

# ORTEC®

## AlphaVision®

Alpha Spectrometry Management Software



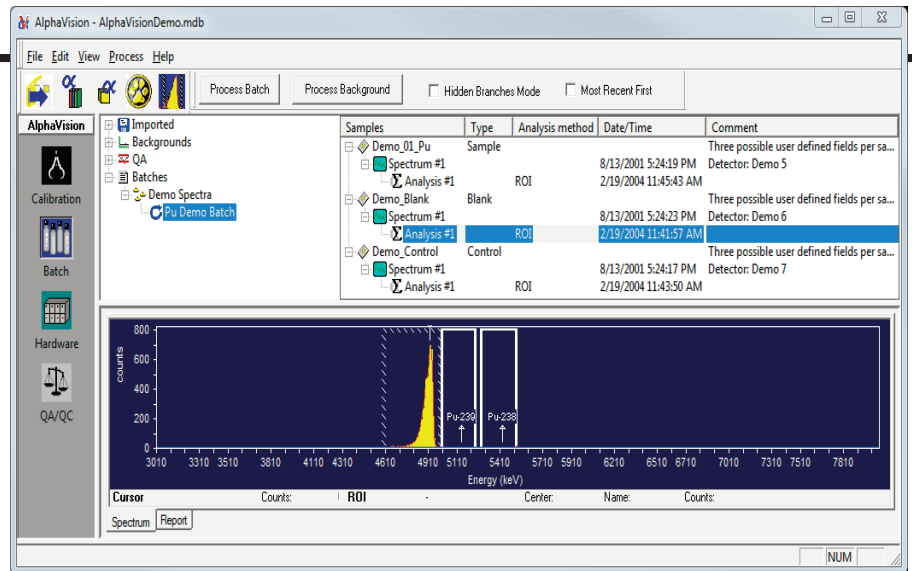
“The Comprehensive Alpha Spectrometry Solution for Compatible, Efficient, and Defendable Alpha Measurements.”

**AMETEK®**  
ADVANCED MEASUREMENT TECHNOLOGY

# AlphaVision

AlphaVision is a comprehensive PC-based alpha spectrometry application that combines rich features and intuitive processes to meet the demands of modern Radiochemistry Laboratories.

In large scale commercial laboratories with hundreds of alpha detectors or small labs with only a few detectors, AlphaVision is your solution to optimize routine measurement processes and monitor system performance.



## Why AlphaVision?

### Compatibility

- Operates in the most common PC environments — Windows 7 (32 & 64 bit) and Windows XP.
- Microsoft Access Database with Data Management tools and LIMS integration capability.
- Crystal Reports integration for Rich Standard Reports and Custom Report capability.
- Extensive Analysis capability to accommodate a wide variety of Radiochemistry processes.

### Process Efficiency

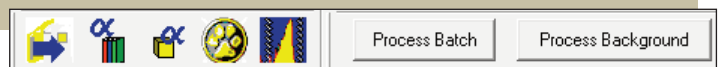
- Batch Configuration process with LIMS<sup>1</sup> integration to maximize throughput and minimize errors.
- Intuitive Sample Management including Query tools to quickly locate Batches and Samples.
- Rapid Data Review and Analysis modification process.
- Integrated Hardware control for up to 256 detectors in a common interface.

### Defendable Results

- Security controls to limit user access to authorized functions.
- Compliance with Industry Standards such as ANSI N13.30 and N42.23.
- Comprehensive Quality Control features.
- Historical Analysis retention when re-analyzing samples.
- Detailed Event Logging for routine operations, warnings, and errors.

## Now Introducing AlphaVision 6.0!

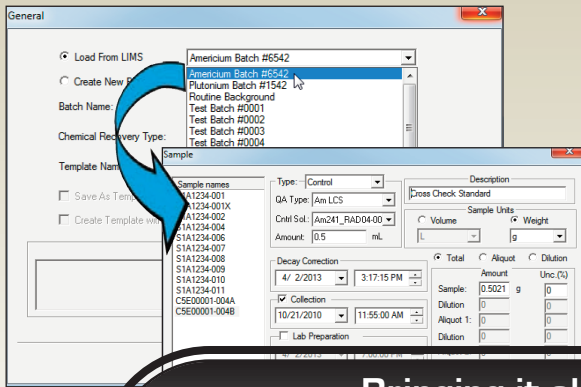
- New!** 64-Bit Windows 7 Compatibility.
- New!** Crystal Reports Version 11.5 Integration for reliable custom reports compatible with common file formats.
- New!** Integrated Hardware Control to instantly change vacuum, pulser, or high voltage status on large detector groups.<sup>2</sup>
- New!** Automated ROI Adjustment for gain shift corrections during analysis.
- New!** Automated Spectrum and Report Export during batch counting processes for use with external applications.
- New!** Formal Verification and Validation test results available as an option.
- New!** Toolbar Controls for rapid access to the most common menu functions.



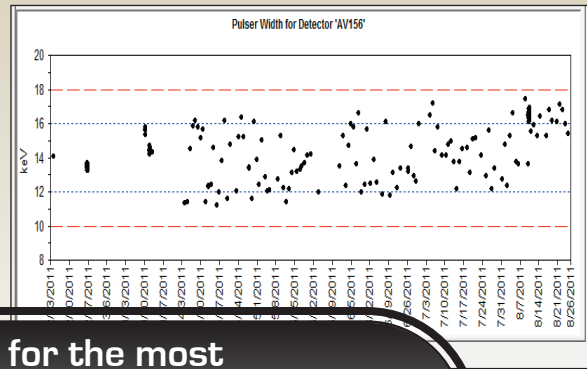
<sup>1</sup> Laboratory Information Management System.

<sup>2</sup> Hardware control is available for instruments with software control capability.

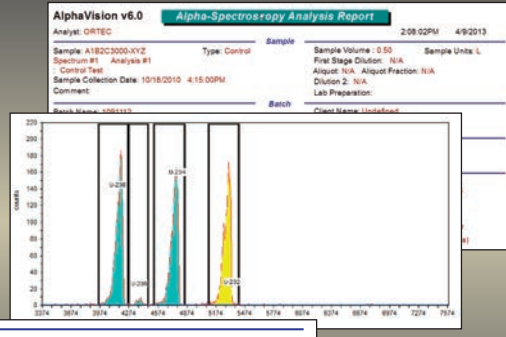
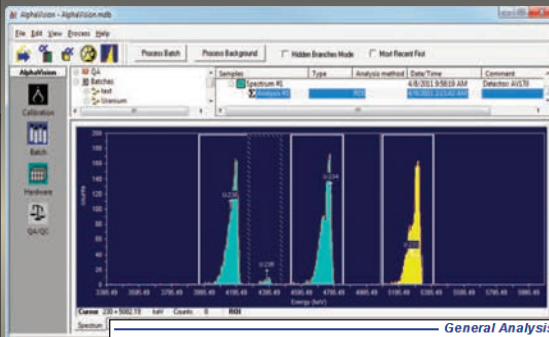
## Batch Automation



## Quality Assurance



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

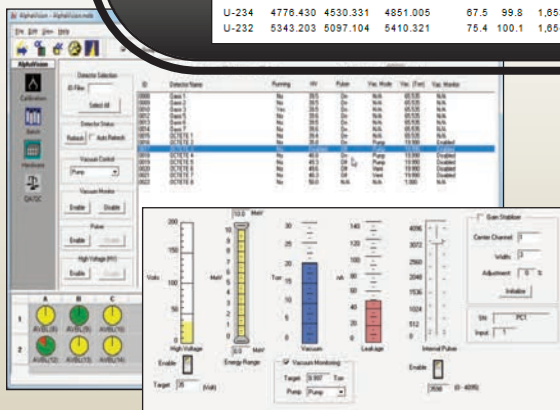


Analysis Method: ROI Analysis, Set Name = UROI  
Decay Correction: 4/7/20 11 3:26:52PM  
MDA Constants:  $K_{\alpha} = 1.64$ ,  $K_{\beta} = 1.64$

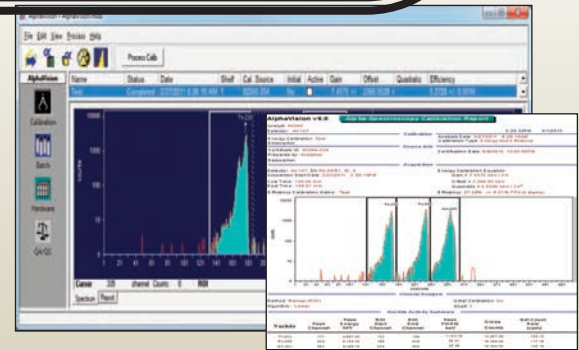
Nuclide Library: Uranium  
MDA Source: Background

### Nuclide Summary (ROI)

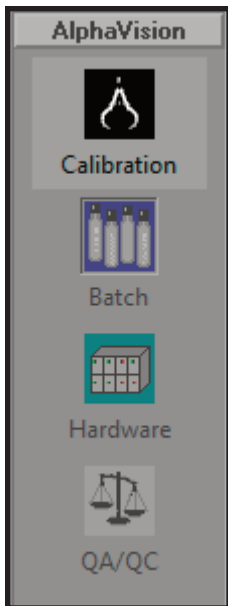
| Nuclide | Peak Energy keV | ROI Start keV | ROI End keV | FWHM keV | B.R. % | Gross Counts | Bkgd Counts | Net Counts | Activity pCi/L | 1.00Sigma TPU pCi/L | Critical Level pCi/L | MDA pCi/L  |
|---------|-----------------|---------------|-------------|----------|--------|--------------|-------------|------------|----------------|---------------------|----------------------|------------|
| U-238   | 4157.453        | 3958.099      | 4261.858    | 70.9     | 100.0  | 1,777.00     | 0.0000      | 1,777.00   | 6.959E+000     | 4.274E-001          | 0.000E+000           | 1.000E-002 |
| U-235   | 4381.179        | 4269.316      | 4470.670    | 67.9     | 80.2   | 59.00        | 0.0000      | 59.00      | 2.881E-001     | 4.109E-002          | 0.000E+000           | 1.321E-002 |
| U-234   | 4776.430        | 4530.331      | 4851.005    | 67.5     | 99.8   | 1,853.00     | 0.8000      | 1,652.20   | 6.483E+000     | 4.004E-001          | 7.746E-003           | 2.611E-002 |
| U-232   | 5343.203        | 5097.104      | 5410.321    | 75.4     | 100.1  | 1,854.00     | 2.4000      | 1,651.60   | 6.116E+000     | 3.437E-001          | 1.445E-002           | 4.033E-002 |



## Hardware Control



## Calibration



## Calibration

- α Energy and Efficiency Calibration
- α Automated and Interactive Peak Fit
- α Traceable Historical Calibration Records
- α Active/Deactivate Calibrations
- α Customizable Calibration Report
- α Unlimited Calibration Standards

AlphaVision - AlphaVision.mdb

File Edit View Process Help

Process Calib

| Name             | Status    | Date                   | Shelf | Cal. Source | Initial | Active                              | Gain                     | Offset                   | Quadratic | Efficiency        |
|------------------|-----------|------------------------|-------|-------------|---------|-------------------------------------|--------------------------|--------------------------|-----------|-------------------|
| 2011.07.27_AV002 | Completed | 7/27/2011 10:48:26 PM  | 1     | 82242-334   | No      | <input type="checkbox"/>            | 7.4575 +/- 0.0131 KeV/ch | 3366.9528 +/- 3.1260 KeV |           | 0.2713 +/- 0.0022 |
| 2011.09.29_AV002 | Completed | 8/31/2011 11:25:48 AM  | 1     | 82236-334   | No      | <input type="checkbox"/>            | 7.4575 +/- 0.0131 KeV/ch | 3366.9528 +/- 3.1260 KeV |           | 0.2740 +/- 0.0022 |
| 2011.09.29_AV002 | Completed | 9/29/2011 11:47:47 PM  | 1     | 82236-334   | No      | <input type="checkbox"/>            | 7.4575 +/- 0.0131 KeV/ch | 3366.9528 +/- 3.1260 KeV |           | 0.2722 +/- 0.0022 |
| 2011.10.31_AV002 | Completed | 10/31/2011 10:04:05 AM | 1     | 82236-334   | No      | <input checked="" type="checkbox"/> | 7.4575 +/- 0.0131 KeV/ch | 3366.9528 +/- 3.1260 KeV |           | 0.2745 +/- 0.0022 |
| 2011.11.11_AV002 | Completed | 11/28/2011 6:40:36 AM  | 1     | 82236-334   | No      | <input type="checkbox"/>            | 7.4575 +/- 0.0131 KeV/ch | 3366.9528 +/- 3.1260 KeV |           | 0.2732 +/- 0.0022 |

**AlphaVision v6.0 Alpha-Spectroscopy Calibration Report**

Analyst: 60040  
 Detector: AV147  
 Calibration: 5:20:32PM 4/1/2013  
 Analysis Date: 2/27/2011 6:26:18AM  
 Calibration Type: Energy And Efficiency

Energy Calibration: Test  
 Description:   
 Certificate ID: 82240-334  
 Prepared by: Analytics  
 Description:   
 Certification Date: 6/8/2010 12:00:00PM

Acquisition  
 Detector: AV147, SN:50-05R1, ID: 0  
 Acquisition Start Date: 2/25/2011 2:06:18PM  
 Energy Calibration Equation: Gain = 7.4575 keV/Ch  
 Live Time: 140.00 min. O Resol = 3.366.95 keV  
 Real Time: 140.01 min. Quadratic = 0.0000 keV/Ch<sup>2</sup>  
 Efficiency Calibration Name: Test  
 Efficiency: 27.28% +/- 0.31% TPU (2 sigma)

General Analysis  
 Method: Manual (ROI) Initial Calibration: No  
 Algorithm: Linear Shelf: 1

| Nuclide | Peak Channel | Peak Energy keV | ROI Start Channel | ROI End Channel | Peak FWHM keV | Gross Counts | Net Count Rate (cpm) |
|---------|--------------|-----------------|-------------------|-----------------|---------------|--------------|----------------------|
| Th-230  | 177          | 4.68750         | 132               | 186             | 1.75276       | 14,297.00    | 102.12               |
| Pu-239  | 240          | 5.15540         | 186               | 249             | 26.51         | 16,489.00    | 117.78               |
| Am-241  | 284          | 5.48570         | 249               | 303             | 25.98         | 16,064.00    | 136.19               |

Calibration Source: STD-123

Certificate ID: STD-123  
 Manufacturer: Source Supplier  
 Certification: 2/24/2011  
 11:00:00 AM

Source Activity Units: DPM

Nuclides

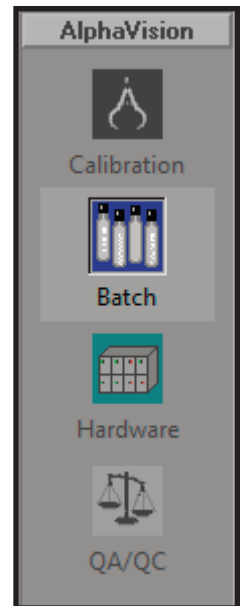
| Name   | Activity (DPM) |
|--------|----------------|
| Th-230 | 410.0000       |
| Pu-239 | 330.0000       |
| Am-241 | 330.0000       |

Add... Edit... Remove

OK Cancel

## Batch Automation

- α Analysis Templates for Consistent Processes
- α LIMS Integration Capability
- α Extensive Analysis Options for Peak Fit, Activity Calculations including Tracer and Dilution Schemes, and Detection Limits
- α Custom Reports with Crystal Reports 11.5
- α True “Count to MDA” Presets
- α Interactive Review/Reanalysis



AlphaVision - AlphaVision.mdb

File Edit View Process Help

Process Batch    Process Background     Hidden Branches Mode     Most Recent First

| Samples     | Type | Analysis method | Date/Time           | Comment         |
|-------------|------|-----------------|---------------------|-----------------|
| Spectrum #1 |      |                 | 4/8/2011 9:58:19 AM | Detector: AV170 |
| Analysis #1 | ROI  |                 | 4/9/2011 2:11:42 AM |                 |

counts

Energy (keV)

U-238    U-235    U-234

3995.49    4195.49    4395.49    4595.49    4795.49    49

Units: 0    ROI

General

Load From LIMS

Americium Batch #6542

Plutonium Batch #1542

Batch Name: Routine Background

Chemical Recovery Type: Test Batch #0001

Template Name: Test Batch #0002

Sample

| Sample names  | Type            | Description          |
|---------------|-----------------|----------------------|
| S1A1234-001   | Control         |                      |
| S1A1234-001X  |                 |                      |
| S1A1234-002   | QA Type: Am LCS | Cross Check Standard |
| S1A1234-004   |                 |                      |
| S1A1234-006   |                 |                      |
| S1A1234-007   |                 |                      |
| S1A1234-008   |                 |                      |
| S1A1234-009   |                 |                      |
| S1A1234-010   |                 |                      |
| S1A1234-011   |                 |                      |
| C5E00001-004A |                 |                      |
| C5E00001-004B |                 |                      |

Amount: 0.5 mL

Decay Correction: 4/ 2/2013 3:17:15 PM

Collection: 10/21/2010 11:55:00 AM

Lab Preparation: 4/ 2/2013 7:00:00 PM

User defined

Key:    Value:

Tracer Amt: 0.1    Manual CR: 0 (%)

Calc. Dilution: 1.000e+000

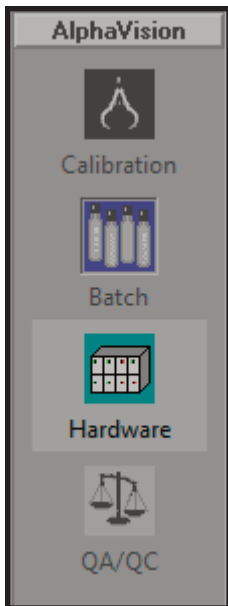
Sample: 0.5021 g    Dilution: 0    Amount: 0    Unc (%): 0

Aliquot 1: 0    Dilution: 0    Amount: 0    Unc (%): 0

Aliquot 2: 0    Dilution: 0    Amount: 0    Unc (%): 0

< Back    Next >    Finish    Cancel





## Hardware Control

- α Rapid Detector “Group” Operations
- α Integrated Instrument Control Based on Instrument Type
- α Detector Status Indicators “at a glance”
- α Automated Instrument Setup
- α Configurable Detector Grid

**AlphaVision - AlphaVision.mdb**

File Edit View Help

☑ Show Group Control

AlphaVision

Detector Selection  
 ID Filter:   
 Select All

Detector Status  
 Refresh  Auto Refresh

Vacuum Control  
 Pump

Vacuum Monitor  
 Enable Disable

Pulsar  
 Enable Disable

High Voltage (HV)  
 Enable Disable

| ID   | Detector Name | Running | HV       | Pulsar | Vac. Mode | Vac. (Torr) | Vac. Monitor |
|------|---------------|---------|----------|--------|-----------|-------------|--------------|
| 0008 | Dasis 1       | No      | 39.5     | On     | N/A       | 65.535      | N/A          |
| 0009 | Dasis 2       | No      | 39.5     | On     | N/A       | 65.535      | N/A          |
| 0010 | Dasis 3       | Yes     | 39.5     | On     | N/A       | 65.535      | N/A          |
| 0012 | Dasis 5       | No      | 39.6     | On     | N/A       | 65.535      | N/A          |
| 0013 | Dasis 6       | No      | 39.5     | On     | N/A       | 65.535      | N/A          |
| 0014 | Dasis 7       | No      | 39.6     | On     | N/A       | 65.535      | N/A          |
| 0015 | OCTETE 1      | No      | 39.4     | On     | N/A       | 65.535      | N/A          |
| 0016 | OCTETE 2      | No      | 39.8     | On     | Pump      | 19.990      | Enabled      |
| 0017 | OCTETE 3      | No      | Disabled | Off    | Pump      | 19.990      | Enabled      |
| 0018 | OCTETE 4      | No      | 48.8     | On     | Pump      | 19.990      | Disabled     |
| 0019 | OCTETE 5      | No      | 48.3     | Off    | Pump      | 19.990      | Disabled     |
| 0020 | OCTETE 6      | No      | 49.6     | Off    | Vac       | 19.990      | Disabled     |
| 0021 | OCTETE 7      | No      |          |        |           | 19.990      | Disabled     |
| 0022 | OCTETE 8      | No      |          |        |           | 19.990      | Disabled     |

Auto Refresh Interval: 2 (sec.)

View (O) PULSER OPERATION

Reset

Chamber 1 (lenctude) Chamber 2 (lenctude) Chamber 3 (lenctude) Chamber 4 (lenctude) Chamber 5 (lenctude) Chamber 6 (lenctude) Chamber 7 (lenctude) Chamber 8 (lenctude)

|   | A        | B        | C        | D | E        | F        | G        | H        |
|---|----------|----------|----------|---|----------|----------|----------|----------|
| 1 | AVBL(8)  | AVBL(9)  | AVBL(10) |   | AVBL(15) | AVBL(16) | AVBL(17) | AVBL(18) |
| 2 | AVBL(12) | AVBL(13) | AVBL(14) |   | AVBL(19) | AVBL(20) | AVBL(21) | AVBL(22) |

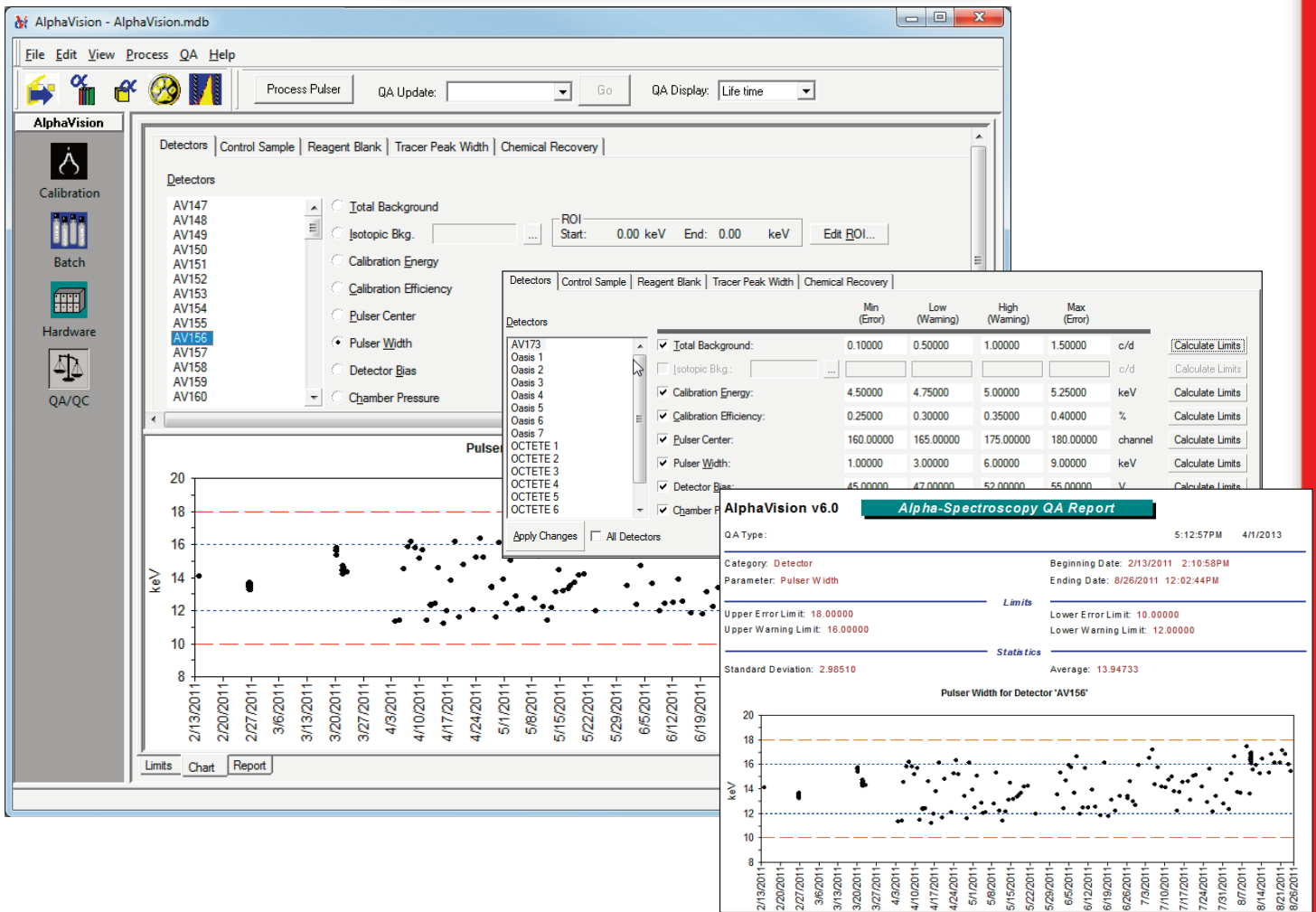
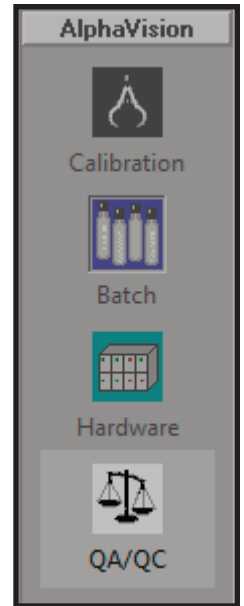
High Voltage: 0-200 V  
 Energy Range: 0-10 MeV  
 Vacuum: 0-30 Torr  
 Leakage: 0-140 nA  
 Internal Pulsar: 0-4096

Target: 35 (Volt)  
 Target: 9.997 Torr  
 Pump: Pump

SN: PC1  
 Input: 1

## Quality Assurance

- α ANSI N42.23 and ANSI N13.30 Compliant
- α Automated Control Charts and Reports
- α Warning/Alarm Limit Calculations
- α Monitoring Parameters:
  - ✓ Detector Background (Total and Isotopic)
  - ✓ Calibration Energy and Efficiency
  - ✓ Pulser Centroid and Width
  - ✓ Detector Bias and Chamber Pressure
  - ✓ Reagent Blank Nuclide Activity
  - ✓ Control Sample Nuclide Activity
  - ✓ Tracer Peak Width
  - ✓ Chemical Recovery



# AlphaVision

## Specifications

**Operating System Requirements** Windows 7 (32 and 64-bit) and Windows XP (32-bit)

### Supported Hardware

ORTEC Alpha Suite integrated spectrometers (Alpha Aria, Duo, Ensemble, and Mega) are recommended in order to take advantage of the software controlled operations and Windows 7 64-bit USB connectivity.

Legacy instrumentation compatible with ORTEC CONNECTIONS such as ORTEC OCTÊTE-PC, OCTÊTE-Plus, 576A, Soloist, 920 series, and Oxford OASIS, as well as the ORTEC 676 Alpha King, Tennelec TC-256, and Canberra 7401/7404 models which are supported through ORTEC MCBs. Connectivity to these devices may be limited to Windows XP or Windows 7 32-bit operating systems depending on the communication protocol employed.

Contact your local representative to determine if your instrument is supported in the desired operating systems, or if an alternative communication protocol, such as the DPM-USB, is available.

### Analysis Methodology

- Peak Search/Fit Methods: Second Derivative (Mariscotti)<sup>3</sup>, Top Hat Correlation<sup>4</sup>, Peak Interference Correction, ROI (Regions of Interest) including automatic shift of ROIs based on the Tracer Peak, Best Peak, or All Peak positions, and Interactive ROI Adjustment to optimize peak fit during reanalysis.
- Nuclide Activity Calculations: Absolute (no Tracer), Tracer Recovery Correction, Chemical Recovery Correction (Automatic and Manual), Background Subtraction, Blank Subtraction, Total Propagated Uncertainty.
- MDA Methods: KTA, Currie, ANSI N13.30, (corrections such as dilution scaling, tracer and chemical recovery, etc. included).
- Presets: Real and Live Time, Tracer Peak Area, MDA.

### System Management

- Select, Archive, and Compact Database.
- Search Samples by Batch/Sample ID or Batch Tree Navigation.
- Event Log captures process information, warnings, and errors.
- Purge Data.
- Security:
  - ◆ Configuration – Save Batch Template, Edit Sample Properties and Client Info, Edit Master Nuclide Library, Nuclide Libraries, Standards, Tracers, and ROIs.
  - ◆ Detector Management – Add, Remove, Configure, Move, Edit Properties, Calibrate, Edit Chamber Pressure and Leakage Current Thresholds.
  - ◆ Quality Assurance – Edit QA Types and Limits.
  - ◆ System – View and Clear Event Log, Edit Batch Tree, Edit Users and Security Levels.

## Ordering Information

| Model   | Description   |
|---------|---|
| A36-BW  | AlphaVision Alpha Spectrometry Management Software for Windows. Includes standalone or first network copy and binary use license.                             |
| A36-BVW | AlphaVision software (A36-BW) with V&V Test Results and Certificate of Validation (A36-VW).   |
| A36-NW  | Single Use Network Copy. Requires current version of AlphaVision.<br>Example: For a three-station network, order one copy of A36-BW and two copies of A36-NW. |
| A36-UW  | Update from A36-B32, A36-BW, or A36-NW to latest version of AlphaVision.  |
| A36-UVW | AlphaVision software update (A36-UW) with V&V Test Results and Certificate of Validation (A36-VW).  |
| A36-GW  | Additional Hard Copy Documentation for AlphaVision.   |
| A36-VW  | AlphaVision V&V Test Results and Certificate of Validation.   |

<sup>3</sup>M.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).

<sup>4</sup>K. 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.]

Specifications subject to change  
050213

**ORTEC**<sup>®</sup>

[www.ortec-online.com](http://www.ortec-online.com)

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

**AMETEK**<sup>®</sup>  
ADVANCED MEASUREMENT TECHNOLOGY