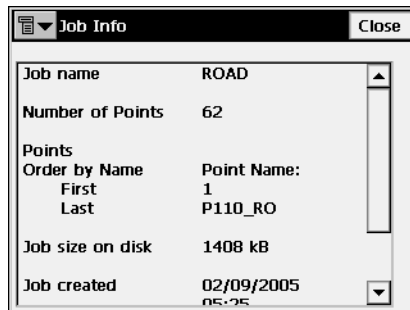
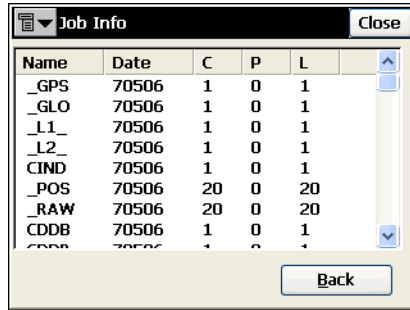


Figure 2-141. Job Information

- *Job name:* the name of the job open.
- *Number of Points:* the amount of the points stored in the job.
- *Points:* the names of the first point and the last one from the list of the points ordered by name.
- *Job size on disk:* the space that the job takes up on the disk.
- *Job created:* the time and date of job creation.
- *Job modified:* the time and date of job modification.

- *OAF expire on:* the date of OAF expiration for the given GPS receiver. Tap **Clk to expand** under the date to display the Current, Purchased and Leased status for all OAF options (Figure 2-142 on page 2-122).
- *Firmware version:* the number and build date of the firmware loaded to the GPS receiver.



The screenshot shows a window titled 'Job Info' with a 'Close' button in the top right corner. Below the title bar is a table with five columns: 'Name', 'Date', 'C', 'P', and 'L'. The table contains several rows of data. A vertical scrollbar is on the right side of the table. At the bottom of the window is a 'Back' button.

Name	Date	C	P	L
_GPS	70506	1	0	1
_GLO	70506	1	0	1
_L1	70506	1	0	1
_L2	70506	1	0	1
CIND	70506	1	0	1
_POS	70506	20	0	20
_RAW	70506	20	0	20
CDDb	70506	1	0	1
CDDb	70506	1	0	1

Figure 2-142. Job Info – OAF

Mode

To set the instrument mode, tap **Job ▶ Mode** or the instrument icon in the upper left corner of the main screen (Figure 2-143).

Observation Mode

The *Observation Mode* screen selects the instrument type and wireless control options.

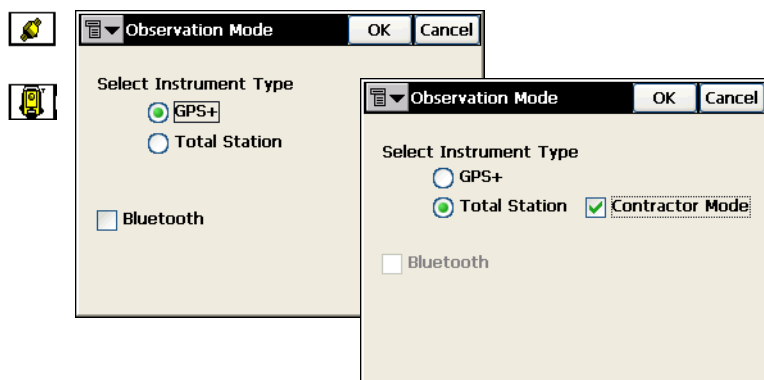


Figure 2-143. Observation Mode

- *Select Instrument Type*: sets the operation mode for surveying; either GPS+ or Total Station. If Total Station mode is selected, it becomes possible to choose Contractor mode. Contractor mode is a scaled down version of the existing Total Station mode.
- *Bluetooth*: the option for remote (wireless) control on short distances. Only available if a Bluetooth device is available.

The bitmap in the upper-left corner of the screen displays the *Help* menu.

Notes:

[illegible]