ORTEC®

GammaVision® 8

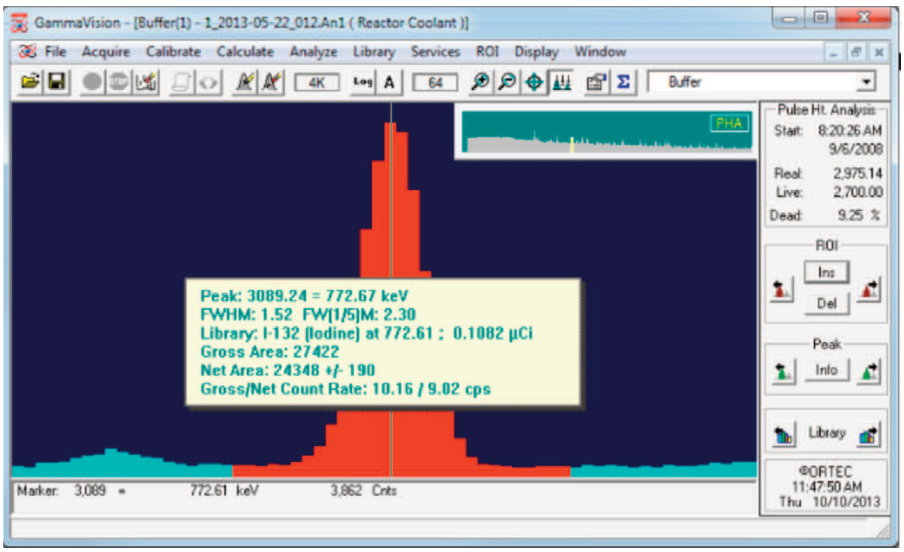
Gamma Spectroscopy Software

"Compatible, Efficient, and Defendable Results for Gamma Spectroscopy Applications."

AMETEK®
ADVANCED MEASUREMENT TECHNOLOGY

GammaVision 8

GammaVision is an All-Inclusive gamma spectroscopy application for High and Low Resolution gamma spectrometer systems. It packs all of the basic and advanced features for accurate and consistent measurements in an intuitive interface that simplifies setup and operation. With embedded MCA controls, advanced spectrum analysis functions, automation for routine operations, quality control and security, GammaVision is universally fit for large scale production labs, nuclear power plants, research and education, automated monitoring systems, and many other applications.



WHY GAMMAVISION?

Compatibility	• Operates in the most common PC Environments – 64-bit Windows 10, 8.1, and 7 Pro • Multiple Languages: English, German, Chinese, and French • Extensive Analysis and Detection Limit capability to accommodate a variety of applications • Optional Report Writer with MS Access Data Storage and Crystal Reports for Rich Custom Reports
Process Efficiency	• Integrated Hardware control • Automation Scripting for Consistent measurement processes • Simplified Calibration using Wizards and Interactive Editors • Customizable Spectrum Display with "Live" update during acquisition and Detailed Peak Evaluation
Defendable Results	• Compliance with Industry Standards such as ANSI N42.14, ANSI N13.30, and ISO/DIS 11929 • Quality Control Reports, Trending, and optional instrument lock-out on violations • Security to limit access to specified functions • Comprehensive V&V Test Results available as an option

New Features in GammaVision 8

New! Windows 10 Compatibility

New! Low/Medium Resolution Spectrum Analysis Engine for use with Scintillation systems

New! Expanded Peak Background fit options to improve Peak Rit and Detection Limit determination

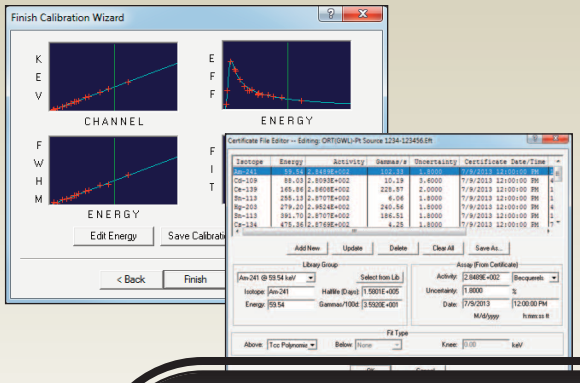
New! Improved Peak Interference and Background correction with Directed (Forced) Peak Fit methodology

New! Enhanced Library Reduction and Peak Evaluation controls to optimize analysis results

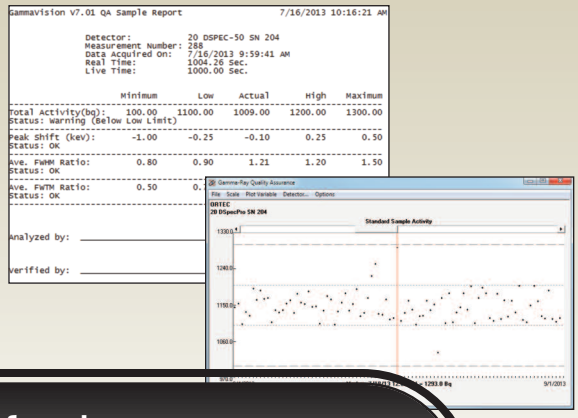
New! Read/Write ORTEC ANSI N42.42 Files

GammaVision 8

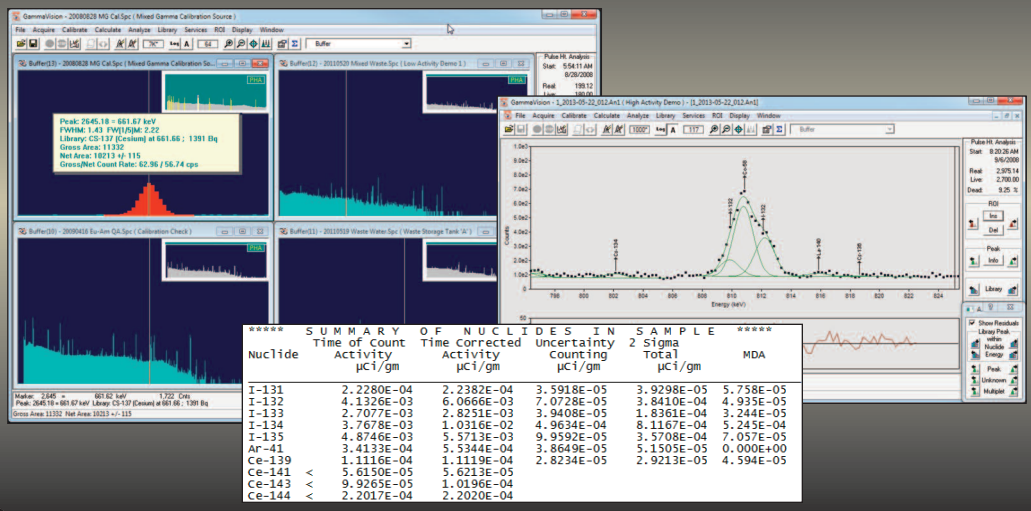
Calibration



Quality Assurance

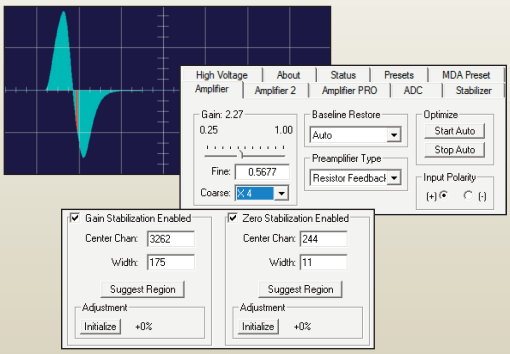


Bringing it all together for the most Compatible, Efficient, and Defendable Results Possible!

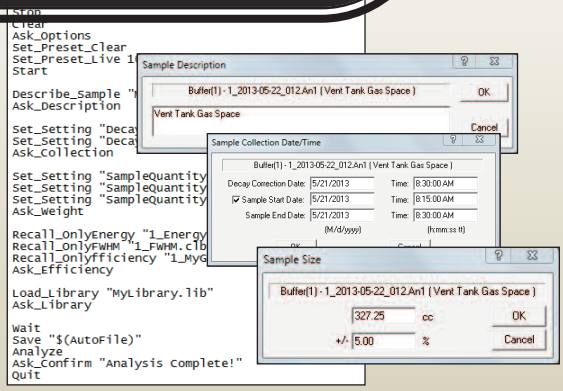


Nuclide		Time of Count Activity µCi/gm	Time Corrected Activity µCi/gm	Uncertainty Counting 2 Sigma µCi/gm	Total µCi/gm	MDA
I-131		2.2280E-04	2.2382E-04	3.5918E-05	3.9298E-05	5.758E-05
I-132		4.1326E-03	6.0666E-03	7.0728E-05	3.8410E-04	4.935E-05
I-133		2.7077E-03	2.8251E-03	3.9408E-05	1.8361E-04	3.244E-05
I-134		3.7678E-03	1.0316E-02	4.9634E-04	8.1167E-04	5.245E-04
I-135		4.8746E-03	5.5713E-03	9.9592E-05	3.5708E-04	7.057E-05
Ar-41		3.4133E-04	5.5344E-04	3.8649E-05	5.1505E-05	0.000E+00
Ce-139		1.1116E-04	1.1119E-04	2.8234E-05	2.9213E-05	4.594E-05
Ce-141	<	5.6150E-05	5.6213E-05			
Ce-143	<	9.9265E-05	1.0196E-04			
Ce-144	<	2.2017E-04	2.2020E-04			

Hardware Control



Automation

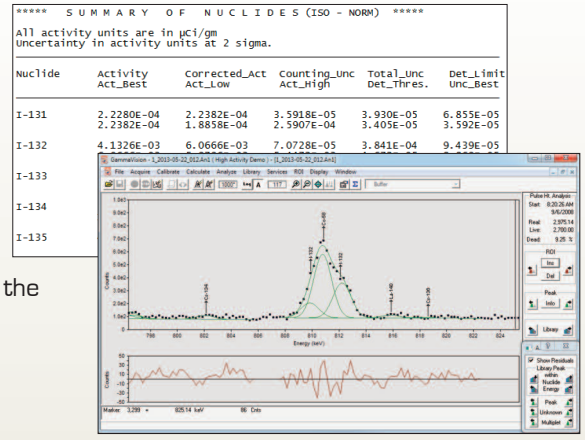


GammaVision 8

Spectrum Analysis

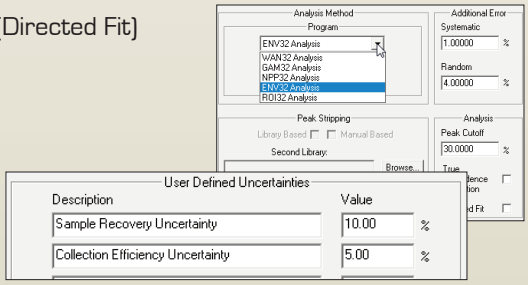
The core purpose of GammaVision is the accurate identification and quantification of radioactive material using high or low resolution gamma spectroscopy systems. This process requires accurate system calibration and analysis settings, robust peak search and fit algorithms, and a variety of corrections for background, peak interferences, attenuation, reporting units, and other factors. It is also important to comply with regulations and standards for reporting measurement uncertainty and detection limits.

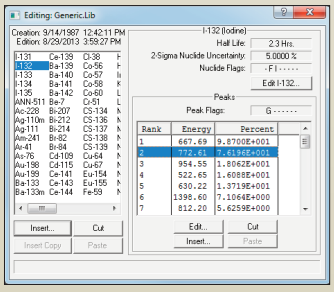
For accuracy, efficiency, and standards compliance, GammaVision is the right choice.



Key Analysis Features:

- Standards Compliant: ISO/DIS 11929, ANSI N42.14, ASTM E181
- Total Uncertainty Propagation with all analysis parameters and up to 9 User-Defined custom Parameters
- Analysis Parameters: Peak Search Sensitivity, Maximum Peak Uncertainty, Peak Match Width, Fraction Limit and Key Line Tests, Background Determination by Fixed Channels or Fraction of Peak Width, Multiplet Peak Deconvolution Range, Peak Range for Detection Limits, Automatic Energy Recalibration Criteria, and more!
- User-Defined Nuclide Libraries with Key Line, Peak Activity, and MDA Criteria
- 19 MDA Methods: ORTEC MDA, ORTEC Critical Level, Suppress MDA, KTA Rule, Japan 2-Sigma Limit, Japan 3-Sigma Limit, Curie Limit, RISO MDA, ORTEC LLD, Peak Area, Air Monitor – GIMRAD, Reg. Guide 4.16, Counting Lab USA, DIN 25 482.5 Erkennungsgrenze, DIN 25 482.5 Nachweisgrenze, EDF-France, NUREG-0472, ISO-11929 Decision Threshold (Critical Level), ISO-11929 Detection Limit (MDA)
- Optionally Calculate Nuclide Activity with the Absence of Qualified Peaks (Directed Fit)
- Graphical Peak Fit and Residuals Display
- Customizable Reports
- Application Specific Analysis Engines
  - WAN32: Simple spectra with a small list of possible nuclides
  - GAM32: Simple spectra with a large list of possible nuclides
  - ROI32: WAN32 with the addition of user-defined regions of interest
  - ENV32: Complex spectra with a large list of possible nuclides
  - NPP32: Complex spectra with a small or well-characterized nuclide mix
  - NAI32: Low Resolution (Scintillator) spectrum analysis
- Peak Search Methodology
  - Library Driven Peak Location
  - Second Difference method ("Mariscotti")
  - User-Defined Region of Interest
- Analysis Corrections
  - Nuclide Dependent or Independent Background/Blank Subtraction
  - Partial or Complete Peak Overlap fitting (Deconvolution/Peak Stripping)
  - Nuclide Decay from Collection time, During Collection, and During Acquisition
  - Random and Cascade Summing
  - Gain/Energy Calibration Shift
  - Internal and External Absorption
  - Relative Geometry Extrapolation
  - Peak-Weighted Average Nuclide Activity





Nuclide	Activity Act_Best	Corrected_Act Act_Low	Counting_Unc Act_High	Total_Unc Det_Thres.	Det_Limit Unc_Best
I-131	2.2280E-04	2.2382E-04	3.5918E-05	3.930E-05	6.855E-05
	2.2382E-04	1.8858E-04	2.5907E-04	3.405E-05	3.592E-05
I-132	4.1326E-03	6.0666E-03	7.0728E-05	3.841E-04	9.439E-05
I-133					
I-134					
I-135					

SUMMARY OF NUCLIDES (ISO - NORM)

All activity units are in µCi/gm
Uncertainty in activity units at 2 sigma.

Nuclide	Time of Count Activity µCi/gm	Time Corrected Activity µCi/gm	Uncertainty Counting µCi/gm	2 Sigma Total µCi/gm	MDA
I-131	2.2280E-04	2.2382E-04	3.5918E-05	3.9298E-05	5.758E-05
I-132	4.1326E-03	6.0666E-03	7.0728E-05	3.8410E-04	4.935E-05
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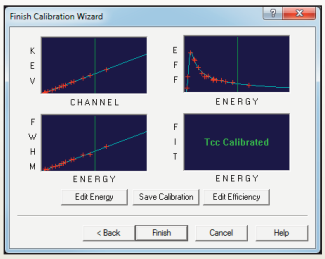
Ce-139	1.1116E-04	1.1119E-04	2.8234E-05	2.9213E-05	4.594E-05
Ce-141 <	5.6150E-05	5.6213E-05			
Ce-143 <	9.9265E-05	1.0196E-04			
Ce-144 <	2.2017E-04	2.2020E-04			

SUMMARY OF NUCLIDES IN SAMPLE

Calibration

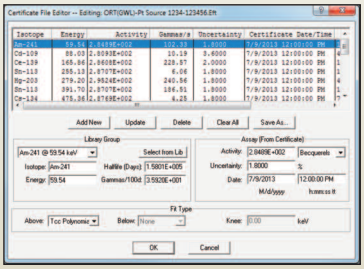
An accurate calibration is essential for proper peak identification and quantification – particularly for complex spectra with closely overlapping peaks. This can be a tedious and time-consuming process with some systems, but it's easy with GammaVision's Calibration Wizard. Simply acquire a spectrum, load a calibration library and source certificate, and the calibration is complete!

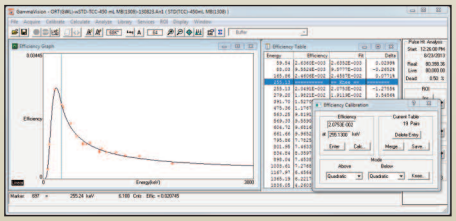


Calibrations can also be automated as part of the routine counting or QA processes.

Key Calibration Features:

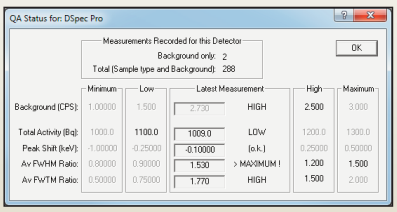
- Calibration Types
  - Channel to Energy – Quadratic Fit
  - Energy to Shape (FWHM) – Quadratic Fit
  - Energy to Efficiency – Natural Logarithm Polynomial Fit across full energy range; or Linear, Quadratic, and Point-to-Point Interpolation fits for separate high and low energy regions
  - Peak-To-Total (Cascade Summing)
- Calibration Processes
  - Automatic Energy Calibration (U.S. Patent No. 6,006,162)
  - Calibration Wizard
  - Semi-Automatic and Manual/Interactive
  - Automation using Job Functions
  - Automatic Energy Calibration Adjustment during Analysis
- Calibration Reports and Graphic Display

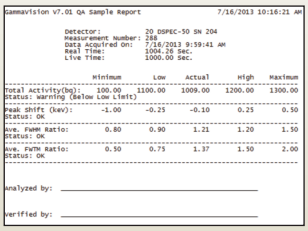




Quality Assurance

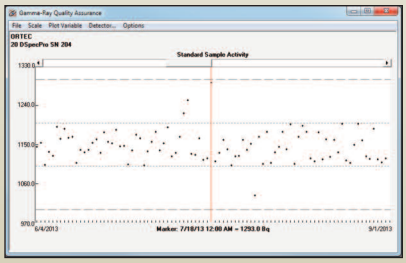
Periodic instrument performance checks are necessary to ensure that the system is operating properly when samples are analyzed. These checks may be required by regulations, standards, or other governing bodies that may audit the results. The minimum performance measures should include validation of the system calibration parameters, limits that define acceptance and a warning when these limits are exceeded. Control charts for trending is also desirable and formally required for some applications.



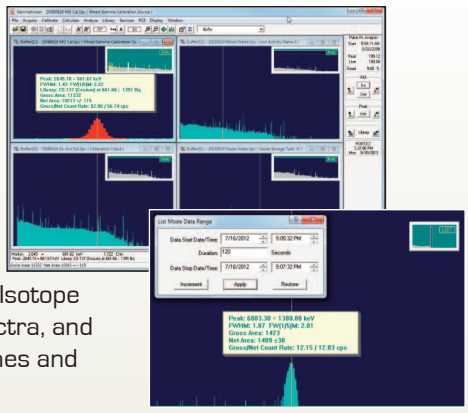


Key Quality Assurance Features:

- ANSI N13.30 and ANSI N42.14 Compliant
- Parameters Monitored
  - Background Count Rate
  - Total Source Activity
  - Total Spectrum to Library Peak Energy Difference
  - Average Actual to Calibration FWHM Ratio
  - Average Actual to Calibration FWTM Ratio
  - Individual Peak Details Available in Database
- Low/High Warning and Minimum/Maximum Violation Limits with Optional Detector Lock-out
- QA Reports and Trend Charts



User Interface and Security



GammaVision provides an intuitive user experience with the MCA Emulator "Spectrum Window" being the focal point of operation. This approach simplifies routine processes, such as hardware control and count rate/peak evaluation, but also provides the base for more advanced operations such as calibration, QA, and spectrum analysis with the most commonly used functions implemented as "hot keys" or toolbar buttons for rapid access.

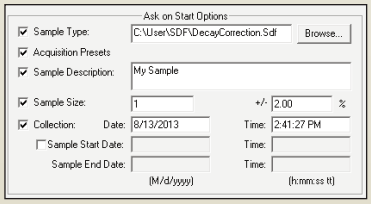
The spectrum view offers all of the tools needed for basic MCA emulation including Hardware Control, Peak Navigation and Zoom functions, Region of Interest evaluation, Interactive Peak Search, Spectrum Overlay for comparison, Isotope Markers to identify nuclide common peaks, Summing/Subtraction of other spectra, and Spectrum Channel Smoothing. It also enables user preferences for color schemes and spectrum data views.

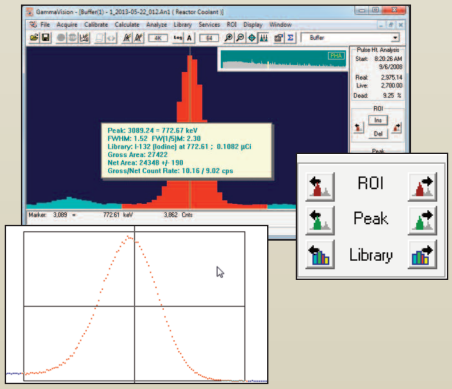
For easy access to spectra, GammaVision's Multiple Detector Interface (MDI) mode can display up to 16 interactive windows (8 Live Detectors and 8 from Spectrum Files) with independent operation. Additionally, multiple detectors can be enabled for efficient group operations by synchronizing routine Start, Stop, and Clear processes from a single command.

Spectra are traditionally collected in Pulse Height Analysis (PHA) mode with data stored in channels related to pulse height. GammaVision can also store data in "List Mode", or time-correlated events, with the ability to filter the events after acquisition by user-defined time ranges. This process allows long acquisitions to be scanned by shorter time intervals to identify precisely when activity was detected or interrogate a specific period of interest.

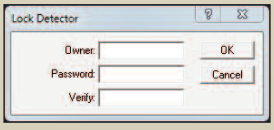
Basic sample measurements are simple processes when using the standard "Ask on Start" options. Just check the user inputs required for each measurement and the user is prompted to select the applicable files or input sample data when the acquisition is started. Additional options may be set to automatically save and analyze the spectrum and print the analysis report.

Key User Interface Features:



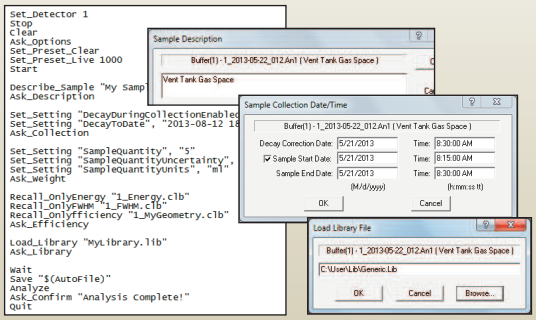


- γ Spectrum View
  - View up to 8 live detectors and 8 saved spectra simultaneously
  - Real Time display update during acquisition.
  - Zoom In/Out independent of Full Spectrum Window
  - User-Defined Spectrum Properties: Colors, Data Points
- γ Interactive ROI/Peak Calculations
  - Peak Centroid, Shape, Gross/Net Area and Activity with Uncertainty
  - Variable Number of Background Channels
  - Improved FWHM accuracy when peak centroid falls between two channels.
- γ Advanced Features
  - Fast Mariscotti Peak Search to instantly mark Regions of Interest
  - Region of Interest (ROI) reports in Column or Paragraph format
  - Isotope markers with peak amplitude estimation to confirm peak source
  - Interactive "Jump to Peak" by ROI, Library Energy, or Peak Search options
  - Spectrum overlay for direct visual comparison to a reference
  - Combine Spectra by Channel Summing or Stripping
  - Spectrum Smoothing to improve statistically poor peak shape
  - List Mode Spectra filtered by Time Range
  - Ask On Start Basic Measurement process
- γ Security
  - Menu Level Password protection
  - Detector Locking by Owner



Automation

Although the toolbar and menus options are simple and intuitive, this method of operation does not guarantee consistent processing that is often needed for measurements performed frequently or by different individuals. In these circumstances a more structured approach using simple text scripts called "Jobs" may be preferred. This feature enables every detail of the process to be defined in advance or created dynamically by a custom user interface. Virtually all of the hardware commands, analysis parameters, and processes required measurements can be programmed for consistent and reliable results every time.



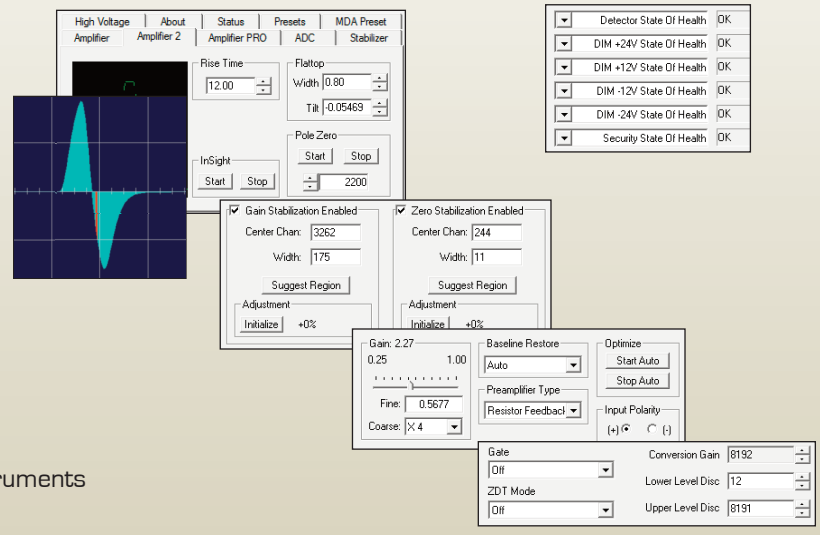
Key Automation Features:

- Simple Text Scripts require no prior programming experience
- Define and Set any Analysis Parameter or prompt for user input
- All Hardware Control functions available
- Jobs may be dynamically generated by custom data entry interfaces
- Custom Variables available for advanced programming
- Run External Applications to set parameters and automate data integration

Hardware Control

The interface between hardware and software is provided through the ORTEC CONNECTIONS framework which supports up to 250 detectors across a local network. This application layer encompasses all of the hardware drivers and communication protocols that are necessary for software applications to control the MCB (Multi-Channel Buffer) instruments. Hardware controls are accessed through MCB Property pages that are integrated with GammaVision and other standard ORTEC applications.

Windows 10, 8.1 and 7 64-bit hardware compatibility is available for all ORTEC instruments that use USB and TCP/IP connectivity. Instruments that are dependent on a host computer, such as plug-cards or USB devices, can optionally be shared on a network through local MCB Servers allowing full control from remote locations.



Key Hardware Control Features:

- List Mode Data Acquisition[1]
- High Voltage Bias Control
- Course and Fine Gain Adjustment
- Zero and Gain Stabilizer
- SMART-1 Detector functions
- ZDT loss-free counting correction
- Analog and Digital Amplifier Filters
- Automatic and Manual Optimization
- Sample changer control
- Insight® Oscilloscope mode
- Battery Voltage monitoring for portable instruments
- State-of-Health Monitoring
- Acquisition Presets including Real and Live Time, ROI Peak, ROI Integral, Peak Uncertainty, or MDA

[1]List Mode Data Acquisition is available for specific instrumentation, such as the DSPec-50/502, DSPec-Pro, digiBASE and others.

GammaVision 8

Ordering Information

NOTE: A66-BW and associated models include High and Low Resolution Analysis Engines for HPGe and Scintillator systems. A66SV-BW and associated models do not include the High Resolution Analysis Engines for HPGe systems.

Model	Description
A66-BW	GammaVision Gamma Spectroscopy Software for Windows. Includes standalone or first network copy and binary use license.
A66-BVW	GammaVision software (A66-BW) with Test Results (A66-VW).
A66-NW	GammaVision Single Use Network Copy. Requires current version of A66-BW. Example: For a three-station network, order one copy of A66-BW and two copies of A66-NW.
A66-UW	GammaVision Update from A66-B32, A66-BW, or A66-NW to latest version of GammaVision.
A66-UVW	GammaVision software update (A66-UW) with Test Results (A66-VW).
A66-GW	Additional Hard Copy Documentation for GammaVision.
A66-VW	GammaVision V&V Test Results and Certificate of Validation.
A66SV-BW	GammaVision Gamma Spectroscopy Software for Windows (Scintillator Only Option).
A66SV-NW	GammaVision Single Use Network Copy (Scintillator Only Option). Requires current version of A66SV-BW.
A66SV-UW	GammaVision Update from A35-B32 (ScintiVision) or A66SV-BW models to current version of A66SV-BW.

Subscriptions

Subscriptions are available for any current GammaVision license acquired through the purchase of A66-B32, A66-BW, A66-NW, A66-BVW, and A66-UVW models. Subscriptions provide automatic updates for one licensed copy as new releases become available.

A66-2YW	2 year subscription for A66-BW
A66-3YW	3 year subscription for A66-BW
A66-4YW	4 year subscription for A66-BW
A66-5YW	5 year subscription for A66-BW

Options

A11-BW	CONNECTIONS Programmer's Toolkit with ActiveX™ Controls
A44-BW	Report Writer Option for GammaVision
A49-B32	DataMaster Spectrum File Conversion
ANGLE-B32	Advanced Efficiency Calibration Software for HPGe Detectors
C53-B32	Nuclide Navigator® III Master Library
Global Value	Productivity Suite for GammaVision
LVIS-B32	Counting Laboratory Application Manager

Specifications subject to change
091815

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