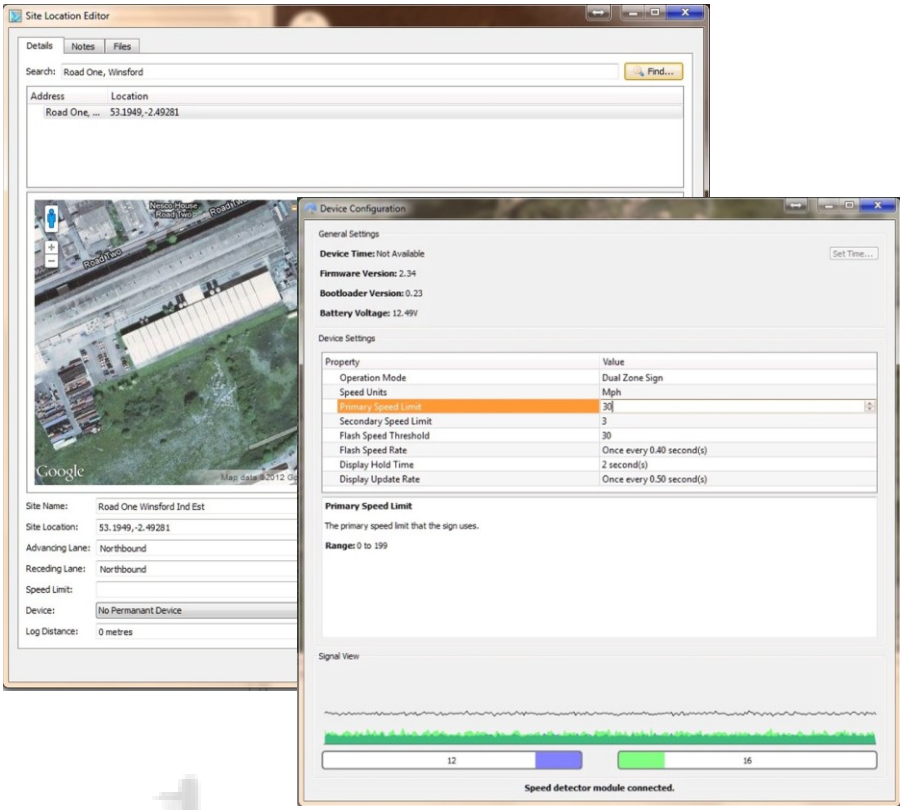
Traffic Surveyor Software

User Guide Inc:

Low Bridge Warning



Controlling the Future Today

TWM Traffic Control Systems Ltd
Unit 4,
Oasis Business Park
Road One
Winsford Industrial Estate
Winsford
Cheshire
CW7 3PP
Tel : 01606 59 66 22 Fax : 01606 59 66 33
E mail : info@twmtraffic.com
www.twmtraffic.com

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Introduction

This guide is intended to provide the user with a solid understanding of the software used for analysing traffic information collected from a Speed Sign+ or Data Recorder unit.

The software is used to store the locations where data has been collected along with any data that has been imported into the software. Any data that has been imported can be analysed inside the software to produce charts and tables which provide easy to understand and detailed statistics about the traffic.

Requirements

The software has minimal requirements for operation, these are as follows:

- *Windows XP/Vista/Windows 7*
- *A working internet connection*
- *Hard drive(s) with at least 128MB of free space.*

Extensive use of Google Maps means that a permanent internet connection is required for use, site locations are displayed on a map for your convenience, this software will not operate correctly without access to an internet connection.

All data is stored in the root of your Documents folder, the software creates a database named traffic.db. This file can be moved to other installations if required, if the file is missing the software will automatically create a new empty database.

Installation

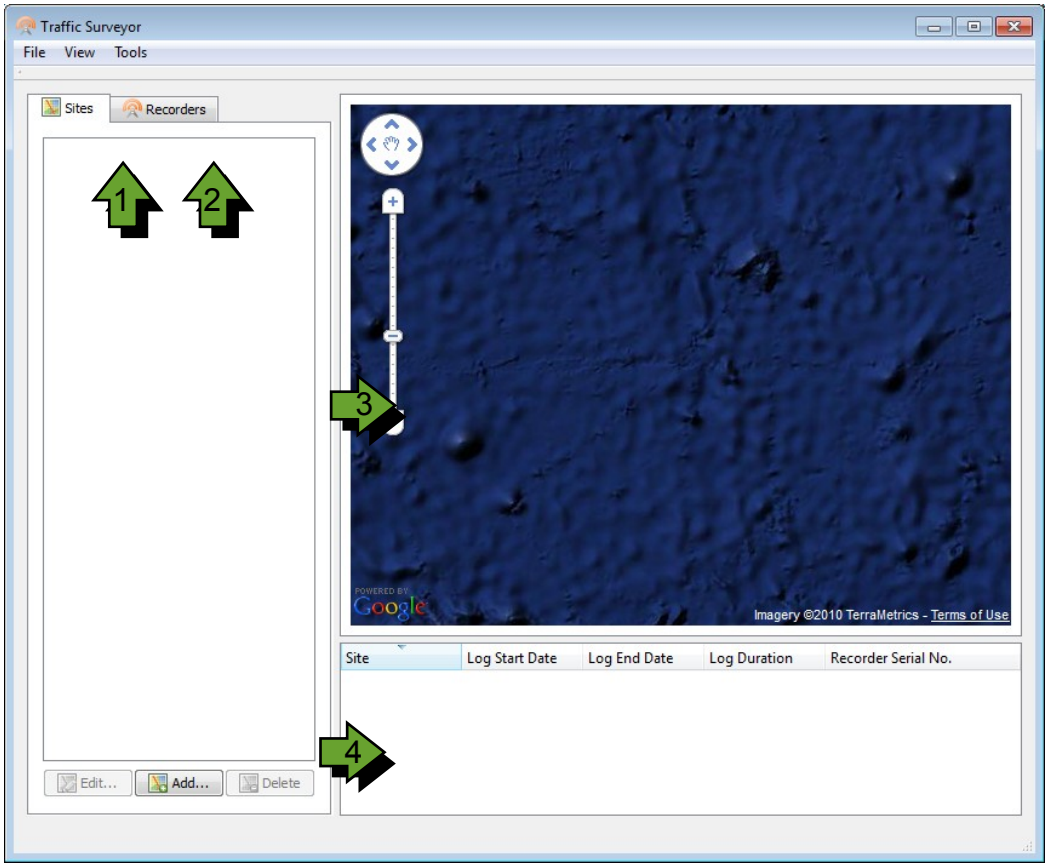
To install the software, you should run Setup.exe from the installation CD-ROM, this will start the installer which will guide you through the setup process.

Once the installer has finished, the application can be started by double clicking on the application icon.

Your installation CD also includes a device driver for windows, when the device is first inserted windows will prompt you to supply a device driver, you should select the browse option and select the CD as the install location. Additionally after installation of the application, the device driver can also be found in the folder where the application was installed.

Getting Started

When the software is initially launched, it will be in a default configuration which

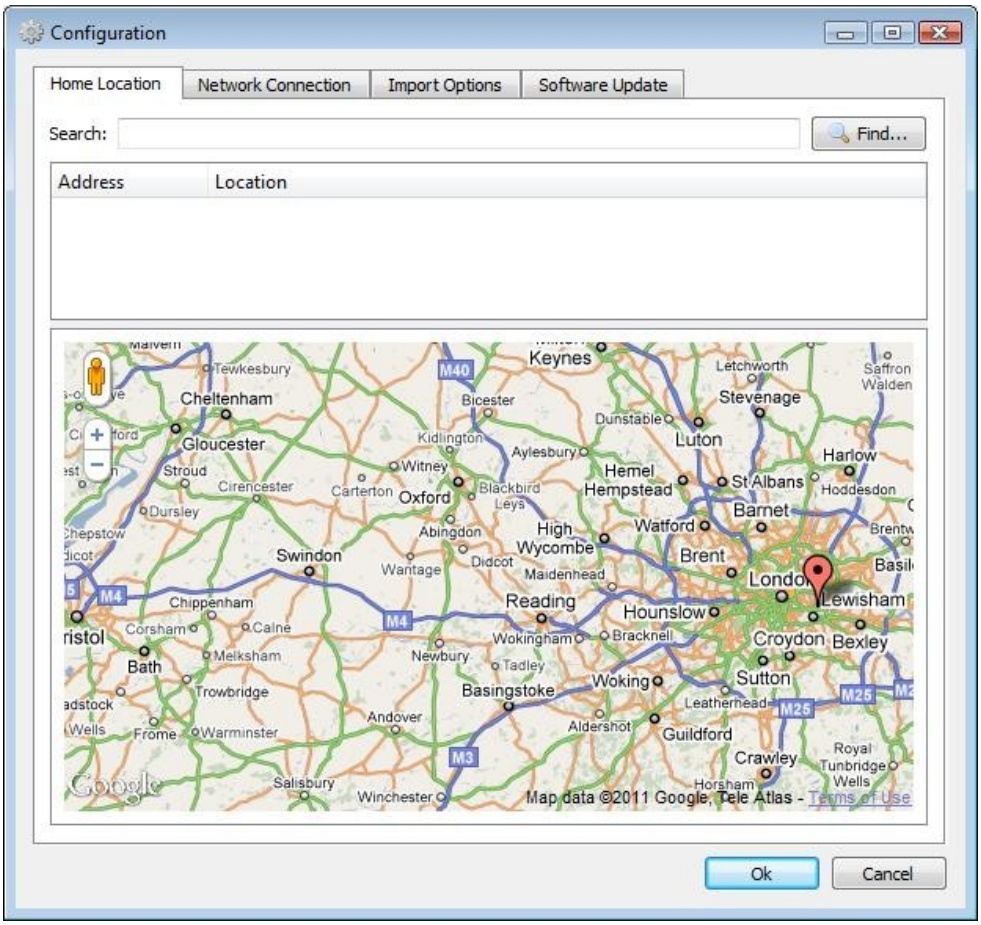


needs to be changed to suit your settings.
There are a number of parts of the user interface which you need to be familiar with, these are:

1. **Sites** is where the sites are created, edited, deleted and listed.
2. **Recorders** is where data logging devices are created, edited, deleted and listed.
3. **Map** this visually shows the locations of all sites, clicking on a site in the sites tab will automatically scroll the map to that location, conversly, clicking on a site on the map will select the corresponding site in the site tab.
4. **Log Imports** is where the imported data is displayed. This lists all log files that have been imported for the selected sites, multiple sites may be selected.

Configuration

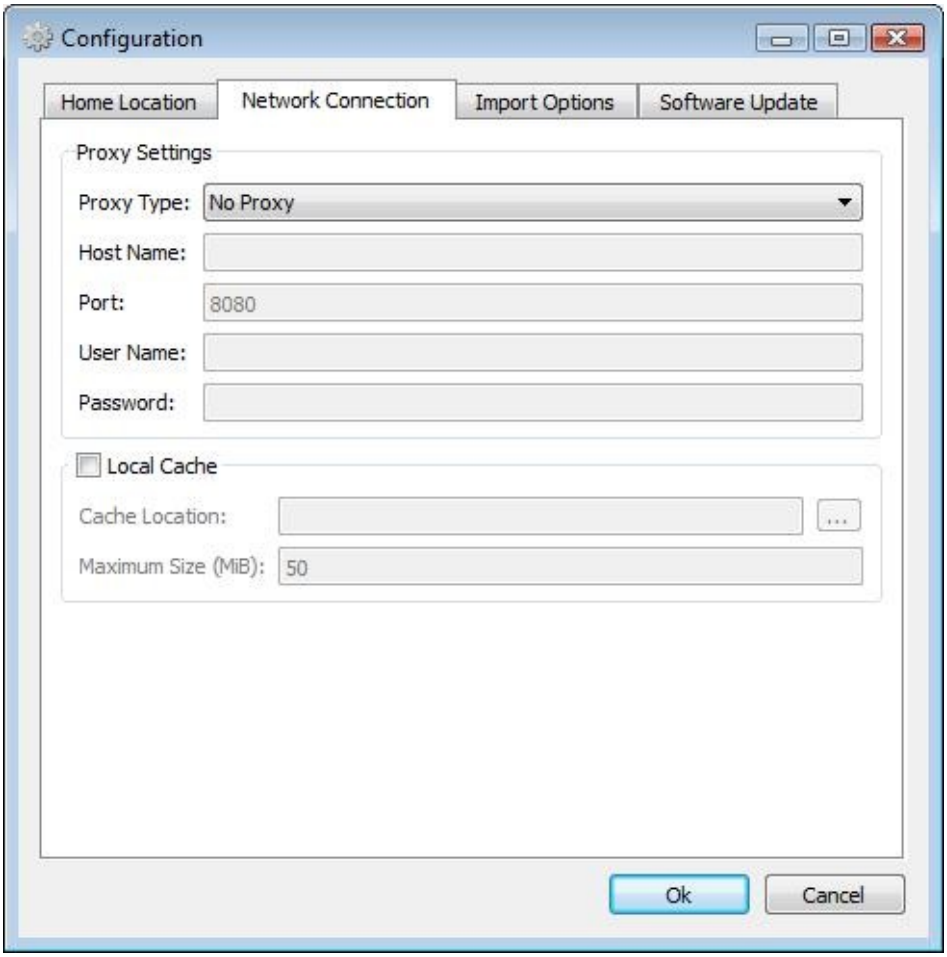
The software relies heavily on Google Maps to make it easy for you to identify site locations, before you start adding sites it is recommended that you set your home location, this is the “default” location that the sofware uses when sites are added.



The home location can be set by selecting **Tools/Options** from the menu bar. The location marker can be dragged around the map to select the position, in addition to this, the search box allows a postcode to be entered and then a location close to this can be selected from the results.

Once you are happy with the location, click ok to store the home location.

The **network connection tab** contains settings on how the software handles an

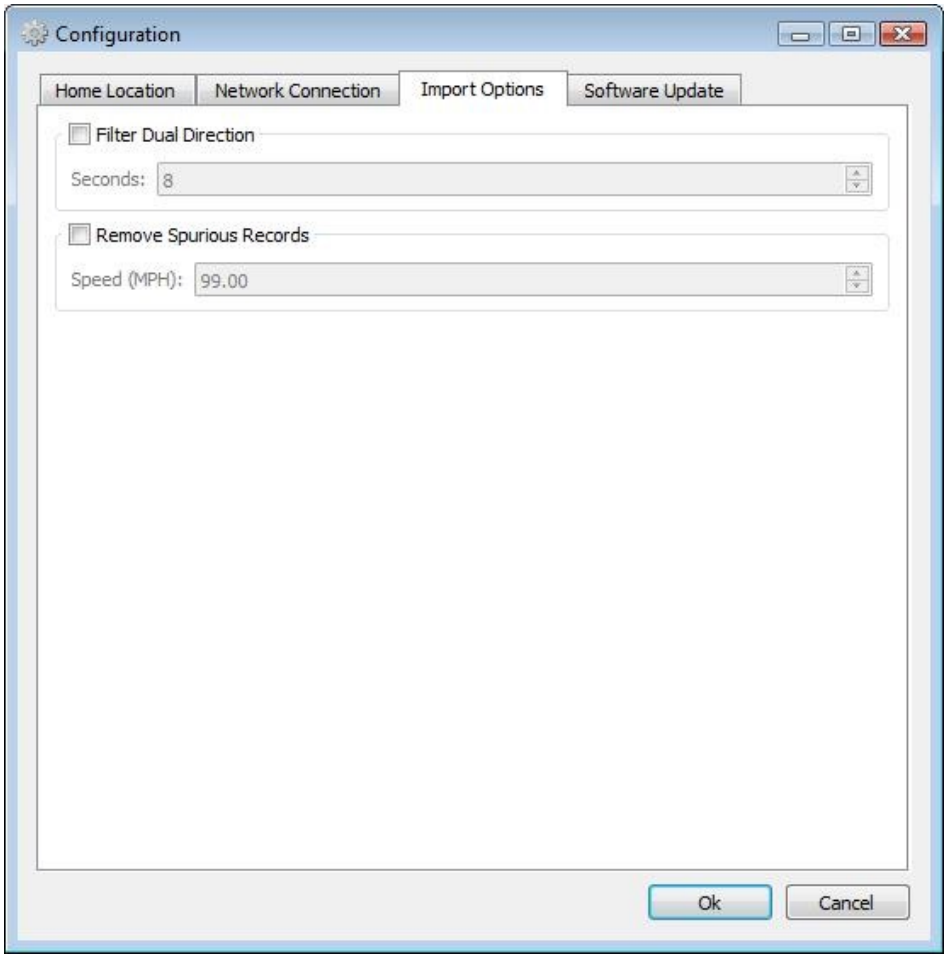


internet connection.

Some organisations control internet access through proxy servers, the software supports Socks and HTTP proxies, the configuration for these is available through the Network Connection tab. You should contact your IT department for settings specific to your network.

The local cache setting will allow the software to attempt to cache map data. The map is presented to the software as a set of tiles (like a jigsaw), each zoom level will have a new set of tiles for the same location. The software only downloads the tiles which are necessary for the current zoom level and portion of the map that is visible. If the cache is enabled, these tiles will be stored and loaded without the need to request them from the internet. We recommend that in most situations you do not cache the tiles as you may end up with “stale” tiles that are out of date, however, in some circumstances it may be useful, i.e on a laptop which is taken out into the field where internet access is not available, a local cache in this situation may allow previously cached portions of the maps to be seen. Setting the maximum size to a small amount (50Mb) will limit the possibility of ending up with stale data in the cache.

The **import options tab** has options for controlling whether the source data is



filtered as it is imported into the system.

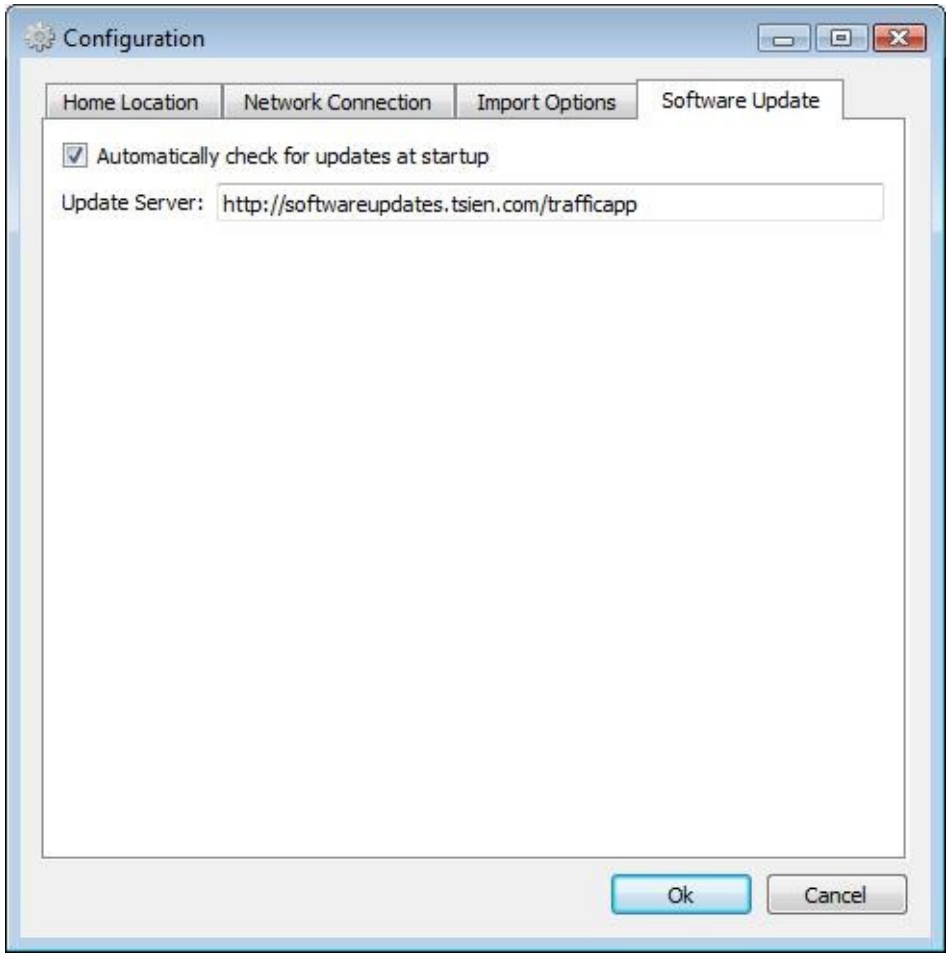
Filter Dual Direction, this option (when enabled) will filter out records where an event has been seen in the opposite direction within the specified number of seconds. This can be useful when using data that has been obtained from a site where large slow moving vehicles (i.e trucks) are in use, as due to their size and shape they will generate signals in both directions as they pass the sensor. you should note that by enabling this feature you will not see any records where vehicles in opposite directions pass at the same time.

Remove Spurious Records, in rare circumstances some vehicles due to their shape may generate spurious speed events in the data, these can be filtered out by enabling this option and setting a speed value. All records above this speed will not be imported.

Please note that changing the configuration here will affect every import after the change has been made.

These options are also available after import by right clicking on the imported log file in the main window.

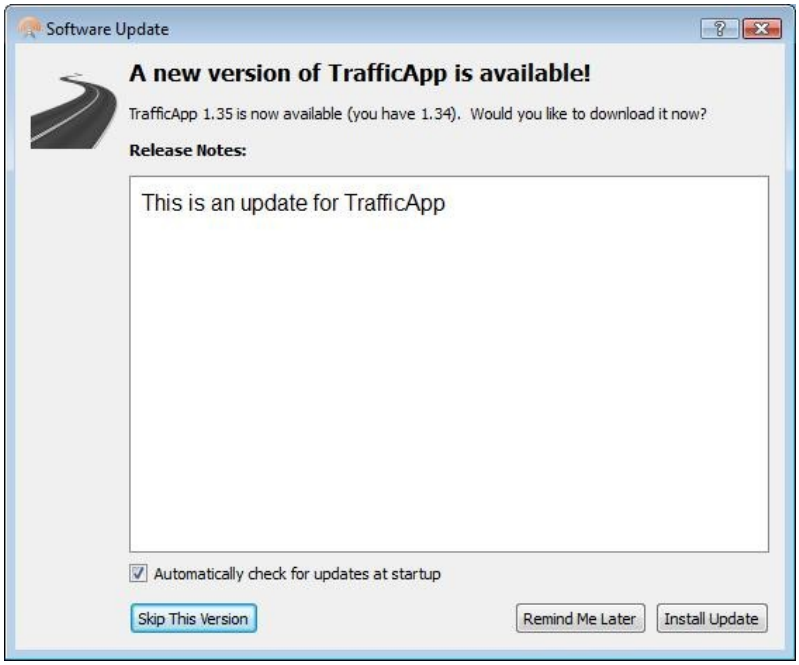
The **software update tab** has options for setting whether the software will



automatically check for updates.
When “Automatically check for updates at startup” is ticked, the application will automatically contact the software update server when the application is started. If an update is available, details about the update will be shown.

The update server should not be changed from the default shown unless you have been instructed to do so (in the case of beta updates).

The software updates are signed with a high security certificate, this means that once the update has finished downloading, it is then verified to ensure that it has not been tampered with. If the software does not pass verification, it is not written to disc or installed.



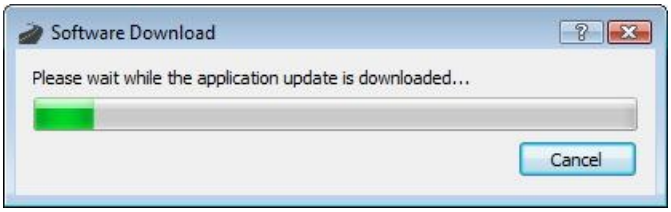
When an update is available, the following window will appear:
The window displays the current and new version numbers and also the release notes for the new software which will indicate new features and any fixes which are in the new version.

The “Automatically check for updates at startup” box allows the automatic check to be disabled, if this has been previously disabled it can be re-enabled through Tools/Options.../Software Update.

The “Skip This Version” button will stop the automatic check from prompting for this version of the update. The software will only display the update window when a newer update becomes available (providing automatic updates are enabled).

The “Remind me later” button will close the update window, but the next time the software is started (and automatic updates are enabled) the reminder that this software update is available will be shown.

To accept and install the update, click “Install Update”. A window will appear which

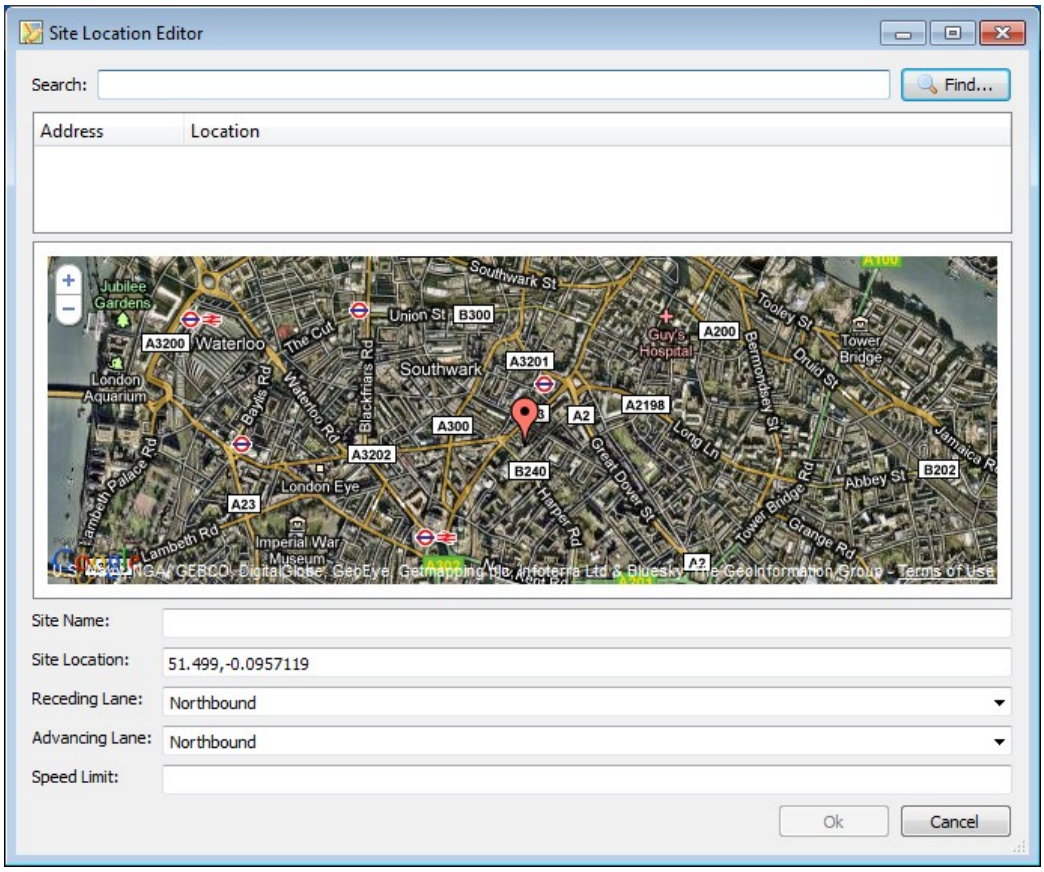


shows the progress of the download.
Once the software has completed downloading and the update has been verified, the application will then close and the update installed. If any errors occur during the download or authentication process, then an error message will be displayed explaining what the problem was.

To manually check for software updates, select Tools/Check For Updates...

Site Management

Site Creation



To create a site, click “Add...” on the Sites tab, this will open the site editor window. The software manages your sites so that you can see them on a map, this makes it easy to identify where a specific site is and also how a site may relate to other sites that have been stored inside the software.

Like the home configuration, a site can be added by postcode search and by dragging the marker to fine tune the final location, by default the marker is dropped at the home location.

There are a number of pieces of information which can be added to the site, these include:

Site Name, a descriptive name for the site. This will be displayed in the sites tab in the main window and additionally will be shown on reports that are generated inside the software.

Site Location, this shows the latitude and longitude of the site location.

Receding Lane, this allows a descriptive name to be added to describe traffic moving away from the sensor, the software provides “Northbound”, “Southbound”, “Eastbound” and “Westbound” for your convenience, but you can enter in anything you like to make this more descriptive.

Approaching Lane, like receding lane but describing traffic moving towards the sensor.

Speed Limit, this allows you to define a speed limit for the site location. This information is used by the report generator to indicate how many vehicles are over the speed limit. Setting this value to zero disables the speed limit for this site.

Once you are happy with your site parameters, click Ok to save the site into the database, the window will close and the site will now appear in the Sites tab and the site will also now be available when data is imported into the software.

Site Editing

Sites are edited using the same window as site creation, to edit a site select the site in the sites tab (in the main window) and click the “Edit...” button. Once you have applied your changes, click “Ok” to save them.

You should note that editing a site will affect any site that has been used to import data, therefore you should only use edit to correct a mistake and not to change a site location to a nearby location as a time saver!

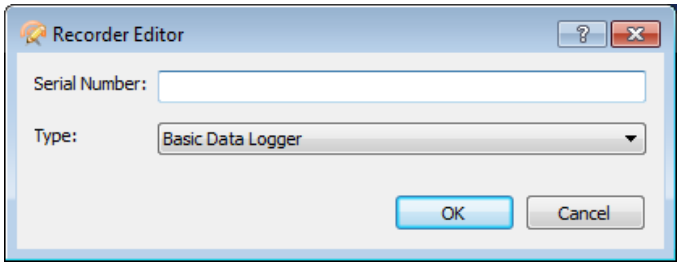
Site Deletion

Sites can be deleted by selecting “Delete...” from the sites tab in the main window, you should be aware that this is permanent operation and all data pertaining to that site will be destroyed! The software will warn you before proceeding.

Recorder Management

Recorder Creation

To create a recorder, click “Add...” on the Recorders tab, this will open the recorder



editor window.

The software keeps track of your recorders, this ensures that you know what recorder was used for a set of data.

To add a recorder to the system, simply enter the serial number of the unit into the serial number box and select the type of unit from the drop down list.

Once you are happy with the information, select “Ok” to add the recorder to the system. The new recorder will now appear in the recorders tab and can be used when importing data into the software.

Recorder Editing

Recorders are edited using the same window as recorder creation, to edit a recorder select the recorder in the recorders tab (in the main window) and click the “Edit...” button. Once you have applied your changes, click “Ok” to save them.

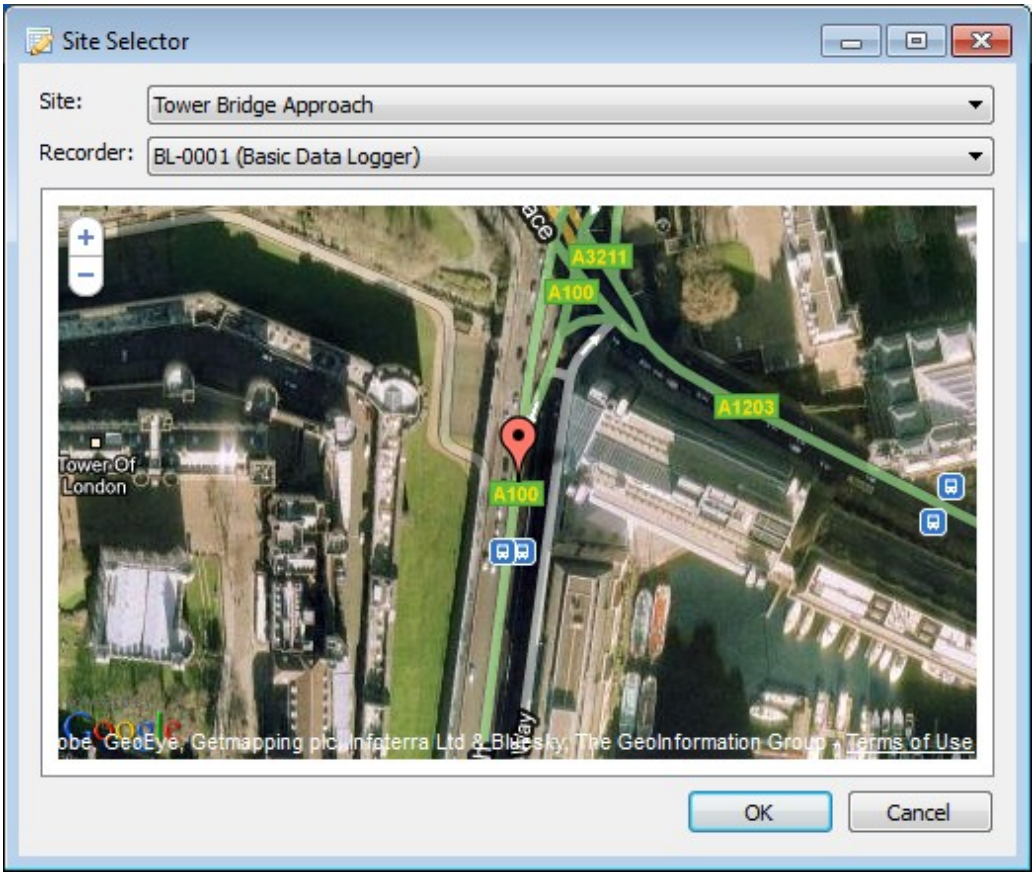
Recorder Deletion

Recorders can be deleted by selecting “Delete...” from the recorders tab. Please note that it is not possible to delete a recorder which has been used to import data, in this situation all logs that reference that recorder must be deleted first.

Importing Data

If a device is connected, the log file may be directly imported from it using **File/Import From Connected Device...** When importing data directly from the device, the software will automatically store a backup of the raw imported data in “My Documents” before deleting it from the device.

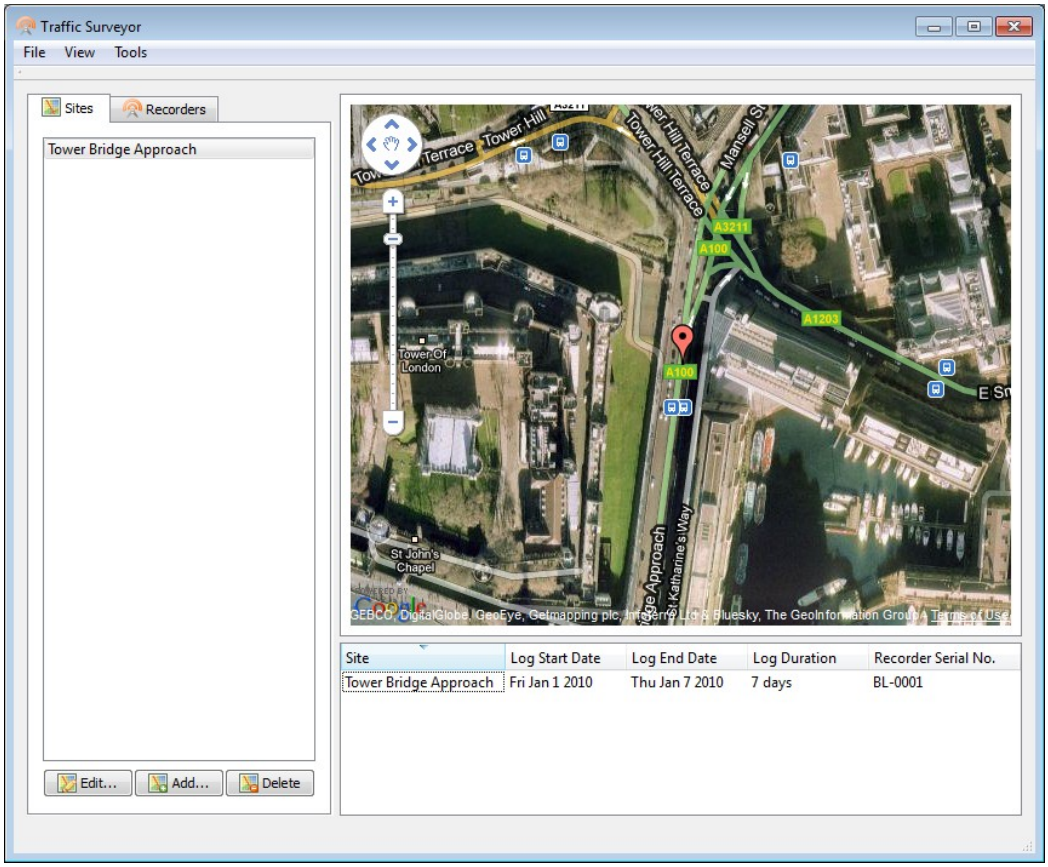
Alternatively log files may be manually imported using **File/Import...**



The log files may include information about the recorder serial number and site location, if this is the case then the data will automatically import without any interaction from the user.

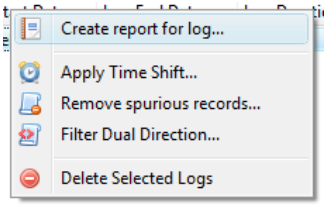
If this information is not available, then a window is displayed which will allow you to select the site and/or recorder that relates to the log file.
Once the correct site and recorder has been selected, click “Ok” to perform the import.

When the data has finished importing, the log file will appear in the logs section for



the site in the main window.
The data is now in the system and can be used to generate reports or for simple data analysis. The log viewer shows a summary of the imported log which includes, the start and end date, calculated duration, site name and recorder serial number.

Right clicking on a log file will open a menu which provides a number of options



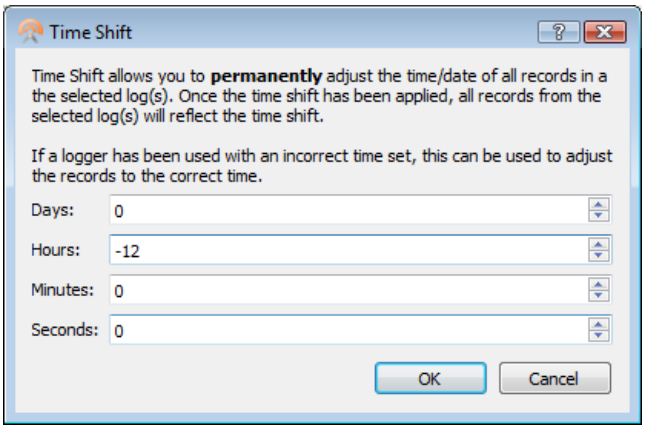
which can be used on the selected log(s).

Create report for log...

This is a shortcut which has the same effect as selecting File/Create Report... and then selecting the “Selected Logs” option.

Apply Time Shift...

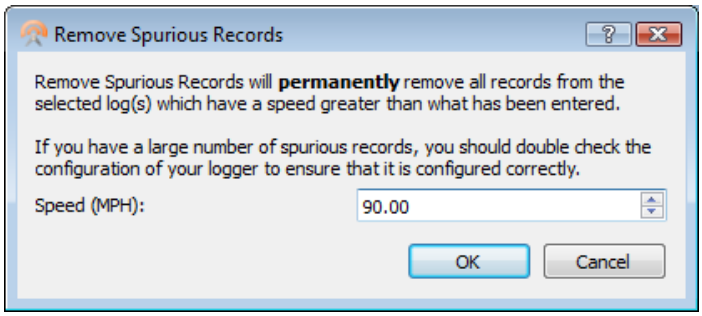
If the clock has been set incorrectly on the logging device, this function can be used "time shift" the imported data back to the correct time & date. Please note that the



time shift is permanently applied to the records.

Remove spurious records...

Radar signals are by nature very complex and sensitive to reflected signals, occasionally a vehicle may reflect a signal back in such a manner that the device will log a very high reading. The software in the device has been designed to filter out such events, but occasionally you may find such an event recorded. This option allows you to remove all records from the selected logs which are above a user

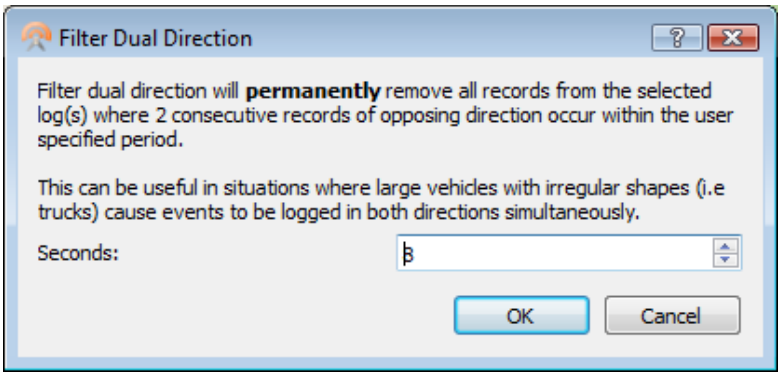


specified speed. These records are permanently removed from the system.

Filter Dual Direction

This option operates in a similar manner to the **Remove spurious records** feature.

Depending on the site it may be necessary to filter out events which occur in opposite directions within a given timeframe, some vehicles can produce radar signals in both directions, this option allows you to remove such records from a dataset, these records are removed permanently from the system.



Delete Selected Logs

To delete an imported log, you need to right click on the log file in the log viewer, this will pop up a menu which will offer you the ability to delete the log. Please note that this is permanent and the data will be removed from the system.

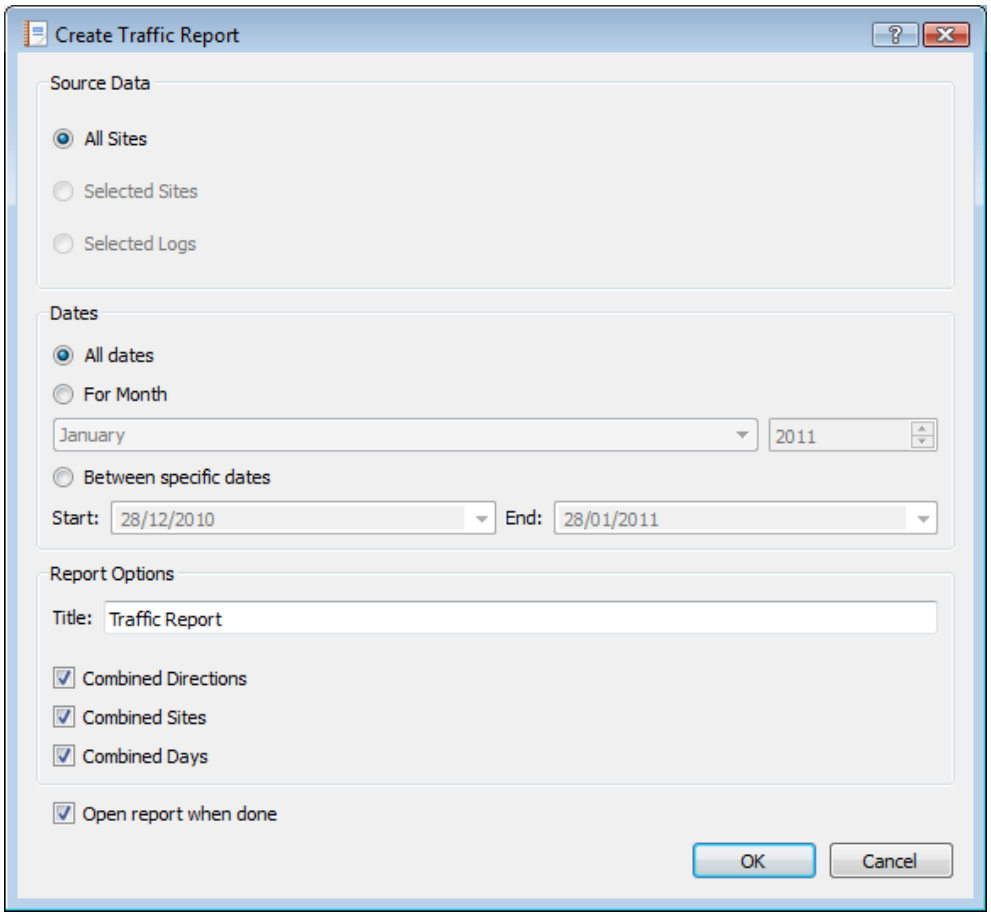
Report Creation

The software can generate reports from your imported log files, there are many options for filtering the data that is used to generate the report, however, reports are “site centric” meaning that you generate reports for a site or group of sites, you cannot generate a report for a specific logger (this is actually possible using multiple selection methods) as this information would not provide any meaningful statistical information.

There are 2 main methods for selecting which information is filtered:

1. **Filtering specific sites**. You can select multiple sites in the sites tab by holding the control key while clicking on the site names, as you click on each site the list of logs will change to include the currently selected sites.
2. **Filtering specific logs**. In addition to selecting specific sites, you can then select a set of logs (in the same manner as you selected the sites) to be used for site creation, you should also note that the list of logs can be sorted by clicking on the header section.

Once you have selected a data set (it is not a requirement to select a set of sites or logs as the software provides the option to use “all logs” as the data set) select



File/Create Report... to open the report creation window.

The first 3 options select the data source to be used for the report.

1. **All Sites**, all logs in the database will be used for the report
2. **Selected Sites**, use only the logs for the selected sites for the report.
3. **Selected Logs**, use only the selected logs for the report.

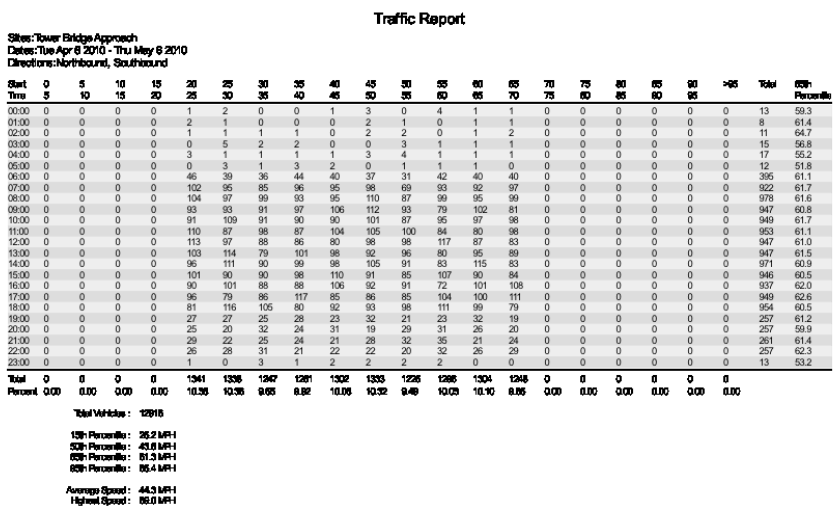
Options 2 & 3 may not be selectable if no sites or logs are selected in the main window.

The data may then be further filtered by date, you can either opt to use data from all dates or data for a specific monthly period or between a specific range of dates.

The report options alter how the data is used.

- **Combined Directions**, the report will combine all directions. If this option is selected then the direction information is effectively ignored and the end result is that the report contains counts of traffic combined for both directions. If this option is unchecked, then the result is that directions will generate different reports for both directions, this may be useful to see counts of traffic coming in or out of a site.
- **Combined Sites**, the report will combine all sites. If this option is selected, then all traffic counts from the sites will be combined into a single count, this may be useful for where you have multiple sites in a village and want to look at the results as a whole rather than individual locations.
- **Combined Dates**, the report will combine all dates into a single page. If this option is selected, then counts of traffic over multiple days are combined into a single day, this effectively lets you average out traffic over your entire data collection period.

These options can be combined, so if all 3 are ticked then the final output report will consist of a single table which combines all data in the data set.



Traffic Report

Sites: Tower Bridge Approach
Dates: Tue Apr 6 2010 - Thu May 6 2010
Directions: Northbound, Southbound

Start Time	0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80	80 85	85 90	90 95	>95	Total	85th Percentile
00:00	0	0	0	0	1	2	0	0	1	3	0	4	1	1	0	0	0	0	0	0	13	59.3
01:00	0	0	0	0	2	1	0	0	0	2	1	0	1	1	0	0	0	0	0	0	8	61.4
02:00	0	0	0	0	1	1	1	1	0	2	2	0	1	2	0	0	0	0	0	0	11	64.7
03:00	0	0	0	0	0	5	2	2	0	0	3	1	1	1	0	0	0	0	0	0	15	56.8
04:00	0	0	0	0	3	1	1	1	1	3	4	1	1	1	0	0	0	0	0	0	17	55.2
05:00	0	0	0	0	0	3	1	3	2	0	1	1	1	0	0	0	0	0	0	0	12	51.8
06:00	0	0	0	0	46	39	36	44	40	37	31	42	40	40	0	0	0	0	0	0	395	61.1
07:00	0	0	0	0	102	95	85	96	95	98	69	93	92	97	0	0	0	0	0	0	922	61.7
08:00	0	0	0	0	104	97	99	93	95	110	87	99	95	99	0	0	0	0	0	0	978	61.6
09:00	0	0	0	0	93	93	91	97	106	112	93	79	102	81	0	0	0	0	0	0	947	60.8
10:00	0	0	0	0	91	109	91	90	90	101	87	95	97	98	0	0	0	0	0	0	949	61.7
11:00	0	0	0	0	110	87	98	87	104	105	100	84	80	98	0	0	0	0	0	0	953	61.1
12:00	0	0	0	0	113	97	88	86	80	98	98	117	87	83	0	0	0	0	0	0	947	61.0
13:00	0	0	0	0	103	114	79	101	98	92	96	80	95	89	0	0	0	0	0	0	947	61.5
14:00	0	0	0	0	96	111	90	99	98	105	91	83	115	83	0	0	0	0	0	0	971	60.9
15:00	0	0	0	0	101	90	90	98	110	91	85	107	90	84	0	0	0	0	0	0	946	60.5
16:00	0	0	0	0	90	101	88	88	106	92	91	72	101	108	0	0	0	0	0	0	937	62.0
17:00	0	0	0	0	96	79	86	117	85	86	85	104	100	111	0	0	0	0	0	0	949	62.6
18:00	0	0	0	0	81	116	105	80	92	93	98	111	99	79	0	0	0	0	0	0	954	60.5
19:00	0	0	0	0	27	27	25	28	23	32	21	23	32	19	0	0	0	0	0	0	257	61.2
20:00	0	0	0	0	25	20	32	24	31	19	29	31	26	20	0	0	0	0	0	0	257	59.9
21:00	0	0	0	0	29	22	25	24	21	28	32	35	21	24	0	0	0	0	0	0	261	61.4
22:00	0	0	0	0	26	28	31	21	22	22	20	32	26	29	0	0	0	0	0	0	257	62.3
23:00	0	0	0	0	1	0	3	1	2	2	2	2	0	0	0	0	0	0	0	0	13	53.2
Total	0	0	0	0	1341	1336	1247	1281	1302	1333	1256	1286	1304	1245	0	0	0	0	0	0		
Percent	0.00	0.00	0.00	0.00	10.36	10.36	9.65	9.92	10.06	10.32	9.49	10.09	10.10	9.65	0.00	0.00	0.00	0.00	0.00	0.00		

Total Vehicles : 12915

15th Percentile : 35.2 MPH
50th Percentile : 45.6 MPH
85th Percentile : 51.3 MPH
95th Percentile : 55.4 MPH

Average Speed : 44.3 MPH
Highest Speed : 66.0 MPH

1

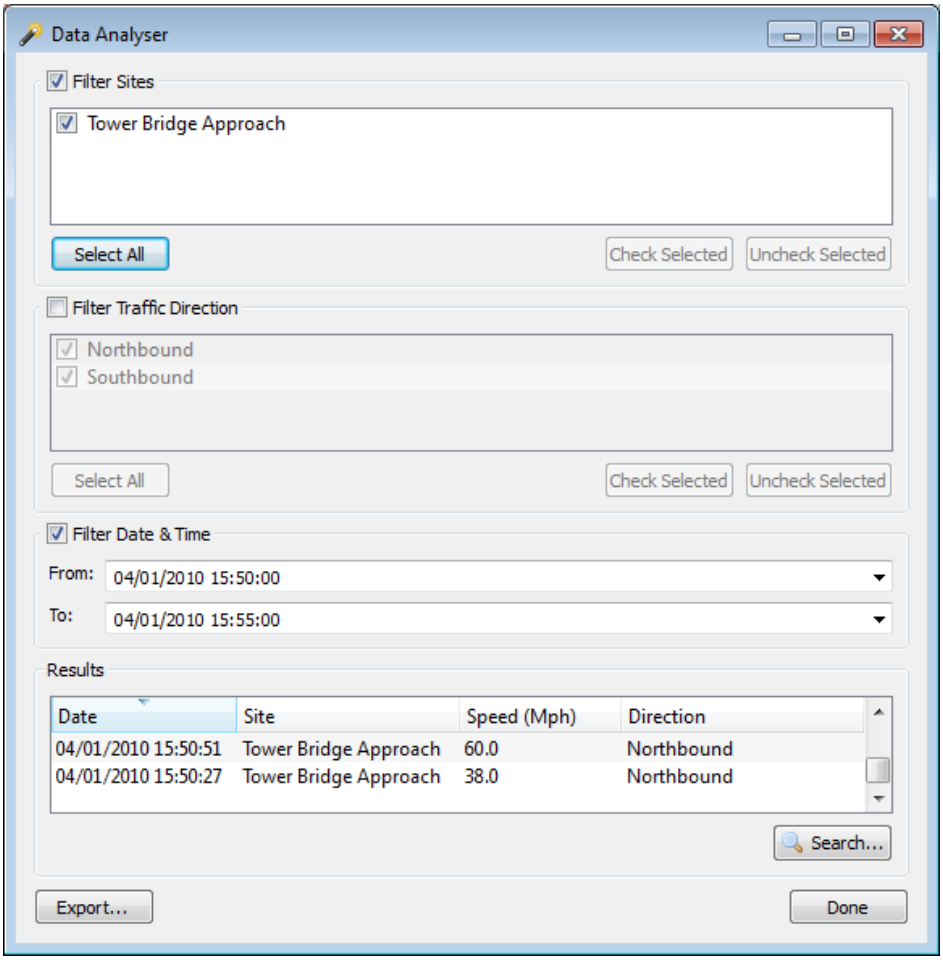
These options are powerful and give a huge amount of scope in report generation.

Data Analysis

If further analysis of the data is required, the software provides a mechanism for quickly looking at specific results (i.e if you have specific knowledge of a time/date that a vehicle passes and want to know what speed it was doing) or creating a CSV file from data to import into a spreadsheet to perform your own analysis.

To access the data analyser, select **Tools/Data Analyser...** from the main menu. You can filter the results by specific sites, directions, and date and times. This example shows that we were looking for events that occurred at the “Tower Bridge Approach” site between 4th Jan 2010 at 15:50 and 4th Jan 2010 at 15:55, this yields 2 results.

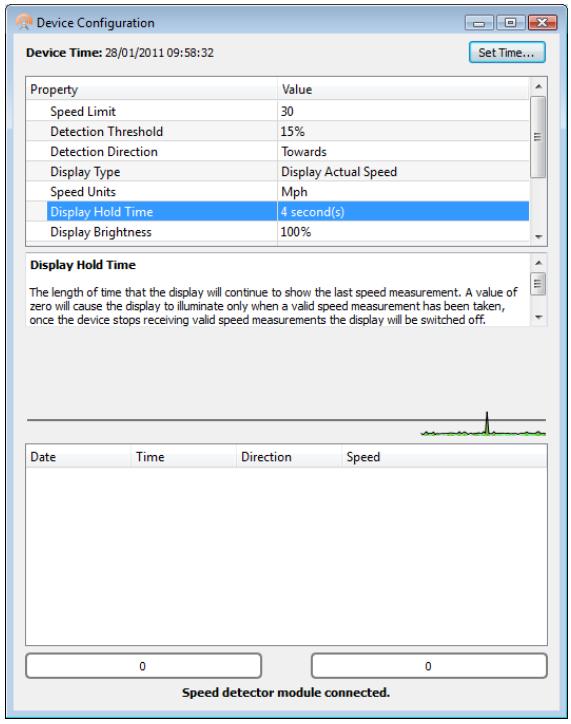
The “Export...” button exports the results of the filter to a CSV file (the file is actually tab delimited) so that custom analysis can be performed on the data, using the



filters you can extract as much data or as little as required.

Device Configuration

Devices configuration is performed inside the application by selecting **Tools/Configure Connected Device...**, please note that this option is only available to select when a device is connected. Please note that when a device is



connected via USB no logging to the devices memory will be performed.

The configuration on the device can be changed in realtime, and the window shows the strength of the signal being received by the radar and it also displays the log of traffic, this allows adjustments to be made and the results to be seen instantly - making site installation and adjustments easy.

Depending on the unit type, there are a number of configuration options which may or may not be available, but these include:

- **Speed Limit**, for units with a speed sign, this is the speed at which will cause the sign to trigger and warn the driver about their speed. The units (MPH/KPH) are set with the "**Speed Units**" option

- **Detection Threshold**, this parameter sets the signal level at which the unit considers that it is receiving valid radar reflections and can be set from 0-99. A high value for this parameter will make the unit less sensitive to traffic. A low value will make the unit more sensitive, there is a practical limit to how sensitive the unit can be made as setting this value too low will result in "false triggers" from the outside environment (I.e trees, animals etc).

- **Detection Direction**, in normal operation this should be set to Towards, but there are options to detect and trigger for traffic moving away or in either direction. Please note that this only affects the display on a speed sign and it is not used by the logging functionality.

- **Display Type**, the display can be set to show different types of information to the driver:

    - **Display Speed Limit**, when the speed limit is exceeded, the sign will display the fixed speed limit.
    - **Display Actual Speed**, when the speed limit is exceeded, the target vehicles speed will be displayed
    - **Display Difference**, when the speed limit is exceeded, the difference between the speed limit and target vehicles speed will be displayed.

- **Speed Units**, this sets the units which are used to determine if the speed limit has been exceeded, this is used in conjunction with the “Speed Limit” option. The choice is between Mph or Kph.

- **Display Time**, this sets the amount of time that the sign will remain active after being triggered.

- **Display Brightness**, this sets how bright the display will be. Setting the brightness to a lower value will decrease the power consumption of the device when the display is active.

- **Logger Inter-Vehicle Gap**, this parameter is the time period that the radar unit uses to determine that an event has taken place. Once the radar unit has “triggered” it can only finish when it sees a period of no activity as set by this parameter. Setting this parameter too high may have the effect of “merging” vehicles that are traveling in close proximity, conversely, setting this parameter too low may have the effect of detecting a single vehicle multiple times.

- **Logger Sensitivity**, this parameter sets the number of readings above the detection threshold that are required to consititute a valid event. This allows the unit to become less sensitive to spurious radar reflections, I.e a small blip of radar reflection from the environment will not result in a valid reading. Ideally this value should be set as low as practically possible.

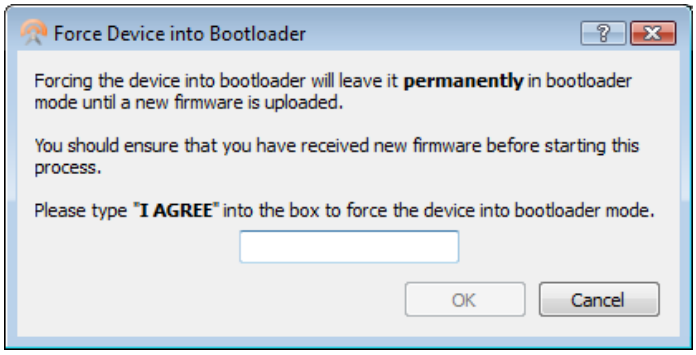
- **Display Update Rate**, this setting allows for apparent responsiveness of the display as vehicle approaches to give a steady display.

- **Sensor Angle**, for data loggers this value should be set to 45 degrees. For speed signs this value should be set to 0 degrees, this reflects the angle at which the sensor is facing with regards to the road.

Firmware Updates

The device firmware can be upgraded in the field quickly and easily, to upgrade the firmware you should ensure that you have the firmware before starting the upgrade process, the upgrade process places the device into a bootloader mode which can only be terminated by completion of the upgrade process. Removing the power during the upgrade process is safe, however, the device will re-power in bootloader mode and will do so until the upgrade process is completed.

The upgrade can be started by connecting a device and then selecting **Tools/Force Connected Device To Bootloader...**, as a safety measure a dialog appears which requires you to type in “I AGREE” before the device is placed into bootloader mode. Once in bootloader mode, the software will automatically detect the device and will ask you if you want to update the firmware, selecting yes will prompt you to select the firmware, once this has been done the software will update the firmware and you will see the progress on screen. Once complete, the



device will reset and will be detected as a speed detector by the application again.

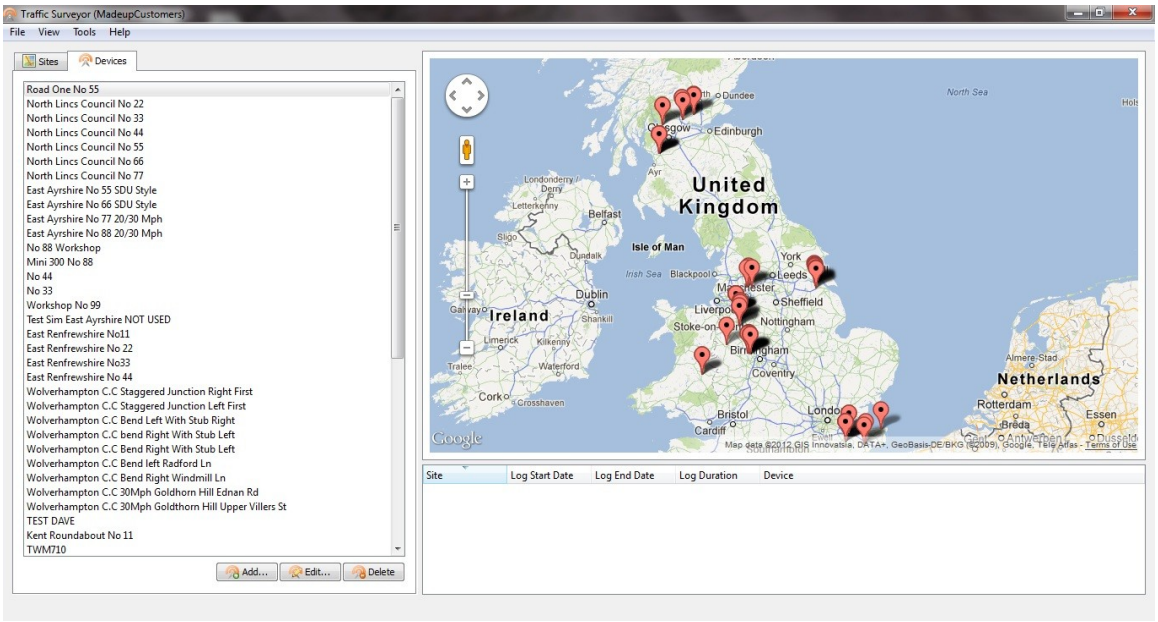
You should not use this option unless you have been in consultation with the manufacturer or supplier of the device.

Low Bridge Detection

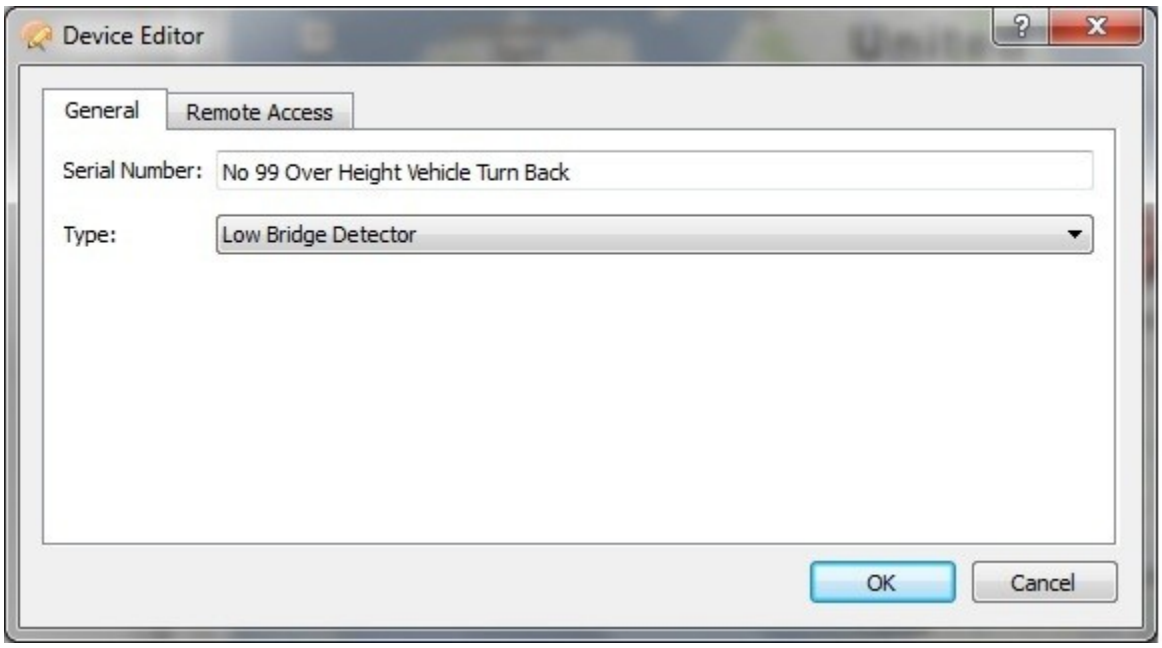
Site Creation

(See relevant section)

Device Creation



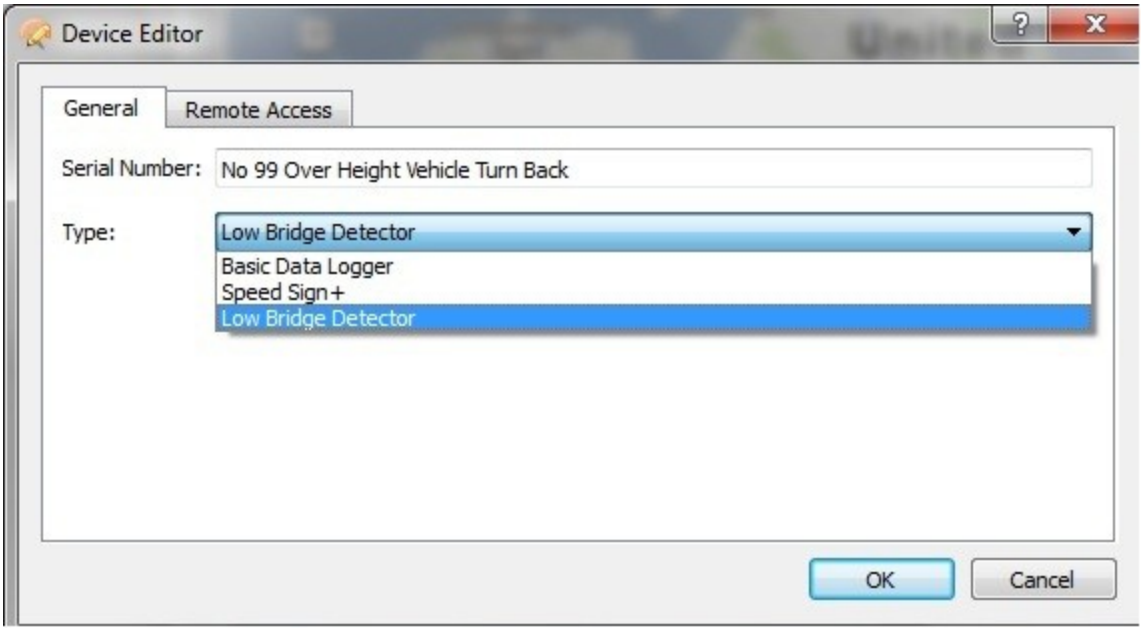
To create a Device, click “Add...” on the Device tab, this will open the Device editor window.



There are a number of pieces of information which can be added to the Device, these include:

Serial Number: a descriptive name for the Device. This will be displayed in the Device tab in the main window

Type: Shows type of sign.

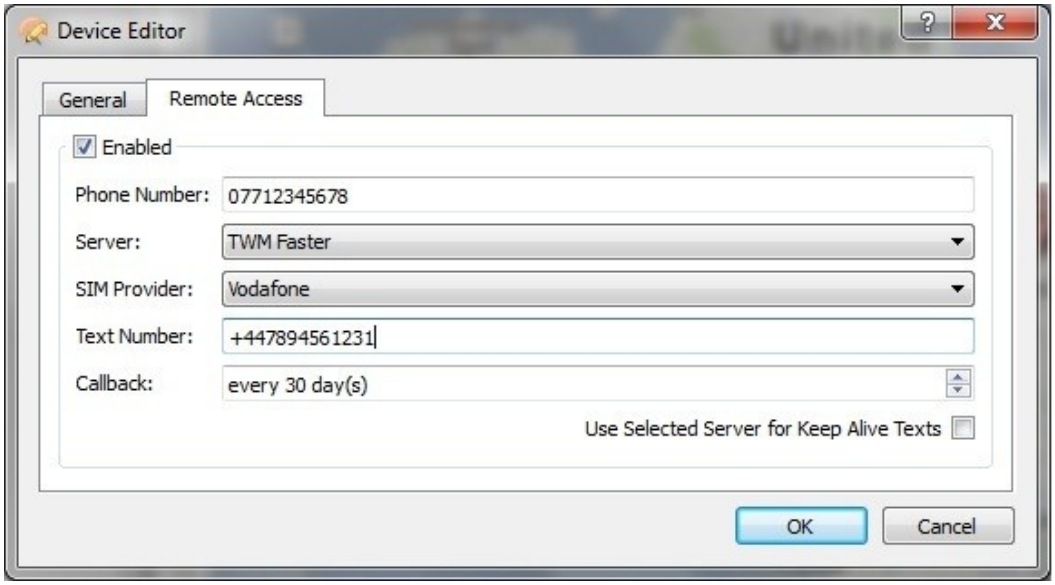


Basic Data Logger: This is a basic speed sign with data collection.

Speed Sign +: Advanced speed sign with data logger.

Low Bridge Detector: Low bridge detection system.

Remote Access

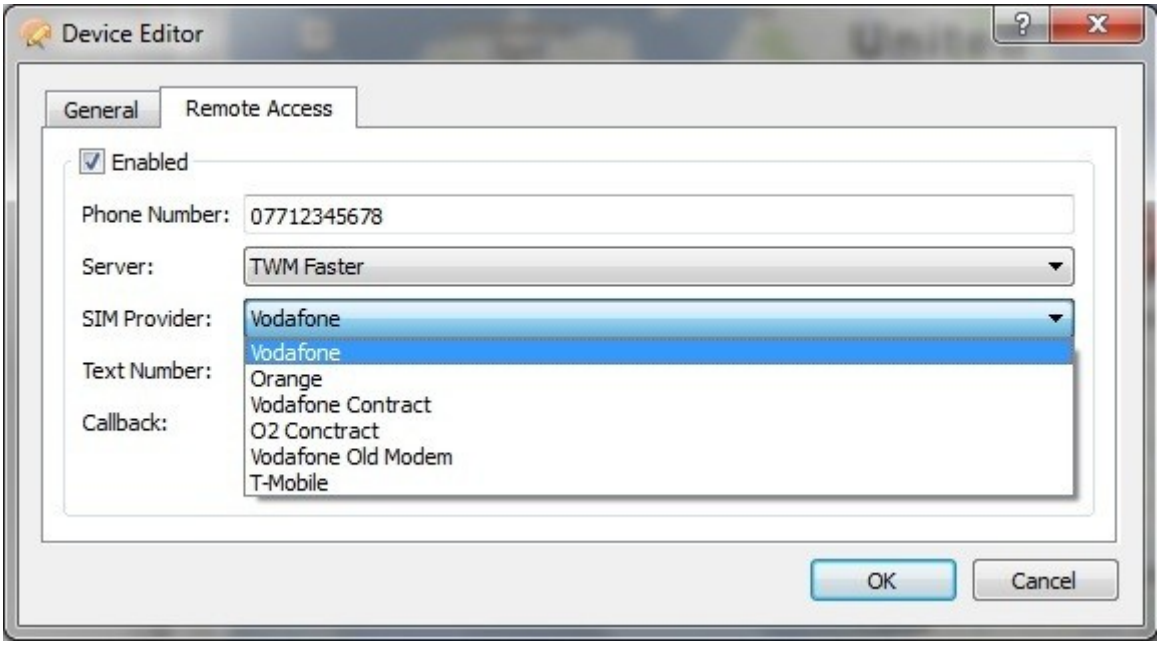


Enable: Insert tick to use this section.

Phone Number: Insert the phone number for the sim card with or without the +44 if +44 is used the first “0” MUST be omitted.

Sever: (see relevant section) this must be set for the server the device is using for remote access normally TWM's server.

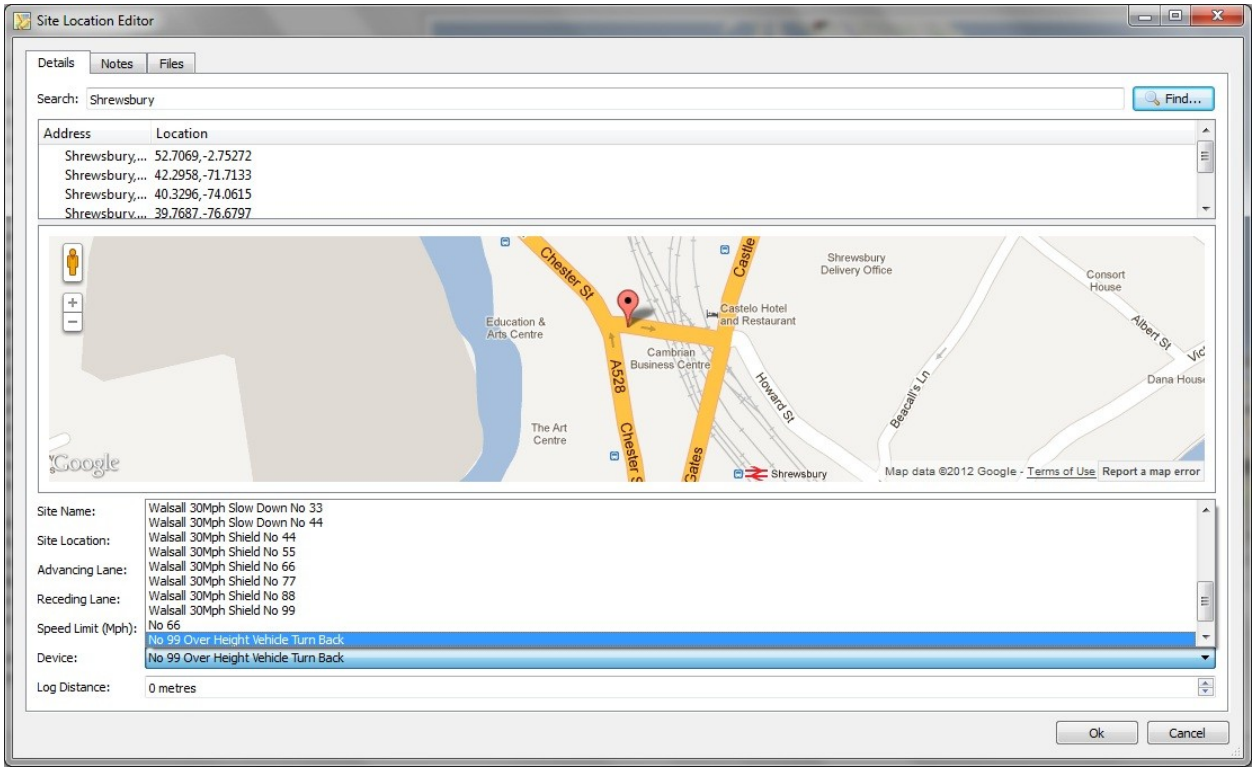
SIM Provider: This is to be set for the sim used in the device



Text Number: A mobile number can be inserted here for monthly notification to be delivered to.

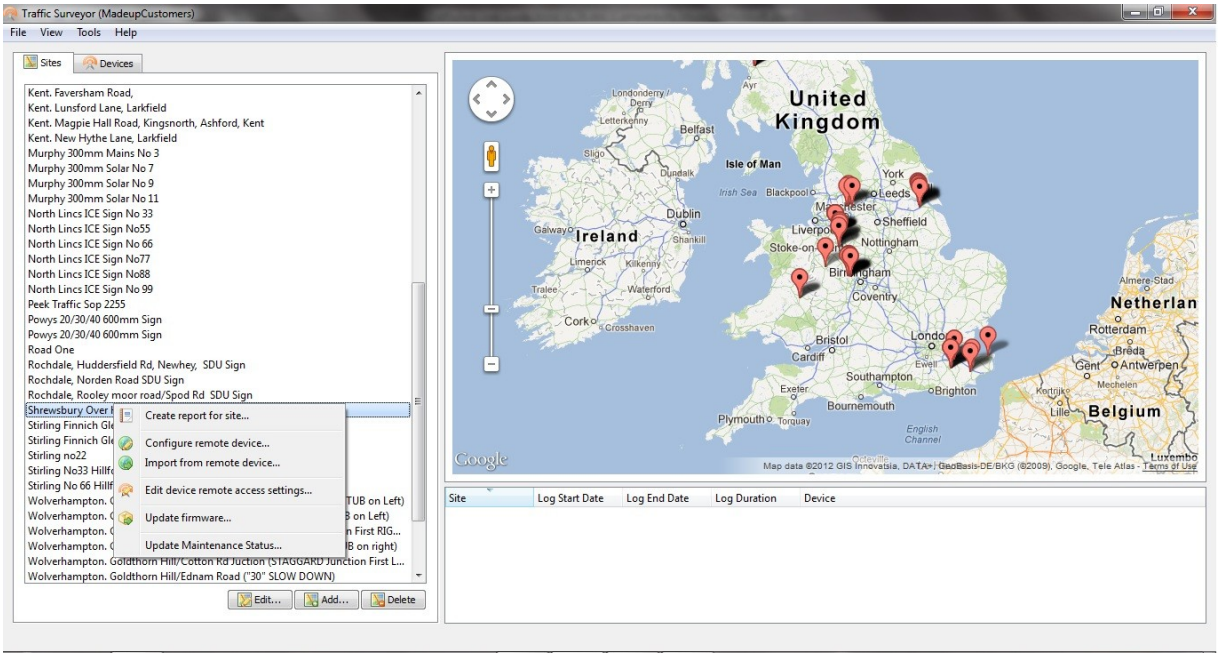
Callback: Settings can be changed for notification time intervals to be set. (normally 30 days).

Once complete return to the site list (tab) and find the site you wish to contact highlight and then click the edit button at the bottom of the window. To set the device from the list see below (see relevant section).



Communication

Once you have allocated the sign to the correct site location, Highlight the site from the list and right click to reveal a short cut list for relevant actions to be under taken.



Create report from site…: Not available on low bridge

Configure remote device…: Communicate with sign via TWM remote access server to change the settings of the over height detection system.

Import from remote device…: Not available on low bridge.

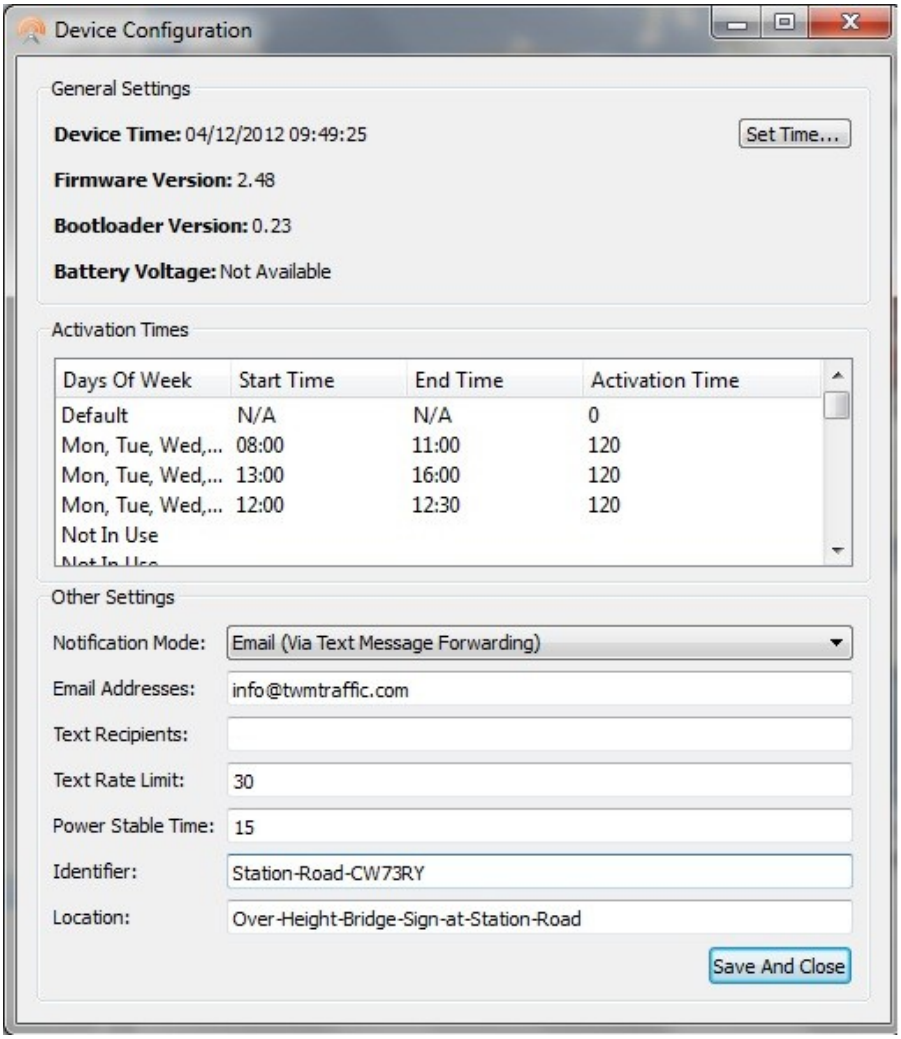
Edit device remote access setting...: Change settings for remote access E.G. Sim provider, Callback section.

Update firmware…: FOR TWM USE ONLY.

Update Maintenance status…: Only available on maintenance version.

Configure Remote Device: after you have clicked the configure the remote button a connection dialog box appears

Once connected the following window appears.



General settings

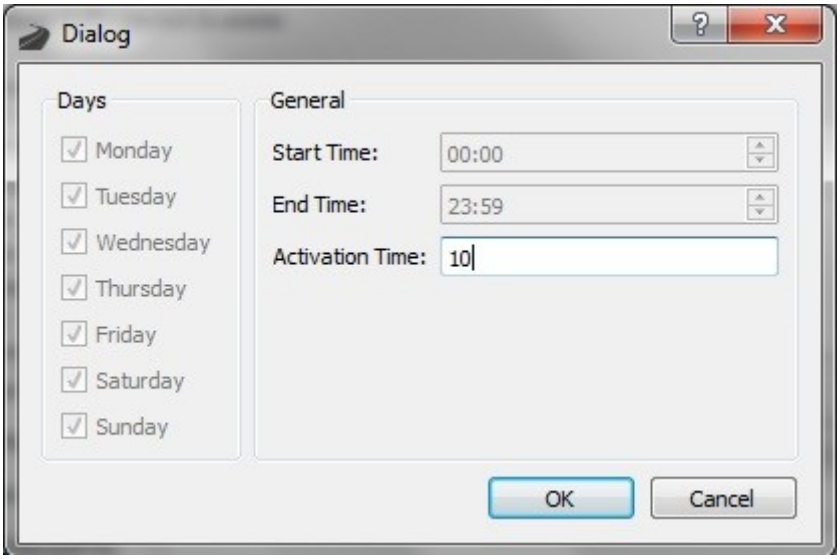
Device time: shows time and date with the option of resetting the time and date via the **Set Time** button.

Firmware version: shows the current firmware version In the system (can be updated via Remote Update Firmware).

Bootloader Version: shows current Bootloader version (needed for updating firmware).

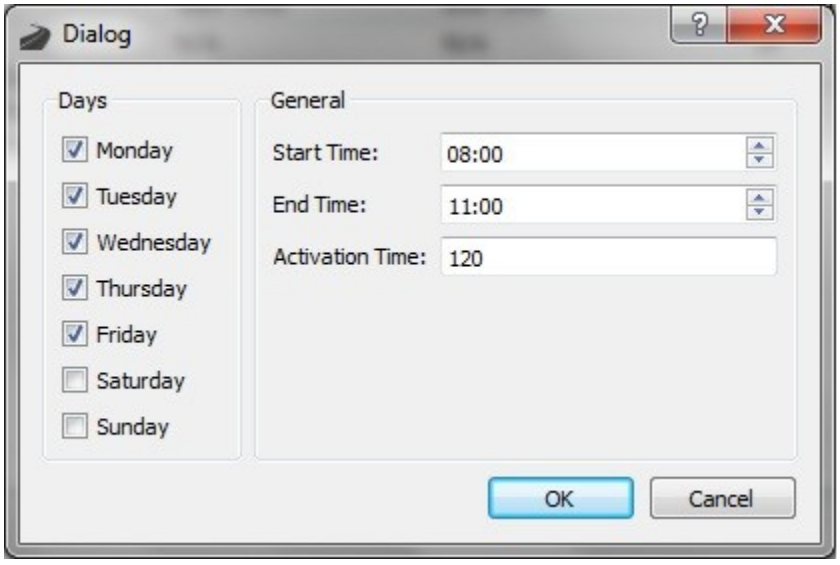
Battery: Not used on Low Bridge System.

Default Activation Time:



Only the Activation Time can be changed on the default Activation Time dialog window, this should be set for the default activation time if set to ten seconds the sign will only activate for ten seconds every over height detection.

Activation Time:



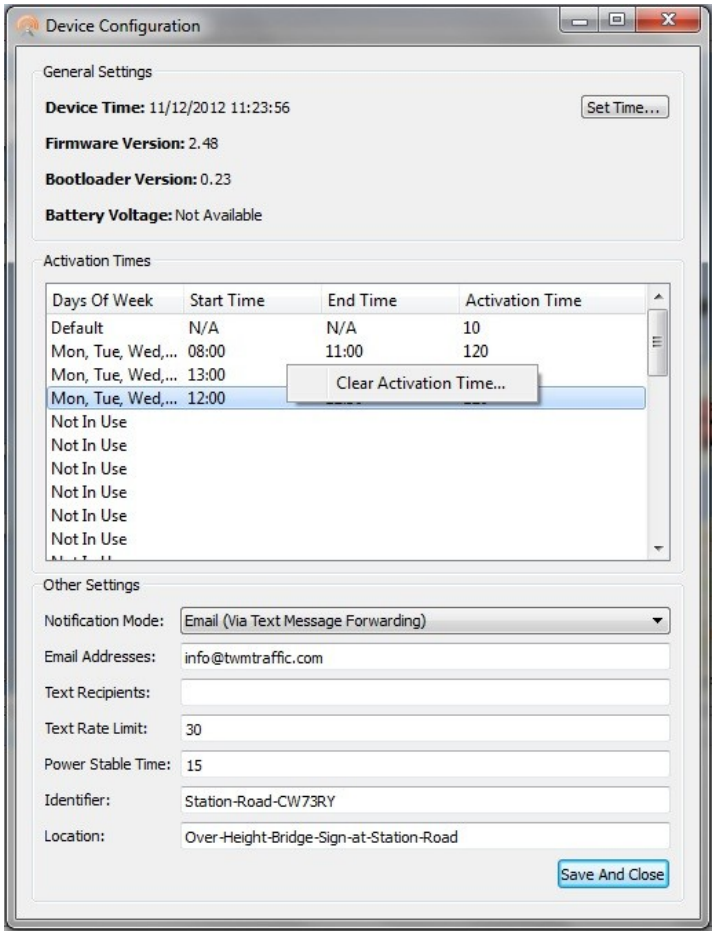
Days: Select days of the week, weekends or combination of either.

General: Start Time and End Time using 24 hr clock see above for an example.

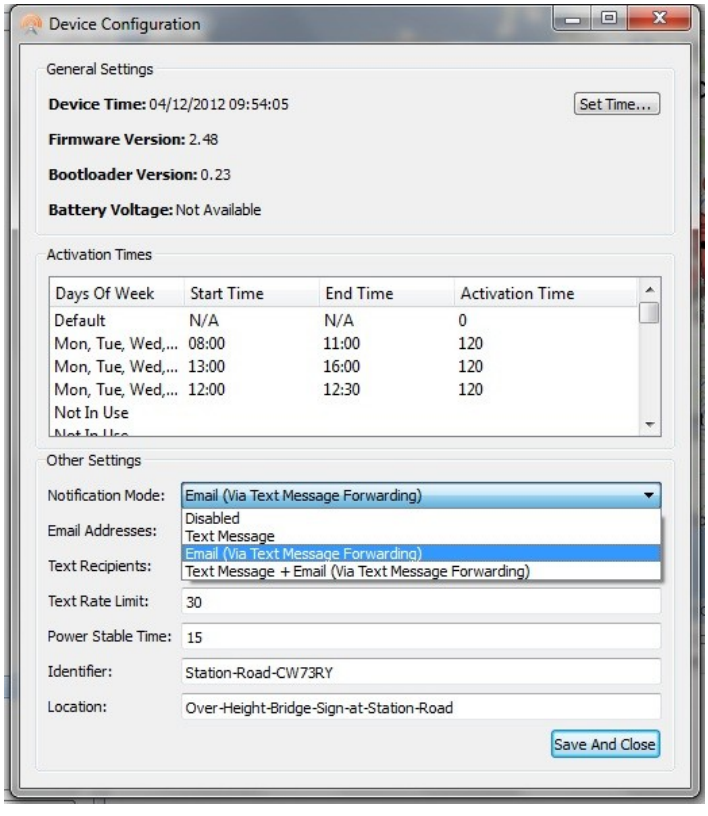
Activation Time: Select an activation time in seconds (example above shows 2mins).

Once set click OK to save changes.

Clear Activation Time: If one of the activation times is no longer needed, it can easily be removed by right clicking over the Activation Time you wish to remove and clicking the shortcut menu that appears (Clear Activation Time….).



Notification Mode:



Disabled: No Email or Text will be sent

Text Message: Just text messages will be sent to the number stated below.

Email (via Text Message forwarding): Just Emails will be sent Via TWM Server

Text Message + Email (via Text Message forwarding): Both Text Messages and Emails will be sent by the Low Bridge System.

Text Recipients: Insert text recipients number here for low bridge alerts.

Text Rate Limit: Sets rate to limit time between text messages.

Power Stable Time: Sets time unit has to see a power fault before it sends a text message.

Identifier: Used to identify which Low Bridge System is sending messages Via text or email.

Location: Used to identify which Low bridge Warning system has sent an ALERT**.**

Save and Close: Save current settings and closes window, Returns to the Main Site and Devices Window.