The World Leader in Vibrating Wire Technology

48 Spencer Street
Lebanon, NH 03766, USA
Tel: 603•448•1562
Fax: 603•448•3216
E-mail: geokon@geokon.com
http://www.geokon.com

Level Logger and Software Operating Manual

Version 2.03.14

(Doc REV B 1/12)

Warranty Statement

Geokon, Inc. warrants its products to be free of defects in materials and workmanship, under normal use and service for a period of 13 months from date of purchase. If the unit should malfunction, it must be returned to the factory for evaluation, freight prepaid. Upon examination by Geokon, if the unit is found to be defective, it will be repaired or replaced at no charge. However, the WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion or current, heat, moisture or vibration, improper specification, misapplication, misuse or other operating conditions outside of Geokon's control. Components which wear or which are damaged by misuse are not warranted. This includes fuses and batteries.

Geokon manufactures scientific instruments whose misuse is potentially dangerous. The instruments are intended to be installed and used only by qualified personnel. There are no warranties except as stated herein. There are no other warranties, expressed or implied, including but not limited to the implied warranties of merchantability and of fitness for a particular purpose. Geokon, Inc. is not responsible for any damages or losses caused to other equipment, whether direct, indirect, incidental, special or consequential which the purchaser may experience as a result of the installation or use of the product. The buyers sole remedy for any breach of this agreement by Geokon, Inc. or any breach of any warranty by Geokon, Inc. shall not exceed the purchase price paid by the purchaser to Geokon, Inc. for the unit or units, or equipment directly affected by such breach. Under no circumstances will Geokon reimburse the claimant for loss incurred in removing and/or reinstalling equipment.

Every precaution for accuracy has been taken in the preparation of manuals and/or software, however, Geokon, Inc. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages or losses that result from the use of the products in accordance with the information contained in the manual or software.

Table of Contents

Introduction

Small, simple and affordable, Geokon Level 1000 & 2000 loggers can measure and record data at specified intervals ranging from once every 2 seconds, to once every 12 hours. Geokon's Data Recording Software requires no programming skills, and enables the user to effortlessly select reading rate, specify the user's ID, and initiate the start of data collection. For immediate use of the data logger refer to the Quick Start Guide.

In addition, all data can be saved in a format easily read by spreadsheet applications such as "Microsoft Excel." or "Lotus 1-2-3.". It is our goal to bring you accurate, low-cost, easy-to-use data loggers that integrate easily into the user's working environment. To better understand your needs and to better serve you, we welcome and appreciate your feedback.

Thank you for choosing Geokon for your data logging requirements.

Battery Warning

Geokon level loggers contain a lithium battery. Do not cut the battery open, incinerate, or recharge. Do not heat lithium batteries above 85ºC unless the battery is specifically rated for higher temperatures. Dispose the battery in accordance with local regulations.

Hardware

Package Inspection

Verify that the data logger(s) was not damaged in transit by carefully unpacking all items in the shipping carton and looking for obvious signs of physical damage. If the data logger is damaged, repack it in its original container and contact Geokon Customer Service ; phone 603-448-1562 , or email info@geokon.com. . Any damage noted upon receipt must be documented to file a claim against the carrier.

System Requirements

Geokon Data Recording software requires an IBM or compatible PC with the following:

- Pentium or higher processor
- Windows XP/Vista/Windows 7
- 128 MB RAM
- Color 800 X 600 monitor
- 30 MB free disk space
- CD-ROM
- Available 9 pin male serial (COM) port

NOTE: Although the software is designed to work with the Windows Operating Systems listed above, Geokon cannot guarantee operation on OS's no longer supported by Microsoft Support Life Cycle Policy

Getting Started

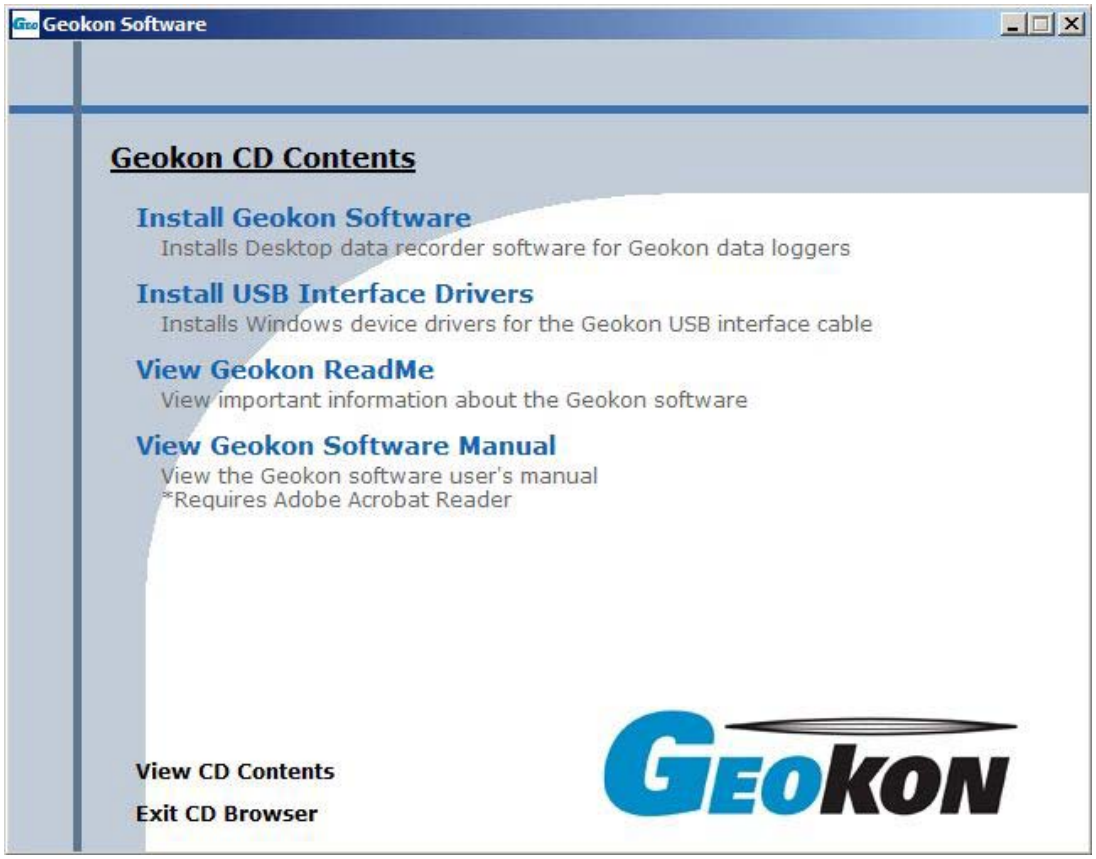
For simplicity and ease of use all Geokon model 4570, level 1000 and level 2000 software automatically configures itself specifically for each class of logger by reading the device type. Each class of logger has a unique device type and identifies itself when queried by the host computer. This has been implemented to minimize confusion and to eliminate the need to learn different software packages. Therefore, only one software package and only one manual is required for all Geokon Downhole Water Level Data Loggers. In certain instances where differences occur, an attempt is made in this manual to bring clarification and avoid confusion.

Software Installation

Installing from CD ROM

Insert the CD ROM labeled Geokon Data Recording Software into the host computer's CD ROM drive. From the Windows Start Menu, choose the Run command and type d:\autorun.exe into the **Open field and click** OK, it will bring the installation menu window **Geokon CD Contents** as shown below.

If the host computer's CD ROM Drive is not the D: drive, use the correct letter for the instructions above.

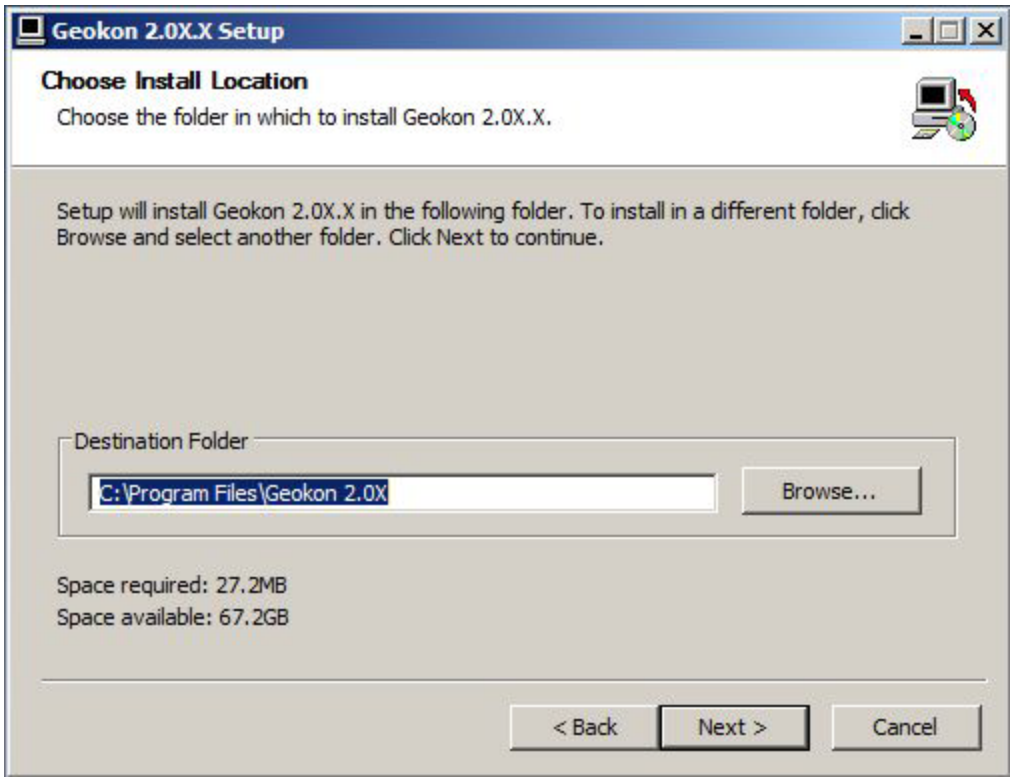


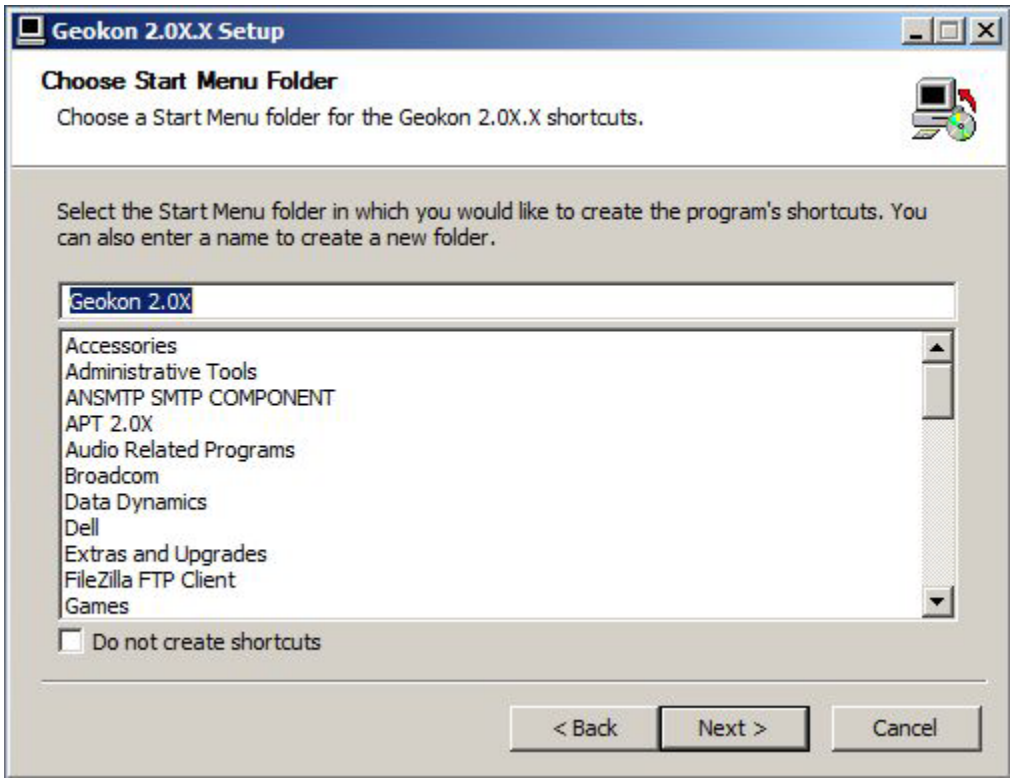
Click **Install Geokon Software.**

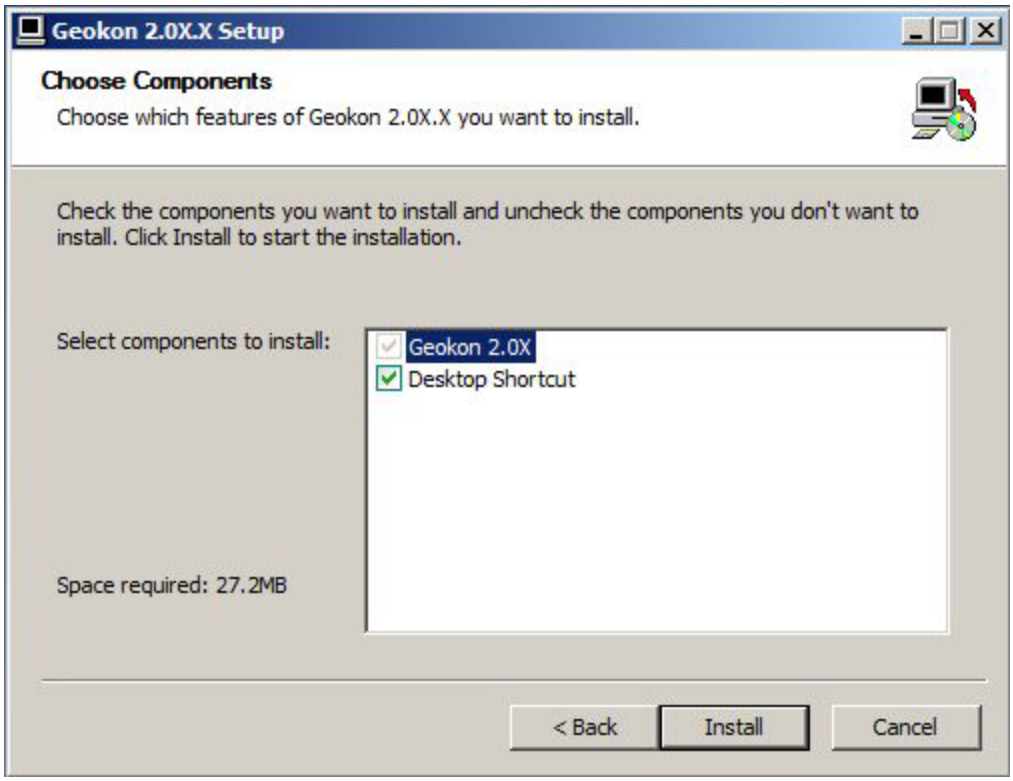
Install Geokon Software

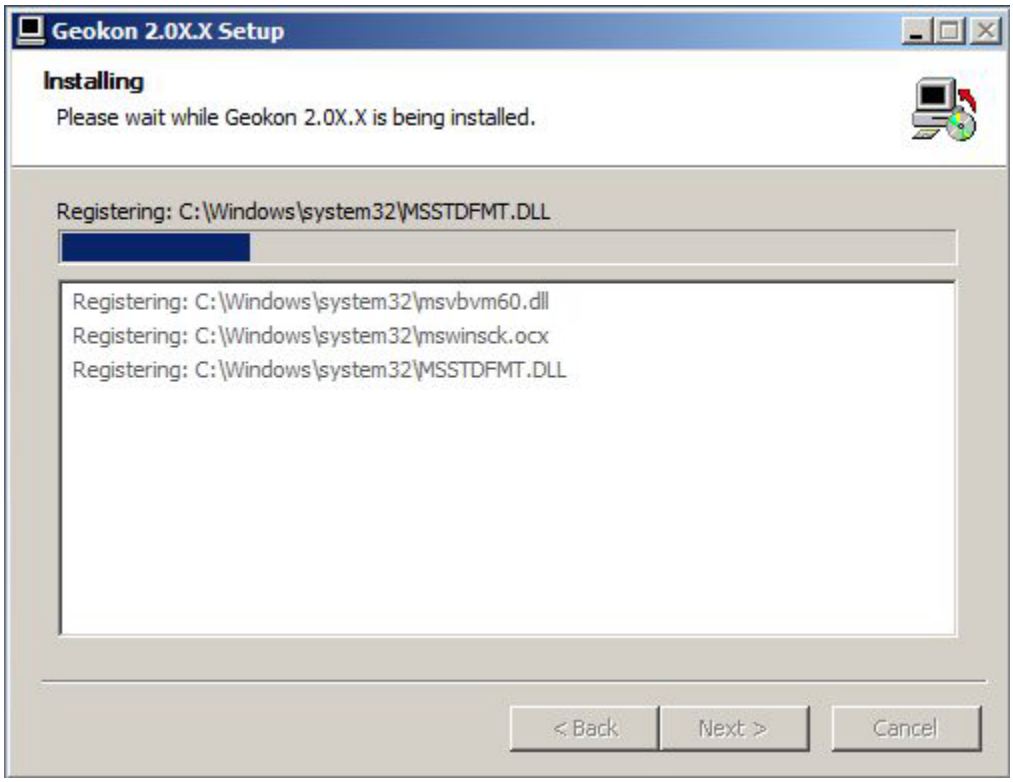
The selected language will be displayed on the installation windows.

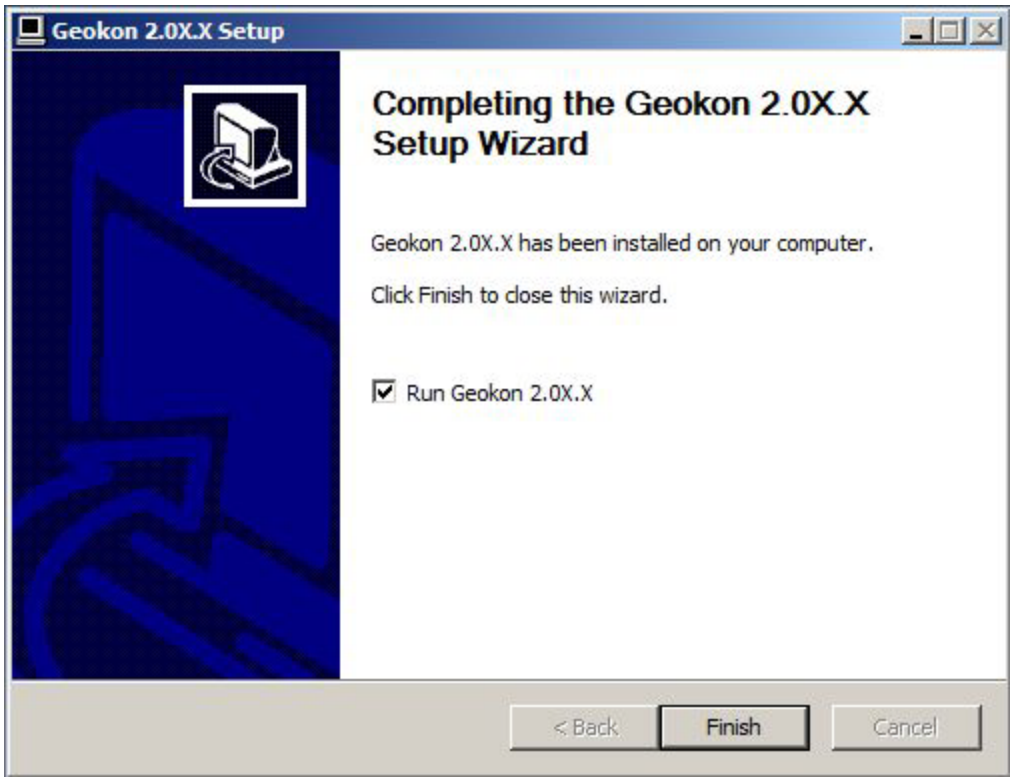
The following screens (could possibly show a previous version number) are examples of the installation windows:


Geokon 2.0X.X Setup
Choose Install Location
Choose the folder in which to install Geokon 2.0X.X.
Setup will install Geokon 2.0X.X in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.
Destination Folder
C:\Program Files\Geokon 2.0X
Browse...
Space required: 27.2MB
Space available: 67.2GB
< Back
Next >
Cancel


Geokon 2.0X.X Setup
Choose Start Menu Folder
Choose a Start Menu folder for the Geokon 2.0X.X shortcuts.
Select the Start Menu folder in which you would like to create the program's shortcuts. You can also enter a name to create a new folder.
Geokon 2.0X
Accessories
Administrative Tools
ANSMTP SMTP COMPONENT
APT 2.0X
Audio Related Programs
Broadcom
Data Dynamics
Dell
Extras and Upgrades
FileZilla FTP Client
Games
Do not create shortcuts
< Back
Next >
Cancel


Geokon 2.0X.X Setup
Choose Components
Choose which features of Geokon 2.0X.X you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Install to start the installation.
Select components to install:
Geokon 2.0X
Desktop Shortcut
Space required: 27.2MB
< Back
Install
Cancel


Geokon 2.0X.X Setup
Installing
Please wait while Geokon 2.0X.X is being installed.
Registering: C:\Windows\system32\MSSTDFMT.DLL
Registering: C:\Windows\system32\msvbvm60.dll
Registering: C:\Windows\system32\mswinsck.ocx
Registering: C:\Windows\system32\MSSTDFMT.DLL
< Back
Next >
Cancel



Install USB Interface Drivers (for use with IFC200)

The USB interface drivers can be installed when the host computer has USB drivers. After the installation the data logger will communicate with the PC through USB port. The host computer must have USB drivers to install the USB interface drivers.

Select the **Install** button to install USB interface drivers.

View Geokon Read Me, View Geokon Software Manual are documents about Geokon data loggers, software, and more. After installation, the software will be listed under the default Geokon software program group and saved under the default C:\Program Files\Geokon 2.0X.XX\ directory.

Quick Start Guide

For immediate use of the data logger, follow these six simple steps:

1. Install the software (see Software Installation, if help needed with this step).
2. Attach the logger to the host computer using the interface cable, as shown in the Interface Cable Installation below (IFC200).
   Note: The end cap of the Level1000 and Level2000 needs to be unscrewed to access the communication port.
3. From the Communication Menu, select **Auto Configure port**.
4. From the Device Menu, select **Start Device**.
5. Select the **Reading Rate** to be used.
6. Click on **Start Device**.

After a brief pause while the software communicates with the device, the user will see the message **Device Started**. The device is now running and taking measurements. Place it in the elected environment to perform its measurements. When the user is ready to view the measurements, simply connect it to the computer and select **Read Device Data** from the Device Menu.

Interface Cable Installation

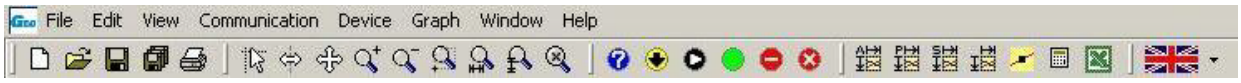
Attaching the Interface Cable
IFC200 interface cable for USB connection.

1. Insert the male connector of the IFC200 interface cable into the female receptacle of the data logger. Insert the female USB connector into the USB.

NOTE: Geokon water level data loggers use IFC200 interface cables. For interface cable and data logger assistance contact Geokon technical support.

Running the Software

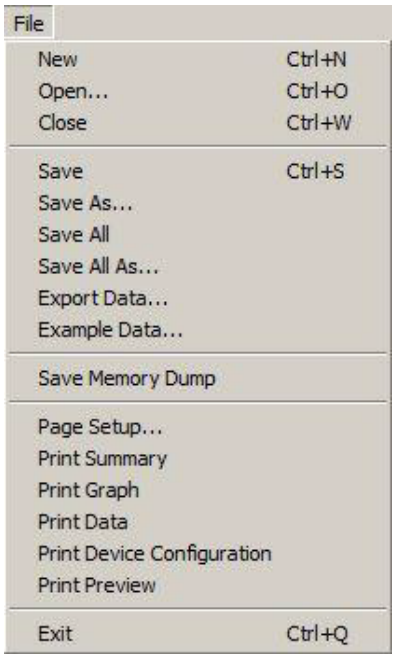
Run the software by selecting the Geokon icon in the Geokon Software program group. The software will open and is immediately ready for starting a device or downloading data. The tool bar and menu items will appear as shown below. All toolbar commands are also menu commands.



NOTE: Throughout this manual, when a menu command has a corresponding toolbar command, the toolbar icon is included with the description of the menu command.

The File Menu

The File Menu will appear as follows:



File Menu: New

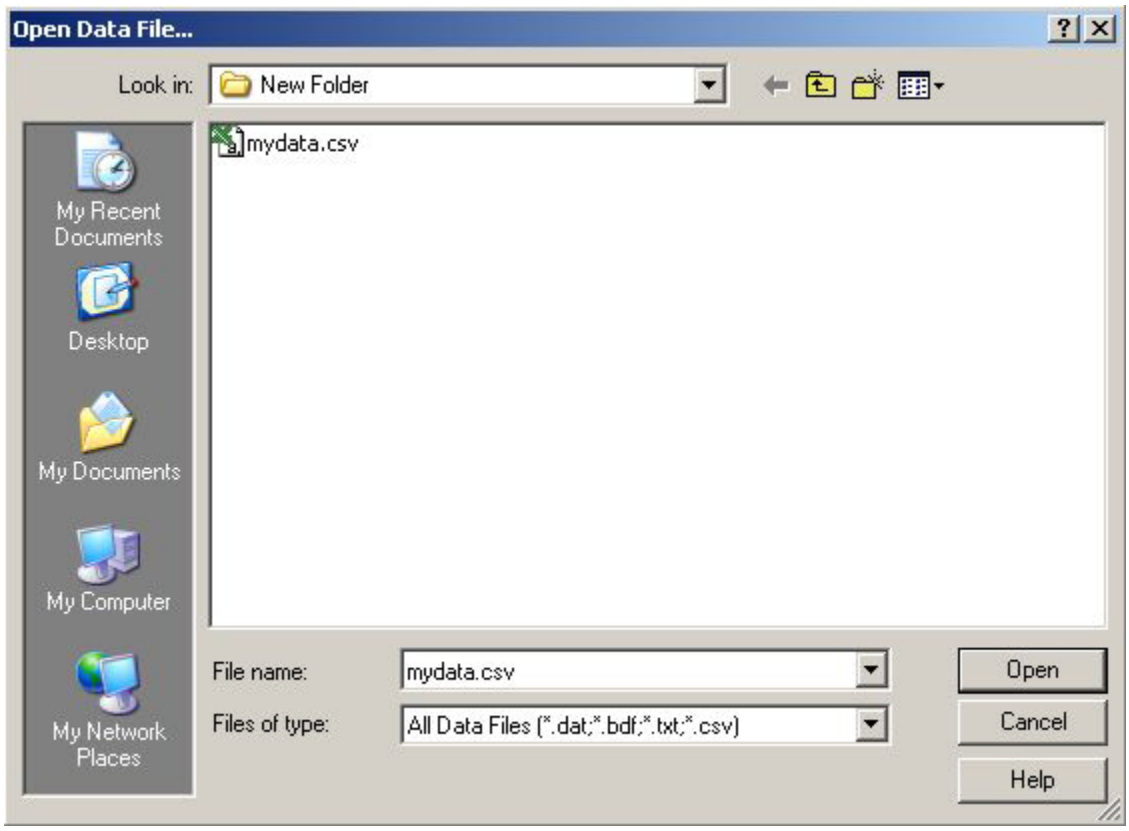
Select this command to create a new graph window. It will not discard any information that is already on the screen or in existing windows. Multiple windows may be created and displayed simultaneously, and may be manipulated using the Window Menu..

File Menu: Open 

Select this command to open previously saved data files, loading them into the current window. If no windows are open, a new one will be created. Data in the current window is not discarded, the new data is added as an additional dataset. Multiple windows may be created and displayed simultaneously, and may be manipulated using the Window Menu.

Open Dialog Box

Select the Open command for the following window:



There are three types of files that may be opened with this software. These file formats are described in Save.

File Menu: Close

This command closes the currently active window. If the data displayed in the window has not been saved, the user will be prompted to save it at this time. This command will not discard data from or close any other existing windows.

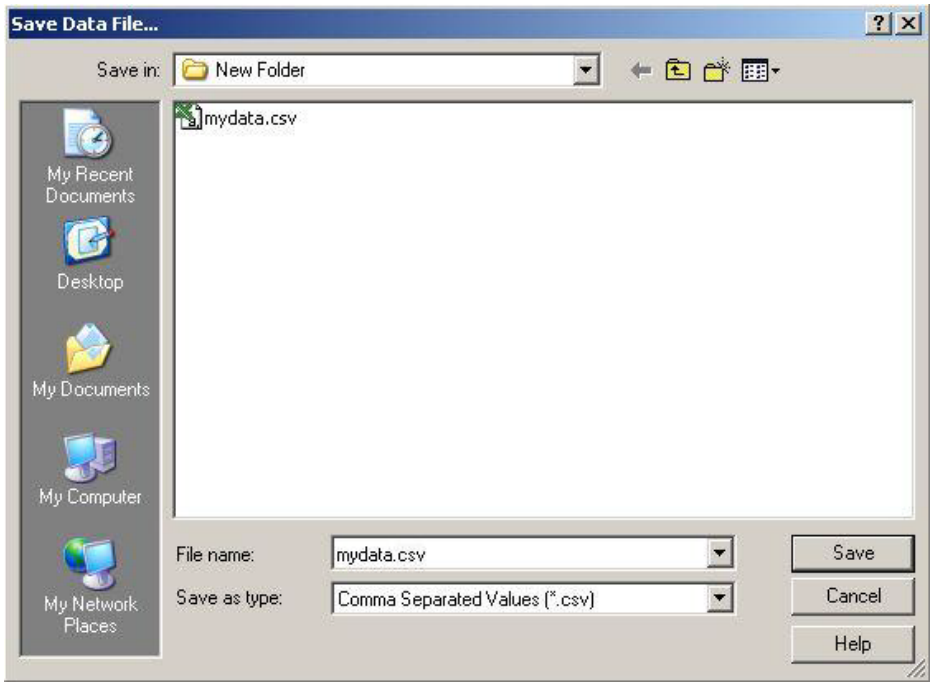
File Menu: Save

File Menu: Save As

Select **Save As** from the **File Menu** to save a copy of data under an alternate name, in any of the three file types discussed on the following page.

File Menu: Save All

Select **Save** or **Save All** from the **File Menu** to display the window as shown below:



Data may be saved as any of three types of files. These files are as follows:

***.dat**
This is our own internal ASCII data format. This format can be viewed by most text editing or word processing software.

***.txt**
Files stored in this format contain tab delimited text and can be viewed by most word processing and spreadsheet programs.

***.csv**
Files stored in this format contain comma separated values and are directly readable by Microsoft Excel. and many other spreadsheet programs.

NOTE: In order to save a dataset, it must be displayed in the Graph or Data tab.
NOTE: To read data in an external program use the Export Data command.

File Menu: Save All As

Select **Save All As** from the **File Menu** to save all copies of datasets under alternate names, in any of the three file types discussed.

NOTE: The user will be prompted to save each individual dataset as a different file. The software does not upload one file as multiple datasets; they are required to be uploaded individually.

File Menu: Export Data

Select **Export Data** from the **File Menu** to export a copy of the data in a format that is designed for easy import into programs such as Excel. . Data can be read in the same units displayed on the screen. The three file types are the same as those provided with the Save command, except data which is specific to the software, such as graph colors, is stripped out. Use Export to open the file in another program.

File Menu: Example Data

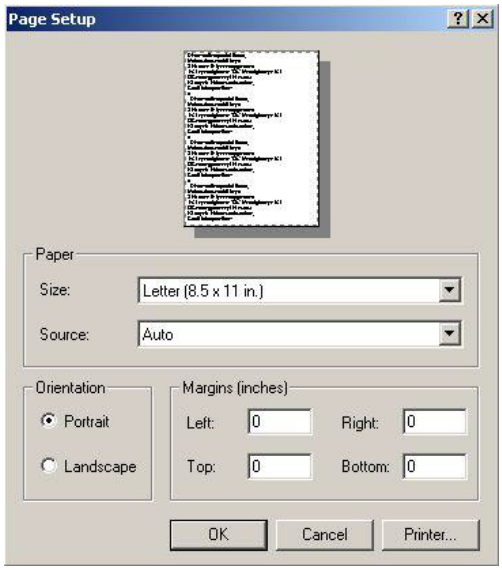
Select the **Example Data** command from the **File Menu** to load and display sample data. Example data can be given for Temperature, Humidity, Pressure, Voltage, Current, Shock, Level, pH, Bridge, and Wireless Series Data Recorders. Simply enter in the name of a data logger and click OK.

File Menu: Save Memory Dump

Select **Save Memory Dump** from the **File Menu** to download the entire memory contents of the attached device and save it in binary format. This command is useful to the factory for troubleshooting problems in the field and recovering data from a malfunctioning device. The user will typically not use this command unless directed to do so by our tech support department.

File Menu: Page Setup

Select **Page Setup** from the **File Menu** to bring up the window below. This window allows the user to select the printer and printing options. The options will vary according to the particular printer and network. Consult the printer manufacturer for details about the printer's options.



File Menu: Print Summary

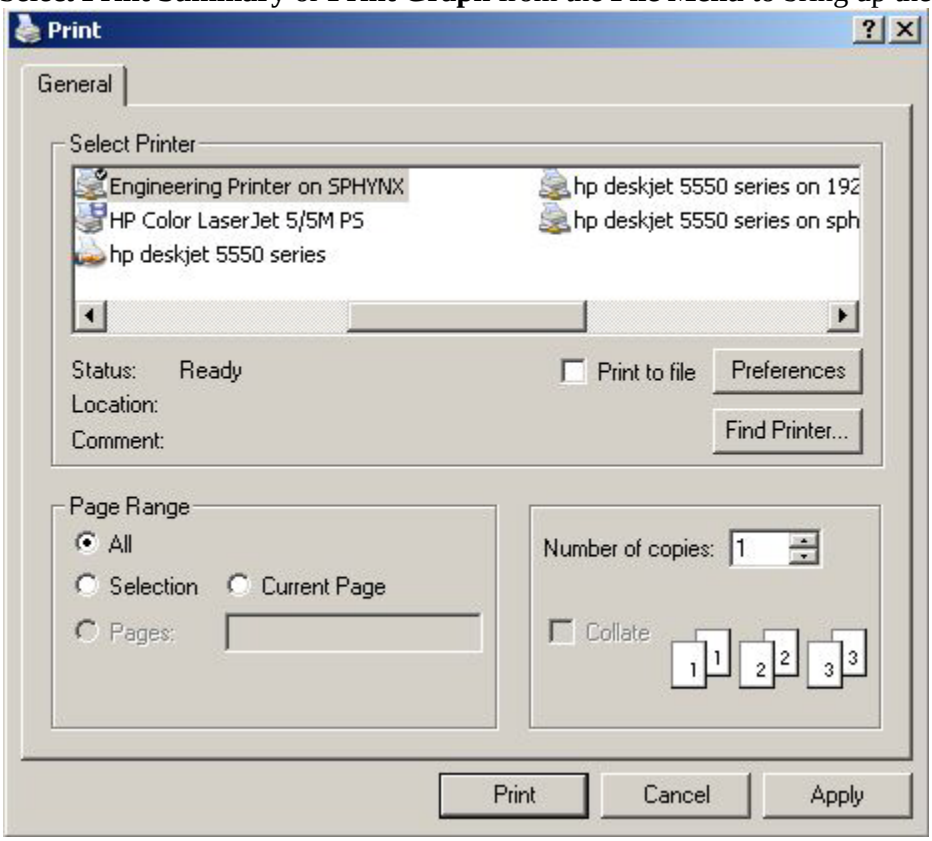
Select **Print Summary** from the **File Menu** to print the statistics for currently selected device.

File Menu: Print Graph

Select **Print Graph** from the **File Menu** to print the currently selected graph to the host printer. The single dataset file can be printed by viewing the Graph tab. Print out the composite graph can be achieved through the Composite Graph tab.

Print Dialog Box

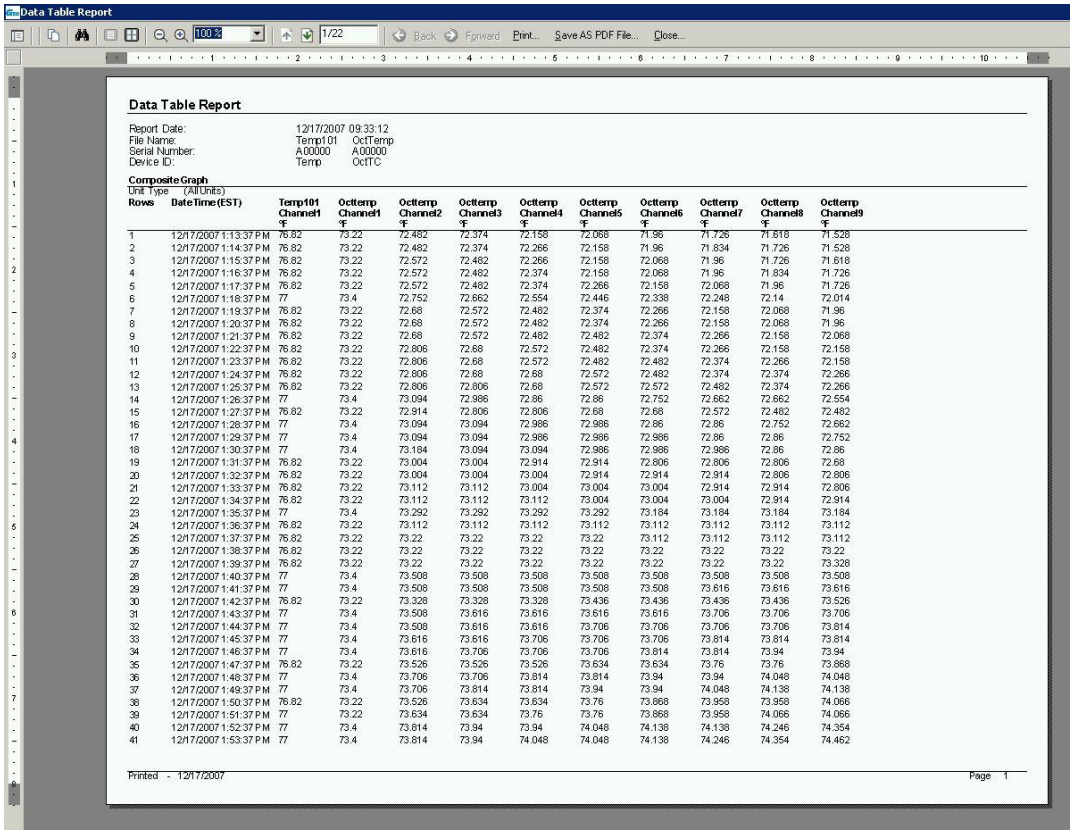
Select **Print Summary** or **Print Graph** from the **File Menu** to bring up the Print Dialog Box:



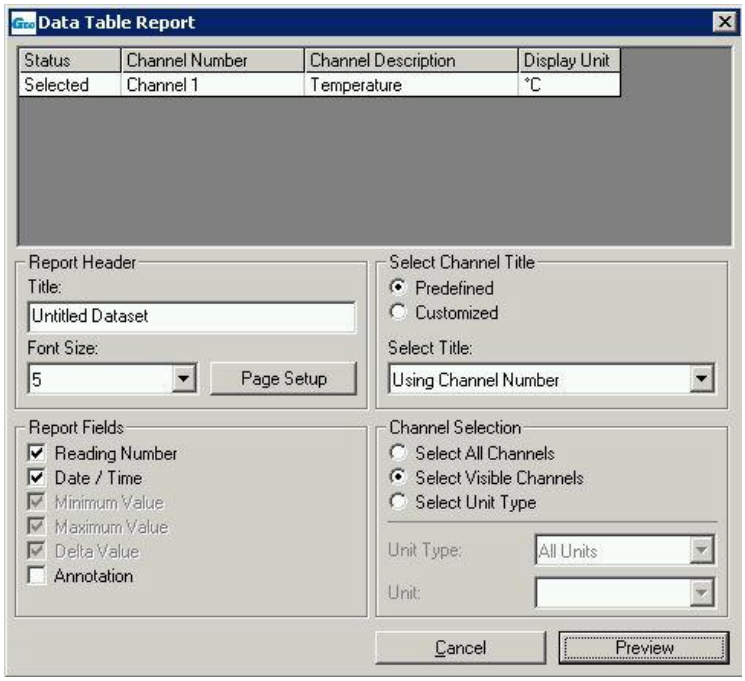
File Menu: Print Data

Select **Print Data** from the **File Menu** to print tabular data. The data table report allows the user to customize their tabular data for general or reporting purposes. The amount of data will vary depending upon the selected datasets and the reading ranges that selected by the user.

Preview Report (See Print Preview)
The window below is the sample of the report preview:



1) Single Graph Data File

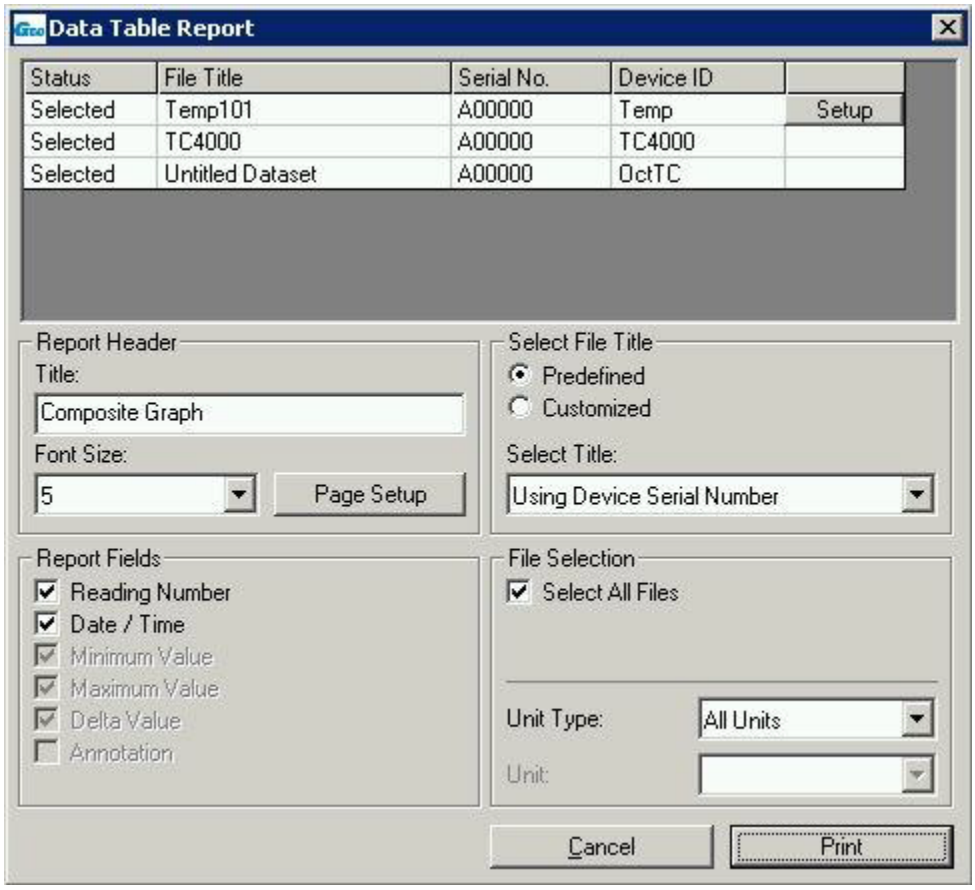


- List View Section (top of the form)

The user can select or unselect the channels by clicking the cell of the Status column

- Report Header Section
  - The user can change the report title
  - The user can change the font size for the report
  - The user can setup report page by clicking Page Setup button (See Page Setup)
- Select Channel Title Section
  - The user can select the channel title by using predefined or customized options
- Report Fields
  - The Minimum, Maximum and Delta are not available for the single graph report
- Channel Selection
  - The user can select which channels to display
  - The Unit type and Unit fields are available if the user selects the Select Unit Type option button
- Preview button
  - Click the Preview button to preview the report of the single graph

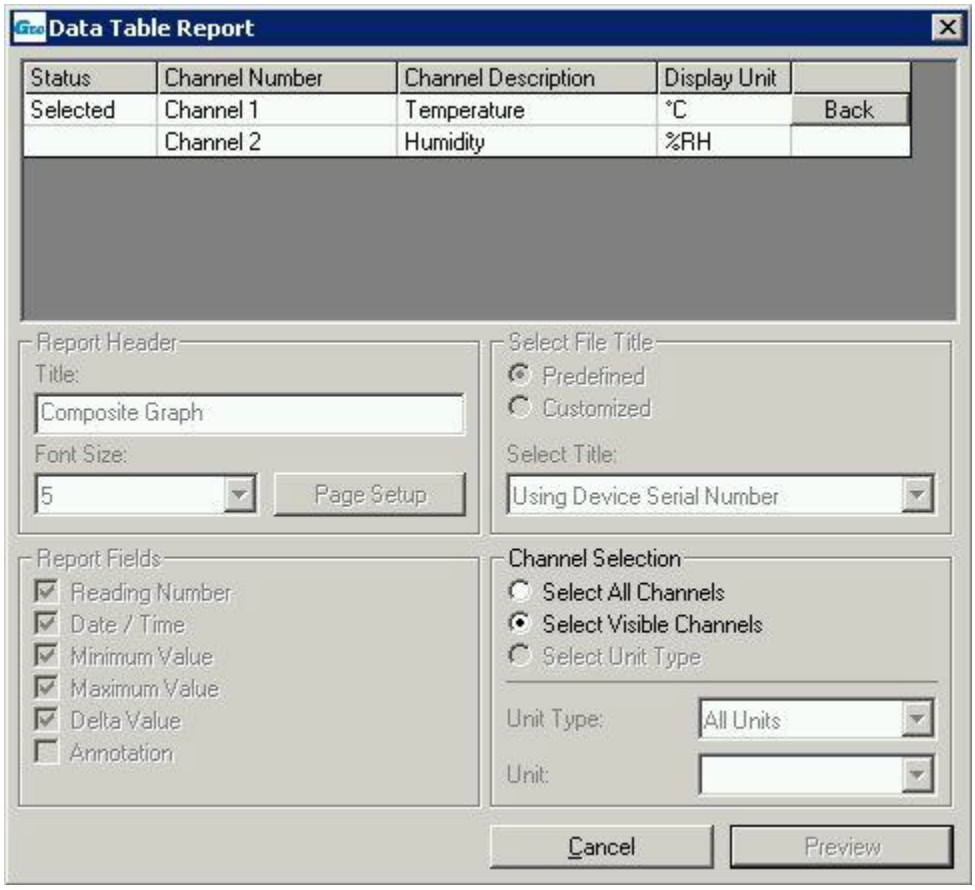
2) Composite Graph Data File



- List View Section (top of the form)

The user can select or unselect the files by clicking the cell of the Status column

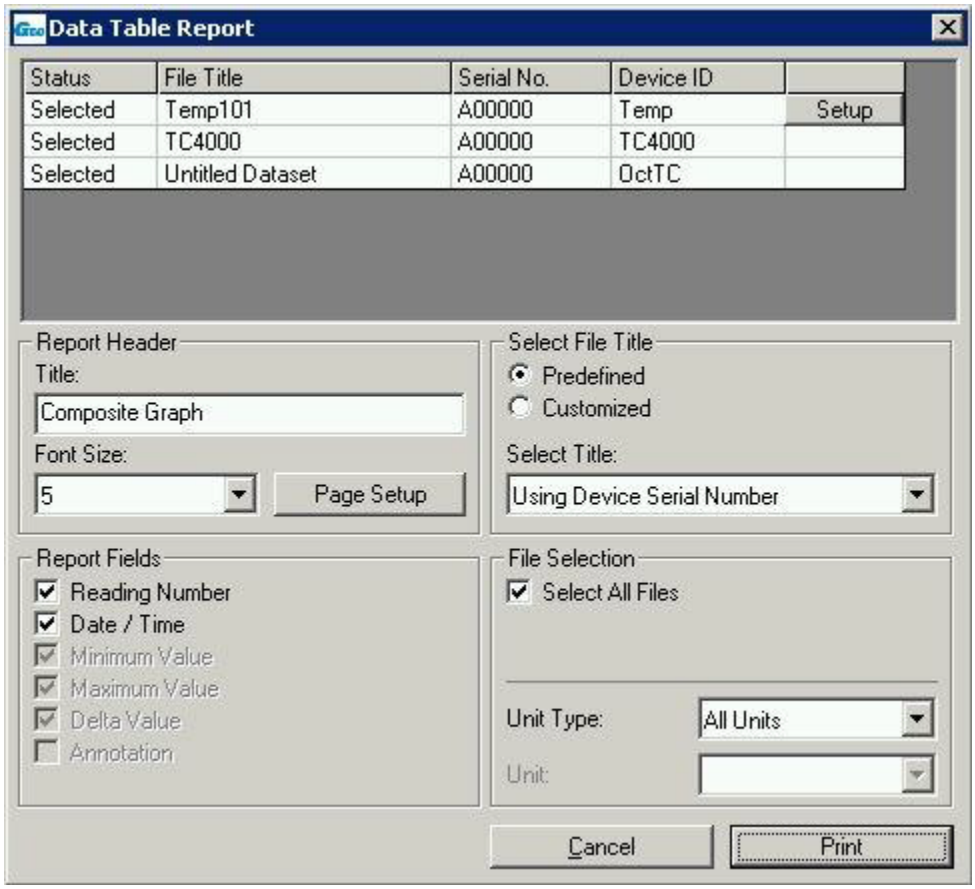
The Setup button will appear if the file is selected
Click the Setup button, the Channel list view appears (the channels list of the file will be displayed with a Back button)



The user can select or unselect the channels by clicking the cell of the Status column
Click the Back button to back to the file list view

- Report Header Section
  - The user can change the report title
  - The user can change the font size for the report
  - The user can setup report page by clicking Page Setup button
- Select File Title Section
  - The user can select the file title by using predefined or customized options
- File Selection
  - The user can use the 'Select All Files' check box to select all files
  - The unit field is available if the user selects a specific unit type from the Unit Type field.
- Report Fields
  - The Minimum, Maximum and Delta are not available if the All Units is selected as the Unit Type
- Preview button
  - Click the Preview button to preview the report of the composite graph

Print Report
1) Print the report without the preview (uncheck the **Print Preview** option of **File** menu)
Click 'Print Data' the form 'Data Table Report' appears as below.
Click the Print button and the Print dialog box appears.



2) Print the report from the preview
Click the Print button on the tool bar of the report preview window.

File Menu: Print Device Configuration

Select **Print Device Configuration** from the **File Menu** to print information that relates to the dataset file currently displayed on the screen.

NOTE: The message **unable to print device configuration** will inform the user if there is no dataset file open.

File Menu: Print Preview

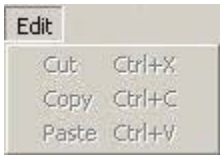
Select **Print Preview** from the **File Menu** to place a check mark next to it. When this menu item is checked, the result of Print Graph, Print Data, Print Summary and Print Device Configuration will display on the screen, rather than on the host printer. This allows a preview of the data to be printed. To uncheck this menu item select **Print Preview** again.

File Menu: Exit

Select **Exit** from the **File Menu** to close all open files and exit the program. There will be a prompt to save all files that have been changed.

The Edit Menu

The Edit Menu will appear as follows:

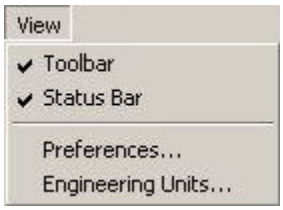


Edit Menu: Cut, Copy & Paste

The **Edit Menu** toolbar is currently disabled.
The Cut, Copy and Paste functions are not available for use.

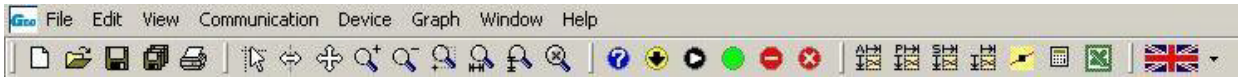
The View Menu

The **View Menu** will appear as follows:



View Menu: Toolbar

The **Toolbar** option is used to show or hide the toolbar located at the top of the screen. Hiding the toolbar allows more room for the graph being displayed.

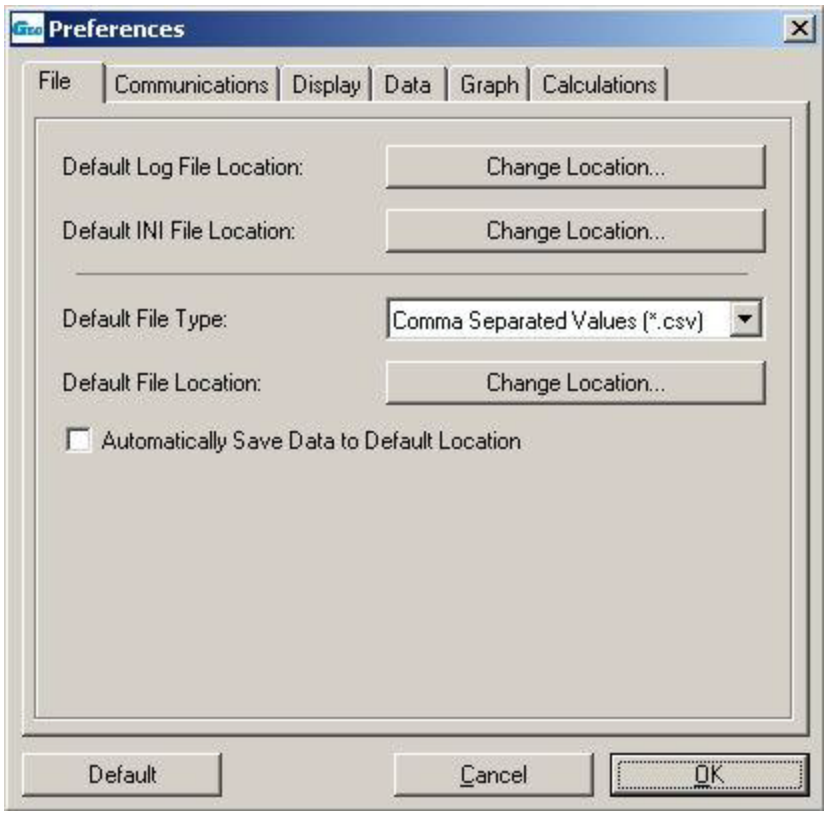


View Menu: Status Bar

The **Status Bar** option is used to show or hide the status bar located at the bottom of the screen. Hiding the status bar allows more room for the graph being displayed.

View Menu: Preferences

Select **Preferences** to display the window shown below.
The following six tabs are found in this window: File, Communications, Display, Data, Graph, and Calculations. Each tab creates the ability to set preferences for a part of the program.



File Tab

Select the **File** tab from **Preferences Form**, to set the default file locations.

Default Log File Location

The **Default Log File Location** from the **Preferences Form** refers to the log files that are created while the software is running. Not all data loggers create a log file. The software appends a log file for each wireless transmitter when it receives a transmission. Through this option the user can change the default location where the log files are saved.

Default INI File Location

Select the **Default INI File Location** from the **Preferences Form** to refer to the initial settings the software will apply when it starts up. For those without read/write privileges, the INI File Location can be changed to a public folder for multiple users.

Default Data File Type

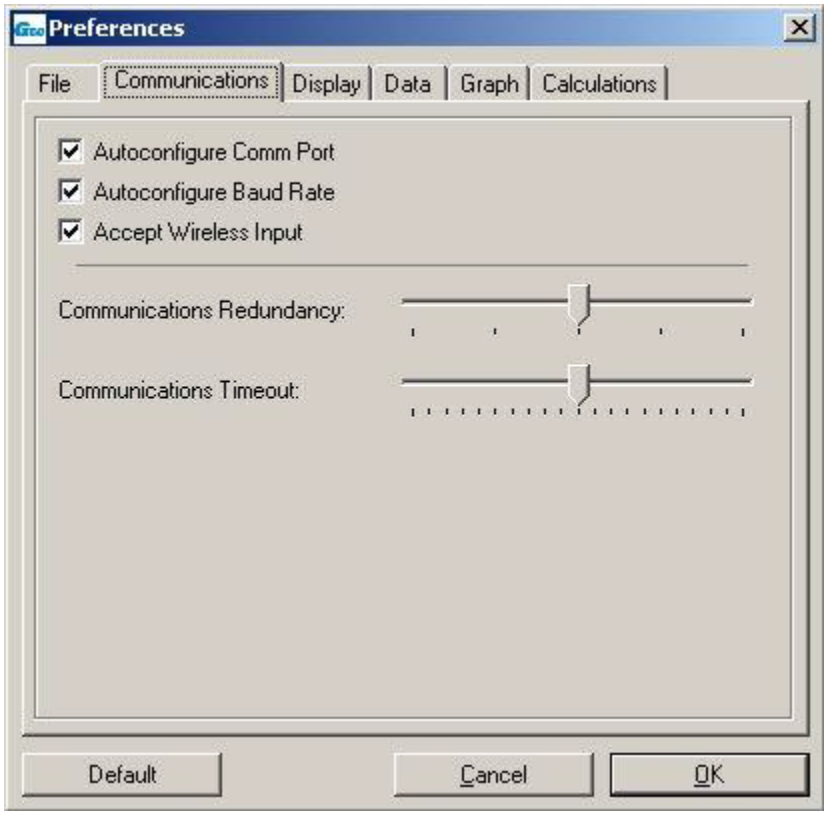
Select the **Default File Type** to choose from the list of file types in the drop down menu . The type can be changed when the file is saved, it is simply convenience setting. When checked, the data will be automatically be saved to the default file location that was selected in the file tab.
NOTE: This is limited to the data that was downloaded from the device to the computer (see Read Device Data).

Default Data File Location

Select the **Default Data File Location** from the **Preferences Form** to refer to the folder that the datasets are saved to. When the user Saves a file, the chosen directory will be the default save location. This can be changed when the user saves the file, it's simply a convenience setting.

Communications Tab

This tab sets various Communications preferences.



Autoconfigure Comm Port

Check this option to automatically configure the correct COM port in use to the host computer's . Leave this item checked unless the software is having trouble identifying the host computer's COM port (this happens rarely, usually only on older PCs). If this item is unchecked, the user must configure the Comm settings manually. See Select Comm Port.

Autoconfigure Baud Rate

Check this option to automatically configure the correct communications speed. Leave this item checked unless the software is having trouble identifying the host computer's COM port (this happens rarely, usually only on older PCs). If this item is unchecked, the baud rate must be configured manually. See Select Baud Rate.

Accept Wireless Input

Check this option to accept real time readings from the RF series of data loggers. To accept these readings the computer must have an RFC101A interface cable connected to an available COM port and the wireless RF logger or extender radios must be enabled to transmit.

Communications Redundancy

This refers to the number of times the PC will try to communicate with the logger. Setting the tab closer to the left will decrease the number of times it will try to communicate and setting the tab further to the right will increase the number of times it will try to communicate with the logger.

Communications Timeout

This refers to the length of time the PC will wait for the response from the data logger. Setting the tab closer to the left will decrease the amount of time the PC waits for a response, while setting the tab further to the right will increase the length of time the PC will wait. This setting is used when the user is has a device that takes a longer time to respond to the PC.

Display Tab

The **Display Preferences Tab** sets display time and language settings.

Use 24 Hour Time Format

Check this box to use a 24-hour format. Leave it unchecked to use a 12-hour format.

Use UTC Standard Time

Check this box to use Universal Coordinated Time (UTC). Formerly known as Greenwich Mean Time (GMT).

Use UTC Abbreviation Time

Check this box to display the time zone that is relative to UTC time. If both the **Use UTC Standard Time** box and **Use UTC Abbreviation Time** box are unchecked then the system time of the PC will be displayed.

Select Display Language

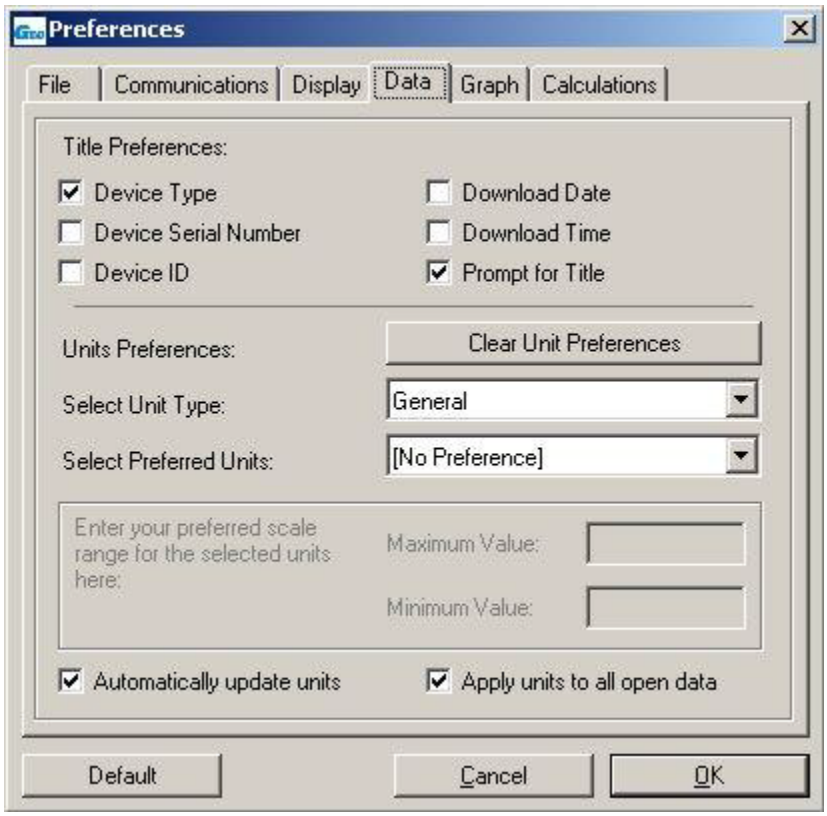
Choose the language to be displayed on the software from the language drop down list. The software toolbar command also offers the language choice.

Automatically Select Language

Check the **Automatically Select Language** box to choose the restarted software language as the computer system language and ignore the selected language. Unchecked the restarted software language is always the selected language.

Data Tab

The **Data Preferences** tab can set various data preferences.



Title Preferences

The **Title Preferences** settings determine which items appear in the Title of the dataset. If all boxes are unchecked **untitled dataset** will appear as their title name. The Device Type, Device Serial Number, Device ID, Download Date, and Download Time can be selected or unselected. Check the **Prompt for Title** box to prompt for a title each time, rather than generating its own title. These features must be enabled prior to downloading the data for them to apply.

Units Preferences

The **Units Preferences** settings determine the units used for the various types of measurements. In **Select Unit Type**, select the type of measurement from the dropdown list, then **Select Preferred Units** to use from the second dropdown list. The high point and low point range can be defined on the graph. This defines the **Preferred Scale**. See Set Graph to Preferred Scale.

Clear Unit Preferences

Select the **Clear Unit Preferences** button to set all unit preferences to the [No Preference] setting.

Automatically update units

Check the **Automatically update units** option to allow preferred units to change when the corresponding units are changed on the screen.

Apply units to all open data

Check the **Apply units to all open data** option to trigger all corresponding units to change datasets on the screen. From this tab the graph preferences can be selected.

Graph Tab

In the **Graph Preferences** tab the graph preferences can be selected.

Autoscale Graph

Check the **Autoscale Graph** option to automatically optimize the vertical scale of the graph to match the minimum and maximum data points shown on the graph. This provides maximum resolution for viewing the graph.

NOTE: The Composite Graph will have the Autoscale Graph option applied if there are multiple datasets that have the Autoscale Graph option applied and un- applied.

Smart Autoscale

Check the **Smart Autoscale** option to round the vertical and horizontal scales to a tenth of a decimal point providing a slightly wider scaled range. If the option is off then the horizontal and vertical scales will be rounded to the thousandth.

NOTE: The Composite Graph will have the Smart Autoscale option applied if there are multiple datasets that have the Smart Autoscale option applied and un- applied.

Buffer Vertical Scale

Check **Buffer Vertical Scale** option to add an extra 10 measurements to the beginning and end ranges of the vertical scale, making the plotted lines more centered in the graph.

Autoscale on Zoom

Check **Autoscale on Zoom** option to automatically scale the graph when zooming in using the horizontal zoom tool only.

Synchronize Time

Check **Synchronized Time** option to view multiple graphs which only affects the composite graph tab. When checked, multiple datasets will be shown over a scaled period of time through the composite graph. When unchecked the multiple datasets will instead overlap each other and the time shown is directly related to which graph the cursor has selected.

Synchronize Vertical Scale

Check **Synchronize Vertical Scale** option to view multiple graphs which only affects the composite graph tab. When checked multiple datasets are shown with scaled vertical ranges, meaning each parameter (temperature, humidity, etc.) will have one default set range for each parameter. When the option is unchecked each plotted graph will have its own individual scaled vertical range.

Annotate Data

Check **Annotate Data** option to permit all annotations be viewed on the computer screen, this option is beneficial when printing the annotations. When this option in unchecked, the data can still be annotated, yet it is not visible on the screen unless that data point has been clicked, whereas the annotation appears in the top left hand corner of the graph.

Animate Graph

Check the **Animate Graph** option to create blinking maximum and minimum alarm setting lines on the screen.

Calculations Tab

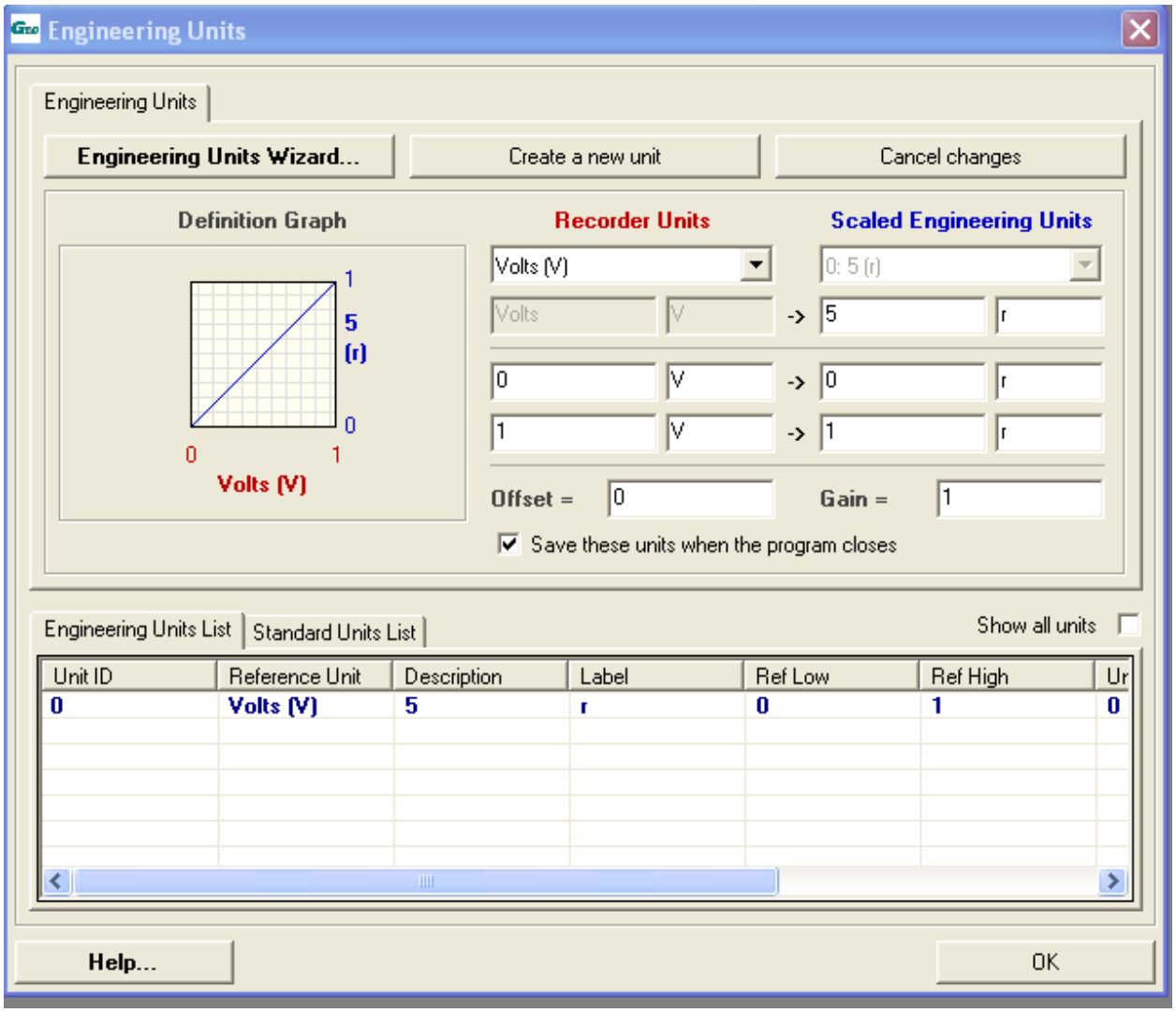
In Calculations Preferences tab various calculations preferences can be set.

View Menu: Engineering Units (Software level)

This is a Geokon software feature which allows the customization of engineering units. These units are software level units (saved in the software specific to user's PC not the device) and their functions are the same as non-customized units.

NOTE: There are two types of engineering unit levels (software and device). The user can manipulate the software level engineering units whenever the software is on, but the device level is only available to edit when the connected device has engineering units attribute.

Select **Engineering Units** from the View Menu to display the following window:



Create **Engineering Units** by using the **Engineering Units Wizard** button or **Create a new unit** button on bar below.

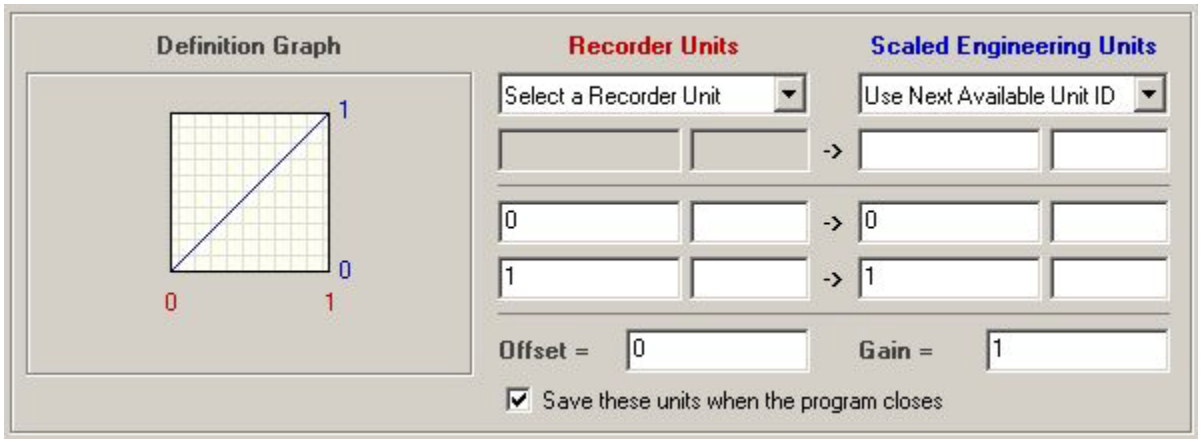
Engineering Units Wizard

Select the **Engineering Units Wizard** button to bring up the Engineering Units Wizard window in the following screen.

The wizard will calculate the engineering unit based on the input.

Edit Engineering Units

If the box below is enabled the engineering units can be edited directly. Otherwise, choose the **Create a new unit** button or highlight a record from the Engineering Units List to enable this part first.



Definition Graphs

The **Definition Graph** compares Recorder Units and Scaled Engineering Units when data is input for the engineering units.

Recorder Units

Select a Recorder Unit must be selected, then input the low/high reference values. When no specific unit is displayed the **Select a Recorder Unit** dropdown list (Fig. 1) will contain all available units, otherwise, it will only contain the unit that relates to the displayed unit (Fig. 2) as shown below.

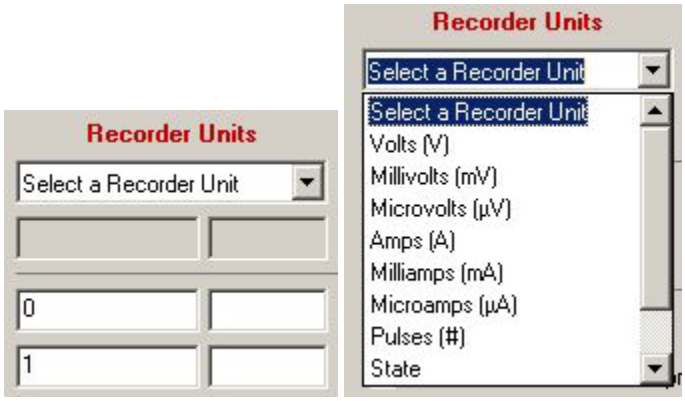


Fig.1

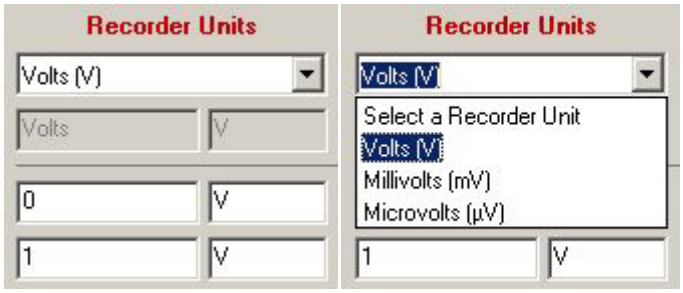


Fig.2

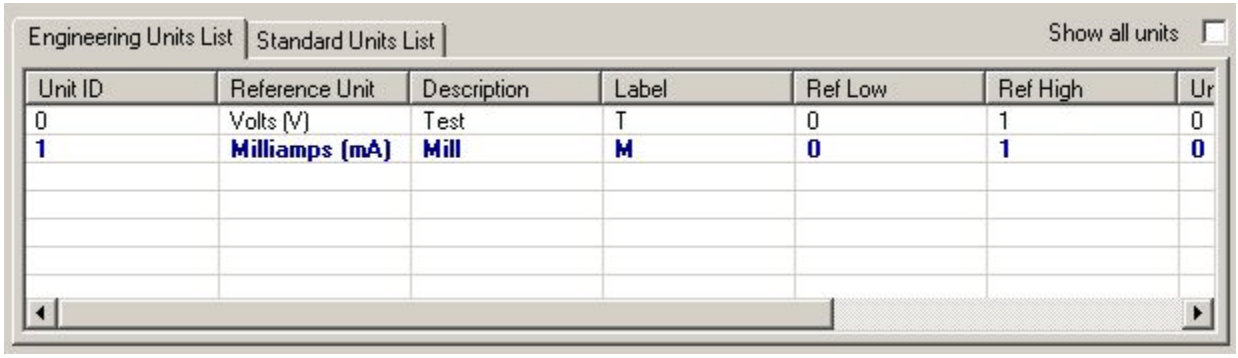
Scaled Engineering Units

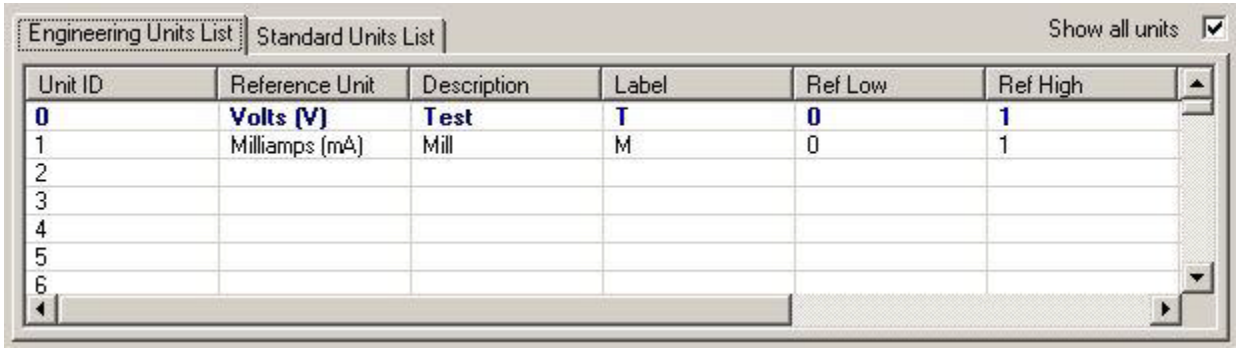
The **Scaled Engineering Units**, screen shot of Edit Engineering Units, requests the description, label, and low/high unit values of the engineering unit. The description field allows the full name of the parameter to be displayed in the software. Examples of this are Volts, Milliamps, pH, Gallons, etc. This name is displayed on the graph and data table as the description of the data. The label field allows the label of the parameter to be displayed in the software. Examples are V, mA, pH, G, etc. The gain and offset fields are the equivalent of the "m" and the "b" respectively in the "Y = m * X + b" equation. X is the raw data from the device and Y is the data displayed by the software. Choose the **Scaled Engineering Units** dropdown list to select the unit ID. If **Use Next Available Unit ID** is set as the default, the software will assign the next available unit ID to the created unit.

If the checkbox **Save these units when program closes**, screen shot bottom of Edit Engineering Units, is checked when the program closes, the created unit will be saved in the software after the software is closed. Otherwise, the created unit will be lost after the software closes.

Engineering Units List

The **Engineering Units List** tab will display all the customized engineering units. To Edit a record highlight it. The information will be displayed in the Edit Engineering Unit's Recorder Units section.

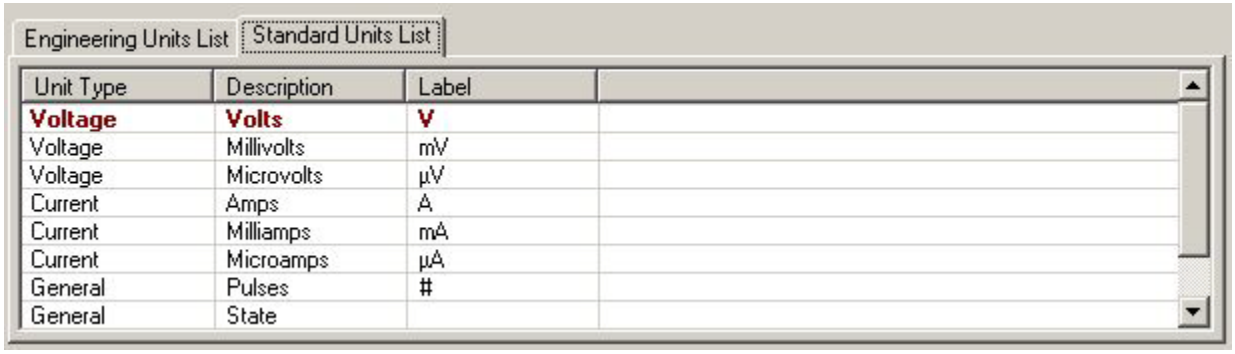




NOTE: The **Show all units** checkbox defines the status of both **Engineering Units List** tab and **Use Next Available Unit ID** dropdown list box. If checked, all available unit ID's will be displayed on both fields. The unit ID range is 0-255.

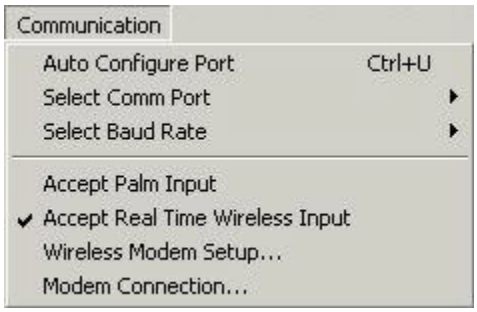
Standard Units List

The **Standard Units List** tab will display all the available unit type(s) that can be used to make customized engineering units.



The Communication Menu

The Communication Menu displayed below:



Communication Menu: Auto Configure Port

Select **Auto Configure Port** from the **Communication Menu** to automatically indicate which COM/USB port the device is attached and which baud rate the device uses to communicate. This command operates only when an interface cable is connected to an available COM/USB port and a functioning data logger. **If this command fails to find the device, then the device is not functioning properly or the interface cable is not properly connected**. Once the software has identified the COM/USB port and the proper baud rate, the information will be stored in the configuration file. This command only needs to be activated once. If a different COM/USB port is later used, or if a device with a different baud rate is used, then re-select the command.

Communication Menu: Select Comm Port

Select the **Comm Port** to manually set/choose the communication/USB port in which to connect the data logger. The correct COM/USB port must be selected, or the software will not to communicate with the data logger. To automatically configure this option, refer to Auto Configure Port.

Communication Menu: Select Baud Rate

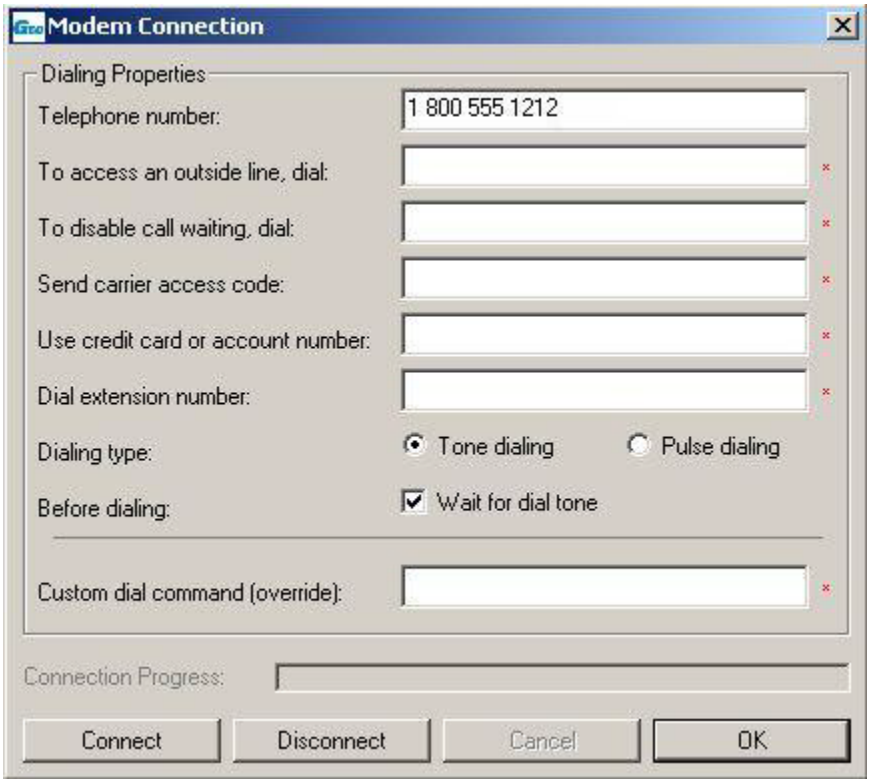
Select the **Baud Rate** from the **Communication Menu** to manually set the speed to use to communicate with the data logger. The correct baud rate must be selected, to allow the software to communicate with the data logger. To automatically configure this option, refer to Auto Configure Port.

Communication Menu: Accept Real Time Wireless Input

Geokon's Level Loggers does not have wireless communication capabilities.

Communication Menu: Modem Connection

Select **Modem Connection** from the **Communication Menu**, to the following window:



Enter the telephone number (required) and other modem settings (not required, marked by red asterisk) in this screen. The software will read data from a remote device equipped for modem data transfer, not all data loggers are capable of remote operation.

Connect Button

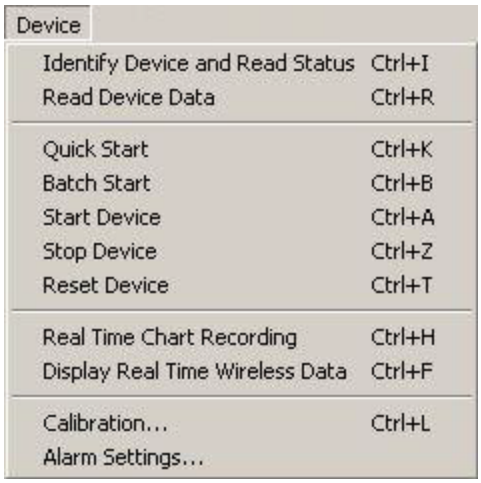
Select the **Connect** button to connect to the remote station.

Disconnect Button

Select the **Disconnect** button to disconnect from remote station.

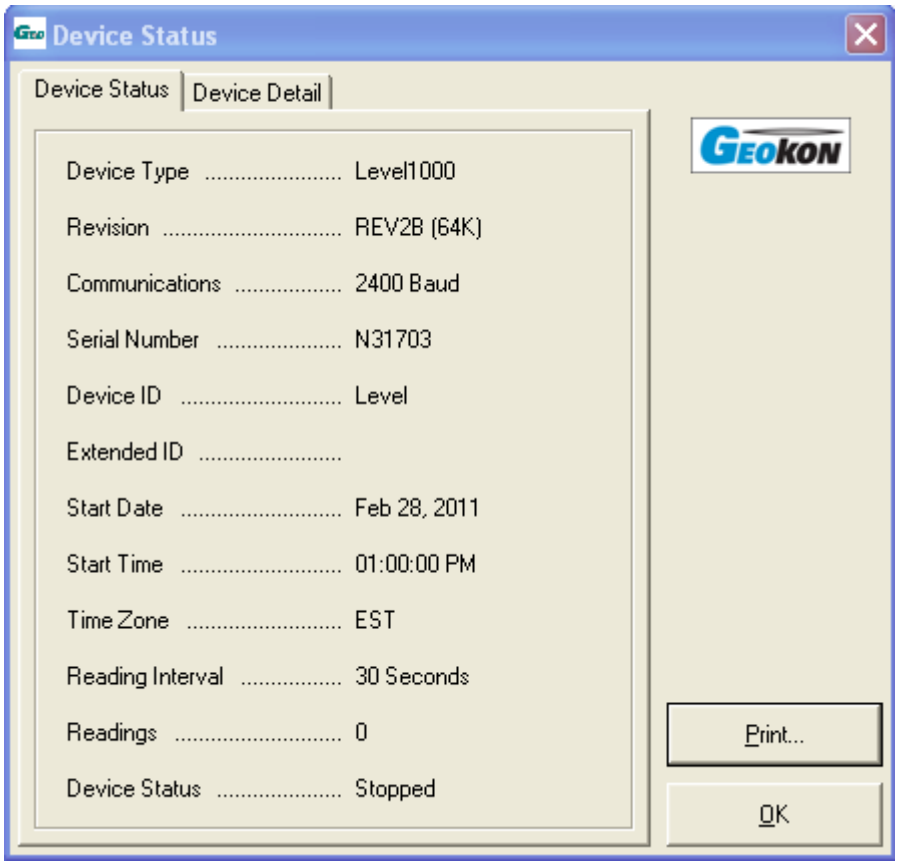
The Device Menu

The Device Menu will appear as shown:



Device Menu: Identify Device and Read Status

Select **Identify Device and Read Status** from the **Device Menu** to allow software to communicate with the attached data logger and display a window similar to this one:



Device Status Tab

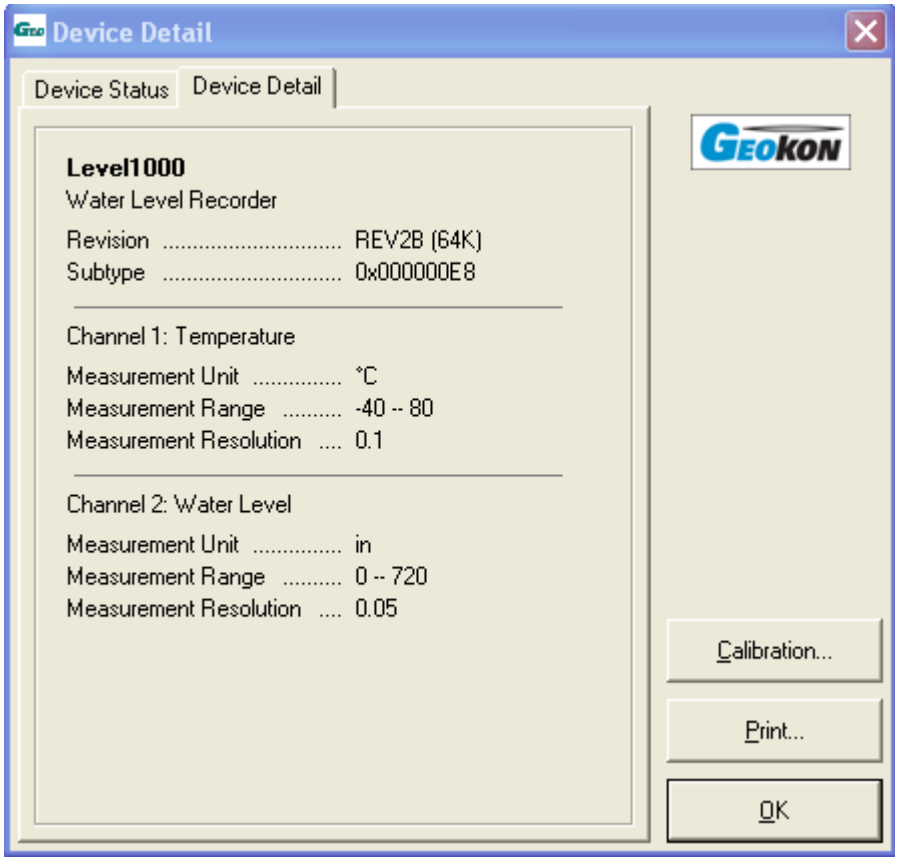
The **Device Status** tab displays the device type, revision number, serial number, Extender (user) ID, and operating parameters of the particular device in the Device Status dialog box. The serial number is set at the factory and cannot be changed by the software. The user ID can be selected when starting the device. This command will also verify that the software is able to communicate with the device and that the correct COM/USB port has been selected. If the device does not communicate, verify the following:

1. Are the COM port and baud rate correct?
2. Is there another device using the selected COM port, such as a modem?
3. Is the device's battery dead?
4. Is the IFC200 cable connected to the correct COM port?

In addition, this command will read and indicate the current status and all pertinent information of the device that is connected. This provides a quick method for determining the current state or status of a particular device.

Device Detail Tab

The **Device Detail** tab displays the details of the device. An example of a Level1000 data logger is seen in the screen below:



The details include device type (device name as heading), revision number, subtype, and channel information. Information about Engineering Units, Wrap Around, and Calibration will be displayed when the device supports these features.

NOTE: When these features exist, a corresponding button will be displayed on the lower right side of the screen. A Calibration button is displayed in the example on the screen above.
The following details are described as follows:

Password

Not used with Geokon's Level Logger 1000 or 2000.

Alarm Settings

Not used with Geokon's Level Logger 1000 or 2000.

Engineering Units

Select **Engineering Units** to display an engineering unit screen to permit the type of units to be displayed on the graph to be defined (see Engineering Units for full operating instructions).

Calibration

Select **Calibration** to display a calibration screen to permit the device to be calibrated (see Calibration for full operating instructions).

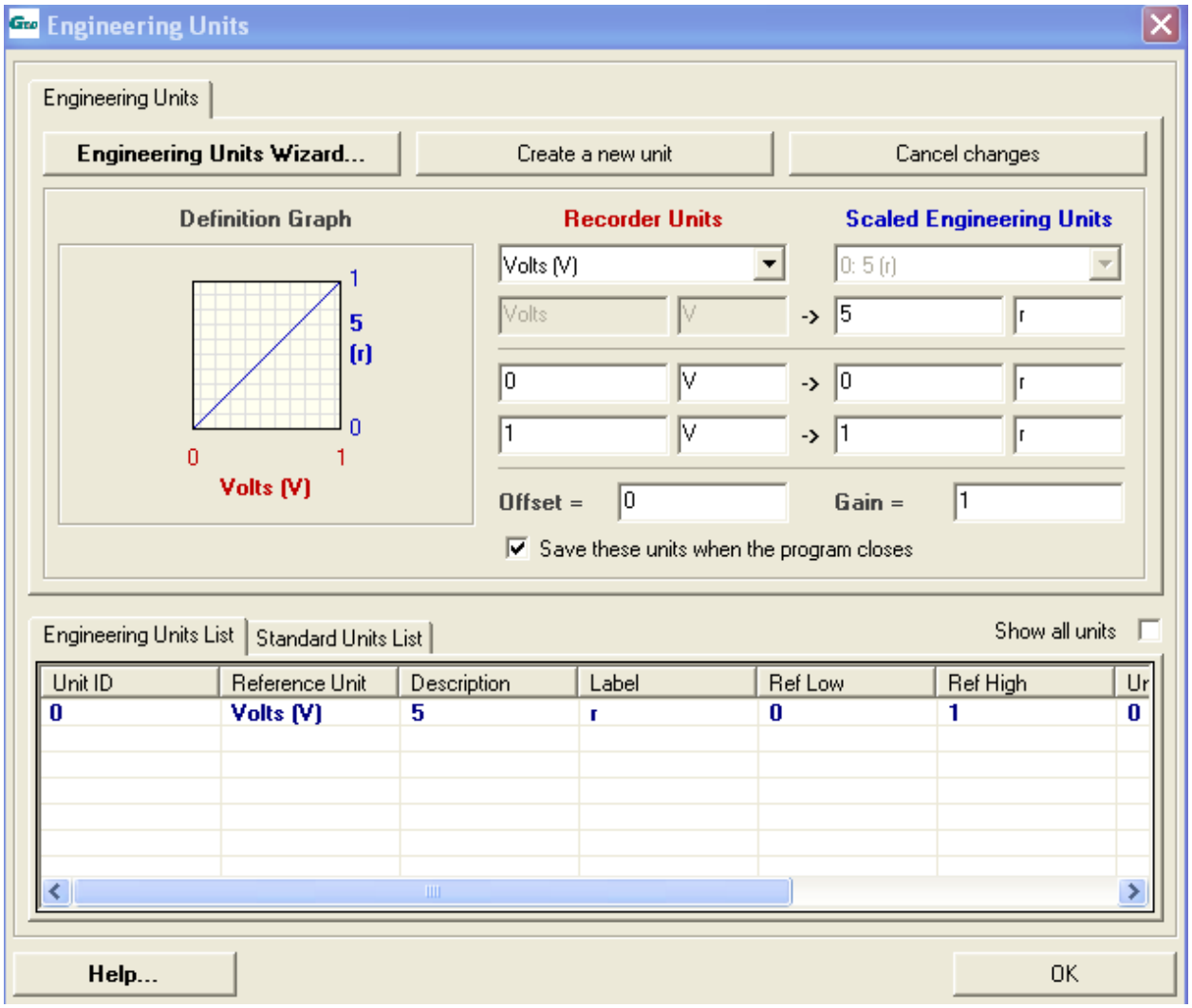
Device Password

Not used with Geokon's Level Logger 1000 or 2000.

Engineering Units (Device/Software level)

The **Engineering Units** command is only available when a data recorder with this feature is connected to the host computer. Multiple engineering units can then be defined into multi-channel recorders.

NOTE: If the **software level engineering units** does not have the record of device engineering unit, a new software level record of device engineering unit with an unique unit ID will be created when Identify Device and Read Status are performed.



Enable Engineering Units

The **Enable engineering units on this device** option indicates if the units programmed into the device should be displayed when data is downloaded.

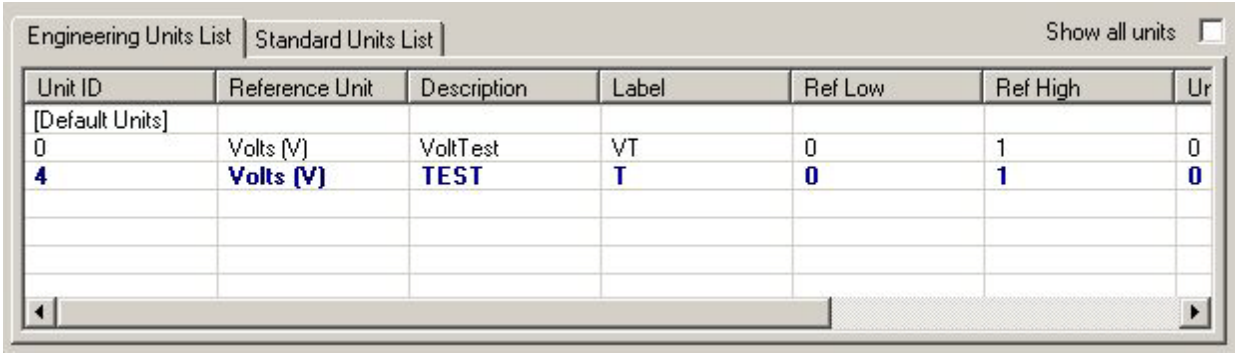
Prompt for unit selections on download

The **Prompt for unit selections on download** option allows the stored information to be edited each time the data is uploaded.

The label field is used to enter the label of the parameter that is to be displayed in the software. Examples are V, mA, pH, G, etc. The gain and offset fields are the equivalent of the "m" and the "b" respectively in the "Y = m * X + b" equation. X is the raw data from the device and Y is the data displayed by the software.

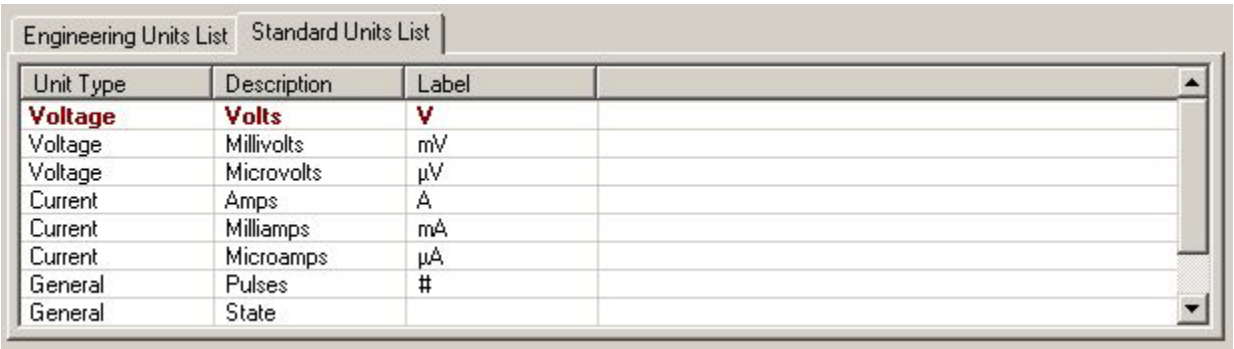
Engineering Units List

The function of the **Show all units checkbox** is described in Software Level Engineering Units List, see Engineering Units (software level).



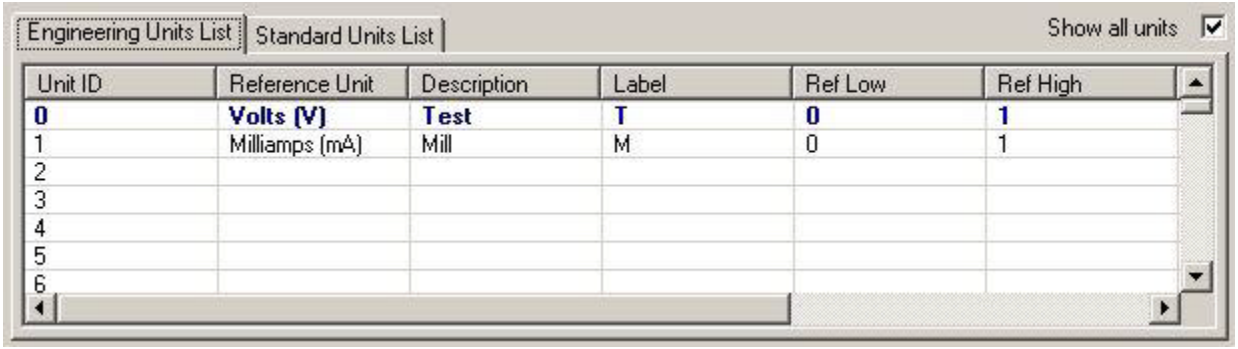
Standard Units List

The **Standard Units List** tab will display all the available unit types that can be used to make customized engineering units.



2. Engineering Units

The **Engineering Units** tab will be the same as Engineering Units Software level.



NOTE: The **Device Units** and **Engineering Units** tabs will be opposed so they cannot be edited at same time.

Device Menu: Read Device Data

To download the data from the device to the computer, select **Read Device Data** from the **Device Menu**. This command automatically downloads all the stored data from the device and displays it in both graphical and tabular format. The standard Temp101 will download data at approximately 120 readings per second. A progress bar located near the bottom of the screen gives a visual indication of how long the download will take.

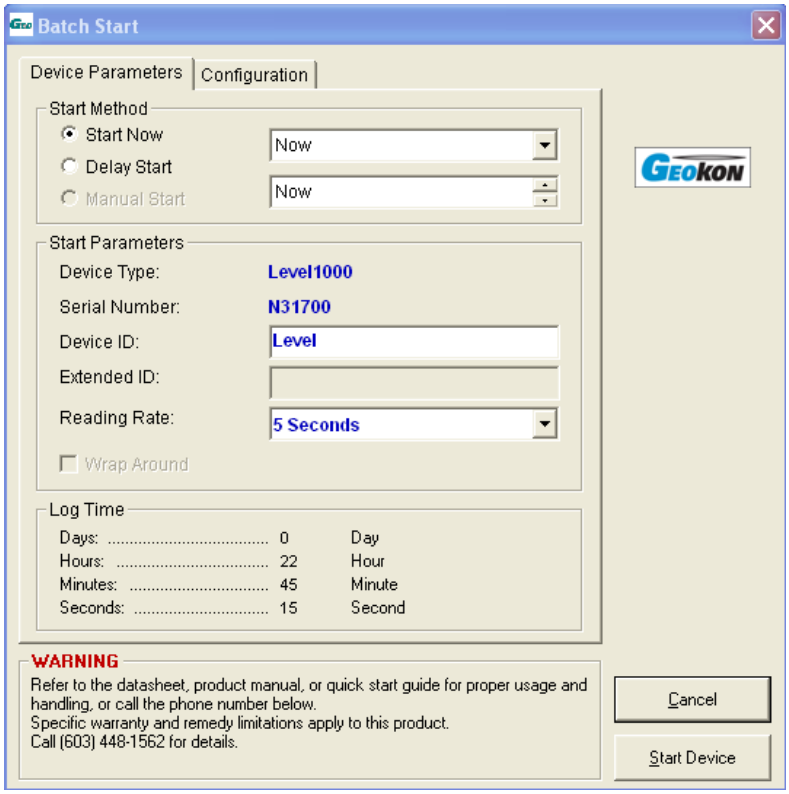
NOTE: The data logger continues to record after the data has been downloaded. Use Stop Device to stop the data logger from taking readings.

Device Menu: Quick Start

Select **Quick Start** from the **Device Menu** to start the device without asking for any settings. It will use the previously set user ID and reading rate. This is useful for saving time, especially when programming multiple devices with the same parameters.

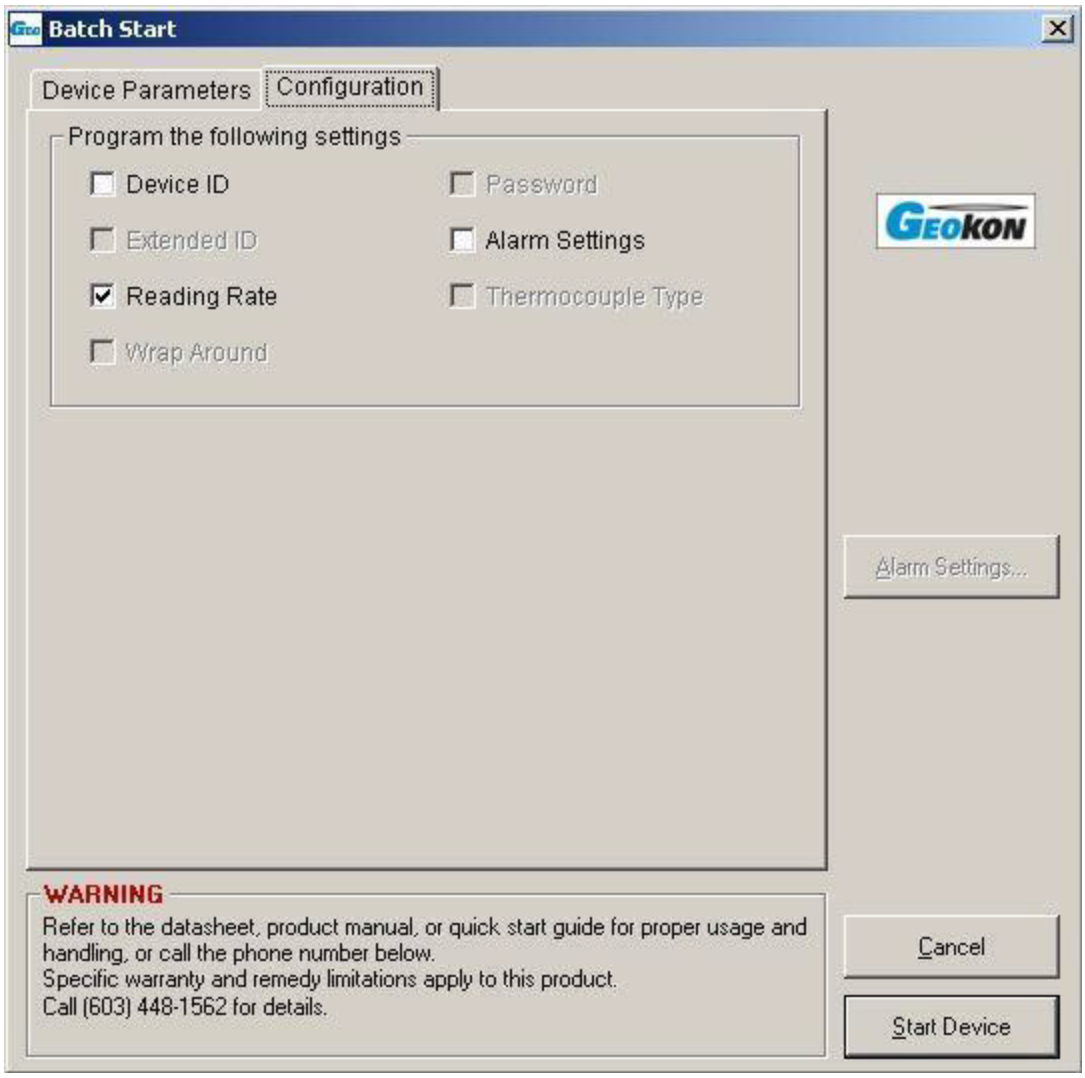
Device Menu: Batch Start

Select **Batch Start** from the **Device Menu** to display the following window:



Device Parameters Tab

The **Device Parameters** tab has similar functions as Start Device. The availability of Device ID field, Extended ID field, Reading Rate, and Wrap Around field (option available depending on device) depends on the selections in the Configuration tab. If the device has the alarm setting feature then a corresponding button will be displayed on the screen. An Alarm Settings button is displayed on the screen above.



Configuration Tab

The **Configuration** tab has five selectable parameters; **Device ID, Extended ID, Reading Rate , Wrap Around**, and **Alarm Settings** options. The availability of these fields depends on the features the device supports.

Device ID

Check the **Device ID** box to give the device up to a 6-character name in the **Device Parameters** tab.

Extended ID

Check the **Extended ID** box to give the device an additional 16-character name in the **Device Parameters** tab. Not used with Geokon's Level Logger 1000 or 2000.

Reading Rate

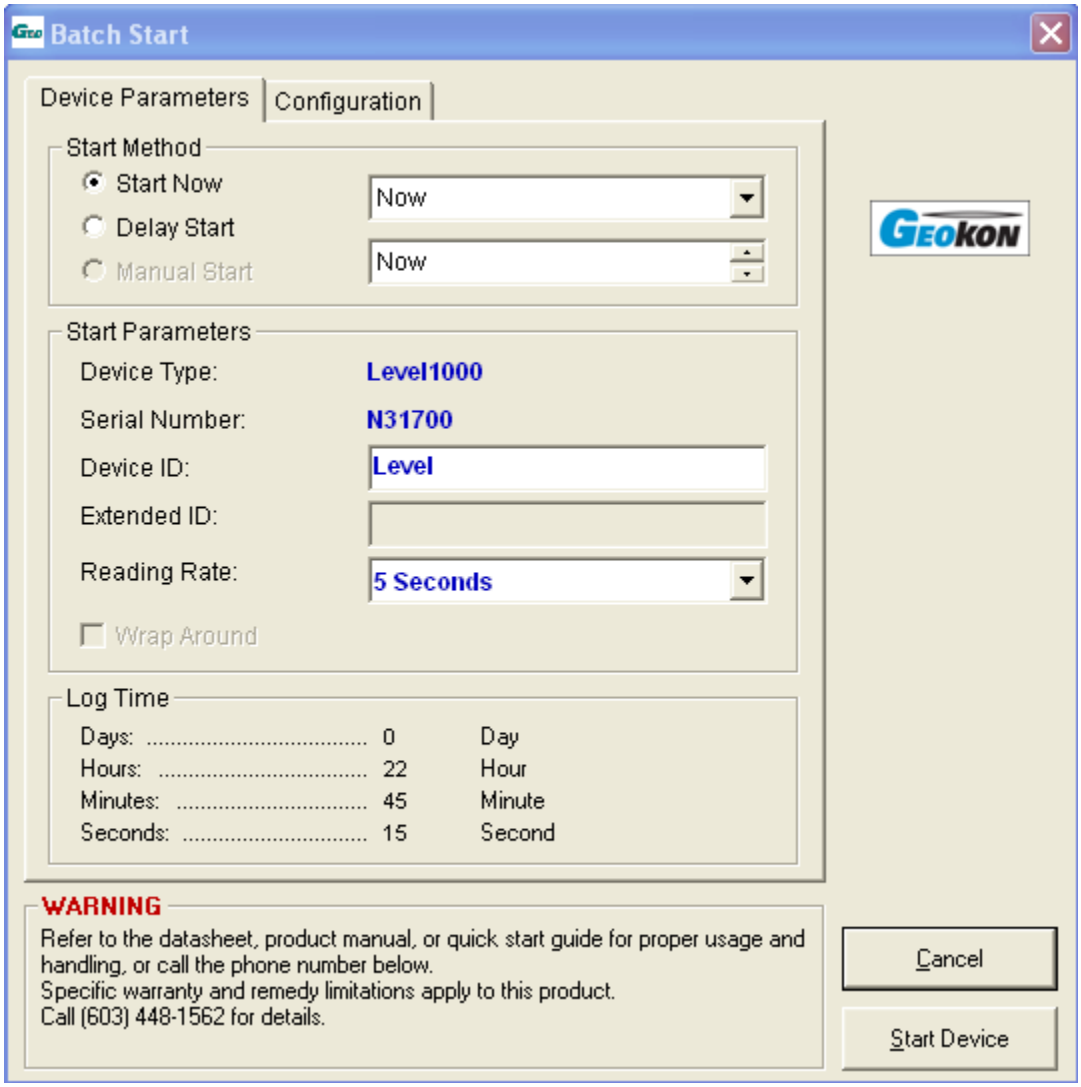
Check the **Reading Rate** box to choose the reading rate from the **Device Parameters** tab.

Wrap Around

Check the **Wrap Around** box to choose the wrap around memory feature from the **Device Parameters** tab. Not used with Geokon's Level Logger 1000 or 2000.

Device Menu: Start Device

Select **Start Device** from the **Device Menu** to display the following window:



NOTE: Starting the device will erase all readings currently stored in its memory.

The **Start Device** window allows the start time and reading rate to be set. The **Start Method** setting may be used, along with the **Start Now** radio button, to start the data logger immediately. Alternatively, the user can select the **Delay Start** option to delay the start of data collection. The start time may be delayed up to six months from the current time.

When the device has a feature such as password, alarm setting, thermocouple type, trigger settings, wireless configuration and engineering units then a corresponding button will be displayed on the

screen. An **Alarm Settings** button is displayed in the example below in the lower right hand portion of the screen. *Not used with Geokon's Level Logger 1000 or 2000.*

The device start time may be delayed after the start button of the data logger has been pushed. This time will depend on the value of the delay start.

The reading rate can be selected to determine its data recording frequency. When selected, the maximum recording time will be calculated for the particular device, based on its internal memory capacity, and displayed in **Log Time** box. Once started, the device will continue to record readings until its memory is full. When full, the data recorder will stop recording additional readings then place itself into a low power state to maximize battery life. The data stored in the data logger is always preserved (even in the case of battery failure) unless the device is reset or started. **When re-started the existing readings are then overwritten.**

- Manual Stop (default option for logger operation)
  - The device will continue to record data until the memory is full, or until the device is stopped manually using the Geokon software.

Device ID

A Device ID may be entered in the space provided in any combination of six letters and/or numbers. The Device ID is written to the device and will appear in graphs or reports when the device is read later. Use it for identification of the device or personnel linked to the device, etc.
When all parameters/settings are set, press **Start Device** to program and begin recording data.

Device Menu: Stop Device 

Selecting **Stop Device** from the **Device Menu** permits the software to communicate with the data logger and stop it from taking additional measurements. The data logger will enter a low power state to conserve battery life. When the memory is full, the data recorder will stop recording additional readings and place itself into a low power state to maximize battery life automatically, this is simply a convenient way to extend the life of the battery. This mode is obvious to the user because the device will immediately wake up when the host computer communicates with the logger. When the device will not be used for a long period of time, stopping the device from collecting more data will conserve power to extend battery life. Stopping the device has no effect on the data in memory, the data is always retained.

Device Menu: Reset Device 

Select **Reset Device** from the **Device Menu** to permit the software to communicate with the data logger device, and stop it from taking further measurements. **This will also <u>erase</u> all readings currently stored in memory**. Resetting the device will cause the data logger to enter a low power state to conserve battery life.

Device Menu: Real Time Chart Recording 

The **Real Time Chart Recording** command provides a graphical method for acquiring and viewing data in real time. Choose the Real Time Chart Recording command to select the menu items and toolbar to appear as shown below:

A logger must be connected to the interface cable to select and use the following features: reading rate, setup real time recording parameters, and start and stop the real time graphing.

Note: Data is not stored internally in the data logger while in Real Time Recording Mode.

Start Recording

Select the **Start Recording** button to take a reading from the logger and update the screen at the selected reading rate.

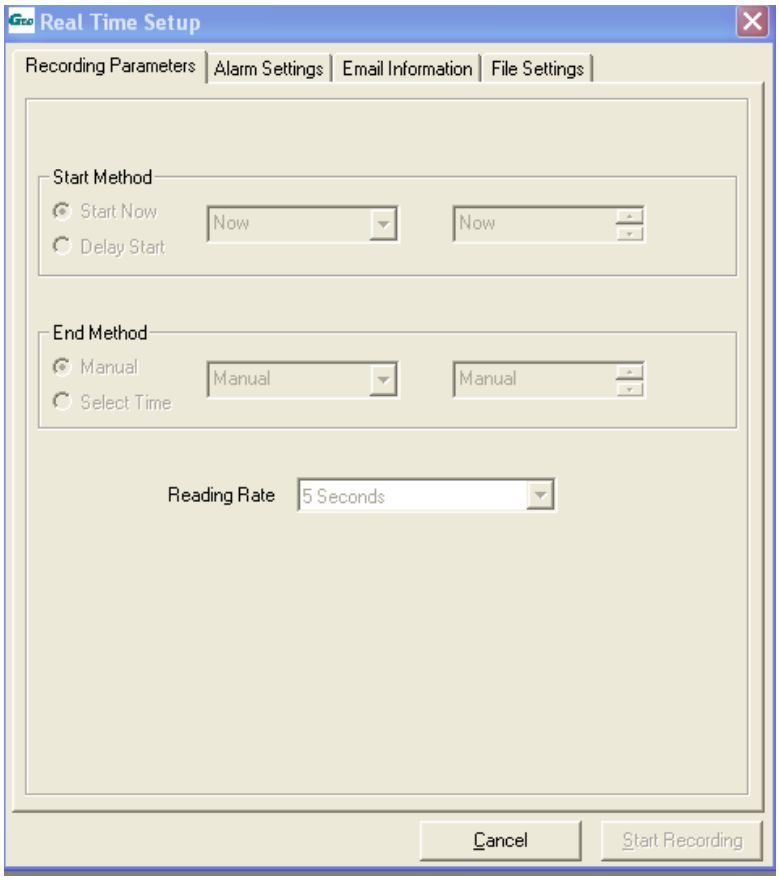
Done Recording

Select the **Done Recording** button to discontinue recording from the logger.
An example of a real-time graph, using a Level 1000 logger:

The data can also be viewed in tabular format while in the real time mode. Switching back and forth from a graphical to a tabular format is easily done. While in the real time recording mode, access to most software commands is restricted to eliminate interference with data collection. All windows except for the current window are inactive during data collection.

Real Time Setup

From the **Real Time Chart Recording** on the **Device Menu**, select the **Recording Setup** Button. This will display the following window:



Recording Parameters Tab

The **Recording Parameters** tab allows for set up of the recording start and end time.

Start Method: Start Now or Delay Start

Select **Start Now** to begin recording immediately or select **Delay Start** to delay the recording.
Not used with Geokon's Level Logger 1000 or 2000.

End Method: Manual or Select Time

There are two methods to end Real Time Recording, (1) manually and (2) automatically. To end Real Time Recording manually select the **Done Recording** button on the Real Time Chart Recording Toolbar. To end automatically choose select time from the **Real Time Setup screen**.
Not used with Geokon's Level Logger 1000 or 2000.

Reading Rate

Select the **Reading Rate** from the dropdown list. To setup the Real Time Recording rate click the **Start Recording** button to start real time recording. *Not used with Geokon's Level Logger 1000 or 2000.*

Alarm Settings Tab (software level)

Not used with Geokon's Level Logger 1000 or 2000.

3. Channel Settings

Not used with Geokon's Level Logger 1000 or 2000.

Email Information Tab

Not used with Geokon's Level Logger 1000 or 2000.

Message Options

Not used with Geokon's Level Logger 1000 or 2000.

File Settings Tab

Not used with Geokon's Level Logger 1000 or 2000.

Data Save

Not used with Geokon's Level Logger 1000 or 2000.

Data Export

Not used with Geokon's Level Logger 1000 or 2000.

Preferences

Not used with Geokon's Level Logger 1000 or 2000.

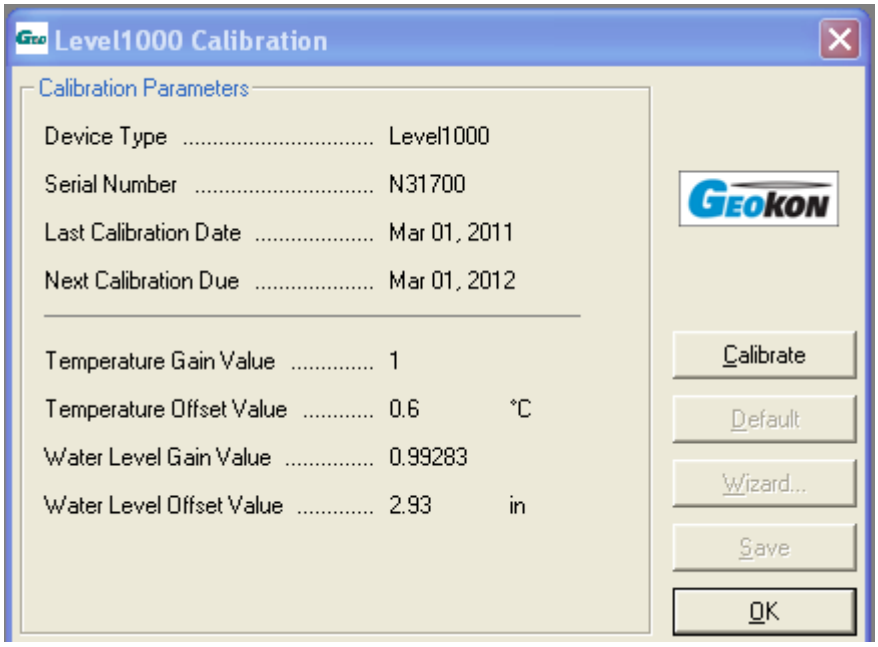
Device Menu: Display Real Time Wireless Data

Not used with Geokon's Level Logger 1000 or 2000.

Device Menu: Calibration

Select **Calibration** from the Device Menu. All data logger devices can be calibrated through the software. This eliminates the need for opening the device or adjusting potentiometers. Calibration parameters, as well as the last calibration date, are stored within the device itself in non-volatile memory. This can be accessed through the software. It also allows the device to maintain calibration while being used on any computer. Most data loggers can be effectively calibrated using a single point to correct an offset. In some cases, two points may used to correct for gain and offset errors. The Temp101 uses a single point calibration. The calibration offset is defined as the value the device reads at zero. Thus, if the Level Logger 1000 reads 0.6ºC when the correct value is 0ºC, the user would enter 0.6ºC for the calibration offset. The 0.6ºC would then be subtracted from each reading downloaded from the device, and the data would be correct without any further manipulation. The Calibration window shown below is displayed when the **Calibration** command is selected, and a logger is connected to the interface cable. To edit the calibration values, click on the **Calibrate** button. The **Default** button may be used to return all values to their default settings (0.000 for offset values, and 1.000 for gain values.)

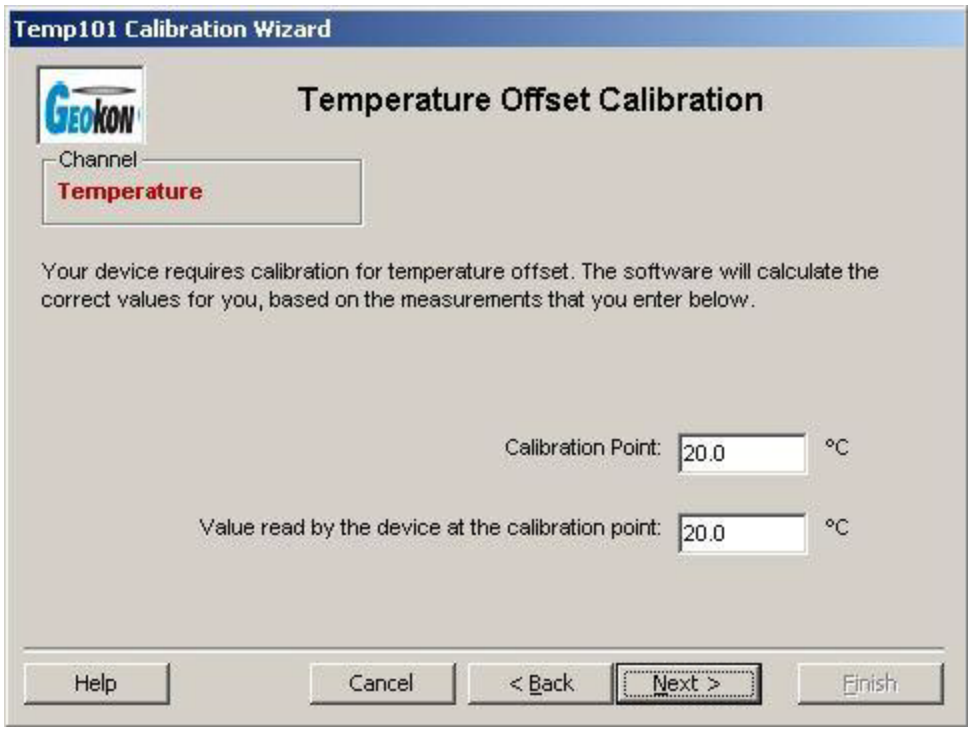
Sample Calibration Screen



For convenience, a **Wizard** button is available. Select this button to display the **Calibration Wizard**, a series of screens with fields can be fill in regarding the behavior of the *un-calibrated* (all values set to the default) device. The wizard performs the calculations for the offset and/or gain values and puts them into the correct fields in the calibration window. To commit to any changes, select **Save** to store the calibration information in the device. The calibration is then saved, and the new calibration values are displayed on the screen.

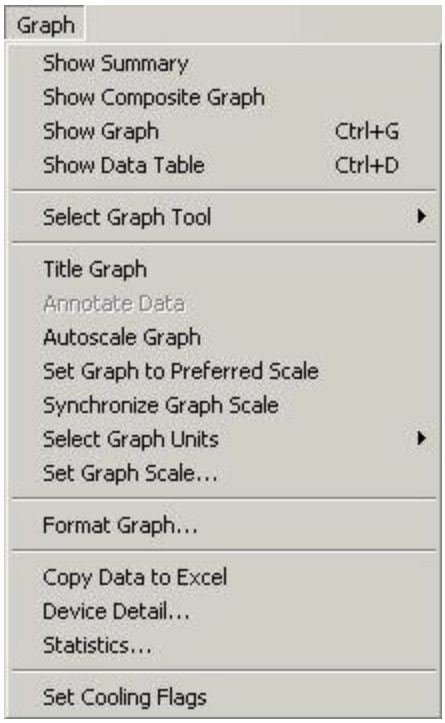
The Calibration Wizard

The **Calibration Wizard** displays information which correlates to the type of device attached. The following screen is an example of a Temperature Gain/Offset calibration on the Temperature channel of a Temp101 device. To calibrate the device select the **Next** button, complete the required fields for each channel of the device, and select the **Next** button again until the Wizard highlights the finished button. Select the **Finish** button and the calculations are made and the correct values are placed into the Calibration windows. Select **Save** to save these values into the device.



The Graph Menu

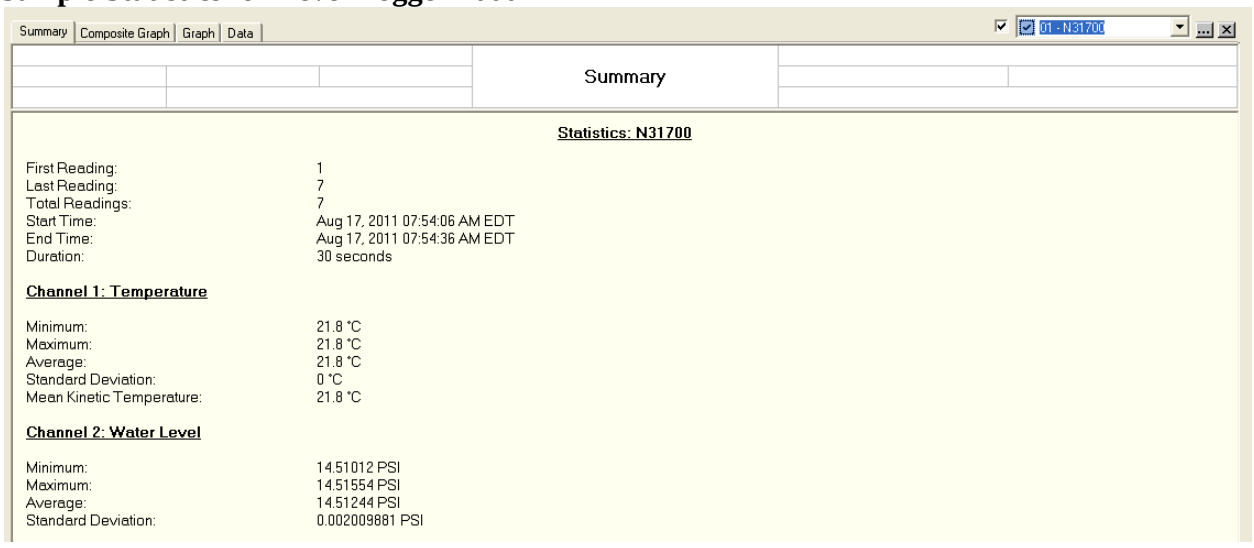
The Graph Menu appears like this:



Graph Menu: Show Summary

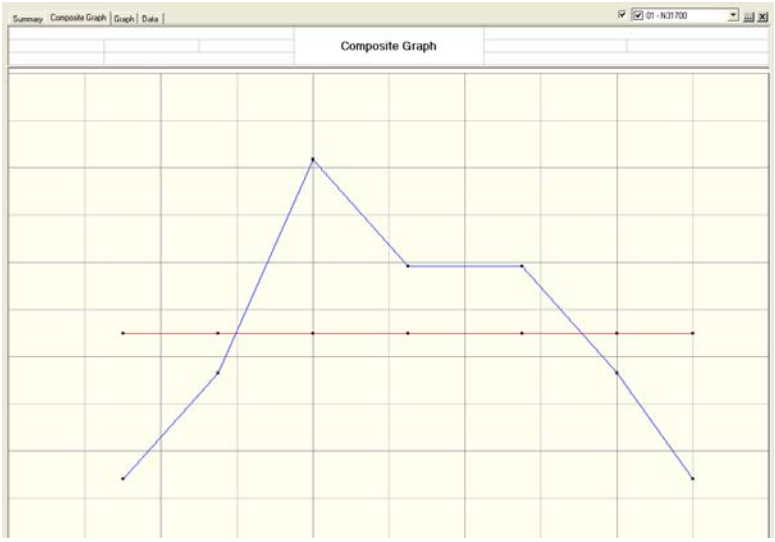
Select the **Show Summary** command from the **Graph Menu** to display the **Summary** tab, which will appear as follows:

Sample Statistics for Level Logger 1000



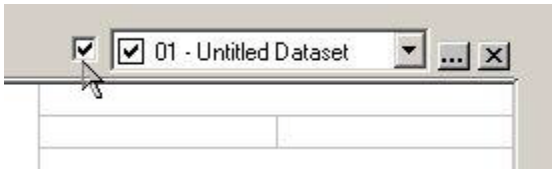
Graph Menu: Show Composite Graph

Select the **Show Composite Graph** command from the **Graph Menu** to display the **Composite Graph** tab, which will appear as follows:

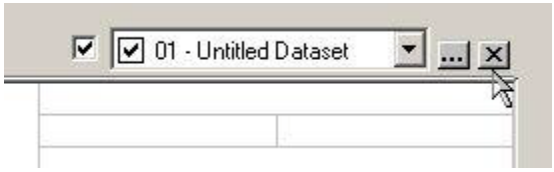


The **Composite** tab displays a graph of one or more datasets. Datasets can be loaded by using the Open command from File Menu. Once loaded, they are displayed as graphs.

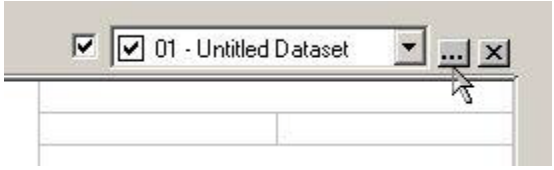
To display the dataset(s) select one from the dropdown list at the top-right corner of the composite graph (see below). Select the checkbox next to the list to select or deselect the dataset(s) for display. Deselecting the dataset(s) does not unload it, it remains in memory and can be reselected at any time.



To unload a dataset from the memory, select it from the dropdown list at the top-right corner of the composite graph. Select the **X** button on the right to unload the dataset (see below). Once a dataset is unloaded, it cannot be redisplayed without reloading it using the Open command from File Menu.



To manipulate multiple datasets simultaneously select the ellipses ()button in the middle to open **Graph Configuration form** (see below).



Deselect Dataset

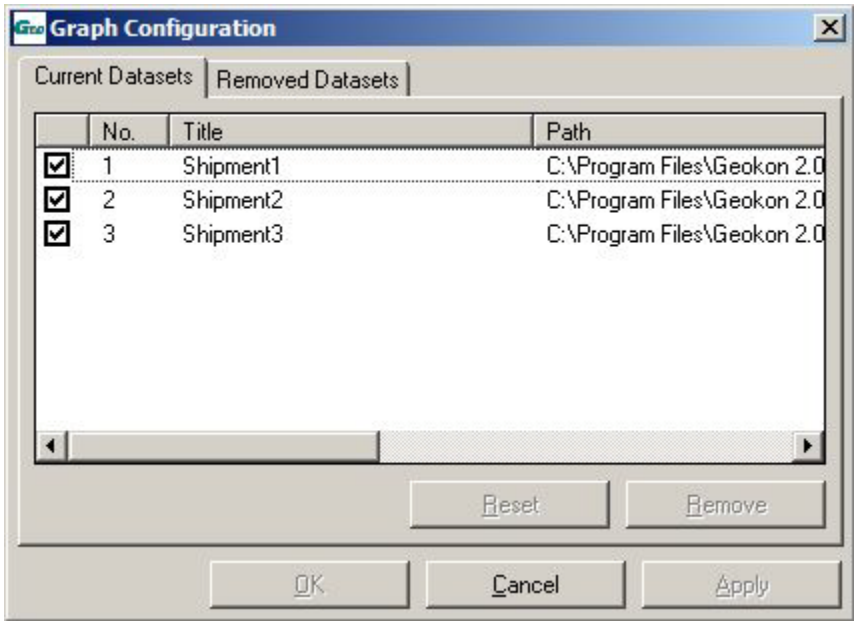
To **deselect dataset(s)** for display on the composite graph, uncheck them.

Unload Dataset

Highlight **dataset(s)** and press the **Remove** button to unload them from memory.

Unload Data Set into Temporary Buffer

Select the **Remove** button to place the unloaded dataset(s) in the temporary buffer, rather than unloading them permanently. They can be restored or reset. After selecting the **Apply** button or the **OK** button, the unloaded dataset(s) cannot be redisplayed without reloading them using the Open command from File Menu.

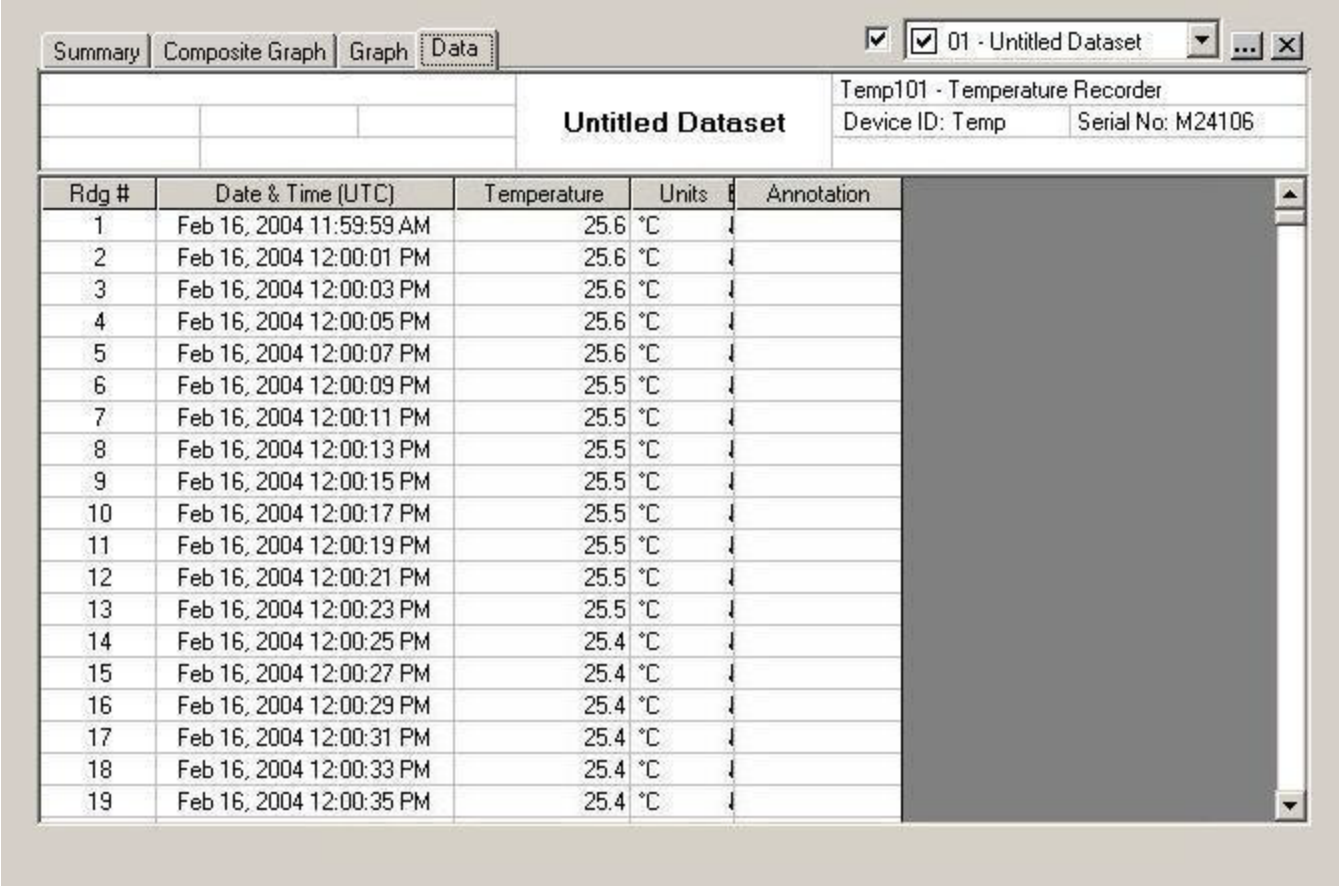


Graph Menu: Show Graph

Select the **Show Graph** command from the **Graph Menu** to display the **Graph** tab. This tab is similar to the Composite Graph except that only one dataset can be displayed at a time.
NOTE: In order to save a dataset, it must be displayed in the Graph or Data tab.

Graph Menu: Show Data Table

Select the **Show Data Table** command from the **Graph Menu** to direct the software to display the **Data** tab as shown in the window below:



Rdg #	Date & Time (UTC)	Temperature	Units	Annotation
1	Feb 16, 2004 11:59:59 AM	25.6	°C	
2	Feb 16, 2004 12:00:01 PM	25.6	°C	
3	Feb 16, 2004 12:00:03 PM	25.6	°C	
4	Feb 16, 2004 12:00:05 PM	25.6	°C	
5	Feb 16, 2004 12:00:07 PM	25.6	°C	
6	Feb 16, 2004 12:00:09 PM	25.5	°C	
7	Feb 16, 2004 12:00:11 PM	25.5	°C	
8	Feb 16, 2004 12:00:13 PM	25.5	°C	
9	Feb 16, 2004 12:00:15 PM	25.5	°C	
10	Feb 16, 2004 12:00:17 PM	25.5	°C	
11	Feb 16, 2004 12:00:19 PM	25.5	°C	
12	Feb 16, 2004 12:00:21 PM	25.5	°C	
13	Feb 16, 2004 12:00:23 PM	25.5	°C	
14	Feb 16, 2004 12:00:25 PM	25.4	°C	
15	Feb 16, 2004 12:00:27 PM	25.4	°C	
16	Feb 16, 2004 12:00:29 PM	25.4	°C	
17	Feb 16, 2004 12:00:31 PM	25.4	°C	
18	Feb 16, 2004 12:00:33 PM	25.4	°C	
19	Feb 16, 2004 12:00:35 PM	25.4	°C	

Data Tab

The **Data** tab displays data in table format, to easily determine the exact value of each data point.

Graph Menu: Select Graph Tool

Select the **Select Graph Tool** command from the **Graph Menu** to enable the cursor mode which the mouse will assume when it is pointed and clicked over the graph. Several cursor modes are available, each with a specific function as follows:

Cursor 

When the cursor mode is selected,

1. Click on a data point of the graph to indicate the value.
2. Click on or near a data point on the graph to indicate the value of the data point.

The data point selected can be changed by navigating the cursor or;

A. use clicking method.
B. click and drag the mouse horizontally in the graph.
C. use the functions (move left, move right) on the keyboard.

Time Cursor 

When this cursor mode is selected, choose one of the following methods;

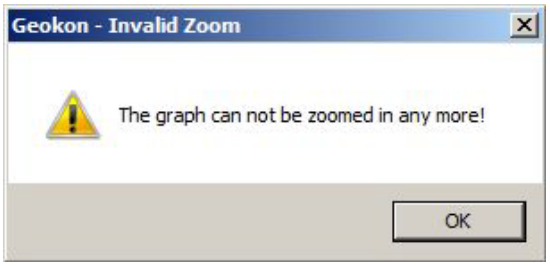
1. Click and drag the mouse horizontally over the graph area or
2. Use the arrow keys (left, right) on the keyboard, to indicate the time and value of each data point the cursor passes over.

Scroll 

Select the cursor mode to **scroll** the graph in any direction to view a particular section. To scroll the graph, click and hold the mouse button, then drag the mouse in the direction desired. When dragging the cursor a line with an arrow is drawn to indicate the direction and amount of the scrolling operation. When the mouse button is released, the graph is then scrolled in the direction and by the amount specified.

Zoom In 

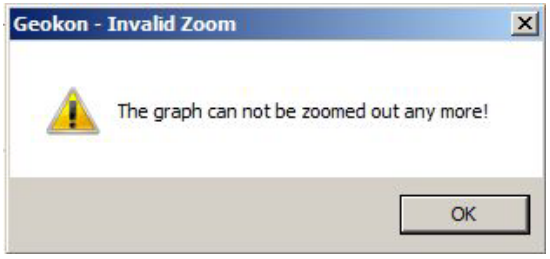
When this cursor mode is selected, click on the graph to **Zoom In** for a close-up view of a particular area of the graph. Multiple zooms may be performed to obtain best view. The software can only zoom in to a limited extent. If the zoom limit is reached, the following message will be displayed.



Message Box 1: Warning for Zoom In

Zoom Out 

When this cursor mode is selected, click on the graph to **Zoom Out** for an overall view of a particular area of the graph. Multiple zooms may be performed to obtain the best view. To avoid zooming out too many times a warning message may be set . This will reset the software.



Message Box 2: Warning for Zoom Out

Box Zoom 

Select the cursor mode, then click and drag on the graph to draw a rectangle. When the mouse button, is released the graph will **Zoom In** to obtain a close-up view of that area of the graph.

Horizontal Zoom
Select the cursor mode, then click and drag on the graph to draw a horizontal rectangle. When the mouse button is released, the graph will **zoom in** to get a close-up view of that area of the graph.

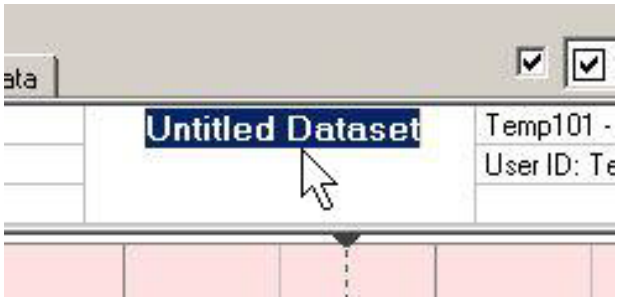
Vertical Zoom
Select the cursor mode, then click and drag on the graph will draw a vertical rectangle. When the user releases the mouse button, the graph will **zoom in** to get a close-up view of that area of the graph.

Cancel Zoom
Select Cancel Zoom to cancel any zoom modes. The graph will be redrawn in its default state.

Graph Menu: Title Graph

This feature will be disabled when no dataset is displayed on the screen. Otherwise, there are two ways to modify the title graph.
1. The title graph can be modified by selecting **Title Graph** from the Graph Menu or the Right Click Pop-Up Menu. The entering screen will appear as follows:

2. Double click the graph title area, to highlight and modify it.

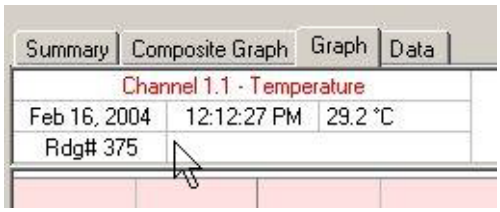


Graph Menu: Annotate Data

This feature will be disabled if there is no channel selected. Otherwise, there are two ways to annotate data.

1. Select the **Annotate Data** menu from the Graph Menu or the Right Click Pop-Up Menu. The following screen will appear:

2. Double click the annotate data area on the heading of the graph. Type the annotation in the box as shown below:



Graph Menu: Autoscale Graph

Select the **Autoscale Graph** command from the Graph Menu to optimize the vertical scale of the graph to match the minimum and maximum data points shown on the graph. This provides maximum resolution for viewing the graph.

Graph Menu: Set Graph to Preferred Scale

Select **Set Graph to Preferred Scale** command from the Graph Menu to set the graph to the preferred scale.
If no preferences are set, the graph will show on the vertical scale, the measurement range of the device (this may differ from the rated operating range shown on the label of the device). The time scale will begin when the first reading was taken, and end when last reading was taken.

Graph Menu: Synchronize Graph Scale

Select the **Synchronize Graph Scale** command from the Graph Menu to synchronize the time and value axes of the graph.

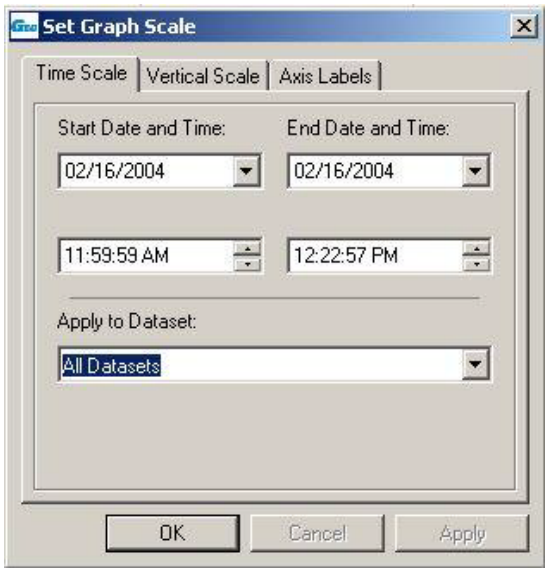
Graph Menu: Select Graph Units

Select the **Select Graph Units** command from the Graph Menu to select the units to be used when displaying the graph. The available units will vary depending on the type of data logger used.

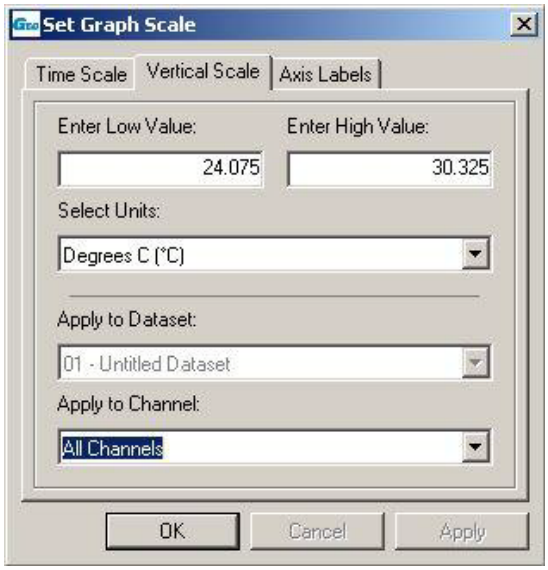
Graph Menu: Set Graph Scale

Select the **Set Graph Scale** command from the Graph Menu to manually change and specify the values of the vertical and horizontal axis. The following three screens are shown for each of the tabs:

Time Tab

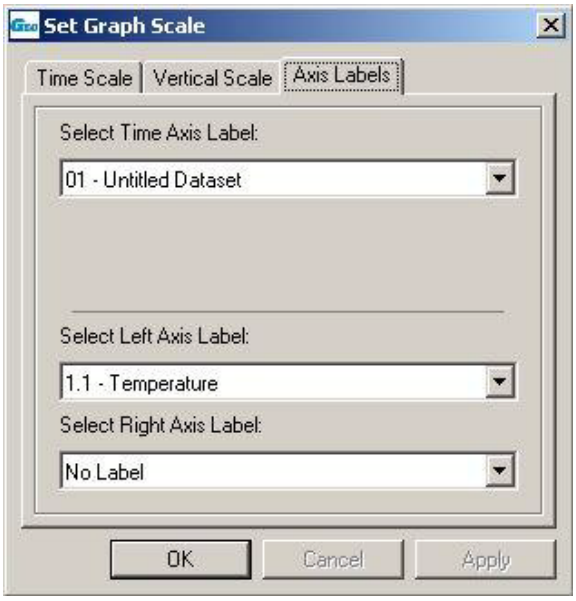


Scale Tab



NOTE: In order to enter the low value or the high value of the unit a unit from the **Select Units** dropdown list box must be selected first. There is no unit selected if the value of the **Select Units** dropdown list box is **No Units Selected**.

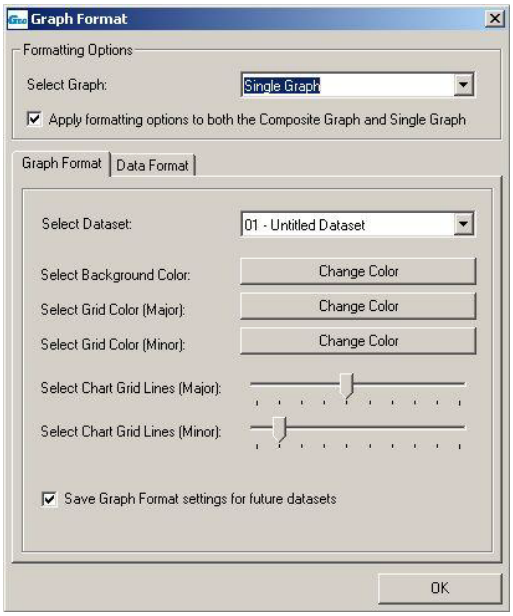
Axis Tab



Different data recorders will show a slightly different window depending on the number of channels and the parameters being recorded. Scaling of the horizontal axis is controlled by the **Select Time Range** section. To set the end points of the horizontal axis, select the specified endpoints from the dropdown date and time selectors. The vertical axis is set using the **Vertical Scale Tab**.

Graph Menu: Format Graph 

Select the **Format Graph** command from the Graph Menu to show the following window:

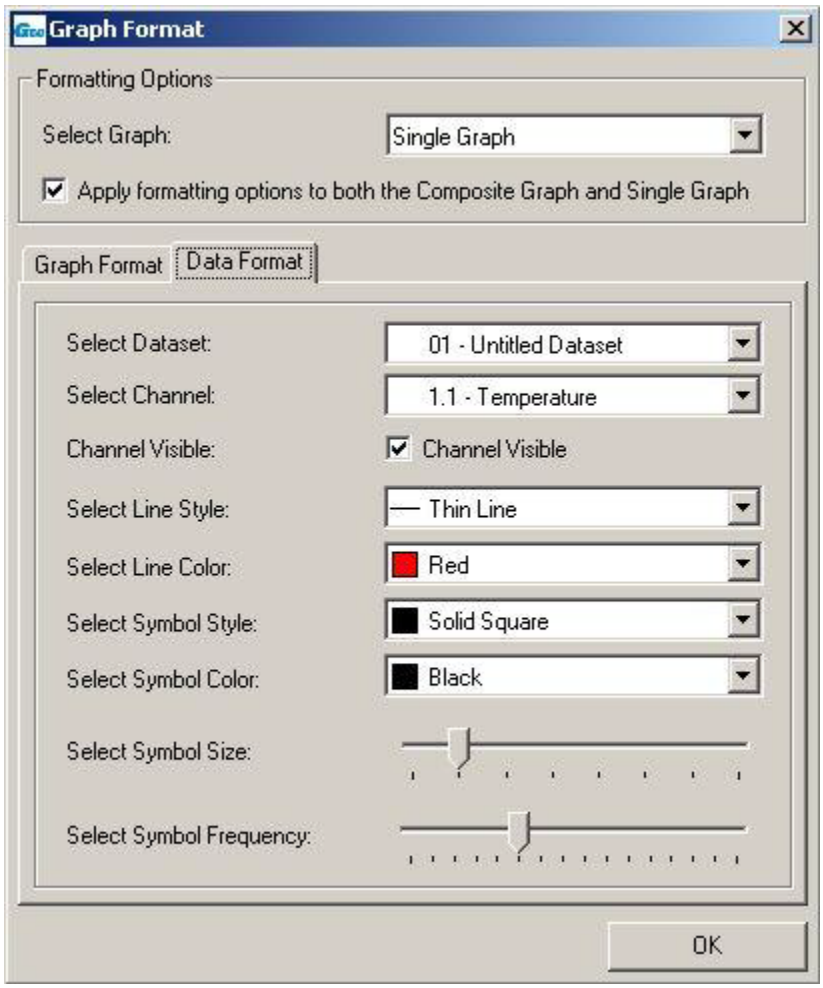


Edit **Formatting Options** to apply formatting to the single graph, the composite graph, or both.

Graph Format Tab

Select the **Graph Format** tab to set the background color for the entire graph, as well as the color and number of the major and minor grid lines. Changes are applied to the dataset selected at the top of the frame.

The **Data Format** looks like this:



Data Format Tab

This window allows the user to customize the look of the graphical data for each dataset. First, select the dataset to customize from the dropdown list. Choose the channel from the second dropdown list (some devices have multiple channels). Then, select the thickness of the line, line color, symbol style, and symbol color from the remaining dropdown lists. Finally, select the symbol size and frequency (see Manipulate Plotting Symbol) and whether the channel should be visible or not (see Hide Selected Channel and Show Hidden Channels).

Manipulate Plotting Symbol

The **Select Symbol Size** slider and the **Select Symbol Frequency** slider are used to manipulate the plotting symbols. The zero setting removes all plotting symbols, and higher settings will approximately double the number of symbols on the graph as the slider is moved up one notch.

Hide Selected Channel

Uncheck the **Channel Visible** option to hide the selected channel or choose the Right Click Pop-up Menu to hide the selected channel.

Show Hidden Channels

Check the **Channel Visible** option to show the hidden channel. Click OK., the graph will be immediately redrawn with the option chosen. Choose The Right Click Pop-Up Menu to show the hidden channel also.

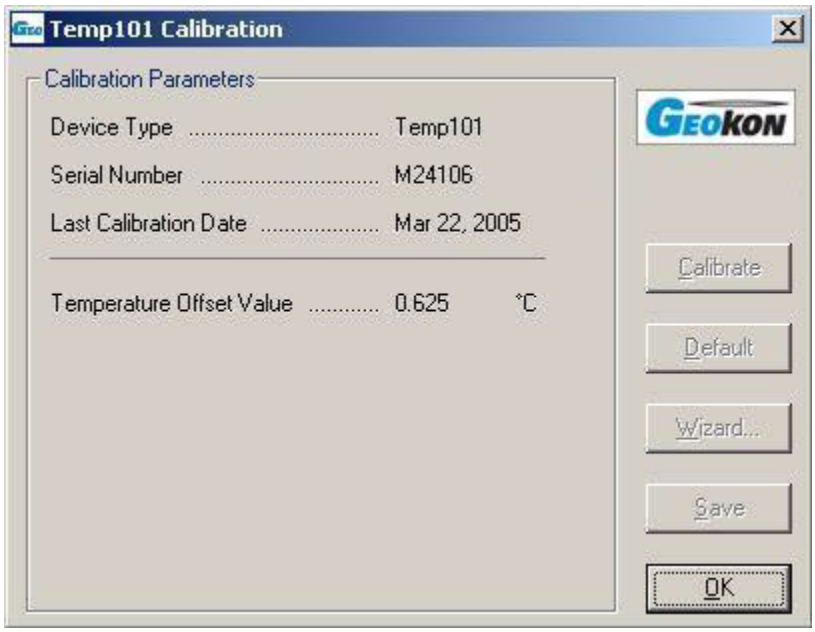
Graph Menu: Copy Data To Excel.

Select **Copy Data To Excel.** to allow the software to launch the Microsoft Excel. spreadsheet program, and copy the current dataset to an Excel. worksheet. This command will only work with a compatible version of Excel. properly installed on the host computer.

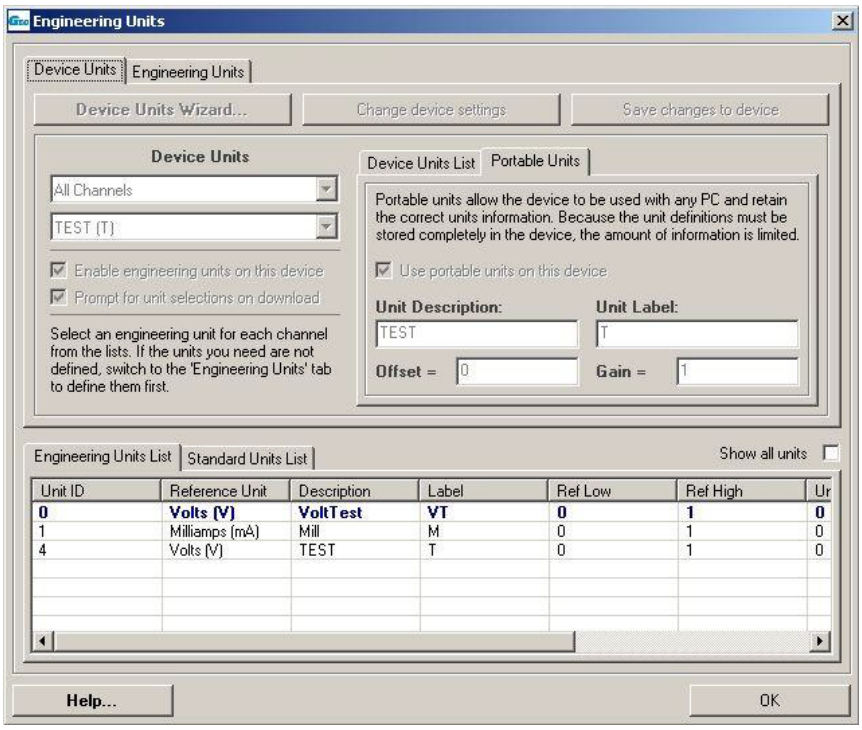
Graph Menu: Device Detail

Select the **Device Detail** command to display the device details of the selected dataset. This will include device type, revision number, subtype, and channel information. Information about alarm setting, thermocouple type, wireless configuration, wrap around and engineering units may also be displayed if the device supports those features. The window is similar to Identify Device and Read Status features.

Select **Calibration** button from the **Device Detail** tab to display a read-only calibration form that shows the user the device of the selected dataset calibration information.

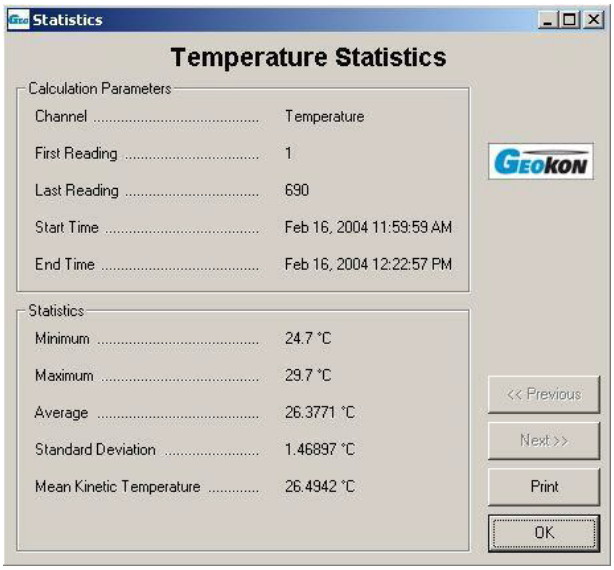


Select the **Engineering Units** button from the **Device Detail** tab to display a read-only engineering unit screen. This command is only available when the selected dataset is generated from a device that has this feature.



Graph Menu: Statistics

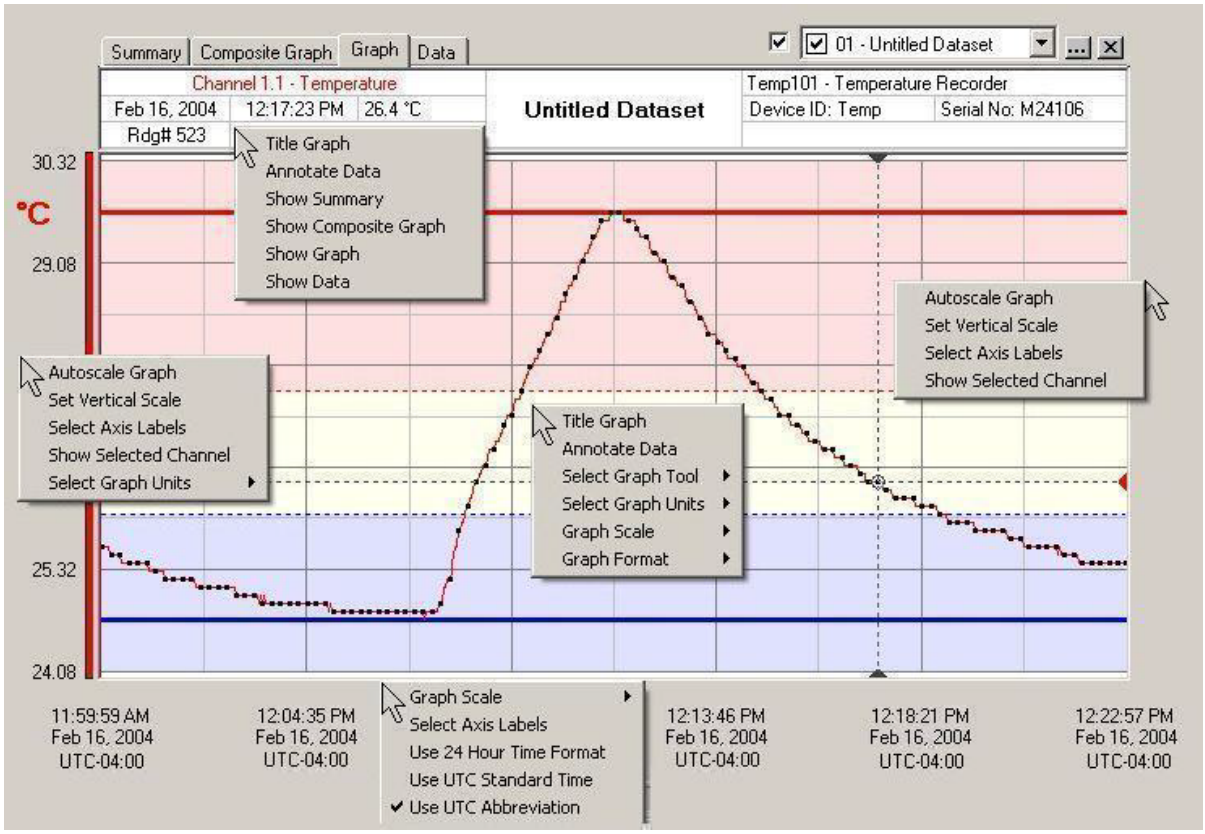
Select the **Statistics** command to calculate some basic statistics for data on each individual channel. A typical screen for some calculated statistics for the temperature channel of a Temp101 might appear as follows:



For data recorders with more than one channel, the Next and Previous buttons will be available. This allows the user to quickly view the statistics on each channel. In the example for the RHTemp101, activating the Next button will update the dialog box with the statistics for the humidity channel.

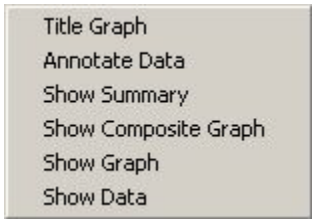
The Right Click Pop-Up Menu

The **Right Click Pop-Up Menu** incorporates menus from the Graph Menu. It provides a convenient way to manipulate the graph. It will show different pop-up menus depending on the position of the mouse on the screen.
The **Right Click Pop-up Menu** will appear 1 of 2 ways (see window #2):
Window #1: (there is a dataset selected)



Submenu A

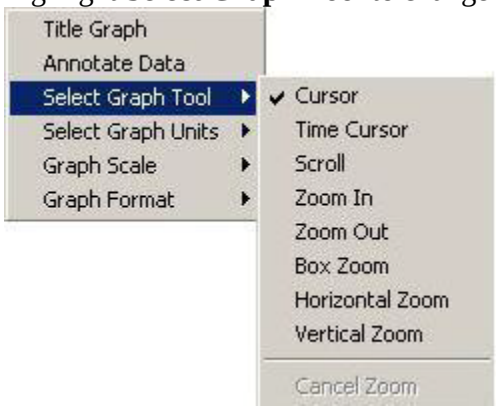
Click the **Title Graph** submenu to modify the title graph (see Title Graph).



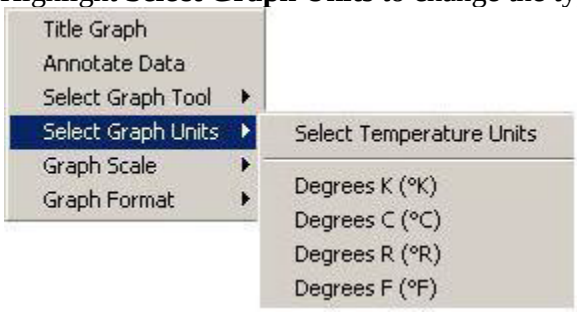
Click the **Annotate Data** submenu to modify the **Annotate Data** (see Annotate Data).
Click the **Show Summary, Show Composite Graph, Show Graph**, and **Show Data** options to bring up the Summary, Composite Graph, Graph, and Data tabs, respectively.

Submenu B

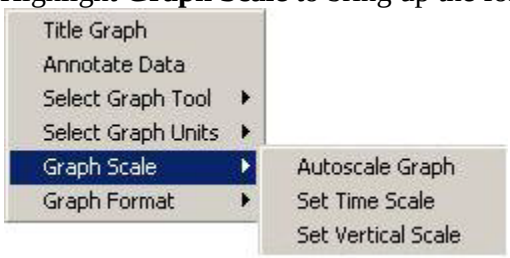
Highlight **Select Graph Tool** to change the cursor mode (see Select Graph Tool).



Highlight **Select Graph Units** to change the type of scaling units (see Select Graph Units).



Highlight **Graph Scale** to bring up the following box.

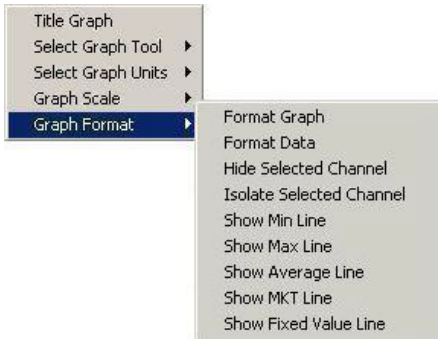


Click the **Autoscale Graph** option to automatically optimize the vertical scale of the graph (see Autoscale Graph).

Click the **Set Time Scale** submenu to display a time scale setting form (see Set Graph Scale).

Click the **Set Vertical Scale** submenu to display a vertical scale setting form (see Set Graph Scale).

Highlight **Graph Format** to bring up the following box:



Click **Format Graph** to display a graphic format setting form (see Format Graph).

Click **Format Data** to display a data format setting form.

Click the **Hide Selected Channel** to hide the channel selected in the graph.

Click the **Isolate Selected Channel** to hide all channels but the selected channel in the graph.

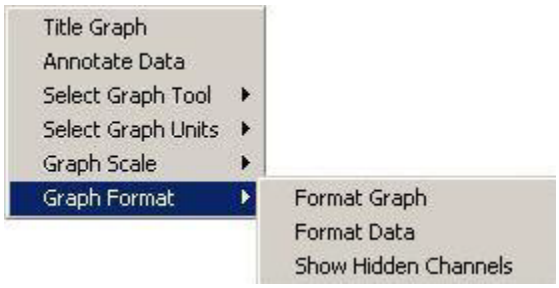
Click the **Show Min Line** to display the minimum line and value of the selected channel in the graph.

Click the **Show Max Line** to display the maximum line and value of the selected channel in the graph.

Click the **Show Average Line** to display the average line and value of the selected channel in the graph.

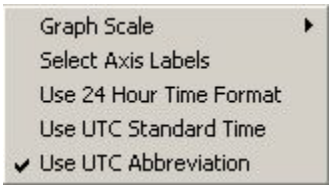
Click the **Show MKT Line** to display the MKT line and value of the selected channel in the graph. The menu is not available if the selected channel does not have the MKT property.

Click the **Show Fixed Line** to display the fixed line and value of the selected channel in the graph based on the user's input.



Click the **Show Hidden Channels** to show all hidden channels in the graph.

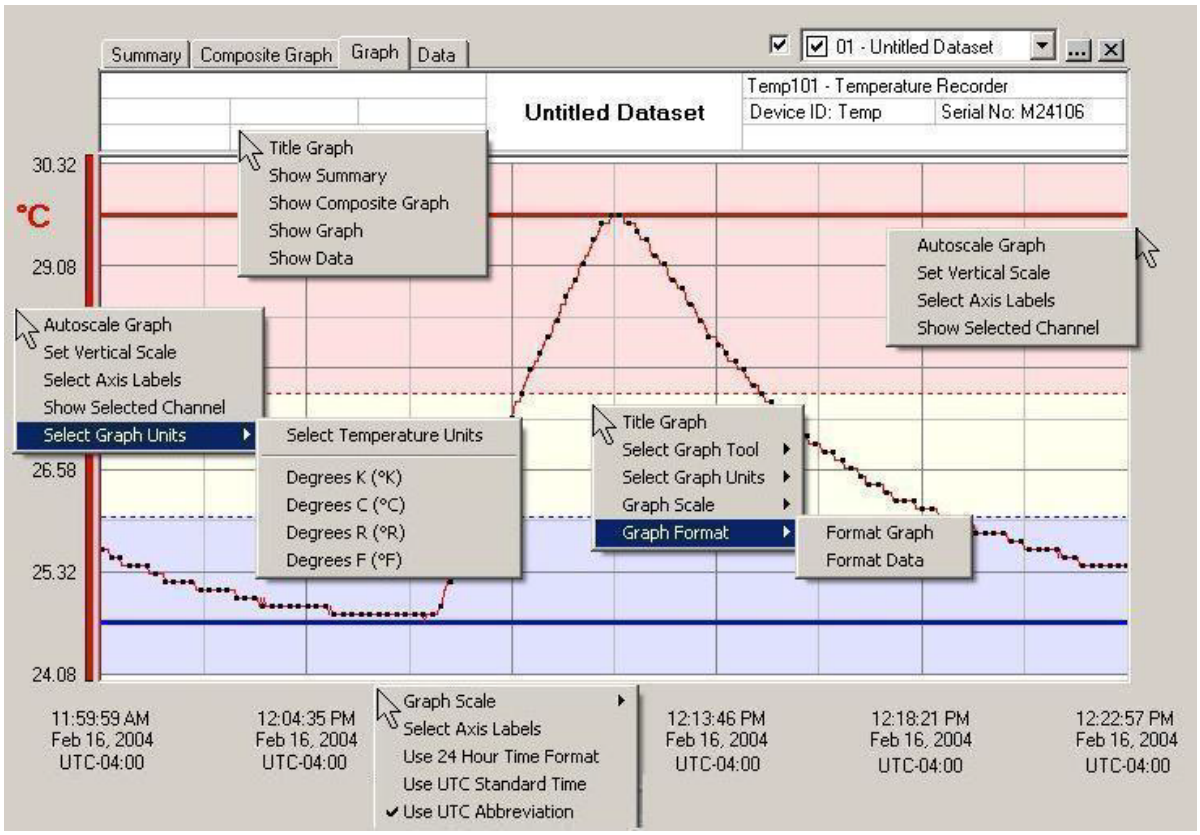
Submenu C



Select the **Select Axis Labels** to bring up the **Set Graph Scale** box, under the Axis Labels tab. The user can choose which vertical labels are shown and whether they will be shown on the left or right sides.

Use 24 Hour Time Format, Use UTC Standard Time, or **Use UTC Abbreviation** to change the way the time is viewed (see display preferences).

Window #2:
The **Right Click Pop-up Menu** will appear below if there is no channel selected on the screen by the user.

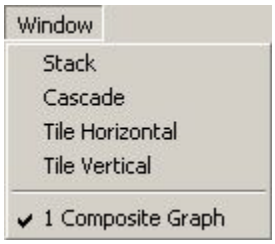


Here the **Right Click Pop-up Menu** is similar to Window #1 with two differences:

1. The submenu Annotate Data is not available.
2. The submenu Hide Selected Channel is not available in Graph Format menu.

The Window Menu

The Window menu looks like this:



Window Menu: Stack

Choose **Stack** from the Window Menu to resize all the open graph windows to take up the whole main window and are to stack (overlay) on top of each other.

Window Menu: Cascade

Select **Cascade** from the Window Menu to resize all the open graph windows to a medium size, and then positions them in a staggered layer, one on top of the other, to maintain the title bars are visible.

Window Menu: Tile Horizontal

Select **Tile Horizontal** from the Window Menu to rearrange the open graph windows, to make fully visible and to align horizontally next to each other with no overlapping.

Window Menu: Tile Vertical

Select **Tile Vertical** from the Window Menu to rearrange the open graphs windows to make fully visible and to align vertically next to each other with no overlapping.

Window Menu: Selected File

When only one graph menu with multiple data sets is open, the line will show the selected tab that is open in the graph menu.

When multiple open graph menus are open with different data set(s) in each one, all the file names will be listed under this option. This method allows a desired graph to be viewed.

The Help Menu

The Help Menu looks like this:

Help Menu: Contents

Select **Contents** from the Help Menu to bring up the Help window, and presents the Table of Contents for the online manual.

Help Menu: About

Select **About** from the Help Menu to bring up the **About** window, and presents information about the company and the software version. This screen includes the Geokon Inc. address, phone number for technical information, e-mail address and web site. It also includes the full revision number of the software and the date of release.

Help Menu: Geokon Website

Select **Geokon Website** from the Help Menu to bring up the Geokon Website for additional information.

Note: For this feature an internet connection and browser must be enabled on the host computer.

Specifications

		Geokon Level1000	GeoKon Level2000
Pressure Sensor:		Semiconductor Strain Gauge	Semiconductor Strain Gauge
Range	PSI	0 to 30 PSIA	0 to 15 PSIG
	Feet	0 to 30'	0 to 30'
	Meters	0-9 m	0-9 m
Accuracy	FSR	±0.3%	±0.3%
	inches	+/-1.25	+/-1.25
	CM	3.175cm	3.175cm
Resolution	inches	0.05"	0.02"
	CM	0.127CM	.0508CM
Response Time:		90% change in 1 ms	90% change in 1 ms
Repeatability:		±0.5% FSR; ±0.2% typical	±0.5% FSR; ±0.2% typical
Burst Pressure:		150 PSI	75 PSIG
Temperature Channel:		Semiconductor	Semiconductor
Range:		-40 to +80°C	-40 to +80°C
Accuracy:		±0.5°C (0 to 50°C)	±0.5°C (0 to 50°C)
Resolution:		0.1°C	0.1°C
Battery Life:		1 year typical at 25°C, user replaceable	1 year typical at 25°C, user replaceable
Memory:		16, 383 readings per channel / 32,766 total readings	16, 383 readings per channel / 32,766 total readings
Construction:		316 SS	316 SS
Sampling Rates:		1 reading every 2 seconds to 1 every 12 hours	1 reading every 2 seconds to 1 every 12 hours
Atmospheric Compensation:		N/A	Automatic through vented cable
Clock Accuracy:		±1 minute/month	±1 minute/month
Communication:		USB	USB
Size:	Inches	5.7 " x 1.25" dia	Submersible end: 9.1" x 1.25" dia.
	MM	145mm x 32mm	Submersible end: 231.14mm x 31.75" dia.
Weight	lbs/oz	8 oz	3 lbs
	grams	220	1361
Start Modes:		Software programmable immediate start	Software programmable immediate start
		delay start up to 6 months	Delay Start up to 6 months
Calibration:		Digital Calibration through software	Digital Calibration through software
Operating Environment:		-40 to +80°C	-40 to +80°C
Dessicant:		N/A	Indicating silica gel (blue = dry; pink = saturated)
Dessicant Life:			7 days @ 99% RH; (can be regenerated by heating canister @ 350°F for 1 hour)

Level1000 and Level2000 Maintenance

Battery Replacement

Geokon level loggers contain a user-replaceable 3.6 volt. Replacement batteries may be purchased from the factory. Installation instructions can be found below. If the customer does not wish to replace the battery themselves, the device may be returned to the factory for service. Please contact Geokon for return instructions. Geokon will replace the battery and return the data logger promptly.

Level 1000 and Level 2000 Battery Replacement Procedure

Materials:
Small needle nose pliers
Replacement battery (TL-2150

1. Carefully unscrew the sensor end cap and pull the electronics out.
2. The battery is the purple cylinder on the circuit board.
3. Gently pull out the old battery.
4. Insert the new battery one lead at a time, using pliers to fully push the leads into the sockets. The battery should be flat against the circuit board, and the positive lead should be closest to the communications jack.
5. Ensure the circuit board is inserted into the white plastic bushing. The sensor cable should not be twisted, or kinked. From the connection to the circuit board, it should run up towards the battery, then down to the sensor.
6. Insert the electronics back into the tube and carefully screw the cap on.

Desiccant Care

The Geokon Level2000 communication end (vented end) contains a desiccant cartridge to absorb moisture that may build up in the cable. Unsaturated, the desiccant is blue in color and will turn pink once it has become saturated. The whole cartridge, which contains the desiccant and vent cap, can be removed and baked for ~2 hours at 250-300°F to regenerate it. There is no need to remove the O-Rings before baking as they are rated up to 400°F.

The desiccant cartridge can also be replaced, please contact Geokon for ordering information.

O-Ring Maintenance

MADGETECH
WE BUILD DATA LOGGERS

O-RINGS 101: PROTECTING YOUR DATA

COMMON MODES OF O-RING FAILURE

INSTALLATION

INSTALLATION DAMAGE

What signs do I look for?

Small nicks, cuts, and gashes in the O-Ring.

How can I prevent this?

Install the new O-Ring carefully, per instructions on other side of this pamphlet. In service, lubricate the O-Ring regularly to prevent pinching and shearing.

COMPRESSION

COMPRESSION SET

What signs do I look for?

A flattened cross-section relative to the sealing surfaces.

How can I prevent this?

Review the application in terms of temperature and chemical exposure. The temperature specification of the logger may have been exceeded, or a chemical present in the process might have hardened the O-Ring.

CHEMICAL

CHEMICAL DEGRADATION

What signs do I look for?

Hardening, blistering, cracking, discoloration.

How can I prevent this?

Investigate the environment in which the logger is used to see what chemicals are present. Contact MadgeTech for a chemically compatible O-Ring, specific to the application.

THERMAL

THERMAL DEGRADATION

What signs do I look for?

Radial cracking, deformation.

How can I prevent this?

This is not common. Therefore, it should be assumed the logger has been used outside of its specified operating range. Please verify the operating environment before continuing to use the logger.

OUTGASSING

OUTGASSING

What signs do I look for?

Reduction in cross-section (can be hard to detect visually).

How can I prevent this?

This is common in high vacuum applications. Contact MadgeTech to discuss a solution for your application. (It might be as simple as not using an O-Ring at all!)

SPIRAL

SPIRAL FAILURE

What signs do I look for?

Cuts or marks spiraling around the circumference.

How can I prevent this?

Install the new O-Ring carefully per the enclosed instructions. In service, lubricate the O-Ring regularly to prevent twisting.

DO'S AND DON'TS OF O-RING MAINTENANCE

MadgeTech data loggers come directly from the factory with high quality O-Rings that have been properly installed. As a user, there are only a few things that you need to remember to maintain a functional O-Ring seal.

DO:

- Clean them frequently (use compressed air or a soft brush to avoid abrasion).
- Lubricate regularly (if it doesn't feel slippery, it needs to be lubricated). We recommend Parker® Super-O-Lube, but any silicone based O-Ring lubricant will work. This is most important on the seals that are frequently opened and closed for communication with the logger.
- Inspect the O-Ring regularly for signs of failure (see the reverse side of this pamphlet for details on what to look for).

DON'T:

- Poke, jab, pry at the O-Ring with sharp or pointed objects.
- Expose the O-Rings to harsh chemicals (when in doubt, call MadgeTech).
- Expose the seals to high pressure (all of our submersible data loggers are rated to 60PSIG).
- Expose the seal to high temperatures (see data logger for operating temperature range).

Phone: 603-456-2011 www.MadgeTech.com info@MadgeTech.com

PROPER O-RING REPLACEMENT

1) Unscrew the part(s) to expose the O-Ring.
2) Use a small pointed tool (knife or pick) to pry the old O-Ring out of its groove.
3) Make sure that the O-Ring groove is free of any dirt or debris.
4) Partially screw the mating parts back together leaving the O-Ring groove exposed.
5) Apply a thin coat of lubricant to the O-Ring.
6) Stretch the O-Ring over the cap and into its groove. Avoid stretching the O-Ring over the threads! Sharp threads can cut your new O-Ring!

Commonly Asked Questions

Level1000 and Level2000 Differences

Question: What are the differences between the Level1000 and the Level2000?

Answer: The Level1000 utilizes an absolute pressure sensor. This allows for the unit to be self-contained, but does not compensate for the fluctuation of atmospheric pressure. The Level2000 incorporates a gauge pressure sensor with a vent tube to compensate for the fluctuation of atmospheric pressure. The vented tube on the Level2000 allows for communication via an interface cable with the logger while it is in its environment.

Level 1000 and Level2000 Similarities:

Question: What are the similarities between the Level1000 and the Level2000?

Answer: Both the Level1000 and the Level2000 loggers accurately monitor and record water levels and temperature over time. The internal temperature sensor of both loggers provides accurate temperature measurements without the need of an additional temperature logger. Both loggers also have a battery life of approximately 1 year and user selectable reading rates of once every 2 seconds which allows for accurate recording of rapid water level changed to once every 12 hours for long term monitoring.

Applications:

Level1000: Used for applications where levels will be recorded over a short period of time. Used for applications where large level changes are anticipated/expected.

Level2000: Used for applications over a longer period of time. Used for applications where smaller level changes are anticipated and where higher accuracy is required.
Typical applications include water level monitoring, environmental studies, waste water treatment, flood analysis, groundwater monitoring, lake and wetland studies and more.

Sensor Ranges:

Question: How long can the Level2000 cable be extended?

Answer: Level1000 does not come with a cable. Level2000 standard cable length can be specified from 1 to 30ft. Custom cable lengths are available up to 100ft

Submersion:

Question: What are the submersion specifications on the Level1000 and the Level2000?

Answer:
Level1000: IP68, 100psi, 230ft, 70 meters (sensor range dependent)
Level2000: IP68, 50psi, 115ft, 35 meters (sensor range and cable length dependent)

Freeze Test:

Question: So… I froze a Level1000 into a solid block of ice, what happened to the logger?

Answer: As ice formed in the pressure port it applied pressure to the diaphragm. So, data captured during a freeze will not be representative of the actual depth of the logger. This should not come as a

surprise, and this is clearly not a flaw of the recorder… using pressure you can only measure depth when submerged in a fluid, and ice is not a fluid. The good news is that there was no damage to the logger. Pressure exerted by the ice on the transducer never exceeded 25psia, and the logger came out as good as new.

Desiccant:
The desiccant is located in the communications end of the Level2000
Question: Can it be purchased separately?

Answer: Yes, the Level2000 desiccant chamber assembly can be purchased separately (MadgeTech part number Level2000-DA

Question: Can the desiccant be reused if it becomes saturated? How can you tell it is saturated?

Answer: Yes you will be able to tell that the desiccant is saturated by the color. When it is saturated it will turn pink. The desiccant as well as the whole cartridge can be removed and baked for ~2 hours at 250-300°F to regenerate it. There is also no need to remove the O-Rings before baking as they are rated up to 400°F.

Resolution:
Question: The specification sheet for the Level 1000 states a nominal range of 0 – 30 ft and a measurement range of 0 – 100 ft (resolution 0.05”), yet the Level 2000 claims a range of 0 – 30 ft nominal range and resolution of 0.02”. Can you explain?

Answer: The Level1000 uses a 30psia transducer and the Level2000 uses a 15psig transducer. The Level2000 has a resolution of .02 and the Level1000 has a resolution of .05.

Contact Information

For further information described in this manual, please contact:

Geokon Inc.

48 Spencer Street
Lebanon, NH 03766
USA
Phone: (603) 448-1562
Fax: (603) 448-3216
Email: geokon@geokon.com
Web: http://www.geokon.com

Terms and Conditions

Software License.

(A) For purposes hereof, "Software" means the computer programs included in the Product at delivery, together with all codes, techniques, software tools, formats, designs, concepts, methods, and ideas associated with those computer programs. The term also includes all copies of any part of the software, as well as the manual(s) and printed materials provided by Seller.

(B) Seller grants Buyer a non-exclusive, non-transferable license to use the Software, in object code form only, according to the terms set forth below. Buyer may operate the Software only (i) in conjunction with and as part of the Product; (ii) in the manner in which it is intended by Seller; and (iii) at Buyer's plant site where the Product is first used. Buyer may negotiate with Seller separate licenses to use the Software at other plant sites. Buyer's use of Software shall be governed exclusively by Seller's and/or an third party owner's applicable license terms.

(C) Buyer shall not (i) make the Software available to any person or entity other than its employees, who must use the Software only as specified above; (ii) modify the Software or merge it with another program; (iii) reverse engineer, disassemble, decompile, or make any attempt to discover the source code of the Software; (iv) translate or create derivative works based on the Software; (v) remove, obscure, or alter any notice of the patent, copyright, or other proprietary rights related to the Software; (vi) sub-license, sell, lend, rent, or lease any portion of the Software; (vii) copy any portion of the Software; (viii) operate the Software other than in conjunction with operation of Product; or (ix) transfer the Software in violation of applicable United States Export laws and regulations.

(D) The Software involves valuable proprietary rights to Seller and others. There is no transfer to Buyer of any title to or any ownership of the Software or any patent, copyright, trade secret, trade name, trademark, and other proprietary rights related to the Software, regardless of the form in which they exist. Seller may at any time replace, modify, alter, improve, enhance, or change the Software.

(E) Both the license and Buyer's right to use the Software terminate automatically if Buyer violates any of these Terms and Conditions. In the event of termination, Buyer must immediately return, or destroy, all copies of the Software.

Note: For full details on Terms and Conditions go online to www.geokon.com.