

ORTEC[®]

Global Value 7

**Productivity Add-On for GammaVision[®]
on Microsoft[®] Windows[®] 7/8.1 and XP[®] Professional**

**Software Version 7
User Manual**

Advanced Measurement Technology, Inc.

a/k/a/ ORTEC[®], a subsidiary of AMETEK[®], Inc.

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TABLE OF CONTENT

1	INTRODUCTION.....	6
2	GETTING STARTED	6
2.1	Installation.....	8
2.2	Initial GammaVision Configuration.....	9
2.2.1	B30Winds.ini File Configuration	9
2.2.2	Sample Definition Files (SDF) Configuration	10
2.2.3	Acquisition Settings Configuration	12
2.2.4	File Settings	12
2.3	Microsoft Word and Excel Configuration.....	12
3	PROCESS OVERVIEW	13
3.1	GammaVision Process Overview	13
3.2	Global Value Process Overview	15
3.3	Global Value Interface Overview	18
4	ROUTINE GLOBAL VALUE OPERATIONS.....	20
4.1	Sample and QA Measurements.....	20
4.2	Analysis Data Review	21
4.3	Quality Assurance Data Review	22
4.4	Add/Edit Users and Permissions	22
4.5	Change User Password	22
4.6	Resetting the “Job Running” Flags	22
4.7	Repairing a Database Connection.....	22
4.8	Create Geometry Source Certificate from a Master Source Certificate.....	22
4.9	Add Detector to the Global Value Configuration.....	23
4.10	System Backup.....	24
4.11	Validating Critical Configuration Files	24
4.12	Accessing Analysis Results for Custom Data Integration	24
4.13	Database Archive	25
4.14	Changing the Analysis Engine for Measurements	25
4.15	Configuring Automation Jobs.....	26
4.16	Changing the QA Source	29
	APPENDIX A – CONFIGURATION AND DATA MANAGEMENT PROGRAMS	A1
A.1	Global Value Quick Start	A2
A.2	Sample Administration	A9
A.3	Sample Publisher.....	A51
A.4	QA Administration	A58
A.5	QA Publisher.....	A76
A.6	GVQASummary	A82
A.7	Analysis Log	A83
A.8	GVDetectorMonitor	A85
A.9	Database Utility.....	A86
A.10	File Backup	A87
A.11	File Compare	A89
A.12	GVDataExport.....	A90
A.13	EFT Convert	A91

APPENDIX B – AUTOMATION JOB PROGRAM REFERENCE	B1
B.1 GVSetUser & GVQASetUser	B2
B.2 GVClearData	B3
B.3 GVRecallSpectrum	B3
B.4 GVDeadTimeCheck	B4
B.5 GVTimerControl	B5
B.6 GVSampleData	B6
B.7 GVSampleDataPlus	B13
B.8 GVSampleDataSC	B27
B.9 GVSDFData	B54
B.10 GVSetSDFParameter	B55
B.11 GVAskConfirm	B55
B.12 GVGetConfiguration.....	B56
B.13 GV_GetRType	B57
B.14 GV_GetSiteUnit	B58
B.15 GV_GetBatch.....	B58
B.16 GV_GetComment	B59
B.17 GV_GetGDTPressure	B59
B.18 GV_GetSamplePump	B60
B.19 GV_GetRWP	B60
B.20 GV_GetRadMon	B61
B.21 GV_GetCustomData	B61
B.22 GV_GetRptData.....	B63
B.23 GVIncrementCounter	B64
B.24 GV_Custom_Rpt.....	B64
B.25 Print_Rpt.....	B65
B.26 GrossGamma	B66
B.27 GVQApeaks	B66
B.28 GVQABackground	B67
B.29 GVQAcheckStatus	B67
B.30 UfoToPbc.....	B68
B.31 GVTemplateMaster.....	B69
B.32 GVCopyFile	B70
B.33 GVOpenFile	B71
B.34 GV_ResetInputs	B71
B.35 GVspectrumMux	B71
B.36 GVGammaProductsChangeSample.....	B76
 APPENDIX C – SUMMARY OF GLOBAL VALUE PROGRAMS	 C1
APPENDIX D – FIELD SIZE LIMITATIONS	D1
APPENDIX E – NETWORK CONFIGURATION CONSIDERATIONS	E1

APPENDIX F – EXCEL ADD-IN FUNCTION REFERENCE	F1
Appendix F Notes.....	F2
F1 - GVAnalysisParameter	F3
F2 - GVCustomDataParameterListCount.....	F4
F3 - GVCustomDataParameter	F5
F4 - GVINIPParameter	F5
F5 - GVMostRecentFilename.....	F6
F6 - GVDetectorListCount.....	F6
F7 - GVDetector	F7
F8 - GVDetectorDatabasePath	F7
F9 - GVDetectorDatabasePathByDetectorNumber.....	F8
F10 - GVSpectrumList.....	F8
F11 - GVNuclideList.....	F9
F12 - GVConsolidateNuclideList	F9
F13 - GVParseList.....	F10
F14 - GVNuclideName	F10
F15 - GVNuclideActivity	F11
F16 - GVNuclideFactor	F11
F17 - GVNuclideData	F13
F18 - GVNuclideDataList	F14
F19 - GVUnidentifiedPeakListCount	F14
F20 - GVUnidentifiedPeakList.....	F15
F21 - GVUnidentifiedPeak	F15
F22 - GVUnidentifiedPeakData.....	F16
F23 - GVUnidentifiedPeakDataList	F16
F24 - GVRWPListCount	F17
F25 - GVRWPList.....	F17
F26 - GVRWP	F18
F27 - GVRadMonitorListCount.....	F18
F28 - GVRadMonitorList	F19
F29 - GVRadMonitor	F19
F30 - GVPopulateDetectorList	F20
F31 - GVPopulateSpectrumList	F20
F32 - GVGenerateSpectrumList.....	F21

1 INTRODUCTION

Global Value is a productivity add-on for GammaVision which is designed to transform the standard gamma spectroscopy system into a state-of-the-art production environment with automated measurement processes, custom reporting, quality assurance, and data management.

GammaVision's built-in Job commands enable many basic tasks to be automated, but production laboratories often require additional functionality to streamline processes and generate custom reports. This functionality is provided by Global Value through a set of modules that are normally run within the JOB process similar to standard JOB commands. In some cases, the Global Value modules replace standard JOB commands and in others new functionality is added. For instance, the analyst may be prompted for the sample description, decay date, and sample weight individually using the standard GammaVision interface or by using one of Global Value's interfaces, which combines several inputs and the ability to calculate various parameters or customize the interface. Global Value also provides modules to prompt for a User Login and additional sample information unrelated to the analysis process which can be automatically displayed on custom reports. Once the automation sequences are established using JOB files (or Job Configuration Files and Job Templates) they are easily launched using Global Value's Quick Start program which provides a simple interface for navigating automation routines and active processes.

After an analysis is performed using GammaVision's analysis engines, key analysis parameters are stored in the Global Value databases, and custom reports are automatically generated as text or PDF files, displayed in Microsoft® Word, or sent to the default printer. These reports are based on simple text templates that are easily modified by system administrators. The Sample Administration module provides the interface for performing electronic reviews and data modifications in a secure environment complete with user names displayed on the final reports.

Some applications require data transfer to other systems or custom calculations which are beyond the capability of the standard custom reports. Global Value features an **Excel Add-In** which provides virtually unlimited capability for handling applications for customers familiar with developing Microsoft Excel® spreadsheets or Visual Basic for Applications (VBA) programs. ORTEC also offers additional services to generate turnkey calculations and applications.

Global Value's Quality Assurance (QA) module is intended to replace GammaVision's built-in functionality with a more comprehensive QA solution. Similar to the sample analysis processes described above, Global Value's enhanced QA module is completely automated using GammaVision's Job process. It includes custom reports, electronic data review, and embedded user names. Unlike the standard GammaVision QA, Global Value's QA data and charts are also accessible from remote computers.

2 GETTING STARTED

Global Value simplifies routine gamma spectroscopy tasks – from spectrum acquisition and analysis to custom reporting, data review, and report archival – in an automated and structured manner to minimize the potential for error and enhance productivity. The default configuration and automation routines are very flexible and are intended to meet a wide variety of applications.

Review Section 3 Process Overview which describes the primary functionality and objectives of GammaVision and Global Value and how they work together to optimize counting lab processes.

The primary differences in specific site installations will primarily be the reporting formats, custom calculations, default data inputs, and electronic publishing routines.

The following steps describe the overall installation and operation process:

- 1) If upgrading from a previous version ensure that the current configuration files have been backed up prior to continuing.
- 2) When configuring computers intended for spectrum acquisition and analysis automation processes perform the following:
 - a. Ensure that GammaVision and CONNECTIONS are installed and operational.
 - b. Configure GammaVision in accordance with Section 2.2 to ensure proper handshaking with Global Value.
- 3) Install Global Value per Section 2.1 Installation.

IMPORTANT NOTE!

If upgrading from a previous version of Global Value or restoring databases from a previous version the following **MUST** be performed:

- A. After ensuring that no counting operations are in progress, open the Sample Administration program and synchronize all databases. This process will automatically update the database structure for compatibility with the features available in this version of Global Value. Note that this process can take several minutes with large databases, and the process must be allowed to complete once it started to ensure that the structure is fully updated.
 - B. Open the QA Administration program with a connection to each QA database. The database structure for this version of Global Value will automatically be updated when the program opens.
- 4) Modify the default configuration as described in Section 3.3 and Section 4 to establish the appropriate automation processes, as well as security, custom reporting, data integration, Quality Control, and System Maintenance requirements. When installing Global Value as an upgrade, the Global Configuration Files and Job Templates provided with the new installation should be compared to the existing files to ensure that new functionality in the automation Job programs is properly configured with the correct parameters. Generally, the best approach is to start with the new Default Configuration Files and apply changes necessary to duplicate the site specific requirements previously implemented. If desired, the system can be reconfigured using one of the default data entry interfaces similar to a new installation rather than duplicate the legacy automation routines as the new interfaces offer more functionality and options than the previous versions.

- 5) Open the Quick Start program and verify operation by running the automation Jobs and accessing any shortcuts established on the custom menu system.
- 6) Review and optionally Publish analysis results from the Sample and QA Administration programs, search for results using the Analysis Log, and monitor Detector and QA status by running the applicable utility programs from the Quick Start menus.

2.1 Installation

NOTES

- 1) Installation normally requires a User account with Administrative rights. In Windows 7 the option to “Run as Administrator” can be used for the installation process if necessary.
- 2) Refer Section 2 for additional configuration steps to complete after the program installation.

Start the installation by running the self-extracting installation program (i.e. GlobalValueInstallation7.0.0.exe). This file is available from the installation disk and may be stored on a network server or other location depending on the specific site configuration.

The dialog shown in Figure 2.1.1 will be displayed during the installation process to allow different components to be installed.

- The “Program Files” option will install all of the required programs for Global Value to perform its intended functions.

Additional Program Files may optionally be installed for Publishing Sample and QA data (See Sections A.3 and A.5) and automating system backup (See Section A.10) if the default programs are desired. These options should not be checked when Site Specific Publisher or Backup processes have been implemented.

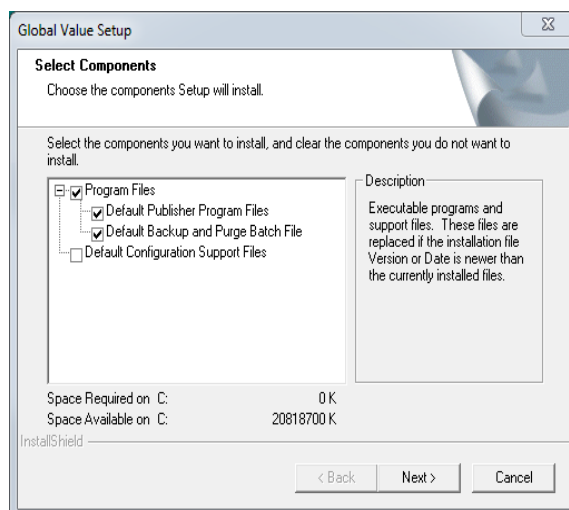


Figure 2.1.1 Installation Component

- The “Default Configuration Support Files” should normally be installed with a new installation to establish standard counting operations. This option provides a set of standard automation routines for QA and Sample measurements using the three main data entry programs offered with Global Value. Several routines are configured for use with a detector configured as ID = 1 in GammaVision, and “DEMO” routines are available to demonstrate

the processes using example spectra when no physical detector is configured on the computer.

This option should not be selected when installing Global Value on subsequent computers at a common site because the appropriate configuration is expected to be copied from a previously established system or backup location, and additional configuration files (such as Global Configuration Files) can result in unexpected behavior when running automation processes from Quick Start.

The Default Configuration Support Files are also located on the installation disk.

- If the message shown in Figure 2.1.2 is displayed after the installation has completed, then select the “This program installed correctly” option.

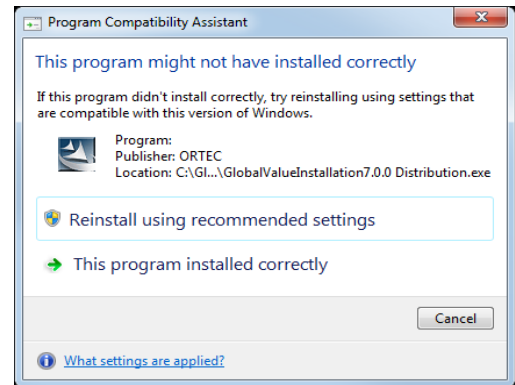


Figure 2.1.2 Program Compatibility

2.2 Initial GammaVision Configuration

This section is only required when configuring computers intended for spectrum acquisition and analysis automation processes. Computers configured for remote data access (i.e. data review, configuration, etc., but not spectrum analysis) are not required to have GammaVision installed. However, some operations on remote computers will still attempt to locate GammaVision as part of the integrated validation process. To avoid error messages displayed if GammaVision is not found a text file can be created with the name GV32.exe and stored anywhere on the local computer. This file can then be selected if prompted by the Sample Administration program.

Prior to setting configuration parameters using Global Value, a few parameters must be established in GammaVision to ensure that these programs interface properly. This requires particular parameters to be set in the B30Winds.ini file (Global Analysis parameters), SDF files (sample specific analysis parameters), Acquisition Settings for each detector, and File Settings as described in the subsections that follow.

2.2.1 B30Winds.ini File Configuration

The B30Winds.ini file contains analysis settings that are used for every analysis performed in GammaVision. This file is located in the GammaVision installation directory (C:\Program Files\GammaVision or C:\Program Files (x86)\GammaVision) and can be modified using any text editor such as Notepad. The GammaVision User Manual has details related to these analysis settings, but a few parameters are discussed here due to the integration requirements with Global Value.

- 1) Item #19: (**Save UFO File Flag must be set to “T”**) – If this parameter is set to “F”, then the .UFO file is deleted immediately after the analysis is completed. As described in Section 3, Global Value loads some of the analysis information from this file, so it must be available after the analysis is completed. The Peak Background Correction (PBC) files and Analysis Results display in GammaVision and GVPlots also rely on information from this file.
- 2) Item #27: (**Print discarded peak table must be set to “T”**) – This parameter ensures that all unidentified peaks in Global Value are reported. The Discarded Peak table is the list of peaks that are associated with a particular nuclide during the initial peak identification but removed from consideration after the nuclide has been rejected for failing a specified test (e.g., the Fraction Limit or Key Line test). These peaks are normally reported in the Unidentified Peak list in Global Value, but the information is only available if this flag is set to “T” (true).
- 3) Item #38: (**Second MDA type, T=Calculate**) – This parameter determines if MDA2 is calculated and which calculation method is used. Normally, this method is set to Method 2 (Critical Level) and “T” (true). This MDA value provides additional sorting options for the nuclide activity table on custom reports which can be useful for data evaluation when using the Directed Fit option in the analysis settings. (See the custom report parameters “|_NUC_<|” and “|_NUC_>|” in Section A.2.3.5.)
- 4) Item #42: (**Print MDA in Nuclide Summary Flag should be set to “T”**) – This parameter determines if the MDA value will be displayed in the Nuclide Summary in addition to nuclide activity. Note that MDA values may be optionally suppressed based on nuclide flags set in the analysis library.
- 5) Item #58: (**Regional Decimal Settings must be set to “T”**) – This parameter determines if the decimal separator from the Regional Settings in Control Panel will be used to report numbers on the report, or if the decimal will be used for reporting numbers regardless of the Regional Settings. As described in Section 3, Global Value parses some information directly from the analysis report in addition to loading data from the UFO file and spectrum, so the values on the report have to be interpreted as numeric based on the operating system settings or an error will be generated.

2.2.2 Sample Definition Files (SDF) Configuration

The SDF files contain sample specific analysis settings which are applied to the analysis. With the exception of the Sample Description and a few parameters specified in the B30Winds.ini file, the SDF files can specify every analysis parameter required for an analysis in GammaVision. These parameters may also be modified when automation Jobs are executed based on analyst input/selection or parameters specified in the Job. All of the SDF parameters are discussed in the GammaVision manual; however further discussion is provided here to ensure compatibility with Global Value and discuss different options for initial configuration and system maintenance.

NOTE: The only parameter critical in setting up Global Value is on the **Report** tab as specified in items 1 and 2 below. All other parameters may be set based on user preference and the specific applications employed.

- 1) At a minimum, the following **Reporting Options** on the **Report** tab **MUST** be selected: LIBRARY PEAK LIST and NUCLIDE ABUNDANCE. It is recommended that ALL reporting options are checked. If the UNKNOWN PEAKS option is not selected, these peaks will not be available in Global Value.
- 2) Global Value uses the ASCII text report generated by the GammaVision analysis engine as one source of information. It parses this report and extracts the relevant information for storage in the database and retains a copy of the full detailed report (minus signature blocks) so it is available for review within the Global Value system. For this to occur, Global Value and GammaVision must be configured such that GammaVision stores the report files in a directory where Global Value knows to look for them. In GammaVision, the path is set in the analysis options (SDF file) on the **Report** tab. The Output option must be set to "File" along with the Global Value Analysis Report Path for the respective detector. The path is normally set as part of the automation process using the GVSetSDFParameter program (Section B.10) or using the standard GammaVision Job command SET_SETTING along with a dynamically generated configuration parameter generated by the Quick Start program. (See Section 3.3 which describes the typical automation processes.)
- 3) The "Internal" option should be set for the LIBRARY and CALIBRATION parameters on the **Sample** tab and the PEAK BACKGROUND CORRECTION parameter (if used) on the **Corrections** tab.

By setting the Library, Calibration, and PBC file fields to "Internal", these parameters can be set by commands in the Job process — either by prompting the user to choose a file or by specifying the file without user input. If "Internal" is not selected, then the file specified in the SDF file is always used for analysis regardless of any change implemented in Job files or GammaVision's menu selections.

Using the "Internal" option for the calibration file also allows the Energy, FWHM, and Efficiency calibrations to be loaded from separate files. For example, the Energy/FWHM calibration may be frequently updated (i.e. as part of a daily calibration routine) while the efficiency calibration is loaded from files that are updated less frequently.

- 4) The appropriate DECAY CORRECTION options on the **Decay** tab should be set for each type of sample. Generally, this requires a dedicated SDF file for decay during collection in which all decay options are applied and for background counts and other types of samples where no decay corrections are applied. When using Global Value's Sample Data modules (GVSampleData, GVSampleDataPlus, and GVSampleDataSC), the default dates in the data entry prompts can be set to the current date/time, the current date only, or a specified date/time. The default date/time in the SDF files are not important because these fields are automatically updated, but the option to apply the decay corrections must be specified in advance. (Note that the decay correction options can be modified using

the SET_SETTING GammaVision Job command, but this method may not be suitable for all of the automation process available with Global Value.

- 5) None of the options on the **Isotopes** tab are necessary when using Global Value. These parameters are easily calculated with the Global Value custom report summaries using Adjustment Factor tables with more formatting flexibility than offered on the standard GammaVision report.

2.2.3 Acquisition Settings Configuration

- 1) Spectrum names are usually created dynamically from configuration parameters generated by the Quick Start program, so the options in the **Start/Save/Report** section are not used with Global Value.
- 2) The **Group Acquisitions** section should normally be set to “Current MCB”.
- 3) All items in the **Ask on Start Options** section should be unchecked to avoid conflicts with data entry prompts specified in the Global Value automation processes.

2.2.4 File Settings

On the GENERAL tab accessed from the menu “File\Settings” set the following items:

- 1) **Save File Format** = Integer SPC
- 2) All items in the **Ask on Save Options** section should be unchecked.

2.3 Microsoft Word and Excel Configuration

(Note that these instructions are for 2007 – 2013 versions and may differ for other versions.)

The default paragraph properties in Microsoft Word may need to be adjusted to ensure that the report displays properly as follows:

- 1) Open Paragraph Properties from the Ribbon and set the following parameters:
 - a. In Spacing section, set Before and After to 0 pts.
 - b. Line Spacing = Single
- 2) Select “Save As Default” at the bottom of the Paragraph Properties dialog.
- 3) Select the option “All Documents based on the Normal.dotm template?” then select OK.

Security may need to be adjusted in Microsoft Excel to allow the macros to run automatically.

This is most easily accomplished by adding a trusted location as follows:

- 1) Open the “Trust Center” (File\Options, then Trust Center on the left panel)
- 2) Open “Trust Center Settings” from button on the lower right of the Trust Center dialog.
- 3) Select “Trusted Locations” on the left panel of the Trust Center Settings dialog.
- 4) Select the Add New Location button.
- 5) Browse to the root directory where Global Value Excel files are located (typically C:\User). Ensure that the “Subfolders of this location are also trusted” checkbox is checked.
- 6) Select OK at each of the Trust Center and Excel Options dialogs to back out to the main Excel interface.

3 PROCESS OVERVIEW

Global Value is an add-on product to GammaVision so it is important to understand a few details about GammaVision to help clarify how these products work together to improve data management and productivity.

In the simplest of terms, GammaVision's core purpose is to acquire and analyze high resolution spectra while Global Value manages the data and automation processes. These functions are described in more detail in the remainder of this section.

3.1 GammaVision Process Overview

GammaVision provides the functions necessary for hardware control, calibration, library and analysis configuration, and automation to support its primary objective of spectrum analysis. The main inputs and outputs of this analysis process are shown Figure 3.1.1 followed by a brief explanation of each parameter. Refer to the GammaVision User Manual for additional detail regarding spectrum analysis and the functions required to establish these input parameters.

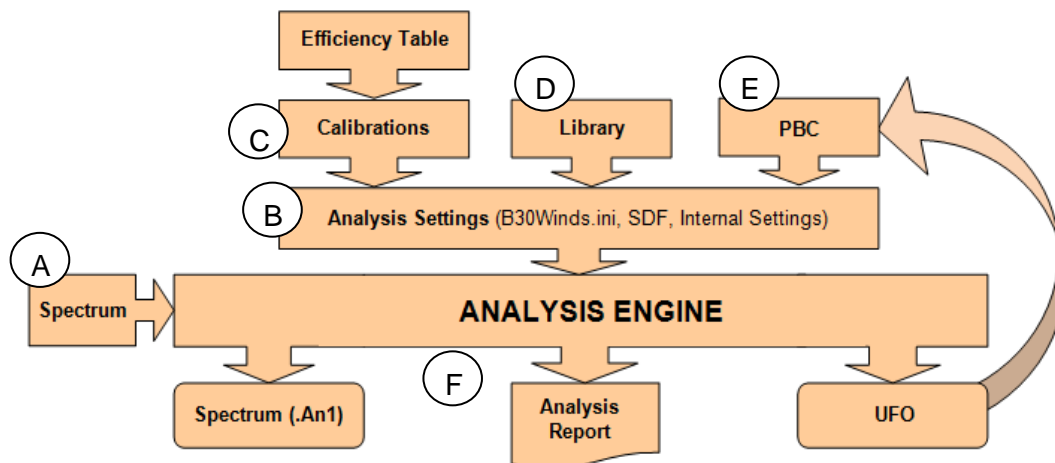


Figure 3.1.1 GammaVision Process Overview

- A) The **Spectrum** is the acquisition data received from an instrument. It contains the channel by channel histogram, hardware and acquisition settings, and several other analysis parameters. GammaVision may acquire the data directly from a detector or load a previously saved spectrum file for analysis.
- B) The **Analysis Settings** includes all of the peak-search parameters, decay correction options, reporting options, nuclide corrections, and other analysis parameters. These parameters are managed in the B30Winds.ini file for global parameters used by all analyses and the Sample Definition Files (SDF) files which contain parameter settings for specific analysis types. The parameters set in the SDF file can also be overridden by menu or Job commands as applicable.

- C) The **Calibration** establishes the channel/energy relationship (energy calibration), expected peak shapes at different energies (FWHM calibration), and the detector efficiency at specified energies (efficiency calibration). The calibration process is has been simplified using the automation wizard built into GammaVision. Simply load a calibration spectrum, library with appropriate energies, and an efficiency table containing the source assay information to generate all three calibrations.
- D) The **Library** associates specific energy peaks with appropriate nuclides such that each nuclide has a signature for identification. The library also contains information such as nuclide half-life, peak abundance, and various peak and nuclide flags used for activity calculations and reporting options.
- E) The **Peak Background Correction (PBC)** file is structured similar to a nuclide library. Instead of peak abundances, it contains peak count rates which can be subtracted from a sample count to eliminate the contribution to peaks from background or a blank. Various other corrections, such as Attenuation or Geometry, can also be applied based on the analysis settings, but PBC is mentioned here because Global Value normally manages the generation of these files as described in Section 3.2.
- F) The following output files files are created by the analysis engine:
- **Spectrum (.An1)**: This file contains all of the original spectrum data plus the analysis settings and calibration data used for analysis.
 - **Analysis Report (RPT)**: This file is an ASCII text report that displays most of the information available in the UFO file in a readable form. The format depends on the reporting options and engine used for the analysis as described in the GammaVision manual.
 - **Unformatted Output file (UFO)**: This file contains the analysis results, including peak and nuclide information, in a binary format, and is used to create PBC files and display analysis results in GammaVision and GVPlots.

GammaVision automation is accomplished using simple text files called “Jobs” with commands that allow users to automate many of the menu functions and run external programs. These Jobs provide a structured process for consistent and reliable analysis results by limiting the decisions required by the analyst at the time of measurement. For example, most analysis parameters can be pre-configured for a particular measurement by an administrator such that the analyst only has to enter information that changes with each sample like the sample size, collection time, etc.. When using Global Value the automation Jobs are dynamically created by the Quick Start program as described in Section A.1 to simplify and optimize automation far beyond the GammaVision basics.

3.2 Global Value Process Overview

Global Value extends GammaVision automation and spectrum analysis with tools to efficiently capture sample and analysis data, as well as manage the results in a secure electronic environment. An outline of this process is shown in Figure 3.2.1.

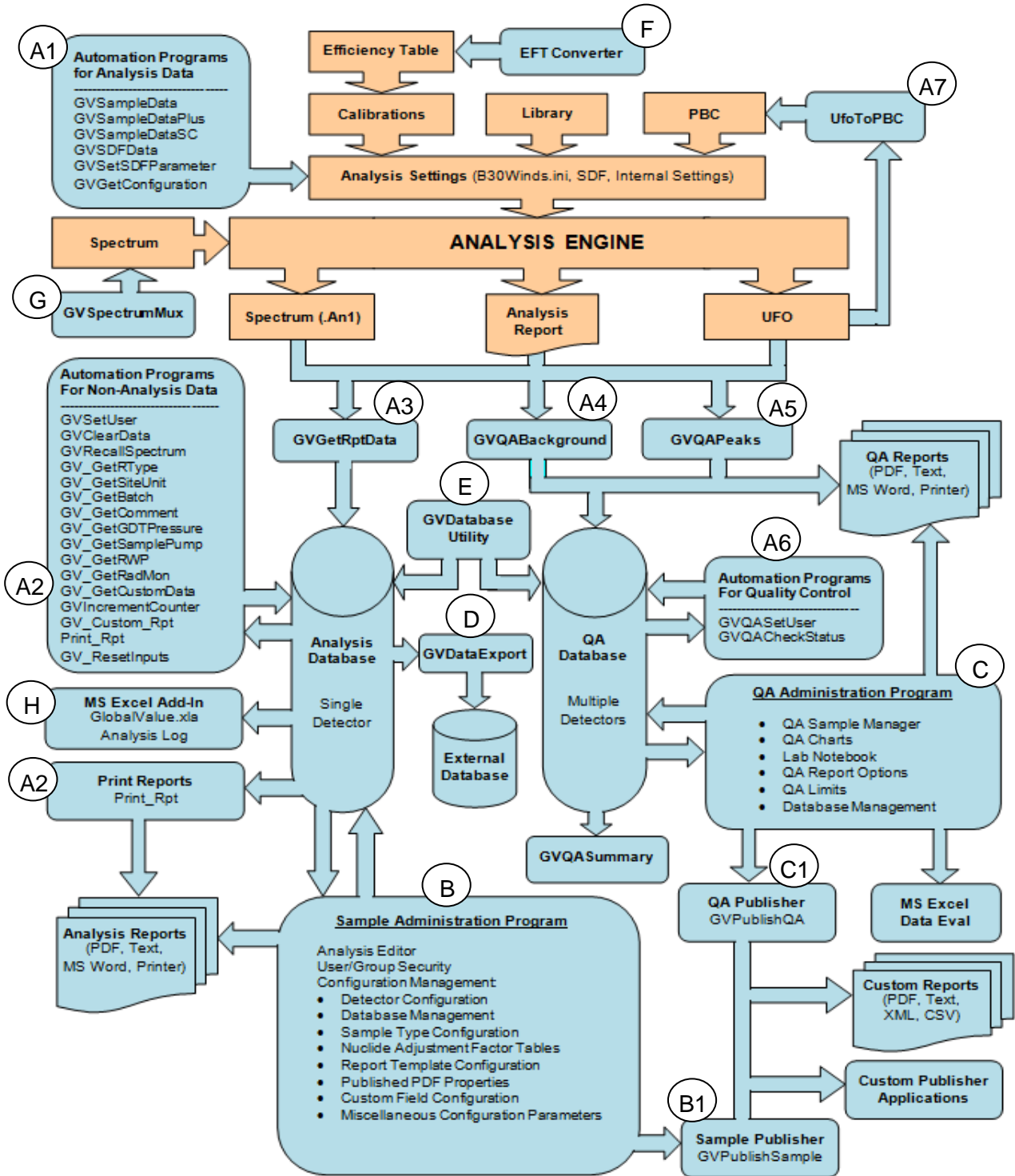


Figure 3.2.1 Global Value Process Overview
Page 15 of 30

Global Value stores analysis results and QA data in protected databases that are intended for access only through the program interfaces. Global Value keeps track of any changes applied to data in the databases for audit trail capability, but it also provides the ability to export data to a non-secure environment for additional processing.

- A) Global Value uses the Job process in GammaVision to automate sample measurements. This process is initiated from the Quick Start program which dynamically creates Job from Job Templates and Configuration Files as described in Section A.1. Global Value provides several programs that are run within Jobs to collect and store sample information, load analysis results into databases, generate reports, etc.. These programs are described in Appendix B, and are shown in the Figure 3.2.1 process as “AX”, where X is a numeric value.
- A1) **Analysis Data** programs are used to modify or set the analysis parameters used for analysis such as the decay time, sample size, calibration, library, and many other parameters.
 - A2) **Non-Analysis Data** programs are used to modify or set parameters that are not used in the analysis process such as the current user name, sample comments, and other information related to the sample. These programs are also used to set or update database flags and generate/print analysis reports.
 - A3) The **GVGetRptData** program retrieves analysis information for samples from the Spectrum, Analysis Report, and UFO file, and stores a copy of the analysis report in the analysis database.
 - A4) The **GVQABackground** program retrieves analysis information for background QA measurements from the Spectrum, Analysis Report, and UFO file, and stores a copy of the analysis report in the QA database. This program also generates the Background QA report based on settings established in the QA Administration program, and optionally renders it in various formats.
 - A5) The **GVQAPeaks** program retrieves analysis information for QA source measurements from the Spectrum, Analysis Report, and UFO file, and stores a copy of the analysis report in the QA database. This program also generates the QA report based on settings established in the QA Administration program, and optionally renders it in various formats.
 - A6) **Non-Analysis QA** programs are used to set the current user for QA measurements or check the detector QA status when measuring samples.
 - A7) The **UfoToPBC** program dynamically creates a background correction file based on the analysis results. This program is normally used in conjunction with the Background QA measurements, but can also be used to create background correction files associated with Blank measurements.

- B) The **Sample Administration** program contains the Configuration Editor where Detector parameters, Adjustment Factors, Report Templates, and other configuration parameters are managed, as well as the Analysis Editor for electronic data review. (See Section A.2).
- B1) The **GVPublishSample** program is executed when Publishing samples from the Analysis Editor to generate data files in PDF, Text, XML, or CSV formats and run custom programs for additional processing of this data. The GVPublishSample program can also be run through automation jobs. (See Section A.3)
- C) The **QA Administration** program contains QA charts, a Lab Notebook, QA Limits, and reporting options, as well as the QA Sample Manager for electronic data review. QA data can also be exported to Excel for additional evaluation with preformatted statistics and charts. (See Section A.4).
- C1) The **GVPublishQA** program is executed when Publishing samples from the QA Sample manager to generate data files in PDF, Text, XML, or CSV formats and run custom programs for additional processing of this data. The GVPublishQA program can also be run through automation jobs. (See Section A.5)
- D) The **GVDataExport** program is used to copy analysis records from the secure Global Value databases, which store analysis data from a single detector, to a non-secured Access database that can store results from multiple detectors. (See Section A.12)
- E) The **GVDatabaseUtility** program can repair corrupted databases and reset automation Job flags when the Quick Start program or GammaVision is terminated abnormally. (See Section A.9).
- F) The **EFTConverter** program creates geometry specific efficiency tables (source certificates) from a Master Source certificate file to quickly generate new tables based on the quantity or fraction of source material used in each geometry. (See Section A.13)
- G) The **GVspectrumMux** program enables spectrum summing capability with several options, including changing the conversion gain and calibration parameters. (See Section B.35)
- H) The **Excel Add-In** provides the functions to retrieve any of the sample data stored in the Global Value databases as well as various configuration parameters such as nuclide adjustment factors and detector file paths. These functions can be used to populate worksheet cells similar to the standard Excel functions, like AVERAGE or SUM, allowing complex post-analysis calculations to be automated. These functions can also be used in VBA code to allow fully automated processing scripts, similar to those used for the Analysis Log. (See Appendix F)

3.3 Global Value Interface Overview

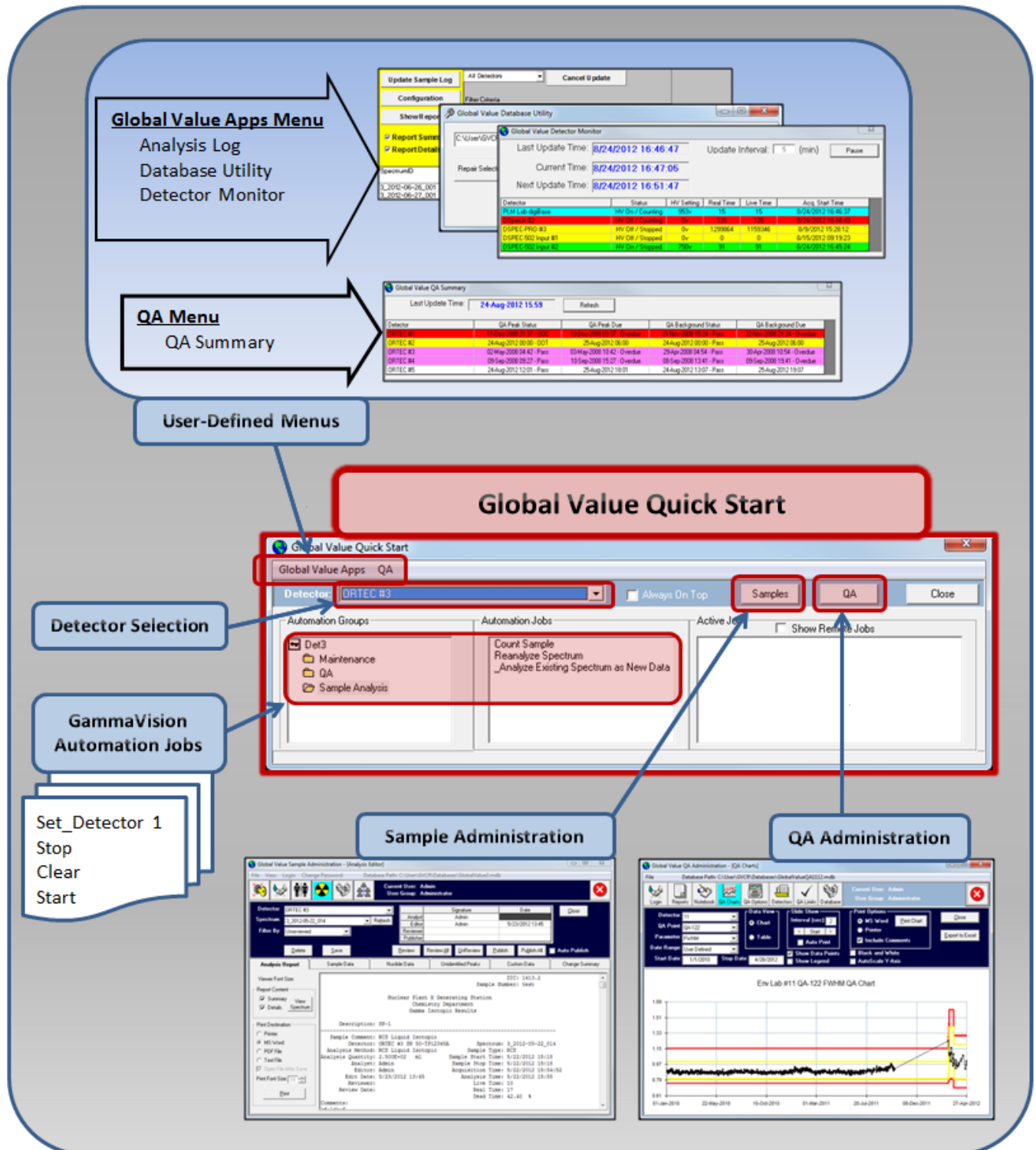


Figure 3.3.1 Global Value Interface Overview

As shown in Figure 3.3.1, the Quick Start program is the main launch pad for Global Value automation jobs and support applications on measurement computers. It provides links to the Sample and QA Administration programs, configurable menu links to other programs or files, and dynamically creates and runs automation Jobs for sample measurements for the selected detector. Note that remote computers typically do not run the automation Jobs for sample measurements, so the other support applications are normally run directly from Window's shortcuts.

The measurement process for samples and QA is very simple. Simply select the detector from the drop down list, open the applicable folder in the Automation Groups section, and then click on the desired Automation Job. The Quick Start program creates the automation Job and then runs it in GammaVision where the user is prompted for additional information or action as required.

The process of creating automation Jobs is based on merging Job Templates (which define the process) with Configuration Files (which contain the value of parameters to use in the process) as described in Sections A.1 and B.31. A typical sample measurement Job Template would follow a process similar to the following:

1. Set detector, Stop, clear etc....(Standard Gamma Vision commands).
2. Check Quality Assurance (QA) Status (Optional).
3. Prompt for User Login (Optional).
4. Copy a Sample Default File (SDF) template to a detector specific file in the TEMP directory.
5. Change various default parameters within the TEMP SDF.
6. Prompt for Sample data using GVSsampleData, GVSsampleDataPlus, or GVSsampleDataSC programs and load the updated TEMP SDF file into GammaVision.
7. Clear temporary data associated with any previously canceled measurements from the Database so this data doesn't get associated with the current sample.
8. Load the Energy, FWHM, and Efficiency Calibrations, as well as the Library.
9. Prompt for Optional Non-Analysis Input data such as Radiation Work Permits, Radiation Monitor Readings, Comments, etc..
10. Load the Peak Background Correction File.
11. Wait until the acquisition has completed, then Save the Spectrum and Analyze.
12. Update the Daily, Monthly, and Annual counter registers in the Global Value detector database.
13. Load the spectrum analysis results from the text report, spectrum, and UFO file to the Global Value Database
14. Create the Custom Report Summary based on the specified Report Template.
15. Optionally print the report or save to one of the supported formats.
16. Open a predefined Excel workbook to automate further calculations or reports based on the current analysis results.
17. Run the Sample Publisher program to generate additional reports in the supported formats and run custom programs.

The Default Configuration Files contain several Job Templates that can be used for routine measurement processes or as a starting point for configuring automation processes tailored to a specific application. These files can be found in the C:\User\GVCR\Job Templates directory.

The Default Global Configuration Files contain the predefined parameters that are used with the default Job Templates. These files can be found in the C:\User\GVCR\Configuration Files directory. Changes to Global parameter settings should be made in the file 0_SiteSpecific.cfg to override the standard settings with those desired for a specific site configuration.

Additional configuration parameters are provided in each Job Configuration file that is selected from the Quick Start interface to initiate the automation process. Any of the global configuration parameters can be overridden by setting them in the Job Configuration files.

The best way to fully understand how automation jobs are rendered by merging Job Templates and Configuration files is to run an automation routine from Quick Start. After the Job is started, then compare the Job content (X_Run.job or X_RunReanalysis.job in the C:\User\GVCR directory) to the Job Template content and replacing the parameters in the Job Template with those defined in the GVQuickStart.cfg or GVQuickStartReanalysis.cfg files in the C:\User\GVCR directory. These configuration files contain the content from the Job Configuration File, Quick Start program, and Global Configuration Files as described in Section A.1.

4 ROUTINE GLOBAL VALUE OPERATIONS

4.1 Sample and QA Measurements

Instrument checks and sample measurements are performed from the Global Value Quick Start program by selecting the applicable Detector, Automation Group, and Automation Job. The automation Job is created and run in GammaVision as described in Section 3.3 and Appendix A.1, and an item is added to the Active Jobs list on the Quick Start window.

Quality Control and Instrument Background measurements are typically performed at a fixed interval – often daily for instrument performance and as infrequently as weekly or monthly for background measurements depending on site requirements. The process used for Quality Control checks can include an automatic energy calibration or gain stabilization with AS FOUND and AS LEFT measurements, or no adjustments at all based on the required protocol. Background measurements include spectrum analysis, which can be used for detection limit verifications, and optionally create background correction files automatically. If any QA parameter is outside of the acceptance limits then some of the fields on the Quick Start program will be color coded in yellow (out of tolerance) or red (out of control) as applicable. Example processes for each of these options are available in the Default Configuration Files which can be optionally installed or accessed from the installation disk.

Sample measurements typically follow the process described in Section 3.3 using GVSAMPLEDATA, GVSAMPLEDATAPLUS, or GVSAMPLEDATA SC, as well as other programs, to collect sample and analysis information. Spectrum reanalysis follows the same process except that a spectrum is chosen for reanalysis at the start of the automation process rather than acquiring data from an instrument.

Example measurement processes using each of the main data entry interfaces are provided in the Default Configuration Files which can be optionally installed or accessed from the installation disk. The choice of interface for most applications can be summarized as follows:

- **GVSAMPLEDATA**: This interface is useful for very basic sample data inputs or custom interfaces developed in Excel. These processes typically require multiple user prompts to capture all of the necessary parameters for a measurement, but also can be configured such that the analyst enters as little data as possible and cannot change key analysis parameters defined for the process chosen. See Section B.6 for additional information.
- **GVSAMPLEDATAPLUS**: This interface extends the data input capabilities to include calculations for sample volume based on flow rate and collection time, or conversion of measured sample units to different analysis units based on correction factors (i.e. Wet vs Dry weight ratios). This program can perform many of the basic calculations that in early versions of Global Value would have required the Excel interface in a more streamlined manner. See Section B.7 for additional information.
- **GVSAMPLEDATA SC**: This interface can be used with Sample Changers or individual sample measurements. It uses the concept of Analysis Methods, which define the default parameters for various types of sample measurements, and allows setting all of the required analysis parameters, including sample volume calculations similar to GVSAMPLEDATAPLUS and custom data fields, in one interface. The custom data fields can be used to capture manual input data or sample information that was previously loaded into an information management systems to minimize data entry errors. For typical measurement processes, this interface is typically chosen as the default. See Section B.8 for additional information.

4.2 Analysis Data Review

Analysis data for samples measurements is reviewed from the Sample Administration program which is accessed from the Samples button on the Quick Start program or directly from Window's shortcuts (for remote access computers). This program provides the ability to review and modify analysis reports with tracking capability (if authorized based on the user security settings). Reports can also be published for automated integration with document control and other data storage systems. See Section A.2.2 for additional information related to data review and Section A.3 for information related to the publishing options.

4.3 Quality Assurance Data Review

QA data is reviewed from the QA Administration program which is accessed from the QA button or menus configured on the Quick Start program, or directly from Window's shortcuts (for remote access computers). This program provides data trends, electronic review and publishing of the QA reports, capturing comments in the Lab Notebook, adjusting the QA parameters and limits, and database management functions. See Section A.4 for additional information related to data review and Section A.5 for information related to the publishing options.

4.4 Add/Edit Users and Permissions

- 1) Add/Edit Users and Permissions as described in Section A.2.3.1.
- 2) Synchronize all Global Value databases as described in Section A.2.3.9.

4.5 Change User Password

- 1) Users can change their own password as described in Section A.2.1.
- 2) If a user forgets their password, then it can be reset as described in Section A.2.3.1, and then changed per Section A.2.1.

4.6 Resetting the "Job Running" Flags

If GammaVision is terminated abnormally after an automation Job is started by the Quick Start program, then flags in the database that specify when Jobs are active may not get reset. This condition will be evidenced by a message that indicates that a Job is currently in process for a detector that is not actually running a Job. This condition can be corrected using the Database Utility as described in Section A.9.

4.7 Repairing a Database Connection

Under rare circumstances a database connection may be abnormally terminated while data is being written to the database. If this occurs the Global Value applications may not be able to restore a connection and a series of errors will be displayed when attempting to run the application. This condition can be corrected by running the Database Utility program as described in Section A.9.

4.8 Create Geometry Source Certificate from a Master Source Certificate

When sources are prepared from a common master supply (i.e. a liquid vial), the source certificates for the individual geometries are easily generated after creating a source certificate for the master source in GammaVision. This process is accomplished using the GVEFTConvert program as described in Section A.13.

4.9 Add Detector to the Global Value Configuration

Note: If adding a new computer to the Global Value system to support installation of a new detector, then install Global Value (Program Files only), then copy the content of the C:\User folder from an existing computer to the new one as a starting point. After configuring the new detector as described below, then folders and files associated with detectors controlled from other computers can be deleted from the new computer.

Once a gamma detector system is established in Global Value, adding an additional detector is a relatively easy task as follows:

- 1) Ensure that the detector has been configured for use with GammaVision as specified in the GammaVision User Manual.
- 2) With the new detector window active in GammaVision configure the Acquisition Settings as specified in Section 2.2.3.
- 3) Create a new folder in the root Job directory (C:\User\Job\ if using the Default Configuration) with the name DetX (where X is the detector number).
- 4) Copy the applicable Job Configuration files from an existing detector to the new Detector Job folder, and make detector specific modifications as necessary. For example, the Window size and position parameters may need to be modified (if used), and the QA source information may be different.
- 5) Create calibration files in the calibration directory (C:\User\Cal\ if using the Default Configuration) using the same naming convention as existing calibration files for other detectors. Typically, the naming convention is X_Geometry_Y where X is the detector number and Y is the position designator. The only difference in calibration file names for different detectors is the detector number.

Note that temporary calibration files may be used for testing by copying existing calibration files from a different detector. If this approach is used, then the calibration files should be copied by opening the calibration file within GammaVision and then saving each file to the new detector file name. This is required because GammaVision retains a copy of the file path internally, and copying these files outside of GammaVision (i.e. using Windows Explorer) will result in unexpected results. The most notable issue when copying calibration files outside of GammaVision is that the calibration file path shown on the analysis report will be the same as the analysis spectrum path instead of the actual calibration file path. When this occurs, the default geometry option in any of the Global Value program interfaces will be blank when running the re-analysis automation processes.

- 6) Create a calibration file in the Energy calibration director (C:\User\Cal\Energy\ if using the Default Configuration) with the name X_Energy.clb (where X is the detector number). This calibration file can be copied from an existing file used for another detector without any additional changes required.
- 7) Create a new folder in the root Spectrum directory (C:\User\SPC\ if using the Default Configuration) with the name DetX (where X is the detector number).
- 8) Create a new Detector database by copying the file "GlobalValue1.md_" from the Default Configuration to the desired location using a naming convention similar to existing detector databases (i.e. GlobalValueX.mdb, where X is the Detector number).

- 9) If the detector QA data will not be stored in an existing QA database, then create a new QA database by copying an existing QA database for any detector to the desired location with a logical file name. Note that QA can be established for multiple detectors in a single database depending on the network configuration employed.
- 10) Add the new Detector in the Sample Administration Configuration Manager on the Detectors tab as described in Section A.2.3.2, and then Synchronize changes to all existing databases.
- 11) If the QA Database established was a copy of an existing QA database, then delete any detectors configured in the database other than those required for the new configuration as described in Section A.4.6.

Note that all QA records and Lab Notebook Comments associated with detectors to be deleted must be removed, and this is most easily accomplished using the Database Purge process described in Section A.4.8. After purging the QA Data records, the QA Limits and QA Points also need to be removed per Sections A.4.7.2 and A.4.7.1 in order to delete a detector.

- 12) Set up QA Parameters and Limits for the new detector as described in Section A.4.7.
- 13) Test the automation jobs from Opening Quick Start to verify operation. Note that the QA Peak and QA Background processes should be run first in order to establish an appropriate Energy/FWHM calibration and Background Correction file which are typically used for sample measurements.

4.10 System Backup

System backups can be accomplished using a simple batch process included with Global Value or using third party software. The method chosen is often determined by the level of local IT support or site personnel experience. Regardless of the method chosen it is important to ensure that all Global Value applications are closed – including any that could be running with remote database connections prior to initiating the backup process.

Refer to Section A.10 for details related to configuring and running the File Backup batch process provided with Global Value.

4.11 Validating Critical Configuration Files

Critical configuration files are validated by comparing the files on the production computers to those in a read-only location managed by administrative personnel. This process is configured as described in Section A.11, and normally is configured to run from the Quick Start menus or Window's shortcuts depending on the site configuration.

4.12 Accessing Analysis Results for Custom Data Integration

The databases used in the Global Value system are secured to prevent unauthorized changes, but the data can still be made available in a few different ways to accommodate integration with

other systems. One method is to create various file structures, such as text, comma-separated values, or XML using the publisher programs as described in Sections A.3 and A.5. Normally, these programs are initiated using the Publishing process as part of the electronic data review as described in Sections A.2.2 and Sections A.4.2 for analysis results and QA data respectively.

Analysis results for samples can also be exported from the Global Value databases to an unsecured Microsoft Access database as described in Section A.12. This process can be automated as part of the GVPublishSample configuration by using the RUN commands described in Section A.3.1, launched from custom site applications, or used in the manual interactive mode.

4.13 Database Archive

Database archiving is normally performed based on the size of the database which is dependent on the number of measurements made. When a database exceeds approximately one hundred megabytes then consideration should be given to Archiving the database, Purging older data, and then Compacting the production database. This process results in having a copy of the current database as an Archived backup that can be loaded into the Sample or QA Administration programs to review older data while the current production databases remain fairly small to improve performance and reduce the time required for system backups.

- 1) Prior to archiving, purging, or compacting a database it is important to ensure that no other database connections are active (i.e. no measurements in progress and no remote connections to the database).
- 2) Perform Archive, Purge, and Compact functions as follows:
 - a. For detector databases use the Sample Administration Configuration Editor on the Detectors tab as described in Section A.2.3.2.
 - b. For QA Databases use the QA Administration program as described in Section A.4.8.

4.14 Changing the Analysis Engine for Measurements

The analysis engine is specified in the GammaVision SDF files which are loaded by various processes depending on the automation processes implemented. Typically these automation processes use the WAIT “ENG” command after the spectrum analysis where “ENG” is the name of the analysis engine. This WAIT command ensures that the analysis has completed before the automation process runs Global Value programs to read the analysis results. Therefore, the analysis engine specified in the analysis options must be the same as the engine name specified with the WAIT command in the automation Job. This is accomplished by setting the Analysis Engine name in the Configuration Files.

When using the default configuration files, the analysis engine name is specified in the global configuration file “3_GammaVisionFunctions.cfg” which can be found in the directory “C:\user\GVCR\Configuration Files”. The parameter name is |AnalysisEngine|, and this parameter is used in conjunction with the |Analyze| parameter as follows: (Review Section A.1 for details related to Job Templates and Configuration parameters.)

```
|AnalysisEngine|= Env32  
|Analyze|= Analyze|CrLF|Wait |AnalysisEngine|
```

This parameter is set globally because the same analysis engine is typically used for all measurements within a particular site configuration. However, if a different analysis engine is desired for specific measurements, then the |AnalysisEngine| parameter can be set in the Job Configuration file to override the global setting. It is critical to ensure that the analysis engine specified in the automation process matches the name used in the analysis options under all circumstances.

Note: If the analysis engine must be changed globally, then it may be desirable to copy the |AnalysisEngine| parameter to the file 0_SiteSpecific.cfg so that site specific changes to global configuration parameters are more easily identified.

4.15 Configuring Automation Jobs

Several automation processes for sample and QA measurements are available in the Default Configuration Files to accommodate most standard processes. These processes are grouped by the sample data interface program (GVSampleData, GVSampleDataPlus, and GVSampleDataSC) and QA.

As described in Section A.1, Job files are created and run from the Quick Start program by combining Job Configuration files with Job Templates. The Job Templates define the automation process and are stored in the directory “C:\User\GVCR\Job Templates”. Each of the default Job Templates use a prefix that defines the interface type followed by a description of the process. For example, GVSampleData_Acquisition.jtp is used for measurements associated with data acquisition when using the GVSampleData program interface, whereas GVSampleData_Reanalysis.jtp is used for spectrum reanalysis processes. Other Job Template files will use the GVSampleDataPlus, GVSampleDataSC, QABkgd, or QAPeak prefixes.

Within the Job Templates various piped parameters are used as placeholders for the actual code that gets rendered in the final Job file. These parameters must be defined in the configuration files for this process to work correctly. All of the parameters specified in the default Job Templates have been validated at the factory so these are known good starting points for initial system configuration. If the process must be modified, then a copy should be made with an appropriate naming convention (i.e. use the site name as a prefix) to avoid

changes to the default files. These files may be replaced when upgrading to newer versions, so it is important to keep modified versions in different files.

The Configuration Files define the piped parameters used in the Job Templates. As described in Section A.1, the configuration file merged with the Job Template to create the Job file is comprised of Job Configuration files (normally in C:\User\Job\DetX where X is the detector number), parameters created by the Quick Start program, and Global Configuration files located in the "C:\User\GVCR\Configuration Files" directory. Typically, changes to the automation processes are managed in these files rather than the Job Templates.

There are several Global Configuration Files installed with the default configuration. These files can be opened and modified using any text editor such as Notepad. Normally there are only a few parameters that are modified within the Global Configuration files. When changes are necessary the applicable parameters should be copied the file 0_SiteSpecific.cfg so that specific changes to global configuration parameters are more easily identified. Note that setting global parameters in this file overrides those in the other global configuration files.

The most complex Global Configuration file is 4_GlobalValueFunctions.cfg which defines all of the "RUN" parameters used throughout the Job Templates. This file should not be modified to avoid the potential for adverse impact on all automation processes.

GVSAMPLEDATA and GVSAMPLEDATAPLUS program interfaces

When using the GVSAMPLEDATA and GVSAMPLEDATAPLUS program interfaces for sample measurements, most of the process changes are managed by changing settings in the Job Configuration files. These files contain a series of parameters that are logically named for the command, program, or function with which they are linked. For example, the following parameters can be found in a Job Configuration file used with the GVSAMPLEDATA program interface:

```
|GVGetSampleData_SampleDescription|=FILE: |CONFIGDIR|DescriptionsList_Examples.txt  
|GVGetSampleData_DecayDate|=Now  
|GVGetSampleData_Quantity|=1  
|GVGetSampleData_QuantityUnits|=ml  
|GVGetSampleData_QuantityUnitsEnabled|=F  
|GVGetSampleData_LiveTime|=1000
```

The prefix for each parameter is common to the program, and the suffix is associated with the command line arguments as described for each program in Appendix A and B. Additional parameters may be specified in the Global Configuration files, and rarely require changes.

The main "RUN" program parameters are often included in the Job Configuration Files in order to simplify minor changes to the automation process by turning various functions off or on. The following parameters, for example, may be included in the Job Template to generate the code

that will prompt for Radiation Monitor data and RWP entries as defined in 4_GlobalValueFunctions.cfg.

```
|Run_GVGetRadMonitor|  
|Run_GVGetRWP|
```

These prompts can then be optionally disabled for specific sample types by adding the equal sign after the parameter in the Job Configuration file as shown below.

```
|Run_GVGetRadMonitor|=  
|Run_GVGetRWP|=
```

When the Job is created, these parameters will be replaced with empty space instead of the code defined in the Global Configuration files such that very comprehensive Job Templates are easily configured for specific measurement processes.

GVSAMPLEDATA SC program interface

When using the GVSAMPLEDATA SC program interface for sample measurements, there are typically only a few parameters that are modified in the Job Configuration file, such as the methods file path and “Continue” commands. These parameters use the GVSAMPLEDATA SC prefix as described previously.

The majority of the configuration changes for the GVSAMPLEDATA SC interface are accomplished in the methods file. The default methods file, which is defined in the Job Configuration File, is “GVSAMPLEDATA SC_Methods.csv” in the directory “C:\User\GVCR\Configuration Files” directory. The format of this file is described in Section B.8.2.4, and the default methods file can be used as a template.

Another file that is typically configured for the GVSAMPLEDATA SC interface is the Custom Data Input file. This file defines the custom fields that can be used for manual user input, or it can be created and fully populated with information from a data management system for optimal data integration. The structure of this file is described in Section B.8.2.24.1, and a few examples are installed with the default configuration files in the “C:\User\GVCR\Configuration Files” directory using the prefix “GVSAMPLEDATA SC_CustomInputData”.

Other files that define the activity and sample size units, dilution factors, and flow units are also found in the directory “C:\User\GVCR\Configuration Files” with the prefix “GVSAMPLEDATA SC” and an applicable suffix defining their purpose.

The GVSAMPLEDATA SC program is the main interface used with Sample Changers. When using the Sample Changer mode of operation all of the data required to be captured for each sample should be accomplished in the GVSAMPLEDATA SC interface to avoid any additional prompts once the sample changer automation is started. Refer to the Global Configuration file

9_SampleChanger.cfg to ensure that the appropriate methodology for changing the sample is implemented.

A few automation routines are configured to sum spectra from multiple detectors using the GVSpectrumMux program described in Section B.35. This operational array must be defined in terms of the number of detectors and an appropriate system prefix. These parameters can be found in the applicable Job Configuration file, such as “GVSampleDataSC Examples\Acquisition\ Array Acquisition – Single Sample.cfg” as follows:

```
|NumberOfDetectorsInArray|=2  
|ArraySystemPrefix|=1
```

The same parameters can be found in several QA Job Configuration files that use the “Array” prefix in the file name.

4.16 Changing the QA Source

A) When the new QA source uses the same nuclide mix and geometry as the current source then only the following parameters are required to be updated:

- 1) Update the Source Identification, Decay Date (source assay date), and live time in all QA Check Job Configuration Files, including standard QA, QA with Gain Adjustment, and QA with Automatic Energy Calibration (as applicable for the site configuration). Note that the live time will only need to be adjusted if the count time has been extended over time to ensure that sufficient counts are included in the most limiting peak for the automatic energy calibration in GammaVision to be reliable. The parameters in the Job Configuration File are :

```
|QASOURCEID|  
|GVSetSDFParameter_DecayDateTimeValue|  
|GVSetSDFParameter_LiveTimeValue|  
|GVSetSDFParameter_ActivityUnitsValue|
```

- 2) Update the Target Activity values in the QA Limits section of the QA Administration program as described in Section A.4.7.

Since the efficiency for the QA source should be unaffected the QA results should fall within the specified limits without any other changes. If the QA results fall outside of the limits or show a bias, then there may be sufficient inaccuracy between the two sources to warrant recalibration for the QA geometry. This recalibration should only affect QA measurements as the QA efficiency calibration should NOT be used for sample measurements. If a change in QA results is determined to be related to instrument performance rather than a difference in source content then the impact on previous analysis results should be evaluated.

- B) If the new QA source uses the same nuclide mix as the current source but a different geometry, then update the QA efficiency calibration in addition to the parameters specified in Step A.
- C) If the new QA source uses a different nuclide mix then the QA Configuration will need to be reconfigured with a representative analysis library (set in the Job Configuration files), calibration, and QA Points similar to an initial system configuration. Typically, a change of this type also warrants purging data from the previous source from the database and starting fresh with the new points and parameters.

Appendix A – Configuration and Data Management Programs

Table of Content

A.1	Global Value Quick Start	A2
A.2	Sample Administration	A9
A.3	Sample Publisher	A51
A.4	QA Administration.....	A58
A.5	QA Publisher	A76
A.6	GVQASummary	A82
A.7	Analysis Log.....	A83
A.8	GVDetectorMonitor	A85
A.9	Database Utility	A86
A.10	File Backup	A87
A.11	File Compare	A89
A.12	GVDataExport.....	A90
A.13	EFT Convert.....	A91

A.1 Global Value Quick Start

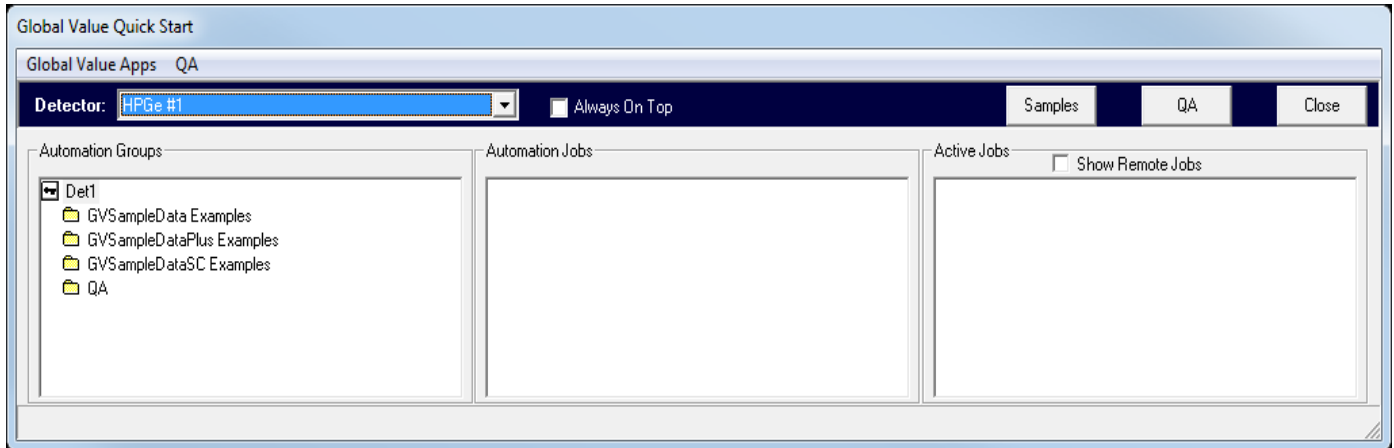


Figure A.1.1 Global Value Quick Start Interface

The primary purpose of Global Value Quick Start is to dynamically generate automation processes and run them in GammaVision. These “Jobs” (as referred in GammaVision) are used to collect sample information, acquire and analyze spectra, generate reports, and perform other functions associated with sample measurements. The Quick Start application also provides the central interface to launch other programs and runs as a fixed toolbar on the Window’s Desktop to keep it in the forefront.

Workstations configured for remote data access do not use this application because they do not have a need to generate automation processes. Instead, they would normally utilize direct links (Window’s shortcuts) to the applicable data management applications.



Figure A.1.2 Global Value Quick Start Header

The Quick Start header contains customizable menus, a Detector pick list, an option to keep the application at the forefront, and buttons to launch the Sample Administration and QA Administration programs described in sections A.2 and A.4 respectively. The menus are configured as simple shortcuts to launch programs or open files as described in the Quick Start Configuration (Section A.1.1).

The **Always On Top** checkbox is checked with the default configuration. In this condition the application remains at the forefront of the screen even when other applications are running. Uncheck this checkbox to view other applications in full screen mode or overlap the Quick Start program. The checkbox status is stored in the GVSsampleAdmin.INI file using the parameter GVMMenuWindowState.

The list of Detectors is populated based on the configuration established in the default database. When populating this list, any detector whose Job file path is not valid will be omitted from this list. This allows a limited list of detectors to be displayed in the list when certain detectors are not accessible in a particular lab. To establish this configuration the Detector Job path (set on the Detectors tab in Sample Administration Configuration) should normally be set to a local Job path (i.e. C:\User\Job\Det1\). Note that this path must exist during the detector

configuration. The workstation that should not display this detector in Quick Start must not have the associated Job folder, so it should be moved to another location or deleted. To simplify configuration changes in the future the folders can simply be moved to an “Out of Service” folder during normal operation to limit the detector list as desired, and then moved back to the required location if necessary when detector configuration changes are needed.

The default database path is specified on the Misc tab in Sample Administration Configuration (See Section A.2.3.7) If the current default database path is not valid, then the user will be prompted to set the default database when the Quick Start program is started and this path will be set as the current default. Normally, this would be a database that is locally accessible, but it could be any database on the local network. Note that the default database must be a Detector database for sample data – not a QA database.

When a detector is selected from the pick list all of the folders within the detector Job directory specified in the Sample Administration Configuration on the Detectors tab will be displayed in the **Automation Groups** list. Any files with the JOB or CFG extension in the main Job directory will be displayed in the Automation Jobs list. Clicking on the subfolders in the Automation Groups expands that folder to show additional subfolders and updates the Automation Jobs list with JOB and CFG files within that subfolder. An expanded folder can be collapsed by double-clicking on it. This mini-Windows Explorer style interface allows automation routines to be logically grouped in multiple subfolders such that the user can drill down to the appropriate predefined automation process to accomplish a specific task (such as counting specific types of samples, re-analyzing spectra, or running QA).

NOTE: Files with the JOB extension are **Job Files** that can be run by GammaVision without modification, or they may contain parameter codes that are translated at run time in the same way that Job Templates are merged with Configuration Files. Files with the CFG extension are referred to as **Job Configuration Files** which specify a path to a **Job Template** and set variable parameter values to merge with the template as described in Section B.31 for GVTemplateMaster.

Single-clicking an item in the Automation Jobs list will dynamically create and run an automation Job in GammaVision as described in Section A.1.2. Once GammaVision has been started, the Active Jobs list is updated to show the Detector name and Job that is currently active. When that instance of GammaVision is closed the respective item will be removed from the Active Jobs list. If the **Show Remote Jobs** option is selected then any detectors in the pick list that are currently running automation Jobs from a different computer are also displayed in the Active Jobs list.

When the Active Jobs list is updated the program also checks the most recent Peak and Background QA results. If any parameters failed outside the tolerance limits for the selected detector then the Detector and Automation Jobs fields will turn yellow. If any parameters failed outside the control limits then the Detector and Automation Jobs fields will turn red. In either condition a message will also be displayed in the status bar indicating which type of QA failed. This check is also applied when the detector selection is changed so the user is immediately notified of the QA status. This indication is intended solely as a warning to the user. The Quick Start program will not prevent the user from counting samples under this condition, however, the GVQACheckStatus program (Section B.29) can be configured to prevent counting samples as part of the automation routine if desired.

The Quick Start program will allow one automation Job to run for creating new Sample records (acquisition or load spectrum processes) and for updating existing Sample records (reanalysis) simultaneously. A message indicating that an Acquisition or Reanalysis Job is already running will be displayed in the status bar if an Automation Job is selected from the list while the same type of Job is currently running.

NOTE: If GammaVision or Quick Start is terminated abnormally (i.e. by ending the process using Task Manager or an abrupt computer shutdown such as loss of power), then a flag set in the Global Value detector database will still indicate that an automation Job is running, and the message described above will be displayed even though no Jobs are shown in the Active Jobs list. In this condition the GVDatabaseUtility (Section A.9) must be used to manually clear the flag.

A.1.1 Quick Start Configuration

The GlobalValueQuickStart.INI contains parameters to configure the application menus as well as the width of the Automation Groups, Automation Jobs, and Active Jobs lists.

The list width parameters are shown below.

```
|MaxAutomationGroupsWidth|=0  
|MaxAutomationJobsWidth|=0  
|MaxActiveJobsWidth|=0
```

These parameters can be set to a static width for a custom view, or zero to automatically set the list width to approximately one third of the screen width. When setting manual widths, the value must be specified in twips which is 15 times the pixel settings. For example, if the screen resolution is set to 1024 x 768, then the screen width is 15,360 twips (1024 x 15). The window border and frame alignment also requires approximately 490 twips leaving a maximum of 14,870 twips available to split between the three list controls.

Normally, the default automatic width is sufficient. However, when very large monitors with high resolution are installed the spacing may not be optimal. In these cases, the manual settings may be desired to reduce the width of the list controls. Note that the Sample, QA, and Close buttons also align to right side of the Active Jobs list, so their position is also affected when changing the list width settings.

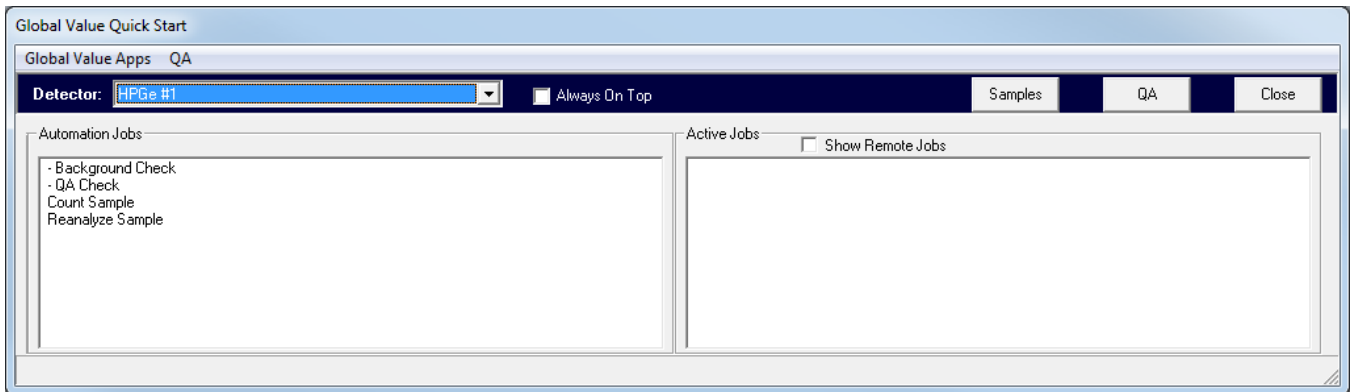


Figure A.1.3 Global Value Quick Start Header

Another situation where manual width settings are useful is when there are only a few automation Jobs in the main Job folder and no subfolders are necessary. In this case, the Automation Groups list can be hidden by setting the |MaxAutomationGroupsWidth| parameter to one (1). The other lists can either be left at the defaults or manually set to approximately half of the available twip width for a display similar to Figure A.1.3.

Menus are configured using a series of Main Menu and Menu Item parameters as shown below.

```
|MainMenu|=1 | Global Value Apps  
|MenuItem|=1 | Analysis Log | C:\User\GVCR\AnalysisLog.xls
```

The menu structure contains two key parameters (MainMenus and MenuItems) which must contain the required pipe-separated inputs. Any combination of these parameters may be included as long as the maximum number of top level menus and menu items is not exceeded, and each is listed sequentially by number.

|MainMenu| - This parameter specifies the Index and Name of a top level menu. Up to 5 top level menus may be specified.

|MenuItem| - This parameter specifies the Main Menu Index, Menu Name, and File path (including any command line arguments) for the application or file to be open when this menu item is selected. Up to 20 menu items may be specified for each top level menu.

A single dash (-) may be specified for the name of a menu item to insert a line separator in the list rather than a file or application name. When the separator is used a parameter for the file path is still required. In this case any text (other than the space character) is sufficient.

An example of a valid configuration is shown below. This configuration would generate the menu shown in Figure A.1.4 with links to the specified programs.

```
|MainMenu|=1 | Global Value Apps
|MenuItem|=1 | Analysis Log          | C:\User\GVCRA\AnalysisLog.xls
|MenuItem|=1 | -                      | N/A
|MenuItem|=1 | Database Utility          | C:\User\GVCRA\GVDatabaseUtility.exe
|MenuItem|=1 | Detector Monitor              | C:\User\GVCRA\GVDetectorMonitor.exe
|MenuItem|=1 | Spectrum Multiplexer         | C:\User\GVCRA\GVSpectrumMux.exe
```

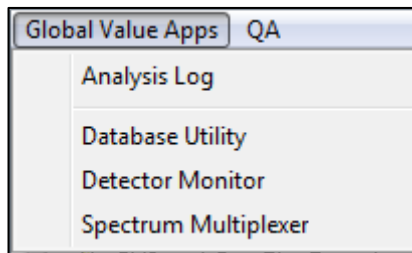


Figure A.1.4 Global Value Menu Example

A.1.2 Quick Start Automation Process

Automation processes (sample counting, spectrum re-analysis, QA measurement, etc.) are initiated by Single-Clicking the applicable item in the Automation Jobs list. The following actions are performed by Quick Start to validate, configure, and launch the automation process in GammaVision.

- 1) Determine if the automation process is for Reanalysis by looking for the parameter "[GVQuickStartReanalysis|=T". This code is normally a standard parameter that also sets the Reanalysis Flag for all of the Global Value programs called throughout the automation process when using CFG files to initiate the process. However, it can also be located within commented lines of a standard JOB file that is run directly in GammaVision without modification.
- 2) Determine if an Acquisition or Reanalysis Job is running for the selected detector on the current computer. If yes, then display a message indicating that a Job is already in progress, and terminate the automation process.

- 3) Determine if an Acquisition or Reanalysis Job is running for the selected detector on a different computer. If yes, then display a message indicating that a Job is already in progress along with the computer name that is running it, and terminate the automation process. See Note at the end of Section A.1 regarding manually resetting the Job Running flags in the event of abnormal termination of GammaVision or Global Value.
- 4) Create a Configuration file in the same directory as Quick Start (C:\User\GVCR) as follows:
 - a) Determine the file name based on the reanalysis flag described in Step #1.
 - i. For reanalysis the file name will be GVQuickStartReanalysis.cfg.
 - ii. If not reanalysis the file name will be GVQuickStart.cfg.
 - b) Create the file content consisting of the Job Configuration file content, Dynamically generated parameters, and Global Configuration file content as follows:
 - i. If the item selected from the Automation Jobs list is a CFG file then add the Job Configuration file content to the configuration file. If the item selected was a JOB file, then nothing is added to the configuration file at this step.
 - ii. Add dynamically generated data parameters shown in the table below to the configuration file as follows:
 - All Detector data is read from the selected detector database. See Section A.2.3.2 Sample Administration Configuration Detectors tab.
 - Day, Month, and Year Spectrum Counter values are read from the detector database. These values are updated during the automation process using the GVIncrementCounter program. (See Section B.23) Buffered values (X-digits) are padded on the left with zeros, but will expand in length if the counter exceeds the maximum X-digit value.
 - Date and Time parameters are based on the date and time that the automation process is initiated.
 - The Job Counter is stored in a text file named DetX.dat where X is the detector number. The counter in this file is reset each day, and gets incremented when the automation process starts. This counter value may not be the same as the Daily Counter stored in the database because the database counter does not get updated if the automation process is canceled in GammaVision before the GVIncrementCounter program is called (which is immediately before the analysis data is loaded into the Global Value database). (See Section B.23)

Parameter/Example	Definition
GLOBALVALUEDIR =C:\User\GVCR\	Quick Start application directory
DETNO =1	Detector Number
DETDESC =Detector #1	Detector Description
DETDBPATH =C:\User\GlobalValue1.mdb	Sample Database Path
DETQADBPATH =C:\User\GlobalValueQA.mdb	QA Database Path
DETJOBNAME = Sample Count	Automation Job name
DETJOBDIR =C:\User\Job\Det1\	Automation Job Directory
DETRPTDIR =C:\User\SPC\Det1\	Detector Analysis Report Directory
DETCRPTDIR =C:\User\	Detector Custom Report Directory
DETNETDIR =c:\User\	Detector Network Directory
DETPUBDIR =C:\User\Publish\	Detector Publish Directory
DETSPECTRUMPREFIX =1_	Detector File Prefix
STARTDATE =2013-May-23	Date formatted as YYYY-MMM-DD

Parameter/Example	Definition
STARTDATE_YEAR =2013	4-digit year
STARTDATE_MONTH =05	2-digit month
STARTDATE_MONTHSP =May	3-character month abbreviation
STARTDATE_DAY =23	2-digit day
STARTDAYOFYEAR =143	Day of year (no buffer)
STARTDAYOFYEARBUFFERED =143	3-digit Day of year
STARTTIME =15:59:01	Start Time with colon separator
STARTTIME_HOUR =15	2-digit Start Time Hour
STARTTIME_MIN =59	2-digit Start Time Minute
STARTTIME_SEC =01	2-digit Start Time Second
STARTTIME_FILEFORMAT =155901	Start Time with no separator
DETJOBCOUNTER =2	Job Counter from DAT file
DAYSPECTRUMCOUNTER =65	Day Counter (no buffer)
DAYSPECTRUMCOUNTERBUFFERED2 =65	2-digit Day Counter
DAYSPECTRUMCOUNTERBUFFERED3 =065	3-digit Day Counter
MONTHSPECTRUMCOUNTER =117	Month Counter (no buffer)
MONTHSPECTRUMCOUNTERBUFFERED2 =117	2-digit Month Counter
MONTHSPECTRUMCOUNTERBUFFERED3 =117	3-digit Month Counter
MONTHSPECTRUMCOUNTERBUFFERED4 =0117	4-digit Month Counter
YEARSPECTRUMCOUNTER =159	Year Counter (no buffer)
YEARSPECTRUMCOUNTERBUFFERED3 =159	2-digit Year Counter
YEARSPECTRUMCOUNTERBUFFERED4 =0159	3-digit Year Counter
YEARSPECTRUMCOUNTERBUFFERED5 =00159	4-digit Year Counter
YEARSPECTRUMCOUNTERBUFFERED6 =000159	5-digit Year Counter

iii. Add the content of all Global Configuration files. This includes all files with the CFG file extension in the “C:\User\GVCR\Configuration Files\” directory. These files contain standard parameter definitions that are used for all automation processes, and aren’t normally modified from the default installation files (with the exception of 0_SiteSpecific.cfg intended for this purpose). If a parameter needs to be altered for a particular automation process, then it can be set in the Job Configuration to override the default definition. (See Section B.31 GVTemplateMaster for additional detail.)

5) Determine the Job Template content as follows:

- a) If the Automation Job that was selected was a **Job File** (JOB extension) then use the file content for the Job Template.
- b) If the Automation Job that was selected was a **Job Configuration File** (CFG extension) then the Job Template path is determined by the parameter “|**TEMPLATE**|” in the configuration file created in Step #4 which must be set equal to a valid Job Template file path.

- 6) Create a Job File to run in GammaVision as follows:
 - a) Determine the file name based on the reanalysis flag described in Step #1 (where X below is the detector number):
 - i. For reanalysis the file name will be X_RunReanalysis.job.
 - ii. If not reanalysis the file name will be X_Run.job.
 - b) Merge the Job Template and Configuration File content using the process described for GVTemplateMaster in Section B.31 to create the final Job file.
- 7) Start a new instance of GammaVision and run the Job file as follows:
 - a) Determine if a detector will be controlled in the automation process by searching the Job file content for the keywords "SET_DETECTOR" and "SETDETECTOR" (neither of which are case sensitive).
 - i. If a detector will be controlled, then set the GammaVision "LastIndex" registry parameter to the appropriate list ID if a match can be established in the MCB Configuration file. If a match cannot be established, then clear this registry entry. This change overrides detector window settings that could result in opening multiple detector windows (or an incorrect one) when GammaVision opens.
 - ii. If no detectors are expected to be controlled, then the "-B" command line parameter will be passed to GammaVision when it is started to ensure that GammaVision starts with a Buffer window active.
 - b) Determine the available screen space available between the Quick Start program and the Windows Taskbar and set the corresponding top, left, width, and height coordinates.
 - c) Start GammaVision and pass command line parameters for the Buffer (if applicable), Zoom coordinates, and the path to the Job file created in Step #6. Note that the GammaVision window size can be dynamically adjusted afterwards in the Job file using the "Zoom" command if desired. At this point GammaVision is in control of the automation process by running the specified Job file.
- 8) Set a flag in the detector database indicating that a Job is active for either Reanalysis or non-Reanalysis (presumed Acquisition) processing. (This is the flag checked in Step #2 previously.)
- 9) Update the Active Jobs list using the Detector name and the Automation Job name that initiated the process. If the automation process was for reanalysis, then an exclamation point ("!") is also appended to the entry.
- 10) To check the status of a particular Job simply select that Job in the Active Job list to set the focus to the associated instance of GammaVision. Note that if the GammaVision window is minimized then the icon in the Windows taskbar gets the focus but the application window will still be minimized.
- 11) When the automation Job completes and GammaVision is closed the Active Jobs list will automatically update to reflect the currently running Jobs. This is possible because Quick Start keeps track of the particular instance of GammaVision that is running each Job.

Note: If GammaVision was terminated abnormally (i.e. using Task Manager) then Quick Start will lose track of that particular instance of GammaVision. Under this condition Task Manager must be used to shut down the Quick Start program in order to reset the Active Jobs list. Otherwise, the program will not allow a new Job for that detector to be started as it appears that a local Job is still running. Although this is rare after a system is properly setup, it is still possible in unforeseen circumstances. This condition would also require the use of the GVDatabaseUtility described in Section A.9 to reset the applicable Job Running flag(s).

A.2 Sample Administration

This Sample Administration program is the main interface for reviewing Sample Analysis Results and managing System Configuration settings (except for QA Limit/Report settings managed in the QA Administration program). It is normally started by selecting the “Samples” button from Global Value Quick Start on lab computers used for sample measurements, or from a Windows Shortcut on remote access computers used for data review. When started from a Windows shortcut, the default view is normally as shown in Figure A.2.1. When started from Quick Start the program opens with the Analysis Editor displayed and the current Quick Start detector selected by default.

The program can accept two optional comma-delimited, command line arguments listed in any order.

- 1) Full Path to a target detector database: This path overrides the default database specified on the Misc tab in the Configuration Manager and is not typically necessary.
- 2) Detector ID: If the Detector ID is provided, then the Analysis Editor is activated with the specified detector selected in the Detector dropdown list when the program opens. This mode immediately displays the most recent analysis report for that detector. This method is used by Quick Start when the “Samples” button is selected. (Note that the Detector ID is the description specified on the Detectors tab in Configuration Manager – NOT the detector number.)

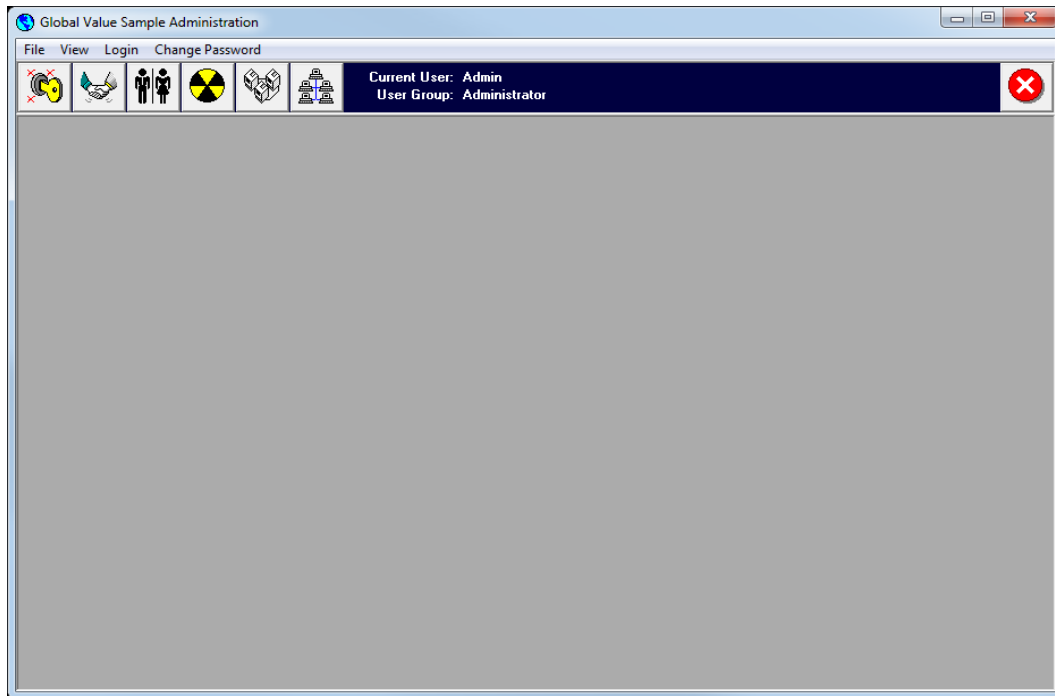


Figure A.2.1 Sample Administration Default View

The Global Value structure requires that each detector is assigned a unique database to store analysis results for Samples in order to provide broad flexibility for remote data access while also ensuring continued operation during network outages. (See Appendix E – Network Configuration Considerations) This architecture requires each detector database to store the Security and Configuration settings managed by the Sample Administration program so that all of the information necessary for system operation is always available to the application if a database connection can be established.

This Sample Administration program must connect to a Global Value database structured to store analysis data for samples - not a QA database. The default database path is set on the Misc tab of the Configuration Manager (Section A.2.3.7) and typically points to one of the production detector databases. If the default database path is not valid then the user will be prompted to select a valid database.

Once a connection is established to a production database, the Sample Administration program can determine the location of all other databases in the Global Value network from tables that are managed on the Detectors tab of the Configuration Manager (Section A.2.3.2). When the Analysis Editor is activated and detectors are selected from that interface, a dynamic connection is established to the applicable detector database in order to display and update analysis records.

Changes applied to Security or Configuration parameters from the Sample Administration program are initially only applied to the default database that was connected on startup. They are not applied to the detector databases that are dynamically connected when reviewing data in the Analysis Editor.

After all Security and Configuration changes are applied, they must be pushed to all of the other production databases using the Synchronization function (Section A.2.3.9) so that all databases in the Global Value system contain the current configuration settings. In order to avoid discrepancies between the databases, configuration changes (including security changes) should only be made when all of the databases in the Global Value network are accessible. If an error is indicated in the Synchronization process, then corrective action should be taken to avoid Synchronizing FROM any databases that are not currently up to date. Otherwise, the changes would be rolled back to settings stored in the out of date database.

NOTE: It should also be clear with this process that concurrent Security and Configuration changes from different locations may result in unexpected results because one user may be pushing updates to the other's database while changes are in progress. Additionally, if analysis measurements are in progress when configuration changes are made then changes may or may not be reflected in the final results based on the timing of the database updates. For this reason, changes to Security and Configuration parameters which must be synchronized to the other databases should be made from a single location when active measurements are not in progress.

Navigation controls on the program header provide the following links and information:

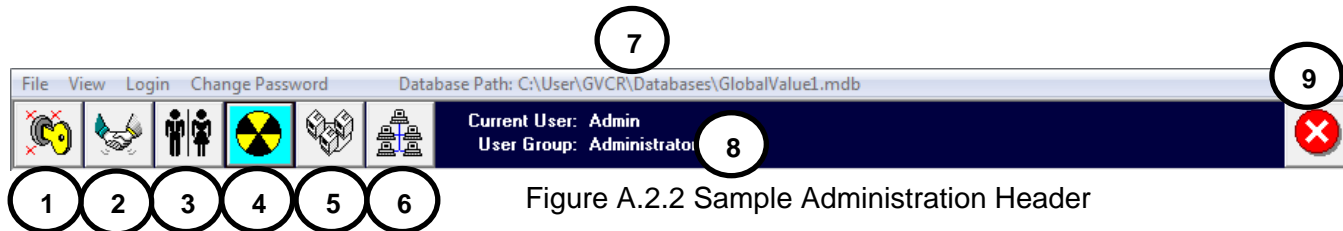


Figure A.2.2 Sample Administration Header

- 1) **Password Editor** for users to manage their system password. (Section A.2.1)
- 2) **User Login** to change the current user.
- 3) **Security Editor** to manage Users and User Group Permissions (Section A.2.3.1)
- 4) **Analysis Editor** for analysis data review, editing, and approval. (Section A.2.2)
- 5) **Configuration Manager** to manage various configuration settings. (Section A.2.3)
- 6) **Synchronize Databases** to push Security and Configuration changes from the default database to the other databases. (Section A.2.3.9)
- 7) **Database Path** for the currently selected detector in the Analysis Editor.
- 8) **User Name and Group** for the current user logged in.
- 9) **Close Button** to exit application.

A.2.1 Sample Administration Login and Password Management

NOTE: The default installation database uses a default User Account which has all permissions enabled. The User Name and Password is “Admin” (case sensitive). This User Name should be deleted or the password changed during the initial configuration to prevent unauthorized access.

When the Sample Administration program opens a prompt is displayed for login. If a valid User Name is selected from the list with the correct password, then the User and Group Names will be displayed in the toolbar and the associated permissions will be enabled. The current user can log out and a different user login while the program is open by selecting the User Login button as shown in Figure A.2.2.

If the login prompt is canceled then User Name and Group are set to “None” and no permissions are enabled. This configuration enables a “read-only” mode for users that are not registered in the system with specific permissions enabled.

Users can also login and simultaneously change their password using the Password Editor shown in Figure A.2.1.1. This window is accessed by selecting the first toolbar button shown in Figure A.2.2 or the “Change Password” menu. After entering the current and new passwords select the “Save Password” button. If the inputs are validated then a prompt is displayed indicating that the changes were saved. Note that this change has only been applied in the current default database.

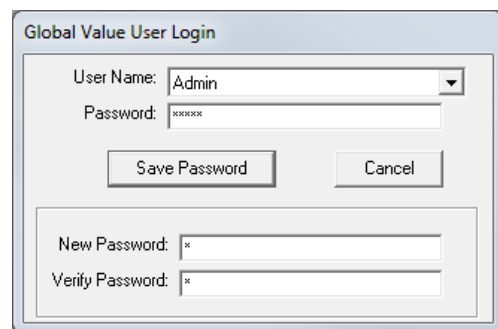


Figure A.2.1.1 Password Change

After acknowledging the changed password prompt the window shown in Figure A.2.1.2 is displayed and the process of synchronizing the change to all of the other databases is automatically initiated. This synchronization is normally much faster than the synchronization function initiated from the toolbar due to the amount of data being updated.

If any errors occur during the synchronization process then a message is displayed at the bottom of the window. If necessary, correct the connection issue and select the “Update” button to synchronize changes again. It is important to ensure that all databases are updated or the login credentials will not be the same on all systems.

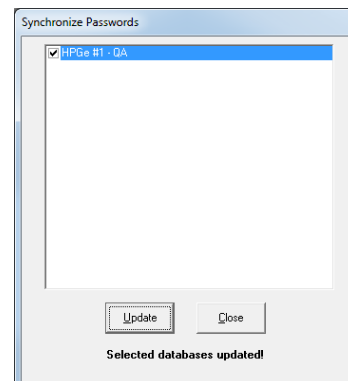


Figure A.2.1.2 Synchronize Password

A.2.2 Sample Administration Data Management

NOTE: If a Detector Description is specified on the command line when running the Sample Administration program then the Analysis Editor is automatically displayed with the specified detector selected in the Detector list as shown in Figure A.2.2.1. The Analysis Editor can also be accessed by selecting the fourth toolbar button as shown in Figure A.2.2 or the View\Samples menu.

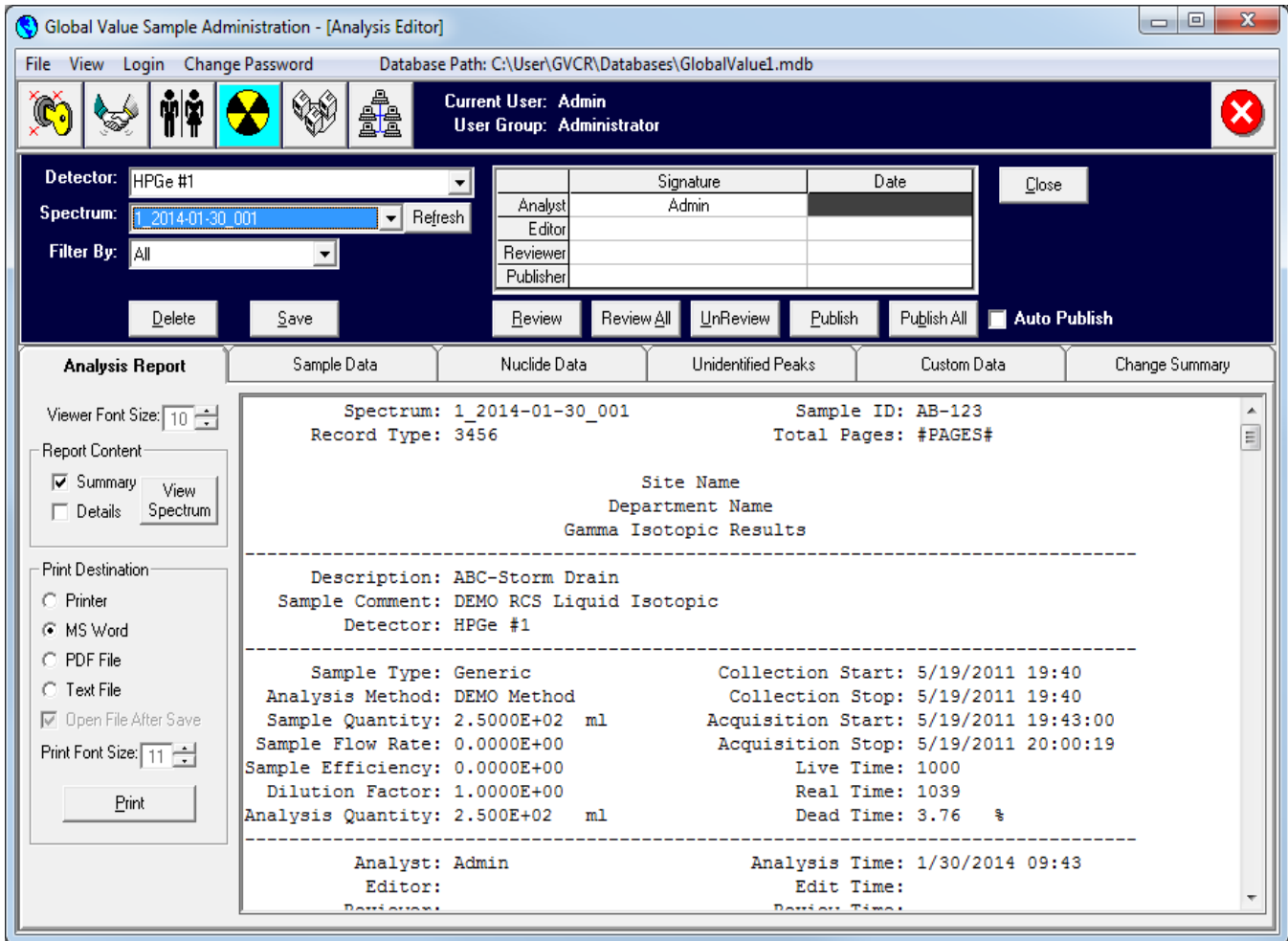


Figure A.2.2.1 Sample Administration Analysis Editor

The Analysis Editor is used for managing sample analysis data. The complete reports can be reviewed and electronic signatures applied, various parameters can be edited, and approved reports can be published to PDF files. Additional reporting and data integration options can be automated using the Sample Publisher program described in Section A.3.

As shown in Figure A.2.2.1, the Analysis Editor is comprised of a main header and several tabbed sections which are discussed in Sections A.2.1 through A.2.6. The header section contains fields for selecting the Detector, Spectrum, and Filter options, as well as various buttons to process the data using an electronic edit/review process as follows:

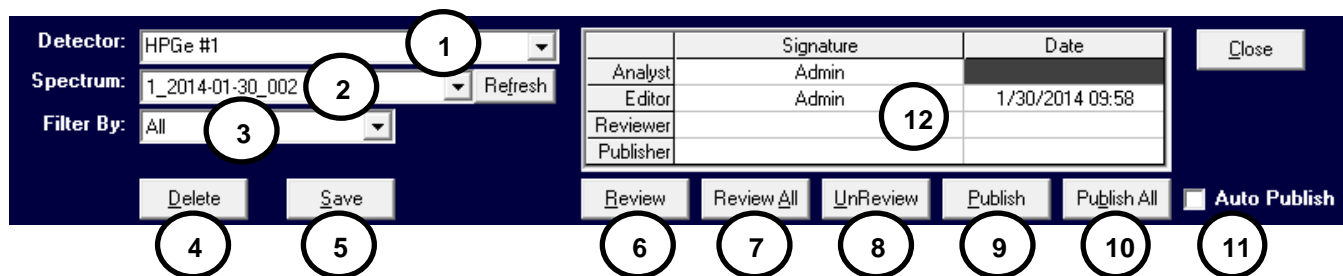


Figure A.2.3 Analysis Editor Header

- 1) **Detector List:** This list is populated with all detectors configured on the Detectors tab in Configuration Management. (See Section A.2.3.2) and an “Archived Database” option. When a detector is selected from the list the program will connect to the specified detector database to display analysis information. If the associated database is not available (i.e. the network, server, or local computer is not accessible) then a message is displayed indicating that the database could not be connected. When the “Archived Database” option is selected a standard File Open dialog is displayed to allow the user to select an archived Detector database.
- 2) **Spectrum List:** This list is populated with spectra from the selected detector database based on the “Filter By” criteria specified below. The list can be refreshed by clicking on the **Refresh** button next to this field to reflect changes due to the addition of new records or data being reviewed or published. When a spectrum filename is selected from this list the associated analysis information is displayed in the signature grid and tabbed sections.
- 3) **Filter By List:** This field filters the list of spectra displayed in the Spectrum dropdown to only those meeting the specified criteria. This filtering capability is intended to simplify the electronic review process. It is not intended as a mechanism for searching sample results based on all available parameters. (See Section A.7) for more advanced search capabilities using the Analysis Log.) The following filtering options are available:
 - a. **Unreviewed:** This option will limit the list of spectra to only those that do not have a Reviewer signature applied.
 - b. **UnPublished:** This option will limit the list of spectra to only those that do not have a Publisher signature applied.
 - c. **Previous X Days:** When this option is selected a field is displayed to specify the number of days. The list of spectra is limited to only those where the Report Date (also referred to as the Analysis date) is after the current date/time minus the number of days specified.
 - d. **All:** This option will populate the Spectrum list with all spectra in the database.
 - e. **All Custom Data Parameters:** Each custom parameter defined on the Custom Fields tab in the Configuration Manager is listed in the Filter By list. A field is displayed to specify the custom parameter criteria when one of these options are selected, and the spectrum list is updated accordingly.
- 4) **Delete Button:** This button is only enabled if the Current User belongs to a Group that has permission to Delete Data. When selected a prompt is displayed indicating that all of the data associated with the currently selected spectrum will be permanently deleted from the database. None of the files stored outside of the database are affected (i.e. published reports, spectra, etc.)

- 5) **Save Button:** This button is only enabled if the Current User belongs to a Group that has permission to Edit Data and the record has not been locked (i.e. Reviewed or Published). When selected any changes made on the tabbed sections (Sample Data, Nuclide Data, Unidentified Peaks, and Custom Data) are saved in the database. Any changes are reflected in the Change Summary tab, and the Report Summary content is updated. The Editors' name is also changed to the name of the Current User as the data owner if the "Separate Editor and Analyst" option is selected on the Misc tab in Configuration Management. (See Section A.2.3.7)
- 6) **Review Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the custom report summary is refreshed based on the specified report template such that the Reviewer name and date will be displayed on the final report (if these parameters are used on the template). If changes are made on the Sample tabbed sections prior to selecting the Review button, then a prompt will be displayed to save changes prior to applying the Review signature. If changes are saved at this point, then the Editor name is changed to the current user similar to selecting the Save button. If changes are not saved then all changes are discarded prior to applying the review signature and refreshing the custom report. After the Review signature has been applied all of the fields on the tabbed sections are locked to prevent further changes.
- 7) **Review All Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the review process described for the Review Button is applied to every spectrum in the Spectrum List.
- 8) **UnReview Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the Reviewer and Publisher signatures are removed and the custom report is refreshed to remove the same signatures and dates. The fields on the tabbed sections are also unlocked to allow changes based on the current user's group permissions.
- 9) **Publish Button:** This button is only enabled if the Current User belongs to a Group that has permission to Publish Data. When selected the custom report summary is refreshed based on the specified report template such that the Publisher name and date will be displayed on the final report (if these parameters are used on the template). The Report Summary and Report Details are then saved to a PDF file in the detector specific "Publish Report Path" directory as established on the Detectors tab in the Configuration Manager. (See Section A.2.3.2) The file name and any password protection are determined by settings on the "PDF Properties" tab in the Configuration Manager. (See Section A.2.3.6) If the publisher name already exists then a prompt to publish the report again will be displayed. If not already locked as a result of the Review process, all of the fields on the tabbed sections are locked to prevent changes. After the PDF report has been saved a program called GVPublishSample.exe in the Global Value directory is run to provide additional data processing requirements. The Sample Publisher described in Section A.3 offers several options for published report content and data integration including the ability to run additional programs for custom applications.
- 10) **Publish All Button:** This button is only enabled if the Current User belongs to a Group that has permission to Publish Data. When selected the publishing process described for the Publish Button is applied to every spectrum/report in the Spectrum List.
- 11) **Auto Publish Option:** When this option is selected the Publish and Publish All buttons are hidden, and reports are automatically published as described for the Publish (or Publish All) buttons when the Review (or Review All) button is selected.

A.2.2.1 Analysis Report

The Analysis Report tab is the main interface for reviewing analysis results. It includes a “text only” representation of the analysis report along with a Spectrum Histogram viewer with various print and export options. The content in the report viewer may appear to be editable, but no changes from this interface are retained in the database or included with reports generated from the print options.

The screenshot shows the 'Analysis Report' tab interface. On the left, there are several control panels: 'Viewer Font Size' (set to 10), 'Report Content' (with 'Summary' checked and 'Details' unchecked, and a 'View Spectrum' button), and 'Print Destination' (with radio buttons for 'Printer', 'MS Word', 'PDF File', and 'Text File', and a checked 'Open File After Save' option, plus a 'Print Font Size' set to 11 and a 'Print' button). The main report area displays the following text:

```
Spectrum: 1_2014-01-30_002      Sample ID: SN: 12345
Record Type: 3456                Total Pages: #PAGES#

Site Name
Department Name
Gamma Isotopic Results

-----
Description: High Activity Demo
Sample Comment: SC: My Comment
Detector: HPGe #1

-----
Sample Type: Generic              Collection Start: 5/19/2011 19:30
Quant Calc Type: Flowrate         Collection Stop: 5/19/2011 19:40
Quant Input Value: 2.000E+00      CFM      Acquisition Start: 5/19/2011 19:43:00
Multiplier: 1.000E+00            Acquisition Stop: 5/19/2011 20:00:19
Divisor: 1.000E+00               Live Time: 1000
Analysis Quantity: 5.663E+05      cc       Real Time: 1039
                                       Dead Time: 3.76 %

-----
Analyst: Admin                   Analysis Time: 1/30/2014 09:49
Editor: Admin                     Edit Time: 1/30/2014 09:49
Revision:                          Revision Time:
```

Figure A.2.2.1.1 Analysis Report

The following options are available on this tab:

- **Viewer Font Size:** This field specifies the font size used in the report viewer. Use the up and down arrows next to the field to change the font size as necessary based on your monitor resolution and report content.
- **Report Content:** The report viewer displays any combination of the Summary and Detailed Reports and allows access to the spectrum viewer as described below. Note that the report viewer only displays standard text (similar to Notepad). If a report template uses the parameter |SPCPICTURE| then the code #SpectrumPlaceholder# will be displayed in this view. When reports are printed to any format other than text (i.e. Printer, PDF, or MS Word) an image of the full spectrum in Log scale will replace the text placeholder. When printing to a text file, the placeholder is simply removed.
 - 1) **Summary Option:** The Custom Summary report generated by the specified template is displayed in the report viewer. Note that
 - 2) **Details Option:** The standard GammaVision report for each analysis (maximum of 2) is displayed in the report viewer. If the Summary option is also checked then the details follow the summary.

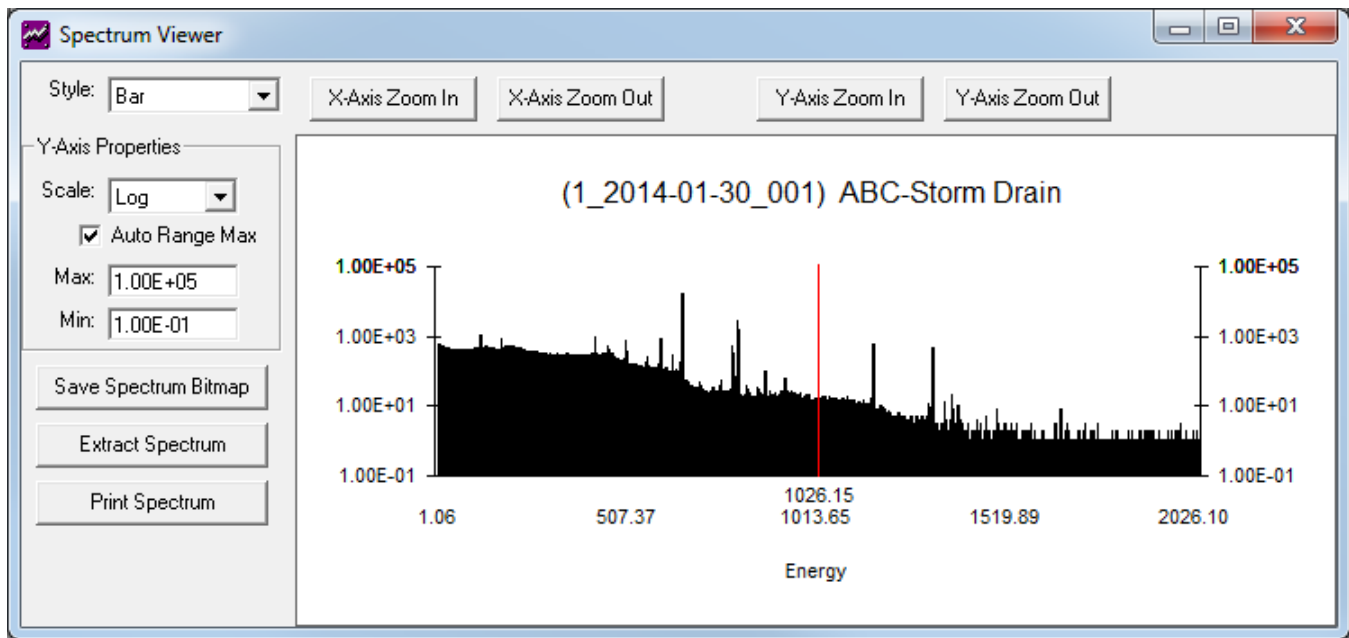


Figure A.2.2.1.2 Spectrum Viewer

- 3) **View Spectrum:** This option displays the interactive spectrum viewer shown in Figure A.2.2.1.2 with data plotted as a Bar Chart, Line Graph, or Points. The spectrum can be zoomed in and out using the buttons above the spectrum window or through keyboard shortcuts where F5/F6 and Up/Down arrow keys zoom horizontally, and the F7/F8 keys zoom vertically similar to GammaVision. The vertical scale can also be viewed in Log or Linear scale with automatic or manual range settings. After setting the desired view an image of the spectrum can be saved to a Bitmap file or printed. The full spectrum file can also be extracted from the database and saved to a file for use directly in GammaVision.
 - **Print Destination:** This section has several options for report output which are applied when the **Print** button is selected.
 - 1) **Printer:** The report is printed on the default printer.
 - 2) **MS Word:** The report is displayed in Microsoft Word (MS Word is required).
 - 3) **PDF File:** The report is saved to a PDF file. A standard “Save As” dialog is displayed indicating the path and file name. The default path is the “Custom Report Path” established for the selected detector in the Configuration Manager, and the default file name is the Spectrum name. Both the path and file name can be changed in the “Save As” dialog. (Also see “Open File After Save” below.)

NOTE: Printing the report to a PDF file is not the same as Publishing the report. When Publishing, the report is always saved to the “Publish” directory, and the file name and protection is determined by the PDF Properties in the Configuration Manager. GVPublishSample is also launched for additional processing when publishing. When printing a PDF file you can change the name and location, the file is not encrypted, and no additional processing occurs after the file is saved.

- 4) **Text File:** The report is saved to a text file. A standard “Save As” dialog is displayed indicating the path and file name. The default path is the “Custom Report Path” established for the selected detector in the Configuration Manager, and the default file name is the Spectrum name. Both the path and file name can be changed in the “Save As” dialog. (Also see “Open File After Save” below.)
- 5) **Open File After Save:** This option is only enabled when the PDF File or Text File option is selected. If this option is checked then the saved report will be opened and displayed using the associated program similar to opening the file directly from Windows Explorer.
- 6) **Print Font Size:** This field specifies the font size used when the report is printed to the selected destination. Use the up and down arrows next to the field to change the font size as necessary based on your report content. The default font size for the standard GammaVision report is 11 points. Higher values may result in a poorly formatted report. This option is typically used to reduce the font size to allow more information to be displayed on the custom report summaries (i.e. more nuclide columns when multiple calculations or data grouping is desired). The Printed Report font is limited to the range 8 – 11 to avoid formatting problems with printing.

A.2.2.2 Sample Data

The Sample Data tab contains fields for viewing or modifying information associated with the sample. Some parameters cannot be modified without a complete reanalysis of the spectrum because changes could invalidate the nuclide results, unidentified peaks, etc. which are determined by the GammaVision analysis engine. These fields are shaded in grey below the Report Template field.

Analysis Report	Sample Data	Nuclide Data	Unidentified Peaks	Custom Data	Change Summary
Description: High Activity Demo Comments: My custom comments here.				Site Unit: Unit #1 Sample Type: Generic R-Type: 3456 Sampler ID: SPID: 123456789 GDT Pressure: psig Batch ID:	
Report Template: GVSampleDataPlus_Medium_Part-Cart		Acq. Start: 5/19/2011 19:43:00 Report Date: 1/30/2014 09:49		RWPs: 2014 - Add: 2014-12345 Remove: 2014-56789	
Collection Start: 5/19/2011 19:30 Collection Stop: 5/19/2011 19:40 Quantity: 566340 cc Dead Time: 3.76 %		Live Time: 1000 seconds Real Time: 1039 seconds		Rad Monitor: Reading:	
Calibration File1: 1_47mmFilter_0.Clb Calibration Desc1: ORTEC #1 47mm Filter Shelf 0 Library1: AirFilter.lib Calibration File2: 1_CharcoalCartridge_0.Clb Calibration Desc2: ORTEC #1 Charcoal Cartridge Shelf 0 Library2: AirCharcoal.lib				Add: SPING #1 1.230E-04 Remove:	

Figure A.2.2.2.1 Analysis Report

All of the other parameters on this tab can be modified if the Current User belongs to a group with permission to Edit Data and the results have not been locked (i.e. Reviewed or Published). These fields will have a white background if the corresponding parameter code is included on the Report Template. Otherwise these fields will have a light yellow background. Refer to Section A.2.3.5 for Report Template parameter codes.

The shading of various fields based on whether or not that parameter will be displayed on the custom report summary is only for convenience to avoid confusion that may result with some data displayed on this tab that is not displayed on the report summary. Data may still be entered in fields that are not displayed on the currently selected report to allow the data to be used with the Excel Add-In functions, other report templates, or used for filtering or sorting criteria using the Sample Log.

The following parameters may be modified on this tab with changes saved to the database when the Save button in the Analysis Header is selected: (Refer to Appendix D for field size limitations.)

- **Description:** Edit the Sample Description text in this field as applicable. Changes to this field are applied to the Sample Description displayed on the custom report summary, but not to the standard GammaVision detailed reports. If the description is distinctly different than originally specified during the analysis, then the description should be updated using a Reanalysis Job similar to the process followed for changing a calibration or library file.
- **Comments:** Add or modify comments related to the sample in this field as applicable.
- **Report Template:** All report templates that are saved in the database can be selected from the list. For older systems that stored report templates as text files (.cus extension), the search button next to this field may be selected to browse to the specified template file. This older method affords no protection against unauthorized changes to the report templates so it is generally preferable to convert older template files to the newer format stored in the database, and select the appropriate template from the list.
- **Site Unit:** The Site Unit may be selected from the list which is populated based on the list established on the Misc tab in the Configuration Manager. Alternatively, ad hoc text may be entered in this field as the data entry is not limited to those items in the list.
- **Sample Type:** The Sample Type may be selected from the list which is populated based on the list established on the Sample Types tab in the Configuration Manager. If an item from the list is selected then the R-Type field is automatically set to the corresponding parameter. Alternatively, ad hoc text may be entered in this field as the data entry is not limited to those items in the list. If text is entered that does not match any of the Sample Types in the list then the R-Type field will be cleared automatically.
- **R-Type:** This field is automatically set when a Sample Type is selected from the list established on the Sample Type tab in the Configuration Manager. The default R-Type (Record Type or Document Control code) can be changed if desired.
- **Sampler ID:** Edit the Sampler ID text in this field as applicable.
- **GDT Pressure:** Edit the Gas Decay Tank Pressure in this field as applicable.
- **RWPs:** The RWP (Radiation Work Permit) consists of a prefix and suffix which are concatenated together with a hyphen in between. The default prefix (usually the 4-digit year) is specified on the Misc tab in the Configuration Manager. Both the prefix and suffix fields can be changed by editing directly in these fields. After entering the prefix and suffix, the RWP is added to the list by selecting the **Add** button in this section. To remove an RWP, select the item in the list and then select the **Remove** button in this section or press the **Delete** key.
- **Radiation Monitor Readings:** The Radiation Monitor may be selected from the list established on the Misc tab in the Configuration Manager. Alternatively, ad hoc text may be entered in this field as the data entry is not limited to those items in the list. After selecting or entering a Radiation Monitor ID (or description) and an associated numeric reading the pair is added to the list by selecting the **Add** button in this section. To remove a Radiation Monitor Reading, select the item in the list and then select the **Remove** button in this section or press the **Delete** key.

A.2.2.3 Nuclide Data

The Nuclide Data tab contains nuclide data that can be modified if the Current User belongs to a group with permission to Edit Data and the results have not been locked (i.e. Reviewed or Published). The Analysis # and Nuclide Name are not editable except when adding a new Nuclide to the grid manually by selecting the last empty row in the grid. In this condition, the Analysis # is determined by selecting the applicable analysis geometry from a displayed list, and the Nuclide Name can be selected from a list or a typed manually. The nuclide list is recommended to avoid spelling errors and ensure that the nuclide names in Nuclide Adjustment Factors match those used for analysis. Once the nuclide name is specified the rest of the nuclide data fields must be entered. Typically, the nuclide data can be found in various locations of the standard GammaVision report or will be manually calculated. When adding a new nuclide or modifying any of the other data fields the Edited status automatically updates to “Yes”.

This tab has two optional grid displays. The Standard nuclide data display is shown in Figure A.2.2.3.1 and the ISO NORM nuclide data display is shown in Figure A.2.2.3.2. The “Show ISO NORM” checkbox under the Nuclide Data tab is used to toggle between the two views. The “Show ISO NORM” option can be hidden with the applicable setting on the Misc tab in the Configuration Manager to prevent toggling between the Standard and ISO NORM Nuclide Data. (See Section A.2.3.7) This option is typically used when ISO NORM data is not used for a particular application; however, the checkbox may be checked before hiding it such that only the ISO NORM data is displayed if desired.

The Standard Nuclide Time of Count (TOC) field can also be optionally hidden or displayed by an option set on the Misc tab in the Configuration Manager. This field is typically hidden for applications where there is no particular interest in the Time of Count activity when decay is applied or when decay correction is not used.

Analysis Report		Sample Data		Nuclide Data		Unidentified Peaks		Custom Data		Change Summary	
				<input type="checkbox"/> Show ISO NORM							
Analysis #	Nuclide	Activity (uCi/cc)	TOC Activity (uCi/cc)	Report Uncertainty	Counting Uncertainty (uCi/cc)	Total Uncertainty (uCi/cc)	MDA	MDA2	Edited		
1	Cs-134	1.1520E-08	1.1520E-08	6.6603E+00	3.5714E-10	7.6728E-10	5.6065E-10	2.7652E-10	No		
1	Cs-137	3.2277E-07	3.2277E-07	5.9385E+00	2.1538E-09	1.9168E-08	7.8936E-10	3.9005E-10	No		
1	Co-57	3.9280E-09	3.9280E-09	1.3030E+01	4.4396E-10	5.1182E-10	0.0000E+00	0.0000E+00	No		
1	Co-58	5.1182E-08	5.1181E-08	6.1549E+00	8.7151E-10	3.1502E-09	3.7484E-10	1.8298E-10	No		
1	Co-60	1.4363E-08	1.4363E-08	6.3473E+00	3.6809E-10	9.1165E-10	1.4876E-10	6.8519E-11	No		
1	Mn-54	3.9274E-10	3.9274E-10	4.3314E+01	1.6852E-10	1.7011E-10	2.2493E-10	1.0797E-10	No		
1	Ag-110m	3.2986E-09	3.2986E-09	1.2442E+01	3.6134E-10	4.1042E-10	0.0000E+00	0.0000E+00	No		
1	Sb-125	2.6834E-08	2.6834E-08	8.3025E+00	1.5488E-09	2.2279E-09	0.0000E+00	0.0000E+00	No		
1	Fe-59	<4.1668E-10	<4.1667E-10	0.0000E+00	2.4162E-10	2.4162E-10	4.1668E-10	1.9904E-10	No		
1	Ce-141	<7.1736E-10	<7.1733E-10	0.0000E+00	4.3030E-10	4.3030E-10	7.1736E-10	3.5447E-10	No		
1	Ce-144	<4.8961E-09	<4.8960E-09	0.0000E+00	2.9488E-09	2.9488E-09	4.8961E-09	2.4292E-09	No		
1	Zn-65	<4.0076E-10	<4.0076E-10	0.0000E+00	2.3057E-10	2.3057E-10	4.0076E-10	1.8994E-10	No		
2	I-131	<4.7559E-10	<4.7551E-10	0.0000E+00	2.8540E-10	2.8540E-10	4.7559E-10	2.3510E-10	No		
2	I-133	<2.1833E-10	<2.1796E-10	0.0000E+00	1.2860E-10	1.2860E-10	2.1833E-10	1.0594E-10	No		

Figure A.2.2.3.1 Standard Nuclide Data

Analysis Report		Sample Data		Nuclide Data				Unidentified Peaks		Custom Data		Change Summary	
<input checked="" type="checkbox"/> Show ISO NORM													
Analysis #	Nuclide	ISO NORM Activity (uCi/cc)	ISO NORM TOC Activity (uCi/cc)	ISO NORM Count Unc. %	ISO NORM Total Unc. %	ISO NORM Count Unc. (uCi/cc)	ISO NORM Total Unc. (uCi/cc)	ISO NORM Det Limit (uCi/cc)	ISO NORM Dec Thres (uCi/cc)	ISO NORM Minimum (uCi/cc)	ISO NORM Maximum (uCi/cc)	Edited	
1	Cs-134	1.1520E-08	1.1520E-08	4.370	7.338	5.0341E-10	8.4533E-10	6.1796E-10	3.0383E-10	1.1026E-08	1.2014E-08	No	
1	Cs-137	3.2277E-07	3.2277E-07	0.667	5.938	2.1538E-09	1.9168E-08	9.9809E-10	4.9323E-10	3.2066E-07	3.2489E-07	No	
1	Co-57	3.9280E-09	3.9280E-09	11.302	13.030	4.4396E-10	5.1182E-10	6.8386E-10	3.3853E-10	3.4923E-09	4.3637E-09	No	
1	Co-58	5.1182E-08	5.1181E-08	1.703	6.155	8.7151E-10	3.1502E-09	5.0092E-10	2.4542E-10	5.0326E-08	5.2037E-08	No	
1	Co-60	1.4363E-08	1.4363E-08	3.625	6.845	5.2059E-10	9.8317E-10	2.9230E-10	1.4015E-10	1.3852E-08	1.4874E-08	No	
1	Mn-54	3.9274E-10	3.9274E-10	42.908	43.314	1.6852E-10	1.7011E-10	2.6044E-10	1.2542E-10	2.2736E-10	5.5812E-10	No	
1	Ag-110m	3.2986E-09	3.2986E-09	14.846	15.976	4.8973E-10	5.2698E-10	7.2760E-10	3.5336E-10	2.8181E-09	3.7792E-09	No	
1	Sb-125	2.6834E-08	2.6834E-08	5.772	8.303	1.5488E-09	2.2279E-09	2.4396E-09	1.2066E-09	2.5314E-08	2.8354E-08	No	
1	Fe-59	9.6394E-11	9.6391E-11	151.100	151.100	1.4565E-10	1.4565E-10	4.6463E-10	2.2247E-10	3.7943E-12	2.7107E-10	No	
1	Ce-141	1.7167E-10	1.7166E-10	151.100	151.100	2.5939E-10	2.5939E-10	7.1910E-10	3.5437E-10	6.7572E-12	4.8274E-10	No	
1	Ce-144	1.1764E-09	1.1764E-09	151.100	151.100	1.7775E-09	1.7775E-09	5.2609E-09	2.6042E-09	4.6306E-11	3.3082E-09	No	
1	Zn-65	9.1986E-11	9.1986E-11	151.100	151.100	1.3899E-10	1.3899E-10	4.1100E-10	1.9457E-10	3.6208E-12	2.5868E-10	No	
2	I-131	1.1386E-10	1.1384E-10	151.100	151.100	1.7204E-10	1.7204E-10	4.7664E-10	2.3503E-10	4.4817E-12	3.2018E-10	No	
2	I-133	5.1305E-11	5.1217E-11	151.100	151.100	7.7522E-11	7.7522E-11	2.1879E-10	1.0591E-10	2.0195E-12	1.4428E-10	No	

Figure A.2.2.3.2 ISO NORM Nuclide Data

A.2.2.4 Unidentified Peaks

The Unidentified Peaks tab contains the same data displayed on the GammaVision report for unidentified peaks. The Identification field is editable to allow the source of the peak to be specified if the Current User belongs to a group with permission to Edit Data and the results have not been locked (i.e. Reviewed or Published). All other fields are read-only.

Analysis Report		Sample Data		Nuclide Data		Unidentified Peaks		Custom Data		Change Summary	
Energy	Identification	Channel	Bkgd Counts	Net Counts	Net Countrate	% Uncert	FwHM	Suspect	Flags		
176.36		705.10	5452	1519	1.52	15.61	0.856	-	M		
510.91	Ann	2043.16	5372	6345	6.35	5.46	2.505	-			
606.88		2427.03	3451	484	0.48	35.51	1.187	-	D		
671.56		2685.68	534	168	0.17	49.29	0.853	-	s		
677.53		2709.56	531	151	0.15	56.27	1.234	-	s		
1365.38		5460.92	13	96	0.10	25.79	1.242	-	s		
1400.37	Sum Peak	5601.66	11	61	0.06	29.79	1.706	-	D		
1475.19		5900.18	10	32	0.03	56.34	0.390	-	sM		
1505.15		6020.01	3	79	0.08	24.49	0.397	-	sM		
1690.87		6762.95	0	29	0.03	37.14	1.312	-	s		

Figure A.2.2.4.1 Unidentified Peak Data

A.2.2.5 Custom Data

The Custom Data tab contains fields for viewing or modifying Custom Data associated with the sample. The parameters in the grid are defined on the Custom Fields tab in the Configuration Manager. (See Section A.2.3.8) The fields on this tab can be modified if the Current User belongs to a group with permission to Edit Data and the report has not been locked (i.e. Reviewed or Published). See Appendix D for data length limits.

Analysis Report	Sample Data	Nuclide Data	Unidentified Peaks	Custom Data	Change Summary
Parameter		Parameter Data			
Quantity Calc Type		Flowrate			
Quantity Calc Input Value		2.000E+00			
Quantity Calc Units		CFM			
Quantity Calc Multiplier		1.000E+00			
Quantity Calc Divisor		1.000E+00			
Sample Number		SN: 12345			
Analysis Method					
Dilution Factor					
Sample Quantity					
Sample Comment		SC: My Comment			
Sample Flowrate					
Flowrate Units					
Collection Efficiency					
Batch ID					
Project ID					
Analysis ID					
Matrix					

Figure A.2.2.5.1 Custom Data

A.2.2.6 Change Summary

The Change Summary tab displays details of every change applied in the Analysis Editor tabs along with the user name and date/time the changes were saved. This includes the data/value prior to and after each change. It also provides indication of a complete spectrum reanalysis including the Analyst name and the date/time of the reanalysis. Any changes made during the reanalysis are not tracked since the review effectively starts over at this point with all associated analysis data reset to the GammaVision analysis report data.

Analysis Report	Sample Data	Nuclide Data	Unidentified Peaks	Custom Data	Change Summary
<pre> 1/30/2014 09:58 - Admin ----- Changed Cs-134 Data From: Activity: 1.1520E-08 Time of Count Activity: 1.1520E-08 Reported Uncertainty: 6.6603E+00 Counting Uncertainty: 3.5714E-10 Total Uncertainty: 7.6728E-10 MDA: 5.6065E-10 MDA2: 2.7652E-10 ISO NORM Activity: 1.1520E-08 ISO NORM TOC Activity: 1.1520E-08 ISO NORM Count Uncert: 5.0341E-10 ISO NORM Count Uncert #: 4.370 ISO NORM Total Uncert: 8.4533E-10 ISO NORM Total Uncert #: 7.338 ISO NORM Decision Thres: 3.0383E-10 ISO NORM Det. Limit: 6.1796E-10 ISO NORM Min Activity: 1.1026E-08 ISO NORM Max Activity: 1.2014E-08 To: Activity: 0.0000E+00 Time of Count Activity: 0.0000E+00 Reported Uncertainty: 6.6603E+00 Counting Uncertainty: 3.5714E-10 Total Uncertainty: 7.6728E-10 </pre>					
<pre> Changed 510.91 keV Unidentified Peak Resolution From: To: Ann ----- Changed 1400.37 keV Unidentified Peak Resolution From: To: Sum Peak ----- ***** 1/30/2014 09:49 - Admin ----- Changed Radiation Monitor List From: To: SPING #1 - 1.230E-04 </pre>					

Figure A.2.2.6.1 Change Summary

A.2.3 Sample Administration Configuration Manager

Global Value Configuration Management consists of the Security and Configuration Manager modules which are accessed from the Sample Administration toolbar and menus as described in Section A.2. After changes are applied to the default database connected to the application on startup all of the other detector databases must then be updated using the Synchronization Option (See Section A.2.3.9).

The Security module consists of User Names and Permissions as described in Section A.2.3.1. “Security” permission is required to access this module.

The Configuration Manager consists of Detector settings, Sample Types, Nuclide Adjustment Factor tables, Report Templates, Published PDF report properties, Custom Field definitions, and Miscellaneous operational settings as described in Sections A.2.3.2 through A.2.3.8. “Configuration” permission is required to access this module.

The Database Synchronization function is described in Section A.2.3.9. “Configuration” permission is required to synchronize databases. Since Security changes also must be synchronized, users with Security permission should also normally have Configuration permission. However, users with Configuration permission are not required to be granted Security permission.

A.2.3.1 User Accounts and Group Permissions

The Security Editor is accessed as described in Section A.2 from the Sample Administration toolbar button or associated menu. This editor has two tabs as shown in Figures A.2.3.1.1 and A.2.3.1.2 for establishing Groups with applicable permissions and then assigning Users to those groups.

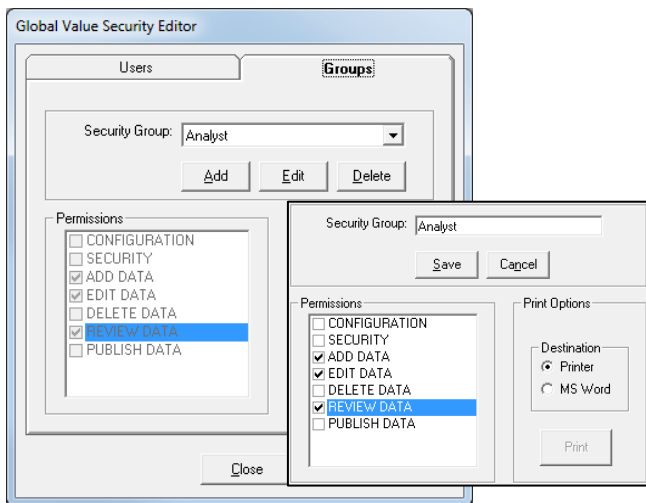


Figure A.2.3.1.1 Security Groups

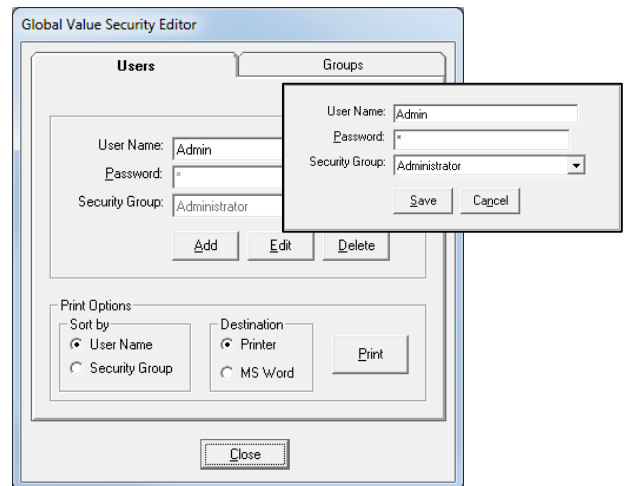


Figure A.2.3.1.2 Security Users

To simplify the setup and maintenance process, permissions are assigned to Groups rather than individuals. This makes it easy to change permissions for an entire group in one step instead of having to change the same setting for every affected user. There are a few Security Groups configured by default, but they can be modified as necessary to meet specific installation needs.

When Adding or Editing Security Groups, the PERMISSIONS field is enabled to allow selection of appropriate options as follows:

- **Configuration:** Allows access to all Configuration parameters described in Sections A.2.3.2 through A.2.3.9.
- **Security:** Allows access to User Accounts and Group Permissions described in Section A.2.3.1.
- **Add Data:** Allows users to login for sample counting or QA and set the analyst name for display on reports when the Login prompt is configured in Job files. Users who do not have this permission set will not be able to add data to the database, so they will not be allowed to progress past the Login prompt. If the Login prompt is not employed in Job files, this permission has no effect on operation with Jobs. This permission also allows users to Add comments in the QA Administration Lab Notebook.
- **Edit Data:** Allows analysis data to be modified in the Analysis Editor and if the sample has not been locked (i.e. Review or Publish signature applied). If data is modified in the Analysis Editor, then the current user's name will be added to the "Editor" field, and the "Edit Date" set to the current date/time. The Change Summary is also updated to reflect any changes along with the Editor name and date/time. This permission also allows users to edit their own comments in the QA Administration Lab Notebook.
- **Delete Data:** Allows complete analysis records (all reports and data associated with a spectrum) to be removed from the applicable Sample or QA database. The spectrum and any other files saved outside of the Global Value database are not affected.
- **Review Data:** Allows a Review Signature to be applied to (or removed from) Sample or QA records stored in the database. This also locks (or unlocks) the data fields to prevent or allow changes in the Analysis Editor as applicable.
- **Publish Data:** Allows analysis reports to be published to the specified location. This also locks (or unlocks) the data fields to prevent or allow changes if a Review signature was not previously applied. Typically, this is the last step in an electronic review process.

While in the edit mode, the buttons below the Security Group field change to Save/Cancel as shown in Figure A.2.3.1.1. Select the Save button to save the changes or Cancel to discard them. If changes are saved, then all other databases must be synchronized as described in Section A.2.3.9. **Note that at least one Security Group must always exist!**

A report summarizing the Group Permissions can be printed or displayed in Microsoft Word (if installed) by selecting the appropriate destination and the **Print** button.

User names and initial passwords are established along with the applicable Security Group on the Users tab as shown in Figure A.2.3.1.2. Note that User Names currently assigned as the Analyst, Editor, Reviewer, or Publisher for Sample or QA reports are not affected when users are deleted or permissions are changed using the Security Editor. Any changes are applied to future operations after all databases are synchronized, but no existing records are affected. Similar to the Groups editor described above the buttons on the Users tab change to Save/Cancel as shown in Figure A.2.3.1.2. Any changes must be synchronized to the other databases as described in Section A.2.3.9. Note that this synchronization can be performed after all changes have been saved – not after each individual change is saved.

When new users are established a default password can be set with the expectation that the user will change and synchronize their own password as described in Section A.2.1.

A report summarizing the Users and associated Groups can be printed or displayed in Microsoft Word (if installed) by selecting the appropriate sort order, destination, and then the **Print** button.

A.2.3.2 Detector Parameters

Each detector that will use Global Value to store analysis results must be configured on the Detectors tab. All fields are required (except for the File Prefix which is highly recommended) and some must be unique for each detector as identified by the blue fields shown in Figure A.2.3.2.1.

The screenshot shows the 'Detectors' tab in a software application. The interface includes several input fields and buttons. The 'Detector Description' field is highlighted in blue and contains 'HPGe #1'. Other fields include 'Detector Number' (1), 'File Prefix' (1_), 'Database' (C:\User\GVCR\Databases\GlobalValue1.mdb), 'Analysis Report Path' (C:\User\SPC\Det1\), 'Custom Report Path' (C:\User\), 'Network Report Path' (C:\User\), 'Publish Report Path' (C:\User\Publish\), and 'Job File Path' (C:\User\Job\Det1\). A 'Detector QA Settings' section contains a 'QA Database' field (C:\User\GVCR\Databases\GlobalValueQA.mdb) and a checked 'Synchronize Security Settings' checkbox. A 'Database Tools' panel on the right has buttons for 'Archive', 'Compact', and 'Purge', and a dropdown menu showing '1 / 1 / 2014'. A note at the bottom of the fields states '* Fields must be unique for each detector.'

Figure A.2.3.2.1 Detectors Tab

The following is an explanation of each field:

- **Detector Description:** This description is displayed in drop down selectors on various Global Value screens, such as the Quick Start program, Analysis Editor, and the Sample Log which uses the Excel Add-In.
- **Detector Number:** This number should be the same as the detector number established when MCB Configuration is run during the initial instrument setup with GammaVision. This value is critical for QA measurements and automation Job processes.
- **File Prefix:** If analysis reports from more than one detector are generated by GammaVision in the same directory then the File Prefix is required. During the automation Job process the program "GV_GetRptData" is run to load analysis results from the GammaVision files. This program searches for the most recent analysis report in a specified directory to get the necessary information. If each detector sends its analysis reports to a separate directory then this process is very efficient, and a File Prefix is not required. However, if several detectors send reports to the same directory at the same time then it would be possible for Global Value to get results from the wrong files unless a unique identifier is provided. The unique identifier that prevents this mix up is the File Prefix. This parameter is also used in various utility programs in Global Value to associate various types of files with a specific detector (for example calibration files in the GVGetConfiguration program).

Database: Each detector requires a unique database to store analysis data associated with samples. The path to that database is specified in this field and can be set using a standard Windows File Open/Save dialog by selecting the button next to this field. Database paths may be set to the local "C:\\" drive when running Global Value from a stand-alone computer, but should use a fully qualified network path (or mapped drive path) when remote data access on a network is desired. If the databases and data files

are stored on local computers (vs a network server), then the “C:\User” directory must be shared with Read/Write permissions for the personnel or groups that will run Global Value. Refer to Appendix E for information regarding network configurations and database/file storage locations.

When **Adding Detectors** a new database must be created. This can be accomplished by copying one of the existing detector databases or the file “GlobalValue1.md_” to the new database name. The content of the starting point database is not important because the Configuration data will be updated when the database is synchronized from the current default (Master) database and any existing sample results can be deleted using the database purge function on this tab (see below) after the synchronization. The only requirement for the new database is a valid path and proper structure for storing configuration and analysis data.

- **Analysis Report Path:** This is the directory where Global Value will look for the standard GammaVision report to get analysis data. This path must match the report path specified in the SDF files used for the selected detector. This path should normally be a directory on the local computer so that the system can operate without interruption in the event of a network or server outage, but it can also be set to a server or shared folder location, which is necessary when operating in a configuration that allows running automation Jobs for the same detectors from multiple workstations. Click on the button next to this field to browse to the appropriate directory. If a network path is desired it can be typed directly into the field.
- **Custom Report Path:** This is the default directory for printing Text or PDF analysis reports from the Analysis Editor or using the Print_Rpt program in JOB files. When printing reports from the Analysis Editor, the standard Windows “Save As” dialog is displayed. The current directory is set to the Custom Report Path, and the file name is set to the spectrum file name. The directory and filename can both be changed in the dialog. When using the Print_Rpt program from JOB files, the report is saved in the Custom Report Directory unless the path is specified as a command line argument. (See Section B.25 Print_Rpt for more detail.) Click on the button next to this field to browse to the appropriate directory. If a network path is desired it can be typed directly into the field.
- **Network Report Path:** This path is not used directly by the Analysis Editor or any other Global Value programs by default. However, it is an available parameter that can be used in automation Jobs, with Excel worksheets that implement the Excel Add-In, or other custom programs. Click on the button next to this field to browse to the appropriate directory. If a network path is desired it can be typed directly into the field.
- **Publish Report Path:** This path is the directory where PDF files are automatically stored when “Publishing” reports. Typically, this is a local directory for optimal efficiency in saving PDF files, and the GVPublishSample program (See Section A.3) is used for additional processing including moving reports to a network location where they can be pulled directly into the Document Control / Record Keeping system. If no additional processing is required, then the Publish directory can be set directly to the network location. Click on the button next to this field to browse to the appropriate directory. If a network path is desired it can be typed directly into the field.

- **Job File Path:** This path is the directory that the Quick Start program uses to search for automation Jobs or Job Configuration files for the selected detector. The path must be unique so that only Jobs associated with the selected detector can be executed from the Quick Start program. This path should normally be a directory on the local computer so that the system can operate without interruption in the event of a network or server outage. However, the path can be set to a network path to allow running automation Jobs for the same detectors from multiple computers if desired.
Click on the button next to this field to browse to the appropriate directory. If a network path is desired it can be typed directly into the field.
- **QA Database:** This field specifies the path to the database where QA data is stored for the selected detector. Unlike data associated with samples, the QA databases may contain information for multiple detectors. When configuration data is synchronized from the Sample Administration program the associated detector parameters described in this section and Security settings (users and groups) are copied to the specified QA Database. The “Synchronize Security Settings” option is available only for backward compatibility. This option must be checked to synchronize the detector and security settings to the QA database as these settings are no longer available directly in the QA Administration program.

The following command buttons are available to manage detector settings:

- **Add:** Add a new detector to the list and set the field parameters. Settings must be saved after all of fields have been populated.
- **Edit:** Change parameters for an existing detector. All of the parameters are disabled when selecting a detector until the Edit button is selected to prevent inadvertent changes to these critical parameters.
- **Delete:** Completely remove the detector configuration from the working database. Deleting the detector from the configuration does not actually delete any analysis information, nor does it delete the database associated with that detector or any files that may have been created outside of the database. When a detector is deleted from the configuration that detector will no longer be available in the Quick Start program, Sample or QA Administration programs, or Excel Add-In functions after the databases are synchronized.
- **Save:** Save changes made by Adding or Editing a detector configuration. (This button is only displayed after Add or Edit button is selected.)
- **Cancel:** Discard changes in the Add or Edit detector configuration mode. (This button is only displayed after Add or Edit button is selected.)

The following Database Tools are provided for the currently selected detector. These tools are disabled when in the Edit mode.

- **Archive:** This function allows you to save the database for the selected detector to another file name similar to copying the database file in Windows Explorer. The default file name for the database will be the original database name followed by the current date in the format “YYYY-MM-DD”. The detector database is not changed in any way. Note that analysis data can be accessed from an archived database by selecting the “Archived Database” item in the Detector list in the header section.

If it is necessary to query an archived database using the Analysis Log, then a temporary Detector should be established with a path to the respective database so that it will be available to the Analysis Log. The archived detector database will also be available as a direct Detector selection in the Analysis Editor with this configuration.

- **Compact:** This function compacts the database for the selected detector similar to the process performed by Microsoft Access. Global Value uses an Access format database which does not reclaim used space when data is deleted (i.e. the file size is not automatically reduced when records are deleted). Normally there is very little space to recover unless a large number of records have been removed (i.e. after using the Purge function).
- **Purge:** This function will delete all analysis records in the selected detector database that are prior to date specified in the field below this button. The date can be selected from a calendar control by selecting the drop down arrow. When Purge is selected a confirmation dialog will be displayed indicating that all analysis data prior to the specified date will be deleted. Select “Yes” to purge the data, or “No” to cancel. This Purge function is normally used to clear old records when setting up a new database or after Archiving a production database that is very large (hundreds of megabytes). Administrative procedures are normally established to Archive databases on at least an annual basis and Purge data older than some specified cutoff in the current production database. Typically a year or two of data in the current production database is sufficient for easy retrieval while keeping the system running without unnecessary delays.

A.2.3.3 Sample Types and Record Types

Sample Types are simply descriptive categories of samples that are often tied to a specified Document Control code (or Record Type / R-TYPE) for record keeping purposes. These parameters are linked to allow the selection of a meaningful Sample Type and have the sometimes cryptic R-Type set automatically in automation Jobs (See Section B.13) and in the Analysis Editor. They can also be displayed on the Custom Report Summaries or used as filter parameters when searching for specific samples using the Analysis Log. (See Appendix D for field length limitations.)

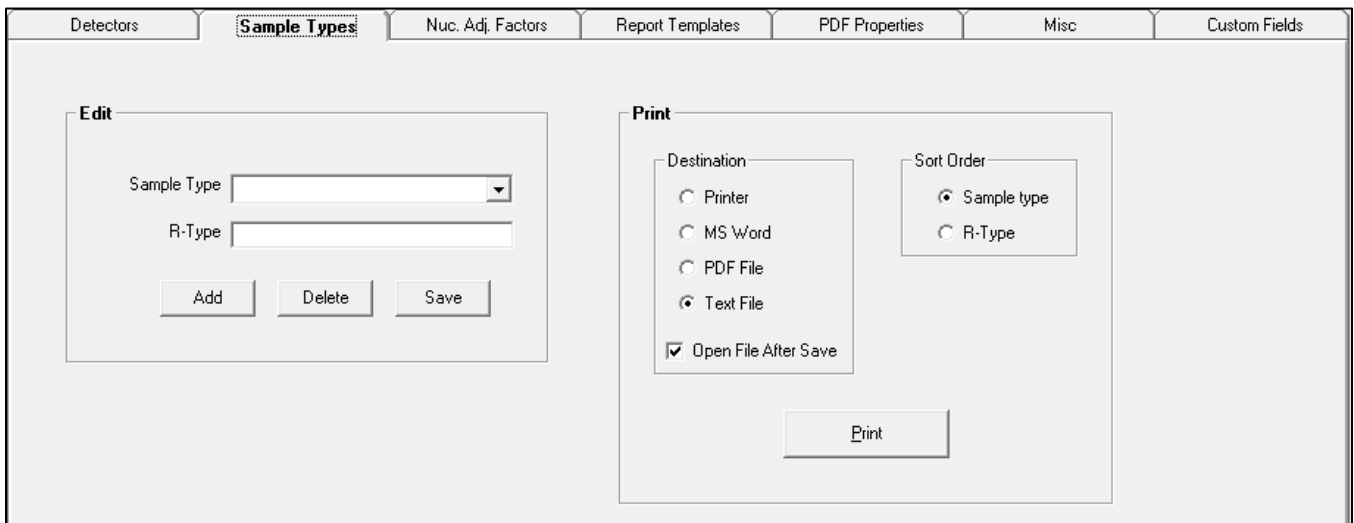


Figure A.2.3.3.1 Sample Types Tab

The following command buttons are available to manage Sample/R-Types as shown in Figure A.2.3.3.1:

- **Add:** A prompt is displayed allowing the new Sample and R-Types to be entered.
- **Delete:** Remove the selected item from the database. A confirmation dialog will be displayed to help prevent inadvertent deletions.

- **Save:** Saves changes to the R-Type field for the selected Sample Type. Note that the Sample Type is not editable after the Add function as this field is often a key parameter established in automation Jobs and other configuration files.
- **Print:** Generates a report of all Sample Types and associated R-Types based on the selected Destination and Sort Order. If the Destination is set to the PDF or Text File options, then a standard Windows dialog will be displayed to specify to the desired location. If the “Open File After Save” option is checked, then the PDF or Text file will be opened using the default program for opening these types of files similar to opening one of these files directly from Windows Explorer. Note that Microsoft Word must be installed to use the MS Word option.

A.2.3.4 Nuclide Adjustment Factors

Nuclide Adjustment Factors are used for a variety of calculations on custom report summaries and using the Excel Add-In. For example, nuclide activity can be multiplied by the specified adjustment factor to calculate Dose Equivalent Iodine or divided by the adjustment factor to determine a fraction of a limit such as Derived Air Concentration fraction for air samples. The adjustment factors can also be used to group nuclide activities by various types, such as Natural vs Reactor Products or Fission vs Activation products or Noble Gas vs Non-Gas activity. These groups can be accomplished by including the applicable nuclides in a table named for the applicable category with an adjustment factor of “1” which can be multiplied by the nuclide activity. (See example Report Templates).

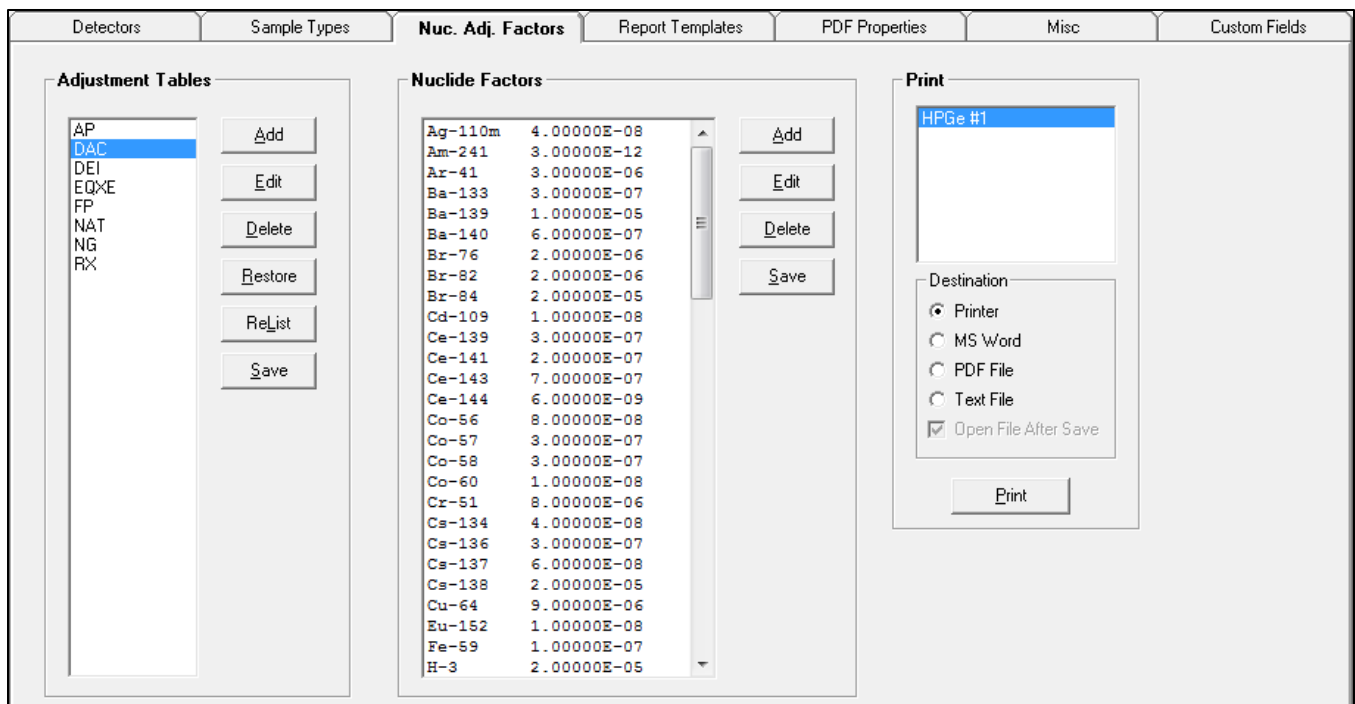


Figure A.2.3.4.1 Nuclide Adjustment Factors Tab

Nuclide Adjustment Factors must be assigned to Adjustment Tables that define the adjustment or correction factors. Several tables are defined in the database installed with the default configuration files. These tables are EXAMPLES ONLY and are not intended as a technical reference for any particular application. All adjustment factors employed in a production environment MUST be verified to meet the specific site needs based on procedural and regulatory requirements as well as the library configuration established for sample analysis.

ADJUSTMENT TABLES are managed using the buttons from this group in Figure A.2.3.4.1 as follows:

- **Add:** A prompt is displayed to enter a new table name. Names should generally be kept short as they will be used as special codes on the report templates. (See Section A.2.3.5) Only alpha numeric characters may be used in the name with no spaces. The new table name will be added to the list, but it is not saved to the database and cannot be edited or nuclides added until it is saved.
- **Edit:** A prompt is displayed to change the name of the selected table. This prompt is also displayed by double-clicking on a table name. After changing a table name the table list must be saved before changes can be made to the nuclide list for that table.
- **Delete:** The selected table name will be appended with “_Delete” to indicate that this table will be completely removed from the database when the table list is saved.
- **Restore:** This option restores the table name after the Edit or Delete options are used if the changes have not been saved.
- **ReList:** The list of table names is refreshed from the database. Any changes to the table list, such as adding new names or flagging tables to delete, that have not been saved are discarded.
- **Save:** The list of tables is saved to the database. Any tables with the “_Delete” flag appended are permanently removed and table names that have been edited are updated at this time.

NUCLIDE ADJUSTMENT FACTORS are managed using the buttons from this group in Figure A.2.3.4.1 as follows: (Note that the list of Nuclide Adjustment Factors is associated with the currently selected Adjustment Factor Table.)

- **Add:** A prompt is displayed to enter a new nuclide and associated adjustment factor. All existing nuclide names are listed in the drop down list for selection (with auto-search enabled while typing) or a new nuclide name can be entered to add it to the list. Nuclide names must match those specified in the sample analysis in order for the correction factors to be applied correctly. The adjustment factor for the selected nuclide can be entered in any format, but all adjustment factors are displayed in scientific notation with five significant digits in the list. No changes are stored in the database until the list is saved.
- **Edit:** A prompt is displayed to change the name of the selected nuclide and value of the adjustment factor. The edit mode is also enabled by double-clicking on an item in the list. No changes are made in the database until the list is saved.
- **Delete:** A dialog is displayed to confirm that the selected nuclide will be deleted from the list. If YES is selected, then the nuclide name is set to “Deleted” and the adjustment factor value is set to zero. No changes are made in the database until the list is saved.
- **Save:** The list of adjustment factors for the selected table is saved to the database. Any nuclides listed as “Deleted” are permanently removed, and all items added or changed in the list are saved.
- **Print:** A report is generated with all Nuclide Adjustment Factors associated with the selected Adjustment Table and Detector to the specified Destination. If the Destination is set to the PDF or Text File options, then a standard Windows dialog will be displayed to specify to the desired location. If the “Open File After Save” option is checked, then the PDF or Text file will be opened using the default program for opening these types of files similar to opening one of these files directly from Windows Explorer. Note that Microsoft Word must be installed to use the MS Word option.

A.2.3.5 Report Templates

Report Templates are simple text templates that define the data and layout of the Global Value custom report summaries. Special Parameter Codes are used to return analysis data from the database and all other text is displayed on the report exactly as shown on the template.

The template editor behaves similar to a standard Windows text editor, such as Notepad, allowing the use of routine Cut, Copy, Paste, Delete commands available from the Right-Click shortcut menu or using standard keyboard combinations (Ctrl + X, C, V, etc.). The standard page width is 78 characters using the default font size of 11 cpi. The ruler at the top of the template editor can be used as a guide to ensure that the maximum width is not exceeded. The ruler is 80 characters wide and will scale with the template layout when changing the Viewer Font size. If more characters per line are required, then the font size in the rendered reports can be adjusted from the Analysis Editor or in automation Jobs with the Print_Rpt program as described in Section B.25.

NOTE: Do not use the TAB character when aligning text because this character is treated as a single SPACE character when report summaries are generated.

Several example templates are provided in the database which may be used as a starting point for creating your own reports.

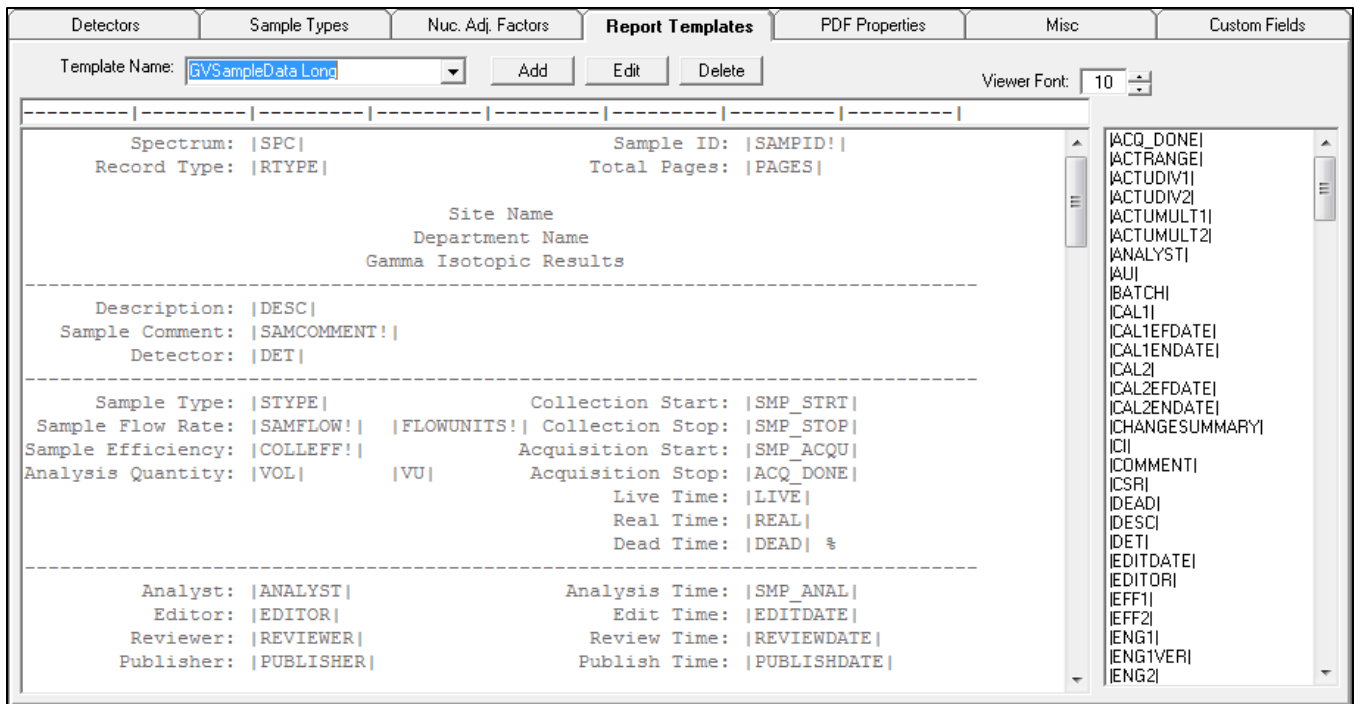


Figure A.2.3.5.1 Report Templates Tab

Parameter codes are available in the list to the right of the template editor as shown in Figure A.2.3.5.1. A detailed description of each parameter is available in Table A.2.3.5. These parameters can be added to the report template in Edit mode by clicking on the item in the list and pasting it to the appropriate location in the report template using the Right-Click shortcut menu or the keyboard combination "CTRL + V". This process uses the Windows clipboard for temporary storage similar to the standard Copy/Paste functions in other Windows applications.

The following command buttons are available to manage Report Templates:

- **Add:** Edit mode is enabled with a blank report template name and layout. Enter a name for the report and define the layout by adding standard text around the desired report parameters. A simple method of creating a new report template is to copy the entire content of an existing template, paste it into the empty template editor, and then modify it as necessary for the new report content. The Add, Edit, and Delete buttons are replaced with the Save and Cancel buttons when in the edit mode.
- **Edit:** Edit mode is enabled to allow an existing report template name and layout to be modified. The Add, Edit, and Delete buttons are replaced with the Save and Cancel buttons when in the edit mode.
- **Delete:** A dialog is displayed to confirm that the selected report template should be deleted from the list. If YES is selected, then the template is permanently deleted.
- **Save:** The template name and content are saved to the database. Note that neither the template name nor the template content fields can be blank, and the template name must be unique.

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
ACQ_DONE	Acquisition Complete Time Report Format = Regional Short Date and Time format = hh:mm:ss XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
ACTRANGE	Activity Range Factor (format = "0.00")	X	X	X	X	X
ACTUDIV1 ACTUDIV2	Activity Units Divisor from analysis settings for first (or only) and second analysis (format = "0.0000E+00")	X	X	X	X	X
ACTUMULT1 ACTUMULT2	Activity Units Multiplier from analysis settings for first (or only) and second analysis (format = "0.0000E+00")	X	X	X	X	X
ANALYST	Analyst Name	X	X	X	X	X
AU	Activity Units (i.e. Bq/ml)	X	X	X	X	X
BATCH	Batch ID	X	X	X	X	X
CAL1 CAL2	Calibration File Name for first (or only) and second analysis	X	X	X	X	X
CAL1EFDate CAL2EFDate	Efficiency Calibration Date/Time for the First (or only) and second Analysis Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
CAL1ENDate CAL2ENDate	Energy Calibration Date/Time for the First (or only) and second Analysis Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
CHANGESUMMARY	Full content of Change Summary (left aligned on report)	X	X	X	X	
CI	Confidence Interval (Sigma) from analysis settings (format = "0")	X	X	X	X	X
COMMENT	Comments field content (left aligned on report)	X	X	X	X	
CSR	Cs-134/137 Ratio (Format = "0.000") Must be located on the report after the nuclide table.	X	X	X		
DEAD	Dead Time (Format = "0.00")	X	X	X	X	X
DESC	Sample Description	X	X	X	X	X
DET	Detector Description	X	X	X	X	X
EDITDATE	Most recent date when changes were applied in the Analysis Editor Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
EDITOR	Most recent Editor Name	X	X	X	X	X
EFF1 EFF2	Efficiency Calibration Description for first (or only) and second analysis	X	X	X	X	X
ENG1 ENG2	Analysis Engine used for first (or only) and second analysis	X	X	X	X	X

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
ENG1VER ENG2VER	Analysis Engine Version for first (or only) and second analysis	X	X	X	X	X
GDT-P	Gas Decay Tank Pressure (Format = "0.00")	X	X	X	X	X
GDT-V	Gas Decay Tank Volume (Format = "0.00")	X	X	X	X	X
GRCTS	Total Gross Counts in the first ROI, or the entire spectrum if no ROI exists.	X	X	X	X	X
GRCR	Gross Counts divided by Live Time (Format = "0.00")	X	X	X	X	X
IR	I-131/133 Ratio (Format = "0.000") Must be located on the report after the nuclide table.	X	X	X		
LIB1 LIB2	Library File Name for first (or only) and second analysis	X	X	X	X	X
LIBMW	Library Match Width from analysis settings (format = "0.00")	X	X	X	X	X
LIVE	Live Time (Format = "#0")	X	X	X	X	X
MAXHL	Half-Lives Cutoff Limit (format = "0.00")	X	X	X	X	X
NUCRAT_NUM_DIV_F	Nuclide Ratio Calculation NUCRAT=The parameter indicating that the nuclide ratio calculation will be returned. NUM =The Nuclide Name whose activity will be used as the Numerator in the calculation. DIV =The Nuclide Name whose activity will be used as the Divisor in the ratio calculation. F = Number format used in the display of the calculated value as follows: <ul style="list-style-type: none"> "S" indicates scientific notation followed by the number of digits to follow the decimal place. A number without the "S" specifies the number of digits to follow the decimal place in a fixed number format. Must be located on the report after the nuclide table. The value returned is left aligned.	X	X	X		
PAGEBREAK	Forces a new page at the current location.	X	X	X		
PAGES	Total number of pages in report document. A placeholder (#PAGES#) is displayed in the Analysis Editor report viewer, and this parameter is replaced by the number of pages in the report when printing to the Printer or MS Word, or saving the report to PDF or Text formats. This placeholder is used because the number of pages will change depending on the print option (Summary, Details, or both).	X	X	X		
PBC1DATE PBC2DATE	Peak Background Correction DATE for the First (or only) and second Analysis Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
PBC1NAME PBC2NAME	Peak Background Correction Filename for the First (or only) and second Analysis	X	X	X	X	X
PBCMW	PBC Match Width from analysis settings (format = "0.00")	X	X	X	X	X
PKCUTOFF	Peak Cutoff from analysis settings (format = "0.00")	X	X	X	X	X
PUBLISHDATE	Publish Date/Time Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
PUBLISHER	Publisher Name	X	X	X	X	X
RADMON	Radiation Monitors and values. Each set separated by commas.	X	X	X	X	X
RANDUNCERT	Additional Random Uncertainty from analysis settings (format = "0.00")	X	X	X	X	X
REAL	Real Time (Format = "#0")	X	X	X	X	X
REVIEWDATE	Review Date/Time Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
REVIEWER	Reviewer Name	X	X	X	X	X
RSFCORR	Random Summing Factor Correction (format = "0.00000E+00")	X	X	X	X	X
RSFSLOPE	Random Summing Factor Slope (value entered in analysis options) (format = "0.00000E+00")	X	X	X	X	X
RTYPE	R-Type (Record Type)	X	X	X	X	X
RWP	RWPs separated by commas.	X	X	X	X	X
SMP_ACQU	Acquisition Start Date/Time Report Format = Regional Short Date and Time format = hh:mm:ss XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
SMP_ANAL	Analysis Report Date/Time Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
SMP_STOP	Sample Stop Date/Time Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
SMP_STRT	Sample Start Date/Time Report Format = Regional Short Date and Time format = hh:mm XML/CSV Format = YYYY-MM-DD hh:mm:ss	X	X	X	X	X
SMPLR	Air Sampler Identification	X	X	X	X	X
SPC	Spectrum File Name	X	X	X	X	X
SPCPATH	Spectrum File Path	X	X	X	X	X

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
SPCPICTURE	Image of Spectrum in Log mode. A placeholder (#SPECTRUMPLACEHOLDER #) is displayed in the Analysis Editor report viewer, and this parameter is replaced by the spectrum image when printing to the Printer or MS Word, or saving the report to PDF format. Only one image per document is allowed. If more than one is specified then only the first is rendered as an image.	X		X		
STYPE	Sample Type	X	X	X	X	X
SYSUNCERT	Additional Systematic Error from analysis settings (format = "0.00")	X	X	X	X	X
TEXE	Total Equivalent Xe-133 (Curies) 1) Requires an Adjustment Factor Table named "EQXE" and a "*" or "/" to be used in the Nuclide Activity row (i.e. *_EQXE_S2) 2) Requires a valid GDT Volume and Pressure 3) Cannot precede the nuclide table. 4) Number format is "0.00E+00" 5) Calculation details: TEXE = EQXE Conc * Tank Volume where: <ul style="list-style-type: none"> • EQXE Conc = $\sum(A_i * EQXE_i)$ = EQXE column total • Tank Volume (cc) = $K * (P_1 * V_1) / P_2$ • P1 = GDT pressure (psig) + 14.7 • P2 = 14.7 (atmospheric pressure) • V1 = GDT Volume (ft3) • K = Units Conversion = 2.83E-02 (12³ in³/ft³) * (2.54³ cm³/in³) / (1E+6 uCi/Ci) 	X	X	X		
UDUN?	User-Defined Uncertainty Name from analysis options (where ? is replaced by 1 through 9)	X	X	X	X	X
UDUV?	User-Defined Uncertainty Value from analysis options (where ? is replaced by 1 through 9) (format = "0.00")	X	X	X	X	X
UNIDPK	Simple Unidentified Peak List (Energy – Identification) 1) Peaks are taken from the first analysis report if dual analyses were performed. 2) Table is left aligned based on the location of the UNIDPK parameter. 3) Peak Energies within the table are right aligned. 4) Number format is "0.00"	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
UNIDPK_	<p>Advanced Unidentified Peak List (Full Unidentified Peak Table)</p> <ol style="list-style-type: none"> 1) Table includes: Background and Net Counts, Net Countrate, Uncertainty, FWHM, Flags, and Identification in that order. 2) Number formats are the same as the Unidentified Peak table in the Analysis Editor. 3) The Identification column is populated with the Identification field value from the Analysis Editor if the field has been populated (i.e. manually updated by the user). If this field is blank then the entry from the Suspect Nuclide column is displayed. 4) One or more optional parameters separated by the underscore character can be included to filter the data shown in the table using the following format: <p> UNIDPK_MINENERGY#_MAXENERGY#_MINBKGD#_MAXBKGD#_MINNET#_MAXNET#_MININT#_MAXINT#_MINUNCERT#_MAXUNCERT# </p> <p>Where</p> <ul style="list-style-type: none"> • “#” is replaced with the desired value for each parameter. • MINENERGY: returns records where peak energy > #. • MAXENERGY: returns records where peak energy < #. • MINBKGD: returns records where peak background > #. • MAXBKGD: returns records where peak background < #. • MINNET: returns records where net area > #. • MAXNET: returns records where net area < #. • MININT: returns records where net countrate (intensity) > #. • MAXINT: returns records where net countrate (intensity) < #. • MINUNCERT: returns records where % uncertainty > #. • MAXUNCERT: returns records where % uncertainty < #. 	X	X	X		
UNIT	Site Unit	X	X	X	X	X
VOL	Sample Quantity (Format = “0.000E+00”)	X	X	X	X	X
VOLUNCERT	Sample Quantity Uncertainty (format = "0.00")	X	X	X	X	X
VU	Sample Quantity Units	X	X	X	X	X
CUSTOM!	Any custom parameters established on the Custom Fields tab in Sample Administration Configuration Editor can be displayed using the Report Code specified for each parameter. These codes have an exclamation point (!) at the end.	X	X	X	X	X

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
Nuclide Table Parameters						
_ACT_S#	Primary Nuclide Activity Column (normally decay corrected) <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) See GV_GetRptData (Section B.22) for optional default values assigned to nuclides that exceed the Half-life cutoff limit. 4) Format is determined by the last one or two characters where: <ul style="list-style-type: none"> • S - Indicates scientific notation. Fixed number format is used if omitted. • # - Specifies the number of digits to follow the decimal place in either scientific or fixed number formats. 	X	X	X		
_ACTCT_S#	Time of Count Activity (not decay corrected) <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 	X	X	X		
_DC_S#	Decay Correction (DC) <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) Calculated as $DC = DTA \times DDC \times DDA$ Where: (See GammaVision manual for calculations.) DTA = Decay to Acquisition DDC = Decay During Collection DDA = Decay During Acquisition NOTE: This is the overall decay correction. The Time of Count activity generated in GammaVision has the DDC and DDA corrections applied, so this value cannot be directly derived by the difference between the Time of Count and Decayed activities.	X	X	X		
_EHL_S#	Elapsed Half Lives (EHL) <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) Calculated as $EHL = \ln(DC) / \ln(2)$ If too many half-lives have elapsed, then this calculation may result in an error in the $\ln(DC)$ function. If this occurs, then the following calculation is used instead: $EHL = (\text{Acquisition Start} - \text{Collection End}) / \text{Half-Life}$ 	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
F	<p>Nuclide Summary Peak Flags (typically used with Standard Nuclide Data)</p> <p>E – Displayed if any of the nuclide information has been changed in the Analysis Editor.</p> <p># – Displayed if the Bad Shape flag was displayed on the original GammaVision report.</p> <p>A – Displayed if the decayed activity is less than the MDA value.</p> <p>B – Displayed if the decayed activity is less than the MDA2 (normally critical level) value.</p> <p>When this field is used in the nuclide summary, the “E” flag that previously followed the nuclide activity value is no longer displayed. Otherwise, the table displays standard nuclide activity with the “E” as in previous versions.</p>	X	X	X		
FF	<p>Nuclide Summary Peak Flags Full List (typically used with ISO NORM Nuclide Data)</p> <p>< – Displayed if the Standard Nuclide activity is reported as <MDA.</p> <p>E – Displayed if any of the nuclide information has been changed in the Analysis Editor.</p> <p># – Displayed if the Bad Shape flag was displayed on the original GammaVision report.</p> <p>A – Displayed if the decayed activity is less than the MDA value.</p> <p>B – Displayed if the decayed activity is less than the MDA2 (normally critical level) value.</p> <p>C – Displayed if the ISO NORM Best decayed activity is less than the Decision Threshold (Critical Level) value.</p> <p>D – Displayed if the ISO NORM Best decayed activity is less than the Detection Limit (MDA) value.</p> <p>When this field is used in the nuclide summary, the “E” flag that previously followed the nuclide activity value is no longer displayed. Otherwise, the table displays standard nuclide activity with the “E” as in previous versions.</p>	X	X	X		
_HL_S#	<p>Half Life (days) (HL)</p> <p>1) Must be on the same row as the _NUC_ code.</p> <p>2) Value is right aligned.</p> <p>3) S# - See _ACT_S# format code.</p>	X	X	X		
_IDEC_S#	<p>ISO NORM Nuclide Activity Column (normally decay corrected)</p> <p>1) Must be on the same row as the _NUC_ code</p> <p>2) Value is right aligned.</p> <p>3) S# - See _ACT_S# format code.</p> <p>4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.</p>	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
_ ITOC _S#	ISO NORM Time of Count Activity (not decay corrected) 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code.	X	X	X		
_ IUAC _S#	ISO NORM Counting Uncertainty in Activity Units 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.	X	X	X		
_ IUPC _S#	ISO NORM Counting Uncertainty in Percent 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code.	X	X	X		
_ IUAT _S#	ISO NORM Total Uncertainty in Activity Units 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content. 5) If Standard Nuclide Activity is reported as <MDA, then this value is set to the ISO NORM Counting Uncertainty in Activity Units.	X	X	X		
_ IUPT _S#	ISO NORM Total Uncertainty in Percent 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Standard Nuclide Activity is reported as <MDA, then this value is set to the ISO NORM Counting Uncertainty in Percent.	X	X	X		
_ IMIN _S#	ISO NORM Minimum Activity as Reported by GammaVision 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
_ IMAX _S#	ISO NORM Maximum Activity as Reported by GammaVision 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.	X	X	X		
_ ICRL _S#	ISO NORM Critical Level (Decision Threshold) 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.	X	X	X		
_ IMDA _S#	ISO NORM Minimum Detectable Activity (Detection Limit) 1) Must be on the same row as the _NUC_ code 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value similar to the GammaVision report content.	X	X	X		
_ MDA_S#	Standard Nuclide MDA 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value.	X	X	X		
_ MDA2_S#	Standard Nuclide MDA2 (Typically Critical Level) 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value.	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
A_NUC_?	<p>Indicates the start of the Nuclide table with the specified records.</p> <ol style="list-style-type: none"> 1) Must be the first parameter on the nuclide table line. 2) The “A” flag is optional. If included all nuclides from the first and second analysis will be included in the table. If omitted, the last EFF , CAL , or LIB code found before the nuclide table determines which analysis nuclides to display based on the parameter suffix (i.e. 1st or 2nd analysis nuclides). This feature may be used to display the results from each analysis in separate nuclide tables. 3) The “?” flag can be set to R, M, <, >, or omitted to define which nuclides are displayed in the table as follows: <ul style="list-style-type: none"> • R – Omits nuclides reported with the “<” symbol. • M – Omits nuclides reported without the “<” symbol. • < – Shows nuclides with activity less than or equal to the MDA2 value. • > – Shows nuclides with activity greater than or equal to the MDA2 value. • Omitted – Shows all nuclides. Nuclides without the “<” flag are reported first. 4) Nuclide name is left aligned to the parameter position. 	X	X	X		
_UNCT_S#	<p>Standard Nuclide Uncertainty Reported</p> <ol style="list-style-type: none"> 1) Data is based on the standard GammaVision report uncertainty as set in the Analysis Options (i.e. % or Activity units for Total or Counting Uncertainty). This value is set to the Total Uncertainty if the Total option is selected. 2) Must be on the same row as the _NUC_ code. 3) Value is right aligned. 4) S# - See _ACT_S# format code. 	X	X	X		
_UNCTAC_S#	<p>Standard Nuclide Counting Uncertainty in Activity Units</p> <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value. 	X	X	X		
_UNCTAT_S#	<p>Standard Nuclide Total Uncertainty Activity Units</p> <ol style="list-style-type: none"> 1) Must be on the same row as the _NUC_ code. 2) Value is right aligned. 3) S# - See _ACT_S# format code. 4) If Decay Correction is enabled, then this value is decay corrected unless the Half-Life Cutoff is exceeded. If the Half-Life Cutoff is exceeded, then this value is set to the Time of Count value. 5) If Standard Nuclide Activity is reported as <MDA, then this value is set to the Standard Nuclide Counting Uncertainty. 	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
?_XXX_S#	<p>Nuclide Adjustment Factor or Calculated Nuclide Value</p> <p>1) The “?” flag can be set to as follows: *, /, *A, /A, *M or omitted to define the column content as follows:</p> <ul style="list-style-type: none"> • “*” (asterisk) or “/” (backslash) – Value is calculated as Standard Nuclide Activity times (*) or divided by (/) Adjustment Factor. If Standard Nuclide Activity is <MDA, then value is reported as "---". • “*A” or “/A” – Value is calculated as Standard Nuclide Activity times (*) or divided by (/) Adjustment Factor. If Standard Nuclide Activity is <MDA, then the MDA is used in the calculation and the MDA result is included in the column total. • “*M” or “/M” – Value is calculated as Standard MDA times (*) or divided by (/) Adjustment Factor. • “*M2” or “/M2” – Value is calculated as Standard MDA2 times (*) or divided by (/) Adjustment Factor. • “*IB” or “/IB” – Value is calculated as ISO NORM Best Activity times (*) or divided by (/) Adjustment Factor. • “*IMN” or “/IMN” – Value is calculated as ISO NORM Minimum Activity times (*) or divided by (/) Adjustment Factor. • “*IMX” or “/IMX” – Value is calculated as ISO NORM Maximum Activity times (*) or divided by (/) Adjustment Factor. • “*IMD” or “/IMD” – Value is calculated as ISO NORM MDA (Detection Limit) times (*) or divided by (/) Adjustment Factor. • “*ICL” or “/ICL” – Value is calculated as ISO NORM Critical Level (Decision Threshold) times (*) or divided by (/) Adjustment Factor. • Omitted – Adjustment Factor value is displayed without calculations. Column total is not calculated. <p>2) “XXX” is the name of a valid Nuclide Adjustment Factor Table as displayed in the Adjustment Factor Editor.</p> <p>3) Must be on the same row as the _NUC_ code.</p> <p>4) Value is right aligned.</p> <p>5) S# - See _ACT_S# format code.</p>	X	X	X		

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
TOTAL TOTALI	Nuclide Activity and Nuclide Adjusted column totals 1) TOTAL - Column Totals are displayed for all columns except for MDA, MDA2, ISONORM MDA (Detection Limit), ISO NORM Critical Level (Decision Threshold), Uncertainty, and Nuclide Adjustment Factors displayed without calculations (i.e. no * or / applied) for nuclides with activity greater than zero and not reported as "<" MDA. 2) TOTALI - Calculates column totals similar to TOTAL except that the ISO NORM columns (Activity, TOC Activity, Minimum, Maximum, and any calculations based on these parameters) include all nuclide data in the total even if the standard activity is reported as "<" MDA. 3) Values in any column less than zero are not included in the totals (i.e. when using the GammaVision Directed Fit option which could generate negative activity.) 4) Totals are aligned and formatted based on parameter format codes in the nuclide table. 5) Must be on a row after the _NUC_ code (normally immediately after the nuclide table).	X	X	X		
Nuclide Parameters for XML and CSV files (Format = 0.0000E+00) (See related parameters in the previous table for more detail.)						
PUBNUCACT	Standard Nuclide Activity (normally decay corrected)				X	X
PUBNUCAU	Activity Units				X	X
PUBNUCBADSHAPE	TRUE or FALSE depending on Bad Shape Flag status				X	X
PUBNUCDC	Decay Correction (See _DC_S# above for calculation.)				X	X
PUBNUCEDITED	TRUE or FALSE depending on Edit status				X	X
PUBNUCEHL	Elapsed Half Lives (See _EHL_S# above for calculation.)				X	X
PUBNUCFLAG	Returns "<" if activity reported as "<" MDA value, otherwise blank.				X	X
PUBNUCHL	Half-Life (days)				X	X
PUBNUCMDA	Standard Nuclide MDA				X	X
PUBNUCMDA2	Standard Nuclide MDA2			X	X	
PUBNUCNAME	Nuclide Name			X	X	
PUBNUCTOACT	Standard Nuclide Time of Count Activity (not decay corrected)			X	X	
PUBNUCUNCT	Standard Nuclide Reported Uncertainty Data is based on the standard GammaVision report uncertainty as set in the Analysis Options (i.e. % or Activity units for Total or Counting Uncertainty).			X	X	
PUBNUCUNCTAC	Standard Nuclide Counting Uncertainty in Activity Units			X	X	
PUBNUCUNCTAT	Standard Nuclide Total Uncertainty in Activity Units			X	X	
PUBNUCIDEC	ISO NORM Best Activity (normally decay corrected)			X	X	

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data	CVR	TXT	PDF	XML	CSV
PUBNUCITOC	ISO NORM Best Time of Count (not decay corrected)			X	X	
PUBNUCIUAC	ISO NORM Counting Uncertainty in Activity Units			X	X	
PUBNUCIUPC	ISO NORM Counting Uncertainty in Percent			X	X	
PUBNUCIUAT	ISO NORM Total Uncertainty in Activity Units			X	X	
PUBNUCIUPT	ISO NORM Total Uncertainty in Percent			X	X	
PUBNUCIMIN	ISO NORM Minimum Activity			X	X	
PUBNUCIMAX	ISO NORM Maximum Activity			X	X	
PUBNUCICRL	ISO NORM Critical Level (Decision Threshold)			X	X	
PUBNUCIMDA	ISO NORM Minimum Detectable Activity (Detection Limit)			X	X	
PUBNUC_TBL	Nuclide Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*TBL PUBNUC_/TBL	Calculated as Standard Nuclide Activity times (*) or divided by (/) Adjustment Factor value from table named "TBL". If Standard Nuclide Activity is <MDA, then value is reported as zero.			X	X	
PUBNUC_*ATBL PUBNUC_/ATBL	Calculated as Standard Nuclide Activity times (*) or divided by (/) Adjustment Factor value from table named "TBL". If Standard Nuclide Activity is <MDA, then the MDA is used in the calculation.			X	X	
PUBNUC_*MTBL PUBNUC_/MTBL	Calculated as Standard Nuclide MDA times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*M2TBL PUBNUC_/M2TBL	Calculated as Standard Nuclide MDA2 times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*IBTBL PUBNUC_/IBTBL	Calculated as ISO NORM Best Activity times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*IMNTBL PUBNUC_/IMNTBL	Calculated as ISO NORM Minimum Activity times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*IMXTBL PUBNUC_/IMXTBL	Calculated as ISO NORM Maximum Activity times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*IMDTBL PUBNUC_/IMDTBL	Calculated as ISO NORM MDA (Detection Limit) times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
PUBNUC_*ICLTBL PUBNUC_/ICLTBL	Calculated as ISO NORM Critical Level (Decision Threshold) times (*) or divided by (/) Adjustment Factor value from table named "TBL".			X	X	
QA Header Parameters for All File Types						
QAANALYST	Analyst Name	X	X	X	X	
QADESC	Sample Description	X	X	X	X	
QADETNO	Detector Number	X	X	X	X	
QAPAGES	Total number of pages in report document.	X	X			

Table A.2.3.5.1 Report Template Parameter Codes

Report Code	Returned Data		CVR	TXT	PDF	XML	CSV
QAPUBLISHDATE	Publish Date/Time Format = YYYY-MM-DD hh:mm:ss for all file types		X	X	X	X	
QAPUBLISHER	Publisher Name		X	X	X	X	
QAREVIEWDATE	Review Date/Time Format = YYYY-MM-DD hh:mm:ss for all file types		X	X	X	X	
QAREVIEWER	Reviewer Name		X	X	X	X	
QASMP_ACQU	Acquisition Start Date/Time Format = YYYY-MM-DD hh:mm:ss for all file types		X	X	X	X	
QASPC	Spectrum File Name		X	X	X	X	
QATYPE	QA Type (either QAPeak or QABackground)		X	X	X	X	
QA Data Parameters for XML and CSV files							
QAPUBHIGHCTRL	QA Parameter High Control Value				X	X	
QAPUBHIGHTOL	QA Parameter High Tolerance Value				X	X	
QAPUBLOWCTRL	QA Parameter Low Control Value				X	X	
QAPUBLOWTOL	QA Parameter Low Tolerance Value				X	X	
QAPUBPARAMETER	QA Parameter Name (i.e. Energy, FWHM, etc.)				X	X	
QAPUBPOINT	QA Point Name (i.e. QA-122, QA-1408, etc.)				X	X	
QAPUBRESULT	Result as displayed on QA report (i.e. PASS, Low OOT, etc.)				X	X	
QAPUBTARGET	QA Parameter Target Value				X	X	
QAPUBVALUE	QA Parameter Measured Value				X	X	

A.2.3.6 PDF Properties

The PDF Properties define the PDF file names and passwords that are employed when “Publishing” reports from the Analysis Editor. These properties are not used when printing reports to the PDF format from automation Jobs or from the Analysis Editor.

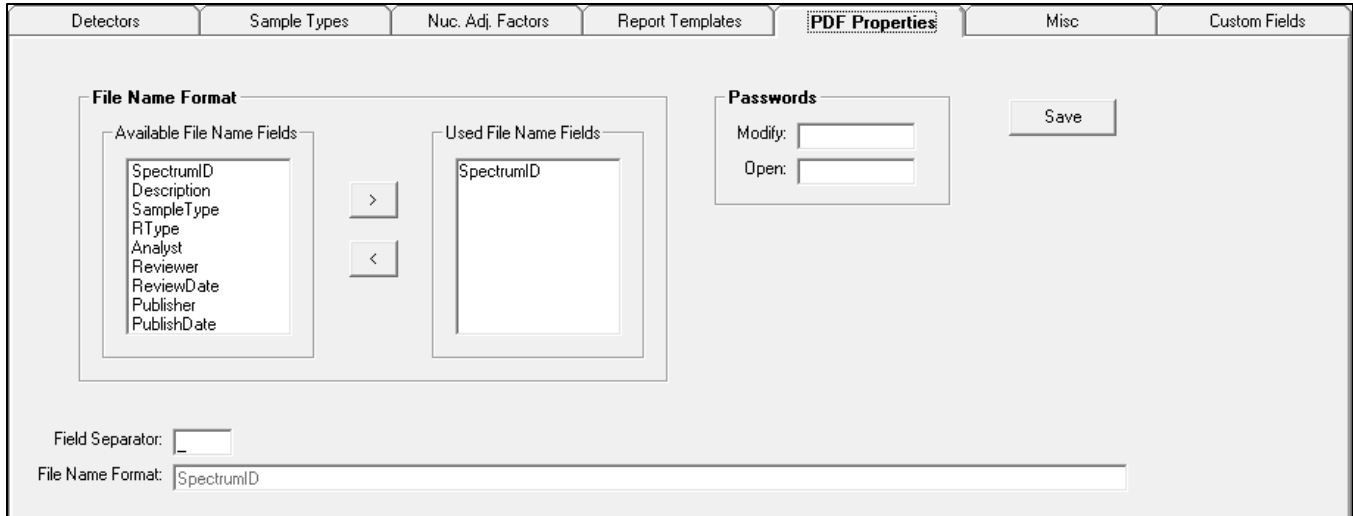


Figure A.2.3.6.1 PDF Properties Tab

The File Name Format is established by adding any of the available field names to the “Used File Name Fields” list using the arrow buttons or simply double-clicking on an item in the “Available File Name Fields” list. Items may be removed from the list in a similar manner.

Each field may be separated by additional characters, such as “-“ or “_” to make the file name easy to decode or parse. The ‘File Name Format’ field displays the file naming convention consisting of the specified fields and separation characters.

When using the “Date” fields, the format of the applicable date is “YYYY-MM-DD hhmm”.

NOTE: When using the GVPublishSample program described in Section A.3, only the SpectrumID can be used as the filename.

NOTE: Invalid file name characters, such as (\ / : * ? ” < > |), could be used in several available File Name fields including the sample description, user names, Sample Type, and RType since all of these fields are treated as simple text throughout the application. These characters would result in an error preventing the PDF file from being saved, so caution should be exercised when using these fields. Generally, this should not be issue for fields that are predefined by an administrator including the names, Sample Type, and RType, but the Sample Description is less predictable in routine operation.

For additional assurance of report content integrity, passwords can be set to Modify or Open PDF files using the applicable fields on this tab. Generally, the reports should be available for viewing by anyone, but encryption to prevent unauthorized changes may be desired. This condition is established by leaving the “Open” password blank and specifying a password in the “Modify” password field. Note that modifications to PDF files that are encrypted require a PDF editor.

Changes are not stored in the database until the **Save** button is selected.

A.2.3.7 Startup and Non-Analysis Sample Input Defaults

The Misc tab in the Configuration Editor allows default parameters to be defined for system startup and various data input fields that are not related to the spectrum analysis as described below.

NOTE: Parameters on this tab are automatically saved when changes are made!

Default Database Path: C:\User\GVCRA\Databases\GlobalValue1.mdb

GammaVision Path: C:\Program Files (x86)\GammaVision\Gv32.exe

Gas Decay Tank Volume: 600 Cubic Feet

Default GDT Pressure: 100 psig

RWP Prefix: (Current Year is used if left blank.)

Default Sampler ID: SPID:

Sample Admin Interface Options

- Show Time of Count Activity in Nuclide Grid
- Separate Editor and Analyst
- Show ISO NORM Nuclide Option

Default Monitor List

- Add
- Remove
- SPING #1
- SPING #2
- WRGM

Site Units List

- Add
- Remove
- Unit #1
- Unit #2

Figure A.2.3.7.1 Misc Tab

NOTE: Changes made on this tab are automatically saved to the current database!

The following parameters are available on this tab:

- **Default Database Path:** This field requires the full path to the default (Master) Global Value database. The path can be entered directly, or use the button next to this field to browse for the specified database file. This database is used read by the Quick Start and Sample Administration programs on startup to load configuration data, such as the Detector list and associated properties. It is normally one of the detector databases used for storing analysis data for samples - not a Quality Assurance database.

When the default database path is changed a connection to the new database is automatically attempted so that the Sample Admin program doesn't have to be closed and reopened for the change to take effect. If the path is not valid, then a prompt to browse to the default database will be displayed. If a valid database is not selected, then the database path reverts back to the default before the change.

NOTE: A different database can be used as the default when opening the Sample Administration program by specifying the full path on the command line as described in Section A.2, but this method is not recommended for a standard configuration.

NOTE: This parameter is established only for the local computer. It is not pushed to the other databases with the Synchronization described in Section A.2.3.9.

- **GammaVision Path:** This field requires the full path to the GammaVision program on the local computer. The Quick Start program uses this path to launch GammaVision with automation Job files so a valid path is required. The path may be entered directly or use the button next to this field to browse to "GV32.exe", which is normally installed in the directory "C:\Program Files\GammaVision" for 32-bit Windows or "C:\Program Files (x86)\GammaVision" for 64-bit Windows.

NOTE: This parameter is established only for the local computer. It is not pushed to the other databases with the Synchronization described in Section A.2.3.9.

If Global Value is being installed on a remote computer that does not have GammaVision (i.e. for remote data sharing only), then a message will be displayed when the Configuration Manager is accessed from the Sample Administration indicating that the GammaVision path is invalid along with a prompt to set the GammaVision path. To avoid this message when accessing the Configuration Manager establish a place holder file by creating a text file on the local computer, renaming it to GV32.exe, then setting the full path to that file in this field.

- **Gas Decay Tank Volume:** This is the Gas Decay Tank volume in Cubic feet that is used for the Total Equivalent Xenon (|TEXE|) calculation described in Table A.2.3.5.1.
- **Default Gas Decay Tank Pressure:** This is the default value displayed when the analyst is prompted for Gas Decay Tank pressure during automation Jobs using the GV_GetGDTPressure program (see Section B.17).
- **RWP Prefix:** This is the default text displayed in the RWP Prefix field when the analyst is prompted for RWP (Radiation Work Permit) numbers during automation Jobs using the GV_GetRWP program (see Section B.19). If this field is left blank then the current year (format = "YYYY") is displayed in the RWP entry prompt.
- **Default Sampler ID:** This is the default text displayed when the analyst is prompted for a Sampler Identification during automation Jobs using the GV_GetSamplePump program (see Section B.18).
- **Default Monitor List:** This is the list of monitors that are displayed when the analyst is prompted for Radiation Monitor Readings during automation Jobs using the GV_GetRadMon program (see Section B.20). A comprehensive list is not always required because the analyst may enter monitor names that are not listed if necessary.
- **Site Units List:** This is the list of Unit names that are displayed when the analyst is prompted for the Site Unit during automation Jobs using the GV_GetSiteUnit program (see Section B.14). A comprehensive list is not always required because the analyst may enter a unit name that is not listed, or the unit name may be specified without user input.
- **Show Time of Count Activity in Nuclide Grid:** When this option is checked the Standard Nuclide Time of Count activity field will be displayed in the Analysis Editor Nuclide Grid. Otherwise, this field will be hidden. (See Section A.2.2.3)
- **Separate Editor and Analyst:** When this option is checked the signature grid on the Analysis Editor header will include the Editor and Edit Date row which is updated with the current user name and date when changes are saved. Under this condition, the original Analyst name is not changed. If this option is not checked, then the Editor row is not displayed in the Signature grid, and Analyst name is updated to the current user (along with the hidden Editor field) when changes are saved. The appropriate setting is dictated by the individual site protocol for electronic data review.
- **Show ISO NORM Nuclide Option:** When this option is checked the "Show ISO NORM" checkbox is displayed on the Analysis Editor Nuclide Data tab to allow toggling between the Standard Nuclide data and ISO NORM nuclide data. Otherwise, the "Show ISO NORM" checkbox is hidden, and the last setting (checked or not checked) determines which data is displayed on the Nuclide Data tab. (See Section A.2.2.3)

A.2.3.8 Custom Fields

The Custom Fields tab in the Configuration Editor allows end-users to define custom parameter fields to meet a variety of needs. The data associated with custom fields can be specified using the standard data entry prompt associated with GVGetCustomData (See Section B.21), custom applications, or the Analysis Editor. This data can also be displayed on the custom reports or loaded into Excel using the Add-In functionality.

Detectors		Sample Types		Nuc. Adj. Factors		Report Templates		PDF Properties		Misc		Custom Fields	
Move Up		Add		Delete		Save							
Move Down													
Parameter Name (50 Char Max)	Interface Label (30 Char Max)	Report Code (10 Char Max)	Locked										
QuantityCalculationType	Quantity Calc Type	QCTYPE	X										
QuantityCalculationValue	Quantity Calc Input Value	QCVALUE	X										
QuantityCalculationUnits	Quantity Calc Units	QCUNITS	X										
QuantityCalculationMultiplier	Quantity Calc Multiplier	QCMULT	X										
QuantityCalculationDivisor	Quantity Calc Divisor	QCDIV	X										
AnalysisMethod	Analysis Method	ANAMETHOD	X										
DilutionFactor	Dilution Factor	DILFACTOR	X										
SampleQuantity	Sample Quantity	SAMQUANT	X										
SampleFlowrate	Sample Flowrate	SAMFLOW	X										
FlowrateUnits	Flowrate Units	FLOWUNITS	X										
CollectionEfficiency	Collection Efficiency	COLLEFF	X										
SampleComment	Sample Comment	SAMCOMMENT											
SampleID	Sample Number	SAMPID											
BatchID	Batch ID	BATCHID											
ProjectID	Project ID	PROJECTID											
AnalysisID	Analysis ID	ANALYSISID											
Matrix	Matrix	MATRIX											

Figure A.2.3.8.1 Custom Fields Tab

The following fields must be established for each Custom Parameter:

- **Parameter Name:** This field is used to reference the custom parameter when using GVGetCustomData (See Section B.21) or the Excel Add-In GVAnalysisParameter function (See Section F1). The parameter name cannot have spaces.
- **Interface Label:** This field is used for the field labels in the Analysis Editor (See Section A.2.2.5) and the GVGetCustomData manual data input interface (See Section B.21).
- **Report Code:** This field is used to display custom data parameters on Report Templates and are automatically added to the Report Template parameter list described in Section A.2.3.5.
- **Locked:** This Option is either set to “X” to lock the field in the Analysis Editor or left blank to allow editing. Typing anything other than an empty space in the “Locked” field will set it to “X”. This option locks fields that should only be set or modified through the applicable data entry interfaces implemented in automation Jobs where calculations, dependencies, or validation rules are imposed.

The following command buttons are available to manage Custom Field parameters:

- **Add:** Adds a row to the bottom of the grid to allow a new field to be defined.
- **Delete:** Removes the currently selected field row. Any data associated with a deleted parameter will be removed from all databases so caution should be exercised, such as archiving the databases, before deleting custom fields.

- **Save:** All custom field data in the grid is saved if valid entries have been entered.
- **Move Up / Move Down:** Moves the currently selected row up or down within the grid. Custom parameters are displayed in the Analysis Editor and in the GVGetCustomData data entry prompt in the order in which they are displayed in the configuration grid.

A.2.3.9 Synchronizing Databases

When the Sample Administration program starts, it establishes a connection to the default database, which acts as the Master database for Security and Configuration changes, as described in Section A.2. Changes applied to Security and Configuration parameters are only saved in this default database until the others are updated using the Database Synchronization option shown in Figure A.2.3.9.1 which is accessed from the Sample Administration program as shown in Figure A.2.2.

Each detector that is configured in the current database is displayed in the list to represent the database used to store sample analysis data along with an additional entry for the associated QA

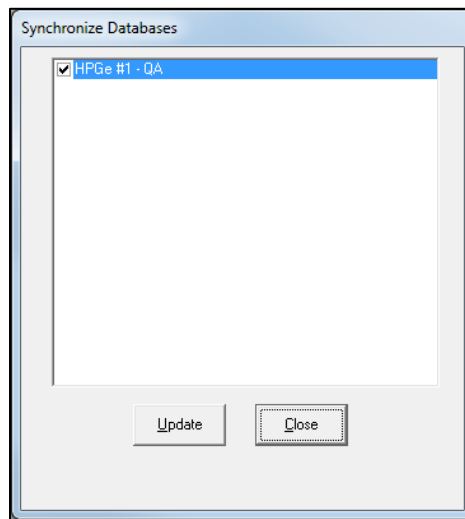


Figure A.2.3.9.1 Synchronize Databases

database. If the Default Database on the Misc tab in Configuration Manager is the same path as any detector database, then that detector database item is omitted from the list. If any detector database is the same physical database as the default, but has a different path specified in the configuration (i.e. local path vs shared drive path vs fully qualified network name path), then that item will be included in the list, but it will be automatically unchecked when the synchronization process runs based on a flag that is set in the default (or Master) database when the synchronization is initiated.

The **Update** button must be selected to start the synchronization all of the selected databases. If a detector database is not currently available then uncheck the associated detector before the update or the synchronization will be delayed by the network timeout setting while the program attempts a connection. If a database cannot be accessed then that item will automatically be unchecked and a message will be displayed temporarily at the bottom of the dialog. Corrective action should be taken to ensure that all database remain in synchronization to avoid the potential of synchronizing from an outdated database and losing more recent changes.

A.3 Sample Publisher

Previous versions of Global Value did not include the standard publishing program as this functionality was originally intended for custom development for special applications. Based on experience with many custom installations over the years, Global Value now provides a default publisher program that satisfies the most common requirements without customization. If additional functionality is required, the publisher provides the capability to launch other applications after the published files have been rendered to common file structures that are easily processed. This approach allows site personnel to develop their own custom applications without having to understand the underlying details associated with extracting information from Global Value databases.

When samples are published from the Global Value Sample Administration program, the publisher program is automatically run with the full path to the published PDF report passed as a command line parameter. The default publisher program requires this PDF report path to use only the Spectrum ID as the file name. This file naming convention is used by default, but it is possible to change the published PDF file name in the Sample Administration Configuration. If the file name is changed to anything other than only the Spectrum ID, then the publisher program will not behave as expected. Additionally, the Spectrum ID must start with the detector number followed by an underscore (i.e. "1_" for Detector #1). This is normally accomplished by configuring the File Prefix as "X_" where X is the detector number on the Detectors tab in Sample Administration Configuration, and then using the |DETSPECTRUMPREFIX| parameter generated by Quick Start as the first parameter in generating the Spectrum ID.

The publisher program, "GVPublishSample", resides in the installation directory with all of the other Global Value programs, and has an INI file by the same name. The settings in the INI file determine which files are generated when the publisher runs and which applications will be launched. File types that can be generated include PDF, Text, XML, and CSV. In combination with the GVDataExport program, it can also be used to push analysis results into a non-secured Microsoft Access database capable of receiving results from multiple detectors. See Section A.12 for more detail related to GVDataExport. After the publisher has generated the required reports and launched the specified programs, the original PDF file created by the Sample Administration Analysis Editor is deleted to avoid a large number of unnecessary files accumulating on the local workstation.

GVPublishSample has the following comma-delimited command line parameters:

- 1) Full Path to PDF Report (required): *The PDF file name must match the spectrum ID, and the file prefix must be in the format "DETNO_" where DETNO is the detector number. This is the default configuration for new installations.*
- 2) Full Path to Configuration File (optional): *This optional configuration file may be specified when using the publisher program outside of the routine publishing process. This may be useful for generating CSV or XML reports and/or processing the data dynamically within automation Jobs. When this file is omitted, such as when publishing results from the Analysis Editor, the default configuration file "GVPublishSample.ini" in the Global Value installation directory is used.*

A.3.1 Configuration File Content

The Configuration file consists of a series of parameters that are used for generating various file types and running applications. These parameters are enclosed in pipe characters (“|”) similar to those used with the Quick Start and GVSampleDataSC programs. Each configuration file can be configured to generate multiple output files and process them with different applications automatically if desired.

Two types of parameters are used to generate files and run applications. The file generation parameters use the prefix “Output” and those used for running applications use the prefix “RunApp”. All of the “Output” parameters must be listed before the associated “RunApp” parameters.

In addition to the prefix each parameter has a property name followed by a unique character identifier. This unique identifier is a single character that is used to group the Output and RunApp properties as well as link the Output file to the RunApp parameters. This identifier can be any alphanumeric character, thereby providing up to thirty six (36) different Output and RunApp scenarios in the same file.

The following shows the complete list of Output and RunApp parameters which are discussed in more detail in the remainder of this section.

```
|OutputTypeX|=
|OutputEnabledX|=
|OutputCoverTemplateX|=
|OutputIncludeSummaryX|=
|OutputIncludeDetailsX|=
|OutputDirectoryX|=
|OutputFileExtensionX|=

|RunAppPathX|=
|RunAppEnabledX|=
|RunAppCommandLineParameterX|=
```

Where:

X = Single character unique identifier (0-9, A-Z not case sensitive)

- **OutputType**

The OutputType can be set to PDF, TXT, XML, or CSV.

When set to XML or CSV, an appropriate XML or CSV template must be specified for the OutputCoverTemplate parameter. The IncludeSummary and IncludeDetails parameters are ignored for these Output Types.

When set to PDF or TXT, the report content is based on the OutputCoverTemplate, OutputIncludeSummary, and OutputIncludeDetails parameters – any of which can be omitted. PDF reports will use the same security rules (passwords) as established in Sample Administration Configuration on the PDF Properties tab.

Multiple reports can be generated with different content by using the unique character identifier “X” as shown in Section A.3.1.

- **OutputEnabled**

This parameter is set to “T” (true) to enable the specified report output. Anything other than “T” will disable the report output. This parameter allows output configurations to be established for

testing or other temporary conditions without removing the complete set of parameters from the file.

- **OutputCoverTemplate**

The OutputCoverTemplate is a report template appropriate for the output type specified. This parameter can be the full path to a text file or the name of a Report Template established in the Sample Administration Configuration. Normally, the latter option would be used as it provides security for the template content.

For PDF and TXT output types this parameter is optional. If a template is specified then it is processed in the same way as the Summary Reports in Sample Administration Configuration and is used as the first section of the report.

For XML and CSV output types this parameter is required since the template defines the layout and content of these file types. These templates are processed different than those used for summary reports and must comply with the formatting rules described below. Note that these templates cannot be used as standard analysis report summaries displayed in the Analysis Editor.

See Section A.2.3.5 for report template parameters for use with Text, PDF, CSV, and XML files.

The XML Template requires the following configuration:

- 1) The data set record must be enclosed in the tags <GVPublishDataSet> and </GVPublishDataSet>.
- 2) The Sample Data record must be enclosed in valid opening and closing tags. The recommended tags are <GVPublishSampleData> and </GVPublishSampleData>, but other names could be used if desired.

The Sample Data parameters described for standard report templates may be included within this record with each parameter enclosed in appropriate opening and closing tags. Attributes may also be included in tags if desired.

- 3) The nuclide data record must be enclosed in the tags <GVPublishNuclideData> and </GVPublishNuclideData>.

The report parameters in Table A.2.3.5.1 with the "PUBNUC" prefix are valid within the nuclide record with each parameter enclosed in appropriate opening and closing tags.

- 4) When the XML Template is rendered, the Sample Data parameters are replaced with the applicable results and a record for each nuclide is generated with the tags and data specified.

The following is an example of a valid XML Template. The piped parameters are those specified in Table A.2.3.5.1 for Report Templates, but this example does not include all possible parameters. The tag names are only for example except for the record tags discussed above which must be named accordingly. Indentation and spacing is for readability only.

```
<GVPublishDataSet>
```

```

    <GVPublishSampleData>
      <SpectrumID>|SPC|</SpectrumID>
      <SpectrumPath>|SPCPATH|</SpectrumPath>
      <Detector>|DET|</Detector>
      <AcquisitionStartTime>|SMP_ACQU|</AcquisitionStartTime>
      <AcquisitionStopTime>|ACQ_DONE|</AcquisitionStopTime>
      <SampleCollectionStartTime>|SMP_STRT|</SampleCollectionStartTime>
      <SampleCollectionStopTime>|SMP_STOP|</SampleCollectionStopTime>
      <Analyst>|ANALYST|</Analyst>
      <SampleSize>|VOL|</SampleSize>
      <SampleSizeUnits>|VU|</SampleSizeUnits>
      <ActivityUnits>|VU|</ActivityUnits>
      <Geometry>|EFF1|</Geometry>
    </GVPublishSampleData>

```

```

    <GVPublishNuclideData>
      <Nuclide>|PUBNUCNAME|</Nuclide>
      <Activity>|PUBNUCACT|</Activity>
      <TOCActivity>|PUBNUCTOCACT|</TOCActivity>
      <ActivityUnits>|PUBNUCAU|</ActivityUnits>
      <MDA>|PUBNUCMDA|</MDA>
      <MDA2>|PUBNUCMDA2|</MDA2>
      <ReportedUncertainty>|PUBNUCUNCT|</ReportedUncertainty>
      <CountUncertainty>|PUBNUCUNCTAC|</CountUncertainty>
      <TotalUncertainty>|PUBNUCUNCTAT|</TotalUncertainty>
      <Flag>|PUBNUCFLAG|</Flag>
      <BadShape>|PUBNUCBADSHAPE|</BadShape>
      <Edited>|PUBNUCEDITED|</Edited>
      <HalfLife>|PUBNUCHL|</HalfLife>
      <ElapsedHalfLives>|PUBNUCEHL|</ElapsedHalfLives>
      <DecayCorrection>|PUBNUCDC|</DecayCorrection>
      <DACFactor>|PUBNUC_DAC|</DACFactor>
      <DACMult>|PUBNUC_*DAC|</DACMult>
      <DACDiv>|PUBNUC_/DAC|</DACDiv>
    </GVPublishNuclideData>

```

```
</GVPublishDataSet>
```

The CSV (Comma-Separated Values) Template requires the following configuration:

- 1) The Sample Data and Nuclide Data have two separate records. In the rendered CSV file the Sample Data will be returned in a single row, and the Nuclide Data will be generated with one row per nuclide.
- 2) The Sample Data record must start with the parameter "CSVSAMPLEDATA:". This parameter is not returned in the final CSV file. Sample Data parameters described for standard report templates may be included within this record.
- 3) The Nuclide Data row must start with the parameter "CSVNUCLIDEDATA:". This parameter is not returned in the rendered CSV file. Report parameters with the "PUBNUC" prefix are valid parameters within the nuclide record.
- 4) All parameters in the Sample or Nuclide Data rows are returned exactly as listed in each row. If quotes around parameters are desired to ensure that data with commas, dates, etc. are interpreted correctly, then the quotes must be included around the applicable parameters in the template. The comma (or other character delimiter) must also be included to separate each parameter.
- 5) Additional text may be included outside of the Sample Data and Nuclide Data record. For example, a header row or other information may be desired for readability or to satisfy custom application processing requirements.

The following is an example of a valid CSV Template with a few parameters. Note that parameters with the exclamation character ("SAMPID!" in this case) are available only if configured as custom parameters in Sample Administration Configuration.

Detector, Spectrum, SampleID, Sample Date/Time, Acquisition Start Time
CSVSampleData: "|DET|", "|SPC|", "|SAMPID!|", "|SMP_STOP|", "|SMP_ACQU|"

Nuclide Name, Activity, TOC Activity, Activity Units
CSVNuclideData:"|PUBNucName|", "|PUBNucAct|", "|PUBNucTOCAct|", "|PUBNucAU|"

- **OutputIncludeSummary**

This parameter is used only for the PDF and TXT output types. It is ignored for XML and CSV output types. When set to “T” (true), the Summary Report stored for the sample is included after the coversheet in the PDF or TXT report that is generated.

- **OutputIncludeDetails**

This parameter is used only for the PDF and TXT output types. It is ignored for XML and CSV output types. When set to “T” (true), the Detailed Report stored for the sample is included as the last section of the PDF or TXT report that is generated.

- **OutputDirectory**

A valid directory (file folder) path must be specified to indicate where the rendered file will be stored. The file name will be the same as the original PDF file name (which is also the Spectrum ID).

- **OutputFileExtension**

This parameter defaults to the Output type (PDF, TXT, XML, or CSV) if no extension is specified. Other extensions may be assigned as necessary. For example, a text file may be saved with the DAT extension if desired.

- **RunAppPath**

This parameter requires the full path to an application to be run. Command line parameters may also be assigned as described below.

- **RunAppEnabled**

This parameter is set to “T” (true) to enable the specified application. Anything other than “T” will not allow the application to run. This parameter allows configurations to be established for testing or other temporary conditions without removing the complete set of parameters.

- **RunAppCommandLineParameter**

Multiple Command Line parameters can be specified for the application. If more than one is provided, then they will be comma-delimited in the order in which they are listed in the configuration file.

The following dynamic parameters may be specified in addition to any static parameters desired:

|DETNO|=Detector Number
|SPECTRUMID|=Spectrum ID
|OutputFileNameX|=File name of output file.
|OutputFilePathX|=Full path of output file.
|OutputFileDirectoryX|=Directory of output file.

Where:

X = Single character unique identifier matching the respective RunApp and Output group.

- **Example Configuration**

The following example demonstrates how four different output files of different types can be generated and two custom applications configured to run with command line parameters. Notes and comments as shown are acceptable in the configuration file.

XML file for passing data in a standard format.

```
|OutputType1|=XML  
|OutputEnabled1|=T  
|OutputCoverTemplate1|=PublishXMLTemplate  
|OutputDirectory1|=C:\User\XML  
|OutputFileExtension1|=xml
```

CSV file for passing data in an easily read format.

```
|OutputType2|=CSV  
|OutputEnabled2|=T  
|OutputCoverTemplate2|=PublishCSVTemplate  
|OutputDirectory2|=C:\User\CSV  
|OutputFileExtension2|=csv
```

Text file consisting of only the coversheet – possibly used as a Meta Data file.

```
|OutputType3|=TXT  
|OutputEnabled3|=T  
|OutputCoverTemplate2|=PublishTXTTemplate  
|OutputIncludeSummary3|=F  
|OutputIncludeDetails3|=F  
|OutputDirectory3|=C:\User\TXT  
|OutputFileExtension3|=asc
```

PDF file with a cover sheet, summary report, and detailed report(s).

```
|OutputType4|=PDF  
|OutputEnabled4|=T  
|OutputCoverTemplate4|=PublishPDFTemplate  
|OutputIncludeSummary4|=T  
|OutputIncludeDetails4|=T  
|OutputDirectory4|=C:\User\PDF  
|OutputFileExtension4|=pdf
```

Run application to process the XML file.

```
|RunAppPath1|=C:\User\GVCR\XMLProcessor.exe  
|RunAppEnabled1|=T  
|RunAppCommandLineParameter1|=|OutputFilePath1|
```

Run application to process the CSV file with additional command line parameters.

```
|RunAppPath2|=C:\User\GVCR\CSVProcessor.exe  
|RunAppEnabled2|=T  
|RunAppCommandLineParameter2|=|DETNO|  
|RunAppCommandLineParameter2|=|SpectrumID|  
|RunAppCommandLineParameter2|=|OutputFileName2|  
|RunAppCommandLineParameter2|=|OutputFileDirectory2|  
|RunAppCommandLineParameter2|=|OutputFilePath2|  
|RunAppCommandLineParameter2|=TRUE
```

The last parameter is a static flag for some condition or status required by the application.

A.4 QA Administration

The QA Administration program is the main interface for reviewing QA data and managing QA settings. It is normally started by selecting the “QA” button from Global Value Quick Start on lab computers used for sample measurements, or from a Windows Shortcut on remote access computers used for data review. When started from a Windows shortcut, the default view is normally as shown in Figure A.4.1. When started from Quick Start the program opens with the QA Chart view displayed and the current Quick Start detector selected by default.

The program can accept two optional comma-delimited, command line arguments listed in any order.

- 1) Full Path to a target QA database: This path is required to identify a production QA database for the applicable detectors.
- 2) Detector ID/Number: This is the Detector number specified in the MCB Configuration which is also the Detector Number specified in the Sample Administration Configuration Manager. If the Detector ID is provided then the trend chart window will be displayed with the specified detector selected in the dropdown list when the program opens.

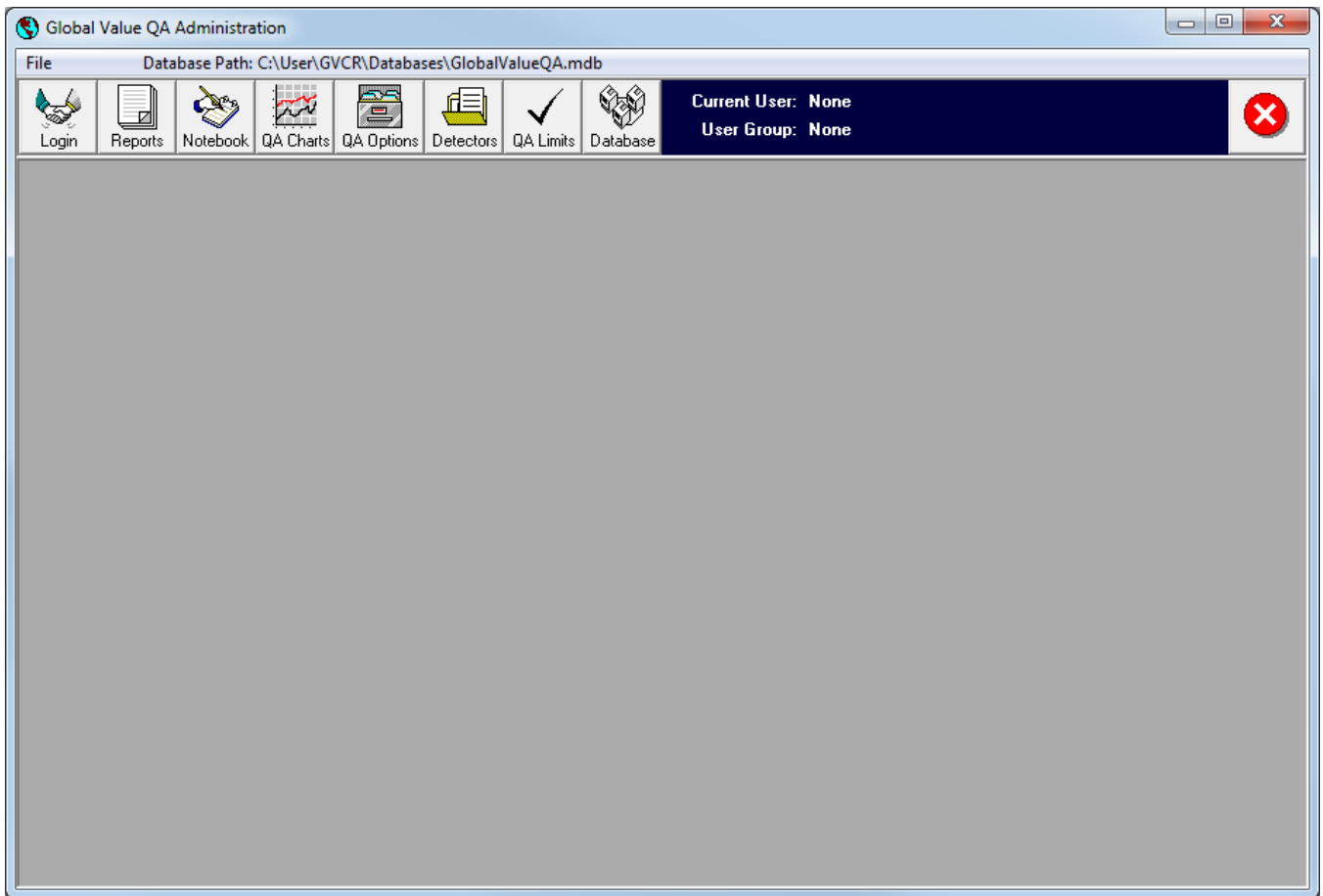


Figure A.4.1 QA Administration Default View

Unlike databases that store analysis results for samples, the QA databases can store data for multiple detectors. The QA Reporting options are also set in the QA database and may be set different in each database as these parameters are not synchronized across all databases. This allows setting different report header options for each location in a multi-lab site. The security and database configuration parameters, however, are managed from the Sample Administration program and synchronized to the QA databases to ensure that these settings are consistent throughout the Global Value system. (See Section A.2.3.1)

When using separate databases for different detectors (or groups of detectors) or when accessing QA data from a remote computer, there are two options available to establish a connection to the appropriate database as outlined below.

- 1) Establish a Windows shortcut or Menu Item in the Quick Start program's INI file to the GVQAdmin program with the full path to the database on the command line. For example, a directory on a local computer may be shared with the such that the fully qualified network name can be used on the command line as follows:

C:\User\GVCR\GVQAdmin.exe \\ComputerName\GVCR\Databases\GlobalValueQA.mdb

- 2) Users with CONFIGURATION permissions as established in the Security settings may connect to a different database using the "Load Archived Database" option under Database Management (Section Section A.4.8).

QA Administration Toolbar Control

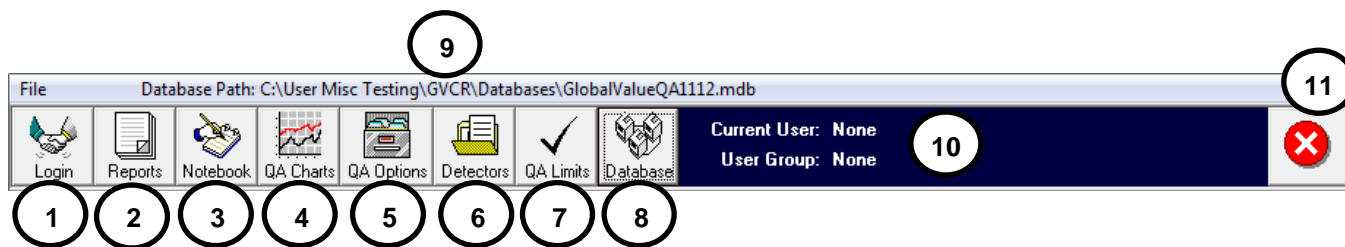


Figure A.4.2 QA Administration Header

- 1) **User Login** to change the current user.
- 2) **QA Sample Manager (Reports)** for data review and approval. (Section A.4.2)
- 3) **Lab Notebook** for entering comments related to QA failures, changes to QA Limits, and Instrument Maintenance/History. (Section A.4.3)
- 4) **QA Charts** for reviewing data trends (Section A.4.4)
- 5) **QA Options** to establish reporting options (Section A.4.5)
- 6) **Detector Parameters** for removing detectors that were inadvertently synchronized from the Sample Administration program. (Section A.4.6)
- 7) **QA Limits** to establish QA Points, Parameters, and associated Limits (Section A.4.7)
- 8) **Database Management** for archive, purge, and compact functions (Section A.4.8)
- 9) **Database Path** for the currently connected database.
- 10) **User Name and Group** for the current user logged in.
- 11) **Close Button** to exit application.

A.4.1 QA Administration Login

The Login prompt for the QA and Sample Administration programs are identical and are displayed when the program opens or when the applicable toolbar button is selected. If a valid Login User Name and Password is supplied, then the User and Group Names will be displayed in the toolbar near the top of the window, and permissions associated with the User Group will be enabled. If **Cancel** is selected then the User Name and Group are set to "None" and no permissions are enabled. This allows visitors to view QA data without the ability to make any changes.

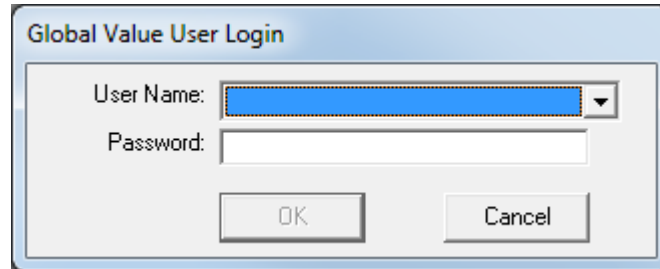


Figure A.4.1.1 Login Prompt

Note that users and group permissions as well as password changes cannot be modified in the QA Administration program. These settings are managed from the Sample Administration program and synchronized to all databases in the Global Value system.

A.4.2 QA Sample Manager (Reports)

The QA Sample Manager is the main interface for reviewing QA reports similar to the Analysis Editor in Sample Administration. It includes a few report filter options, a "text only" representation of the QA report, Spectrum Histogram viewer, and various print and export options. The reports can also be reviewed electronically and published to PDF files with additional reporting and data integration options automated using the QA Publisher program described in Section A.5.

As shown in Figure A.4.2.1, the QA Sample Manager is comprised of a main header with selection

QAType	QADateTime	Analyst	Reviewer	ReviewDate	Publisher	PublishDate
QAPeak	10/5/2011 14:01:07	Admin	Admin	10/5/2011 18:49		
QAPeak	10/5/2011 14:01:06	Admin	Admin	10/5/2011 18:49		
QABkgd	10/6/2011 06:13:59	Admin	Admin	10/6/2011 06:58		
QAPeak	10/6/2011 15:31:03	Admin	Admin	10/6/2011 18:24		
QAPeak	10/6/2011 15:31:04	Admin	Admin	10/6/2011 18:24		

Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-122						
Channel	488.00	484.00	485.00	487.60	491.00	PASS
Energy	122.07	121.77	121.87	122.01	122.27	PASS
FWHM	0.90	0.75	0.80	0.92	1.00	PASS
ActivityDiff	1078.000	-7.500	-5.000	2.319	5.000	PASS
QA-662						
Energy	661.66	661.06	661.36	661.56	661.96	PASS
FWHM	1.40	1.05	1.26	1.35	1.54	PASS
ActivityDiff	1345.000	-7.500	-5.000	3.866	5.000	PASS

Figure A.4.2.1 QA Sample Manager

controls and buttons to progress reports through the review process and access the PDF security module, a grid with QA measurements and the applicable reviewer/publisher names and dates, and the report viewer.

A.4.2.1 QA Sample Manager Header Controls

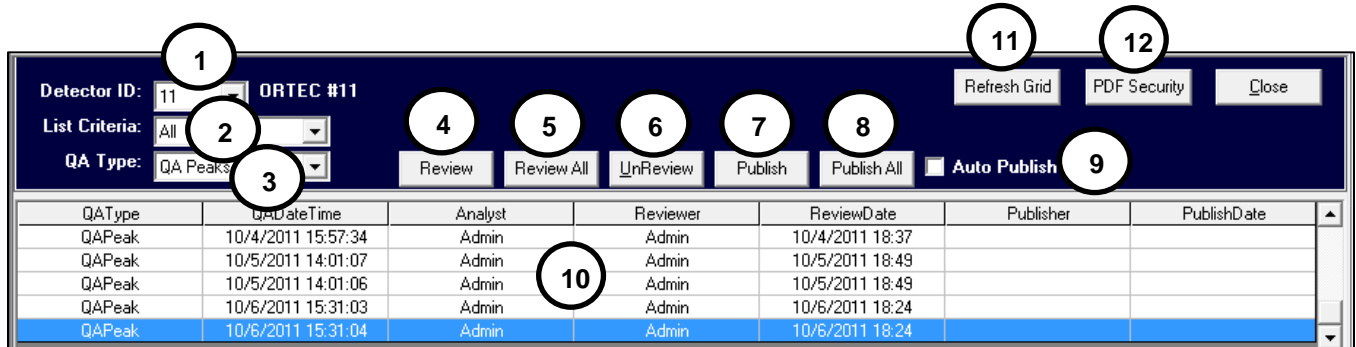


Figure A.4.2.1.1 QA Sample Manager Header

- 1) **Detector ID List:** This list is populated with the Detector Number for each detector in the current database. The detector list in the QA database is configured on the Detectors tab in Sample Administration Configuration Management and each QA database is updated when the databases are synchronized. When a detector is selected from the list the QA measurement grid is updated with records associated with the selected detector.
- 2) **List Criteria:** In combination with the QA Type, this field filters the list of measurements displayed in the grid to only those meeting the specified criteria. This filtering capability is intended to simplify the electronic review process. The following filtering options are available:
 - a. **Unreviewed:** This option will limit the list to those not having a Reviewer signature applied.
 - b. **UnPublished:** This option will limit the list to those not having a Publisher signature applied.
 - c. **Previous X Days:** When this option is selected a field is displayed to specify the number of days. The list is limited to those where the QA measurement Date/Time is after the current date/time minus the number of days specified.
 - d. **All:** This option disables the review signature and date filters.
- 3) **QA Type:** In combination with the List Criteria, the QA Type selection filters the list of reports displayed in the grid to only those meeting the specified criteria: QA Peaks, QA Background, or All Measurements.
- 4) **Review Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the QA report is refreshed such that the Reviewer name and date will be displayed on the final report.
- 5) **Review All Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the review process described for the Review Button is applied to every spectrum in the grid.

- 6) **UnReview Button:** This button is only enabled if the Current User belongs to a Group that has permission to Review Data. When selected the Reviewer and Publisher signatures are removed and the QA report is refreshed to remove the same signatures and dates.
- 7) **Publish Button:** This button is only enabled if the Current User belongs to a Group that has permission to Publish Data. When selected the QA report and detailed GammaVision report (if this option is enabled in the QA Reporting Parameters) are saved to a PDF file in the detector specific "Publish Report Path" directory as established on the Detectors tab in the Configuration Manager. (See Section A.2.3.2) The file name and any password protection are determined by settings on the "PDF Security Settings" dialog. If the publisher name already exists then a prompt to publish the report again will be displayed.

After the PDF report has been saved a program called GVPublishQA.exe in the Global Value directory is run to provide additional data processing requirements. The QA Publisher described in Section A.5 offers several options for published report content and data integration including the ability to run additional programs for custom applications.
- 8) **Publish All Button:** This button is only enabled if the Current User belongs to a Group that has permission to Publish Data. When selected the publishing process described for the Publish Button is applied to every QA measurement in the grid.
- 9) **Auto Publish Option:** When this option is selected the Publish and Publish All buttons are hidden, and reports are automatically published as described for the Publish (or Publish All) buttons when the Review (or Review All) button is selected.
- 10) **QA Measurement Grid:** This list is populated with QA results meeting the filter criteria. The grid can be refreshed using the **Refresh Grid** button to reflect changes due to the addition of new records or data being reviewed or published. When a row is selected in the grid the associated analysis report is displayed in report viewer.

Right-click in the grid to display the **Delete** option (if the user has DELETE permission). When selected a prompt will be displayed indicating that the selected QA sample will be permanently deleted. This includes ALL of the QA data associated with the selected report that is stored in the database. Generally, it is good practice to archive or backup the database prior to deleting QA data. No files outside of the database are affected (i.e. published reports, spectra, etc.)

- 11) **Refresh Grid Button:** This button is used to refresh the QA Measurement grid based on the List Criteria and QA Type filters after changes to the records in the grid have been applied such as review and publish signatures.

- 12) **PDF Security Button:** This button is used to access the PDF Security Settings dialog shown in Figure A.4.2.1.2 which allows setting the PDF file name structure as discussed in Section A.2.3.6 for the Analysis Editor.

Note that when the QA Publisher is used for additional data processing or reporting, the PDF report name can only be set to the SpectrumID.

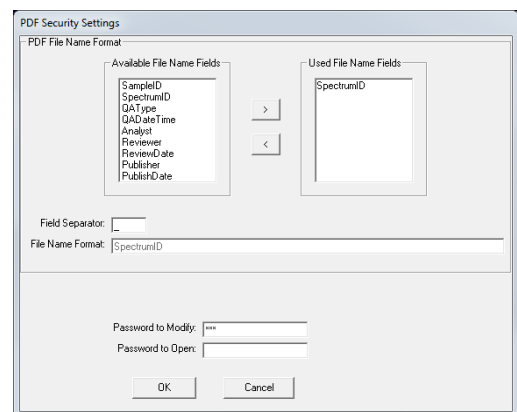
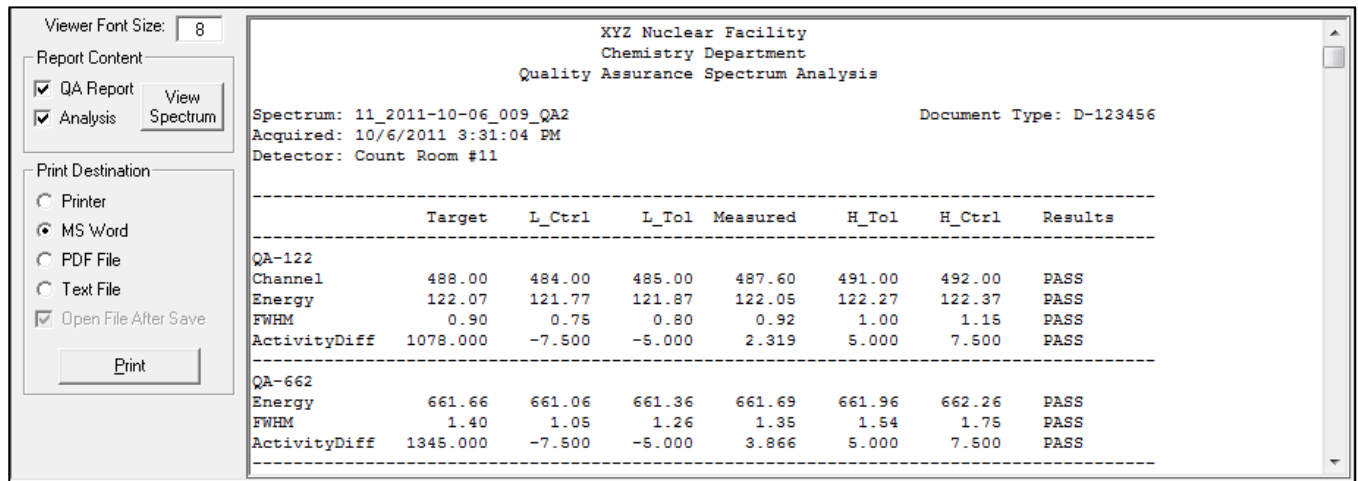


Figure A.4.2.1.2 PDF Security Settings

A.4.2.2 QA Sample Manager Report Viewer



The screenshot shows a software window titled 'QA Report Viewer'. On the left is a control panel with a 'Viewer Font Size' dropdown set to '8'. Below it are two sections: 'Report Content' with checkboxes for 'QA Report' and 'Analysis', and 'Print Destination' with radio buttons for 'Printer', 'MS Word', 'PDF File', and 'Text File', plus a checked 'Open File After Save' checkbox and a 'Print' button. The main area displays the report header: 'XYZ Nuclear Facility', 'Chemistry Department', and 'Quality Assurance Spectrum Analysis'. It includes metadata: 'Spectrum: 11_2011-10-06_009_QA2', 'Acquired: 10/6/2011 3:31:04 PM', 'Detector: Count Room #11', and 'Document Type: D-123456'. The core of the report is a table with columns: Target, L_Ctrl, L_Tol, Measured, H_Tol, H_Ctrl, and Results. Two sections are shown: 'QA-122' and 'QA-662', each with rows for Channel, Energy, FWHM, and ActivityDiff.

	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results
QA-122							
Channel	488.00	484.00	485.00	487.60	491.00	492.00	PASS
Energy	122.07	121.77	121.87	122.05	122.27	122.37	PASS
FWHM	0.90	0.75	0.80	0.92	1.00	1.15	PASS
ActivityDiff	1078.000	-7.500	-5.000	2.319	5.000	7.500	PASS
QA-662							
Energy	661.66	661.06	661.36	661.69	661.96	662.26	PASS
FWHM	1.40	1.05	1.26	1.35	1.54	1.75	PASS
ActivityDiff	1345.000	-7.500	-5.000	3.866	5.000	7.500	PASS

Figure A.4.2.2.1 QA Report Viewer

The QA Report viewer is nearly identical to the report viewer in the Analysis Editor. It includes a “text only” representation of the QA report along with a Spectrum Histogram viewer with various print and export options. The content in the report viewer may appear to be editable, but no changes from this interface are retained in the database or included with reports generated from the print options.

The following options are available with the report viewer:

- **Viewer Font Size:** This field specifies the font size used in the report viewer to accommodate different monitor resolution and report content.
- **Report Content:** The report viewer displays any combination of the QA Report and Detailed GammaVision Report. Note that the report viewer only displays standard text (similar to Notepad). If the “Print Spectrum on QA Report” option is selected in the QA Reporting Options, then the code #SpectrumPlaceholder# will be displayed in this view. This code is set in the report when the GVQAPeaks program (Section B.27) or GVQABackground program (Section B.28) is run in the automation Job. It cannot be added after the report has been stored in the database. When reports are printed to any format other than text (i.e. Printer, PDF, or MS Word) an image of the full spectrum in Log scale will replace the text placeholder. When printing to a text file, the placeholder is simply removed.
 - 1) **QA Report Option:** The QA report is displayed in the report viewer.
 - 2) **Analysis Option:** The standard GammaVision report is displayed in the report viewer. If the QA Report option is also checked then the GammaVision report is appended to the QA Report.

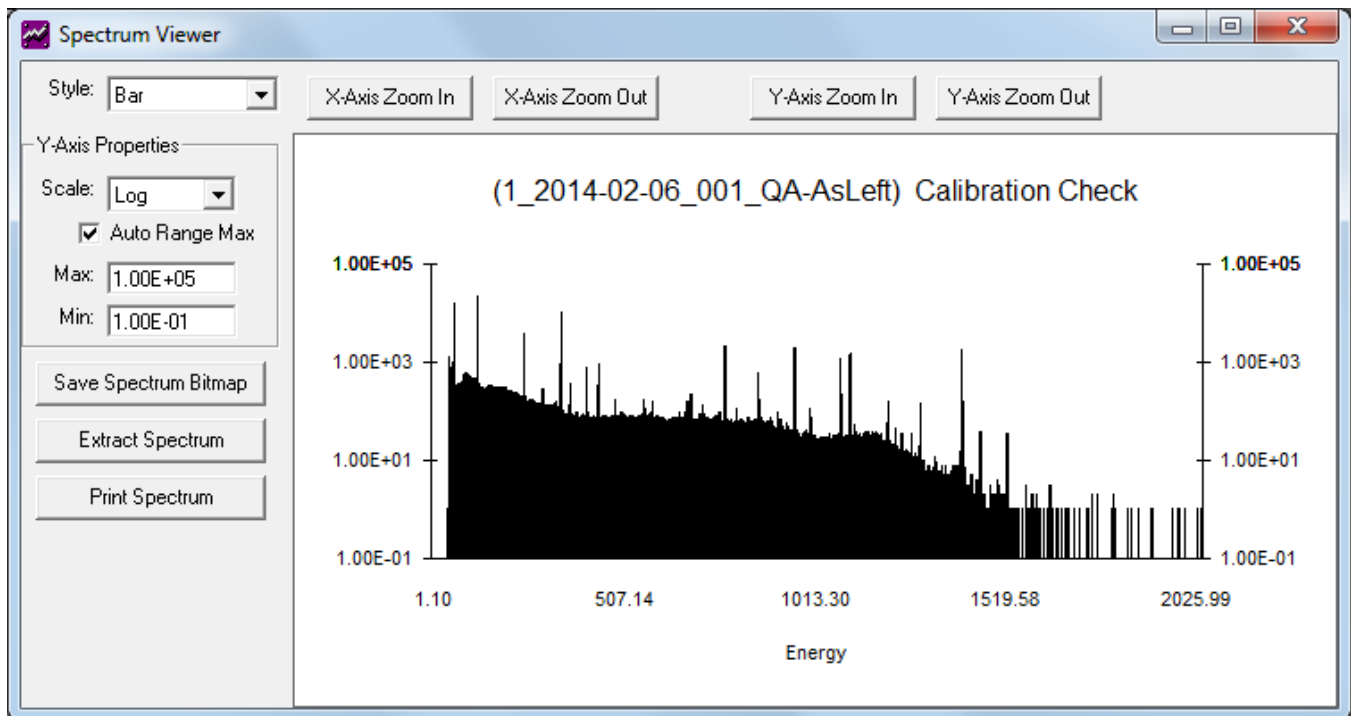


Figure A.4.2.2.2 Spectrum Viewer

- **View Spectrum:** This option displays the interactive spectrum viewer shown in Figure A.4.2.2.2 with data plotted as a Bar Chart, Line Graph, or Points. The spectrum can be zoomed in and out using the buttons above the spectrum window or through keyboard shortcuts where F5/F6 and Up/Down arrow keys zoom horizontally, and the F7/F8 keys zoom vertically similar to GammaVision. The vertical scale can also be viewed in Log or Linear scale with automatic or manual range settings. After setting the desired view an image of the spectrum can be saved to a Bitmap file or printed. The full spectrum file can also be extracted from the database and saved to a file for use directly in GammaVision.
- **Print Destination:** This section has several options for report output which are applied when the **Print** button is selected.
 - 1) **Printer:** The report is printed on the default printer.
 - 2) **MS Word:** The report is displayed in Microsoft Word (MS Word is required).
 - 3) **PDF File:** The report is saved to a PDF file. A standard “Save As” dialog is displayed indicating the path and file name. The default path is the “Custom Report Path” established for the selected detector in the Configuration Manager, and the default file name is the Spectrum name. Both the path and file name can be changed in the “Save As” dialog. (Also see “Open File After Save” below.)

NOTE: Printing the report to a PDF file is not the same as Publishing the report. When Publishing, the report is always saved to the “Publish” directory, and the file name and protection is determined by the PDF Properties in the Configuration Manager. GVPublishQA is also launched for additional processing when publishing. When printing a PDF file you can change the name and location, the file is not encrypted, and no additional processing occurs after the file is saved.

- 4) **Text File:** The report is saved to a text file. A standard “Save As” dialog is displayed indicating the path and file name. The default path is the “Custom Report Path” established for the selected detector in the Configuration Manager, and the default file name is the Spectrum name. Both the path and file name can be changed in the “Save As” dialog. (Also see “Open File After Save” below.)
- 5) **Open File After Save:** This option is only enabled when the PDF File or Text File option is selected. If this option is checked then the saved report will be opened and displayed using the associated program similar to opening the file directly from Windows Explorer.

A.4.3 Lab Notebook

The Lab Notebook provides a simple method for keeping track of detector specific comments or issues. These comments may be anything from an explanation for anomalous QA results to routine detector maintenance.

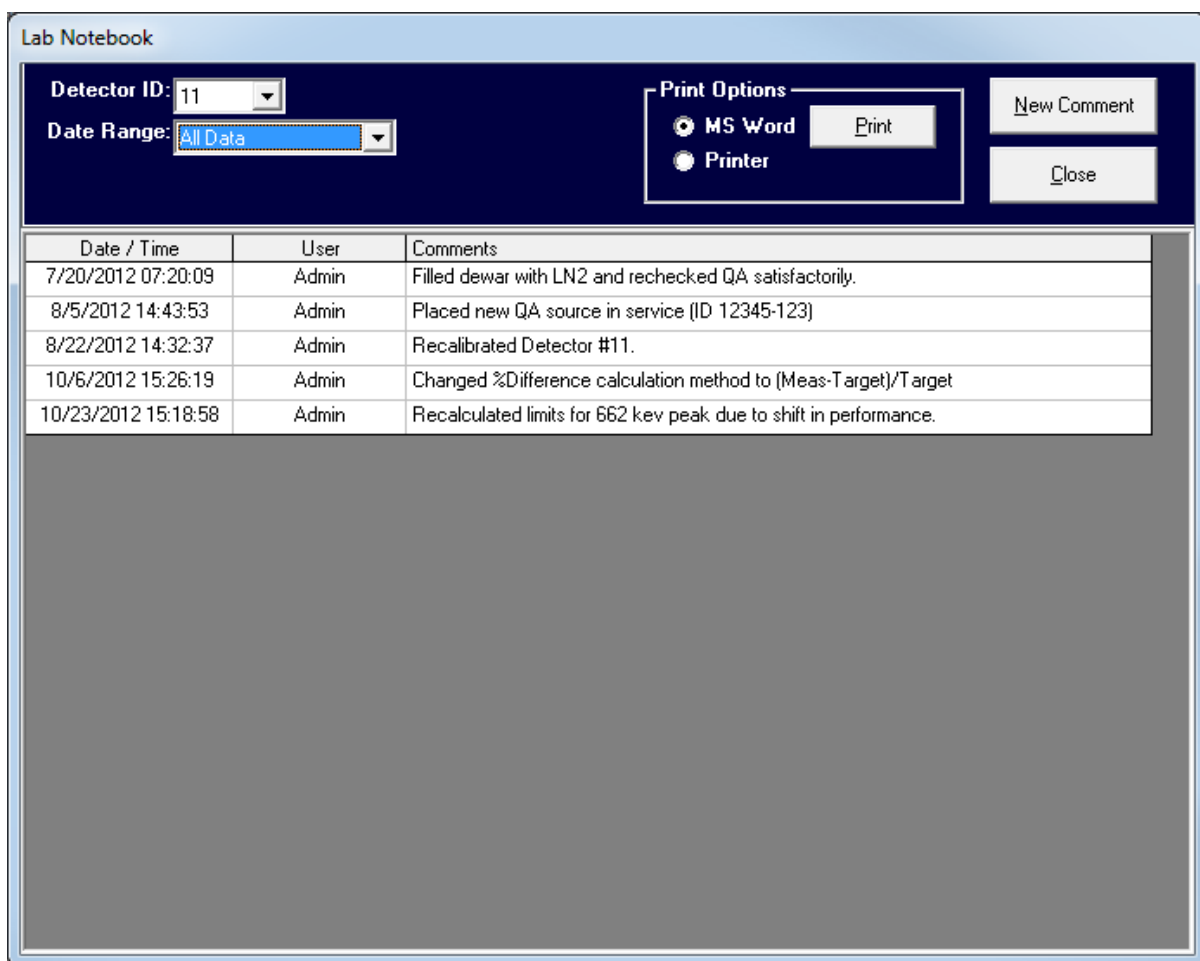


Figure A.4.2.1 Lab Notebook

The following options are available with the Lab Notebook:

- **Detector ID:** The detector list is populated based on all of the detectors configured in the current database. When a detector is selected all of the comments meeting the Date Range criteria are displayed in the grid.
- **Date Range:** The date range options are identical to those described for the QA Charts. (Section A.4.4) with the default settings based on the current QA Chart settings.

- **New Comment:** Select this button to add a new comment record to the end of the list. The current user name and the date/time are automatically set and cannot be changed. New comments can only be added if the current user belongs to a group with permission to ADD Data.
- **Comment Grid:** This grid displays the comments meeting the Date Range criteria. If the current user belongs to a security group with permission to EDIT DATA then comments associated with their name can be edited by selecting the comment field. These fields are disabled if the current user does not have the appropriate permission.
- **Print Options:** This section allows the user to generate a report showing the Lab Notebook comments to either Microsoft Word or the default printer.

A.4.4 QA Charts

The QA Charts provide instrument performance evaluation through trend plots and statistical data evaluation. This interface allows easy access to the underlying QA data as well as a mechanism to generate trend reports and custom data evaluation.

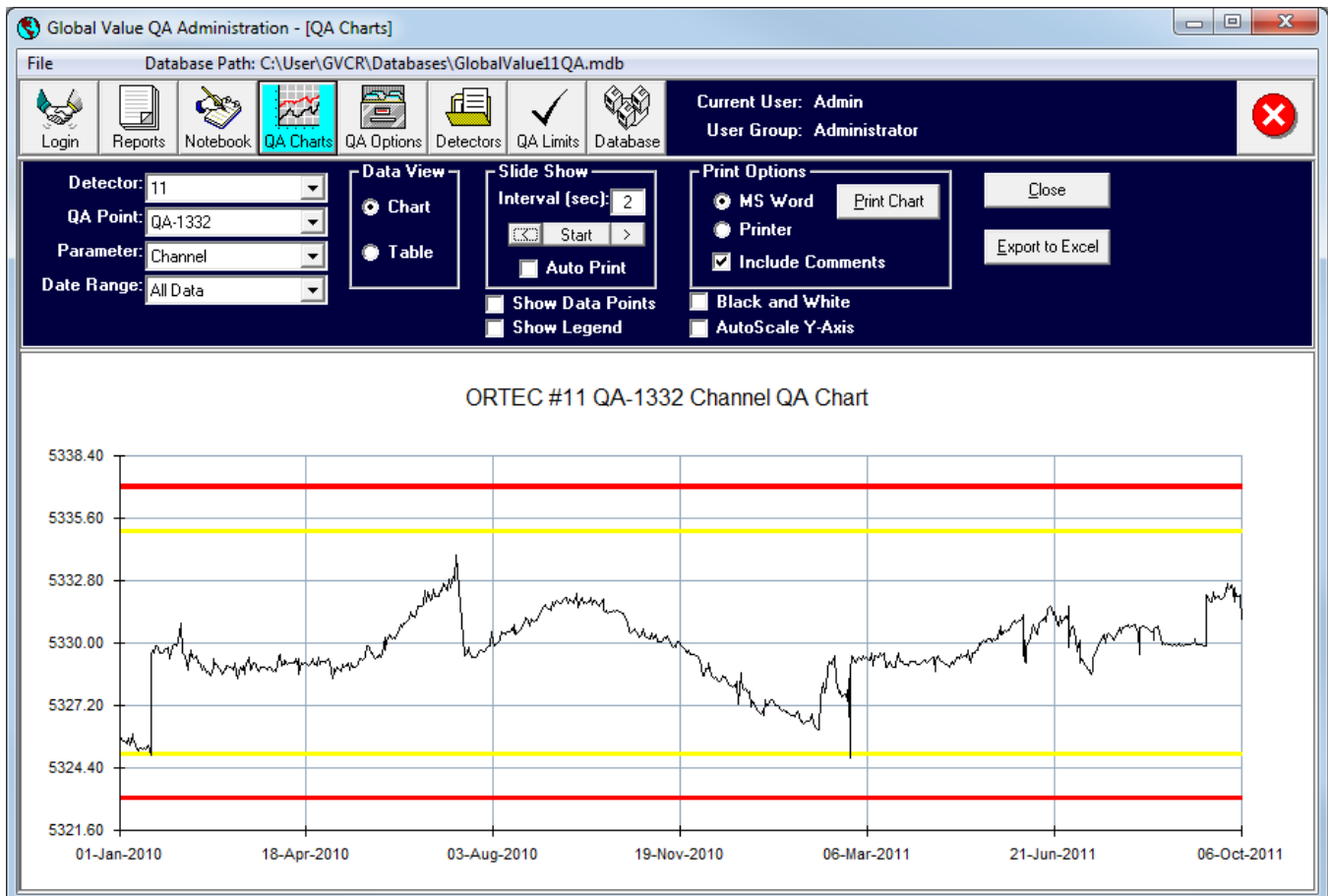


Figure A.4.4.1 QA Charts

A.4.4.1 QA Chart Header Controls

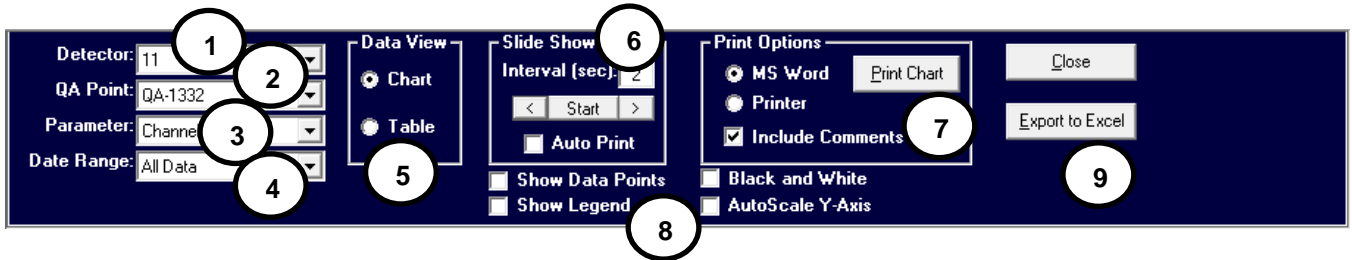


Figure A.4.2.1.1 QA Sample Manager Header

- 1) **Detector:** The detector list is populated based on all of the detectors configured in the current database. When a detector is selected, the QA Point list is updated and the first QA Point is selected by default. The QA chart and table data is updated to reflect the current plot parameter.
- 2) **QA Point:** The list of QA Points is populated based on each point established for the selected detector in the QA Limits. When a QA Point is selected the Parameter list for that QA Point is updated and the first parameter is selected by default. The QA chart and table data is updated to reflect the current plot parameter.
- 3) **Parameter:** The list of Parameters is populated based on limits established for each parameter in the QA Limits. When a Parameter is selected the QA chart and table data is updated.
- 4) **Date Range:** The Date Range specifies the criteria for data displayed in the data table and chart. The following options can be selected:
 - a. **Previous X Days =:** This is the default selection when the QA Charts are opened. A field is displayed below the list to specify the number of previous day's data to display. This entry is stored on the local computer to be used as the default the next time QA Charts are accessed.
 - b. **Year:** A field is displayed below the list to specify the calendar year of data to display. This entry is stored on the local computer to be used as the default the next time this Date Range is selected.
 - c. **Quarter:** A field is displayed below the list to specify the calendar quarter of data to display. The quarter entry can be any valid Month/Year combination (i.e. 1/2005, Feb-2005, or March 2005 may all be valid entries for 1st Quarter 2005 depending on the Regional computer settings). This entry is stored on the local computer to be used as the default the next time this Date Range is selected.
 - d. **All Data:** All data removes any date filters and loads up to a maximum of 4000 data points. If more than 4000 data points exist in the database for the selected Parameter, then only the most recent 4000 points will be displayed.
 - e. **Use-Defined:** Start and Stop date fields are displayed to set the specific data range.
- 5) **Data View:** QA Data can be viewed in the form of a Chart or a Table. The Slide Show and Print Options are only displayed when the **Chart** option is selected. The **Table** option provides easy access to the data behind the charts. This data can be used in other applications by selecting the range of fields in the table, right-clicking in the selected region, and selecting **Copy** from the shortcut menu. The table data can then be pasted into another application such as Notepad, Excel, etc..
- 6) **Slide Show:** (This option is only displayed when in the Chart View.) The Slide Show feature provides a very simple method for reviewing trend charts. Simply enter the number of

seconds to pause on each chart and select the **Start** button. The button face color will change to teal indicating that the slide show is in progress and the text changes to "Stop". The slide show will automatically cycle through each parameter of every QA Point for all detectors. Select the **Stop** button to pause the slide show at any point. The "<" or ">" buttons may also be used to manually navigate through each QA parameter instead of selecting parameters from the list.

If the **Auto Print** option is selected when the Slide Show is run, then all of the charts are printed (three charts per page) with the Comments page included as the cover page if the "Include Comments" option is checked in the Print Options.

- 7) **Print Options:** (This option is only displayed when in the Chart View.) The Print Options provide a method for generating QA charts in the form of a report. The report can be printed to the default printer or displayed in Microsoft Word depending on the selection. If the **Include Comments** option is checked then all of the comments in the Lab Notebook for the selected detector within the date range of data displayed on the chart will be included on the report.
- 8) **Chart Options:**
 - a. **Show Data Points:** Data points on the measured value data series are displayed when this option is checked.
 - b. **Chart Legend:** The legend is displayed in the upper right corner of the chart when this option is checked.
 - c. **Black and White:** The Control and Tolerance limits are displayed in black and white with the Control line in Dashes and the Tolerance line in dots when this option is checked. This mode is useful when printing to non-color printers where the grayscale of the limit lines may not produce clear charts.
 - d. **AutoScale Y-Axis:** When this option is not checked the QA chart is centered around the QA Control limits. In this condition it may not be possible to see points that fall outside of the established limits. When this option is checked, the Y-Axis will be scaled to show all data. In this condition a single outlier may cause the rest of the chart data to appear very compressed.
- 9) **Export to Excel:** When this button is selected the currently displayed QA data will be exported to Microsoft Excel. A statistics summary page is generated along with several charts which can be used to evaluate the data. The statistics are generated using standard Excel functions. Refer to Microsoft Excel's Help for an explanation of each function used in the statistics summary. All worksheets and charts are unprotected to allow changes to these functions (either manually or automated through macros) to meet site specific needs.

Note that changes to QA data in the worksheets do not affect any data stored in the QA database. This allows bad data points or outliers to be removed from the data set in Excel to calculate new limits while retaining all of the original data in the database. Typically, the workbooks with the data set used to recalculate limits should be saved (and possibly protected to avoid inadvertent changes) if needed for review at a later time.

A.4.5 QA Options

The QA Reporting Parameters and Options page allows customization of the QA report header and footer fields along with options related to the report content.

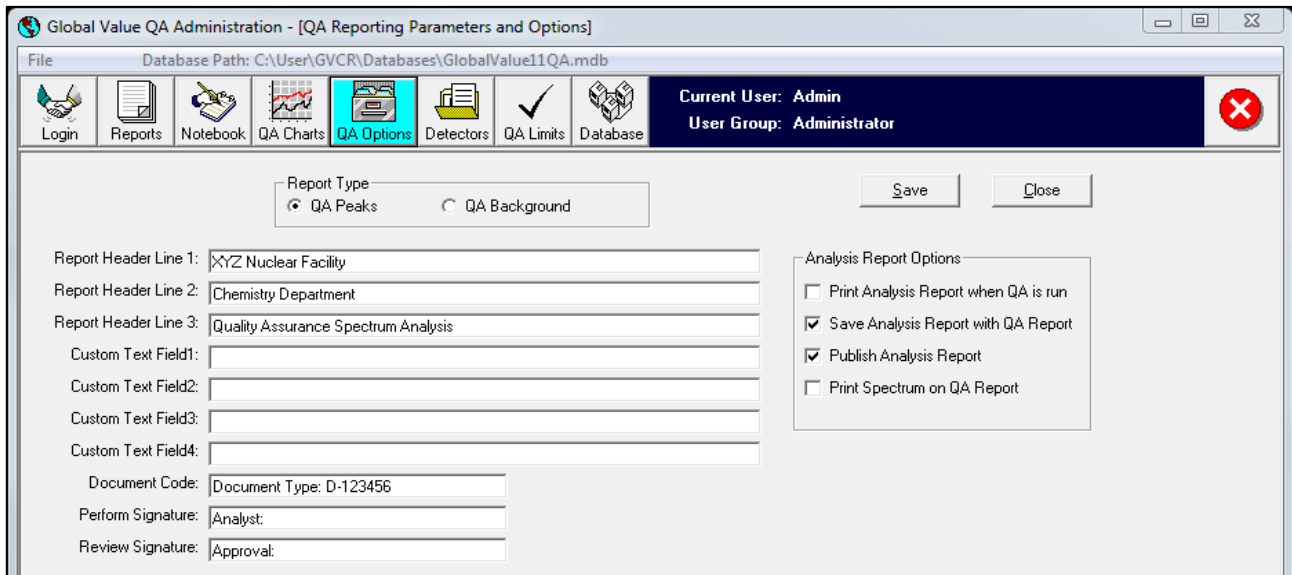


Figure A.4.5.1 QA Reporting Parameters and Options

The following fields are available to establish the QA Report content:

- **Report Type:** This selection determines which QA Type (Peak or Background) reporting options are being displayed/edited.
- **Report Header Lines 1-3:** These are the first three lines of the QA report which are horizontally centered.
- **Custom Text Field 1-4:** These fields provide four lines of custom text that immediately precede the QA data table. All lines are horizontally aligned to the left. Typically, these fields are used as operator aids to specify corrective actions in the event of a failed QA measurement.
- **Document Code:** Text in this field is aligned to the right of the Spectrum file name. This field is intended to display a Record Type or Document Control code as determined by the site record keeping system, but may be used for other purposes.
- **Perform Signature:** This text is displayed below the QA data table on the left side. If an electronic signature is applied to the report (i.e. if a login is required by the QA Automation Job) then the User Name is displayed immediately to the right of this text. If electronic signatures are not used, then a signature field may be included using the underscore (“_”) after the label or the field may be left blank.
- **Review Signature:** This text is displayed below the QA data table on the right side. If QA reports are reviewed in the QA Sample Manager then the User Name is displayed immediately after this text. If electronic signatures are not used, then a signature field may be included using the underscore (“_”) after the label or the field may be left blank.
- **Print Analysis Report when QA is run:** If this option is checked, then the standard GammaVision analysis report will be printed along with the Global Value QA report when GVQAPeaks or GVQABackground are run in the automation Job.

- **Save Analysis Report with QA Report:** If this option is checked, then the standard GammaVision analysis report will be saved in the database along with the Global Value QA report when GVQAPeaks or GVQABackground are run in the automation Job.
- **Publish Analysis Report:** If this option is checked, then the standard GammaVision analysis report will be published (included in the PDF file) when publishing the QA report. This option is unchecked and disabled if the previous option is not checked because the standard GammaVision report is not available in the database.
- **Print Spectrum on QA Report:** If this option is checked, then an image of the spectrum is included on the QA report just below the data table when reports are printed to a PDF file, Microsoft Word, or the default printer.
- **Save button:** This button saves changes to the report parameters for the selected QA Type.

The following is an example QA Report showing the QA data table below the report header fields. This table consists of all the defined parameters for each QA Point (Bkgd or Peak definition) and their associated data values (Target, Low Control, Low Tolerance, Measured, High Tolerance, High Control). The measured value reported for parameters ending in "Diff" are calculated as a Percent Difference from the Target based on the methodology specified with the QA Limits.

My Nuclear Power Station Chemistry Department Daily Quality Control Check							
Spectrum: 1_000130				Record Type: Q6-444			
Acquired: 17-Feb-2005 07:46:49							
Detector: DSpecJr							
Place Instrument Out of Service if any of the following conditions occur:							
1) Any parameter is Out of Control							
2) The same parameter is Out of Tolerance twice consecutively							
3) Any QA Peak is not found							
	Target	L_Ctrl	L_Tol	Measured	H_Tol	H_Ctrl	Results

QA-122							
Channel	244.00	243.00	243.50	243.87	244.50	245.00	PASS
Energy	122.00	121.50	121.75	122.11	122.25	122.50	PASS
FWHM	1.00	0.80	0.90	0.79	1.10	1.20	Low OOC
Activity	4.81E-2	4.40E-2	4.60E-2	4.99E-2	5.00E-2	5.20E-2	PASS
ActivityDiff	0.048	-7.500	-5.000	-3.977	5.000	7.500	PASS

QA-1332							
Channel	2665.00	2663.00	2664.00	2664.51	2666.00	2667.00	PASS
Energy	1332.50	1331.50	1332.00	1332.67	1333.00	1333.50	PASS
FWHM	2.00	1.00	1.50	1.92	2.50	3.00	PASS
Activity	9.94E-2	9.00E-2	9.50E-2	9.77E-2	1.05E-1	1.10E-1	PASS
ActivityDiff	0.099	-7.500	-5.000	1.728	5.000	7.500	PASS

Analyst: Admin				Approval: Admin			

The Results of each parameter are reported as follows:

- **Pass:** Measured value is between the Low and High Tolerance values.
- **Low OOC:** Measured value is lower than the Low Control value.
- **Low OOT:** Measured value is between the Low Tolerance and Low Control values.
- **High OOT:** Measured value is between the High Tolerance and High Control values.
- **High OOC:** Measured value is higher than the High Control value.
- **NO DATA:** The QA parameter was not identified (i.e. no peak identified)

A.4.6 QA Detectors

Detector settings are established in the Sample Administration program and transferred to the QA databases when synchronizing databases. The Detector editor in QA Administration is provided only as a means to remove detectors that are no longer needed. For example, when establishing multiple QA databases in a networked system a copy from one computer may be used as the starting point on another computer and the original detectors will need to be removed.

Note that detectors cannot be deleted when they have associated QA Reports/Data, Comments, or QA Points/Limits established. Removing associated records may require Purging the database as discussed in Database Management. (See Section A.4.8)

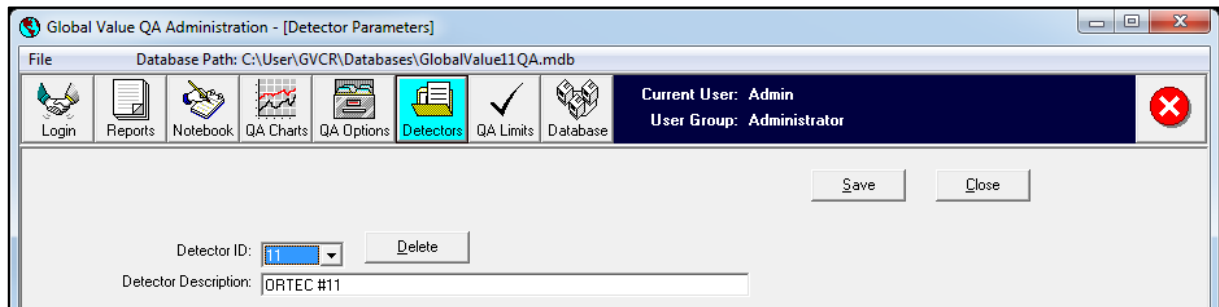


Figure A.4.6.1 QA Detectors

A.4.7 QA Limits

The QA Limits define which QA Points and associated parameters are reported for each detector as well as the number format for each parameter and the methodology for calculating the percent difference from a target value.

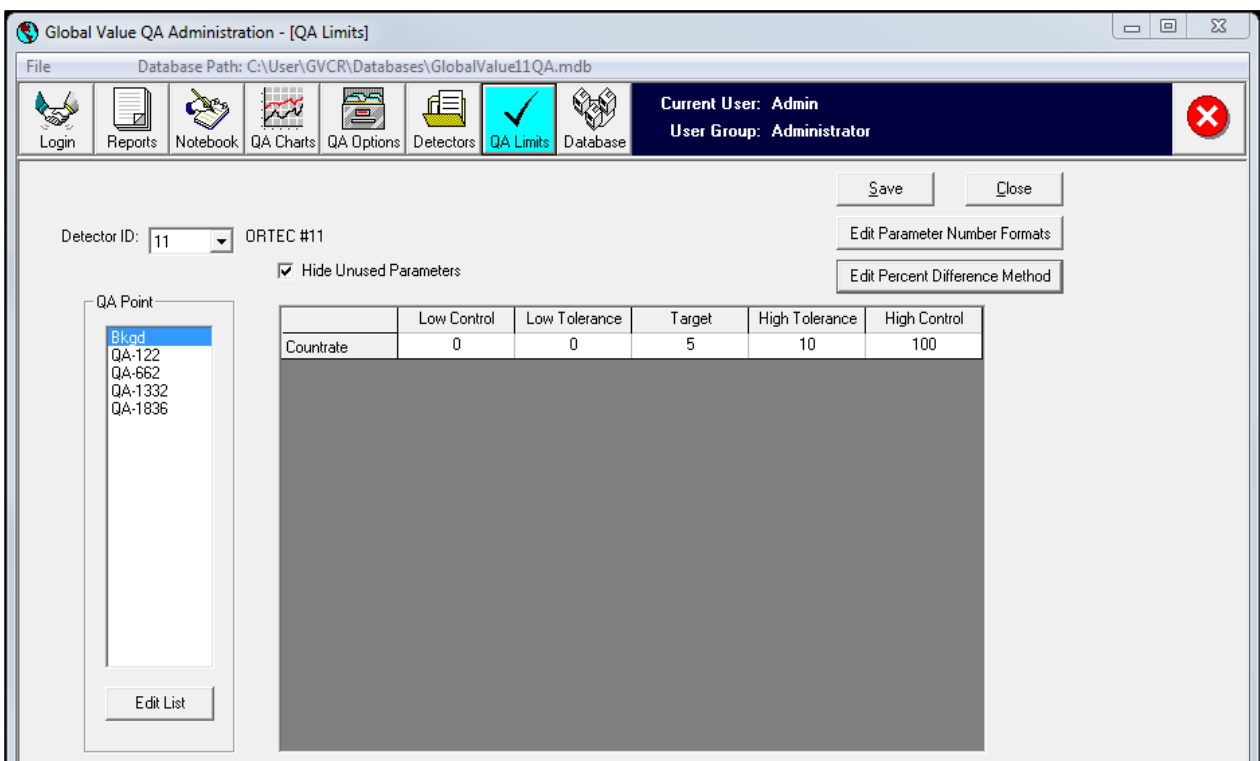


Figure A.4.7.1 QA Limits

A.4.7.1 QA Points

When Background QA is run the overall spectrum count rate is determined by summing all of the channel counts and dividing by the Live Time. This count rate or a percent difference from a target count rate can then be monitored for the Background QA using the “Bkgd” QA Point.

QAPeak measurements store data for all QA Points that match a nuclide name in the GammaVision analysis results. Since these QA Points are intended to represent a specific spectrum peak it is important that each nuclide in the GammaVision library used for the QA measurement has only that peak of interest and no others. With this configuration the nuclide in the library is also typically named for the peak energy rather than the actual nuclide name. For example, the Y-88 1836 kev peak would be configured with a nuclide name of QA-1836 with only the 1836 kev peak defined. Multiple peak nuclides like Eu-152 would require several nuclide names, such as QA-122, QA-778, QA-1408, etc., with each having only the associated peak energy listed. If more than one peak is listed for the QA analysis library then the data will not be accurately transferred to the database.

After establishing the necessary libraries for each Detector QA in GammaVision, the QA Points can be established by selecting the Detector ID and editing the QA Point list by selecting the Edit List button. The Detector Nuclide Editor shown in Figure A.4.7.2 is displayed to allow configuring the QA Points.

The Available Points list displays all of the QA Points (“Bkgd” or nuclide names used as peak identifiers) that have been previously established for any detector. The Detector specified QA Points are shown in the list on the right. Select the appropriate list item, and use the arrow buttons to add or remove QA Points in the detector list. **NOTE:** If a QA Point with associated limits or data is removed then all of the limits and data are also removed from the database. It is advisable to Archive the database prior to making these changes to prevent the loss of historical QA data.

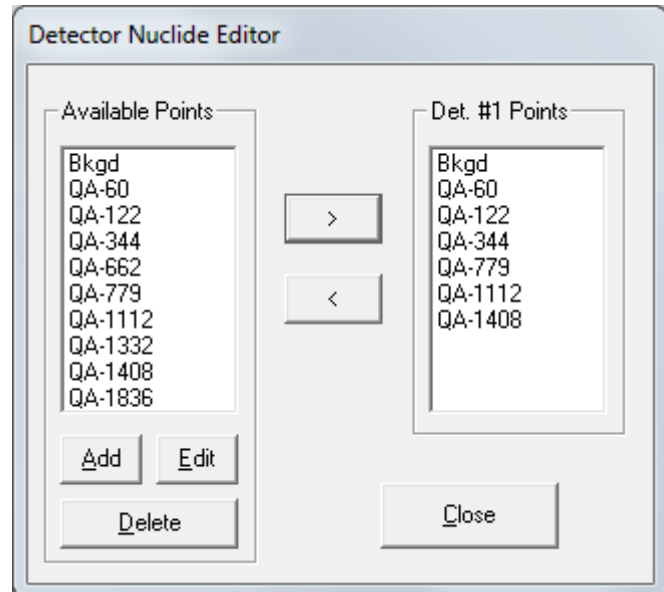


Figure A.4.7.1.1 QA Points/Nuclide Editor

QA Points can be added to the Available Points list using the **Add** button, and existing QA Points may be modified by selecting the **Edit** button or double-clicking on the list item. Select an item and then the **Delete** button to remove a QA Point from the Available Points list. QA Points that are currently assigned to any detector cannot be removed from the Available Points list.

Any changes made are applied to the QA Points list for the selected detector in the QA Limits editor.

NOTE: The “Bkgd” QA Point is required for Background QA measurements and should not be removed or renamed.

A.4.7.2 QA Parameters

After establishing the QA Points for the selected detector, the limits and target values associated with each parameter can be configured in the QA Limits editor as follows: (See Figure A.4.7.1)

- 1) Select a QA point in the list. If no limits have been established for any parameters associated with the selected point then the full list of parameters is displayed in the grid. If parameters have been previously established for the selected QA Point then the only those parameters are displayed in the grid by default. The entire list of parameters can be displayed (i.e. to establish limits for new parameters) by unchecking the “Hide Unused Parameters” checkbox.
- 2) Select a field in the Limits Grid and enter the appropriate limits and target value using the following guidance:
 - a. The target value is required. If the target field is empty when changes are saved then data for that parameter will be discarded regardless of any entries in the Limits fields.
 - b. The Control Limits typically correspond to 3-sigma bounds, and Tolerance Limits typically correspond to 2-sigma bounds. The actual criteria for these are determined by site requirements. If a target value is set but Limits are not specified then all limits for that parameter are set to zero by default.
 - c. All parameters that end with “Diff” will calculate the measured value for that parameter in terms of a percent difference from the target value as specified in Section A.4.7.4
 - d. The “Countrate” and “CountrateDiff” parameters are applicable only when the “Bkgd” QA Point is selected (i.e. for Background QA). All other parameters are used for Peak QA which requires an associated nuclide name for each peak monitored as discussed in Section A.4.7.1.
 - e. Different parameters may be established for each QA Point. For instance, you may want to monitor the Channel and Energy centroid on a low and high energy peak, but monitor the Activity (or ActivityDiff) for several peak energies in between or vice versa.
- 3) Select the **Save** button to save changes to the parameters for the selected QA Point. A prompt will be displayed to save changes if a different Detector ID or QA Point is selected prior to saving changes.

A.4.7.3 QA Parameter Formatting

The number format can be specified for each parameter using formatting codes similar to those used by Microsoft Excel and most programming languages. These number formats are applied to the values displayed in the QA Limits grid as well as QA reports. The number formats are not detector specific.

Select the **Edit Parameter Number Formats** button to display the Parameter Format editor shown in Figure A.4.7.3.1 6.2.12.

The number format may be specified using standard format codes for fixed decimal or scientific notation or using named formats such as General, Fixed, Scientific, etc.. Select the **Help** button to view example formatting codes and example number formats. A message is displayed if an invalid format code is entered, and changes will not be saved until all format codes are valid.

Select the **Save** button to save changes to the number formats.

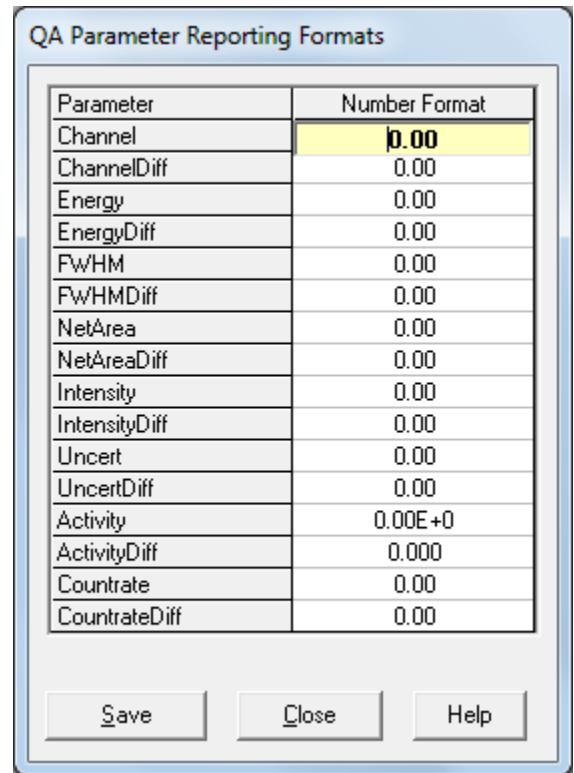


Figure A.4.7.3.1 Parameter Format Editor

A.4.7.4 Percent Different Methodology

The formula for calculating the Percent Difference from the target value for the parameters that have the “DIFF” suffix can be set to one of four methods as shown in Figure A.4.7.4.1. The Target value is the value entered in the QA Parameter grid, and the Measured value is the value associated with the analysis data. Each of these formulas is multiplied by 100 to convert to percent. (i.e. $100 \times (\text{Target} - \text{Measured}) / \text{Target}$)

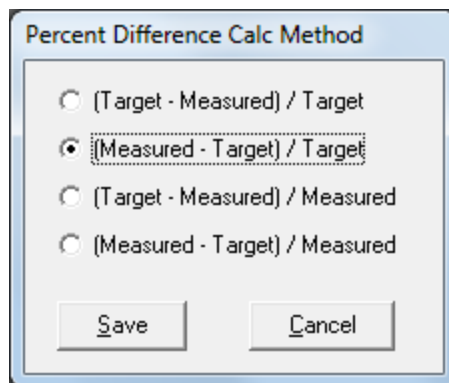


Figure A.4.7.4.1 Percent Difference Method

A.4.8 Database Management

The Database Manager provides the tools that may be necessary to manage QA databases as described below.

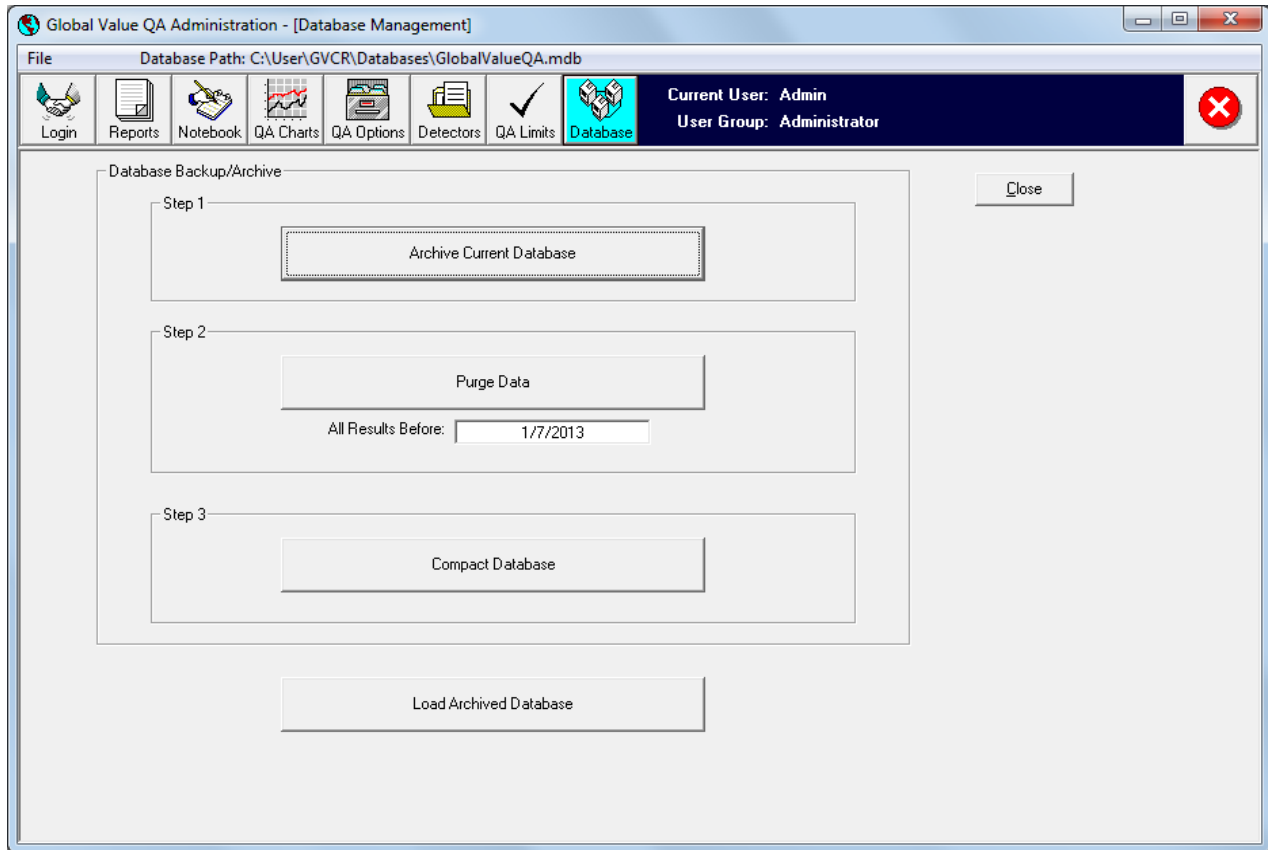


Figure A.4.8.1 QA Database Management

- **Archive Current Database:** A standard “Save As” dialog is displayed to save the current database to an archive file. The default archive path is the current database name followed by the international date format (YYYY-MM-DD). This function copies an exact image of the current database to the new file path.
- **Purge Data:** This option is typically used to clear records out of a database when establishing a new database (i.e. for initial installation or establishing a database for a new year if data is archived annually). All QA data prior to the specified date will be removed from the database including any comments in the Lab Notebook. Configuration parameters such as Detector file paths, QA Limits, and Reporting parameters are not changed. Generally, the database should be compacted after purging a significant number of records to reduce the database size.
- **Compact Database:** The QA database does not automatically reclaim unused space when records are deleted. After purging data or deleting a large number of data points the database file size can be reduced by using the Compact function. This operation is performed on the database which is currently connected to the QA Administration program (path is shown on the menu bar).
- **Load Archived Database:** A dialog is displayed to select an archived QA database. The new database path is displayed in the menu bar and a connection is established. All operations performed in the QA Administration program after loading an archived database are implemented only in the database currently connected.

A.5 QA Publisher

Previous versions of Global Value did not include the standard publishing program as this functionality was originally intended for custom development for special applications. Based on experience with many custom installations over the years, Global Value now provides a default publisher program that satisfies the most common requirements without customization. If additional functionality is required, the publisher provides the capability to launch other applications after the published files have been rendered to common file structures that are easily processed. This approach allows site personnel to develop their own custom applications without having to understand the underlying details associated with extracting information from Global Value databases.

When QA reports are published from the Global Value QA Administration program, the publisher program is automatically run with the full path to the published PDF report passed as a command line parameter. The default publisher program requires this PDF report path to use only the Spectrum ID as the file name. This file naming convention is used by default, but it is possible to change the published PDF file name in the QA Administration Configuration. If the file name is changed to anything other than only the Spectrum ID, then the publisher program will not behave as expected. Additionally, the Spectrum ID must start with the detector number followed by an underscore (i.e. "1_" for Detector #1). This is normally accomplished by configuring the File Prefix as "X_" where X is the detector number on the Detectors tab in Sample Administration Configuration, and then using the |DETSPECTRUMPREFIX| parameter generated by Quick Start as the first parameter in generating the Spectrum ID.

The publisher program, "GVPublishQA", resides in the installation directory with all of the other Global Value programs, and has an INI file by the same name. The settings in the INI file determine which files are generated when the publisher runs and which applications will be launched. File types that can be generated include PDF, Text, XML, and CSV. After the publisher has generated the required reports and launched the specified programs, the original PDF file created by the QA Administration program is deleted to avoid a large number of unnecessary files accumulating on the local workstation.

GVPublishSampleQA has the following comma-delimited command line parameters:

- 1) Full Path to PDF Report (required): *The PDF file name must match the spectrum ID, and the file prefix must be in the format "DETNO_" where DETNO is the detector number. This is the default configuration for new installations.*
- 2) Full Path to Configuration File (optional): *This optional configuration file may be specified when using the publisher program outside of the routine publishing process. This may be useful for generating CSV or XML reports and/or processing the data dynamically within automation Jobs. When this file is omitted, such as when publishing results from the Analysis Editor, the default configuration file "GVPublishSample.ini" in the Global Value installation directory is used.*

A.5.1 Configuration File Content

The Configuration file consists of a series of parameters that are used for generating various file types and running applications. These parameters are enclosed in pipe characters (“|”) similar to those used with the Quick Start and GVSampleDataSC programs. Each configuration file can be configured to generate multiple output files and process them with different applications automatically if desired.

Two types of parameters are used to generate files and run applications. The file generation parameters use the prefix “Output” and those used for running applications use the prefix “RunApp”. All of the “Output” parameters must be listed before the associated “RunApp” parameters.

In addition to the prefix each parameter has a property name followed by a unique character identifier. This unique identifier is a single character that is used to group the Output and RunApp properties as well as link the Output file to the RunApp parameters. This identifier can be any alphanumeric character, thereby providing up to thirty six (36) different Output and RunApp scenarios in the same file.

The following shows the complete list of Output and RunApp parameters which are discussed in more detail in the remainder of this section.

```
|OutputTypeX|=
|OutputEnabledX|=
|OutputCoverTemplateX|=
|OutputIncludeSummaryX|=
|OutputIncludeDetailsX|=
|OutputDirectoryX|=
|OutputFileExtensionX|=

|RunAppPathX|=
|RunAppEnabledX|=
|RunAppCommandLineParameterX|=
```

Where:

X = Single character unique identifier (0-9, A-Z not case sensitive)

A.5.1.1 OutputType

The OutputType can be set to PDF, TXT, XML, or CSV.

When set to XML or CSV, an appropriate XML or CSV template must be specified for the OutputCoverTemplate parameter. The IncludeSummary and IncludeDetails parameters are ignored for these Output Types.

When set to PDF or TXT, the report content is based on the CoverTemplate, IncludeSummary, and IncludeDetails parameters – any of which can be omitted. PDF reports will use the same security rules (passwords) as established in QA Administration PDF Properties.

Multiple reports can be generated with different content by using the unique character identifier.

A.5.1.2 OutputEnabled

This parameter is set to “T” (true) to enable the specified report output. Anything other than “T” will disable the report output. This parameter allows output configurations to be established for testing or other temporary conditions without removing the complete set of parameters.

A.5.1.3 OutputCoverTemplate

The OutputCoverTemplate is a report template appropriate for the output type specified. This parameter can be the full path to a text file or the name of a Report Template established in the Sample Administration Configuration. Normally, the latter option would be used as it provides security for the template content.

For PDF and TXT output types this parameter is optional. If a template is specified then the rendered content is used as the first section of the report. For PDF and TXT output types, this template is processed by replacing the QA Header parameters with the applicable QA data. See Section A.2.3.5 (Report Templates)

For XML and CSV output types this parameter is required since the template defines the layout and content of these file types. These templates are processed significantly different than those used for generating summary reports and must comply with the formatting rules described below.

The XML Template requires the following configuration:

- 1) The data set record must be enclosed in the tags <GVPublishDataSet> and </GVPublishDataSet>.
- 2) The Sample Data record must be enclosed in valid tags. The recommended tags are <GVPublishSampleData> and </GVPublishSampleData>, but other names could be used if desired.

Sample Data parameters described for QA report templates may be included within this record. (See Section A.2.3.5 for details regarding Report Templates.) Each parameter should be enclosed in appropriate tags. Attributes may also be included in tags if desired.

- 3) The nuclide data (QA Point) record must be enclosed in the tags <GVPublishQAData> and </GVPublishQAData>.

Parameters described in Section A.2.3.5 for Report Templates with the "QAPUB" prefix are valid parameters within the QA Data record.

- 4) When the XML Template is rendered, the Sample Data parameters are replaced with the applicable results, and a record for each QA parameter is generated with the tags and data specified.

The following is an example of a valid XML Template. The piped parameters are those specified in Section A.2.3.5 for Report Templates. The field tag names are only for example except for the record tags discussed above which must be named accordingly. Indentation and spacing is for readability only.

```

<GVPublishDataSet>
  <GVPublishSampleData>
    <SpectrumID>|QASPC|</SpectrumID>
    <AcquisitionStartTime>|QASMP_ACQU|</AcquisitionStartTime>
    <QAType>|QATYPE|</QAType>
    <Description>|QADESC|</Description>
    <DetectorNumber>|QADETNO|</DetectorNumber>
    <Analyst>|QAANALYST|</Analyst>
    <Reviewer>|QAREVIEWER|</Reviewer>
    <ReviewDate>|QAREVIEWDATE|</ReviewDate>
    <Publisher>|QAPUBLISHER|</Publisher>
    <PublishDate>|QAPUBLISHDATE|</PublishDate>
  </GVPublishSampleData>
  <GVPublishQAData>
    <QAPoint>|PUBQAPOINT|</QAPoint>
    <QAParameter>|PUBQAPARAMETER|</QAParameter>
    <QATarget>|PUBQATARGET|</QATarget>
    <QALowControl>|PUBQALOWCTRL|</QALowControl>
    <QALowTolerance>|PUBQALOWTOL|</QALowTolerance>
    <QAValue>|PUBQAValue|</QAValue>
    <QAHighTolerance>|PUBQAHIGHTOL|</QAHighTolerance>
    <QAHighControl>|PUBQAHIGHCTRL|</QAHighControl>
    <QAResult>|PUBQARESULT|</QAResult>
  </GVPublishQAData>
</GVPublishDataSet>

```

The CSV (Comma-Separated Values) Template requires the following configuration:

- 1) The Sample Data and QA Data have two separate records. In the rendered CSV file the Sample Data will be returned in a single row, and the QA Data will be generated with one row per QA parameter.
- 2) The Sample Data record must start with the parameter "CSVSAMPLEDATA:". This parameter is not returned in the final CSV file.
 Sample Data parameters described for QA templates may be included within this record. (See Section A.2.3.5 for details regarding Report Templates.)
- 3) The Nuclide Data row must start with the parameter "CSVQADATA:". This parameter is not returned in the rendered CSV file.
 Parameters described in Section A.2.3.5 for Report Templates with the "QAPUB" prefix are valid parameters within the QA Data record.
- 4) All parameters in the Sample or QA Data rows are returned exactly as listed in each row. If quotes around parameters are desired to ensure that data with commas, dates, etc. are interpreted correctly, then the quotes must be included around the applicable parameters in the template. The comma (or other character delimiter) must also be included to separate each parameter.
- 5) Additional text may be included outside of the Sample Data and Nuclide Data record. For example, a header row or other information may be desired for readability or to satisfy custom application processing requirements.

The following is an example of a valid CSV Template. The piped parameters are those specified in Section A.2.3.5 for Report Templates. Note that this example does not include all possible parameters.

SpectrumID, Acquisition Time, QA Type, QA Description

CSVSampleData: "|QASPC|", "|QASMP_ACQU|", "|QATYPE|", "|QADESC|"

QA Point, QA Parameter, QA Value, QA Result

CSVQAData:"|PUBQAPOINT|", "|PUBQAPARAMETER|", "|PUBQAValue|", "|PUBQAREsult|"

A.5.1.4 OutputIncludeSummary

This parameter is used only for the PDF and TXT output types. It is ignored for XML and CSV output types. When set to "T" (true), the QA Report stored for the sample is included in the PDF or TXT report that is generated.

A.5.1.5 OutputIncludeDetails

This parameter is used only for the PDF and TXT output types. It is ignored for XML and CSV output types. When set to "T" (true), the Detailed Report stored for the sample is included in the PDF or TXT report that is generated.

A.5.1.6 OutputDirectory

A valid directory (or folder) path must be specified to indicate where the rendered file will be stored. The file name will be the same as the original PDF file name (also same as Spectrum ID) with the file extension described in Section A.5.1.7.

A.5.1.7 OutputFileExtension

This parameter defaults to the Output type (PDF, TXT, XML, or CSV) if no extension is specified. Other extensions may be assigned as necessary.

A.5.1.8 RunAppPath

This parameter requires the full path to an application to be run. Command line parameters may be assigned as described below.

A.5.1.9 RunAppEnabled

This parameter is set to "T" (true) to enable the specified application. Anything other than "T" will not allow the application to run. This parameter allows configurations to be established for testing or other temporary conditions without removing the complete set of parameters.

A.5.1.10 RunAppCommandLineParameter

Multiple Command Line parameters can be specified for the application. If more than one is provided, then they will be comma-delimited in the order in which they are listed in the configuration file.

The following dynamic parameters may be specified in addition to any static parameters desired:

- |DETNO|=Detector Number
- |SPECTRUMID|=Spectrum ID
- |OutputFileNameX|=File name of output file.
- |OutputFilePathX|=Full path of output file.
- |OutputFileDirectoryX|=Full path of output file.

Where:

X = Single character unique identifier matching the respective RunApp and Output group.

A.5.1.11 Example Configuration

The following example demonstrates how four different output files of different types can be generated and two custom applications configured to run with command line parameters. Notes and comments as shown in this example are acceptable in the configuration file.

XML file for passing data in a standard format.

```
|OutputType1|=XML  
|OutputEnabled1|=T  
|OutputCoverTemplate1|=PublishQAXMLTemplate  
|OutputDirectory1|=C:\User\XML  
|OutputFileExtension1|=xml
```

CSV file for passing data in an easily read format.

```
|OutputType2|=CSV  
|OutputEnabled2|=T  
|OutputCoverTemplate2|=PublishQACSVTemplate  
|OutputDirectory2|=C:\User\CSV  
|OutputFileExtension2|=csv
```

Text file consisting of only the coversheet – possibly used as a Meta Data file.

```
|OutputType3|=TXT  
|OutputEnabled3|=T  
|OutputCoverTemplate2|=PublishQAMetaDataTemplate  
|OutputIncludeSummary3|=F  
|OutputIncludeDetails3|=F  
|OutputDirectory3|=C:\User\TXT  
|OutputFileExtension3|=asc
```

PDF file with a cover sheet, summary report, and detailed report(s).

```
|OutputType4|=PDF  
|OutputEnabled4|=T  
|OutputCoverTemplate4|= PublishQAMetaDataTemplate  
|OutputIncludeSummary4|=T  
|OutputIncludeDetails4|=T  
|OutputDirectory4|=C:\User\PDF  
|OutputFileExtension4|=pdf
```

Run application to process the XML file.

```
|RunAppPath1|=C:\User\GVCR\XMLProcessor.exe  
|RunAppEnabled1|=T  
|RunAppCommandLineParameter1|=|OutputFilePath1|
```

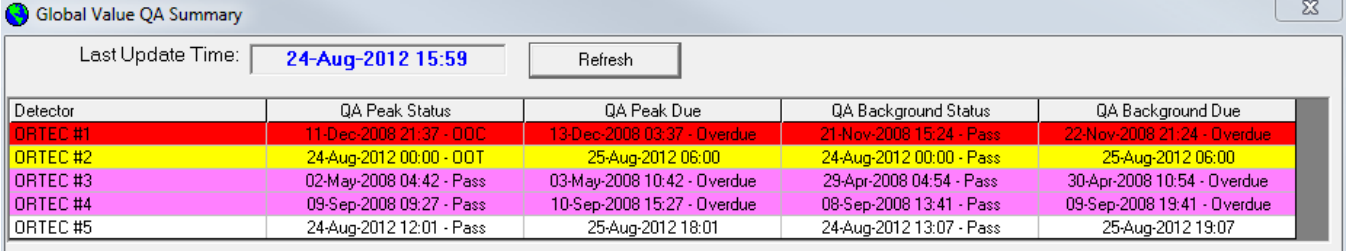
Run application to process the CSV file with additional command line parameters.

```
|RunAppPath2|=C:\User\GVCR\CSVProcessor.exe  
|RunAppEnabled2|=T  
|RunAppCommandLineParameter2|=|DETNO|  
|RunAppCommandLineParameter2|=|SpectrumID|  
|RunAppCommandLineParameter2|=|OutputFileName2|  
|RunAppCommandLineParameter2|=|OutputFileDirectory2|  
|RunAppCommandLineParameter2|=|OutputFilePath2|  
|RunAppCommandLineParameter2|=TRUE
```

The last parameter is a static flag for some condition or status required by the application.

A.6 GVQASummary

This program provides a QA Status summary for multiple detectors. The results are based on the most recent QA Peaks and QA Background measurements and the maximum time span between measurements as set in the configuration file.



Detector	QA Peak Status	QA Peak Due	QA Background Status	QA Background Due
ORTEC #1	11-Dec-2008 21:37 - OOC	13-Dec-2008 03:37 - Overage	21-Nov-2008 15:24 - Pass	22-Nov-2008 21:24 - Overage
ORTEC #2	24-Aug-2012 00:00 - OOT	25-Aug-2012 06:00	24-Aug-2012 00:00 - Pass	25-Aug-2012 06:00
ORTEC #3	02-May-2008 04:42 - Pass	03-May-2008 10:42 - Overage	29-Apr-2008 04:54 - Pass	30-Apr-2008 10:54 - Overage
ORTEC #4	09-Sep-2008 09:27 - Pass	10-Sep-2008 15:27 - Overage	08-Sep-2008 13:41 - Pass	09-Sep-2008 19:41 - Overage
ORTEC #5	24-Aug-2012 12:01 - Pass	25-Aug-2012 18:01	24-Aug-2012 13:07 - Pass	25-Aug-2012 19:07

Figure A.6.1 GVQASummary

Each row in the grid is color coded depending on the QA Status as follows:

- Red: Any parameter is Out of Control (OOC)
- Yellow: Any parameter is Out of Tolerance (OOT) and none are OOC.
- Magenta: QA Peak or QA Background is Overage, but neither is OOT or OOC.
- White: All parameters passed and are within the required due date.

A.6.1.1 Configuration File Content

The Configuration file consists of the following parameters which are enclosed in pipe characters (“|”) similar to those used in other Global Value configuration files.

|SampleDatabasePath| is the full path to one of the Global Value detector databases that store sample data. This parameter is for backward compatibility only. The current version of this program uses the default database specified in the Sample Administration Configuration Manager on the Misc tab.

|QAPeakMaxHours| and **|QABackgroundMaxHours|** are the maximum number of hours allowed between QA Peak and Background evaluations measurements respectively.

|DetectorNumberList| is a comma delimited list of detector numbers to include in the QA Summary to restrict the list to a subset of the full detector list. If no detector numbers are provided, then all detectors will be shown in the QA Summary.

Example Configuration:

```
|SampleDatabasePath|=C:\User\GVCR\Databases\GlobalValue1.mdb
|QAPeakMaxHours|=30
|QABackgroundMaxHours|=30
|DetectorNumberList|=
```


A.7 Analysis Log

Global Value's Analysis Log is an Excel workbook that employs the Excel Add-In functions to provide advanced data filtering and report accessibility. The main worksheet in the Analysis Log contains the controls shown in Figure A.7.1. This interface allows the user to select an individual detector or "All Detectors" from the dropdown selector, specify dates for various fields, and query the detector database for the associated analysis results by selecting the **Update Sample Log** button. The list of samples and related data will automatically populate the worksheet.

Update Sample Log	All Detectors	Cancel Update
Configuration	Filter Criteria	
Show Report	> Report Date	01-Jan-2007 00:00
<input checked="" type="checkbox"/> Report Summary	< Report Date	01-Feb-2007 00:00
<input type="checkbox"/> Report Details	> Acquisition Date	
	< Acquisition Date	
	> Sample Collection Start Date	
	< Sample Collection Start Date	
	> Sample Date	
	< Sample Date	

Figure A.7.1 Analysis Log Controls

Before using the Analysis Log it must be properly configured with a valid database and the appropriate fields enabled. This is accomplished by selecting the **Configuration** button. After entering the password at the login prompt, the form shown in Figure A.7.2 is displayed. (The default password is "pwd".)

Analysis Log Configuration

Default Database Path: C:\User\GVCR\GlobalValue1.mdb

Workgroup Path: C:\User\GVCR\GVCUSTOMREPORT.MDW

Max Records per Detector: 500 (Max = 2000)

Default Max Report Date: Today

Default Previous Days Criteria: 1

Configure Field Properties Save Close

Figure A.7.2 Analysis Log Configuration

Set the database and workgroup paths to establish a connection to a Global Value database that contains Sample results. (Note that this log will not query the QA database.)

The max records field has a maximum value of 2000. This parameter limits the number of records that will be returned if the date ranges specified on the Analysis Log result in a very large number of samples.

The default max report date can be either Today or None. If Today is selected, then the current date is set in the "<Report Date" filter field when the workbook is opened. The ">Report Date" filter field is automatically set to the "<Report Date" field minus the Default Previous Days Criteria value.

Select the **Configure Field Properties** button to specify which fields and data formats will be displayed on the Analysis Log using the form shown in Figure A.7.3. After querying the selected detectors based on the specified date criteria use the AutoFilter dropdowns at the top of each column to further refine the search criteria based on values set in these fields.

Field Name	Field Label	Display	Alignment	Field Format	Width
Detector	Detector	Yes	Left	Text	25
SampleDescription	SampleDescription	Yes	Left	Text	35
ReportDate	ReportDate	Yes	Center	DD-MMM-YYYY hh:mm	15
AcquisitionStart	AcquisitionStart	Yes	Center	MM/DD/YYYY hh:mm	15
CollectionStart	CollectionStart	Yes	Center	MM/DD/YYYY hh:mm	15
CollectionStop	CollectionStop	Yes	Center	MM/DD/YYYY hh:mm	15
Unit	Unit	Yes	Left	Text	10
SampleType	SampleType	Yes	Left	Text	15
RType	RType	Yes	Left	Text	15
Batch	Batch	Yes	Left	Text	15
SamplePump	SamplePump	Yes	Left	Text	15
Analyst	Analyst	Yes	Left	Text	15
Reviewer	Reviewer	Yes	Left	Text	15
ReviewDate	ReviewDate	Yes	Center	YYYY-MM-DD hh:mm	20
Publisher	Publisher	Yes	Left	Text	15
PublishDate	PublishDate	Yes	Center	YYYY-MM-DD hh:mm	20
SpectrumPath	SpectrumPath	Yes	Left	Text	30
TotalCounts	TotalCounts	Yes	Center	0.0000E+00	15
Quantity	Quantity	Yes	Center	0.0000E+00	15
QuantityUnits	QuantityUnits	Yes	Center	Text	10
ActivityUnits	ActivityUnits	Yes	Center	Text	10
LiveTime	LiveTime	Yes	Center	0	10
RealTime	RealTime	Yes	Center	0	10
DeadTime	DeadTime	Yes	Center	0.00	10
Calibration1	Calibration1	Yes	Left	Text	30
CalibrationFile1	CalibrationFile1	Yes	Left	Text	30
Library1	Library1	Yes	Left	Text	20
Calibration2	Calibration2	Yes	Left	Text	30
CalibrationFile2	CalibrationFile2	Yes	Left	Text	30
Library2	Library2	Yes	Left	Text	20
GDPPressure	GDPPressure	Yes	Center	0.00	10
RType	RType	Yes	Left	Text	15
RWPList	RWPList	Yes	Left	Text	30
RadMonitorList	RadMonitorList	Yes	Left	Text	30

Close

Figure A.7.3 Analysis Log Field Properties

The Analysis Log can display over forty fields - all of which can be used as filter criteria. The order in which the fields are displayed is the same as displayed in this form. The fields can be changed by selecting a row and then selecting an available field from the dropdown list. Custom field parameters are included in the dropdown list in addition to the default parameters. When a field name is changed, the Field Label is automatically set to the Field Name, but it can be changed to reflect a more meaningful label if desired. The remaining fields specify if the field is displayed, data alignment and format, and column width.

NOTE: Depending on the version of Microsoft Excel installed on your system some functionality of the standard Sample Logs may not be available. The AutoFilter features, for instance, are only enabled with protected worksheets in Excel 2002 and later. With earlier versions, it may be necessary to unprotect the worksheet or use VBA code to customize the workbook in order to achieve similar functionality.

To view an image of the analysis report associated with a particular spectrum simply double-click anywhere on the applicable row, or select any cell on that row and click on the **Show Report** button. The Report Summary and/or Detailed Reports will be displayed depending on the options selected by the Show Report button.

A.8 GVDetectorMonitor

This program shows the status of each detector configured with ORTEC CONNECTIONS on the local computer including the HV and Acquisition status; HV setting; Real, Live, and Dead Time; Acquisition Start Time; and Estimated Acquisition Stop Time as shown in Figure A.8.1.

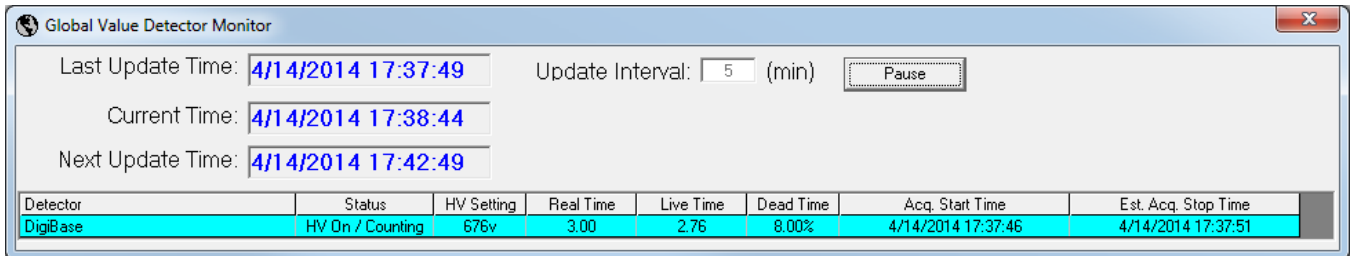


Figure A.8.1 GVDetectorMonitor

Each row in the grid is color coded depending on the High Voltage and acquisition condition as follows:

- Red: HV Off and Acquiring data
- Yellow: HV Off and Not Acquiring data
- Cyan: HV On and Acquiring data
- Green: HV On and Not Acquiring data

Note: This program is not accurate for instruments that do not report the HV status, as it is always displayed as if it was off.

A.9 Database Utility

This program enables users to reset certain process flags or repair a database that has become corrupted.

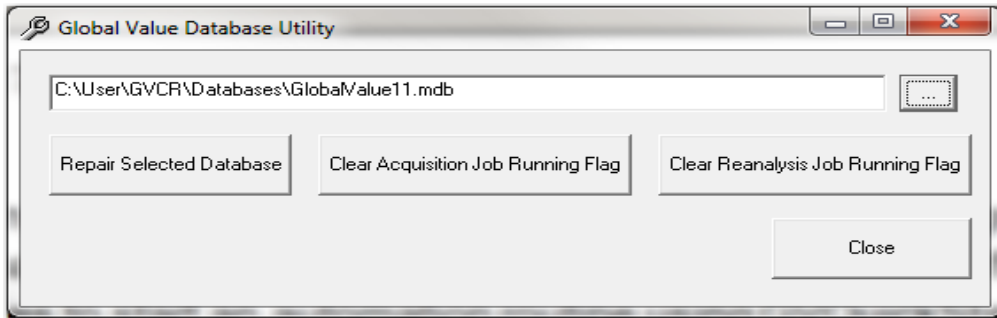


Figure A.9.1 GVDatabaseUtility

Process Flags

The process flags are set when Global Value initiates automation Jobs from the Quick Start program so that the programs can determine if an automation routine is running from a different location. If the flag is set and a user from a different computer tries to start an automation routine for the same detector using GVQuickStart then a message is displayed indicating that the system is in use and which computer started the automation routine.

If the automation routine is shutdown abnormally (i.e. GVQuickStart or GammaVision is closed from Windows Task Manager or a Run-Time error occurred) then this flag will remain set in the database. Under this condition, GVQuickStart will not be able to run an automation routine for the associated detector system until the associated flag is reset using the Database Utility program.

To reset the flag, browse to the database by selecting the button next to the text field (or type the path), and select the **Clear Acquisition Job Running Flag** or **Clear Reanalysis Job Running Flag** button as applicable. (See Figure A.9.1) A message will be displayed indicating that the flag has been reset, and GVQuickStart will be able to run automation routines.

Database Repair

Although it is extremely rare, it is possible to corrupt a database if it is abruptly disconnected during a write operation. This is most likely to occur in a networked operation where the local computer is disconnected from the network or shutdown while a remote computer is writing data. A corrupted database is apparent when the Global Value programs cannot access the database and a series of errors will generally be displayed when programs are run.

To repair the database, browse to the database by selecting the button next to the text field (or type the path), and select the **Repair Selected Database** button. (See Figure A.9.1) An appropriate message will be displayed indicating the results of the repair process.

After repairing the database verify that last operation completed successfully. If the database was being Synchronized as described in Section A.2.3.9 from a different database, then the Synchronization should be run from the Master source again to ensure that this repaired database received all of the applicable configuration changes. If data was being edited for a particular sample, then that sample data should be reviewed for completeness and edited as applicable.

A.10 File Backup

NOTE

It is important that all Global Value applications are closed on the local computer, no remote computers are connected to the local databases, and that the process runs to completion to ensure that all files are backed up successfully.

The process of backing up and purging unneeded files is accomplished by running the "File Backup and Purge" batch routine. An example process is installed with the Default Configuration Files with a shortcut in the Global Value folder which links to the file C:\User\GVCR\BackupAndPurge.bat. This file is a standard DOS batch file with commands to copy all files from a source directory to the specified destination directory, and then delete unnecessary files from specified directories. This file can be modified using any text editor, and personnel experienced with batch file programming can extend the capability of the program. Additional comments regarding specific batch scripting implemented can be found within the batch file.

Batch File Description

The batch file requires the backup Destination path as a command line argument. The shortcut provided for backups in the default configuration files uses the path "C:\User-GVNetworkFiles\SystemBackups\System1\User\" (which is created when the Default Configuration Files option is selected during installation). This path should be changed to a valid network location during the system configuration.

The source directory to be copied is specified within the batch file near the beginning of the batch script as shown below:

```
@echo off
Set DestDir=%1
Set SourceDir="C:\User"
```

This path can be modified directly in the batch file or converted to read another comma-delimited command line parameter as follows:

```
@echo off
Set DestDir=%1
Set SourceDir=%2
```

After the Destination and Source directories are set, a message is displayed in the command window using the script shown below. Note that the message can be modified during the system configuration to meet site specific needs.

```
cls
echo *** Backing Up %SourceDir% ...
echo ***
echo *** ENSURE THAT ALL GLOBAL VALUE APPLICATIONS ARE CLOSED!!!
echo ***
echo *** THIS WINDOW WILL CLOSE AUTOMATICALLY WHEN BACKUP IS COMPLETE!!!
echo ***
echo *** CLOSING THIS WINDOW MANUALLY WILL TERMINATE THE BACKUP!!!
echo ***
echo ***
pause
```

The message is displayed until the Enter key is pressed on the keyboard, and then the files are copied using the XCOPY command as shown below. The additional command line parameters are described in the batch script comments.

```
xcopy %SourceDir% %DestDir% /e /v /y /k /h /c
```

After the source directory has been copied, then unnecessary files are deleted from a specified directory (including all subdirectories) using the script shown below. This process frees up valuable disk space and improves the efficiency of future system backups.

```
echo Deleting old spectra...
set SPCPath=C:\User\SPC\

for /f "tokens=*" %%G in ('dir /a:d /b "%SPCPath%") do (
    start C:\User\GVCR\GVDeleteFiles.exe %SPCPath%%G, *.An1, 90
    start C:\User\GVCR\GVDeleteFiles.exe %SPCPath%%G, *.Spc, 0
    start C:\User\GVCR\GVDeleteFiles.exe %SPCPath%%G, *.Ufo, 90
    start C:\User\GVCR\GVDeleteFiles.exe %SPCPath%%G, *.rpt, 0
)

exit
```

Note that the SPCPath root directory is set as a static path within the batch file. This parameter could easily be converted to a command line parameter similar to the Destination directory described previously if necessary for added flexibility.

In the FOR loop the GVDeleteFiles program is run with command line parameters as follows:

```
C:\User\GVCR\GVDeleteFiles.exe DIRECTORY, CRITERIA, MAXDAYS
```

Where:

DIRECTORY = folder from which files will be deleted.

CRITERIA = File criteria (use *.ext to delete all files with "ext" extension)

MAXDAYS = Files older than the current date - MAXDAYS that meet the File Criteria will be deleted.

Example to delete all Report files from the C:\User directory that are older than 30 days.

```
C:\User\GVCR\GVDeleteFiles.exe C:\User, *.Rpt, 30
```

A copy of the spectrum and report files are stored in the Global Value database, so it isn't necessary to retain any of these file types (.An1, .Spc, .Rpt) unless desired for quick reference on the local computer outside of Global Value. The UFO files are used for displaying analysis results within GammaVision and creating PBC files, so typically a local copy is retained for sufficient time to allow all data reviews to be completed. Retaining any of these files locally is strictly a matter of convenience to avoid having to restore a copy from the backup directory when needed.

A.11 File Compare

This program is intended to confirm the integrity of critical configuration files by comparing reference files to those used in production. The reference files are established by copying files from a known good configuration to location that is normally read-only to non-administrative personnel running the system. Typically, the file structure is established for the files that are common to all computers and those that are unique for each detector or computer system. An example directory structure is provided in the "C:\User-GVNetworkFiles\GVFileCompareImage" directory that is created if the Default Configuration Files option is selected during the Global Value installation.

This program has the following comma-delimited, command line parameters:

- 1) Criteria File Path: Full path to a file specifying the comparison criteria as described below.
- 2) Exceptions Only Flag: If the Exceptions Only flag is set to "T", then the report is simplified by showing any exceptions at the top followed by a summary of the other directories compared. If this flag is set to anything other than "T", then the report will display the results of each directory compared in the order in which they are listed in the comparison criteria file.

Example: C:\User\GVCR\GVFileCompare.exe CRITERIAFILEPATH, EXCEPTIONSONLYFLAG

Compare Criteria File Format

The first line in this file is the full path to the file where the results of the comparison will be saved. Each subsequent line is the Source Folder Path and the Compare Folder Path separated by a comma.

Example:

```
C:\User\GVCompare.txt  
C:\CompareImage\GVCR, C:\User\GVCR  
C:\CompareImage\GVCR\Job Templates, C:\User\GVCR\Job Templates
```

Extra spacing may be included for ease of readability as shown below.

```
C:\User\GVCompare.txt  
C:\CompareImage\GVCR, C:\User\GVCR  
C:\CompareImage\GVCR\Job Templates, C:\User\GVCR\Job Templates
```

NOTES:

- 1) Only the files in the source folder are included in the comparison and output report. Files that may change with some frequency but are located within a folder with critical files that do not change should be excluded from the Source Folder to avoid being shown as an exception when the GVFileCompare program runs.
- 2) Subfolders are not included in the compare criteria. Each applicable folder must be specified separately.
- 3) Files typically included in a compare image are the program files associated with Global Value, INI files for Global Value or GammaVision, Calibrations, Libraries, SDF

files, Configuration Files, Job Templates, etc.. Spectrum and Report files or Excel files that frequently change are normally excluded from the compare image.

- 4) If a Subject Matter Expert or Administrator intentionally changes a file on the working system (i.e. changes to calibrations, libraries, analysis options, or configuration files that may occur over time) then a copy of the new file should be copied to the relevant location in the compare image directory.
- 5) The compare image directory should normally be configured with read-only privileges for non-administrative personnel to prevent unauthorized changes.

A.12 GVDataExport

This program exports all of the associated analysis data from a secured Global Value database containing Sample information to an unsecured MS Access database that is structured to accommodate analysis results from multiple detectors. Once the data is transferred to the unsecured database it is accessible from applications outside of Global Value (i.e. for automated data integration with other systems).

Analysis data may be exported using command line parameters described below or using the interface shown in Figure A.12.1. When using the interactive mode, the analysis results from samples may be transferred individually by selecting the Sample ID and then the “Export Sample” button, or all of the samples in the selected detector database can be exported by selecting the “Batch Export” menu item. When using the Batch mode, all results are deleted from the receiving database before exporting the new data so this process may take considerable time when there a large number of samples.

The target database to accept the exported analysis results is specified in the file GVDataExport.INI which has one parameter for the database path as shown in this example.

```
[ExportDatabasePath]=C:\User\GVCR\Databases\GlobalValue_Export.mdb
```

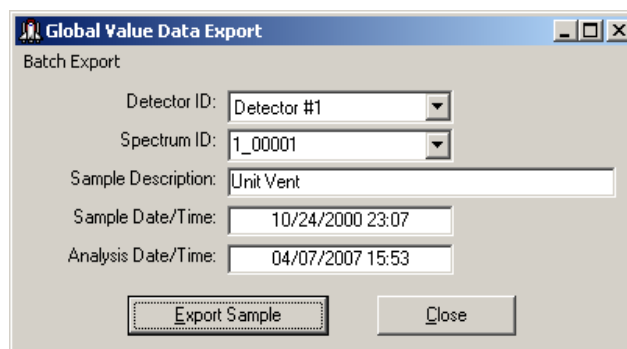


Figure A.12.1 GVDataExport

This program has the following comma-delimited, command line parameters:

- 1) Detector Number
- 2) SpectrumID

If a valid Detector Number and SpectrumID is supplied then the sample data associated with the SpectrumID is automatically exported to the unsecured database. If either parameter is omitted or invalid, then the form shown in Figure A.12.1 is displayed for interactive operation.

A.13 EFT Convert

This program generates geometry specific Efficiency tables from a Master Source Certificate (GammaVision Efficiency Table) using the interface shown in Figure A.13.1. This is an efficient way to quickly generate efficiency tables for calibration when labs create sources for various geometries from a known standard such as a liquid vial.

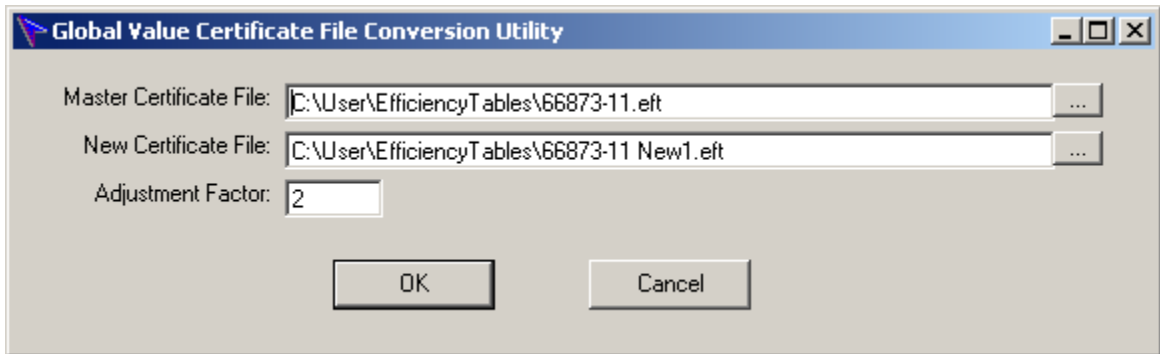


Figure A.13.1 GVEFTConvert

To create a new Efficiency Table from a Master certificate perform the following:

- 1) Browse to the Master Certificate File by clicking on the button next to this field.
- 2) Specify the full path for the New Certificate File by typing directly in this field or using the browse button.
- 3) Enter an Adjustment Factor to scale the activity values specified in the Master Certificate to the amount contained in the prepared geometry. This could be a quantity based on volume or weight if the master source certificate contains activity per volume or weight, or a fractional value if the master source certificate contains total activity for the source material.
- 4) Select the OK button to generate the new Efficiency Table. All Gammas Per Second and Activity values in the Master file are multiplied by the Adjustment Factor when creating the new file. None of the other information from the Master file is modified.

Appendix B – Automation Job Program Reference

Table of Content

B.1	GVSetUser & GVQASetUser	B2
B.2	GVClearData	B3
B.3	GVRecallSpectrum.....	B3
B.4	GVDeadTimeCheck.....	B4
B.5	GVTimerControl	B5
B.6	GVSampleData	B6
B.7	GVSampleDataPlus.....	B13
B.8	GVSampleDataSC	B27
B.9	GVSDFData	B54
B.10	GVSetSDFParameter.....	B55
B.11	GVAskConfirm.....	B55
B.12	GVGetConfiguration	B56
B.13	GV_GetRType	B57
B.14	GV_GetSiteUnit	B58
B.15	GV_GetBatch	B58
B.16	GV_GetComment	B59
B.17	GV_GetGDTPressure.....	B59
B.18	GV_GetSamplePump	B60
B.19	GV_GetRWP.....	B60
B.20	GV_GetRadMon.....	B61
B.21	GV_GetCustomData.....	B61
B.22	GV_GetRptData	B63
B.23	GVIncrementCounter	B64
B.24	GV_Custom_Rpt.....	B64
B.25	Print_Rpt	B65
B.26	GrossGamma.....	B66
B.27	GVQAPeaks	B66
B.28	GVQABackground.....	B67
B.29	GVQACheckStatus.....	B67
B.30	UfoToPbc	B68
B.31	GVTemplateMaster.....	B69
B.32	GVCopyFile.....	B70
B.33	GVOpenFile.....	B71
B.34	GV_ResetInputs	B71
B.35	GVspectrumMux	B71
B.36	GVGammaProductsChangeSample	B76

B.1 GVSetUser & GVQASetUser

These programs prompt for a user name and password for Sample measurement and QA automation processes using the dialog shown in Figure B.1.1. With a successful login, the analyst name is set in the Detector (Samples) or QA database for the specified detector, and this name is assigned to subsequent analysis or QA measurements on that instrument. If these functions are not called in the automation processes then the last user name set for Sample Analysis or QA measurements on each detector will be used as the default for subsequent measurements on the respective detector.

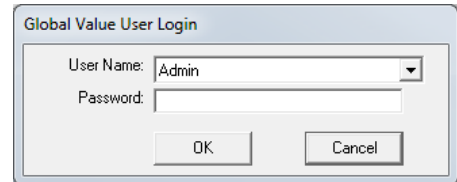


Figure B.1.1 GVSetUser & GVQASetUser Prompt

GVSetUser has the following comma-delimited command line parameters:

- 1) Full Path to a Detector (Samples) database (required)
- 2) Require Login Flag (optional): *When the "Require Login Flag" is set to "T" (true) the login prompt cannot be cancelled. A valid login is required. If this parameter is omitted or set to anything other than "T", then users can cancel the login dialog and the analyst name is set to an empty string.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty as no further processing is necessary.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*
- 4) Reanalysis Flag (optional): *(Not applicable for GVQASetUser) When the Reanalysis Flag is set to "T" (true) the analyst name is set for Reanalysis processes. If this parameter is omitted or set to anything other than "T", then the analyst name is set for non-Reanalysis processes such as Sample counts or loading spectra as a new analysis. Refer to Section A.1.2 for further information on Reanalysis processes run from Quick Start.*

GVQASetUser has the following comma-delimited command line parameters:

- 1) Detector ID (required): *This is the Detector ID (or number) specified in the MCB Configuration and QA Detector configuration.*
- 2) Full Path to a QA database (required)
- 3) Require Login Flag (optional): *When the "Require Login Flag" is set to "T" (true) the login prompt cannot be cancelled. A valid login is required. If this parameter is omitted or set to anything other than "T", then users can cancel the login dialog and the analyst name is set to an empty string.*
- 4) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty as no further processing is necessary.*
 - b. *If "Cancel" is selected the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

B.2 GVClearData

When automation processes are run to analyze samples for the first time (i.e. spectrum collection) the “non-analysis” data is initially stored as temporary records. Non-analysis data refers to any information that is not specifically passed to GammaVision, which includes most of the editable fields in the Sample Administration Analysis Editor. These records are linked to the Spectrum ID when the analysis has completed and results are transferred to Global Value. If the automation process is interrupted before the analysis is completed, then these temporary records could be inadvertently associated a subsequent analysis if different inputs were required for that analysis.

The GV_ClearData program deletes all of these temporary records to ensure that only those intended will be associated with the analysis results. It should normally be run in the automation Job process prior to starting sample data input.

Note that temporary records are not used for reanalysis processes because all of the data has already been linked to the analysis results; therefore, this function is unnecessary for reanalysis process that use the GVRecallSpectrum program described in B.3.

GV_ClearData has the following comma-delimited command line parameters:

- 1) Full Path to a Detector (Samples) database (required)

B.3 GVRecallSpectrum

This program prompts the user to select a Spectrum for reanalysis using the prompt shown in Figure B.3.1. The Spectrum list is populated with analysis records in the specified database that have not been electronically reviewed (locked) in the Sample Administration Analysis Editor. Spectra can be un-reviewed with the appropriate permissions to allow reanalysis when required.

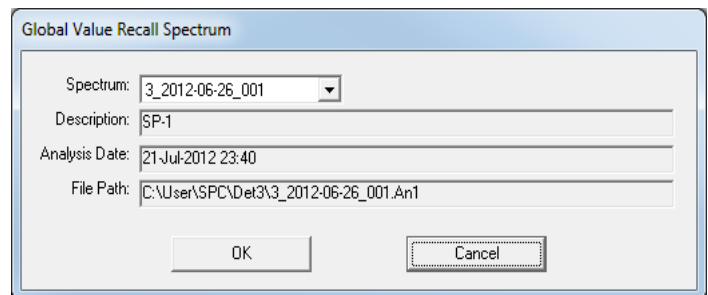


Figure B.3.1 GVRecallSpectrum Prompt

When a Spectrum is selected from the list the Description, Analysis Date, and Spectrum File path are also displayed for further validation that the correct spectrum has been selected. When OK is selected the Reanalysis spectrum ID is stored in the database, commands are written to a helper Job to recall the spectrum, and the reanalysis data file is written as described below.

GVRecallSpectrum has the following comma-delimited command line parameters:

- 1) Full Path to a Detector (Samples) database (required)
- 2) Full Path to Job File (required): The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:
 - a. If “OK” is selected the file contains the RECALL command and the spectrum path. If the spectrum file does not exist, then the spectrum stored in the database will be extracted to the specified location. Note that samples stored in Global Value prior to Version 2.3 will not have spectra available in the database.
 - b. If “Cancel” is selected the file contains the QUIT command to terminate the Job and close GammaVision immediately.

- 3) Full Path to Data File (required): *The content of the Data File is created by the application to include data associated with the selected sample. This file provides input to other Global Value programs that can run in the re-analysis processes, such as GVSampleData, GVSampleDataPlus, GVSampleDataSC, and GVGetConfiguration. Note that different file names should be specified for each detector to ensure that concurrent automation Jobs do not overwrite the file content before it has been loaded into all subsequent programs in the automation Job. The file content is demonstrated with example data as follows:*

```
SpectrumID= 1_00001
Description=Unit Vent
SampleStart=2000-10-24 23:07:00
SampleStop=2000-10-24 23:07:00
Detector=Countroom #4
CalFileName=1_47mmFilter_1.clb
LibFileName=General.lib
Quantity=28910000
QuantityUnits=cc
DatabasePath=C:\User\GVCR\GlobalValue1.mdb
```

B.4 GVDeadTimeCheck

This program monitors the detector dead time during automation Jobs and displays a warning to the operator if the dead time limit is exceeded.

If a geometry list is provided, then the program will prompt the user to place the sample in the next geometry position when the dead time check fails. (See Figure B.4.2.) The appropriate efficiency calibration file is loaded into GammaVision when the program closes to ensure that the analysis results are accurate for the sample position specified.

If no geometry sequence is provided, or placing the sample in the last geometry specified still results in high dead time, the user can either cancel the count or elect to continue counting under the existing condition.

The Restart Acquisition button clears the spectrum and restarts the acquisition. This option is useful when it is obvious that a sample was not placed on the detector, or the sample is repositioned during the acquisition.

GVDeadTimeCheck has the following comma-delimited command line parameters:

- 1) Detector Number (required): *This is the Detector ID (or number) specified in the MCB Configuration and Sample Administration configuration.*
- 2) Dead Time Limit (required): *This value is listed as a percentage value. For example, a limit of 10% would require a value of 10.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is*

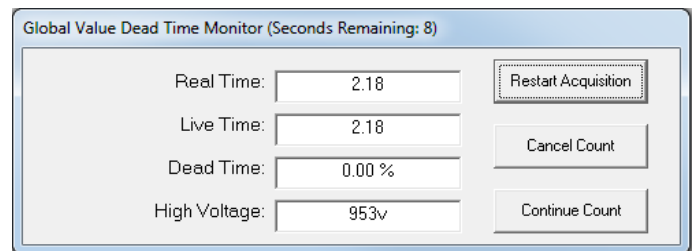


Figure B.4.1 GVDeadTimeCheck Prompt

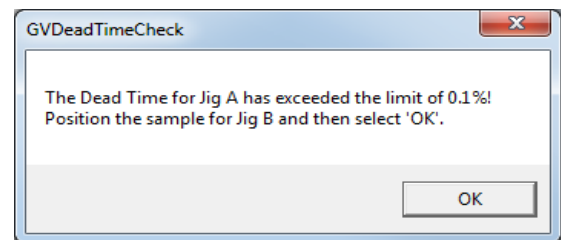


Figure B.4.2 Dead Time Exceeded Message

normally configured to run this helper Job immediately after the application closes. The file content is as follows:

- a. If “Continue Count” is selected or the program closes automatically, and an item from the Geometry list has been specified, then the command “Recall_Efficiency” followed by the full path to a calibration file is written to the file with the file path determined as follows: $CalFilePath = CalDirectory + CalFilePrefix + Geometry + “.clb”$.
 - b. If “Continue Count” is selected or the program closes automatically, and an item from the geometry list has not been set – either due to no geometry list file specified or the dead time limit being exceeded for the last geometry in the list – then the file is empty.
 - c. If “Cancel” is selected the file contains the QUIT command to terminate the Job and close GammaVision immediately.
- 4) Dead Time Check Duration (optional): This value is the number of seconds required for monitoring the count time before the program can determine that the dead time is below the limit. If the dead time exceeds the specified limit during the evaluation period the dead time field will be set to a red background, and the warning message will be displayed when the evaluation period has expired. If the dead time does not exceed the limit, then the application will terminate without any messages after the specified duration has elapsed. The minimum and default value for this parameter is 10.
- 5) Full Path to Geometry List (optional): The specified file must be a text file that contains a list of valid geometries for the specified sample type on each line. The first geometry is the default and will determine the efficiency calibration file recalled in the subsequent Job file if the dead time limit is not exceeded. If the dead time limit is exceeded, then the user will be prompted to move the sample to the next geometry position in the list after which the dead time will be checked again. If the dead time limit is not exceeded, then the specified geometry will determine the efficiency calibration file loaded in the subsequent Job file. If the dead time limit is exceeded after all geometries in the list have been used, then the message will simply indicate that the dead time limit has been exceeded. Under this condition no efficiency calibration is loaded in the subsequent Job file, therefore some default efficiency calibration should be specified prior to running this program in the main automation Job.
- 6) Calibration Directory (optional): Used to generate a fully qualified calibration file path. This parameter is only required if a valid Geometry list is specified. (See 3.a)
- 7) Calibration File Prefix (optional): Used to generate a fully qualified calibration file path. This parameter is only required if a valid Geometry list is specified. (See 3.a)

B.5 GVTimerControl

This program is typically used within the automation process to ensure that the data acquisition is started at a precise time. It acts as a countdown timer to pause an automation Job until the specified date/time is reached. This is accomplished by entering the Target Date/Time and clicking on the “Start Timer” button. When the time remaining reaches zero, the program closes and allows the Job to continue to the next step. The program can also be closed immediately by selecting the “End Timer” button.

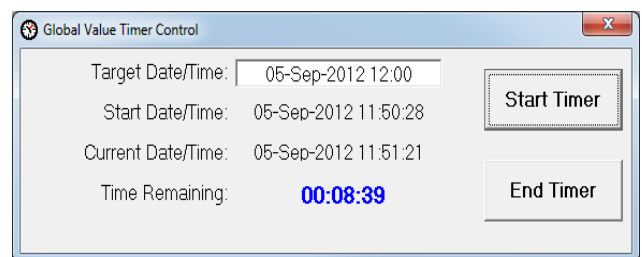


Figure B.5.1 GVTimerControl Prompt

B.6 GVSampleData

This program is used in automation Jobs to collect basic data related to sample analysis. It allows the use of Microsoft Excel spreadsheets for custom calculations and data entry, or a basic data entry form for routine samples. The following parameters are available:

- Sample Description
- Decay Correction Date/Time
- Sample Collection Start and Stop Date/Time (when using Excel interface only)
- Sample Quantity and Quantity Units
- Live Time Preset

The Interface method is dictated by command line parameters as described below. Implementation for each method is further detailed in sections B.6.1 and B.6.2.

GVSampleData has the following comma-delimited command line parameters:

- 1) Full Path to SDF file (required): *The Decay date/time (and Collection Dates/Times when using the Excel interface) and Sample Quantity and Units will be written to the SDF file specified on the command line. This parameter is required and should be unique to the detector so that Jobs running on other systems will not inadvertently modify this file prior to being loaded into GammaVision.*
- 2) Full Path to JOB file (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If the Excel interface is used or "OK" is selected on the basic data interface then the following commands are written to the Job File:*

*Describe_Sample "Description Specified"
Recall_Options "SDFPath"
Set_Preset_Clear
Set_Preset_Live <Live Time Value>*

NOTE: The Preset commands are only written if the Live Time field is implemented with this program. (See parameter #8.) Presets cannot be changed in GammaVision during an active acquisition, so the main automation Job must ensure that the acquisition is stopped prior calling this Job, and started (or restarted) afterwards as applicable.

- b. *If "Cancel" is selected the file contains the QUIT command to terminate the Job and close GammaVision immediately.*
- 3) Full Path to Microsoft Excel file (optional): *If a valid path is provided, then the file will automatically be opened for data entry. All of the other command line parameters used for data input are ignored with the exception of the Live Time Preset. (See section B.6.2 for additional details.)*
- 4) Default Sample Description (optional): *This parameter is used to populate the Description field on the Basic Form interface. To display a dropdown list of sample descriptions, use the following syntax for the Sample Description field: "FILE: FILEPATH" where FILEPATH is the full path to a text file with a list of sample descriptions. Not applicable when using the Excel interface.*

- 5) Default Decay Date/Time (optional): *This parameter is used to populate the Decay Date/Time field on the Basic Form interface. This field can be set to the current date using the word "TODAY" or the current date/time using the word "NOW". Not applicable when using the Excel interface.*
- 6) Default Quantity (optional): *This parameter is used to populate the Quantity field on the Basic Form interface. Not applicable when using the Excel interface.*
- 7) Default Quantity Units (optional): *This parameter is used to populate the Quantity Units field on the Basic Form interface. Not applicable when using the Excel interface.*
- 8) Default Live Time (optional): *This parameter is used to populate the Live Time field. If omitted the Live Time field is hidden such that this application has no control over live time settings. This may be desirable in automation processes where different preset types are employed (such as Real Time, MDA, Uncertainty, etc.) or the Live Time preset is not intended to be adjustable by the analyst. The Live Time preset field is applicable to both the basic data entry form and the Excel interface. If the Re-Analysis Flag (parameter #9) is set to "T" (true), then the Live Time field behaves as if the default live time was omitted.*
- 9) Re-Analysis Flag (optional): *If set to "T" (true), the Sample Description, Decay Date, Quantity, and Quantity Units fields on the Basic Form interface are populated with data from the previous analysis. Any default parameters are ignored. A valid Re-Analysis Data File path (parameter #10) must also be specified. Not applicable when using the Excel interface.*
- 10) Re-Analysis Data File (optional): *If the Re-Analysis Flag (parameter #9) is set to "T" (true), this file is read to populate fields on the Basic Form interface. The re-analysis data file must be generated by the GVRecallSpectrum program (section B.3) or a custom developed application capable of creating the same content. Not applicable when using the Excel interface.*
- 11) Editable Quantity Units Flag (optional): *If set to "T" (true), the Quantity Units field on the Basic Form interface is editable to allow changes by the analyst. If not set to "T", the Quantity Units are not editable. Not applicable when using the Excel interface.*

B.6.1 GVSAMPLEDATA Basic Form Interface

The Basic Form interface shown in Figure B.6.1.1 is displayed when the Excel file path command line parameter is omitted. Fields in this dialog are populated with default values specified on the command line. If the Re-Analysis Flag is set to "T", then these fields are populated from the Re-Analysis Data file, and any default values set in command line parameters are ignored.

Figure B.6.1.1 GVSAMPLEDATA Basic Form

The following is an example Job excerpt using the Basic Data Entry form:

```
Set_Detector 1
Stop
Clear
Run "C:\User\GVCR\GVSampleData.exe C:\User\1_AirFilter.sdf, C:\User\1_SampleData.job, , Waste Tank, Now, 55, ml, 100"
Wait "C:\User\GVCR\GVSampleData.exe"
Call " C:\User\1_SampleData.job"
Start
Wait
Analyze
```


B.6.2 GVSAMPLEDATA EXCEL INTERFACE

The Excel interface is implemented by specifying a valid Excel File Path for the respective command line parameter. The Excel file is automatically opened when GVSAMPLEDATA is run. After entering sample data and calculating parameters if required, the Excel file must be saved and closed. When the Excel file is closed, the GVSAMPLEDATA program reads data from the file and updates the SDF and Job files specified on the command line. If the Excel file was not saved after changes, then inaccurate data will be used for the analysis. In addition to the standard analysis parameters saved to the SDF file, custom data parameters and additional analysis settings can be set using VBA code. The example Excel Interface automation routine in the default installation, which is configured to calculate air sample volume, demonstrates how to pass custom data parameters to Global Value and populate the Excel interface with the original data during the re-analysis process.

With the exception of the Live Time all other parameters used for the Basic Form Interface are ignored when the Excel interface is implemented. If a default Live Time preset is specified on the command line, then a prompt for the Live Time as shown in Figure B.6.2.1 will be displayed after the Excel file is closed. Note that the Live Time can also be set dynamically using VBA code as described later in this section.

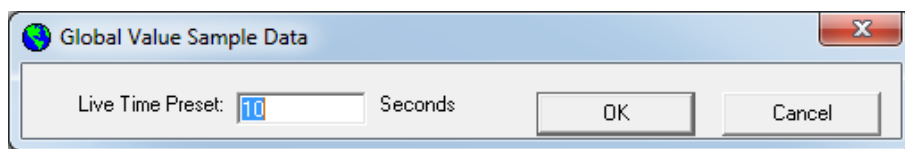


Figure B.6.2.1 GVSAMPLEDATA Live Time Prompt

The following is an example Job excerpt using the Excel interface:

```
Set_Detector 1
Stop
Clear
Run "C:\User\GVCR\GVSAMPLEDATA.exe C:\User\1_AirFilter.sdf, C:\User\1_SampleData.job, C:\User\1_AirVolume.xls"
Wait "C:\User\GVCR\GVSAMPLEDATA.exe"
Call "C:\User\1_SampleDataJOB"
Start
Wait
Analyze
```

B.6.2.1 Excel Workbook Format Requirements

The Excel file must be configured properly to ensure that the correct data is returned. This program reads data from the following cells in a worksheet named "GlobalValue":

Cell	Sample Data
B1	Sample Description
B2	Collection Start Date/Time
B3	Collection Stop Date/Time
B4	Decay Correction Date/Time
B5	Quantity
B6	Quantity Units

If a worksheet named “GlobalValue” is not found, or these fields are not populated, then no data is returned by the program.

NOTE: The “GlobalValue” worksheet fields are typically linked to another worksheet that is configured for data entry and calculations, such as sample volume based on flow rate, as shown in Figures B.6.2.2 and B.6.2.3.

The screenshot shows an Excel form titled "Air Filter Volume Calculation". The form contains the following fields and values:

- Sample Location: Portable (dropdown menu)
- Sample Description: Portable Sampler
- Collection Start: 10/17/2000 22:03
- Collection Stop: 10/24/2000 23:07
- Sample Flowrate: 3 lpm
- Collection Efficiency: 0.95
- Conversion Factor to cc's: 1000
- Collection Time: 10144 minutes
- Counting Volume (cc's): 2.8910E+07

Figure B.6.2.2 Data Entry Worksheet

The screenshot shows an Excel spreadsheet with the following data:

	A	B
1	Description	Portable: Portable Sampler
2	Collection Start Date/Time	10/17/2000 22:03
3	Collection Stop Date/Time	10/24/2000 23:07
4	Decay Date/Time	10/24/2000 23:07
5	Volume	2.891E+07
6	VolumeUnits	cc
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		

Figure B.6.2.3 “GlobalValue” Worksheet

B.6.2.2 Using Excel Forms and Macros

Visual Basic for Applications (VBA) may be used to optimize data entry and populate the worksheet with the original data during a re-analysis process. VBA Forms may also be employed when a more standard interface is preferred over the spreadsheet view. Forms may also simplify data validation and other processes during or after data entry for those familiar with VBA programming.

Workbooks that run Excel Forms or Macros on startup can fire these processes twice in succession when launched from GVSsampleData. The typical result is that two forms are displayed when the workbook opens. This effect is due to the connection method employed by GVSsampleData and is easily addressed with a simple validation process shown in the VBA code snippet below. This process checks a worksheet cell to see if a date/time has been set in the previous five seconds. If it hasn't then the date/time gets set in that cell. This part of the code will execute when the GVSsampleData program connects to the workbook. If the date/time has been set within the previous five seconds, then the connection phase must have been executed so the form is displayed. The position settings effectively hide Excel so it is not readily apparent to the end-user that Excel is being used for the data entry process. The affect is similar to interfacing with a stand-alone Windows application.

```

Private Sub Workbook_Activate()
    On Error Resume Next
    If Worksheets("Calc").Range("A20").Value > Now - (5 / 24 / 60 / 60) Then
        With Application
            .WindowState = xlNormal
            sLeftPos = .Left
            sTopPos = .Top
            sHeight = .Height
            sWidth = .Width

            .Left = -100
            .Top = -100
            .Height = 10
            .Width = 10
        End With
        frmDataEntry.Show
    Else
        Worksheets("Calc").Range("A20") = Now
    End If
End Sub

```

Typically, a second macro (as shown below) is run when the workbook is closed to reset the Excel window size so that it displays properly when opened using any method other than the GVSAMPLEDATA program. (Note that the position and size variables have PUBLIC scope to the workbook.)

```

Sub Auto_Close()
    On Error Resume Next
    With Application
        If Not sLeftPos = 0 Then
            .Left = sLeftPos
            .Top = sTopPos
            .Height = sHeight
            .Width = sWidth
        End If
    End With
End Sub

```

B.6.2.3 Custom Data Parameters and Re-Analysis Automation

The Excel Interface can be used in combination with other Global Value Job Programs to pass custom data associated with the sample during the measurement process and re-populate the Excel interface with the original sample data during re-analysis. The Excel Interface examples demonstrate this process and can be referenced for additional detail for specific commands and parameters used in the automation Jobs. The Reanalysis process is described below with the standard sample count being very similar. File paths and WAIT commands have been removed for simplicity.

- 1) Prompt for user login and make a Buffer window active in GammaVision.
- 2) Select the buffer and prompt for a spectrum to re-analyze. The file created at this step will be read by the Excel spreadsheet to get some of the sample data. (See Section B.3 GVRrecallSpectrum for detail related to the file content.)

```
Run "GVRrecallSpectrum.exe GlobalValue1.mdb, 1_Recall1.Job, 1_Recall1Data.txt"
```

- 3) Create an SDF file from the detector-independent template file and modify default parameters as applicable. This SDF file will be updated by GVSampleData later.

```
Run "GVCopyFile.exe DecayCorrection_uCi.Sdf, 1_RunReanalysis.sdf"
```

- 4) Make a detector specific copy of an Excel file that can be used for data input with the GVGetSampleData program. Note that "Reanalysis" is appended to the file name as this naming convention will be used in the Excel VBA code to set the sample data fields.

```
Run "GVCopyFile.exe AirVolumeCalc.xls, 1_AirVolumeCalcReanalysis.xls"
```

- 5) Prompt for sample data using the Excel Workbook that was just created. See B.6 Item #2 for parameters that will be set in the helper Job (Sample Description, Recall SDF, and Live Time if applicable).

```
Run "GVSampleData.exe 1_RunReanalysis.sdf, 1_SampleDataReanalysis.Job,
1_AirVolumeCalcReanalysis.xls, , , , , T, 1_RecallData.txt, T"
```

```
Call "1_SampleDataReanalysis.Job"
```

- 6) Load the Efficiency calibration and Library. This can be accomplished either using GVGetConfiguration as shown here, or by calling a Job that is dynamically created by the Excel VBA code from the previous step if desired.

```
Run "GVGetConfiguration.exe 1_ConfigReanalysis.Job, 1_, C:\User\Cal\, C:\User\Lib\, , , T,
1_RecallData.txt"
```

- 7) Set or prompt for PBC files and other parameters. Similar to the calibration and library parameters, these settings can be modified by creating dynamic Jobs in Excel VBA code, and then calling those Jobs here.

- 8) Run_GVGetCustomData to load custom data from a file created by the Excel VBA code previously. The file path to the custom data file must be synchronized in the Excel file to ensure that the correct file is used here.

```
Run "GV_GetCustomData.exe GlobalValue1.mdb, 1_GVSampleData-CustomDataReanalysis.txt, T, T,
C:\User\GVCRA\TEMP\1_AbortReanalysis.Job"
```

- 9) Analyze the spectrum, load the analysis data to the database, generate the custom report, and print the results as applicable.

In Step #5, the GVSampleData program is run with key command line parameters that specify its behavior. In this case, it is passed the SDF file, helper Job file, Excel file, Re-analysis data file, and a flag indicating that it will run in the Re-analysis mode. (See comma-delimited command line parameters in Section B.6). The following process is implemented when GVSampleData is run:

- 1) Since a path to an Excel file is passed to the program this file is automatically opened.
- 2) When the Excel file is opened the VBA code in the sub routine "Workbook_Activate" fires. The following is a brief snippet of this sub routine to highlight the main process. Details are omitted for simplicity. Refer to the VBA code in the AirVolumeCalc.xls file for full details.)

```
Private Sub Workbook_Activate()
'Determine if any code should be run based on flag setting. This prevents the code from
'running when data is read from the GlobalValue worksheet after the file has been closed
'by the user.
If Not Sheets("Main").Range("DataSavedFlag") = "TRUE" Then
'If the file contains the word "Reanalysis" then read the Reanalysis Data File with
'the same file prefix as this Excel file name. Details for reading the content of the
'Reanalysis Data file are in the "GetReanalysisData" function.
If InStr(1, ActiveWorkbook.Name, "Reanalysis", vbTextCompare) > 0 Then
szRootReanalysisDataFileName = Sheets("Main").Range("ReanalysisDataRootFileName")
bRecallDataSuccess = GetReanalysisData(GetAppPath & GetFilePrefix & _
szRootReanalysisDataFileName & ".txt")

If bRecallDataSuccess Then
'If the RecallData file is read successfully, then set the applicable fields
'to the previous analysis data either from the parameters read from the
'RecallData file or by using the GVAnalysisParameter Excel Add-In function.
End If
Else
'Setup default parameters for non-reanalysis conditions here if desired...
End If
'Set a cell value so this code doesn't run again when the GlobalValue worksheet
'is read by the GVSampleData program.
Sheets("Main").Range("DataSavedFlag") = "TRUE"
End If
End Sub
```

The following is a brief overview of the process implemented in the Workbook_Activate code:

- a. Check the cell content in the “Main” worksheet to prevent the code from firing twice. This is similar to the process described in Section B.6.2.2. Instead of setting a date/time, we simply change the content of a cell to the word “TRUE” when the code runs. After the file is saved and closed, the GVSampleData program opens the file to read the content of the GlobalValue worksheet, and the Workbook_Activate function fires again. This time the cell content is already set to “TRUE” so the rest of the code is bypassed. This requires that the value of the cell in the source file copied in Step #4 of the Job process described previously is something other than “TRUE”.
 - b. If the Excel file name contains the word “reanalysis”, then populate the applicable fields with data from the original analysis as follows:
 - i. Read the text file created by the GVRecallSpectrum program in Step #2 of the Job process described previously. The path to this file is determined by a “root” file name stored in the “Main” worksheet along with the file prefix which is determined by the name of the Excel file. This requires the Excel file to be named using the same Detector Prefix as the RecallData text file. The path is assumed to be in the same directory as the Excel file since both files are dynamically created in the C:\User\GVC\R\Temp directory for each automation process.
 - ii. When reading the RecallData text file several variables are set to the values stored within this file to use for populating fields in various worksheets. The target database path and Spectrum ID are also read from the RecallData file, and this data allows the use of the GVAnalysisParameter Excel Add-In function (See Appendix F) to get any other analysis or custom data for this sample to repopulate fields in the worksheet.
 - c. If the Excel file name does not contain the work “reanalysis”, then the current code doesn’t do anything. A commented placeholder is used to indicate where special initialization code would be set for this condition. Typically, additional code is unnecessary here because the worksheet is generally easier to configure with default settings than it would be to use VBA code.
- 3) When the Excel file is closed it is important to capture all of the important data and save the file. This is usually accomplished by having the user click a button on the Worksheet or Form that runs VBA code to automate this process. In the Excel example Job that uses AirVolumeCalc.xls a button is included on the “Calc” worksheet with the caption “Save and Continue”. The VBA code that runs when this button is clicked is as follows:

```
Private Sub cmdContinue_Click()  
    Call GenerateCustomDataFile  
    ActiveWorkbook.Save  
    Application.Quit  
End Sub  
  
Sub GenerateCustomDataFile()  
    On Error GoTo errorHandler  
  
    Open GetCustomDataFilePath For Output As #1  
    Print #1, "DisplayForm = No"  
    Print #1, "ShowSavedData = No"  
    Print #1, "SampleFlowrate = " & Sheets("Calc").Range("SampleFlowRate")  
    Print #1, "FlowrateUnits = " & Sheets("FlowUnitsList").Range("FlowRateUnits")  
    Print #1, "CollectionEfficiency = " & Sheets("Calc").Range("CollectionEfficiency")  
    Close #1  
    Exit Sub  
errorHandler:  
    'Exit  
End Sub
```

The following is a brief overview of the process implemented in this code:

- a. Run the GenerateCustomDataFile routine to create a text file that will be passed to the GV_GetCustomData program in Step #8 of the Job process described previously. Refer to GV_GetCustomData for more detail related to the content of this file. Note that the DisplayForm and ShowSavedData parameters are set to “No” so that this data transfer process is invisible to the user.
- b. After the custom data file is created, the file is saved and Excel is closed. At this point, the GVSampleData program opens the Excel file, reads the data from the GlobalValue worksheet, updates the SDF file specified on the command line, and creates the helper Job file content as described in Section B.6.2.

If analysis setting changes beyond those specified on the GlobalValue worksheet are desired then additional VBA code may be used to create a Helper Job that is called before Step #9 of the Job process described previously. The content of this Job will be a series of “Set_Setting” Job commands for each applicable parameter, and the file can be created using a function similar to “GenerateCustomDataFile” shown in the previous example. Refer to the Set_Setting Job command in the GammaVision User Manual for additional detail with this command.

B.7 GVSAMPLEDATAPLUS

GVSAMPLEDATAPLUS is a sample data entry program that extends the basic form interface of the original GVSAMPLEDATA to include sample collection start and stop time, and sample quantity calculations based on flowrate or unit conversion. The quantity calculations include adjustment by a multiplier and divisor to correct for collection efficiency, sample plateout, dry/wet ratio, etc. Various flags in the application's configuration file determine which fields are displayed on the user interface and how sample volume calculations will be implemented.

When the application is started, the interface shown in Figure B.7.1 is displayed. Several fields may be hidden depending on flags set in the application's configuration file described in section B.7.1. These flags allow the user interface to be customized for specific sample types, and determine how the analysis quantity will be calculated when applicable.

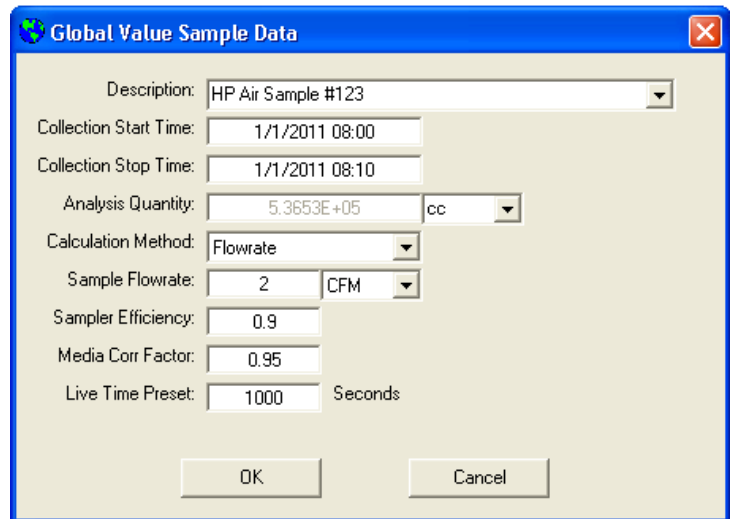


Figure B.7.1 GVSAMPLEDATAPLUS Interface

GVSAMPLEDATAPLUS has the following command line parameter:

- 1) Full Path to Configuration File (required): *The configuration file must contain the parameters described in section B.7.2. This file should be unique to ensure that it is not overwritten by other processes prior to use.*

B.7.1 GVSAMPLEDATAPLUS Operation

GVSAMPLEDATAPLUS is run from within GammaVision automation Jobs, and displays the interface shown in Figure B.7.1. When the program is closed the content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:

- a. If "OK" is selected then the following commands are written to the Job File:

```
Describe_Sample "Description Specified"  
Recall_Options "SDFPath"  
Set_Preset_Clear  
Set_Preset_Live <Live Time Value>
```

NOTE: The Preset commands are only written if the Live Time Preset parameter is implemented with this program. (See Section B.7.2) Presets cannot be changed in GammaVision during an active acquisition, so the main automation Job must ensure that the acquisition is stopped prior calling this Job, and started (or restarted) afterwards as applicable.

- b. If "Cancel" is selected the file contains the QUIT command to terminate the Job and close GammaVision immediately.

This application also creates a Custom Data File which allows custom data parameters to be stored for the analysis (See Section B.7.2.31).

The following is an example of how this application would be run from an acquisition Job.

```
Run "C:\User\GVCR\GVSampleDataPlus.exe C:\User\GVCR\Temp\1_GVQuickStart.cfg"  
Wait "C:\User\GVCR\GVSampleDataPlus.exe"  
Stop  
Call "C:\User\GVCR\Temp\1_SampleDataPlus.job"  
Start  
...  
Run "C:\User\GVCR\GV_GetCustomData.exe" (with applicable parameters)
```

B.7.2 GVSAMPLEDATAPLUS CONFIGURATION

The parameters in this section are required in the configuration file specified on the command line for this program. Any other text in the configuration file is ignored to allow comments or other parameters to be included without affecting the application.

Any valid variables may be used for setting the configuration file parameters in the Global Value Quick Start process as well. Typically, this would include parameters defined in the Global or Job Configuration Files, or those generated by GlobalValueQuickStart when an automation process is initiated. This is normally accomplished in the automation Job by making a copy of GVQuickStart.cfg (or GVQuickStartReanalysis.cfg) using GVCopyFile. The following is an example Job excerpt that would be run prior to GVSAMPLEDATAPLUS:

```
Run "C:\User\GVCR\GVCopyFile.exe C:\User\GVCR\GVQuickStart.cfg, C:\User\GVCR\Temp\1_GVQuickStart.cfg"  
Wait "C:\User\GVCR\GVCopyFile.exe"
```

The file path "C:\User\GVCR\Temp\1_GVQuickStart.cfg" is passed to GVSAMPLEDATAPLUS as a command line argument as shown in section B.7.1.

Configuration File Parameter List

The following parameters must be defined in the configuration file passed to the application. Each parameter is defined in detailed in the remainder of this section.

Section	Parameter Name
B.7.2.1	GVSampleDataPlus_ReanalysisFlag
B.7.2.2	GVSampleDataPlus_SampleDescription
B.7.2.3	GVSampleDataPlus_CollectionStartTime
B.7.2.4	GVSampleDataPlus_ShowCollectionStartField
B.7.2.5	GVSampleDataPlus_CollectionStopTime
B.7.2.6	GVSampleDataPlus_ShowCollectionStopField
B.7.2.7	GVSampleDataPlus_Quantity
B.7.2.8	GVSampleDataPlus_QuantityOutputShow
B.7.2.9	GVSampleDataPlus_LiveTimePreset
B.7.2.10	GVSampleDataPlus_MaxDecayHours
B.7.2.11	GVSampleDataPlus_QuantityCalculationMethod
B.7.2.12	GVSampleDataPlus_QuantityCalculationMethodShow
B.7.2.13	GVSampleDataPlus_QuantityCalculationInputValue
B.7.2.14	GVSampleDataPlus_QuantityCalculationInputUnits
B.7.2.15	GVSampleDataPlus_QuantityCalculationInputUnitsAllowChange
B.7.2.16	GVSampleDataPlus_QuantityCalculationInputUnitsLabel
B.7.2.17	GVSampleDataPlus_QuantityCalculationOutputUnits
B.7.2.18	GVSampleDataPlus_QuantityCalculationOutputUnitsAllowChange
B.7.2.19	GVSampleDataPlus_QuantityCalculationOutputUnitsLabel
B.7.2.20	GVSampleDataPlus_QuantityCalculationMultiplierValue
B.7.2.21	GVSampleDataPlus_QuantityCalculationMultiplierLabel
B.7.2.22	GVSampleDataPlus_QuantityCalculationMultiplierShow
B.7.2.23	GVSampleDataPlus_QuantityCalculationDivisorValue
B.7.2.24	GVSampleDataPlus_QuantityCalculationDivisorLabel
B.7.2.25	GVSampleDataPlus_QuantityCalculationDivisorShow
B.7.2.26	GVSampleDataPlus_QuantityCalculationIgnorePrevious
B.7.2.27	GVSampleDataPlus_SDFFFilePath
B.7.2.28	GVSampleDataPlus_JOBFilePath
B.7.2.29	GVSampleDataPlus_ReanalysisDataFilePath
B.7.2.30	GVSampleDataPlus_CustomDataInputFilePath
B.7.2.31	GVSampleDataPlus_CustomDataOutputFilePath
B.7.2.32	GVSampleDataPlus_QuantityCalculationConversionTablePath

B.7.2.1 |GVSampleDataPlus_ReanalysisFlag|

This flag is set to either “T” (true) or “F” (false). If set to “T”, then a valid reanalysis data file path must be provided. (See B.7.2.29) The Live Time Preset field is also hidden and not used if this parameter is set to “T”. Setting this parameter to anything other than “T” equates to “F” (false).

Example:

|GVSampleDataPlus_ReanalysisFlag|=T

B.7.2.2 |GVSampleDataPlus_SampleDescription|

This parameter sets the default Sample Description or the Full Path to a text file with a list of Sample Descriptions. To display a dropdown list of sample descriptions, use the following syntax for the Sample Description field: “FILE: FILEPATH” where FILEPATH is the full path to a text file with a list of sample descriptions.

Example:

|GVSampleDataPlus_SampleDescription|=FILE: |CONFIGDIR|DescriptionList.txt

Where |CONFIGDIR| is defined in the Configuration Files, and the contents of DescriptionList.txt are configured as follows:

First Description
Second Description
Etc. (no limits on number of descriptions entered)

B.7.2.3 |GVSampleDataPlus_CollectionStartTime|

This parameter sets the default Date/Time for the Collection Start field when it is displayed. The parameter can be set to a static date/time or keywords can be used where “TODAY”=current date and “NOW”=current date and time.

If the Collection Start Time field is hidden (See B.7.2.4), then this parameter is ignored.

Examples:

|GVSampleDataPlus_CollectionStartTime|=2012-06-08 13:25
|GVSampleDataPlus_CollectionStartTime|=April 1, 2012 12:00
|GVSampleDataPlus_CollectionStartTime|=NOW
|GVSampleDataPlus_CollectionStartTime|=TODAY

B.7.2.4 |GVSampleDataPlus_ShowCollectionStartField|

This flag is set to either “T” (true) or “F” (false) to show or hide the Sample Collection Start Time field respectively. If the Sample Collection Stop Time field is hidden, then the Sample Collection Start Time field is hidden automatically, and this parameter is ignored.

If this field is hidden, then the Sample Collection Start time passed to the SDF file will be the same as the Sample Collection Stop Time. The label for the Sample Collection Stop Time field is also changed to reflect a single sample date/time entry.

This field must be displayed when using the “Flowrate” Quantity Calculation Method. (See B.7.2.11)

Example:

```
|GVSampleDataPlus_ShowCollectionStartField|=T
```

B.7.2.5 |GVSampleDataPlus_CollectionStopTime|

This parameter sets the default Date/Time for the Collection Stop Time (or Sample Date/Time) field. The parameter can be set to a static date/time or keywords can be used where “TODAY”=current date and “NOW”=current date and time.

If the Collection Stop Time (or Sample Date/Time) field is hidden, then this default time is written to the specified SDF file for analysis. If this field is hidden and a default date/time is not specified, then the current date/time is written to the specified SDF file.

Examples:

```
|GVSampleDataPlus_CollectionStopTime |=2012-06-08 13:25  
|GVSampleDataPlus_CollectionStopTime |=8/9/2012 08:00  
|GVSampleDataPlus_CollectionStopTime |=NOW  
|GVSampleDataPlus_CollectionStopTime |=TODAY
```

B.7.2.6 |GVSampleDataPlus_ShowCollectionStopField|

This flag is set to either “T” (true) or “F” (false) to show or hide the Sample Collection Stop Time field respectively. If the Sample Collection Stop Time field is hidden, then the Sample Collection Start Time field is also hidden automatically.

If this field is hidden, then the default Sample Collection Stop time is passed to the SDF file.

Both the Sample Collection Start and Stop Time fields must be displayed in order for the “Flowrate” Quantity Calculation Method to be calculated correctly. (See B.7.2.11)

Example:

```
|GVSampleDataPlus_ShowCollectionStopField|=T
```

B.7.2.7 |GVSampleDataPlus_Quantity|

This parameter sets the default analysis quantity. The analysis quantity field is also the QuantityCalculationOutput field. If a quantity calculation method is specified, then this field is disabled and the content is determined by the calculation method.

Example:

```
|GVSampleDataPlus_Quantity|=1000
```

B.7.2.8 |GVSampleDataPlus_QuantityOutputShow|

This flag is set to either “T” (true) or “F” (false) to show or hide the Analysis Quantity (QuantityCalculationOutput) field. When this field is hidden, the Quantity Output Units field is also hidden. If the Quantity Output Units field is enabled, then this flag should be set to “T”.

Example:

```
|GVSampleDataPlus_QuantityOutputShow|=T
```

B.7.2.9 |GVSampleDataPlus_LiveTimePreset|

The Live Time Preset is the default preset in seconds. If this field is not set (or set equal to nothing) then the Live Time Preset field is hidden and the application does not return Preset Job commands in the helper Job. (See Section B.7.1)

Example:

```
|GVSampleDataPlus_LiveTimePreset|=3600
```

B.7.2.10 |GVSampleDataPlus_MaxDecayHours|

The Max Decay Hours specifies the maximum number of hours allowed between the Sample Date/Time (or Sample Collection Stop Time) and the current time. This parameter is useful for applications that require samples to be counted within a specified time period after collection. Fractional hours are acceptable.

Examples:

```
|GVSampleDataPlus_MaxDecayHours|=2  
|GVSampleDataPlus_MaxDecayHours|=0.5
```

B.7.2.11 |GVSampleDataPlus_QuantityCalculationMethod|

The Quantity Calculation Method dictates how the Analysis Quantity (QuantityCalculationOutput) value is calculated. The options are as follows:

- 1) None - The Analysis Quantity field is enabled for direct entry/modification by the analyst. The Quantity Calculation Input field is hidden, and no calculations are implemented. The Analysis Quantity Units dropdown list is populated with the default Output Quantity Units and those specified in the Quantity Calculation Conversion Table (See B.7.2.32). If the Method specified is not set to either "Flowrate" or "UnitConversion" as described below, then it is automatically set to "None".
- 2) Flowrate – This method calculates the analysis quantity in the required units based on flowrate in the units specified. The flowrate and analysis quantity units are configured in the Quantity Calculation Conversion Table (See B.7.2.32). The Analysis Quantity is calculated as follows:

$$AQ = QI * Dur * CF * M / D$$

Where:

- AQ = Analysis Quantity
- QI = Quantity Input value (flow rate in this case)
- Dur = Duration (Collection Stop Time – Collection Start Time in minutes)
- CF = Conversion Factor (See B.7.2.32)
- M = Multiplier value
- D = Divisor value

- 3) UnitConversion – This method allows the sample quantity to be entered in different units than the analysis quantity. For example, the analyst may enter 100 g and have 0.1 Kg used for the analysis. The Analysis Quantity is calculated as follows:

$$AQ = QI * CF * M / D$$

Where:

- AQ = Analysis Quantity
- QI = Quantity Input value
- CF = Conversion Factor (See B.7.2.32)
- M = Multiplier value
- D = Divisor value

Examples:

|GVSampleDataPlus_QuantityCalculationMethod|=None

|GVSampleDataPlus_QuantityCalculationMethod|=Flowrate

|GVSampleDataPlus_QuantityCalculationMethod|=UnitConversion

B.7.2.12 |GVSampleDataPlus_QuantityCalculationMethodShow|

This flag is set to either “T” (true) or “F” (false) to show or hide the Quantity Calculation Method dropdown list. Displaying the list provides maximum flexibility in performing various calculations, but this configuration does not provide the structure that is often desired for data input. When this configuration is used the labels for the Quantity Calculation Input, Multiplier, and Divisor fields must be sufficiently generic to apply to all types of calculations.

Typically, this field is hidden and the Quantity Calculation Method is preset for a specific sample type. For example, an automation Job for Air Filters may use the Flowrate Calculation Method, with the labels set similar to those shown in Figure B.7.1.

Example:

```
|GVSampleDataPlus_QuantityCalculationMethodShow|=F
```

B.7.2.13 |GVSampleDataPlus_QuantityCalculationInputValue|

This parameter sets the default value for the Quantity Calculation Input field. This field is only used when the Quantity Calculation Method is set to either “Flowrate” or “UnitConversion”. (See B.7.2.11)

Example:

```
|GVSampleDataPlus_QuantityCalculationInputValue|=2
```

B.7.2.14 |GVSampleDataPlus_QuantityCalculationInputUnits|

This parameter sets the default units for the Quantity Calculation Input field. This field is only used when the Quantity Calculation Method is set to either “Flowrate” or “UnitConversion”. (See B.7.2.11) The input and output unit combination must be defined in the Quantity Calculation Conversion Table (See B.7.2.32).

Example:

```
|GVSampleDataPlus_QuantityCalculationInputUnits|=cfm
```

B.7.2.15 |GVSampleDataPlus_QuantityCalculationInputUnitsAllowChange|

This flag is set to either “T” (true) or “F” (false) to enable or disable the Quantity Calculation Input Units field. If enabled the analyst can select predefined units from the dropdown list, or manually type in their own units.

Example:

```
|GVSampleDataPlus_QuantityCalculationInputUnitsAllowChange|=T
```

B.7.2.16 |GVSampleDataPlus_QuantityCalculationInputUnitsLabel|

This parameter sets the label for the Quantity Calculation Input field. This label is normally set to describe the expected units for this field, such as flow rate, weight, volume, etc. When the Quantity Calculation Method dropdown list is displayed this label should be generic enough for all calculation methods so that it is meaningful regardless of the method selected. (See B.7.2.11)

Examples:

|GVSampleDataPlus_QuantityCalculationInputUnitsLabel|=Sample Flow Rate:
|GVSampleDataPlus_QuantityCalculationInputUnitsLabel|=Sample Dry Weight:

B.7.2.17 |GVSampleDataPlus_QuantityCalculationOutputUnits|

This parameter sets the default units for the Quantity Calculation output (analysis quantity) field. When the Quantity Calculation Method is set to either "Flowrate" or "UnitConversion", the input and output unit combination must be defined in the Quantity Calculation Conversion Table (See B.7.2.32).

Examples:

|GVSampleDataPlus_QuantityCalculationOutputUnits|=cc
|GVSampleDataPlus_QuantityCalculationOutputUnits|=Kg

B.7.2.18 |GVSampleDataPlus_QuantityCalculationOutputUnitsAllowChange|

This flag is set to either "T" (true) or "F" (false) to enable or disable the Quantity Calculation Output Units field. If enabled the analyst can select predefined units from the dropdown list, or manually type in their own units.

Example:

|GVSampleDataPlus_QuantityCalculationOutputUnitsAllowChange|=T

B.7.2.19 |GVSampleDataPlus_QuantityCalculationOutputUnitsLabel|

This parameter sets the label for the Quantity Calculation Output (analysis quantity) field. This label is normally set to describe the expected units for this field, such as Analysis Quantity, Calculated Volume, etc. When the Quantity Calculation Method dropdown list is displayed this label should be generic enough for all calculation methods so that it is meaningful regardless of the method selected. (See B.7.2.11)

Examples:

|GVSampleDataPlus_QuantityCalculationOutputUnitsLabel|=Analysis Quantity:
|GVSampleDataPlus_QuantityCalculationOutputUnitsLabel|=Sample Wet Weight:
|GVSampleDataPlus_QuantityCalculationOutputUnitsLabel|=Sample Volume:

B.7.2.20 |GVSampleDataPlus_QuantityCalculationMultiplierValue|

This parameter sets the default value for the Quantity Calculation Multiplier field. This field is only used when the Quantity Calculation Method is set to either “Flowrate” or “UnitConversion”. (See B.7.2.11)

Example:

|GVSampleDataPlus_QuantityCalculationMultiplierValue|=0.95

B.7.2.21 |GVSampleDataPlus_QuantityCalculationMultiplierLabel|

This parameter sets the label for the Quantity Calculation Multiplier field. This label is normally set to describe the expected units for this field, such as Efficiency, wet/dry ratio, etc. When the Quantity Calculation Method dropdown list is displayed this label should be generic enough for all calculation methods so that it is meaningful regardless of the method selected. (See B.7.2.11)

Examples:

|GVSampleDataPlus_QuantityCalculationMultiplierLabel|=Sampler Efficiency:

|GVSampleDataPlus_QuantityCalculationMultiplierLabel|=Wet/Dry Ratio:

B.7.2.22 |GVSampleDataPlus_QuantityCalculationMultiplierShow|

This flag is set to either “T” (true) or “F” (false) to show or hide the Quantity Calculation Multiplier field. When the field is displayed the content is editable by the analyst. When it is hidden, the default Quantity Calculation Multiplier value is used for any quantity calculations specified as long as the default value is greater than zero. If the default is zero, then the multiplier is not used in the quantity calculation.

This field is only used for Quantity Calculations, so it is normally hidden when the Quantity Calculation Method is set to “None”.

Example:

|GVSampleDataPlus_QuantityCalculationMultiplierShow|=T

B.7.2.23 |GVSampleDataPlus_QuantityCalculationDivisorValue|

This parameter sets the default value for the Quantity Calculation Divisor field. This field is only used when the Quantity Calculation Method is set to either “Flowrate” or “UnitConversion”. (See B.7.2.11)

Example:

|GVSampleDataPlus_QuantityCalculationDivisorValue|=2.5

B.7.2.24 |GVSampleDataPlus_QuantityCalculationDivisorLabel|

This parameter sets the label for the Quantity Calculation Divisor field. This label is normally set to describe the expected units for this field, such as Plate out Factor, Dry/Wet Ratio, etc. When the Quantity Calculation Method dropdown list is displayed this label should be generic enough for all calculation methods so that it is meaningful regardless of the method selected. (See B.7.2.11)

Examples:

|GVSampleDataPlus_QuantityCalculationDivisorLabel|=Plate out factor:
|GVSampleDataPlus_QuantityCalculationMultiplierLabel|=Dry/Wet Ratio:

B.7.2.25 |GVSampleDataPlus_QuantityCalculationDivisorShow|

This flag is set to either “T” (true) or “F” (false) to show or hide the Quantity Calculation Divisor field. When the field is displayed the content is editable by the analyst. When it is hidden, the default Quantity Calculation Divisor value is used for any quantity calculations specified as long as the default value is greater than zero. If the default is zero, then the divisor is not used in the quantity calculation.

This field is only used for Quantity Calculations, so it is normally hidden when the Quantity Calculation Method is set to “None”.

Example:

|GVSampleDataPlus_QuantityCalculationDivisorShow|=F

B.7.2.26 |GVSampleDataPlus_QuantityCalculationIgnorePrevious|

This flag is set to either “T” (true) or “F” (false), and it is only used when the Reanalysis Flag is set to “T” (true).

When set to “T”, the Quantity Calculation method specified in the configuration file is used regardless of what method was used in the previous analysis (if applicable). In order to be able to change the calculation method during reanalysis (i.e. when a sample is initially analyzed with an incorrect method) this parameter should be set to “T”.

When set to “F” the Quantity Calculation method used with the previous analysis is used instead of the Quantity Calculation method specified in the configuration file. This option is normally used for routine sample reanalysis so that all of previous parameters are shown in the data entry window.

Example:

|GVSampleDataPlus_QuantityCalculationIgnorePrevious|=T

B.7.2.27 |GVSampleDataPlus_SDFFilePath|

This parameter requires the full path to an SDF file. The Decay and Collection Dates/Times, Sample Quantity, and Quantity Units for analysis will be written to the SDF file which is subsequently loaded into GammaVision in the helper Job. (See Section B.7.1). This file path should be unique for each detector so that Jobs running on other systems will not inadvertently modify this file before it is read into GammaVision during the automation process.

Examples:

```
|GVSampleDataPlus_SDFFilePath|=C:\User\GVCR\Temp\1_Run.sdf  
|GVSampleDataPlus_SDFFilePath|=|GVCopySDF_Destination|
```

The second example shows how a parameter variable from Quick Start configuration files can be used to set the file path. This parameter must be defined in the configuration file passed to the program. In this example, this parameter is the destination path in the Run_GVCopyFile program definition. Early in the main automation Job a template SDF file is normally copied from the default location to a temporary folder with the detector name specified as a prefix to ensure that it is unique for this process.

B.7.2.28 |GVSampleDataPlus_JOBFilePath|

This parameter requires the full path to a helper Job that is called when the program closes. (See Section B.7.1 for file content.)

Example:

```
|GVSampleDataPlus_JOBFilePath|=|GLOBALVALUEDIR|TEMP\|DETNO|_SampleData.Job
```

This example demonstrates how parameter variables from Quick Start configuration files can be used to define the file path. These parameters must be defined in the configuration file passed to the program.

B.7.2.29 |GVSampleDataPlus_ReanalysisDataFilePath|

This parameter requires the full path to the reanalysis data file generated by the GVRecallSpectrum application. (See Section B.3) This parameter is only used when the Reanalysis Flag is set to "T".

Example:

```
|GVSampleDataPlus_ReanalysisDataFilePath|=|GVRecallSpectrum_DataFilePath|
```

This example demonstrates how parameter variables from Quick Start configuration files can be used to define the file path. The parameter variable shown is defined in the Global Configuration Files, and it routinely used for any program requiring access to this file.

B.7.2.30 |GVSampleDataPlus_CustomDataInputFilePath|

This parameter requires the full path to a custom data input file as described for GV_GetCustomData. (See Section B.22) This file is used as a template for creating the Custom Data Output File described below. This file should normally contain the following text:

```
DisplayForm = No  
ShowSavedData = No
```

Example:

```
|GVSampleDataPlus_CustomDataInputFilePath|=  
|CONFIGDIR|GVSampleDataPlus_CustomDataInput.txt
```

B.7.2.31 |GVSampleDataPlus_CustomDataOutputFilePath|

This parameter requires the full path to a custom data output file. (See Section B.22) This file is generated when the application closes and must be used as an input to the GV_GetCustomData application in the main automation Job file after the application closes and before using the GV_GetCustomData program to capture other custom data. This file has the following content:

- Full content of the Custom Data Input File as described in B.7.2.30.
- QuantityCalculationType=Calculation Method Type (i.e. Flowrate, UnitConversion, or N/A if no quantity calculation is applied)
- QuantityCalculationValue=Calculation Input value (i.e. Flowrate or Unit Conversion Input value, or N/A if no quantity calculation is applied.)
- QuantityCalculationUnits=Calculation Input Units or N/A if no quantity calculation is applied.
- QuantityCalculationMultiplier=Multiplier field value formatted as “0.000E+00” or N/A if the multiplier is not used.
- QuantityCalculationDivisor=Divisor field value formatted as “0.000E+00” or N/A if the multiplier is not used.
- If the Reanalysis Flag is set to “T”, then the parameter names and values of any previously stored custom data are also included in this file.

The following Quantity Calculation Custom fields must be defined in the Sample Administration Configuration in order for these parameters to be stored in the Global Value database:

```
QuantityCalculationType  
QuantityCalculationValue  
QuantityCalculationUnits  
QuantityCalculationMultiplier  
QuantityCalculationDivisor
```

Example:

```
|GVSampleDataPlus_CustomDataOutputFilePath|=  
|GLOBALVALUEDIR|TEMP|DETNO|_CustomData.txt
```

Example Custom Data Output File Content:

```
DisplayForm =No  
ShowSavedData =No  
QuantityCalculationType=Flowrate  
QuantityCalculationValue=2.000E+00  
QuantityCalculationUnits=cc/min  
QuantityCalculationMultiplier=9.500E-01  
QuantityCalculationDivisor=1.000E+00
```

B.7.2.32 |GVSampleDataPlus_QuantityCalculationConversionTablePath|

This parameter requires the full path to a Conversion Table file that is used for Flow rate and Unit Conversion Analysis Quantity Calculations. This file is also used to define the default Analysis Quantity units to display in the dropdown list when the Quantity Calculation Method is set to "None".

Example:

```
|GVSampleDataPlus_QuantityCalculationConversionTablePath|=  
|CONFIGDIR|ConversionTable.txt
```

The File format for the Conversion Table content is four comma-delimited parameters as follows:

Calculation Method, Input Units, Output Units, Conversion Factor

The Conversion factor is used to convert the input units into the output units specified using the calculations shown in Section B.7.2.11. The Input and Output units define the available selections in the Quantity Calculation Input and Output unit dropdown list.

Examples:

```
Flowrate, cc/min, L, 1E-3  
Flowrate, CFM, L, 28.320  
UnitConversion, L, cc, 1000  
UnitConversion, g, Kg, 1E-3
```

The default quantity units to display without calculations are also included in this file. These settings have three comma-delimited parameters and must follow the Flowrate and UnitConversion parameters. Note that the second parameter is ignored, and can be blank.

Examples:

```
None, ,L  
None, ,gm
```

B.8 GVSAMPLEDATA SC

GVSAMPLEDATA SC provides an interface for sample data entry when using sample changers, importing data, and using custom data fields. This program includes most commonly used parameters, including Geometry and Library selection, so that all data can be entered for multiple samples from a common location.

When using the “Multiple Samples” option, which is typical for sample changer operations, the interface is similar to that shown in Figure B.8.1. The Sample Queue is hidden when run in the Single Sample mode.

The content of the Analysis Data and Custom Sample Data sections may be modified by the Analysis Method and Custom Data configurations respectively.

The screenshot shows the 'GV Sample Data' window. It is divided into several sections:

- Analysis Data:** Contains fields for Analysis Method (Service Air), Sample Description (Service Air SA-117), Sample Comment (Monthly Surveillance), Sample Start Date/Time (6/12/2012 08:22), Sample Stop Date/Time (6/12/2012 08:52), Sample Type (Service Air), Geometry (4L Gas Marinelli_0), Library (Gas), Sample Flowrate (2 SCFM), Dilution Factor (1), Analysis Quantity (1.6141E+06), and Activity Units (uCi). There is a checked box for 'Custom Sample Data' and a 'Collection Efficiency' field set to 0.95.
- Custom Sample Data:** Contains fields for Batch ID (B123456789), Project ID (Project C), Client (Client #2), Sample ID (3), Analysis ID (AN123456844), Method (HPGe), Matrix (Filter), Sample Type (SAMPLE), Location (Location #4), Purpose (Purpose Y), Contact Name (Contact #2), and Contact Phone Number (111-222-3388).
- Sample Queue:** A table with columns 'Position' and 'Sample Description'. It contains three rows: 1 (Service Air SA-146), 2 (Service Air SA-148), and 3 (Service Air SA-117). The third row is highlighted. Buttons for 'Add', 'Update', and 'Remove' are located to the left of the table.

At the bottom of the window are 'Continue' and 'Cancel' buttons.

Figure B.8.1 GVSAMPLEDATA SC for Multiple Samples

GVSAMPLEDATA SC has the following command line parameter:

- 1) Full Path to Configuration File (required): *The configuration file must contain the parameters described in section B.8.2. This file should be unique to ensure that it is not overwritten by other processes prior to use.*

B.8.1 GVSAMPLEDATA SC Operation

B.8.1.1 Implementation

GVSAMPLEDATA SC is run from within GammaVision automation Jobs to allow Sample Data to be captured for one or more samples depending on the mode. When the "Continue" button is selected the following processes occur:

- 1) If the Multiple Samples option is disabled, then the sample data displayed is stored as the only sample in the hidden queue.
- 2) An automation Job is created for each sample in the queue by merging the Output Configuration file (See Section B.8.3) with the specified Job Template (See Sections B.8.2.11, B.8.2.18, and B.8.2.19 for Samples, QA Peaks, and QA Background respectively). This Job file creation process is similar to that described for GVTemplateMaster (See Section B.32). The file name for each Job file is the same as the Job File Path parameter (See Section B.8.2.5) with the Sample Queue position appended.
- 3) A text file containing analysis data is created for each sample in the queue. The file name for each sample is the same as the Job File Path parameter (See Section B.8.2.5) with "_SDFData" and the Sample Queue position appended. These files must be passed to the GVSDFData program (See Section B.9) in the sample specific Jobs created in Step #1. See Section B.8.3.17 for the full content and format of this file.
- 4) A text file containing custom data is created for each sample in the queue. The file name for each sample is the same as the Job File Path parameter (See Section B.8.2.5) with "_CustomData" and the Sample Queue position appended. These files must be passed to the GV_GetCustomData program (See Section B.21) in the sample specific Jobs created in Step #1. See Section B.8.3.16 for the full content and format of this file.
- 5) When reanalyzing samples a Job file is created to load the PBC file used in the previous analysis. (See Section B.8.2.10 for file path and content.)
- 6) If more than one sample has been added to the Sample Queue, then a report showing the full list of samples is printed to the default printer.
- 7) A helper Job is created which calls the automation Job generated in the Step #1 for the first sample in the queue. If multiple samples were in the queue, then the automation Job for each subsequent sample is called at the end of the current sample Job. (See Section B.8.3 for applicable Job Template parameters that are used for this purpose.)

When the "Cancel" button is selected a helper Job is created as described in Step #7 except that the content of the file is the QUIT command to terminate GammaVision.

The following is an example of how this application would be run from an acquisition Job:

```
Run "C:\User\GVCR\GVSampleDataSC.exe C:\User\GVCR\Temp\1_SampleDataSCData.txt"  
Wait "C:\User\GVCR\GVSampleDataSC.exe"  
Call "C:\User\GVCR\Temp\1_SampleDataSC.job"
```

NOTE: When using this application with multiple samples that include the QA Peak and QA Background options, the user must login to both the Detector/Sample database and the QA Database using GVSetUser and GVQASetUser respectively prior to running this application.

(See Section B.1) This is required in order to set the current analyst name for all subsequent measurements that will result from running this program. This is frequently unnecessary because QA measurements are typically run and verified prior to starting a batch of unattended measurements using a sample changer. If only Samples or QA measurements are made, then login to only the applicable database is necessary

B.8.1.2 Data Entry

- 1) Select an Analysis Method from the dropdown list. The analysis method specifies a number of parameters to use in the analysis process as well as default values for many of the sample data fields. See Section B.8.2.4 for details related to the Analysis Method settings.
- 2) If Laboratory Information Management System (LIMS) Data is imported as shown in Figure B.8.1, then select the appropriate sample data. The LIMS Data can be linked to Analysis Data fields that are updated when the LIMS record is selected. If LIMS data is not imported, then custom data section may be used for manual data entry as shown in Figure B.8.2. These parameters cannot be linked to the other Analysis Data fields, so they can be updated at any time. See Section B.8.2.24 for details related to the LIMS Data integration.

- 3) Validate or update all sample data fields.
- 4) If using the “Multiple Samples” mode then select the “Add” button to add the current sample to the list. The Position Number will automatically be set to the sample position within the grid.
- 5) Sample data may be reviewed by selecting the applicable item within the list. All of the associated fields will be populated with the data last saved for the selected sample. If any changes to the data are required, then select the “Update” button after making changes to save changes in the Sample Queue.

The screenshot shows a software dialog box titled "GV Sample Data". It is divided into two main sections. The top section, "Analysis Data", contains several input fields: "Analysis Method" (dropdown menu with "RCS Liquid Isotopic" selected), "Sample Description" (dropdown menu with "SP-1" selected), "Sample Comment" (text field with "RCS Liquid Isotopic"), "Decay Date/Time" (text field with "6/26/2012 12:59:00"), "Sample Type" (dropdown menu with "RCS" selected), "Geometry" (dropdown menu with "250mlPolyBottle_0" selected), "Library" (dropdown menu with "Rx Isotopic" selected), "Sample Quantity" (text field with "2.5000E+02" and a unit dropdown with "ml" selected), "Dilution Factor" (text field with "1.0000E+00" and a "Lookup" button), "Analysis Quantity" (text field with "250" and a unit dropdown with "ml" selected), and "Activity Units" (dropdown menu with "uCi" selected). A checkbox labeled "Custom Sample Data" is checked. The bottom section, "Custom Sample Data", has a "Sample Number" text field containing "12345". At the bottom of the dialog are two buttons: "Continue" and "Cancel".

Figure B.8.2 GVSAMPLEDATA for Single Sample

- 6) A sample may be removed from the Sample Queue by selecting the item within the list and then selecting the “Remove” button. All samples following the removed item will automatically be renumbered based on their order in the list.
- 7) After all samples have been added to the Sample Queue (or when using the Single Sample mode), select the “Continue” button to initiate the processes described previously in this section. Alternatively, the measurement can be canceled and GammaVision closed by selecting the “Cancel” button.

B.8.1.3 Analysis Quantity Calculations

The Analysis Quantity is calculated based on sample flow rate or dilution depending on the settings in the Analysis Method selected. See Section B.8.2.4 for details related to the Analysis Methods.

1) Analysis Quantity based on Flow rate

$$AQ = SF * EFF * Dur * CF / DF$$

Where:

AQ	= Analysis Quantity
SF	= Sample Flow rate (See B.8.2.4.16)
EFF	= Collection Efficiency (B.8.2.4.18)
Dur	= Duration (Collection Stop Time – Collection Start Time in minutes)
CF	= Conversion Factor (See B.8.2.4.17)
DF	= Dilution Factor (See B.8.2.4.14)

2) Analysis Quantity based on Dilution

$$AQ = SQ * EFF / DF$$

Where:

AQ	= Analysis Quantity
SQ	= Sample Quantity (See B.8.2.4.5)
EFF	= Collection Efficiency (B.8.2.4.18)
DF	= Dilution Factor (See B.8.2.4.14)

B.8.2 GVSampleDataSC Configuration

The parameters in this section are required in the configuration file specified on the command line for this program. Any other text in the configuration file is ignored to allow comments or other parameters to be included without affecting the application.

Any valid variables may be used for setting the configuration file parameters in the Global Value Quick Start process as well. Typically, this would include parameters defined in the Global or Job Configuration Files, or those generated by GlobalValueQuickStart when an automation process is initiated. This is normally accomplished in the automation Job by making a copy of GVQuickStart.cfg (or GVQuickStartReanalysis.cfg) using GVCopyFile. The following is an example Job excerpt that would be run prior to GVSampleDataSC:

```
Run "C:\User\GVCR\GVCopyFile.exe C:\User\GVCR\GVQuickStart.cfg, C:\User\GVCR\Temp\1_SampleDataSCData.txt"  
Wait "C:\User\GVCR\GVCopyFile.exe"
```

The file path "C:\User\GVCR\Temp\1_SampleDataSCData.txt" is passed to GVSampleDataSC as a command line argument as shown in section B.8.1.

Configuration File Parameter List

The following parameters must be defined in the configuration file passed to the application. Each parameter is defined in detailed in the remainder of this section.

Section	Parameter Name
B.8.2.1	GVSampleDataSC_MultipleSamples
B.8.2.2	GVSampleDataSC_DETNO
B.8.2.3	GVSampleDataSC_DETSPECTRUMPREFIX
B.8.2.4	GVSampleDataSC_AnalysisMethodFilePath
B.8.2.5	GVSampleDataSC_JobFilePath
B.8.2.6	GVSampleDataSC_CalibrationDirectory
B.8.2.7	GVSampleDataSC_LibraryDirectory
B.8.2.8	GVSampleDataSC_DETRPTDIR
B.8.2.9	GVSampleDataSC_PBCDirectory
B.8.2.10	GVSampleDataSC_PBCLoadJobFilePath
B.8.2.11	GVSampleDataSC_JobTemplateFilePath
B.8.2.12	GVSampleDataSC_DefaultSDFFilePath
B.8.2.13	GVSampleDataSC_DefaultReportTemplate
B.8.2.14	GVSampleDataSC_ActivityUnitsFilePath
B.8.2.15	GVSampleDataSC_SampleSizeUnitsFilePath
B.8.2.16	GVSampleDataSC_FlowUnitsFilePath
B.8.2.17	GVSampleDataSC_DilutionFactorsFilePath
B.8.2.18	GVSampleDataSC_QAPeakJobTemplateFilePath
B.8.2.19	GVSampleDataSC_QABkgdJobTemplateFilePath
B.8.2.20	GVSampleDataSC_QAPeakConfigurationFilePath
B.8.2.21	GVSampleDataSC_QABkgdConfigurationFilePath
B.8.2.22	GVSampleDataSC_Reanalysis
B.8.2.23	GVSampleDataSC_ReanalysisDataFilePath
B.8.2.24	GVSampleDataSC_LIMSInputFilePath
B.8.2.25	GVSampleDataSC_EditableLIMSData
B.8.2.26	GVSampleDataSC_EditableCollectionEfficiency
B.8.2.27	GVSampleDataSC_HideLiveTimePreset
B.8.2.28	GVSampleDataSC_ContinueCommand

B.8.2.1 |GVSampleDataSC_MultipleSamples|

This flag is set to either “T” (true) or “F” (false). When set to “T” (true) the grid for adding samples to the automation queue is displayed. (See Figure B.8.1) If set to anything else, the grid is not displayed so the application is effectively in the single sample analysis mode. (See Figure B.8.2).

This flag is ignored in Reanalysis mode because the program is configured to edit only the sample being reanalyzed.

Example:

```
|GVSampleDataSC_MultipleSamples|=T
```

B.8.2.2 |GVSampleDataSC_DETNO|

This parameter is the Detector Number as set in Global Value configuration on the Detectors tab. This is the same number established for the respective detector in MCB Configuration during the hardware configuration.

Example:

```
|GVSampleDataSC_DETNO|=|DETNO|
```

where |DETNO| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.3 |GVSampleDataSC_DETSPECTRUMPREFIX|

This parameter is the Spectrum Prefix as set in Global Value configuration on the Detectors tab for the applicable detector.

Example:

```
|GVSampleDataSC_DETSPECTRUMPREFIX|=|DETSPECTRUMPREFIX|
```

where |DETSPECTRUMPREFIX| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.4 |GVSampleDataSC_AnalysisMethodFilePath|

This parameter requires the full path to the Analysis Method File. This file is a comma-separated values (CSV) file format that contains all of the Analysis Methods and associated parameters except for those associated with “QA Peaks” and “QA Background”. The first record (row) in this file is reserved as the parameter (column) headings. This record is ignored when the file is read by GVSAMPLEDATA SC, so any meaningful descriptions may be used. The default header descriptions are similar to the following:

AnalysisMethod, SDFFileName, Geometry, Library, Quantity, QuantityUnits, ActivityUnits, LiveTime, ReportTemplate, SampleType, Different Start/StopTimes, DefaultSampleDateTime, UseDilution, DilutionFactor, UseFlowrate, Flowrate, FlowrateUnits, CollectionEfficiency, SampleComment, SampleDescription, ContinueCommand

Example:

|GVSampleDataSC_AnalysisMethodPath|=|CONFIGDIR|GVSampleDataSC_Methods.csv

where |CONFIGDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files. This parameter is normally set in the Global Configuration Files.)

As described in Section B.8.1, several parameters are set to default values when the Analysis Method is selected on the GVSAMPLEDATA SC interface. These parameters are described in the remainder of this section.

B.8.2.4.1 Analysis Method

These method names are displayed in the Analysis Method dropdown list on the GVSAMPLEDATA SC interface. The method names must be unique; therefore, empty records (rows) are not allowed in this file.

B.8.2.4.2 SDF File Name

The SDF File Name excludes the directory path and file extension. This file name is used to set the |GVSampleDataSCOut_SDFDATAFILEPATH| parameter (See Section B.8.3.17) with the SDF path defined as “|SDFDIR|SDFFileName.sdf” where |SDFDIR| must be defined in the Quick Start Configuration file.

If this parameter is omitted then the default SDF file path (See B.8.2.12) is used to set the |GVSampleDataSCOut_SDFDATAFILEPATH| parameter.

B.8.2.4.3 Geometry

The Geometry is the default Calibration File name excluding the directory path, File Prefix as defined for each detector in Global Value Configuration, and the file extension. If omitted or a valid geometry is not specified, then no default selection is made in the Geometry dropdown list.

B.8.2.4.4 Library

The Library is the default Library File name excluding the directory path and file extension. If omitted or a valid library is not specified, then no default selection is made in the Library dropdown list.

B.8.2.4.5 Quantity

The default quantity must be numeric if set. If omitted the Analysis Quantity field is blank. When using Flowrate calculations, this field is ignored.

B.8.2.4.6 Quantity Units

This parameter sets the default units for the Sample Quantity and Analysis Quantity.

The dropdown list for the Analysis Quantity Units is populated from the Flow Units File (See Section B.8.2.16) when the Flowrate calculation is implemented.

The dropdown list for the Sample Quantity Units is populated from the Sample Size Units File (See Section B.8.2.15) when the Flowrate calculation is not implemented.

B.8.2.4.7 Activity Units

The default activity units must match one of those defined in the Activity Units file. (See Section B.8.2.14) If omitted then no default selection is made in the Activity Units dropdown list.

NOTE: The SDF file activity units must be set to “Bq” for the activity conversion to be valid. The Activity Units file has conversion factors to convert the reported activity from Bq to the activity units selected in GVSampleDataSC. This conversion factor is written to the SDF file Activity Units Divisor field as part of the automation Job process as described in Section B.8.1.1 Step #3.

B.8.2.4.8 Live Time

The default Live Time preset value must be numeric. If omitted the user must enter a Live Time for the sample count.

This field is ignored in the Reanalysis Mode since presets are not applicable.

B.8.2.4.9 Report Template

The Report Template must match the name of a Report Template defined in the Global Value Configuration on the Report Templates tab. This parameter is not editable on the program interface. If an invalid template name is specified, then the user will be prompted to select a valid name when the report is generated for the measurement. See Section B.25 for a detailed description of the GV_Custom_Rpt program.

B.8.2.4.10 Sample Type

The Sample Type must match one of the Sample Types defined within the Global Value Configuration on the “Sample Types” tab. If it doesn’t match a predefined Sample Type, then none of the items in the dropdown list will be selected by default.

B.8.2.4.11 Different Start/Stop Times

This parameter is set to either “Yes” or “No”. When set to “Yes” the Sample Start Date/Time field is displayed in the Analysis Data section. When set to “No” only the Sample Stop Date/Time is displayed and the label is changed to “Decay Date/Time”. In this condition the Sample Start Date/Time is set to the same time as the Sample Stop Time.

B.8.2.4.12 DefaultSampleDateTime

The default Sample Date/Time can be any valid date/time format. It can also be set to the current date using the word "TODAY" or the current date/time using the word "NOW".

Both the Sample Collection Start and Stop Time fields are populated with this setting.

B.8.2.4.13 Use Dilution

This parameter is set to either "Yes" or "No". When set to "Yes" the Dilution field and a button to access selectable Dilution schemes are displayed. See Section B.8.2.17 for details related to the Dilution Factors file format.

When set to "No" the Dilution Factor field is hidden and set to a value of one.

B.8.2.4.14 Dilution Factor

A Default Dilution Factor may be set if desired. The value must be greater than zero. If the "Use Dilution" parameter is set to "No", then this parameter is ignored, and a default value of one is used.

B.8.2.4.15 Use Flowrate:

This parameter is set to either "Yes" or "No". When set to "Yes" the Flowrate, Flowrate Units, and Collection Efficiency fields are displayed and populated with the default parameters specified in this section.

When set to "No" the Flowrate and Flowrate Units fields are hidden and not used for Analysis Quantity calculations.

B.8.2.4.16 Flowrate:

The default flowrate is set to zero if the default value is blank, less than zero, or non-numeric. This field is ignored if the "Use Flowrate" parameter is set to "No".

B.8.2.4.17 Flowrate Units

The default Flowrate units must match one of those defined in the Flow Units File (See Section B.8.2.16) If omitted then no default selection is made in the Flow Units dropdown list.

B.8.2.4.18 Collection Efficiency

If the Collection Efficiency value is greater than zero or the "Use Flowrate" parameter is set to "Yes", then the Collection Efficiency field is displayed and populated with the default value.

If the Collection Efficiency is not specified and the Flowrate calculation is not implemented, then this field is hidden and not used in the Analysis Quantity calculation.

B.8.2.4.19 SampleComment

This parameter sets the default text for the Sample Comment field.

B.8.2.4.20 Sample Description

This parameter sets the default Sample Description or the Full Path to a text file with a list of Sample Descriptions. To display a dropdown list of sample descriptions, use the syntax "FILE: FILEPATH" where FILEPATH is the full path to a text file with a list of sample descriptions.

B.8.2.4.21 Continue Command

This parameter sets the automation Job instructions that will be created in the helper Job described in Section B.8.1.1 Step #7 when the "Continue" button is selected. The instructions in this helper Job are performed prior to calling the automation Job for the first sample.

If nothing is specified then the default Continue Command for the program will be used. This is typically the desired configuration when using the "multiple samples" mode because the command set in this condition is not specified to the last sample loaded in the sample queue.

When using the Single Sample mode each Analysis Method can specify different instructions to run when the program closes. For example, a method may be configured for samples that require Radiation Monitor Readings (See Section B.21). The commands that must be generated to prompt for this information can be set in the Continue Command as follows:

The Continue Command requires one parameter that is defined in the configuration file passed to this program followed by the equals ("=") sign.

Example: "|Run_GVGetRadMonitor|="

When using the process described in Section B.8.2 with the default Global Value installation, the content of the helper Job when counting a sample on Detector #3 would be:

```
Run "C:\...\GV_GetRadMon.exe C:\...\GlobalValue3.mdb, F, C:\...\3_Abort.Job"  
Wait "C:\...\GV_GetRadMon.exe"  
Call "C:\...\3_Abort.Job"  
Call "C:\...\3_SampleDataSC1.Job"
```

The last line calls the automation Job for the first (or in this case the only) sample in the queue.

Configuration Parameters may also be combined to allow for multiple commands. This is accomplished by making a parameter that includes others that are predefined. The following example shows a parameter configured to prompt for Radiation Monitor Readings and Radiation Work Permits:

```
|RunRadMonitor_RunRWP|=|Run_GVGetRadMonitor||CrLf||Run_GVGetRWP|
```

If the Continue Command is set to "|RunRadMonitor_RunRWP|=" then the helper Job content would be:

```
Run "C:\...\GV_GetRadMon.exe C:\...\GlobalValue3.mdb, F, C:\...\3_Abort.Job"  
Wait "C:\...\GV_GetRadMon.exe"
```

```
Call "C:\...\3_Abort.Job"  
Run "C:\...\GV_GetRWP.exe C:\...\GlobalValue3.mdb, F, C:\...\3_Abort.Job"  
Wait "C:\...\GV_GetRWP.exe"  
Call "C:\...\3_Abort.Job"  
Call "C:\...\3_SampleDataSC1.Job"
```

Refer to Section B.32 (GVTemplateMaster) for details related to configuration parameters and how they are used with Job Templates to create automation Job commands.

B.8.2.5 |GVSampleDataSC_JobFilePath|

This parameter specifies the full path to a Job File that will be called from the main application Job immediately after the GVSAMPLEDATA SC application closes. The contents of this Job are either the word "Quit" if the Cancel button is selected in the application interface (this command terminates the automation routine and closes GammaVision), or the text specified in the "ContinueCommand" parameter followed by the path to a dynamically generated Job file for the first sample in the queue.

Example:

```
|GVSampleDataSC_JobFilePath|=  
|GLOBALVALUEDIR|Temp\|DETNO|_SampleDataSC|TempFileSuffix|.job
```

where each parameter is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.6 |GVSampleDataSC_CalibrationDirectory|

This parameter specifies the directory to search for valid calibration files associated with the applicable detector. This relationship between the calibration file name and the detector is based on the file name prefix matching the required detector prefix. (See Section B.8.2.3)

The Geometry list on the application's interface is populated with all of the files with ".clb" extension and the specified File Prefix within this directory. The file prefix and extension is omitted from the file name when displayed in the Geometry list.

Example:

```
|GVSampleDataSC_CalibrationDirectory|=|CALDIR|
```

where |CALDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.7 |GVSampleDataSC_LibraryDirectory|

This parameter specifies the directory to search for valid library files. The Library list on the application's interface is populated with all of the files with ".lib" extension from this directory. The file extension is omitted from the file name when displayed in the Library list.

Example:

```
|GVSampleDataSC_LibraryDirectory|=|LIBDIR|
```

where |LIBDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.8 |GVSampleDataSC_DETRPTDIR|

This parameter is used to set the "ReportFileName" parameter in the SDF Data file. The use of this file is described in Section B.8.1.1 Step #3. The full content of the SDF Data file is described in Section B.8.3.17.

Example:

```
|GVSampleDataSC_DETRPTDIR|=|DETRPTDIR|
```

where |DETRPTDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.9 |GVSampleDataSC_PBCDirectory|

This parameter specifies the directory where PBC (Peak Background Files) are stored. It is used to create the content of a helper Job that is called in the automation Job created for reanalysis processes as described in Section B.8.1.1 Step #5.

The full content of the helper Job is: Load_PBC "PBCDirectory\PBCFilename"

Where the PBCDirectory is the directory specified for this parameter, and PBCFileName is the name stored in Global Value for the previous analysis. If PBC was not used for the previous analysis then the content of the helper Job is blank.

Example:

```
|GVSampleDataSC_PBCDirectory|=|PBCDIR|
```

where |PBCDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.10 |GVSampleDataSC_PBCLoadJobFilePath|

This parameter specifies the file path where the Job content described in Section B.8.2.9 will be saved.

Example:

```
|GVSampleDataSC_PBCLoadJobFilePath|=  
|GLOBALVALUEDIR|Temp\|DETNO|_LoadPBCReanalysis.job
```

where each parameter is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.11 |GVSampleDataSC_JobTemplateFilePath|

This parameter specifies the full path to a Job Template file which is used to create the automation Jobs for each sample in the queue as described in Section B.8.1.1 Step #2. This template is not used for Peak or Background QA. At a minimum this Job Template must include the following functions:

- 1) Change Sample (Multiple Samples mode only. Changer type dictates the specific commands.)
- 2) Set Sample Description
- 3) Copy the Default SDF file to the sample specific SDF file path
- 4) Update the sample specific SDF file using data from the SDF Data file
- 5) Load the SDF file into GammaVision
- 6) Set the Sample Type / R-Type
- 7) Load the calibration and library files
- 8) Load the Custom Data from the Custom Data file.
- 9) Load the PBC file used for the previous analysis (for re-analysis only)
- 10) Save, Analyze, and load analysis data into Global Value.
- 11) Create and Print (if applicable) reports
- 12) Call the Job File for the Next sample in the queue

Refer to Section B.31 and the example Job Templates for more detail related to the file content.

Example:

```
|GVSampleDataSC_JobTemplateFilePath|=|JOBTemplateDIR|SCCountSamples.jtp
```

where |JOBTemplateDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.12 |GVSampleDataSC_DefaultSDFFilePath|

This parameter specifies the full path to the SDF file to be used if an SDF File name is not specified in the Analysis Methods file for the selected method. Typically, this parameter is not used.

Example:

|GVSampleDataSC_DefaultSDFFilePath|=|GVCopySDF_Destination|

where |GVCopySDF_Destination| defines the SDF File path where the template SDF File is saved using the GVCopyFile program as described in Section B.8.2.

B.8.2.13 |GVSampleDataSC_DefaultReportTemplate|

This parameter specifies the Report Template to be used if a Report Template name was not specified in the Analysis Methods file for the selected method. See Section B.8.2.4.9 for template name requirements. Typically, this parameter is not used.

Example:

|GVSampleDataSC_DefaultReportTemplate|=Generic Template

B.8.2.14 |GVSampleDataSC_ActivityUnitsFilePath|

This parameter specifies the full path to a text file that defines the valid units that are used to populate the Activity Units dropdown list. The file also includes conversion factors to convert from the standard activity units set in the SDF file to those specified. The default file content includes conversion factors from standard units of Becquerel (Bq).

Example:

|GVSampleDataSC_ActivityUnitsFilePath|=
|CONFIGDIR|GVSampleDataSC_ActivityUnits.txt

The file contains comma-delimited parameters as follows: (Unit, Conversion Factor)

Data starts after the asterisk (*) line.

Ci, 3.7E+10
Bq, 1
DPM, 0.01666667

Any text can precede the asterisk (*) line, but the asterisk line must exist as it signals the start of the parameters to be read. The units use conversion factors from Bq. This conversion factor is written to the SDF file Activity Units Divisor field as part of the automation Job process as described in Section B.8.1.1 Step #3.

B.8.2.15 |GVSampleDataSC_SampleSizeUnitsFilePath|

This parameter specifies the full path to a text file that defines the valid units that are used to populate the Sample Quantity Units dropdown list. Note that the user can also enter units that are not included in this list.

Example:

```
|GVSampleDataSC_SampleSizeUnitsFilePath|=  
|CONFIGDIR|GVSampleDataSC_SampleSizeUnits.txt
```

The file format is as follows:

```
Data starts after the asterisk (*) line.  
*****  
g  
mg  
Kg  
ml  
L  
Sample
```

Any text can precede the asterisk (*) line, but the asterisk line must exist as it signals the start of the parameters to be read.

B.8.2.16 |GVSampleDataSC_FlowUnitsFilePath|

This parameter specifies the full path to a text file that defines the valid sample flow and analysis quantity units that are used to populate the Flowrate and Analysis Quantity Units dropdown lists. The file also includes conversion factors to convert from the flow units to the analysis units.

Example:

```
|GVSampleDataSC_FlowUnitsFilePath|=|CONFIGDIR|GVSampleDataSC_FlowUnits.txt
```

The file contains comma-delimited parameters as follows:
(Flow Units, Volume Units, Conversion Factor)

```
Data starts after the asterisk (*) line.  
*****  
SCFM, cc, 28316.84659  
LPM, cc, 1000
```

Any text can precede the asterisk (*) line, but the asterisk line must exist as it signals the start of the parameters to be read. Only acceptable combinations can be used for the Flow rate calculation (See Section B.8.1.3 for the Flow rate calculation.)

B.8.2.17 |GVSampleDataSC_DilutionFactorsFilePath|

This parameter specifies the full path to a text file that defines the valid dilution schemes that are used to populate the Dilution Schemes list. This list is accessed by selecting the “Lookup” button next to the Dilution Factor field. When an item in this list is selected and the dialog box is closed, the associated dilution value is set in the Dilution Factor field. This process can simplify the calculation of multiple dilutions when the typical dilution fractions are pre-defined.

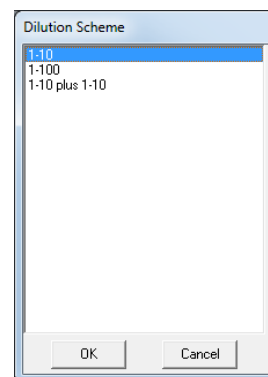


Figure B.8.2.17 Dilution Schemes

Example:

```
|GVSampleDataSC_DilutionFactorsFilePath|=  
|CONFIGDIR|GVSampleDataSC_DilutionFactors.txt
```

The file contains comma-delimited parameters as follows: (Dilution Scheme, Dilution Factor)

Data starts after the asterisk (*) line.

```
1-10, 10  
1-100, 100  
1-10 plus 1-10, 100
```

Any text can precede the asterisk (*) line, but the asterisk line must exist as it signals the start of the parameters to be read.

B.8.2.18 |GVSampleDataSC_QAPeakJobTemplateFilePath|

This parameter specifies the full path to a Job Template file which is used to create the automation Jobs for the “QA Peaks” Analysis Method as described in Section B.8.1.1 Step #2. At a minimum this Job Templates must include the following functions:

- 1) Change Sample (Multiple Samples mode only. Changer type dictates the specific commands.)
- 2) Set Sample Description
- 3) Copy the Default SDF file to the sample specific SDF file path
- 4) Update the sample specific SDF file using options set in the QA Peak Configuration File (See Section B.8.2.20)
- 5) Load the SDF file into GammaVision
- 6) Load the calibration and library files
- 7) Save, Analyze, and load QA data into Global Value.
- 8) Recalibrate Energy/FWHM, and load AS LEFT QA data (as applicable)
- 9) Call the Job File for the Next sample in the queue

Refer to Section B.31 and the example Job Templates for more detail related to the file content.

Example:

```
|GVSampleDataSC_QAPeakJobTemplateFilePath|=|SCQAPeak|
```

where |SCQAPeak| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.19 |GVSampleDataSC_QABkgdJobTemplateFilePath|

This parameter specifies the full path to a Job Template file which is used to create the automation Jobs for the “QA Background” Analysis Method as described in Section B.8.1.1 Step #2. At a minimum this Job Templates must include the following functions:

- 1) Change Sample (Multiple Samples mode only. Changer type dictates the specific commands.)
- 2) Set Sample Description
- 3) Copy the Default SDF file to the sample specific SDF file path
- 4) Update the sample specific SDF file using options set in the QA Background Configuration File (See Section B.8.2.20)
- 5) Load the SDF file into GammaVision
- 6) Load the calibration and library files
- 7) Save, Analyze, and load Background data into Global Value.
- 8) Call the Job File for the Next sample in the queue

Refer to Section B.31 and the example Job Templates for more detail related to the file content.

Example:

```
|GVSampleDataSC_QABkgdJobTemplateFilePath|=|SCQABkgd|
```

where |SCQABkgd| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.20 |GVSampleDataSC_QAPeakConfigurationFilePath|

This parameter specifies the full path to a Configuration file which defines Job specific parameters used to create the automation Jobs for the “QA Peaks” Analysis Method as described in Section B.8.1.1 Step #2. This configuration file is normally the Job Configuration File used to run QA Peaks as a standalone process from Quick Start.

Refer to Section B.31 and the example Job Configuration Files for more detail related to the file content.

Example:

```
|GVSampleDataSC_QAPeakConfigurationFilePath|=  
|JobDir|Det|DETNO|QA\Daily Calibration Check.cfg
```

where each parameter is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.21 |GVSampleDataSC_QABkgdConfigurationFilePath|

This parameter specifies the full path to a Configuration file which defines Job specific parameters used to create the automation Jobs for the “QA Background” Analysis Method as described in Section B.8.1.1 Step #2. This configuration file is normally the Job Configuration File used to run QA Background as a standalone process from Quick Start.

Refer to Section B.31 and the example Job Configuration Files for more detail related to the file content.

Example:

```
|GVSampleDataSC_QABkgdConfigurationFilePath|=  
|JobDir|Det|DETNO|\QA\Daily Background.cfg
```

where each parameter is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.22 |GVSampleDataSC_Reanalysis|

This flag is set to either “T” (true) or “F” (false). If set to “T”, then a valid reanalysis data file path must be provided. (See B.7.2.29) The Live Time Preset field is also hidden and not used if this parameter is set to “T”. Setting this parameter to anything other than “T” equates to “F” (false).

Example:

```
|GVSampleDataPlus_ReanalysisFlag|=T
```

B.8.2.23 |GVSampleDataSC_ReanalysisDataFilePath|

This parameter specifies the full path to the reanalysis data file generated by the GVRecallSpectrum program previously in the automation job. (See Section B.3) If the Reanalysis Flag is set to “T”, then the contents of this file are read by the application to populate the program fields with data from the previous analysis.

Example:

```
|GVSampleDataSC_ReanalysisDataFilePath|=|GVRecallSpectrum_DataFilePath|
```

where |GVRecallSpectrum_DataFilePath| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.24 |GVSampleDataSC_LIMSInputFilePath|

This parameter specifies the full path to the LIMS Input data file. The “LIMS” term refers to a Laboratory Information Management System which could be any data storage system. When these systems can be configured to create a CSV file in the proper format the data can be seamlessly loaded into Global Value. When LIMS integration is not necessary or possible this file can be used to establish data input fields for custom data parameters or default parameters for configurations that require modification to the Analysis Method defaults.

Example:

```
|GVSampleDataSC_LIMSInputFilePath|=  
|LIMSDIR|GVSampleDataSC_CustomInputData.csv
```

where |LIMSDIR| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.2.24.1 LIMS Input File Format

The format of the LIMS Input File is Comma-Separated Values (CSV) with a variable number of parameters up to a maximum of twelve for the List and Field types described below. The Link field types do not count against the number of parameters allowed. The header consists of the first four records which define the parameters and their use as follows:

- 1) Record 1: Parameter Name – Any descriptive name is valid.
- 2) Record 2: Parameter Type – Valid entries are:
 - a. **“List”**: All unique data for this field will be displayed in the Custom Sample Data section of the GVSAMPLEDataSC program in a dropdown list box. List parameter types should be listed as the first set of parameters in the file, and the order in the file dictates the dropdown field order as well. The content of subsequent fields is limited to those records containing all of the previous dropdown list selections. It is critical to ensure that the full combination of all List fields results in a unique records within this file.
 - b. **“Field”**: The associated data will be displayed in standard text fields. When List parameters are implemented, the content of the Field parameters is based on the unique record defined by the selection of all List items.
 - c. **“Link”**: The data will be updated in the respective field in the Analysis Data section of GVSAMPLEDataSC. Similar to the Field parameters, the Linked parameters are determined by the unique combination of parameters in the List fields. When no data is specified for a linked field the associated field will be cleared and require manual entry by the analyst. An appropriate Analysis Method must be selected before selecting the LIMS data or some parameters may be ignored. For example, data specified for FLOWRATE will be ignored if the Analysis Method does not implement the flow rate calculation. The following Link field codes are available to update the respective fields in the Analysis Data section:
 - i. SAMPLEDESCRIPTION
 - ii. SAMPLECOMMENT
 - iii. COLLECTIONSTART
 - iv. COLLECTIONSTOP

- v. SAMPLETYPE
 - vi. GEOMETRY
 - vii. LIBRARY
 - viii. SAMPLEQUANTITY
 - ix. SAMPLEQUANTITYUNITS
 - x. DILUTIONFACTOR
 - xi. COLLECTIONEFFICIENCY
 - xii. ACTIVITYUNITS
 - xiii. COUNTTIME
 - xiv. FLOWRATE
 - xv. FLOWRATEUNITS
- 3) Record 3: Field Label – The label as displayed on the program interface.
 - 4) Record 4: Parameter Name – The Parameter Name must match a name defined in the Sample Administration Configuration Custom Fields. The data associated with these parameters is written to the Custom Data file for each sample as described in Section B.8.1.1 Step #4 so that the data can be stored in the Global Value database and reported as required. The parameter name is not required for Linked fields because the associated data is stored with the Analysis Data parameters.

B.8.2.24.2 LIMS Input File Examples

The following examples demonstrate how the LIMS Input file can be configured for different applications. The file content is shown in the Microsoft Excel interface for clarity.

- 1) Simple field for user entry:

This example demonstrates a single custom parameter field that allows the analyst to enter the applicable data. Since there aren't any List type parameters, the displayed field will be blank even if data is provided after the fourth record.

1	
1	Sample ID
2	Field
3	Sample Number:
4	SampleID

Figure B.8.2.24.2.1 Simple LIMS Input File Content

Custom Sample Data

Sample Number:

Figure B.8.2.24.2.2 Custom Data for Single parameter data

2) Complex LIMS Data:

This example demonstrates a more robust integration with the file content generated by a LIMS. The first two parameters define the unique records, the second two are fields populated with the specified data, and the last three are linked to Analysis Data fields to update the respective parameters when a unique record is selected.

Note that the List fields display only the unique data for that parameter list as shown below. When selections are made in the List fields the Field parameters and Linked parameters are updated accordingly.

	1	2	3	4	5	6	7
1	BatchNumber	Project	Analysis ID	Matrix	Sample Desc Link	Sample Quant Link	Sample Quant Units Link
2	List	List	Field	Field	Link	Link	Link
3	Batch ID:	Project ID:	Analysis ID:	Matrix:	SAMPLEDESCRIPTION	SAMPLEQUANTITY	SAMPLEQUANTITYUNITS
4	BatchID	ProjectID	AnalysisID	Matrix			
5	B-12345	Project A	AN-123	Liquid	ABC-Storm Drain	250 ml	
6	B-12345	Project B	AN-234	Liquid	DEF-Storm Drain	1000 ml	
7	B-12345	Project C	AN-345	Soil	ABC-Drain Sludge	483 g	
8	B-56789	Project A	AN-456	Filter	Tank 123 Crud	500 ml	
9	B-56789	Project B	AN-567	Soil	Area B3YZ Ditch #3	250 g	
10	B-56789	Project C	AN-678	Liquid	Area NN4-3 Drain	1 L	

Figure B.8.2.24.2.3 Complex LIMS Input File Content

Custom Sample Data

Batch ID:

Project ID:

Analysis ID:

Matrix:

Figure B.8.2.24.2.4 Custom Data Display List Fields limited to unique data

Custom Sample Data

Batch ID:

Project ID:

Analysis ID:

Matrix:

Figure B.8.2.24.2.5 Custom Data fields populated based on List Field selections

B.8.2.25 |GVSampleDataSC_EditableLIMSData|

This flag is set to either “T” (true) or “F” (false) to enable or disable editing of LIMS Data. When set to “T”, the “FIELD” parameters can be edited after selections have been made in the “LIST” parameter dropdown boxes. When set to “F”, the “FIELD” parameters are disabled to ensure that the data stored in the LIMS Input File is used for the sample analysis. (See Section B.8.2.24 for LIMS File field types.)

Example:

```
|GVSampleDataSC_EditableLIMSData|=T
```

B.8.2.26 |GVSampleDataSC_EditableCollectionEfficiency|

This flag is set to either “T” (true) or “F” (false) to enable or disable editing of the Collection Efficiency field when it is displayed.

Example:

```
|GVSampleDataSC_EditableCollectionEfficiency|=T
```

B.8.2.27 |GVSampleDataSC_HideLiveTimePreset|

This flag is set to either “T” (true) or “F” (false) to display or hide the Live Time preset field. When displayed a valid number (seconds) greater than zero is required.

This flag has no affect in reanalysis mode. In this condition the Live Time preset field is hidden because it is not used.

Example:

```
|GVSampleDataSC_HideLiveTimePreset|=F
```

B.8.2.28 |GVSampleDataSC_ContinueCommand|

This parameter specifies the default functions to be run in the helper Job when the program is closed by selecting the “Continue” button. This parameter is ignored if a Continue Command has been specified for the last sample in the queue (or the only sample when using Single sample mode). See Section B.8.2.4.21 for details related to the use of the Continue Command.

Note that the Continue Command is not followed by the equal sign (“=”) in this context, but it is required when specified in the Analysis Methods.

Example:

```
|GVSampleDataSC_ContinueCommand|=|Run_GVAskConfirm|
```

where |Run_GVAskConfirm| is defined in the Quick Start Configuration file. (See Section A.1 for more details regarding the Quick Start configuration files.)

B.8.3 GVSAMPLEDATA SC Output Configuration File

As described in Section B.8.1.1 Step #2, an automation Job is created for each sample in the queue when the Continue button is selected. This process is similar to that described for the GVTemplateMaster in Section B.32 which requires a Configuration File and a Job Template. The Job Template was described in Sections B.8.2.11, B.8.2.18, and B.8.2.19 for Samples, QA Peaks and QA Background respectively. The Configuration File content is the subject of this section.

The Configuration File consists of a series of parameters generated by GVSAMPLEDATA SC followed by the entire content of the configuration file passed to this program on the command line. Additionally, when the Analysis Method is "QA Peaks" or "QA Background" the content of the QA Peak or QA Background Configuration file (See Sections B.8.2.20 and B.8.2.21 respectively) is added to the beginning of the file content.

Since the configuration file passed to the program is typically a copy of the configuration file generated by Quick Start, it should include all of the parameters normally expected in Job Templates when combined with those added by GVSAMPLEDATA SC. The output configuration file is generated in the same directory as the application with a name of GVSAMPLEDATA SC.cfg for acquisition processes or GVSAMPLEDATA SCReanalysis.cfg for reanalysis processes. It is overwritten for each sample prior to use in creating automation Jobs.

The parameters generated by GVSAMPLEDATA SC for samples are as follows:

B.8.3.1 |GVSAMPLEDATA SCOut_COUNTPOSITION|

Position within the Sample Queue list.

B.8.3.2 |GVSAMPLEDATA SCOut_SAMPLEPOSITION|

Position within the Sample Queue list. (Same as COUNTPOSITION.)

B.8.3.3 |GVSAMPLEDATA SCOut_NEXTPOSITION|

Next position in the Sample Queue list (i.e. COUNTPOSITION + 1).

B.8.3.4 |GVSAMPLEDATA SCOut_NEXTJOB|

This parameter is used to allow automation Jobs for each sample position to link to the next Job. The parameter is set to the "Call" Job command followed by the Job File Path with the NEXTPOSITION value appended. The following is an example of the content for the first of two samples in the queue:

```
|GVSAMPLEDATA SCOut_NextJob|=Call "C:\User\GVCR\Temp\3_SampleDataSC2.job"
```

When this parameter is used as the last step in the Job Templates, the automation Job for the first sample would automatically call the automation Job for the next sample.

This parameter is set equal to nothing for the last sample in the queue so that the automation Job process returns to the main automation Job where the QUIT command is normally set to close GammaVision upon completion of the counting processes.

B.8.3.5 |GVSampleDataSCOut_LISTINDEX|

Position within the Sample Queue list buffered to two places (i.e. 01)

B.8.3.6 |GVSampleDataSCOut_SPECTRUMNAME|

This parameter provides a standard spectrum file naming convention as follows:

(Note: Other methods for defining spectrum file names can be used in lieu of this option.

For example, in some applications it is useful to include some of the other GVSampleDataSCOut parameters including the Analysis Method or one of the parameters specified from the LIMS integration in combination with the Date parameters generated by Quick Start and the |GVSampleDataSCOut_LISTINDEX| parameter from Section B.8.3.5.)

- 1) When a single sample is counted the spectrum name consists of the Detector Spectrum Prefix (See Section B.8.2.3) followed by the Start Date Year, Start Date Month, Start Date Day, and Daily Spectrum counter. These are the same parameters generated by Quick Start when an automation Job is initiated. (See Section A.1).

Example:

```
|GVSampleDataSCOut_SPECTRUMNAME|=
3_|STARTDATE_YEAR|_|STARTDATE_MONTH|_|STARTDATE_DAY|_|DAYSPECTRUMCOUNTERBUFFERED3|
```

- 2) When multiple samples are counted the same spectrum naming convention is used with the sample queue position appended.

Example:

```
|GVSampleDataSCOut_SPECTRUMNAME|=
3_|STARTDATE_YEAR|_|STARTDATE_MONTH|_|STARTDATE_DAY|_|DAYSPECTRUMCOUNTERBUFFERED3|01
```

- 3) When a spectrum is reanalyzed this parameter is set to the original spectrum file name.

B.8.3.7 |GVSampleDataSCOut_DETECTORFILEPREFIX|

Detector Spectrum File Prefix (See Section B.8.2.3)

B.8.3.8 |GVSampleDataSCOut_DESCRIPTION|

Sample Description as entered for the sample.

B.8.3.9 |GVSampleDataSCOut_ANALYSISQUANTITY|

Analysis Quantity specified for the sample (formatted as 0.00000E+00).

B.8.3.10 |GVSampleDataSCOut_QUANTITYUNITS|

Analysis Quantity units specified for the sample.

B.8.3.11 |GVSampleDataSCOut_COLLSTARTDATETIME|

Sample Collection Start Date and Time.

B.8.3.12 |GVSampleDataSCOut_COLLSTOPTDATETIME|

Sample Collection Stop Date and Time.

B.8.3.13 |GVSampleDataSCOut_DECAYDATETIME|

Same as Sample Collection Stop Date and Time.

B.8.3.14 |GVSampleDataSCOut_EFFICIENCYFILEPATH|

Full path to the Efficiency Calibration file. This parameter consists of the Calibration Directory (See Section B.8.2.6), Detector Spectrum Prefix (See Section B.8.2.3), Geometry name selected for the sample, and the “.clb” file extension.

Example:

|GVSampleDataSCOut_EFFICIENCYFILEPATH|=C:\User\Cal\3_250mIVial.clb

B.8.3.15 |GVSampleDataSCOut_LIBRARYFILEPATH|

Full path to the Library file. This parameter consists of the Library Directory (See Section B.8.2.7), Library name selected for the sample, and the “.lib” file extension.

Example:

|GVSampleDataSCOut_LIBRARYFILEPATH|=C:\User\Lib\Environmental.lib

B.8.3.16 |GVSampleDataSCOut_CUSTOMDATAFILEPATH|

Full path to the Custom Data File path described in Section B.8.1.1 Step #4. The file name for each sample is the same as the Job File Path parameter (See Section B.8.2.5) with “_CustomData” and the Sample Queue position appended.

Example:

```
|GVSampleDataSCOut_CUSTOMDATAFILEPATH|=C:\User\GVCR\Temp\3_SampleDataSC_CustomData1.txt
```

This file contains the custom data parameters and associated data for each sample. Each of these parameters must be defined in the Sample Administration Configuration Custom Fields. The following shows the content of this file. Data for each sample would be specified for each parameter. All of the fields in the Custom data section (LIMS Input) would follow these fixed parameters:

```
DisplayForm = No  
ShowSavedData = No  
AnalysisMethod =  
DilutionFactor =  
SampleQuantity =  
SampleComment =  
SampleFlowrate =  
FlowrateUnits =  
CollectionEfficiency =
```

B.8.3.17 |GVSampleDataSCOut_SDFDATAFILEPATH|

Full path to the SDF Data File described in Section B.8.1.1 Step #3. The file name for each sample is the same as the Job File Path parameter (See Section B.8.2.5) with “_SDFData” and the Sample Queue position appended.

Example:

```
|GVSampleDataSCOut_SDFDATAFILEPATH|=C:\User\GVCR\Temp\3_SampleDataSC_SDFData1.txt
```

This file contains the parameters that will be passed to the SDF file used for analysis using the GVSDFData program (See Section B.9) during the automation processes. This file content is as follows:

```
LiveTime: (as specified for Live Time preset)  
Weight: (Analysis quantity from Sample Data)  
ActivityUnits: (Activity Units from Sample Data)  
QuantityUnits: (Analysis Quantity from Sample Data)  
Divisor: 1 (Activity Units Conversion Factor)  
DecayDateTime: (Sample collection Stop Date and Time)  
CollectionStart: (Sample collection Start Date and Time)  
CollectionEnd: (Sample collection Stop Date and Time)  
ReportFileName: (Path specified for DetRptDir (See Section B.8.2.8) with “*” appended.
```

B.8.3.18 |GVSampleDataSCOut_SAMPLETYPE|

Sample Type selected as selected.

B.8.3.19 |GVSampleDataSCOut_REPORTTEMPLATE|

The Report Template specified for the selected analysis method or the default template if none is specified for the analysis method.

B.8.3.20 |GVSampleDataSCOut_AnalysisMethod|

The Analysis Method specified for the sample.

B.8.3.21 |GVSampleDataSCOut_DilutionFactor|

The Dilution Factor specified for the sample.

B.8.3.22 |GVSampleDataSCOut_SampleQuantity|

The Sample Quantity specified for the sample.

B.8.3.23 |GVSampleDataSCOut_SampleComment|

The Sample Comment specified for the sample.

B.8.3.24 |GVSampleDataSCOut_SampleFlowrate|

The Sample Flowrate specified for the sample.

B.8.3.25 |GVSampleDataSCOut_SampleFlowrateUnits|

The Sample Flowrate Units specified for the sample.

B.8.3.26 |GVSampleDataSCOut_CollectionEfficiency|

The Collection Efficiency specified for the sample.

B.8.3.27 Other GVSAMPLEDataSCOut parameters:

A parameter is generated for each of the Custom Data parameters specified for the sample in the format |GVSampleDataSCOut_CustomDataParameterName| where CustomDataParameterName is the name of the parameter as specified in the fourth record of the LIMS Input file. For the Custom Data shown in Figure B.8.2.24.2.5 the following parameters would be generated:

|GVSampleDataSCOut_BatchID|=B-12345
|GVSampleDataSCOut_ProjectID|=Project B
|GVSampleDataSCOut_AnalysisID|=AN-234
|GVSampleDataSCOut_Matrix|=Liquid

B.9 GVSDFData

This program is used to modify Sample Definition File (SDF) fields with analysis information stored in a simple text file. This text file is very easy to generate with a custom application as compared to writing the data directly to the binary SDF structure. A static set of parameters can also be set in this text file to meet the needs for some implementations. This program is more efficient than the GVSetSDFParameter program (See Section B.10) when multiple parameters must be written to the file.

After updating the SDF file with GVSDFData the SDF file must be recalled in GammaVision to be used for the spectrum analysis.

GVSDFData has the following comma-delimited command line parameters:

- 1) Full Path to SDF file (required): *This file should be unique to the detector so that Jobs running on other systems will not inadvertently modify this file prior to being loaded into GammaVision.*
- 2) Full Path to SDF Data file (required): *This text file contains the parameters and associated data to write to the SDF file. The file content is as follows:*

Each line of the SDF Data file should contain the Parameter, a Colon, and the Parameter Value. The following list includes all parameters that can be modified by this program:

CollectionStart	ReportFileName
CollectionEnd	LibFileName
DecayDateTime	CalFileName
LiveTime	PBCFileName
RealTime	SystematicError
Weight	RandomError
Multiplier	ABSConfigID
Divisor	ABSLength
ActivityUnits	ABSTypeID
QuantityUnits	ABSFileName
	RandomSummingFactor

Notes:

- 1) The parameters may be in any order and only those to update are required.
- 2) Parameters not matching those listed above exactly are ignored.
- 3) Date/Time parameters may be any standard date/time format.
- 4) ActivityUnits and QuantityUnits are limited to 6 characters.
- 5) ReportFileName is limited to 255 characters.
- 6) LiveTime and RealTime are Long Integers
- 7) Changes to ActivityUnits and QuantityUnits will require appropriate adjustments in the Multiplier and Divisor since the standard activity units in GammaVision are “uCi” or “Bq” as set in the Sample Defaults File.
- 8) ABSLength is the Absorber length.
- 9) ABSConfigID is either Linear (0) or Mass (positive number). An empty space is equivalent to zero; therefore, a negative value is required for no change.
- 10) ABSTypeID is either External (0) or Internal (positive number). An empty space is equivalent to zero; therefore, a negative value is required for no change.
- 11) ABSFileName is the full path to an Attenuation file. If a path is specified, then the “Internal” attenuation option is automatically turned off.

B.10 GVSetSDFParameter

This program is used to update a single field in a Sample Definition File (SDF) with the specified data as described below. This process simplifies implementation for some applications, but the GVSDFData program (See Section B.9) is more efficient when many parameters must be updated.

GVSetSDFParameter has the following comma-delimited command line parameters:

- 1) Full Path to SDF file (required): *This file should be unique to the detector so that Jobs running on other systems will not inadvertently modify this file prior to being loaded into GammaVision.*
- 2) SDF Parameter Name (required): *Any of the parameters described for GVSDFData (See Section B.9) may be specified.*
- 3) Parameter Value (required): *If an invalid data type is specified then no changes are written to the SDF file.*

B.11 GVAskConfirm

This application replaces the standard ASK_CONFIRM job command in GammaVision by prompting for user response with a message.

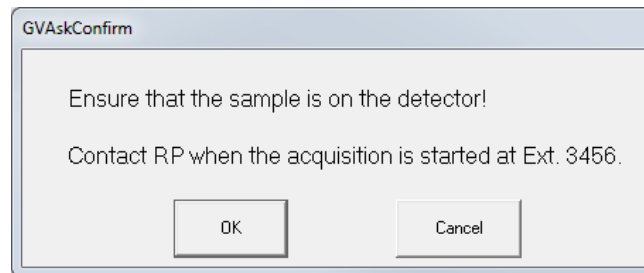


Figure B.11.1 GVAskConfirm Prompt

GVAskConfirm has the following comma-delimited command line parameters:

- 1) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty as no further processing is necessary.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*
- 2) Message (required): *Prompt for user response formed as a question where the Yes/No answer is expected to perform the actions described above. Pipe characters ("|") may be used for force a new line in the message.*

B.12 GVGetConfiguration

This program prompts the user for a Geometry and Library to use for analysis.

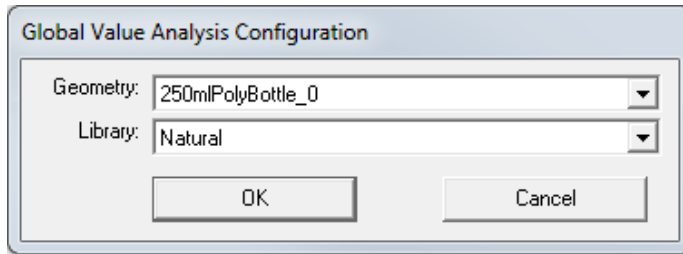


Figure B.12.1 GVGetConfiguration Prompt

GVGetConfiguration has the following comma-delimited command line parameters:

- 1) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*

- a. *If "OK" is selected the file contains commands to load the efficiency calibration and library files as follows.*

Recall_Efficiency "CALFILE PATH"

Load_Library "LIBFILE PATH"

Where:

CALFILEPATH = Calibration File Directory & File Prefix & Geometry & .clb

LIBFILEPATH = Library File Directory & Library & .lib

Each of the file path parameters are specified as command line parameters.

- b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*
- 2) File Prefix (required): *The Geometry list is populated with Calibration Files starting with the File Prefix in the Calibration File directory (without the file prefix or extension). This parameter is also used to generate the Calibration File Path as described in the first command line parameter. In order for this application to work properly the calibration files should use the Detector File Prefix as configured on the Detectors tab in Sample Administration Configuration.*
- 3) Calibration File Directory (required): *The Geometry list is populated with Calibration Files starting with the File Prefix in the Calibration File directory (without the file prefix or extension). This parameter is also used to generate the Calibration File Path as described in the first command line parameter. The directory must terminate with the "\" character.*
- 4) Library File Directory (required): *The Library list is populated with Library Files in the Library File directory (without the file extension). This parameter is also used to generate the Library File Path as described in the first command line parameter. The directory must terminate with the "\" character.*
- 5) Default Geometry (optional): *The Geometry is a calibration file name without the File Prefix and extension. If the specified geometry matches an item in the geometry list, then that item is selected by default. If no match is available then no items are selected. This parameter is also used to generate the Calibration File Path as described in the first command line parameter.*

- 6) Default Library (optional): *The Library is a file name without the file extension. If the specified library matches an item in the library list, then that item is selected by default. If no match is available then no items are selected. This parameter is also used to generate the Library File Path as described in the first command line parameter.*
- 7) Re-Analysis Flag (optional): *If set to "T" (true), then the Geometry and Library list items are set to those used in the previous analysis stored in the Global Value database. If the files are no longer available in the specified directories then no item will be selected in the respective list.*
- 8) Re-Analysis Data File (optional): *If the Re-Analysis Flag (parameter #7) is set to "T" (true), this file is read to determine which Calibration and Library files were used in the previous analysis. The re-analysis data file must be generated by the GVRecallSpectrum program (section B.3) or a custom developed application capable of creating the same content.*

B.13 GV_GetRType

This program sets the Sample and Record Type for the sample. The Sample Type relates a meaningful description to a document control code (R-Type or Record Type) that may be less meaningful to the analyst. See Section A.2.3.3 for Sample Type and R-Type configuration.

GV_GetRType has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Sample Type (optional): *If a valid Sample Type is specified, then the R-Type is automatically set based on the configuration established in Sample Administration Configuration on the Sample Types tab. If this parameter is omitted the dialog shown in Figure B.13.1 is displayed to allow the analyst to select the appropriate Sample Type. In addition to the pre-defined Sample Types displayed in the list the analyst may also enter any other Sample Types by typing in the dropdown field.*
- 3) Re-Analysis Flag (optional): *If set to "T" (true), then the Sample Type from the previous analysis is used as the default. If a Sample Type was previously specified then the prompt is not displayed. If a Sample Type was not previously specified then the prompt is displayed requiring analyst input.*
- 4) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

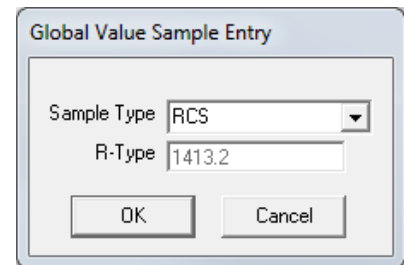


Figure B.13.1 GV_GetRType Prompt

B.14 GV_GetSiteUnit

This program sets the Site Unit for the sample.

GV_GetSiteUnit has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required):
The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.
- 2) Site Unit (optional): *Any text may be specified for the site unit. If this parameter is omitted the dialog shown in Figure B.14.1 is displayed to allow the analyst to select from a pre-defined list or manually type the unit name. If a Site Unit is specified then the dialog is not displayed.*
- 3) Re-Analysis Flag (optional): *If set to "T" (true), then the Site Unit from the previous analysis is used as the default. The prompt is always displayed for reanalysis mode.*
- 4) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

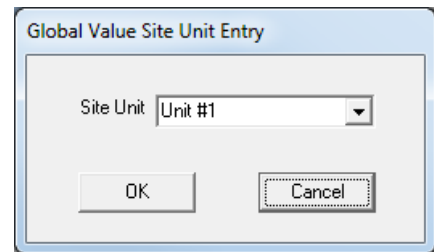


Figure B.14.1 GV_GetSiteUnit Prompt

B.15 GV_GetBatch

This program sets the Batch Description for the sample.

GV_GetBatch has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Batch Description (optional): *Any text may be specified for the batch description. If this parameter is omitted the dialog shown in Figure B.15.1 is displayed to allow the analyst to enter the Batch identifier. If a Batch Description is specified then the dialog is not displayed.*
- 3) Re-Analysis Flag (optional): *If set to "T" (true), then the Batch from the previous analysis is used as the default. The prompt is always displayed for reanalysis mode.*
- 4) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

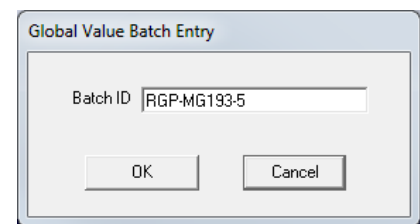


Figure B.15.1 GV_GetBatch Prompt

B.16 GV_GetComment

This program prompts the analyst for comments associated with the sample. The display shown in Figure B.16.1 is displayed under all conditions. Comments may be entered as free-form text with line breaks similar to any text editor; however, the TAB character cannot be used.

GV_GetComment has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required):
The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.
- 2) Pre-defined Comments (optional): *The pre-defined comments provide a method of generating a custom prompt for specific comments. The analyst is not required to add additional comments and is allowed to change the pre-defined text if desired. Line breaks can be forced in the Pre-defined comments by using the pipe character (“|”). For example, a pre-defined comment of “Name:|Company:” would show “Name:” and “Company:” on separate lines. The pre-defined comments are ignored in re-analysis mode.*
- 3) Re-Analysis Flag (optional): *If set to “T” (true), then the Comments from the previous analysis are used as the default.*
- 4) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If “OK” is selected the file is empty so the automation process is unaffected.*
 - b. *If “Cancel” is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

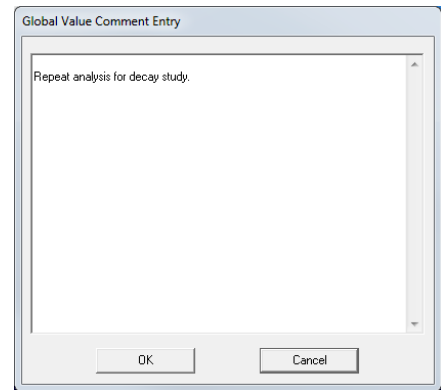


Figure B.16.1 GV_GetComment Prompt

B.17 GV_GetGDTPressure

This program sets the Gas Decay Tank pressure for the sample. This parameter is normally used to calculate Total Equivalent Xenon activity. A default entry can be specified in Sample Administration Configuration on the Misc tab.

GV_GetGDTPressure has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required):
The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.
- 2) Re-Analysis Flag (optional): *If set to “T” (true), then the GDT pressure from the previous analysis is used as the default.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If “OK” is selected the file is empty so the automation process is unaffected.*
 - b. *If “Cancel” is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

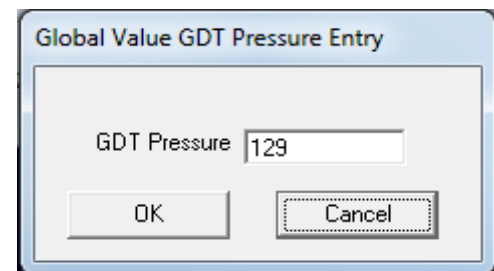


Figure B.17.1 GV_GetGDTPressure Prompt

B.18 GV_GetSamplePump

This program sets the Sample Pump Identification for the sample. A default entry can be specified in Sample Administration Configuration on the Misc tab.

GV_GetSamplePump has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required):
The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.
- 2) Re-Analysis Flag (optional): *If set to "T" (true), then the Sample Pump ID from the previous analysis is used as the default.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

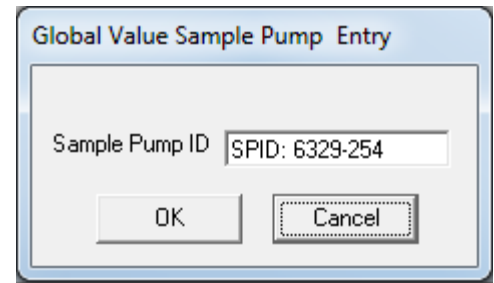


Figure B.18.1 GV_GetSamplePump Prompt

B.19 GV_GetRWP

This program sets the Radiation Work Permits for the sample. The default prefix can be specified in Sample Administration Configuration on the Misc tab. Several RWPs may be entered using the **Add** button, and existing RWPs may be removed using the **Remove** button.

GV_GetRWP has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required):
The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.
- 2) Re-Analysis Flag (optional): *If set to "T" (true), then the RWPs from the previous analysis are used as the default.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

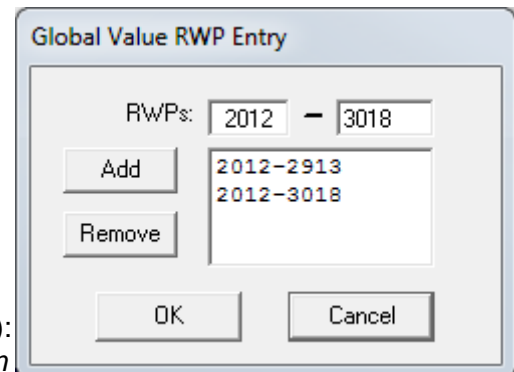


Figure B.19.1 GV_GetRWP Prompt

B.20 GV_GetRadMon

This program sets the Radiation Monitor Readings for the sample. The monitor list is established in Sample Administration Configuration on the Misc tab. Ad hoc monitor names may also be manually entered. Several monitor readings may be entered using the **Add** button, and existing entries may be removed using the **Remove** button. All monitor readings must be numeric.

GV_GetRadMon has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Re-Analysis Flag (optional): *If set to "T" (true), then the monitor readings from the previous analysis are used as the default.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*

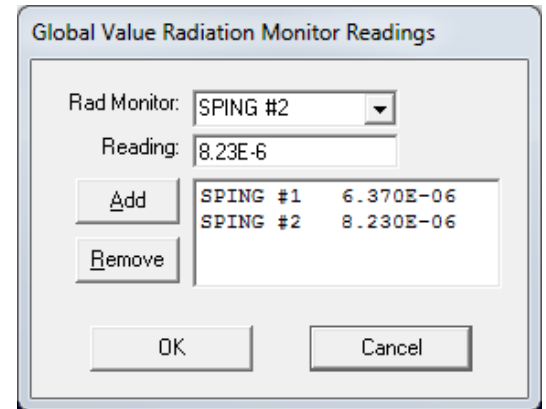


Figure B.20.1 GV_GetRadMon Prompt

B.21 GV_GetCustomData

This program sets the Custom Data parameters for the sample. This data may be collected using a prompt similar to Figure B.21.1 or by reading the data file passed to the program on the command line. The option to display the prompt or not is specified in the data file as described below.

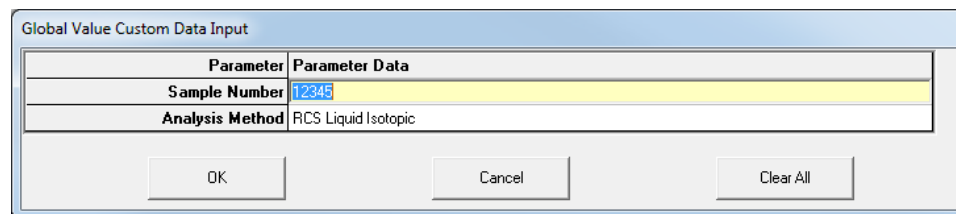


Figure B.21.1 GV_GetCustomData Prompt

GV_GetCustomData has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Data Source File (optional): *The data source file is an ASCII text file that determines if the prompt shown in Figure B.21.1 will be displayed, or if the data will be stored directly in the database. It also determines which parameters are used along with the associated data.*

If this parameter is omitted, then all Custom Parameters defined in Global Value will be displayed in the prompt with no default values specified. This configuration is rare.

The first two lines in Data Source file should have the parameters "DisplayForm" and "ShowSavedData" followed by either "Yes" or "No" (anything other than "Yes" equals "No").

If "DisplayForm" is set to "Yes", then a prompt similar to Figure B.21.1 will be displayed. If "DisplayForm" is set to "No" then the data parameters specified in the file are stored in the database without the prompt.

If "ShowSavedData" is set to "Yes" then the custom data currently stored for each parameter will be used as the default. Any parameters set to default values within the Data Source file are ignored. If "ShowSavedData" is set to "No" then the parameter data stored in the Data Source files is used as the default. This parameter should be set to "Yes" for reanalysis processes. It should be set to "No" for other processes that may require default parameters to be defined within the Data Source file.

Following the "DisplayForm" and "ShowSavedData" parameters the names of any Custom Parameters established in Sample Administration Configuration on the Custom Fields tab can be listed along with default values. When using a Data Source file, the list of Custom Parameter displayed in the prompt will be limited to those specified in this list. This allows the analyst to be prompted for only the specific custom parameters necessary for a particular type of sample.

The following example shows the file content required to prompt for the parameters shown in Figure B.21.1 with default data:

```
DisplayForm = Yes
ShowSavedData = No
SampleNumber=12345
AnalysisMethod=RCS Liquid Isotopic
```

The following example shows the file content required to store data generated by another application directly in the database:

```
DisplayForm = No
ShowSavedData = No
SampleFlowRate=2
SampleFlowUnits=scfm
```

- 3) Append Custom Data Flag (required): When this flag is set to "T" (true) the custom data is appended to any existing custom data parameters for the specified sample. When set to "F" (false) then all custom data associated with the specified sample is deleted prior to saving the current parameters. This flag is normally set to "T" (true).
- 4) Re-Analysis Flag (optional): If set to "T" (true) and the "ShowSavedData" parameter is set to "Yes" the custom data from the previous analysis is used as the default.
- 5) Full Path to Job File (required): The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:
 - a. If "OK" is selected the file is empty so the automation process is unaffected.
 - b. If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.

B.22 GV_GetRptData

This program loads the analysis data from the most recent GammaVision analysis results for the specified detector. The criteria for determining the most recent analysis result is determined by the detector specific analysis report file (RPT extension) in the GammaVision Analysis directory. The detector specific directory and file prefix is specified on the Detectors tab in Sample Administration Configuration. Once the correct analysis result is identified the results are retrieved from a combination of the analysis report, UFO file, and spectrum file. In addition to the specific analysis parameters, a complete image of the analysis report (without the signature lines) is also stored in the detector specific database.

When making a new measurement, data that is not directly required for the spectrum analysis is stored in the database with a temporary spectrum ID. This includes the sample data collected using any of the "GV_Get..." programs (i.e. GV_GetSiteUnit). The final spectrum ID is determined as described above based on the most recent analysis results for the specified detector. When the analysis results are stored, all of the temporary records are updated with the final spectrum ID. This process requires GV_GetRptData to be called immediately after the spectrum analysis, and the other "GV_Get..." programs to be called prior to the analysis. When reanalyzing a spectrum, the spectrum ID is already known so the process of using a temporary

GV_GetRptData has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Analysis Number (optional): *The analysis number can be set to one (1) or two (2). If any other value is specified, it is treated as one (1). If the analysis number is set to one then any previously stored analysis data for the most recent analysis associated with the specified detector are deleted and the new results are saved. The Unidentified Peak list is also saved from the first analysis of a spectrum.*

If the analysis number is set to two then the results from a second analysis of the same spectrum is saved to the database. The report image, calibration file name/dates, library file name, PBC file name/date, analysis engine/version, and nuclide information are saved from the second analysis. All other parameters are expected to be identical to the first analysis.

Duplicate nuclides are not allowed between the first and second analysis therefore different libraries are required. This functionality is intended for Particulate/Charcoal air samples analyzed from a single spectrum so that results from both analyses can be displayed on a single report summary. For this application the library content is usually identical for both analyses except for the nuclide flags. Nuclides flagged as "Activity Not in Total" are not stored in the Global Value database, so this flag can be used to filter out nuclides that are not of interest. For example, all of the particulate nuclides may have this flag set for the iodine analysis, and the iodine nuclides have the flag set for the particulate analysis. The primary reasons for using a consistent library structure are to avoid an extensive unidentified peak list in either analysis, and to ensure that interference corrections are implemented appropriately for complex analyses.

There are other applications aside from the Particulate/Charcoal air samples example that can benefit from this configuration. For example, it could be used to determine the activity for two different nuclides from the same peak which is often used as a conservative measure for some applications. It can also be used to simplify the analysis of particular nuclides by eliminating interferences in the second analysis library.

- 3) Omit Flag for Half-Life Cutoff (optional): *If set to "T" (true), then nuclides reported as "> X Halfives" in the decayed activity column are not transferred to the Global Value database. If*

this parameter is not set to "T" (true), then the nuclide data is stored with the default decayed activity set to 9.999E+99 which is intended to flag the data is questionable.

- 4) Zero Flag for Half-Life Cutoff (optional): *If set to "T" (true), then nuclides reported as "> X Half-lives" in the decayed activity column are transferred to the Global Value database with a decayed activity of zero instead of the default value of 9.999E+99. This flag is ignored if the Omit Flag for Half-Life Cutoff is not set to "T".*
- 5) Re-Analysis Flag (optional): *If set to "T" (true), then the spectrum ID for retrieving analysis results is based on the most recent selection in the GVRecallSpectrum program instead of searching for the most recent analysis as described previously. As with all of the Job programs that use the reanalysis flag, the GVRecallSpectrum program must be run at the beginning of the automation process to ensure that the correct spectrum ID is used for the reanalysis processes.*

B.23 GVIncrementCounter

This program updates the Daily, Monthly, and Annual spectrum counters for the specified detector database. Each time this program is run the counters are incremented by one.

The counter values are available as configuration parameters which are dynamically generated by GVQuickStart. These parameters can be used in Job Templates and Configuration files to generate spectrum file names from parts of the current date (day, month, and year) and the associated sequential counter value.

Aside from the configuration file generated by GVQuickStart, the current counter values can also be accessed using the GVINIPParameter function from the Excel Add-In. See Appendix F Function F4.

GVIncrementCounter has the following command line parameter:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*

B.24 GV_Custom_Rpt

This program generates the Custom Report summary based on the Report Template specified and analysis information stored in the database. If the Report Template is not valid then a prompt similar to that shown in Figure B.24.1 is displayed for the analyst to select one from the list.

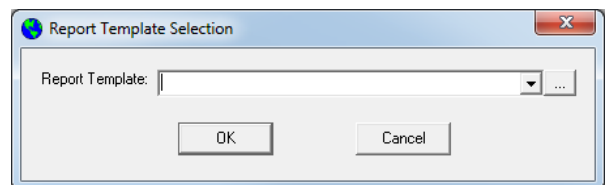


Figure B.24.1 GV_Custom_Rpt Prompt

This summary report is stored in the database and can be viewed using the Sample Administration Analysis Editor, Analysis Log, or using the print functions described in Section B.25.

GV_Custom_Rpt has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Report Template name (optional): *The template names are established in Sample Administration Configuration on the Report Templates tab. If an invalid template name is specified then the dialog shown in Figure B.24.1 is displayed to allow the analyst to select a pre-defined template name.*

This program currently allows Report Template files with the .cus extension to be used for backward compatibility. The file content must follow the same configuration rules as the report templates defined in the database.

- 3) Re-Analysis Flag (optional): *If set to "T" (true), then the spectrum ID used for generating the report summary is based on the most recent selection in the GVRecallSpectrum program. If set to "F" (false), then the spectrum ID used for generating the report summary is based on the most recent analysis. See Section B.22 for more information regarding the spectrum ID determination.*

B.25 Print_Rpt

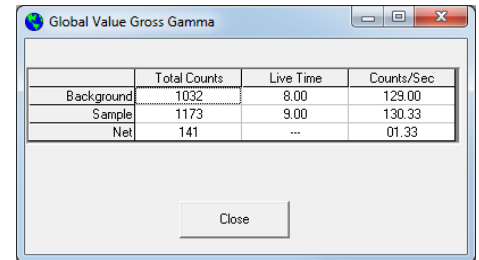
This program sends the report to a text or PDF File, Microsoft Word, or the default printer as specified by the command line arguments. All of the same options for generating reports are available from the Analysis Editor in the Sample Administration program.

Print_Rpt has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Report Filename: *This parameter is no longer used and should be blank.*
- 3) Report Type (optional): *The following report types are acceptable:*
 - CVR - *Print only the report summary (Global Value Custom Report)*
 - ALL - *Print report summary and all detailed GammaVision analysis reports*
 - Omitted – *Print detailed GammaVision analysis reports without the report summary.*
- 4) Report Destination (optional): *Any of the following parameters are acceptable:*
 - WORD – *Displays report in Microsoft Word (requires MS Word to be installed)*
 - PDF – *Save report to a PDF file (required Directory – Item #6)*
 - TXT – *Save report to a Text file*
 - Omitted – *Print report on the default printer*
- 5) Font Size (optional): *If omitted the default size is 11 points. The maximum practical font size is also 11 points to avoid formatting and table alignment issues on the standard GammaVision analysis report. The minimum practical font size is 8 points.*
- 6) File Directory (optional): *This parameter specifies the directory PDF or Text reports. It is ignored if the Report Destination is not set to PDF or TXT. If a path for PDF or Text reports is not specified then the Custom Report Path specified in Sample Administration Configuration on the Detectors tab for the applicable detector is used as the default. The file name will always be the same as the Spectrum File name.*
- 7) Re-Analysis Flag (optional): *If set to "T" (true), then the spectrum ID used for generating the report summary is based on the most recent selection in the GVRecallSpectrum program. If set to "F" (false), then the spectrum ID used for generating the report summary is based on the most recent analysis. See Section B.22 for more information regarding the spectrum ID determination.*

B.26 GrossGamma

This program gets the Total Counts, Live Time, and Counts per second from the specified Background and Sample spectra, and calculates the difference in Total Counts and Count rate. The data may be displayed in a prompt similar to that shown in Figure B.26.1 or stored in an Excel Worksheet as described below. When using the Excel interface, the functionality offered by this application can also be accomplished using the Excel Add-In which offers additional capability. See Appendix F for more information regarding the Excel Add-In.



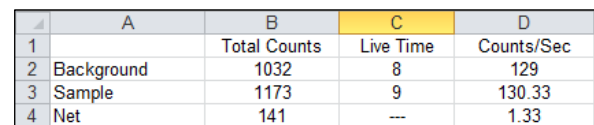
	Total Counts	Live Time	Counts/Sec
Background	1032	8.00	129.00
Sample	1173	9.00	130.33
Net	141	---	01.33

Figure B.26.1 GrossGamma Prompt

GrossGamma has the following comma-delimited command line parameters:

- 1) Full path to background spectrum (required): *Spectrum format must be Integer SPC.*
- 2) Full path to sample spectrum (required): *Spectrum format must be Integer SPC.*
- 3) Excel File path (optional): *If a file path to an Excel file is provided, then the content shown in Figure B.26.1 is stored in the Excel file. The Excel Workbook must have a Worksheet named "GlobalValue" where the data is stored starting with the first row and column as shown in Figure B.26.2..*

If a path is not provided, then a prompt similar to that shown in Figure B.26.1 is displayed. The parameters in the grid are automatically copied to the clipboard when selected to allow pasting the data into another program.



	A	B	C	D
1		Total Counts	Live Time	Counts/Sec
2	Background	1032	8	129
3	Sample	1173	9	130.33
4	Net	141	---	1.33

Figure B.26.2 GrossGamma Excel

B.27 GVQAPeaks

This program collects the applicable QA information for spectrum peaks and generates the QA report. Similar to the GV_GetRptData program (See Section B.22) the applicable data is read from the most recent analysis results in the specified location.

The QA report content is determined by the configuration established in the QA Administration program (See Section A.4.5) which specifies the report header, QA Points/Limits, and other reporting options, such as whether the detailed GammaVision report is included with the QA report.

GVQAPeaks has the following comma-delimited command line parameters:

- 1) Detector ID (required): *This is the Detector number specified in the MCB Configuration which is also the Detector ID specified in Sample Administration Configuration on the Detectors tab.*
- 2) Full Path to the QA Database (required): *The QA database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 3) Report Destination (optional): Any of the following parameters are acceptable:
 - *WORD – Displays report in MSWord*
 - *NONE – No report will be displayed or printed; however, the report is available for review and printing using the QA Administration program.*
 - *Omit this parameter to print the report on the default printer*

B.28 GVQABackground

This program collects the applicable QA information for spectrum background and generates the QA report. Similar to the GV_GetRptData program (See Section B.22) the applicable data is read from the most recent analysis results in the specified location.

The QA report content is determined by the configuration established in the QA Administration program (See Section A.4.5) which specifies the report header, QA Points/Limits, and other reporting options, such as whether the detailed GammaVision report is included with the QA report.

GVQABackground has the following comma-delimited command line parameters:

- 1) Detector ID (required): *This is the Detector number specified in the MCB Configuration which is also the Detector ID specified in Sample Administration Configuration on the Detectors tab.*
- 2) Full Path to the QA Database (required): *The QA database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 3) Report Destination (optional): Any of the following parameters are acceptable:
 - *WORD – Displays report in MSWord*
 - *NONE – No report will be displayed or printed; however, the report is available for review and printing using the QA Administration program.*
 - *Omit this parameter to print the report on the default printer*

B.29 GVQACheckStatus

This program checks the most recent QA Peak and Background results and displays a prompt similar to that shown in Figure B.29.1 if any parameters were outside the specified limits. The **View QA Reports** button can be selected to show the last QA Peak and Background reports.

This program would normally be called as one of the first few functions in an automated analysis routine requiring spectrum acquisition.



Figure B.29.1 GVQACheckStatus Failure Notification

GVQACheckStatus has the following comma-delimited command line parameters:

- 1) Detector ID (required): *This is the Detector number specified in the MCB Configuration which is also the Detector ID specified in Sample Administration Configuration on the Detectors tab.*
- 2) Full Path to the QA Database (required): *The QA database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 3) Full Path to Job File (required): *The content of a helper Job is created by the application to provide additional functionality within the GammaVision environment. The main Job is normally configured to run this helper Job immediately after the application closes. The file content is as follows:*
 - a. *If "OK" is selected the file is empty so the automation process is unaffected.*
 - b. *If "Cancel" is selected, the file contains the QUIT command to terminate the Job and close GammaVision immediately.*
- 4) Allow Continue Flag (optional): *If set to "T", then the Continue Counting Sample button is displayed on the warning prompt. The user can select this button to continue a sample count even though a QA parameter failed. If this flag is set to "F" or omitted, then the user has no choice but to abort the count if any parameter fails the QA check.*

B.30 UfoToPbc

This program creates a Peak Background Correction (PBC) file using all of the Identified Peaks stored in the specified UFO file. This function is similar to the CREATEPBC job command in GammaVision except that the PBC file name can be named with the current date/time automatically, and an automation Job with commands to load this PBC file is updated.

This program is typically run in the QA Background automation processes when long background counts are measured.

UfoToPbc has the following comma-delimited command line parameters:

- 1) UFO File Path (required): *Full path to the UFO file generated by the GammaVision analysis.*
- 2) PBC File Path (required): *Full path to the PBC file to be created. This path may use the keyword "DATE" which will be replaced by the current date and time in the format "YYYY-MM-DD_hhmm".*

Example:

*On June 22, 2012 16:49 C:\User\PBC\1_Date.pbc translates to
C:\User\PBC\1_2012-06-22_1649.pbc*

- 3) JOB File Path (optional): *If the full path to a JOB file is provided, then the contents will be replaced with the text Load_PBC "PBCFileName" where PBCFileName is the PBC file path specified as the second command line argument. This helper Job would normally be called in the main analysis Jobs to set the default PBC file for analysis to the current file path.*

Example:

Load_PBC "C:\User\PBC\1_2012-06-22_1649.pbc"

B.31 GVTemplateMaster

This program replaces user-defined parameters in a Template file with the parameter values specified in a Configuration file and saves the merged data to a Result file. In general, the Template file defines the process, and the Configuration file provides the details within that process. This functionality is used by Quick Start to create dynamic Job files in the automation process as described in Section A.1 and the GVSampleDataSC program described in Section B.8. The GVTemplateMaster program allows this functionality to be implemented with other custom applications.

GVTemplateMaster has the following comma-delimited command line parameters:

- 1) Template File Path (required): *Full path to the file that defines the process.*
- 2) Configuration File Path (required): *Full path to the file that contains the parameter details.*
- 3) Result File Path (required): *Full path to the file that is generated when the Configuration parameters are merged with the process Template. This file is overwritten if it exists.*

Process Details:

The GVTemplateMaster starts by reading the Configuration file and saving the parameter list and associated data. These parameters are similar to variables declared in a programming language. These parameters are used in the Job Templates to allow the process to be consistent for all measurements while details within that process are determined by the parameter data specified.

Qualified parameter names are encased in pipes. The data assigned to the parameters can be static text or other valid parameters defined within the same file.

Example:

Three parameters are defined as |Message|, |Name|, and |Greeting|. Data can be assigned to these variables as follows:

```
|Name|=Mike  
|Message|=Hello  
|Greeting|=|Message| |Name|
```

The data stored with the |Greeting| parameter is interpreted as "Hello Mike". If data for the |Name| or |Message| parameters were not defined, then an error would occur.

When the Configuration file is read, all parameters that are followed immediately by the equal sign ("=") are stored with their associated data. Any matching parameters found in the Template file are replaced with the data stored for that parameter, and the result is saved to the Result file path specified.

There are two special parameters that are interpreted by the program and cannot be used to store any other data.

- 1) |CrLf| - This parameter is automatically replaced with the "Carriage Return Line Feed" character set to force a new line in the Result file.
- 2) |LINK| - This parameter should be followed by the full path to another Configuration file. After the list of parameters defined in the current file is loaded the program will load any parameters from the file path specified by the |LINK| parameter. This chain will continue until the |LINK| parameter is not set to a valid file name. (**NOTE:** The full path specified for the |LINK| parameter CANNOT contain any user-defined variables!)

Implementation Example:

Template File Content	Configuration File Content
My Name is MyName . My Department is MyDepartment . My User ID is MyID . MyInfo	MyName =JB Nimble MyDepartment =Chemistry MyID =2345 MyInfo = MyName CrLf MyDepartment CrLf MyID

The Result file generated by running the GVTemplateMaster program will be:

```
My Name is JB Nimble
My Department is Chemistry.
My User ID is 2345.
JB Nimble
Chemistry
2345
```

When reading Configuration files the data is stored for each parameter the first time the parameter is found. If the parameter is set multiple times within the configuration file, then it is ignored after the first instance. For example, if the following text was specified in a Configuration file, then the value of |MyParameter| that gets returned in the Results file will be "One".

```
|MyParameter|=One
|MyParameter|=Two
```

This process allows standard parameters that may run external process to be overridden or "turned off" by setting the parameter equal to nothing earlier in the configuration file. This methodology is frequently employed in the automation Jobs initiated by Quick Start where functions defined in the Global Configuration files are overridden in the Job Configuration file. See Section A.1 for more detail related to the Quick Start program.

Parameter definitions are nearly limitless in terms of the number of parameters and naming convention; however care should be taken to avoid using the same parameter within its own data definition. For example, "|MyValue|=My value is |MyValue|" is a circular reference that cannot be resolved. This condition will cause the program to fail without generating the Results file.

B.32 GVCopyFile

This program makes a copy of any valid file. If the specified file to copy or the destination directory does not exist, or the destination file name is not specified, then the program fails without displaying any errors.

This program is typically used for copying a generic system file to a detector specific file name. For example, Decay.sdf may be copied to 1_Decay.sdf during an automation process so that changes can be made to the target file without affecting the source file or any automation routines running on other detectors.

GVCopyFile has the following comma-delimited command line parameters:

- 1) Source File Path (required): *Full path to Source file to be copied.*
- 2) Destination File Path (required): *Full path to Destination file to be created. The directory where this file will be copied must exist or the copy process will fail.*

B.33 GVOpenFile

This program opens the file specified using the default program. This process is similar to opening a file from Windows Explorer. This program is useful for opening files from applications that may change installation path with different versions, such as Microsoft Excel or Word.

GVOpenFile has the following command line parameter:

- 1) Target File Path (required): *Full path to File to be opened using the default program.*

B.34 GV_ResetInputs

This program is included for backward compatibility for installations that use the legacy reanalysis method. It is not used with the reanalysis configurations supplied with this release. As described in Section B.22, the “non-analysis” parameters are usually saved with a temporary spectrum ID during the spectrum acquisition phase. When the GV_GetRprtData program runs these temporary spectrum IDs are updated to the actual spectrum ID. The old reanalysis process operated in the same way as the spectrum acquisition process which required all of the “non-analysis” parameters to be reset to the temporary spectrum ID, and the GV_ResetInputs program accomplished this task. With this configuration it is not possible to perform acquisition and reanalysis processes in parallel, and there is a risk of data loss if a reanalysis process is canceled before completion. For these reasons, the new methodology is preferred, which makes the GV_ResetInputs program obsolete.

GV_ResetInputs has the following comma-delimited command line parameters:

- 1) Full Path to Detector (Samples) Database (required): *The database path is defined on the Detectors tab in Sample Administration Configuration for each detector.*
- 2) Spectrum ID. *This parameter is normally set by the Job File variable “\$(ShortBase)” when recalling a spectrum for reanalysis.*

B.35 GVSpectrumMux

This program provides a simple method for summing multiple spectra into a single spectrum. This process is similar to a hardware signal multiplexer, but with much better performance and additional options to meet various application needs. The options included with this program include:

- 1) Summing multiple spectra data by channel or energy position with the option to also sum the acquisition time.
- 2) Perform software Gain Adjustment based on a user-defined energy calibration.
- 3) Convert the Input Spectra to a different ADC Conversion Gain in the output spectrum.

These options can be implemented in an automated fashion by specifying a configuration file as a command line argument to the program (See Section B.35.2) or using the standard User Interface that allows various settings to be adjusted and spectra generated interactively.

GVSpectrumMux has the following comma-delimited command line parameters:

- 1) Configuration File Path: *Full path to Configuration file formatted as described in Section B.35.2. If a valid path is provided, then the output spectrum will be created automatically based on the configuration file settings. If a valid file path is not specified, then the User Interface described in Section B.35.1 is displayed for interactive spectrum multiplexing.*

B.35.1 GVSpectrumMux User Interface

The User Interface mode of operation is typically used to perform manual spectrum summing or conversion operations as needed for special circumstances and generate configuration files that can be used as a template in automation processes.

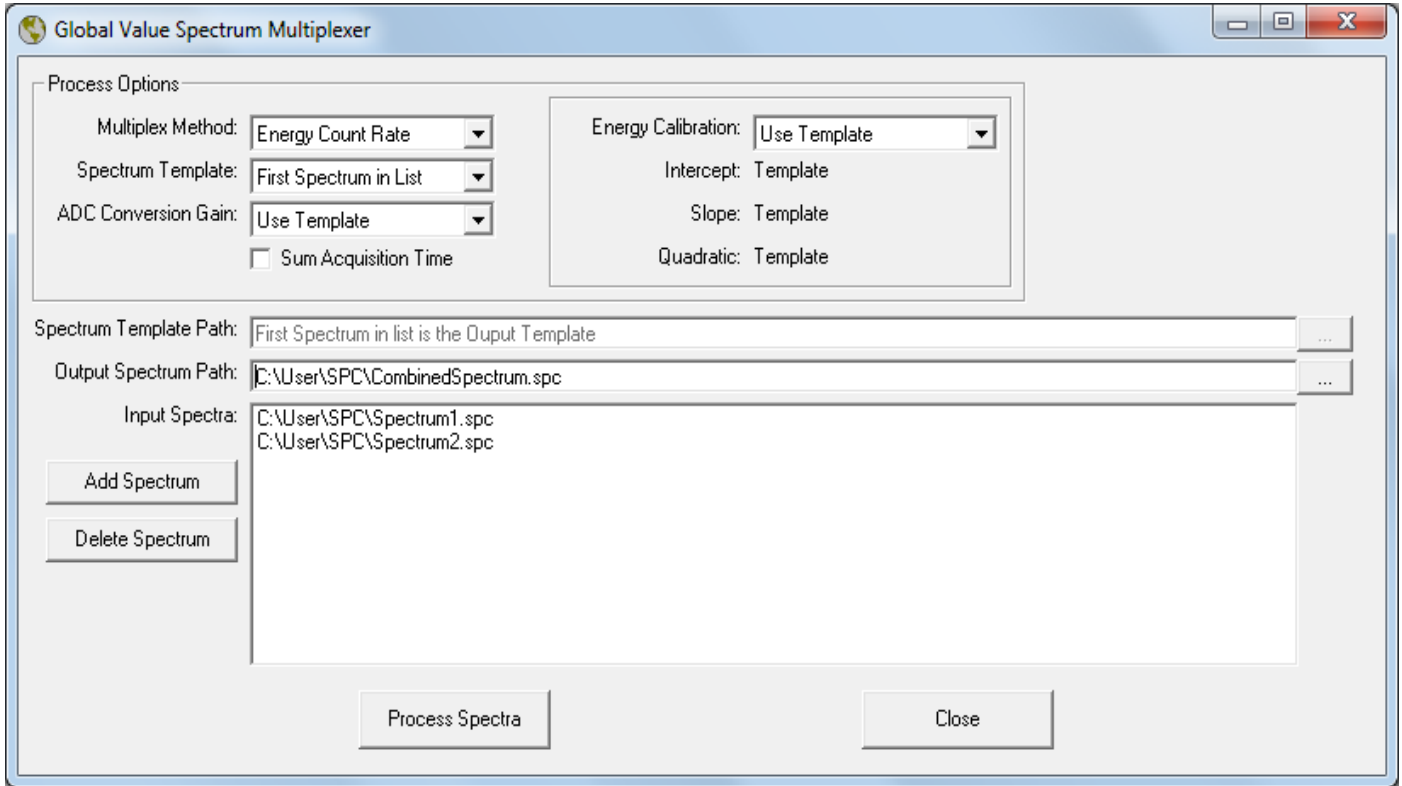


Figure B.35.1 GVSpectrumMux User Interface

As shown in Figure B.35.1, the GVSpectrumMux interface has two functional sections. The upper section establishes the multiplexer processing options, and the lower section defines the paths to the input spectra to process and the path to the output spectrum that will be generated. After the Spectrum paths and Processing options are set select the “Process Spectra” button to create the Output Spectrum.

Spectra are added and removed from the Input Spectra list using the buttons to the left of this field. At least one Input spectrum is required. With a single spectrum input configuration the multiplexer simply offers a simple way to convert an existing spectrum to a different number of channels or normalize the “peak to channel” positions based on user-defined energy calibration coefficients. This can be useful when evaluating spectra by Regions of Interest in applications that define Regions of Interest by start and stop channel (vs start/stop energy) when gain shifts are routinely corrected by energy recalibration in the software rather than actual gain adjustments in the hardware. If the energy calibration is accurate then the manual energy calibration parameters will effectively perform a software gain adjustment in the resulting spectrum that should match the pre-defined Regions of Interest based on channel position.

The processing options are as follows:

1) Multiplex Method

The Multiplex Method determines how the spectrum channel data will be summed with the following options:

- a. Raw Channel Data: *This method sums the total counts for each channel from all input spectra. This method is useful when peak positions for all spectra are well matched, and either the Live Time is the same for all spectra or the Sum Acquisition Time option is used.*
- b. Channel Count Rate: *This method sums the Live Time corrected count rate for each channel from all input spectra and then divides the total by the effective Live Time to determine the final channel counts. This method is useful when peak positions for all spectra are well matched, and the Live Times for input spectra are not the same for all spectra.*
- c. Energy Count Rate: *This method calculates the Live Time corrected channel count rate for each spectrum based on the fractional energy range represented by the input spectrum channel width to that of the channel width represented in the output spectrum. The total channel count rate is then divided by the effective Live Time to determine the final channel counts. This method is useful when the Energy Calibration for each input spectrum is expected to be more accurate than the actual peak positions by channel due to gain differences in individual instruments. Live Time differences are also taken into account with this method.*

Since each spectrum channel represents the number of events measured within a specified energy range we can calculate the fractional counts from the Input Spectrum channels to the relevant Output Spectrum channels as follows:

- i. Determine if the input and output spectrum channels overlap based on their minimum and maximum energy range meeting the following criteria:

$$OC_{Min} < IC_{Max} \text{ AND } OC_{Max} > IC_{Min}$$

Where:

IC_{Min} = Minimum Energy for the Input Spectrum Channel

IC_{Max} = Maximum Energy for the Input Spectrum Channel

OC_{Min} = Minimum Energy for the Output Spectrum Channel

OC_{Max} = Maximum Energy for the Output Spectrum Channel

- ii. If the energy range overlaps then determine the fraction of the Input channel energy range that overlaps the output channel energy range as follows:

$$ICF_{Min} = \text{Higher of } IC_{Min} \text{ and } OC_{Min}$$

$$ICF_{Max} = \text{Lower of } IC_{Max} \text{ and } OC_{Max}$$

$$OC_{Countrate} = IC_{Countrate} * (ICF_{Max} - ICF_{Min}) / (IC_{Max} - IC_{Min})$$

Where:

ICF_{Min} = Minimum Energy for the Input Channel Fraction

ICF_{Max} = Maximum Energy for the Input Channel Fraction

$IC_{Countrate}$ = Input Channel Countrate

$OC_{Countrate}$ = Output Channel Countrate

- iii. Sum all of the output channel countrate contributions from all applicable input channels and then divide by the effective Live Time to determine the total output spectrum channel counts.

The following example demonstrates how this method is applied when the input and output are not perfectly matched by energy/gain. As shown in Figure B.35.2 there are two channels in the Input Spectrum (999 and 1000) that overlap the applicable energy range for Channel 1000 in the Output Spectrum. For this example assume that the Input and Output Spectrum Live Time is 100 seconds.

Input Spectrum Channel 999 count rate contribution =

$$1000/100 * (250.000 - 249.875) / (250.000 - 249.750) = 5.0 \text{ cps}$$

Input Spectrum Channel 1000 count rate contribution =

$$500/100 * (250.125 - 250.000) / (250.25 - 250.000) = 2.5 \text{ cps}$$

Total Input Spectrum count rate contribution = 5.0 + 2.5 = 7.5 cps

Output Spectrum Channel 1000 counts = 7.5 cps * 100 seconds = 750

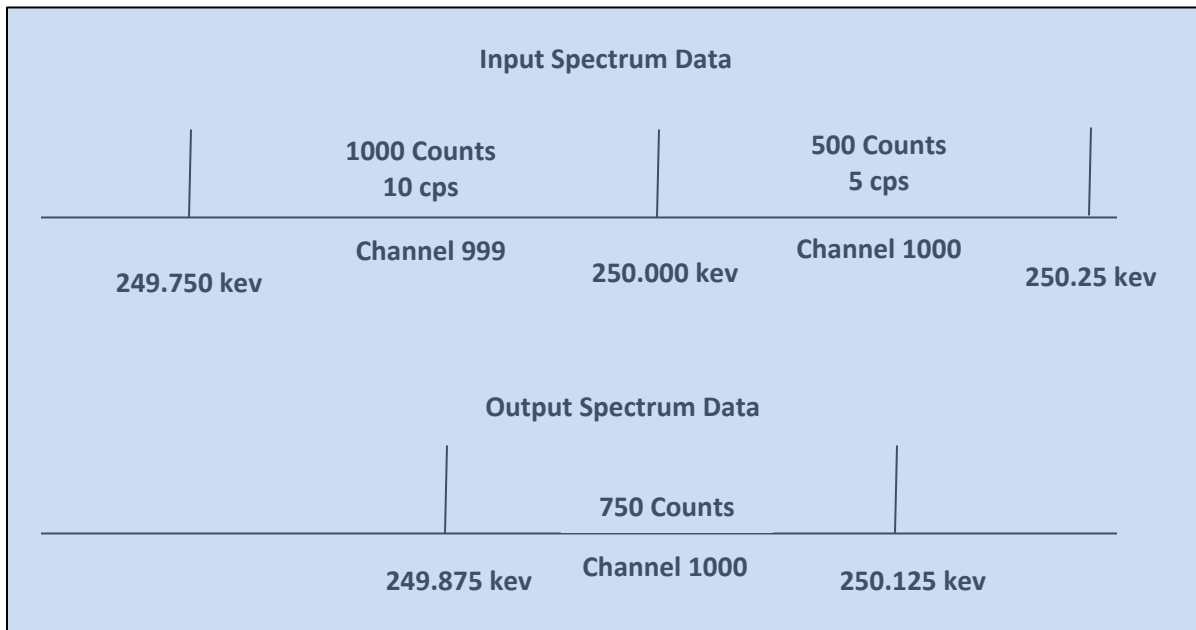


Figure B.35.2 Sum by Energy Countrate Example

2) Spectrum Template

The Spectrum Template defines all of the spectrum parameters that are not modified by the multiplexer program. The program loads this spectrum file as the starting point for the output spectrum format and then modifies the channel data and ADC Conversion Gain, Energy Calibration coefficients, and Live/Real Time parameters (as applicable). The options for the Spectrum Output Template are:

- a. First Spectrum in List: *This option uses the first spectrum in the array of spectra being summed as the output template.*
- b. User Defined: *This option enables the Spectrum Template Path field and requires a valid spectrum file path to be specified.*

3) ADC Conversion Gain

The ADC Conversion Gain (number of spectrum channels) in the output spectrum file can be different from the input files. This option may be useful when there are few spectrum counts in order to make spectrum peaks more obvious by converting 16,384 channel spectra to 8,192 or 4,096 channels. This option should be used in conjunction with the “Energy Count Rate” Multiplex Method and an appropriate Energy calibration to ensure that the full spectrum is converted. Also note that changes to the ADC Conversion Gain should only go from a higher number channels in the Input spectra to fewer channels in the Output spectrum to avoid spectrum distortion.

- a. Use Template: *This option uses the spectrum template file as described above to determine the ADC Conversion Gain.*
- b. Static Settings: 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768: *These options set the ADC Conversion Gain to the value specified.*

4) Sum Acquisition Time

- a. Enabled: *This option emulates an extension of the acquisition time for a single detector by summing the Real and Live time in addition to the spectrum data. The Dead Time is calculated by the new Real and Live time values.*
- b. Disabled: *This option emulates the concurrent acquisition from multiple detectors at the same time such that the Live and Real time is normalized for the measurement time based on the Multiplex Method and Spectrum Template selected when the spectrum data is summed.*

5) Energy Calibration

- a. Use Template: *The Energy Calibration in the Spectrum Template is used for the Output Spectrum.*
- b. User Defined: *The values specified for the Energy Calibration Intercept, Slope, and Quadratic are used for the Output Spectrum energy calibration.*

B.35.2 GVSpectrumMux Automation with Configuration Files

The GVSpectrumMux program can be run in a more automated mode by setting the specified parameters in a configuration file and passing this file to the program as a command line parameter. This is a convenient way to operate a multiple detector array with software multiplexing in the standard GammaVision automation Job process. The individual detector spectra and the summed output spectrum can also be analyzed independently.

The configuration file must be configured as shown below. The same format is used for the GVSpectrumMux.INI file which is updated each time the “Process Spectra” button is selected in the User Interface mode. This INI file can be used as a template if desired, but a different file name should be used for automation routines to avoid inadvertent changes when the User Interface mode is used.

The following is an example configuration file followed by an explanation of each parameter.

```
|GVSpectrumMux_SumMethod|=3
|GVSpectrumMux_SpectrumTemplateOption|=0
|GVSpectrumMux_ADCConvGainOption|=0
|GVSpectrumMux_OutputADCConvGain|=
|GVSpectrumMux_EnergyCalibrationOption|=0
|GVSpectrumMux_OutputEnergyIntercept|=
```

|GVSpectrumMux_OutputEnergySlope|=
|GVSpectrumMux_OutputEnergyQuadratic|=
|GVSpectrumMux_SpectrumTemplatePath|=
|GVSpectrumMux_SpectrumOutputPath|=C:\User\SPC\OutputSpectrum.spc
|GVSpectrumMux_NumberOfSpectra|=2
|GVSpectrumMux_SpectrumPath1|= C:\User\SPC\InputSpectrum1.spc
|GVSpectrumMux_SpectrumPath2|= C:\User\SPC\InputSpectrum2.spc
|GVSpectrumMux_SumAcquisitionTime|=F

|GVSpectrumMux_SumMethod|= Multiplex Method Index
(1=Raw Channel Data, 2=Channel Count Rate, 3=Energy Count Rate)

|GVSpectrumMux_ADCConvGainOption|= ADC Conversion Gain Option Index
(0=Use Template, 1=128, 2=256, 3=512, 4=1024, 5=2048, 6=4096, 7=8192, 8=16384, 9=32768)

|GVSpectrumMux_OutputADCConvGain|= ADC Conversion Gain Value
(Must be blank if the previous parameter is set to zero. Otherwise, a valid value from the ADCConvGainOption list must be specified.)

|GVSpectrumMux_EnergyCalibrationOption|= Energy Calibration Option Index
(0=Use Template, 1=User Defined)

|GVSpectrumMux_OutputEnergyIntercept|= Energy Calibration Intercept Value
(Blank to use Template value.)

|GVSpectrumMux_OutputEnergySlope|= Energy Calibration Slope Value
(Blank to use Template value.)

|GVSpectrumMux_OutputEnergyQuadratic|= Energy Calibration Quadratic Value
(Blank to use Template value.)

|GVSpectrumMux_SpectrumOutputPath|= File path for output spectrum.

|GVSpectrumMux_SpectrumTemplateOption|= Spectrum Template Option Index
(0=First Spectrum in List, 1=User Defined)

|GVSpectrumMux_SpectrumTemplatePath|= File path for the spectrum template.
(Blank to use the first Input spectrum in the list.)

|GVSpectrumMux_NumberOfSpectra|= Number of Input Spectra
(Specifies the number of Input spectrum paths to read using the SpectrumPathX parameter.)

|GVSpectrumMux_SpectrumPathX|= Input Spectrum File Path
(Repeat for each input spectrum with X replaced by the spectrum list index.)

|GVSpectrumMux_SumAcquisitionTime|= Sum Acquisition Time Option
(T = Sum Acquisition Times, F = Do not Sum Acquisition Times)

B.36 GVGammaProductsChangeSample

This program communicates with the Gamma Products sample changer using computer to computer serial communication with a Null Modem cable. The Gamma Products Sample Changer computer must be running the sample changer software and configured to accept input commands over the serial port for this communication to occur. The COMM port settings on the Global Value computer are set by the program to 9600 bits/sec, 8 data bits, no parity, and flow control Off as required by the sample changer communication protocol when this program was developed.

Multiple sample changers can be controlled from one Global Value computer using multiple COMM ports. The target port for the application can then be specified as one of the command line arguments as described below. For each COMM port connection, the program stores the most recent sample changer position in an INI file with the syntax `COMMX_POSITION=Y` where X is the COMM port number and Y is the current position.

The `GVGammaProductsChangeSample` program is compatible with an older DOS version of the sample changer control software as well as a more recent version used in the Windows environment. The communication protocol used for each of these configurations is specified using a command line parameter as described below.

`GVGammaProductsChangeSample` has the following comma-delimited command line parameters:

- 1) Target Position or Reset Command: *This parameter is either the desired sample changer position or the reset command (“R”) to send to the Gamma Products Sample Changer computer. If a number is specified, then the command is formatted as “XL” where X is the target sample position.*

If this parameter is omitted, then the program’s INI file is read to determine the most recent position for the specified COMM port. This value is incremented, and the INI file updated to reflect the new position. This value is then used with the “XL” command format where X is the target sample position. If the INI protocol is used, then the initial position (position 1) must be specified on the command line in order to reset the value in the INI file for the first sample.
- 2) COMM Port Number: *This parameter specifies the COMM Port number as configured in the computer Hardware Properties. Refer to the Windows Operating System documentation to configure COMM Ports. If this parameter is omitted, then 1 is used as the default.*
- 3) COMM Type: *The COMM Type specifies the handshaking protocol between the Global Value computer and the Gamma Products Sample Changer computer as follows:*
 - 0 (zero): *This setting is used when the Gamma Products computer is running the Windows application. With this configuration the program uses the Carriage Return (Ascii character 13) as a termination character when sending commands and receiving responses. Responses from the Sample Changer computer are managed as follows:*
 - “LOK” – *The Sample Position was set successful and the program exits.*
 - “E” – *An error occurred, and the error message is displayed. A “Retry” button is displayed to allow the user to resend the command after correcting the condition.*
 - “J” – *A message is displayed indicating that the Sample Changer has jammed. A “Retry” button is displayed to allow the user to resend the command after correcting the condition.*
 - 1 (one): *This setting is used when the Gamma Products computer is running the DOS application. With this configuration the program sends commands and receives responses without the terminating Carriage Return character. Responses from the Sample Changer computer are expected to be a single character managed as follows:*
 - Bell Character (Ascii character 7) – *The Sample Position was set successful and the program exits.*
 - “J” – *A message is displayed indicating that the Sample Changer has jammed. A “Retry” button is displayed to allow the user to resend the command after correcting the condition.*

Appendix C – Summary of Global Value Programs

This appendix provides a quick reference to the application programs installed with Global Value and their respective command line parameters. The list is organized by the high level application interfaces, Utility Programs, and automation Job programs used with routine QA and Sample measurements. These programs are installed in the C:\User\GVCR directory along with other support files and subfolders required for normal operation of Global Value. Refer to the applicable section of this User Manual for additional detail related to each program.

The following parameters are used throughout the table below:

- **DETNO:** The Detector Number specified in Sample Administration Configuration.
- **DETDBPATH:** Full Path to the applicable Detector Database for Sample data.
- **DETQADBPATH:** Full Path to the applicable Detector Database for QA data.
- **JOBPATH:** Full Path to a Job file created by the program and subsequently called in the main Job.

Refer to the GammaVision User Manual for detail related to SDF (Sample Defaults Files), UFO (Unformatted Output Files), and PBC (Peak Background Correction Files).

Main Application and Administration Programs

Program	Section	Command Line Parameters
GlobalValueQuickStart	A.1	N/A
GVSampleAdmin	A.2	1) DETDBPATH 2) Detector Description
GVQAAdmin	A.4	1) DETQADBPATH 2) Detector Number

Application Specific Utility Programs

Program	Section	Command Line Parameters
GVPublishSample	A.3	1) PDF Report File Path 2) Configuration File Path
GVPublishQA	A.5	1) PDF Report File Path 2) Configuration File Path
GVQASummary	A.6	N/A
AnalysisLog.xls	A.7	N/A
GVDetectorMonitor	A.8	N/A
GVDatabaseUtility	A.9	N/A
File Backup (BackupAndPurge.bat)	A.10	1) Target Backup Directory
GVDeleteFiles	A.10	1) Target Directory 2) File Criteria (*.ext) 3) Max Days
GVFileCompare	A.11	1) Criteria File Path 2) Report Exceptions Only Flag
GVDataExport	A.12	1) Detector Number 2) Spectrum ID
GVEFTConvert	A.13	N/A

Automation Job Programs Common to Quality Assurance and Sample Measurements

Program	Section	Command Line Parameters
GVCopyFile	B.32	1) Source File Path 2) Destination File Path
GVSetSDFParameter	B.10	1) SDF File Path 2) SDF Parameter Name 3) SDF Parameter Value
GVSDFData	B.9	1) SDF File Path 2) SDF Data File Path
GVAskConfirm	B.11	1) JOBPATH 2) Message Text
GVIncrementCounter	B.23	1) DETDBPATH
GVOpenFile	B.33	1) Target File Path
GVTemplateMaster	B.31	1) Template File Path 2) Configuration File Path 3) Result File Path
GVspectrumMux	B.35	1) Configuration File Path
GVGammaProductsChangeSample	B.36	1) Position or Command 2) Comm Port Number 3) Comm Type

Automation Job Programs for Quality Assurance Measurements

Program	Section	Command Line Parameters
GVQASetUser	B.1	1) DETQADBPATH 2) Detector Number 3) Require Login Flag 4) JOBPATH
GVQAPeaks	B.27	1) Detector Number 2) DETQADBPATH 3) Report Destination (WORD, NONE, or omit)
GVQABackground	B.28	1) Detector Number 2) DETQADBPATH 3) Report Destination (WORD, NONE, or omit)
UfoToPbc (also be used for "Blank" Samples)	B.30	1) UFO File Path 2) PBC File Path 3) Job File Path

Automation Job Programs for Sample Measurements

Program	Section	Command Line Parameters
GVSetUser	B.1	1) DETDBPATH 2) Require Login Flag 3) JOBPATH 4) Reanalysis Flag
GV_ResetInputs	B.34	1) DETDBPATH 2) Spectrum ID
GVDeadTimeCheck	B.4	1) Detector Number 2) Dead Time Limit Value 3) JOBPATH 4) Check Duration 5) Geometry List File Path 6) Calibration Directory 7) Calibration File Prefix
GVQACheckStatus	B.29	1) Detector Number 2) DETQADBPATH 3) JOBPATH 4) Allow Continue Flag
GVClearData	B.2	1) DETDBPATH
GVRecallSpectrum	B.3	1) DETDBPATH 2) JOBPATH 3) Reanalysis Data File Path
GVSampleData	B.6	1) SDF File Path 2) JOBPATH 3) Excel File Path 4) Default Sample Description 5) Default Decay Date/Time 6) Default Quantity 7) Default Quantity Units 8) Default Live Time 9) Reanalysis Flag 10) Reanalysis Data File Path 11) Editable Quantity Units Flag
GVSampleDataPlus	B.7	1) Configuration File Path
GVSampleDataSC	B.8	1) Configuration File Path
GVGetConfiguration	B.12	1) JOBPATH 2) Calibration File Prefix 3) Calibration File Directory 4) Library File Directory 5) Default Geometry 6) Default Library 7) Reanalysis Flag 8) Reanalysis Data File Path
GV_GetCustomData	B.21	1) DETDBPATH 2) Data Source File Path 3) Append Data Flag 4) Reanalysis Flag 5) JOBPATH

Automation Job Programs for Sample Measurements (continued)

Program	Section	Command Line Parameters
GV_GetRType	B.13	1) DETDBPATH 2) Sample Type 3) Reanalysis Flag 4) JOBPATH
GV_GetSiteUnit	B.14	1) DETDBPATH 2) Site Unit 3) Reanalysis Flag 4) JOBPATH
GV_GetBatch	B.15	1) DETDBPATH 2) Batch Description 3) Reanalysis Flag 4) JOBPATH
GV_GetComment	B.16	1) DETDBPATH 2) Default Comment 3) Reanalysis Flag 4) JOBPATH
GV_GetGDTPressure	B.17	1) DETDBPATH 2) Reanalysis Flag 3) JOBPATH
GV_GetSamplePump	B.18	1) DETDBPATH 2) Reanalysis Flag 3) JOBPATH
GV_GetRWP	B.19	1) DETDBPATH 2) Reanalysis Flag 3) JOBPATH
GV_GetRadMon	B.20	1) DETDBPATH 2) Reanalysis Flag 3) JOBPATH
GVTimerControl	B.5	N/A
GV_GetRptData	B.22	1) DETDBPATH 2) Analysis Number 3) Omit Nuclide if >Half-Life Cutoff Flag 4) Decayed Activity = 0 if >Half-Life Cutoff Flag 5) Reanalysis Flag
GV_Custom_Rpt	B.24	1) DETDBPATH 2) Report Template Name 3) Reanalysis Flag
Print_Rpt	B.25	1) DETDBPATH 2) No Longer Used 3) Report Type (CVR, ALL, or omit) 4) Report Destination (WORD, PDF, TXT, or omit) 5) Font Size 6) File Directory (for PDF or TXT files) 7) Reanalysis Flag
GrossGamma	B.26	1) Background Spectrum Path 2) Sample Spectrum Path 3) Excel File Path

Appendix D – Field Size Limitations

Field / Parameter	Limitations
Spectrum ID (Filename)	50 Characters (No Invalid File name characters allowed such as: () \ / : * ? " < > and others.)
Detector Description	100 characters max (A practical limitation for proper display on custom report summaries is 64 characters – i.e. use only the first line in the MCB Configuration dialog box.)
Sample Description	130 characters max (A practical limitation for proper display on custom report summaries is 64 characters – i.e. use only the first line in the GammaVision Sample Description dialog box.)
Calibration Description	100 characters (A practical limitation for proper display on custom report summaries is 64 characters – i.e. use only the first line in the GammaVision Calibration Description dialog box.)
Calibration File Name Path	255 characters (A practical limitation for proper display on custom report summaries is 64 characters in the file name.)
Library	100 characters max (A practical limitation for proper display on custom report summaries is 64 characters in the file name.) Note that GammaVision has an additional limitation of 32 characters for the full path length when using Jobs. The library will still be used for analysis if the path is longer, but the path is not displayed correctly on the analysis report, and the default library may not be set in the Global Value prompts when reanalyzing a spectrum.
Custom Report Template	Report Template names in Configuration Management are limited to 50 Characters.
Group and User Names	20 Characters max
PDF Passwords	50 Characters max
Sample Type / R-Type	20 characters max
RWP	20 characters max (prefix and suffix combined. Suffix max is 6 characters.)
Rad Monitor ID	10 characters max
Rad Monitor Reading	Numeric
Air Sampler ID	25 characters max
GDT Pressure	Numeric
Site Unit	50 characters max
Batch ID	50 characters max
Comments	64,000 characters max

Field / Parameter	Limitations
Unidentified Peak Resolution	25 characters max
Nuclide/QA Peak Name	10 characters max
Nuclide Data Parameters	Numeric
Nuclide Adjustment Factors	Numeric
Nuclide Adjustment Tables	10 characters max and cannot contain the underscore character (“_”) or blank spaces.
Custom Parameter Name	50 characters max
Custom Parameter Label	30 characters max
Custom Parameter Report Code	10 characters max
Custom Parameter Value	50 characters max

Appendix E – Network Configuration Considerations

There are several different ways to setup the Gamma Spectroscopy system on a network – each with its own advantages and disadvantages. Three configurations are described below to help you determine which configuration is best suited for your application.

Unlike other systems which may require a client-server model, Global Value is well suited for any of these configurations because each detector is assigned a unique database that can be located anywhere on the local network. Configuration Management functions can be performed on any individual database and all configuration changes easily pushed to all other databases in the network. This distributed data file topography allows the convenience of managing configuration parameters as if you were working from a centralized database server with the added flexibility of storing analysis and configuration data on a local computer to minimize counting lab interruptions in the event of a single point failure (network, server, or PC).

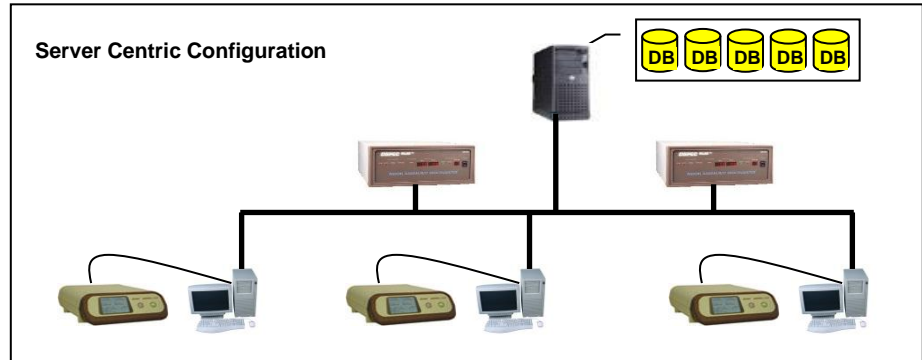
Network Dependent

Advantages

- Remote data access
- PC failure does not affect entire system

Disadvantages

- Network or server failure disables entire system
- More expensive



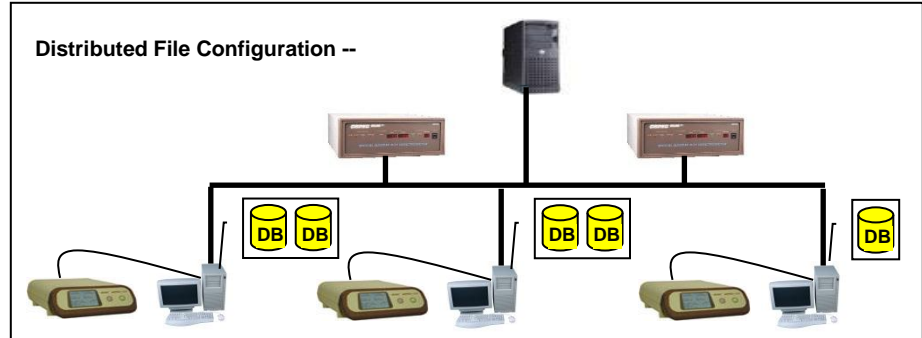
Limited Network Dependency

Advantages

- Remote data access
- Core functionality is still operable with a network, server, or PC failure
- Less Expensive

Disadvantages

- Multiple system backups
- Duplication of common files



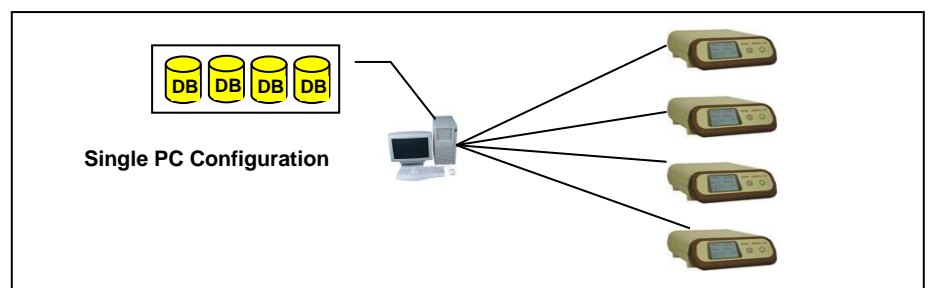
Network Independent

Advantages

- Single System Backup
- Less Expensive

Disadvantages

- PC failure disables entire system
- No remote data access



Appendix F – Excel Add-In Function Reference

Table of Content

Appendix F Notes	F2
F1 - GVAnalysisParameter	F3
F2 - GVCustomDataParameterListCount	F4
F3 - GVCustomDataParameter	F5
F4 - GVINIPParameter	F5
F5 - GVMostRecentFilename	F6
F6 - GVDetectorListCount	F6
F7 - GVDetector	F7
F8 - GVDetectorDatabasePath	F7
F9 - GVDetectorDatabasePathByDetectorNumber	F8
F10 - GVSpectrumList	F8
F11 - GVNuclideList	F9
F12 - GVConsolidateNuclideList	F9
F13 - GVParseList	F10
F14 - GVNuclideName	F10
F15 - GVNuclideActivity	F11
F16 - GVNuclideFactor	F11
F17 - GVNuclideData	F13
F18 - GVNuclideDataList	F14
F19 - GVUnidentifiedPeakListCount	F14
F20 - GVUnidentifiedPeakList	F15
F21 - GVUnidentifiedPeak	F15
F22 - GVUnidentifiedPeakData	F16
F23 - GVUnidentifiedPeakDataList	F16
F24 - GVRWPListCount	F17
F25 - GVRWPList	F17
F26 - GVRWP	F18
F27 - GVRadMonitorListCount	F18
F28 - GVRadMonitorList	F19
F29 - GVRadMonitor	F19
F30 - GVPopulateDetectorList	F20
F31 - GVPopulateSpectrumList	F20
F32 - GVGenerateSpectrumList	F21

Appendix F Notes

- 1) To enable the functionality in the Excel Add-In a reference must be established to the GlobalValue.xla file as follows:
 - a. Open the Visual Basic Editor in Excel. In Excel 2007 and later select the Visual Basic icon in the “Code” section of the Developer tab on the ribbon. If the Developer tab is not visible, then it can be enabled from the Options page (File\Options menu), Customize Ribbon tab, in the Main Tabs list.
 - b. In the Visual Basic Editor select the menu item “Tools\References”.
 - c. In the References dialog, select the Browse button.
 - d. In the Browser dialog change the “Files of Type” dropdown list to “Microsoft Excel Files (*.xlsm, *.xlam *.xls, *.xla)” or “All Files *.*”.
 - e. Browse to “C:\User\GVCR\GlobalValue.xla”.
 - f. Select the “Open” button to close the browser dialog and set the reference.
 - g. “GlobalValue” should now be displayed in the Available References list.
 - h. Select the “Ok” button to close the Reference List dialog.
 - i. Close the Visual Basic Editor.
 - j. The Excel Add-In functions are now available for this workbook.
- 2) The “**DatabasePath**” parameter used in most functions is the full path to a Global Value database used for storing Sample data. The Add-In functions are not compatible with QA databases.
- 3) The “**WorkGroupPath**” parameter used in most functions is the full path to the file “GVCCustomReport.mdw” which is located in the installation directory - usually “C:\User\GVCR”.
- 4) The “**SpectrumID**” is a unique string that identifies each analysis in the database. It is the same as the Spectrum and Analysis report name without the file extension.
- 5) The arguments required for each function may be a static numeric value or character string, a formula that evaluates to a numeric value or character string, or a reference to a worksheet cell containing a numeric value or character string as applicable.
- 6) Global Value functions are described in the table below. Examples are also provided to demonstrate how these functions can be combined with calculations, common Excel functions, and conditional formatting to demonstrate the power and flexibility of custom calculations in the Excel environment. Example files may be found in the directory “C:\User\GVCR\Excel” (if the Default Configuration Support Files are installed) or in “Example Files\User\GVCR\Excel” on the installation disk.

F1 - GVAnalysisParameter

GVAnalysisParameter(DatabasePath,WorkGroupPath,SpectrumID,Parameter)

This function returns a string representing the specified Parameter for the associated SpectrumID.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The SpectrumID records must be stored in the specified database path.

Parameter is any one of the following: (not case sensitive)

- Multiple Parameter Codes can be used to return the same data as shown.
- Parameter Codes with 1 or 2 suffix return data for the first or second analysis respectively.
- ReportSummary, ReportDetail, and ChangeSummary codes are available for use with VBA as the returned content will typically overflow a worksheet cell.

Data Returned	Parameter Codes
Acquisition Dead Time (%)	DEAD, DeadTime
Acquisition Live Time (seconds)	LIVE, LiveTime
Acquisition Real Time (seconds)	REAL, RealTime
Acquisition Start Date/Time	SMP_ACQU, AcquisitionStart
Activity Units	AU, ActivityUnits
Activity Units Divisor	ActUDiv1, ActivityUnitsDivisor1 / ActUDiv2, ActivityUnitsDivisor 2
Activity Units Multiplier	ActUMult1, ActivityUnitsMultiplier1 / ActUMult2,ActivityUnitsMultiplier 2
Activity Range Factor	ACTRANGE, ActivityRangeFactor
Additional Random Uncertainty	RANDUNCERT, RandomUncertainty
Additional Systematic Uncertainty	SYSUNCERT, SystematicUncertainty
Analysis Date/Time	SMP_ANAL, ReportDate
Analysis Engine Name	ENG1 / ENG2
Analysis Engine Version	ENG1Ver / ENG2Ver
Analyst Name	Analyst
Batch ID	Batch
Change Summary	ChangeSummary
Comments	Comment
Custom Parameter Data	CUSTOM! (Where "CUSTOM" is a valid custom parameter name)
Detector Description	DET, Detector
Edited Date/Time	EditDate
Editor Name	Editor
Efficiency Calibration Date/Time	CAL1EFDate / CAL2EFDate
Efficiency Calibration Description	Eff1, Calibration1 / Eff2, Calibration2
Efficiency Calibration File Name	Cal1, CalibrationFile1 / Cal2 / CalibrationFile2
Energy Calibration Date/Time	CAL1ENDate / CAL2ENDate
Gas Decay Tank Pressure	GDT-P, GDTPressure
Gross Spectrum Counts (or first ROI)	GRCTS, TotalCounts
Half-Lives Cutoff	MAXHL, HalfLivesCutoff
Library Match Width	LIBMW, LibraryMatchWidth
Library Name	LIB1 / LIB2, Library1 / Library2
PBC File Date/Time Modified	PBC1Date / PBC2Date
PBC File Name	PBC1Name / PBC2Name
PBC Match Width	PBCMW, PBCMatchWidth
Peak Cutoff	PKCUTOFF, PeakCutoff
Published Date/Time	PublishDate
Publisher Name	Publisher
Uncertainty Confidence Interval	CI, ConfidenceInterval, Sigma
User-Defined Uncertainty Name	UDUN?, UserDefinedUncertaintyName? (where ? = 1 through 9)
User-Defined Uncertainty Value (%)	UDUV?, UserDefinedUncertaintyValue? (where ? = 1 through 9)

Random Summing Factor Correction	RSFCORR
Random Summing Factor Slope	RSFSLOPE
Record Type	RType
Report Details (GammaVision output)	ReportDetail1 / ReportDetail2
Report Summary (Coversheet)	ReportSummary
Reviewed Date/Time	ReviewDate
Reviewer Name	Reviewer
Sample Collection Start Date/Time	SMP_STRT, CollectionStart
Sample Collection Stop Date/Time	SMP_STOP, CollectionStop
Sample Description	DESC, SampleDescription
Sample Pump ID	SMPLR, SamplePump
Sample Quantity	VOL, Quantity
Sample Quantity Uncertainty	VOLUNCERT, QuantityUncertainty
Sample Quantity Units	VU, QuantityUnits
Sample Type	STYPE, SampleType
Site Unit	Unit

Example:

Spreadsheet formula =GVAnalysisparameter(A1,A2,A3,A4) returns the Sample Description for spectrum 01_00324.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains the text "01_00324" (a valid SpectrumID in the Detector database)

Cell A4 contains the text "SampleDescription" or "Desc"

F2 - GVCustomDataParameterListCount

GVCustomDataParameterListCount(DatabasePath, WorkGroupPath)

This function returns the total number of Custom Data Parameters defined in the specified database.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The SpectrumID records must be stored in the specified database path.

Example:

Spreadsheet formula = GVCustomDataParameterListCount (A1,A2) returns the number of custom parameters defined in GV_Report1.mdb.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F3 - GVCustomDataParameter

GVCustomDataParameter(DatabasePath, WorkGroupPath, ListID)

This function returns the name of the Custom Data Parameter associated with the specified ListID with the exclamation point character (!) appended as a suffix. The string returned by this function may be used with the GVAnalysisParameter function to return the value associated with the custom parameter for a specified Spectrum ID.

Argument Notes:

See Notes 1 & 2 above for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is detector specific.

ListID is a number that identifies the position of an item within the list.

Example:

Spreadsheet formula = GVCustomDataParameter(A1,A2, 2) returns the second custom parameter name followed by “!”.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F4 - GVINIPParameter

GVINIPParameter(DatabasePath, WorkGroupPath, Parameter)

This function returns a string representing the specified Initialization Parameter from the target database.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is detector specific.

Parameter is any one of the following items:

- Detector Parameters: DetectorID (Detector Description), DetectorNumber, FilePrefix, RPT_PATH (Analysis Report Path), CRPT_PATH (Custom Report Path) NET_PATH (Network Path), Publish_Path, Job_Path, Database_Path, QADatabase_Path, DailySpectrumCounter, MonthlySpectrumCounter, AnnualSpectrumCounter
- Non-Detector Specific Parameters: GDT_Volume (Gas Decay Tank Volume), MONITORLIST, RWP_PREFIX

Example:

Spreadsheet formula =GVINIPParameter(A1, A2, "RPT_PATH") returns the directory specified for this detector's analysis reports.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F5 - GVMostRecentFilename

GVMostRecentFilename(Directory)

This function returns a string representing the file name of the last analysis report (no extension) generated by GammaVision in the specified directory.

Argument Notes:

Directory is the full path to the GammaVision Analysis Report directory terminated by the “\” character.

Example:

Spreadsheet formula = GVMostRecentFilename(GVINIPParameter(A1, A2, "RPT_PATH")) returns the file name of the last analysis report generated in the analysis report directory specified in the specified detector database.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F6 - GVDetectorListCount

GVDetectorListCount(DatabasePath, WorkGroupPath)

This function returns the number of detectors configured in the Global Value database.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is not detector specific.

Example:

Spreadsheet formula = GVDetectorListCount(A1,A2) returns the number of detectors specified in the specified database.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F7 - GVDetector

GVDetector(DatabasePath, WorkGroupPath, ListID)

This function returns the detector description for a specified detector in the Global Value database.

Argument Notes:

See Notes 1 & 2 above for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is not detector specific.

ListID is a unique number that identifies each detector in the database. This number is defined by the order that each detector was added to the database.

Example:

Spreadsheet formula = GVDetector(A1,A2,ROW()) returns the name of the detector listed in the specified database where the ListID is the same value as the cell row.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F8 - GVDetectorDatabasePath

GVDetectorDatabasePath(SourceDatabasePath, WorkGroupPath, DetectorName)

This function returns the full path to a specified detector's database.

Argument Notes:

See Notes 1 & 2 above for a description of the **SourceDatabasePath** (equivalent to DatabasePath) and **WorkGroupPath** arguments. The database is not detector specific.

DetectorName is the unique Detector Description that identifies each detector in the Sample Administration Configuration on the Detectors tab.

Example:

Spreadsheet formula = GVDetectorDatabasePath(A1,A2,"Detector #2") returns the database path for the detector named "Detector #2" in the Sample Administration Configuration.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F9 - GVDetectorDatabasePathByDetectorNumber

GVDetectorDatabasePathByDetectorNumber(SourceDatabasePath, WorkGroupPath, DetectorNumber)

This function returns the full path to a specified detector's database.

Argument Notes:

See Notes 1 & 2 above for a description of the **SourceDatabasePath** (equivalent to DatabasePath) and **WorkGroupPath** arguments. The database is not detector specific.

DetectorNumber is the unique Detector Number that identifies each detector in the Sample Administration Configuration on the Detectors tab.

Example:

Spreadsheet formula = GVDetectorDatabasePathByDetectorNumber(A1,A2,2) returns the database path for the detector that has been assigned Detector Number 2.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw

F10 - GVSpectrumList

GVSpectrumList(DatabasePath, WorkGroupPath, _ Optional GreaterThanReportDate, _ Optional LessThanReportDate, _ Optional GreaterThanAcquisitionStartDate, _ Optional LessThanAcquisitionStartDate, _ Optional GreaterThanSampleStartDate, _ Optional LessThanSampleStartDate, _ Optional GreaterThanSampleStopDate, _ Optional LessThanSampleStopDate, _ Optional IMaximumSpectrumCount)

This function returns a comma delimited list of spectra that meet the specified date criteria with the maximum number of spectra optionally limited by IMaximumSpectrumCount value. This function is typically used in VBA code as worksheet cells may limit the string length.

Argument Notes:

See Notes 1 & 2 above for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is detector specific.

GreaterThan...LessThan... date arguments are optional and must be valid dates if supplied. The SampleStopDate is equivalent to the Decay Correction Date in Global Value.

IMaximumSpectrumCount specifies the maximum number of records to return. The most recent records are returned if the list is limited by this value.

Example:

Spreadsheet formula = GVSpectrumList(A1, A2, "1/1/03") returns a comma delimited list of all spectra in the specified database that were analyzed after January 1, 2003.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

F11 - GVNuclideList

GVNuclideList(DatabasePath, WorkGroupPath, SpectrumID, Optional IncludeMDA)

This function returns a comma delimited list of all nuclides associated with the specified SpectrumID if IncludeMDA is set to TRUE. If IncludeMDA is omitted or FALSE, then only nuclides not flagged as <MDA are included in the list.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

IncludeMDA is a Boolean (TRUE/FALSE) that determines if all nuclides associated with the SpectrumID are returned or only those not flagged as <MDA.

Example:

Spreadsheet formula = GVNuclideList(A1, A2, A3, TRUE) returns a comma delimited list of all nuclides associated with the specified Spectrum ID – even those reported as <MDA.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F12 - GVConsolidateNuclideList

GVConsolidateNuclideList(NuclideList)

This function consolidates several nuclide lists into one comma delimited list with no duplicates. This is useful when combining the results of several analyses on a single spreadsheet.

Argument Notes:

NuclideList is a comma delimited list of nuclides. When combining the results of several analysis results, the nuclide lists must be combined before use in this function. (See Example below.)

Example:

Spreadsheet formula = GVConsolidateNuclideList(A4) returns a comprehensive list of all unique nuclide from a comma-separated list that has some duplicated names.

Where:

Cells A1 and B1 contain the GVNuclideList function described in Formula F11 with two different SpectrumIDs specified. Each cell contains a different nuclide list with some common nuclides belonging to each analysis.

Cell A4 contains the formula: =A1 & ", " & B1 which concatenates the two strings with a comma between them to maintain the required comma delimited format required by the GVConsolidateNuclideList function.

F13 - GVParseList

GVParseList(List, ListID, ParseCharacter)

This function returns an item in a character delimited list based on the number of the item in the list. This function is generally used in combination with the Nuclide Lists, Nuclide Data, Unidentified Peak Lists, RWP Lists, Radiation Monitor Reading Lists, etc. to retrieve an individual item from the list.

Argument Notes:

List is a character string of items delimited by a common character.

ListID is a number that identifies the position of an item within the list.

ParseCharacter is the character that separates each item within the list. Global Value functions generally return a comma (",") delimited list; however, strings delimited by other characters may be parsed using this function.

Example:

Spreadsheet formula = GVParseList(A1, 1, ",") returns the first item of a comma delimited list stored in cell A1.

F14 - GVNuclideName

GVNuclideName(DatabasePath, WorkGroupPath, SpectrumID, ListID)

This function returns a nuclide name for the specified SpectrumID based on the order number of the nuclide in the database.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

ListID is the order number of the nuclide for the associated SpectrumID.

Example:

Spreadsheet formula = GVNuclideName(A1, A2, A3, 1) returns the first nuclide associated with the specified SpectrumID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F15 - GVNuclideActivity

GVNuclideActivity(DatabasePath, WorkGroupPath, SpectrumID, Nuclide, Optional IncludeMDA)

This function returns the activity value associated with the specified Nuclide and SpectrumID. If IncludeMDA is set to TRUE, then the activity value is returned for nuclides with activity <MDA as well as nuclides with detectable activity. If IncludeMDA is omitted or FALSE, then the activity value is only returned for nuclides not flagged as <MDA in the database.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

Nuclide is the exact nuclide name listed in the database.

IncludeMDA is a Boolean (TRUE/FALSE) that determines if the activity value will be returned for nuclides with activity <MDA.

Example:

Spreadsheet formula = GVNuclideActivity(A1, A2, A3, A4, FALSE) returns the nuclide activity for the associated SpectrumID and Nuclide if the activity is NOT reported as <MDA. Otherwise, zero is returned.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

Cell A4 contains the nuclide name.

F16 - GVNuclideFactor

GVNuclideFactor(DatabasePath, WorkGroupPath, Nuclide, AdjustmentTable)

This function returns the nuclide adjustment factor value associated with the specified Table. Nuclide Adjustment tables are setup and modified using the Global Value Configuration Editor.

Argument Notes:

See Notes 1 & 2 above for a description of the **DatabasePath** and **WorkGroupPath** arguments. The database is not detector specific.

Nuclide is the exact nuclide name listed in the database.

AdjustmentTable is the name of a valid Adjustment Table as displayed in the Configuration Editor.

Example:

Spreadsheet formula = GVNuclideFactor (A1, A2, A4, A5) returns the DAC Adjustment Factor for the specified nuclide.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A4 contains the nuclide name.

Cell A5 contains the name of the nuclide Adjustment Factor table. (i.e. DAC, DEI, etc.)

F17 - GVNuclideData

GVNuclideData(DatabasePath, WorkGroupPath, SpectrumID, Nuclide)

This function returns a comma delimited string of all nuclide information stored in the database in the following order:

- 1) Less than flag (<) or empty string if activity is not reported as <MDA.
- 2) Standard Activity Value (Decayed if applicable)
- 3) Analysis Number (1 or 2) (2 is for the second result set of a dual analysis)
- 4) Nuclide ListID (used for reporting order)
- 5) Edited Flag (True/False) (indicates if the nuclide data was modified in the Analysis Editor)
- 6) Standard Uncertainty (as reported on the Gamma Vision report)
- 7) Standard MDA
- 8) Standard Counting Uncertainty in Activity Units
- 9) Standard Total Uncertainty in Activity units
- 10) Standard MDA2 (normally set to Critical Level method in B30Winds.ini file)
- 11) Standard Time of Count Activity
- 12) Nuclide Name
- 13) Bad Shape Flag (True/False)
- 14) Half-Life (days)
- 15) Decay Correction
- 16) Elapsed Half-Lives
- 17) ISO NORM Activity (decayed if applicable)
- 18) ISO NORM Time of Count Activity
- 19) ISO NORM Counting Uncertainty in Activity Units
- 20) ISO NORM Counting Uncertainty in Percent
- 21) ISO NORM Total Uncertainty in Activity Units
- 22) ISO NORM Total Uncertainty in Percent
- 23) ISO NORM Minimum Activity
- 24) ISO NORM Maximum Activity
- 25) ISO NORM Detection Limit
- 26) ISO NORM Decision Threshold

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Nuclide is the exact nuclide name listed in the database.

Example:

Spreadsheet formula = GVParseList(GVNuclideData(A1, A2, A3, A4), 1, ",") returns "<" if the standard nuclide activity was reported as <MDA.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

Cell A4 contains the nuclide name.

F18 - GVNucleideDataList

GVNucleideDataList(DatabasePath, WorkGroupPath, SpectrumID)

This function returns the comma delimited nuclide data string described for GVNucleideData (F17) for all nuclides associated with the specified SpectrumID with each nuclide data set delimited by the pipe “|” character.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Example:

Spreadsheet formula B1 = GVParseList(GVNucleideDataList (A1, A2, A3), 1, “|”) returns the comma-delimited NuclideData data string described in F17 for the first nuclide in the list.

Spreadsheet formula B2 = GVParseList(B1, 1, “,”) returns “<” if the standard nuclide activity for the first nuclide in the NuclideDataList was reported as <MDA.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F19 - GVUnidentifiedPeakListCount

GVUnidentifiedPeakListCount(DatabasePath, WorkGroupPath, SpectrumID)

This function returns the total number of unidentified peaks associated with the specified SpectrumID.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Example:

Spreadsheet formula = GVUnidentifiedPeakListCount(A1, A2, A3) returns the number of unidentified peaks associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F20 - GVUnidentifiedPeakList

GVUnidentifiedPeakList(DatabasePath, WorkGroupPath, SpectrumID)

This function returns a comma delimited string of all unidentified peak energies associated with the specified SpectrumID along with any resolution text with the peak energy and resolution text separated by a dash (“-“) character. The GVParseList function can be used to extract specific items from the list.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Example:

Spreadsheet formula = GVUnidentifiedPeakList(A1, A2, A3) returns a comma delimited list of all unidentified peaks and associated resolution comments separated by the dash character.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F21 - GVUnidentifiedPeak

GVUnidentifiedPeak(DatabasePath, WorkGroupPath, SpectrumID, ListID)

This function returns the unidentified peak associated with the specified SpectrumID and ListID along with any resolution text. The GVParseList function can be used to extract the peak energy and resolution text.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

ListID is a number that identifies the position of an item within the list.

Example:

Spreadsheet formula = GVUnidentifiedPeak(A1, A2, A3, 1) returns the first unidentified peak energy and resolution text separated by the dash character for the associated Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F22 - GVUnidentifiedPeakData

GVUnidentifiedPeakData(DatabasePath, WorkGroupPath, SpectrumID, ListID)

This function returns a comma delimited string of all Unidentified Peak information stored in the database in the following order:

- 1) Peak Energy
- 2) Peak Channel
- 3) Background Counts
- 4) Net Counts
- 5) Net Count Rate
- 6) Percent Uncertainty
- 7) FWHM
- 8) Suspect Nuclide
- 9) Peak Flags
- 10) Resolution Text (as entered in the Analysis Editor)

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

ListID is a number that identifies the position of an item within the list.

Example:

Spreadsheet formula = GVParseList(GVUnidentifiedPeakData(A1, A2, A3, 1), 1, ",") returns the peak energy for the first unidentified peak associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F23 - GVUnidentifiedPeakDataList

GVUnidentifiedPeakDataList(DatabasePath, WorkGroupPath, SpectrumID)

This function returns the comma delimited unidentified peak data string described for GVUnidentifiedPeakData (F22) for all peaks associated with the specified SpectrumID with each peak data set delimited by the pipe "|" character.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Example:

Spreadsheet formula B1 = GVParseList(GVUnidentifiedPeakData (A1, A2, A3), 1, "|") returns the comma-delimited Unidentified Peak data string described in F22 for the first peak in the list.

Spreadsheet formula B2 = GVParseList(B1, 1, ",") returns the peak energy for the first unidentified peak in the list.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F24 - GVRWPListCount

GVRWPListCount(DatabasePath, WorkGroupPath, SpectrumID)

This function returns the total number of Radiation Work Permits associated with the specified SpectrumID.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

Example:

Spreadsheet formula = GVRWPListCount (A1, A2, A3) returns the number of RWPs associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F25 - GVRWPList

GVRWPList(DatabasePath, WorkGroupPath, SpectrumID)

This function returns a comma delimited string of all Radiation Work Permits associated with the specified SpectrumID. The GVParseList function can be used to extract a specific item from the list.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

Example:

Spreadsheet formula = GVRWPList(A1, A2, A3) returns a comma delimited list of all RWPs associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F26 - GVRWP

GVRWP(DatabasePath, WorkGroupPath, SpectrumID, ListID)

This function returns the Radiation Work Permit associated with the specified SpectrumID and ListID.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

ListID is a number that identifies the position of an item within the list.

Example:

Spreadsheet formula = GVRWP(A1, A2, A3, 1) returns the first RWP for the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F27 - GVRadMonitorListCount

GVRadMonitorListCount(DatabasePath, WorkGroupPath, SpectrumID)

This function returns the total number of radiation monitor readings associated with the specified SpectrumID.

Argument Notes:

See Appendix F Notes for a description of the DatabasePath, WorkGroupPath, and SpectrumID arguments. The database is detector specific.

Example:

Spreadsheet formula = GVRadMonitorListCount(A1, A2, A3) returns the number of Radiation Monitor Readings associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F28 - GVRadMonitorList

GVRadMonitorList(DatabasePath, WorkGroupPath, SpectrumID)

This function returns a comma delimited string of all Radiation Monitor Readings associated with the specified SpectrumID. The GVParseList function can be used to extract a specific item from the list.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

Example:

Spreadsheet formula = GVRadMonitorList(A1, A2, A3) returns a comma delimited list of all Radiation Monitor Readings associated with the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F29 - GVRadMonitor

GVRadMonitor(DatabasePath, WorkGroupPath, SpectrumID, ListID)

This function returns the Radiation Monitor Reading associated with the specified SpectrumID and ListID.

Argument Notes:

See Appendix F Notes for a description of the **DatabasePath**, **WorkGroupPath**, and **SpectrumID** arguments. The database is detector specific.

ListID is a number that identifies the position of an item within the list.

Example:

Spreadsheet formula = GVRadMonitor (A1, A2, A3, 1) returns the first Radiation Monitor Reading for the specified Spectrum ID.

Where:

Cell A1 contains the full path to the database.

Cell A2 contains the full path to GVCustomReport.mdw.

Cell A3 contains a valid SpectrumID in the Detector database.

F30 - GVPopulateDetectorList

GVPopulateDetectorList(DatabasePath, WorkGroupPath, cbo)

This procedure adds each Detector Description and associated database path to two columns in the specified combobox control. It is only available in VBA.

Set the "BoundColumn" property for the combobox to 2 to set the "LinkedCell" value to the detector database path when a detector description is selected in the combobox.

This can be useful when used in combination with the GVPopulateSpectrumList procedure as described in Formula F31.

Argument Notes:

See Notes 1 & 2 above for a description of the DatabasePath and WorkGroupPath arguments. The database is detector specific.

cbo is the name of a valid combobox.

Example:

The following code populates the combobox "Detectors" when the workbook opens. The Database and WorkGroup paths are stored in cells A2 and A3 respectively.

```
Sub AutoOpen()  
    GVPopulateDetectorList Sheets("Reference").Cells(1, 2).Text, _  
        Sheets("Reference ").Cells(1, 3).Text, _  
        Sheets("NuclideList").Detectors  
End Sub
```

F31 - GVPopulateSpectrumList

GVPopulateSpectrumList(DatabasePath, WorkGroupPath, ComboBoxName)

This procedure adds each SpectrumID listed in the database to the specified combobox control. It is only available in VBA.

Argument Notes:

See Notes 1 & 2 above for a description of the DatabasePath and WorkGroupPath arguments. The database is detector specific.

ComboBoxName is the name of a valid combobox.

Example:

The following code is used in a worksheet combobox control Click event. The combobox "Detector1" is linked to cell A1 to set the database path. When a detector is selected in this combobox, the database path is updated in cell A1 and the combobox "Spectrums" gets populated with a list of SpectrumIDs for that detector. The WorkGroupPath is specified in cell A2.

```
Private Sub Detector1_Click()  
    GVPopulateSpectrumList Me.Cells(1, 1), Me.Cells(2,1), Spectrum1  
End Sub
```

F32 - GVGenerateSpectrumList

```
GVGenerateSpectrumList(DatabasePath, WorkGroupPath, _  
    StartCellRange, _  
    Optional GreaterThanReportDate, _  
    Optional LessThanReportDate, _  
    Optional GreaterThanAcquisitionStartDate, _  
    Optional LessThanAcquisitionStartDate, _  
    Optional GreaterThanSampleStartDate, _  
    Optional LessThanSampleStartDate, _  
    Optional GreaterThanSampleStopDate, _  
    Optional LessThanSampleStopDate)
```

This procedure adds each SpectrumID matching the date criteria to subsequent rows in a column starting from the specified cell. It is only available in VBA code.

Argument Notes:

See Notes 1 & 2 above for a description of the DatabasePath and WorkGroupPath arguments. The database is detector specific.

StartCellRange is a string representing a cell reference in "A1" reference style (i.e. "C3") where the first of all SpectrumIDs will be returned.

GreaterThan...LessThan... date arguments are valid dates used as query criteria. All dates are optional. The SampleStopDate is equivalent to the Decay Correction Date in Global Value.

Example:

The following code is used in a worksheet button's Click event. This code clears cells A13 through A1000, then generates the Spectrum List starting from cell A13. The Database and WorkGroup paths are stored in cells B1 and B2, and the date query parameters are listed in cells C3 through C10.

```
Private Sub Button1_Click()  
    Me.Range("A13:A1000").Clear  
    GVGenerateSpectrumList Me.Range("B1"), Me.Range("B2"), "A13", _  
        Me.Range("C3"), Me.Range("C4"), _  
        Me.Range("C5"), Me.Range("C6"), _  
        Me.Range("C7"), Me.Range("C8"), _  
        Me.Range("C9"), Me.Range("C10")
```

End Sub