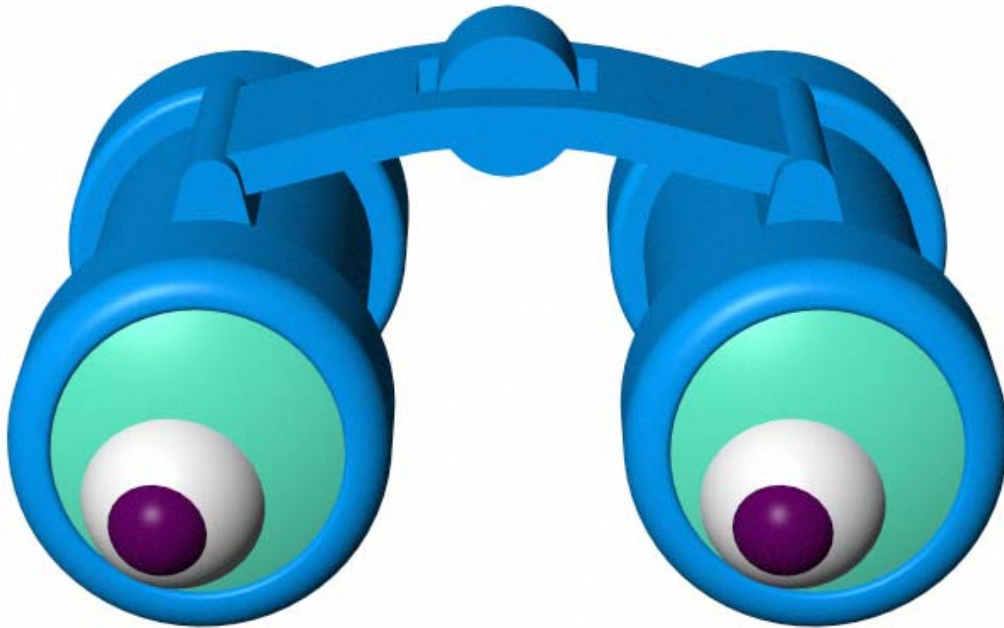


# SeeG3



## *SeeG3* Users Manual

V2.00

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Erie, Colorado, USA

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## Introduction

This manual explains the operation of Micro-g Solutions' (MGS) *SeeG3* Software version 2.0. *SeeG3* allows users of the Scintrex CG-3 meters a convenient way to download observed data directly from the meter and/or view CG-3 format data in the Windows™ environment. Once the data is uploaded into the *SeeG3* environment, users can view all valid data channels including gravity, standard deviation, tilt x, tilt y, temperature, and earth tide correction. *SeeG3* also allows users to calculate correction factors that can be applied to their data. The user can correct for polar motion, pressure, tides, and drift.

*SeeG3* requires a binary security file that is unique to each individual system to operate.

## System Requirements

*SeeG3* runs best with the following minimal standards:

Operating System:	Windows 98 or Windows 2000
Free Hard Drive Space:	2MB or greater
RAM:	64MB or greater
Processor:	Intel™ P2 or greater
Processing Speed:	200MHz

## Installing SeeG3

Licensed users of **SeeG3** will receive one Compact Disc media with at least the following<sup>1</sup>:

1. README.TXT (f) – Overview of installation procedures
2. **SeeG3**Help.pdf(f) – This document
3. Setup.exe(f) – Install application for Windows™ Machines
4. SysChk.exe (f) – System Password generation application.
5. data.txt(f) – Sample data for practice processing.
6. Acrobat(d) – Directory containing Adobe Acrobat Reader (5.0).
7. LICENSE.TXT – Standard Software Licensing Information.

If you do not have ALL the listed files and/or directories on your CD, please contact MGS immediately. To install the software:

- Double click the Install application. Follow the instructions. It is highly recommended that you accept ALL installation paths.
- From the Micro-g Solutions Program files menu, run the SysChk.exe program and generate the “SysChk.bin” file
- Email the file “SysChk.bin” to [mking@microgsolutions.com](mailto:mking@microgsolutions.com). You will receive via a return e-mail the binary password file **SeeG3**PWInfo.bin<sup>2</sup>. This usually takes less than twelve hours during a normal business week.
- Upon receipt of **SeeG3**PWInfo.bin, manually copy the file into the newly created BIN directory of Micro-g Solutions. (Usually c:\Program Files\**SeeG3**\BIN). If a valid password is not found in the BIN directory, **SeeG3** issues the warning “Invalid Password File” and exits after acknowledgement from the user.

You are now ready to run **SeeG3**.

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<sup>1</sup> (f) and (d) indicate “file” and “directory” respectively

<sup>2</sup> Security files are unique to each computer. Please send only ONE file at a time.

## SeeG3

To learn how to edit, view and graph data from an existing file (*SeeG3* supports the standard Scintrex CG-3 format), we will use the sample data included on the distribution disk (data.txt).

### SeeG3 Text File Structure

The input and output data files used by *SeeG3* are equivalent to the standard CG-3 format<sup>3</sup> and are stored as ASCII text. The header information holds data and information that is constant for all stations/observations listed under that header. The station information contains data that was acquired from the specified position at the time of acquisition. For a sample file we will use the “data.txt” file that is automatically installed and located in the *SeeG3* directory.

### How SeeG3 works

*SeeG3* allows users to load and view CG-3 format data from a file or directly from a CG-3 gravity meter. After loading the data into the software application, the user is able to select which channels of data to view and make corrections to the channels to determine a corrected relative gravity observation.

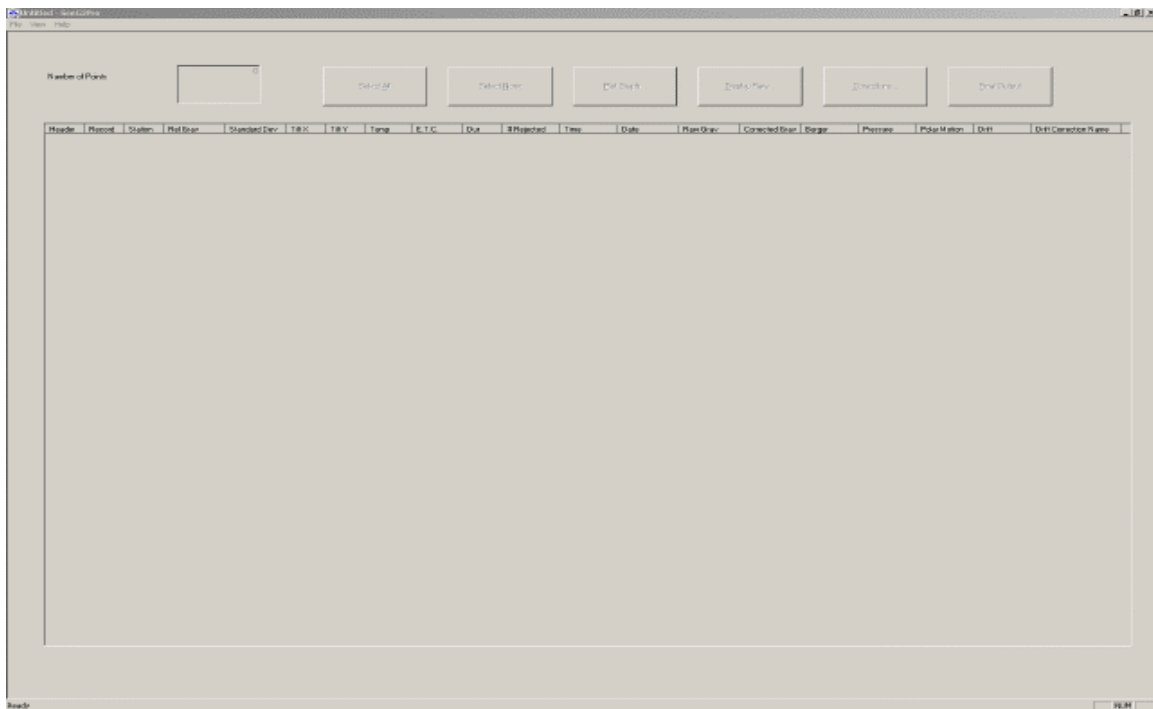


Figure 1 - Blank start-up screen for SeeG3.

<sup>3</sup> See your CG-3 manual for details of the data format; make sure the file has all ten channels.

## Starting SeeG3

To start *SeeG3* double click on the “*SeeG3*” icon. The screen displayed in Figure 1 will appear on the screen. Select File | Import and the screen shown in Figure 2 will now appear on the screen.

The raw data will be stored in the window on the left. The right portion of the screen is broken into three parts (Meter, ASCII and Instrument). If “ASCII File” is selected at the top of the screen, then the user can open an existing CG-3 format data file. If “Instrument” is selected, then the user can configure the port settings and retrieve data directly from a CG-3 meter serial data port.

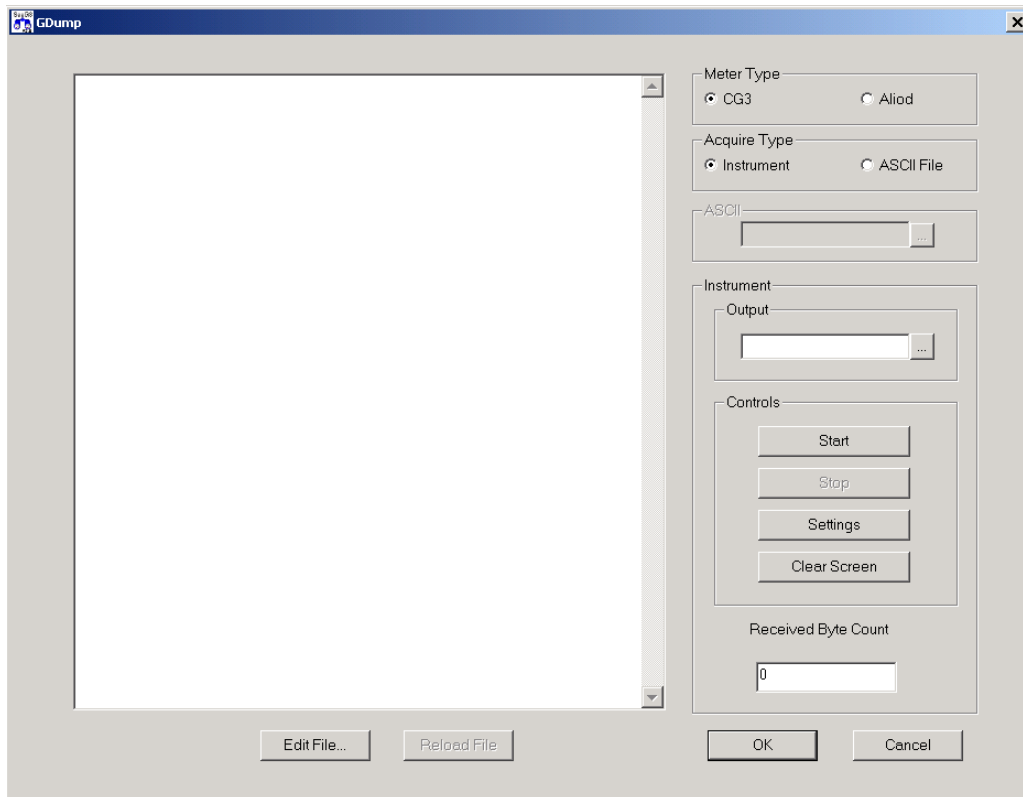


Figure 2 - File and Instrument Data Import Screen

## Viewing Data

### File Data

To load previously existing CG-3 format data from a file, select the “ASCII File” option at the top of the screen. When “ASCII File” is selected, all of the “Instrument” controls are disabled and vice versa.

Click on the button to the right of where it says “ASCII” to load a text file. Use the browser to select the sample file “data.txt” from the *SeeG3* install directory and click “Open”.

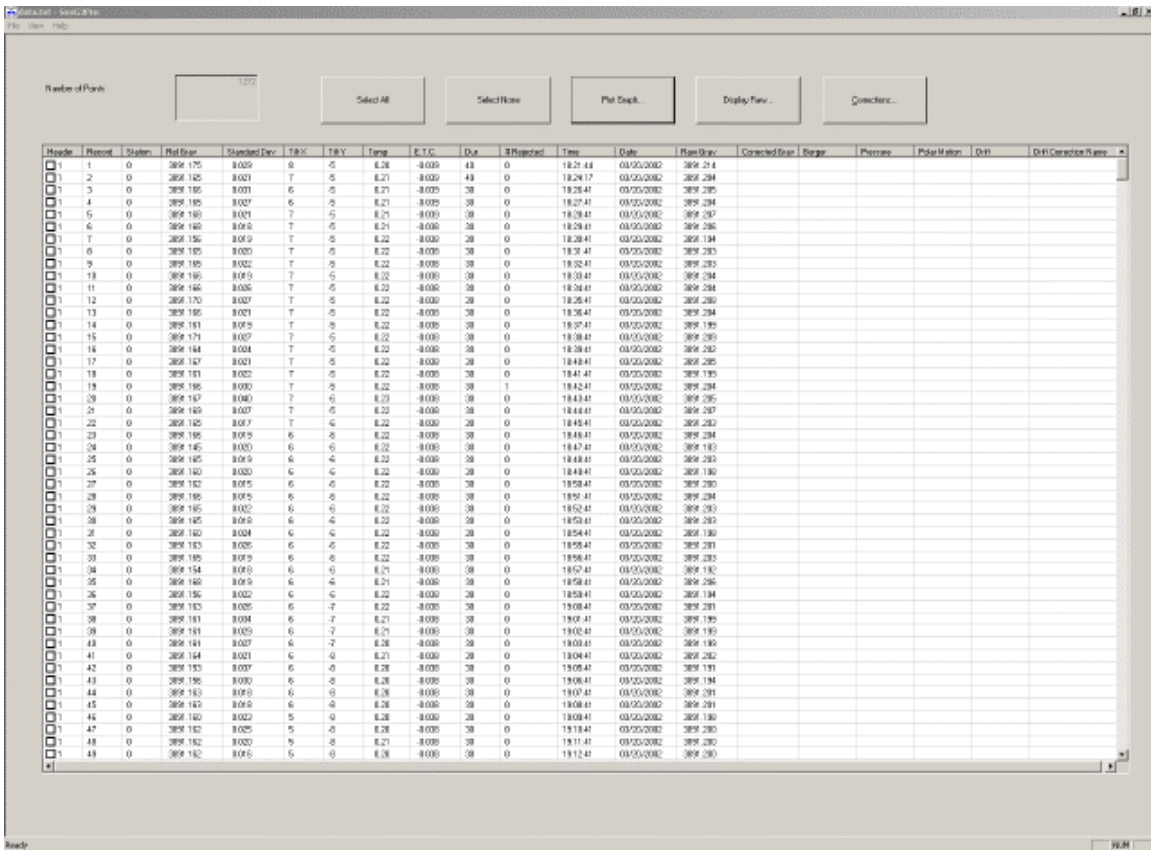


Figure 3 - Data loaded into the main option screen.

The left portion of the “gDump” window will now update with the raw CG-3 format data from the file. The user can browse through this data using the scroll bars on the right side of the window.

If the user is satisfied with the data, he or she can click “OK” on the bottom of the screen and return to the opening screen of the program. The data is now loaded and the appropriate options will be enabled as seen in Figure 3.

For each station occupied, there is a row of text. This text is separated into thirteen columns. The header column refers to the header number to which the station belongs. The record number is the number of stations with respect to the header it belongs too, i.e. the sequential index of the station within the designated header block. The rest of the data (station, gravity, standard deviation, tilt x, tilt y, temperature, earth tide correction, duration, number of rejections, time, and date) is calculated directly by the meter.

Click on the check box to the far left of the screen to select individual points to view. If the user would like to view all the points, he or she can click the “Select All” button and then click on either “Display Raw” or “Plot Graph”. If the user clicks “Display Raw” then the header information and the station information of the selected points will be shown in CG-3 format in the new dialog box shown in Figure 4.

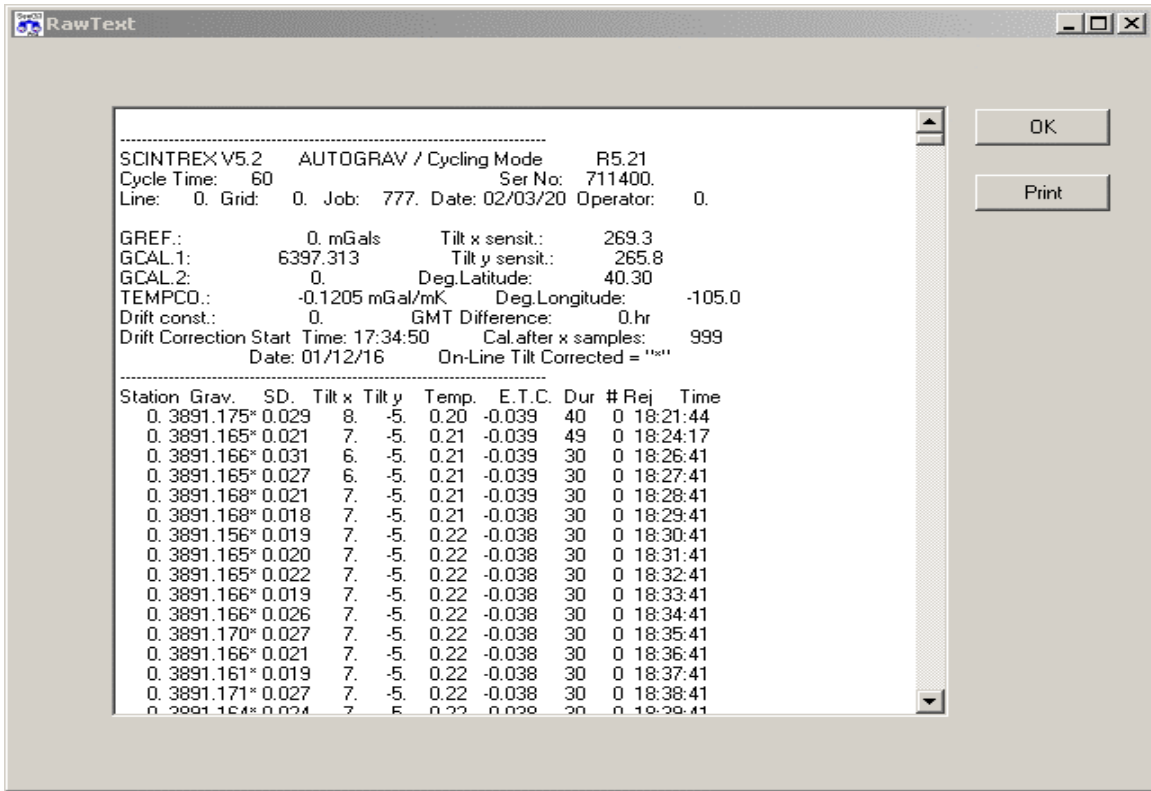


Figure 4 - View of Raw Data of Selected Points in Main Window

If the user clicks on “Plot Graph”, then the graph screen will appear with the selected points graphed as shown in Figure 5.

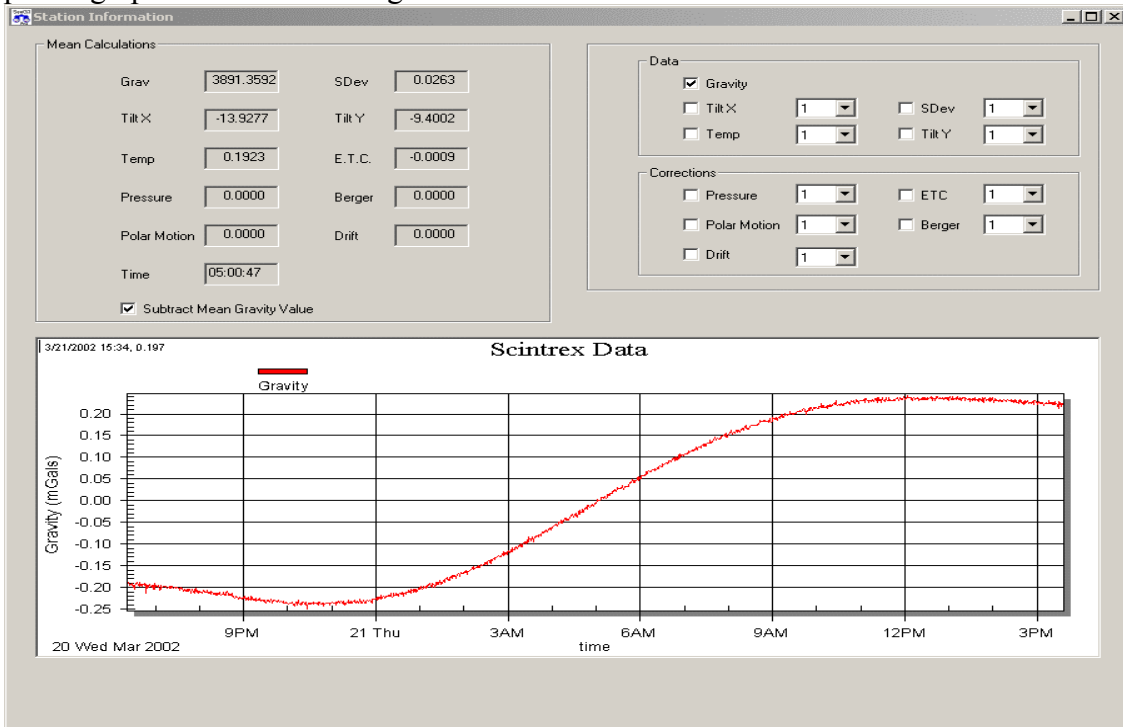
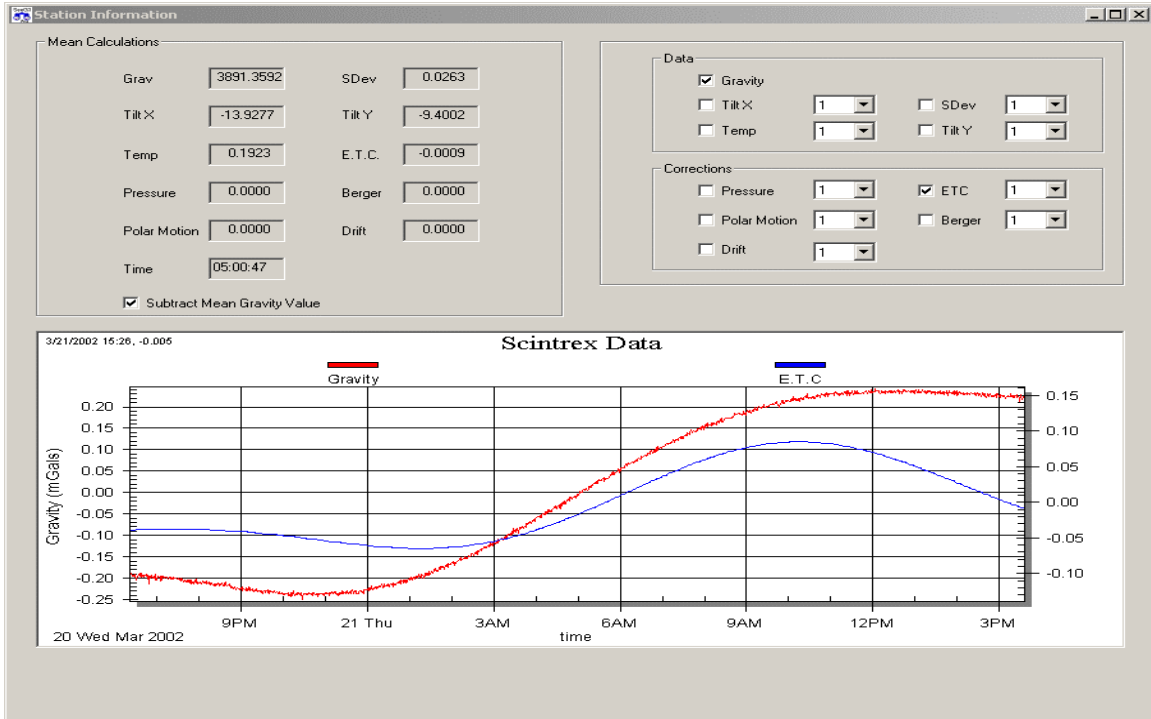


Figure 5 - Raw Data Graph from selected points in Main Window



The top part of this screen contains the mean values of all the selected points. Just below these are the check boxes that allow the user to select which channels to view. If the user clicks on the Sdev check box he or she can see that the standard deviation for those points is now graphed.

Next to the check boxes there is a list box next to all of the channels except for gravity. This allows the users to change the scale of the points by factors of 10. The scale on the left is for gravity while the scale on the right is for all other plotted channels.

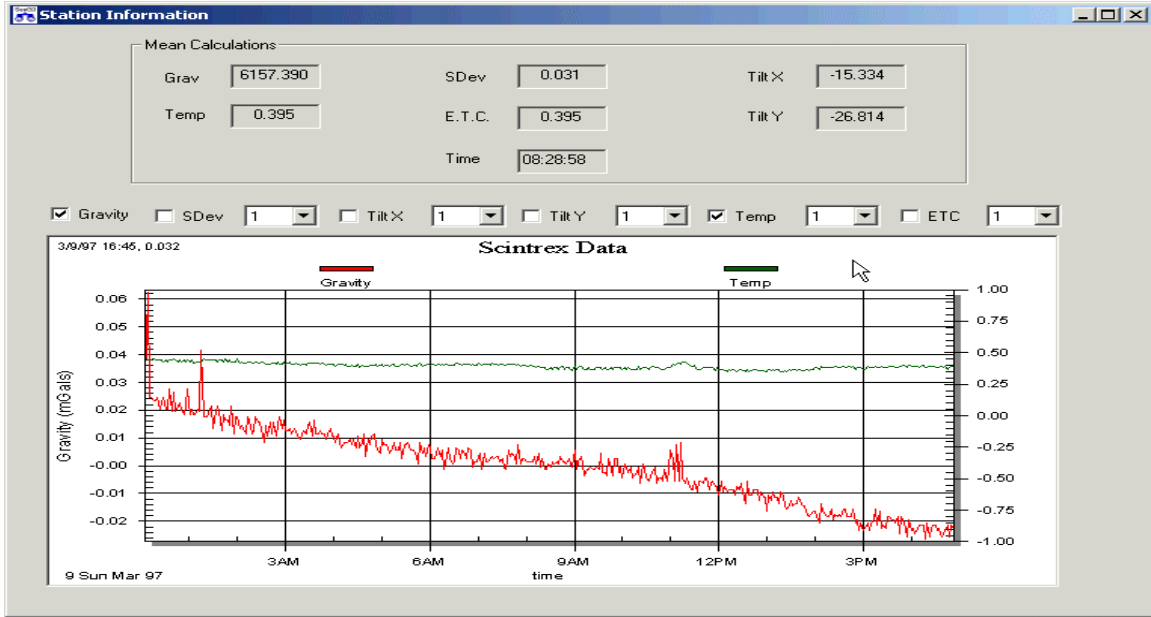


**Figure 6 - Raw Gravity Data with ETC from selected points in Main Window.**

The user can also click and drag on the graph to zoom in on them. Double clicking on the graph object allows complete editing of the plot area including title, scaling, and printing.

At any time the user can change which points are selected and update the graph by re-clicking on either "Display Raw" or "Plot Graph".

The user can click the check boxes next to the channel names to display up to ten channels (gravity, standard deviation, tilt x, tilt y, temperature, earth tide corrections, pressure, Berger, polar motion, and drift). In Figure 6, for example, gravity and the earth tide correction are shown. Figure 7 shows gravity versus temperature.



**Figure 7 - Gravity (red) and Temperature (green). Note the correlation between spikes in gravity and spikes in temperature.**

To allow comparison of signals, the user can multiply a channel by selecting a multiplier value from the drop down list next to the channel to modify. This enables the user to more clearly see trends and correlations in the data as shown in Figure 8. The user can also click and drag on the graph to zoom in on a point of interest as shown in Figure 9. Lastly, the user can modify graph properties by either right clicking or double clicking on the graph.

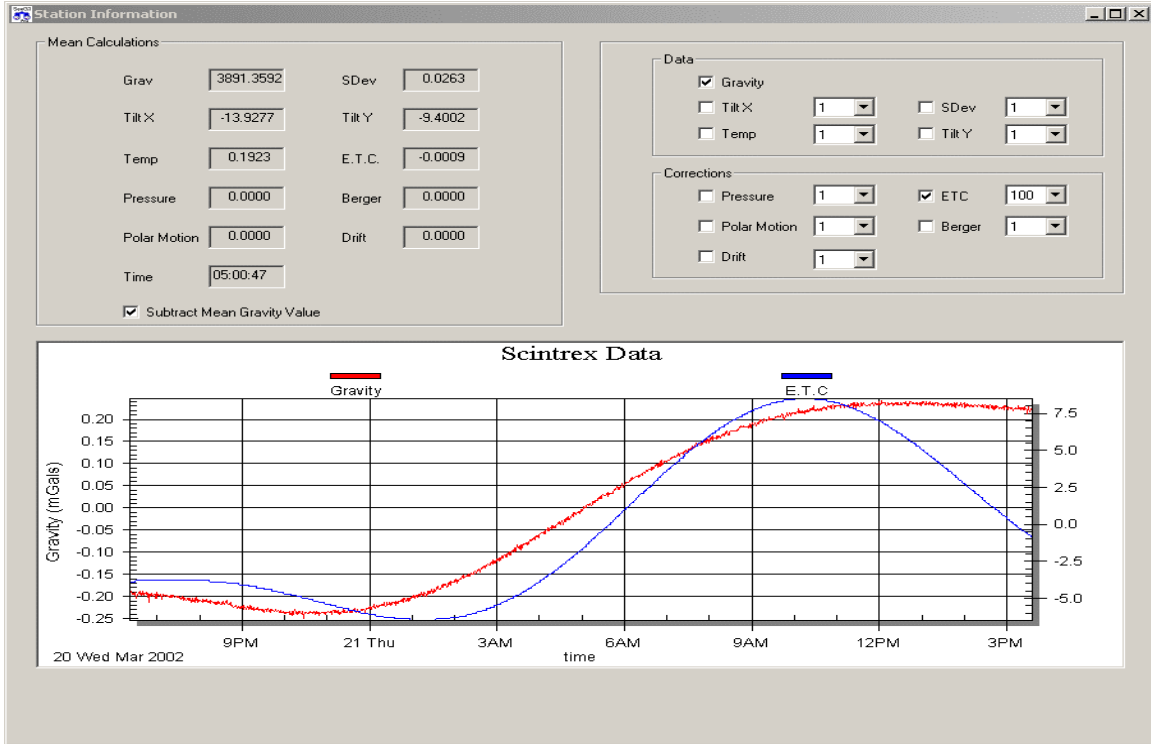


Figure 8 - Earth Tide Correction multiplied for viewing correlations.

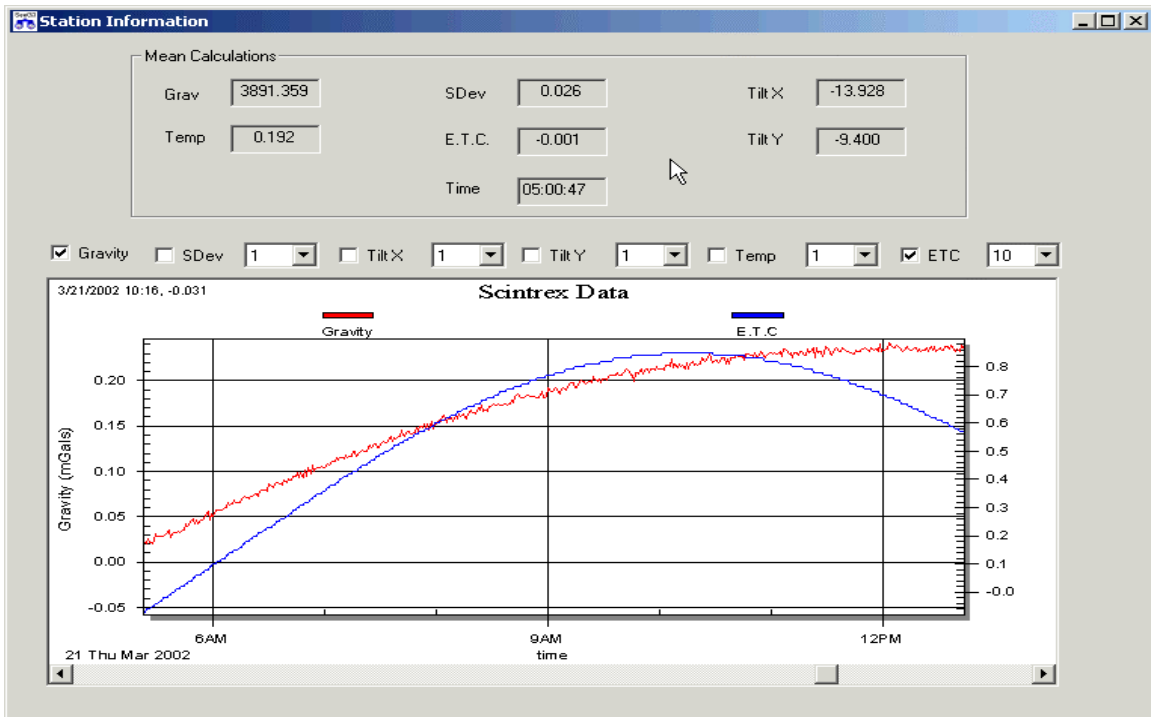


Figure 9 - Earth Tide correction multiplied and zoomed for viewing correlations.

## Downloading Instrument Data

To acquire data from a CG-3 meter, select the “Import...” option from the main menu and click on the “Instrument” selector at the top of dialog screen. This will cause the “Instrument” controls to become enabled while all of the “ASCII” controls become disabled.

Click on the button to the right of “Output” to select a text file for output. In the browser, enter the name of the output data file (such as “data.txt”) and click “Open”.

Now click on the “Settings” button and choose the appropriate settings for serial communication. The CG-3 instrument must be set to these same parameters. NOTE: Consult your CG-3 manual for the recommended settings.

When finished selecting port settings, click “OK” to go back to the gDump screen.

Click the “Start” button to start monitoring the specified communications port. Move to the CG-3 instrument and begin the download process from the instrument control panel. The display will show all data received in the view area. The user can watch the progress of the communication by looking at the “Received byte count” which will start increasing as soon as the meter is told to dump data. To stop monitoring the communication or terminate the download before completion push the stop button.

When the “Received byte count” stops increasing, this means that there is no more data, and the communication port will close automatically. If the user presses the stop button before all communication is finished, he or she may need to edit the file to get rid of partial data<sup>4</sup>.

If the user is satisfied with the data, they can click the “OK” button on the bottom of the screen. This will take the user back to the opening screen of the program and the raw CG-3 formatted data will be loaded and options enabled as seen previously in Figure 3.

For each station in the raw text file there will be a single row of text. This text is separated into thirteen columns, one for each type of data. The header is the header number that the station belongs to. The record number is the number of the station with respect to the header it belongs too. The rest of the data is the data calculated by the meter.

The user can click on the check box on the far left of the screen to select individual points to view in the graph tool. To view all the points in either text or graph form, click the “Select All” button and click either “Display Raw” or “Plot Graph” respectively.

If the user clicks “Display Raw” then the header information and the station information of the selected points will be shown in CG-3 format in the new dialog box as shown previously in Figure 4.

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<sup>4</sup> See “Editing Data” on the next page.

## Editing Data

Prior to editing any data, it is strongly recommended that you back up original data in a safe location on your hard drive or other media. In the gDump dialog box, if there is a problem with the data, the user can click on the “Edit File” button on the bottom of the screen. This will start notepad and load the current file so that the user can edit the file and remove any data that he or she does not like. After editing the data the user can save the file and go back into *SeeG3*. If the user clicks the “Reload” button the corrected data will be displayed.

## Modifying Graph Properties

Most users will want to modify graph properties so that they can customize how they want the data to be plotted. By double clicking on the plot screen the user will see the dialog box in shown in Figure 10. By navigating through the various options the user can select appropriate colors and scales.

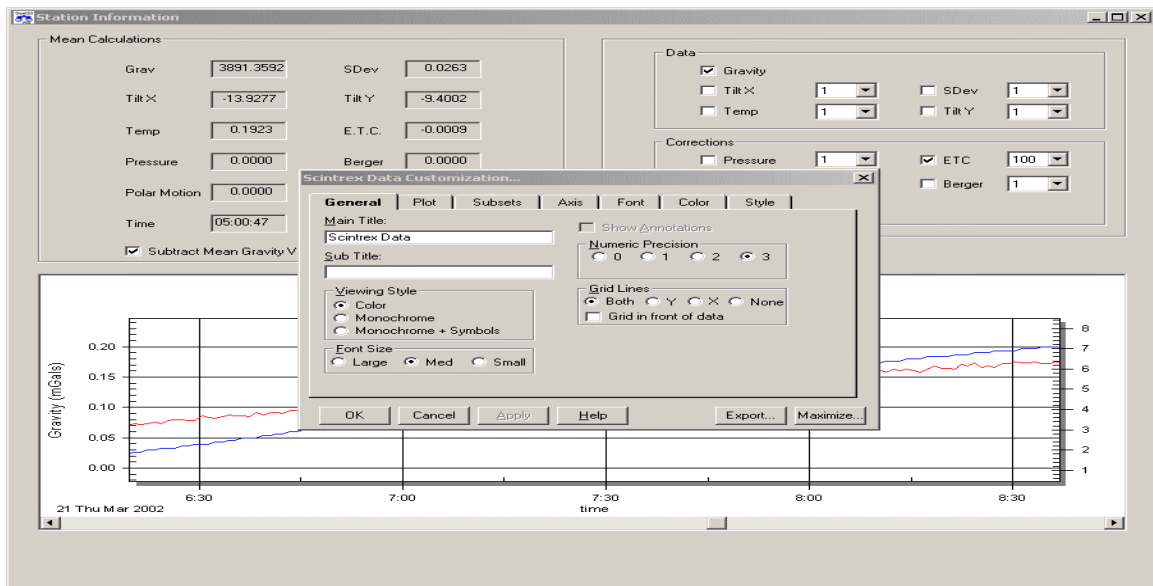


Figure 10 - Modifying graph properties menu displays by double clicking on graph area.

## Adding Corrections

*SeeG3* allows users to calculate and apply corrections for polar motion, pressure, tides (Berger and Longman), and drift. To apply corrections to some or all station points, the user just needs to select which points to apply the corrections to and click on the “Corrections” button. This will bring up the dialog in Figure 11.

**Figure 11 - Corrections Menu**

In the tide section the user can choose either to use Longman<sup>5</sup> or Berger tide corrections, or remove completely the tide corrections out of the data.

In the Pressure area the user can enter an elevation and click the “set” button to calculate the nominal pressure. The user then can add or modify points that the user knows the pressure for and when the user presses the “Apply” button, SeeG3 will calculate the pressure corrections for all the selected points by linear interpolation.

In the Polar Motion area, the user can load a polar motion file, and SeeG3 will interpolate the correction from the supplied file.

<sup>5</sup> The Longman Correction is standard and made by the Cg3 EPROM software. Berger is a more advanced tide correction .

In the “Drift” area, the user can use the selected points to find any drift that occurs over time. The user can also apply that drift over any other points that he wants.

When the user finishes calculating the corrections, he can hit the “Apply” button in the middle of the screen to apply the changes to the data.

## **SeeG3 Views**

### **Main View**

This Dialog box is what controls the entire *SeeG3* program. From here the user will get the data, and view it as he or she sees fit.

### **File**

#### **Import**

This option is for getting data to view.

#### **Exit**

This option is to exit the program.

### **View**

#### **Raw**

This option is for viewing the selected raw text.

#### **Plot**

This option is for viewing the selected stations graphically.

### **Help**

#### **About SeeG3**

This option shows the user what version is currently installed

### **Number of Points**

This box shows the total number of points that were acquired.

### **Select All Button**

This button is for selecting all the points in the view area. (This makes selection a lot faster than clicking each individual point.

### **Select None Button**

This button is for deselecting all the points in the view area. (This makes deselecting a station much faster than clicking each individual point.

### **Plot Graph Button**

This button is for plotting the selected points graphically in a separate dialog box.

### **Display Raw Button**

This button is for displaying the selected points and their appropriate headers in a separate dialog box.

### **Corrections Button**

This button is for the user to decide what data corrections he would like to calculate and apply.

### **Final Output**

When the user is done with correcting the data, he can click this button to bring up a final output dialog box. This final information combines each station into one point.

### **View Area**

This area is a list of all the points acquired by the software.

The user can click the points that he or she would like to see, and the appropriate button (Plot Graph or Display Raw) to view the data, or (Corrections) to correct the selection points.

If the user right clicks, or double clicks on the area, more options will be seen.

### **GDump**

This dialog box is where the user uploads data for viewing.

**OK Button:** Click this button to parse data to the Main Screen.

**Cancel Button:** Click this button to exit back to the Main Screen with out parsing data.

### **Meter Type**

For selecting either CG3 or Aliod from L&R (the latter function is yet to be added)

### **Acquire Type**

This selection is for acquiring data from either a CG-3 meter or from an existing file.

### **ASCII**

This button is for selecting a file to acquire data from.

**Input Browse Button:** The user can click this button to get the file that he or she wants to use for input.

### **Instrument**

**Output Browse Button:** The user can click this button to get the file that he or she wants to save to.

**Start Button:** Click this button to start monitoring of specified comport.

**Stop Button:** Click this button to stop monitoring of comport.

**Settings Button:** Click this button to set up communication settings.

**Clear Screen Button:** Click this button to clear the input window.

**Received Byte Count:** This monitors how much data is coming in from the



Specified comport.

**Edit File Button:** This button launches notepad or other default text editor, so that the user can fix any errors or delete unwanted data from the current file that he or she is using.

**Reload Button:** This button is for reloading data that has been edited. Use this button After editing the contents of a file.

### **Input Window**

This window is where raw text is displayed so that the user can view and make changes.

**Edit File Button:** The user can click this button if he or she would like to make changes to the file.

**Reload Button:** The user can click this button after making changes to reload the data to the input window.

### **Raw Display**

This dialog box is for viewing the raw text data for selected points.

**OK** – This button closes the view.

**Print** – This button is for printing output to a printer.

### **Plot Graph**

This dialog box is for viewing the selected points graphically.

**Mean Calculations:** These values represent the mean of all selected points.

**Gravity:** Gravity is the only channel plotted on the left axis. Click the check box to graph the gravity values of the selected points.

**Other Channels:** All channels other than gravity are plotted on the right axis. The User can click the check box next to the channel he or she wants to display. The user can then select the multiplier to multiply the value related to the specified channel.

**Plot View:** This view shows the graph of all the selected points.

### **Corrections**

This dialog box is for selection what data corrections to apply to the selected points.

**Tide** – This area is where the user selects what tide model to use. By default Longman is used<sup>6</sup>. The user has the choice of either Longman, Berger, or None.

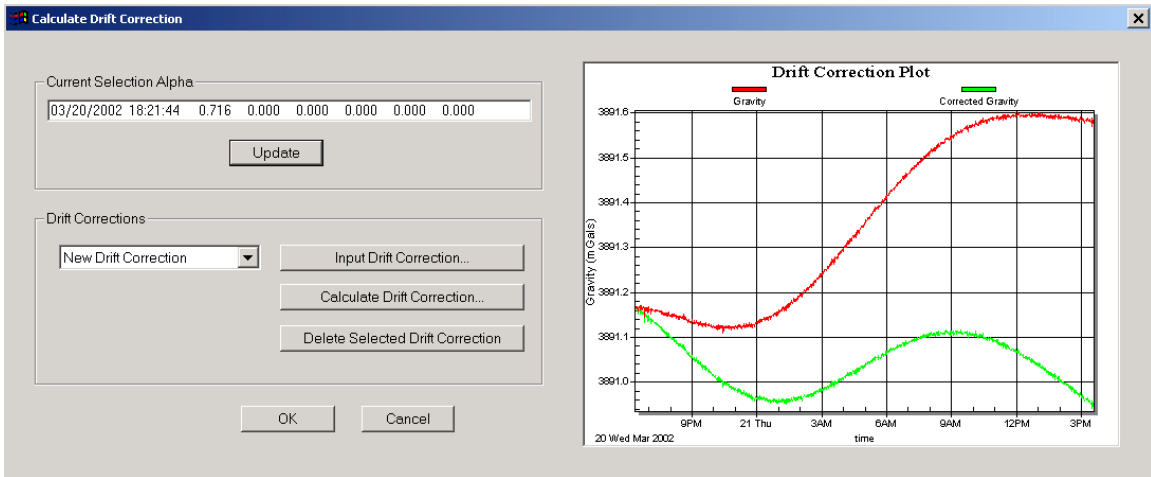
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<sup>6</sup> The Scintrex CG-3 meters add a Longman tide correction to all data by default.

**Pressure** – This area is for adding a pressure correction. The user can enter an elevation and click “Set” to calculate the nominal pressure. Then in the list box below you can enter the pressure that you recorded at any time during the run. When the user hits the “Apply” button, the pressure correction will be calculated for all selected points.

**Polar Motion** – This area is for adding a polar motion correction to your data. The user can select a polar motion file to use and the corrections will be added to the data.

**Drift** – This is where the user can add a drift correction to the data. By clicking the “Calculate Drift” button the dialog box in Figure 12 will appear. They user can manually edit the drift calculation by editing the “Current Selection Alpha” edit box on the top left of the screen and clicking the “Update” button, or he can click on “Input Drift Correction” button. If the user clicks the “Calculate Drift Correction” button, a new dialog will pop up that allows the user to select a name for the drift correction. This allows users to study the affect of different types of corrections on their data. The drift correction effect will be shown on the right window.



**Figure 12 - Drift Correction Dialog Box.** The red is the data before drift correction and green is after correction.

## ***Final Output***

This dialog box contains all selected data combined by station. It consists of eight channels, Time, Date, Station, Latitude, Longitude, Gravity, Standard Deviation, and Number of points for that station. This can be seen in Figure 13. The table is always sorted by the station names.



## **License Information**

Licensed users of *SeeG3* are entitled to one install per License. Additional installations, including support, can be purchased directly from Micro-g.

## **Support**

Questions concerning the operation of *SeeG3* software and any problems using *SeeG3* should be directed to:

[microg@microgsolutions.com](mailto:microg@microgsolutions.com)

You can expect to receive an email or phone call within forty-eight hours of your inquiry.

## **Maintenance**

Periodically MGS will post an upgrade “patch” for *SeeG3* on the website. These patches will be posted without notification so please check back every few weeks to get the latest patch if applicable.