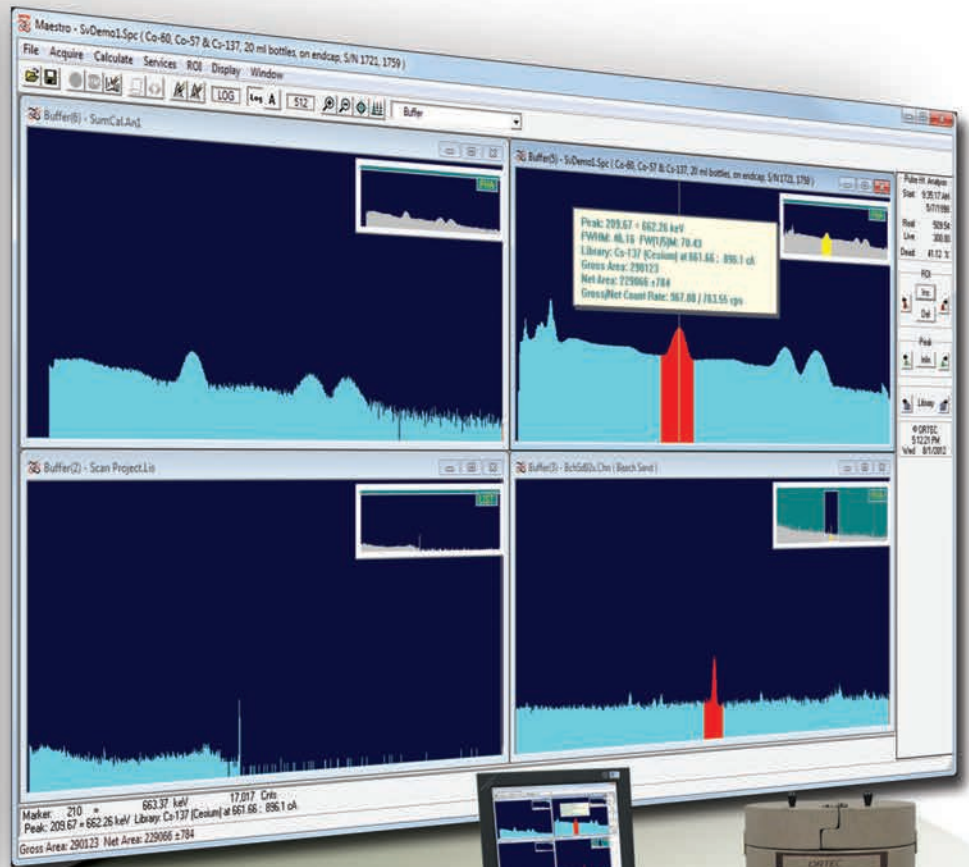


ORTEC[®]

MAESTRO[®] V7

Multichannel Analyzer (MCA)
Application Software



AMETEK[®]
ADVANCED MEASUREMENT TECHNOLOGY

Advanced Features

- Windows 7 (32-bit and 64-bit) and Windows XP (32-bit) compatible.
- ORTEC CONNECTIONS 32- and 64-bit network connectivity: local and remote control for all supported instruments via a common GUI.
- Intuitive User Interface consistent with other ORTEC application software such as GammaVision and ScintiVision.
- Advanced “smart” analysis functions: Fast Peak Search, Region of Interest (ROI), Peak Fit, and Overlay Spectrum Comparison.
- Password protected functions.
- Multiple Detector Interface (MDI): choose to view up to eight “live” and eight stored spectra simultaneously on a single PC.
- Automated “Jobs” for consistent and reliable data acquisition and reporting.
- NEW “List Mode,” time-tagged data event gathering; create time-sliced spectra of any period during data acquisition.

Real Benefits

- Integration with the most popular PC platform in the world maximizes compatibility, productivity, and cost-effectiveness.
- Low Total Cost of Ownership with hardware/software compatibility and remote control operations.
- Rapid implementation with minimal training.
- Robust data evaluation for accurate and reliable results.
- Eliminate unauthorized changes to system parameters and loss of acquiring data.
- Efficiency improved through instant access to detector status and spectrum data.
- Maximize productivity with consistent processes and data integrity.
- Ability to select acquisition of “period of interest” enhances detection sensitivity.

MAESTRO is a multichannel analyzer (MCA) “emulation” software package. When used in conjunction with a personal computer, and appropriate MCB hardware, MAESTRO constitutes an advanced “smart” multichannel analysis environment for use in a wide variety of scientific applications in industry, teaching, and research, including nuclear counting laboratories.

The MAESTRO user interface provides live spectral display and control of hardware and provides a number of “smart” analysis tools. The spectrum display and manipulation has a common “look and feel” with other ORTEC spectroscopy products, such as GammaVision and Scintivision.

Full control of acquisition and all MCB hardware features is provided. The software auto-detects the attached hardware, presenting the user with only those features specifically available for that hardware. For example, members of the ORTEC DSPEC series of digital HPGe gamma spectrometer systems provide full control of the digital filter, auto-PZ and Insight® oscilloscope mode. These features are displayed by the MAESTRO software when the DSPEC hardware is connected to the system.

As a member of the ORTEC CONNECTIONS suite of software products, MAESTRO has the capability to fully support up to 250 detector systems across a local area network; a remote detector appearing to a local operator is no different to one physically attached to the local PC workstation.

For over two decades, MAESTRO has set the standard for Windows-based MCA Emulation. MAESTRO Version 7.0 advances further, adding the following new features:

- **New!** Windows 7 64-Bit Compatibility with CONNECTIONS Version 8
- **New!** List Mode Data Acquisition for Time Correlated Spectrum Events
- **New!** Improved Peak fit calculations
- **New!** Improved graphics handling for multiple displays
- **New!** Open spectrum files directly from Windows Explorer
- **New!** Improved performance with Job Functions and display updates

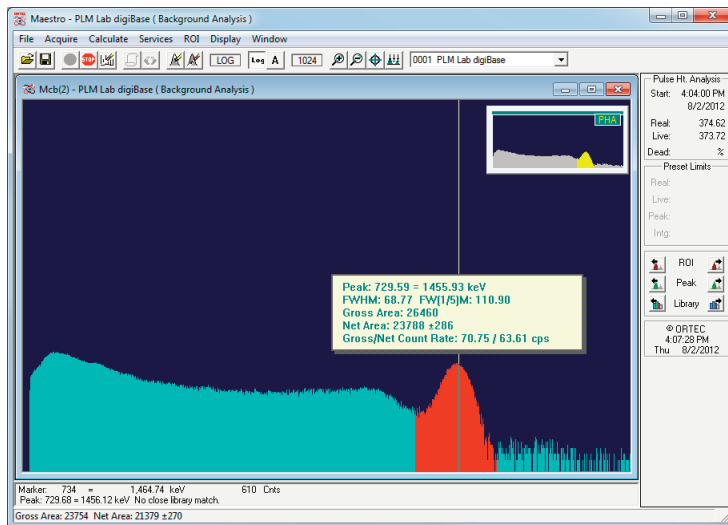
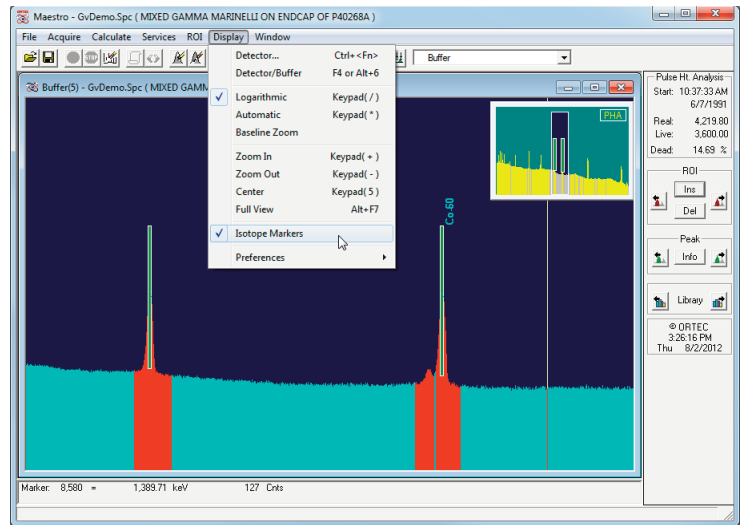
It's really no surprise that MAESTRO continues to be the worlds most popular nuclear MCA software!



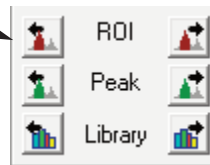
Display and User-Interface Features

MAESTRO provides an intuitive user interface to simplify hardware control and both routine and advanced measurement processes. The most commonly used functions are implemented as "hot keys" or toolbar buttons for rapid access.

The spectrum window is often the primary user focus when using MAESTRO and up to eight live detectors and eight saved spectra can be displayed concurrently. Full and expanded views of each spectrum are shown simultaneously. The spectrum expanded view can be zoomed in to examine a specific peak or energy region. Both windows display any marked Regions of Interest (ROIs), and the zoomed region is easily repositioned by simply clicking the new position in the full spectrum display.

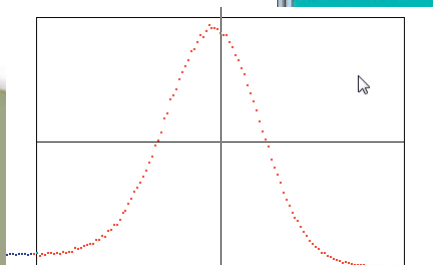
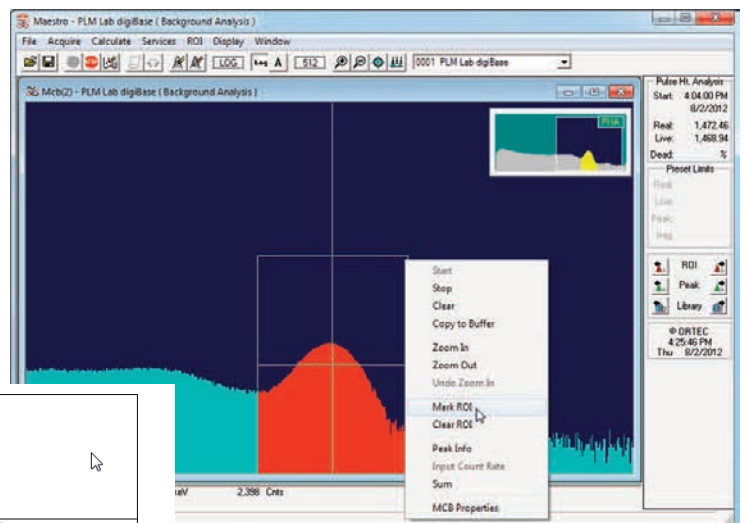


When viewing a live detector, the spectrum view is updated in real time and provides current spectral data, live peak calculations, and hardware properties — even for remote instruments connected to different computers on the network. Viewing spectrum peaks, library energies, or regions of interest is simple with the convenient side panel buttons.



Working with individual Regions of Interest (ROIs) or calculating peak areas is easily accomplished with either the advance peak search or "rubber rectangle" features. As many regions as desired may be marked, and these may be saved to an "ROI" file that can be recalled and applied later to a different spectrum.

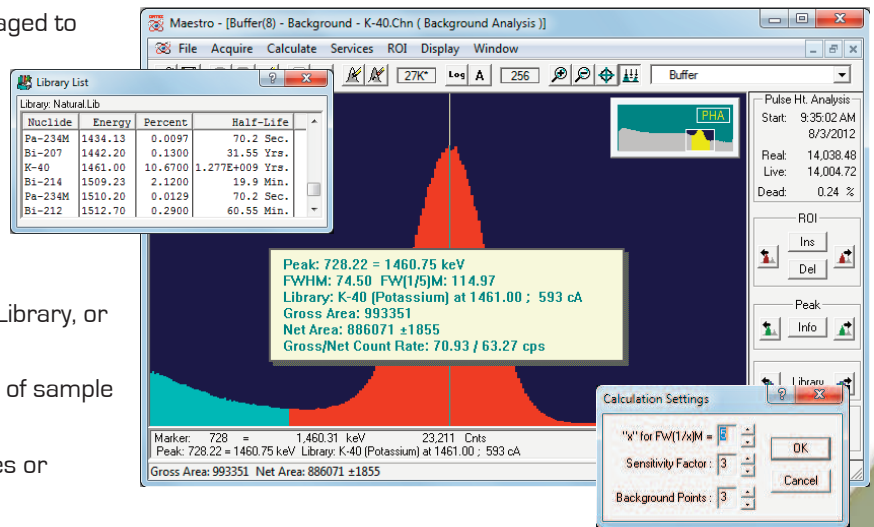
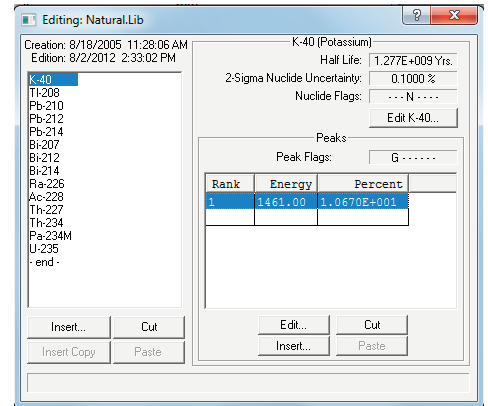
MAESTRO permits a wide choice of display options. Choose from a variety of color schemes, and display the spectrum as dots or filled bars. These settings can be used to create the optimal view for various lighting conditions or simply to suit your preference.



Advanced Features

Aside from the basic MCA Emulation functions, MAESTRO has advanced features to rapidly assess spectrum data such as:

- Multipoint Energy and Peak Shape Calibration for accurate peak calculations.
- Fast Mariscotti Peak Search to instantly mark Regions of Interest based on user-defined sensitivity settings.
- Nuclide Identification from libraries tailored to the application. Isotope markers show the location of library energies with amplitude estimation at each peak to confirm identification.
- Peak Calculations including centroid, shape, gross and net area with uncertainty, and semi-quantitative nuclide activity based on peak abundance corrections.
 - **New!** Choice of number of channels averaged to determine background.
 - **New!** Improved FWHM accuracy when peak centroid falls between two channels.
- Region of Interest (ROI) reports consisting of all Peak Calculation parameters for each marked region.
- Interactive "Jump to Peak" using ROI marker, Library, or Peak Search options.
- Spectrum overlay for direct visual comparison of sample results to a reference.
- Spectrum Stripping to clearly reveal differences or remove background.
- Spectrum Smoothing to improve statistically poor peak shape.



These features are available with saved spectra or when operating on a detector. When data collection is in progress peak calculations shown in the "Peak Info" window are updated in real time for immediate results.

Automation with Jobs

Although interfacing with MAESTRO from the toolbar and menus is 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 may be preferred, and simple text scripts called "Jobs" provide this capability in MAESTRO. The command set includes the most common operations, and has been expanded in Version 7 to include List Mode functions, closing MCB or Buffer windows, and enhancements to the "WAIT" command to improve efficiency. Custom processes can also be implemented with the "RUN" command which launches any external application.

Job Files may be run automatically when MAESTRO starts by including the path to the Job file as a command line argument in Windows shortcuts. This approach is frequently used to establish consistent processes from a common initiation point, and provides a simple method to run multiple Jobs in separate instances of MAESTRO.

```

|Close any existing windows.
-----
CLOSEMCBS
CLOSEBUFFERS

'Set Detector and activate List Mode.
-----
SET_DETECTOR 1
SET_LIST

'Set Presets and Acquire List Data.
-----
SET_PRESET_CLEAR
SET_PRESET_Real 1000
CLEAR
START
WAIT
SAVE "MyListData.LIS"

'Load List File, Filter data to a
specific date range, and save to
SPC spectrum format.
-----
CLOSEMCBS
RECALL "MyListData.LIS"
SET_RANGE "6/29/2012", "14:05:00", 900
SAVE "MyListDataRange.spc"

'Loop through List Data and generate
ROI reports for spectra generated from
100 second time intervals.
-----
CLOSEBUFFERS
RECALL "MyListData.LIS"
Loop 10
SET_RANGE "$[Loop]00", "100"
DESCRIBE_SAMPLE "Measurement #$(Loop1)"
RECALL_ROI "DECAYPK.ROI"
REPORT "PRN"
End_Loop

'Set the detector back to PHA Mode.
-----
SET_DETECTOR 1
SET_PHA
    
```

Hardware Control

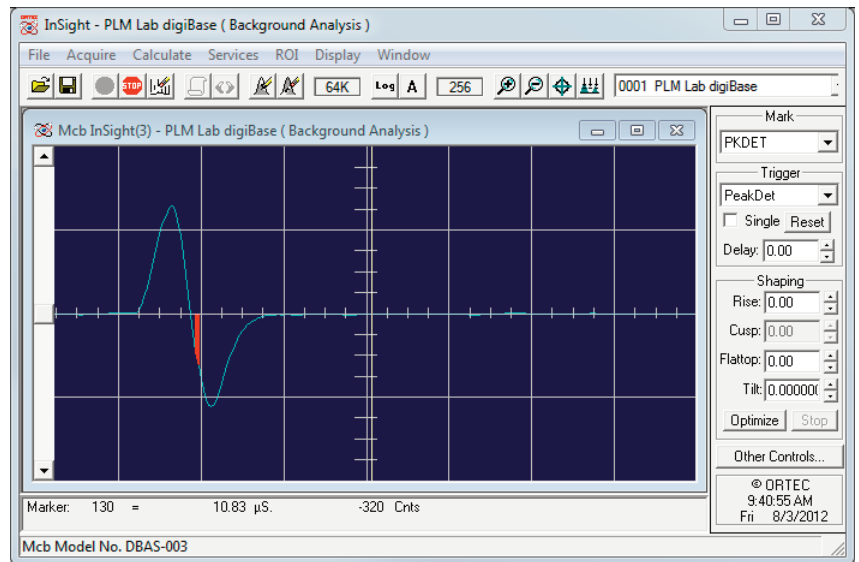
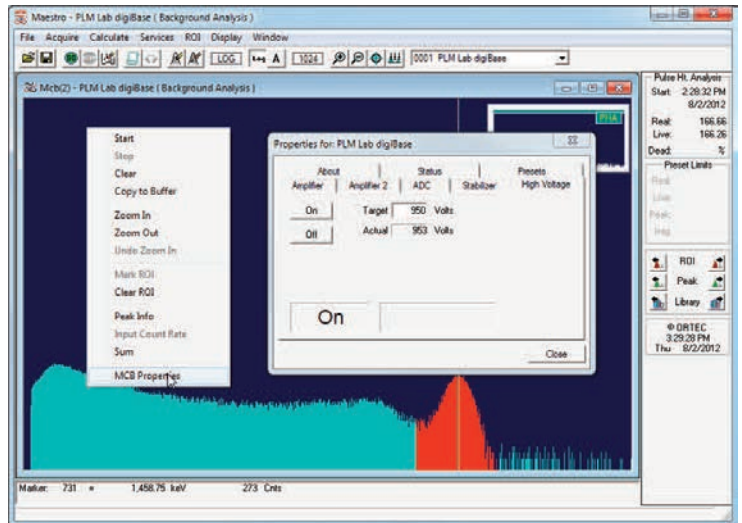
With the release of CONNECTIONS Version 8, 64-bit Windows 7 compatibility is available for all instruments that use USB¹ and TCP/IP connectivity. This update also retains compatibility for instruments that were previously supported in 32-bit Windows XP and/or Windows 7². Instruments that are dependent on a host computer, such as plug-cards or USB devices, can be shared on a network through the MCB Servers running on each computer. This process allows 64-bit Windows 7 computers to operate instruments that are not 64-bit compatible through their 32-bit host computers.

The interface between hardware and software is provided through the ORTEC CONNECTIONS framework. This application layer encompasses all of the hardware drivers and communication protocols that are necessary for software applications to control the MCB (Multichannel Buffer) instruments. The hardware controls are accessed through MCB Property pages that are integrated with MAESTRO and other standard ORTEC applications.

The MCB Properties pages are tailored to the specific instrument such that only the applicable features are presented to the user. Common features for various instruments include:

- Detector HV bias control
- Course and Fine Gain Adjustment
- Zero and Gain Stabilizer
- SMART-1 Detector functions
- ZTD loss-free counting correction
- Analog and Digital Amplifier Filters
- Automatic and Manual Optimization
- Sample changer control
- ID results for Detective instruments
- Insight® Oscilloscope mode
- Battery Voltage monitoring for portable instruments.
- Acquisition Presents including Real and Live Time, ROI Peak, ROI Integral, Peak Uncertainty, or MDA

Further details for hardware functions are provided in the relevant product literature.



¹ Excludes the microBase which has been obsolete for several years.

² Instruments using the IPX/SPX protocol require Windows XP. This may be accomplished on a Windows 7 computer using the XP Mode Virtual Machine. Instruments that have a Dual-Port Memory option can take advantage of the DPM-USB to communicate over a USB connection in the Windows 7 or XP environments.

“List” Mode Spectrum Acquisition

The most commonly used acquisition mode in nuclear spectroscopy is pulse height analysis or PHA mode. In this mode a spectrum is gathered for a period, usually known as the acquisition time, of the incoming pulse-height data, event by event. These data are stored in a histogram versus pulse height (usually proportional to energy). The spectrum is the histogram of all events in the acquisition period.

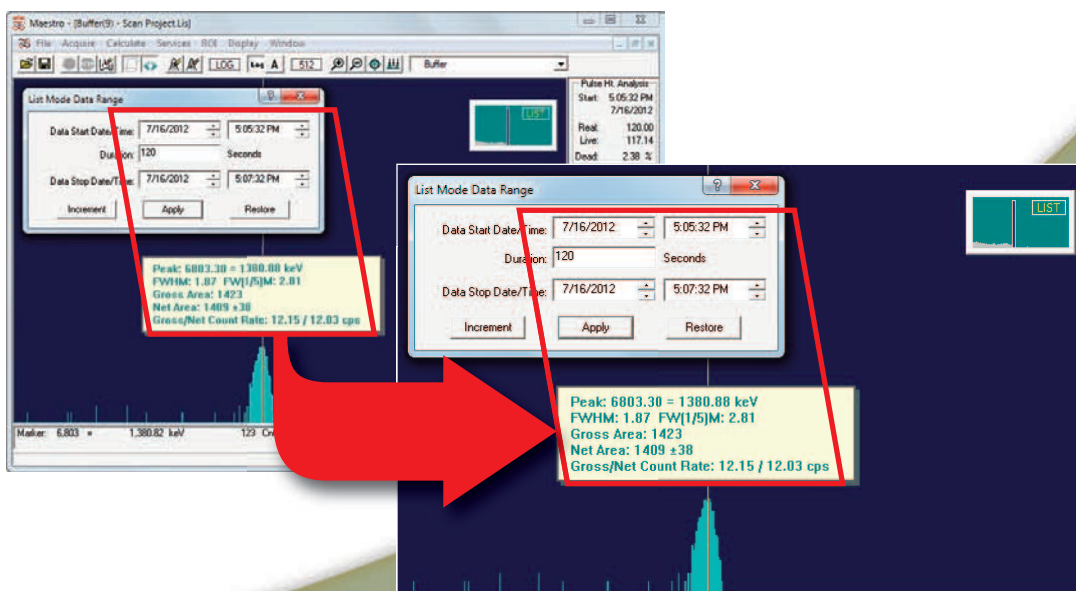
List mode acquisition adds another dimension to PHA mode. During the acquisition every event is “time tagged,” that is to say its time of occurrence is recorded along with its pulse height. After the acquisition is completed, the data may be sorted and spectra constructed to represent the measurement situation during some period of interest, for example, when the detection system was experiencing a transient of high activity.

List mode data acquisition has been available in certain ORTEC instruments, such as the digiBASE, digiBASE-E, DSPEC Pro, and more recently the DSPEC-50/502 for some time, but was only accessible through custom applications using the CONNECTIONS Programmer’s Toolkit. With the release of MAESTRO Version 7 this functionality is now accessible in a standard application!

In MAESTRO Version 7, post-acquisition evaluation of list mode data is simplicity itself! When loaded into a buffer window, the collection start and stop time range can be varied to instantly create a complete spectrum that represents that selected time period. This process allows the “period of interest” to be selected directly, or the software can scan through the entire collection period with a user-defined window. Identifying transient activity periods is as easy as that!

When a particular time period of interest has been defined, this data set may be saved to a new List Mode file consisting of this subset of data, or to any of the traditional ORTEC spectrum formats that are compatible with all standard ORTEC applications. These formats include:

- **CHN** A compact binary format that contains the basic MCA emulation data — such as detector and sample description, energy calibration, acquisition information, and the spectrum.
- **SPC** A compact binary format that contains more advanced parameters used by products such as GammaVision.
- **SPE** A simple ASCII text format contains data similar to the CHN files.



MAESTRO®

Ordering Information

Model	Description
A65-BW	MAESTRO Multichannel Analyzer (MCA) Application Software. Includes standalone or first network copy binary use license.
A65-GW	Hard Copy Documentation for MAESTRO. Note: A PDF version of the MAESTRO manual is installed with the application. Hard copy documentation must be ordered separately if desired.
A65-NW	Single Use Network Copy. Requires current version of A65-BW.
A65-UW	MAESTRO update from A65-BW or A65-B32 models.
A65-VW	MAESTRO V&V Test Results and Certificate of Validation.
A65-2YW	2 Year Software Subscription for A65-UW.
A65-3YW	3 Year Software Subscription for A65-UW.
A65-4YW	4 Year Software Subscription for A65-UW.
A65-5YW	5 Year Software Subscription for A65-UW.

Options

A11-B32	CONNECTIONS Programmer's Toolkit with ActiveX™ Controls.
A12-B32	Analysis Results File (UFO) Toolkit.
A49-B32	DataMaster Spectrum File Conversion Software.
C53-B32	NuclideNavigator III Master Library.

Note: Software Subscriptions provide automatic updates when new versions of MAESTRO become available. These options are available to users holding a Binary Use License (BUL) for the current version of MAESTRO (A65-BW).

Specifications subject to change
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