
Centurion (Gold, Parks, CC & Field)

Users Guide
V1.37

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I. Introduction

This Users Guide will walk you through the basic operation of Centurion. Everything from installation, to traffic counter data downloading, to report generation will be shown.

Before beginning, have a traffic counter with a few unretrieved data files in its memory ready. If possible, have these traffic counter files be Per-Vehicle (Raw) data to best demonstrate all of the features of the program.

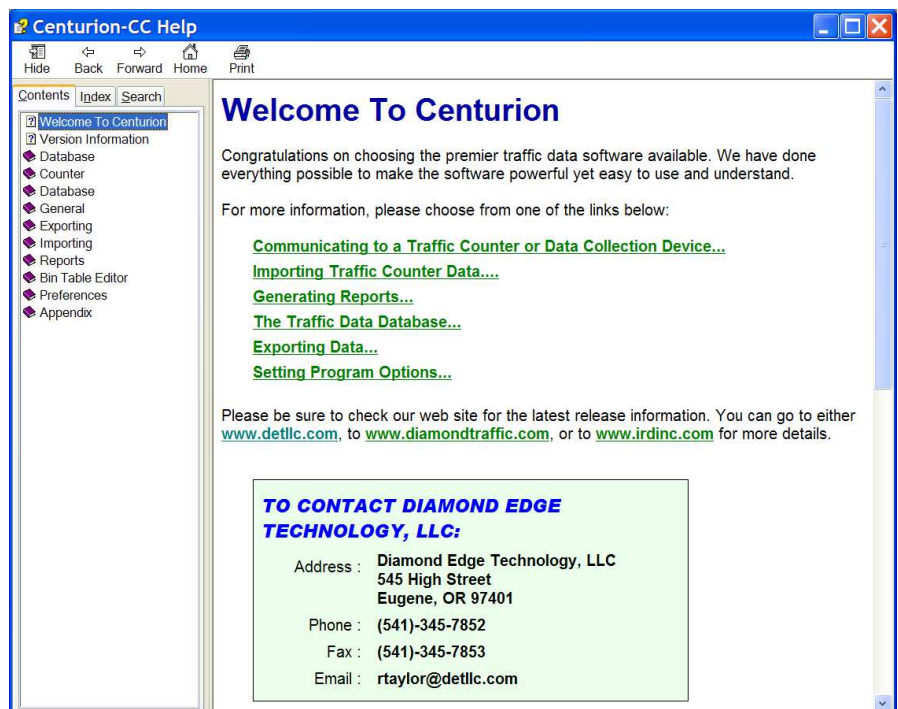
You can also use a Datahog and/or a floppy disk to bring any standard binary data file into the software. This Users Guide demonstrates how to do this.

NOTE: For your convenience, Centurion automatically places three "Sample" binary data files in the Download directory. These files can be used by selecting the Manual Import function described in this document.

On-Line Help:

Centurion has a Windows context specific HTML Help system. This can be accessed at any time by pressing the F1 key (or selecting one of the help options from the Help menu). It is also available from the Start Menu.

Please refer to this document for information not covered in the Users Guide.



Version Information:

Version	Explanation
1.00 07/26/02	First commercial release.

*Note: Changes to versions from 1.01 to 1.31 are no longer included in this document.
Refer to www.dettlc.com for historical version information.*

V1.32 Build #0001 1/15/08	<p><i>New version which has the following major new features:</i></p> <ul style="list-style-type: none"> Completed support for the Omega Traffic Counter programming & monitoring (via BlueTooth and new USB connection ability) Changed the MDI Form Style to better support multiple documents. This is a major change that provides an “Outlook” style bar on the left side of the main window with buttons for every open window. This method makes it much easier to switch between windows when running in Maximized. The “Scanning” window is also on this bar and when switching from a non-maximized window (like a counter programming window) to a maximized window (like a report) the program automatically restores the maximized state. Changed the Dialing Directory window to be a MDI window and to work more seamlessly with the program. Window now includes an Add & Delete button and right clicking on the directory pops-up a variety of options to sync the Dialing Directory with the Map View (Gold only). Added new Open Terminal Window function to the Telemetry menu to allow direct connecting to any port on your computer. You can also link to a counter from this window. USB Drivers for all Diamond & IRD USB Enabled Traffic Counters now included in the install. This includes in addition to the Omega the Phoenix, Pegasus, Unicorn, TCC-540, Unicorn-Limited, & Apollo counters (USB port available on new models). Contact us for specific information on using these drivers. View Calls window now allows clipboard Cut (Control+X), Copy (Control+C), and Select All (Control+A). In addition three new buttons allow you to export any selected records directly to Excel, your Web Browser (HTML), or to a Text File. <p><i>In addition, the following minor changes and bug fixes have been made:</i></p> <ul style="list-style-type: none"> Changed the way ActiveSync is detected (must now have an active RAPIMGR.EXE process running for Cent-Lite). Completely changed the COM port setup. New Communication preferences window asks detailed questions about how you want Centurion to communicate to devices including new support for USB based traffic counters. Increased initial program loading speed when BlueTooth is installed. Command line "PORT=" now just selects one COM port (i.e. "PORT=23" tells the program to scan on COM23 only). The Modem Rate setting is kept visible if even Modem Initialization turned off for a counter. Firmware upload file names don't have to be in upper case anymore. Fixed problem with after a Cold Restart counter not always correcting blank on Lane Axle configuration lines. Fixed not syncing clock up when in Reset & Restart with TT-6-BT or TT-8-BT counters. Removed "Number of Record Intervals" from the Counter Setups. Fixed problem with closing counter link from Scanning window causing problems with "Port Not Open". New “Start Communications” and “Stop Communications” buttons on Outlook bar work in any mode. All modem setups can now be named to make reference to them easier. Changed so all length values (Sensor Spacing, Loop Length, etc) settable during counter programming are done with a spin edit box (instead of typing in the value). The “Montana” file naming convention has been modified and now applies to all downloaded files (including those done during a direct counter link). Database editor has three new buttons for exporting selected records to Excel, your web browser (HTML), and to a Text file. You can also select all records by pressing Control+A. Window now appears after a Check Database that lists all changes made during the repair process. Error displays if you try to call a site from a modem configuration that does not have a defined COM port. Fixed various issues in polling system with V2.80 and higher EPROM counters (especially with MMC files). Updated support for Omega data files "Extended" Site ID and Info lines. Various corrections to the View Call window have been made. Changed to always use Speed Bin or Length Bin totals instead of Axle Bin totals when importing Classification data and creating a volume table from it. This prevents the problem of some sites being configured in Pres-Pres mode and showing up as all zeros.
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Version	Explanation
Build #0002 2/16/08	<p><i>Build #0002 made the following minor changes and bug fixes:</i></p> <ul style="list-style-type: none"> • Took out the "Don't Build On Open" option. Future version may implement this in a different way. • Added support for the UPP5 V3.10 set loop detect, drop-out, and warm-up values (check in Set Hidden Options). • Fixed various issues connection to UPP5, Apollo, and Unicorn-Limited counters with new USB Port. • Added "Site ID Only" naming convention for file names. This applies to downloading and direct linking. • Fixed a variety of issues with the Omega link, downloading, and file directory handling. • Now handles converting to text correctly data that has environmental storage enabled. • For Unicorn, Phoenix, & Pegasus counters running on the V1.10 or later MDK platform, software will now show various battery charge/discharge information (double click on battery voltage to display this info). • Fixed problem loading new Omega file format.
Build #0003 3/26/08	<p><i>Build #0003 made the following minor changes and bug fixes:</i></p> <ul style="list-style-type: none"> • Changed so initial ID of counter will send 0x01, 0x05, 0x05 quickly if during the initial ID of a counter via telemetry is not working (solved problem with linking to certain sites/modems). • Changed the Download Name Based On Site ID function to post review the file for the actual Site ID name and to then rename the file to that name (fixes 10 character vs. 15 character names on older version EPROM's). • Added "?CENT" and "?CENTURION" as doing the same thing as "?STAN" on a polling command. • Fixed problem with not autopolling Master/Slave sites correctly (would only poll the first one). • Created update versions so Auto-Update feature would work from versions less than 1.32. • Fixed a bug in handling 2/29 data when importing (incorrectly changed end date of a data to 3/2).
Build #0005 5/2/08	<p><i>Build #0005 made the following minor changes and bug fixes:</i></p> <ul style="list-style-type: none"> • Initial support for new I-Loop board setting of loop voltage and capacitors contained in the V3.15 and later EPROM's (times, setting/monitoring loops in Test Sensors, and new command under setup). • Fixed problem with decoding DOW value (needed to be -1). • Fixed multiple problems throughout code handling years 00-99 versus years 1980-2079 (some code thought it was a different way). • Now do a "setdisk" and "SetCurrentDir" before doing a web update to insure files go to the correct place. • Added a new Toolbar button that allows you to show/hide the Scanning Bar and Quick Bar. • Fixed problem on Direct Dial window not being able to type in an upper case Site ID. • Added a "Maximum Site Poll Time" value to the Communication Preferences. Polling is automatically disconnected if time exceeds this setting. • When opening database from a maximized window it now correctly starts as Maximized. • Fixed problem with Daylight savings adjust function when made switchover to Windows Time/Date functions. This was causing the majority of the linking to a counter problem. • Fixed problem setting clock on later version EPROM's. • Fixed saying letter code 'c' on telemetry regardless of actual version of counter. • Fixed version number on TT-6/8-BT (actually a firmware error with V1.00-V1.07 code, fixed with V1.08 and up). • Program no longer exits when it can't find the specified COM port on startup.
V1.33 Build #0006 8/5/08	<p><i>New version which has the following major new features:</i></p> <ul style="list-style-type: none"> • Improved Lane Renumber feature allows easier changing of lane numbers for imported data. • New Time Shift function allows data to be shifted forward or back in time. • Completely redesigned Find Function in the data editor. It now stays on top and allows you to search for first, last, and next matches. Will also rollover to beginning of data when at end. • Contains multiple changes and features specific to the Ohio DOT (including Ohio TMG exports for Card 3, 4, C, & L for permanent sites, short counts, and monthly data). <p><i>In addition, the following minor changes and bug fixes have been made:</i></p> <ul style="list-style-type: none"> • Fixed problem with Access Violation on shortcuts from the database view menu (now use Global Hotkey). • Made the "Find Next" button on the task bar work correctly with the site data editor. • Site data editor now lets you select a range of data to edit (tag the first-last record of site's imports and then click edit). • Added button to open TMG Editor from Site Setup. • Noted under Site Setup lanes that the direction code here does not apply to TMG. Also made this field a combo box of N, S, E, W. • Fixed naming of bin number on site data search and added a note about searching. • Added option to do Week Total instead of Average on Weekly 24 Hour Volume Report. • Added support for new Expanded Site ID (now includes the 15 character serial number) available in Omega counters. Also added support for reading the last study variables. • Made multiple changes for IN DOT (including check box on PRN export, four choices for PRN file naming [Standard, SiteID+Standard, Site ID.PRN, and Site ID.x.PRN]). • When IN DOT Format is selected for PRN files, the following changes are made to the PRN export:

Version	Explanation
	<ul style="list-style-type: none"> Record 1, Value 1, is now the Serial # instead of the Site ID. Record 1, Value 2, is now the Site ID instead of Info Line 1 Record 1, Value 3, is always 01 instead of being an 01 for the first counter of a site or an 02 for the second counter of a site. TMG Identification no longer appends to County (Record 3, Value 2) Format code is returned as a 410 instead of 400. For all PRN files, Lane Layout (Record 1, value 9) is set to a 0 if Volume mode, otherwise set to a 3. In addition Record Number is now correctly reported in columns 71-75 of Record 1. Support for the newer Omega now included with faster USB connection speeds. Also includes multiple enhancements to the firmware update feature to insure accuracy and updating of all Omega icons. All system settings are now saved automatically after a call to General, Ports, Organization, or Directory Preferences. Fixed problem with Access Violation on closing out Telemetry link with no other MDI Windows open during linking. Fixed so closing map when call initiated from other place does not disconnect link. Added preference option to move the Direct Dial Directory from database to database. Fixed bug in changing the Telemetry Station list giving a "Field Not Found" error. Changed so all download file naming uses an "_" instead of a "." to allow easier viewing of files when extensions are not visible to user. Fixed problem with not creating two lanes with RoadRunner East/West data. No longer allow user to specify database sub-directories (forced to match by Centurion). Map view now properly closed and reopened when database directory has changed. Warning window displayed if you try to reimport non-existent data files. Warning window also displayed if you try to time-shift non-existent data. Changes for Ohio DOT: <ul style="list-style-type: none"> Added "Ohio Short Count" and "Ohio Monthly" check boxes to the export dialog. Changed file naming convention to include support for all three modes (Permanent, Short, & Monthly). Fixed bug causing sites with short ID's (like 892) from not containing the correct name. "Short Count" does not breakup files. "Monthly" breaks files into monthly sections, "Permanent" does daily. When "Short Count" selected, TMG Lane of Travel is extracted from the first character of each lane info line. TMG Direction is extracted from the second character. Added a "Auto-Export" file directory setting and an "Auto-Export" setting to each telemetry zone. When "Auto-Export" has been set to "Ohio TMG" for any zone, at the end of any import the data is automatically exported (works only if import is also enabled). "Ohio TMG" auto-export picks volume, class, or length output based on the type of data downloaded. Note that Ohio Monthly and Ohio Short Count check boxes do apply, so they should be turned off if necessary. Also the export process will be halted if a site has never had it's data exported before, so setting TMG info first for each site is useful. Changed all TMG Exports to use blanks instead of zeros for non-existent data.
V1.34	<p>New version which includes the TSDP (Timestamp Data Processor) subsystem. This highly advanced program allows for the analysis of all Timestamp data collected by the new Omega Traffic counter. TSDP provides the user with the flexibility of collecting and processing timestamp data, which can increase data accuracy to more than 99% (depending on the lane and site configuration).</p>
Build #0001 9/24/08	<p>In addition, the following minor changes and bug fixes have been made:</p> <ul style="list-style-type: none"> Multiple changes for Ohio DOT (exporting, importing, and lane shifting changes). Removed SnMis totals from TMG Exports. Fixed problem not allowing Lane Grouping imports on Unicorn-Limited counters. Several changes to processing Omega data files. Includes support for new 0xFC module (Block Text) in addition to better handling of the Last Study variables. Fixed problem with access violation on Peek Monthly export. Added new option "Always ask about overlay data". This is to help with multi-file imports and allows the user to specify what to do with each file. Changed to allow user to select same lane as existing data for lane shift function during import.
Build #0003 11/03/08	<p>Build #0003 made the following minor changes and bug fixes:</p> <ul style="list-style-type: none"> Added binary file support for new Titan II data. Fixed variety of problems with linking to and downloading data from Omega counters.
Build #0009 02/07/09	<p>Build #0004-0009 made the following minor changes and bug fixes:</p> <ul style="list-style-type: none"> Multiple changes for Ohio DOT auto-export functionality. Added an "Operator" and "Weather" field to database imports. Fixed bug exporting to Binary when gap present in data. Added ability to firmware upload to Unicorn, Phoenix, Pegasus, and TCC-540 counters with an MDK V1.10 motherboard and V3.21 or later firmware. Added support for new Titan II traffic counter (linking, downloading, and TSDP processing).

Version	Explanation
Build #0010-#0013 03/01/09	<p>Build #0010-0013 made the following minor changes and bug fixes:</p> <ul style="list-style-type: none"> Added ability to move all setup information to the Windows shared directories. This is asked on startup and the user can choose yes or no without affecting the program functionality (but it does allow for better support of Windows security issues). Made multiple changes to the way serial communication works with dialup and SOIP. Users can now set a timing multiplier for each method in the Telemetry preferences tab (to speed up or slow down connection rates). Added sending logoff characters to counters on SOIP links. Changed to use new EMS QuickExport V4.1 (which fixed a problem with Excel spreadsheet errors). Made multiple changes and improvements to setting/reading loop dropout values and N.C. Frequency with the new I-Loop board. Sped up writing out system options in counters with V2.80 and higher firmware. Added importing and exporting SpeedxLength and SpeedxAxle Peek PRN files. Fixed a problem with ODOT export files when individual files are used and there are even day gaps in data. Changed the way COM ports are identified and used. No longer use the IsPortAvailable command first. Instead all device names are checked continuously to allow connection of a USB->Serial adapter after the program has started.
V1.35	<p>Latest release for supporting the new Intelligent Loop Board (I-Loop) along with many other minor changes and improvements</p> <ul style="list-style-type: none"> Additional changes for Ohio DOT. Now supports importing and exporting PRN files of SpeedxLength and SpeedxAxle formats. Also supports direct copying to database of various PRN fields like City, Location, Serial Number, and County. System now isolates itself to one CPU core by default. This improves timed serial functionality. New command line argument "CORE=x" where "x" is the processor core to use (or an 'A' for all cores, 'F' for first core found). Software now supports the V4.00 UPP5 firmware including the new Compression functionality. Multiple changes for Oregon DOT to better support their particular PRN formatting. New options in the Preferences menu to match up the PRN output and to trim extra catch-all bins. Improved the overall program operation and eliminated cause of lockup when closing counter links. Added ability to set "MMC Auto Erase when MMC is Full" feature of V3.24 and higher UPP5 counters.
Build #0001 4/19/09	
Build #0002 6/18/09	<p>Build #0002 made the following minor changes and bug fixes:</p> <ul style="list-style-type: none"> Added warning if cannot create the YOURREG.TXT file to warn users of potential fatal operation error. Program also now creates a copy of YOURREG.TXT on the desktop for easier access. Changed to use DCD, CTS, or DSR as a valid connection signal (only DCD was used prior to this). Fixed bug incorrectly using 115,200 baud on UPP5 counter USB links. Added the I-Loop firmware upload command (when linked to V4.xx and higher counters). Improved the counter firmware upload system to work more reliably over modem connections. Added press Ctrl+Alt+C during counter link to reset entire link without hanging up. Added new tab in the directories preferences showing the BDE configuration and automatically running the BDE Administrator when NET DIR is double clicked. Added "Peek PRN" to the zone auto-export options. Added three new preferences settings for Peek PRN exports: <ul style="list-style-type: none"> Create sub-directories with station ID's. Auto create Volume when Class is exported and Monthly with volume. Fixed position of Export progress when Scanning Panel is open.
Build #0003 7/27/09	<p>Build #0003 made the following minor changes and bug fixes:</p> <ul style="list-style-type: none"> Added additional check for BDE sub-directory at "C:\Program Files\Borland\Common Files\BDE". Changed the PRN exports so that if you enable creating sub-directories then the program overwrites instead of creates a new file for existing PRN files. Fixed some various issues with PRN file exporting across different date ranges. Fixed problem incorrectly trying to print counter setup when Piezo V4 board installed. Made several changes to better support the Titan II: <ul style="list-style-type: none"> Added CE key function and record interval support for binary files. Added a check so that versions 1.10-1.13 cannot be updated to 1.14 or higher without factory help. Fixed problem with direct serial connection to Titan II switching to 115,200 baud. Added option to not print report headers with black background (Montana DOT request). Enabled in new preferences options "Use Transparent Report Header". Changed the PRN export utility to use the "Create Volume from Class" and "Create Monthly from Volume" check boxes even when doing a manual export.
Build #0004 to #0006 10/24/09	<p>Build #0004 adds some initial loop class functionality (including a Per-Vehicle database update) in addition to these other changes:</p> <ul style="list-style-type: none"> Added "Reverse PRN Speed x Columns" function. Fixed problem with processing TSDP created volume files. Fixed problem with not always seeing overlay data when imports have matching start/stop times.

Version	Explanation
	<p>Build #0006 makes multiple changes to support V4.04 and later Unicorn/Phoenix/Pegasus counters along with these changes:</p> <ul style="list-style-type: none"> All data and registration info now kept in the Windows standard AppDataDir automatically (no longer asks if the user wants to make the change). Changed to use HTTP instead of FTP for updating the program. Added LoopXSpace to the System Status window (took the place of the unused XON/OFF). Made check in updating the Loop Firmware to skip over same version updates if any board in the stack is different (only update the different ones). Unicorn/Phoenix/Pegasus V4.04 changes: <ul style="list-style-type: none"> Added ability to enable/disable Opto-Output on I-Loop boards with V4.04 firmware. Fixed a spin-edit problem that turned 16.4' into 16.3'. Added switchover to 16 bit Loop Length value on lane setup fields (also supports change to binary storage format to allow this change). Added block address to firmware update protocol. Added the Per-Vehicle DB Check function to the CheckDB utility. Fixed a problem not updating tables when the # of per-vehicle imports = 0 but the table still exists. Finished the "D" command on the polling system. Users can delete individual files (Dx), a range of files (Dx-y), unretrieved files (D-1), or the MMC (DMMC). Changed to use DBVersion.ini file to determine whether or not to update the per-vehicle database sub-files. <p>Build #0010 improves the communication system and other program functions as follows:</p> <ul style="list-style-type: none"> Changed some of the way COM ports are accessed to better prevent AsyncPro lockup issues. Improved program functionality if a different system accesses the COM ports during scanning. Fixed problem with trying to link at 9600 after power cycle (needed to send 0x01 to insure new Get Status worked). Changed the counter link reset key to be the Esc key (instead of Ctrl+Alt+C). Added to the bin table commands the checksum values (and also a couple other places) when this feature is enabled. Added support for V4.05 EPROM's to set the LoopRelay value. Major changes to allow setting and using both the Loop Relay and the Dynamic Sensor Assign values when setting up, viewing, and monitoring lanes with V4.05 and later EPROM's. Fixed CC problem when doing a Site Data Edit looking for a Gold alias. Fixed a problem on Basic Volume 60 Report when interval length > 1 hour. Added warning message when could not find bin table definitions for Reporting or Exporting. Changed so you can't click out of the add new site box on the map unless something is put in site name line. Added putting an , at the end of an SOIP link followed by an F character to enable double 0xFF characters from being converted to single during a download. Fixed problem not remembering the window position for UPP5 counter links. <p>Build #0016 adds the ability to Combine (add together) Lanes that overlay in addition to the regular shifting/renaming of a site. This allows users to collect data with multiple counters and directly combine the two datasets at import time (or by using the Merge Sites function).</p> <p>It also makes these changes:</p> <ul style="list-style-type: none"> Created a Texas only version with custom features for Texas DOT. Added a separate Author/Publisher website link on the Help menu. Added the 'OVERRIDEUPLOAD' command line switch to help test out MDK units. Multiple changes to PRN <i>importing</i> to allow for better management of PRN files created by Centurion. Now allow PRN Axle Class only imports that are not 15 classes (uses default name of 241A%02i.AXL for class name). This also applies to Speed and Length bin PRN files that do not match the norm. Fixed volume export PRN starting minute not = 0 when force interval >= 60. Added a SpeedByAxle and SpeedByLength Peek sub-directory to prevent file naming problem when creating simultaneous Speed and SpeedByAxle/SpeedByLength tables. Fixed not re-enabling New Site box for using merge function second time. Also fixed merge function not calling up lane shift window automatically. Eliminated issue with not always recognizing when map was displayed at program close. This caused having to press the Map button twice on some occasions to get map to display. Changed display so that large MMC/SD cards show the amount of memory in KB instead of bytes (to fit screen). Fixed problem not displaying Loop Class values in monitor lanes and when mode is Basic or Advanced Loop Class. Multiple advances to the Loop Class Table create function. Fixed per-vehicle shifting/combining problem when adding two datasets that don't have a partial set start. <p>Build #0020 fixes a problem not connecting to counters with a bad leap year date setting, adds a Leap Year Fix function to the database, and also makes these changes:</p> <ul style="list-style-type: none"> Changed to identify different releases of 4.04 to deal with HLE releasing various dated copies.

Version	Explanation
Build #0024 04/01/10	<ul style="list-style-type: none"> Fixed problem of label on Lane 1 Sensor Spacing. Fixed problem in direct connect high speed MMC downloading (switching to high speed before result comes in). Added support for "LX=" after tune on new 4.50 firmware for reporting updated frequencies. <p>Build #0024 fixes issue with retrieving files from mixed MMC/RAM files and also makes these changes:</p> <ul style="list-style-type: none"> Fixed problem not adding station name to SpeedxAxle and SpeedxLength sub-directories when Auto Create Station sub-directories is enabled. Changed Omega download to not use ACK to move forward during download if the block number is wrong by - 1 (try NAK once first). Fixed overlaid text issue when going into Hidden Options menu with UAA. Automatically change 0 Count Modes into '1' during import.
V1.36 Build #0008 09/08/10	<p>New release for operation on Windows Vista and Windows 7 (64 or 32 bit version). This includes new libraries, full support for Loop Only Classification, Signed Installers and Drivers so that USB drivers will install under Windows Vista and Win 7, a fundamental change in the base code to use wide strings, and every component library has been upgraded. <i>This release must be installed onto older versions; it is not available as a web update.</i></p> <p>Loop Only Classification related changes:</p> <ul style="list-style-type: none"> Added support for 0x04 Loop Class Flag Field (including new 64/16 Length values). Fixed some bugs editing Loop Class fields in Raw Database. Update I-Loop Board Firmware option no longer displayed when no I-Loop found in system. Major changes implemented to better support loop class table creation and uploading tables to counter. New menu option called "Manage Loop Class Tables" appears when linking to Loop Class enabled counters where you can upload and erase tables inside of Loop Boards. A high speed function is available when directly connecting to counter (otherwise it is done at the regular communication rate). New report for printing Loop Only Classification detail graphs. Added Loop Class Records to New ASCII Exports. <p>In addition, software now supports Direct Polling of Peek 241/ADR Counters to simplify multi-manufacturer systems, Importing/Exporting the Direct Call Directory to Excel, and these changes:</p> <ul style="list-style-type: none"> Fixed problem with access error when remember window size function is selected and all windows are closed. Corrected report preview window size when scanning bar is open. Changed Volume Data Dump to only include labels on lanes that are enabled. Changed the default directory to AppDirectory (Application Program Directory, typically C:\Program Files (x86)\Diamond\Centurion [type]). Unless specified by the user, this directory and sub-directories are the only one used by the program at any time. New checks and changes to make sure AppDirectory is fully usable by the program at run time. If it isn't, a warning message appears so the user can correct the access violations before losing registration and licensing data. Added a Test Directories button on the Directories Preferences box (allows you to insure access to all the directories). Dumped Sedlan "TRestructure" component. Table restructuring now done by our own interface to the database. Added "Lane Veh #" type setting to IF7/SF7 values (for support of new feature in V3.31-3.99 and V4.50+ counters). Added ability to disable <Esc> Key use for counter reset (go into Counter preferences). This can help if running Centurion with other applications that use the Esc key. Added ability to do a counter reset to the UPP5 Versions < 2.80 and also to the Uni-Lim/Apollo links. Now auto-create the AutoExport directory along with other directories. Fixed the "CC10" command not working in the auto-poller. All counter issue handling updating Enabled Lanes when directional is turned on/off. Fixed passing Unicode Strings to TSDP. Fixed problem adding "_1" onto UAA and UPP5 < 2.80 file names when set to download file based on Site ID. Fixed old bug in APRO not allowing it to work with USB connection to counters (AwWin32.pas modifications, not carried forward with changes other programmer did to make AsyncPro work with Unicode). Added Omega/Titan II "EZOTG Program" and "Code Loader" automatic upload utility. Improved the Terminal window by allowing baud changing during the link (right click inside the box), fixed the backspace function, and made the character display work more smoothly. Fixed some minor issues with Exporting To Excel (string vs. smallint errors) and added in Loop Only class variables. Changed to use a mixed 4.06/4.07 version of the AsyncProlibrary (to eliminate issues with access violations). Changed to support not ever needing pre-setup database aliases (can all be set from inside of program). Eliminated screen flash on program startup (effect of the TChartEditor component). Fixed issue switching from landscape/portrait mode not redrawing screen correctly. Added additional functions to synchronize the Direct Calling Directory to the Map. The database Export directory can now be specified separately from the other database directories. Now uses internally held databases aliases to prevent Windows 7 and Vista issues with writing to the BDE configuration file. Also automatically switch to known good directory for PDOXUSRS.NET to prevent security lock-down keeping the BDE from opening. Added button to the BDE directory tab to allow saving the aliases if the user wants. Also explains to the user that this

Version Explanation

	<ul style="list-style-type: none"> may cause some systems to hang. Added mask edit to Posted speed limit (must be up to three digits with optional single decimal point). Fixed problem with database Site Copy not correctly making new files with Source sub-directory dates. Fixed several other Source file errors that could crop up with Site Delete, Site Merge, and Site Setup Report function. Changed the name of the function to add two sites together from the Site Setup Editor from "Merge Sites" to "Combine Sites". This is to help distinguish it from the other Merge Sites function available from the main database view. Also added in some explanatory text to help users understand the difference between the functions. Fixed problem with the Parking Lot monitor not re-displaying the counter monitor bar after closing the window. The "Tuning ..." message is now cleared correctly after retuning loops. Eliminated the SOIP option on the Open Terminal Window. Instead, a new button allows you to "Call With Terminal" from the Direct Call a Site function. This works with both SOIP and standard sites. Fixed problem with not sending password correctly to old style UPP5 and all UAA counters.
V1.37 Build #0004 12/20/10	<p>Version 1.37 Build #0004 has these major changes:</p> <ol style="list-style-type: none"> Complete update to support 60 Bins instead of 30 across the system (except Report generator). Now supports 120 Definitions for the Axle Class system. Complete update to support 64 Lanes instead of 32. Update to support Ball Hitch Detect functions on each vehicle, and enabled for each lane on a per-import basis. Also contains the foundation for the Special Vehicle Markers system to support future classifying enhancements on new generation counters. <p><i>Also includes these changes:</i></p> <ul style="list-style-type: none"> Added update of Release Date/Time when doing a counter firmware update to the Scanning box. Increased the size of the answer from 10,000 to 30,000 to allow for very large response file directories. Fixed problem not saving direct entry delay multipliers on setup screen. Updated bin table editor and report generator for V2 table support. Changed database as follows: <ul style="list-style-type: none"> Increased size of "____ Class File Name" from 12 to 30 characters in both the Master tables and auto convert the base tables. Changed "TMG: Directions" and "TMG: Lanes" from 32 to 64 characters to accommodate new database capability. Increased max number of lanes in Stations to 64. LANESET: Changed Lane Number and Physical Lane Number to go up to 64. IMPORTS: Added Ball Hitch Detect (32 bit lane bit map) PER-VEHICLE: Increased Lane Number to 64, allowed class numbers to 60, added Special Vehicle Markers. CLASSIFICATION: Added "Bin Total 31-60" at end. VOLUME: Added "Lane 33-64" at end. Reset SVM to be before Other record. Fixed some bugs in conversion of database and added text noting to wait while database undergoes conversion. Added Volume Export for Titan II Study (to support up to 64 Lanes) Added combo-box for selecting type of per-vehicle export (Matching, Normal, Enhanced, With Bins, Enhanced+Bins, Loop Class). Added preferences option for splitting all ASCII and Binary exports into daily files. Greatly improved the Binary exporter to fully included all Loop Class values (including signatures) and to support full database exporting. System is now completely import, edit, export, reimport without any loss in the flow. Changed the import rules around the Default Bin Table so that DEFAULTTX is used consistently whenever possible on imports, even if user sets the default to blank (now true even on Volume imports). Completed full support for 64 Lanes/60 Bins on Direct to Excel Export and also added BHD to Excel Export. Fixed issue saving file to Text using Unicode instead of Ansi text (improved look of Text Save function). Saved text now also looks improved with edited out MPH/FT/CM labels and the file is automatically opened in the editor at end. Fixed problems displaying Lane Grouping updates on user interface and also corrected display so that "GPS Baud" rate does not overlap the setting box on the Titan II link. Fixed messages that required a setting in the Length Class table when going into the Site Setup dialog. The COM port monitor now separately allows monitoring the detailed log file and the trace file. When enabling the log file, the system does show an hour glass (or spinning loop under Vista/Win 7) during writing out of this file to show it performing calculations when closing. Default for log file is off. Fixed issue with breaking up binned multi-day Binned and ASCII day files showing multiple error message dialogs and blank files when a missing day was found in the set. Can now specify a minimum left scale value for the Loop Class Detail graph to help show scales better for vehicles; and clicking on the graph brings up the chart editor where multiple functions are available (print, save, export, etc.) <p>Build #0007 04/11/11</p> <ul style="list-style-type: none"> Corrected multiple issues with uploading Loop Class tables. Added extra 0x01 characters to Master/Slave switch and altered timing to improve switching performance. Completed the Reclassify Data function from the Per-Vehicle database editor. Completed the Loop Class Results Analysis Tool from the Per Vehicle database editor. Multiple changes, bug fixes, and improvements to the Loop Class table generator. Includes ability to make smaller tables, supports smart % matching system, and completes all aspects of table generation not already done.

Version	Explanation
Build #0008 05/20/11	<ul style="list-style-type: none"> Added allowing changing the Master/Slave by clicking on the Serial ID value. Fixed not clearing LaneInfos when making Ohio Exports short count format. Added function for importer to auto move characters at end of Info Line 1 to Lane Info 1 and Lane Info 2 when import is coming from an Omega ('h' custom version). Added "Move Decimal on GPS Coords" function (on by default). This also fixes the incorrect formatting of the GPS value returned by the Omega and Titan II counters.
Build #0009 06/15/11	<ul style="list-style-type: none"> Added support for importing data that has Lane Grouping enabled inside of the counter. Fixed some issues with importing data for Ohio using the 'h' custom version. You can now disable scanning for Sprite traffic counters in the Preferences dialog box to speed up looking for other traffic counters. <p><i>Update to speed up Omega/Titan II downloading along with misc. other improvements as detailed below:</i></p> <ul style="list-style-type: none"> Support for higher baud rates (to 921.6K) on serial devices which support it. Fixed several issues in the Set Hidden Options command (0.0 battery voltage, some other wrong conversions). Added 2K and 3K as settable block download sizes for the Omega and Titan II in the Counter options preferences box. This speeds up downloading files from these counters by reducing overhead. Also changed the XMODEM protocol to use quicker block access selects to immediate request next blocks instead of waiting on a timer. Fixed problem with Study duration for open studies (used to display very large number). Corrected display issues on the Titan II/Omega file directory on the last file (now says "to present" instead of "Dec 31"). <p><i>Supports Firmware Update for the Uni-Lim and Apollo Counters and makes multiple other changes and improvements as follows:</i></p> <ul style="list-style-type: none"> Made the following changes to the Omega/Titan II counter link: <ul style="list-style-type: none"> Greatly sped up the firmware Upload function. Increased overall speed of communication in almost all modes. Eliminated the auto-resending of EZOTG/Code Loader. Added support for Code Load V1.11 output of last written address (xxxx>) value and also added support for the V1.31 full CRC values for the Firmware Status function and window display (Ctrl+Alt+U). Fixed a variety of issues which caused potential corruption of the uploaded firmware. This includes a auto-resend if the link locks up or is lost during an upload. Added a customizable USB Delay Time to improve the linking time on some machines. Fixed issue with not making the Settings and Main Link screen clocks match on the Titan and Omega link screens. Added an "Ohio Site ID" setting to the Preferences which makes any Site ID on Omega/Titan II data files, counter screens, or when keying in for a new Start Collecting be zero filled to be at least 6 characters long. Fixed the Time Zone offset values to not have +13 and instead include the missing +4 value. Added support for the V1.32 setting for Auto Setting of Daylight Savings time. Fixed problem handling 'h' version inputs which put the Lane codes into position 28-29 for only a single lane of data. Fixed bug which caused firmware to not resize download file after download (timer multiply error). This caused junk to appear at end of files. Changed so counters do not download ALL FILES as a single file but them as multiple files. Added detection of devices being plugged in or removed to the USB port using the standard windows WM_DEVICECHANGE message handler. This helps speed up various computer systems and makes them more stable. Fixed the width of the Upload [Type] [Ver] Display on the Uni-Lim, Apollo, and V2.80+ screens. Solved an issue with the Volume Import during Lane Overlap which caused missing Lane(s) on the first record only when Lane Shifting was enabled.
Build #0021 10/26/11	
Build #0026 03/22/12	

Version	Explanation
Build #0028 07/12/12	<ul style="list-style-type: none"> ○ Fixed file naming scheme so that Standard File Naming now adds "_x.bin" to the end to not overwrite existing. ○ Fixed incorrectly seeing two lanes of volume instead of one on RoadRunner CSV import. <p>Major updates to the <i>Parking Lot System</i> function including:</p> <ul style="list-style-type: none"> • Signs and Counters can now be connected to either by MAC address or direct COM Port Connection. • Added ability to specify the Sign Board Address for shared COM ports. • Fixed the linking and polling functions to improve stability of system. <p>Also contains these additional changes and bug fixes:</p> <ul style="list-style-type: none"> ○ Added support for clearing the Retrieved File marker on Unicorn, Phoenix, and Pegasus counters that are firmware version 4.16-4.49, and all V4.56 and higher. ○ Also added the Live Time Adjust function for setting the clock without stopping collection on those same counters and versions of firmware. ○ Fixed a problem reading out the directional info line on V4.04 and higher firmware. ○ Cleaned up the Last Closed Time/Date value (no longer displays junk when not set). ○ Corrected issue with not linking to counters that are set to 9600 baud (such as the parking lot system counters). ○ Updated the Titan II link to match functionality in the Omega link. ○ Changed the Set Counter Time box to use 24 Hour clock format. ○ Modified the Import function to better handle disk files with multiple counter files. ○ Also changed the Importer to record actual data End Time (instead of file end time) on all import records. For example, a Classification file with 15 minute intervals that is stopped at 11:36 used to show an end time of 11:36. Now, it will show an end time of 11:29 (the last interval in the file end time). This makes the Data Overlay window more effective. ○ New option in Preferences-General-Export to "Put Imports on a separate tab for Direct To Excel exporting". This causes a third tab to open up listing the imports, instead of placing them on the main Station Setup sheet. ○ New option in Preferences-Communication-Telemetry to "Use POLLOG.TXT For Polling Log". When enabled, the software no longer writes to the database polling log. Instead, it does the following: <ul style="list-style-type: none"> ▪ Creates a new sub-directory off the main program directory named "Poll Log". ▪ Further sub-directories will be created by Year-Month of polling. ▪ Inside the Year-Month polling directory text files will be created each time a polling is performed. ▪ The text file details out every status and information that used to be placed in the database polling log, but instead is kept here for users who want it as a text file. <p>Update to complete <i>Loop Class Table Generator</i> with better memory management and new 16-Bit features. Also to address these issues:</p> <ul style="list-style-type: none"> ○ Fixed problem with reading in new bin table from counter and then writing it to disk. ○ Changed the layout of the Excel Exports so "Imports" are on a new tab and lanes are fixed. ○ Fixed bug in not deleting the correct file when you select individual or range of files and there is 1 or more MMC or TAM files in the counter. ○ Fixed bug in SiteLeapYearFix which did not update the database name of MLaneset and therefore accidentally created a CenturionCC alias when none was needed. ○ Made multiple improvements to progress bar updating during database functions. ○ External file editor used to view Loop Class files > 50MB. ○ Added the unlicensed information to the end of the YOURREG.TXT file. ○ Fixed issue with "Index Out Of Bounds" error during some old database updates. ○ Added a "Link To Site With Terminal" function to direct dial directory.

Version	Explanation
Build #0030 07/26/12	<p>Supports new V4 Piezo Board with V1.20 or later firmware Negative Filter and Baseline Reset functions. Also makes multiple other changes and improvements as follows:</p> <ul style="list-style-type: none"> ○ Added a Pause button to the Monitor Lanes screen and also a Filter 2-3 checkbox. ○ Fixed problem in Field that kept the Terminal window from opening correctly. ○ Put in a “Mute” button in the Test Sensors screen. ○ Changed the WinXP install to use path specific device driver files (Win7/Vista files are unchanged). ○ Added the “Manifest” files to the installer (Win7/Vista only). Also changed the way the system deletes old “uninstall” shortcuts.
Build #0033 12/11/12	<p>New Export Forced Interval function to allow users to choose the record interval for all export formats in addition to these changes:</p> <ul style="list-style-type: none"> ○ Adjusted some elements of the Loop Class interface. ○ Changed the WADOT Trips export to auto-switch to use Length bins if data collection mode changes in the middle of the month. ○ Adds support for the new Auto Daylight Savings adjust in V4.28-4.49 and V4.68+ ○ Minor corrections to handling database end dates/times and single import datasets. ○ Fixed “0” showing up in Weekly Site Summary on the totals page (when user collects non-directional two lane data). ○ Updated to the new V3 eDocEngine system which improves the look and layout of PDF, RTF, Excel, and other “Save As...” formats on reports. In particular, the Excel save now lines up columns more consistently across pages and matches the report better as well. ○ Changed the unlicensed function to include Drive ID and other info in coding. ○ Added “Ohio TMG (L/3)” and “Ohio TMG (D/3)” to the Auto Export selection box. ○ Modified the Bin Table version number edit to work more smoothly (changed components). ○ Added an “Export Errors” dialog box which lists all export errors just like the Import Errors box does. This new dialog takes the place of individually showing errors whenever auto-exports are enabled as part of the auto-polling system (fixing an Ohio reported issue).

I.a. Difference between Gold, CC, Parks, & Field Versions

Centurion is currently available for your PC in four versions:

Gold:

The most complete package with all functions and features described in this users guide. This includes the complete map based Telemetry, Polling, and Auto-Polling functions as described in section XII of this manual.

CC (City/County):

Identical to the Gold version but without the Telemetry and Polling options (used to call up remote counters by modem).

Parks:

Limited version which only allows access to the Volume (Count) database. All program functions related to Per-Vehicle and Classification data are not accessible.

Field:

Very limited version which disables all database functions (including reports and exporting). This version is intended for field operations where only programming and downloading a counter directly connected to the computer are required, or when just a simple modem call-up is needed.

Please note that this users guide describes the full Gold version of the program. If you are using CC, Parks, or Field, some features will not be available. In all versions, the ability to download, program, and monitor traffic counters and other devices hooked directly to your computer is identical.

II. Registration

When your computer returns from rebooting, double click on it to see the splash screen (either the Diamond Traffic Products screen or the IRD screen will appear depending on the vendor):



Note: This screen can be turned off using the Preferences menu (see section X).

After the splash screen disappears, the main window will appear and an automatic registration dialog window immediately pops up:

Centurion-CC Registration

Welcome to Centurion-CC registration. To register, please follow these steps:

STEP #1: Establish an internet connection. You must be connected to the internet before clicking the Register button below. If you are not on-line, please do so before continuing or use the Manual Registration button.

STEP #2: Verify the License Name shown below. It should be in the format of "Company Name (User Name)". If it is incorrect, change it to the legal name of the organization you are registering this software to before continuing.

Licensed To :

STEP #3: Fill in the following information about this installation. This will be verified by the sales office and later used to provide you with the final software authorization key, so please make sure it is accurate.

Company : <input type="text" value="Your Company"/>	Contact : <input type="text" value="Your Name"/>
Address : <input type="text" value="Address Line 1"/>	Phone : <input type="text" value="Your Phone Number"/>
<input type="text" value="Address Line 2"/>	Fax : <input type="text" value="Your Fax"/>
City : <input type="text" value="City"/>	E-Mail : <input type="text" value="you@yourcompany.com"/>
State/Province : <input type="text" value="State"/>	Postal : <input type="text" value="ZIP Code"/>

STEP #4: Click register to connect to the registration web site and register your copy of Centurion-CC

You must register the software in order to use it. If your registration fails or you are not connected to the internet, click the Manual Register button instead and email the registration file created by the software to your Centurion-CC provider. Thank you for choosing Centurion-CC.

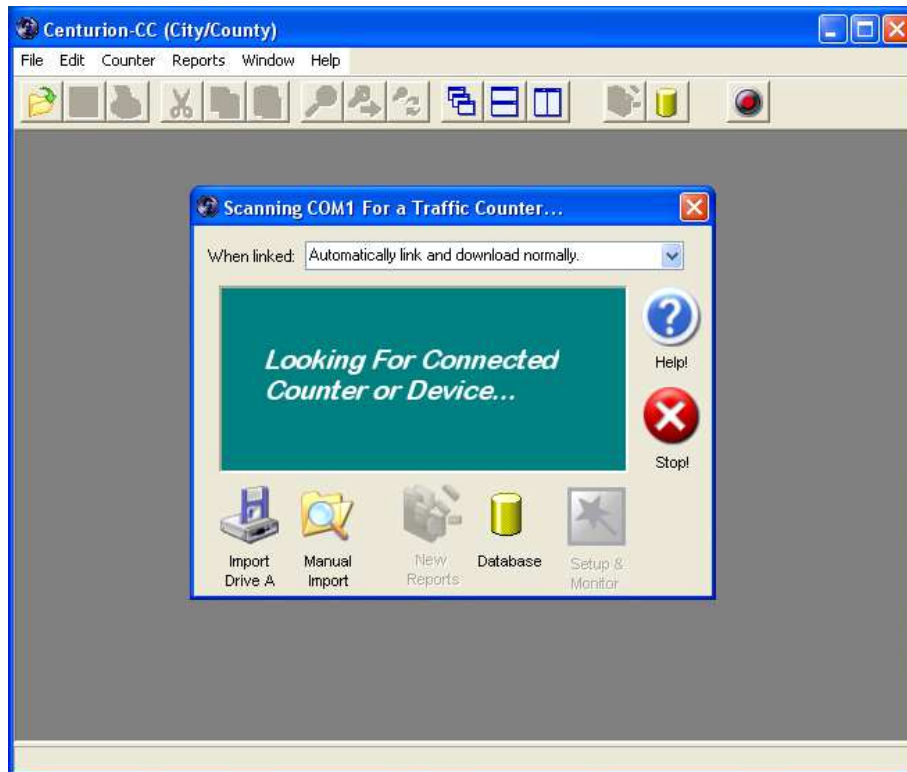
Latest Version & Contact Information : www.dettlc.com

Carefully enter in all information and verify that it is correct. When you are ready, click Register via Email if you are connected to the internet and the software will automatically generate an email registration for you to send in.

You MUST register the software to use Centurion. If you are unable to register via the internet, please click Manual Register and follow the instructions given.

III. Counter Communication - Basic

After registration, normal program operation begins. The software defaults to searching for a traffic counter on COM port 1 (or the first available COM port) as shown below.



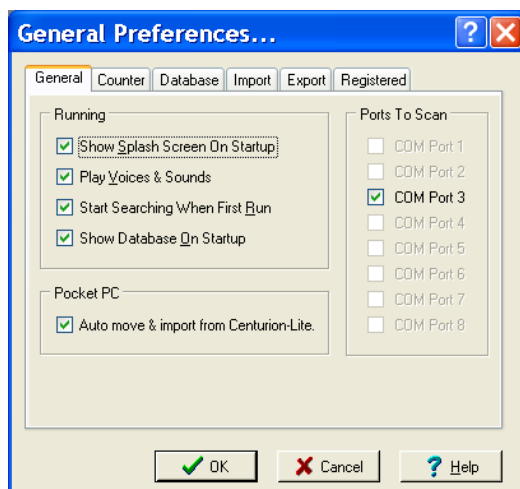
Connect a counter with a few data files in it (such as an Apollo). The software should immediately find it and connect to it.

To stop scanning, click the Stop button or close the window. Note that scanning for counters can go on simultaneously with all other Centurion operations.

NOTE: The [When Linked](#) option and the [Setup & Monitor](#) button are part of the *Advanced Counter Communications*. See the next section (IV) for more complete details on using this feature.

If the software does not respond when you connect the counter, it could be because it is not connected to COM port 1. You can tell Centurion to scan other COM ports by double clicking the "Looking for connected Counter or Device" label or by selecting "Preferences -> General Options" from the File menu.

If you do either of these, the following window will appear:

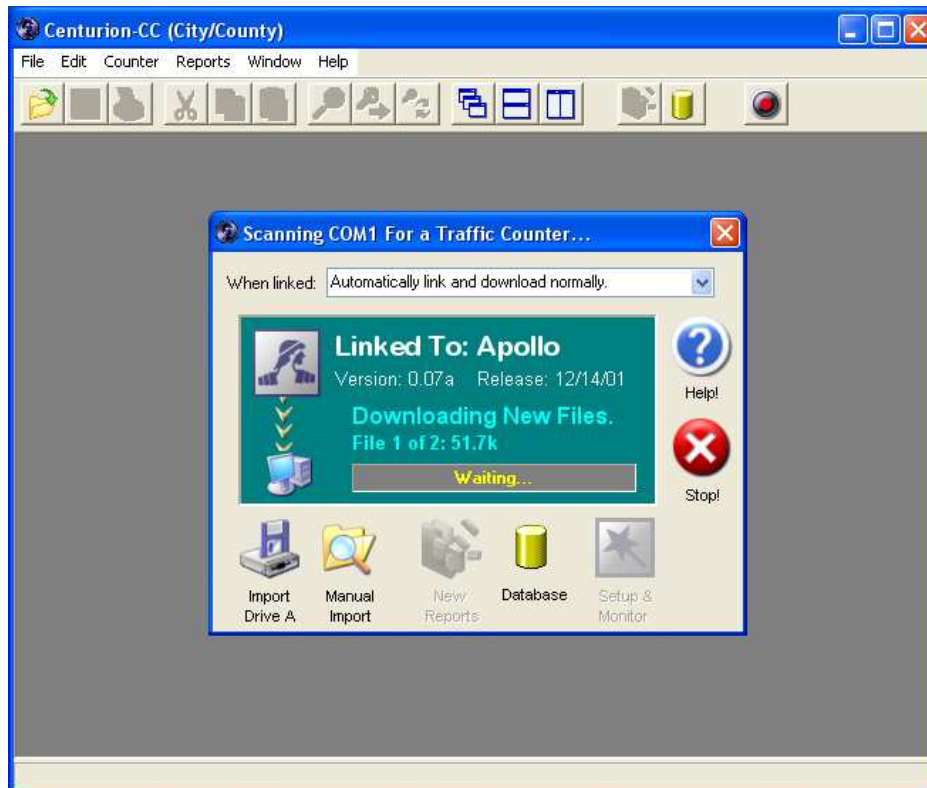


The "Ports To Scan" section allows you to select what COM ports you want to scan for connected traffic counters. COM ports that don't exist on your computer are grayed out (in this example, only COM3 is available).

While you can select as many COM ports as you wish, we recommend selecting only the one that you are going to be using. This will greatly speed up all operations of the software because it does not have to switch between multiple COM ports.

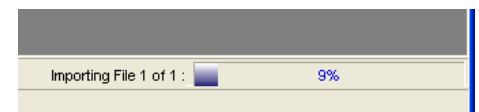
In a later section, all of these preferences options will be described. Click Ok to continue.

If you connect a counter (such as the Apollo) that contains data files, the window changes to:

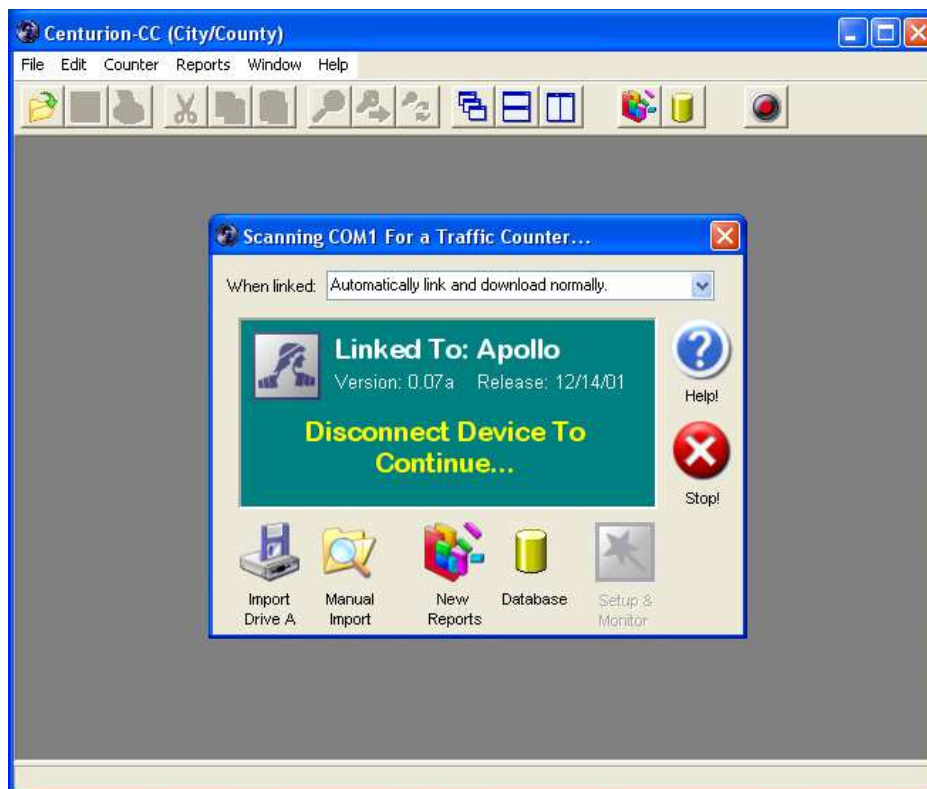


The “Waiting” will change to show the progress of the download. When it is complete, Centurion automatically moves to the next file to download.

Once any data file has been retrieved, it is immediately brought into the database. You will see a small progress bar such as this appear when importing is going on:



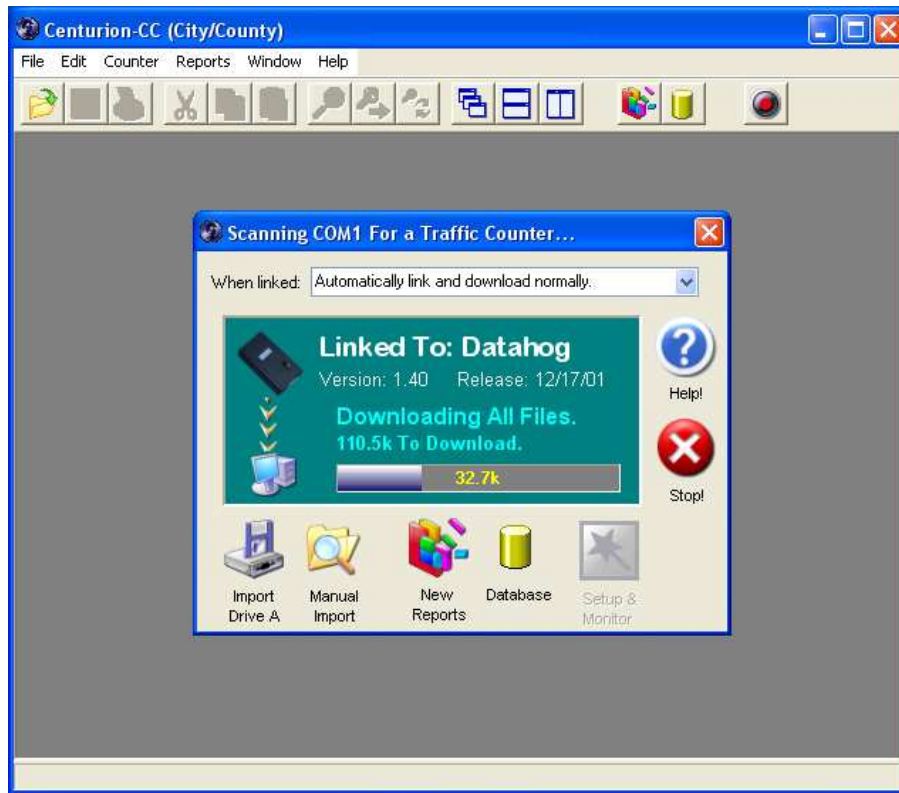
When download is complete, you will be prompted to disconnect the counter:



Note that the “New Reports” button has been enabled. This is because you have brought some new data into the database and a report can be generated. See the Reports section for more information.

After disconnecting, you can immediately connect another device such as the Datahog (shown on next page).

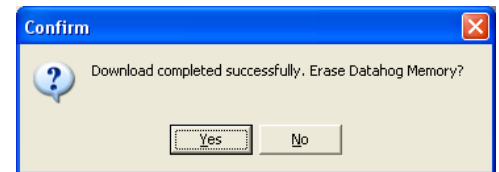
NOTE: When a Datahog, Unicorn-Limited, or Apollo with Flash finishes you will be asked if you want to erase the memory.



The Datahog acts just like a counter to Centurion

All Data that is brought in adds to the "New Reports" list. When you do select it, Centurion will create a report for each piece of new data.

When the download is complete, you are asked if you want to erase the Datahog memory:



Select Yes to clear the memory of the Datahog.

COUNTER COMMUNICATIONS NOTES:

- Does not support multi counters on a single serial connection (Master/Slave).
- If there are any unretrieved files in the counter memory, it downloads those files only. If there are no unretrieved files, the software downloads ALL files in the counter memory.
- Files are named <yy-mm-dd download> <site or DATAHOG> <start yy-mm-dd hhmm data>.BIN during download and are immediately copied to the Archive sub-directory of the Download sub-directory where Centurion is installed.
- Centurion either ignores data that already exists in the database or allows you to rename the Site ID of matching data. This allows you to download the same data multiple times without any problem.

IV. Counter Communication – Advanced

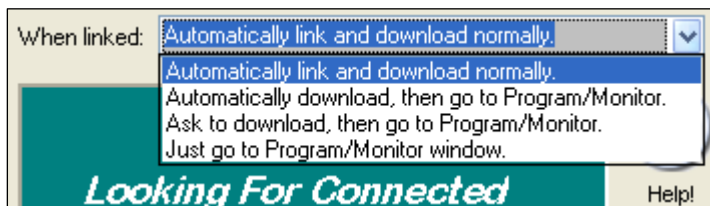
In addition to the traffic counter data downloading & processing described in the previous section, Centurion can also completely program and monitor a traffic counter. This feature is only available on the following models and versions of traffic counters:

<i>Model</i>	<i>Versions</i>
Unicorn-Limited & Apollo	1.20 or higher
Unicorn, Phoenix, Pegasus, & TCC-540	2.39, 2.44, 2.45, 2.80 and higher.
Phoenix-WIM & TCC-540-WIM	2.80 and higher.
Sprite (Tube, Loop, or Both)	All versions.
Traffic Tally 2/4/6/8 – Bluetooth	All versions.
Omega Traffic Counter – USB & Bluetooth	All versions.

Connecting any of the above devices will allow the *Advanced Counter Communication* function to operate and you will see the Setup & Monitor button become enabled like this:



Please note that before this button will become enabled, the regular processing of data files (if any) in the counter will occur just as described in the previous section. Since you can also download and process data files in the Advanced section, you may want to override the normal download process. Centurion provides you with some options under the When Linked drop down box to do this:



These options only affect how Centurion handles traffic counters that are supported by the advanced function. All other traffic counters and devices (such as the Datahog) are downloaded & processed normally.

Automatically link and download normally – This option (the default) treats traffic counters that are supported by the advanced function exactly like any other counter and exactly like versions of Centurion prior to 1.20. When downloading is complete, you can either disconnect the counter or click on the *Setup & Program* button to access the advanced functions.

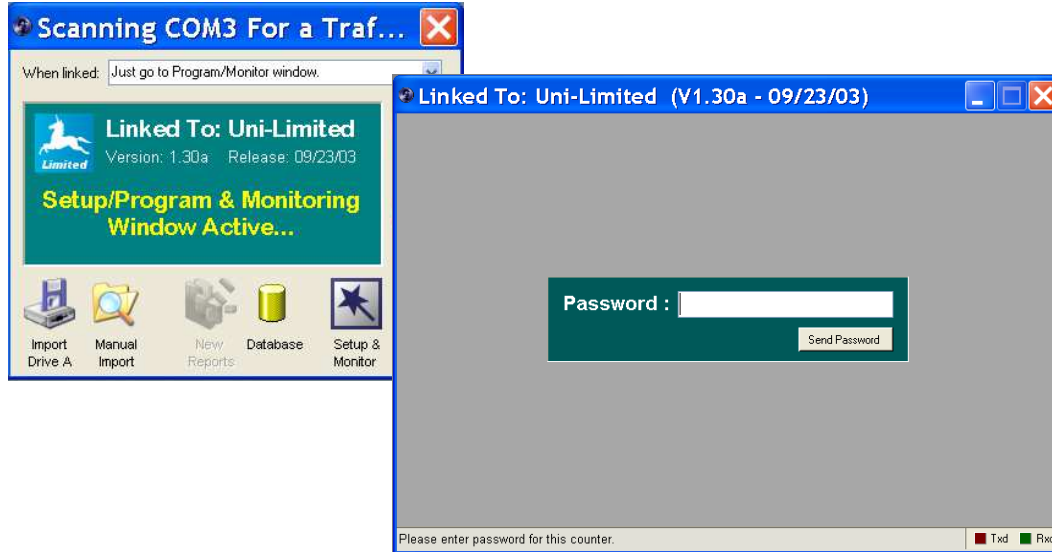
Automatically download, then go to Program/Monitor – Data is first downloaded and processed from the counter (if any), and then the advanced functions for Program & Monitoring are started automatically.

Ask to download, then go to Program/Monitor – If counter contains any data files, you will be asked if you want to download & process them. When download is complete (or if you say no), the advanced functions for Program & Monitoring are started automatically.

Just go to Program/Monitor window – No data downloading will occur automatically. Instead, the advanced functions for Program & Monitoring are started automatically (where you can choose to download and process data if desired). This option most closely resembles the operation of the older TrafMan software.

Whichever option you select, it will be remembered and become the default each time Centurion is run. Note that if you exit the Advanced Counter Communication function you can click the Setup & Monitor button at any time to restart it as long as the counter stays connected.

Once the Setup & Monitor button has been clicked (or the advanced function started automatically), the scanning window changes to say "Setup/Program & Monitoring Window Active" and a new counter link window is displayed as shown below:



In this case a Unicorn-Limited Version 1.30 has been connected to the computer.

Enter the correct password and press <Enter> (or click Send Password).

For all of the following examples, a Unicorn-Limited with Flash Memory will be used. Note that because Centurion supports different kinds of counters with different capabilities (such as loops, TAM, and piezos) some options will not be shown (such as retuning loops). Please refer to the online help for more complete information on these other features.

Once the password is entered, Centurion will check the counters time versus the computer and, if they differ by more than 30 seconds (or 2 minutes for the Sprite), the following window will display:



Select one of the options to change the time or click the Cancel button to exit this window.

After the password and time question have been answered, the main counter status screen is displayed:

This is the main option bar. Click on any button to show sub-options. Any option not currently available will be gray.

You can resize the window at any time to make it easier to read by grabbing a corner with the mouse.

This side of the window shows information for the current option (in this case *Show Status-Current Counter State*).

The **Txd** (Transmit) and **Rxd** (Receive) lights will blink on and off as Centurion talks to the Traffic Counter.

To see the current configuration in more detail, use the option bar and click on *System Configuration*.

This window's appearance (as well as most other windows) changes depending on the traffic counter model, mode of operation, and current status.

The status line displays current Centurion operation information. It also displays error messages and other data as appropriate.

Click on *Site ID & Data Options* and/or *Lane Configuration* to see other current setup information:

To set the traffic counter system configuration (to set items such as Storage Mode and File Creation options), click on the **Set System Configuration** button. By default the *Data Collection Options* will be displayed like this:

The screenshot shows the 'Set System Configuration' window with the 'Data Collection Options' tab selected. The window title is 'Linked To: Uni-Limited (V1.30a - 09/23/03)'. The left sidebar contains buttons: Show Status, Start Collecting Data, Retrieve/Delete Files, Monitor Sensors & Traffic, Set System Configuration, General System Options, Data Collection Options (selected), Set Hidden Options, In-Day # and Times, Cold Restart Counter, and Modify Bin Tables. The main area displays the following settings:

- Data Type To Collect: **Count (Volume)** (indicated by an arrow from the text to the right)
- SnMis Storage Mode: View Only
- Enable Lane Grouping: ☐
- Maximum Axle Spacing: 40.0'
- Speed & Length Format: U.S.
- Create New Files When: Manually
- Weekly File Start Day: Sun
- Erase 1st When No Mem: ☒

At the bottom right, there are status indicators for Txd (red) and Rxd (green).

You can change the Storage Mode (Raw, Binned, Count, or Sensor) with this option. Other selections on this page allow you to set how files are created, the number formats (U.S. or Metric), plus other options. Please refer to your traffic counter users manual for more information.

You can also use the *General System Options*, *Set Hidden Options*, and *In-Day # & Times* to configure the counter:

The screenshot shows the 'Set System Configuration' window with the 'General System Options' tab selected. The window title is 'Linked To: Uni-Limited (V1.30a - 09/23/03)'. The left sidebar is the same as the previous screenshot. The main area displays the following settings:

- Passwords Required: ☒
- Current Password: PASS
- Daylight Savings Adj: No Adjust
- Fall Back Date: 10/31
- Spring Forward Date: 04/04
- Time of Change: 02:00 AM
- Date Format: MM/DD/YY

At the bottom right, there are status indicators for Txd (red) and Rxd (green).

The screenshot shows the 'Set System Configuration' window with the 'Set Hidden Options' tab selected. The window title is 'Linked To: Uni-Limited (V1.30a - 09/23/03)'. The left sidebar is the same as the previous screenshots. The main area displays the following settings:

- SnMis #3 To Vehicle: ☒
- Low Battery Level: 5.5
- Counter Serial #: [Empty text field]
- Multi-Counter Serial ID: 0

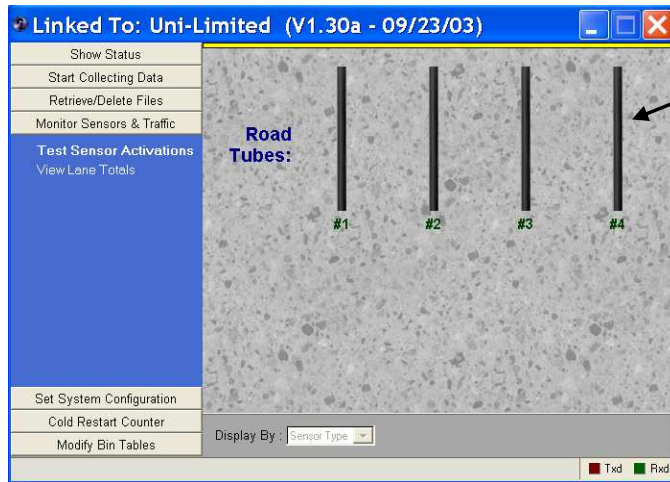
At the bottom right, there are status indicators for Txd (red) and Rxd (green).

The screenshot shows the 'Set System Configuration' window with the 'In-Day # and Times' tab selected. The window title is 'Linked To: Uni-Limited (V1.30a - 09/23/03)'. The left sidebar is the same as the previous screenshots. The main area displays the following settings:

- Number of In-Day Times: ☒ Zero ☐ One ☐ Two ☐ Three ☐ Four
- In-Day #1 Start At: 00:00 Stop At: 00:00
- In-Day #2 Start At: 00:00 Stop At: 00:00
- In-Day #3 Start At: 00:00 Stop At: 00:00
- In-Day #4 Start At: 00:00 Stop At: 00:00

At the bottom right, there are status indicators for Txd (red) and Rxd (green).

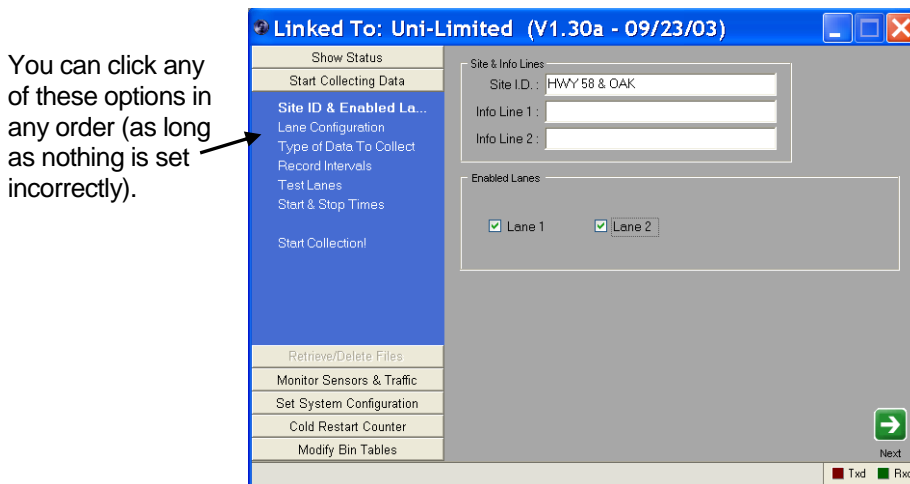
Once the system configuration has been set, you may want to connect the road tubes (or other sensors) to the counter and then click the **Monitor Sensors & Traffic** button. Since the counter is not collecting data, the default is to display the Test Sensor Activations window:



Each road tube is displayed here. When one is activated, it will light up briefly and a tone will sound (a different tone for each sensor).

Note that when connecting to a counter that has loops, they will also be displayed in this window and will light up for as long as the loop sees the vehicle. In addition, a Tune Loops button will appear at the bottom of the screen.

Now that the sensors are working, you are ready to click on **Start Collecting Data**. The first window to appear lets you set the Site ID and which lanes are enabled:



You can click any of these options in any order (as long as nothing is set incorrectly).

Enter in the correct Site ID and Info Lines. You can also enable or disable individual lanes. You **MUST** have at least one enabled lane to proceed to any other part of this function.

The **Next** (and **Previous** buttons) allow you to quickly skip from screen to screen.

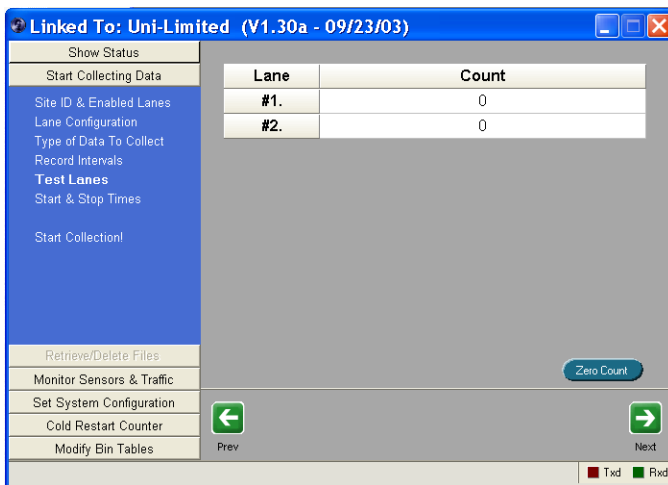
The *Lane Configuration* window is different for Count mode vs. Raw/Binned modes:

The *Type of Data To Collect* is only available when collecting Binned or Raw data:

Record Intervals (only available when collecting Binned or Count data) allows you to set the frequency data is written to memory:

Selecting more than one interval will cause the screen to display additional period and start time settings.

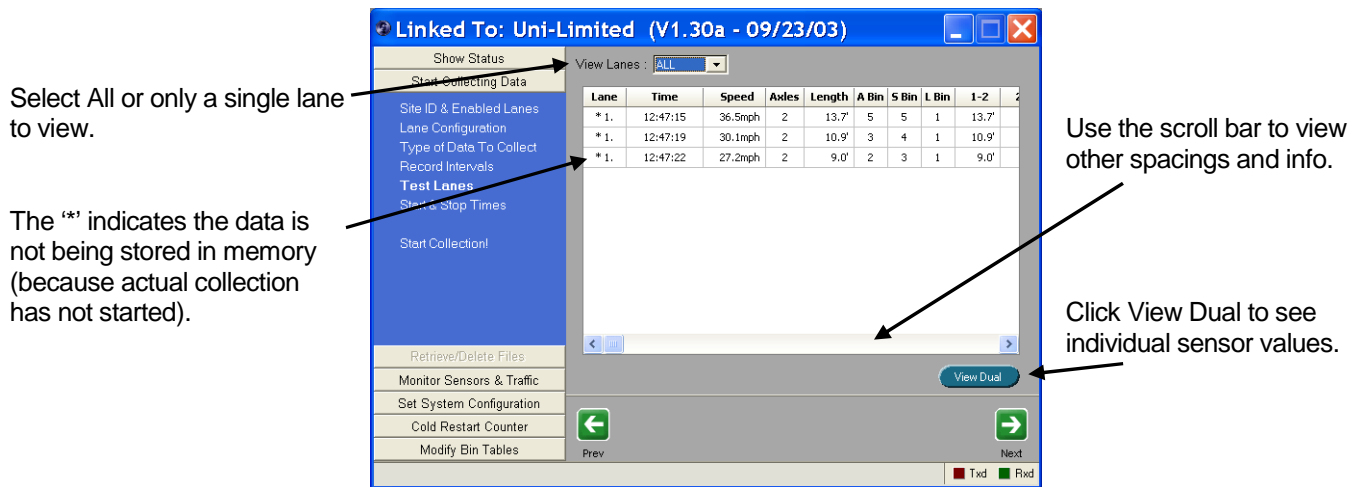
The *Test Lanes* function also varies if you are collecting Count data vs. Raw/Binned/Sensor data. The following shows a typical Count Mode screen:



Note that only the enabled lanes are shown.

The Zero Count button will reset all totals to zero. If a counter with a Piezo Board is connected, a column of piezo values will also be displayed. If a counter with loops is connected, a Retune Loops button is displayed.

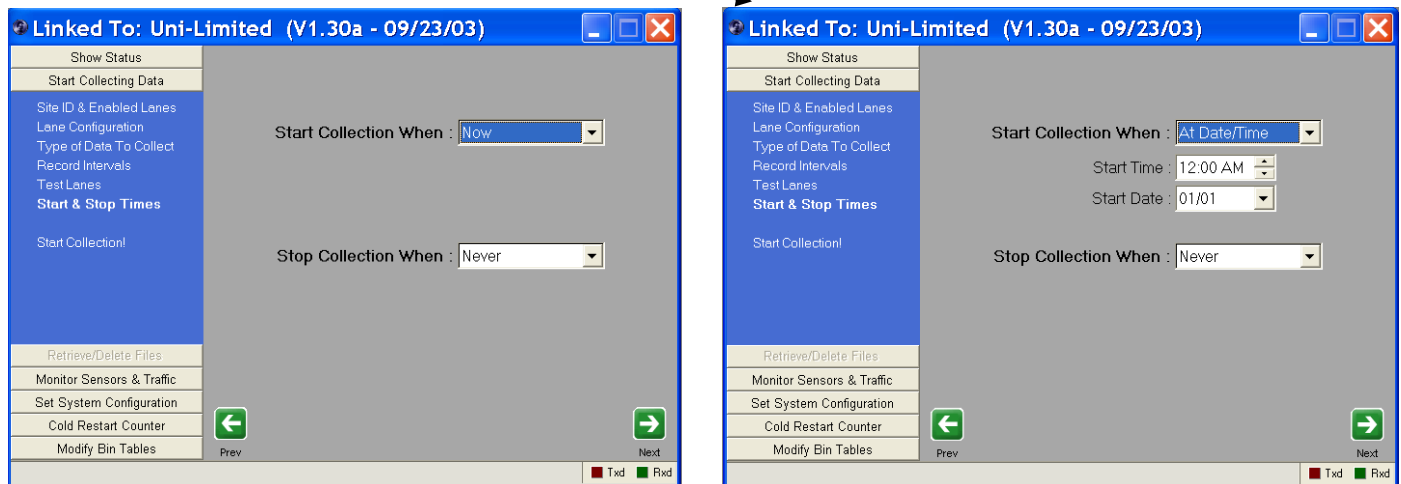
When collecting Raw, Binned, or Sensor data, the *Test Lanes* screen appears as follows:



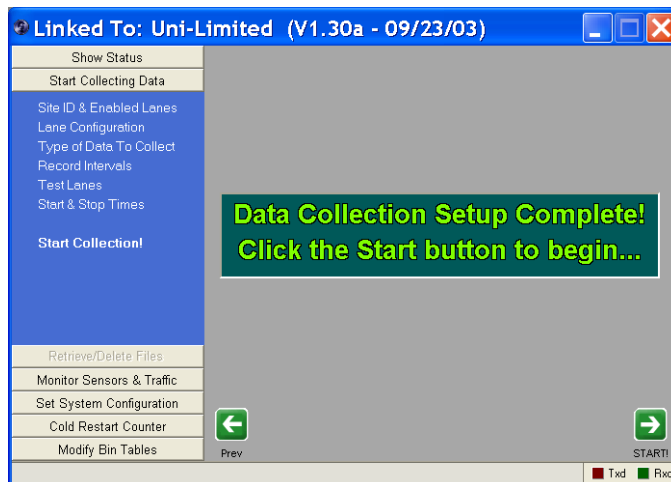
It is also useful to resize the window so you can see all the data as shown below:



Start & Stop Times controls when the counter will actually begin collecting data. The default is to start Now and stop Never. If you select to Start or Stop on a particular Date/Time, Centurion displays additional options as shown in this window:

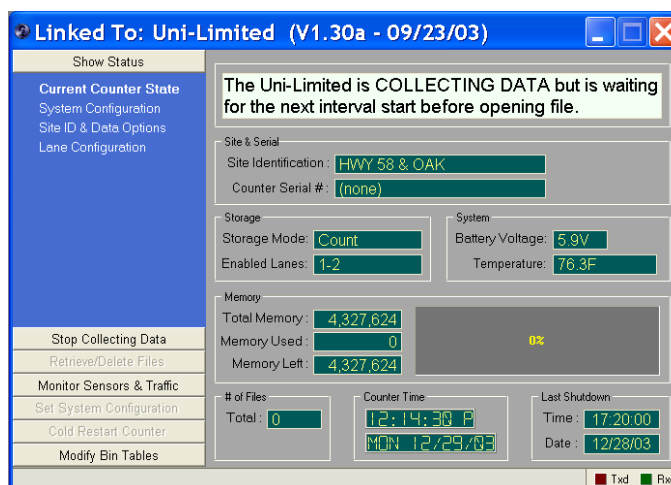


The last Start Collecting Data option is to actually begin collecting data and is shown in this window:



Click either the *Start Collection!* option or the *Start Button* to begin data collection.

After data collection has been started, the program returns to the main counter status screen like this:



Collecting has started but the counter is waiting for the beginning of a new interval before actually opening a file.

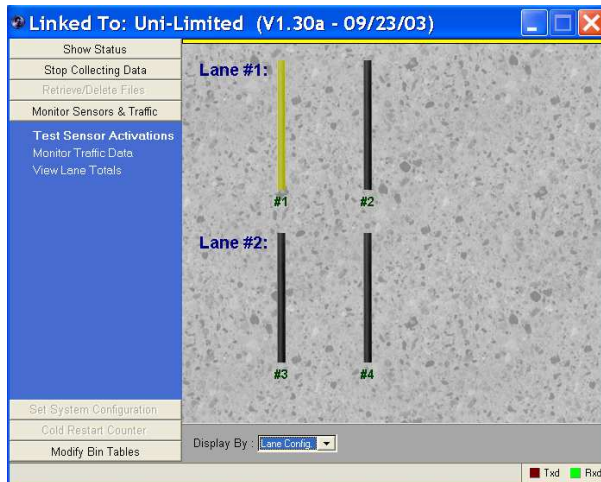
Note that the **Start Collecting Data** button has changed to say **Stop Collecting Data**. You would use this option to stop the data collecting process.

Once data collection has started, you can now *Monitor Traffic Data* to check on counter operation by clicking on the **Monitor Sensors & Traffic** button. This function is identical to the *Test Lanes* function previously described.

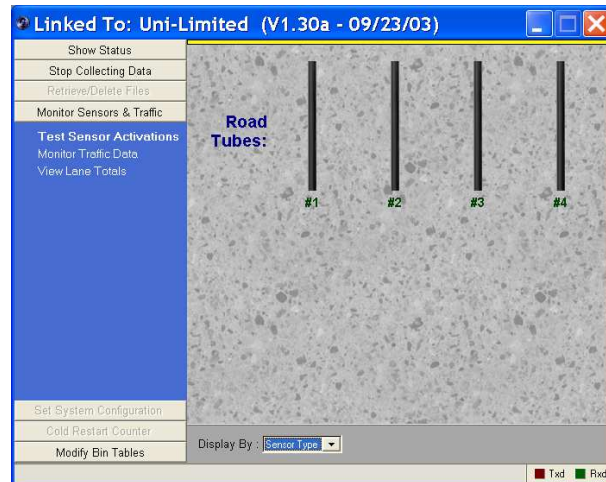
In addition, you can also use the *Test Sensors Activations*. This function operates in a similar fashion to testing sensors when collection has not started, but there are two differences. The first is that only sensors that are actually being used for data collection are displayed and the second is that in Raw and Binned modes the sensors can be displayed by lane configuration. This gives a more realistic view of the actual sensor activations.

The following examples show the various ways *Test Sensor Activations* can display when data collection has begun. You use the “Display By” option to control the way the sensors are displayed.

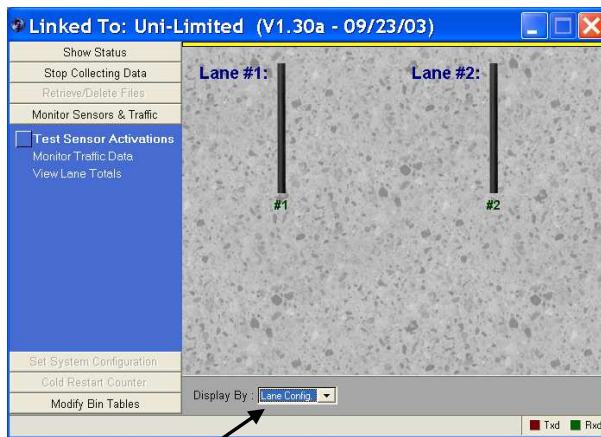
Binned data, by lane, one sensor active:



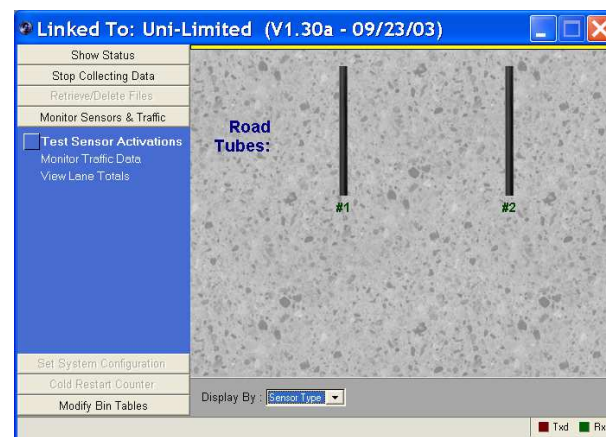
Binned data, by sensor type:



Count data, by lane:

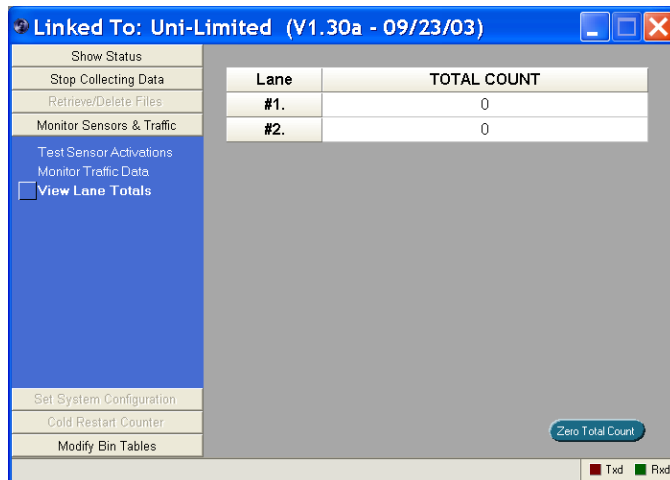


Count data, by sensor type:



Use the “Display By” option to switch between modes.

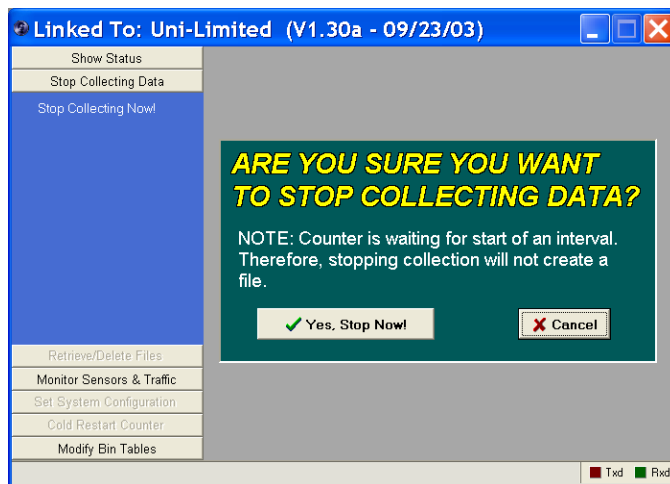
You can also *View Lane Totals* at any time whether collecting data or not:



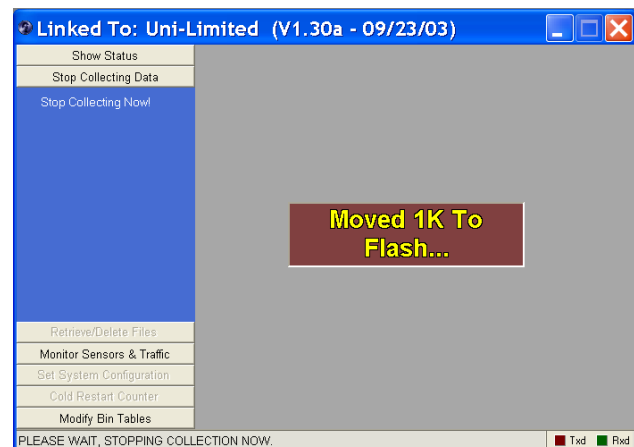
Only lanes currently enabled are displayed.

The Zero Total Count button resets all values to 0. This is also done automatically when counter begins data collection.

To stop data collection, click on the **Stop Collecting Data** button. You must then click the **Yes, Stop Now!** button or click the *Stop Collecting Now* option in the function bar to verify you really want to stop.



If the counter contains flash memory, the file will be moved to flash once it is closed as shown here:



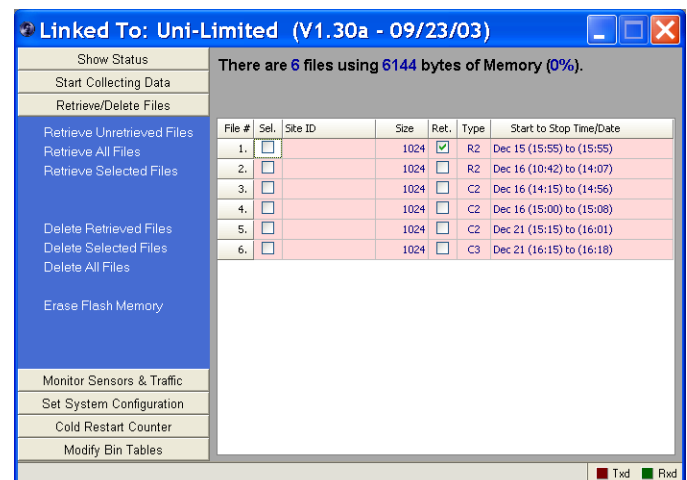
Once data has been collected and files stored in the memory of the counter, click the **Retrieve/Delete Files** button to access a wide variety of data download and processing functions:

Click on any of the options shown here to begin downloading data. You can optionally check the box marked "Sel." to specify individual files to retrieve or delete.

You can also double click on any file to retrieve it.

The column "Ret." is checked to indicate files that have already been downloaded into the computer.

Note that files with a red background (all of them in this example) are stored on Flash or TAM memory and as such, can only be deleted by erasing the entire Flash or TAM memory.



When retrieving data, Centurion displays a status window indicating the progress as shown below:

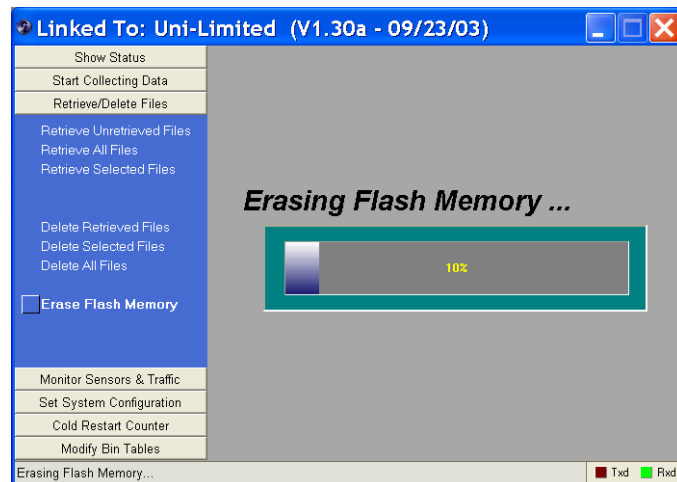
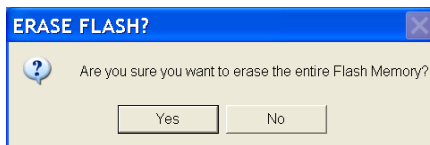


All data downloaded is automatically imported in the Centurion database.

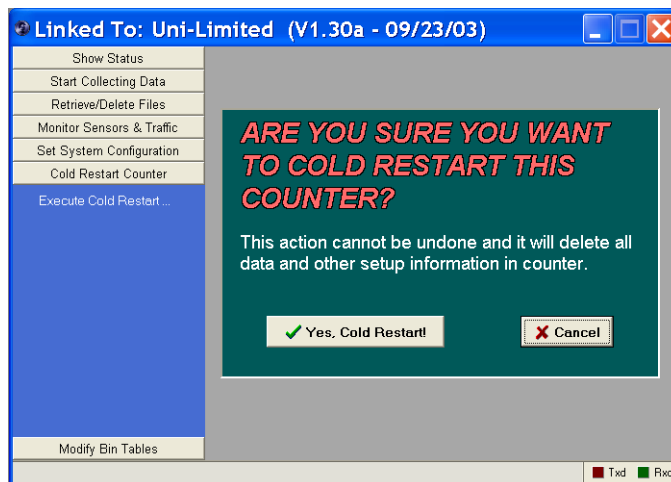
Click the Cancel button to abort this download and all other downloads selected (if any).

If the counter contains Flash memory or TAM memory, you can select the *Erase Flash Memory* or *Erase TAM Memory* function. You must first verify that you want to do this before continuing.

Select **Yes** to begin erasing...

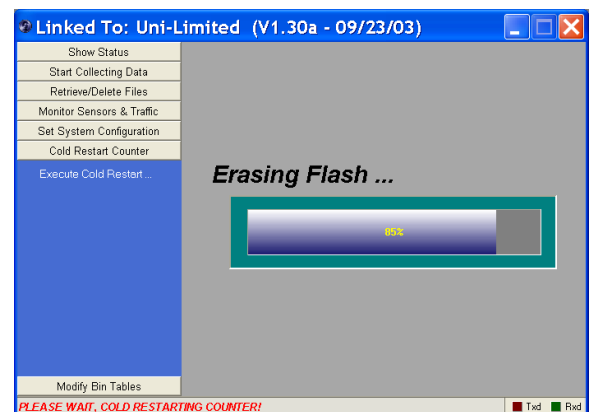


And finally, Centurion allows you to **Cold Restart** the counter to clear its memory and reset the entire counter back to the default state. Click on the Cold Restart button on the option bar to see this screen:



Click Yes, Cold Restart! or click the Execute Cold Restart option to begin. This cannot be undone, so use caution.

If the counter contains flash, it will be erased as shown here:



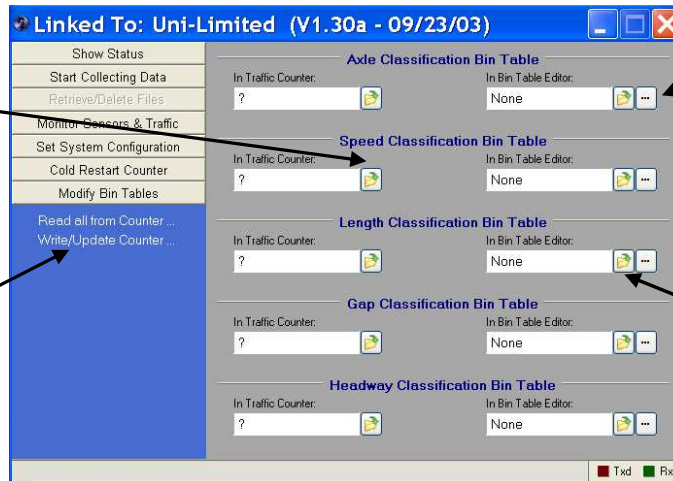
IV.a. Modifying Bin Tables

Centurion will allow you to customize the way a traffic counter classifies vehicles. While many customers do not need this function, it can be a powerful way to setup your traffic counter with the exact bin tables you want to collect data for.

Click on the **Modify Bin Tables** button to display this screen:

Click the *Read all from Counter* command or click any of these open buttons to download the current bin table from the counter.

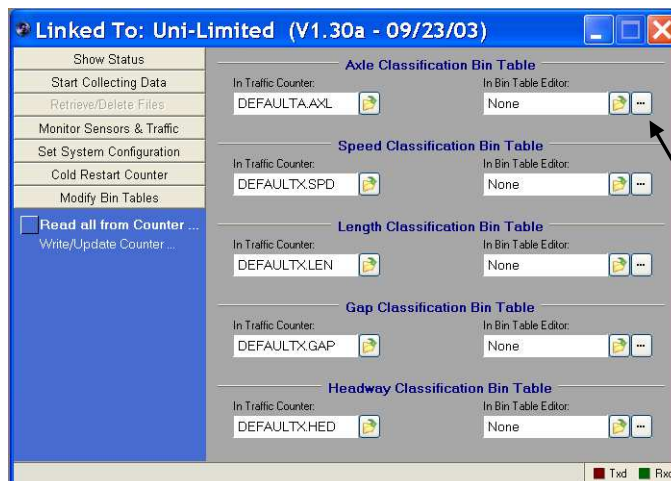
Click the *Write/Update Counter* command to send any changes you have made to the counter.



You can click any of these buttons to open the Bin Table editor and start viewing or editing a bin table.

Click any of these buttons to select a new bin table from a disk file.

Click on the *Read all from Counter* option and the display will change to show something like this:



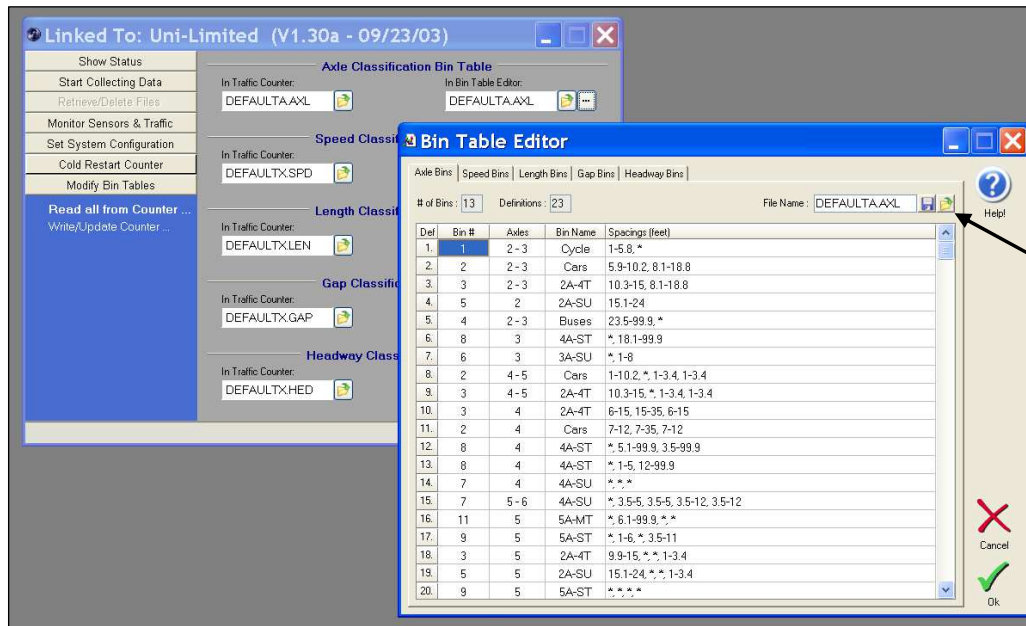
This shows the name of the bin table definitions currently being used by the counter.

To view or change any of them, click on the "..." button.

For example, click on this button to view/edit the Axle Classification Table. This will open the Bin Table Editor and show the current table that is in the counter.

On the next page the Bin Table Editor is shown when accessed from the advanced counter functions. Please note that section IX – Bin Table Editor describes the actual editor in far more detail, so please refer to that section for more specific information on actually editing and viewing bin tables.

A typical view of the Bin Table editor is shown below:

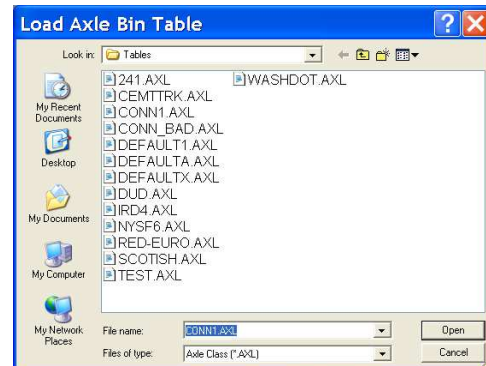


The first time you open the editor, whatever values you read out of the counter are automatically loaded into the editor.

To load a different table from disk, click this button.

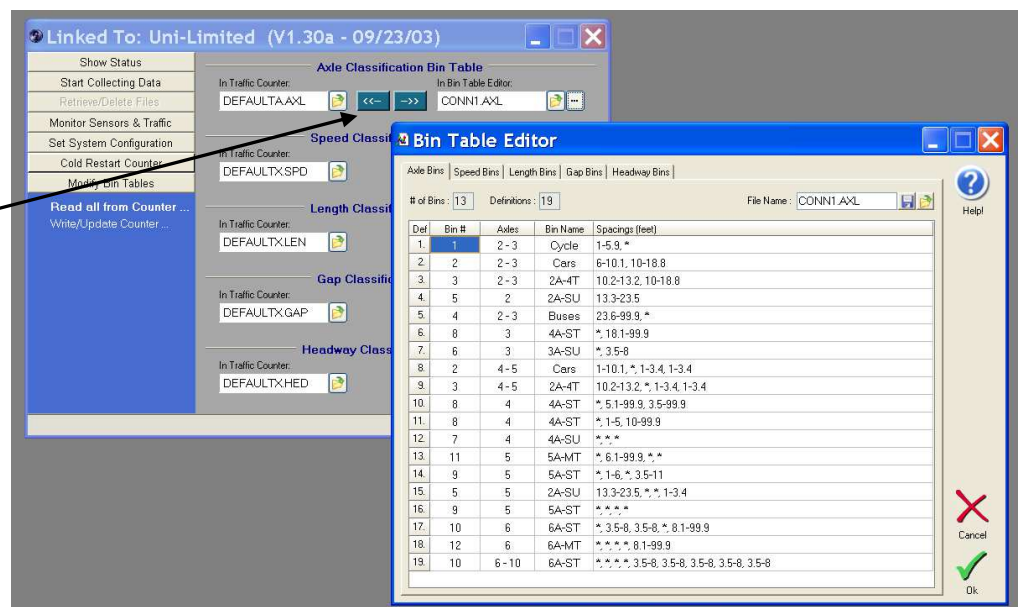
When you click the Open new table button, a window like this will appear letting you select the specific file you want to open.

As an example, click on CONN1.AXL and then click the Open button.

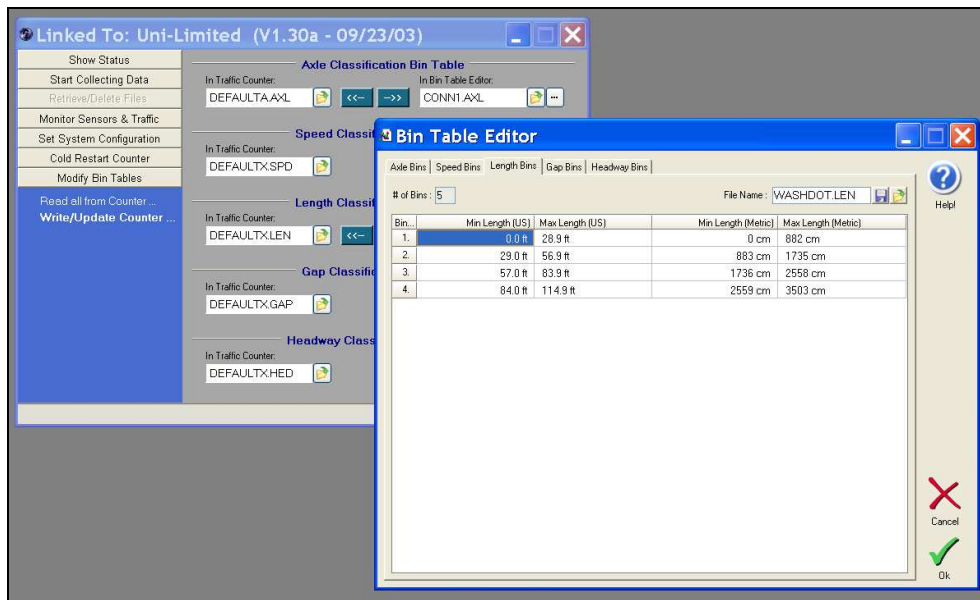


The Bin Table editor will then load the CONN1.AXL file definitions as shown below:

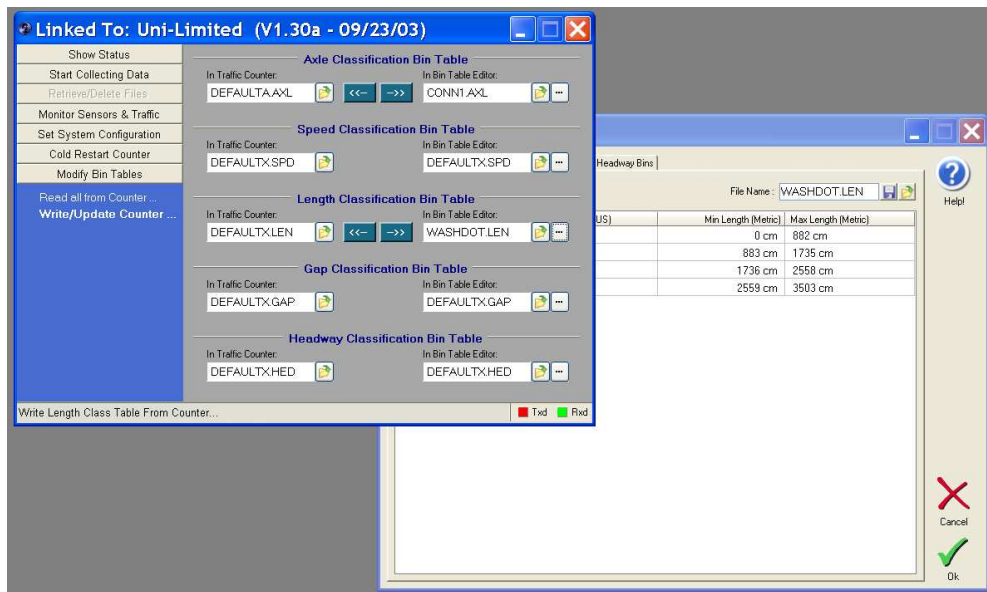
Note that the names are now different between what is in the counter and what is in the Bin Table Editor. Also, two transfer buttons have appeared allowing you to write the new table to the counter.



You can also load/view/modify other bin tables definitions by clicking on any tab in the Bin Table Editor. In the following window the Length classification table has been changed to WASHDOT.LEN:



Once the Bin Tables have been set, click back on the advanced counter communication window and then click *Write/Update Counter*. This command will automatically write any table to the counter that is different than what is in the bin table editor:



In this example the Axle Class Table and Length Class table will be written to the counter.

When the update is complete, you can disconnect the counter and update a different counter (if desired). You do not have to close the Bin Table to do this so your current bin table settings are saved.

IV.b. Bluetooth Counter Communication

Centurion allows you to communicate to your Bluetooth enabled traffic counter. Currently, the following counters are supported:

Traffic Tally 2, 4, 6, or 8 - BT	All Versions
Omega Traffic Counter	All Versions

To support Bluetooth, you must first enable it on your computer and set it up to link to a counter. All supported counters use the same Device Name and Bluetooth Address and can be linked to, one at a time, via the same Bluetooth COM port.

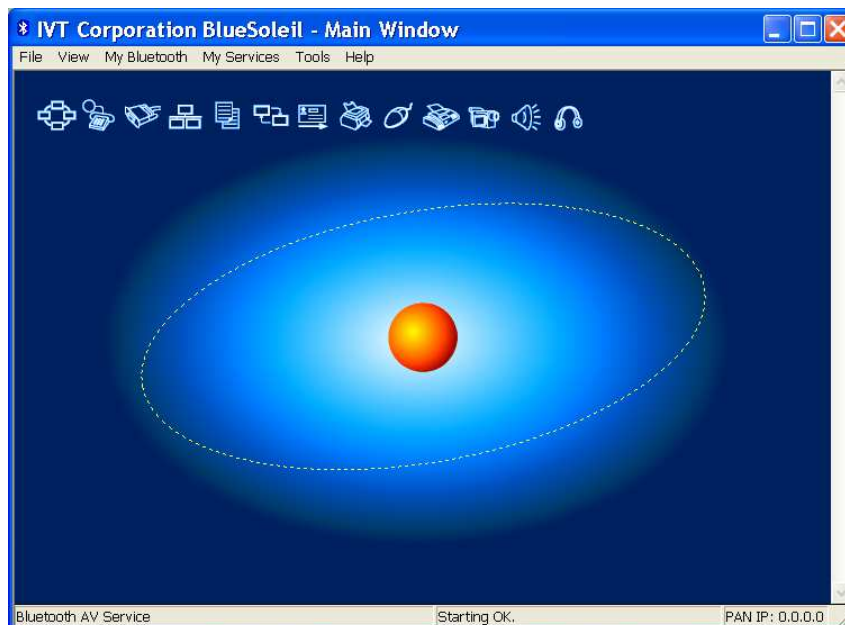
There are many available products available to support Bluetooth communications. The best type is one which allows you to setup a link to the traffic counter which is automatically enabled whenever a specific COM port is accessed (for example, COM11).

Other types of software allow you to scan occasionally for devices (such as once a minute) or to manually request a Bluetooth link with a device. While not as easy to use, all of these methods will work with the Centurion software.

A Typical Bluetooth Desktop Setup

The following describes setting up a desktop computer running Windows XP and using an ABE USB Bluetooth adapter with the BlueSoleil software drivers.

1. Check the BlueSoleil website and insure you have the latest version of the software.
2. Make sure the Bluetooth device is *not* plugged into the computer.
3. Run the driver software installation program.
4. Restart your computer and plug in the ABE Bluetooth USB adapter.
5. Run BlueSoleil (will automatically run after the first install). You should see the following:



6. If desired, click on My Services and disable those services you do not need (none are required to connect to the traffic counter).
7. If desired, click on My Bluetooth – Device Properties and set the Accessibility options. For greater security, make your computer “Non Connectable” and “Non Discoverable”.
8. Bring your traffic counter to the computer and activate it. For the TT-2/4/6/8, this is done by activating the Display reed switch. For the Omega, any counter collecting data is always active. For non-collecting Omega's, activate either reed switch to turn on the Bluetooth.
9. Press <F5> on your computer. This causes the BlueSoleil program to search for new devices.
10. Within a short period it should find the counter and display the generic link name like shown here.
11. Double click on Diamond Traffic Counter.
12. When Service Discovery Finished appears, right click on the Diamond Traffic Counter symbol and select Connect – Bluetooth Serial Port Service.
13. If a successful connection is made, a line should connect the traffic counter to your computer. You should also be informed of the COM port that has been established to connect to this device. Make sure have the checkbox enabled to automatically connect to this device when this COM port is opened.



Make note of this COM port! You will need this to setup Centurion to talk to the device.

Using Centurion with your Bluetooth Traffic Tally 2/4/6/8 or Omega Traffic Counter

Centurion works with a Bluetooth counter by opening a COM port that has been previously setup for Diamond Traffic Counter devices. When this is done, the Bluetooth system tries to link to the counter and allow Centurion to talk to it. When communication is finished, Centurion closes the link and this disconnects the counter from the computer.

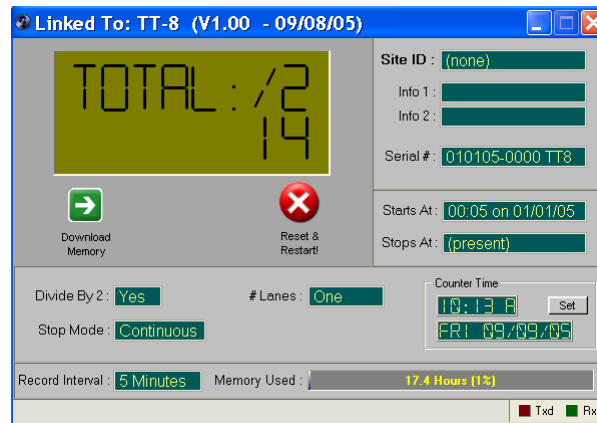
Follow these steps to setup Centurion to use with your Bluetooth Counter:

1. Run the program.
2. If the traffic counter Scanning window is open, close it (Stop Scanning).
3. Go into File – Preferences. Click in the counter tab. Change the “Bluetooth Port” value from None to the COM port you previously setup.
Once this is done, a new Bluetooth icon will appear in the scanning window.
4. Open the traffic counter Scanning window. You should see something like this:

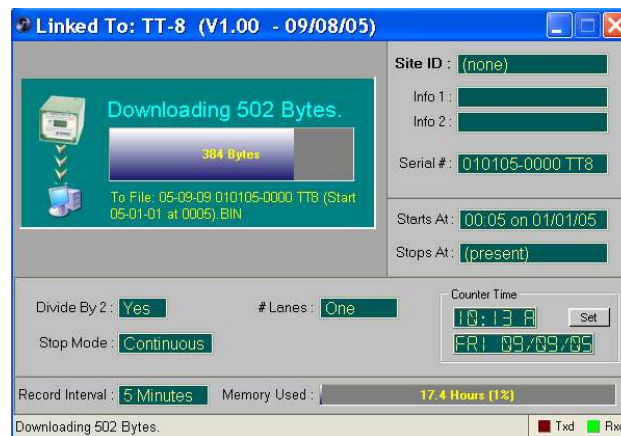


5. Bring your traffic counter next to your computer and wake it up (if asleep).
6. Click on the Bluetooth icon. This should automatically link the computer to the counter. If a connection is made, the type of counter connected and other info will appear followed by the program, monitor, and setup window.

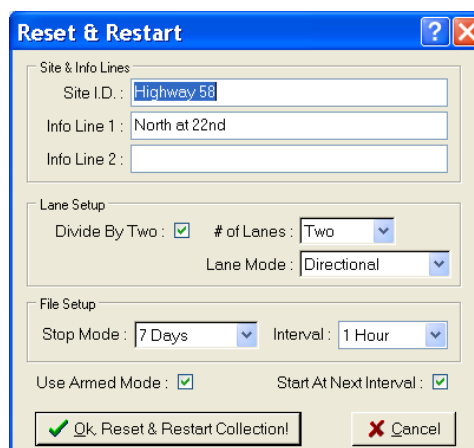
7. The following window appears when the Bluetooth connection is made with a TT-2/4/6/8 (see below for information on the Omega):



8. Click on the Set button to change the time (if the counter differs by more than 5 minutes from your computer this will happen automatically).
9. Click on the Download Memory button to download data to your computer. This is only enabled when you have unretrieved data present in the memory of the counter. The following will appear:



10. When downloading is complete it will automatically import the data into the Centurion database.
11. Click on the Reset & Restart button to reprogram the counter. Reprogramming automatically deletes any data in memory, so make sure you have downloaded the data you want to keep first. The following window allows you to change programming options:



12. Adjust all settings and Click Ok to begin new collection. The “Armed” mode sets the counter to hold itself inactive until the user activates Display and then Reset in the field.
The “Start At Next Interval” programs the unit to wait until the start of a new interval before collection is to begin.
13. When done communicating to the counter, close the window. Centurion will close the COM port for the counter and this should normally disconnect the Bluetooth link.
If the counter does not disconnect, active Reset on the counter and the link will be terminated from the counter side.

When connecting to an Omega Traffic Counter:

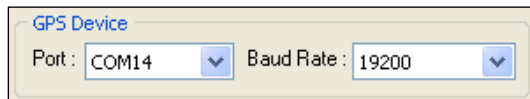
7. This section to be completed in the next release.

IV.c. Using a GPS Device

Centurion has a feature to allow the automatic programming of any counters Info Line 1 & 2 with the current GPS location. To use this function, you must have a GPS device installed or connected to your computer that supports the “NMEA” protocol.

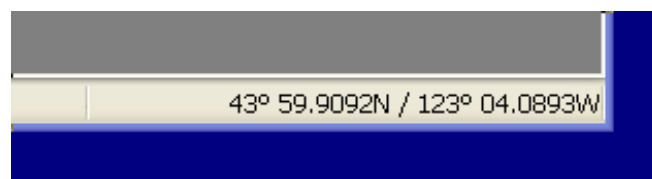
Most GPS devices support this functionality and, once enabled, will provide the current location of your computer to a COM port on your computer. In the case of internal GPS device (or one connected by BlueTooth or USB), this COM port is actually simulated or virtual by the GPS software. Please refer to your GPS device information and follow the steps necessary to enable NMEA output. You will need to know the COM port and Baud rate the GPS information is on to setup Centurion. Any NMEA protocol will work, but we recommend enabling v2.1 with a baud rate of 19200.

Once your GPS device is setup, run Centurion and go into the File – Preferences – General window. The first tab, “General”, has the following options:



Select the COM Port and Baud Rate your GPS device is configured to. Once this is selected, the GPS functionality is turned on for all counter communications.

Activate the counter scanning window. Immediately Centurion will access your GPS device and scan it continuously for current location information. When it gets a location, the bottom of the main Centurion window will display it like this:



Once the GPS device information is enabled, Centurion automatically fills in the Info Line #1 and Info Line #2 for all new data collection sessions. This data is then stored with the file so that later downloads can be verified for correct location. The user is not allowed to edit the Info Line #1 or #2 values when this function is turned on (to turn it off again, set the GPS Device Port to “None”).

IV.d. Windows vs. Classic Monitor Lanes

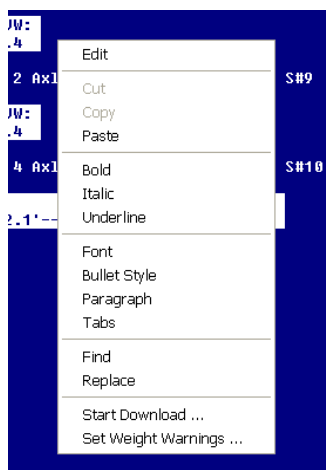
Centurion V1.31 and later supports a *classic* monitor lanes view. This classic view is similar to TrafMan and supports some additional features not available in the Windows mode.

Click to alternate between windows and classic view modes.

When in a WIM mode, you can select one of 4 display modes.

The classic view will display data identically to the older TrafMan software. You can see in the above example how WIM weights are displayed in the IRD mode. Centurion supports cutting and pasting data from this window, as well as the ability to scroll forward and back as needed.

Right clicking on any part of the classic view brings up the standard editor control as shown below. In particular the bottom two options are specific to the monitor mode:



The Start Download selection allows you to start/stop storing monitored data to a text file. Clicking on the Set Weight Warnings allows you to setup a warning color and tone when certain maximums are reached (as shown below).

IV.e. Using the Counter “Live” Time Adjust

Centurion V1.37 Build 23 and higher along with the Unicorn, Phoenix, and Pegasus counter versions 4.16-4.49 and version 4.56 and higher support what is known as the “Live” time adjust function. This function is designed to allow you to modify the counter Date/Time while the counter is collecting data without having to stop and restart. Prior versions of the software and firmware required you to stop collecting before you could change the clock, and this meant you generally lost an interval of data.

The function is turned ON by default. You control it in the **General Preferences->Counter** tab inside the Time Options group box. You should check the “Check Counter vs. Computer Time when first link” option so that Centurion will match the counter and computer time when it links to the counter. The next option enables or disables the “Live” Time adjust function. Check the box by “If supported, use ‘Live’ adjust to set time of counter” to enable the “Live” time adjust function.

Once enabled, Centurion will try to make the counter match the computer time whenever it detects one minute or more in difference between the clocks. There are some limits, however, as follows:

- ☐ The counter must support this function, of course. Counters that don’t support the function are supported in exactly the same way as they always have been.
- ☐ Normally, this feature is to make adjustments of just a few minutes at a time. However, it will support bigger changes if it detects them. There is a limit of time differences no more than 4 hours or any difference that would alter the actual date (instead of the time) cannot be changed with this function.
- ☐ It is also intended to be used when data collection is active, but it works when not collecting data too. As long as the time change is not too great, this function will be used automatically by Centurion to make the times match.

You can alter the behavior of this function using the other settings as follows:

Adjust min only:

If checked, Centurion will look only at the minutes value and not the hours of the computer clock and try to make that value match up. This is useful if you have counters in multiple time zones and don’t expect the times to be off more than a few minutes, Centurion can assume hour sized differences are time zone differences and concentrate instead on matching up the minute values.

Block vehicles if subtracting:

When subtracting time from a counter, the unit must wait for the real world to catch up to it. For example, if the counter thinks it is 6:40 in the morning and it is really 6:30, it must wait at 6:40 for 10 minutes doing nothing so its clock will resync to the actual time. If this value is checked, the counter will NOT store vehicles in memory during the time it waits.

Normally, users do not need to check this box. Adding vehicles to Volume or Classification tables during the minor minute adjustments should not affect tables too dramatically. However, if you are collecting Per-Vehicle data of any type, you can get timestamps on vehicle records that are duplicates and/or out of order time wise during the adjustment period. This won’t confuse Centurion, but it might another software package.

Store T/D if adding:

If adding time to the counter, you may want to record a special Time/Date record (a T/D) into the file to signify the jump ahead. Checking this box will indicate your desire to do that. Note that even if checked, it will only happen if (a) you are in a Per-Vehicle mode or (b) you are in an interval mode, Volume or Classification, and you cross an interval boundary.

How does the “Live” time adjustment work inside the counter:

If you are not collecting data, the “Live” time adjustment happens instantly. If you are collecting data, then it depends on the data collection storage mode (Raw, Binned, etc) and whether or not you are adding time or subtracting time as follows:

When subtracting minutes from the counter clock – The counter will reset the clock back one minute at the beginning of each new minute for the duration of time specified. For example, if Centurion detects the counter is 10 minutes fast, it will tell the unit to subtract off 10 minutes from its time starting at the beginning of the next minute. So if the clock read 12:46:23 when the command was sent, when it rolled over to 12:47:00 it will reset itself back to 12:46:00. It will repeat that 9 more times to subtract off the 10 minutes you requested, and then move forward normally.

Depending on the mode you are in, this causes different effects. In Volume and Classification the effect is almost non-noticeable because the current interval will simply be longer with each delayed minute. However, in Per-Vehicle and Sensor modes, vehicles can be recorded that have duplicate times and/or are out of order, something that is not normally possible. Centurion can cope with this, but if you plan to process the data with other software that cannot you should check the “Block Vehicles if Subtracting” box to prevent data problems down the line.

When adding minutes to the clock – This is actually more complicated than subtracting time because the user can add time which crosses interval boundaries and make it impossible for the importing software to understand what has occurred. There are two basic scenarios:

A) User adjusts clock just a few minutes (less than a single interval).

B) User adjusts clock a lot of minutes (more than a single interval).

In scenario A, the user just wants to add a few minutes to the clock. Centurion will send the number of minutes to add and, if you are in Volume or Classification modes, the counter will wait until the beginning of the next interval to apply the time jump all at once (the clock will jump forward). No record will be made in the file in this instance. In Per-Vehicle or Sensor mode, the time jump will be made at the next one minute interrupt, and a T/D record will be recorded in memory if you have checked the “Store T/D if adding” box.

In scenario B, the user needs to skip ahead more than a few minutes. In many ways it is probably better to stop collection, reset the clock, and restart collection if you have this much of a correction to do (since you have already lost more than an interval anyway). However, Centurion will support this and will send the number of minutes to adjust. Just like in scenario A, if you are in Volume or Classification, the counter waits until the end of the current interval before making the change, and then skips ahead to the new interval point. Because this was such a large jump, Centurion will also record a T/D record in Binned and Volume modes if you have checked the “Stored T/D if adding box”. In Per-Vehicle and Sensor mode, scenario A and B are identically handled.

Both of the above scenarios (A & B) mostly apply to Volume and Classification. In Per-Vehicle and Sensor modes, you are usually ok to add minutes to the clock without too much of a penalty. It should be noted that in heavy traffic flow you could get a vehicle time that was stored with the vehicle prior to the adjustment and thus makes other vehicles out of sync, so software should watch for that. Recording of a new Time/Date stamp (T/D) is optional, although it does alert the system to something having been changed.

“Live” time adjustment and the Autopoller:

Enabling the “Live” time adjust function will also affect the autopoller. During all communication to counters, Centurion will adjust times of units that support this feature (if enabled).

A note will be made in the autopoller log file of counters that receive a “Live” time adjustment.

V. Reports

After you finish with the basic and/or advanced Counter Communication functions, click the New Reports button on the main Scanning window to see a report of the data you just downloaded. Depending on the type of data, a window similar to the following will appear:

Traffic Data Report (2 of 3): 24TH AND UNIV.

Per Vehicle | Class | Volume

Starting Time & Date: 3:16 PM 1/22/2002 Ending Time & Date: 10:09 AM 1/24/2002

Report Style: Per-Vehicle Data Dump

Lanes: All (1,3)

Print Lanes: ☒ Together ☐ Separate

Data: ☒ Include Vehicles ☒ Include SnMis

Per-Vehicle Data Dump Report: 24TH AND UNIV.

Station ID : 24TH AND UNIV. Last Connected Device Type : Apollo
 Info Line 1 : Sample Report Version Number : 1.00
 Info Line 2 : Serial Number :
 GPS/Other : DB File : 24TH AND UNIV.DB Number of Lanes : 2
 Posted Speed Limit : 35.0 mph

Lane Configuration

#	Dir	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Volume Mode	Volume Sensors	Axle Class	Speed Class	Length Class	Gap Class	Hiway Class	Speedx Axle	Speedx Length	SnMis Store	Divide By 2
1	N	Northbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X						No	
3	S	Southbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X						No	

Vehicles In Database From: 3:16 PM - 1/22/2002 To: 10:09 AM - 1/24/2002

Date	Time	Lane	Speed	Axles	Length	Ax	So	Ln	Go	Hd	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14
01/22/2002	15:16:31.00	#1	28.5	3	21.2	2	3	5	8	8	9.0	12.2											
01/22/2002	15:16:34.00	#1	29.0	2	8.0	2	3	2	1	1	8.0												
01/22/2002	15:16:36.00	#3	28.7	2	9.3	2	3	2	8	8	9.3												
01/22/2002	15:16:37.00	#1	30.3	2	9.7	2	4	2	1	1	9.7												
01/22/2002	15:16:39.00	#1	30.0	2	8.0	2	4	2	1	1	8.0												
01/22/2002	15:16:40.00	#3	27.8	2	7.8	2	3	2	3	3	7.8												
01/22/2002	15:16:52.00	#3	24.7	2	8.0	2	2	2	1	1	8.0												
01/22/2002	15:17:07.00	#3	30.8	2	7.8	2	4	2	3	3	7.8												
01/22/2002	15:17:13.00	#3	31.7	2	8.1	2	4	2	2	2	8.1												
01/22/2002	15:17:16.00	#3	25.9	2	7.8	2	3	2	1	1	7.8												
01/22/2002	15:17:20.00	#3	29.9	2	7.4	2	3	2	2	2	7.4												
01/22/2002	15:17:30.00	#1	34.1	2	10.0	2	4	3	6	6	10.0												
01/22/2002	15:17:46.00	#1	24.9	2	22.8	5	2	5	3	3	22.8												
01/22/2002	15:17:55.00	#1	30.9	2	8.1	2	4	2	3	3	8.1												
01/22/2002	15:18:01.00	#3	25.7	2	10.9	3	3	3	6	6	10.9												
01/22/2002	15:18:05.00	#3	25.3	2	7.5	2	3	2	2	2	7.5												
01/22/2002	15:18:10.00	#1	25.9	7	83.6	13	3	12	3	3	88	19.7	7.9	7.9	30.5	8.7							
01/22/2002	15:18:16.00	#1	26.2	2	8.4	2	3	2	2	2	8.4												
01/22/2002	15:18:52.00	#1	25.3	5	46.9	11	3	8	6	6	9.5	21.0	8.2	8.2									
01/22/2002	15:19:05.00	#1	26.1	2	9.9	2	3	2	3	3	9.9												
01/22/2002	15:19:11.00	#1	32.6	2	9.2	2	4	2	2	2	9.2												
01/22/2002	15:19:13.00	#3	26.0	2	7.8	2	3	2	7	7	7.8												
01/22/2002	15:19:22.00	#1	23.9	2	20.0	5	2	5	3	3	20.0												
01/22/2002	15:19:30.00	#3	23.7	2	7.9	2	2	2	4	4	7.9												
01/22/2002	15:19:33.00	#3	24.7	2	9.4	2	2	2	1	1	9.4												
01/22/2002	15:19:46.00	#3	23.5	2	8.5	2	2	2	3	3	8.5												
01/22/2002	15:20:12.00	#1	27.5	2	8.3	2	3	2	6	6	8.3												
01/22/2002	15:20:27.00	#3	29.3	2	8.1	2	3	2	6	6	8.1												
01/22/2002	15:20:32.00	#1	26.0	2	7.9	2	3	2	4	4	7.9												
01/22/2002	15:20:36.00	#3	32.9	2	9.0	2	4	2	2	2	9.0												
01/22/2002	15:20:42.00	#1	28.8	2	10.9	3	3	3	2	2	10.9												

Navigation icons: Back, Forward, Home, Print, etc.

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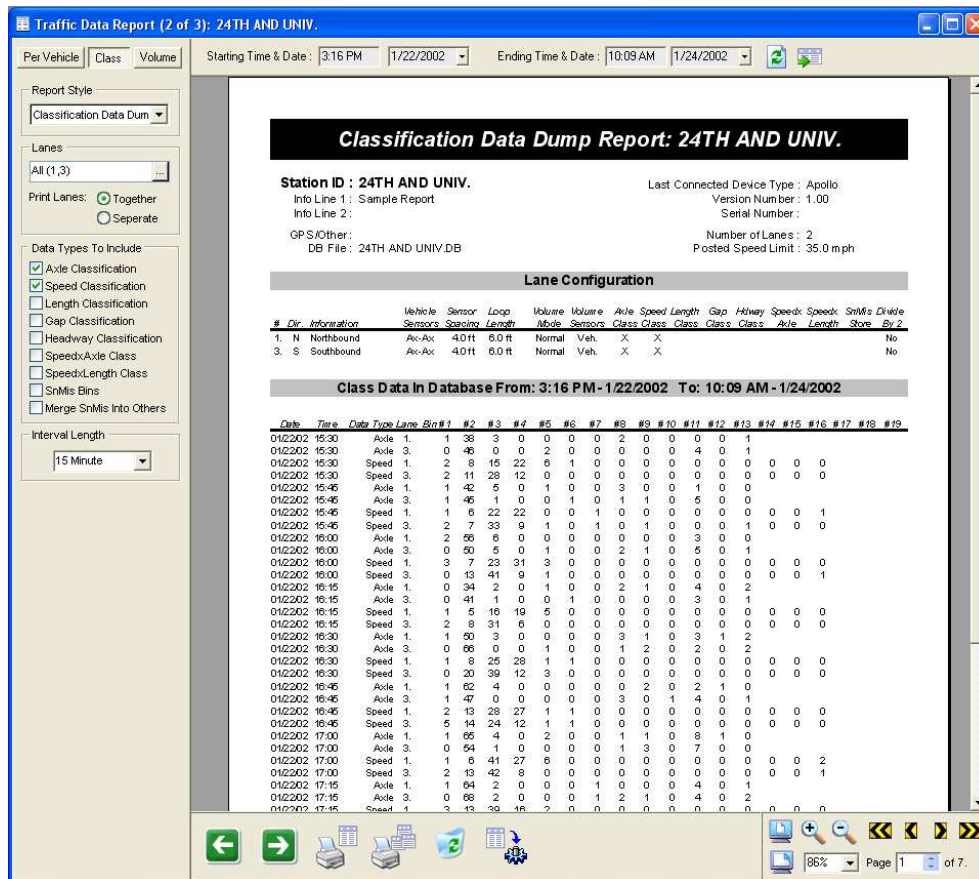
The report generator is a WYSIWYG tool. The current report content is shown in the preview window.

When you see the report you want, simply click Print to send it to the printer.

You can instantly switch between types of the same data (from Per-Vehicle to Class or to Volume) clicking on the Class or Volume tab.

IMPORTANT NOTE: Starting with Centurion-CC V1.20 Build #0002, the Report Generator no longer instantly applies any changes you make to the current report (such as enabling certain lanes or switching from Per-Vehicle to Class data). Instead, you must click the **Rebuild** button at the top of the report (which appears whenever options have changed).

This change allows users to more easily select multiple different report options without having to wait for each new report to be generated.



This is the Class version of the same data shown in the Per-Vehicle view.

Note that data that was collected in Binned (Class) mode won't have a Per-Vehicle tab and data that was collected in Count (Volume) mode won't have a Class tab.

Click "Volume" to see the data in a Volume Report.

This shows the Volume version of the same data.

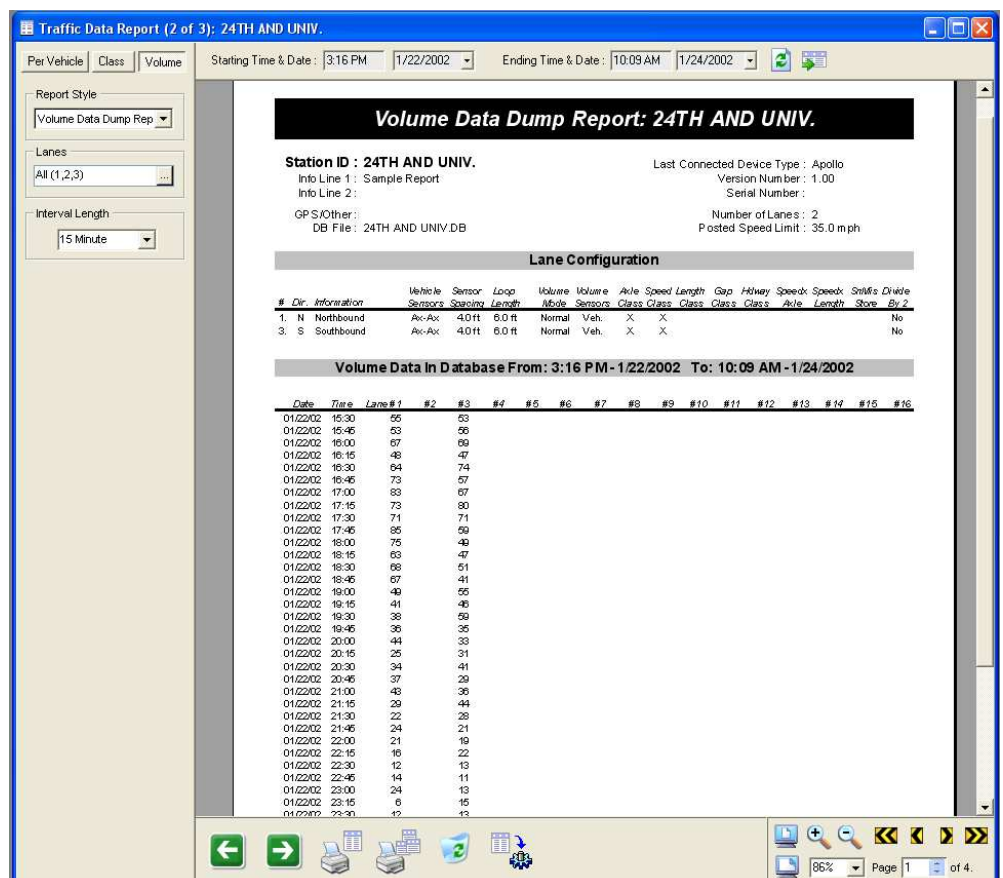
Note that the left panel shows options and controls specific to the data type and report selected.

Right click on any part of the page to bring up this window:

- ☒ Print All Pages
- ☐ Print Grand Total Only
- ☒ Include Graphs
- ☐ Don't Include Graphs

Select to print all pages or only grand total pages (during print only, not during preview).

Also you can select to include or not include graphs. You must rebuild the report after changing this option before it takes effect..



Traffic Data Report (2 of 3): 24TH AND UNIV.

Per Vehicle | Class | Volume

Starting Time & Date: 3:16 PM 1/22/2002 Ending Time & Date: 10:09 AM 1/24/2002

Report Style: Classification Data Dump

Lanes: All (1,3)

Print Lanes: ☒ Together ☐ Separate

Data Types To Include:

- ☒ Axle Classification
- ☒ Speed Classification
- ☐ Length Classification
- ☐ Gap Classification
- ☐ Headway Classification
- ☐ Speed/Axle Class
- ☐ Speed/Length Class
- ☐ SnMis Bins
- ☐ Merge SnMis Into Others

Interval Length: 15 Minute

Classification Data Dump Report: 24TH AND UNIV.

Station ID : 24TH AND UNIV.
 Info Line 1 : Sample Report
 Info Line 2 :
 GPS/Other :
 DB File : 24TH AND UNIV.DB

Last Connected Device Type : Apollo
 Version Number : 1.03
 Detail Number :
 Number of Lanes : 2
 Posted Speed Limit : 350 mph

Lane Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Volume Mode	Volume Sensors	Axle Class	Speed Class	Length Class	Gap Class
1.	N	Northbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X		
3.	S	Southbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X		

Class Data In Database From: 3:16 PM - 1/22/2002 To: 10:09 AM - 1/24/2002

Date	Time	Data Type	Lane	Bin #1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
01/22/02	15:30	Axle	1	1	38	3	0	0	0	0	0	0	0	0	0

Click here to switch from Portrait to Landscape mode (and back again).

On any report, you can zoom in to see more detail by clicking the + or - buttons or by selecting the zoom level.

Traffic Data Report (2 of 3): 24TH AND UNIV.

Per Vehicle | Class | Volume

Starting Time & Date: 3:16 PM 1/22/2002 Ending Time & Date: 10:09 AM 1/24/2002

Report Style: Classification Data Dump

Lanes: All (1,3)

Print Lanes: ☒ Together ☐ Separate

Data Types To Include:

- ☒ Axle Classification
- ☒ Speed Classification
- ☐ Length Classification
- ☐ Gap Classification
- ☐ Headway Classification
- ☐ Speed/Axle Class
- ☐ Speed/Length Class
- ☐ SnMis Bins
- ☐ Merge SnMis Into Others

Interval Length: 15 Minute

Classification Data Dump Report: 24TH AND UNIV.

Station ID : 24TH AND UNIV.
 Info Line 1 : Sample Report
 Info Line 2 :
 GPS/Other :
 DB File : 24TH AND UNIV.DB

Last Connected Device Type : Apollo
 Version Number : 1.03
 Detail Number :
 Number of Lanes : 2
 Posted Speed Limit : 350 mph

Lane Configuration

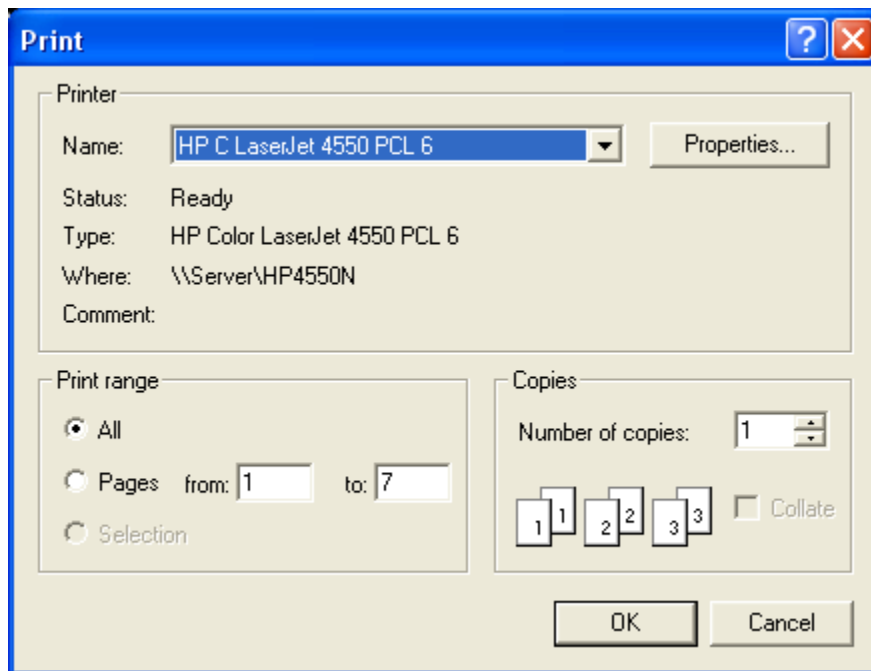
#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Volume Mode	Volume Sensors	Axle Class	Speed Class	Length Class	Gap Class
1.	N	Northbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X		
3.	S	Southbound	Ax-Ax	4.0 ft	6.0 ft	Normal	Veh.	X	X		

Class Data In Database From: 3:16 PM - 1/22/2002 To: 10:09 AM - 1/24/2002

Date	Time	Data Type	Lane	Bin #1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
01/22/02	15:30	Axle	1	1	38	3	0	0	0	0	0	0	0	0	0

Zoom out to see the whole page at once.

Any page can be selected using the arrow buttons, page spinner, or by pressing PgUp or PgDn.

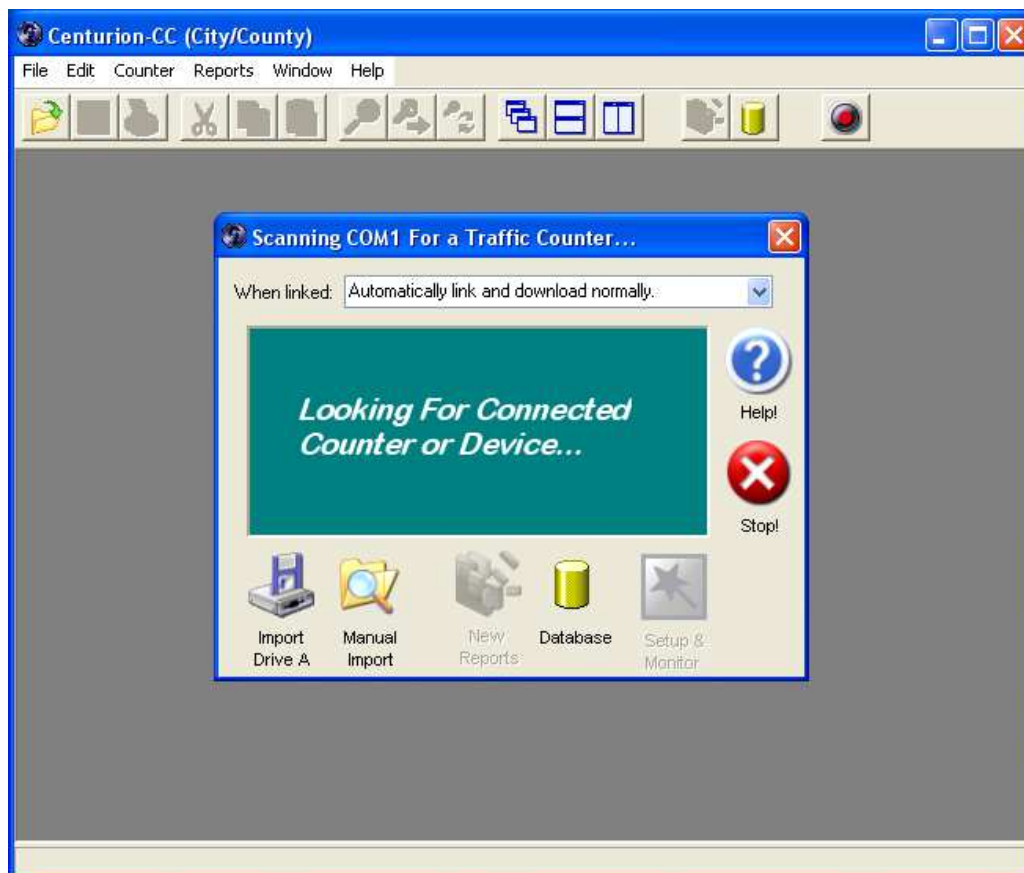


Click the Print button to send the report to the printer.

You can select the printer to send it to, the number of copies, and what pages to print.


Centurion remembers your printer selection and will default to this printer each time it is run.

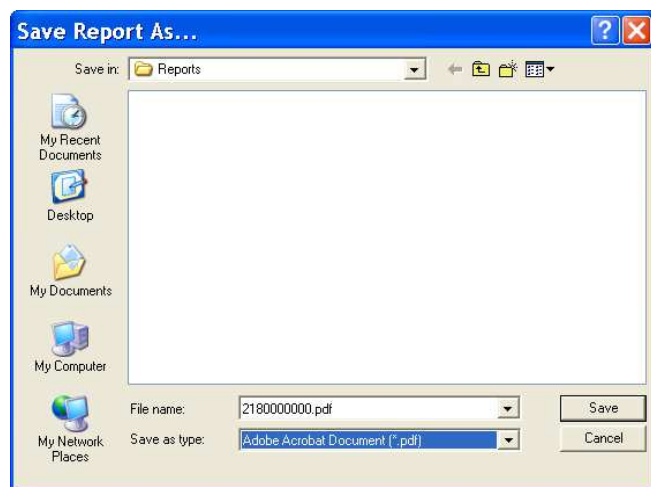
Finally, close the report generator and you will see how the New Reports button is now gray (because you viewed the reports for the data you downloaded).



Download more data to generate some more new reports, or click the Database button to access all the data you have collected (see next section).

V.a. Saving Reports to a File

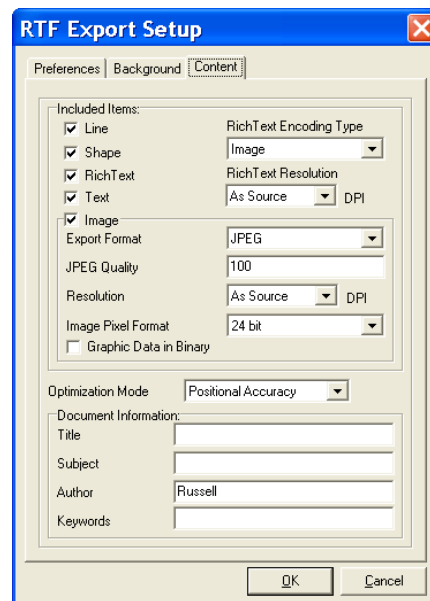
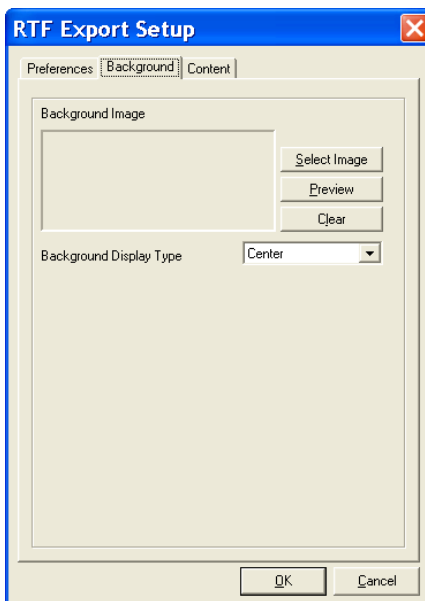
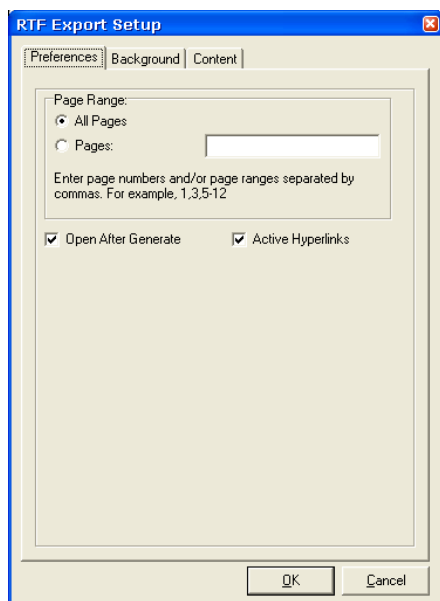
Any report can be saved to disk by clicking on the  speed button (or by selecting File-Save from the menu). This will present the following dialog box:



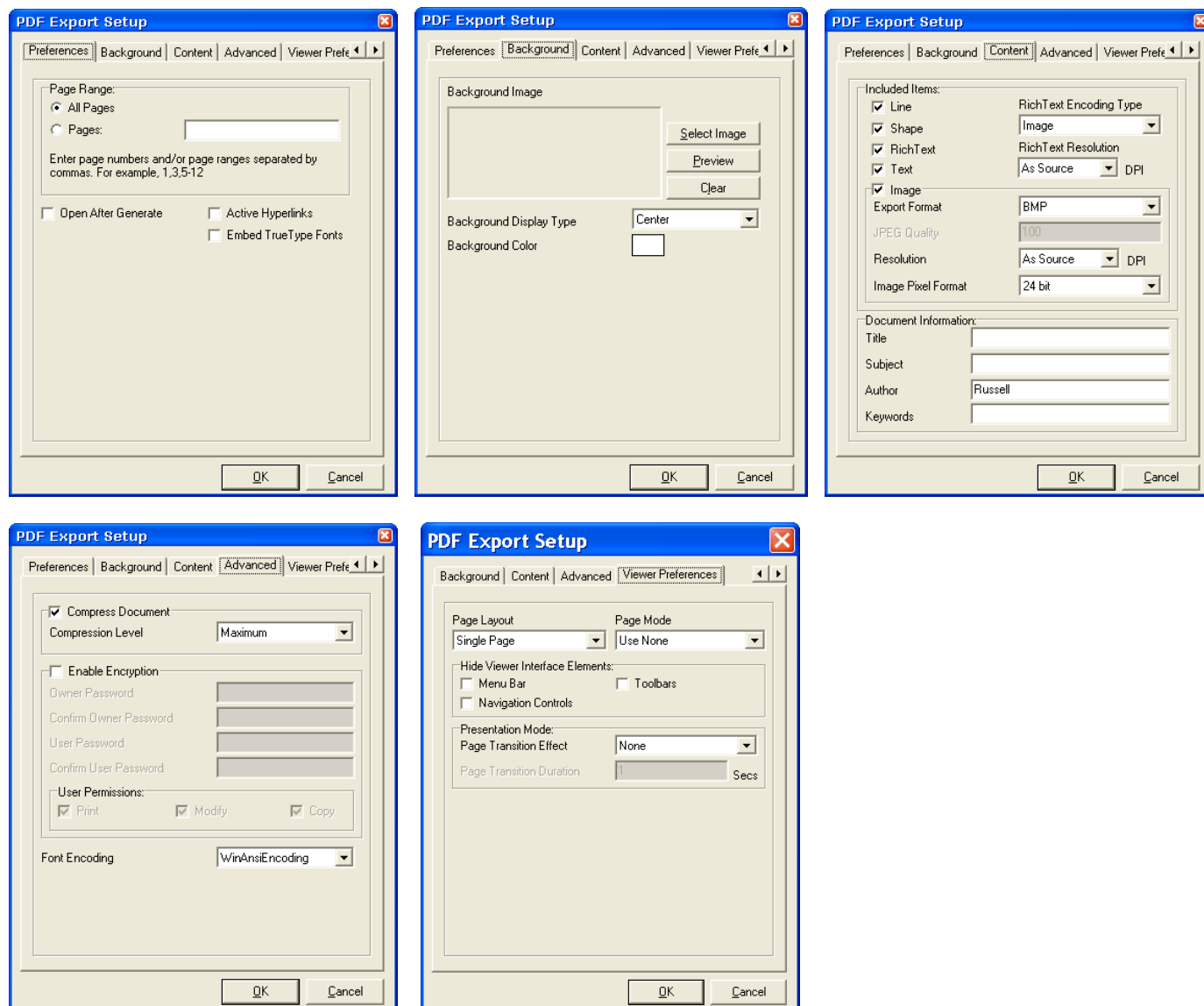
Type in the name to save the file to and select the type by clicking the drop down box.

Depending on the format selected a variety of other dialogs will appear allowing you to control the exact format of the saved report. Examples for a few of the save types are shown below:

Save As Rich Text (RTF) Options:



Save As Adobe Acrobat (PDF) Options

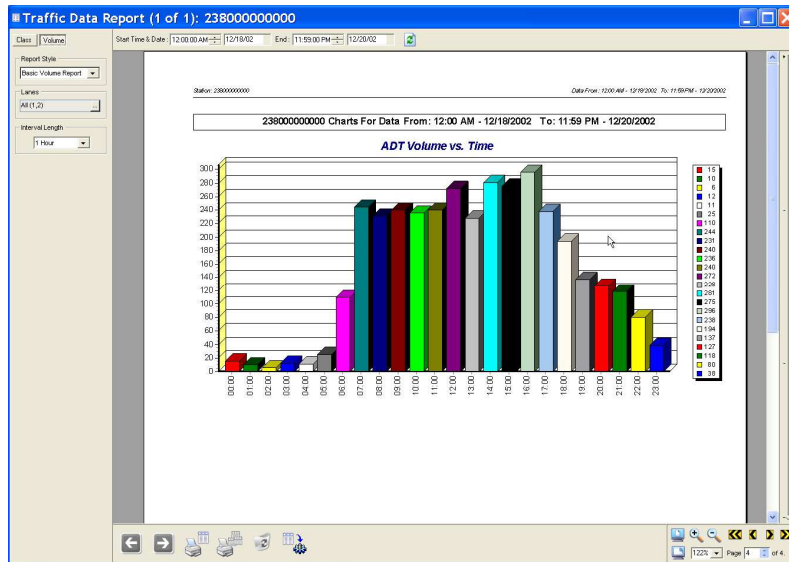


VI. Chart Editor

One of the most powerful features of Centurion is the Chart Editor. With this tool you can customize and modify any chart on any report. You can change *pie charts* into *bar charts*, add advanced analysis to a report, export and print charts separate from the main report, easily save your chart configurations as the default for new data reports, plus many other features.

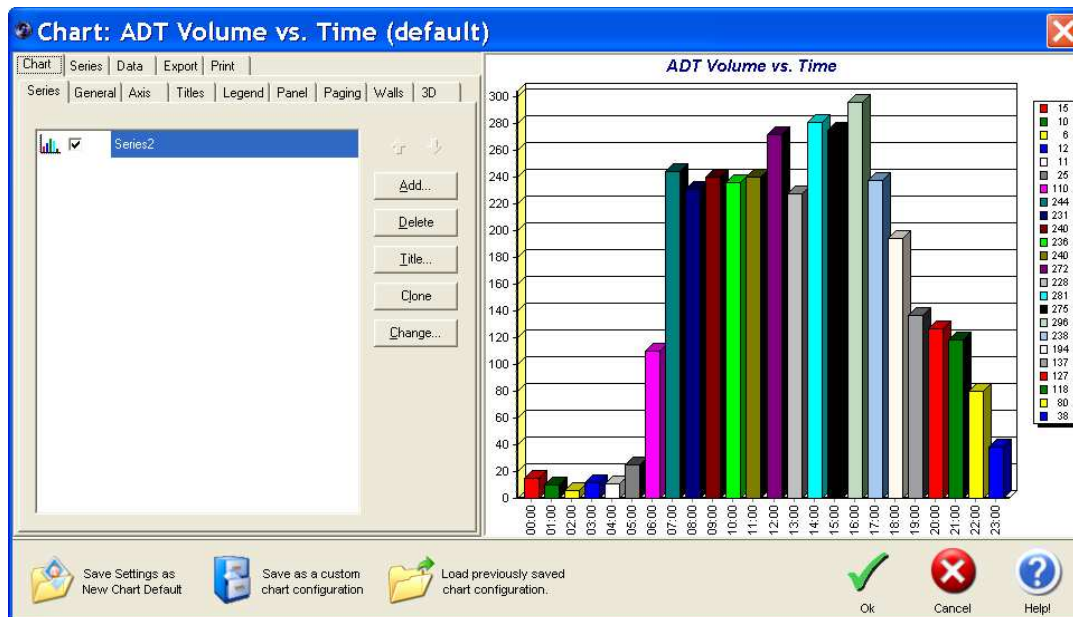
Please note that a separate user manual is available for the Chart Editor (you can select it from the Start Menu).

To use the chart editor, simply generate a report from any data and scroll to the page the chart is on. For example:



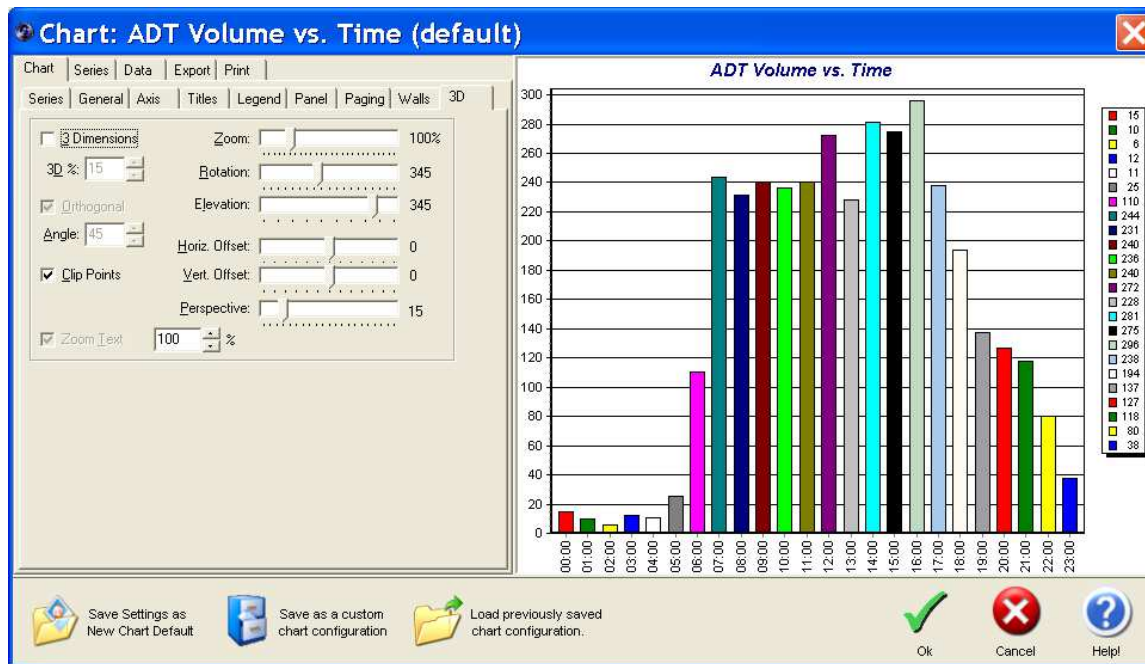
This shows the default “ADT Volume vs. Time” on the summary page of the Basic Volume Report

Suppose you wanted to change this report to not be 3D and to only have a single color. Simply double click on the chart and the following dialog appears:



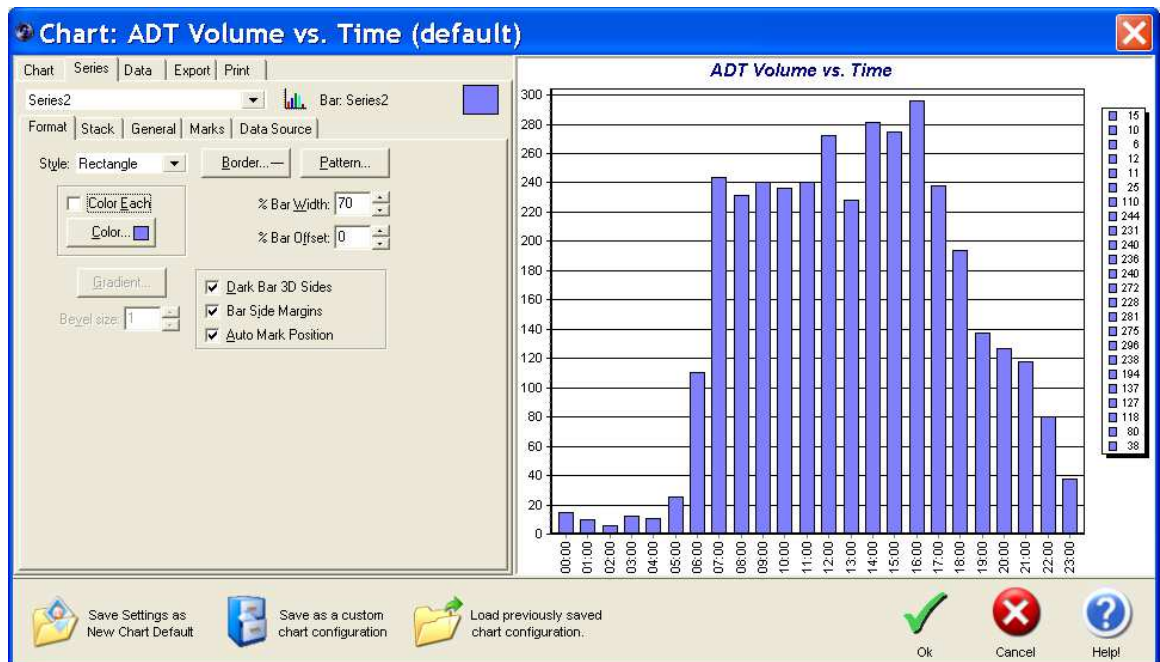
The left box is a very sophisticated Chart Editor. The right box shows the current chart and is instantly updated with any changes you make.

The Chart Editor has literally hundreds of options. However, to make our two changes for a non-3D chart with single colors, you would typically do the following:



Click the **Series** main tab and uncheck the Color Each box.

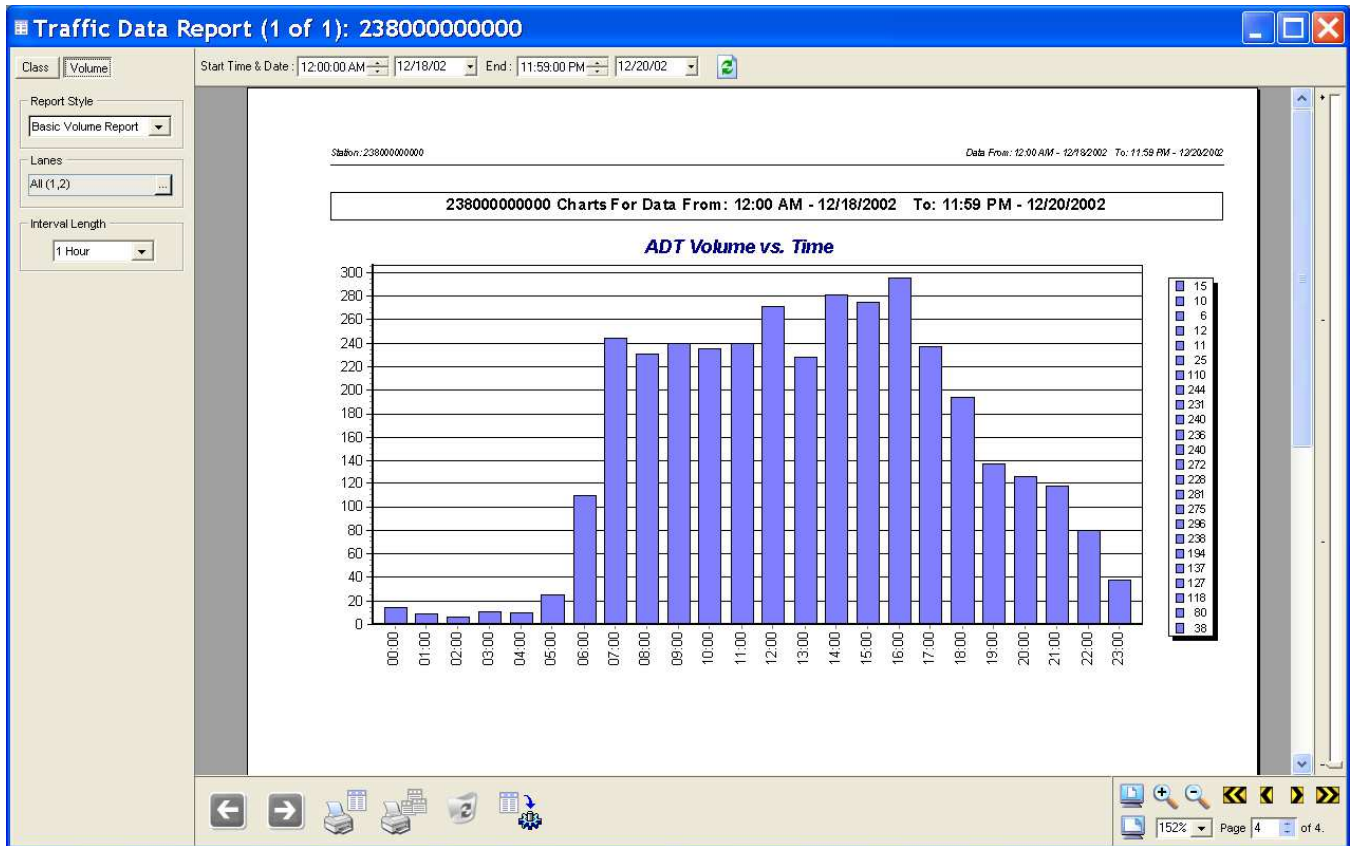
The chart will instantly change to what's shown here.



Now that the chart shows the format we want, we can either:

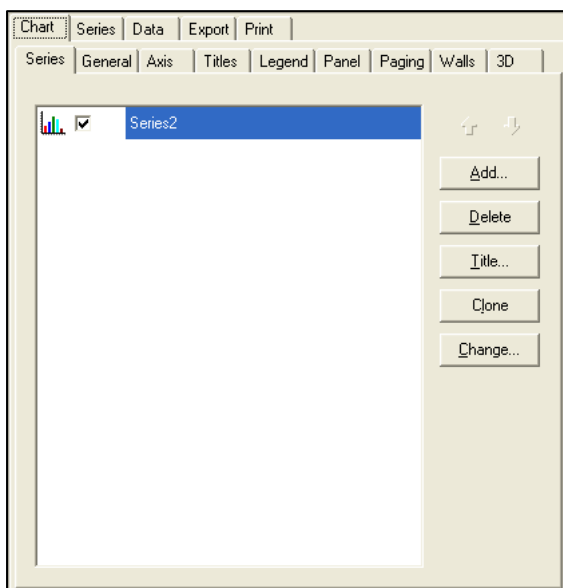
- ☐ *Ok* to just use it this one time.
- ☐ *Save as a custom Chart Configuration* to save the current chart configuration to a file that later can be loaded with the *Load Previously Saved Chart Configuration*.
- ☐ Click *Save Settings as New Chart Default* to use this style of chart for all future occurrences of "ADT Volume vs. Time" (you can always change it again of course).

Regardless of the option you choose, when the Chart Editor is closed the program immediately regenerates the report with the new settings. From our example, we would now see:



If you clicked *Save Settings as New Chart Default*, then this new chart style will be used for all future reports as well. This very advanced system allows the user total control over virtually any aspect of report chart presentation.

The Chart Editor has many other abilities. The main page of the Chart Editor shows:

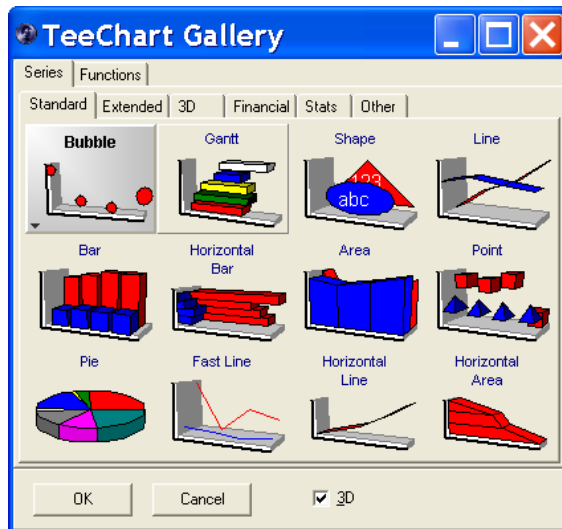


A "Series" is a set of numbers displayed in a certain way on the chart. In this window, it shows a series named "Series2" which is a Bar Chart. You can change the series to another kind of a chart and/or add additional charts directly to the current chart.

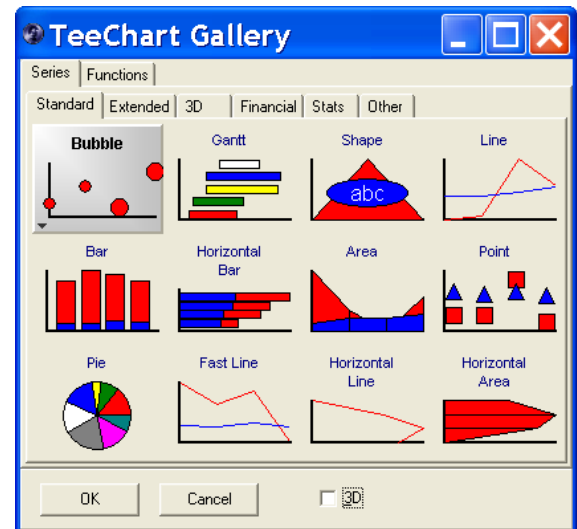
See the next page for the typical types of Charts available.

Clicking the “Add” button from the **Chart - Series** page gives access to these types of charts:

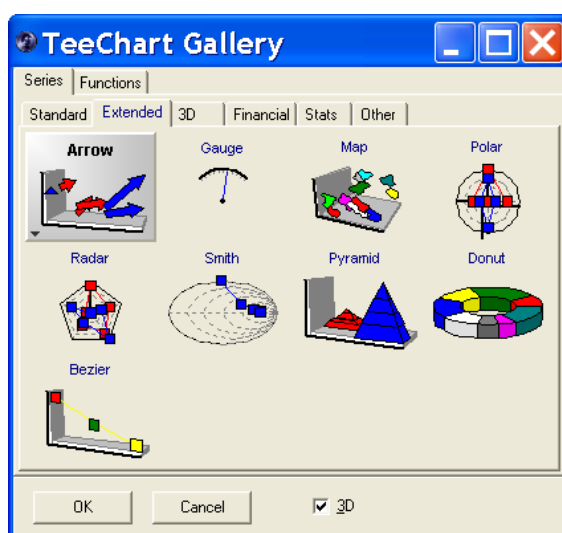
3D:



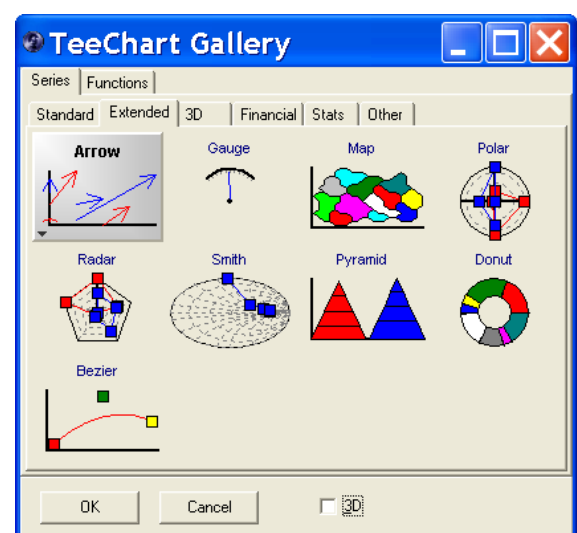
2D:



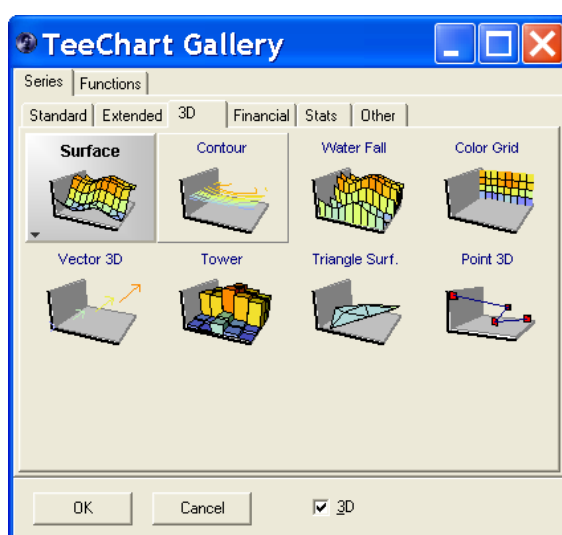
3D:



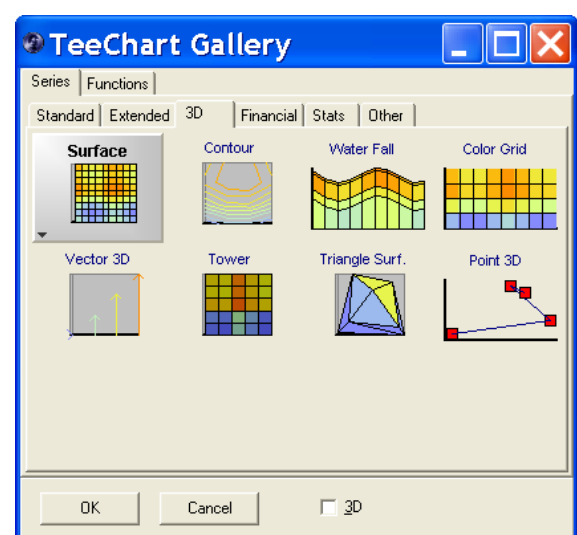
2D:



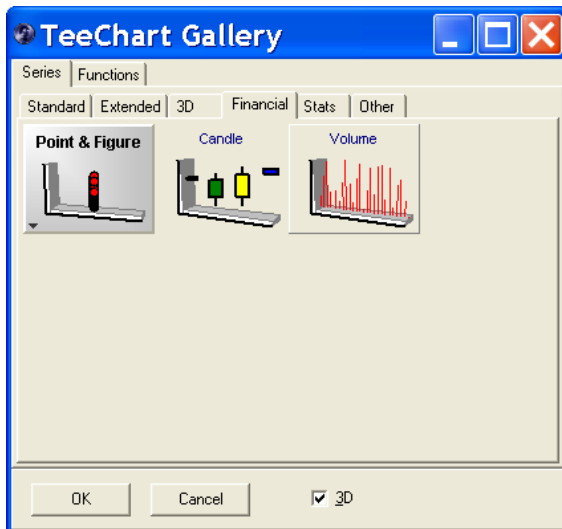
3D:



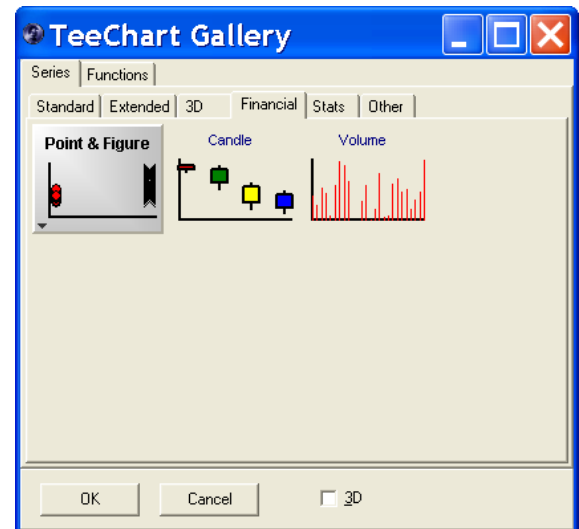
2D:



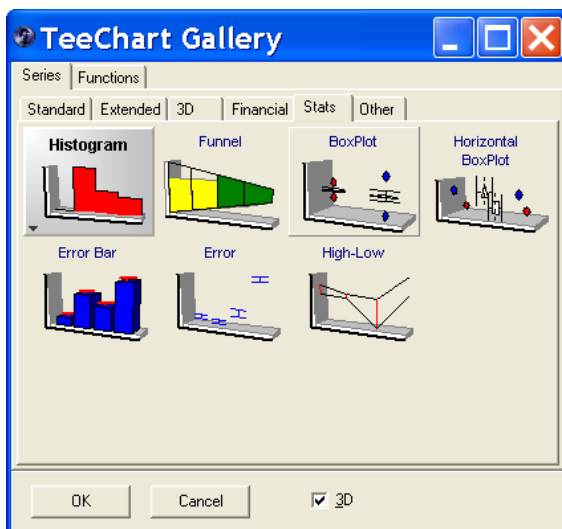
3D:



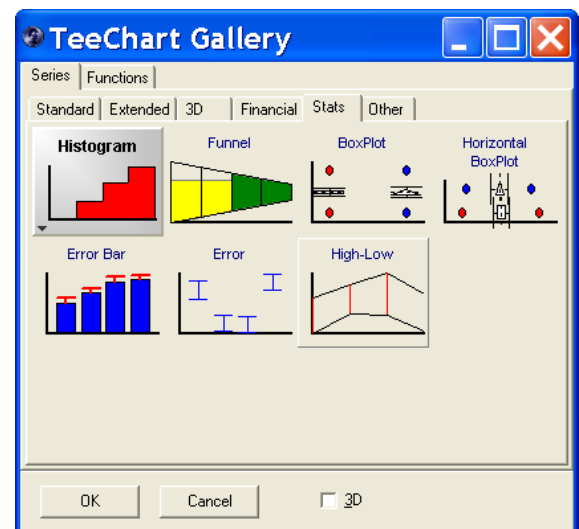
2D:



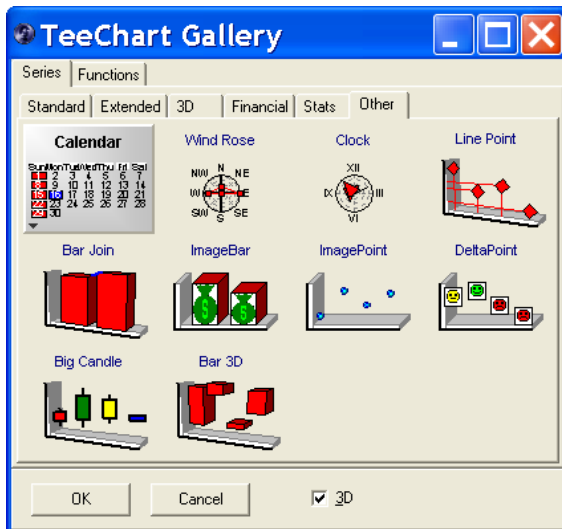
3D:



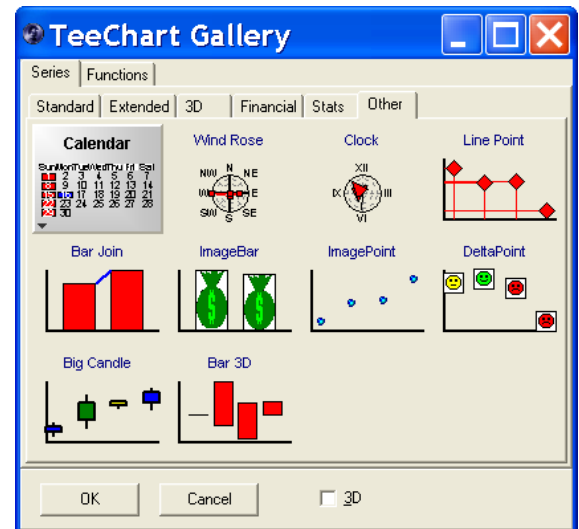
2D:



3D:

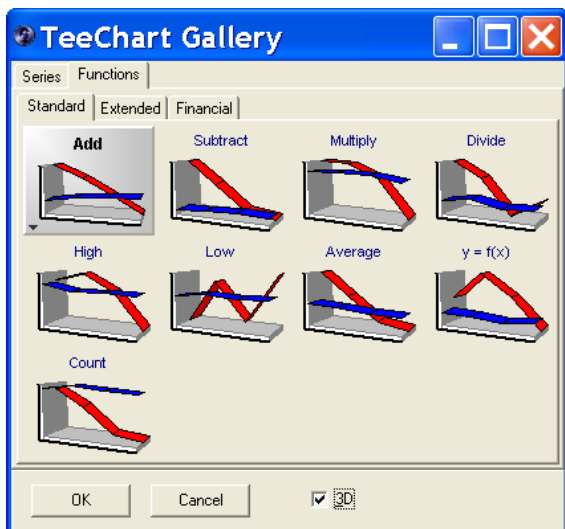


2D:

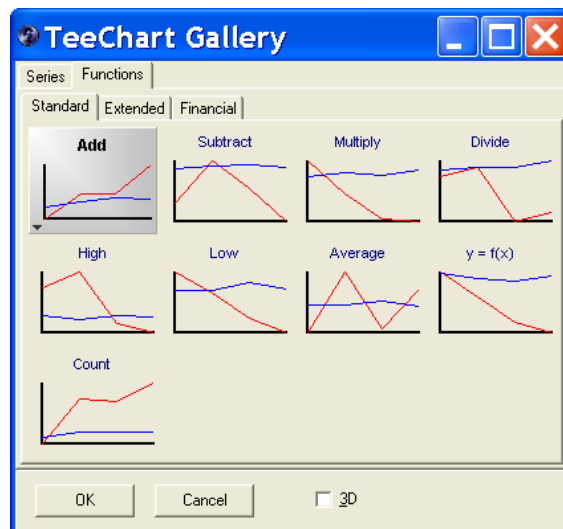


The Functions tab gives access to mathematical and other types of functions that can be added to the chart. Note that depending on the release, there may be additional functions than shown below.

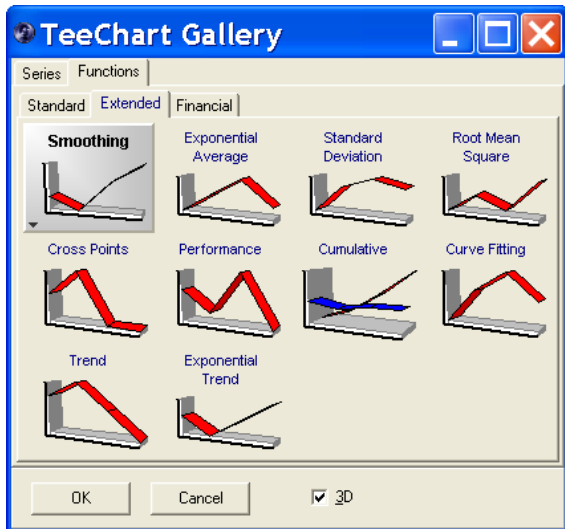
3D:



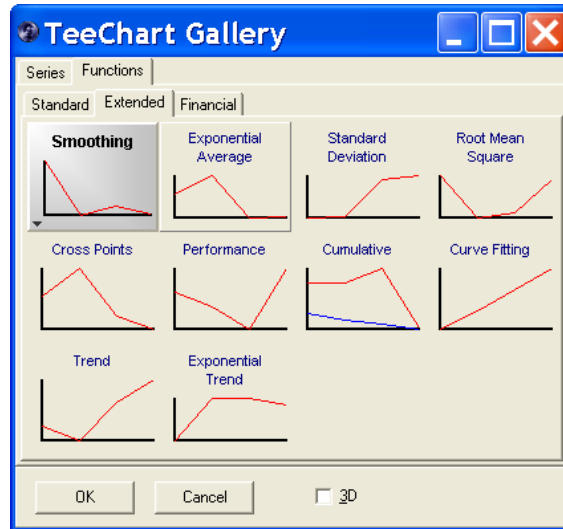
2D:



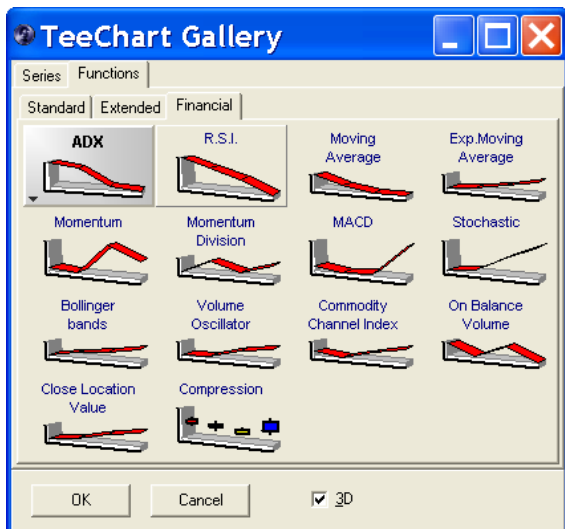
3D:



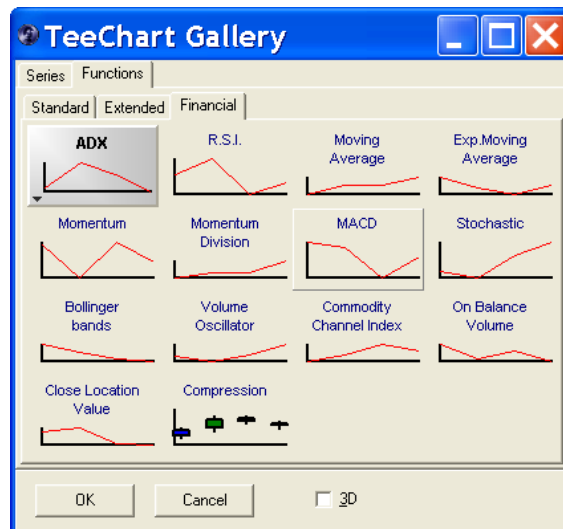
2D:



3D:



2D:



There are far too many features of the chart editor to cover completely in this document. Please refer to the “TeeChart Users Guide” for more information (it can be found in your Centurion start menu folder).

The following pages show some of the main pages and the options available. This is for quick reference only.

Chart – Series:

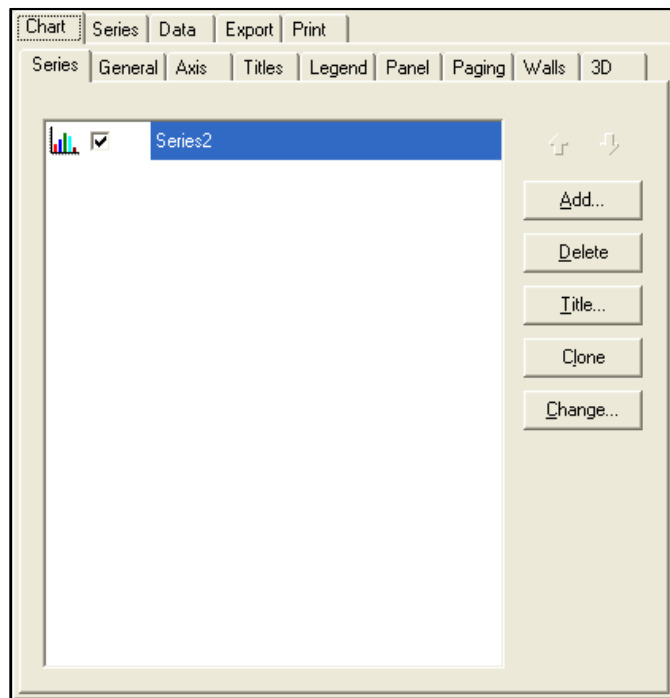


Chart – General:

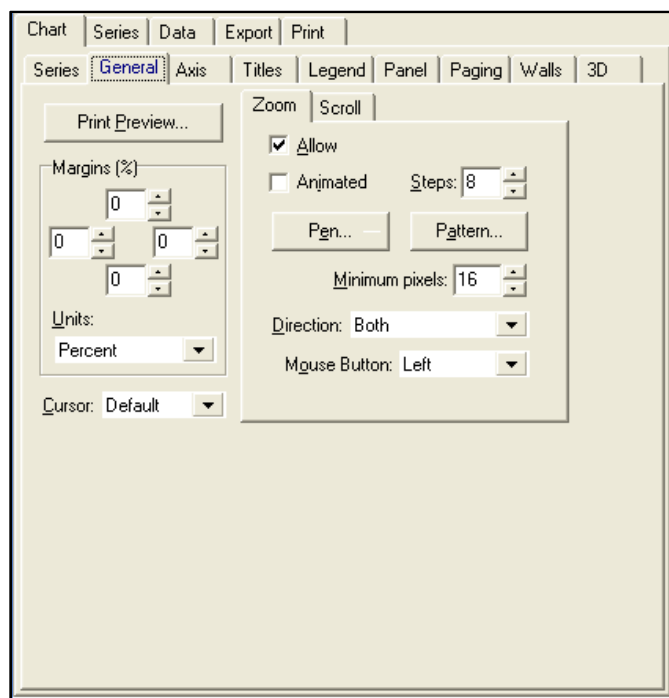


Chart – Axis:

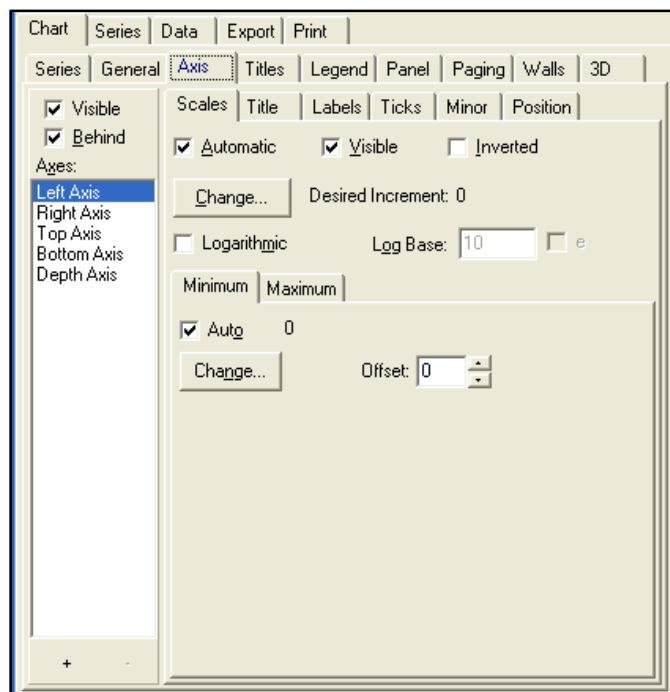


Chart – Titles:

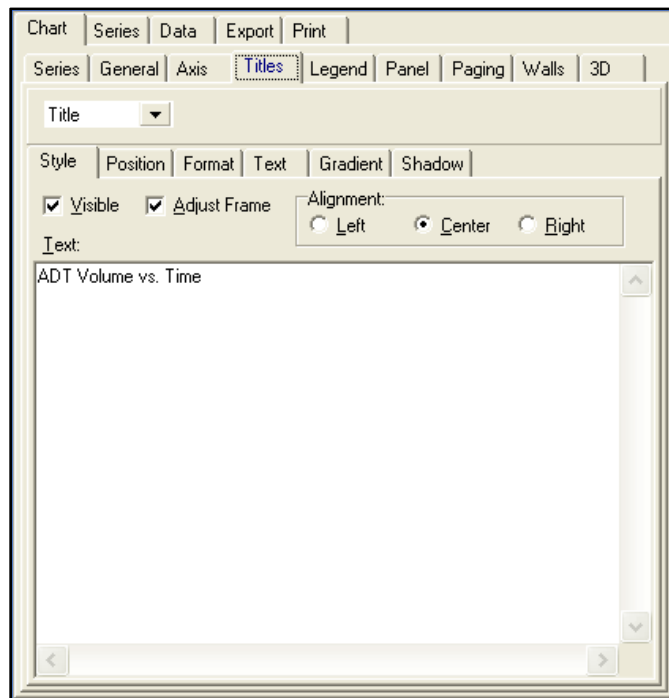


Chart – Legend:

The Chart Legend dialog box is shown with the 'Legend' tab selected. It contains the following options:

- ☒ Visible
- Legend Style: Automatic
- ☐ Inverted
- Text Style: Value
- ☐ Check boxes
- Vert. Spacing: 0
- ☐ Font Series Color
- Dividing Lines...

Chart – Panel:

The Chart Panel dialog box is shown with the 'Panel' tab selected. It contains the following options:

- Color... (with a color selection box)
- ☐ Default
- Back Image:
 - Browse...
 - Style:
 - ☒ Stretch
 - ☐ Tile
 - ☐ Center
 - ☐ Inside
 - ☐ Transparent

Chart – Paging:

The Chart Paging dialog box is shown with the 'Paging' tab selected. It contains the following options:

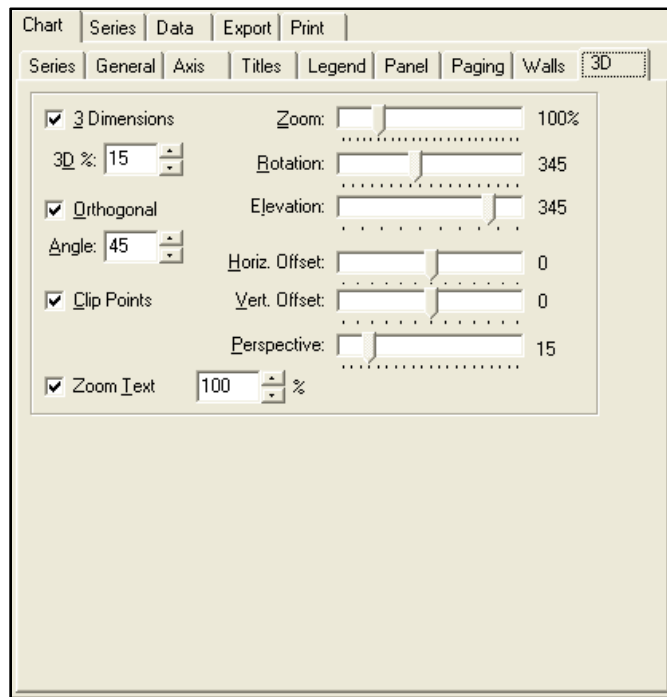
- Points per Page: 0
- ☒ Scale Last Page
- ☒ Current page Legend
- Page 1 of 1
- Navigation buttons: Previous, First, Next, Last

Chart – Walls:

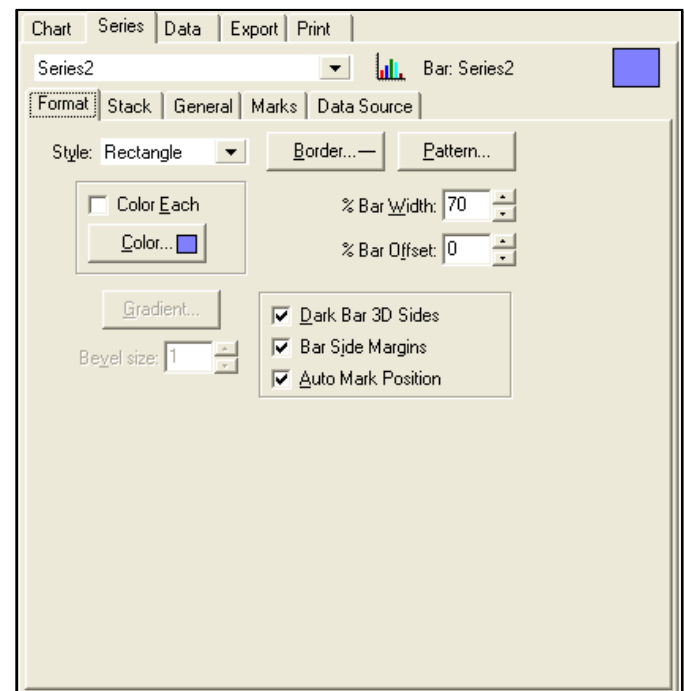
The Chart Walls dialog box is shown with the 'Walls' tab selected. It contains the following options:

- ☒ Visible Walls
- Left | Right | Bottom | Back
 - Color... (with a color selection box)
 - ☒ Visible
 - Border... (with a border selection box)
 - ☒ Dark 3D
 - Pattern... (with a pattern selection box)
 - Size: 0
 - ☐ Transparent
 - Transparency: 0

Chart – 3D:



Series:

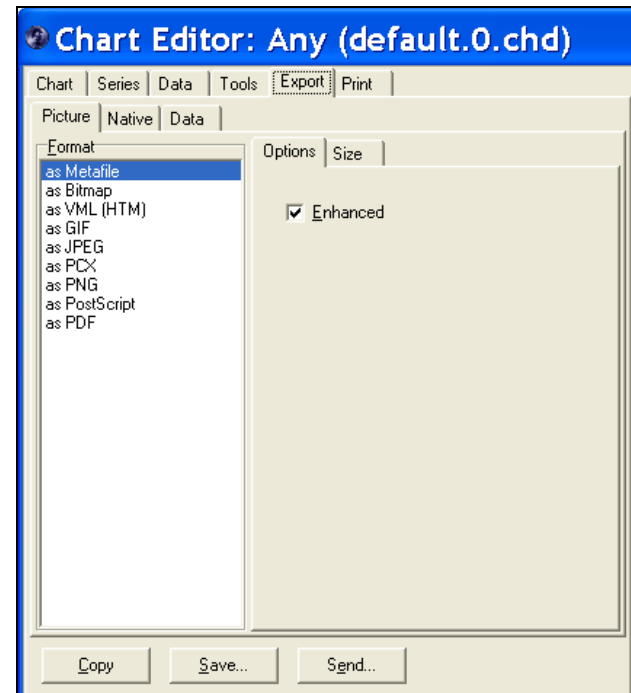


Data:

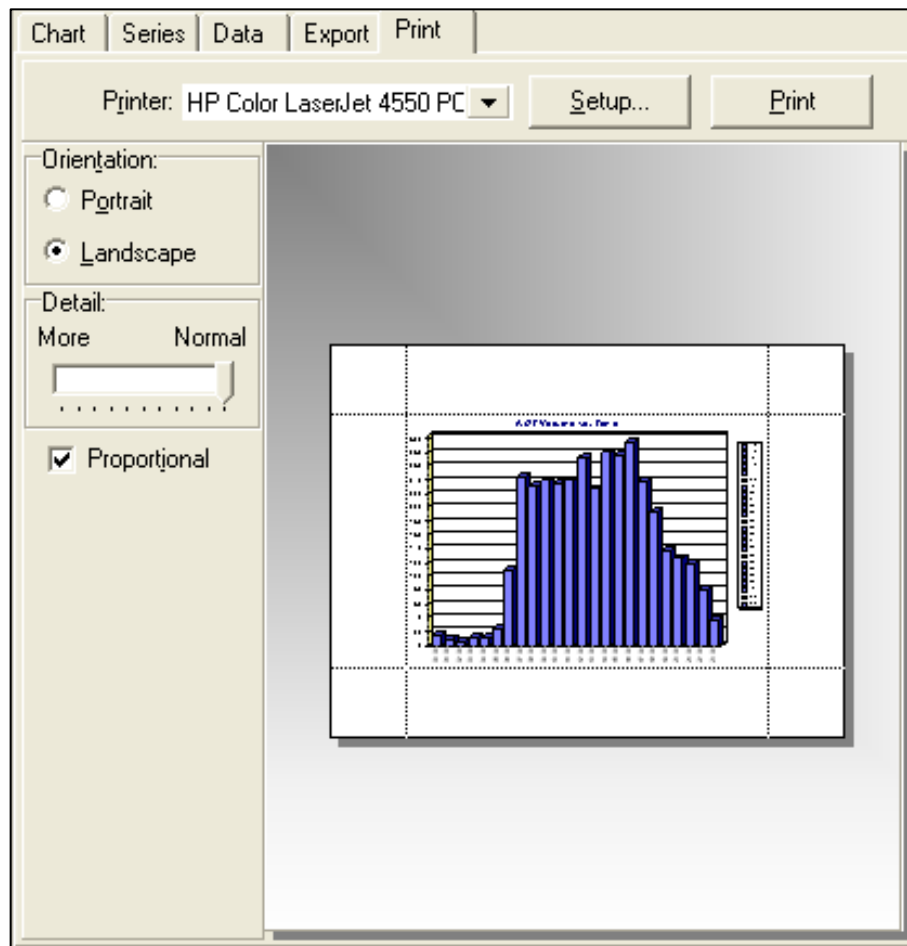
The Data tab shows a table with two columns: # Text and Bar. The data is as follows:

# Text	Bar
0 00:00	15
1 01:00	10
2 02:00	6
3 03:00	12
4 04:00	11
5 05:00	25
6 06:00	110
7 07:00	244
8 08:00	231
9 09:00	240
10 10:00	236
11 11:00	240
12 12:00	272
13 13:00	228
14 14:00	281
15 15:00	275
16 16:00	296
17 17:00	238
18 18:00	194
19 19:00	137

Export:



The final “Print” tab allows you to print the chart out separately from the main report.



VII. Database

The Database holds all of the data you have ever brought into the software.

Traffic Database

Per Vehicle/Raw Data | Classification Data | Volume Data

Imp	Stn	Station ID	Info Line 1	Info Line 2	Start Time	Start Date	End Time	End Date	Counter Type	Version	Has Axl	Has Spd	Has Len	Has Gap	Has Hed	Has SnMis
748000000000		740022000000	13XXXXXX		16:00	08/16/01	23:59	08/08/04	Phoenix	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
748100000000		740166000000	1133XXXX		19:00	08/16/01	23:59	08/08/04	Phoenix	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
750100000000		750029000000	13XXXXXX		00:00	04/02/01	23:59	08/08/04	TCC-540	2.88	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
758000000000		750046000000	New Lebanon		12:00	01/28/02	23:59	08/08/04	Unicom	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
758100000000		750018000000	02XXXXXX		00:00	04/01/01	23:59	03/31/04	Unicom	2.39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
813100000000		810222000000			00:00	04/01/01	23:59	08/08/04	Phoenix	2.39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
818000000000		810174000000	11XXXXXX		18:00	08/14/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
823200000000		820002000000	33XXXXXX		00:00	04/01/01	23:59	01/15/03	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
828000000000		820821000000	1133XXXX		00:00	04/01/01	23:59	08/08/04	TCC-540	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
838000000001		830164000001	02XXXXXX		00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
838000000002		830164000002	Westpoint		00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
838100000000		830362000000	1133XXXX		00:00	07/24/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
838200000000		830038000000			13:00	07/27/01	23:59	08/05/04	TCC-540	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
838300000000		830567000000			18:00	07/26/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
841100000000		840006000000	111XXXXX		00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
848000000000		840902000000	333XXXXX		16:00	07/26/01	23:59	08/04/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
848100000000		840905000000	000222XX		20:00	07/24/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
871100000000		870733000000	000222XX		00:00	04/01/01	23:59	09/02/02	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
871100000002		870733000000	0022XXXX		00:00	04/01/01	23:59	11/11/02	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
874300000000		870069000000			00:00	01/16/01	23:59	01/22/01	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
878000000000		870113000000			00:00	01/18/02	23:59	08/08/04	Str-241	0.00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
912100000000		910108000000	111XXXXX		16:00	05/15/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
918000000000		910081000000	333XXXXX		15:00	07/14/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
918100000000		910060000000	ROUTE 12		19:00	07/13/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
919900000000		910104000000	13XXXXXX		11:00	12/31/01	11:03	06/19/03	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
919900000002		910104000000	RT 8/10 OVERLAP		11:00	12/31/01	10:54	06/19/03	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
928000000000		920060000000	Roscoe		17:00	07/06/01	23:59	08/08/04	Phoenix	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
933100000000		930038000000			15:00	08/20/02	23:59	01/01/03	Phoenix	2.45	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
938000000000		930070000000	ROUTE 23		13:00	07/06/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
938100000000		930048000000			00:00	07/27/01	23:59	08/08/04	Phoenix	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
940000000000		940069000000			14:00	08/18/01	23:59	09/05/01	TCC-540	2.45	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
948000000000		940001000000			19:00	07/06/01	23:59	08/08/04	Phoenix	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
958000000001		950051000000			15:00	07/11/01	23:59	08/08/04	Phoenix	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
958000000002		950051000000			12:00	07/18/01	23:59	08/08/04	Phoenix	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
958100000000		950001000000	11XXXXXX		19:00	07/16/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
958200000000		950145000000	333XXXXX		00:00	07/11/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Report Generator
Export Data
Data Edit
Site Setup

The three tabs show each type of data that can exist (Per Vehicle, Class, and Volume).

Click on the + symbol next to any site to see a list of all data that has been found from that site (see next page).

See section on Exporting for more information on the Export Data function.

Basic site information is shown here including:

Date/Time range of data: These values are automatically updated to reflect the actual range of data currently held in the database. You cannot edit these values directly.

Types of data imported: The "Has Axl", "Has Spd", etc indicate which types of classification data are stored in the database for this site. This allows you to quickly determine which sites collect specific types of data. These values (along with the Counter Type & Version) can be directly edited from the Database window.

If you right click on any site, you will see the following pop-up menu:

Edit Site Setup...
Edit Site Data...

Export Data...
Set TMG Export F7

Tag All Sites ... Ctrl+T
Untag All Sites ... Ctrl+U
Tag Unexported ...

The *Edit Site Setup*, *Edit Site Data*, and *Export Data* do the same function as the buttons of the same name.

The *Set TMG Export* function (also can be accessed by pressing F7) calls up the special TMG Export settings window for the Site. See VIII.b. for more information.

Tag/Untag All Sites will quickly tag or clear the selected tag on all data. The *Tag Unexported* function is much more sophisticated and will cause the program to scan all the data imported into the database. Any which has not been exported at least once will then be tagged.

Check the title of the database window to see how many sites have been tagged.

Clicking the + symbol expands

Traffic Database

Per Vehicle/Raw Data

Classification Data

Volume Data

Imp	Sei	Station ID	Info Line 1	Info Line 2	Start Time	Start Date	End Time	End Date	Counter Type	Version	Has Axl	Has Spd	Has Len	Has Gap	Has Hed	Has SnMis
		758000000000	750046000000	New Lebanon	12:00	01/28/02	23:59	08/08/04	Unicom	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		758100000000	750018000000	02XXXXXX	00:00	04/01/01	23:59	03/31/04	Unicom	2.39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		813100000000	810222000000		00:00	04/01/01	23:59	08/08/04	Phoenix	2.39	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		818000000000	810174000000	11XXXXXX	18:00	08/14/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		823200000000	820002000000	33XXXXXX	00:00	04/01/01	23:59	01/15/03	TCC-540	2.45	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		828000000000	820821000000	1133XXXX	00:00	04/01/01	23:59	08/08/04	TCC-540	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		838000000001	830164000001	02XXXXXX	00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		838000000002	830164000002	Westpoint	00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		838100000000	830362000000	1133XXXX	00:00	07/24/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		838200000000	830036000000		13:00	07/27/01	23:59	08/05/04	TCC-540	2.85	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		838300000000	830567000000		18:00	07/26/01	23:59	08/08/04	TCC-540	2.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		841100000000	840008000000	111XXXXX	00:00	04/01/01	23:59	08/08/04	Str-241	0.00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sei	Start Time	Start Date	End Time	End Date	Has Axl	Has Spd	Has Len	Has Gap	Has Hed	Has SnMis	Exported	Valid	Status	DI Cnt		
	00:00	07/15/04	23:59	07/15/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/16/04	23:59	07/16/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/17/04	23:59	07/17/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/18/04	23:59	07/18/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/19/04	23:59	07/19/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/20/04	23:59	07/20/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/21/04	23:59	07/21/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/22/04	23:59	07/22/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/23/04	23:59	07/23/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/24/04	23:59	07/24/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/25/04	23:59	07/25/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/26/04	23:59	07/26/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/27/04	23:59	07/27/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/28/04	23:59	07/28/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/29/04	23:59	07/29/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/30/04	23:59	07/30/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	07/31/04	23:59	07/31/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/01/04	23:59	08/01/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/02/04	23:59	08/02/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/03/04	23:59	08/03/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/04/04	23:59	08/04/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/05/04	23:59	08/05/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/06/04	23:59	08/06/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/07/04	23:59	08/07/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		
	00:00	08/08/04	23:59	08/08/04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		-1		

Report Generator

Export Data

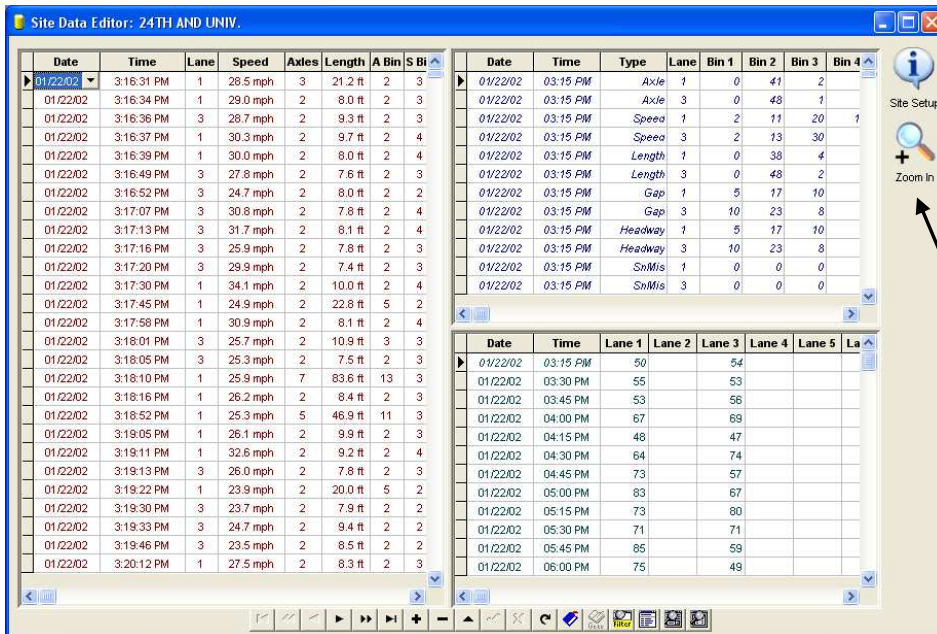
Data Edit

Site Setup

In this case, you see daily files for this site up to 8/8/2004. Use the scroll bars or the navigator buttons to see all the data imported into this site.

All database functions work on either individual imports or all the data depending on if you select it from the sub-list or from the main site name.

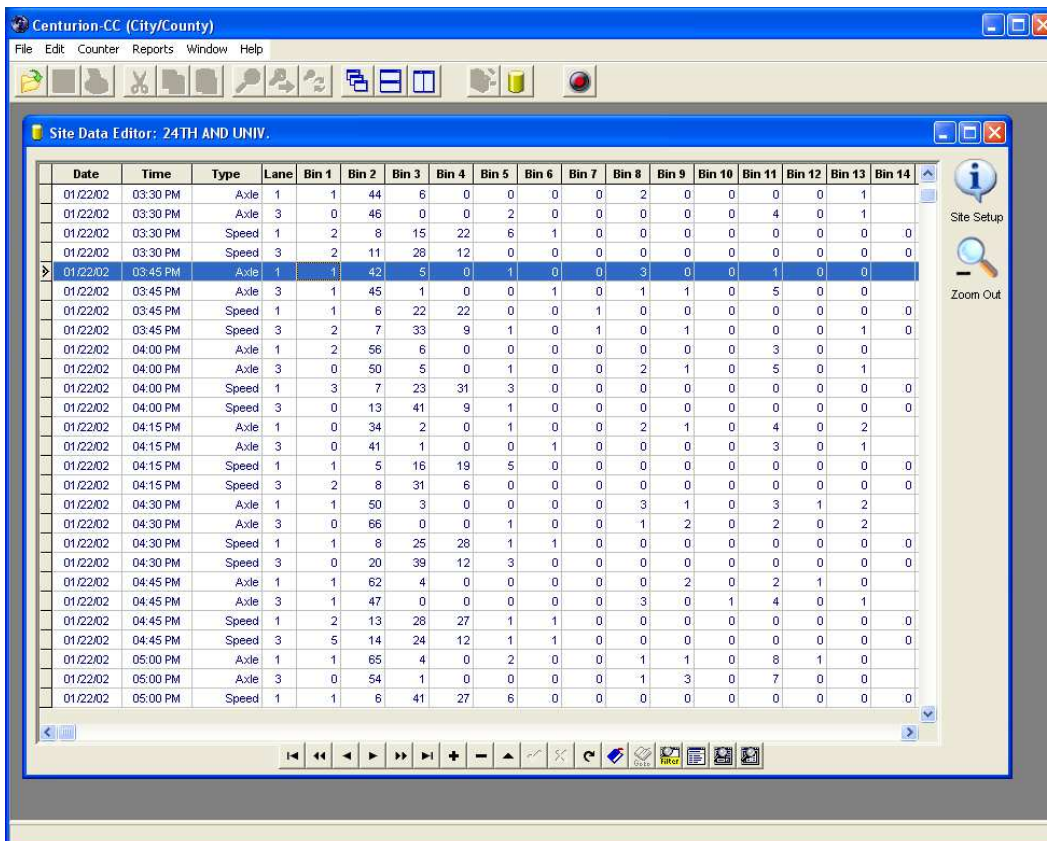
To edit the data, simply double click on the station name (or sub record to edit just the data for that import):



You can edit, filter, and otherwise manipulate the data in the database from this window.

By default, all three data types are shown at once (if they exist).

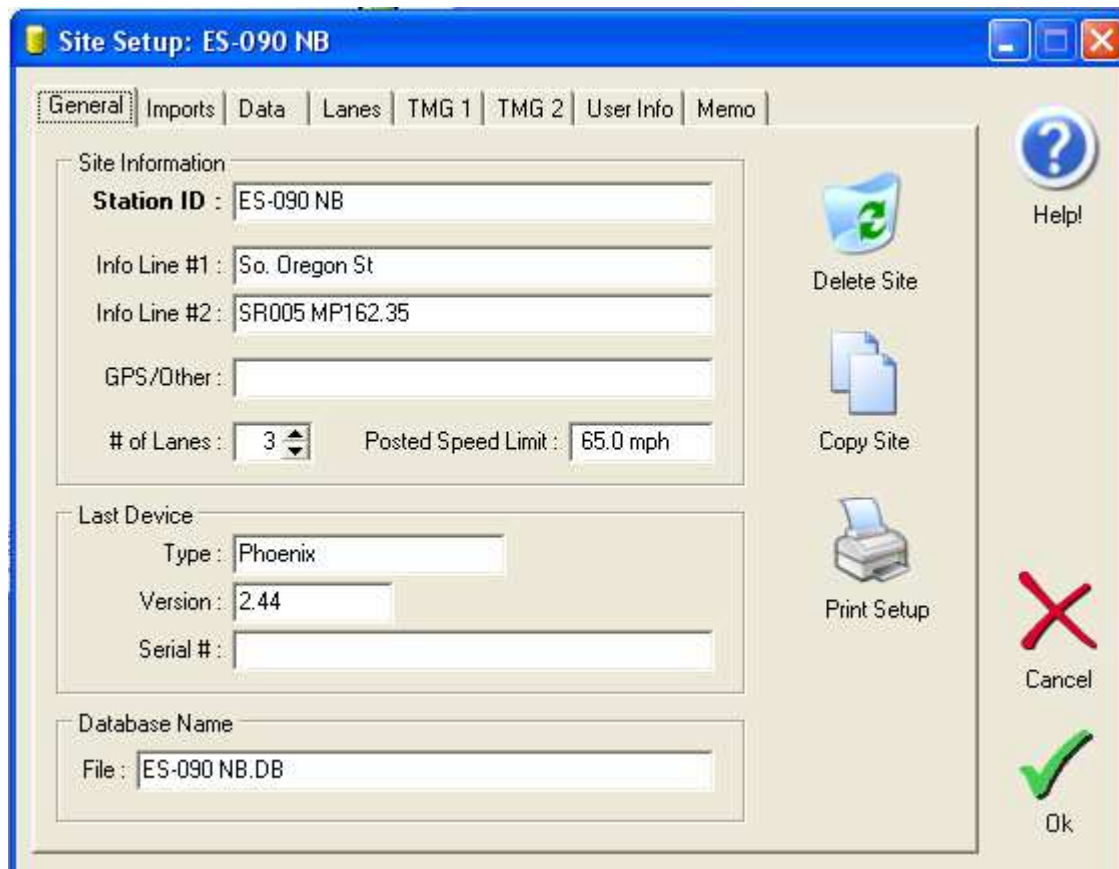
To Zoom in and expand to see only one data type, click the Zoom button.



Click Zoom Out to return to the three pane view.

Click Site Setup accesses the station setup editor for the site. This is the same as select Site Setup from the main database window.

See next page for an example of using the Site Setup function.



The Site Setup editor controls various site/station specific information. Each tab is used to control different information for the site. In addition, the Delete, Copy, and Print Setup buttons will perform useful tasks.

Site Setup: ES-090 NB

General Imports Data Lanes TMG 1 TMG 2 User Info Memo

Site Information

Station ID : ES-090 NB

Info Line #1 : So. Oregon St

Info Line #2 : SR005 MP162.35

GPS/Other :

of Lanes : 3 Posted Speed Limit : 65.0 mph

Last Device

Type : Phoenix

Version : 2.44

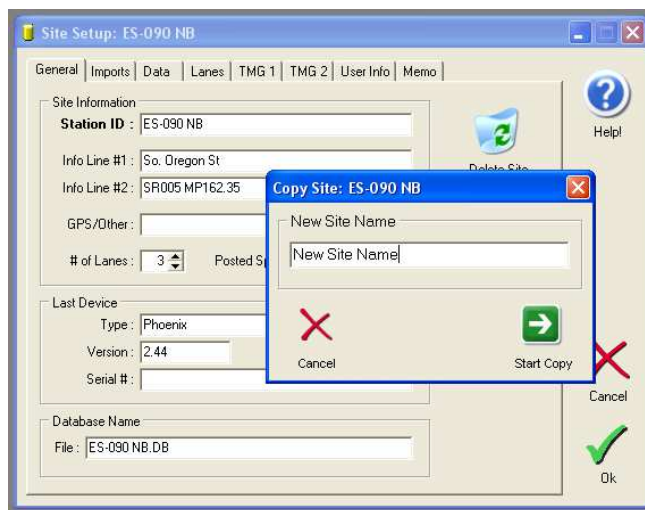
Serial # :

Database Name

File : ES-090 NB.DB

Buttons: Delete Site, Copy Site, Print Setup, Help, Cancel, Ok

The copy site window:



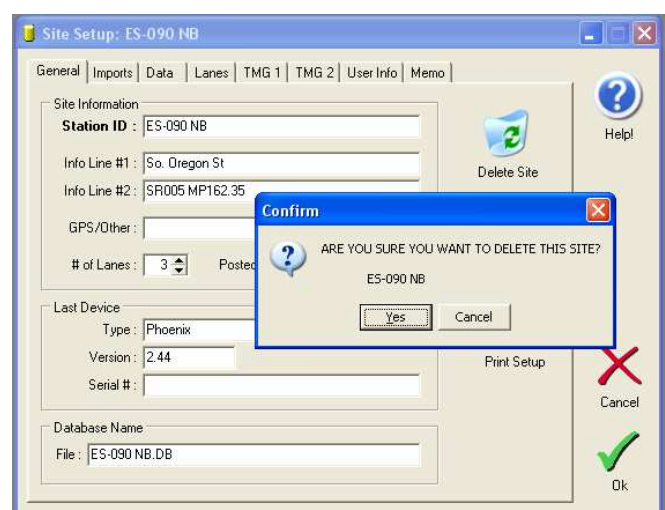
Copy Site: ES-090 NB

New Site Name

New Site Name

Buttons: Cancel, Start Copy

The delete site window:



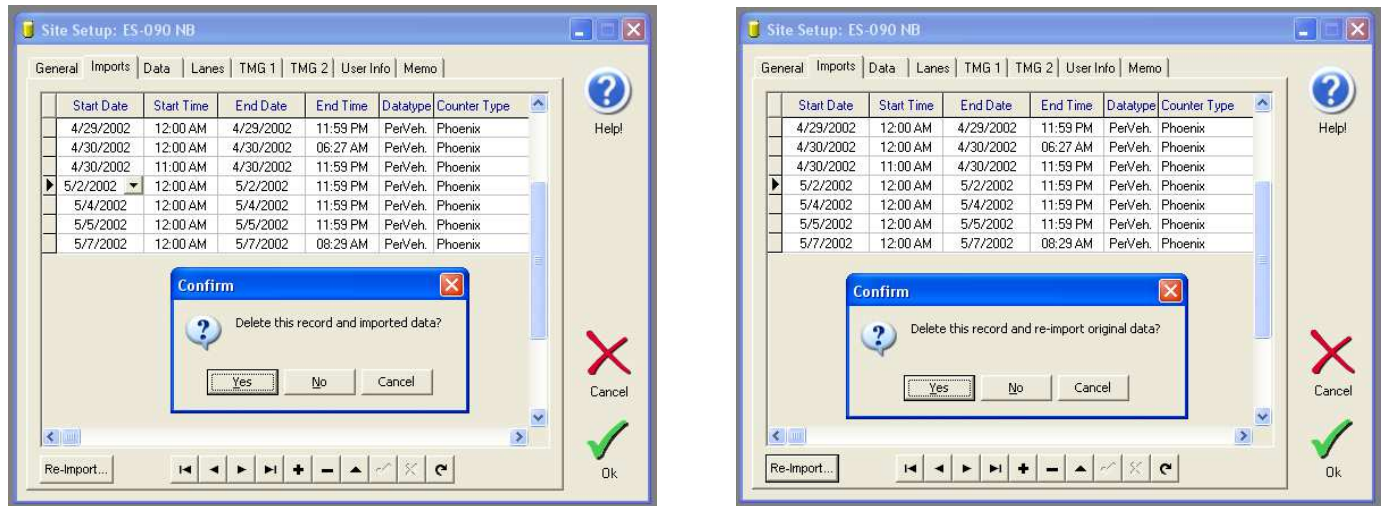
Confirm

ARE YOU SURE YOU WANT TO DELETE THIS SITE?

ES-090 NB

Buttons: Yes, Cancel

From the Imports tab, you can also delete individual imports or re-import corrupted data:



The Print Setup button displays a useful report detailing all your site information:

Site Setup Report: ES-090 NB

Station ID : ES-090 NB
 Info Line 1 : So. Oregon St
 Info Line 2 : SR005 MP162.35
 GPS/Other :
 DB File : ES-090 NB.DB

Last Connected Device Type : Phoenix
 Version Number : 2.44
 Serial Number :
 Number of Lanes : 3
 Posted Speed Limit : 65.0 mph

Data Setup

of Axle Bins : 13
 Axle Class File Name : DEFAULTX.AXL
 # of Speed Bins : 16
 Speed Class File Name : DEFAULTX.SPD
 # of Length Bins : 13
 Length Class File Name : DEFAULTX.LBN
 # of Gap Bins : 6
 Gap Class File Name : DEFAULTX.GAP
 # of Headway Bins : 6
 Headway Class File Name : DEFAULTX.HED

of Record Intervals : 1
 Interval #1 Start Time : 12:00 AM Length : 15 min
 Interval #2 Start Time : Length :
 Interval #3 Start Time : Length :
 Interval #4 Start Time : Length :
 Interval #5 Start Time : Length :

Lane Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Volume Mode	Volume Sensors	Axle Class	Speed Class	Length Class	Gap Class	Headway Class	Speed Class	Sn/Mis	Divide By 2
1.	N	MN #1	Pr-Pr	16.0 ft	6.0 ft	Normal	Veh.	X	X					X	
2.	N	MN #2	Pr-Pr	16.0 ft	6.0 ft	Normal	Veh.	X	X					X	
3.	N	MN #3	Pr-Pr	16.0 ft	6.0 ft	Normal	Veh.	X	X					X	

Individual Imports

Start Date & Time	End Date & Time	Datatype	Counter Type & Version	Counter Serial	Device Status
04/29/2002 12:00 AM	04/29/2002 11:59 PM	PerVeh.	Phoenix 2.44		
→ 11.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 0000 to 042902 To 2359 on 042902					
04/30/2002 12:00 AM	04/30/2002 06:27 AM	PerVeh.	Phoenix 2.44		
→ 11.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 0000 to 043002 To 0627 on 043002					
04/30/2002 11:00 AM	04/30/2002 11:59 PM	PerVeh.	Phoenix 2.44		
399.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 1100 on 043002 To 2359 on 043002					
05/02/2002 12:00 AM	05/02/2002 11:59 PM	PerVeh.	Phoenix 2.44		
838.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 0000 on 050202 To 2359 on 050202					
05/04/2002 12:00 AM	05/04/2002 11:59 PM	PerVeh.	Phoenix 2.44		
449.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 0000 on 050402 To 2359 on 050402					
05/05/2002 12:00 AM	05/05/2002 11:59 PM	PerVeh.	Phoenix 2.44		
394.C:\Program Files\Diamond\Centurion\CCDB\VehicleSource\ES-090 NB (PerVeh) From 0000 on 050502 To 2359 on 050502					

Page 1 of 2. 85%

VII.a. Importing the TrafMan Database

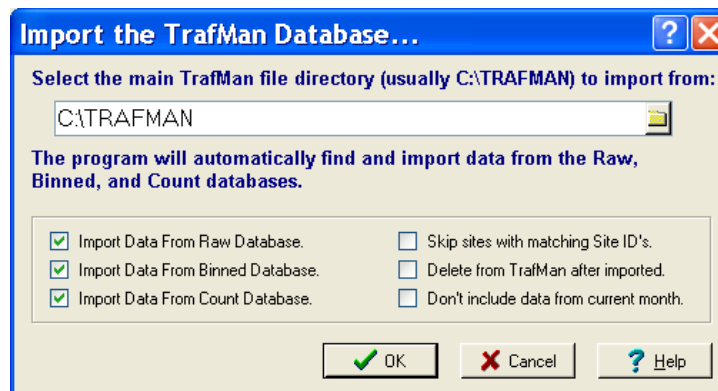
Centurion allows you to bring all of your TrafMan database data directly into the Centurion database. This powerful function will automatically identify and import any data that is not in the Centurion database, and can optionally remove that data from TrafMan once it has been moved to Centurion.

Note that the required disk space for data in Centurion is greater than with TrafMan. For Classification (Binned) data, expect Centurion to use about 3 times the space (1Meg in TrafMan will take 3Meg in Centurion). For Count (Volume) data, it takes about 4 times the space and for Per-Vehicle (Raw) it is roughly the same as TrafMan.

Generally, customers will use this feature in one of two ways:

1. Once Centurion is installed, they will run this feature once to bring in all of their old data and from that point on cease to use TrafMan. All new data will be directly imported with Centurion.
2. Still use TrafMan for regular importing of data, but run this function whenever they also want to use Centurion with the data collected by TrafMan. In this manner, both Centurion and TrafMan contain the datasets.

To start the function, select “Import TrafMan Database ...” from the File menu. The following window will appear (the “Ok” button only appears once a valid file directory has been selected):



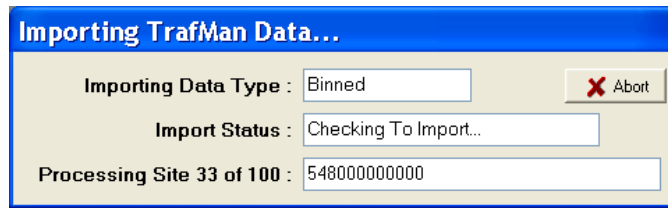
You can enable or disable importing each of the three types of data (Raw, Binned, and Count). In addition, the following three options are available:

Skip Sites with matching Site ID's – Check this option to prevent importing any data from a site that already exists in the database. This can be useful if you only want to bring in data from sites that have not previously been imported into Centurion.

Delete from TrafMan after imported – This option will update the TrafMan database so that data that is currently in the Centurion database is removed from the TrafMan database. Customers who use TrafMan just for importing data and then moving that data into Centurion for processing can enable this option to show them what data has and has not been moved. *Use this option only after making a backup of your TrafMan data!*

Don't include data from current month – Checking this box blocks importing any data that occurs during the current month. All data for dates prior to the 1st of the current month will be imported into Centurion (and removed from TrafMan if the delete box is also checked).

After select your options and click Ok, Centurion immediately begins scanning for data as follows:



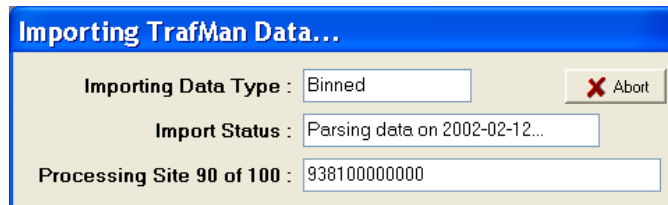
Importing TrafMan Data...

Importing Data Type : Binned ✖ Abort

Import Status : Checking To Import...

Processing Site 33 of 100 : 548000000000

If data is found, Centurion parses a copy out of the TrafMan and shows you the current data date it is processing:



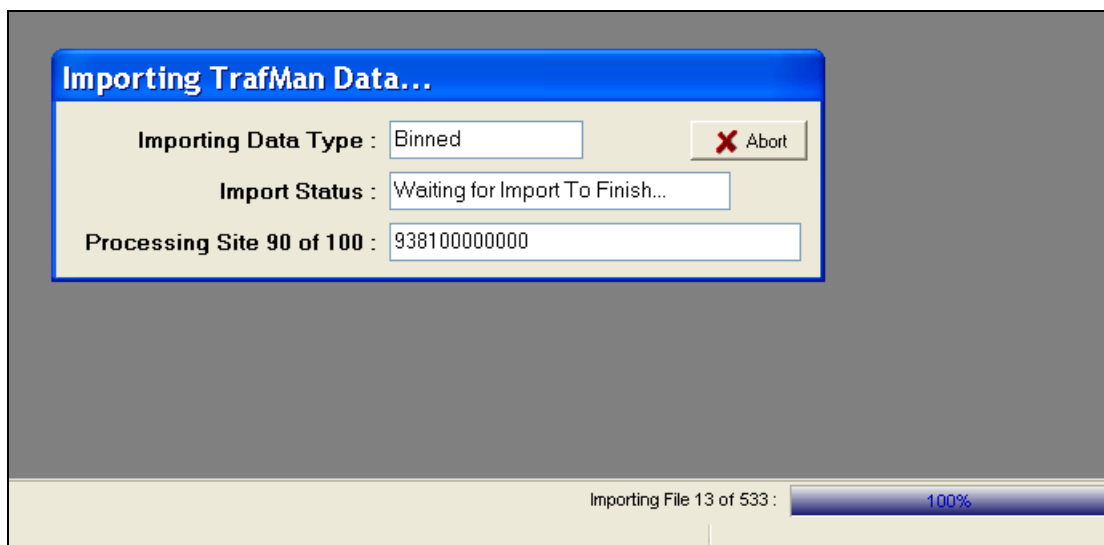
Importing TrafMan Data...

Importing Data Type : Binned ✖ Abort

Import Status : Parsing data on 2002-02-12...

Processing Site 90 of 100 : 938100000000

After all the data for a particular site is parsed, Centurion imports it into the database. A “Waiting” message appears and the bottom right corner of the screen shows the import progress (just as with any other kind of import):



Importing TrafMan Data...

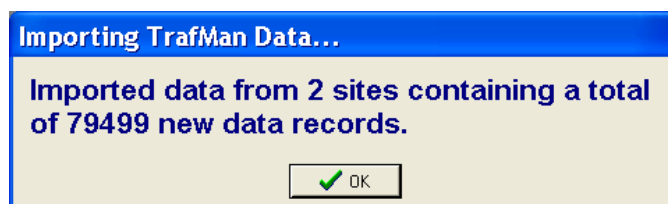
Importing Data Type : Binned ✖ Abort

Import Status : Waiting for Import To Finish...

Processing Site 90 of 100 : 938100000000

Importing File 13 of 533 : 100%

Once all data has been imported (or you click the Abort button), Centurion displays a final message indicating the number of sites and data records brought into the database:



Importing TrafMan Data...

Imported data from 2 sites containing a total of 79499 new data records.

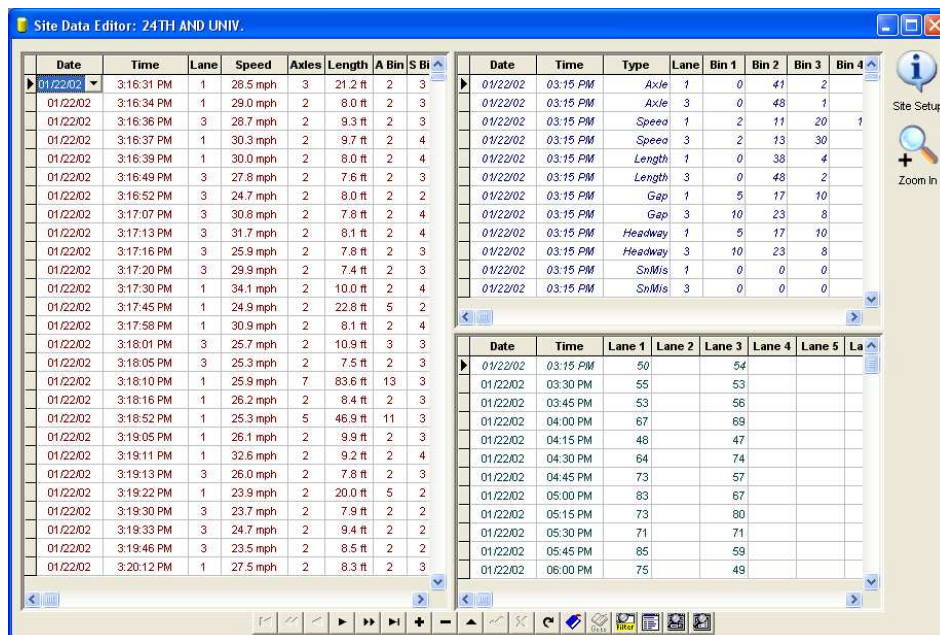
✔ OK

VII.b. Spacing Adjust & Tailgating Detect

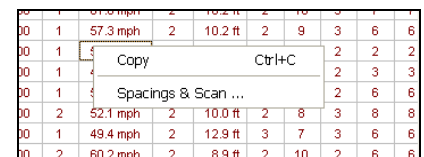
This powerful function allows you to modify data collected incorrectly by your traffic counter. For example, if a user incorrectly places sensors (such as road tubes) the wrong distance apart Centurion allows you to enter in the actual spacing you used and then retroactively fix all the data as it would have been reported.

In addition, Centurion can automatically detect tailgating vehicle patterns (either as a result of the wrong spacing or just road conditions) and split those vehicles up to improve data accuracy.

To use this function first select the data you need to adjust from the list of Sites & Data. You can select either an individual import or all the data from the site. When the site and dataset you want to adjust has been selected, activate the Data Editor so you get a screen similar to this:



Right click on any vehicle in the Per-Vehicle side to display this menu:



Select the *Spacings & Scan* function.

Once this function has been activated, a window similar to this will appear:

Lane #	Info	Current Spacing	New Spacing
1.		6.0 ft	6.0 ft
2.		6.0 ft	6.0 ft

Check that the Start & End Date/Time values are correct (they will default to the same as the data viewed in the database edit window).

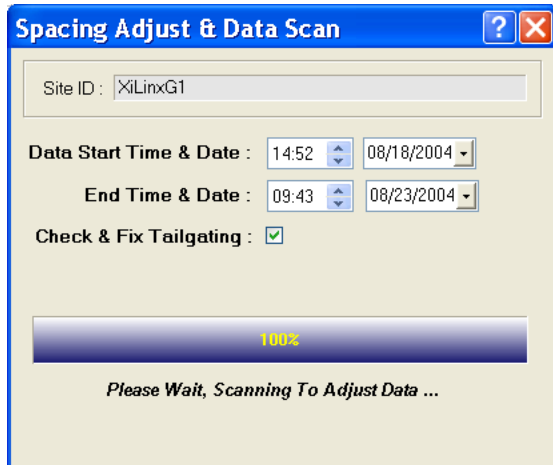
Check the box if you want to “Check & Fix Tailgating” vehicles.

Each lane is shown with a **Current Spacing** and a **New Spacing**.

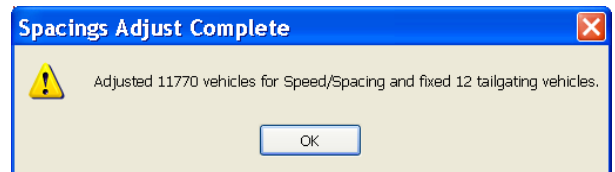
The **Current Spacing** is the spacing that was used when data was first imported into the site. This may or may not actually be the current spacing of the data (check with the user to see what they actually placed the sensors).

The **New Spacing** is what the actual spacing should have been set to in the counter. When both the **New Spacing** and **Current Spacing** are correct, press the *Start Adjust...* button.

Adjustment of data is completely automatic. A progress bar will appear as shown below:



When finished, a message box appears indicating what changes were actually done to the data:



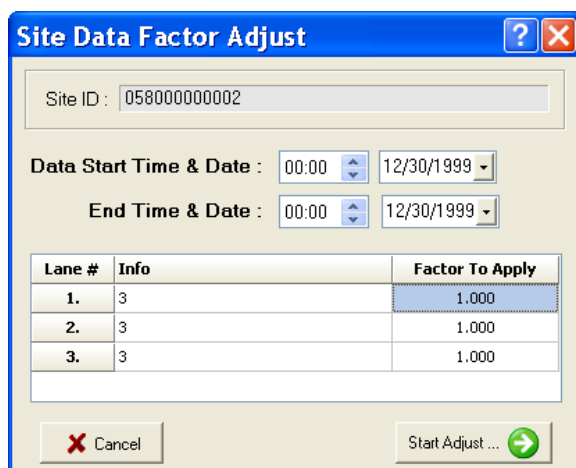
VII.c. Data Factor Adjust

Similar to the Spacings adjust function, Centurion allows you to apply a "Factor" to any lane of data. This factor is a value which is multiplied by each value in the Classification and Volume databases for the specified lane (it has no effect on Per-Vehicle information).

To use this function first select the data you need to adjust from the list of Sites & Data. You can select either an individual import or all the data from the site. When the site and dataset you want to adjust has been selected, activate the Data Editor. After the data is displayed, right click on either the Classification or Volume database display to call up this menu.

18:00	Axle	3	6	1776	92
19:00	Axle	1	16	1585	101
19:00					141
19:00					87
20:00					80
20:00	Axle	2	3	1222	104

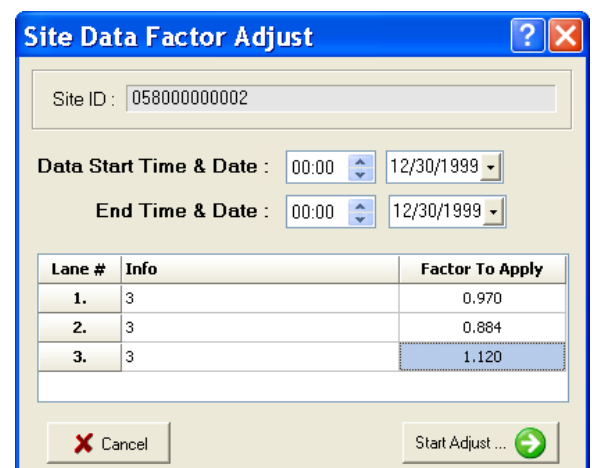
Select the Apply Data Factor function. A window similar to the ones shown below will be displayed:



The window on the left is first shown.

By default, all factors are set to 1.000 meaning no change will be made.

The window on the right shows new factors for all three lanes.



When the factors you wish to apply for any or all lanes have been entered, click the Start Adjust button. Centurion will apply the factors to the data and return you to the database edit screen. Note that you can also modify the Start and End date and times as desired, it does not have to match the data edit window.

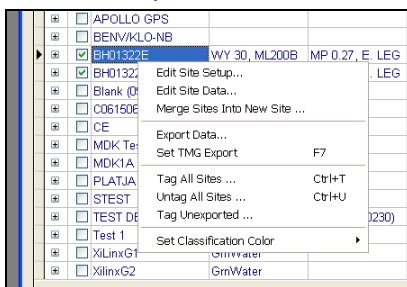
VII.d. Merging Sites & Lane Shifting

Centurion supports merging of two or more sites in the database. This function allows you to create a new site out of existing site data and to optionally lane shift the lane # of the new data as it comes in. To use it, follow these steps:

1. Collect data from a site using two or more counters naming each counter with a slightly different Site ID. You can also name them the exact same Site ID, at which time the Lane Shifting process can be selected during the initial import of the data into the database.
2. Import the data into the database.
3. Once it is in the database, select it as shown in the example below:

<input type="checkbox"/>	BENV/KLO-NB			10:56	06/14/06	14:31	06/20/06	Apollo	1.41
<input checked="" type="checkbox"/>	BH01322E	WY 30, ML200B	MP 0.27, E. LEG	14:00	05/08/06	09:06	05/11/06	Unic-L	1.41
<input checked="" type="checkbox"/>	BH01322W	WY 30, ML200B	MP 0.27, E. LEG	16:00	05/08/06	09:10	05/11/06	Unic-L	1.41
<input type="checkbox"/>	Blank (092806)			10:53	09/28/06	10:54	09/28/06	Apollo	1.45
<input type="checkbox"/>	C0615065	001550	15.1	08:34	06/15/06	09:01	06/16/06	Unic-L	2.84

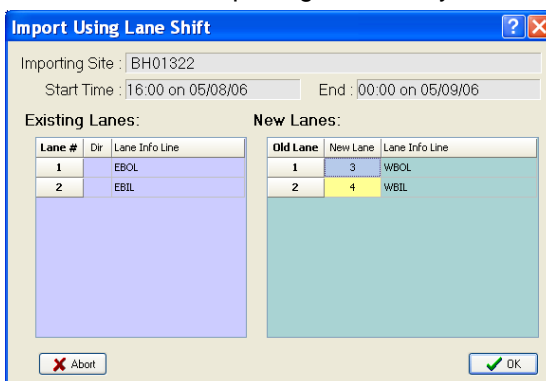
4. Right click on any of the sites and select *Merge Sites Into New Site*:



5. Key in a new site ID for the combined data.



6. Once the data starts importing, an overlay window will appear:



7. This window shows you the existing lanes and new lanes. Key in the lane numbers you want assigned for the new data and click ok.
8. When import is complete, a new site will have been created that is a combination of the selected sites.

Note that this Lane Shift function also is available at import time when two counters have the exact same Site ID. If you select Import Using Lane shift you can bring in new data using this function.

VII.e. Database Check & Repair

To handle any potential database corruptions or other problems, Centurion offers a “Check & Repair DB” utility. This function is designed to scan and correct problems in the database. Use it as often as desired.

To activate, right click on the database window and select “Check & Repair DB”.

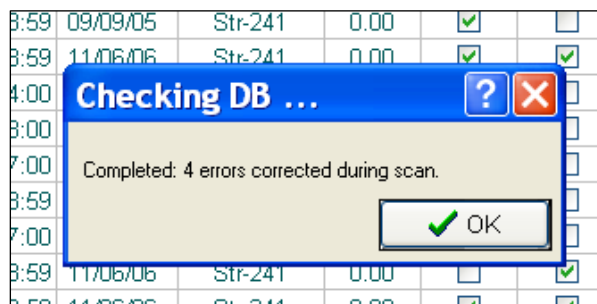
Set Volume Color			
0001	Check & Repair DB		0
0002			0
0001	050045000001	22XXXXXX	0
0002	050045000002	22XXXXXX	0



The program goes through several steps ... checking various aspects of the Database and the data imported. During this process a progress bar is displayed as shown below:

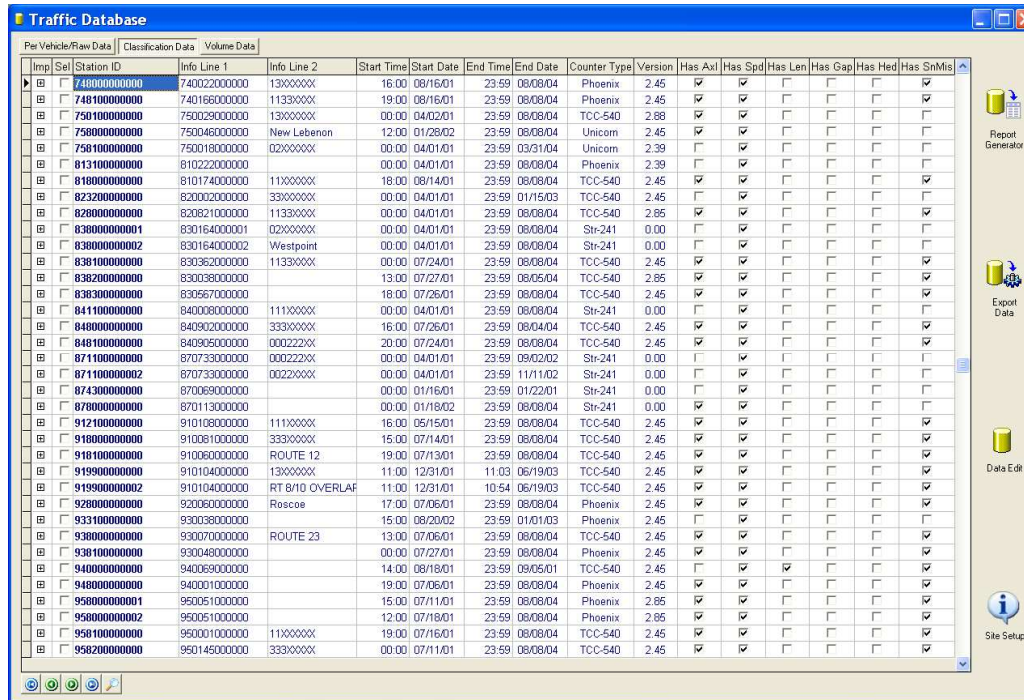
When scan is completed, the database is automatically corrected and the number of errors found during scan is displayed.

Note that “errors” are most often minor issues with database management, not significant problems in most cases. Major errors detected during this process will be separately reported.



VIII. Exporting Data

To export data from the Centurion Database out to another format, please follow these steps:

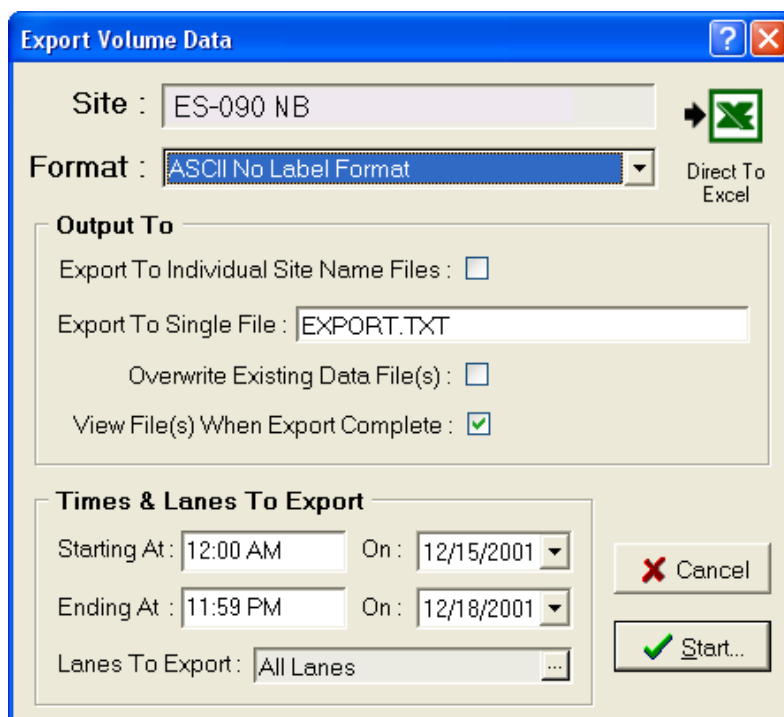


Step #1 – Click the Volume, Classification, or Per Vehicle Tab to select the type of data you want to export (in this example we would export volume data).

Step #2 – Click on the Site Name of the data you want to export. You can also click the check box for multiple sites to export more than one site at a time.

Step #3 – Click the Export Data button.

If we clicked a site named “ES-090 NB” (not shown in above example) and then clicked Export Data, we would see this window like this:



You can further refine the export by modifying the exact time & date range and what lanes are to be exported.

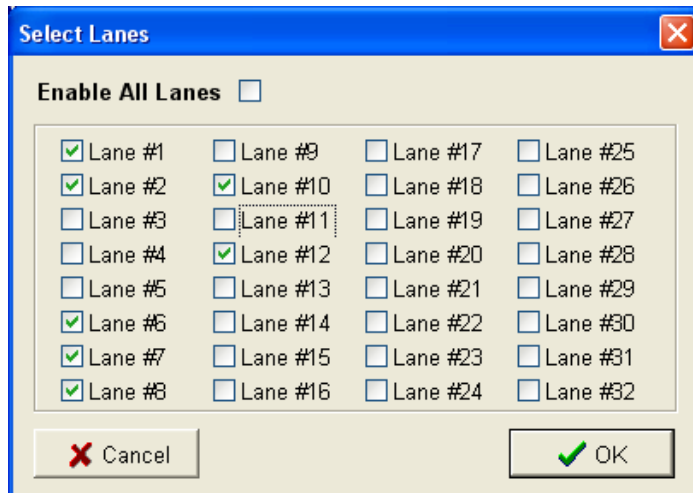
The Format line selects the actual output format for the exported file.

You should always check the File name to make sure it is correct. Centurion will overwrite any existing data automatically if the Overwrite box is checked (otherwise it will append).

Check the View File box to automatically display the actual exported data file at the end of the export.

The Direct To Excel button will create a Microsoft Excel spreadsheet file from your data in one quick step. See VIII.a. for more information.

To change the lanes that are to be exported, click the “...” box on the Lanes To Export.

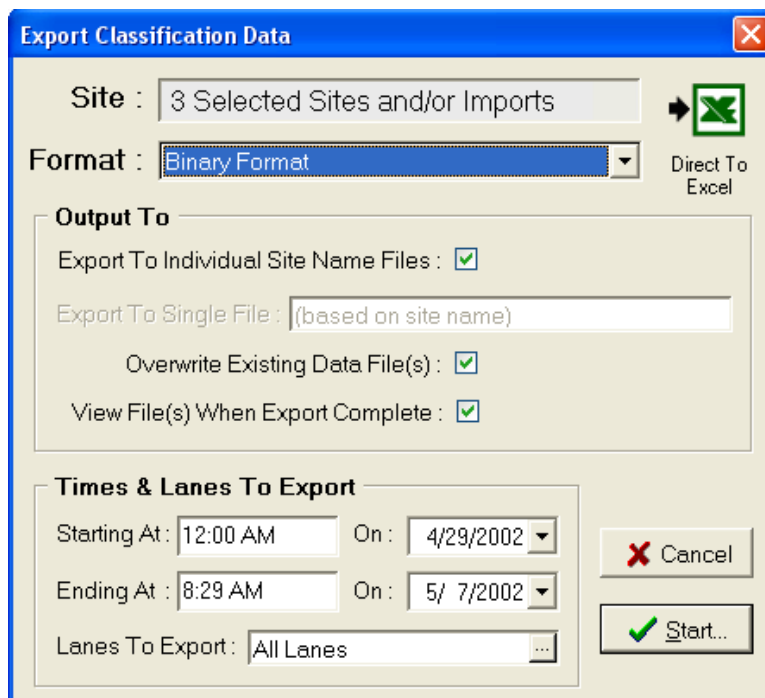


The "Select Lanes" dialog box has a title bar with a close button. It contains a section "Enable All Lanes" with an unchecked checkbox. Below this is a grid of 32 checkboxes, each labeled "Lane #". Lanes #1 through #8 are checked, while Lanes #9 through #32 are unchecked. At the bottom are "Cancel" and "OK" buttons.

Lane #	Checked
Lane #1	Yes
Lane #2	Yes
Lane #3	No
Lane #4	No
Lane #5	No
Lane #6	Yes
Lane #7	Yes
Lane #8	Yes
Lane #9	No
Lane #10	Yes
Lane #11	No
Lane #12	Yes
Lane #13	No
Lane #14	No
Lane #15	No
Lane #16	No
Lane #17	No
Lane #18	No
Lane #19	No
Lane #20	No
Lane #21	No
Lane #22	No
Lane #23	No
Lane #24	No
Lane #25	No
Lane #26	No
Lane #27	No
Lane #28	No
Lane #29	No
Lane #30	No
Lane #31	No
Lane #32	No

Check Enable All Lanes to always export whatever lanes are found in the data file.

If you select more than one site to export, Centurion will apply your export settings to multiple sites and export all of the data to one file automatically:



The "Export Classification Data" dialog box has a title bar with a close button. It contains several sections: "Site" with a text box showing "3 Selected Sites and/or Imports" and a "Direct To Excel" button; "Format" with a dropdown menu set to "Binary Format"; "Output To" with checkboxes for "Export To Individual Site Name Files" (checked), "Export To Single File" (disabled, showing "(based on site name)"), "Overwrite Existing Data File(s)" (checked), and "View File(s) When Export Complete" (checked); and "Times & Lanes To Export" with fields for "Starting At" (12:00 AM), "On" (4/29/2002), "Ending At" (8:29 AM), "On" (5/7/2002), and "Lanes To Export" (All Lanes). At the bottom right are "Cancel" and "Start..." buttons.

Note that the “Export To Individual Site Name Files” box can be checked to send the output of each site to a file named the same as the Site ID. This creates a unique file for each exported site.

If the Export To Individual Site Name is not checked, all the sites are placed in a single file (in sequential order).

When using the Direct To Excel button, multiple sites are created as multiple Excel files (each one is loaded into Excel).

And finally, when the export is complete Centurion will display the newly created file and allow you to edit and/or verify it. You can also easily save, copy, and otherwise manipulate it in the standard text file editor:

```

C:\Program Files\Diamond\Centurion CC\Exports\EXPORT.TXT
Data For Site: 3280000000000
  Info 1: rt 11
  Info 2: polkville
Storage Mode : Count
Start Time   : 12/17/01 at 00:00
Stop Time    : 12/19/01 at 00:00
Data collected by a TCC-540 (ver 2.45)

Time= 00:00:00.00 Date= 12/17/01 (Dec 17, 2001 Mon)
Record Interval Length: 01:00
1: Info: nb drv           Mode: Normal      Sensor: Axle   Divide By 2: D:
2: Info: nb pass          Mode: Normal      Sensor: Axle   Divide By 2: D:
3: Info: sb drv           Mode: Normal      Sensor: Axle   Divide By 2: D:
4: Info: sb pass          Mode: Normal      Sensor: Axle   Divide By 2: D:
1: 00:00 Total:          14
2: 00:00 Total:           3
3: 00:00 Total:          15
4: 00:00 Total:          11
1: 01:00 Total:          16
2: 01:00 Total:           8
3: 01:00 Total:          13
4: 01:00 Total:           5
1: 02:00 Total:           8
2: 02:00 Total:           2
3: 02:00 Total:           6
4: 02:00 Total:           3
1: 03:00 Total:           4
2: 03:00 Total:           5

```

VIII.a. Direct Export To Excel



This button activates the direct creation of a Microsoft Excel workbook of your data. The Lanes and the Start & End times are used to output just the desired data. If you select more than one site to export, Centurion creates an Excel file for each site and loads them all into Excel during the export.

The workbook will always contain two sheets. The first sheet is the Station, Lane, and Imports tables used during the export (for reference). The second sheet contains all of the data selected.

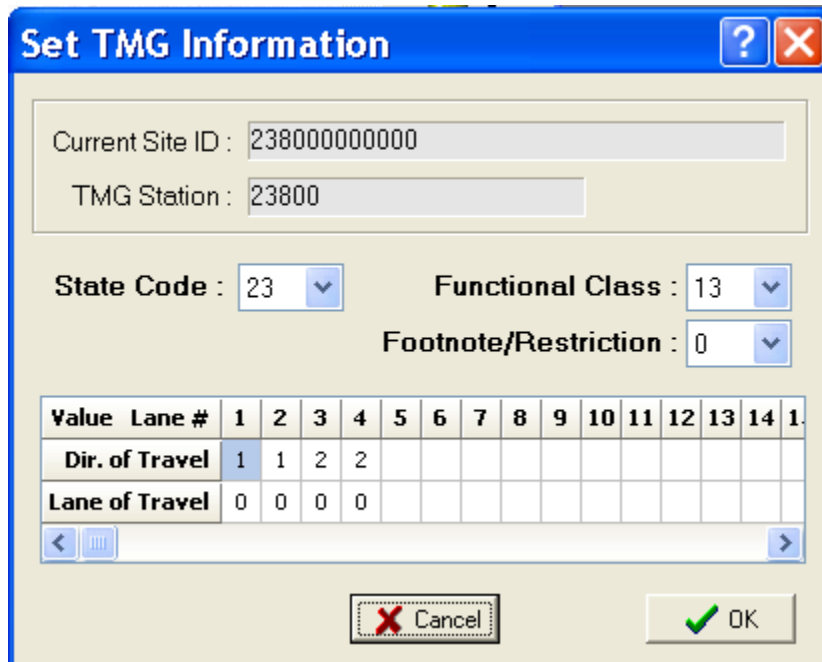
In the Database Export directory (default of C:\Program Files\Diamond\Centurion [Gold, CC, or Parks]\DB\Exports) there will be all of the Database files created for the export. In the Excel sub-directory, the actual Excel XLS files are stored). The database files (STATIONS.DB, LANESET.DB, etc) may also be used by programs such as Microsoft Access, Quattro, Lotus, or any program that will read a standard Paradox style table. Please move these files out of the Exports sub-directory if you want to use them somewhere else because Centurion overwrites all data with the next export.

This function has been tested to work on Excel version 97, 2000, and 2002 (XP). Please let us know if you experience any problems with the resulting Excel file.

VIII.b. TMG Exporting

TMG Exporting (either to *Card 3/Volume*, *Card 4/Old Style Class*, or *Card C/New Style Class*) is fully supported by Centurion. Unlike the other exports, each site needs some specific site configuration information to be programmed in before exporting occurs.

This can happen in two ways: (a) if Centurion detects that a site has not been exported to TMG before, or (b) if the user selects a site in the list of sites and presses the F7 key. In either case the following window will appear:



The dialog box titled "Set TMG Information" contains the following fields and controls:

- Current Site ID: 238000000000
- TMG Station: 23800
- State Code: 23 (dropdown)
- Functional Class: 13 (dropdown)
- Footnote/Restriction: 0 (dropdown)
- A table with 15 columns labeled "Value Lane # 1" through "15". The first column is highlighted.
- Buttons: Cancel (with a red X icon) and OK (with a green checkmark icon).

Value Lane #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dir. of Travel	1	1	2	2											
Lane of Travel	0	0	0	0											

These values are required to properly export TMG data. You can use the scroll bar to select the information for up to 32 lanes per site.

Note that when exporting axle classification data, Centurion exports either *TMG Card 4* or *TMG Card C*. Card C is the new version and is the default format. You can change this to Card 4 by unchecking the "**Write TMG Class as Card C instead of Card 4**" option in the program preferences window (see section X for more information).

VIII.c. Peek PRN & Monthly File Exporting

Centurion allows you to export any Volume, Axle Classification, or Speed Classification to the old style Peek © Traffic PRN Format. In addition, you can also export data Volume data to the Peek Monthly PRN file format. These are fairly simple texts formats which are used by some agencies to further process data.

When either of these formats are selected, Centurion automatically creates a **PeekPRN** sub-directory off of the main export directory. In addition, a **Monthly** sub-directory is created for the Peek Monthly format files and three sub-directories are created for the PRN files named **Volume**, **Class**, and **Speed**. For example, with a default installation you will find any exported PRN volume data in the following directory:

C:\Program Files\Diamond\Centurion CC\Exports\PeekPRN\Volume

Centurion sets up these separate directories because it can simultaneously create a Volume, Class, and Speed file from a single database export. These separate directories will help you organize your data. Monthly exports are always placed in the Monthly sub-directory.

The file name for any Peek PRN export is always in this format: **Dmddsss.PRN** (“mm” is the month of the data, **dd** is the day of the data, and **sss** is a sequence number from **001** to **999**).

The file name for any Peek Monthly export is always in this format: **Mmyysss.PRN** (“mm” is the month of the data, **yy** is the year of the data, and **sss** is a sequence number from **001** to **999**).

Note that these file names are used regardless if the “Export to individual site file names” box is checked or not.

Please make note of the following when setting up a site for export to the Peek PRN format:

Record #1 (first line in data file):

Value 1. This is the Site ID. It should generally be 12 digits long with trailing zeros.

Value 2. Taken from the Info Line 1 value. It should also be 12 digits long with trailing zeros.

Value 3. The twelfth character of the Site ID controls what is placed here. If it is a ‘2’, then a “02” is put into this value. No twelfth character or anything other than a ‘2’ causes a “01” to be put into this value.

1. Always set to “03”

Value 11. A 12 character string always set to “100”.

Value 12. A 12 character string always set to “400”.

Record #2 (second line in data file):

Values 1 – 9. Each always set to “0000”.

Value 10. The last value comes from Info Line 2. It should be eight characters long and indicate the direction code for each lane being output (with an ‘X’ in unused lanes). For example, if you have two lanes with directions of 1 and 3, put a “13XXXXXX” into Info Line 2 before starting the export.

Record #3 (third line in data file):

Value 1. First 20 characters of the TMG: City/Town value.

Value 2. First 20 characters of the combined TMG: County and TMG: Identification values.

Value 3. First 45 characters of the TMG: Location value.

Records #4-6 (fourth, fifth, and sixth lines in data file):

These values vary depending on the type of file. The first two digit value identifies what the remainder of the line will be. A “01” indicates the volume/lane identifiers. A “02” indicates axle classification information. And a “03” indicates speed classification with the corresponding speed ranges indicated.

Please make note of the following when setting up a site for export to the Peek Monthly format:

1. **Station Number:** This is the Site ID. It should generally be 12 digits long with trailing zeros.
2. **ID Number:** Taken from the Info Line 1 value. It should also be 12 digits long with trailing zeros.
3. **Classifier Address:** The twelfth character of the Site ID controls what is placed here. If it is a ‘2’, then a “02” is put into this value. No twelfth character or anything other than a ‘2’ causes a “01” to be put into this value.
4. **City/Town:** First 20 characters of the TMG: City/Town value.
5. **County:** First 20 characters of the combined TMG: County and TMG: Identification values.
6. **Location:** First 40 characters of the TMG: Location value.
7. **Direction Code:** Comes from Info Line 2. It should be eight characters long and indicate the direction code for each lane being output (with an ‘X’ in unused lanes). For example, if you have two lanes with directions of 1 and 3, put a “13XXXXXX” into Info Line 2 before starting the export.

For more information on the Peek PRN format or the Peek Monthly format, please contact an appropriate agency.

IX. Bin Table Editor

This function allows you to create, edit, and print the Bin Table Definition. These definitions describe what type, speed range, or length range a vehicle is for each "Bin". For example, the standard Speed Bins are 16 speed ranges from 0.0-19.9mph (Bin #1), 20.0-24.9mph (Bin #2), etc.

The five types of bin tables are shown below:

Def	Bin #	Axles	Bin Name	Spacings (feet)
1.	1	2-3	Cycle	1-5.8, *
2.	2	2-3	Cars	5.9-10.2, 10-18.8
3.	3	2-3	2A-4T	10.3-15, 10-18.8
4.	5	2	2A-SU	15.1-24
5.	4	2-3	Buses	23.5-99.9, *
6.	8	3	4A-ST	*, 18.1-99.9
7.	6	3	3A-SU	*, 3.5-8
8.	2	4-5	Cars	1-10.2, *, 1-3.4, 1-3.4
9.	3	4-5	2A-4T	10.3-15, *, 1-3.4, 1-3.4
10.	8	4	4A-ST	*, 5.1-99.9, 3.5-99.9
11.	8	4	4A-ST	*, 1-5, 10-99.9
12.	7	4	4A-SU	*, *, *
13.	11	5	5A-MT	*, 6.1-99.9, *, *
14.	9	5	5A-ST	*, 1-6, *, 3.5-11
15.	3	5	2A-4T	9.9-14.9, *, *, 1-3.4
16.	5	5	2A-SU	15.1-24, *, *, 1-3.4
17.	9	5	5A-ST	*, *, *, *
18.	10	6	6A-ST	*, 3.5-8, 3.5-8, *, 8.1-99.9
19.	12	6	6A-MT	*, *, *, *, 8.1-99.9
20.	10	6-10	6A-ST	*, *, *, *, 3.5-8, 3.5-8, 3.5-8, 3.5-8, 3.5-8

Use the Save and Load buttons next to the file name to view other tables and to save your table.

The # of Bins and Definitions are automatically updated as you create the table.

You MUST save your table to use it with Centurion.

You can Print the current table by clicking the Print button at the main window speed bar.

For more information on Bin Tables and what they do, please refer to your Traffic Counter users manual.

Speed Bin Table Editor:

Bin Table Editor

Axle Bins | Speed Bins | Length Bins | Gap Bins | Headway Bins

of Bins: 16 File Name: DEFAULTX.SPD

Bin #	Min Speed (US)	Max Speed (US)	Min Speed (Metric)	Max Speed (Metric)
1.	0.0 mph	19.9 mph	0.0 kph	32.1 kph
2.	20.0 mph	24.9 mph	32.2 kph	40.1 kph
3.	25.0 mph	29.9 mph	40.2 kph	48.1 kph
4.	30.0 mph	34.9 mph	48.2 kph	56.2 kph
5.	35.0 mph	39.9 mph	56.3 kph	64.2 kph
6.	40.0 mph	44.9 mph	64.3 kph	72.3 kph
7.	45.0 mph	49.9 mph	72.4 kph	80.3 kph
8.	50.0 mph	54.9 mph	80.4 kph	88.4 kph
9.	55.0 mph	59.9 mph	88.5 kph	96.4 kph
10.	60.0 mph	64.9 mph	96.5 kph	104.5 kph
11.	65.0 mph	69.9 mph	104.6 kph	112.5 kph
12.	70.0 mph	74.9 mph	112.6 kph	120.6 kph
13.	75.0 mph	79.9 mph	120.7 kph	128.6 kph
14.	80.0 mph	84.9 mph	128.7 kph	136.7 kph
15.	85.0 mph	89.9 mph	136.8 kph	144.7 kph

Help! Cancel Ok

Gap Bin Editor:

Bin Table Editor

Axle Bins | Speed Bins | Length Bins | Gap Bins | Headway Bins

of Bins: 8 File Name: DEFAULTX.GAP

Bin #	Elapsed Time From End of Previous Vehicle
1.	00:03.00 seconds
2.	00:10.00 seconds
3.	00:15.00 seconds
4.	00:20.00 seconds
5.	00:30.00 seconds
6.	01:00.00 seconds
7.	02:00.00 seconds

Help! Cancel Ok

Headway Bin Editor:

Bin Table Editor

Axle Bins | Speed Bins | Length Bins | Gap Bins | Headway Bins

of Bins: 8 File Name: DEFAULTX.HED

Bin #	Elapsed Time from Start of Previous Vehicle
1.	00:03.00 seconds
2.	00:10.00 seconds
3.	00:15.00 seconds
4.	00:20.00 seconds
5.	00:30.00 seconds
6.	01:00.00 seconds
7.	02:00.00 seconds

Help! Cancel Ok

Length Bin Editor:

Bin Table Editor

Axle Bins | Speed Bins | Length Bins | Gap Bins | Headway Bins

of Bins: 13 File Name: DEFAULTX.LEN

Bin #	Min Length (US)	Max Length (US)	Min Length (Metric)	Max Length (Metric)
1.	0.0'	5.9'	0 cm	181 cm
2.	6.0'	9.9'	182 cm	303 cm
3.	10.0'	14.9'	304 cm	455 cm
4.	15.0'	19.9'	456 cm	608 cm
5.	20.0'	24.9'	609 cm	760 cm
6.	25.0'	29.9'	761 cm	912 cm
7.	30.0'	39.9'	913 cm	1217 cm
8.	40.0'	49.9'	1218 cm	1522 cm
9.	50.0'	59.9'	1523 cm	1827 cm
10.	60.0'	69.9'	1828 cm	2132 cm
11.	70.0'	79.9'	2133 cm	2436 cm
12.	80.0'	89.9'	2437 cm	2741 cm

Help! Cancel Ok

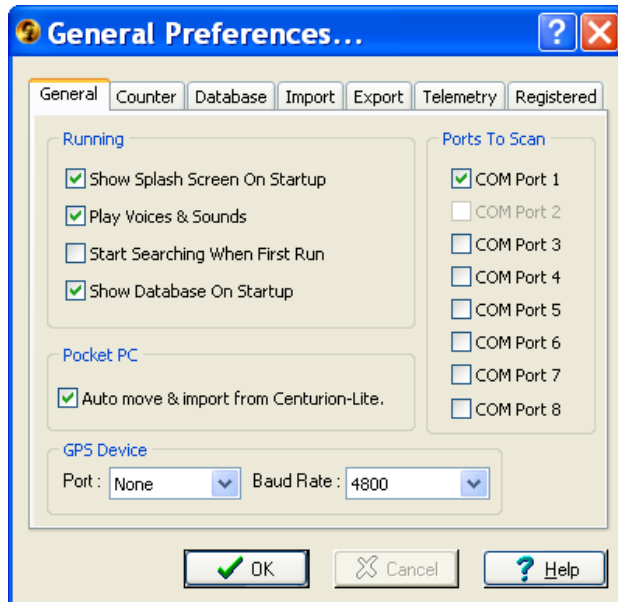
Note that Centurion is 100% compatible with TrafMan bin tables. You can load/save files either way.

A Sample Report of each of the above has been included with the software. Go to the Reports sub-directory of your Centurion software (usually C:\Program Files\Diamond\Centurion [Gold, CC, or Parks]\Reports) and select any of the 5 Bin Table reports (Adobe Acrobat format).

X. Preferences

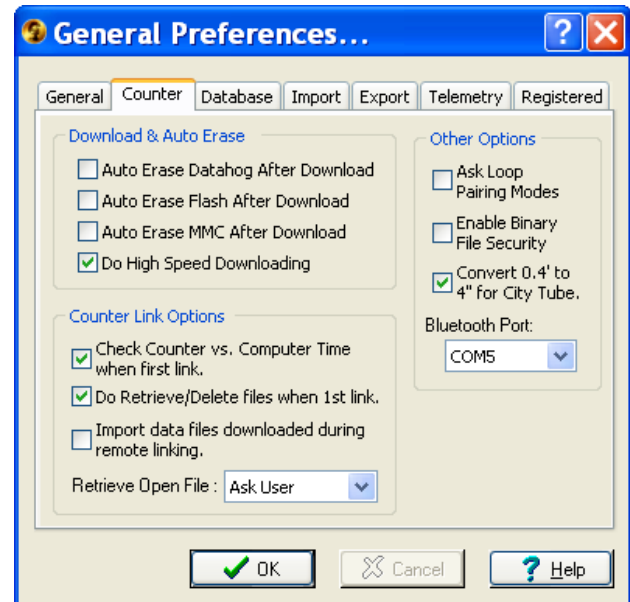
The preferences function from the File menu (Preferences -> General) control various program operation.

General program options.

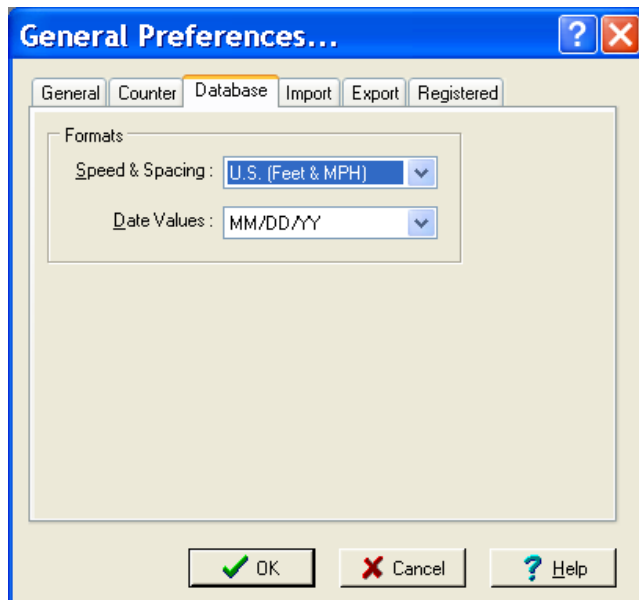


Note: Check the "Auto move & import from Centurion-Lite" to enable automatic connection, data transfer, and importing from any PocketPC running Centurion-Lite.

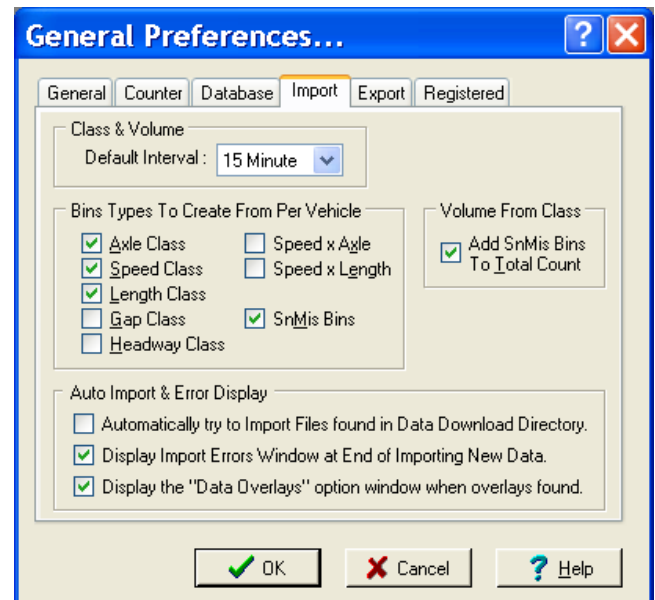
Counter linking and downloading options:

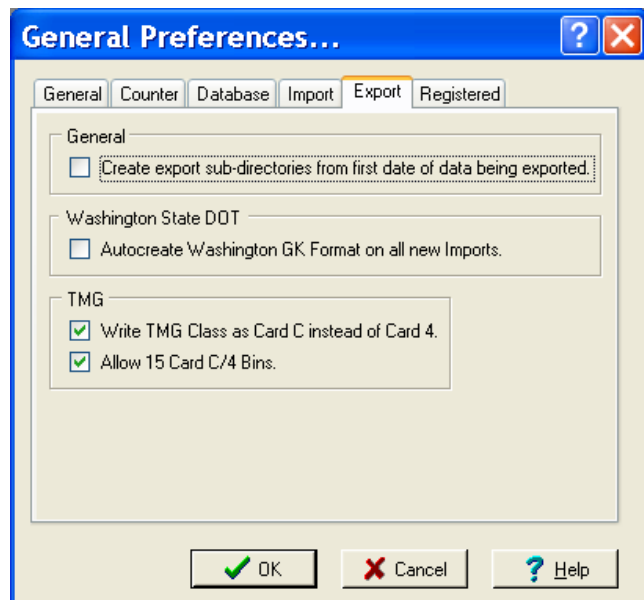


Database and viewing specific options:

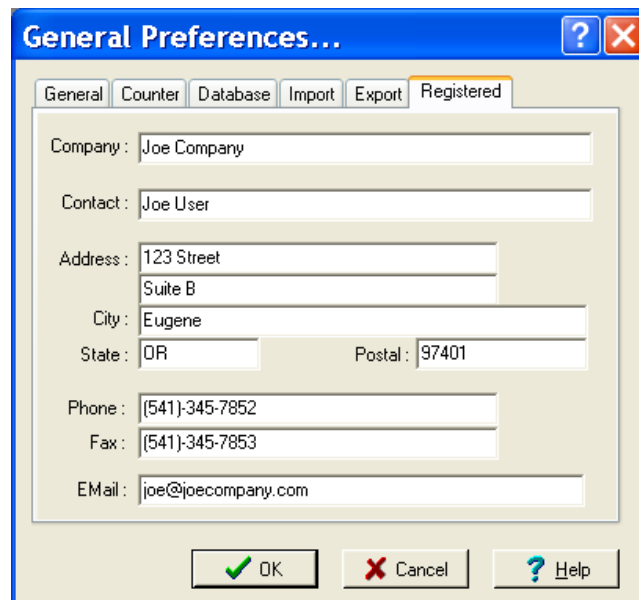


Import preferences:



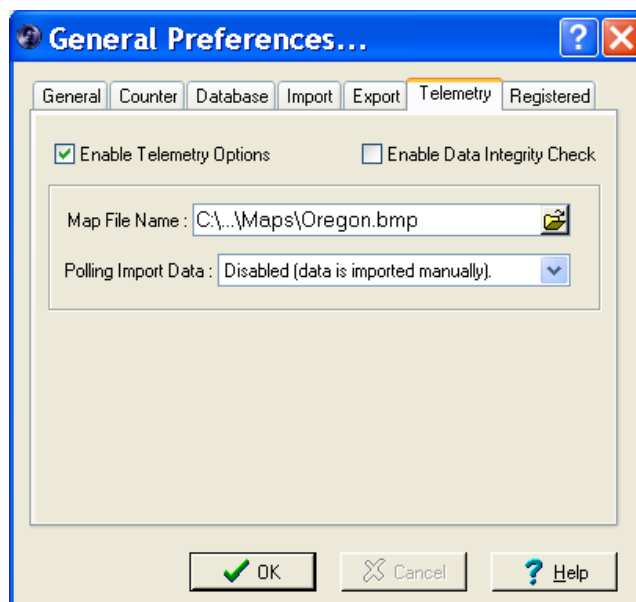
Export options and preferences:

The 'General Preferences...' dialog box has the 'Export' tab selected. It contains three sections: 'General' with a checkbox for 'Create export sub-directories from first date of data being exported'; 'Washington State DOT' with a checkbox for 'Autocreate Washington GK Format on all new Imports'; and 'TMG' with two checked checkboxes: 'Write TMG Class as Card C instead of Card 4.' and 'Allow 15 Card C/4 Bins.' The bottom has 'OK', 'Cancel', and 'Help' buttons.

Registered user options:

The 'General Preferences...' dialog box has the 'Registered' tab selected. It contains a form for user information: 'Company' (Joe Company), 'Contact' (Joe User), 'Address' (123 Street, Suite B), 'City' (Eugene), 'State' (OR), 'Postal' (97401), 'Phone' ((541)-345-7852), 'Fax' ((541)-345-7853), and 'Email' (joe@joecompany.com). The bottom has 'OK', 'Cancel', and 'Help' buttons.

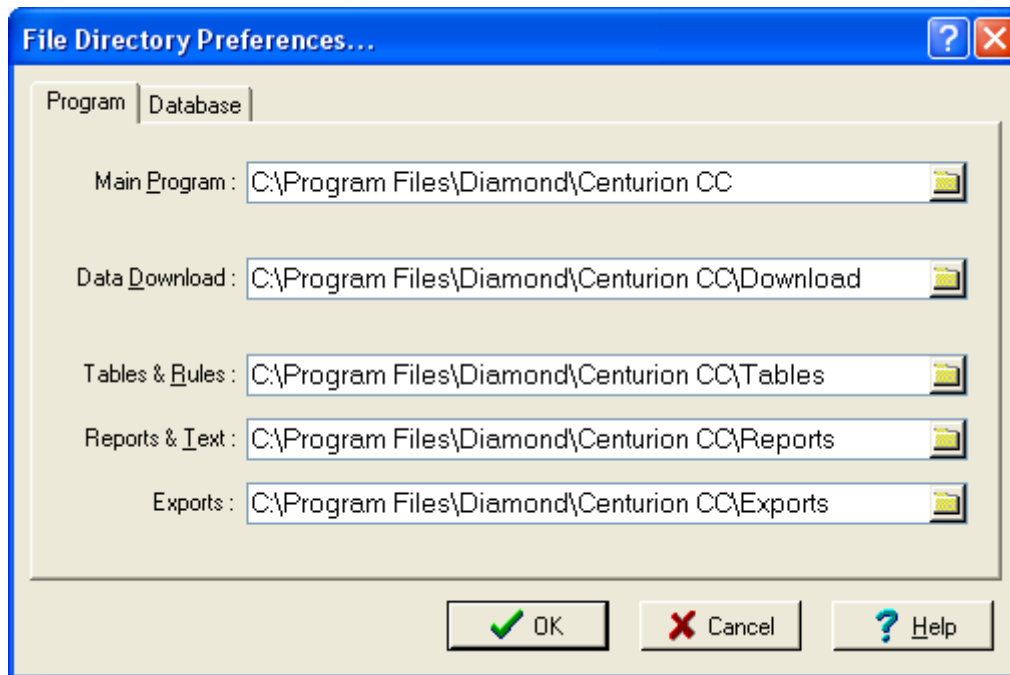
Centurion-Gold also has an additional preferences tab for Telemetry options as follows (refer to section XII for complete information on the Telemetry system):



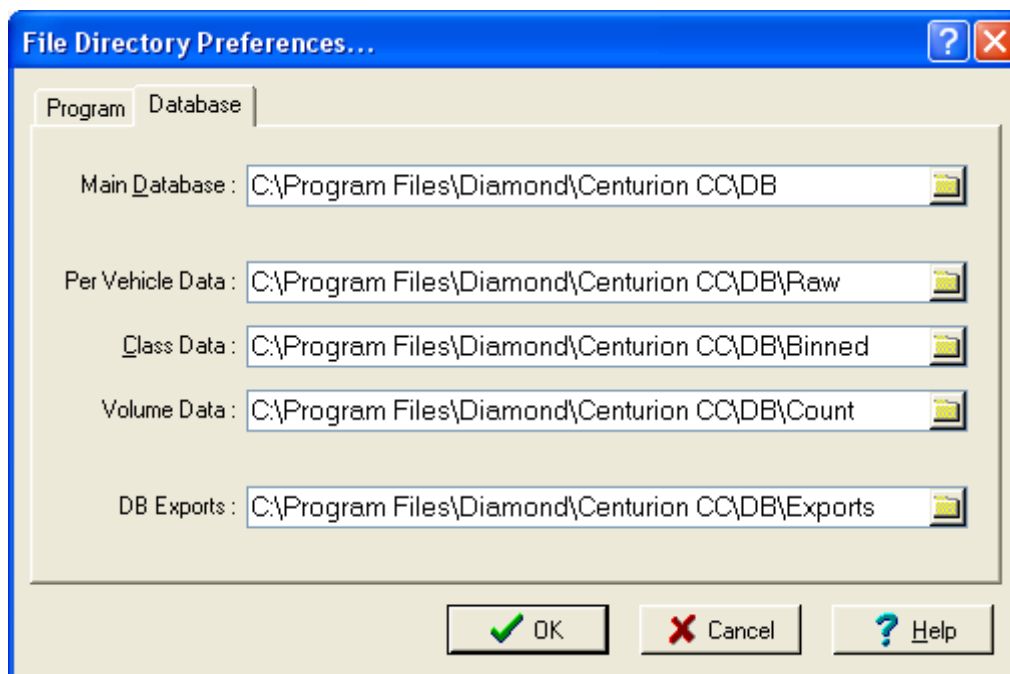
The 'General Preferences...' dialog box has the 'Telemetry' tab selected. It contains two checkboxes: 'Enable Telemetry Options' (checked) and 'Enable Data Integrity Check' (unchecked). Below is a 'Map File Name' field with the value 'C:\...\Maps\Oregon.bmp' and a file selection icon. At the bottom is a 'Polling Import Data' dropdown menu set to 'Disabled (data is imported manually)'. The bottom has 'OK', 'Cancel', and 'Help' buttons.

X.a. File Directory Preferences

The file directory preferences (File -> Preferences -> File Directory) set the program and database file locations:



Main program location and directories.

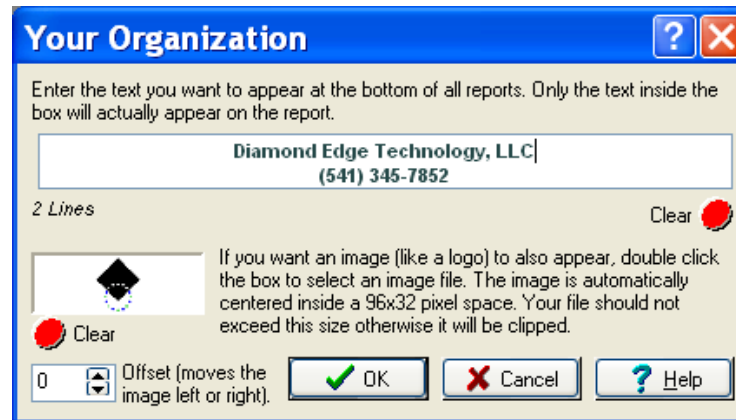


Database location.

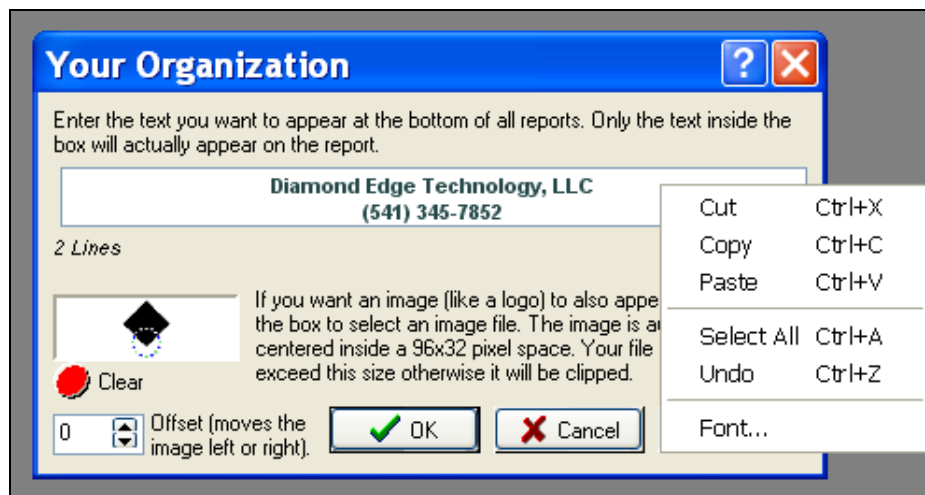
The DB Exports holds the database data and Excel files created with the *Direct To Excel Export* function.

X.b. Organization Preferences

The Organization preferences option (File -> Preferences -> Organization) allows you to enter in a custom name, description, or anything else you want to appear at the bottom of all reports:



It's a "Rich Text" field, so you can change the font and/or colors by selecting the text and right clicking and selecting the "Font" option:

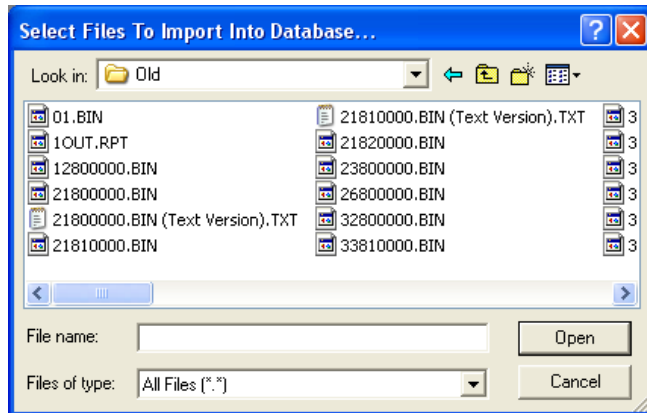


Once entered, Centurion automatically puts the information at the bottom of every printed page (example shown without image):

Centurion-CC Class Data Dump Report	Diamond Edge Technology , LLC (541)-345-7852	Printed: 04/29/03	Page 1
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XI. Other

Centurion has several other functions and options. These are described briefly below:

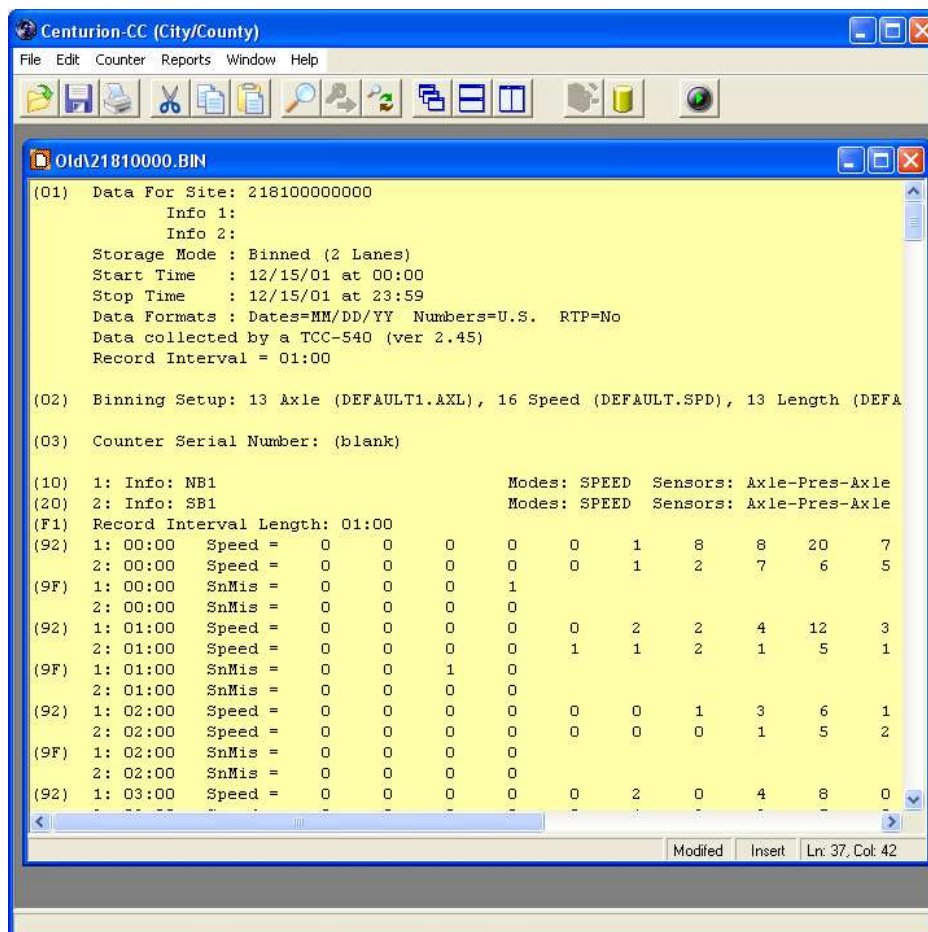
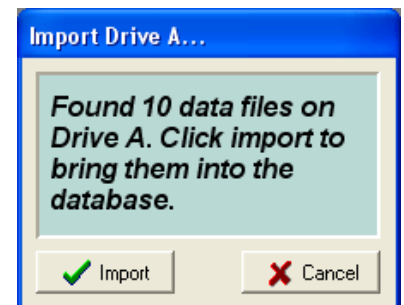


Manual Importing: Select this function from File menu (or click Manual Import from the scanning window).

You can select any binary download file from any source on your computer.

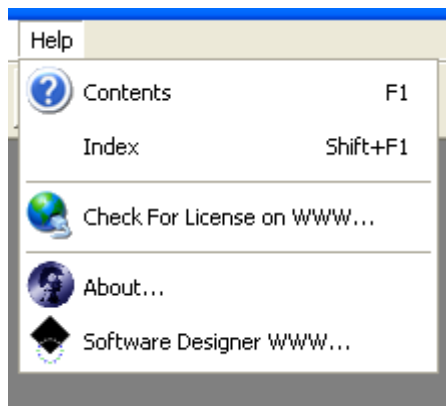
You can also select “Import New Data” to have Centurion automatically scan the download directory for any binary data file. This allows quick importing of data in this directory.

Importing From Drive A: This function scans a floppy disk and imports any data files it finds. Note that it only searches the root directory.



You can open any binary counter file for a quick look at its content.

This file is basically a New ASCII format text file that can be saved and used by other programs.



The various help menu options of Centurion. You can also request a License file from this menu (although Centurion will download this automatically after 30 days).

The “Software Designer WWW...” takes you to the DET website.

Note: If your software is licensed, a “Unlicense Software” option will appear allowing you to remove the license from this computer and move it to a different machine.

About Box's for Diamond and IRD versions of Centurion:




Note: If you are using Gold, Parks, or Field versions, the word “Gold”, “Parks” or “Field” will appear instead of “CC”.

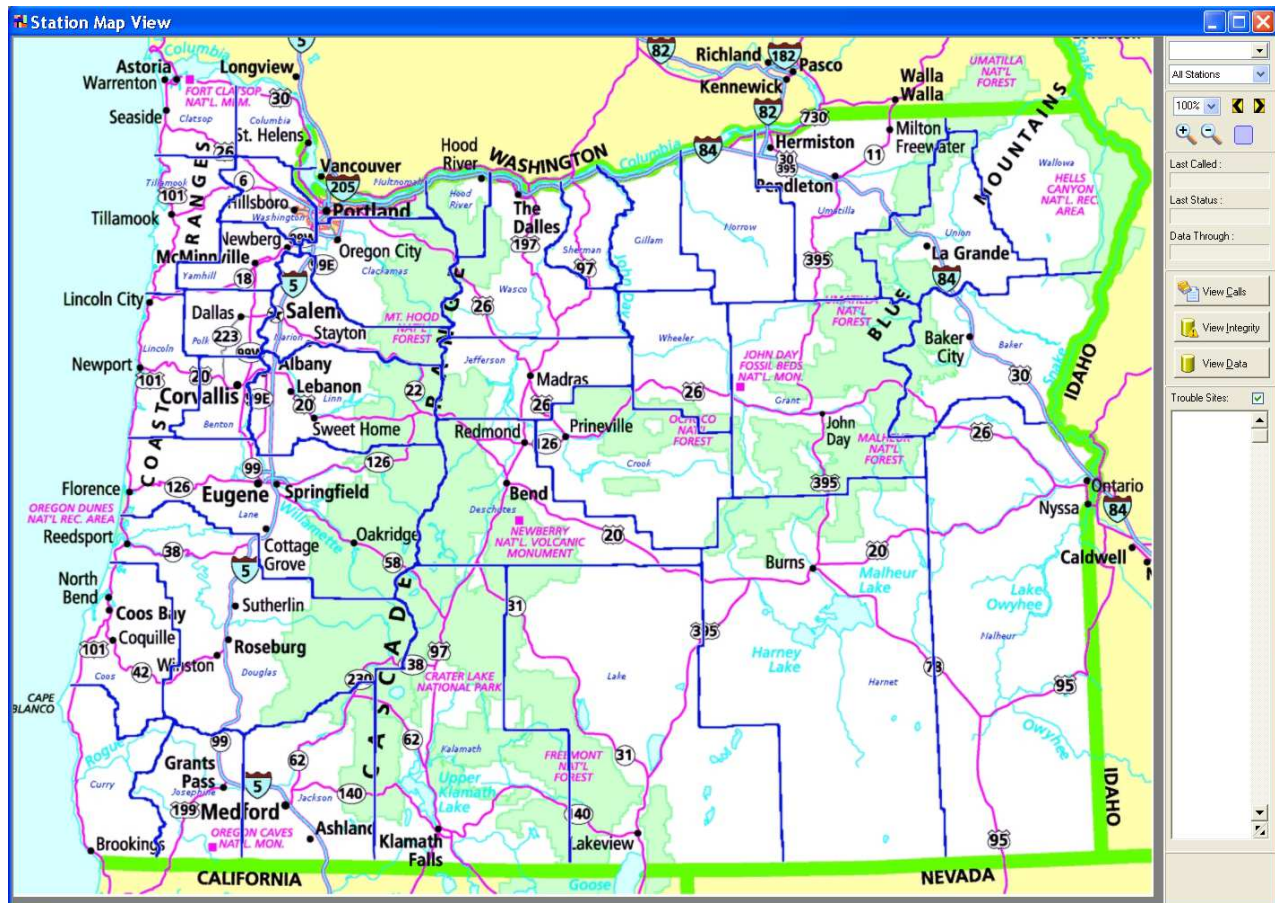
The URL on these pages takes you to either the Diamond Traffic Products or the International Road Dynamics web site.


XII. Telemetry & Polling

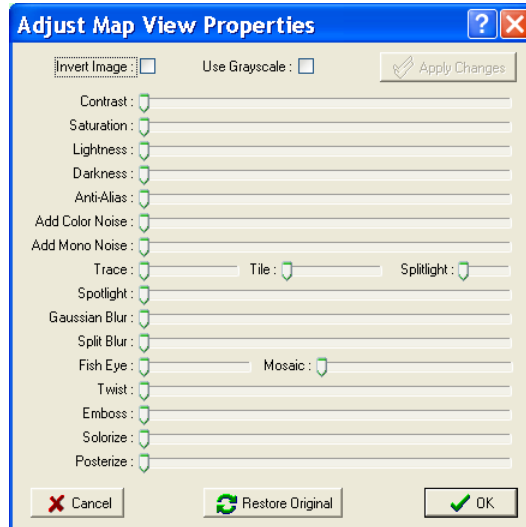
Centurion-Gold supports a complete telemetry and polling system for linking to and downloading data from traffic counters connected via modem or SOIP (serial over internet protocol). CC, Parks, and Field versions of Centurion do not support these functions.

To use the Telemetry system, follow the steps outlined below:

1. Select Files – Preferences – General and click on the Telemetry tab.
2. Check the “Enable Telemetry Options” box and then click the folder icon on the “Map File Name” box. A dialog will open allowing you to select the graphics file for your telemetry station map.
3. At this point you should select the map file representing your state, city, or other location. Centurion comes with some samples (including Oregon, New York, and a blank map). You can select any of these or select the blank one if you do not have a map file.
Note that Centurion supports virtually any graphics format. Most agencies can get an appropriate map from either their GIS department or an online source. You can use whatever size and resolution you desire for your map, however it is generally best to use a Bitmap image that is at least your screen resolution in size.
4. Close the General preferences dialog. You will now see a new main menu option named “Telemetry” appear along with a new map speed button that looks like this: 
5. Click on the map speed button. Depending on map selected something like this will appear:

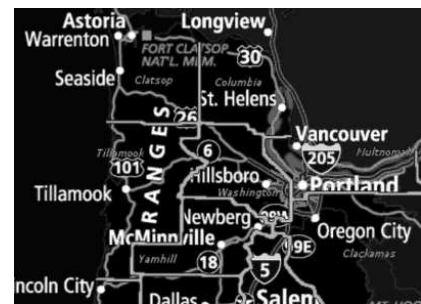


6. For example purposes, the Oregon map will be used. However, even if you do not have a map image available, the Blank sheet can be used to make a very useful visual polling system. Later on a map image can be added to Blank setup and the site locations can be moved to the correct location.
7. To get a feel for the map display, play around with the zoom function and scrolling functions. These are controlled with these buttons:
Select various zoom levels with the + and - buttons or the zoom % box. To fit the whole map on the display, click the  button.
8. If the map image is a bitmap, you can control the look of the map with the “Adjust Map View Properties” function. Right click anywhere on the map and select “Adjust Map View Properties”. The following window will appear:



For demonstration purposes, click the *Invert* and *Use Grayscale* box and then click Apply Changes.

The map image will change to show:




9. For now leave the map in its original state by clicking Restore Original and then click Ok
10. We are now ready to add a site to the map. Right click on the map and select “Add New Station To Map”. The following window will appear:

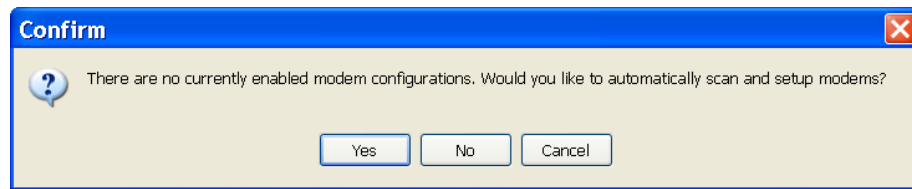
Type in a Station I.D. for the site. This can be a new site or a site already existing in the database. The Site I.D. should match the Site I.D. that is programmed into the counter in the field.

Next enter the Baud Rate, Phone #, and select the type of counter (Diamond or Peek) of the site. Advanced users will recognize many other functions and settings are available, but the Baud Rate, Phone #, and Type are the critical entries at this point.

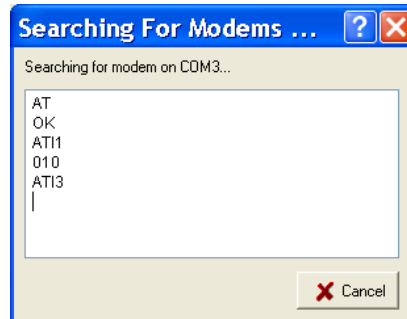
See section XII.a. for information on polling settings. See section XII.b. for information on advanced function settings.

The Modem Setup # tells the software what modem to use when calling the site. Since this is the very first site to be setup, click on the  next to this setting to go into the modem setup screen (see next step).

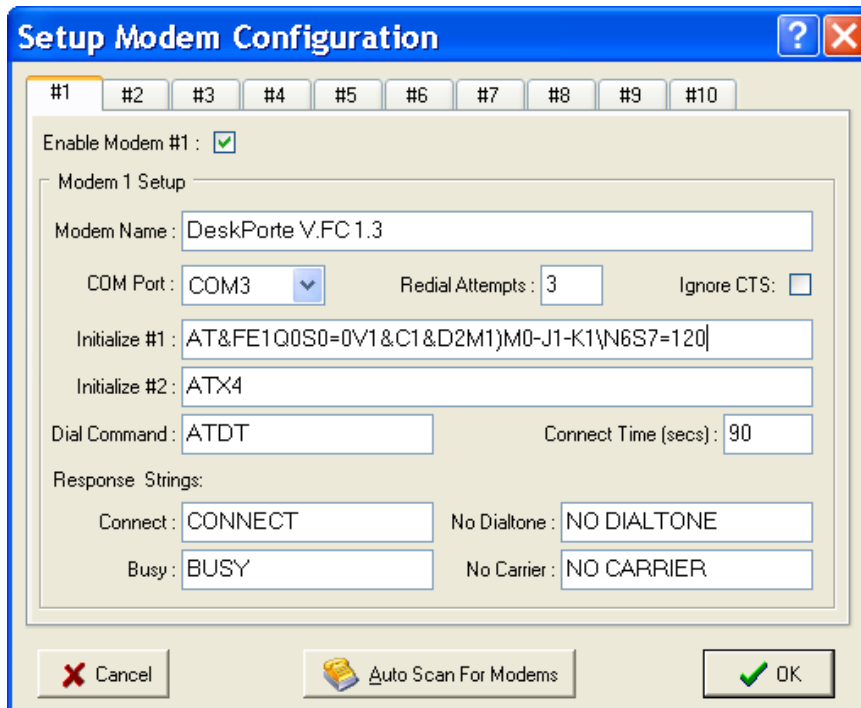
11. If you clicked the ... button next to the Modem Setup #, the following dialog will appear allowing you to setup your modem configuration:



AT&FE1Q0S0=0V1&C1&D2M1)M0-J1-K1\N6S7=120 Click Yes. Centurion will now try to locate and setup any modems found connected to the computer and configure Centurion to work with them. This window appears during setup:



When completed, a window appears indicating if it found any modems and what COM ports they are on. Finally, the actual Modem Setup dialog is displayed (the following shows a Microcomm Deskporte Fast found on COM3):



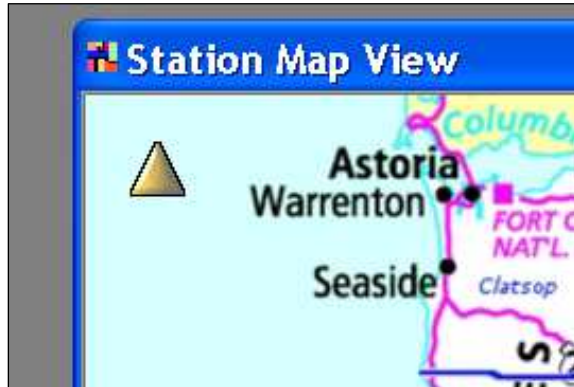
All of the settings needed for Centurion to use the modem are on this screen. You can adjust them as needed for your particular needs.

Note that up to 10 different configurations can be selected. This could be different modems on the same computer, or a single modem configured in different ways for different sites (such as one land line and one cellular setup).

The Auto Scan function can be rerun at any time. Centurion will only overwrite settings that are not marked as enabled, so unmark the setups that you want to be filled in automatically before clicking Auto Scan.

12. Click Ok to close the Modem Configuration window and then click Ok to close the Add Site To Map window. For example purposes, we added a Phoenix site named "171100000000" with a local phone number and a 19200 baud rate.

13. The map will have a new site put on it in the top left corner looking something like this:



The Yellow triangle represents the site. It is yellow because it has an Unknown status. Sites appear in **Red** if they have failed a polling or **Green** if they have been successfully polled. This lets you quickly see what sites are problem and what sites are not.

In addition, the Trouble Site bar on the left of the screen will list all Red or Yellow sites (just Red if unchecked the box at the top of the trouble sites list).

Clicking on any site, selecting in from the combo box at the top right of the window, or selecting it in the Trouble Sites list will highlight it and put a yellow box around it.

14. Highlighted sites (those with a yellow box around them) will appear like this:



Once a site has been highlighted, the information on the right of the window will show the current site status and other information as follows:

171100000000

All Stations

100%

Last Called :
13:24 on 12/1/2005

Last Status :
Ok (Data Download)

Data Through :
23:59 on 1/23/2005

View Calls

View Integrity

View Data

Trouble Sites: ☒

171100000000

The current site is always indicated here. The box below that says "All Stations" is used to select a Zone to work with (see section XII.b for more information on zones).

The time the site was last called (this may be blank for your setup since you haven't called the site yet).

The last status message for the site.

The last day of data that has been imported into the database.

The **View Calls** button will call up a display of the calls made to the selected site (or all sites if no site is selected) and the status of the counter. Similarly, the **View Integrity** displays either the data integrity violations for the selected site or all of the sites. These buttons can be clicked at any time.

View Data will bring up the database select window and open up the selected site. This gives you a quick access to the database data for a site.

Any time you select a site from the Trouble Sites list or from the combo box at the top of the window, the yellow select box will highlight the site. In addition, if the site is not currently visible on the map, the map will be automatically scrolled so that the site is centered in the visible section of the map.

15. The following shows an example of the Call Log window for a site:

View Call Log (All Sites)

Station ID	Call Start Date	Call Start Time	Call End Date	Call End Time	Seq.	Type of Message	Message
018000000002	12/28/05	12:42:47	12/28/05	12:45:11	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
018000000002					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
018000000002					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
018000000002					3	Counter Error	No unretrieved data available to download!
019900000002	12/28/05	12:45:11	12/28/05	12:46:01	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
019900000002					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
019900000002					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
019900000002					3	Data Message	Downloaded File #1 (252 Bytes) into: ".BIN" (3 seconds, 840bps)
029900000001	12/28/05	12:46:01	12/28/05	12:46:47	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
029900000001					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
029900000001					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
029900000001					3	Counter Error	No unretrieved data available to download!
110000000001	12/28/05	12:46:47	12/28/05	12:47:37	0	Call Info	Connected! (CONNECT 9600/REL - LAPM)
110000000001					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
110000000001					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
110000000001					3	Data Message	Downloaded "Test ID 2" File #2 (252 Bytes) into: "05-12-28 Test ID 2 (Start 2005-12-1
171100000000	12/28/05	12:47:38	12/28/05	12:48:28	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
171100000000					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
171100000000					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
171100000000					3	Data Message	Downloaded File #1 (252 Bytes) into: "DUDLY" (3 seconds, 840bps)
202002	12/28/05	12:48:29	12/28/05	12:49:14	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
202002					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
202002					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
202002					3	Counter Error	No unretrieved data available to download!
018000000002	12/28/05	12:49:14	12/28/05	12:49:59	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)
018000000002					1	Counter Info	Linked To: Phoenix (Ver:2.94a 06/17/05)
018000000002					2	Counter Info	Files=8 (0 MMC). Batt=6.5V
018000000002					3	Counter Error	No unretrieved data available to download!
029900000001	12/28/05	12:49:59	12/28/05	12:50:44	0	Call Info	Connected! (CONNECT 14400/REL - LAPM)

Sort By Site: ☐

Note: The "Sort By Site" box can be checked to list the data by site instead of by Start Date & Time.

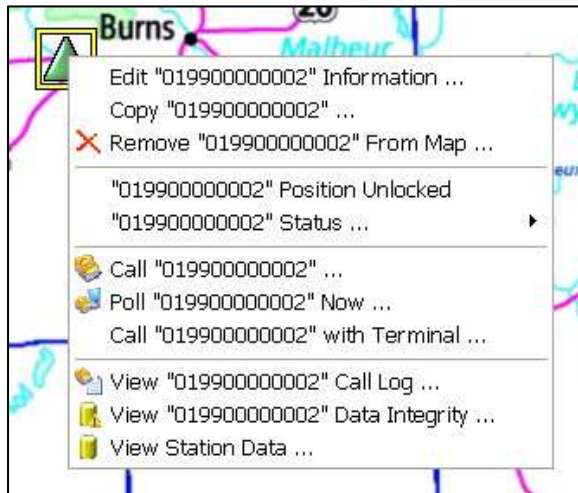
And this is an example of the Data Integrity view window:

View Data Integrity (All Sites)

Station ID	Start Date	Start Time	End Date	End Time	Seq.	Lane	Data Type	Message

16. Now that you have seen how to add a site to the map, setup its parameters, select it and then view the call log, data integrity list, and database data, it is now time to place it in the correct location on the map. To do that, drag the site (by holding down the left mouse button) to the correct location on the map.

Once the site is correctly placed, right click on it to display this menu:

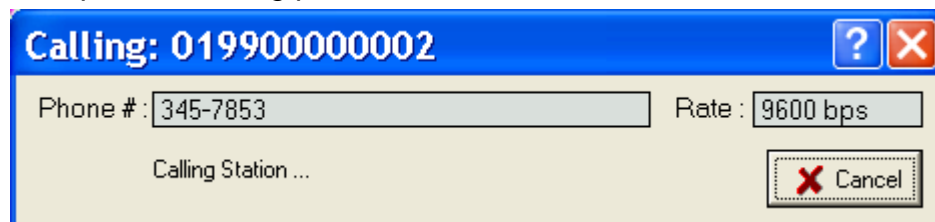


The site has been moved to just west of Bend, Oregon. If it is correctly placed, select the "Position Unlocked" option to Lock it onto the map. This will keep you from inadvertently moving it during normal operations (you can always unlock it and move it later if needed).

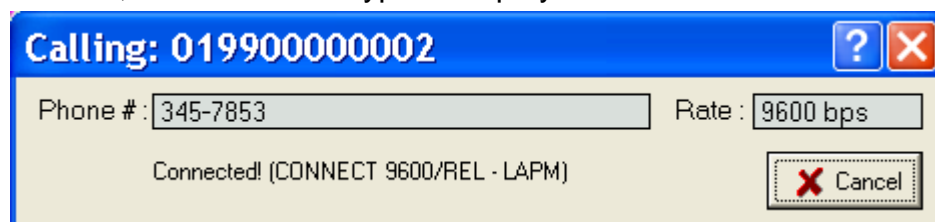
At any time you can Edit the station information, remove it from the map, or select one of the View options at the bottom. You can also copy a station if you want to create a similar station setup somewhere else on the map.

To call a site, either double click it or select the "Call" command. See XII.a. and XII.b. for more information on polling and advanced calling options.

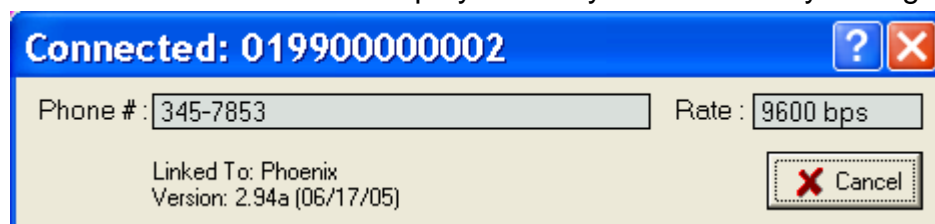
17. As mentioned above, calling any site is as simple as double clicking on it. If it is properly setup, Centurion will immediately call the site with the selected parameters. A window appears detailing each step of the calling process:



When a link is made, the connection type is displayed:

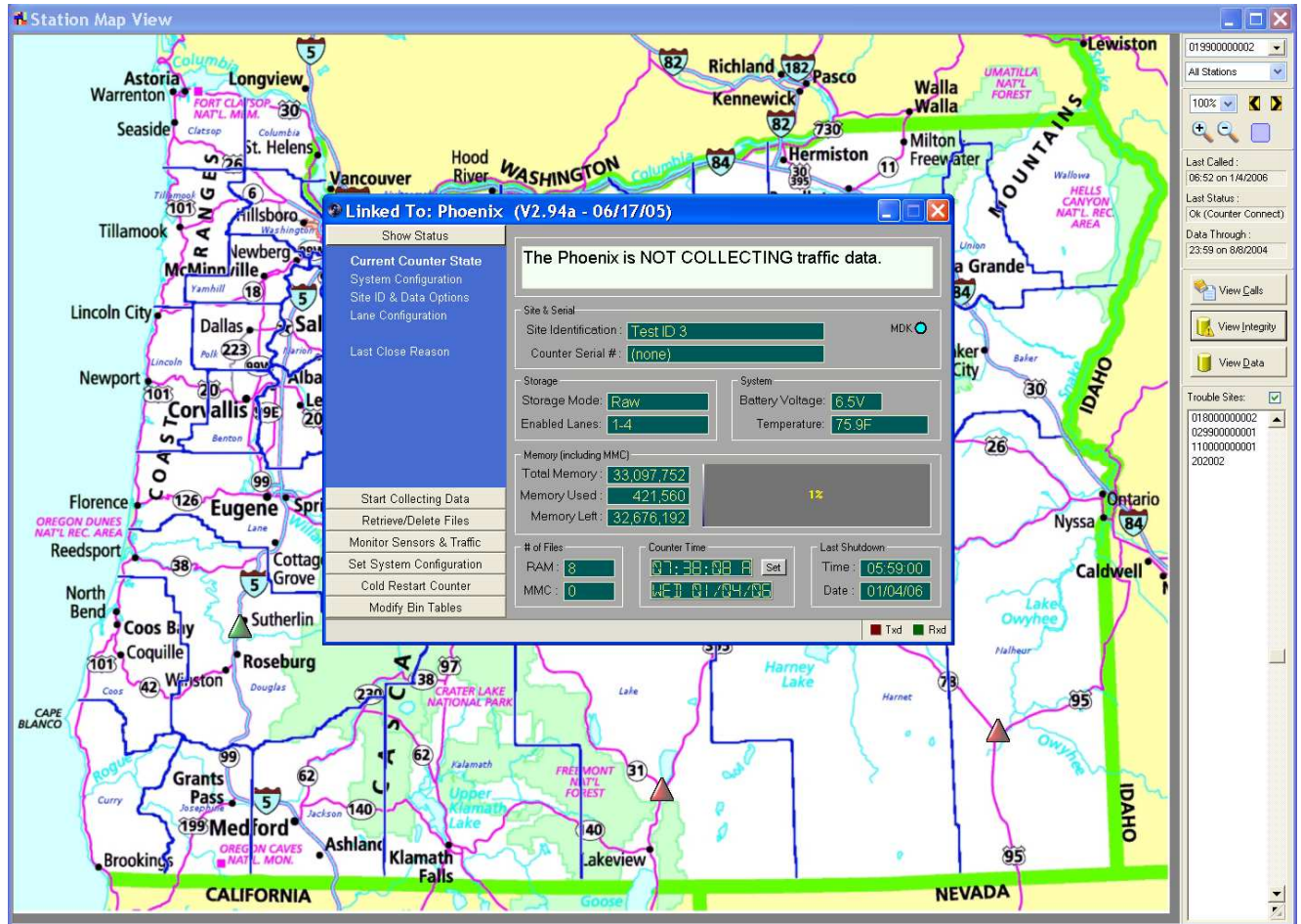


Then the type of counter found will be displayed briefly before actually linking to the site:



Note: At any point a problem is encountered a dialog will appear explaining the problem. This information will also be logged to the Call log file.

18. At this point the normal traffic counter link screen will be displayed and you should see something like this:



19. To hangup, just close the counter link box and you will return to the main map display. Note that while linked to a counter, you cannot access the map display or select any functions (although you are free to use the database).

This concludes the basic setup of the Telemetry system. At this point you will want to add all of your sites to the map and position them. Once this is done, please refer to the Polling and Advanced Telemetry Settings section of the manual for information on these functions.

XII.a. Polling

Centurion contains a complete automatic polling system. This system will call and link to your sites and automatically download data from them entirely without your intervention.

Basic Polling Setup:

- Each site will need to be configured for polling. This includes setting when it will be called and what happens when a connection is made. Right click on your first site you want to setup and select the Edit Site function. A window similar to the following will appear:

Edit Station Information

Station I.D.: 019900000002

Telemetry Settings

Modem Setup #: Setup 1 Baud Rate: 9600

Phone or SOIP: 345-7853

Custom Modem:

Multi Counter: Time Zone Offset: +00

Switch Box: Link Delay Time: 0 sec

Polling Settings

Polling Zone #: None (Polling Time: 11:15) Type: Diamond

Command: CC1

Note: 'CCx' means Common Command x. Click the setup button to view and edit the common polling commands, or enter your own command string.

Cancel OK

Polling commands are setup at the bottom of the window. The first, **Polling Zone #**, controls what Zone or Group of sites you want this site to be a member of. By default, all sites are not part of a zone. Refer to the Advance telemetry section for more information on zones.

The **Type** of counter must be set to the kind of equipment installed in the site. Different equipment has different command protocols and Centurion needs to adjust its operation accordingly.

The Command line controls what happens when the site is polled. You can enter a common command (such as CC1 shown here), or your own specific command for this site. In general, similar sites will use the same common command as this makes adjusting the command for similar sites very easy.

- Click the button next to the **Polling Zone #** option. This will bring up the Polling Time settings and allow to set *when* the site will be called:

Set Polling Times

Enter Polling Time/Date for Each Polling Zone :
(Generic is for sites not assigned to a group.)

Generic Time: 01:00	Zone 5: 01:00
Zone 1: 01:00	Zone 6: 01:00
Zone 2: 01:00	Zone 7: 01:00
Zone 3: 01:00	Zone 8: 01:00
Zone 4: 01:00	Zone 9: 01:00

Cancel OK

The Generic Time is the time for all sites not assigned to a zone (such as our example). However, each zone can have its own polling time.

In addition, the day of the week or of the year can be selected by clicking on the calendar icon to the right of each time. When that is clicked the following window will appear:

Generic Polling Calendar

Options

Polling Frequency

☒ Every Day

☐ Weekly Schedule

☐ Use Year Calendar

Weekly Days To Poll

☐ Sunday

☐ Monday

☐ Tuesday

☐ Wednesday

☐ Thursday


☐ Friday

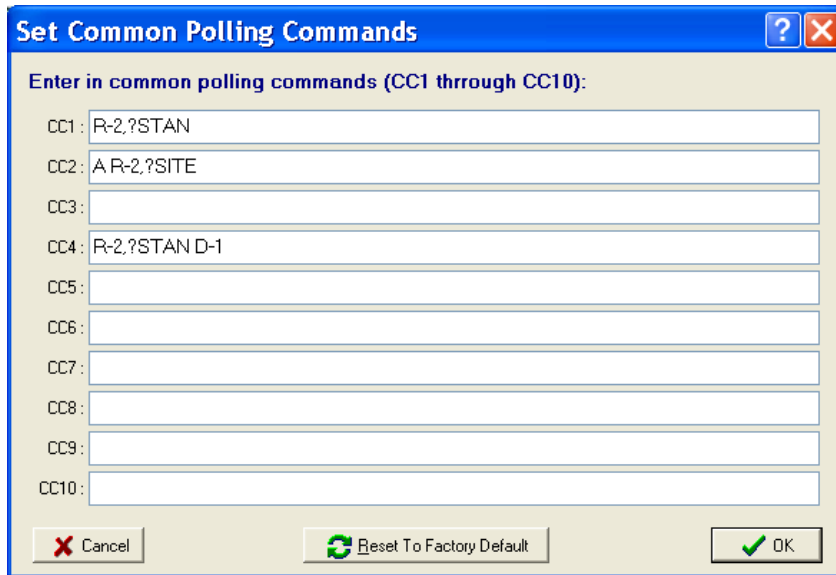
☐ Saturday

Cancel OK

Select the frequency you want to poll this zone or the generic setting for sites not assigned to a zone.

If you select weekly or year calendar, you can select the days of the week or days of the year you want to poll data on.

3. Next click the  button next to the Command option on the edit site information. This calls up the Polling Common Commands window as follows:

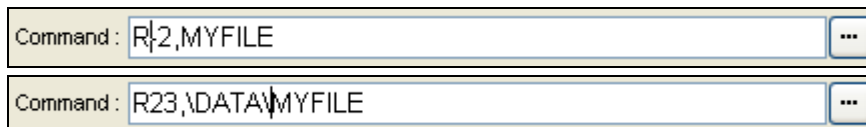


The dialog box titled "Set Common Polling Commands" has a blue header bar with a question mark icon and a close button. Below the header, it says "Enter in common polling commands (CC1 through CC10):". There are ten text input fields labeled CC1 through CC10. CC1 contains "R-2,?STAN", CC2 contains "A R-2,?SITE", and CC4 contains "R-2,?STAN D-1". At the bottom, there are three buttons: "Cancel" (with a red X icon), "Reset To Factory Default" (with a green circular arrow icon), and "OK" (with a green checkmark icon).

There are 10 common polling commands, CC1 through CC10. If any of these are on the Command option Centurion will substitute the command shown here during actual polling. This allows you to specify a common command for a particular site setup (such as all Diamond counters).

The commands shown here are the most commonly used. For example, "R-2,?STAN" means to retrieve all unretrieved files and store them into a standard named file. See below for more information on polling commands.

If you do not want to use a Common command, you can also enter in a specific command for each site. For example:



Two examples of command input fields. The first shows "Command : R-2,MYFILE" with a button to the right. The second shows "Command : R23,\DATA\MYFILE" with a button to the right.

The first retrieves all unretrieved files and stores it into a file named "MYFILE" in the main data download directory. The second retrieves file #23 and stores it into "\DATA\MYFILE".

There are multiple types of commands that can be entered. All commands are separated by a space and are processed from left to right after the connection to the site has been made.

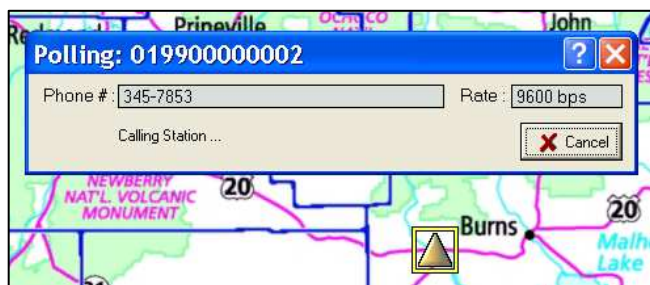
Command	Format	Description
Retrieve all unretrieved data except the open file	R-2,<fname>	<p>Retrieves all data files from the counter that have not been retrieved before. Will not retrieve the open file (if present). This is the most common command used since it downloads all of the collected data except for the current day. <fname> is the file name the data is to be stored into. If it has a path, files will be stored in the specified path (such as C:\data"), otherwise data is stored into the data download directory.</p> <p>The file name part can be either an actual file name (such as "MYDATA.BIN") or one of the following special names:</p> <ul style="list-style-type: none"> ?STAN – Standard mode. The file is stored into a file name that is created based upon the Site ID, type of data, and starting time/date of file. ?SITE – Site ID based name. The Site ID used to create a file name (such as 18000000.BIN). ?NEW – A unique name is generated (one that doesn't already exist in the directory). <p>Note that by default existing files are overwritten. It is therefore a good idea to turn on file append if you are using either a specific file name or the ?SITE special name.</p>

Command	Format	Description
Retrieve all unretrieved data including the open file	R-1,<fname>	Same as above, except will retrieve the open file (if present).
Retrieve all data files	R0,<fname>	Retrieves all data files in counter including the open file.
Retrieve single file	Rx,<fname>	Retrieves the specific file #x from the counter.
Retrieve range of files	Rx-y,<fname>	Retrieves a range of files from #x to #y.
Real Time Poll the open File	RTP,<fname>	Enables Real Time Polling of the open file. This function downloads the currently open file without closing it.

Turn on/off file append	A	<p>Toggles on/off the file append function. File append starts as off, so entering this on the command line will turn it on. For example, a command line of: A R-2,?SITE</p> <p>This turns on file append and then retrieves all unretrieved files in the counter and appends them to a file named the same as the site ID. If file append wasn't turned on, then each subsequent file retrieved would overwrite the previous ones.</p>
-------------------------	---	---

Delete retrieved files	D-1	Deletes any files in the counter that are marked as retrieved. Note that this command does not affect MMC or TAM based files.
Delete all files in counter	D0	Deletes all files in the RAM memory of the counter (except, of course, the open file if present).
Delete a specific file	Dx	Deletes file #x from the RAM memory of the counter. You cannot delete the open file or a file in the MMC or TAM memory.
Delete a range of files	Dx-y	Deletes a range of files from #x to #y in the RAM memory of the counter. You cannot delete the open file or a file in the MMC or TAM memory.
Erase the TAM Memory	DTAM	Erases the installed TAM memory if no unretrieved files exist on it.
Erase the MMC Memory	DMMC	Erases the installed MMC memory if no unretrieved files exist on it.

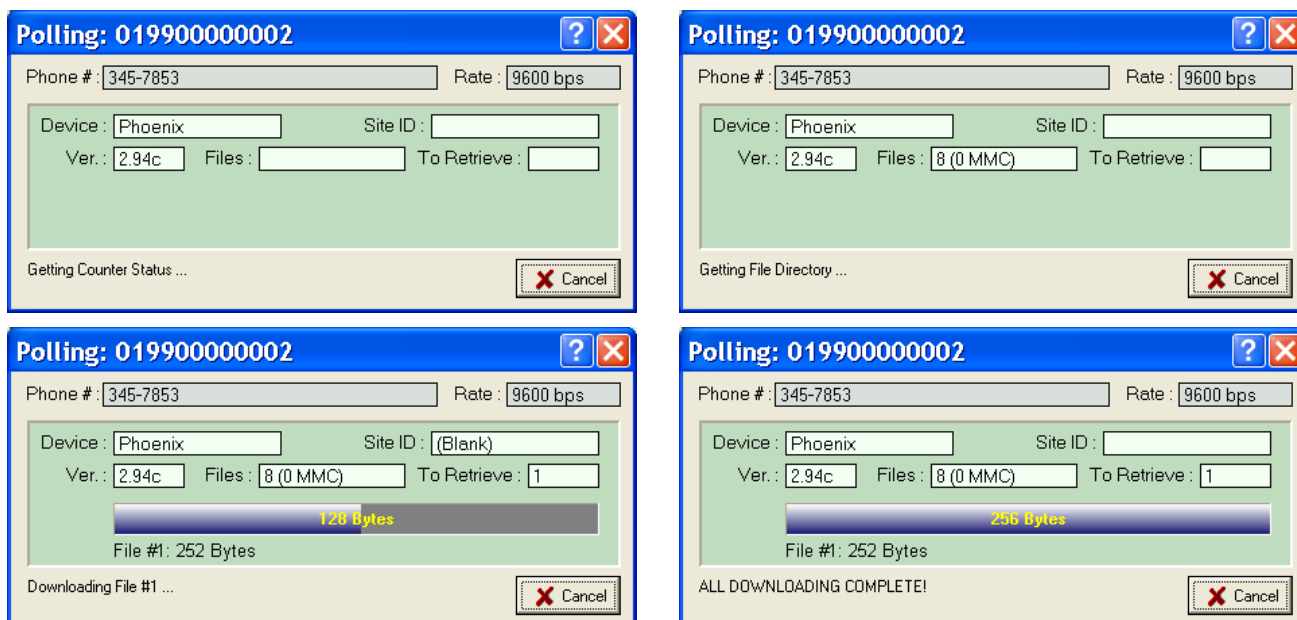
4. While all of the above commands may seem complicated, most users will simply go with CC1 and this will work fine. By default, this will retrieve the unretrieved files in the counter and store them in a standard file name convention in the data download directory. To test out your first site, make sure the Command parameter is set to CC1 and then click ok. Next right click on the site and select **Poll "station" now**. This is the first way any individual site can be polled and the following window should appear:



The software will immediately call the site. Note the yellow box around the site showing which site is being called.

The site itself is also changed to Amber color. This indicates its status is currently unknown. At the end of the poll, it will change to green or red depending on the results.

5. When a connection is made the software will link to the counter and execute the polling commands you specified on the Command line. A series of windows similar to these will appear:



6. In this example the only file retrieved was file #1 and it was successfully downloaded. At the end of this process the site would be changed to Green and the Call Log will list all the activities of the polling system. In addition, data can also be automatically imported into the database at various points (see the advanced section below for more information).
7. Repeat the setup for each of your other sites. This should be simple once the first set is setup, especially if your sites contain similar equipment. When all sites have been configured, review the next section on multi-site polling.

Multi-Site Polling:

There are 5 basic ways to poll data from a site. The first two poll a single site at a time as follows:

- ☐ Call the site (by double clicking on it) and then go into the retrieve files function to download data from the site. This is described in detail in section XII.
- ☐ Setup the polling system, right click on a site, and select Poll Station Now. This is described in the previous section.

The next three methods allow you to poll data from more than one site automatically. These are selected by right clicking on map (anywhere but on a site) and selecting one of these functions:

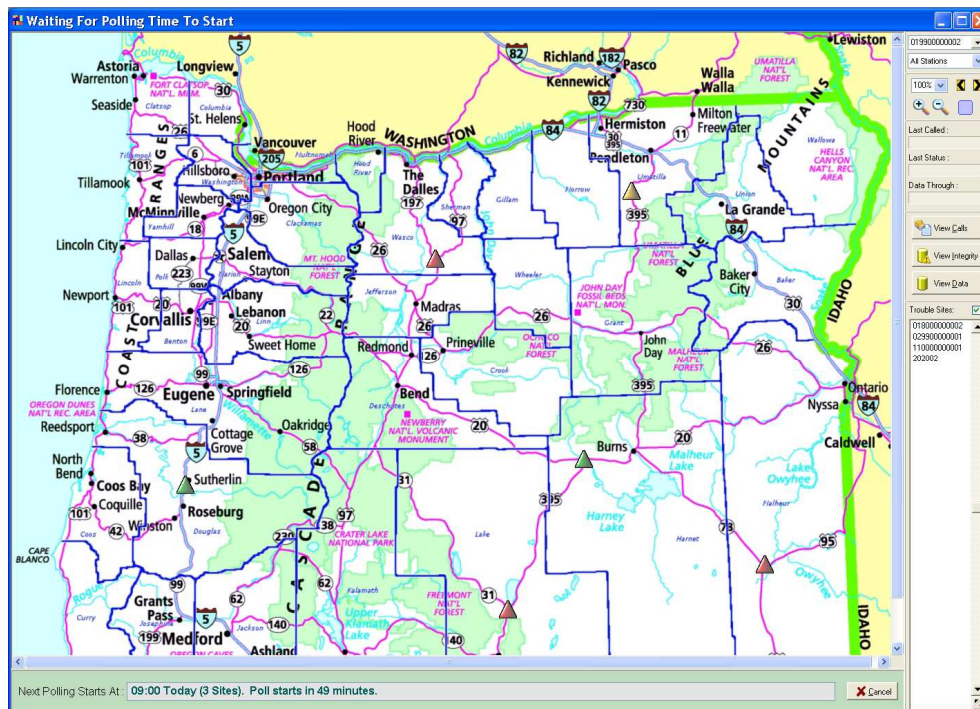


Start Normal Autopolling – This enables the regular autopolling function. The software scans all the sites and determines which sites will be called in which order. Once enabled, the autopolling function is active until you cancel it (or exit the program).

Poll All Stations Now – Starts an immediate poll of every station in the system. If you have currently selected a Zone, then only those stations in the selected zone will be polled.

Poll Trouble Stations Now – Starts an immediate poll of all Amber and Red stations. Like above, if you select a zone then only those stations will be polled.

If you enable the Normal Autopolling system, a panel opens up at the bottom of the map and the screen will look something like the following:

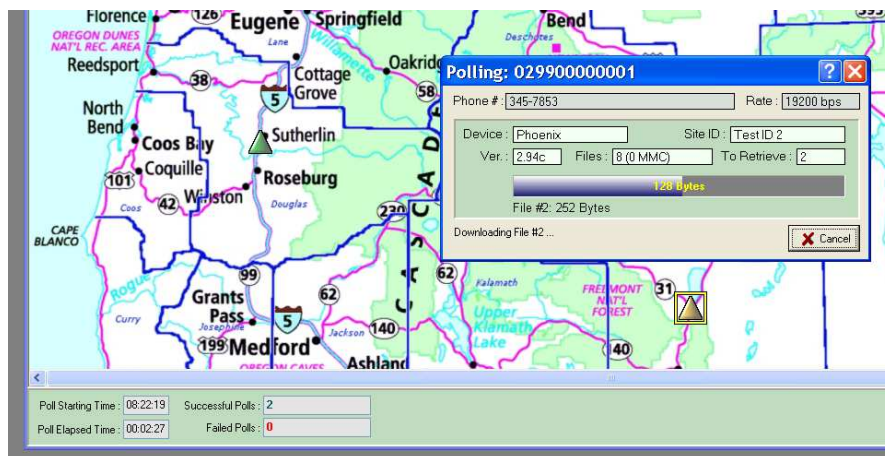


The green panel at the bottom tells you when the next polling will begin and how many sites are in that poll. There is also a time indicated that will count down to the start of the next poll.

The normal autopoller checks all settings and groups sites according to poll times. If two zones have the same poll time, they will be polled together.

This function remains active until you close the map window or click the Cancel button. You can perform all other normal functions while the autopoller is waiting to begin (such as calling other sites, viewing the database, etc).

Once polling begins (either at the specific time or if you have selected Poll All Sites Now or Poll Trouble Sites Now), the panel changes to show the current polling status. A window such as the following will appear:



The yellow highlight box is placed around the site currently being polled.

The poll start time and poll elapsed time is also displayed, along with an indicator of how many sites have been successfully polled vs. how many have failed polling.

When polling is complete, the panel changes to show the results of the poll like this:



In this case, 6 sites were polled. Five polled correctly the first time, one failed each of the three tries made to that site (the "1/1/1" indicates how many failed during each of the three attempts, the "5/0/0" shows that five sites polled correctly the first time and none of the failed sites worked on the second and third attempts).

Click the Cancel button to turn off the results display (and return to the autopoller or the map).

XII.b. Advance Settings

The Telemetry system supports several advanced functions. Each of these is described below.

Zone Selections:

Each station that is part of the Telemetry system can be assigned to a Zone. By default, all stations are left in the Generic or unassigned category, however you can at any time change that in the Edit Site Setup screen.

Assigning a station to a zone has the following affects:

- ☐ The map can be set to display only certain zones. The Zone Select box at the top right of the screen allows you to choose which zones are displayed. When this is changed, only the stations that are part of the selected zone are displayed on the map.
- ☐ When the Zone Select has been changed to display a specific zone, the option to Poll Zone #x Stations now and Poll Zone #x Trouble Stations now becomes available. These functions poll all stations when no zone has been selected.
- ☐ The normal auto polling system allows you to specify a time and day to poll each zone. For example, you could setup Zone #1 to poll Mon, Wed, & Fri and Zone #2 to poll Tue & Thu.

Generally Zones are used by customers with a large number of stations who want to break up their polling so that not all stations are polled at the same time.

SOIP (Serial over Internet Protocol):

Customers are increasingly moving to using an internet link to a traffic data collection device. In most cases a site will have a web address that is used to access the counter. Centurion supports directly linking to these counters without the need of any intervening virtual COM port software.

To use this ability, you must edit the station information as follows:

First set both the **Modem Setup #** and the **Baud Rate** settings to SOIP. This tells the program this is a SOIP based device and does not use a normal dialup modem.

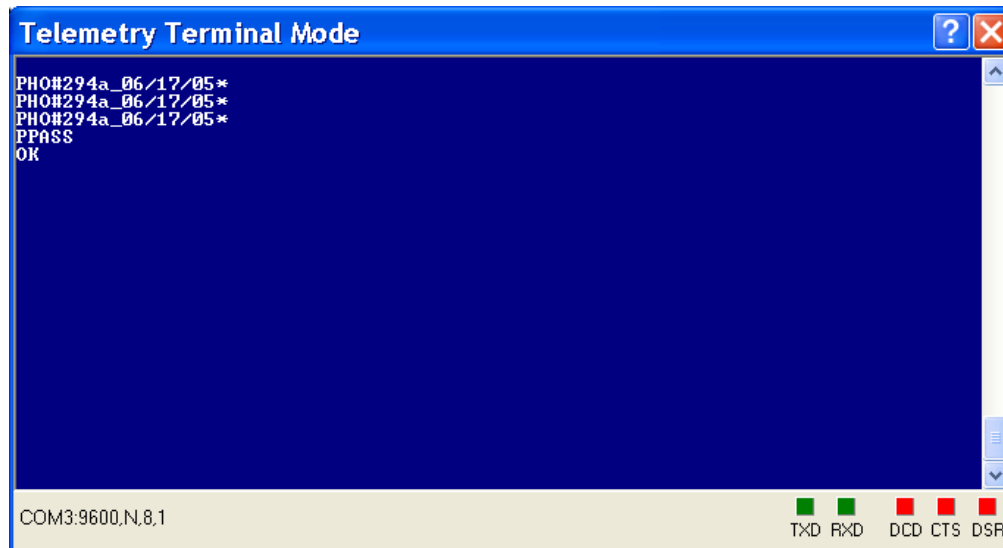
Next set the address of the site followed by an @ character followed by the port number. The address can either be a direct IP address (like 192.168.0.1) or a DNS lookup address as shown here.

The port number is the TCP/IP port to be used to access the counter. In some installations there will be different ports to access different devices.

Once the site has been setup, call it up to test your link. Normally users should be able to easily connect to a site and access its functions.

Call with Terminal:

The call with Terminal command allows you to connect to a site (either standard modem sites or via SOIP) and immediately display a terminal screen. From the terminal screen you can manually enter commands and see the counter or other device response. A typical screen might look like this:



Note: Version 1.31 Build #0003 and later also have a Link To Counter button on this screen which allows you to directly link to the counter after using the terminal.

XII.c. Direct Dial Directory

.New with Centurion V1.31 (Field & Gold) is a Direct Dial Directory function. This function is reached by selecting it from the Telemetry menu or by simply pressing F7 which will display the following:

The screenshot shows a window titled "Direct Call Directory" with a blue header bar. Inside the window is a table with the following data:

Site ID /	Phone or SOIP	Baud	Modem	Link Delay	Time Zone	Multi-Counter	Switch Box
my site 1	1-223-226-1112	9600	#1	3 sec	+ 00		
hwy 58 test site	1-932-411-2221	9600	#1	3 sec	+ 00		
backcountry site	1-122-122-0212	9600	#1	3 sec	+ 00		
hwy 20	1-122-222-3333	9600	#1	3 sec	+ 00		

Below the table is a large empty rectangular area. At the bottom of the window are three buttons: "Cancel All changes" (with a red X icon), "Modem Setup" (with a green person icon), and "Call" (with a green checkmark icon).

From this window you can manually key in any number of sites. The Site ID, Phone Number, and other information is saved in a simple file in the main Centurion directory (named DCD.GRD). Note that if copying this file from one machine to another make sure you exit Centurion completely before copying over this file.

Double clicking on any site will call it. You can insert new sites with the INS key and delete existing sites with the DEL key. The Modem Setup button allows you to configure your various modem parameters.

Note that this list is completely independent of the Centurion-Gold database. Changes in one are not reflected in the other. Because of this it is also available in Centurion-Field.

XII.d. Peek ADR & 241 Polling

Centurion Gold V1.36 Build #0007 and later supports polling data from Peek 241 and ADR counters. This function only works via the map and autopoller, it does not function with a direct connection to a Peek counter. To use it, generally all you must do is put the Peek site on the map just like a Diamond site and then set the *Type* value under the Polling Settings to either **Peek ADR** or **Peek 241**.

Once that is done, you must then setup the Command string for the Peek counter. The available commands are similar, but more limited. You can only retrieve data, not delete it, and the program does not offer as many abilities to determine the status of the counter or the size of files it is downloading.

These are the available commands:

Command	Format	Description
Set to counter ID1 or ID2	AC1 or AC2 ADR1 or ADR2	For sites that have two counters installed (an ID1 and ID2), use this command to indicate the start of the set of commands for the specific ID 1 or 2. You do not need this if only one counter is present (software assumes an ID of 1 when nothing else is specified). Use "ACx" with a 241 site or "ADRx" with an ADR site.
Start binary retrieve of unretrieved data from counter	RBN,<tdpseq>	Starts a binary retrieve of data files into a fixed file name format defined by Peek for binary files. You must specify the TDP sequence # for the site so that you can later post-process the data using Peek software into a PRN file, otherwise Centurion cannot download it (or later import the PRN file). This is the same process TDP users normally did with their binary files, but since the download is coming from Centurion it requires this additional step. Files will be stored in the PRN Binary download directory which is setup in the Communications Preferences dialog.
Retrieve all unretrieved data files into a standard Diamond Binary File (auto convert Peek format to Diamond)	R-2,<fname> or R-1,<fname>	Retrieves all data files from the Peek counter that have not been retrieved before. Will not retrieve the open file (if present). This is the most common command used since it downloads all of the collected data except for the current day. <fname> is the file name the data is to be stored into. If it has a path, files will be stored in the specified path (such as C:\data"), otherwise data is stored into the data download directory. The file name part can be either an actual file name (such as "MYDATA.BIN") or one of the following special names: ?STAN – Standard mode. The file is stored into a file name that is created based upon the Site ID, type of data, and starting time/date of file. This also honors the settings in the setup dialog box. ?SITE – Site ID based name. The Site ID used to create a file name (such as 18000000.BIN). ?NEW – A unique name is generated (one that doesn't already exist in the directory). Centurion tries hard to not overwrite existing files. However, if you specify a specific file name (such as "00123.BIN") you will overwrite any existing, so this is not recommended.

Command	Format	Description
Retrieve all data files	R0,<fname>	Retrieves all data files in counter.
Retrieve single file	Rx,<fname>	Retrieves the specific file #x from the counter.
Retrieve range of files	Rx-y,<fname>	Retrieves a range of files from #x to #y.

Note that because two Peek counters can exist on the same connection, you separate out the set of commands for the first counter (ID1) with the command “AC1” for is 241 counter or “ADR1” for an ADR. Then use “AC2” or “ADR2” to signal the start of the commands for the second counter.

Example #1 – Retrieve the unretrieved files from either a 241 or an ADR in the PRN format with auto-convert to Diamond Binary and use file names that match the standard Centurion naming format for downloaded data files (which is a mixture of the date downloaded, site ID, and date of data):

```
R-1,?STAN
```

Example #2 – Same as above, except with two counters at the site:

```
AC1 R-1,?STAN AC2 R-1,?STAN
```

Example #3 – Same as above, except use Peek Binary Downloading and ADR switching. The first counter is Sequence #16 in the TDP software and the second counter is Sequence #23.

```
ADR1 RBN,16 ADR2 RBN,23
```

Example #4 – Download all the files from a site and store them in a specific directory with a site specific file name:

```
R0,C:\Download\?SITE
```

IMPORTANT NOTE: Some PRN files, both downloaded and on disk, reverse the placement of the Site ID. By default it is the first 12 characters of the first line of the file. However, Indiana DOT and some others have it in the second 12 character. Some Peek counters put it there and use the first twelve characters as either a serial number or general information number.

In the General Preferences dialog, if the “Make PRN INDOT Compatible” checkbox is marked on the *PRN Export* tab, then Centurion uses the second 12 characters as the Site ID on all downloaded PRN files and the first 12 as the Info Line 1.

2ND IMPORTANT NOTE: Centurion also looks to see if the first 8 characters of the first record are all zeros. If they are, then it assumes this is NOT the Site ID and the software will try to find a valid Site ID from the second block of 12 characters. This is independent of the “Make PRN INDOT Compatible” checkbox.

XIII. TSDP (Timestamp Data Processor)

Starting with V1.34, Centurion contains a separate program called TSDP. This program is automatically executed by Centurion whenever the user tries to import “Timestamp” data from a supported traffic counter. When TSDP finishes processing the Timestamp data, Centurion resumes operation and imports the TSDP created records which can include individual vehicle records, bin classification, or simple volume by interval information.

Timestamp data is simply the *very accurate* underlying raw recordings each time a road tube or other sensor activates. For example, the Omega Traffic Counter records the time of every axle that drives over the road tube to the nearest 100,000th of a second. In reality, all traffic counters use timestamp data in some way to create vehicles, classification data, and volume information, but to say you are recording the actual Timestamp data is to indicate that this basic raw timing information is being saved directly to memory for later processing.

Using the Timestamp data TSDP can turn the recorded activations into total volume or individual vehicle records, depending on how the sensors were configured in the roadway. This total volume or vehicle records are then imported into Centurion just like data collected by any traffic counter that does the timestamp processing in the field and stores vehicles, classification, or volume.

So why collect Timestamp data? Why not just use a traffic counter which is smart enough to determine the total volume or individual vehicles in the field? Well, there are several reasons why Timestamp data has caught on with some segments of the traffic counting industry:

- A desktop computer is generally more powerful than a roadside traffic counter. With this additional power and memory it is possible to do some advanced analysis with the timestamp data that is usually beyond the abilities of the traffic counter itself. Typically, you can expect up to a 5% increase in accuracy, especially in cases of urban counts with road tubes stretched across multiple lanes.
- Timestamp data can be easily recalculated. For example, suppose the user accidentally placed the road tubes 5 feet apart instead of 4 feet. With a traditional traffic counter, the data would be highly suspect and contain errors throughout. With Timestamp data, it is a simple matter to just recalculate all of the vehicle records with the new spacing and the data will become instantly correct.
- It is easier to setup in the field. Users simply place the tubes and start recording, TSDP will handle the rest after the data is collected.

There are a few downsides to using Timestamp data. The data files are usually much larger than traditional traffic counter records, and they require more storage space and download time. Timestamp files also have to be post-processed by TSDP before they can be used, which is an extra step required in the office.

With some older or less sophisticated traffic counters, one of the biggest disadvantages of using Timestamp data was that you could not generally tell if the traffic counter was working until after you collected and processed the data. Some counters just had blinking lights or other simple methods to indicate they were functioning, and this often resulted in not getting a good data set because the user couldn't tell in the field if it was setup and functioning correctly.

Fortunately, newer counters such as the **Omega Traffic Counter** from Diamond Traffic Products solves this issue by collecting data in Timestamp format for later flexible processing but also contains all of the necessary intelligence to turn these Timestamps into actual vehicles right on the display of the counter. The Omega also calculates various analysis information such as ADT, average speed, total Trucks / Cars, etc, to give you the best of both worlds. With a counter such as the Omega, its advanced built-in intelligence will display vehicles in real-time to insure that the data is going to be good before the user ever leaves the unit to collect data.

XIV. Loop Only Classification (Loop Class)

Loop Only Vehicle Classification (or simply Loop Class) is an advanced traffic data collection system to record high accuracy Axle Bin Classification data using only inductive loop sensors. In the past, it was necessary to install a Piezo or Road Tube sensor if you wanted to collect Axle Bin Classification data (such as the traditional 13 bin Scheme-F). Some users have also tried using expensive products that require custom loop shapes embedded in the roadway, but Diamond Traffic's Loop Only Class system works specifically with standard loop sizes and shapes that are either already installed or simple to install to produce high accuracy Axle Bin Classification data.

Major features of the Diamond Traffic - Loop Only Classification system:

- ☐ Utilizes an advanced machine learning methodology that teaches itself how to accurately classify vehicles at your particular location, using your loop types, fully taking into account the types of vehicles you collect.
- ☐ Seamlessly integrated with the Diamond Traffic Products Phoenix Traffic Classifier product.
- ☐ Works with standard 6'x6' rectangular loops, 6' circular loops, or virtually any other loop shape.
- ☐ Highly customizable. Users can class to the standard 13 bin Scheme-F, or they can create their own tables and standards that the system will teach itself to work with.
- ☐ Typical accuracy better than 99% across the entire bin range.
- ☐ Shareable Loop Class Table files that allow users across different cities, states, or nationalities to pool their resources and improve their data accuracy.
- ☐ Switching to using Loop Class at a site is as simple as:
 - (a) Update the loop boards in your Phoenix Traffic Counter to support Loop Only Class.
 - (b) Upload the correct Loop Class Table for the site into the loop boards.
 - (c) Change the sensor configuration for each lane:
 From → Loop-Axle-Loop To → LClass Loop-Loop
 - (d) Start Collecting!

Once operational, data output appears exactly as if you were using axle sensors to classify vehicles at site.
- ☐ Advanced functions allow you to directly view Vehicle Signatures, control many aspects of the Loop Class process, and to create your own custom Loop Class Tables from collected vehicle records.

XIV.a. Overview of the Loop Class System

The Loop Class system is made up of the following individual components working together:

V4 Loop Board w/Loop Class Enabled (the “iLoop Board”)

Loop Class is made possible largely through the advanced signal analysis capabilities of the V4 Loop Board. When this board is upgraded to support Loop Only Classification, it is renamed an “iLoop Board”. You must have one or more iLoop Boards in the counter before you can change the lane sensor configuration to a Loop Class mode or to access any of the Loop Class management functions inside the counter. Generally, the first step to switching to using Loop Class is to buy or update a Phoenix Traffic Classifier with iLoop Boards.

Note that the same circuit board that supports Loop Class also is used in non-Loop Class products as a standard loop sensor board. It becomes capable of Loop Class (turns into an “iLoop Board”) only after undergoing several hardware and firmware changes. Contact Diamond Traffic to determine if your existing classifiers are updateable.

Phoenix Traffic Classifier with V4.50 or Higher Firmware

Your Phoenix Classifier main board (the MDK) must be hardware Version 1.20 or later and be running firmware Version 4.50 or later to utilize Loop Class features. V4.50 and higher auto recognizes any installed iLoop Boards, and when detected it allows the operator to enable Loop Class modes as desired (users should check with Diamond Traffic to determine the most current firmware version for Loop Class). This version is also backwards compatible with most other hardware, with the exception of not running on any MDK Board Version < 1.20.

Centurion V1.37 Build #0028 or Later

The main Windows based computer software program that allows you to fully configure, download, and monitor the Phoenix Traffic Classifier with Loop Class enabled. **Centurion-Field/Parks/CC** supports all of the traffic counter specific Loop Class functions, whereas **Centurion-Gold** supports these abilities plus the option for users to create their own Loop Class Tables and work with any advanced Loop Class signatures.

Loop Class Tables

A *Loop Class Table* is a special file that is loaded into each iLoop Board before data collection begins to tell the system how to turn individual vehicle signatures into the correct classification number. Loop Class Tables are a key element in making Loop Class work, and using them correctly is crucial for accurate data collection. Each available Loop Class Table is optimized to provide the highest degree of accuracy for the type of site that the Loop Class system is being used at.

For example, the standard table "HWY99 Full Table (V100).lcl" was created from more than a year's worth of individual vehicle signatures using 6' circular loops that were installed in a rural four lane highway site in Oregon. Loading this table into an iLoop Board running at a similar type of site will result in the greatest accuracy for the Axle Bin Classification values. Customers should use a different table when collecting data from a site that differs significantly, or create their own table for the highest amount of accuracy (more on this later).

Some important features of the Loop Class Tables include:

- ❑ Before collecting data, each iLoop Board should have a Loop Class Table stored in its memory.
- ❑ Loop Class Table's are stored directly on the iLoop Board and are completely independent of other traffic counter settings. Cold Restarting the counter or doing any other function with the main Phoenix firmware does not erase or change them.
- ❑ All tables are split into two sections - *Primary Identification* using 64 bit signature codes (ID64), and *Secondary Identification* using simpler 16 bit signature codes (ID16).
- ❑ The primary section table entries correlate a particular vehicle signature and its length to a specific vehicle class. For example, a table entry might read:

ID64=FFFD56557FFD, Length 8.2'-14.6', Class = #2.

If a vehicle crosses the loops that matches this ID and has a length inside of the specified range, it is assigned in real time to Class #2.
- ❑ If a vehicle is not matched in the primary section (because the ID64 or the length is different from what the table has learned), the secondary identification table is used which normally always generates a best guess class code. Secondary identifications are tagged with the "!" symbol to indicate a lower confidence in the answer, and secondary values are only used when the primary identification fails.
- ❑ Table entries can be simple (as above), or complex where associations between different class values of the same ID code and length are correlated with a percentage based table. Whenever this occurs, the identification is tagged with a "%" symbol. Both primary and secondary identification can get "%" tags.
- ❑ "%" identifiers can result in *individual vehicles* not being classed correctly. However, because the Loop Class Table is built upon many hundreds of thousands of sample vehicles (ideally), "*% values are almost always very accurate over time*". For example, a particular ID64 code with a specific length range may be 99.5% of the time a Class #2, but 0.5% of the time it is a Class #3. The iLoop Board knows this in advance from its learning process and it will distribute vehicles that fall into this range accordingly.
- ❑ iLoop Boards can actually hold more than one table at a time, and you can specify how they are to be used in a variety of ways (priority, site specific, etc).
- ❑ Tables are specific to an Axle Classification scheme. For example, the standard 13 bin Scheme-F is a common source for Axle Bin Classification values. Users are free to specify other schemes and to use anywhere from 1 to 30 different Axle Class Bin values for the classification output.
- ❑ There are standard Loop Class Tables available that are organized by type of site and shape of loop that can be downloaded from Diamond Traffic. The availability of these standard tables will increase as more and more become available. Customers can also share tables between themselves.
- ❑ Creating a new Loop Class Table is a function available to customers in Centurion-Gold, and they can achieve a higher degree of accuracy at their sites by using this feature. The process to create new Loop Class Tables is described in section XIV.a.2. and in XIV.e.

XIV.a.1. Example of switching to Loop Class for a typical 4 Lane Rural Highway site:

The following describes how an average customer might go about updating to using Loop Class at a typical rural highway site with 4 lanes. This example assumes that the standard “HWY99 Full Table (V100).lcl” Loop Class Table is a suitable table for data collection at this site (see the next example for what you can do if this is not the case).

1. Buy or update to a Phoenix Traffic Classifier with the following configuration:
 - Version 4.67 or later firmware.
 - Two iLoop Boards (Loop Class enabled V4 Loop Boards) with V1.54 or later firmware.
2. Insure all of your computers and laptops are running Centurion V1.37 Build #0028 or later.
3. Before traveling to the site, do the following:
 - (a) Run Centurion and connect to the counter.
 - (b) Go into “Set System Configuration” and select “Manage Loop Class Tables”.
 - (c) Check what tables are loaded into the iLoop Boards. You may need to:
 1. Click “Erase All” to clear the memory on the iLoop boards.
 2. Click “Add 1 To All” and then select “HWY99 Full Table (V100).lcl” to load. This is the best table to use for rural highway sites using round loops.
 3. Wait for the upload to finish.
4. Travel to the site and install the counter as you normally would.
5. Turn on the counter, link to it with Centurion, and configure as follows:
 - (a) In “Set System Configuration -> Data Collection Options”, most users will select the “Binned” mode to store data in traditional Axle Classification Binned data format. You can, of course, select “Raw” mode to save individual vehicles, but this is less common and will use a larger amount of memory. Be aware that selecting Raw mode is exactly what you would do if you did not already have a suitable Loop Class Table and you wanted to have the system teach itself how to properly Loop Class vehicles at the site (which is discussed in more detail in the next example).
 - (b) Go to “Start Collecting Data”
 - (c) Enter the Site ID and then turn on lanes 1 through 4.
 - (d) On the “Lane Configuration” page, new options will be available for the “Sensors” configuration. Select LCLs Pres-Pres for each of the 4 lanes.
 - (e) Finish configuration as desired (make sure you set it to store “Axle” bins) and Start Collection.
6. When monitoring vehicles, you will see Axle Class codes being assigned in real time to the vehicles. You may also notice ‘!’ and/or ‘%’ values appearing in front of the Axle Classification number, and these indicate how the class was determined. For example:

```
*6: 19:53:47.51 52.0mph, Length= 7.8', A#1 S#8 L#2
*4: 19:53:49.24 70.7mph, Length= 12.7', A#2 S#12 L#3
*1: 19:53:52.72 83.3mph, Length= 11.0', A#!%3 S#14 L#3
```

The first two vehicles show “A#1” and “A#2”. This indicates that a motorcycle and a car were identified from the primary ID64 table that gave the class for these vehicles using signature and length coding. The third vehicle class shows “A#!%3”, and this means it was put into Class #3 after being tagged with:

- ! : The ID64 signature was new (had not been seen before) or the length was outside the valid range for this ID64 and so the Loop Class board dropped back to using the secondary ID16 signature and table.
- % : This means that the code that was used (the 16 bit code in this case), did not indicate a unique class of vehicle. The system generated the vehicle class based on a percentage table that identifies what the chance is that a vehicle with this length and code is for each valid class.

It is important to understand that any identification with the “!” and/or “%” tag is used only if there is no other better identification available. The counter compares the Loop 1 and Loop 2 Reported Classifications to see which sensor gave the most reliable code, and that is the class used.

7. Let the counter collect data.
8. Download the collected Classification data and import it exactly as you would data that had been collected with an axle sensor installed in the roadway.

XIV.a.2. Example for how to use Loop Class at site that doesn't currently have a suitable Loop Class Table available:

If you want to switch to using Loop Class at a site where either (a) there is no existing Loop Class Table available or (b) you want to try and improve the accuracy of the Loop Class system by customizing a table to your particular site configuration, this example shows you how this is accomplished with the Diamond Loop Class system. Be aware that this is more complicated and time consuming than using an already existing Loop Class Table, but many customers will want or need to do this depending on what sort of site, vehicle patterns, and loop configurations they use.

It is also important to know that this can only be done at a site where you have an existing Piezo or Road tube sensor installed during the initial teaching process. Creating Loop Class Tables is a two step process where you first gather BOTH the traditional axle configuration data from a site using a standard axle sensor and the corresponding loop signature codes. Second, you run the advanced Loop Class Table generation function inside of Centurion to create an accurate new table that correctly classes your vehicles based on what it can learn from the data collected.

Once the new Loop Class Table has been created, you can load it into the iLoop Board at the site it was created from and/or share it with other similar sites that don't have a piezo sensors installed. Making a Loop Class Table is a very useful investment for customers, and it gives them the ability to create accurate classification data across many different sites for years to come.

Follow these steps to create a custom Loop Class Table:

1. Buy or update to a Phoenix Traffic Classifier with the following configuration:
 - Version 4.67 or later firmware.
 - One or more iLoop Boards (Loop Class enabled V4 Loop Boards) with V1.54 or later loop board firmware.
 - A MMC/SD interface with an installed 512MB or larger MMC/SD card.
2. Insure all of you computers and laptops are running Centurion V1.37 Build #0028 or later.
3. You must have at least one computer running **Centurion-Gold** Build #0028 or later. This computer will be used to import all of the Raw (Per-Vehicle) records and to then process them into a Loop Class Table. It should also have at least 2GB of RAM installed (4GB preferred) to handle the processing of vehicles.
4. Before traveling to the site, do the following:
 - i. Run Centurion and connect to the counter.
 - ii. Go into "Set System Configuration" and select "Manage Loop Class Tables".
 - iii. It is not critical what Loop Class Tables are installed in the iLoop Boards before you begin when collecting data for a new table. However, it may be easier to erase all tables before starting to simplify the view (it does not affect table creation either way).
 - iv. If necessary, the MMC/SD should also be erased in preparation for storing the collected data.
5. Travel to the site and install the counter as you normally would.
6. Turn on the counter and configure as follows:
 - i. In "Set System Configuration -> Data Collection Options", set unit to "Raw (Per-Vehicle)".
 - ii. Go to "Start Collecting Data".
 - iii. Enter the Site ID and turn on whichever lanes you want to collect data for.
 - iv. On the "Lane Configuration" page, new options will be available for the "Sensors" configuration. Select "Lcls Pres-Axle-Pres" to turn on BOTH Loop Class identification and traditional Axle Spacing identification. You *must* have a working axle sensor between the two loops in order to collect the type of data that can be used for teaching the system to make a new Loop Class Table.

- v. On the “Type of Data To Collect” screen, set:
 Raw (Per-Vehicle) Mode → Basic Loop Class
 Also set:
 Loop Class Data → Store All Vehicles
 These two settings enable storing the ID64 and ID16 signature information in the file for later processing into a Loop Class Table.

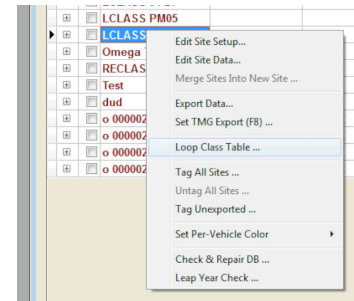
Raw (Per-Vehicle) Mode : Basic Loop Class ▾
 Loop Class Data : Store All Vehicles ▾

7. Begin collection.
 8. When monitoring vehicles, you will notice additional information appears after each vehicle as follows:

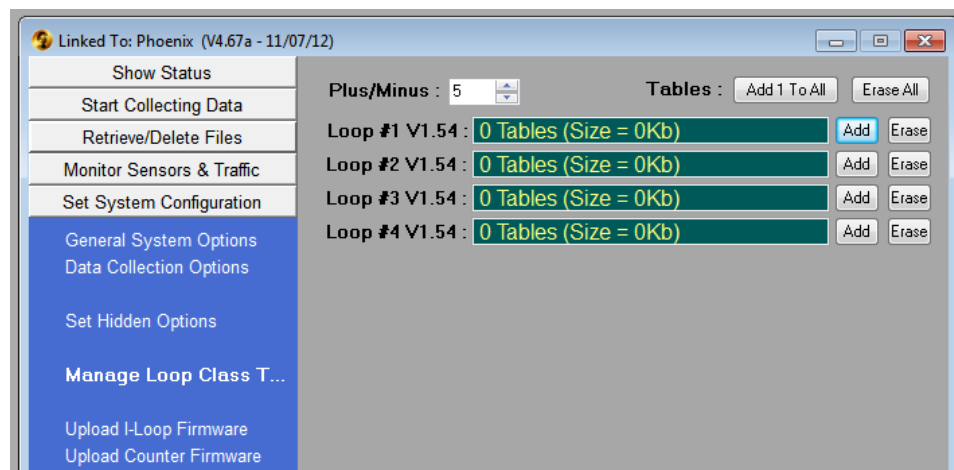
```
*1: 15:33:56.70 76.1mph, Length= 11.0', AM2 S#13 L#3 G#1 H#1
Loop 1 Class #: 2 (ID64=FFFFFFE5555566AA ID16=FD55)
Loop 2 Class #: 123 (ID64=FFFFFFE5555566AA ID16=FD55)
```

The “Loop 1 Class” and “Loop 2 Class” show the signature coding and information from each loop. This data is stored in memory along with all the other relevant data.

9. Let the counter collect data. Ideally, you need about 5,000,000 to 10,000,000 vehicles from a site (or a collection of sites) to create a really good Loop Class Table. The more you collect, the better the table will be.
 10. Download the collected Classification data and import it into Centurion-Gold.
 11. Open the Database and select the “Per-Vehicle/Raw Data” tab.
 12. Right click on either the single site you have collected data from, or tag multiple sites that you have collected from and want to make a merged table, and then select the “Loop Class Table” option to open up the Loop Class Table generator.
 13. Follow the instructions in XIV.e for details on creating a good table for use at your sites from this point.
 14. When the Loop Class Table has been created, follow these simple steps:



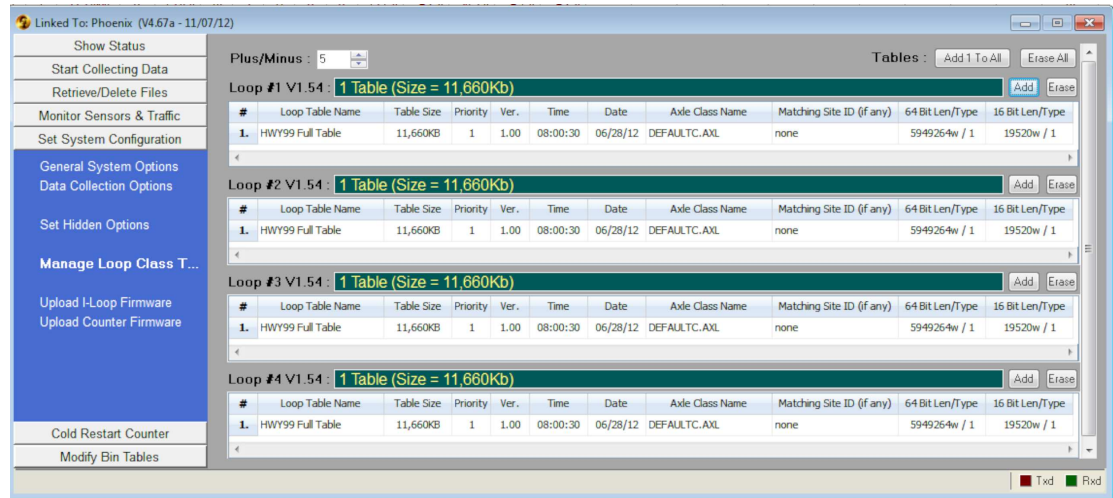
- i. Run Centurion and connect to the counter.
- ii. Go into “Set System Configuration” and select “Manage Loop Class Tables”. If none of your iLoop Boards had a table loaded into them, it should look something like this:



- iii. Click the “Add 1 to All” button and elect the new Loop Class Table you just created.
- iv. The software will load the table to each of the loop boards, in order. During uploading, the current status will display as follows:

Loop #1 V1.54 : Sending (bytes left 11722000) Add Erase

- v. This process may take some time, depending on the size of the Loop Class Table. Since most tables are very large, you can expect anywhere from 10 minutes to several hours to load all the boards with the new Loop Class Table.
- vi. When finished, the screen will change to show each iLoop Board's table status like this:



Note that it is possible to (a) load different Loop Class Tables into each board to allow for sites with varying configurations between the boards, (b) load more than one Loop Class Table into a single board and then configure the priority and when to use the table (see Section XIV.e. for more information).

- vii. Now that the iLoop Boards are ready to go, switch to a Binned storage mode like this:
 - a) Select Data Collection Options and change the Storage mode to Binned.
 - b) Go into Start Collecting.
 - c) Enable "Axle Bins" to be collected.
 - d) Begin data collection.

15. **Finished!**

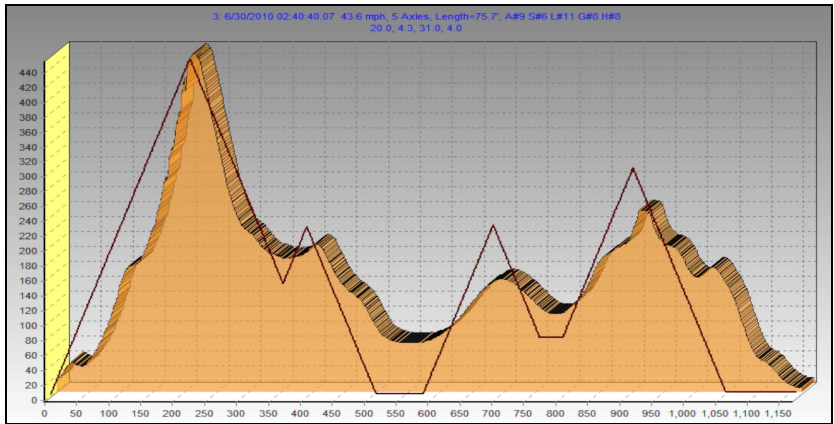
That is the entire process of switching a site that does not have an available Loop Class Table completely over to Loop Only Class.

XIV.b. Loop Board Loop Class Fundamentals

The Phoenix utilizes installed V4 Loop Boards that have been updated to Loop Class functionality to implement most of the operations of the Loop Only Class system. These “iLoop Boards” are designed with high performance ARM processors that can collect and analyze loop sensor information in real time, and then feed back to the main Phoenix board the classification data for each vehicle that crosses the sensors.

The following chart describes some of the basic terms and concepts involved in Loop Class that are helpful for customers to understand when using this system:

<i>Concept</i>	<i>Description</i>
Loop Only Class	The process in which individual vehicles are classified into specific categories such as “Single Trailer Truck”, “Bus”, or “Single-Unit Truck” using only inductive loop sensors. No piezo, road tube, or other axle sensors are used in the process to create the classification once the system has been taught to classify from the loops alone. For most customers, Loop Only Class allows the gathering full Axle Bin Classification data at permanent traffic counter sites without having to install and maintain Piezo sensors.
iLoop Board	A Diamond Traffic V4 Loop Board that has been upgraded to Loop Class capable.
Loop Sensor	An inductive sensor, usually buried in the roadway, that vehicles drive over to trigger a change in the loops magnetic field which is then detected by the electronics. Loops are normally made up of 3-4 turns of overlaid wire that is formed into a square or circle shape, 4’ to 6’ across, with the wires leading back to the cabinet twisted together. A typical inductance reading measured across the loop at the point it enters the cabinet is 80uH-150uH (micro henries), but it can range from 50uH to as much as 750uH.
Axle Sensor	Axle sensors are installed in the roadway to generate a specific signal when the tire of a vehicle strikes them as it drives over. The most common types of axle sensors are Road Tubes (rubber tubes stretched across the road for temporary installations) and Piezo Sensors (crystalline substance in a metal channel permanently embedded in the roadway that outputs a signal when flexed under the weight of the tire). Piezo sensors are the traditional permanent site axle sensor, and most users will be using Loop Class to replace them. Piezo sensors have a much shorter life span than a loop sensor (2-5 years versus 20-25 years).
Scheme (for Classifying)	To identify vehicles as belonging to a particular category or type, the concept of Scheme has been widely implemented in the traffic counting and classifying industry. A Scheme is a description of individual vehicle categories, such as “Bus” or “Car” or “Motorcycle”, which makes up important vehicle type information that is useful for local, State, and Federal roadway management purposes. The mostly widely known scheme is called Scheme-F and it defines 13 categories of vehicles, labeled Class/Bin #1 through Class/Bin #13. In Scheme-F, Class #1 is a motorcycle and Class #13 is a 7 or more axle multi-trailer truck. Most states use Scheme-F, either exactly as it is or with some small changes, and this breakdown of vehicle types is what States use when submitting data to the Federal Highway Administration (FHWA). In addition, the types of vehicles identified by Scheme-F are useful when doing road design to calculate important features such as concrete thickness and the proper type of sub-surface preparation.
Axle Bin Class	The classification of vehicles based on the number of axles and the spacing between them. For example, Scheme-F defines “Single Trailer Trucks” as Class #9, and “Cars” (with or without trailers) as Class #2. Loop Only Class is the process of accurately creating Axle Bin Class values without knowing the actual number and spacing of axles.
Axle Class Table or Axle Bin Table	Table of the total number of vehicles in each Axle Bin Class during a specified time interval (such as hourly). A traffic classifier storing this type of data would be in Binned mode.

Concept	Description
Binned Storage	Saving the Axle Class Tables to memory (instead of individual vehicle records).
Raw Storage	Saving each individual vehicle to memory (instead of just the Axle Class Tables). Raw Storage can optionally include Loop Only Class information to later teach the system how to make a new Loop Class Table for a site.
Real Time Classification	The process of classifying vehicles <i>as they cross the sensors</i> with no delay (or only a short delay of a few seconds, at most). This is the opposite of Post Collection Classification , which classifies vehicles after they have been stored in memory, downloaded to Centurion, and then classified on the computer by running a processing function.
Loop Class Table	<p>A dense, highly detailed, situational dependent analysis table that is created by Centurion from vehicle data collected at a site and then uploaded into the iLoop Board to enable Loop Only Class identification to work. The best Loop Class Tables are generated specifically to work with a fairly narrow type of site setup and are often categorized by:</p> <ul style="list-style-type: none"> - Type of Traffic - Loop Shape - Average Vehicle Speed - Flow of Traffic - Priority/Style - Axle Bin Class Scheme.
Loop Signature	<p>A map of the change in the loop field as a vehicle crosses the sensor and influences the field through changes in inductance caused by the ferrous metal in the vehicle. This sounds complicated, but it simply means that the iLoop Board can create a graph of changes in the loop that are the inverse of the underside of a vehicle as it drives across it. For example, here is a signature of a typical Class #9 truck as it crosses the loop:</p>  <p>As the graph shows, the front the motor and axle generates the strongest change in the magnetic field recorded by the iLoop Board. There is another small peak at the point of the first set of tandem axles, and then less change as the trailer crosses until you near the end of the truck where the final set of tandem axles spike the signal higher again.</p>
ID64	<p>A sixteen digit hexadecimal code assigned to each unique loop signature for use in classification. ID64's are a critical part of the Loop Class system because they allow the iLoop Board to quickly match current signatures to what has been learned in the past. For example, the Class #9 truck above has an ID64 of: Loop 2 ID64 : FFF55D56FD6FD555</p> <p>These numbers are a unique representation of the signature seen from the loop, but broken down into a useable series of numbers for classification purposes.</p>
ID16	<p>Similar to the ID64, the ID16 is a much smaller four digit representation of the unique loop signature collected from the sensor. On the above truck, it is: ID16 : F5F5</p> <p>The ID16 is important because it is used whenever the system cannot find a match for the ID64. Loop Class Tables contain a secondary system where ID16's normally always return a best guess class for a vehicle with that length and code. Although not as accurate as ID64 identification, it is still much better than just classifying based on length alone.</p>
Signature Code	Refers to either or both the ID64 or ID16 code values that are generated by the iLoop Board after collecting all of the data points from the vehicle.

Concept	Description
Self-Learning / Teachable	Indicates that the Loop Class system is not a static, one identification fits all, model. It is a dynamic product that can learn how to make each customers situation fit ideally.
Loop Reported Class	<p>The classification number, with “!” or “%” tags if appropriate, that comes from a single loop analysis and then is <i>reported</i> to the main Phoenix motherboard from the iLoop Board. Note that the Loop Reported Class will be zero (“0”) if no Loop Class Table has been loaded in the iLoop Board.</p> <p>It is important to know that each loop sensor will have its own Loop Reported Class that may not match each other (depending on many factors). The Loop Reported Class is not the same as the Vehicle Class until the Phoenix motherboard compares the two values (one from each loop) and determines which one is most likely to be correct. At that point, the best Loop Reported Class becomes the final Vehicle Class.</p>
Basic Loop Class & Advanced Loop Class	<p>There are two methods of Raw (Per-Vehicle) storage for Loop Class data – Basic and Advanced. When generating your own Loop Class Tables, users normally use the Basic mode as it contains everything necessary to create new tables. However, there is also an Advanced mode which stores much more information including the entire vehicle signature as it was collected by the iLoop Board.</p> <p>Basic Loop Class:</p> <p>Collects and stores all of the standard vehicle information that is normally part of Raw (Per-Vehicle) mode. This includes Lane, Time, Speed, and Length data along with # of Axles and Axle Spacings (when an axle sensor is part of the configuration, such as with LCLs Loop-Axle-Loop mode).</p> <p>Basic also stores for both Loop 1 and Loop 2:</p> <ul style="list-style-type: none"> - ID64 & ID16 - Loop Reported Class (zero if no Loop Class Table loaded). <p>This data plus the vehicle length is matched up against the Axle Bin Class that comes from the number of axles and axle spacing to generate a new Loop Class Table.</p> <p>Advanced Loop Class:</p> <p>Stores everything that Basic stores, and also includes the following for each loop:</p> <ul style="list-style-type: none"> - Complete point-by-point record of the entire signature. - Total number of samples. - Total change induced onto the loop field. <p>Collecting Advanced Loop Class allows you to map out the complete signature from any vehicle using Centurion to plot a graph of the collected data. However, Advanced Loop Class data is <u>very memory intensive</u> and the traffic classifier is limited to how much of this data can be handled at any given time. It is relatively easy to swamp the system and cause it to miss new vehicles as it attempts to gather and store all of the signature data for previous vehicles. Because of this limitation, it is recommended that Advanced Loop Class data be used only when one or two lanes are enabled (depending on traffic flow).</p>
Store All Vehicles & Store Unknowns	<p>When collecting Basic or Advanced Loop Class data, you can choose to store Loop Class data for all vehicles that cross the sensors or just the vehicles that qualify as “unknown” (a vehicle that results in an ID64 that has never been seen before).</p> <p>Storing unknowns can be helpful when searching out new or unique ID codes. Generally speaking, though, you will want to store <u>All Vehicles</u> when collecting data for a new Loop Class Table generation so that the weighting of particular codes for specific classes can be done accurately.</p>

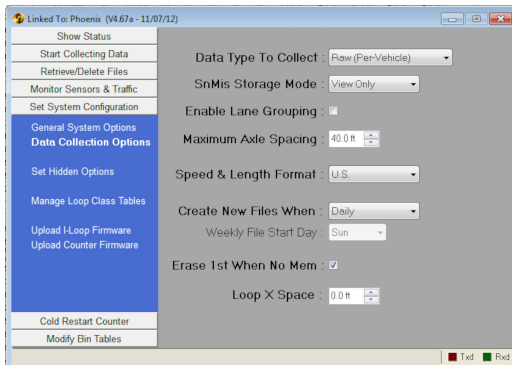
Concept	Description
<p>Axle Spacing Classification</p>	<p>The traditional method of performing Axle Bin Classification where an axle sensor is part of the lane configuration (such as with Loop-Axle-Loop) so that the counter can determine for each vehicle the <u># of Axles & Spacing between each Axle</u>. Using this data, the type of vehicle can be determined by using a definition table which describes the number of axles and the allowable spacing between each axle for a vehicle to qualify for each bin category. For example, in Scheme-F Class #1 is Motorcycle. The Phoenix default Axle Spacing Classification definition file defines this as:</p> <pre>Def #1: Class #1 (Motorcycle) - 2 or 3 axles Axle Spacing 1-2 must be from 1'-5.8' Axle Spacing 2-3 can be anything (as long as 1-2 matches).</pre> <p>Any vehicle meeting the above requirements will be classified as a Class #1 – Motorcycle. Vehicles not meeting the requirements are subjected to other definitions until the vehicle type is determined. It is usually best to have the very last definition collect all the vehicles that fell through the cracks (by saying 2-16 axles, any spacing is ok) and optionally assign them to a category like "Bin #14 - Unclassified".</p>
<p>Loop Class Accuracy</p>	<p>When describing the accuracy of the Loop Class system, there are several factors that should be considered whenever trying to answer this question:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Combined Accuracy – Compares the total number of vehicles in the entire collection period that were put into each bin category from: <ul style="list-style-type: none"> (a) The Loop Class system (b) The traditional Axle Spacing Classification system <p>This is your Combined Accuracy of the system, and Loop Class can usually easily achieve greater than 99% on this kind of a measurement.</p> <input type="checkbox"/> Individual Accuracy – Looks at each individual vehicle and only counts as accurate those records where the Loop Class system and the Axle Spacing Classification generated the exact same class value for the vehicle. The Individual Accuracy is what you would see if you were standing at the roadside and comparing the vehicles that cross the sensors to the counter output in real time. Because some kinds of vehicles, especially Cars and Pickups, tend to have similar ID codes and be of similar lengths, Loop Class does not do as well with them on an individual basis. Individual Accuracy of 80%-90% is typical for Class #2 and Class #3 when doing a Scheme-F style of binning. <p>If you were watching vehicles while physically at the site, you could expect that 1 out of 10 Cars would come up as Class #3 (instead of 2) and 1 out of 5 Pickups would come up as Class #2 (instead of 3). The good news is that (a) it is generally only Classes 2 and 3 (with doing Scheme-F) that show this kind of issue, (b) these classes tend to only be confused with each other not with other classes, (c) Class 2 and 3 are often lumped together as passenger vehicles by customers anyway, and (d) the "%" tag used on these kinds of vehicles insures that over time the correct ratio of each type is maintained ("% ratios are also highly specific to each length range and specific ID64/16 coding). However, while at the site watching vehicles live it may seem like there is a bigger problem than actually exists.</p> <p>It is important to realize that Individual Accuracy for other classes is generally much higher - 98% or more is typical with a good Loop Class Table loaded.</p> <input type="checkbox"/> Total Combined Accuracy – A sum of the total number of vehicles in each bin from the Loop Class generated values compared to the sum of the total number of vehicles in each bin from Axle Spacing Classification. Loop Class usually results in a 100% accuracy with this kind of measurement, but that is not very useful because the Car/Pickup quantity tends to drown out all other measurements of the system accuracy.

The following settings affect how the signatures are collected and coded, and should be modified only with extreme caution. Changing any of these values will likely result in changing the ID64 and ID16 codes reported for a vehicle, and this can dramatically alter how well a particular Loop Class Table does which was generated from data that used the default or different settings.

<i>Concept</i>	<i>Description</i>
Detect	The amount of change in the loop field to trigger the start of a new vehicle. By default it is set to "12", and it should only be changed if false loop triggers are commonly seen after eliminating all potential sources of cross talk.
Dropout	Similar to Detect, dropout sets the amount of change in the loop field to indicate that the vehicle has left the loop and the vehicle should be ended. It is set to "2" by default. Increasing it will trim off the trailing end of vehicles (which will change the ID64/ID16 values), and may result in dropping out high bed truck trailers or other similar vehicle types. Decreasing it (to "1", as low as it can go) could cause the loop sensor to stick on and not properly end vehicles.
Sample Rate	Sets how fast the iLoop board samples the changing loop field to detect a vehicle. By default, it is set to 1000 times per second (hertz). Sample rate is always a trade off. The faster the rate, the better the accuracy for Speed and Length calculations. However, a faster rate also decreases the time spent measuring the loop signal, so it reduces the sensitivity of detection. 1000 hertz is a balanced setting.
Plus/Minus Value	The amount of change in the loop signal, either positive (plus) or negative (minus), that should be still considered a "flatline" when generating the ID64 and ID16 coding values. This is a very important value that dramatically affects signature codes, and changing it from the default of "5" should only be done if you also plan on creating all new Loop Class Tables starting from scratch at your locations.

XIV.c. Loop Class Traffic Counter Setup & Monitoring with Centurion

Centurion provides for the complete setup, monitoring, downloading, and processing of Loop Class data and Loop Class Tables. At this time, the older TrafMan software does not support the majority of the Loop Class protocol, nor is there any plan to include it. For most users, switching to Loop Class will require using Centurion and will involve using these new functions:

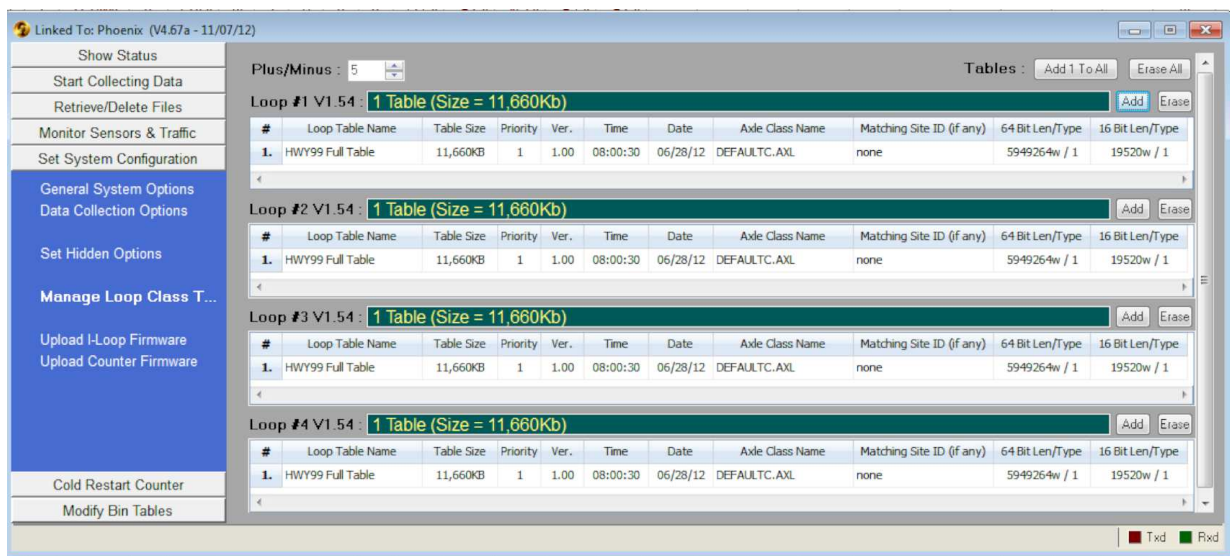


After linking to the counter, go to the “Set System Configuration” tab. Here you will see a new option:

Manage Loop Class Tables

If this new option appears, you can be sure that your Phoenix Traffic Classifier contains one or more iLoop Boards.

Click on the new option, Manage Loop Class Tables. This setting page controls all aspects of managing the Loop Class Tables that are loaded into all the iLoop Boards in the counter:



In this example, you have a counter with four (4) iLoop Boards, all are firmware version 1.54, and each of them has one Loop Class Table named “HWY99 Full Table” loaded into it. By clicking the “Add 1 To All”, “Erase All”, and the individual boards “Add” and “Erase” buttons, you can clear and load additional tables to each of the iLoop Boards as your site requires.

Several other table entries are important to be aware of:

Loop Table Name	The identifying name of the Loop Class Table. This is the primary method by which tables are identified inside of counters, so it is important when making new Loop Class Tables that it is a unique name that identifies the type of site the table can be used with.
Table Size	Amount of memory used up by the table. Each iLoop Board contains 64MB of memory, and can contain up to 16 separate Loop Class Tables.

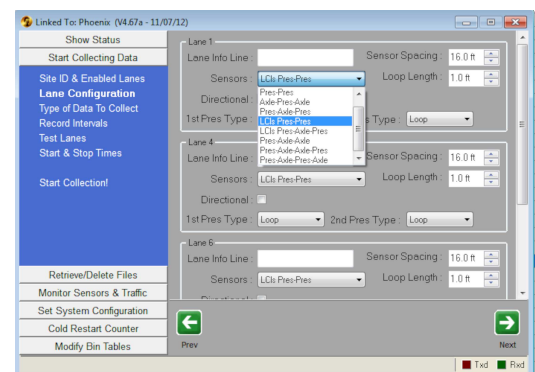
Priority	<p>The priority setting for this Loop Class Table. Priority is used when you load more than one table in memory. The Table with the highest priority is checked first and, if it fails to identify the vehicle, the next table is jumped to. This allows users to setup a base table with a lower priority that is used only after a highly specific table fails to identify the site. For example:</p> <ul style="list-style-type: none"> You create a Loop Class Table called “Base Identification” which always returns a classification code and you assign it a priority level of “2”. Table “Base Identification” is loaded into every one of your Loop Class counters. You then do some Basic Loop Class Data collection at a wide variety of sites, perhaps even from every site, for a one month period. From your individual one month datasets, you create highly specific tables for each of Loop Class site. You assign these tables a priority of “1”, and then load them individually into the specific counter you created them for. Because you have two tables in memory, the iLoop Board will check the priority setting and run them in the lowest to highest priority order. If the highly custom table fails to identify, then the second priority table activates and it ALWAYS returns a valid class code.
Ver & Time/Date	The Version Number (user entered) for the table and the Time/Date (software set) the table was created. This is very helpful to identify Loop Class Tables that have been updated over time to new releases.
Axle Class Name	The file name of the Axle Class Bin definition file used to teach the system what classes belong to what ID codes. DEFAULTC.AXL is the standard Scheme-F table, but any class table can be used that has been created with the Modify Bin Tables function.
Matching Site ID	If a value is entered here, it represents the exact Site ID which must be programmed into the counter before a particular Loop Class Table will activate. This is useful to pre-load multiple Loop Class Tables into an iLoop Board that only activate based on the site ID the user enters in Starting Collecting.

After the Loop Class Tables have been loaded into the iLoop Boards (or if you are collecting Per-Vehicle data for creating a custom Loop Class Table), users can move on to starting data collection. As described in the overview examples, operators normally collect either straight Binned data with Loop Class enabled lanes, or they collect Raw data to be used for later Loop Class Table generation. Some users may even collect Per-Vehicle data all the time.

Either way, during the Start Collection Lane Configuration page, the following new sensor configurations are shown when an iLoop enabled board is available:

When in Binned storage mode, you almost always will want to have a good Loop Class Table loaded and then select LCLs Pres-Pres mode.

In Raw data collection, select LCLs Pres-Pres if you already have a good Loop Class Table loaded into the iLoop Boards (or you expect to get one from another source later on and want to be able to class the data then). Or you can select LCLs Pres-Axle-Pres if you have a working axle sensor as part of this lane setup and you want to store both the Axle sensor derived data (# of Axles and Axle Spacing) along with the Loop Class Data.



When monitoring data and also in Raw storage mode, any lane with **LCLs** as part of its sensor configuration will report the Loop Class info like this:

```
*1: 15:33:56.70 76.1mph, Length= 11.0', AW2 S#13 L#3 G#1 H#1
Loop 1 Class #: 2 (ID64=FFFFFFE5555566AA ID16=FD55)
Loop 2 Class #: 123 (ID64=FFFFFFE5555566AA ID16=FD55)
```

Advanced iLoop Board Functions from Centurion:

You can verify which installed loop boards are iLoop configured by these simple steps:

1. From Show Status, select Print Current Setup
2. Look at the top of the report in the “Hardware Configuration” section. It will list the loop boards installed by number. If the symbol in front of the number is an asterisk (*), then it is an iLoop Board. If it is a pound sign (#), then it is a regular non-Loop Class board.

Hardware Configuration	
Loop Boards Installed: *1,*2,*3,*4	Passwords Enabled: Yes
I/O Board Used: MDK	Current Password: PASS
Language: English	Multi-Counter ID (Slave/Master): Disabled
High Speed Download: Yes	Modem Rate: 19200 Modem Init: ATX1&C1&D2
Piezo V4 HW Version: 4.00	FW Version: 1.22

Indicates all four loop boards are iLoop boards.

It is also possible to directly talk to any individual iLoop Board bypassing the normal Centurion processing of commands/enquires. This is called “Loop Pass Through”, and it is accessed by following these steps:

1. In Centurion, close the counter link window and click Stop Connection.
2. On the Telemetry menu, select Open Terminal Window.
3. Select the COM port your counter is connected to, and leave the baud at 19200.
4. Press Ctrl+E to get a response. You should get something like:
PHO#467a_11/07/12*
5. The trailing “*” indicates that a password is required, type:
PPASS
And press the <Enter> key. You should get an “OK” back.
6. Type in “A02” for Loop Board #1, “A03” for Loop Board #2, “A04” for Loop Board #3, or “A05” for Loop Board #4 and press the <Enter> key.
7. It should report starting the pass through mode. When it finishes, press Ctrl+E again. You should see:
LCL#154a 05/14/12
This indicates you are talking directly to the iLoop Board.
8. At this point you can send commands to the Loop Class board directly. Whenever you want to quit and return to talking to the main Phoenix, press Ctrl+A or Ctrl+C.
9. There are too many iLoop Board commands to list them all here, but a handy one is “FM” that returns the status of the Flash Memory. Contact Diamond for more information on direct iLoop Board communication.

This shows an example of using this advanced function to talk directly to the iLoop Board:

```
PHO#467a_11/07/12*
PPASS
OK
A02
Starting Loop 1 Pass Through .. OK!

-----
Pass Through Mode Enabled
(Ctrl+E for loop sign-on, Ctrl+C to exit)
-----

LCL#154a 05/14/12
>FM
32Mx16 Flash Installed (17% Used):
  Tables = 1
    1 - Site ID : ""
        Loop/Axle: "HWY99 Full Table (V100).lcl" / "DEFAULTC.AXL"
        Len / Loc: 5830KW @ 0x010000W (64=5949264W/V1,16=19520W/V1)
        Version : 1.00 (08:00:30 on 06/28/12)
        Active : 0 Priority: 1 Using: 0
>
```


XIV.d. Centurion Management of Loop Class Data

Centurion contains many features and functions to allow you to utilize your collected Loop Class data. All of these tools are designed to be simple to use, yet also offer powerful functionality to maximize the benefit of using Loop Class data. The previous section (XIV.c) describes how to manage the link to the traffic counter for collecting Loop Class, while this section details out the database aspects of working with Loop Class data.

XIV.d.1. Importing

Loop Class data comes in two forms – **Axle Binned Classification** and **Per-Vehicle (Raw)**. The Axle Binned Classification data that is created from Loop Class enabled counters is virtually identical in every way to any other kind of Axle Bin Classification data that is collected using traditional axle sensors (Piezo's or Road Tubes). Users will likely not need to alter their process for using Axle Bin Class data that comes from Loop Class counters, and all Centurion reports, editing, and exports work in essentially the same way.

Per-Vehicle Data, however, is significantly different when Loop Class is enabled. Basic Loop Class data imports the ID64, ID16, and Loop Reported Class values. Advanced Loop Class data stores this plus each loop's # of Samples, Total Change, and a complete point-by-point record of the change over time that the vehicle induced in the loop field.

XIV.d.2. Viewing & Editing

Because Loop Class data affects primarily the Per-Vehicle database, the majority of functions related to working with Loop Class information are accessible from the “Per Vehicle/Raw Data” tab of the database editor. To work directly with Loop Class information that has been imported, go into the Database and select the “Per Vehicle/Raw Data” tab. Double click a site that has collected Loop Class data (either Basic or Advanced) to call up the data editor. You will see some new fields at the right of each vehicle, and the entire field look something like this:

Site Data: LC1AS5-04-21																																						
Date	Time	Lane	Speed	Axes	Length	A Bin	S Bin	L Bin	G Bin	H Bin	4.0	2.3	3.4	4.5	5.6	6.7	7.8	8.9	9.0	10-11	11-12	12-13	14-15	15-16	LRF Class	ID04	ID05	Samplers	Change	LRF Class	ID04	ID05	Samplers	Change	S.V.M.	Other		
04/21/21	16:29:55.61	4	49.2 mph	2	16.8 m	2	7	4	8	8	0.4															0	FFFFF465555555	F055	0	FFFF46555555555	F055	0	FFFF46555555555	F055	0	FFFF46555555555	F055	(Memo)
04/21/21	16:29:57.66	3	50.6 mph	5	76.9 m	9	8	11	8	1.0	4.4															0	FFTC005604F7055	F075	0	FFTC005604F7055	F075	0	FFTC005604F7055	F075	0	FFTC005604F7055	F075	(Memo)
04/21/21	16:30:00.47	4	61.1 mph	2	19.0 m	2	10	4	7	6	0.0															0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	(Memo)
04/21/21	16:30:39.43	4	50.1 mph	2	38.0 m	5	8	7	6	8	21.2															0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	(Memo)
04/21/21	16:30:56.05	3	47.5 mph	2	18.5 m	2	7	4	8	0.1																0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	(Memo)
04/21/21	16:31:13.07	3	45.7 mph	4	43.8 m	3	7	8	4	14.4	15.2															0	FFFB5575F75F755	F055	0	FFFB5575F75F755	F055	0	FFFB5575F75F755	F055	0	FFFB5575F75F755	F055	(Memo)
04/21/21	16:32:20.30	4	57.3 mph	2	22.5 m	2	9	5	8	0.4																0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	(Memo)
04/21/21	16:34:18.47	4	51.3 mph	2	19.7 m	2	8	4	7	6	0.0															0	FFFFF7555555556	F055	0	FFFFF7555555556	F055	0	FFFFF7555555556	F055	0	FFFFF7555555556	F055	(Memo)
04/21/21	16:35:15.68	4	51.3 mph	2	19.8 m	2	7	4	8	0.4																0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	0	FFFFFDF4F555555	F055	(Memo)
04/21/21	16:35:37.10	4	49.0 mph	2	18.5 m	2	7	4	1	1	7.8															0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	0	FFFFF55555555555	F055	(Memo)
04/21/21	16:36:53.00	3	62.0 mph	2	19.2 m	2	10	4	8	0	7.5															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:37:49.78	4	61.1 mph	2	21.8 m	2	10	5	8	0	7.9															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:37:59.97	3	41.3 mph	2	17.4 m	2	8	4	7	8.4																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:38:07.48	4	50.3 mph	2	17.4 m	2	8	4	2	2	8.7															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:38:40.00	4	57.0 mph	2	73.6 m	2	9	11	6	6	7.5															0	EDFF557D7FD7055	F075	0	EDFF557D7FD7055	F075	0	EDFF557D7FD7055	F075	0	EDFF557D7FD7055	F075	(Memo)
04/21/21	16:39:17.53	3	39.6 mph	2	29.1 m	2	9	7	7	17.6	4.3															0	FFFFF557F755555	F075	0	FFFFF557F755555	F075	0	FFFFF557F755555	F075	0	FFFFF557F755555	F075	(Memo)
04/21/21	16:39:40.52	3	47.7 mph	3	33.0 m	3	7	7	5	11.8	15.2															0	FFFFF5567F75555	F075	0	FFFFF5567F75555	F075	0	FFFFF5567F75555	F075	0	FFFFF5567F75555	F075	(Memo)
04/21/21	16:39:55.93	4	62.6 mph	2	17.5 m	2	10	4	7	7	0.5															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:40:15.93	4	49.0 mph	5	74.6 m	9	7	11	6	6	17.5	4.3														0	F157575757D7055	D075	0	F157575757D7055	D075	0	F157575757D7055	D075	0	F157575757D7055	D075	(Memo)
04/21/21	16:41:01.32	3	52.4 mph	2	16.7 m	2	4	6	6	8.3																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:41:27.17	4	80.2 mph	2	20.0 m	2	14	5	7	8.4																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:42:11.34	3	48.5 mph	2	20.7 m	3	7	5	7	11.1																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:42:29.07	4	53.3 mph	2	19.7 m	2	8	4	7	7.7																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:42:38.00	3	55.5 mph	2	18.0 m	2	9	4	5	5.8																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:42:40.29	3	52.6 mph	5	76.9 m	9	8	11	2	2	16.0	4.3														0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	(Memo)
04/21/21	16:44:10.26	3	45.4 mph	4	49.5 m	3	7	8	7	10.8	14.0															0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	(Memo)
04/21/21	16:45:12.94	3	50.1 mph	2	18.6 m	2	8	4	7	7	9.9															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:45:23.37	4	49.4 mph	2	19.9 m	2	8	4	8	7.6																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:45:27.99	4	49.4 mph	2	23.2 m	3	7	5	3	13.4																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:46:29.47	3	53.3 mph	8	95.5 m	13	8	13	7	17.2	4.4															0	FFFFF555F755555	D075	0	FFFFF555F755555	D075	0	FFFFF555F755555	D075	0	FFFFF555F755555	D075	(Memo)
04/21/21	16:47:12.61	3	52.2 mph	2	23.4 m	3	5	6	6	14.4																0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	0	FFFFF555F755555	F055	(Memo)
04/21/21	16:48:45.02	3	51.1 mph	2	18.5 m	2	7	4	7	9.3																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:52:58.89	4	47.7 mph	2	17.4 m	2	7	4	8	0.3																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:53:02.37	4	49.4 mph	2	23.3 m	2	7	5	2	8.6																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:53:07.89	3	44.2 mph	2	17.7 m	2	8	4	8	0.3																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:53:27.58	3	51.5 mph	5	65.0 m	9	8	10	4	16.1	4.4															0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	0	FFFD505607D7055	F075	(Memo)
04/21/21	16:54:41.95	3	53.3 mph	3	38.5 m	2	8	7	7	10.0	10.0															0	FFFFF555F7D0555	F055	0	FFFFF555F7D0555	F055	0	FFFFF555F7D0555	F055	0	FFFFF555F7D0555	F055	(Memo)
04/21/21	16:54:49.95	3	42.0 mph	5	79.3 m	9	6	11	2	2	19.7	4.3														0	FFFD0556A0F7055	F075	0	FFFD0556A0F7055	F075	0	FFFD0556A0F7055	F075	0	FFFD0556A0F7055	F075	(Memo)
04/21/21	16:57:21.15	4	45.1 mph	2	18.6 m	2	8	4	8	0.0																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:57:24.49	4	49.5 mph	2	19.8 m	2	7	4	1	1	9.9															0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)
04/21/21	16:57:48.10	4	44.7 mph	2	19.6 m	2	6	4	8	7.8																0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	0	FFFFF7D555555555	F055	(Memo)</

The first columns (“Date” to “15-16”) are standard information. The columns after this are new, with Loop #1 first followed by data from Loop #2. “L#1/2 Class” is the Loop Reported Class value for the vehicle, followed by the “ID64” and “ID16” values.

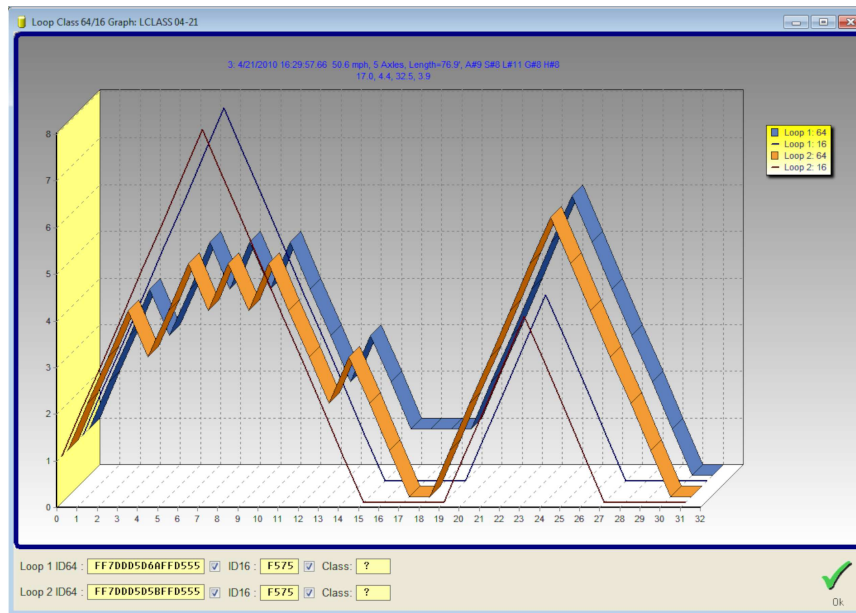
L#1 Class	ID64	ID16	Samples	Change	L#2 Class	ID64	ID16	Samples	Change	S.V.M.	Other	
0	FFFFFEA565555555	FD55			0	FFFFFA9655555555	FD55			(Memo)		
0	FF7DD05D6AFFD555	F575			0	FF7DD05D5BFFD555	F575			(Memo)		
0	FFFFFDF055555555	FD55			0	FFFFFDF055555555	FD55			(Memo)		
0	FFFD556FEA555555	F5D5			0	FFFD556FE7555555	F5D5			(Memo)		
0	FFFFF55555555555	FD55			0	FFFFF55555555555	FD55			(Memo)		
0	FF8F76676557676	FD65			0	FF8F766565576D65	FD65			(Memo)		

When in Basic Loop Class, the “Samples”, “Change”, and “Other” columns will be blank. However, even with just collecting Basic Loop Class data (as shown above), users can still display a graph of the vehicle.

Right click on any record and select “Loop Class 64/16 Graph”. This opens a new window with a graph of the current vehicle signature created from the ID64 and ID16 codes.

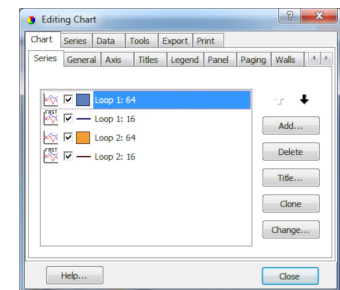
(Notice that “Loop Class Detail Graph” is grayed out – that’s because this is Basic and not Advanced Loop Class data).

Date	Time	Lane	Speed	Axes	Length	A Bin	S Bin	L Bin	G Bin	H Bin	1-2	2-3	3-4	4-5	5-6	6-7
04/21/10	16:29:57.66	3	50.6 mph	2	16.6 ft	2	7	4	8	8	8.4 ft					
04/21/10	16:30:08.47	4	61.1 mph	2	19.7 ft	2	10	4	7							
04/21/10	16:30:39.43	3	50.1 mph	2	38.0 ft	5	8	7	6							
04/21/10	16:30:56.05	3	47.5 mph	2	18.5 ft	2	7	4	4							
04/21/10	16:31:13.07	3	45.7 mph	4	43.6 ft	3	7	8	4							
04/21/10	16:32:20.20	4	57.6 mph	2	22.5 ft	2	9	5	8							
04/21/10	16:34:10.47	4	51.3 mph	2	19.7 ft	2	8	4	7							
04/21/10	16:35:35.68	4	51.3 mph	2	18.5 ft	2	8	4	7							
04/21/10	16:35:37.10	4	49.9 mph	2	18.5 ft	2	7	4	1							
04/21/10	16:36:53.00	3	62.9 mph	2	18.2 ft	2	10	4	8							
04/21/10	16:37:49.78	4	61.9 mph	2	21.9 ft	2	10	5	8	8	7.9 ft					

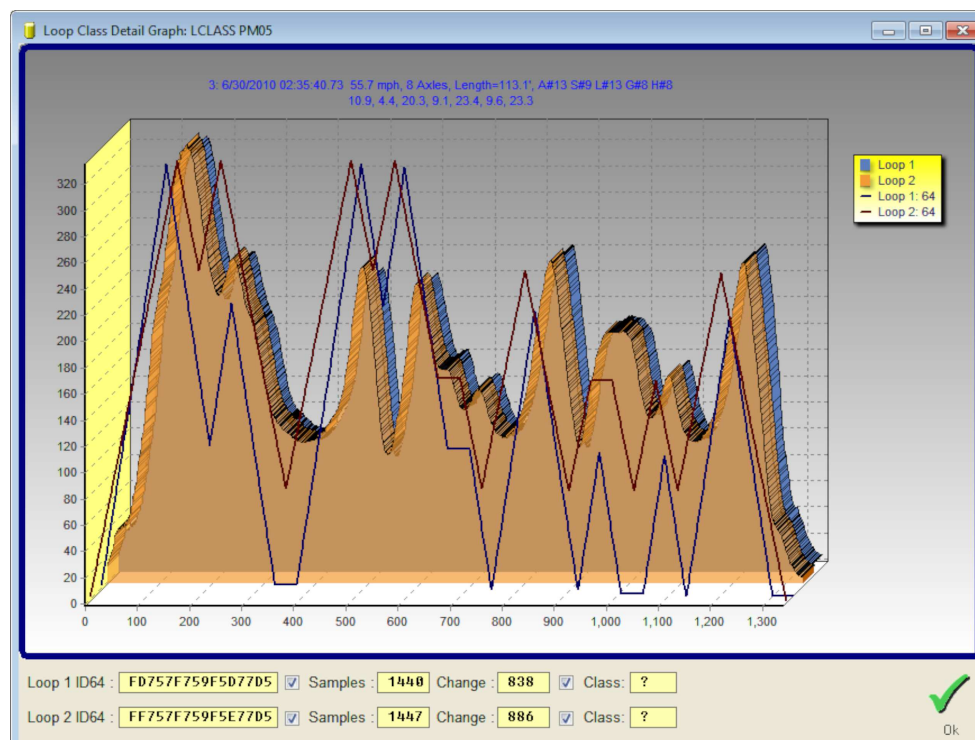


The graph shows both the Loop #1 and the Loop #2 signatures based on the ID64 and ID16 values. It is not as detailed as an Advanced graph, but the overall shape and important features show clearly. The graph window is also resizable to any shape for easier viewing.

Double clicking the graph calls up an editor window where most of the graph features can be altered:



Displaying data and graphs from Advanced Loop Class is very similar. The additional information is stored in the “# of Samples” and “Total Change” fields, and the point-by-point values are saved to the “Other” field record as table of values. The following shows a graph of a complex Class #13 truck, and you see the “Other” values in the database.



This 8 axle vehicle was captured in ~1440 points. To see these individual numbers, double click the word “(memo)” in the “Other” column. Loop #1 values are listed first followed by Loop #2.

Other	
Loop #1 Signature: Samples=1440, Change=838	
14 15 17 17 18 20 22 22 24 26 27 28	
29 30 30 30 31 32 31 31 31 33 34 34	
33 33 33 34 36 35 35 35 35 37 36 39	
44 46 43 45 47 50 52 52 54 57 64 63	
70 75 75 74 80 85 88 92 92 95 95 98	
106 106 113 118 116 121 124 126 127 133 138 141	
146 151 156 155 161 164 165 169 172 175 177 179	
183 186 188 190 192 193 195 197 198 200 202 204	
208 211 212 215 217 219 222 226 228 231 234 238	
246 245 251 254 254 261 264 265 268 276 278 276	
284 290 291 294 298 300 300 299 303 306 307 307	
311 309 313 316 315 317 317 318 318 320 318 320	
321 321 321 323 321 321 321 319 319 319 315 316	
313 310 309 306 305 302 300 297 294 291 288 287	
280 277 274 272 269 267 264 262 260 257 255 252	
247 246 244 242 240 238 236 234 231 231 228 226	
223 220 218 216 213 213 212 210 210 209 208	
206 207 207 206 207 206 207 207 207 208 209 211	
212 213 214 216 217 218 220 221 223 223 225 227	
229 231 231 232 233 233 235 235 235 235 235 235	
233 232 231 230 228 226 225 224 222 221 219 218	
213 212 211 209 207 206 204 203 201 200 199 197	
195 195 194 192 191 190 189 189 188 187 186 185	
183 181 180 180 178 177 176 174 173 170 169 167	
162 161 159 157 155 152 150 148 147 144 143 141	
137 135 133 132 131 129 128 126 125 124 123 122	

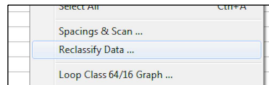
XIV.d.3. Applying a Loop Class Table to an Existing Data Set

You can apply an existing Loop Class Table to a dataset of vehicles that were collected with Basic or Advanced Loop Class. This can all be done directly inside of Centurion without ever involving a traffic counter (except for the original collection of vehicles with Loop Class Data). This is useful if you want to test out a new Loop Class Table and see how well it works on a collected set of vehicles before deploying it to the field, or if you want to switch Loop Class Tables to compare how different tables function with the same data. It also can be used as a basic data collection process when you want to generate Axle Bin Classification values for newly imported Loop Class data which was collected at a site that did not have any Loop Class Table's loaded into the iLoop Boards.

The basic steps in this process are as follows:

1. Go into the Database function, "Per Vehicle/Raw Data" tab, and double click on the site you want to apply the Loop Class Table too.
2. This site must contain vehicles with Basic or Advanced Loop Class data. It can be data that had an axle sensor as part of the collection (LCls Loop-Axle-Loop) or not (LCls Loop-Loop).
3. Verify that the desired Axle Bin Classification table is set for this site by clicking the "Site Setup" button, going to the Data tab, and checking the "Axle Class File Name" record.
4. Exit the Site Setup and then right click on any record.

5. Select "Reclassify Data".



6. The following window appears showing you the data range and an option for entering in a Loop Class Table name.

7. Click the Folder icon on the Loop Class Table line. Navigate to the Loop Class Table you want to use for the Reclassify process.

8. Click "Start Reclassify".

The actual end result of this process depends on whether or not the collected vehicle data in the database was done with an Axle Sensor as part of the setup (LCls Loop-Loop versus LCls Loop-Axle-Loop). If the collected data did not contain an Axle Sensor (was mode LCls Loop-Loop), then the following will be done:

- a) All vehicles with ID64/ID16 values will be processed by the specified Loop Class Table and a new Loop #1 Reported Class and Loop #2 Reported Class will be generated.
- b) The two Loop Reported Classes will be compared, and the vehicle "A Bin" value will be set to the Vehicle Class value that is most likely to be correct.

The above steps are exactly what the Traffic Classifier does in the field when no axle sensor is enabled (LCls Loop-Loop).

If the collected vehicle data was collected in LCls Loop-Axle-Loop mode, then the process is slightly different:

- a) All vehicles with ID64/ID16 values will be processed by the specified Loop Class Table and a new Loop #1 Reported Class and Loop #2 Reported Class will be generated.
- b) The "A Bin" value is not determined from the Loop Reported Class. Instead, the # of Axles and the Axle Spacings are processed by the specified Axle Class File Name and the Vehicle Class is set from there.

Just as above, this is exactly what the counter does when the counter is in LCls Loop-Axle-Loop mode.

After the Reclassify function runs, you are returned to the Data Editor and all affected fields will now reflect the updated classification values. To check the effects of the Reclassify, use the **Check Loop Class Table Accuracy** function described in the next section XIV.d.4.

XIV.d.4. Check Loop Class Table Accuracy

Centurion contains a feature that allows you to verify and generate a report on the accuracy of a Loop Class Table that has been installed in an iLoop Board, or one that has been applied to data with the Reclassify Function (described in previous section XIV.d.3). Note that this function only works with data that has been collected in either Basic or Advanced Loop Class mode using sensor configuration mode **LCLs Loop-Axle-Loop**. This is because the only way to verify that the Loop Class Table is working is to compare it to a known standard, and that is provided by the straight Axle Bin Classification determined through # of Axles and Axle Spacing Classification identification.

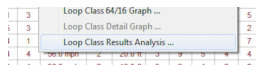
Here is the basic setup to perform this test:

1. Go into the Database function, Per Vehicle/Raw Data tab, and double click on the site you want to check the Loop Class Table with.
2. The site must be one that collected Basic Loop Class or Advanced Loop Class data and used sensor mode **LCLs Loop-Axle-Loop** when collecting it. You can't check accuracy on **LCLs Loop-Loop** datasets.
3. If you are checking the accuracy of a table that was pre-loaded into the iLoop board of the counter before data collection began (and active all during the time data was being collected), skip this step.

If you want to check the accuracy of a Loop Class Table for data that either (a) had no Loop Class Table loaded into the iLoop Boards at the time it was collected or (b) is a new Loop Class Table that you want to check against your existing data, then:

Follow all steps outlined in XIV.d.3. Applying a Loop Class Table to an Existing Data Set

4. Now that all the data correctly reflects what you want to check, right click on any record.



5. Select "Loop Class Results Analysis":

6. The Loop Class Results analysis window will appear.
7. Specify the "Loop Class Table" that should be used in the analysis to verify that the actual Loop Class results that are in the database match what should have been generated by the table. This is specifically designed to test the in-field operation of a Loop Class Table.
8. The "Purge EAAA Vehicles From Analysis" check box allows you to ignore all vehicles starting with an ID64 of "EAAA" from the processing. Typically, vehicles that start with this ID are only signature fragments caused by vehicles crossing lanes/sensors during collection. Purging them helps you see the results for just the valid vehicles.
9. After selecting the above, click "Start Analyze".
10. When finished, a text window appears showing the file contents of the saved Loop Class Analysis results.

Example Loop Class Analysis Results file with explanation:

```
-----
Loop Class Analysis: 202400 (working)          17:13:24 - 11/12/12
-----
File: 202400 (working) (Loop Class Analysis).txt
*****
**** Date Range of Data Collected & Table Used ****
*****
First Vehicle Date & Time: 12/04/2010 at 00:00:27.00
Last Vehicle Date & Time : 06/11/2012 at 23:57:44.00
-----
Total # of Days Collected: 556.00 (ADT=13409)
Number of Axle Class Bins: 13 File Name: DEFAULTC.AXL
Loop Classification File : HWY99 Full Table (V100).lcl
```

Basic information about the dataset including range of data, ADT, classing scheme, etc.

Number of new 64 bit ID's: 5959 (0.0%)
 New ID's Class 4-13 : 3612 (0.0%)
 Classes based on % Value : 11328489 (76.0%)

 **** Bin Table Analysis (Axle, Individual, Combined) ****

Axle = Vehicles based on Axle Bin Classification.
 Comb = Vehicles based on Loop Only Classification.
 Indv = Vehicles based on the Loop Classification that match the Axle classification
 on a vehicle by vehicle basis. If you were standing at the site, this is the
 number that would match the Axle Class number (uses the rule sets of 1% and
 Loop 2 has priority over Loop 1)

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Axle.	26928	5312255	1744727	2476	74290	66264	8228	38485	77256	61994	2280	857	39450
Comb.	26506	5306155	1751551	2453	74011	66219	8167	38441	77251	62080	2277	849	39515
	98%	100%	100%	99%	100%	100%	99%	100%	100%	100%	100%	99%	100%
Indv.	26487	4942183	1380958	2446	73586	65945	8152	38247	76628	61433	2270	842	39424
	98%	93%	79%	99%	99%	100%	99%	99%	99%	99%	100%	98%	100%

Overall Combined Accuracy : 100.0%
 Overall Individual Accuracy: 90.1%

CLASS #1 : Loop Only Class is accurate 98% of the time if you are standing at the site.
 When it classifies Class #1 as something else, it puts vehicle into these classes:
 #2-371 (84%), #3-43 (10%), #5-2 (0%), #6-12 (3%), #7-1 (0%), #8-3 (1%), #9-6 (1%), #10-2 (0%), #11-1 (0%)

CLASS #2 : Loop Only Class is accurate 93% of the time if you are standing at the site.
 When it classifies Class #2 as something else, it puts vehicle into these classes:
 #1-12 (0%), #3-369811 (100%), #4-1 (0%), #5-66 (0%), #6-107 (0%), #7-2 (0%), #8-25 (0%), #9-23 (0%), #10-5 (0%),
 #12-1 (0%), #13-6 (0%)

CLASS #3 : Loop Only Class is accurate 79% of the time if you are standing at the site.
 When it classifies Class #3 as something else, it puts vehicle into these classes:
 #2-363292 (100%), #4-3 (0%), #5-289 (0%), #6-66 (0%), #8-109 (0%), #9-2 (0%), #10-4 (0%), #11-1 (0%), #13-1 (0%)

CLASS #4 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #4 as something else, it puts vehicle into these classes:
 #3-5 (17%), #5-1 (3%), #6-1 (3%), #8-4 (13%), #9-10 (33%), #10-7 (23%), #13-2 (7%)

CLASS #5 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #5 as something else, it puts vehicle into these classes:
 #1-2 (0%), #2-179 (25%), #3-427 (61%), #4-2 (0%), #6-70 (10%), #7-1 (0%), #8-14 (2%), #9-6 (1%), #10-1 (0%), #13-2 (0%)

CLASS #6 : Loop Only Class is accurate 100% of the time if you are standing at the site.
 When it classifies Class #6 as something else, it puts vehicle into these classes:
 #1-4 (1%), #2-104 (33%), #3-136 (43%), #4-1 (0%), #5-50 (16%), #7-10 (3%), #8-5 (2%), #9-5 (2%), #10-1 (0%), #11-1 (0%), #13-2 (1%)

CLASS #7 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #7 as something else, it puts vehicle into these classes:
 #1-1 (1%), #2-9 (12%), #3-22 (29%), #5-10 (13%), #6-15 (20%), #9-6 (8%), #10-11 (14%), #12-1 (1%), #13-1 (1%)

CLASS #8 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #8 as something else, it puts vehicle into these classes:
 #2-17 (7%), #3-143 (60%), #5-5 (2%), #6-2 (1%), #9-50 (21%), #10-14 (6%), #11-1 (0%), #13-6 (3%)

CLASS #9 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #9 as something else, it puts vehicle into these classes:
 #3-2 (0%), #5-1 (0%), #7-1 (0%), #8-29 (5%), #10-579 (92%), #11-1 (0%), #13-15 (2%)

CLASS #10 : Loop Only Class is accurate 99% of the time if you are standing at the site.
 When it classifies Class #10 as something else, it puts vehicle into these classes:
 #3-1 (0%), #5-1 (0%), #8-5 (1%), #9-508 (91%), #12-1 (0%), #13-45 (8%)

CLASS #11 : Loop Only Class is accurate 100% of the time if you are standing at the site.
 When it classifies Class #11 as something else, it puts vehicle into these classes:
 #9-2 (20%), #10-7 (70%), #13-1 (10%)

CLASS #12 : Loop Only Class is accurate 98% of the time if you are standing at the site.
 When it classifies Class #12 as something else, it puts vehicle into these classes:
 #3-1 (7%), #9-1 (7%), #10-3 (20%), #13-10 (67%)

CLASS #13 : Loop Only Class is accurate 100% of the time if you are standing at the site.
 When it classifies Class #13 as something else, it puts vehicle into these classes:
 #3-2 (8%), #6-1 (4%), #9-4 (15%), #10-13 (50%), #11-2 (8%), #12-4 (15%)

"New" ID's are values not seen before by this table, broken down by class range. New ID's are harder to class than already seen ID's, and may indicate a need for more vehicles in the sample when creating the Loop Class table.

The "Axle" line is what Class the vehicles got from the standard "# of Axles" plus "Axle Spacing" classification method (the traditional bin classing system).

"Comb" is what you got (or would have got) with JUST the Loop Class Table loaded into the iLoop Boards. "Comb" is the real results of the total Loop Class System operating.

"Indv" is what you would see if you were standing on the side of the road and watching the system class vehicles using only Loop Class. It is less accurate than "Comb" because the "%" tagged vehicles sometimes get mixed with each other, especially with Class 2/3. However, the end result is still what is shown with "Comb" line.

These lines break down in more detail what happens when there is a problem. Although the accuracy of the system is > 98%, sometimes things do get mis-classed and this shows what happens when it does.

```
*****
**** Total Vehicles with Classifications Analysis ****
*****

Lane   Total   w/LCIs   #1 Cls   #2 Cls   wo/LCIs   SnMis   Avg HT
-----
1. 2768710 2768710 2768710 2768710      0    8323    207
2. 1150738 1150738 1150738 1150738      0    6485     86
3. 1271520 1271520 1271520 1271520      0   10038     95
4. 2264522 2264522 2264522 2264522      0   30603    170
-----
ALL 7455490 7455490 7455490 7455490      0   55449    559
```

```
*****
**** Signature Analysis by LANE ****
*****
```

Lane	Total	Loop #1	L1=Axle	L1<>Axle	%	Loop #2	L2=Axle	L2<>Axle	%
1.	5536702	2767997	2765261	2736	99.9%	2768705	2765901	2804	99.9%
2.	2301422	1150685	1149922	763	99.9%	1150737	1149927	810	99.9%
3.	2543026	1271507	1271033	474	100%	1271519	1271094	425	100%
4.	4528946	2264434	2261954	2480	99.9%	2264512	2261997	2515	99.9%
ALL	14910096	7454623	7448170	6453	99.9%	7455473	7448919	6554	99.9%

(Note: Above table ignores errors that occur when difference is only Class 2/3 confusion)

```
*****
**** Signature Analysis by BIN ****
*****
```

Bin	Axle	Loop 1	Loop 2	Total		Individual		Ign 2/3
				% Comb	% Acc	% Comb	% Acc	
1.	26928	26504	26521	26506	98.4%	26487	98.4%	
2.	5312255	5324117	5309495	5306155	99.9%	4942183	93.0%	7056244
3.	1744727	1733410	1748127	1751551	100.4%	1380958	79.2%	100.0%
4.	2476	2456	2448	2453	99.1%	2446	98.8%	
5.	74290	73982	74104	74011	99.6%	73586	99.1%	
6.	66264	65948	66179	66219	99.9%	65945	99.5%	
7.	8228	7891	8165	8167	99.3%	8152	99.1%	
8.	38485	38506	38483	38441	99.9%	38247	99.4%	
9.	77256	77220	77294	77251	100.0%	76628	99.2%	
10.	61994	61955	62021	62080	100.1%	61433	99.1%	
11.	2280	2288	2271	2277	99.9%	2270	99.6%	
12.	857	857	846	849	99.1%	842	98.2%	
13.	39450	39489	39519	39515	100.2%	39424	99.9%	
ALL	7455490	7454623	7455473	7455475	100.0%	6718601	90.1%	

```
*****
**** Fails to Class Correctly (WARNING #00) ****
*****
```

Number of Times: 66728

```
12/04/10 3: 03:02:59.84 52.8mph, 2 Axles, Length= 13.6', A#1 S#8 L#3 G#8 H#8 (LC1#=2/FFFFFFF955555556-FF55 ,
LC2#=2/FFFFFFF55555555A-FF55) , 4.0'
12/04/10 1: 17:27:43.80 60.8mph, 2 Axles, Length= 25.9', A#5 S#10 L#6 G#2 H#2 (LC1#=2/FFFFFFF955555556-FF55 ,
LC2#=2/FFFFFFF955555556-FF55) , 16.5'
12/04/10 1: 20:47:59.88 62.3mph, 2 Axles, Length= 13.2', A#1 S#10 L#3 G#4 H#4 (LC1#=2/FFFFFFFD55555556-FD55 ,
LC2#=2/FFFFFFFD55555556-FD55) , 3.6'
12/05/10 2: 14:47:10.90 70.3mph, 4 Axles, Length= 11.8', A#7 S#12 L#3 G#5 H#5 (LC1!=5/EFEA966AAAAAAA-F5B9 ,
LC2!%2/EFAA56AAAAAAA-F5BA) , 5.2' 5.0' 5.2'
(etc.)
```

Summary (by Lane and Grand) of the:

- Number of vehicles & how many had ID codes (Total & w/LCIs)
- ID Codes by Loop (#1 Cls, #2 Cls)
- How many vehicles were missing ID their ID Codes (wo/LCIs)
- Number of SnMis
- Average Hourly Total Vehicles (Avg HT)

Signature summary table (by Lane & Grand):

- Total signatures (Total)
- Total Loop #1, how often it's Reported Class matched the Axle Class, how often it didn't match, % accuracy.
- Total Loop #2, how often it's Reported Class matched the Axle Class, how often it didn't match, % accuracy.

Compares each Bin # separately to each Loop Reported Class, and then Combined with final accuracy.

For example, on Class #9 it reports the following:

- The Axle Class based on # of Axles and Axle Spacing gave 77,256 Class #9's.
- Loop 1 reported Class #9 - 77,220 times.
- Loop 2 reported Class #9 - 77,294 times
- Combined, running Loop Class only, the system would have reported 77,251 vehicles for an accuracy of 100.0%.
- If at the site watching each vehicle, you would have seen it correctly identify Class #9 76,628 times for an accuracy of 99.2%

Note that Class 2/3 is very difficult to isolate compared to the other classes, but since most customers lump these together in reports the system shows a "Ignore 2/3" line with the combined accuracy of those bins.

Complete listing of every mismatch in the data set. This may not be particularly useful, but it does show when individually the system misclassifies and what the likely scenarios are when it happens.

This is just a partial list from this dataset.

XIV.e. Creating & Working with Loop Class Tables

Loop Class Table creation is a crucial part to collecting high quality Loop Only Class data. Although some users may be able to get by with standard tables available from Diamond Traffic, many others will want or need to create their own tables to improve the quality of the classification at their own sites. Reasons for wanting to create a custom Loop Class Table include:

- ☐ Currently available tables do not quite fit the site configuration used.
- ☐ Data from the newly switched over Loop Class sites does not match up as expected based on historical data collected using an axle sensor at the site.
- ☐ Changed loop shape or size at sites results in need for a new table that is better defined to the new ID coding.
- ☐ User believes they can get even better data accuracy than currently seeing by using a custom table.
- ☐ The truck and traffic patterns in the location don't quite match other tables, and customer would be well served by a new Loop Class Table that takes these differences into account.
- ☐ Customer is an early adopter of the Loop Class system and there are not many tables currently available.
- ☐ Desire to expand the places Loop Class can be installed, and a new Loop Class table is needed.

All of these are good reasons to do the work to create a custom Loop Class Table. Unfortunately, creating a new Loop Class Table does take some effort and can involve 6 months or more of initial data collection. However, it is almost always worth the effort for customers when the cost and time spent updating and maintaining expensive piezo axle sensors is considered.

The basic steps to creating a new Loop Class Table are detailed in section XIV.a.2 on page 102, and these instructions won't be repeated here. However, once you have collected the necessary data to create your own Loop Class Table (usually 5-10 million Per-Vehicle records with Basic Loop Class enabled from one or more sites), follow these steps to create the new table:

1. From the main database list, go to the "Per Vehicle/Raw Data" tab.
2. If you have multiple sites with data that you are going to use for the Loop Class Table, select all of them. Otherwise, simply select the site you want to use. Right click and select "Loop Class Table":
3. "Create Loop Class Table" dialog box will appear looking like this:
4. First enter in a name for your table in the "Save as" box. As previously mentioned, care should be taken to pick a name that accurately reflects this table since their name is the primary way Loop Class Tables are identified inside iLoop Boards.
5. Other options are described in more detail below. Most users, however, will want to use a setup close to the one shown here:



Other options are described in more detail below. Most users, however, will want to use a setup close to the one shown here:

- Auto create lengths for each bin : Unchecked
- Use min/max whenever possible : Checked
- Do Exhaustive 64-bit Analysis : Unchecked
- Auto set 16-Bit Length Groupings : Unchecked
- Max Spacing/Len Diff : 25.0' - Length Bin Tol : 5.0'
- Vehicle Min Length : 2.0' - Max Length : 150'
- Use assumptions for smaller table : Unchecked

In the Manual Lengths Box (for a Scheme-F binning style):

#1: 0.0'-19.7'	#2: 0.0'-82.0'	#3: 0.0'-98.4'	#4: 19.7'-328'
#5: 19.7'-328.0'	#6 to #13: 23.0'-328.0'	All others: 0.0'-328.0'	

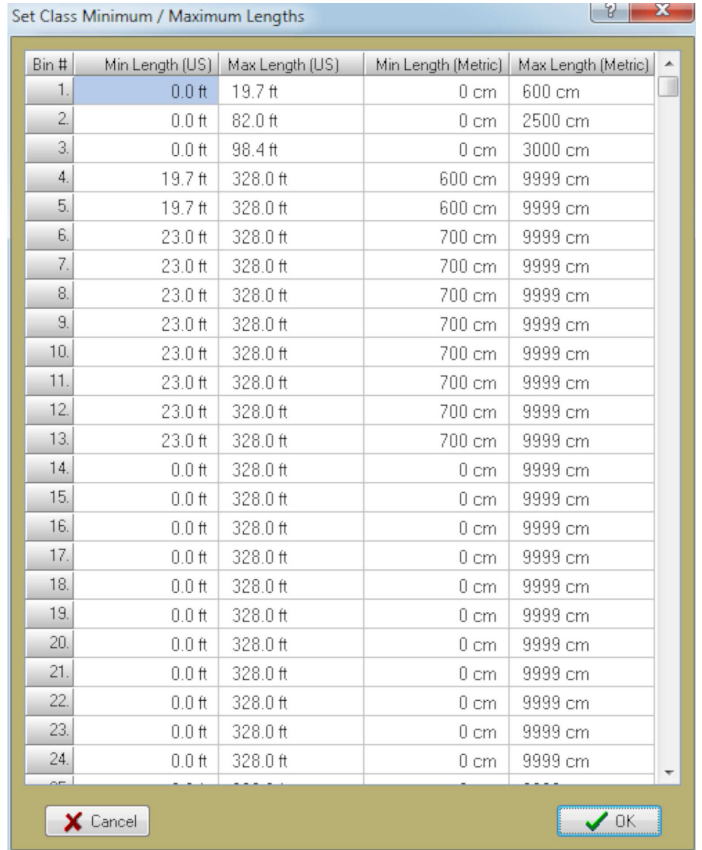
In the 16-Bit Lengths Dialog Box (for Scheme-F binning style):

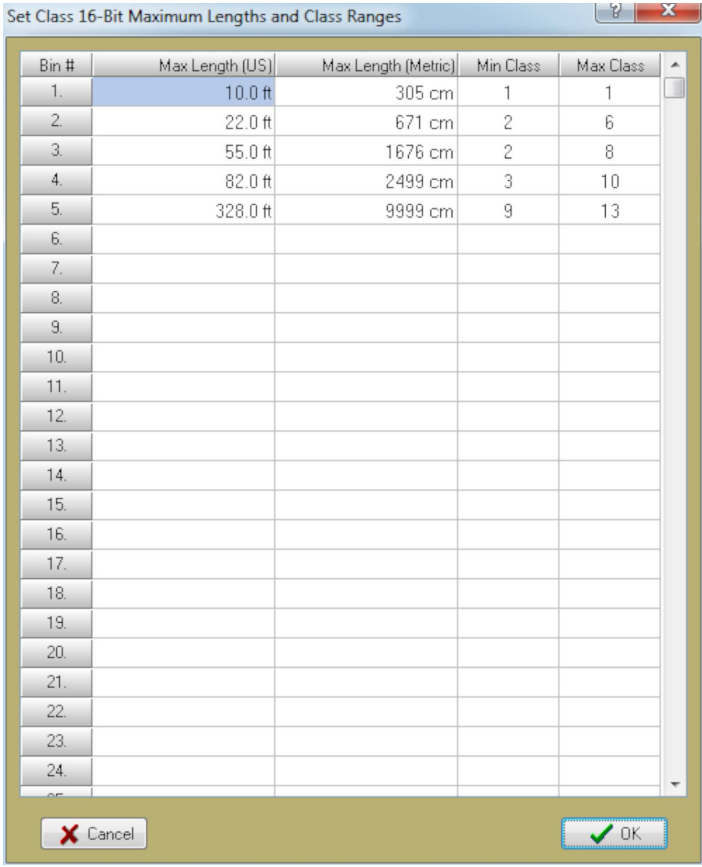
#1: 10.0', Class 1-1	#2: 22.0', Class 2-6	#3: 55.0', Class 2-8
#4: 82.0', Class 3-10	#5: 328.0', Class 9-13	Others: Blank

6. Make sure the "Table Version", "Priority", and if you want the table to "Requires Matching Site ID" is set.
7. Click "Start" to make your table.

Once started, no further user intervention is required. It will take time, possibly many hours, for a table to be created once the process has begun, so patience is definitely necessary during this step.

The recommended settings for creating a Loop Class Table are listed on the previous page. However, some users may do better or want to alter the table generation options. The effect of each option is described below:

Option	Description
Auto create lengths for each bin	<p>If checked, the program scans all of the input vehicles and automatically picks a length range for the Axle Class Bin's that will fit all of the vehicles being processed. If unchecked, you must manually set the valid length ranges for each Axle Class Bin by clicking the "Manual Lengths" button.</p> <p>Generally speaking, it is better to manually set the valid length ranges for each bin. If you allow Centurion to do it, then regardless of how improbable a vehicle is, if it received an Axle Class # from the Axle Classification Scheme it will automatically be included in the final table as a valid length. For example, suppose a vehicle crossed the sensors funny and the Axle Classification reported it as a motorcycle (Class #1) with a length reading of 88'. This is not a valid, obviously, and the Loop ID64 & ID16 codes are likely not good numbers either, but if you Auto-Create the length ranges it will be included in the final table. It will also set a very wide range (up to 88' for Class #1/Motorcycles) as part of the dataset, and this will negatively influence other aspects of the Loop Class Table generation process.</p> <p>Unchecking this box and manually setting the Bin Lengths will cause the system to drop any vehicle with an Axle Classification/Length that is outside of the allowed range. This results in a better final table. Of course, it may also result in the Loop Class Table failing to identify a class when a vehicle does strange activities on the road, but since the Axle Classification method rarely gets this right either, it is better to leave it out.</p>
Manual Lengths	<p>Clicking this button calls up the "Set Class Minimum/Maximum Lengths" dialog box. It is available only when "Auto create lengths for each bin" is not checked.</p> <p>Enter in a valid range for each Bin category, up to Bin 60 (although Bin 30 is the highest the current Loop Class Table will fully support).</p> 

Option	Description
Use Min/Max whenever possible	<p>When checked, which is recommended, the table generator uses Min/Max values on ranges whenever it can. This saves memory because not every length range has to be fully specified (it can just say “Up to 10.0 feet” instead of “6.0 to 10.0 feet”). It is never used if doing so would cause a misclass in the dataset, although there is a very minor chance that it could cause misclasses in new vehicles once the Loop Class Table is deployed in a site.</p> <p>Checking this box saves anywhere from 5% to 20% in final Loop Class Table size, depending on several factors. It is usually desirable to enable this option.</p>
Do Exhaustive 64-bit Analysis	<p>If checked, after the table is created the system will analyze the results of the new table with an exhaustive process that tries to find any potential problems. It has no affect on the final table results.</p> <p>While it can be helpful in some cases, doing the exhaustive analysis can take 10-15 hours or more with a lot of data in the table. It is often easier to skip the analysis and simply apply the table to an existing dataset and view the results after (see section XIV.d).</p>
Auto set 16-Bit Length Groupings	<p>Similar to the “Auto create length bins”, when this is checked the system tries to find the best length and class ranges to use for the secondary ID16 table generator. Normally this should not be checked, and users would click “16-Bit Lengths” to set these up manually.</p>
16-Bit Lengths	<p>When clicked (available only if “Auto set 16-Bit Length Groupings” is not checked), a dialog box appears that allows you to manually enter in the number of and range of the ID16 bit tables. The following shows the recommended settings for Scheme-F style bins, and it can be used as a guide for other classification setups.</p> <p>Note: Bin on this table does not refer to an Axle Class Bin, it indicates which length range bin you are specifying.</p> <p>Vehicles are processed from the 1st to the last set, so the Length is a range from the previous bin to this one. Bin 1 is all vehicles from 0.0’ to 10.0’. Bin 2 is 10.0’ to 22.0’, etc.</p> <p>Vehicles must also meet the class range to qualify for inclusion in this ID16 length bin.</p> <p>Users should insure that the ID16 setup will ALWAYS result in an identification, unless this table is just one of several to be loaded, and then not identifying it with an ID16 is ok to do.</p> 

Option	Description
Max Spacing/Len Difference	Enter in a value to determine what the maximum difference can be between the sum of the axle spacings and the reported total length of the vehicle, before it is considered an invalid vehicle and not used in the Loop Class Table generation. Default is 25.0'
Length Bin Tol	The Length Bin Tolerance specifies what kind of margin should be added to the lengths of the vehicles that are in the dataset when creating the table and setting allowable length ranges. For example, if it found 100 class #4 vehicles with a length range of 22.0' to 28.5', then when creating the table entry for this code if the Length Bin Tolerance was set to 5.0', the system would take 1/2 of the tolerance (2.5') and widen out the allowed range by this amount (to result in 19.5' to 31.0'). The increased range cannot exceed the limits imposed by the Manual Lengths dialog box for each bin category (if "Auto create lengths" for each bin is not checked), nor can it exceed the minimum and maximum vehicle length settings. This setting is intended to allow for a slightly wider length range than actually present in the data for the final Loop Class Table output. Its use is complex, though, because many codes and classes are inside other codes and classes, so the way it is applied can vary widely depending on the situation. Default is 5.0'
Vehicle Min Length & Vehicle Max Length	The range of allowable total length values for any vehicle to be included in the dataset used to create the Loop Class Table, regardless of Axle Bin Class. Defaults to 2.0' to 150.0'.
Use assumptions for smaller table	When checked, this enables a whole series of data compressions to try and shrink the size of the final Loop Class Table. While these changes to make the table physically smaller are not likely to affect the results when processing the vehicles that were used in the creation of the table, they do have a significant chance of misclassifying new vehicles that do not closely match a vehicle previously part of the Loop Class Table generation. For example, if the dataset had 500 vehicles with the ID64 code of FFFFFFFF55555555 and a length range of 12.0' to 16.3', and every one of them is a Class #2, then an assumption it could make is that no length requirement needs to be a part of this table entry because any vehicle with this code always comes up a Class #2. This would be a shorter table entry than one that also specifies you must have a valid length range of 12.0'-16.3' (+/- the "Length Bin Tol" value) for vehicles to meet this table entry. However, if the Loop Class Table after being deployed sees a new vehicle with this same ID64 of FFFFFFFF55555555 and a length of 60', the table with assumptions will misclass it as a Class #2 because it does not have the length check as part of the table entry. A bigger table that doesn't use the assumptions will block it from primary classification and force it to the secondary table due to its length, and there it has a better chance of being classed as a truck of some sort.
Table Version	Simply the version number you want to display when viewing the loaded tables inside the iLoop Board memory.
Priority	Set to the priority level, 1 as the highest and 15 as the lowest, you want assigned to this table. If more than one table is loaded into an iLoop Board, the table with the highest priority is used first. If it fails to identify the vehicle (provide a non-zero Loop Reported Class), then the next table in the list gets used. Tables with identical priority are used in order of loading into the iLoop Board memory.
Require Matching Site ID & Matching Site ID	If checked, the Matching Site ID will be part of the table and it must match the Site ID programmed into the traffic counter during Start Collection or the table will not be used.

Appendix A. Database Technical Description

At the highest level, there are 5 master databases:

Station Setup Database: This is the master database which links to all of the other databases. It contains not just the Site ID, but all of the standard traffic counter setup and TMG setup information used by most State Agencies.

Import List Database: Provides a detailed record of all of the sources for the various kinds of data in the database. It is used to display what is in the database as well as to provide backup file access.

Lane Setup Database: This table provides details about each lane for each site.

Polling & Call Log Database: This database records the polling activity for permanent stations (new in Centurion V1.28).

Data Integrity Check Database: Tracks all data integrity check violations (new in Centurion V1.28).

Each Site in the Station Setup database maintains individual databases for the different types of data that have been collected as follows:

Per Vehicle Database: This contains all Raw Records collected for the site.

Classification Database: This contains all Binned Records collected for the site.

Volume Database: This contains all Count Records collected for the site.

WIM Database: This contains all WIM Records collected for the site.

Environment Database: This is planned for but not implemented in Centurion. Any references to this database should be treated as preliminary in the database descriptions.

#1 – Basic File System Overview:

When the software is first run, it creates the following sub-directories in the directory you specified as the database directory.

DB	DB\VEHICLE	DB\CLASS
	DB\VEHICLE\SOURCE	DB\CLASS\SOURCE
DB\VOLUME	DB\WIM	
DB\VOLUME\SOURCE	DB\WIM\SOURCE	

In the DB directory, the following files are created and used:

STATIONS - Station Setup Database.

DATAINTG - Data Integrity Database

IMPORTS - Import List Database

POLLLOG - Polling & Call Log Database

LANESET - Lane Setup Database

In each of the other directories the actual data records are kept, each in a file unique to the Site ID. The SOURCE subdirectory contains the original binary (or other format) data that was used to bring in the data to the database. These files are renamed to fully indicate the Site ID and date range of the data.

Note: Starting with Centurion V1.26, the files in the SOURCE directories are organized into Year-Month sub-directories. This makes it easier to locate particular imports for a site.

#2 – The STATIONS Database:

The following fields are present in the STATIONS.DB database file. Fields marked by an asterisk are key fields used for sorting and must be unique. In most cases these fields are filled in the first time by data in the counter (if present), and can then later be updated by the user on the PC.

Name	Type	Length	Description
*Station ID	A	30	The actual station number. Size is 30 to allow user to customize it after import from a traffic counter. <i>*This is a required key field.</i>
Info Line 1	A	30	Info Line #1 from counter.
Info Line 2	A	30	Info Line #2 from counter.
Latitude	A	30	Last recorded Latitude reading for counter (from GPS unit).
Longitude	A	30	Last recorded Longitude reading for counter (from GPS unit).
Counter Type	A	20	Type of counter used (C-Sprite, Unicorn, etc.)
Counter Version	A	10	Version number of counter used.
Counter Serial	A	30	Serial number of counter used.
Last Accessed	@		Time & Date data last accessed by user print or edit.
Data Integrity Group	S		Group Number for Data Integrity Checks (default = 0).
Report Profile Number	S		Custom report profile ID number (0=unused, default)

Import Information:

DB File Name	A	50	Database File Name. This is the actual disk file name of the database table holding the data for this site. It will be the same as the Station ID (when possible).
RawImports	I		Number of Imports for each type of data (used to filter the DBView window). The default is 0.
BinnedImports	I		
CountImports	I		
WIMImports	I		
EnviroImports	I		

General Data Information:

Number of Lanes	S		From 0 to 64. This is always the highest number ever found, even if later imports are fewer. Default is 0.
Posted Speed Limit	S		Posted Speed Limit (in tenths of a KPH)
Number of Axle Bins	S		Number of bins used in classification (default = 13)
Axle Class File Name	A	30	Name of classification file (default = DEFAULTX.AXL).
Number of Speed Bins	S		Number of bins used in classification (default = 16)
Speed Class File Name	A	30	Name of classification file (default = DEFAULTX.SPD).
Number of Length Bins	S		Number of bins used in classification (default = 13)
Length Class File Name	A	30	Name of classification file.(default = DEFAULTX.LEN)
Number of Gap Bins	S		Number of bins used in classification (default = 8)
Gap Class File Name	A	30	Name of classification file.(default = DEFAULTX.GAP)
Number of Headway Bins	S		Number of bins used in classification (default = 8)
Headway Class File Name	A	30	Name of classification file (default = DEFAULTX.HED)
Has Axle Class Has Speed Class Has Lenth Class Has Gap Class Has Headway Class Has SpeedxAxle Class Has SpeedxLength Class Has SnMis Class	L		Each of these values is set to True if the data imported contains the type of classification indicated. Does not apply to Volume only imports.
Loop Class Table	A	30	Name of the Loop Classification Table used (if any).
Start Date	D		Start Time & Date of the data in the database.
Start Time	T		
End Date	D		End Time & Date of the data in the database.

Name	Type	Length	Description
End Time	T		
Number Of Intervals	S		Number of Record Intervals used. <i>All interval values apply to both Binned and Count data.</i> Default = 1
Interval #1 Start Time	T		Starting Time Of Interval (Always set to 12:00:00 AM)
Interval #1 Length	S		Length of Interval (Default = 60 minutes)
Interval #2 Start Time	T		Starting Time Of Interval
Interval #2 Length	S		Length of Interval
Interval #3 Start Time	T		Starting Time Of Interval
Interval #3 Length	S		Length of Interval
Interval #4 Start Time	T		Starting Time Of Interval
Interval #4 Length	S		Length of Interval
Interval #5 Start Time	T		Starting Time Of Interval
Interval #5 Length	S		Length of Interval

Telemetry Information:

Telemetry Site	L		True if site is a telemetry site.
Phone Number	A	100	Phone number of site (or IP address)
Custom Modem	A	100	Custom modem configuration for this site.
Baud Rate	I		Baud rate to call site at (0=SOIP).
Polling Group	S		Polling group (or zone) number (0=Disabled/default,1-9=Group or Zone Number)
Time Zone Offset	S		Amount time (in hours) counter should be different from this computer. Default = 0
Multi Counter	A	20	Multi-Counter Station Description
Switch Box	A	20	Switch Box Station Description
Link Delay Time	S		Time (in seconds) to delay link after connection is made.
Polling Command	A	200	Polling command string
Map X Coord	N		Map view coordinates for the site. If these values are blank (or -1), then the site has not been placed on the map.
Map Y Coord	N		
Map Symbol Status	S		Indicates the current status of the site (1-Ok/Green,2-Problem/Amber, 3-Failed/Red)
Map Symbol Locked	L		Indicates if symbol on map is position locked.
Modem Config To Use	S		Modem configuration to use (0=SOIP, 1-10).
Call Counter Type	S		Type of counter to link to (0=Unknown,1=Diamond/IRD,2=Peek 241,3=Peek ADR). Default =1.

TMG Specific Information:

TMG: Identification	A	30	Part of the Traffic Monitoring Guide standard exports.
TMG: County	A	10	
TMG: Location	A	50	
TMG: City/Town	A	50	
TMG: Directions	A	64	
TMG: Lanes	A	64	
TMG: FIPS State Code	A	2	
TMG: Functional Class	A	2	
TMG: HPMS Number	A	12	
TMG: HPMS Subdiv	A	1	
TMG: Post Route Sign	A	1	
TMG: Post Route #	A	8	
TMG: Logpoint	A	10	
TMG: Sample For Vol	A	1	
TMG: Volume # Lanes	S		
TMG: Method For Vol	A	1	
TMG: Sample For Class	A	1	
TMG: Class # Lanes	S		

Name	Type	Length	Description
TMG: Method For Class	A	1	
TMG: Class Algorithm	A	2	
TMG: Class System	A	2	
TMG: Sample For WIM	A	1	
TMG: WIM # Lanes	S		
TMG: Method For WIM	A	1	
TMG: WIM Calibration	A	1	
TMG: Data Retrieval	A	1	
TMG: Sensor 1	A	2	
TMG: Sensor 2	A	2	
TMG: Equipment 1	A	2	
TMG: Model 1	A	15	
TMG: Equipment 2	A	2	
TMG: Model 2	A	15	
TMG: AADT For North	I		
TMG: AADT For South	I		
TMG: AADT For East	I		
TMG: AADT For West	I		
TMG: Year Established	S		
TMG: Year Discontinue	S		
TMG: Footnote	A	10	

User Available Fields:

User Info Line 1	A	50	User specific information.
User Info Line 2	A	50	User specific information.
User Info Line 3	A	50	User specific information.
User Info Line 4	A	50	User specific information.
User Info Line 5	A	50	User specific information.
User Info Line 6	A	50	User specific information.
User Info Line 7	A	50	User specific information.
User Info Line 8	A	50	User specific information.
User Info Line 9	A	50	User specific information.
User Info Line 10	A	50	User specific information.
User Memo Field 1	F	1	User memo field for any type of data.
User Memo Field 2	F	1	User memo field for any type of data.

Type Definitions:

- A – Alpha (character string)
- L – Logical (True or False)
- I – Integer (32 bit signed)
- S – Short Integer (16 bit signed)
- @ – Combined Time/Date
- T – Time Value
- D – Date Value
- M – Memo field (stored external)
- F – Formatted Memo field (stored external).

Other Indicators:

- Green = Set to Last Value Imported. This will overwrite any other setting.
- Blue = First value imported. This will not overwrite any non-blank value.

NOTE:

- a) When importing Per Vehicle/Raw data, the Classification tables are NOT overwritten by the current file settings. Centurion reclassifies the data as it is imported according to the current settings in the database.

#3 – The LANE SETUP (LANESET) Database:

Name	Type	Length	Description
*Station ID	A	30	What station this lane setup is for. Referential integrity link to STATIONS.DB <i>*This is a required key field.</i>
*Lane Number	S		Lane number (1-64). <i>*This is a required key field.</i>
*Physical Lane Number	S		Set to a 0 if not grouped, 1-64 if grouped. <i>*This is a required key field.</i>
Direction	A	1	Single character direction code for this lane.
Information	A	30	Lane Information Line.
Raw Sensors	S		Sensor Configuration for Raw, Binned, & WIM Modes
Count Sensors	S		Sensor Configuration for Count Mode.
Raw Lane Mode	S		Lane Mode used with Raw, Binned, & WIM mode.
Raw Sensor Spacing	S		Sensor spacing (CM) for Raw, Binned, & WIM Modes.
Raw Loop Length	S		Loop Length (CM) for Raw, Binned & WIM Modes.
Axle Class Enabled	L		Axle Classification Enabled.
Speed Class Enabled	L		Speed Classification Enabled.
Length Class Enabled	L		Length Classification Enabled.
Gap Class Enabled	L		Gap Classification Enabled.
Headway Class Enabled	L		Headway Classification Enabled.
SpeedxLength Enabled	L		Speed x Length Classification Enabled.
SpeedxAxle Enabled	L		Speed x Axle Classification Enabled.
SnMis Storage Enabled	L		SnMis Storage Enabled
Count Lane Mode	S		Mode used for count (1-Normal, 2-Subtract, 3-Directional)
Count Divide By 2	L		Divide by 2 enabled or disabled.
Store Class Number	S		For WIM storage, indicates class number (or higher) vehicles are stored in memory.
Comment	A	50	User comment about this lane.

#4 – The IMPORTS Database:

Name	Type	Length	Description
*Station ID	A	30	Site ID this import record is for. Referential integrity link to STATIONS.DB <i>*This is a required key field.</i>
*Start Date	D		Start Time & Date of the data in the import. <i>*These are required key fields.</i>
*Start Time	T		
End Date	D		End Time & Date of the data in the import.
End Time	T		
Counter Type	A	20	Type of counter used (C-Sprite, Unicorn, etc.)
Counter Version	A	10	Version number of counter used.
Counter Serial	A	30	Serial number of counter used.
Datatype	S		Kind of data this is: 1-Raw,2-Binned,3-Count,5-WIM,6-WIM+Binned,7-Env.
Device Status	A	30	Status Line (optional, used to record information such as battery voltage and other data at time of download)
Source File Name	A	200	Name of the original source file for this data in the SOURCE subdirectory. Note that this is set to: “:Per Vehicle (name)” If data derived from Raw Import. “:Class (name)” If data derived from Binned Import.
Data Integrity Check Cnt	S		Data Integrity Check Failure Count (-1=Unchecked, 0=Ok, 1-32767=Number of Data Integrity Failures During Import)

Name	Type	Length	Description
Has Axle Class Has Speed Class Has Lenth Class Has Gap Class Has Headway Class Has SpeedxAxle Class Has SpeedxLength Class Has SnMis Class	L		Each of these values is set to True if the data imported contains the type of classification indicated. Does not apply to Volume only imports.
Data Exported	L		Set to True if the data has been processed by the export function at least once.
Data Is Valid	L		Defaults to True. This can be set to False to indicate the data imported is not valid or suspect.
Operator	A	30	Operator or User ID
Weather	A	30	Weather at time of collection
Ball Hitch Detect	I		Bitmap of Ball Hitch Detect enabled lanes for this import (Lanes 1-32 only, unsigned).

#5 – Per Vehicle (Raw) Database:

Name	Type	Length	Description
*Date	D		Date, Time, and Time Hundredths. * These are required key fields.
*Time	T		
*Time Hundredths	S		
*Lane Number	S		Lane Number (1-64) * This is a required key field
Data Integrity Check	S		Data Integrity (0=Ok,-1=Unchecked,1-32768=Failure Code) Default is -1.
SnMis Number	S		SnMis Number (-1=Vehicle,0-4=SnMis). Default=-1
Speed	S		Speed of vehicle (in 0.1 KPH)
Number of Axles	S		Number of Axles (0=Loop or 2-16)
Total Length	S		Length of vehicle (CM)
Axle Class Number	S		Classification Number (0 = Unclassified, 1-60 otherwise). Default = 0.
Speed Class Number	S		
Length Class Number	S		
Gap Class Number	S		
Headway Class Number	S		
Spacing 1-2 ... Spacing 15-16	S		Spacing between axles (in CM). Blank if not collected.
LClass1 Class	S		Loop #1 Class Code (bit 7 set if from 16 bit, bit 6 set if from a %, bits 0-5 are class - 0=default) 64 Bit Class ID (High Value, unsigned) 64 Bit Class ID (Low Value, unsigned) 16 Bit Class ID (unsigned) Samples in Loop Signature (0=None, default). Total change (/256)
LClass1 ID64HI	I		
LClass1 ID64LO	I		
LClass1 ID16	S		
LClass1 Samples	S		
LClass1 Change	S		
LClass2 Class	S		Loop #2 Class Code (bit 7 set if from 16 bit, bit 6 set if from a %, bits 0-5 are class - 0=default) 64 Bit Class ID (High Value, unsigned) 64 Bit Class ID (Low Value, unsigned) 16 Bit Class ID (unsigned) Samples in Loop Signature (0=None, default).
LClass2 ID64HI	I		
LClass2 ID64LO	I		
LClass2 ID16	S		
LClass2 Samples	S		

LClass2 Change	S		Total change (/256)
Special Vehicle Markers	I		Identifying markers picked up by advanced system processing. This is supported by firmware which detects such things as "Ball Hitch Detect" and other special notes as indicated below: .0 - Ball Hitch Detected (Set when either loop sees what it thinks are a ball hitch type signal). See the Imports record to check if this particular function is active for this import. .1 - .31 - Unused
Other	M	1	Optional additional information

NOTE : Anything in **this color** applies to a vehicle only (when "SnMis Number" = -1).

NOTE : Centurion ignores classifications generated by the counter (if any) and reclassifies all vehicles as they are imported into the database according to the current class settings in the Station setup file.

#6 – Classification (Binned) Database:

Name	Type	Length	Description
*Date	D		Time and Date
*Time	T		* These are required key fields.
*Data Type	S		Type of data (1-Axle, 2-Speed, 3-Length, 4-Gap, 5-Headway, 6-SnMis, 100-160 Speed Bins for Length Bin xx, 200-260 Speed Bins for Axle Bin xx) * This is a required key field.
*Lane Number	S		Lane Number * This is a required key field.
Data Integrity Check	S		Data Integrity (0=0k,-1=Unchecked,1-32768=Failure Code) Default is -1
Interval Length	S		Length of Interval for this data (in minutes) Default is 15 minutes
Partial	L		Set to True if this interval is only partially accounted for.
Bin Total 1 ... through ...	I		Bin Totals for from 1 to 60 bins. Unused bins are blank (which is the default).
Bin Total 60	I		
Misclassified Total	I		Total number of vehicles misclassified.
Unclassified Total	I		Total number of vehicles not classified.

NOTE: Centurion V1.37 expands the classification system from 30 to 60 bins adding fields "Bin Total 31", "Bin Total 32", etc. This is automatically done to all databases when accessed, and increases their size.

#7 – Volume (Count) Database:

Name	Type	Length	Description
*Date	D		Time and Date
*Time	T		* These are required key fields)
Data Integrity Check	S		Data Integrity (0=0k,-1=Unchecked,1-32767=Failure Code). Default = -1
Interval Length	S		Length of Interval for this data (in minutes) Default = 15 minutes
Partial	L		Set to True if this interval is only partially accounted for.
Lane 1 ...through... Lane 64	I		Lane 1 through Lane 64 Total Count Blank = uncollected (the default)

NOTE: Centurion V1.37 expands the volume system from 32 lanes to 64 lanes adding fields "Lane 33", "Lane 34", etc. This is automatically done to all databases when accessed, and increases their size.

#8 – WIM Vehicle Database:

Name	Type	Length	Description
*Date	D		Date, Time, and Time Hundredths. * <i>These are required key fields.</i>
*Time	T		
*Time Hundredths	S		
*Lane Number	S		Lane Number * <i>This is a required key field</i>
*SnMis or Datatype	S		SnMis or Datatype Number (-3=Autocal Setting, -2=WIM Channel Setting, -1=Vehicle, 0-4=SnMis). Default=-1 * <i>This is a required key field.</i>
Vehicle Number	I		Sequential vehicle number (Blank = unused, default)
Data Integrity Check	S		Data Integrity (0=Ok, -1=Unchecked, 1-32768=Failure Code) Default is -1.
Speed	S		Speed of vehicle (in 0.1 KPH)
Number of Axles	S		Number of Axles (0=Loop or 2-16)
Total Length	S		Length of vehicle (CM)
Axle Class Number	S		Classification Number (0 = Unclassified, 1-60 otherwise). Default = 0.
Speed Class Number	S		
Length Class Number	S		
Gap Class Number	S		
Headway Class Number	S		
Spacing 1-2 ... Spacing 15-16	S		Spacing between axles (in CM). Blank if not collected.
Weight 1 ... Weight 16	I		Weights of up to 16 axles (in kg).
Special Vehicle Markers	I		Identifying markers picked up by advanced system processing. This is supported by firmware which detects such things as "Ball Hitch Detect" and other special notes as indicated below: .0 - Ball Hitch Detected (Set when either loop sees what it thinks are a ball hitch type signal). See the Imports record to check if this particular import is active for this function. .1 - .31 - Unused
Other	M	1	Optional additional information and WIM Channel and Autocal setup strings.

NOTE : Anything in **this color** applies to a vehicle only (when "SnMis or Datatype" = -1).

NOTE : When "SnMis or Datatype" = -2, then this is a WIM channel setup value. The "Other" field will be written with a string representing the following data:

Channel, Sensor Type, Threshold, Gain, Timeout, Baseline Threshold, User Calibration, Inverted AutoCal Config, Auto Setting 1, Auto Setting 2, Auto Setting 3, Auto Setting 4, Current Autocal Value

NOTE : Centurion ignores classifications generated by the counter (if any) and reclassifies all vehicles as they are imported into the database according to the current class settings in the Station setup file.

#9 – The Data Integrity (DATAINTG) Database:

The Data Integrity database records data violations during the data integrity check functions. These can come either from the original polling records or from the main database software imports.

Name	Type	Length	Description
*Station ID	A	30	Site ID this data integrity error is for. Referential integrity link to STATIONS.DB <i>*This is a required key field.</i>
*Start Date	D		Start Time & Date of the data in the error. <i>*These are required key fields.</i>
*Start Time	T		
*End Date	D		End Time & Date of the data in the error. <i>*These are required key fields.</i>
*End Time	T		
*Lane Number	S		Lane number of the error (or 0 for all lanes). <i>*This is a required key field</i>
*Sequence Number	S		Sequence number of the error (to allow for multiple errors for the same lane(s)/time). <i>*This is a required key field</i>
Datatype	S		Kind of data this is: 1-PerVehicle, 2-Classification, 3-Volume,5-WIM.
Failure Code Number	S		Failure code number of the message.
Message	A	200	Actual data integrity error message.

#10 – The Polling Log (POLLLOG) Database:

This database records the polling activity for permanent stations. This data is collected from the polling software updates posted to the common FTP site.

Name	Type	Length	Description
*Station ID	A	30	Site ID this polling log entry is for. Referential integrity link to STATIONS.DB <i>*This is a required key field.</i>
*Call Start Date	D		Starting Time & Date of the call. <i>*These are required key fields.</i>
*Call Start Time	T		
*Call End Date	D		Ending Time & Date of the call. <i>*These are required key fields.</i>
*Call End Time	T		
*Sequence Number	S		Sequence number of the call (to allow for multiple messages for the same date & time). <i>*This is a required key field</i>
Connect By	A	100	Phone number or SOIP address.
Data Rate	A	30	Speed/Type of connection.
Type of Message	S		Type of message (1=Call Info, 2=Call Error, 3=Counter Info, 4=Counter Error, 5=Data Message, 6=Data Warning, 7=Data Error)
Message	A	200	Poll log message.

#11 – Borland Database Engine Aliases:

Centurion uses the BDE (Borland Database Engine) to manage all database activity. As part of this process, it creates and maintains 6 “aliases” as follows:

<i>Alias for CC Version</i>	<i>Default</i>	<i>Description</i>
CenturionCC	C:\Program Files\Diamond\Centurion CC\DB	Main database directory. This is the location for all database files except the traffic data itself.
CenturionCC Raw	C:\Program Files\Diamond\Centurion CC\DB\Vehicle	Per Vehicle (Raw) data directory.
CenturionCC Binned	C:\Program Files\Diamond\Centurion CC\DB\Class	Classification (Binned) data directory.
CenturionCC Count	C:\Program Files\Diamond\Centurion CC\DB\Volume	Volume (Count) data directory.
CenturionCC WIM	C:\Program Files\Diamond\Centurion CC\DB\WIM	WIM data directory.
CenturionCC Exports	C:\Program Files\Diamond\Centurion CC\DB\Exports	Export database directory for Direct To Excel and other database output formats (not used for old style Binary, New ASCII, etc).

For the **Parks Version**, the above alias are changed to “CenturionParks”, “CenturionParks Raw”, etc. For the **Gold Version** the above alias are similarly changed to “CenturionGold”, “CenturionGold Raw”, etc. In addition, the default directory is “Centurion Parks” or “Centurion Gold” instead of “Centurion CC”.

Please make note of the following things:

- The BDE Administrator is installed as part of the Centurion package. This tool can be used to set and modify any of these Aliases.
- During installation, these aliases are created and set automatically to the installation directory of the program.
- Users can change the directory setting of any alias using the “Directories Preferences” dialog box in Centurion. Changes to these preferences are automatically updated to the BDE (and the reverse is true as well).

Appendix B. Parking Lot System

Centurion-CC contains a complete Parking Lot or Structure management system. You can real-time manage up to 16 lots containing up to 32 traffic counters and 32 sign boards. Generally, installation of this system is done by trained Diamond Traffic Products personal.

Basic Step-By-Step Instructions:

1. Aerocomm Modem Setup

- a. Install the CL4490 configuration utility on a computer or laptop.
- b. Connect each Aerocomm modem to the computer and perform these steps:
 - i. Set the baud rate to 57600 and click Read Radio.
 - ii. When the values come back, leave everything at the default except as follows:
 1. Change "Client/Server" to Client for all Aerocomms that are to be connected to a sign or traffic counter. Set it to Server for the single Aerocomm that is to be connected to the host computer.
 2. Change "Interface Baud Rate" to 9600.
 3. Make sure the "Destination Address" is: FF FF FF FF FF FF
 - iii. Click Write Radio.
 - iv. Power the Aerocomm unit off then on.
 - v. Change the baud rate to 9600 and click Read Radio. The new settings should be returned.
 - vi. Note on a label the MAC address for this radio. Stick the label to the top of the Aerocomm so it is in plain sight.
- c. Note that the above instructions apply to any Aerocomm modem (whether it is connected to a sign or a traffic counter).

2. Sign Board Setup

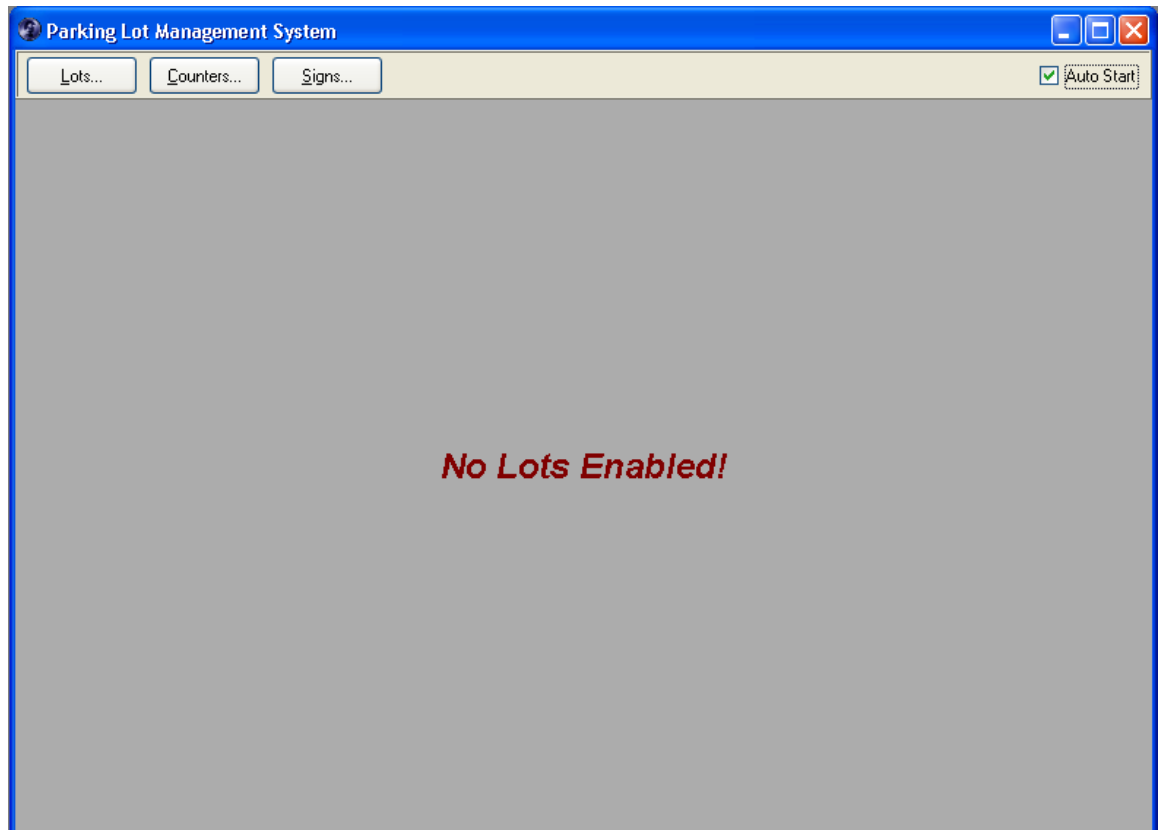
- a. Each sign board is connected to an Aerocomm modem. When connecting, follow these instructions:
 - i. Move all jumpers to the RS232 side.
 - ii. Power for the Aerocomm modem can be fed directly from the second "DC Power" output on the sign.
 - iii. Connect a DB9 Female RS232 connector from the Aerocomm modem to the sign board as follows:
 - Pin 2: "R" Connection (Receive)
 - Pin 3: "T" Connection (Transmit)
 - Pin 5: "G" Connection (Ground)
- b. Sign board should be powered through an 110VAC connection (Green to Ground, White to Neutral, and Red or Black wire to Hot).
- c. Make sure sign board address is set to address #1 (all signs are set to address #1). The current sign board address is displayed by the sign when first powered on.

3. Traffic Counter Setup

- a. System operates with and Unicorn, Phoenix, or Pegasus counter with a “2.39p” version EPROM.
- b. All loop boards in system must use the EPROM which allows vehicles to be over the loops for an extended period of time. This is different from the standard loop EPROM which quickly retunes when a vehicle is over the loop.
- c. Connect the traffic counter to the Aerocomm modem using the provided DB9 Female-Female connector and a standard UPP5 Modem Cable.

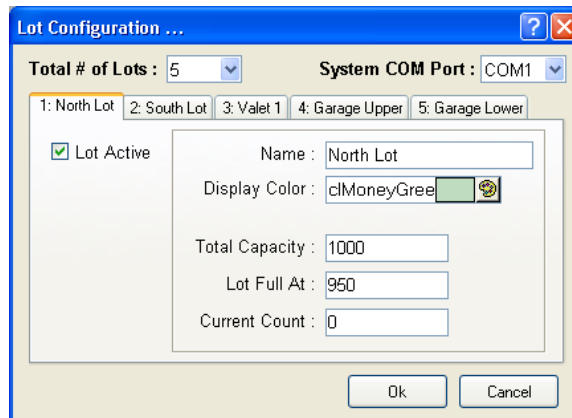
4. Software/Host System Setup

- a. Install Centurion-CC V1.24 (or later) on any computer running Windows NT, Windows 2000, or Windows XP.
- b. Connect the Aerocomm modem previously configured as a “Server” to the computer and power it on. You should note that all Aerocomms will quickly light their Red LED (indicating a Link has been made). Any Aerocomm which does not have the Red LED lit after the Server is powered up is not getting a signal.
- c. Run Centurion. When the main screen appears click Counter – Parking Lot System. The following screen will appear:



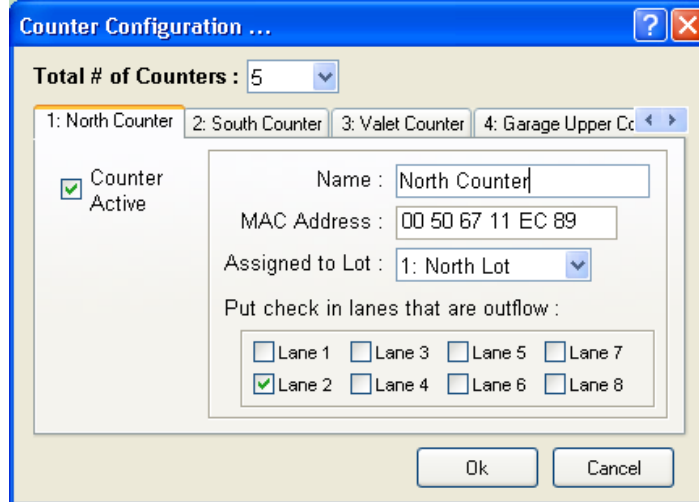
- d. Make sure the “Auto Start” box is checked. This will make the software automatically start the Parking Lot system when the program is run.

- e. **Lot Setup** – Click the Lot Setup button. This will display the main lot setup screen. Make the following selections:
- Set the “System COM Port” to the serial port the Aerocomm modem is connected to.
 - Set the “Total # of Lots” to how many separate lots or parking structures you want to configure. You can have 1 or more signs and 1 or more counters in each Lot. However, all the signs for a particular lot always display the same thing.
 - For each lot, set the following values:
 - Enter a descriptive name. This will appear everywhere the lot is shown.
 - Enter Total Capacity, Lot Full At, and Current Lot count values.
 - If desired, set the display color for the lot.
 - Check the Lot Active box. You can at anytime temporarily disable a lot by un-checking this box.
 - The following shows an example with 5 lots configured:



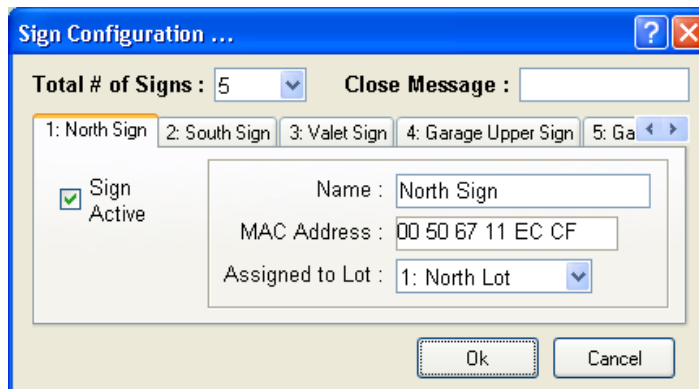
- Click Ok. You will be returned to the main screen and all the lots will be enabled and displayed (each in a different color).
Note: You can resize the window so that all or most of the lots are displayed without scrolling.
- f. **Counter Setup** – Click the Counter Setup button. You can enter settings for up to 32 counters assigned in any way to the lots. Make the following selections:
- Set the “Total # of Counters” value.
 - For each counter, set the following values:
 - Enter a descriptive name. This will appear everywhere the counter is shown.
 - Enter MAC Address of the Aerocomm connected to the counter.
 - Select the Lot the counter is assigned to.
 - Put a check mark in each Lane that is outflow. Unchecked lanes are inflow lanes. Note that only lanes actually enabled by the counter are used regardless of this setting.
 - Check the Counter Active box. You can at anytime temporarily disable a counter by un-checking this box.

6. The following shows an example with 5 counters configured (one for each lot setup above):



The 'Counter Configuration' dialog box shows the configuration for 5 counters. The 'Total # of Counters' is set to 5. The first counter, '1: North Counter', is selected. It is active (checked), named 'North Counter', has MAC Address '00 50 67 11 EC 89', and is assigned to '1: North Lot'. The 'Put check in lanes that are outflow' section shows 'Lane 2' checked, while 'Lane 1', 'Lane 3', 'Lane 4', 'Lane 5', 'Lane 6', 'Lane 7', and 'Lane 8' are unchecked. 'Ok' and 'Cancel' buttons are at the bottom.

- iii. Click Ok. You will be returned to the main screen and all counters will appear with each lot. Specific messages and other information from the main screen will be discussed in a later section.
- g. **Sign Setup** – Click the Sign Setup button. You can enter settings for up to 32 signs assigned in any way to the lots. Make the following selections:
- Set the “Total # of Signs” value.
 - For each sign, set the following values:
 - Enter a descriptive name. This will appear everywhere the sign is shown.
 - Enter MAC Address of the Aerocomm connected to the sign.
 - Select the Lot the sign is assigned to.
 - Check the Sign Active box. You can at anytime temporarily disable a sign by un-checking this box.
 - The following shows an example with 5 counters configured (one for each lot setup above)

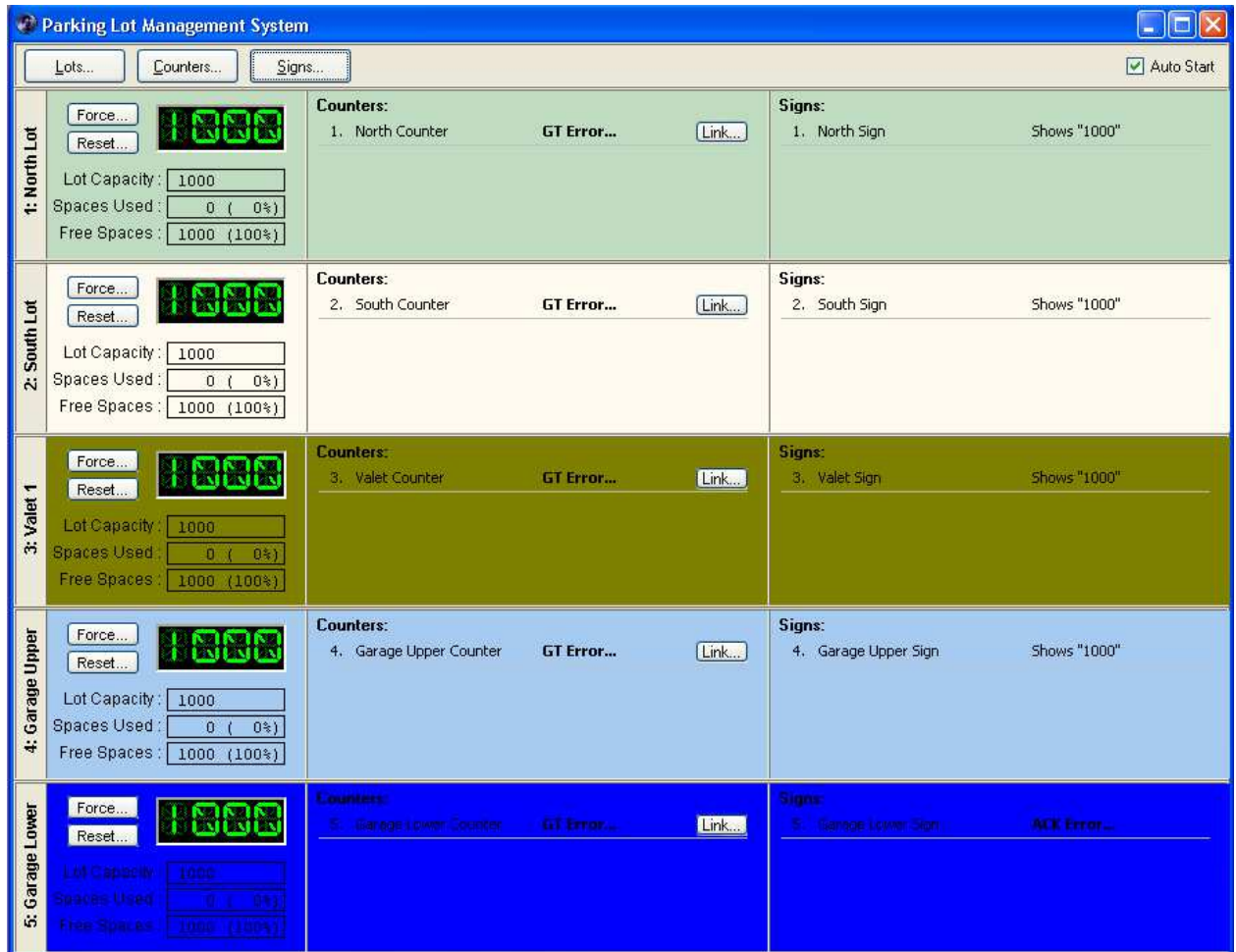


The 'Sign Configuration' dialog box shows the configuration for 5 signs. The 'Total # of Signs' is set to 5. The first sign, '1: North Sign', is selected. It is active (checked), named 'North Sign', has MAC Address '00 50 67 11 EC CF', and is assigned to '1: North Lot'. The 'Close Message' field is empty. 'Ok' and 'Cancel' buttons are at the bottom.

- iii. Click Ok. You will be returned to the main screen and all signs will appear with each lot. Specific messages and other information from the main screen will be discussed next.

5. Operating The Parking Lot System

The following describes various aspects of operating the Parking Lot System. For this example, the system shows 5 lots each with a single traffic counter and sign.



The Green LED numbers show the actual Lot status and what is to be displayed on the signs for that lot. The Counters section on Signs section detail the specific activity for each counter and sign assigned to the lot.

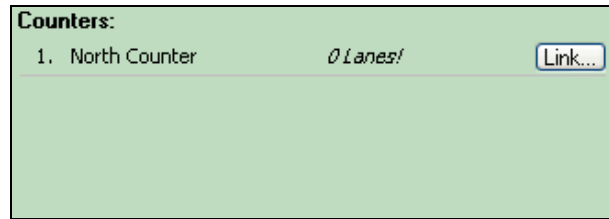
You can force any lot to a certain status by clicking the "Force" button. A menu will appear allowing you to select *Normal*, *Opened*, *Closed*, or *Full*. Once a selection has been made, within a few seconds the signs for that lot will be updated and verified by the system.

In the above example, none of the traffic counters are working. The **GT Error** means a Get Totals error occurred, which will happen anytime the system cannot communicate with a particular counter. An **ADR Error** means the system cannot set the destination address of the radio modem, and generally indicates a failure of the Aerocomm modem connected to the host computer. Other error codes are discussed below.

Also with the above example, the first 4 signs are working but the final sign indicates **ACK Error**. This is an Acknowledge Error and happens whenever a sign does not respond. Note that the message "Shows '1000'" means the sign is actually displaying the number 1000 and this has been verified by the system.

Configuring a counter:

If a properly setup and switched on traffic counter is to the Aerocomm modem configured for the North Counter in the above example, the system will eventually poll the counter (within 10 seconds) and change from **GT Error** to show this:

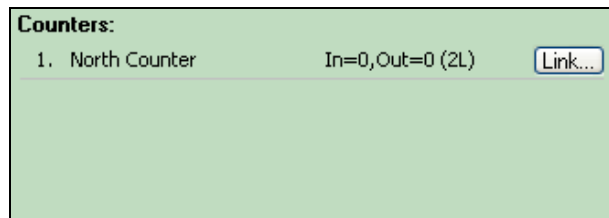


This indicates that the counter has been successfully linked to, but no lanes are enabled. To program the counter and setup lane configuration, click the Link button. Note that all Parking Lot system functions are suspended while you talk to the traffic counter.

While linked to the counter please do the following:

1. Set the Site ID as desired by the customer. All counters are polled nightly and the data imported into the database using the Site ID you program into the counter. It is important to set a meaningful Site ID.
2. Enable the lanes you wish to use.
3. Make sure all lanes function.
4. Start the data collection process.

When counter programming finished, exit the link function. Within about 10 seconds or so the screen will update and show:



The "In" and "Out" values will occasionally update and show you number of vehicles in and out of the lot from this counter. These numbers will often show zero as they are updated every 10 seconds or so, however you should occasionally see numbers appear. The "2L" indicates two lanes are active.

Resetting Lot Count:

Occasionally the actual lot count vs. displayed may be inaccurate. To reset the lot count, follow this procedure:

1. When the person doing the manual counting is at the beginning of the lot, click the Reset button. The lot count value will change to an edit box and no further polling of this lot will occur.
2. Manually count all vehicles in the lot. Ignore vehicles leaving or entering the lot (these will be picked up on the first poll).
3. Type into the Spaces Used value the lot count and press <Enter>. The signs will be updated and the count modified by the next poll.

Appendix C. Technical Notes

1. USB Driver Updating

Centurion is designed to work with a variety of USB enabled traffic counters. This includes the Phoenix, Pegasus, Unicorn, Apollo, Unicorn-Limited, Omega, and Titan-II. Each of these counters requires a device driver to be installed on your computer the first time before communication will work with that type of device (a Phoenix, for example). After the first time, that computer and that type of device know each other and will usually work really well together.

Because there are a variety of Windows types (XP, Vista, Windows 7), different kinds of users (administrative, I.T., novice and experienced), multiple releases of Centurion, and a variety of counters this can all become very complicated. If you have access to it, it is recommended you request someone with extensive computer experience to be on hand to handle setting up the initial communication protocol between the types of equipment you own and your computer. If not, be patient with yourself and you will eventually succeed.

Step 1 – Insure you have the latest drivers.

As of this writing, the current set of Diamond USB drivers is dated 7-16-2010. It can be downloaded from [http://www.dettlc.com/downloads/Diamond USB Drivers 7-16-2010.zip](http://www.dettlc.com/downloads/Diamond%20USB%20Drivers%207-16-2010.zip). It is also included in all releases of Centurion full installs dated after this date.

Once downloaded, we recommend you place it in your C:\WINDOWS\INF sub-directory. This is where Centurion puts it automatically. You can place it elsewhere, and some IT policies may even require it, but this directory will be searched automatically by Windows and makes the whole process easier if you put them there. If you put it somewhere else, you will have to manually tell Windows where the drivers are, which is fine, but time consuming.

NOTE: Do **not** run Centurion at any time during setting up the drivers. It simply makes things slower and more complicated, something you do not need during driver installation.

Step 2 – If you have never connected a traffic counter to your computer before.

You should actually be in really good shape. Simply say Yes to automatically find the drivers for the device and then say yes to trust Diamond Traffic Products (on a Vista or Win 7 machine). Everything will work fine. There is one issue to address:

Omega & Titan II counters will not function correctly at the end of the first driver installation. This is because the counter times out and thinks your PC has failed to connect to it. To fix it, just unplug and replug it in. From then on everything will work fine.

This problem actually occurs on XP machines too, only there it will say “Driver failed to start”. Again, just unplug and reconnect.

If you are asked to insert “Diamond Driver Disk”, usually just browse to either the C:\Windows\Inf\Diamondx86 (Intel Processors) or C:\Windows\Inf\Diamondx64 (AMD Processors). This normally won’t happen, but sometimes it occurs depending on what Window has been told in the past about driver locations.

Step 2 – If you have connected a traffic counter to your computer before.

Now things get complicated. What you want to do is upgrade all of your drivers to the latest version available, which will be at a minimum a driver release date of 07/16/2010.

If you have Administrative privileges on your computer, try these steps:

1. Make sure nothing else is running, including Centurion (this is just to keep things simple).
2. Click Start then Run.
3. Type in “devmgmt.msc” and click Ok.
4. This will open up your Device Manager.
5. Plug in the traffic counter. If you have successfully connected it in the past, once it is connected to your computer, it should appear under the “Ports” tab. It may also appear somewhere else on this list even if it has *not successfully installed*. In either case go on to step 6.
6. Right click on it and select properties.
7. Click the Driver tab.
8. You should see the details including the Provider, Date, and Version. Under Windows XP, no driver from us will ever say it is signed even though they actually are. Under Windows Vista and XP, the most current versions of the drivers will say signed by “diamond traffic products, inc”.
9. If your driver date is less than 7/16/2010, you should try to update it. Click the “update driver” button. If you have placed the files in the “C:\Windows\Inf” folder they may (should) be automatically found. If they are not, you can also try manually placing them in a different folder and installing them from there by specifying that folder during installation.
10. One additional note - because it takes so long to complete driver installation, the Omega and Titan II counters timeout and shut down their USB parts to save power. This will look like a driver failure to install, but it isn't. Simply unplug and plug back in the Omega or Titan II and all should work as planned from this point forward.

Hopefully this guide will remedy some of the confusion about how device drivers work. The basic idea is that inside the traffic counter is a unique Vendor Identification Number (a VID) which Diamond Traffic Products owns. That number is paired with a Product Identification Number (a PID) for each kind of device we make.

Windows reads those numbers out first whenever anything is connected to your computer. It then searches for a device driver which matches the combined VID/PID and, if not already installed, tries to install it. This is how Windows keeps everyone's individual products separate, although sometimes it is very frustrating to understand the complexities of security and multiple operating system differences.

Please let us know if you continue to experience difficulties. Once installed, we are confident that you will find that the drivers will work very well for you with Centurion.