



# **Gas Analyser Manager**

## **Operating Manual**

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## 1.0 Manual Guidelines

### 1.1 Document History

Issued By	Issue Date	Change Control ID	Issue No.	Reason for Change
LA	March 2009	OMGAMUK	1.1	New Instructions
LA	Oct 2009	OMGAMUKSW	1.32	New Instructions upgrade V1.3.06 GAM software
LA	Apr 2010	OMGAMN	1.41	New Instructions (Biogas Check)

### 1.2 Notes

Important/useful information and instructions are shown clearly throughout the manual in a note format.

For example:

✍ Note: For further information please contact Technical Support at Geotech (UK) Limited on +44(0)1926 338111 or email [technical@geotech.co.uk](mailto:technical@geotech.co.uk).

### 1.3 Biogas Check Instrument Users

Users operating a Biogas Check instrument need only to refer to the following sections of this operating manual:

2.0	Introduction	Page 5
3.0	Software Installation and Removal	Page 10
4.0	Getting Started	Page 14
5.0	User Interface	Page 21
	Omit section 5.5	
6.0	Instrument Communication	Page 27
	Omit sections 6.3, 6.4	
10.0	Getting Readings from an Instrument	Page 57
11.0	Problem Solving	Page 63
12.0	Glossary of Terms	Page 64

✍ Note: For GA & GEM range analyser users all sections of this operating manual apply.

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## 2.0 Introduction

This manual explains how to use Gas Analyser Manager (GAM) for the GA2000, GEM2000 and Biogas Check range of instruments listed below:

- GA94
- GEM500
- GA2000
- GA2000 Plus
- GEM2000
- GEM2000 Plus
- Biogas Check

⚠ Note: These instruments are sensitive pieces of scientific equipment, and should be treated as such.

### 2.1 Gas Analyser Manager (GAM)

Gas Analyser Manager (GAM) enables communication with the range of gas analysers listed above in section 2.0 in order to configure the instruments and download data. The GAM application contains powerful new features to help with the organisation of data and remote access.

All data on the PC is stored in metric and converted to the current unit of measurement of the attached instrument.

The main features of GAM are:

- Organisation and transfer of IDs and readings to/from the gas analyser.
- Configuration of the gas analyser.
- Flexible grouping of IDs.
- Structured organisation of transferred data.
- Auto detection of instrument type and available options.
- Secure data mode to prevent tampering.
- Borehole detection via GPS.
- Email and FTP of downloaded readings.
- First time set-up wizard.
- Facility to import existing Datafield Communications data.

### 2.2 What's New in Version 1.4

In addition to the features of version 1.1, 1.2 and 1.3, version 1.4 supports:

- UK Biogas Check.
- SMTP Authentication.

### **2.3 What's New in Version 1.3**

In addition to the features of version 1.1 and 1.2, version 1.3 supports:

- Borehole detection via GPS (Global Positioning System) latitude and longitude coordinates to aid site navigation.
- Manage location data.
- Improved reading viewer.

### **2.4 What's New in Version 1.2**

In addition to the new features of version 1.1, version 1.2 supports:

- Landtec BioGas instrument.
- Searching for an ID.
- The ability to specify source as instrument serial number when saving readings in Monitor Pro format.
- Support for V3.02 Gas Analyser firmware, featuring programmable residual N<sub>2</sub> alarm levels.
- The default configuration folder for new installation has moved to the All Users folder to allow easier sharing of configurations.

### **2.5 What's New in Version 1.1**

- When using a GEM2000 Plus; readings are downloaded from the instrument from both the GA and GEM operating modes. IDs are transmitted to the instrument in the mode specified on each borehole.
- When importing a 'GAM Export File' the user has the ability to specify sites to import and how to control the overwriting of existing data.
- More than one serial port can be scanned for instruments and the software can automatically detect connection of an instrument.
- Supports the 'Event Log' and 'Technician Log-in' features of the latest model GA2000 and GEM2000 instruments.
- Enhanced ID editing facilities, change only selected parameters of a group of IDs.
- Create and label readings that were recorded without an identifier.
- Store user calibration information in downloaded readings file inline or in the header block.
- Supports instrument upgrade facilities.
- Improved performance.

## 2.6 Compatibility

The software is designed to run on the following operating systems:

- Microsoft Windows 2000 Service Pack 4.
- Microsoft Windows XP Service Pack 3.
- Microsoft Windows Vista Service Pack 1.
- Microsoft Windows 7.

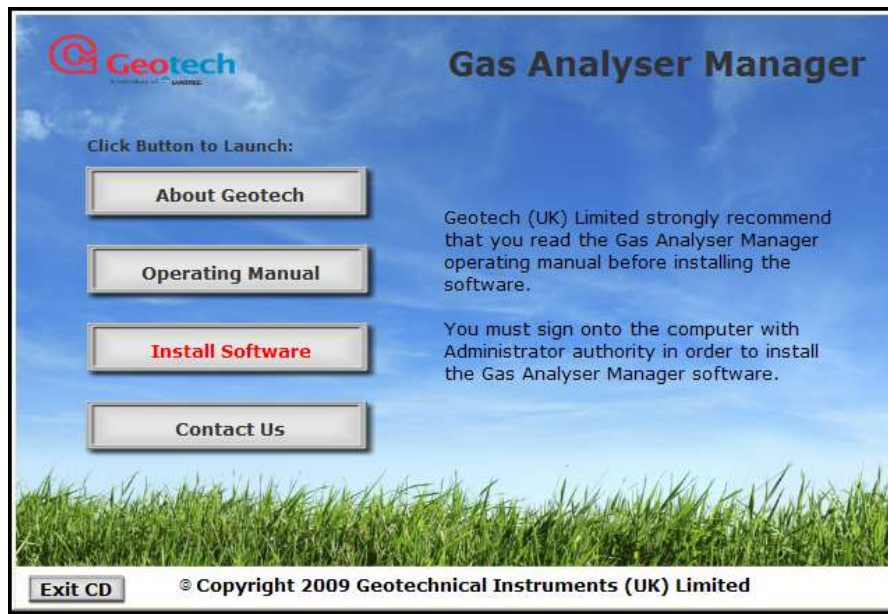
The software requires that Microsoft.NET V2.0 components and MDAC 2.8 are installed. These installations will be carried out during the software installation.

### 3.0 Software Installation and Removal

#### 3.1 Software Installation

Gas Analyser Manager is provided on CD. The user installing the software must sign onto the PC with 'Administrator' privileges.

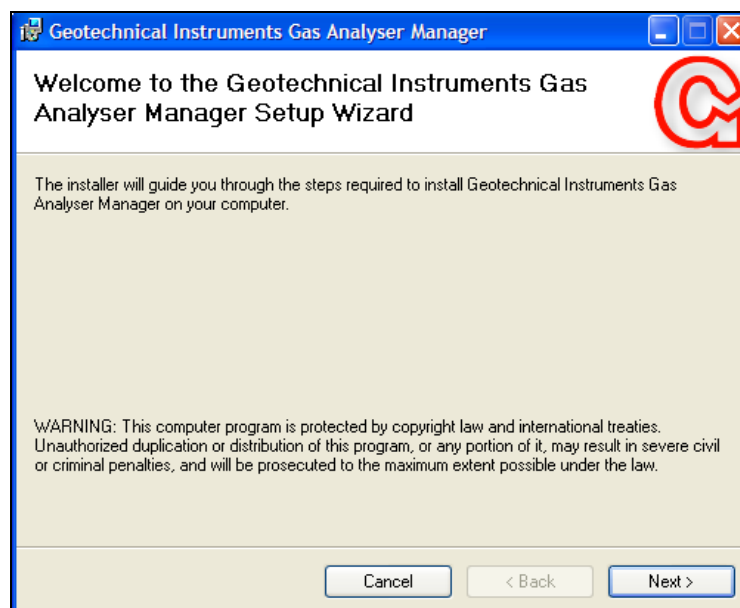
- 1) Insert the CD into the CD/DVD drive. The CD will automatically (autorun) start up and the following screen is displayed:



Software Installation CD Home Screen

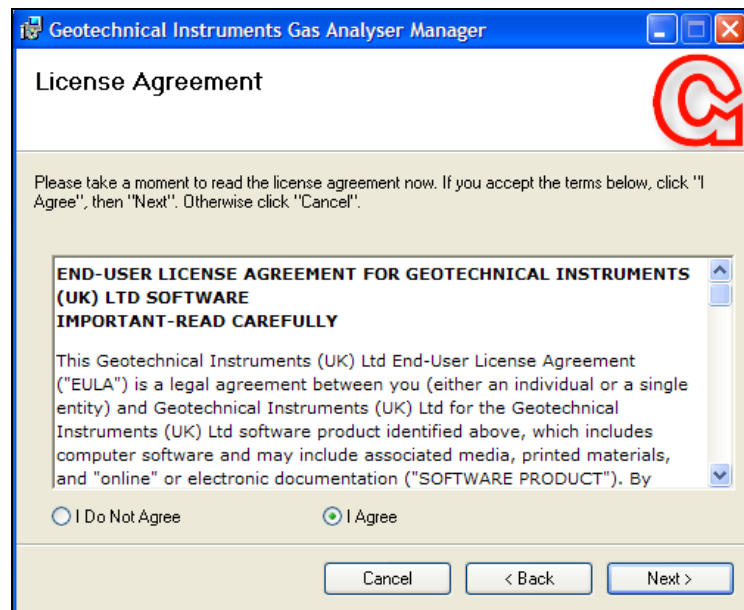
- 2) To install the Gas Analyser Manager programs select the 'Install Software' button and the installation will commence.

During the installation the user will be guided through the 'Setup Wizard' and prompted to make various selections and choices. Once user choices have been selected, click the 'Next' button to move the installation onto the next stage.



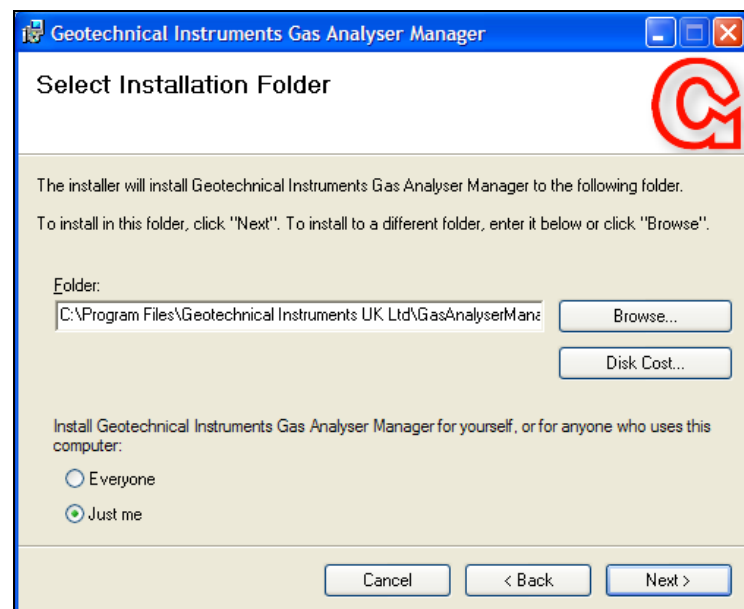
Software Installation

- 3) Select the 'Next' button to continue with the installation or select the 'Cancel' button to cancel and exit.



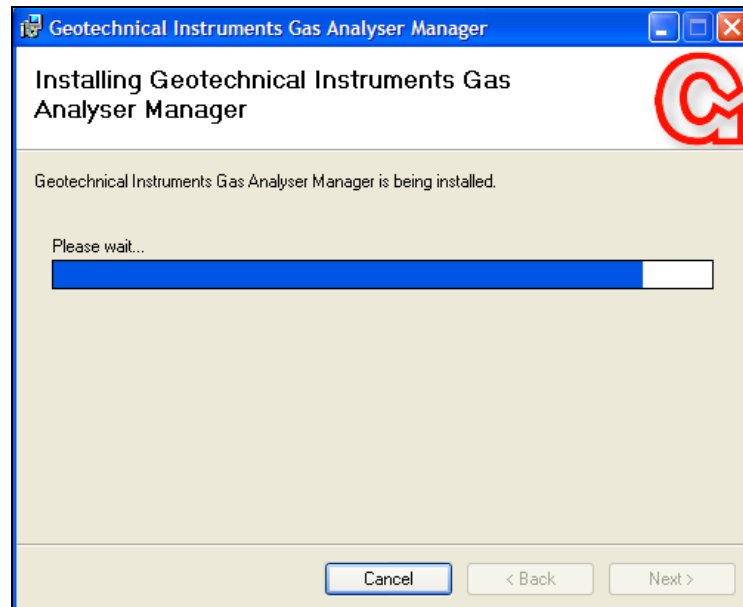
Software Installation

- 4) Select 'I Agree' followed by the 'Next' button and the following screen is displayed.



Software Installation

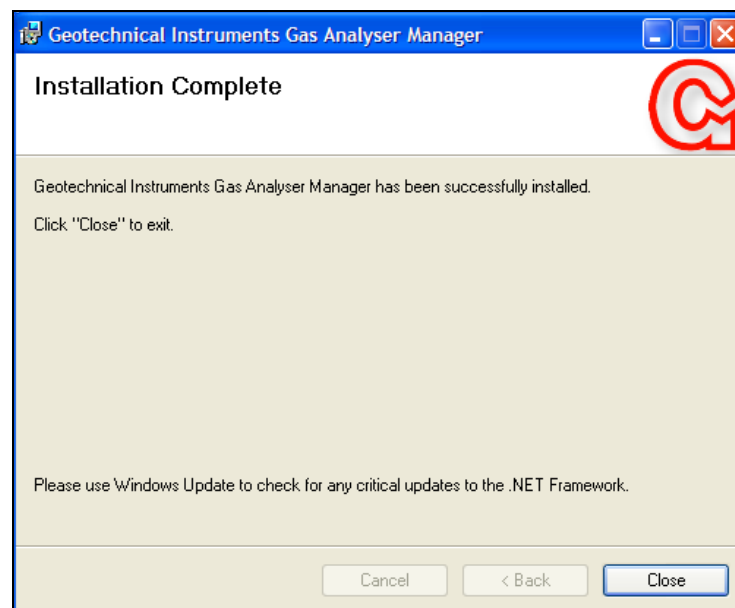
- 5) Choose either the default folder path to install the software programs into or select the 'Browse' button and install the files into your chosen folder. Choose whether to install the software for 'Everyone' or 'Just me' on the current PC followed by the 'Next' button to continue.
- 6) Select the 'Next' button to confirm installation and wait for the software programs to install.



Software Installation

- 7) When the installation is complete, select the 'Close' button to exit the 'Set-Up Wizard'.

✍ Note: It is important to restart the PC after software installation.



Software Installation

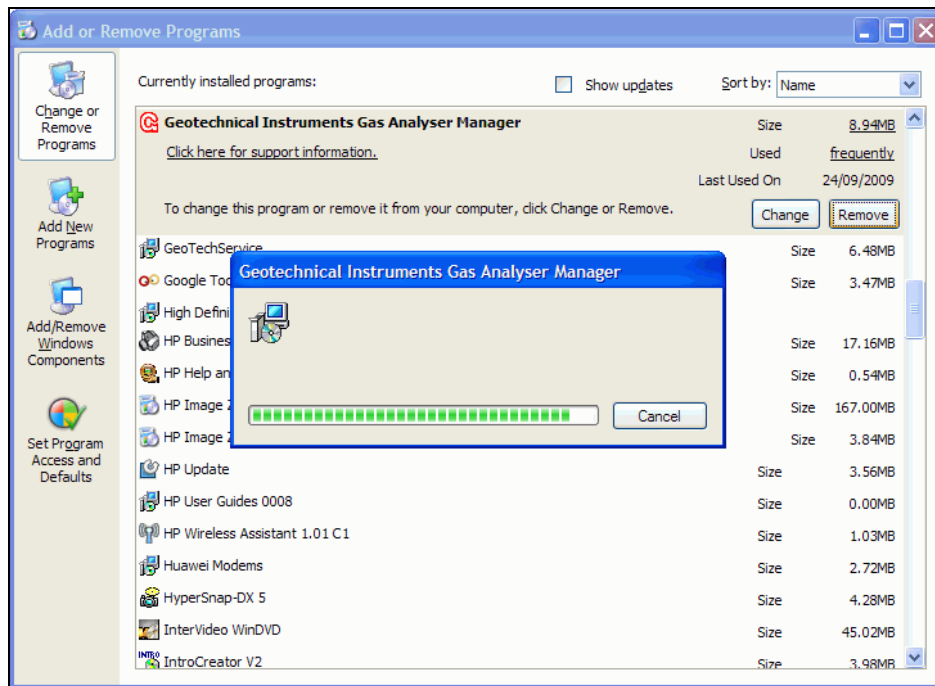
- 8) The operating manual may also be viewed and installed to your computer for reference from the 'Install CD'.
- 9) To exit the installation CD select the 'Exit CD' button from the CD 'Home Page' and reboot the pc.

✍ Note: If your computer does not already have Microsoft.NET V2.0 Framework installed it will be installed automatically during the software installation.

## 3.2 Software Removal

To remove Gas Analyser Manager and all associated files the user must sign onto the PC with 'Administrator' privileges, otherwise the removal request is denied by the operating system.

- 1) To remove the software once installed, select 'Start' from the desktop and then 'Control Panel'.
- 2) Select the 'Add/Remove Programs' icon, highlight 'Geotechnical Instruments Gas Analyser Manager' and select 'Remove'.



Add or Remove Programs

**Note:** Deleting the Gas Analyser Manager application does not automatically remove Microsoft.NET V2.0 Framework. Take into consideration other applications which may use Framework before removing from the 'Add/Remove Programs' option.

- 3) Restart the PC after the software has been removed.

## 4.0 Getting Started

### 4.1 Program Start-up

Once the software is installed connect the analyser to the PC via the USB or serial cable.

- 1) To start the application double-click the desktop shortcut for 'Geotech Gas Analyser Manager'.



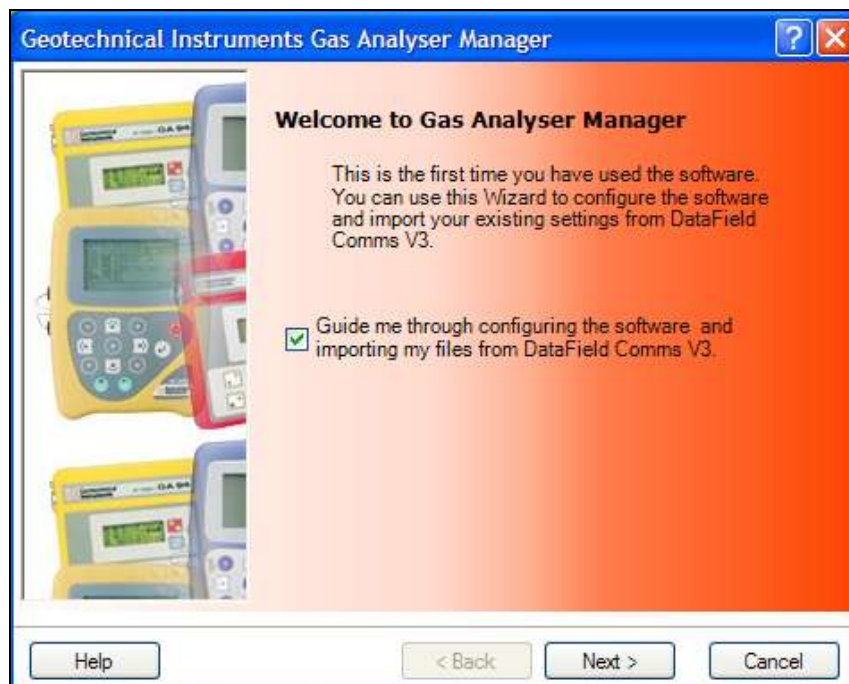
Desktop Icon

- 2) Alternatively, select 'Start' from the desktop, then 'All Programs' and select 'Gas Analyser Manager' from the Geotechnical Instruments program folder.

### 4.2 Running the Software for the First Time

When running the software for the first time, the 'First Time Usage Wizard' will guide the user through specifying important software settings. The user may decide whether to complete the options and settings following the 'Wizard' or to select the 'Next' button through to the end and complete the options from the menu options within the GAM application.

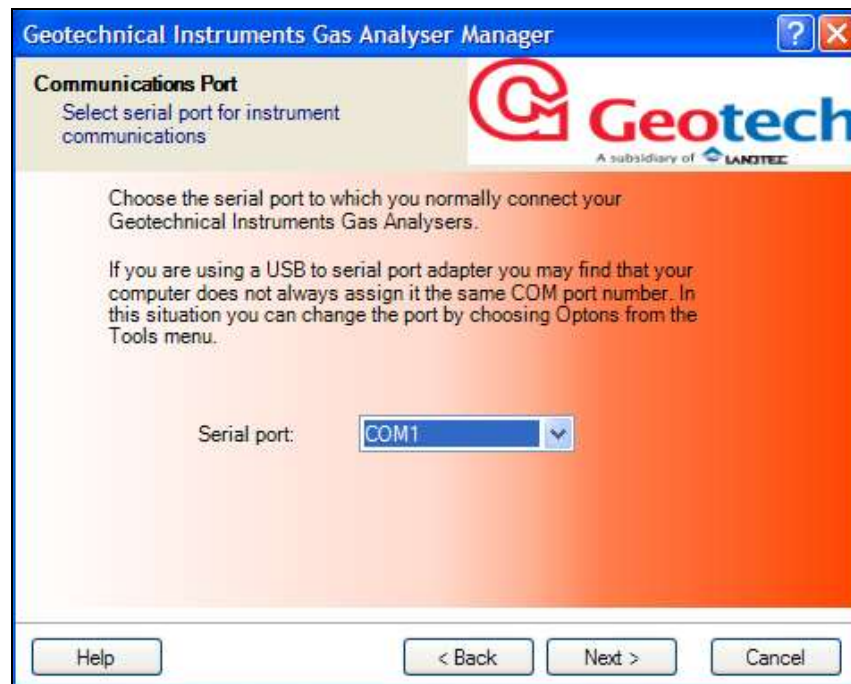
- 1) Follow the on-screen instructions to complete the process.



GAM Software Wizard

#### 4.2.1 Communications Port

The 'First Time Usage Wizard' will prompt for a serial port. Select the serial port to which the instruments are normally attached. If the computer does not have a serial port, use an RS232 to USB converter. Prior to running the software for the first time, install the device and any driver software that it requires. Upon completion note the 'COM' port number assigned to the USB serial adaptor.



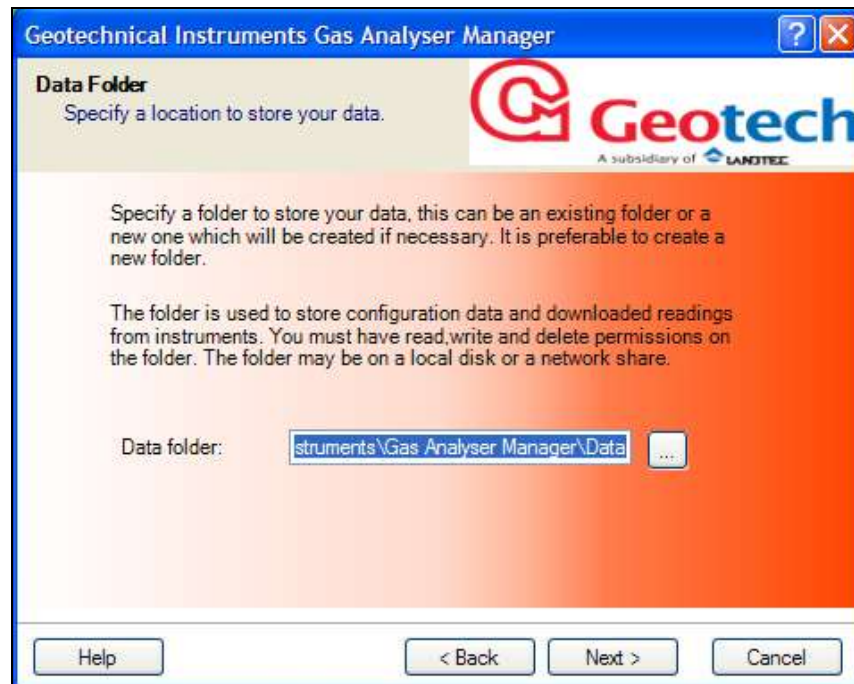
GAM Software Wizard

- 2) If using a USB converter new/different port numbers may have been assigned when connecting the adaptor to a different USB port than the one initially used. In this case you can choose a new serial port by selecting 'Options' from the 'Tools' menu within the GAM application.  
  
*Note:* More advanced serial port communication options are available after running the software for the first time.
- 3) Select the 'Next' button and the 'Data Folder' screen is displayed.

#### 4.2.2 Data Folder

The user must have read/write/delete permissions on the folder.

- 4) Specify a folder for the configuration data; borehole IDs, questions, comments and readings. The specified directory can be a local path name or a network share.

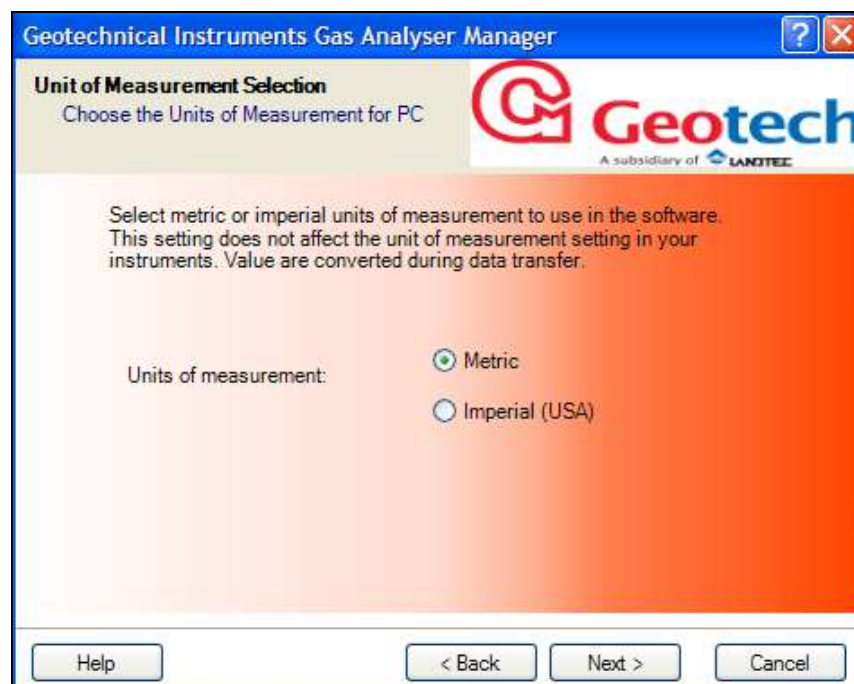


GAM Software Wizard

#### 4.2.3 Units of Measurement

The units of measurement can be set to metric or imperial. This setting only affects the specification of borehole diameters and is independent of the instrument settings. When data is uploaded to the instrument the values are sent in units of measurement compatible with the current instrument settings.

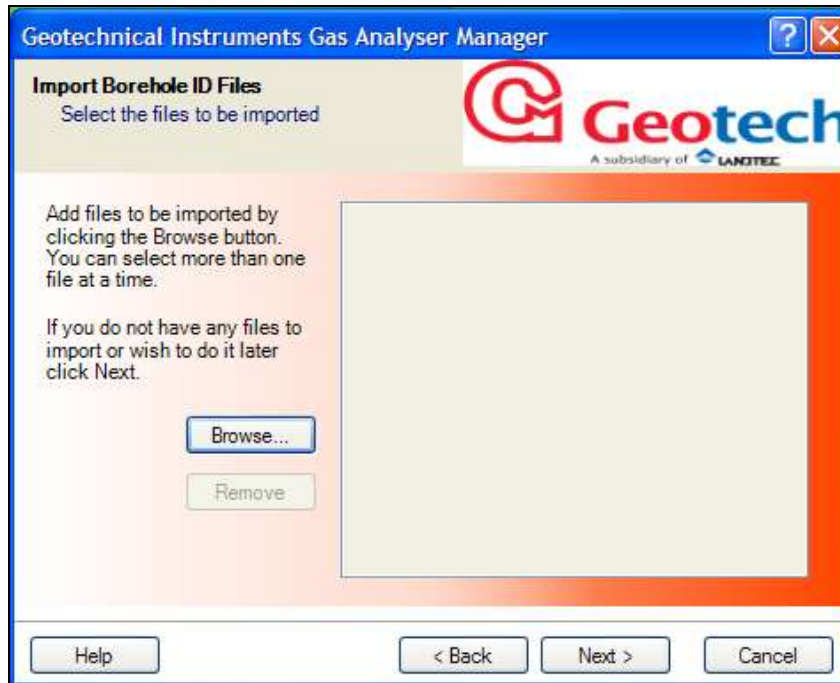
- 5) Specify 'Metric' or 'Imperial' and click the 'Next' button.



GAM Software Wizard

#### 4.2.4 Importing DataField Comms V3 Data

Borehole IDs, Comment Files and Question Files can be imported from DataField Comms software. It is not necessary to import the files during the set-up wizard; files can always be imported at a later time. GAM data files are saved in a different format to DataField Comms.



GAM Software Wizard

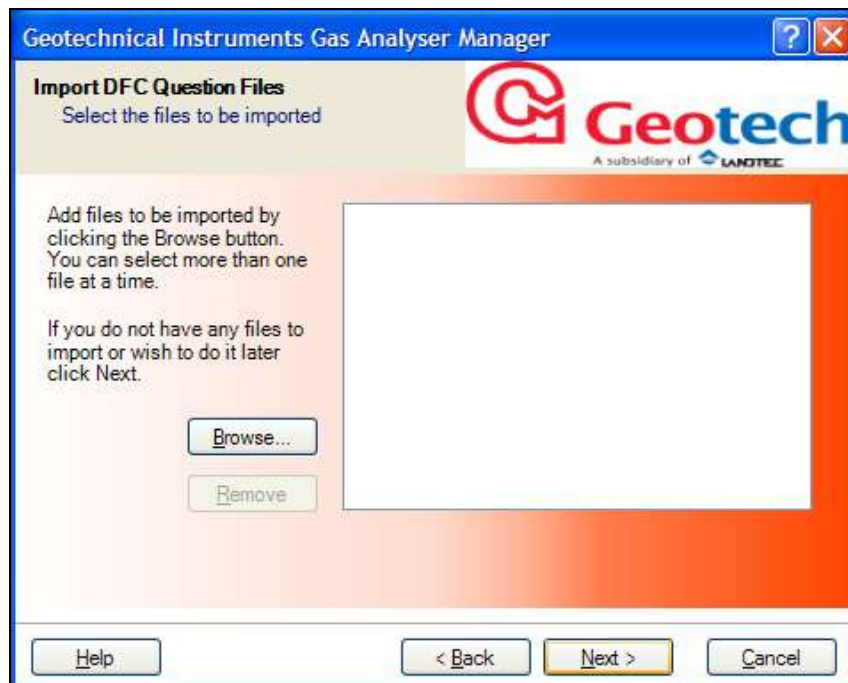
- 6) To import files select the 'Browse...' button and select one or more files to import.
- 7) The first page enables the user to import 'Borehole ID Files'. Choose the files to import, then select the 'Next' button and a prompt to import 'DFC Comment Files' will display.
- 8) Select the 'Browse...' button again to choose the files to import.
- 9) Select the 'Next' button to continue onto the next stage.
- 10) Repeat the above steps for DFC Comment files and DFC Question Files if required. Please refer to the next page for details.

✍ Note: To import DataField Comms V3 files from within the GAM application please refer to 'Section 8.0 – Importing and Exporting Files' of this operating manual.



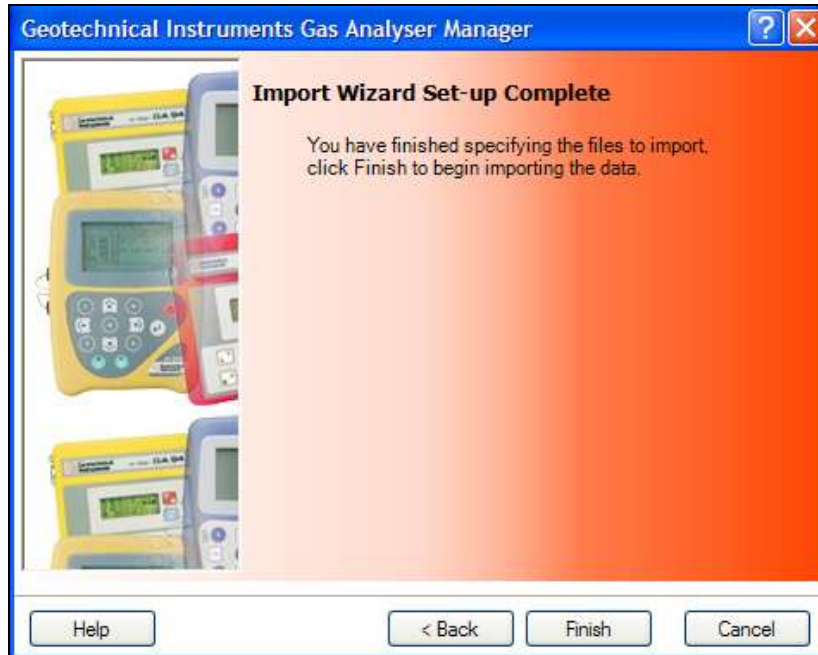
GAM Software Wizard

- 11) Select the 'Next' button to continue onto the next stage.



GAM Software Wizard

- 12) Select the 'Next' button to continue onto the next stage.



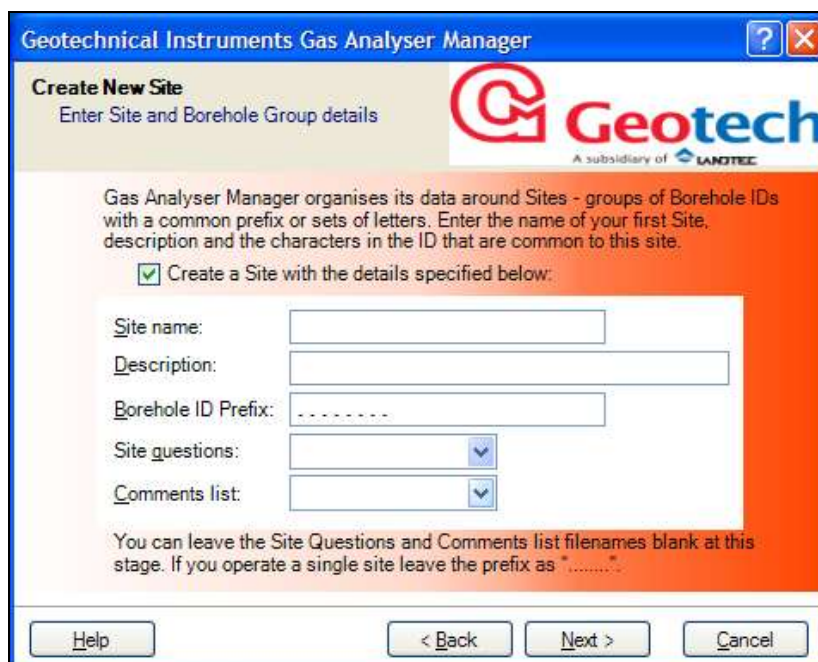
GAM Software Wizard

13) Select the 'Finish' button to complete and exit the 'Installation Set-Up Wizard'.

#### 4.2.5 Create First Site using the Wizard

The 'Create First Site Wizard' enables the creation of the first site. If using this software to configure gas analysers for use with a number of sites, further sites can be created after configuring the software for first time use.

If you prefer, you can skip this stage by clearing the 'Create a Site with the details specified below' checkbox and set up sites using the options in the GAM application.



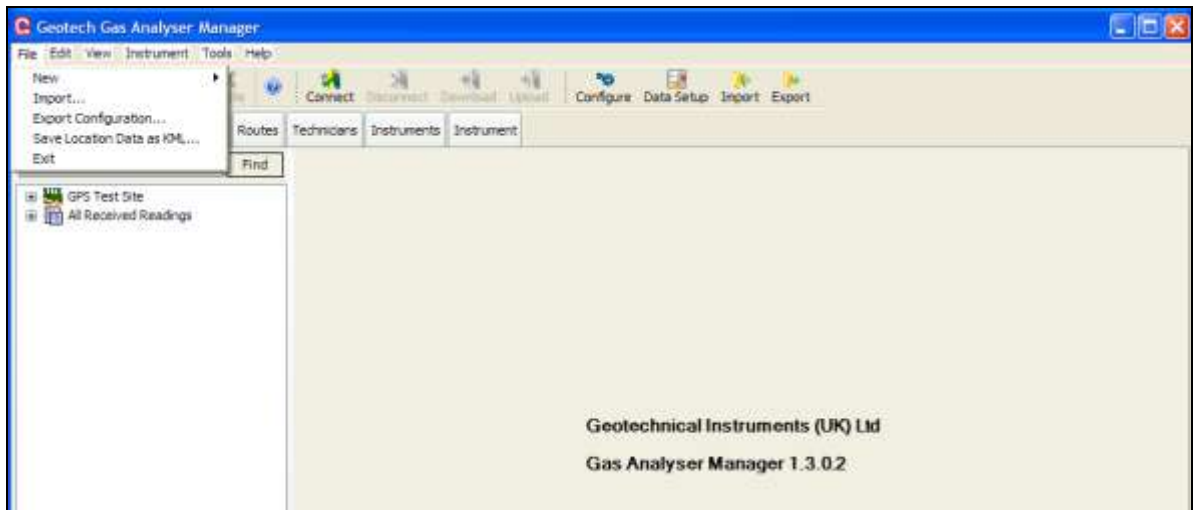
Create New Site

A site is a collection of borehole IDs that normally share a common borehole ID prefix.

If the borehole ID structure has not been identified yet enter a prefix of '.....'. A 'Site Name' must also be specified. At this stage there will not be any 'Site Questions' or 'Comment Files'. These will need to be added later.

### 4.3 Exit the Application

To exit and close the Gas Analyser Manager application, select 'File' from the drop down menu then 'Exit' or, click on the 'X icon' at the top right of the application window.

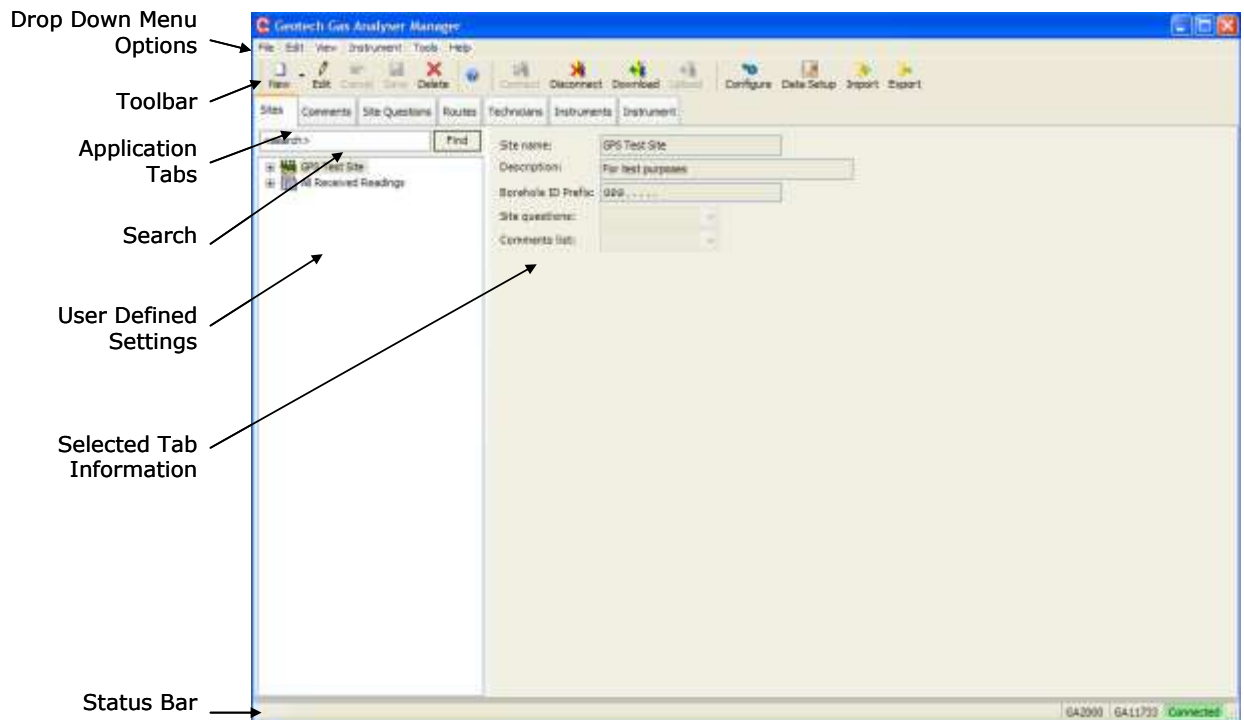


Exit Gas Analyser Manager

## 5.0 User Interface

### 5.1 Default Application Screen

The default application screen displays the 'Sites' tab. The main areas of operation are divided into seven tabs across the top of the main window. The most common operations are available on the toolbar below the drop down menu options. The status bar along the bottom of the screen shows the instrument's connection status; when a connection is in progress the serial number and type of instrument is also shown.



Default Application Screen

#### Drop Down Menu Options

The drop down menu options enable the user to select specific tasks. Move the cursor along the tabs to display the options available. A number of options may be displayed in grey text, indicating that that particular option is not available at that time.

#### Toolbar

The toolbar displays the most common tasks performed by the user. Click on the relevant toolbar icon to action.

#### Application Tabs

There are seven application tabs available to the user. The user may move freely from tab to tab. Most tabs require that an instrument is connected to the PC.

#### Search

The search facility enables the user to enter in search criteria about the sites created. For example, enter a borehole ID or first few characters of the search criteria and select the 'Find' button. If a match is found the data will be displayed.

#### User Defined Settings

The user defined settings lists a hierarchy tree of folders that have been set up by the user, i.e. Site, Borehole Groups and IDs. Click on the + next to the folder name to drill down further and display folder/file content. Click on the - to close the folder information.

**Selected Tab Information**

This window displays the information and fields relevant to the tab selected by the user.

**Status Bar**

The status bar along the bottom of the screen shows the instrument's connection status, i.e. grey when not connected, yellow whilst searching for an instrument on a serial port and green when an instrument has successfully been detected. The instrument's serial number and model type are shown. The bottom line contains status information and communication error messages. The progress bar updates when downloading readings and uploading borehole ID information.

**5.2 Drop Down Menu Options**

Click on each menu tab to display the options available. The option is only available to the user if it is displayed in black text (greyed out text is not available for selection).

**5.2.1 File Menu**

- New Site - Select 'New' then 'Site' to define and set up new site information.
- New Borehole Group - Select 'New' then 'Borehole Group' to create, edit and delete multiple borehole groups.
- New ID - Select 'New' then 'ID' to create, edit and delete new borehole IDs.
- New Route - Select 'New' then 'Route' to create, edit and delete borehole routes created for ease of use by the Site Engineer.
- Import - Select 'File' then 'Import' to select and import an existing data file into GAM.
- Export Configuration - Export configuration enables the user to export the configuration file from the existing PC. For example, if an organisation has a central database which holds all regional data, for speed, the settings may be exported into a new site database.
- Save Location Data As KML - This option enables the user to save the current borehole locations identified using the GPS tracking feature as a '.kml' (Keyhole Marking Language) file. The saved file and borehole locations may then be viewed using Google Earth, Google Maps or Microsoft Virtual Earth to visually locate each borehole location.
- Exit - Exits the application and returns the user to the Windows desktop.

**5.2.2 Edit Menu**

- Delete - Select 'Edit' then 'Delete' to delete the selected item.
- Edit - Select 'Edit' then 'Edit' to update the selected item.

Cancel Changes - Select 'Edit' then 'Cancel Changes' to cancel the last changes made.

Save Changes - Select 'Edit' then 'Save Changes' to save the changes.

### 5.2.3 View Menu

Reading Download Set-up - Select 'View' then 'Reading Download Set-up' to set-up the default rules when downloading data.

Refresh - Select 'View' then 'Refresh' to refresh the screen displayed.

### 5.2.4 Instrument Menu

Connect - Select 'Instrument' then 'Connect' to connect GAM to the attached device.

Download Readings - Select 'Instrument' then 'Download Readings' to download readings from the instrument into GAM.

Get IDs - Select 'Instrument' then 'Get IDs' to get IDs.

Upload Data - Select 'Instrument' then 'Upload Data' to upload data settings from GAM to the instrument.

Disconnect - Select 'Instrument' then 'Disconnect' to disconnect the instrument correctly from GAM before exiting the application.

### 5.2.5 Tools Menu

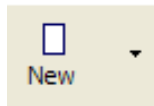
Options - Select 'Tools' then 'Options' to configure serial port and application set-up options.

### 5.2.6 Help Menu

Contents - Select 'Help' then 'Contents' to search and view help text. The GAM application is installed with extensive help text available to the user. The user may either enter search criteria, or click on the folder topic to expand the detail.

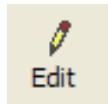
About - Select 'Help' then 'About' to display information about the version of GAM currently installed.

### 5.3 Toolbar Buttons



New

The 'New' button creates a new item depending upon the currently selected tab and item. Other items can also be created by clicking the drop down button on the right-side of the 'New' button.



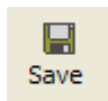
Edit

The 'Edit' button puts the currently selected item into edit mode. If the selected item cannot be edited this button will be disabled. During editing the 'Save' and 'Cancel' buttons are available.



Cancel

The 'Cancel' button aborts the changes to the item currently being edited, reverting the data to its original state.



Save

The 'Save' button saves the changes to the item currently being edited.



Delete

The 'Delete' button deletes the currently selected item.



Connect

The 'Connect' button when selected begins polling the serial port for the Geotechnical Instruments Gas Analyser. When one is discovered the 'Instrument Status Bar' turns green.



Disconnect

The 'Disconnect' button ends the communication with the current instrument. The option is enabled only when an instrument has been found.



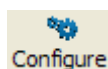
Download

The 'Download' button begins the download of readings from the instrument to the GAM application.



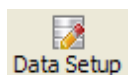
Upload

The 'Upload' button begins the upload of IDs, question files and comment files from the GAM application to the analyser. The item uploaded is determined by the currently selected tab and item.



Configure

The 'Configure' button allows the instrument communication settings to be modified and configuration of other software settings.



Data Setup

The 'Data Setup' button allows the format of the reading data files to be configured.



Import

The 'Import' button allows previously exported configurations to be re-imported.



Export

The 'Export' button allows the user to export the system configuration for backup purposes, for importing onto another installation or for problem diagnostic analysis.

## 5.4 Application Tabs

After configuring the software the user is presented with the main application screen which has the following seven application tabs available for selection.

### Sites

The 'Sites' tab is the main window for configuring the 'Borehole IDs', 'Reading Download Options' and a folder tree view showing the sites, borehole groups, IDs and download data.

### Comments

The 'Comments' tab enables the creation, editing and deletion of comment files. Comment files are used in single/multi-choice site and borehole questions.

### Site Questions

The 'Site Questions' tab enables the creation, editing and deletion of site questions files.

### Routes

The 'Routes' tab enables the grouping of borehole IDs by site or borehole group.

### Technicians

The 'Technicians' tab enables the creation of technician ID codes.

### Instruments

The 'Instruments' tab shows a list of all instruments that have been connected.

### Instrument

The 'Instrument' tab enables the configuration of the instrument and calibration dates to be checked.

## 5.5 Terms

This section provides a brief explanation into some of the terms used throughout GAM.

### 5.5.1 Sites

A 'Site' is a group of boreholes within a common location. Boreholes within a site are identified by one or more matching characters in the borehole ID. Usually the first few characters of an ID are fixed. If not using a common set of characters in the ID, sites can still be created to organise the data.

Within GAM a site is uniquely identified by its 'Site Name'. Within a site, boreholes may be subdivided into groups. For instance, you may wish to group types of borehole by location within the site, or by reading frequency requirements.

Another common aspect of a site is that the boreholes share the same comment files and site question files. When using a GA94 or GEM500 instrument 'Site Questions' are not used and therefore this parameter is ignored.

### 5.5.2 Borehole Groups

A 'Borehole Group' identifies a set of boreholes within a site. The nature of the grouping is entirely up to the user. A borehole ID may only exist in one group at a time. A small site may have a single set of boreholes only and not make use of grouping.

### 5.5.3 Boreholes

A 'Borehole' is a single sampling point on a site that is identified by a unique eight

character identifier. The borehole can be a well-head, borehole or any other fixed point where a gas measurement is taken.

#### **5.5.4 Question Files**

'Question File' define up to five site questions that can be answered by the user on a GA2000/GA2000 Plus or GEM2000/GEM 2000 Plus. Four styles of question are available; simple text answers, value answers, and single or multiple-choice questions from a pre-selected list of comments.

Up to three borehole specific questions may also be defined.

#### **5.5.5 Comment Files**

A 'Comment File' defines a list of up to 64 text strings that are used as the selection choice in the single or multiple choice question files for site or borehole specific questions.

#### **5.5.6 Routes**

A 'Route' is a mechanism that allows the pre-selection of several sites, borehole groups or individual boreholes for simultaneous uploading to an instrument. This option is useful where an instrument is used across several sites.

It is also used to enable the user to order the IDs according to the sequence in which the Site Engineer walks the route when sampling. You can define several sequences containing various combinations of sites, borehole groups and/or individual IDs.

## 6.0 Instrument Communications

### 6.1 Connecting an Instrument

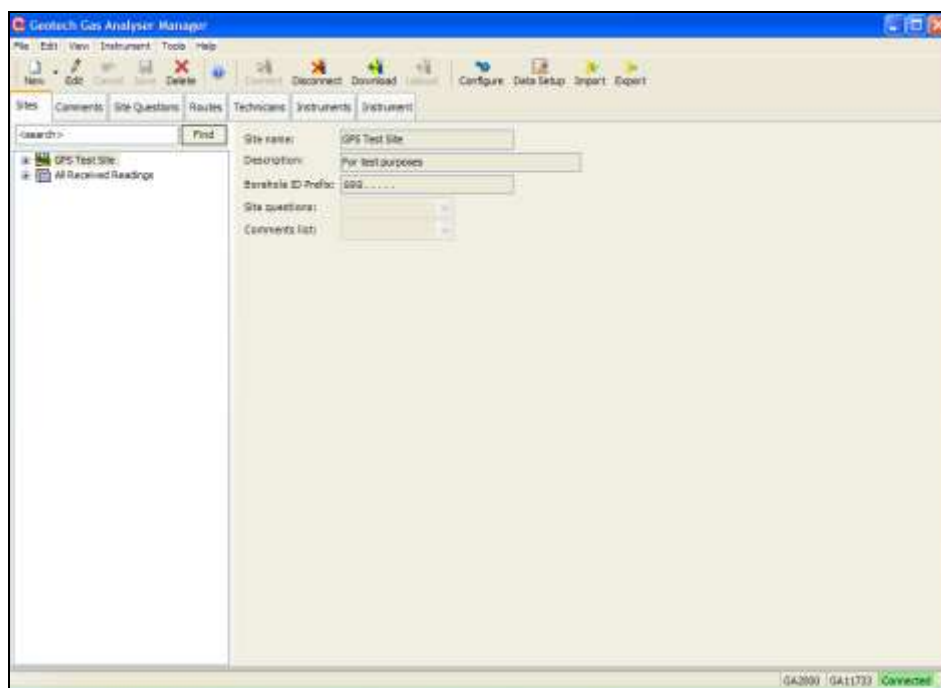
After installing and setting up the software it is recommended that the user confirms that the instrument(s) can communicate with the software.

- 1) Plug the instrument into the serial port specified earlier. You can change the chosen port by choosing 'Options' from the 'Tools' menu.
- 2) The software automatically determines the type of instrument connected. Select the 'Connect' button or select F9.

With GA94 and GEM500 instruments it is necessary to cycle the power of the instrument and choose 'Option 4 – Download' on the analyser after selecting the 'Connect' option.

✍ Note: GA2000, GEM2000 or BioGas instruments; the instrument must be at the 'Main Gas Read Screen' before attempting to connect.

When the instrument is found, the 'Status Bar' at the bottom of the screen turns green and displays the model number and serial number of the instrument. The 'Instrument' tab will now be enabled and the 'Instrument' option becomes available.



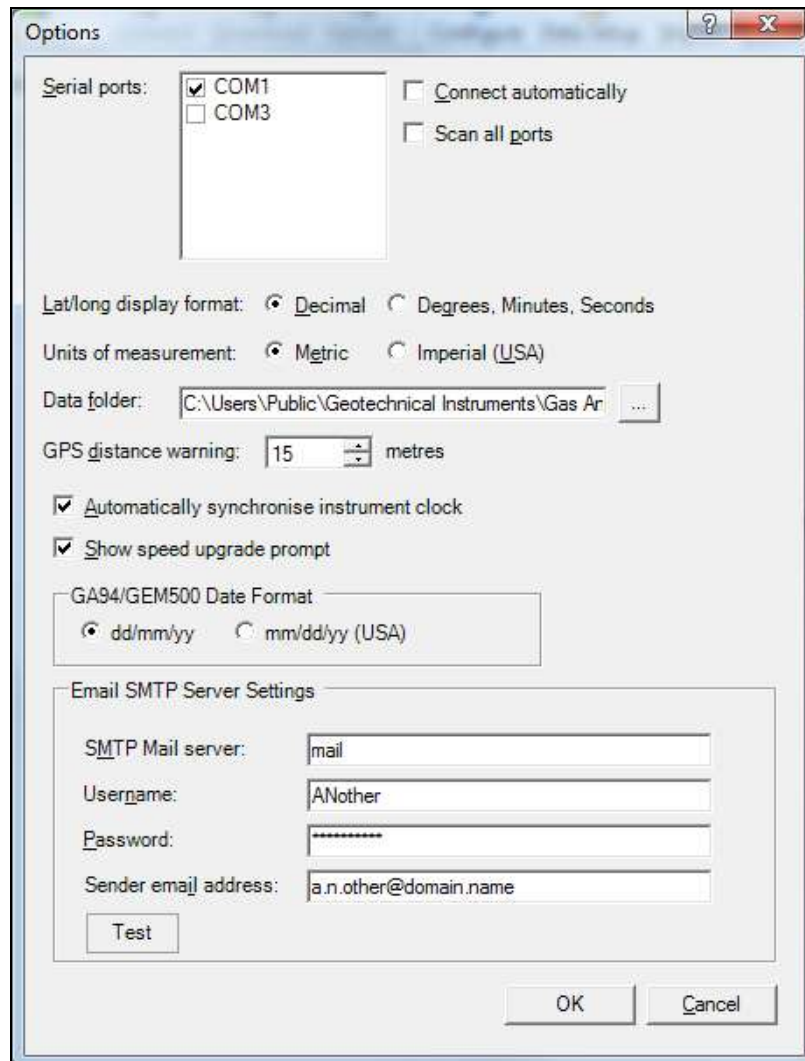
Instrument Connected

- 3) Select the 'Status' tab of the 'Instrument' tab and the instrument details will be shown. To connect another instrument select the 'Disconnect' button, attach the new instrument, then select 'Connect'.

✍ Note: All configuration functions of the software can be carried out without having an instrument connected. Instruments need to be connected when uploading a new configuration or downloading readings to the computer. Gas Analyser Manager can be configured to detect instruments automatically as well as configured to detect instruments on multiple serial ports.

## 6.2 Configuration Options

- 1) To change the configuration of the software, select 'Options' from the 'Tools' menu and the following options are available:



Tools - Options

### Serial Ports

All serial ports fitted to the computer are listed. Place a tick next to the serial ports you may attach your analysers to or tick 'Scan all ports' to have the computer attempt to find a computer on any serial port.

### Connect automatically

Ticking this option allows the software to continuously scan for an instrument and it will connect and disconnect from the instrument automatically. Using this option disables the 'Connect' and 'Disconnect' options on the toolbar.

### Scan all ports

Tick this box to have the computer scan all serial ports on your computer. You would not wish to enable this option if you have other devices connected to some serial ports on your computer.

Lat/Long display format	'Latitude and longitude coordinates' can be associated with each ID. Choose the default display format. Either 'Decimal' (e.g. 52.123567) or 'Degrees, Minutes, Seconds' format (e.g. 52° 32m 12.231s).
Units of measurement	Select either 'Metric' or 'Imperial' units of measurement, this is the unit of measurement the software uses and is entirely independent of the configuration of your instruments. However to avoid confusion you should ensure that you configure your instruments to use the same units of measurement.
Data folder	This is the folder where the configuration including download readings are stored. This should be a folder where you have read/write permissions and it may be on a shared network folder.
GPS distance warning	When viewing readings downloaded with coordinates data, the software can compare the original location specified against the ID with the location of the instrument when the reading was taken. When the distance is more than the amount specified in this parameter the reading's row is highlighted in red.
Automatic clock synchronisation	The 'Automatically Synchronise Instrument Clock' option enables the instrument's internal clock to be set to that of the computer each time a connection is established. This option is not set during the initial 'Setup Wizard'; the setting can be changed at any time.
Show speed upgrade prompt	The latest GA2000 and GEM2000 analysers have the ability to communicate at twice the rate of old analysers. Ticking this option will cause the user to be prompted to upgrade the speed of an analyser when it connects. When the upgrade is applied, the instrument will switch off and you will have to restart the instrument.
GA94/GEM500 date format	If you are using GA45, GA94 or GEM500 gas analysers select the date format of your instrument.

**Email SMTP Server Settings:**

The email server settings are used by the facility to automatically email readings to a specified address as they are downloaded.

SMTP mail server	Specify an SMTP mail server to make use of the option to automatically email readings as they downloaded. Specify an IP address or mail server domain name, e.g. mail.mycompany.com
Username	Specify the username required to logon to the SMTP server. If a domain name is also required, precede

	the username with the domain name followed by a backslash. For example: domain\username
Password	Specify the password of the username required to logon to the SMTP server.
Sender email address	If you specify an SMTP mail server you need to also specify a sender's email address, as a valid internet-format email address.

**Test Button:**

To test the email settings click the 'Test' button. An email will be sent to the Sender email address. A success message or error message will be displayed.

- 2) Select the 'OK' button to accept the changes or 'Cancel' button to exit without saving the changes.

### 6.3 GPS Option

GPS works by receiving signals from satellites in orbit around the earth. These satellites are not geostationary and therefore move across the sky. By picking up the signals from these satellites the GPS chip can work out its position.

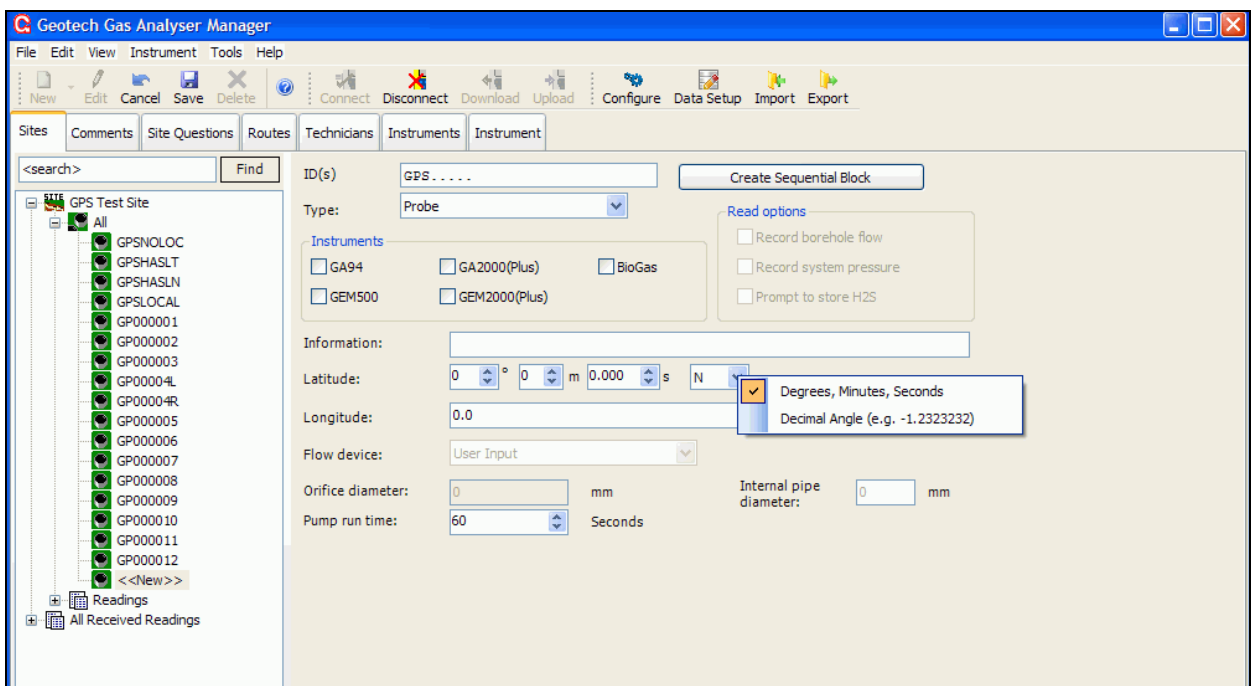
The number of satellites that the GPS chip can locate will affect the accuracy of the position obtained. In general, the more satellites located the better. In practice, 4 satellites will give a reasonable fix, while 8 or more will improve accuracy.

The number of satellites that can be located depends on their position in the sky and also on how much of the sky the instrument can 'see'. The satellite signals do not pass through buildings and are seriously attenuated by trees and vegetation. The system will therefore not work well in built up areas and forests. The performance will also be degraded if close to a single building, which will tend to cut off half of the view of the sky.

The GPS chip and compass are switched on when the instrument is switched on. When first switched on the instrument will take a period of time to locate the satellites and obtain a fix. This time period will vary according to the satellite location, signal strength, and visible sky, but is typically between 30 seconds and 2 minutes. If the instrument has been switched off for an extended period of time or has moved a long distance since it was last switched on the time to obtain a fix will be extended further.

The GPS chip remains on while the instrument is on. This maximises the speed of response. A facility is available via the menu functions, to turn off the GPS location page. This is intended for situations where the GPS guidance is not required. This does not turn off the GPS chip, which remains operational, and GPS data is still stored with the gas readings.

In order to fully utilise the GPS feature borehole IDs must be created with 'longitude' and 'latitude' coordinates predefined then uploaded to the instrument before readings are taken. Specify; degrees, minutes, seconds or decimal angle.



Key in Longitude and Latitude Coordinates for GPS Feature

## 6.4 Manage Location Data

After taking readings containing coordinate data, download the readings to the PC using the 'Download' button on the toolbar.

**Green Highlighting:** Indicates that the readings coordinates are within the tolerance specified (default 16 metres) of the sample point's defined location.

**Red Highlighting:** Indicates that the readings coordinates are outside the tolerance specified (default 16 metres) of the sample point's defined location.

**Yellow Highlighting:** Indicates that the readings have new coordinates and the ID does not yet have any location data defined.

Select the 'Manage location data' button to update the ID definition with new coordinates.

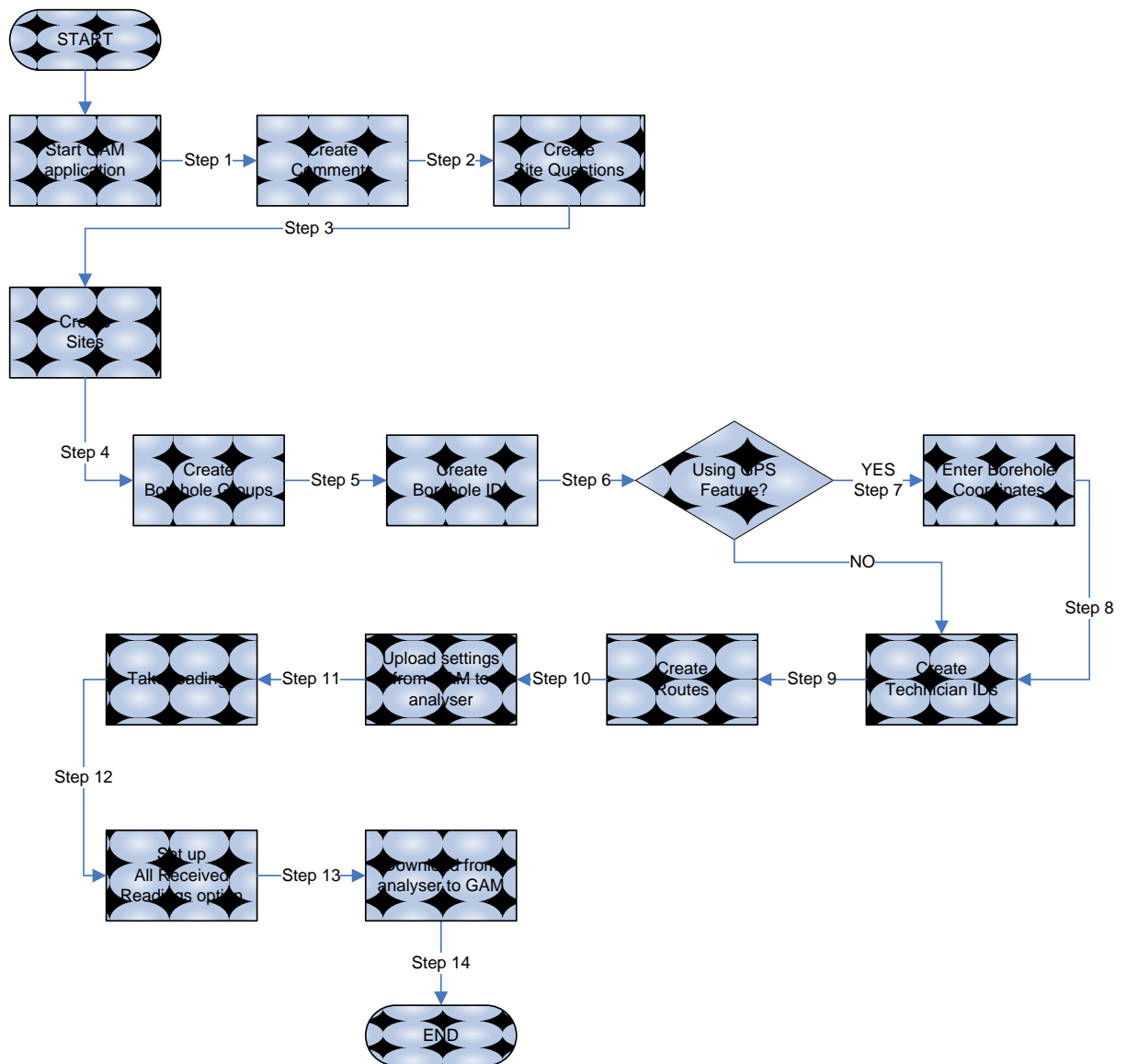
ID	DATE	CH4 (%)	CO2 (%)	O2 (%)	STATUS	LAT	LONG	Location Difference
GPSLOCAL	11/08/2009 00:00:00	43.7	33.3	00.5	18	52.27812195	-1.540114613	Same as master
GPSLOCAL	12/08/2009 00:00:00	43.7	33.3	00.5	18	52.27812195	-1.540114613	Different lang
GPSLOCAL	12/08/2009 12:00:00	43.7	33.3	00.5	18	52.27812195	-1.540114613	Different lang
GPSLOCAL	13/08/2009 00:00:00	43.7	33.3	00.5	18	52.27814	-1.540114613	Different lang
GPSLOCAL	14/08/2009 00:00:00	43.7	33.3	00.5	18	52.27813	-1.54011	Different lang
GPSLOCAL	15/08/2009 00:00:00	43.7	33.3	00.5	18	52.27811	-1.54011	Different lang
GPSLOCAL	16/08/2009 00:00:00	43.7	33.3	00.5	18	52.27812	-1.54011	Smaller error
GPSLOCAL	18/08/2009 00:00:00	43.7	33.3	00.5	18	52.27812195	-1.540114613	Large error
GPSLOCAL	19/08/2009 00:00:00	43.7	33.3	00.5	01	0	0	No location data
GPSLOCAL	19/08/2009 00:00:00	43.7	33.3	00.5	18	0	0	No location data
GPSLOCAL	19/08/2009 00:00:00	43.7	33.3	00.5	18	52.27812195	-1.540114613	New Location
GPS00001	10/08/2009 00:00:00	43.7	33.3	00.5	0			
GPS00001	10/08/2009 00:01:00	43.7	33.3	00.5	1			
GPS00001	10/08/2009 00:02:00	43.7	33.3	00.5	2			
GPS00001	10/08/2009 00:04:00	43.7	33.3	00.5	4			
GPS00001	10/08/2009 00:08:00	43.7	33.3	00.5	8			
GPS00001	10/08/2009 00:16:00	43.7	33.3	00.5	16			
GPS00001	10/08/2009 00:32:00	43.7	33.3	00.5	32			
GPS00001	10/08/2009 00:48:00	43.7	33.3	00.5	64			

Manage Location Data

Note: The 'Location Difference' column is always shown when latitude and longitude information is stored, regardless of whether or not it is included in the saved data file. To update the master location for an ID click the 'Manage Location data' button at the top right corner. For each ID you wish to update click the 'Update Records' check box at the end of the row and then click the 'Apply' button at top right of the window.

## 7.0 Define Site Settings

### 7.1 Define Site Settings Process – Best Practice



#### **Best Practice:**

The above schematic is considered to be best practice when setting up the site data and is meant only as a guide. Step sequences may change dependant upon individual requirements and standards.

Double-click on the 'GAM application' icon on the desktop to start the application and check that you have connection from the analyser to PC via the USB cable and that the status at GAM at the bottom of the application screen reads connected.

Step 1 Create a comments file to hold the site and ID question information.

Step 2 Create up to five site questions.

✍ Note: It is best practice to set up **'Steps 1 and 2' before 'Step 3 - Site Name and Site Details'**. During the site set up, the user will be asked to select the 'Comments File' and 'Site Questions File' attached to that site.

- Step 3 Create the site name and site details.
- Step 4 Create borehole groups.
- Step 5 Create borehole IDs.
- Step 6 Using the GPS Feature?
  - 'YES' Go to Step 7
  - 'NO' Go to Step 8
- Step 7 Enter borehole coordinates.
- Step 8 Create technician IDs.
- Step 9 Create routes.
- Step 10 Upload settings from GAM to the analyser.
- Step 11 Take readings and samples.
- Step 12 Set up the 'All Received Readings' option in GAM.
- Step 13 Download data readings from analyser to GAM.
- Step 14 END

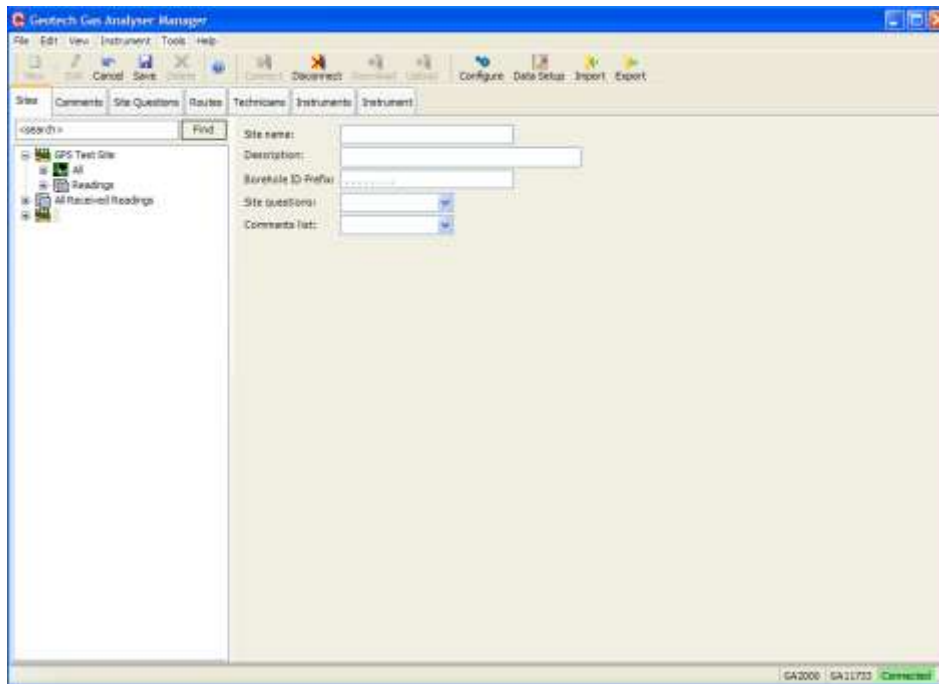
✍ **Note:** **The analyser must be at the 'Main Gas Readings' screen to upload or download data.**

## **7.2 Sites Tab**

A 'Site' is a set of boreholes at the same location that can usually be identified by a common set of characters in the 'Borehole ID'.

### **7.2.1 Creating a New Site**

- 1) From the 'Sites' tab, click the 'New' toolbar button or choose 'New' from the File menu.
- 2) Select 'Site' from the menu and the following screen is displayed:



Create a New Site

3) A new 'Site folder' item is created; complete the following parameters:

Site Name	Enter a short name to identify the site; enter only characters that are valid filename characters.
Description	Enter a description of the site. This field is optional.
Borehole ID Prefix	If the site can be identified by a set of common characters in the borehole ID, enter the characters that are appropriate. Leave the other characters set as a full stop.
Site Question File	Select an existing site question file that is associated with this site. If no site question file has been created yet, leave this section blank. A file can be selected once a site question file has been created.
Comments File	Select an existing comment file that is associated with the site. If no comments file has been created yet, leave this field blank. A file can be selected once a comments file has been created.

*Note:* When creating several sites, ensure that all borehole ID masks are unique and unambiguous. For example, if Site A has a mask of "SITE...." and Site B a mask of "SITEB..." this could lead to confusion because Site A's mask would also be included in "SITEB...".

4) To store the changes, select the 'Save' toolbar icon or 'Save' from the 'Edit' menu.

✎ Note: Borehole IDs can now be created. Borehole IDs within a site can be grouped for easier identification and use.

### 7.2.2 Editing Site Details

- 1) From the main 'Sites' tab, select the 'site name' from the names in the folder tree.
- 2) Select 'Edit' from the 'Edit' menu or select the 'Edit' toolbar icon.
- 3) Enter the details and select the 'Save' button.

✎ Note: If a site or site name is changed, the route will need to be modified to reflect the changes.

### 7.2.3 Deleting a Site

- 1) From the main 'Sites' tab, select the 'site name' by selecting the name in the tree.
- 2) Select 'Delete' from the 'Edit' menu or click the 'Delete' toolbar icon.

✎ Note: Once a site has been deleted the data cannot be restored. All associated borehole IDs will also be deleted.

## 7.3 Borehole Groups

A 'Borehole Group' is used to organise lists of borehole IDs within a site. All sites have at least one borehole group. There is no limit on the number of borehole groups that can be created to organise a site's boreholes; you can create as many as you need to organise your site's boreholes. A single borehole can only exist in one group at a time.

### 7.3.1 Creating a Group

- 1) Select the site in the folder tree for which a group is required.
- 2) Click the 'New' toolbar button or select 'File' menu item and select 'Borehole Group'. A new item will appear below the site in the folder tree with the name '<New>'.



New Borehole Group

- 3) Rename the word '<New>' with the new group name.

✎ Note: Borehole IDs will be created under the selected borehole group.

## 7.3.2 Editing the Group's Name

The name of a group can be edited by clicking a second time on the group name in the tree or by entering 'Edit' mode and editing the name in the borehole ID list in the right-hand window.

## 7.3.3 Deleting a Group

Click on the borehole group name and select the 'Delete' button. All borehole IDs in the group will be deleted permanently.

## 7.3.4 Re-ordering Borehole IDs within the Group

The order of the borehole IDs in the group will be the order in which they appear in the instrument. It is useful to set the order of the IDs to match the order in which they are typically read on site.

In addition to setting the order within the group, if required, a different ordering can be used when creating routes.

- 1) Select the group name in the folder tree. The right-hand panel shows a list of borehole IDs within the group.
- 2) Select the 'Edit' button from the toolbar or menu.
- 3) Borehole IDs can be moved using the shuffle buttons (up/down arrows) on the left-hand side or by dragging and dropping one or more items in the list.
- 4) Select the IDs to be moved using the mouse. To select several IDs at the same time use the Shift and Ctrl buttons to make multiple selections.

## 7.3.5 Moving Borehole IDs to a Different Group

As with moving IDs within the same group, select the IDs to be moved. Then, using the mouse, drag and drop the items into the new borehole group entry in the tree.

## 7.3.6 Editing Borehole ID Details from the Group List

One or more borehole IDs to be edited can be selected by choosing the ID from the appropriate group. Either click a second time on the borehole ID or right click and choose 'Edit' from the context menu that appears. To edit more than one ID at the same time, select the IDs as described above, right click and choose 'Edit' from the context menu.

✎ Note: For Gas Analyser Manager Versions prior to version 1.1, when editing more than one borehole ID at once all IDs will be given the same properties except for the borehole ID value.

## 7.3.7 Borehole (Sample Point) IDs

All references to borehole IDs include well-heads and any other identifiable location

where gas readings and flow measurements are taken. For each borehole ID users can specify which types of Geotechnical Instruments Gas Analyser are used with the borehole.

With GA45/GA94 type instruments only the borehole ID and whether or not pressure data is read can be entered. With GEM500 and GEM2000 instruments the flow device and associated parameters can also be specified.

For GA2000/GA2000 Plus and GEM2000/GEM2000 Plus instruments you can enter the comment text, pump run-time and up to three borehole questions.

⚠ Note: If an organisation uses a combination of instruments a single configuration can be used. There is no need to generate separate data for each type of instrument. When configuration data, i.e. borehole IDs are sent to an instrument, the software works out the type of instrument and appropriate settings to ensure the relevant data is stored to the instrument. To enable an instrument type to receive an ID, ensure the checkbox is ticked.

### 7.3.8 Borehole Parameters

The borehole editor form has the following parameters:

Parameter	Description	Applicability
ID(s)	An eight character identifier for a borehole. An identifier can consist of letters and/or numbers in any combination. Uppercase letters are considered different to lowercase letters. All eight characters must be specified.	All types of instrument.
Type	Select from a drop down box. Choose from other, well, probe, sample port, horizontal collector or biogas.	All types of instrument.
Instruments	Tick boxes, one for each instrument type. Place a tick next to the instrument type(s) to be used with this borehole ID. The options selected determine the parameters below that become available.	
Record system pressure	When selected, the instrument will prompt the user to take a relative pressure reading from the borehole or wellhead.	GA94/GEM500/GA2000
Record borehole flow	When selected, the user will be prompted to record flow either using internal flow sensor.	GA2000 and GEM2000
Prompt to store H <sub>2</sub> S	This option allows CO readings to be taken where there are high levels of H <sub>2</sub> S present.	GA/GEM2000 Plus

Information	Enter any information considered useful to the operator. This text can be viewed on the instrument by the user; enter details that enable the user to locate the borehole or wellhead.	GA2000/GA2000 Plus GEM2000/GEM 2000 Plus
Flow device	From the list choose the type of flow device. Depending on the flow device, enter pipe diameter and orifice diameter information in the adjacent fields.	GEM500 GEM2000/GEM2000 Plus
Longitude and Latitude	Specifies the global position of the ID using latitude and longitude coordinates. If the location is unknown leave these values as 0.0. You can toggle the default display format by selecting 'Options' from the 'Tools' menu. Alternatively, to toggle quickly between the two formats available right click on the value and choose the display format from the menu.  Coordinate data can also be set using the 'Manage location data' option when viewing previously downloaded readings.	GPS equipped Geotech gas analyser. GA2000/GA2000 Plus GEM2000/GEM2000 Plus
Pipe diameter	When required, enter the pipe diameter. Note the units of measurement shown.	GEM500 GEM2000/GEM2000 Plus, with orifice plate, pitot tube, user input or anemometer.
Orifice diameter	When required, enter the orifice plate diameter.	Orifice plates.
Pump run-time	Enter the pump run-time.	GA2000/GA2000 Plus GEM2000/GEM2000 Plus
Questions	Enter up to three specific questions for the borehole.	GA2000/GA2000 Plus GEM2000/GEM2000 Plus
Alarms	Up to ten alarm conditions per ID can be specified. When per-ID alarms are specified, only two per-ID questions can be specified. Alarms can be specified on CH <sub>4</sub> , CO <sub>2</sub> , O <sub>2</sub> , Anemometer, Temperature Probe, 1PSI Pressure, 5PSI Pressure, Barometer, GEM Flow, GEM Power and the three internal cells, identified as Cell1, Cell2, Cell3. The user may specify the same channel more than once,	New GA2000/GA2000 Plus GEM2000/GEM2000 Plus

if required, to have an alarm condition when a value falls outside of a specified range.

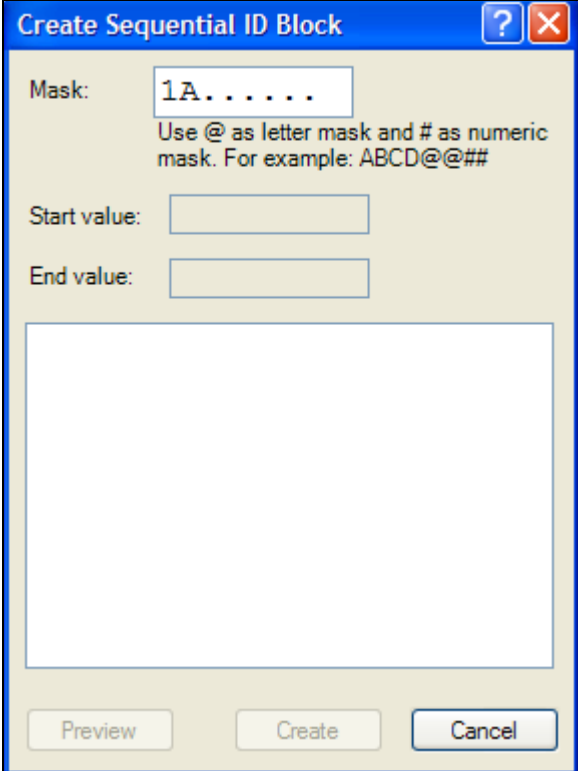
## 7.4 Creating New Boreholes

In the folder tree view of the 'Sites' tab, select the borehole group in which the ID needs to be created, select the 'New' toolbar button or 'New - Borehole ID' menu item on the 'File' menu.

### 7.4.1 Creating a New Block of Sequential Borehole IDs

If using blocks of borehole IDs that share or mostly share the same parameters, a block can be created easily using the 'Create Sequential Block' option available when creating a new borehole ID.

- 1) Select 'New Borehole ID' from the 'File' menu.
- 2) Select the button adjacent the borehole ID field labelled 'Create Sequential ID Block'.



Create Sequential ID Block

- 3) The 'Mask' field shows the borehole ID mask specified for the site. Fill in the remainder of the characters with those characters that will be common among the group. To create the numeric or alphanumeric (A..Z,0..9) sequential list, enter a # symbol for numeric characters or @ symbol for alphanumeric.
- 4) In the field 'Start value' enter the first value. In the field 'End value' enter the final value.

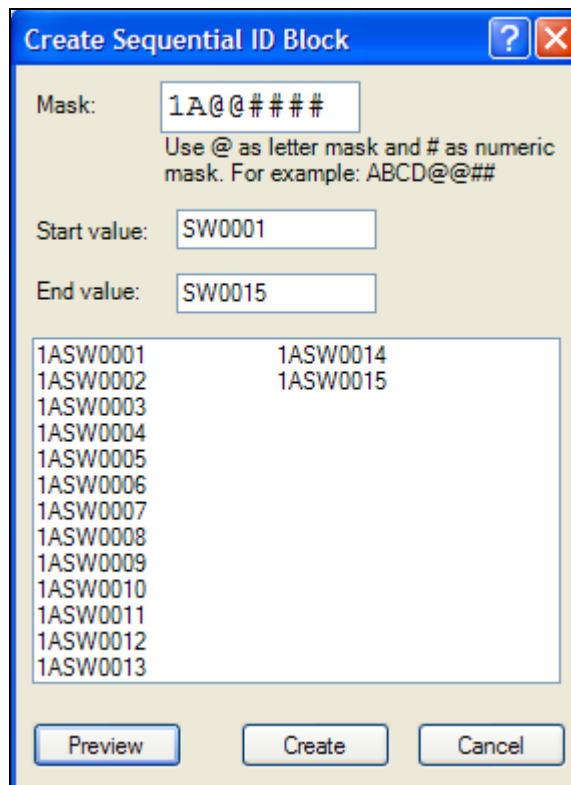
In the 'Start value' and 'End value' fields key in the same number of characters as the number of # and @ symbols specified in the 'Mask' field.

In the 'Mask' field all character spaces must be filled in with a letter, number, # or @ character.

For example:

Mask	Start Value	End Value	Result
LEAXX##	12	56	LEAXX12,LEAXX13,...,LEAXX55,LEAXX56
LEABB@#Q	A8	B3	LEABBA8Q,LEABBA9Q,LEABBB0Q,...,LEABBB3Q

- 5) Select 'Preview' to view a list of the IDs that will be created when saving the data.



Create Sequential ID Block

- 6) Once the values shown in the Preview list are complete, select 'Create' to return to the borehole ID editor where the configuration details of the borehole can be added.
- 7) Select the 'Save' button to store the new boreholes to the borehole ID list.

### 7.4.2 Editing an Existing Borehole ID

From below the borehole group tree item on the sites tab, select the 'ID' and then click the 'Edit' icon on the toolbar. Alternatively, choose an 'ID' from the 'Borehole Group' list and click a second time on the item to switch to the borehole details view.

### 7.4.3 Searching for an ID

To search for a specific ID, enter the ID in the text box label '<search>' and select 'Find'. If the specified ID exists, the ID will be selected in the tree. Partial IDs may also be entered.

### 7.4.4 Borehole Questions

GA/GEM2000 (Plus) instruments can be configured to prompt the Site Engineer to answer up to three borehole questions defined on a per-ID basis when the reading is stored relating to the status of the borehole or wellhead.

There are four types of question:

Alphanumeric	The user is prompted by a question to input any letter or number as an answer up to 72 characters in length. The user is shown a single prompt.
Numeric	The user is prompted by a question to enter a value in a specific format as an answer. The user is prompted to enter one or more values and a unit of measurement is required to answer the question.
Single Selection Comments	The user is shown a list of up to 10 comments. Only one answer can be selected.
Multiple Choice Selection Comments	The user is shown a list of comments. Up to eight answers can be selected by placing a tick mark next to each choice.

## 7.5 Comments Tab

Comments files are used by site questions and borehole questions to allow the user to select one or more textual comments. There are two types of question that use the comments: single selection and multiple-selection comments.

Questions are currently only available on GA2000/GA2000 Plus and GEM2000/GEM2000 Plus models. If you are not using one of these instrument types, ignore this section.

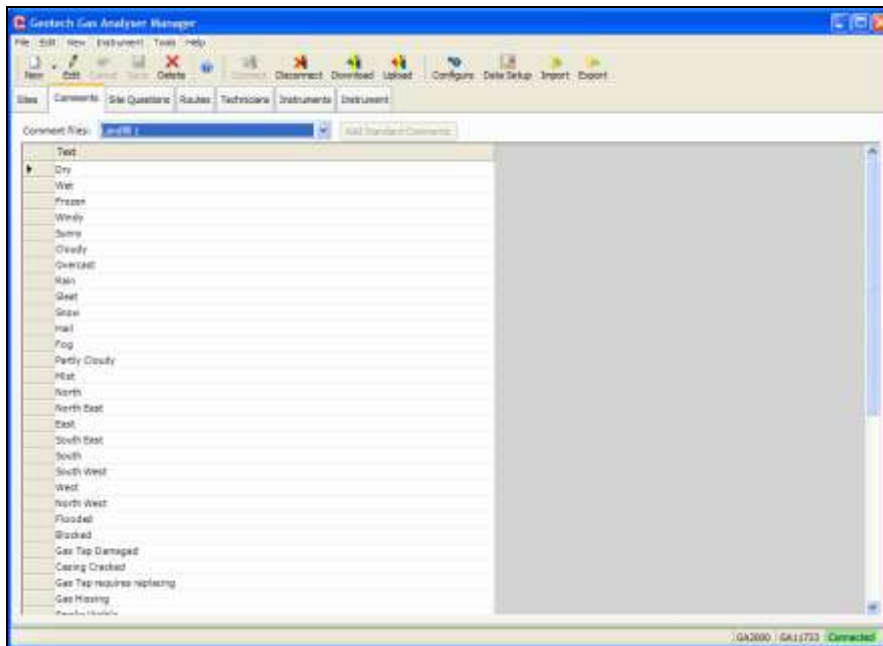
An instrument can have up to 64 comments of up to 35 characters in length. Comments are organised into files, only one file can be used at a time by an instrument and the file used is selected on the 'Site Properties' form. To ensure consistent usage site questions specify the comment file to be used when a comment-type question is selected.

If using multiple choice comments on a site question the user is limited to selecting ten comments. For borehole specific questions the user is limited to choosing eight comments in total. This means that if, on a single borehole, three multiple-choice comments questions are chosen the total number selected is limited to eight; for example three on the first, four on the second and then only one can be selected on the third.

### 7.5.1 Creating a New Comments File

- 1) Select the 'Comments' tab and either choose 'New' from the 'File' menu or toolbar button.

- 2) Now up to 64 phrases can be entered, one per line in the edit window. A number of useful pre-defined phrases can be added to the list of comments.
- 3) Select the 'Add Standard Comments' button. A menu of choices is shown. Select an option to add the comments to the new file.
- 4) Select 'Save' to store the new comments. When creating or editing a set of site questions, the new comment file can now be selected from the drop down list.



Comments Tab

## 7.5.2 Editing an Existing Comments File

- 1) Select the 'Comments' tab and choose the file from the drop down list.
- 2) Enter Edit mode by clicking 'Edit' on the toolbar.

*Note:* It is not recommended to delete an entry from the file by removing the row. This will cause problems to existing questions that are using the file. Instead you can re-use the row or leave it as an empty row.

## 7.5.3 Deleting an Existing Comments File

To delete an existing comments file, select the correct 'Comments File' and choose 'Delete' from the 'Edit' menu or toolbar.

*Note:* All sites that use the comments file need to be modified so that they do not refer to the deleted file.

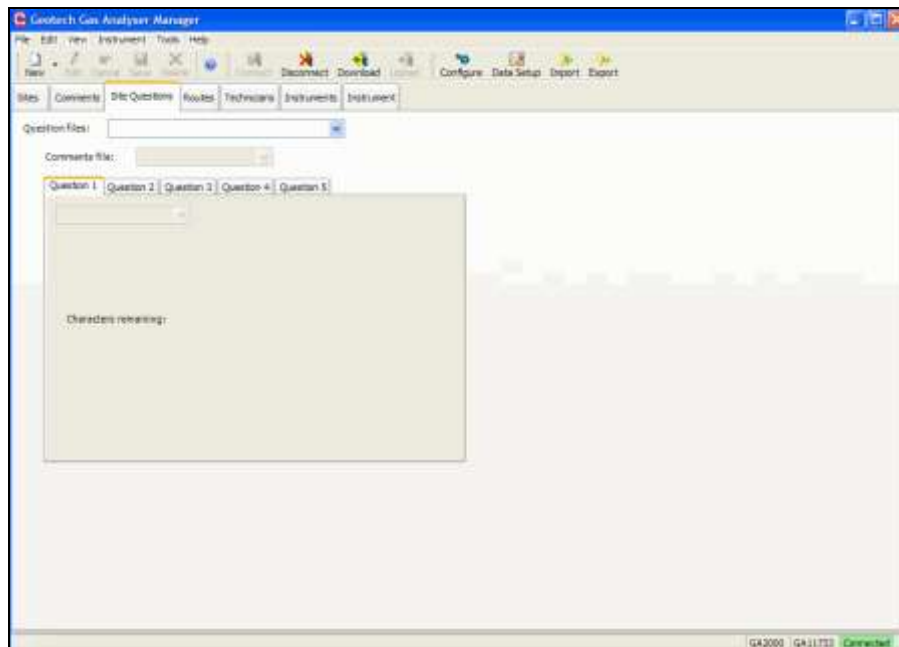
## 7.6 Site Questions Tab

Question files are used with the GA and GEM 2000 (Plus) instruments only. If you have GA94s or GEM500s this section can be ignored.

The 'Site Questions' tab allows users to specify additional information that the instrument cannot read for itself. The type of information is up to the operator. Up to five site questions can be stored in the instrument. These can, for example, relate to the weather or the operator name. Site questions are answered by the operator choosing an option from the 'Instrument' menu. Borehole questions are defined on a borehole specific basis; up to three questions can be defined. Borehole questions can be used to prompt the user to enter information relating to the status of the borehole or well-head.

### 7.6.1 Creating a Site Question File

- 1) Select 'New Site Question' from the 'File' menu or select the 'Site Questions' tab and then select <<New>> from the drop down list.



Site Questions Tab

- 2) Enter a file name for the site questions and click 'OK'.
- 3) Up to five questions can be created. Select the question type from the 'Question Type' drop down list.

There are four types of question:

Alphanumeric

The user is prompted by a question to input any letter or number as an answer up to 72 characters in length. The user is shown a single prompt.

Numeric

The user is prompted by a question to enter a value in a specific format as an answer.

The user is prompted to enter one or more values and a unit of measurement is required to answer the question.

Single Selection  
Comments

The user is shown a list of up to ten comments. Only one answer can be selected.

Multiple Choice Selection  
Comments

The user is shown a list of up to ten comments. The user can select up to eight answers by placing a tick mark next to the choice.

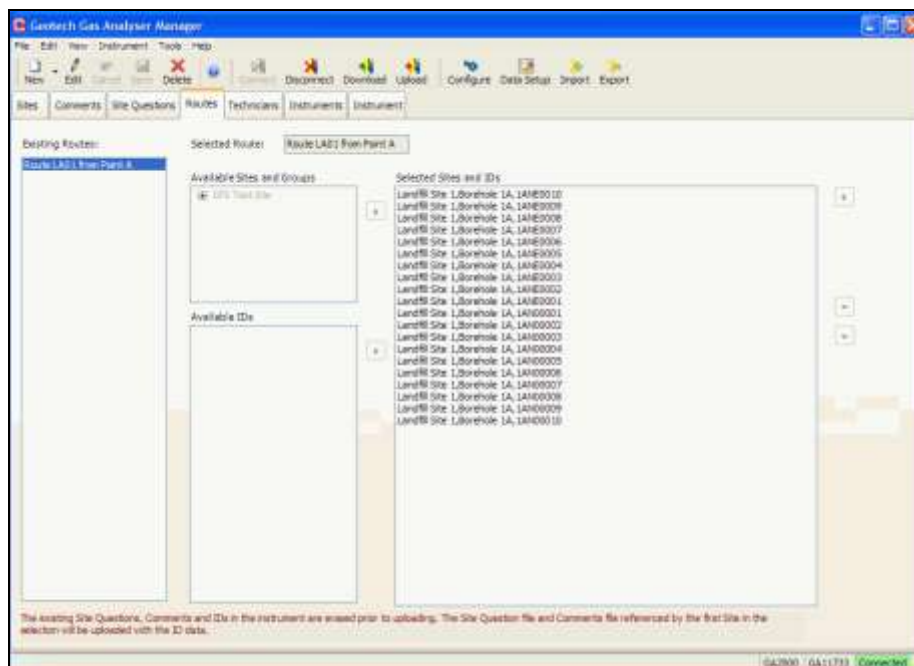
- 4) Select 'Save' on the 'Edit' menu or toolbar when the questions have been completed.

### 7.7 Routes Tab

IDs in the instrument can be organised in a way more suited to the Site Engineer's method of monitoring by creating 'Routes'. A 'Route' is a collection of sites, borehole groups or individual boreholes programmed into the instrument in a single block. When uploading a route all existing IDs, questions and comments are first deleted from the instrument. Multiple routes can be created and stored for later use. Create different routes to reflect your site monitoring requirements.

#### 7.7.1 Creating Routes

- 1) Select 'New Route' from the 'File' menu option or select the 'Routes' tab followed by the 'New' toolbar icon.
- 2) Enter a name for the route in the 'Selected Route' text box.



Routes Tab

- 3) Under 'Available Sites and Groups' the full list of sites and borehole groups are shown. By clicking a borehole group the full list of borehole identifiers for that group is shown in the 'Available IDs' list.
- 4) You can view a whole borehole group by selecting the group name and then selecting the right arrow button adjacent to the list.
- 5) Adding a site or borehole group to the list will cause all borehole IDs in existence at the time of upload to be sent, not just those that existed when the route was created.
- 6) You can select individual borehole IDs by choosing one or more items from the 'Available IDs' list. Use the Ctrl and Shift keys when selecting to easily add sets of IDs.
- 7) After adding the items the order can be adjusted by selecting the items in the 'Selected IDs' list and using the up and down arrow buttons on the right-hand side.
- 8) Select 'Save' to store the changes. The route can now be used with any instrument.
- 9) Creating a route does NOT, in anyway, change the structure of your sites and IDs outside of the defined route, enabling you to define them in any order without affecting the master list of sites, borehole groups and IDs as defined on the 'Sites' tab.

### **7.7.2 Uploading Routes**

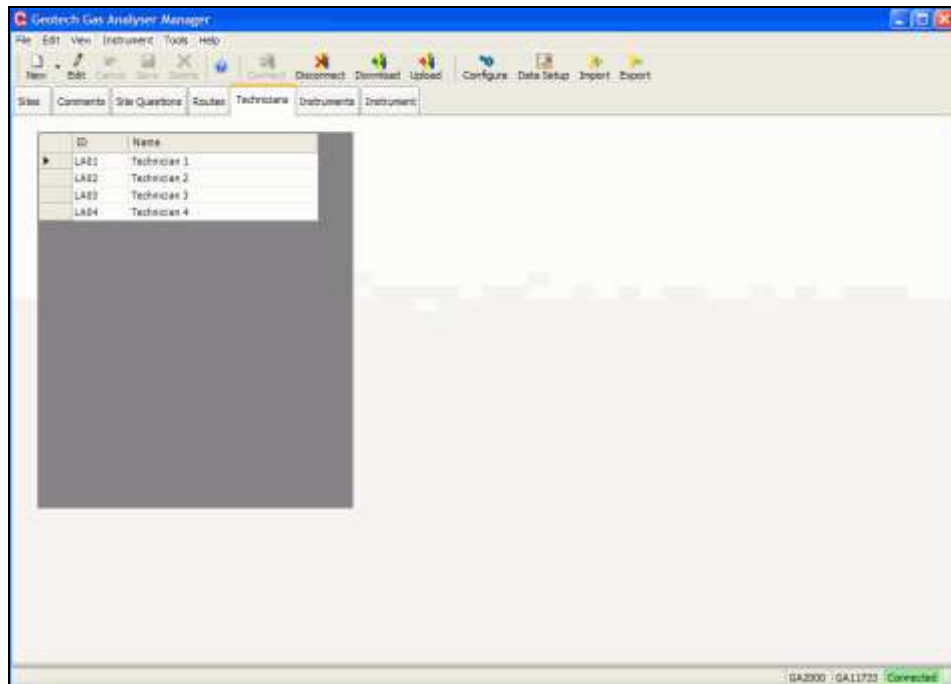
Uploading a route will clear existing IDs, comments and site questions from the instrument.

The comments and site questions uploaded will be those defined against the site properties of the first ID uploaded. A warning message will be displayed if a conflict of site questions and comments is found. In this case you should check which files are correct and ensure that the selection is consistent.

## 7.8 Technicians Tab


GA2000 and GEM2000 gas analysers fitted with Firmware version 3 have a new option that allows a technician identifier to be recorded against each reading taken. When the instrument is started a list of technician identifiers and names is shown. The operator selects their name from a list or they can type in a custom ID. The 'Technicians' tab allows the user to create a list of 'Technician IDs' and names to be uploaded to the instrument.

- 1) From the 'Technicians' tab, select 'Edit' to enter edit mode and then enter IDs and names in the list.



Technicians Tab

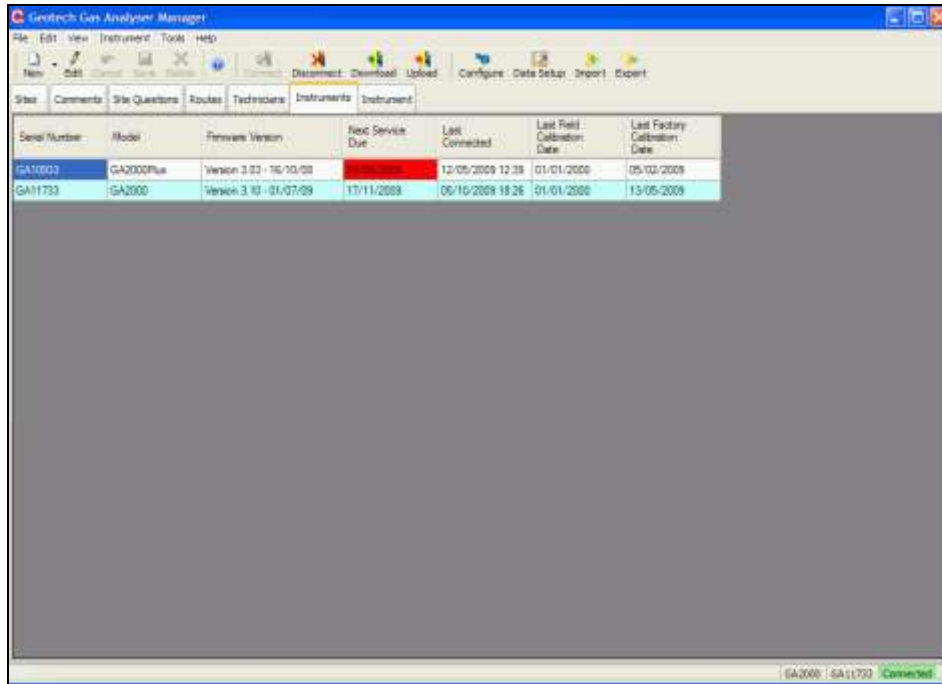
- 2) Once you have completed adding or editing names select the 'Save' button.
- 3) Make sure the analyser which is to receive the upload is connected. Finally, select the 'Upload' button to send the list to your instrument. Existing technician names in the instrument are deleted.

 Note: The 'Upload' option is not available if your instrument does not support the feature or it has not been purchased for the instrument.

**7.9 Instruments Tab**

The 'Instruments' tab displays useful instrument information for the instrument(s) connected.

For example; serial number, model, instrument Firmware Version, model, next service due date, date last connected, date last field calibration and last factory calibration date.

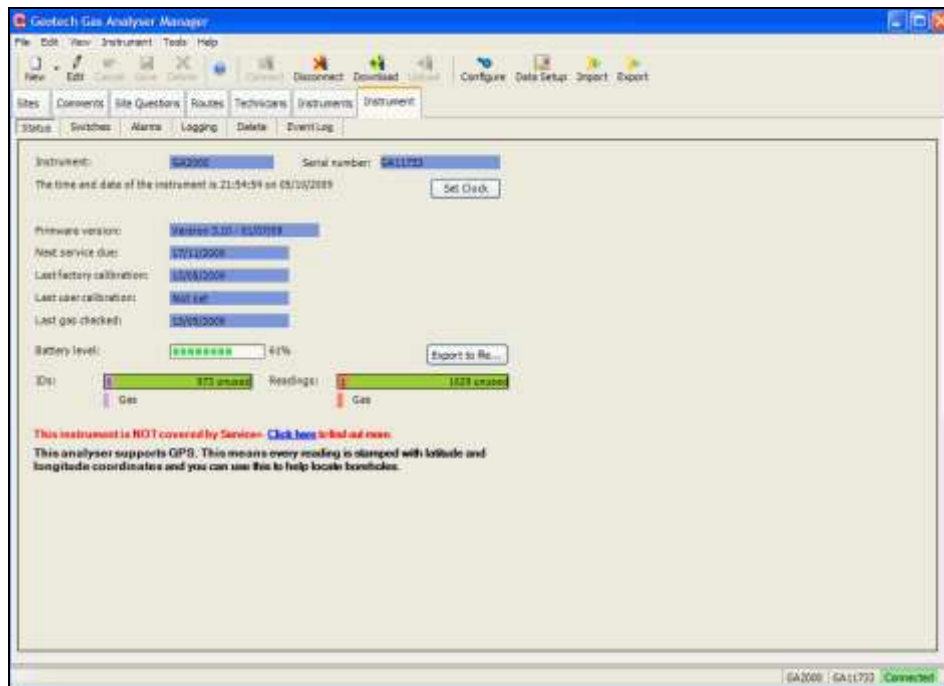


Instruments Tab

✍ Note: The GA2000 Plus instrument listed above is highlighted in red indicating that the next service due date has passed.

**7.10 Instrument Tab**

Instrument maintenance and status information can be obtained by selecting the 'Instrument' tab.



Instrument Tab

**7.10.1 Instrument Settings**

The 'Instrument' tab has the following sections:

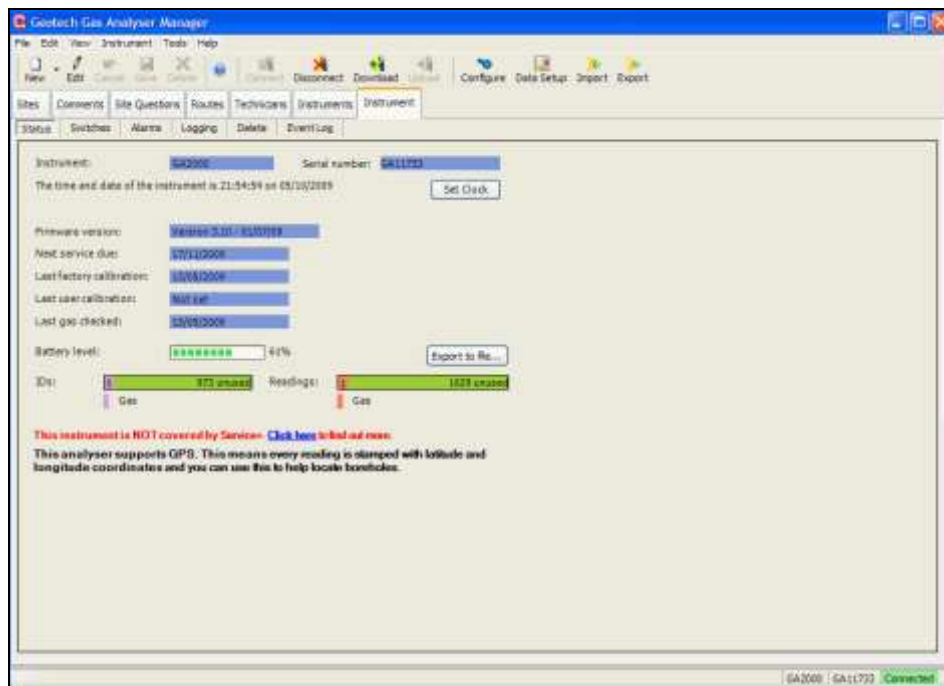
- Status Shows calibration dates, instrument type, battery and memory status and Firmware version information.
- Switches Allows the setting of auto-purge setting, auto power-off, low flow warning sensitivity, purge pump run-time and technician log-in enable.
- Alarms For the setting of instrument alarm levels for CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub> and Residual N<sub>2</sub> where supported by the instrument.
- Logging For setting auto logging parameter ID, interval and pump run-time.
- Delete Allows the deletion of various parameters and cold-start of the instrument.
- Event Log Only available with GA2000 and GEM2000 analysers fitted with Firmware version 3 which have purchased the Event Logging option.

The Event Log shows system activity within the analyser including when user-calibrations are performed and the values obtained during the calibration. This information can be saved to a file by clicking the 'Save As...' button.

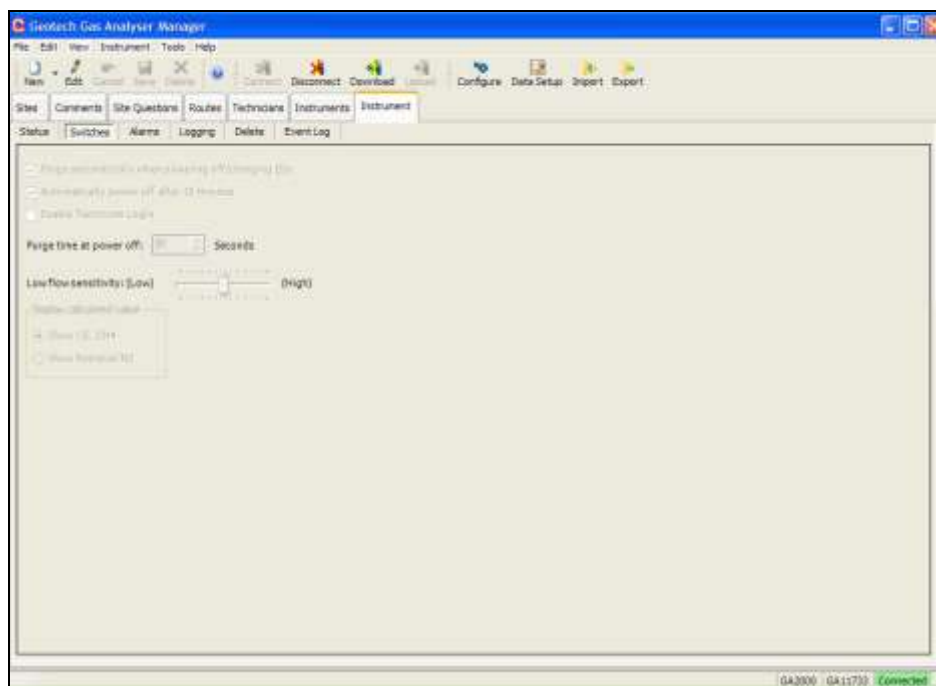
Also when readings are downloaded from the instrument the software can be configured to put the calibration data from the Event Log into the CSV (or other) file, either in the header block or in-line chronologically with the readings.

To edit instrument settings the analyser must be connected. Select the 'Edit' button on the toolbar or 'Edit' menu, make the required changes and then select the 'Save' button to commit the changes to the instrument.

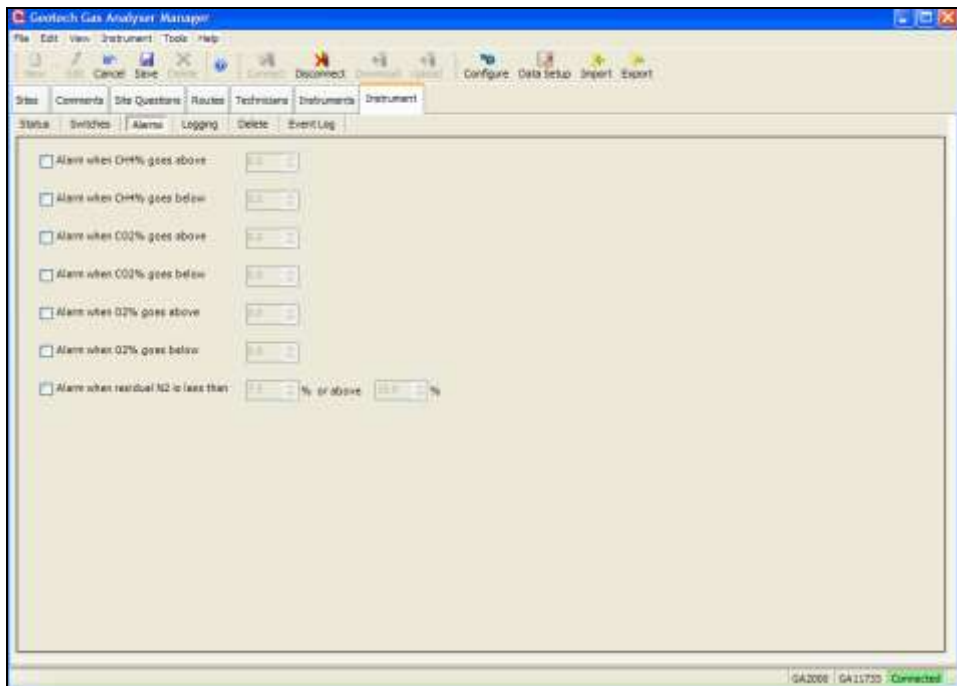
### Instrument Screens:



Instrument - Status

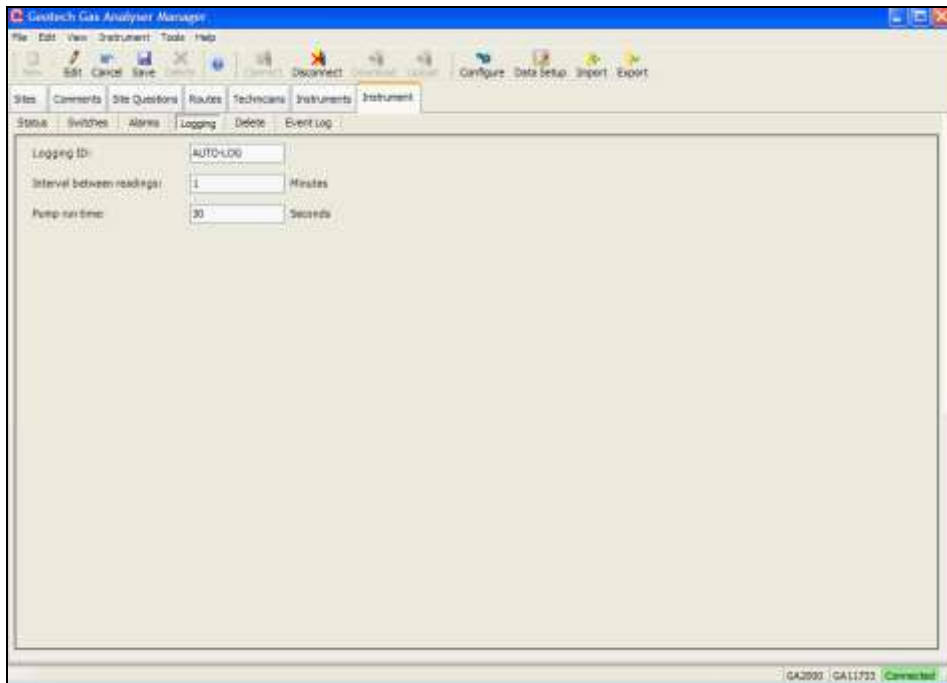


Instrument - Switches



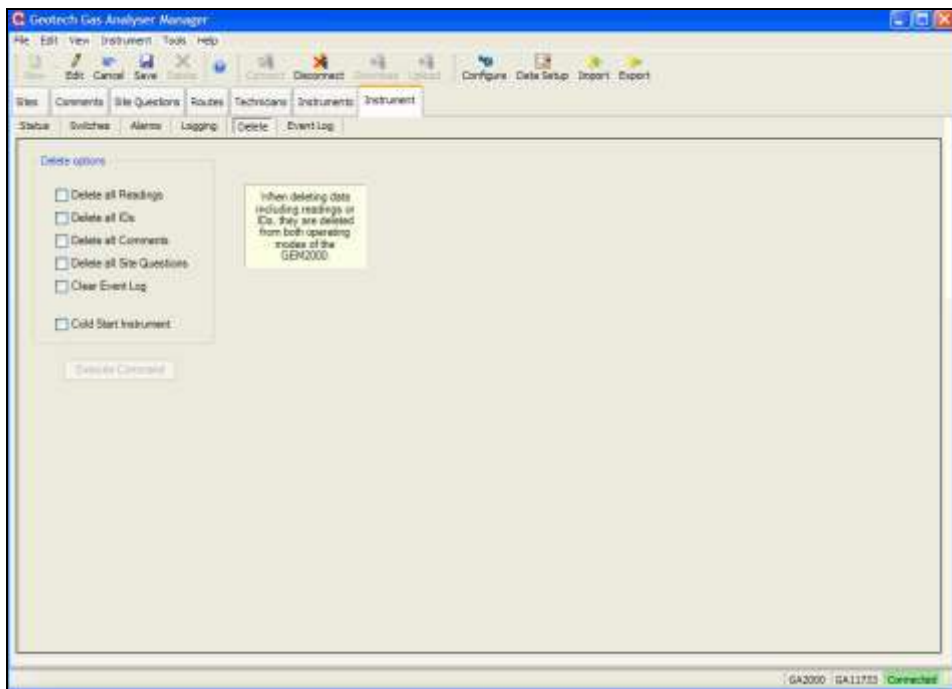
Instrument - Alarms

Alarms can only be set with the GA/GEM2000 instruments attached. An audible and visible alarm indication occurs on the instrument when the specified channel's reading falls below or rises above the specified value.



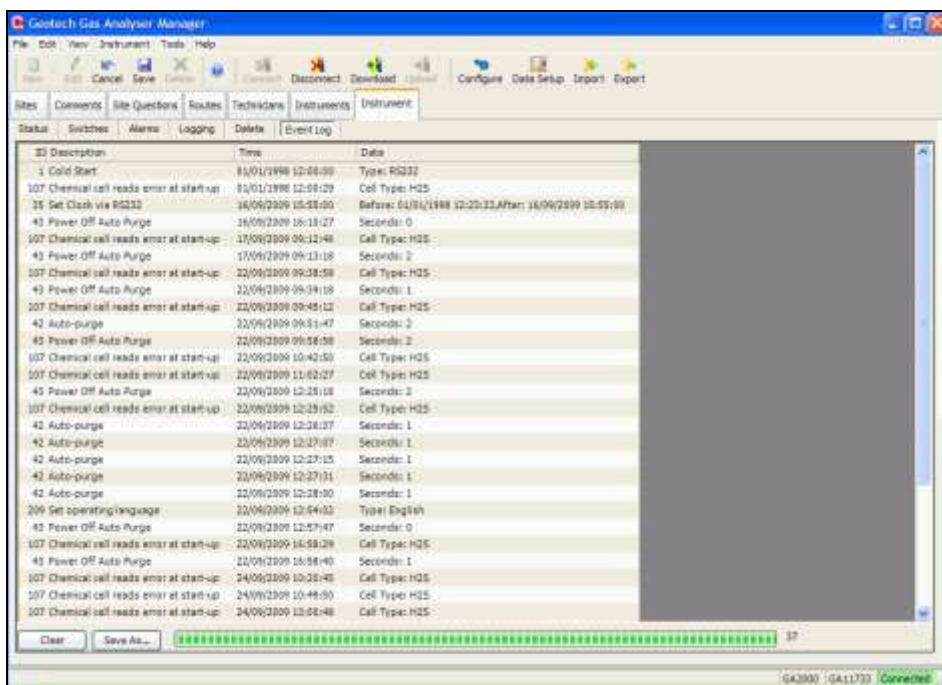
Instrument – Logging

Specify an interval between readings time frame and pump run time.



Instrument – Delete

To delete stored and downloaded readings, tick the relevant options and then select the 'Execute Command' button.



Instrument - Event Log

The event log shows system activity with the analyser.

## 8.0 Importing and Exporting Files

### 8.1 Importing Landtec's DataField Comms V3 Data Files

Gas Analyser Manager is an upgrade to Landtec's DataField Comms V3 software. Configuration files are stored in a new file format, however the user can import old data files into this software.

To import IDs, question files and comment files select 'Import' from the 'File' menu or, select the 'Import' toolbar button.

#### 8.1.1 Importing Question and Comment Files

- 1) To import question files and comment files select 'Import' from the 'File' menu or, select the 'Import' toolbar button.
- 2) Select one or more files to import. After importing the file it is available for selection from the 'Site Questions' tab. You no longer need to keep your existing files.

#### 8.1.2 Importing Borehole IDs

Importing an ID file is just the same as importing questions and comments; however the following points should be noted:

The IDs in the imported file will be analysed and moved into the appropriate Site.

For a Site with more than one Borehole Group, the IDs will be placed into the first Group in the list unless the user selects the 'Group Name' in the tree before selecting to import.

Where no matching 'Site Borehole ID Mask' is found a new Site will be created. When you have specified an empty borehole ID mask (.....) the IDs will be stored in that Site.

✍ Note: Files cannot be converted back to DFC file formats.

### 8.2 Importing the System Configuration

The Gas Analyser Manager Export Configuration option creates a file with the extension .DVE. These files can be imported back into Gas Analyser Manager.

- 1) Select 'Import' from the 'File' menu or select the 'Import' toolbar icon.
- 2) Select the backup file to 'Import' then click 'Open'.
- 3) Select the Site or Sites to import to files into.
- 4) Select the method of import from the 'Import Mode' list.

Delete all existing Sites, groups and borehole IDs

This option will overwrite, without warning all existing configuration data including all borehole details. Existing readings will remain intact.

Only add new Sites, groups and IDs

This option will only add Sites and the associated data that do not already exist.

Add new, overwrite existing data without prompting

This option will merge the current configuration and new data in the Export file. You will be prompted before overwriting any existing borehole configurations.

Add new, prompt to overwrite

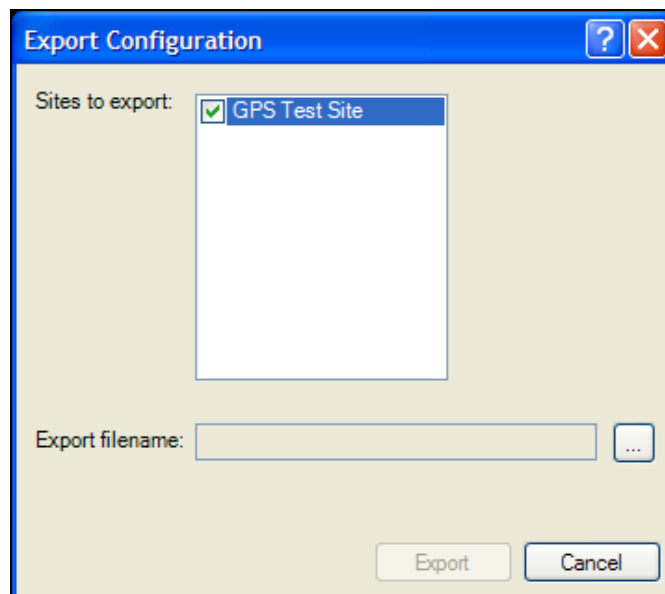
This option will merge the current configuration and new data in the Export file. You will not be prompted before overwriting any existing borehole configurations.

- 5) When you have chosen the sites and import mode select the 'Import' button.

### 8.3 Exporting the System Configuration

This enables the user to export the system configuration for backup or transfer to a different computer by using the 'Export Configuration' option. This facility is also useful for diagnostic analysis by the Geotech Technical Support team should they require a copy of your configuration in order to identify a problem.

- 1) Connect to an instrument, select the 'Export' toolbar button and the following screen is displayed:



Export Configuration

- 2) Place a tick next to the Site(s) you wish to export and then select the name of an export file to hold the exported configuration. To browse for a file click the [...] button.
- 3) Select the 'Export' button to export the data. If the specified file does not exist you will be prompted to create the file. Specify a file name placing the file in a preferred folder on your computer.
- 4) The following message displays when the file export has been successful.



- 5) The exported file can now be used as a backup of the configuration or for importing into another system.
- 6) Select 'Save' to store the configuration. The file can now be sent using the preferred email software.

The exported file contains the borehole details, comments, questions, and Routes you may have created. Download readings are not exported.

## **9.0 Organising Data for Instrument Upload**

Configuration data can be uploaded (sent) to an instrument by choosing the item to send from the 'Site' folder tree, 'Comments' tab, 'Site Questions' tab or 'Routes' tab and clicking the 'Upload' button on the toolbar.

Borehole ID information can be uploaded in this way by choosing a borehole group within a site or by uploading the whole site.

Activities can be organised in a way more suited to the user's method of monitoring by creating routes. A route is a collection of sites, borehole groups or individual boreholes programmed into the instrument in a single block. Multiple routes can be created and stored for later use.

### **9.1 Uploading Routes**

Uploading a route will clear existing IDs, comments and site questions from the instrument. When appropriate, new sites and comments can be uploaded to the instrument.

The comments and site questions uploaded will be those defined against the site properties of the first ID uploaded.

A warning message will be displayed if a conflict of site questions and comments is found. In this case you should check which files are correct and ensure that your selection is consistent.

### **9.2 Uploading Configuration Data and Readings**

To send configuration data to the instrument, click the 'Upload' button or choose 'Upload' from the 'Instrument' menu. The 'Upload' option is enabled when a connection has been established and the selected tab or item is valid for uploading. Site question files, comment files, borehole ID groups and routes can be uploaded.

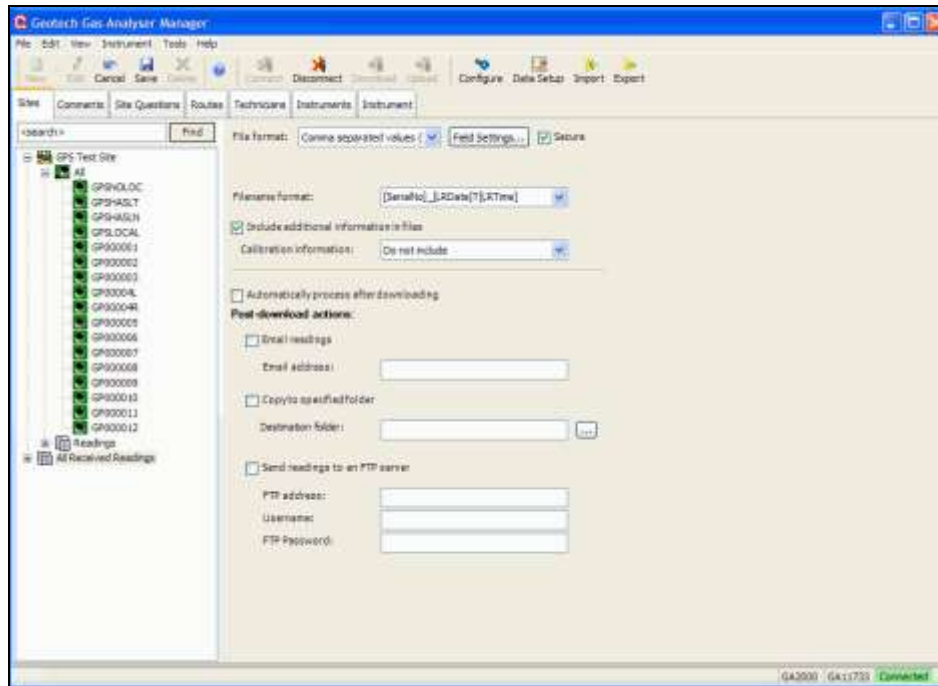
### **9.3 Uploading Readings**

Existing readings can be uploaded back into an instrument. This is useful for GEM instruments for comparison with previous readings. Only readings that have been downloaded with the 'Secure' flag set can be uploaded back into the instrument. Files must be saved in CSV format. Make a connection to the instrument; choose the file from the list in 'All Received Readings' and click the 'Upload' toolbar icon.

## 10.0 Getting Readings from an Instrument

### 10.1 Preparing to Download Readings

- 1) To set-up the default rules when downloading data select 'View' then 'Reading Download Set-up' or select the 'Data Setup' toolbar icon and the following screen is displayed:



View – Reading Download Set-up

- 2) Before downloading readings from the instrument the following parameters need to be configured:
  - File format to store readings (CSV etc).
  - Secure file.
  - Field settings (the columns of data values and the order in the file that you want to them displayed).
  - Filename format.
  - Naming convention for your data files.
  - Post download processing options.

✍ Note: GEM2000: With older instruments installed with version 2 Firmware it is necessary to switch modes using the instruments on-screen menu to download readings stored in each of the two operating modes.
- 3) To configure the download settings chose from the following options:

**File Formats:**

Comma Separated Values (CSV)

Comma separated values; each row has all data values for a single borehole reading. The actual separator character is determined by regional settings.

Tab separated values

Similar to CSV except each reading value is separated with a tab character.

MPR Monitor Pro file format

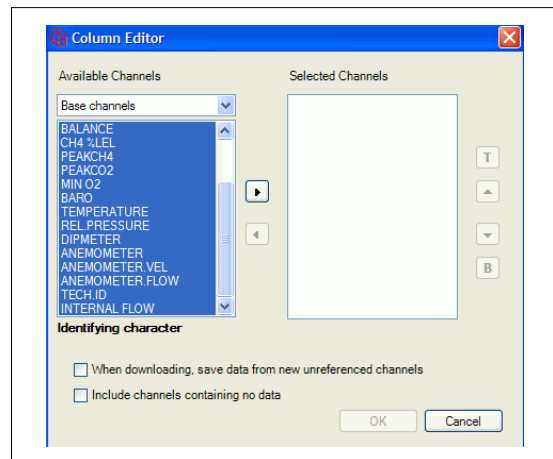
Each row only contains a single channel's value.

Rungas file format

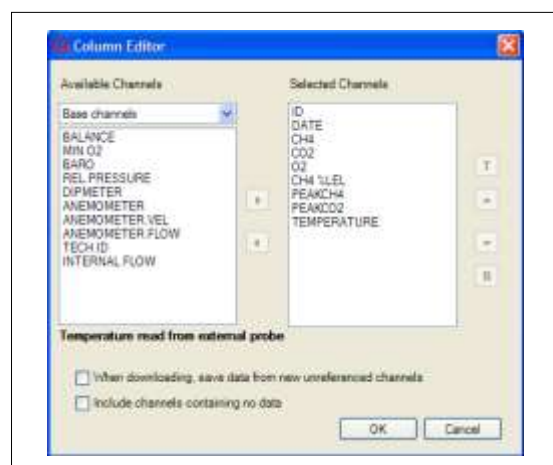
This file format is very similar to CSV except all non-numeric values such as over-range and under-range are shown with a single hyphen character.

Field Settings button

Allows selection of columns to be stored and their order.



Select the required columns followed by the forward arrow > and send the selections over to 'Selected Channels'.



Secure

Tick this box to have a code value inserted into CSV or Tab separated text files. The value inserted into the text file can be used to ensure that the data in the file has not been tampered with. The code formula is not published. A stand-alone software component to enable the scanning of a file to ensure its validity is available from Geotechnical Instruments UK Ltd.

Identify readings using instrument serial number

This option is only available when the file format is set to Monitor Pro. Ticking this box will cause the source parameter to use the instrument serial number. Otherwise source is labelled 'Field Reading'.

Filename Format

Select a file naming convention from the dropdown list or type in own filename format. The extension (.csv, .txt or .mpr) is automatically appended to the filename.

Formatting strings that can be applied to the filename:

- [ComputerName] Adds the name of the computer to the filename.
- [UserName] Adds the name of the authenticated user of this computer.
- [LRDate] Adds the date of the last reading in yymmdd format.
- [LRTime] Adds the time of the last reading in the hhmmss format.
- [DLDate] Adds the date the data was downloaded in yymmdd format.
- [DLTime] Adds the time the data was downloaded in yymmdd format.
- [SerialNo] Adds the serial number of the instrument to the filename.

Include additional information in files

If this option is selected, the CSV files will include the following parameters when the file is saved: Instrument type, serial number, time of download, calibration and service dates.

Calibration information:

GA/GEM2000 instruments with Firmware version 3 or above can include user calibration data in the downloaded readings (where option is purchased).

- Do not include Information is excluded
- Include in header section The user calibration data is included in the title section block of the data file.

- Include in-line with readings  
The user calibration data is included in line with readings in date order. This option may make processing of CSV using external software more difficult.
- Automatically process after downloading  
If wishing to email, file copy or FTP the file, tick this box to have the operation occur automatically after the data has been downloaded from the instrument.
- Email readings  
Specify an email address to send the file to. The file is sent as an attachment in a plain text email. The PC must have a MAPI compatible mail client installed such as Microsoft Outlook. When the email is sent after downloading, some versions of Outlook will send a warning that an external application is trying to access Outlook. When this prompt appears the external request must be accepted. Multiple addresses can be specified by separating each address with a semicolon (no spaces).
- Copy to specified folder  
Enter a local path name or UNC path name to copy the downloaded file to after downloading has completed. This will be an additional copy of the readings to that stored in this application's data folder.
- Send readings to an FTP server  
Specify an FTP server address. This may be a URL or IP address, a user name and password. These settings will be available from the user's system administrator.

**Field Settings:****Formatting the content of the files**

The columns to be stored and their order within the file can be specified. Choose the 'Format...' button to access the 'Column Order' editor. Select the columns to be saved from the list on the left-hand side. They are grouped by instrument type. Choose the instrument type and then select the channels to be saved. Multiple channels can be selected at the same time. Click the right arrow button to move the chosen channels to the 'Selected Channels' column.

Columns from more than one instrument type can be chosen. Most channels appear in most instrument types. A channel only has to be selected once.

Note: If the user decides not to include a channel and then later add that channel to the selected list, any existing files will still

## When downloading, save data from new unreferenced channels

only contain the original columns.

This option allows the user to be sure that when a new channel is added to an instrument but it is not listed in either the selected or available channels no data is lost when downloading.

Note: Turn this feature off when using MS Excel macros that are expecting a predefined data format.

## Include channels containing no data

When this option is ticked channels that do not have any valid values stored will be included as an empty column; otherwise the column is excluded.

- 4) Select 'Save' to store the changes. These settings will be used each time the user downloads readings from the instrument(s).

## **10.2 Downloading Readings**

After configuring the software to download readings, select the 'Download' button on the toolbar or select 'Download Readings' from the 'Instrument' menu.

The status window appears and shows the progress of the download. After downloading the readings are saved in the specified format and processed if the automatic process option was selected. The file is shown. If FTP was selected, the file will be FTP'd to the specified location. If email was selected the file will be sent as an email attachment to the chosen email address.

With version 2 Firmware instruments (serial number < 10000), 'GA mode' and 'GEM mode' readings stored in GEM2000 gas analysers are stored separately within the instrument.

When downloading readings from the latest GEM2000 analysers fitted with version 3 Firmware, the software will download the readings from both of the operating modes automatically. The data will be stored in separate files.

## **10.3 Data Security**

Gas Analyser Manager includes a facility for ensuring that data is secure by making changes to the readings file evident when viewed in Gas Analyser Manager. To use this facility, data from the instrument needs to be stored in the 'Secure CSV' format.

The 'Secure CSV' format incorporates a validation code that will identify if any changes have been made to the data. The validation code formula is not published. A stand-alone software component to scan a file to ensure its validity is available from Geotech (UK) Limited. For further information please contact the Technical Support Team on +44(0)1926 338111.

An additional security feature is that data can be sent via either email or FTP to a remote location directly from the instrument.

**10.4 Viewing Downloaded Readings**

Below the 'All Received Readings' tree item on the 'Sites' tab is a list of all reading files downloaded. The view of the files is unfiltered. Under each 'Site' a filtered view of the readings file that only shows IDs applicable to the site borehole ID mask can be seen.

To view the downloaded readings in an external program right click the file and choose 'Open using Excel' from the context menu. The file will be opened using the registered program for CSV file extensions. If using all-numeric IDs, Microsoft Excel automatically determines this to be a numeric value and will truncate leading zeros.

Model	GA2000Plus	Serial No	GA10933															
MCERTS certified instrument																		
Date downloaded	01/04/2009 12:35																	
Computer & User info	LA	LA																
Date of last user calibration	01/01/2009																	
Date of last factory calibration	05/02/2009																	
Next service due	08/08/2009																	
Date of last Gas Check	05/02/2009																	
Security code	[70A9FA4D]																	
CO	H2S	H2	DATE	CH4	CO2	O2	BALANCE	CH4 %LEI	PEAKCH4	PEAKCO2	MIN O2	BARO	REL PRES	INTERNAL ID				
ppm	ppm	ppm		%	%	%	%	%	%	%	%	mb	mb	l/h				
0	0	0	24/03/2009 14:57	0	0	20.8	79.2	0				1007	-0.06	BOLE0001				
0	0	LOW	31/03/2009 10:21	0	0.1	20.6	79.3	0	0	0.1	20.6	1014	0.08	BOLE0011				
0	0	LOW	31/03/2009 10:35	0	0.1	20.5	79.4	0				1014	-5.54	BOLE9999				
0	0	LOW	31/03/2009 10:51	0	0.1	20.5	79.4	0	0	0.1	20.4	1014	-3.75	BOLE0001				
0	0	LOW	31/03/2009 12:25	0	0.1	20.5	79.4	0				1014	0.04	BOLE0001				
0	0	LOW	01/04/2009 12:07	0	0.1	20.6	79.3	0				1014	0.05	BOLE9998				
0	0	LOW	01/04/2009 12:16	0	0.1	20.5	79.4	0				1014	-4.16	BOLEA002				
0	0	LOW	01/04/2009 12:18	0	0.1	20.5	79.4	0				1014	0.01	BOLEA002				
0	0	LOW	01/04/2009 12:20	0	0.2	20.4	79.4	0				1014	-12.64	BOLEA005				

Example of Readings Opened Using Microsoft Excel

The readings data is automatically displayed in separated cells within the worksheet. The data can now be analysed, reported and graphed using the MS Excel application.

## 11.0 Problem Solving

### Message

I can't get my USB communications lead to work.

Every time I store a reading the analyser asks if there is a H<sub>2</sub>S filter attached, how do I stop this message appearing?

I have just used my flow pod with my GA2000 and after downloading the results, the flow data isn't there.

I have recently purchased a new GA2000 plus and noticed the residual nitrogen feature. Can I have this feature enabled for my other earlier gas analysers?

I have tried to load my GA2000 with a second set of IDs but when I do, the first set of IDs is over-written.

I am using Gas Analyser Manager and my data and ID have disappeared.

Automatic detection could not be started; the port may be in use by another application.

### Action Required

Check 'Windows Device Manager' to ensure the USB driver is installed. Check the USB port has a COM port number mapped and that the port is assigned on 'Tools' then 'Options'.

This message can be configured to be ID specific. Use Gas Analyser Manager (GAM) to toggle the H<sub>2</sub>S filter flag accordingly.

It is likely that the reading was stored before the logging period had elapsed. The logging period must be allowed to run its course.

No. The memory has been extended on your new analyser allowing us to add features such as this. However, if using the latest version of Gas Analyser Manager, the residual Nitrogen can be calculated and downloaded as an extra channel.

To upload more than set of IDs from different groups of sites, you need to use the 'Routes' facility which can be found in Gas Analyser Manager.

Check that your 'Data Folder' is set to the correct location of your files. This can be found in the 'Tools' menu then 'Options'.

Check the analyser is connected to the PC and that the USB port has a COM port number mapped. Select 'OK' to continue and assign a port number by accessing 'Tools' then 'Options'.

✍ Note: For further information please contact Technical Support at Geotech (UK) Limited on +44(0)1926 338111 or email [technical@geotech.co.uk](mailto:technical@geotech.co.uk).

## 12.0 Glossary of Terms

<b>Administrator</b>	The Administrator for the PC (Client) onto which Gas Analyser Manager is to be installed and who has the required security privileges needed to install and remove Gas Analyser Manager program files.
<b>Borehole</b>	A borehole is a single point on a site that is identified by a unique 8-digit character identifier. The borehole can be a well head, borehole or any fixed point where a gas measurement is taken.
<b>Borehole Groups</b>	A borehole group identifies a set of boreholes within a site.
<b>Comment File</b>	A comment file defines a list of 64 text strings that are used for selection choice for site or borehole specific questions.
<b>Connected devices</b>	Instruments (analysers) currently connected to the PC via USB port(s).
<b>Download</b>	Transmission of data from the instrument to the GAM application (IDS, readings, questions etc).
<b>Firmware</b>	Firmware is the name given to the analyser's internal software. The Firmware software is automatically updated when the analyser is returned for servicing.
<b>GAM</b>	Geotech abbreviation for Gas Analyser Manager .
<b>Question Files</b>	Question files define up to five site questions that can be answered by the user on the GA2000/GA2000 Plus or GEM2000/GEM2000 Plus. Four styles of question are available.
<b>Route</b>	A route is a mechanism that allows the pre-selection of several sites, borehole groups or individual boreholes for simultaneous uploading to an instrument.
<b>Service due date</b>	The date the next service is due for the selected device. Instrument icons are highlighted in red in the application, indicating that the instrument is past its service due date.
<b>Site</b>	A site is a group of boreholes within a common location.
<b>Upload</b>	Transmission of data from the GAM application to the instrument (IDs, question files, comment files etc).