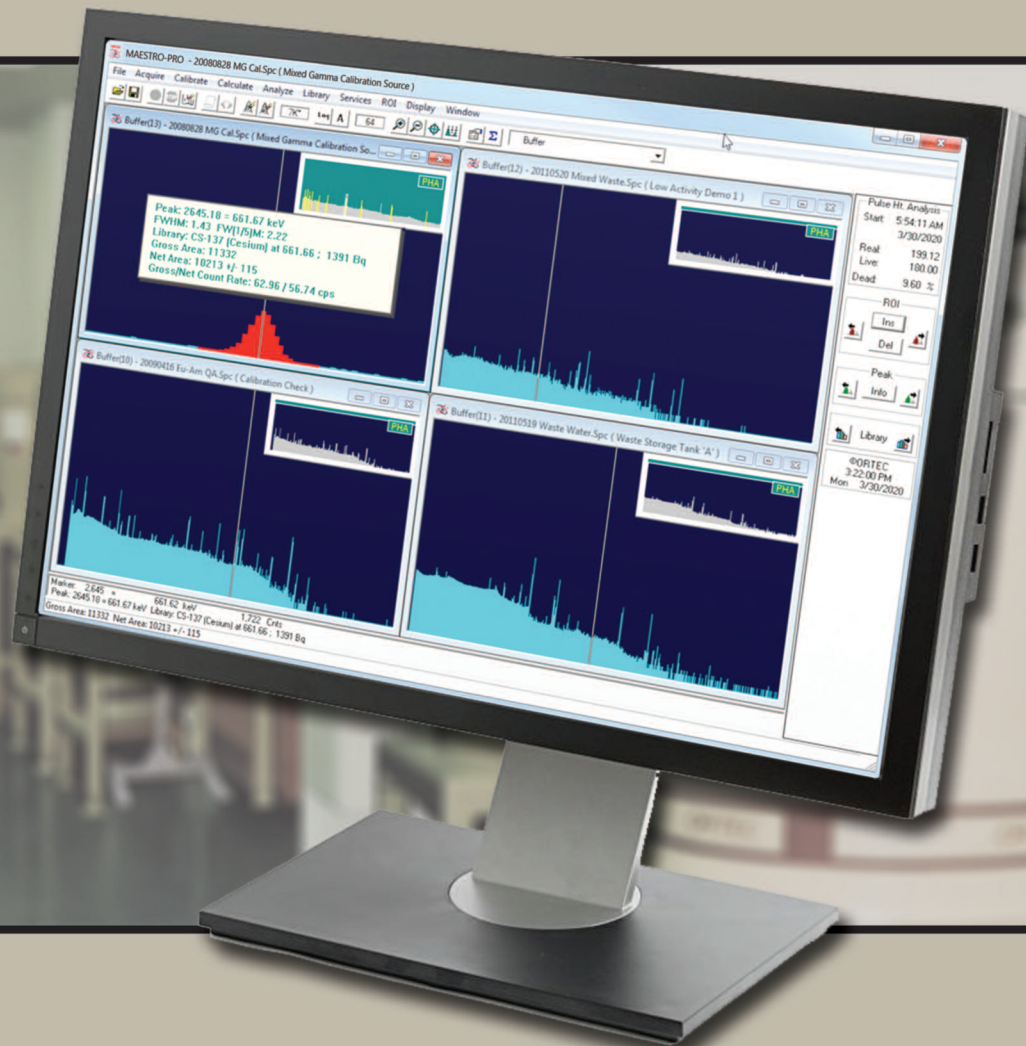


# ORTEC®

## MAESTRO-PRO Version 9

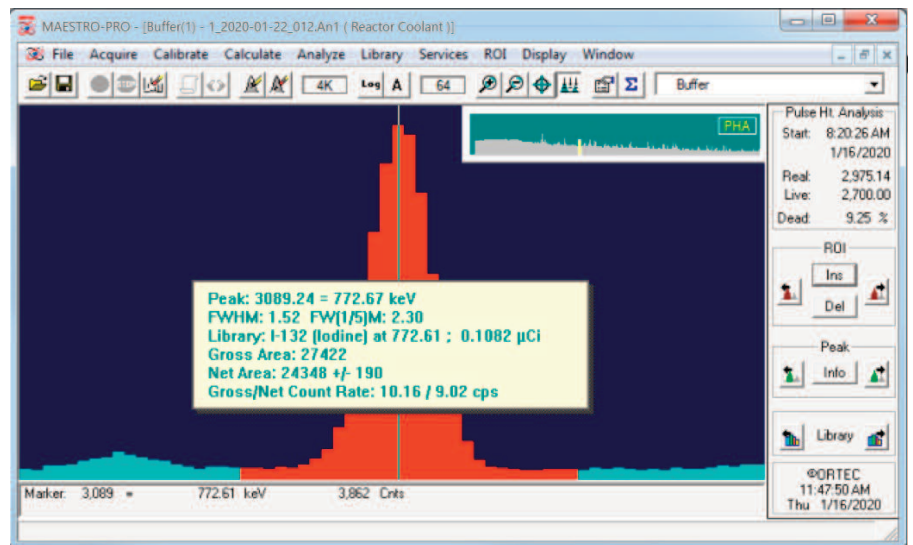
Advanced Spectroscopy Software



**AMETEK®**  
ADVANCED MEASUREMENT TECHNOLOGY

# MAESTRO-PRO 9.0

MAESTRO-Pro is an advanced spectroscopy application based on the same core as GammaVision — ORTEC's flagship gamma spectroscopy application. It expands the functionality of the traditional MAESTRO MCA Emulation application, which has been globally popular for decades, to include multiple languages, extensive calibration features, N42 spectrum file support, peak fit and analysis results display, expanded automation functions, and more. MAESTRO-Pro is the optimal solution for spectroscopy applications that require more than basic MAESTRO MCA Emulation without the need for the full spectrum analysis capabilities of GammaVision.



## WHY MAESTRO-PRO?

### Compatibility

- Operates in the most common PC Environment – 64-bit Windows 10
- Multiple Languages: English, German, Chinese, French, and Russian
- Interactive Peak Search and Peak Fit Display from GammaVision analysis

### Process Efficiency

- Integrated Hardware control
- Automation Scripting compatible with GammaVision for consistent measurement processes
- Simplified Calibration using Wizards and Interactive Editors compatible with GammaVision
- Customizable Spectrum Display with “Live” update during acquisition and Detailed Peak Evaluation

### Defendable Results

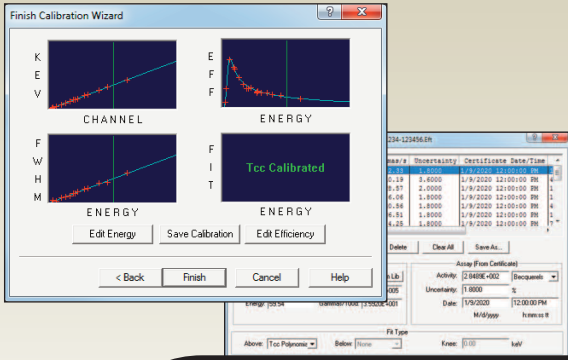
- Security to limit access to specified functions
- Comprehensive V&V Test Results (optional)

## MAESTRO-Pro vs. MAESTRO

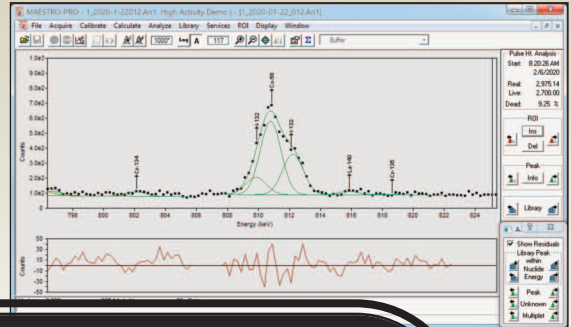
Feature	MAESTRO	MAESTRO-Pro
Languages	English	English, German, Chinese, French, Russian
Spectrum File Formats	CHN, SPC, SPE	CHN, SPC, SPE, N42 (2006 and 2012)
DSPEC-50A/502A Gate Route Mode Support	No	Yes
32k and 64k Channel Spectrum Support	No	Yes
Calibration Features	Basic Energy Calibration	Automated and Interactive Energy, FWHM, and Efficiency with Calibration Reports and Graphical Display
Peak Fit	Basic Region of Interest (ROI)	Basic Region of Interest (ROI), Interactive Peak Fit with multiplets, Display Peak Fit from GammaVision analysis
Automation Functions	Basic spectrum acquisition and ROI reporting functions	Comprehensive automation from GammaVision with the exception of spectrum analysis
Library Editor	External Library Editor	Internal Editor compatible with Nuclide Navigator when installed
Security	None	Menu Passwords
External Spectrum Viewer	WinPlot	GVPlot

# MAESTRO-PRO 9.0

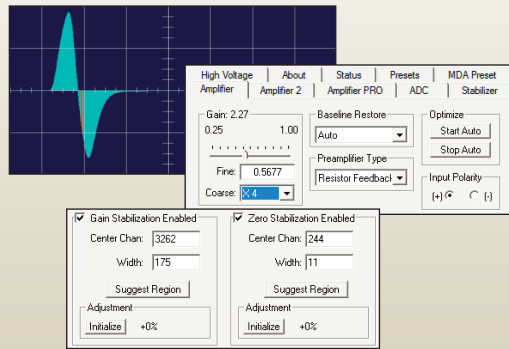
## Calibration



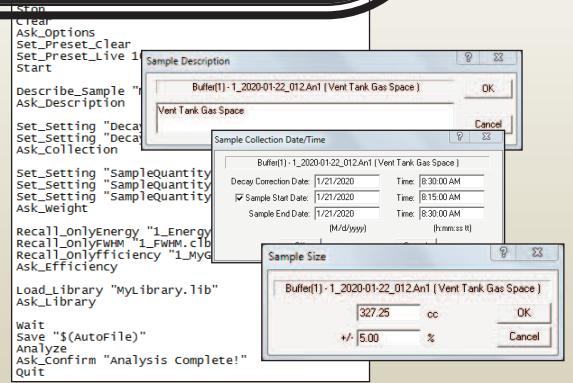
## Interactive Peak Fit and Analysis Results Display



## Hardware Control



## Automation



# MAESTRO-PRO 9.0

## User Interface and Security

MAESTRO-Pro 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 and spectrum evaluation 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, the 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. MAESTRO-Pro 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:

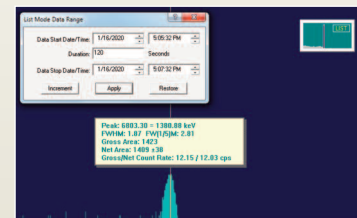
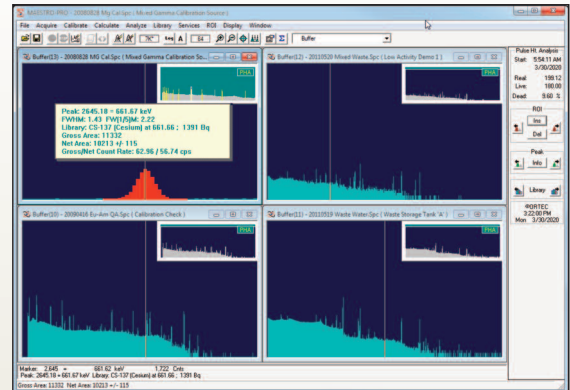
#### γ Spectrum View

- 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 List Mode Spectra filtered by Time Range

#### γ Security

- Menu Level Password protection
- Detector Locking by Owner



Ask on Start Options	
<input checked="" type="checkbox"/> Sample Type:	C:\User\SDF\DecayCorrection.Sdf Browse...
<input checked="" type="checkbox"/> Acquisition Presets	
<input checked="" type="checkbox"/> Sample Description:	My Sample
<input checked="" type="checkbox"/> Sample Size:	1 +/- 2.00 %
<input checked="" type="checkbox"/> Collection: Date:	1/13/2020 Time: 2:41:27 PM
<input type="checkbox"/> Sample Start Date:	Time:
Sample End Date:	Time:
	(M/d/yyyy) (h:mm:ss tt)

Lock Detector	
Owner:	DK
Password:	Cancel
Verify:	

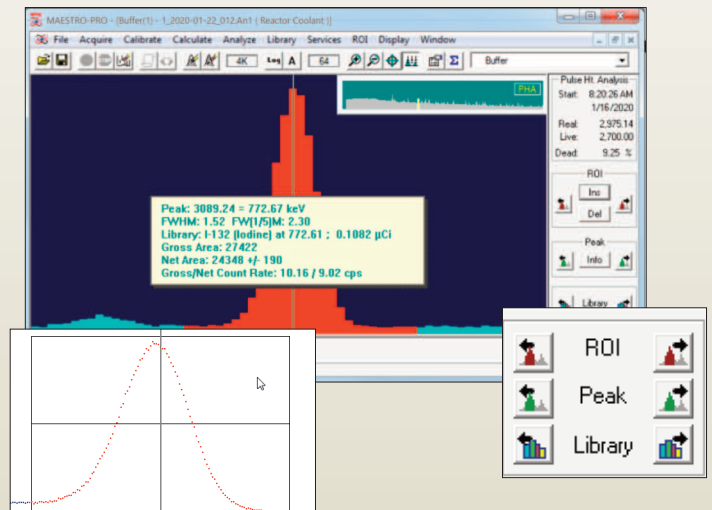
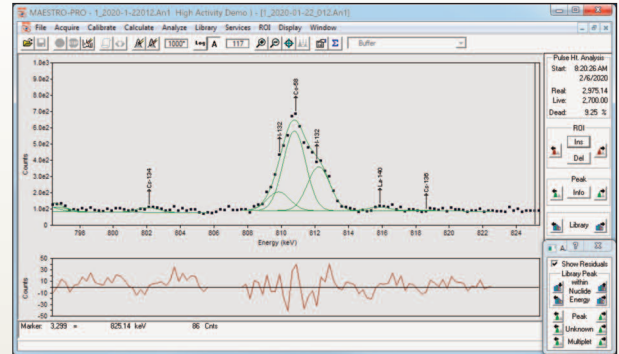
# MAESTRO-PRO 9.0

## Spectrum Evaluation

MAESTRO-Pro is not intended for full spectrum analysis like GammaVision, but it does include basic Region of Interest (ROI) functions and reporting options, interactive peak fitting, and the ability to display the detailed analysis results generated by GammaVision analysis engines for data evaluation.

### Key Analysis Features:

- γ Graphical Peak Fit and Residuals Display to view GammaVision Analysis Results
- γ Interactive Peak Fit to evaluate singlet and multiplet peaks in the viewed spectrum
- γ Fast Mariscotti Peak Search to instantly mark Regions of Interest
- γ Region of Interest (ROI) reports in Column or Paragraph format
- γ Isotope markers with peak amplitude estimation to confirm peak origin
- γ Interactive “Jump to Peak” by ROI, Library Energy, or Peak Search options
- γ Spectrum overlay for direct visual comparison to a reference
- γ Combine Spectra by Channel Summing or Stripping
- γ Spectrum Smoothing to improve statistically poor peak shape
- γ User-Defined Nuclide Libraries compatible with the optional Nuclide Navigator program
- 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 channels



Editing: Generic.Lib

Creation: 9/14/1987 12:42:11 PM  
 Edition: 2/29/2020 3:59:27 PM

I-132 (Iodine)  
 Half Life: 2.3 Hrs.  
 2-Sigma Nuclide Uncertainty: 5.0000 %  
 Nuclide Flags: - F1.....  
 Edit I-132...

Rank	Energy	Percent
1	667.69	9.8700E+001
2	772.61	7.6196E+001
3	954.55	1.8062E+001
4	522.65	1.6088E+001
5	630.22	1.3719E+001
6	1398.60	7.1064E+000
7	812.20	5.6259E+000

Buttons: Insert..., Cut, Edit..., Paste

# MAESTRO-PRO 9.0

## 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 a breeze with the MAESTRO-Pro Calibration Wizard. Simply acquire a spectrum, load a calibration library and source certificate, and the calibration is complete! The calibration process can also be automated as part of the routine counting processes.

Calibrations created within MAESTRO-Pro are not only used for the basic analysis functions within this application, but are also fully compatible with GammaVision and other ORTEC applications.

### Key Calibration Features:

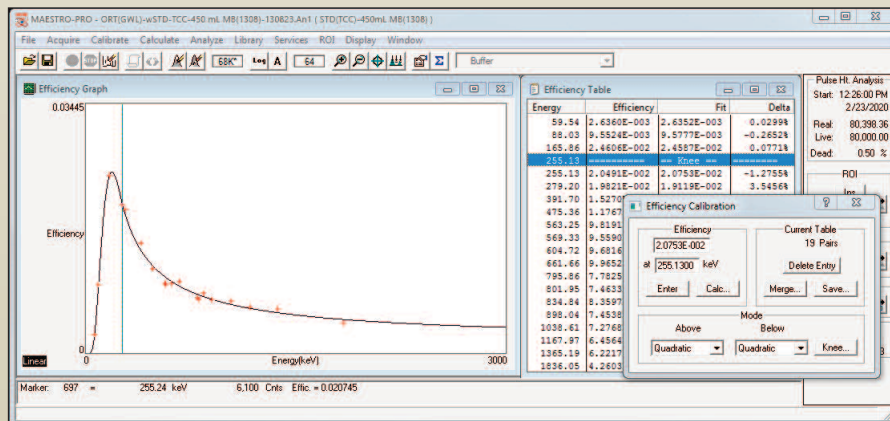
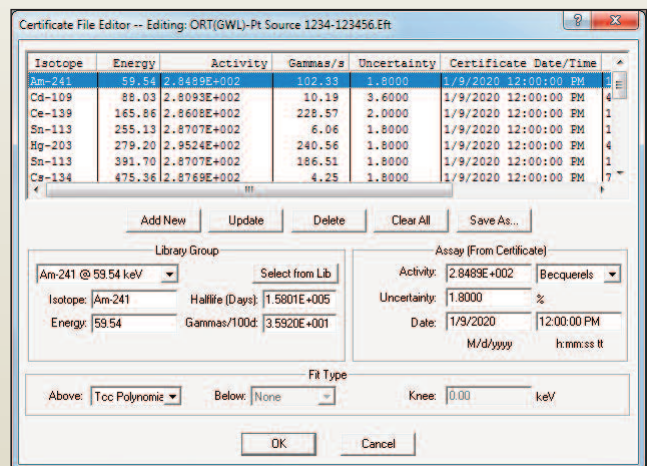
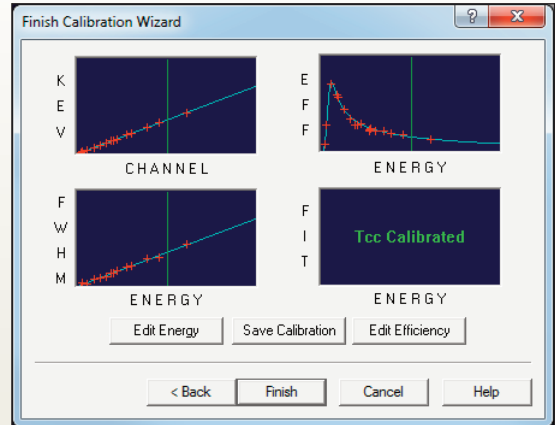
#### γ Calibration Types

- Channel to Energy – Quadratic Fit
- Energy to Shape (FWHM) – Quadratic Fit
- Energy to Efficiency – Natural Logarithm Polynomial Fit across full energy; or Linear, Quadratic, and Point-to-Point Interpolation Fits for separate high and low energy regions
- Peak-To-Total (Cascade Summing)

#### γ 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

#### γ Calibration Reports and Graphic Display



# MAESTRO-PRO 9.0

## 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:

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

```
Set_Detector 1
Stop
Clear
Ask_Options
Set_Preset_Clear
Set_Preset_Live 1000
Start

Describe_sample "My Sample Name"
Ask_Description

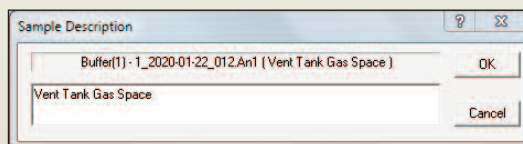
Set_Setting "DecayDuringCollectionEnabled", "0"
Set_Setting "DecayToDate", "2013-08-12 18:20:00"
Ask_Collection

Set_Setting "SampleQuantity", "5"
Set_Setting "SampleQuantityuncertainty", "2.0"
Set_Setting "SampleQuantityunits", "ml"
Ask_weight

Recall_OnlyEnergy "1_Energy.clb"
Recall_OnlyFWHM "1_FWHM.clb"
Recall_Onlyefficiency "1_MyGeometry.clb"
Ask_Efficiency

Load_Library "MyLibrary.lib"
Ask_Library

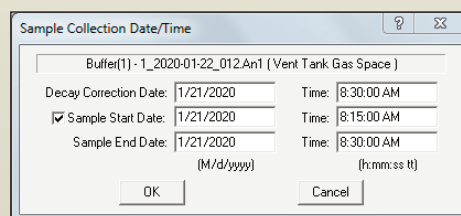
wait
Save "${AutoFile}"
Analyze
Ask_Confirm "Analysis Complete!"
Quit
```



Sample Description

Buffer(1) - 1\_2020-01-22\_012.An1 (Vent Tank Gas Space) [OK]

Vent Tank Gas Space [Cancel]



Sample Collection Date/Time

Buffer(1) - 1\_2020-01-22\_012.An1 (Vent Tank Gas Space)

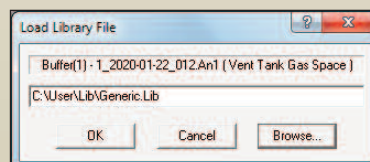
Decay Correction Date: 1/21/2020 Time: 8:30:00 AM

Sample Start Date: 1/21/2020 Time: 8:15:00 AM

Sample End Date: 1/21/2020 Time: 8:30:00 AM

(M/d/yyyy) (h:mm:ss tt)

[OK] [Cancel]



Load Library File

Buffer(1) - 1\_2020-01-22\_012.An1 (Vent Tank Gas Space)

C:\User\Lib\Generic.Lib

[OK] [Cancel] [Browse...]

# MAESTRO-PRO 9.0

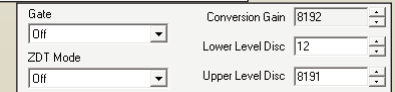
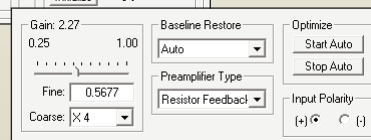
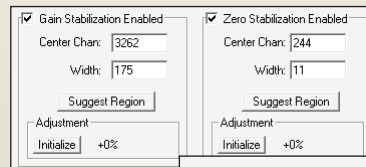
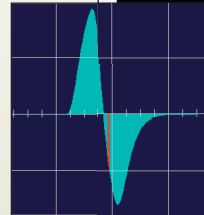
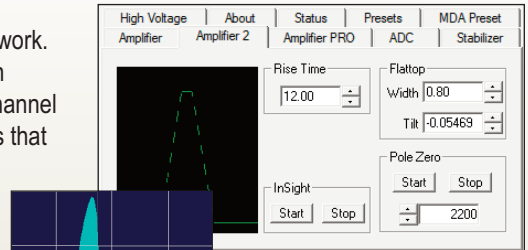
## Hardware Control

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 MAESTRO-Pro and other standard ORTEC applications.

Windows 10 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:

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



Detector State Of Health	OK
DIM +24V State Of Health	OK
DIM +12V State Of Health	OK
DIM -12V State Of Health	OK
DIM -24V State Of Health	OK
Security State Of Health	OK

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

## Ordering Information

Model	Description
A66MP-BW	MAESTRO-Pro Spectroscopy Software for Windows (Single PC License)
A66MP-NW	MAESTRO-Pro Single PC network license (Requires current version of A66MP-BW on the same network)
A66MP-UW	MAESTRO-Pro Single PC Update license from A66MP-BW or A65-BW

Specifications subject to change  
040820