

A simply better software solution for Data Management and Analysis in Counting Laboratory Alpha Spectroscopy



- Detector control, status monitoring and sample analysis of up to 256 detectors on a single display.
- **Support for the latest ORTEC “Alpha Suite” spectrometers.**
- **Easier batch set up, quick search sample retrieval.**
- Additional flexibility through **new analysis modes.**
- Improved custom reporting, **Crystal Reports¹ version 11 compatibility.**
- Microsoft Access[®] compatible database storage of data and results: Easy LIMS (Laboratory Information Management System) interfacing.
- QA meets ANSI N42.23 and N13.30.
- On-line help feature.

¹SAP[®] Business Objects Crystal Reports[™]

AlphaVision®-32

A36-B32 V5.5

Alpha Spectroscopy Data Management and Analysis Software

The release of AlphaVision 5.5 coincides with the release of Alpha Suite, ORTEC's new series of alpha spectrometers. It carries over many of the features of previous versions of AlphaVision, but with significant enhancements in addition to support for the new hardware represented by the Alpha Suite, described in a separate brochure. New features in version 5.5 are shown in **bold italicized text**.

Since inception, AlphaVision has been designed to provide a comprehensive data management and analysis solution to the problems encountered in counting laboratories large and small, including commercial counting laboratories. The emphasis is on multiple samples, flexibility of sample preparation methods, and analysis types and reporting, all within a "set and forget" philosophy. The evolution of AlphaVision has been directed by "practitioners of the art" in busy counting laboratories world wide.

Sample Management

AlphaVision provides:

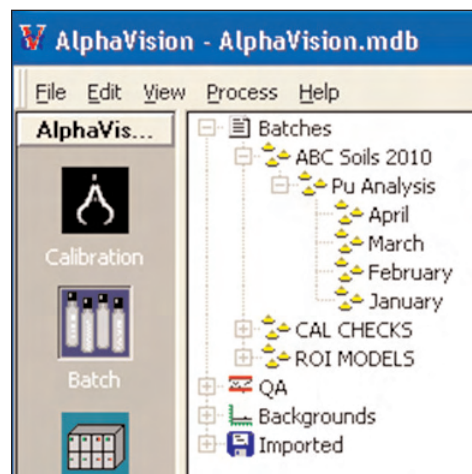
- A unified "control panel" for the management of up to 256 detectors from a single unified display.
- Easy to understand, logically and flexibly organized.
- "Set and Forget" approach for reliable, consistent analyses.
- Extensive "batching" capabilities simplify management of multiple sample types or samples from the same client.
- Powerful batch Explorer with **quick search data retrieval**.
- Real time detector, chamber, calibration, and process QA monitoring.
- Integrated online help with built-in searchable index.
- Flexible reporting capability through Access and **Crystal Reports® version 11**.
- Unique count-to-MDA preset capability.
- Sample dilution set up in the batch wizard:
 - Add tracer to whole sample; analyze whole sample.
 - Add tracer to whole sample; analyze aliquot.
 - Add tracer to whole sample and make up to 2 dilutions.
 - Add tracer to aliquot and analyze aliquot.

Database

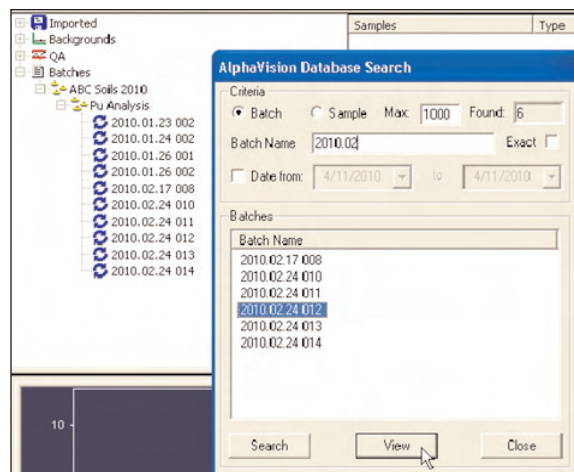
The Access-compatible database is provided for secure data archival. It is compatible with Crystal Reports and comes complete with standard reports for Analysis, Calibration, Background, Pulser Tests, and QA/QC.

These features are designed to simplify data handling processes. All spectra, analysis and QA data are stored in the database rather than in the ORTEC conventional SPC files. **However, if required, spectra can be exported to SPC files through the use of the Batch Explorer.**

The Batch Explorer now features a quick search capability to aid information retrieval. This lets you locate a particular sample or batch from any data category in the Batch Explorer Tree.



Batch Explorer Tree.



Quick Search.

Alpha Spectroscopy Data Management and Analysis Software

LIMS Interfacing

The Batch Wizard enables automatic transfer of sample information from a LIMS (Laboratory Information Management System). Integration with a specific LIMS is a simple programming task; details and a programming example are provided in the AlphaVision manual. ORTEC will provide custom programming services on request for a modest fee; actual cost will vary according to specific requirements.

Step 1: Sample login. The sample is logged into the laboratory's LIMS.

Step 2: AlphaVision. All sample parameters and data Sample ID, Sample Volume and Mass, Sample Collection Date and Time, Decay Correction Date, Laboratory Preparation Date and more, are easily transferred directly from the LIMS. Reducing the risk of transcription error, eliminating a time-consuming step in the sample-data management process, and reducing the overall cost-per-sample.

Step 3: Post Analysis. The Access database archive allows extraction and transfer of analytical results back to the LIMS.

Flexible Output Options

Report generation is based around templates. Standard reports (Analysis, Background, Calibration, and QA) are included and it is simple to create custom reports using Crystal Reports or Access. A graphical representation of the spectral data is included in the one-page standard reports supplied with the software. All analysis details are included in the Access database for easy, customized reporting needs. Totally custom report templates may be generated through the use of **Crystal Reports Version 11**.

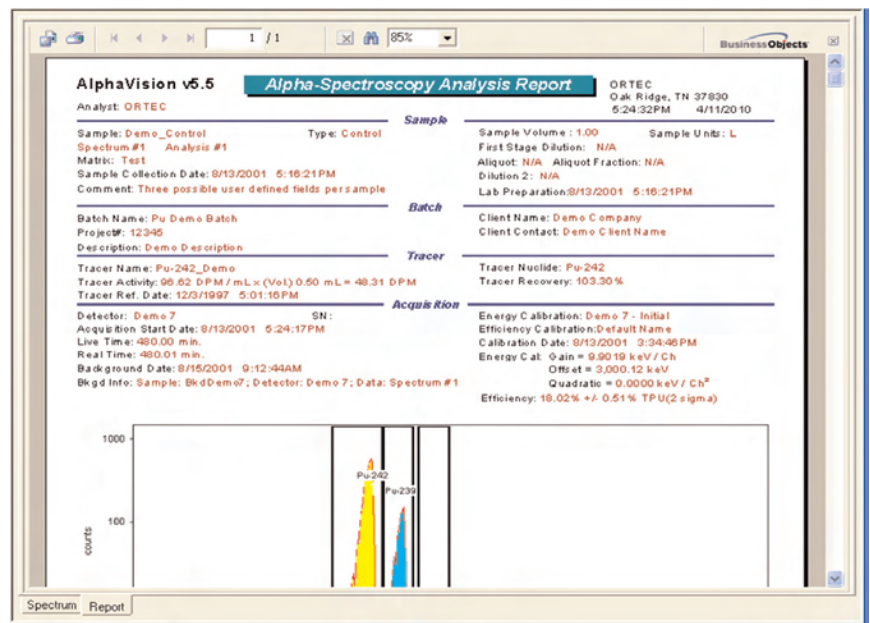
Nuclide Library Management

A built-in Nuclide Library editor provides simple creation and editing of calibration, tracer, and analyte libraries. Libraries may be created and downloaded from the ORTEC Nuclide Navigator III (optional) or created directly from the Master Nuclide Library included with AlphaVision. The Master Nuclide Library is a compilation of nuclear data from PCNuDat (National Nuclear Data Center, Brookhaven National Laboratory). **There is no limit to the number of peak energies per nuclide.**

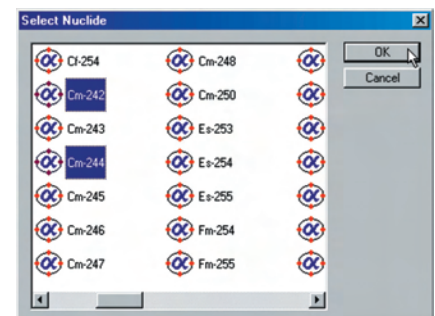
Security

AlphaVision offers a data-management and hardware-operation security process that enables a system manager to assign users appropriate levels of access to QA and analysis data functions; tracer, calibration source, and control solution editors; manipulation of the detector grid; changes to batch templates; and archive processes.

In addition, administrator level security prevents unauthorized changes to Batch Templates and the moving of Detector icons on the on-screen grid. The Database Management Tool is similarly protected.



Report Window



Select Library Nuclides with a Few Mouse Clicks.

AlphaVision Analysis Methods

The emphasis is to provide the analytical tools necessary for the widest variety of sample types and situations:

- Region-of-Interest (ROI) or peak search and fit spectrum analysis.
- ***New Peak Search for Low-Count, Asymmetric Peaks.***
- Interactive or "production" analysis modes.
- Internal or external tracers; No-tracer analyses.
- Sample and tracer decay corrections, ***including manual entry of chemical recovery factor.***
- Tracer contamination correction.
- Background analyses with blank subtraction option.
- Choice of Flexible Detection Limit Formalisms.
- Detector quality control analyses.
- Process quality control analyses.
- User defined sample analyses.
- Flexible Calibrations with Calibration Explorer for easy review.

Peak Finding and Area Determination

Peak Area Determination by Region-of-Interest (ROI)

The region-of-interest (ROI) analysis technique is the primary method for spectrum analysis when the peak locations and shapes are well-known and reproducible. This analysis technique provides integration of counts between a start and end channel and includes user options for background count subtraction and peak location (calibration) adjustment based on tracer peak location and width. ROIs may be specified in energy or in channels; analysis of spectra gathered on detectors with differences in gain/offset and number of channels are handled easily by this means.

Peak Area Determination by Peak Search

AlphaVision offers a choice of peak search and fit algorithms. The methods enable deconvolution and analysis of complex spectra with accuracy and reliability. There are two peak search algorithms to choose from: Mariscotti 2nd Derivative² and Top-Hat Correlation.³

In addition, a library-driven peak fit technique adds user (library) provided nuclide information to assist in the most complex deconvolutions.

New Peak Search for Low-Count, Asymmetric Peaks

AlphaVision v5.5 introduces a new peak search/fit methodology for use when you must fit a peak, even when count statistics, poor shape, or overlap could make it a poor candidate for the standard AlphaVision peak search/fit algorithm. It uses an ROI set to direct the analysis to certain regions of the spectrum, as well as an iterative peak stripping technique.

Interactive Spectral Analysis Mode

Allows an easy way to modify regions-of-interest and update analysis results.

²M.A. Mariscotti. "A Method for Automatic Identification of Peaks in the Presence of Background and its Application to Spectrum Analysis," *Nuclear Instruments and Methods* 50, 309–320 (1967).

³K. Debertin and R.G. Helmer. *Gamma- and X-Ray Spectrometry with Semiconductor Detectors*, Elsevier Science, 1988. (If peak shapes are well-controlled (through good sample preparation) the Top-Hat method is likely to yield better results than the Mariscotti method in which peak width is a free parameter.)

Sample Activity Calculation

Once the peak area has been determined, either via ROI analysis or as a result of the peak search (library search) techniques, the sample activity is calculated using one of two methods:

Absolute Analysis

With the detector efficiency known, the sample activity is calculated directly from the analyte peak areas, with no correction for an internal tracer. Manual chemical recovery values, (i.e., from an external tracer), can be added by the user.

Relative or "Tracer" Analysis

Using the relative analysis technique, the sample results are modified by the ratio of tracer activity found to the tracer activity added.

This calculation is performed concurrently with the analysis and is completely automatic. Chemical recovery values can be tracked by the built-in QA features, and tracer contaminants which may affect analyte results can be automatically subtracted during the analysis. Tracer analysis options include Internal or External (non-alpha-emitting) tracers, corrections for tracer contamination and tracer decay.

Multiple dilution options are provided to allow for flexibility when tracer and sample are mixed and in what way (aliquot or total). ***If chemical recovery has been determined by an alternative method, e.g., gamma spectroscopy, a new manual chemical recovery feature allows application to all samples in a batch.***

Activity and Volume Units

AlphaVision offers flexible choices for activity units of measure through the Tracer, Calibration Source, and Control Solution editor dialogs. The choices are:

Disintegrations per minute (DPM)

curies (Ci)

millicuries (mCi)

microcuries (μCi)

nanocuries (nCi)

picocuries (pCi)

femtocuries (fCi)

millibecquerels (mBq)

becquerels (Bq)

kilobecquerels (kBq)

The default is DPM.

The Tracer amount may be entered in grams (g) or milliliters (mL).

The Control Solution volume may be entered in grams (g) or milliliters (mL).

Flexible Detection Limit Calculation Options

AlphaVision includes the capability for Minimum Detectable Activity (MDA) and Critical Level (Lc) calculations using (user selectable) background or batch blank options. The user can select a default ANSI N13.30 equation or choose the general Currie equation for estimating the detection limits. The standard analysis report displays MDA and Lc based on ANSI N13.30 and N42.23 in user defined units.

AlphaVision®-32

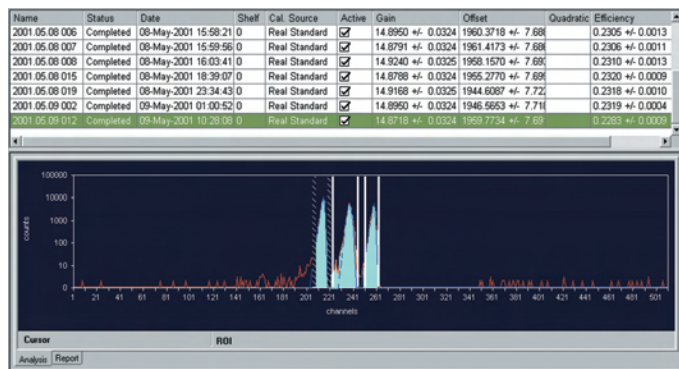
A36-B32 V5.5

Alpha Spectroscopy Data Management and Analysis Software

System Calibration

AlphaVision provides energy and efficiency calibrations based upon calibration standards. The calibration process may be done interactively (a manual calibration), or automated according to user needs. The calibration is written to the Access compatible database and may be browsed using the calibration Explorer.

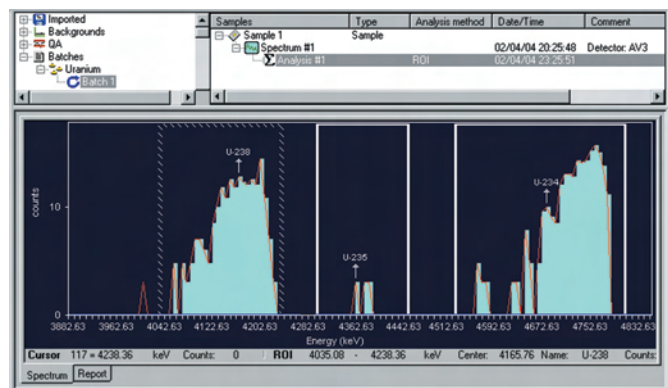
Calibration data records include the record Name, acquisition Date, Calibration ID, Gain, Offset, and Efficiency.⁴ A complete history of calibration analyses and results for each detector is simply displayed. For analyses in which an internal tracer is used, the efficiency calibration can be used to determine the chemical recovery factor.



Calibration Explorer Panel.

Interactive Spectral Analysis

Graphical review and built-in plot generation provide advanced tools for spectral reanalysis. Analysis (initial), Reanalysis (create a new analysis), Update Analysis (update/overwrite information or analysis parameters for an analyzed spectrum) are all provided. For ROI analysis, a built-in interactive reanalysis tool provides graphical adjustment of analysis regions by energy or by channel. Peak search and fit parameters may be adjusted to create a new analysis for comparison or to update a current analysis.

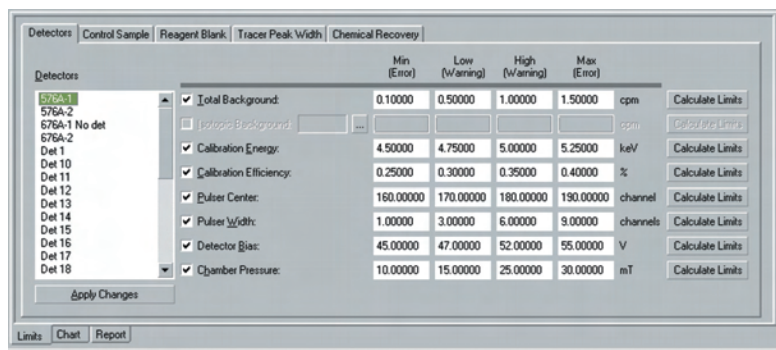


Reanalysis is Complete, All ROIs have Shifted, and the Analysis Date has Updated.

Quality Assurance⁵

Built-in Quality Assurance provides the tools needed to meet the QA recommendations of ANSI N42.23 and ANSI N13.30. Dynamic built-in control charting and QA reporting features can monitor and trend the entire analysis process with warning and alarm limits, control charts, and tabular reports for any or all of the following:

- Chamber Background
- Energy and Efficiency Calibration
- Standard Sample Activity
- Control Sample Activity
- Reagent Blank Activity
- Tracer Peak Shape
- Chemical Recovery
- Pulser Amplitude and Width
- Detector Bias (Alpha Duo, Alpha Ensemble, OCTÊTE PC®, OCTÊTE™-Plus and Oxford Oasis™)
- Sample Chamber Pressure (Alpha Duo, Alpha Ensemble, OCTÊTE PC, OCTÊTE-Plus and Oxford Oasis)



QA Panel, Detectors Tab.

⁴A recent addition is the Nuclide Activity Summary section of the calibration report now includes the FWHM for each identified peak. Existing users upgrading to v5.5 can reanalyze older samples to obtain the new report with this FWHM data.

⁵Improvements in v5.5 include easier QA limits set up and improved organization of background and QA pulser batches.

Alpha Spectroscopy Data Management and Analysis Software

QA monitors are easily tailored to specific laboratory needs. Control charts by week, month, quarter, or user-defined date range, with warning and alarm limits displayed on each chart are available. Each chart may be viewed interactively, allowing examination of data from any monitored parameter. A QA "date tool" enables the user to instantly produce a historical snapshot of detector performance.

Hardware Supported

The latest generation Alpha Suite integrated spectrometers are recommended: Alpha Aria, Alpha Duo and Alpha Ensemble.

Also supports the ORTEC 576A and Soloist,

The following MCBs which may be combined with various spectrometer hardware are supported: 920-8, 920-16, and 920E.

ORTEC has a policy of supporting "legacy" hardware. Spectrometer hardware such as the ORTEC 676, AlphaKing, TC256, and Canberra 7401/7404 are supported through ORTEC MCBs. Also supports ORTEC integrated spectrometers OCTÊTE-PC and OCTÊTE-Plus and the Oxford Oasis.

Many other ORTEC MCBs are supported, consult ORTEC for your model.

Operating System Requirements

AlphaVision-32 V5.5 requires the Windows 2000, XP, or Vista operating systems and any computer capable of running the stated operating systems.

Ordering Information

Model	Description
A36-B32	AlphaVision-32 V5.5 standalone or first network copy (includes documentation and Binary Use License)
A36-G32	Additional documentation for A36-B32
A36-K32	Upgrade from A36-BI to A36-B32
A36-K32-D	Upgrade from A26-BI to A36-B32 or A36-N32
A36-N32	Multiple user add-on (includes BUL, disks, and documentation)
A36-U32	Update for A36-B32 or A36-N32 (requires BUL from any version of AlphaVision-B32)

Example: For a three-station network, order one copy of A36-B32 and two copies of A36-N32.

AlphaVision®-32

A36-B32 V5.5

Alpha Spectroscopy Data Management and Analysis Software

Specifications subject to change
0501110

ORTEC®

www.ortec-online.com

Tel. (865) 482-4411 • Fax (865) 483-0396 • ortec.info@ametek.com
801 South Illinois Ave., Oak Ridge, TN 37831-0895 U.S.A.
For International Office Locations, Visit Our Website

AMETEK®
ADVANCED MEASUREMENT
TECHNOLOGY