

GLog Users Manual

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Introduction

GLog is a program to calculate river gaugings. It operates both mid section (USGS) and mean section methodologies. It allows for rapid entry of gauging data and calculations of results, then produces both graphical and textual outputs.

Installation

GLog is provided as a self-extracting zip file, which runs an installation wizard.

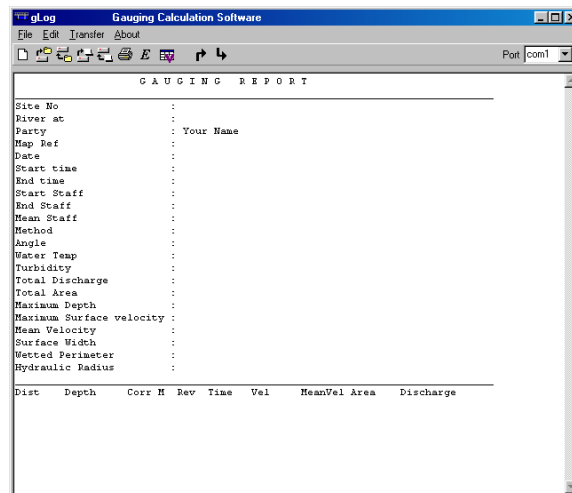
1. Copy GLOGINST.EXE to a temporary directory on your computer.
2. Run the program, typically by double clicking it. A set of install files will appear in the same directory.
3. Click the file SETUP.EXE. An Installation wizard will run.
4. Delete all the files in the temporary directory.

Initial Use

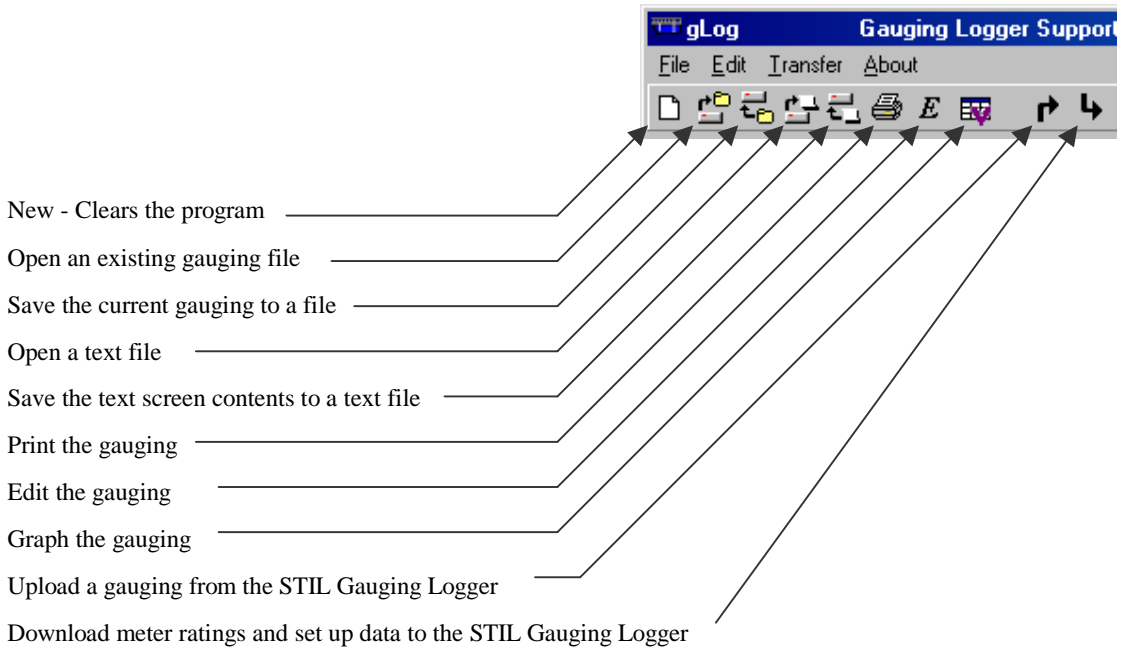
The program is started from the “gLog” entry on your start menu. On the first operation, select the File menu and choose the methodology (mid section or mean section) and the units you prefer. Mid section is used for USGS.

Operation

GLog presents a window looking like:



Operation is controlled by menus, or the “speed bar” of buttons. These buttons operate as follows



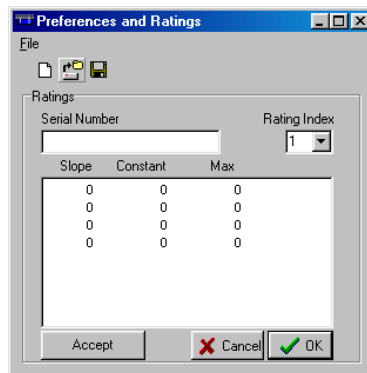
The last two speed buttons and also the serial port configuration are for use with the STIL Gauging Logger, and are not relevant to those using the program just as a gauging calculator.

Entering gaugings

To enter a new gauging:

Clear the program with the “New” button – (only if there has been gauging loaded or previously entered).

Use the “Edit the gauging” speed button. A window will appear like:



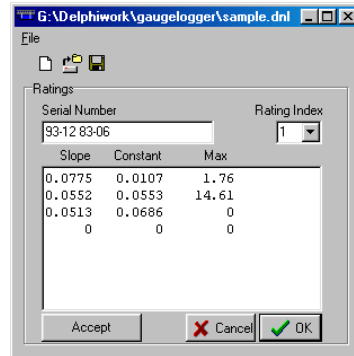
The ratings for the current meter(s) need to be entered at this point. Ratings for contact closure meters are entered as slope and constant (sometimes called offset)

The slope is the water velocity to count ratio (units = m/sec or ft/sec per count)

The constant is an offset (units = m/sec or ft/sec)

Most meters have a ratings curvature. This curve can be approximated by several slopes and constants. In this case a maximum is given for each slope and constant except the last line which has a max of zero.

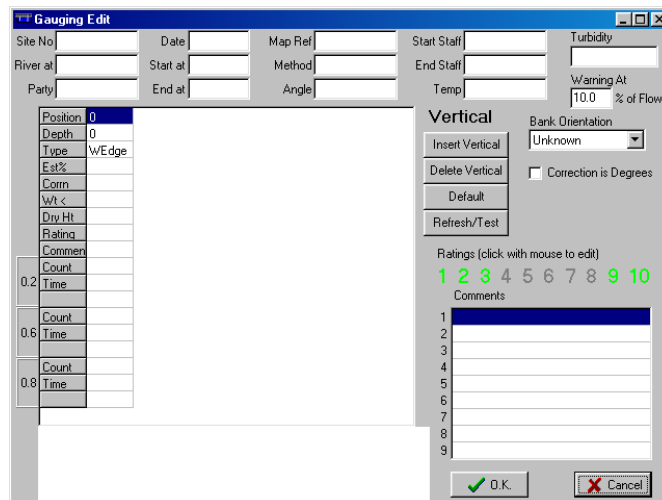
The max value is the count rate in which to change to the next slope and constant (units = counts per second). A typical entry could look like:



The gauging may involve more than one meter (typically by changing the propeller, or the contact). Up to ten ratings can be entered. Once the ratings have been entered they can be saved to a file (with a *.dnl extension), and subsequently retrieved.

To enter or change the ratings, just type the slope, constant and max on successive lines, then press the Accept button, and the display “Tidies up”. Entries are ignored if the Accept button is not used.

Once the ratings are entered, the Edit screen appears:



The Site number, River at, Map Ref, and Party identify the gauging location and the staff responsible. The Date and Times identify when the gauging occurred. Method, Angle, Temperature and Turbidity provide extra documentation about the gauging.

There are two staff gauge values. This allows for changes in the level while gauging. You may just use one and leave the other blank

The Bank Orientation indicates if the left bank has the lower position value (i.e. the beginning of the tape was on the left hand bank).

The “Correction in degrees” option is for horizontal angle correction (e.g. angle of bridge to the flow). This can be entered in degrees or as a fraction. When entering in degrees, zero degrees is normal, when the flow is at right angles to the bridge.

The “Warning At” value is a quality assurance measure. It is used in the graphical display. In a typical gauging, no measured vertical should have more than 10% of the total discharge.

Most of these fields can be left blank, in which case the data item will be omitted from the final gauging report.

Some of the rating numbers are coloured. This indicates which of the ten ratings have valid slope and constants (and are valid for use).

Use the “Tab” key to move between the fields, and the shift Tab to move backwards.

The Comment cells are for comments that can be entered for each vertical.

The Items entered per vertical are:

	Position	Position across the stream or river. Must be entered for every vertical See Note 1.
	Depth	Depth of the stream at the vertical. See Note 3.
	Type	Type of reading. See Note 2.
	Est%	Estimated value. Only for Pier readings. For mean section the estimate. See Note 4.
	Corrn	Horizontal correction value. See Note 5.
	Wt <	Wet Line angle. May be left blank in which case it defaults to 0 degrees See Note 6.
	Dry Ht	Dry Line height May be left blank.
	Rating	Meter Rating Number
	Commen	Comment indices. See Note 7.
0.2	Count	Count for 0.2 reading
	Time	Time for 0.2 readings
0.6	Count	Count for 0.6 reading
	Time	Time for 0.6 readings
0.8	Count	Count for 0.8 reading
	Time	Time for 0.8 readings

Notes:

- The position must be entered from a lower value to a higher value.
- Type of readings may be:

Mid Section	
Centre	Another reading exists on both sides of this vertical.
Waters Edge	Reading exists on one side only, Depth is usually zero.
Estimate	Waters edge estimate. Typically used for Bridge Piers. The Velocity is estimated as a percentage of the reading next to it.
Sounding	A measurement of depth only.
Ad hoc	An arbitrary measurement at an arbitrary depth.
Mean Section	
Centre	Another reading exists on both sides of this vertical.
Waters Edge	The edge of the river/stream. Depth is typically zero.

Effective Waters Point of no flow. The velocity in the adjacent section to this vertical is derived from the other verticals velocity. A percentage is specified (as the Ewe%)

Sounding A measurement of depth only.

Ad hoc An arbitrary measurement at an arbitrary depth.

3. For Ad hoc readings use the depth of the actual reading, not the depth of the river/stream.
4. The Estimate row is labelled "Ewe%" for mean section.
5. If the correction is left blank, a value of zero (degrees) or one (fraction) is used.
6. If wet line angle and dry line height are entered the software does both dry line and wet line corrections for the depth measurement.
7. Comments are entered as "1" or "4", or a combination such as "14" These digits reference the comments listed in the right of the window.
8. It is possible to move to the next logical field using only the Down arrow key or the Enter key. This assists rapid data entry.

The screen with data entered will look like:

The screenshot shows the 'Gauging Edit' window with the following data entered:

Position	3	3.4	3.7	4	4.3	4.6	4.9
Depth	0.46	0.52	0.56	0.58	0.58	0.58	0.58
Type	Est	Centre	Centre	Centre	Centre	Centre	Centre
Est%	70						
Corr		1	1	1	1	1	1
Wt <							
Dry Ht							
Rating		1	1	1	1	1	1
Comment	2						
Count		108	102	108	121	121	141
Time		40	40	40	40	40	40
RMS		0.074	0.074	0.074	0.074	0.074	0.074
Count							
Time							
RMS							
Count		58	57	58	61	61	67
Time		40	40	40	40	40	40
RMS		0.064	0.064	0.064	0.064	0.064	0.064

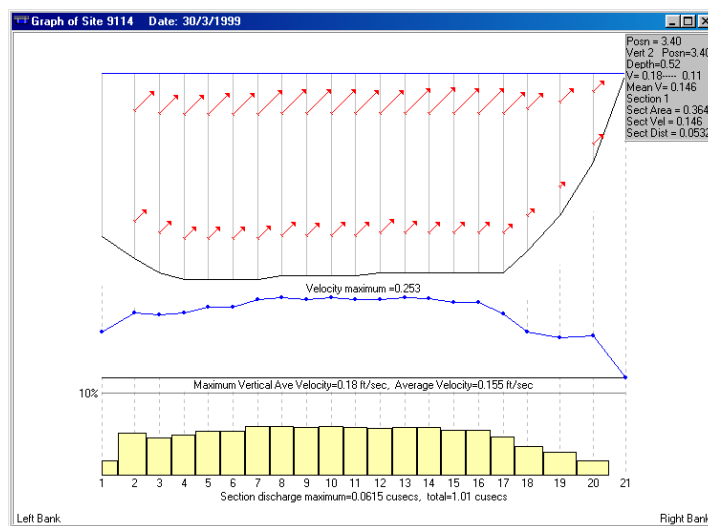
The graphical display at the bottom shows a river cross-section with vertical measurement points indicated by red arrows. The first vertical is at the edge of a pier, marked with a comment number of 2.

A graphical display of the data becomes visible as data is entered. This helps avoid mistakes.

Notice that in the above example, the first vertical has a comment number of 2 that corresponds to a bridge pier. The vertical nature of the pier at the waters edge means that no velocity measurement could be taken. The velocity at the edge of the pier is therefore estimated as 70% of the velocity of the next vertical.

Working with Gaugings

Once the data is entered, a listing of the gauging is displayed. This can be also viewed graphically with the appropriate menu item or speed button. The graphical view looks like:



The gauging can be saved to a file for archiving, or printed. The printed output contains both text and graphical views of the gauging.

The graphical window is mouse sensitive. Moving the mouse over the verticals gives a little panel in the top right hand corner. This gives:

- The position of the mouse in meters across the screen
- For the vertical nearest the mouse cursor:
 - The vertical number
 - The position of the vertical across the stream
 - The depth of the vertical
 - The velocities at 0.2 0.6 0.8
 - The mean velocity of the vertical
- For the section under the mouse
 - The area of the section
 - The mean velocity in the section
 - The discharge of the section.

Clicking the left mouse button in this screen swaps the view from upstream to downstream (swaps the sides)

Clicking the right mouse button in this screen copies the graph to the clipboard for pasting into another program such as Word, or Windows Paint.

Clicking with the RIGHT mouse button on the text window has a similar function.

Customising the Text View

It is possible to customise the text view. When gLog starts it reads in a file “default.txt”. When the .glr file is processed, it “fills in” the text in Windows. It is possible to modify the display by modifying the contents of default.txt before operating the program.

The process of loading a gauging fills in the following fields:

Site No
River at
Party
Map Ref
Date
Start Time
End Time
Start Staff
End Staff
Mean Staff
Method
Angle
Water Temp
Turbidity
Verticals
Total Discharge
Total Area
Total Width
Maximum Depth
Max Surf Velocity
Maximum Surface Velocity
Mean Velocity

If the file default.txt does not have these lines, then they are ignored. If default.txt has lines other than these they are left unchanged.

The details about the content of each vertical can also be modified. As an example it is possible to produce the above report without the meter number or the RMS.

The first line of the Verticals MUST have: “Dist”, “Depth”, “Rev”, “Time”, and “MeanVel”.

The order should be:

Dist	The position across the stream
Depth	The depth of the stream
Corr	The correction for angle
M	The meter number (index)
Rev	Number of revs
Time	Count time
Vel	Velocity of reading
RMS	RMS variation of readings (this is data produced by the STIL Gauging Logger)
MeanVel	Mean velocity in the vertical
SectVel	Mean velocity in the section (same as MeanVel of mid section gauging)
Area	Section Area
Discharge	Section Discharge

The fields:

Corr, M, Vel, RMS, SectVel, Area, and Discharge are optional.

Note that for mid section method, MeanVel (mean velocity) and SectVel (section velocity) are the same.

Leaving any of the fields out of the display will not affect any of the calculated values, either of the vertical, or the whole gauging. All calculations are done to the highest level of accuracy. Any rounding on any of the displayed values will not affect the accuracy of the internal calculations.

Data Format

The raw data file contains all of the gauging information in a text file. This is suitable for post-processing to import the data into other hydrological analysis packages. Conversion utilities are available on request from Scott Technical Instruments.

The format of the raw data file is

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"@Gauging"           Indicates the start of a gauging record
Site Number
Date – in any format
Start Time – in any format
Start Staff value
End Time – in any format
End Staff value
Ascending Flag       Set to 1 for ascending, 2 for descending
Rod Type             Used only with the STIL gauging logger
Start bank and Warning Set to "Leftbank" or "Rightbank" or empty. The number following
is the warning percentage is for section flow verses total flow. This
field is only present if different from 10%.
"x Verticals"        Indicates the number of verticals
For each Vertical
  "- Vertical n"     "n" is the vertical number
  Position
  Depth
  Correction
  Correction Type     "0" is for correction as fraction, "1" for degrees
  Rating Index
  Type of Reading     1=Estimate, 2=mid stream, 3=sounding, 4=ad hoc.
5=Waters Edge
  Est Percentage     Ignored for all except Estimates
  Wet Line Angle     Ignored for all except Mid stream readings
  Dry line Height     Ignored for all except Mid stream readings
  0.2 reading as Count, Time, RMS value.
  0.6 reading as Count, Time, RMS value.
  0.8 reading as Count, Time, RMS value.
  Comments for vertical. Empty if no comments recorded
"-End"              Indicates the end of Verticals in this gauging
"x Ratings"          Indicates the number of ratings used or this gauging
For each Rating in the Gauging
  "- Rating n"       "n" is an incrementing number
  Rating Index
  Serial Number
For four sets
  Slope, Offset, Maximum
"-End"              Indicates the end of Ratings
"3 Comments"        Indicates the start of Comments
Comment Line 1
Comment Line 2
Comment Line 3
River at

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Party
Map Ref
Method
Angle
Temperature
Turbidity
"-End"

Indicates the end of the gauging data.

Notes:

1. Only the Ratings used in a gauging will be in the file. If the user changes meters or propellers part way through a gauging, both Ratings tables will be present.