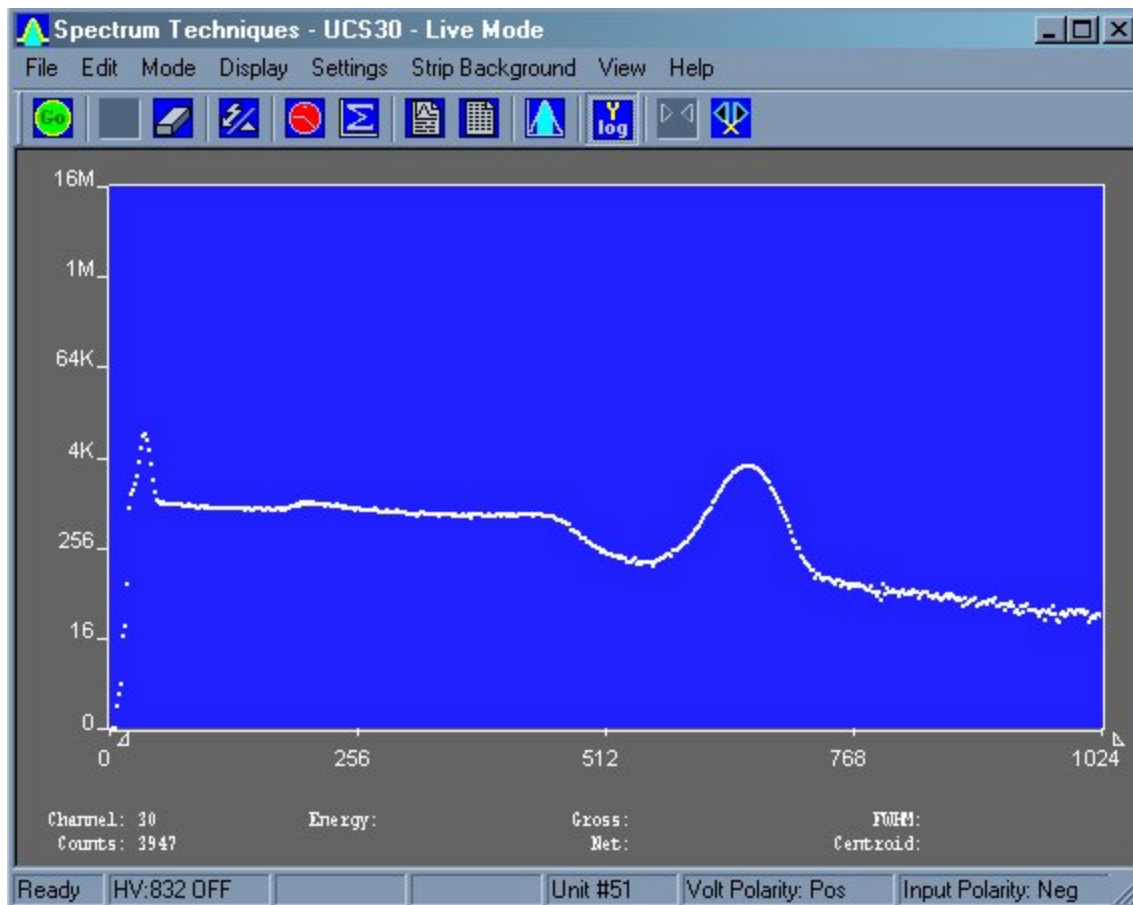


Spectrum Techniques

UCS-30

Universal Computer Spectrometer



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#SK Introduction

Hardware

The Universal Computer Spectrometer offers a unique solution for nuclear spectrometry using the PC platform. A 4K ADC combined with 8K of data memory and multi channel scaling is ideally suited to scintillation spectroscopy and time related studies such as half-life decay.

Constructed in a sturdy, fully-shielded bench top enclosure with Universal Serial Bus (USB) computer interface, the multi channel analyzer contains many advanced features including computer controlled amplifier and high voltage for PM tubes, upper and lower level discriminators, on instrument data memory, and a comprehensive software package for use under Windows 2000 or higher.

The UCS-30 requires only an available USB port and is designed to work seamlessly with USB-equipped PCs. For stability and low noise operation, the unit is AC-line powered with an auto-sensing power supply for 100-250 VAC operation. An on-board microprocessor acts as the master controller and data storage device, as well as the communication link directly to the USB interface.

The integrated amplifier and high voltage are fully compatible with most standard scintillation detectors, eliminating the need for special tube bases and external modules. For ease of setup and calibration, coarse gain, fine gain, high voltage, and lower and upper level discriminator settings are controlled directly from the desktop computer. For operation with other types of detector systems such as alpha spectrometers or single photon counting, a DIRECT input is provided to bypass the scintillation amplifier and allow direct access to the ADC.

A 4096 channel ADC with de-randomizing buffer offers excellent data throughput at high counting rates with minimal dead-time losses. Conversion gain may be changed from 4096 to 2048 to 1024 to 512 or 256 channels via the software. Data from the ADC is stored directly in on-board memory for autonomy and high-speed operation, freeing the host computer for other tasks.

Software

The UCS-30 produces a high-resolution, real-time live color display of spectral data with standard PC graphics running under Windows (2000 and above). Operation is intuitive using pull-down menus and function buttons for the most commonly used commands and

#IDH_INTRODUCTION

\$ Introduction

^K Introduction

display options. The software offers full control of all features including preset live/real time, and regions-of-interest together with centroid, gross and net area calculations.

Control of the hardware amplifier, high voltage, ADC and input discriminators is also through function buttons for straightforward calibration and operation. To simplify identification of peaks, the cursor may be calibrated to read directly in energy units, using either a 2-point linear, or 3-point quadratic relationship to allow for detector non-linearity.

Spectral files may be transferred to disk for long-term storage as binary files or transferred through the clipboard in ASCII format for exporting to other programs. Stored files may be used to collect background data over a long counting period that can be subtracted on a time proportional basis from the spectral data.

To aid in the identification of nuclides, the UCS-30 contains a unique peak-labeling feature named ISOMATCH. Providing the unit is accurately energy calibrated, the user may select a nuclide from the library and the corresponding characteristic emission lines are superimposed on the spectrum along with isotope and energy information. Using this feature, users may quickly check a spectrum and visually identify the emission components for each nuclide present. The ISOMATCH libraries may be created or customized using a text editor.

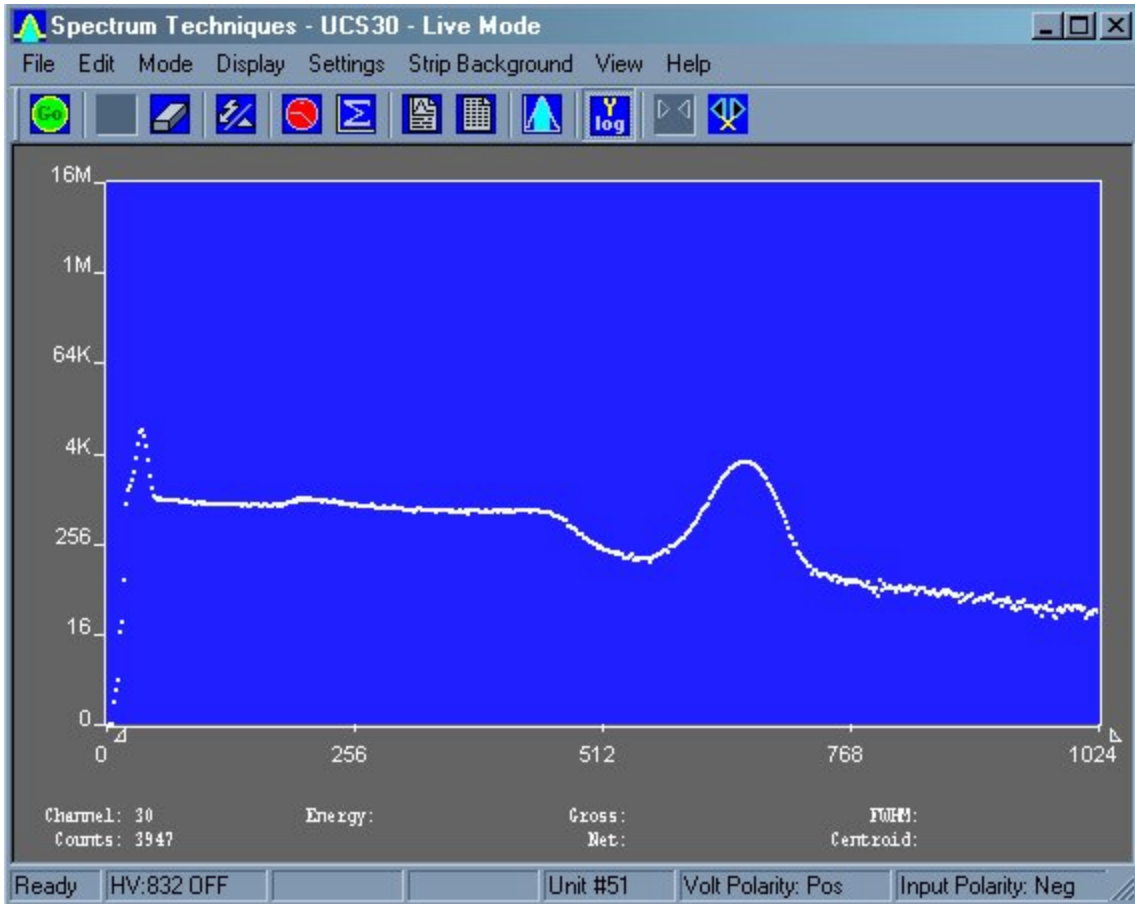
When operating in multi channel scaling mode, the system may be calibrated in time units for direct readout from the cursor.

Both linear and logarithmic vertical display ranges are included which can be useful when performing decay studies

Spectrum files, can be transferred from the ICS 10 DOS program and the ICSW 16 Windows program to the UCS-30 Windows version.

Most functions may be accessed by more than one method. All the functions can be accessed from the Pull Down Menu, some from the Tool Bar Buttons, or by the mouse. If the function has a Tool Bar Button, its symbol will be shown on the left hand side of the description.

#SK Screen View



#IDH_INTROSCREENVIEW

\$Screen View

KScreen View

#SK Installation

System Requirements

The UCS-30 instrument uses a Universal Serial Bus (USB) to communicate with a PC. The PC must have USB compatible drivers, which are available standard on Windows 2000 and later releases. The performance of the USB on older systems may affect the perceived performance of the software; so we recommend that you use a Pentium III or greater class of microprocessor running at 550 MHz or greater to achieve desirable performance.

[Installing Software](#)

[Connections On Rear Panel](#)

[Uninstalling Software](#)

#IDH_INSTALLATION

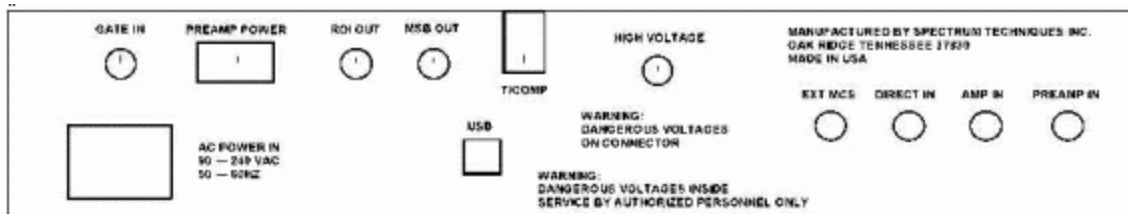
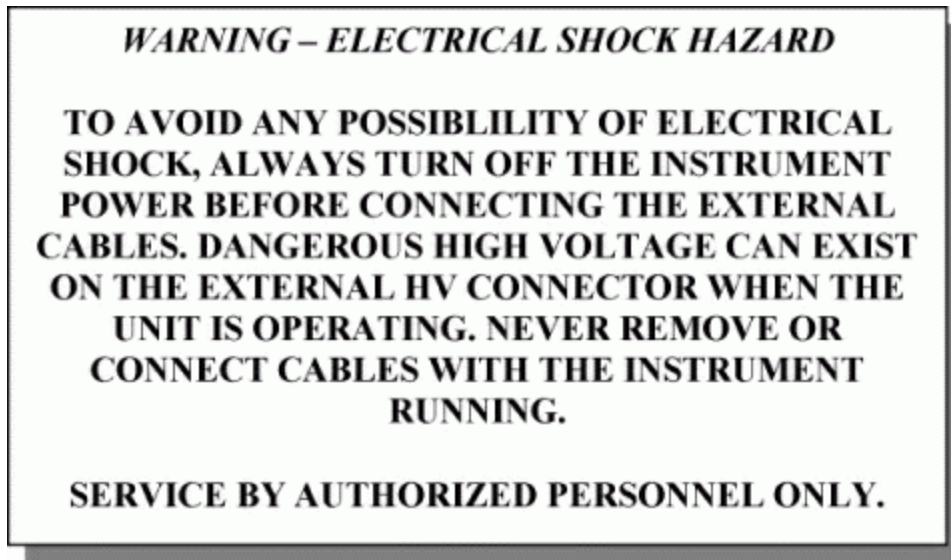
\$Installation

^KInstallation

#SK Connections On Rear Panel

The UCS-30 is equipped with an internal Amplifier/Preamplifier allowing direct connection of a scintillation detector. If you plan to use this feature, connect the signal (anode) output of the detector tube base to the PREAMP IN connector on the rear of the instrument using a BNC cable and connect the high voltage to HIGH VOLTAGE with the MHV cable

These cables appear similar with the MHV being slightly longer than the BNC



Rear Panel

HV Output: MHV (or optional SHV) connector supplies positive 0 - 2048 volt @ 1mA maximum current to power scintillation detector. High voltage is fully regulated and computer controlled in 2 volt increments.

PREAMP IN: BNC connector for direct connection to PMT anode signal. Uses internal

#IDH_INSTCONNECTIONSONREARPANEL

§Connections On Rear Panel

^KConnections On Rear Panel

amplifier/preamp.

AMP IN: BNC connector for signal connection to external preamplifier.

DIRECT IN: BNC connector for connection to external amplifier. Bypasses internal amplifier and connects directly to ADC input. Accepts unipolar or bipolar signals 0-8 volt range.

EXT MCS: BNC connector to input positive MCS TTL pulses > 150nsec. 5 MHz maximum rate.

ROI OUT: BNC connector supplies a pulse out when data is acquired in a channel marked as a ROI. The pulse width is adjustable from 100usec to 25 msec by an internal pot. The pulse amplitude is adjustable from 0volt to 7.5 volts by an internal pot.

GATE IN: BNC connector for connection to external coincidence unit. A positive TTL pulse causes the ADC to accept the next pulse. The Gate pulse must be present before the peak of the input Pulse. Gate pulse width = 50nsec to 2usec.

MSB OUT: (OPTIONAL) BNC connector to output the most significant MCS bit for Mossbauer Applications.

T/COMP: Modular connector for connection to temperature compensated tube base.

HIGH VOLTAGE: MHV (OPTIONAL SHV) connector supplies positive 0 to 2048 volts to power scintillation detectors and proportional tubes. 1-Watt maximum Power available.

USB: Universal Serial Bus connector for communication with computer.

PREAMP POWER: (OPTIONAL) DB-9 connector, supplies + – 12v power for External preamplifier.

When using an external amplifier system, connect the amplifier unipolar or bipolar output to the **DIRECT IN** connector.

#^S^KInstalling Software

Insert the included CD in your CD-ROM drive. The install program will automatically run. Follow the instructions to select the options you want to install.

The default installation directory is C:\Program Files\Spectrum Techniques\UCS 30

Example files:

Spectrum (*.spu) files:

Normal.spu – contains an uncalibrated spectrum of CS-137.

Calibrated.spu – contains a calibrated spectrum of CS-137.

Setup (*.sup) files:

Normal.sup – has settings used in Normal.spu.

Calibrated.sup – has settings used in Calibrated.spu.

Library (*.itm) files

Isotopes.itm – contains a list of common isotope peaks for use with the IsoMatch function.

#IDH_INSTINSTALLINGSOFTWARE

^SInstalling Software

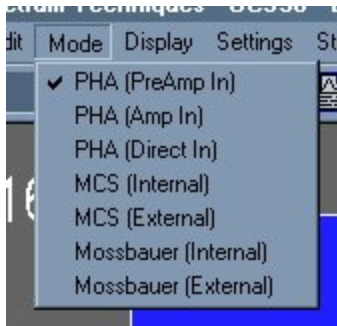
^KInstalling Software

#SK Uninstalling Software

Go to the Windows Start Menu, select Settings, then Control Panel. On the Control Panel, select Add/Remove Software. Find UCS-30, double click and follow the instructions.

#IDH_INSTUNINSTALLINGSOFTWARE
\$Uninstalling Software
^Uninstalling Software

#SK Analysis Modes



See:

[Pulse Height Analysis \(PreAmp In\)](#)

[Pulse Height Analysis \(Amp In\)](#)

[Pulse Height Analysis \(Direct In\)](#)

[Multi Channel Scaling \(Internal\)](#)

[Multi Channel Scaling \(External\)](#)

[Mossbauer \(Internal\)](#)

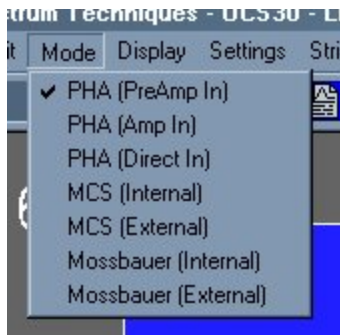
[Mossbauer \(External\)](#)

#IDH_MODES

\$ Analysis Modes

^K Analysis Modes

#SK Pulse Height Analysis (PreAmp In)



This is the normal operating mode for collecting sample gamma emission spectra. The amplitude of each detector pulse is measured by the ADC and stored as an amplitude (energy) spectrum.

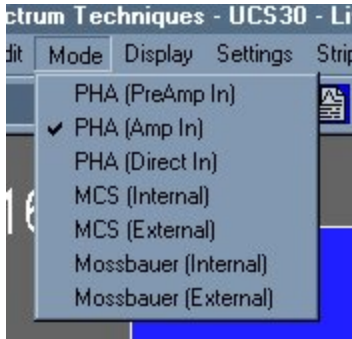
The X axis is scaled to the selected channels and the Y axis is scaled for the counts for each channel. Y axis counts that exceed the maximum Y axis value are 'wrapped', they no longer are scaled to the Y axis, and they appear in a different color.

#IDH_MODESPHA

\$Pulse Height Analysis

KPulse Height Analysis

#SK Pulse Height Analysis (Amp In)



Similar to the 'PHA PreAmp In' operating mode except that the incoming signal bypasses the card's internal Pre-Amplifier.

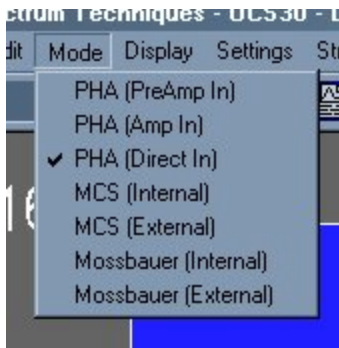
The amplitude of each detector pulse is measured by the ADC and stored as an amplitude (energy) spectrum.

#IDH_MODESPHA_AMP

\$Pulse Height Analysis Amp In

KPulse Height Analysis Amp In

#SK Pulse Height Analysis (Direct In)

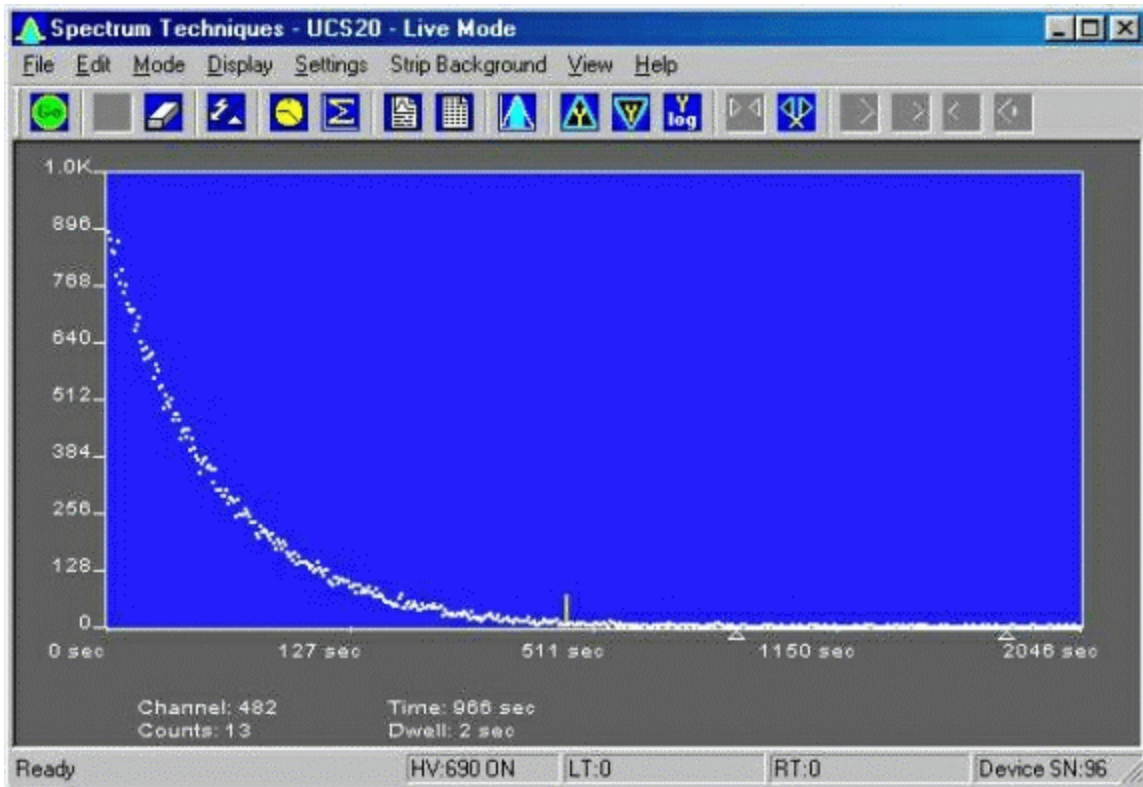


Similar to the 'PHA PreAmp In' operating mode except that the incoming signal bypasses both the card's internal Pre-Amplifier and Amplifier stages.

The amplitude of each detector pulse is measured by the ADC and stored as an amplitude (energy) spectrum.

#IDH_MODESPHA_DIRECT
\$Pulse Height Analysis Direct In
K Pulse Height Analysis Direct In

#SK Multi Channel Scaling (Internal)



Multi Channel Scaling mode is used for measuring time related phenomena such as half-life decay or single photon counting. The ADC is bypassed and incoming events are routed directly into memory for specific predetermined times (dwell time) and stored in sequential memory locations.

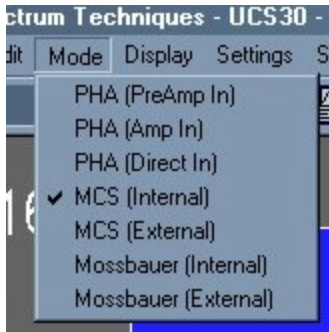
To use this mode, first acquire a spectrum using the Pulse Height Analysis mode. While acquiring the spectrum, adjust the LLD and the ULD to select the energy range of interest (for example, selecting only the 662 keV peak from Cs-137 can eliminate unwanted background and produce a superior decay curve when using a Cs-137/Ba-137 mini-generator.)

Click the Mode menu and select MCS

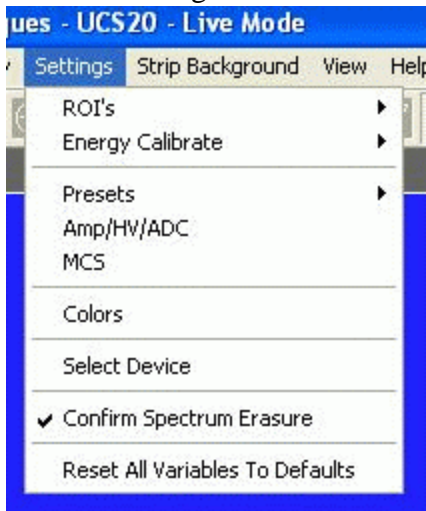
#IDH_MODESMCS

\$Multi Channel Scaling

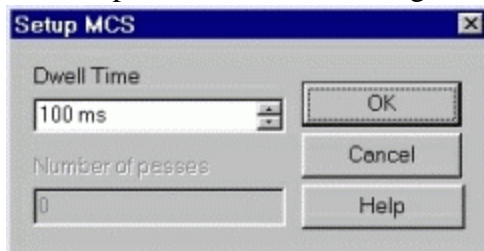
KMulti Channel Scaling



Click the Settings menu and select MCS



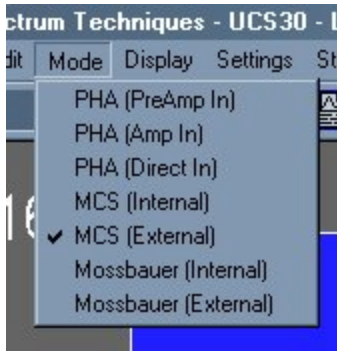
The SetupMCS Dwell Time dialog box will appear:



Enter the Dwell Time. This time is for each memory location (channel). Remember the total pass time will be (Conversion Gain x Dwell Time).

Erase any current memory data and click start. The UCS-30 will proceed to count incoming events for the selected dwell time, store the total in the first channel location, reset the counter and repeat the cycle storing each total in sequential channels.

#SK External Multi Channel Scaling



If you wish to use an external pulse generation system such as a coincidence circuit, it will be necessary to bypass the on-board amplifier and discriminators. Connect the external counts connector to the Ext MCS connector on the back of the instrument and select the menu item MODE then select External MCS.

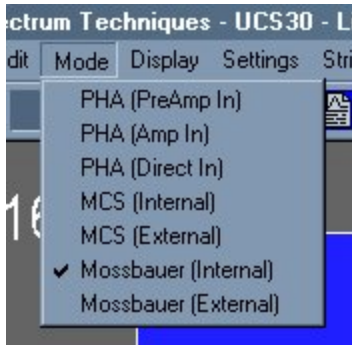
When operating in this mode, the MCS input requires positive TTL signals ($>2.5\text{v}$, $>150\text{ns}$ duration).

#IDH_MODESEXTERNALMCS

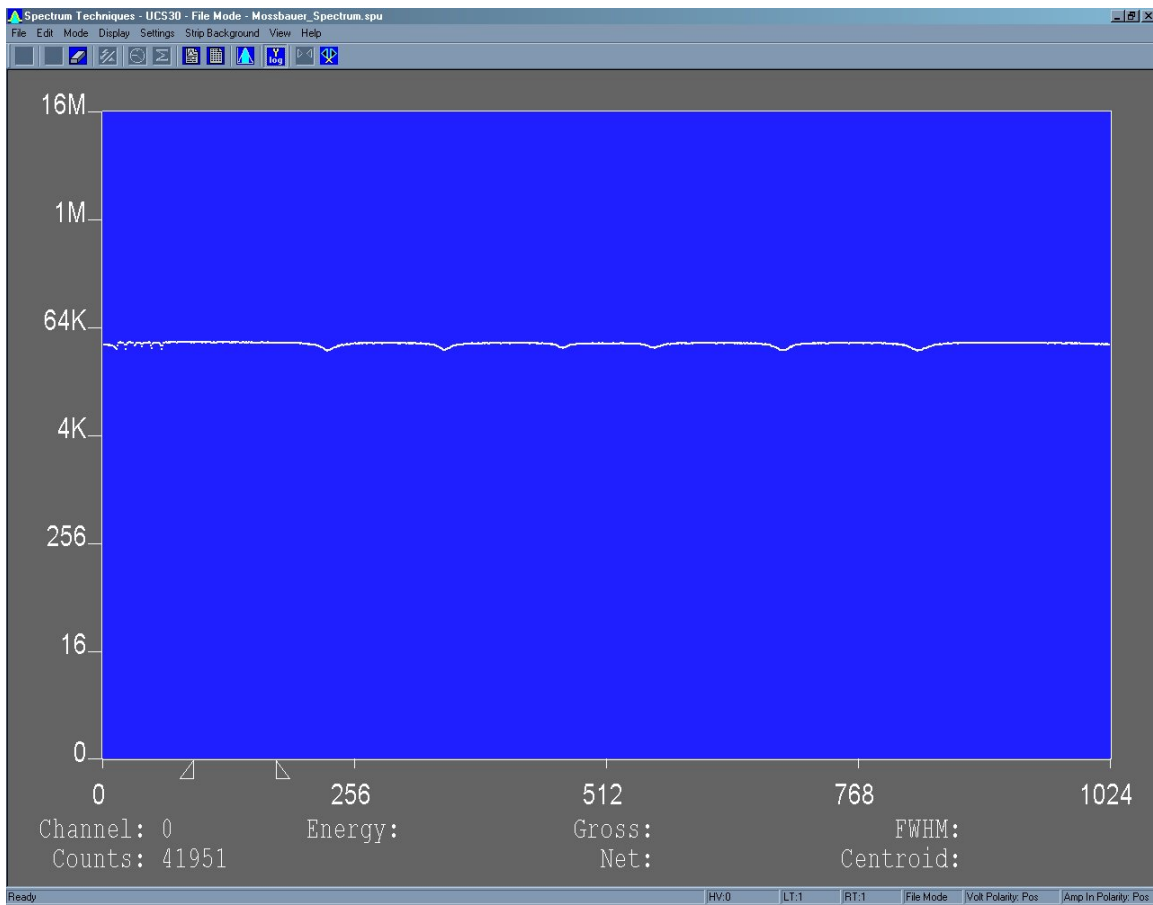
\$External Multi Channel Scaling

KExternal Multi Channel Scaling

#SK Mossbauer (Internal)

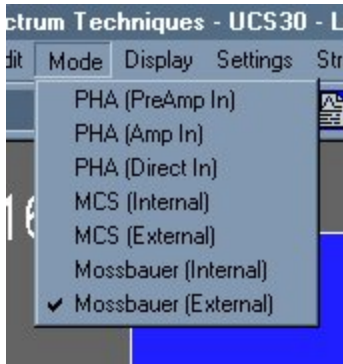


This is the Mossbauer spectrum of a Co-57 source with an enriched Fe-57 absorber, showing nuclear Zeeman splitting.

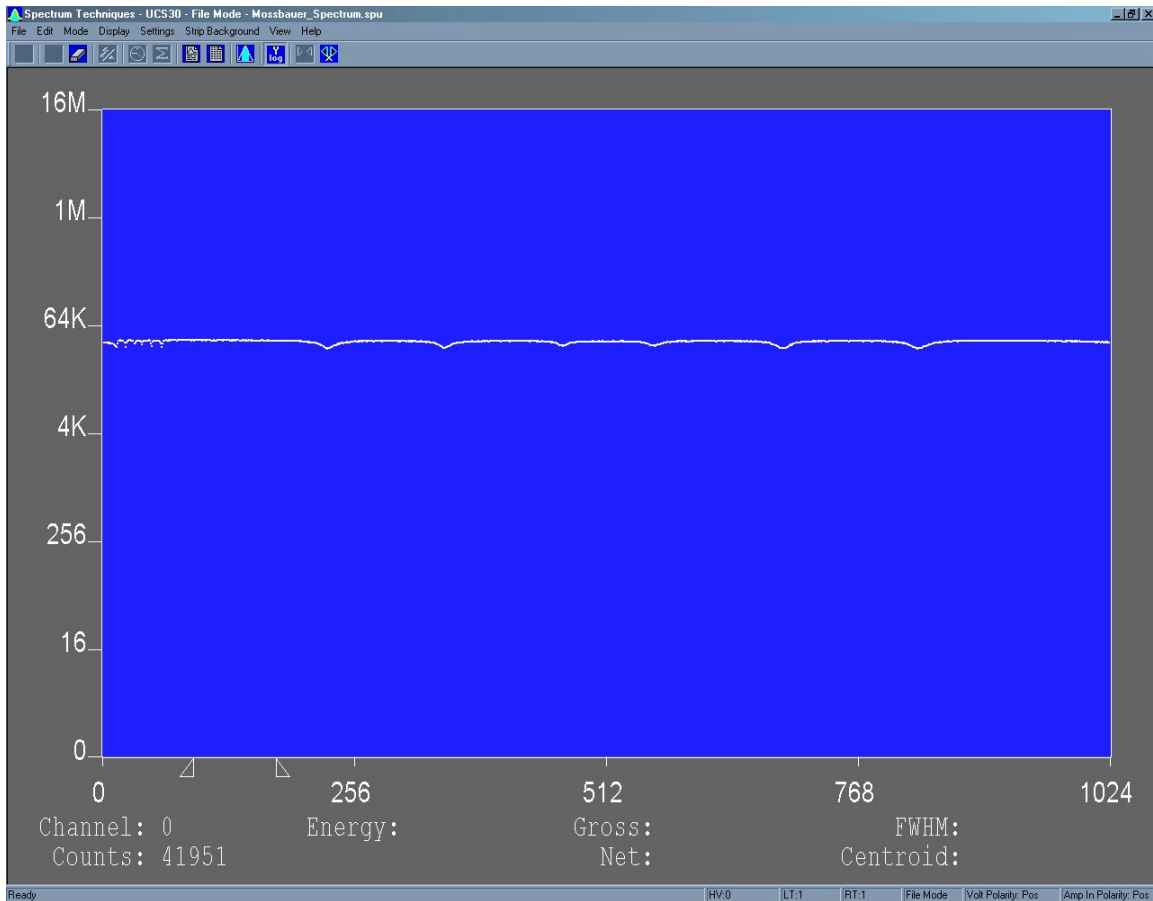


```
#IDH_MODESINTERNALMOSS
$Internal Mossbauer
^KInternal Mossbauer
```

#SK Mossbauer (external)



This is the Mossbauer spectrum of a Co-57 source with an enriched Fe-57 absorber, showing nuclear Zeeman splitting.



#IDH_MOSSEXTERNAL
\$External Mossbauer
^External Mossbauer

#SK Operation

[Screen View](#)

[Live Mode](#)

[File Mode](#)

[Amp/HV/ADC](#)

[Presets](#)

[Go, Stop and Erase](#)

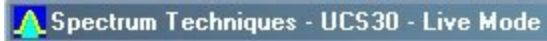
[Region of Interest \(ROI\)](#)

#IDH_OPERATION

\$Operation

^KOperation

#SK Live Mode

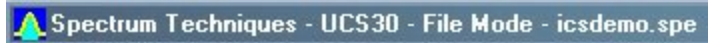


The software starts up in the Live Mode. This mode uses the USB to communicate with the instrument.

If you access the File Menu and click on Open, a new window appears which looks like the current window, except that the title bar shows 'File Mode' instead of 'Live Mode'. File mode does not communicate with the instrument and is used only to view and manipulate files that have been saved to disk.

#IDH_LIVEMODE
\$Live Mode
^KLive Mode

#SK File Mode



File Mode is accessible from the live mode by going to the File Menu and clicking on Open. Select the file you want to view. Some functions, which have no use when viewing files, are disabled in the Menus and the Toolbar.

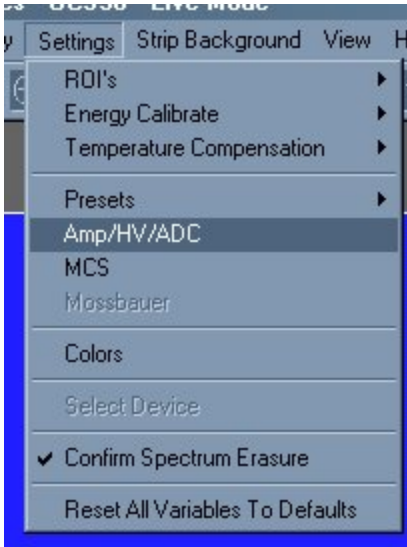
#IDH_FILEMODE
\$File Mode
^File Mode

#SK Amp/HV/ADC

Click the Amp/HV/ADC Button on the toolbar:



Or use the settings menu and click on Amp/HV/ADC

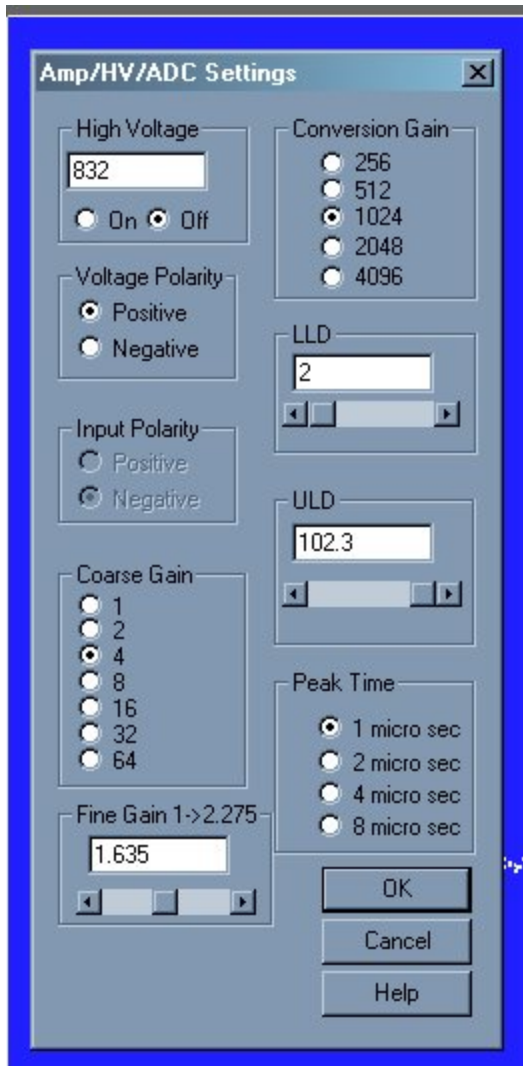


The Amp/HV/ADC dialog box will appear.

#IDH_SETTINGSAMP/HV/ADC

\$ Amp/HV/ADC

^K Amp/HV/ADC



Adjustments may be made to the amplification, high voltage, conversion gain, low level discriminator, and the high level discriminator.

Selecting OK will cause these values to be written to the UCS-30 instrument.

Configuring System Parameters:

Once the program is running it will be necessary to configure the system parameters for correct operation and calibration.

Place a gamma emitting check source near the detector face. Cesium-137 (Cs-137) is a good choice. It has a single peak at 662 keV.

Click on **Settings**, then click on **Amp/HV/ADC**

Set the high voltage to the voltage as listed by the detector manufacturer. As an example, set the high voltage to 600 volts, click **ON**.

***DO NOT** exceed the maximum high voltage rating of the detector, usually 1200 volts.*

Set the amplifier **COARSE GAIN** to 8, and set the **FINE GAIN** to 1 as a starting position. Click on **OK**, to set adjustments and exit the menu.

Start the data acquisition and adjust the **amplifier gain** until the 662 keV peak is approximately mid-scale.

Once the acquisition is started, you may enter the **Amp/HV/ADC** menu, make adjustments while viewing the spectrum. This will allow you to position the peak in the desired channels.

[High Voltage](#)

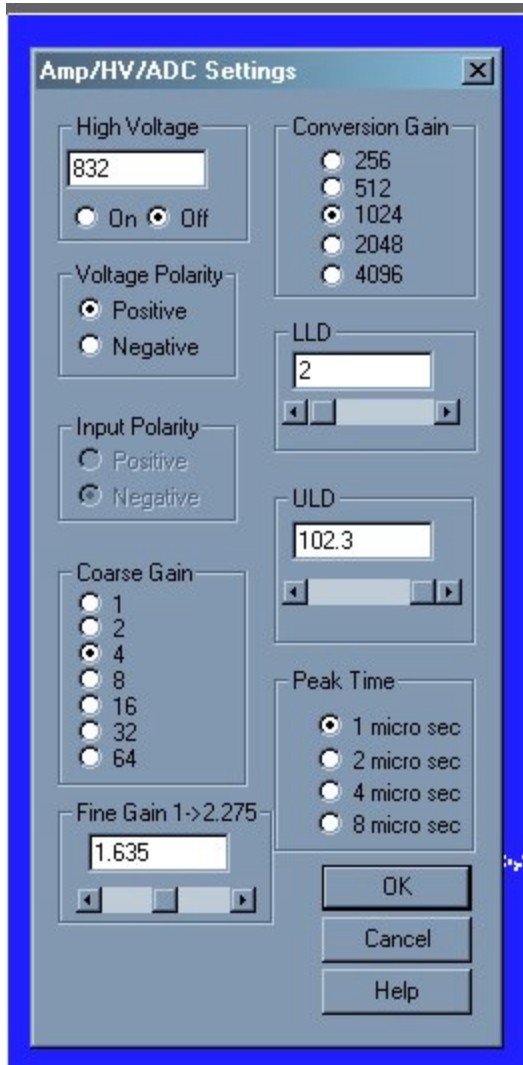
[Amplifier Coarse Gain](#)

[Amplifier Fine Gain](#)

[ADC Conversion Gain](#)

[Lower and Upper Level Discriminators](#)

#SK High Voltage



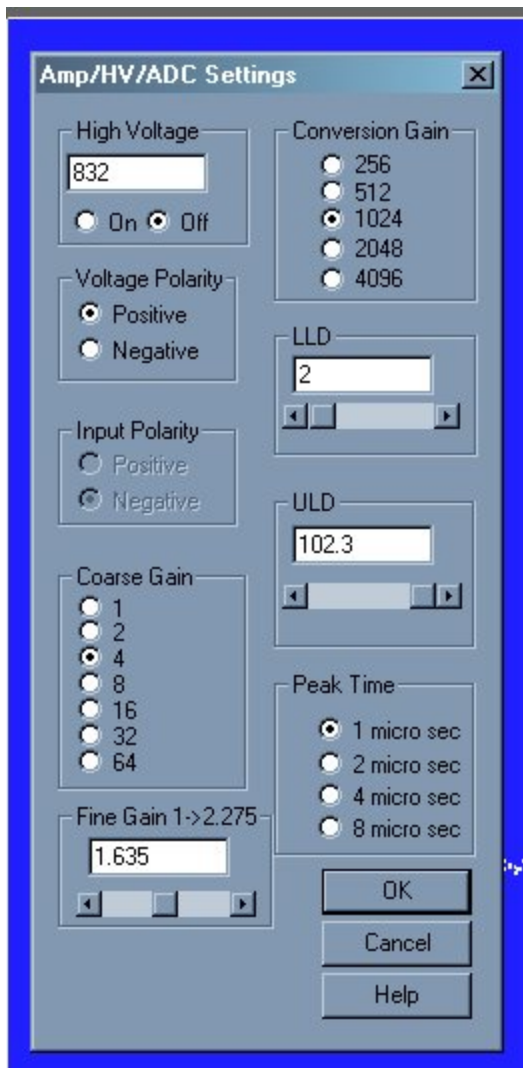
High Voltage may be entered directly in the text box or may be scrolled to the value desired. A warning will be issued if you attempt to input a value higher than 1200 volts, since this is the highest value that many probes can tolerate without damage. If you know that your probe can accept higher than 1200 volts, you may increase the voltage up to 2048 volts.

#IDH_SETTINGSHVA

\$High Voltage

^KHigh Voltage

#SK Amplifier Coarse Gain



Amplifier coarse gain may be set by clicking the radio-button next to the desired multiplier.

See also:

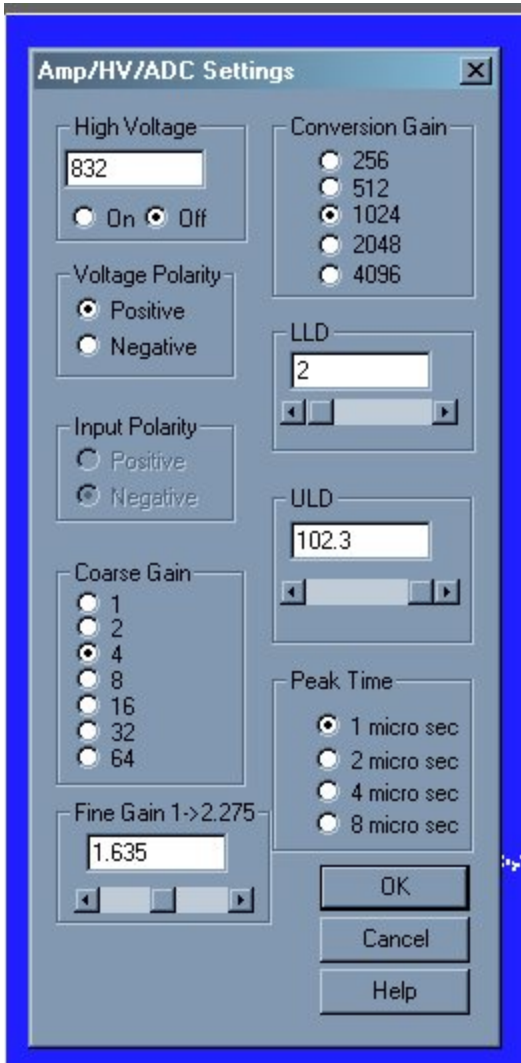
[Amp/HV/ADC](#)

#IDH_SETTINGSCOARSEGAIN

\$ Amplifier Coarse Gain

^K Amplifier Coarse Gain

#SK Amplifier Fine Gain



Amplifier fine gain may be directly entered as a multiplier value between 1.0 and 2.275 in 0.005 increments.

See also:

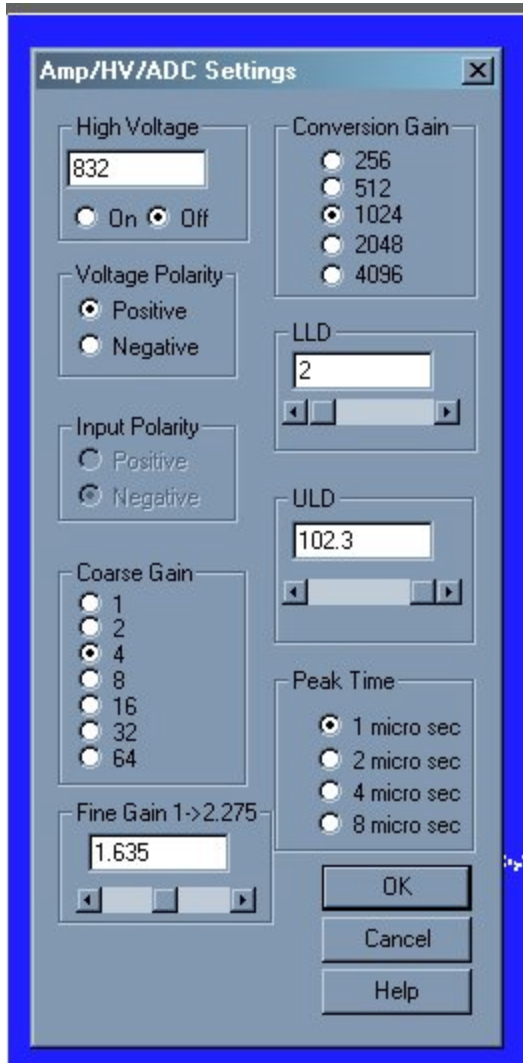
[Amp/HV/ADC](#)

#IDH_SETTINGSFINEGAIN

\$ Amplifier Fine Gain

^K Amplifier Fine Gain

#^{\$K}ADC Conversion Gain



Conversion Gain represents the number of channels that will be sampled and displayed on the screen. Smaller values save as smaller files

The conversion gain default setting is maximum channels. This is preferred for most scintillation detector applications and generally no adjustment is required.

For certain applications, such as alpha spectroscopy, it may be necessary to change this parameter to either 256, 512, 1024, 2048 or 4096 channels.

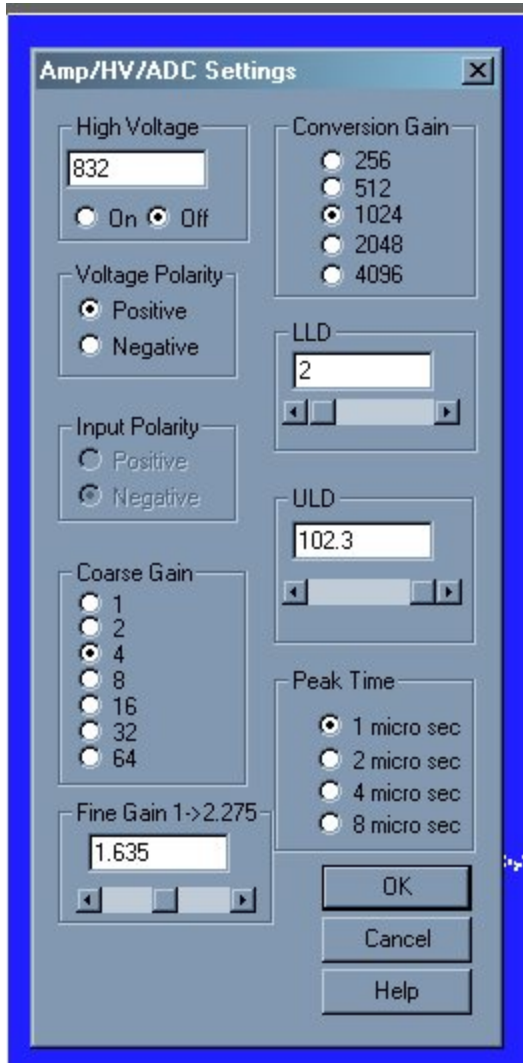
See also: [Amp/HV/ADC](#)

#IDH_SETTINGSADCCONVERSIONGAIN

^{\$}ADC Conversion Gain

^KADC Conversion Gain

#^{SK}Lower and Upper Level Discriminators



LLD and ULD, Lower Level Discriminator, and Upper Level Discriminator, allow the user to set a value between 0 and 102.3 (roughly percent) that cuts off signal before it gets to the ADC. The LLD is often used to block high-count signals in the low range that are not of interest, but require excessive time to sample. The ULD may be set up to 102.3.

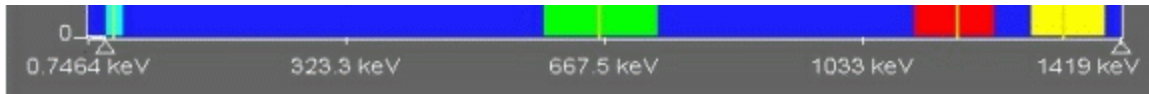
Low level discrimination (LLD) may be scrolled or directly entered.

Upper level discrimination (ULD) may be scrolled or directly entered.

#IDH_STARTUPLLDULD

^SLower and Upper Level Discriminators

^KLower and Upper Level Discriminators

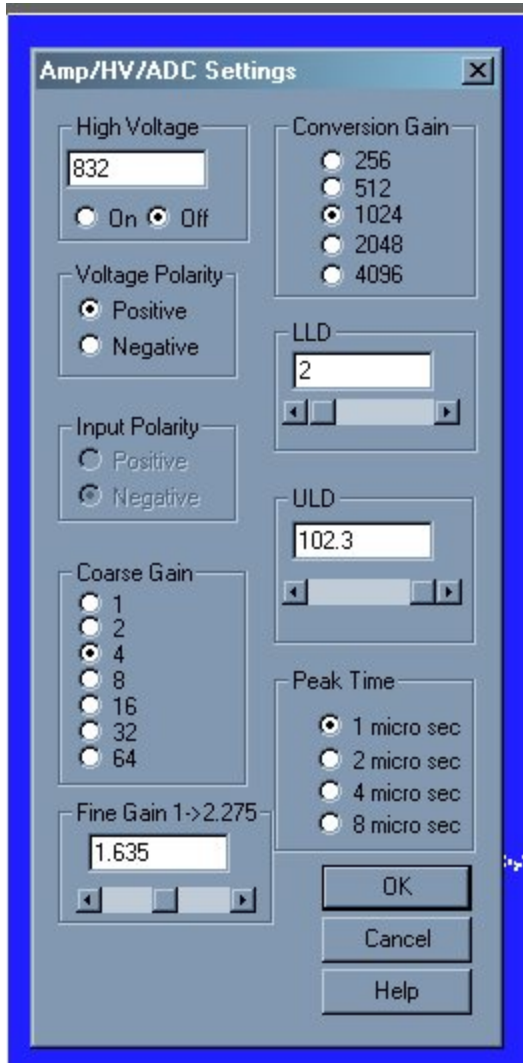


An alternative method to change the LLD and ULD is to use the mouse to move the triangles under the X axis. Move the mouse over the triangle to be moved, press the left button, drag the triangle and release it where desired. The software will not allow the LLD and the ULD set outside appropriate ranges.

See also:

[Amp/HV/ADC](#)

#^{\$}K Voltage Polarity



The ability to switch between positive and negative high voltage polarities is an add-on option.

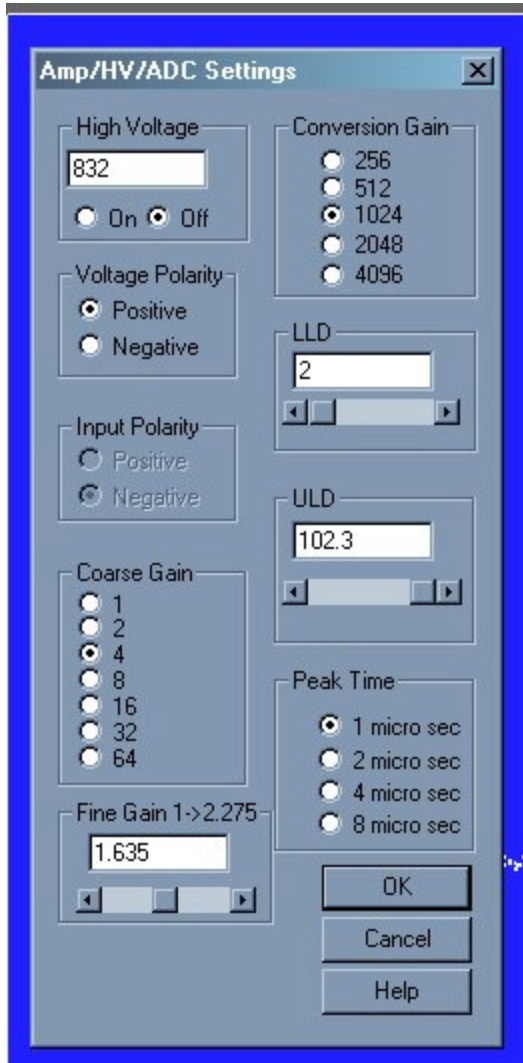
[Amp/HV/ADC](#)

#IDH_SETTINGSVOLTPOL

^{\$}Voltage Polarity

^KVoltage Polarity

#SK Input Polarity



Some detectors require a positive input polarity. This option is only available in PHA Amp In mode.

See also:

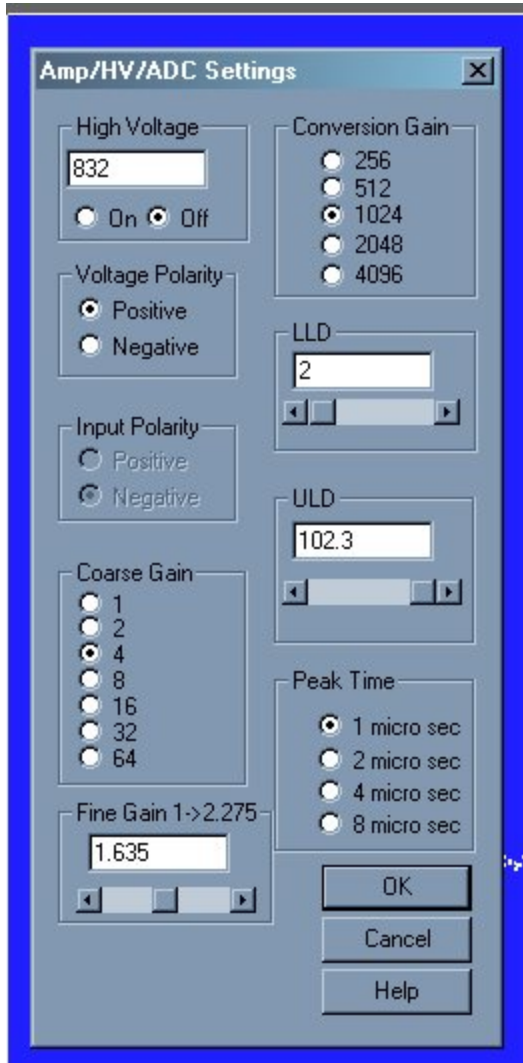
[Amp/HV/ADC](#)

#IDH_SETTINGS_INPUT_POLARITY

\$InputPolarity

^KInputPolarity

#SK Peak Time Shaping



Amplifier Peaking Times of 1, 2, 4, or 8 microseconds are selectable in Amp In mode only.

Peaking times longer than 1 microsecond are useful with solid state detectors such as GeLi or HPGE.

See also:

[Amp/HV/ADC](#)

#IDH_SETTINGSPEAKTIME

\$Peak Time Shaping

^KPeak Time Shaping

#SK Presets

Preset Time

The real time count and the live time count may be changed using the Preset function.

Click the Preset Time Button on the toolbar:



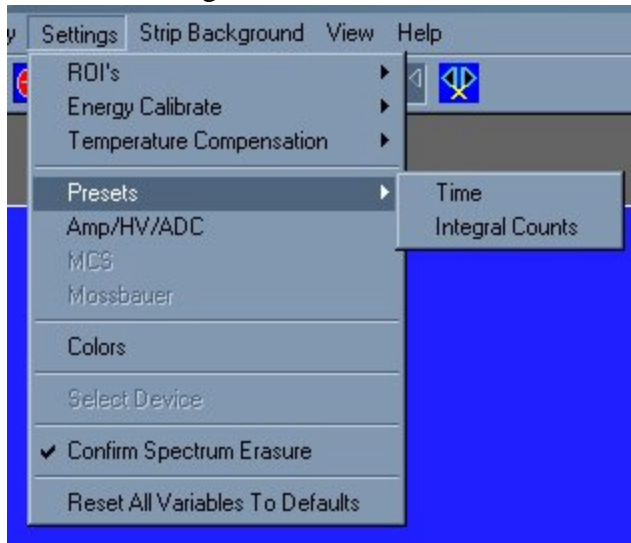
Preset Integral

The instrument can be set to stop automatically after a ROI integral.

Click the Preset Integral Button on the toolbar:



Or use the settings menu and click on Presets:



For details see:

[Preset Time](#)

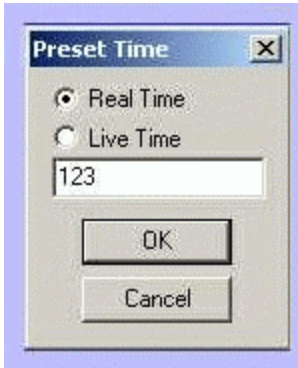
[Preset Integral](#)

IDH_PRESETS

\$Presets

^KPresets

#SK Preset Time

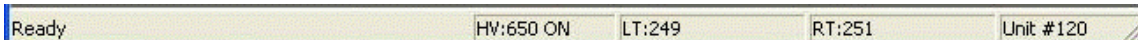


Preset Live Time provides automatic correction for counting losses caused by the system deadtime. Events which occur during the pulse processing cycle are lost to the system so the timer is automatically updated to compensate for these losses. When operating at excessively high count-rates the deadtime meter will indicate a high value and the real counting time may be more than doubled. Increasing the LLD setting can help reduce some high deadtime effects.

Preset Real Time sets the counting timer to run for actual clocktime and makes no correction for losses due to deadtime effects.

Click on **Settings**, click on **Presets**

Enter the **LIVE** or **REAL** time in the correct box. Click on **OK**, to set adjustment and exit menu.



Both the **LIVE TIME** and **REAL TIME** values are displayed on the UCS-30 status bar as LT and RT. These values are saved in the file during data storage.

#IDH_OPPRESETTIME

\$Preset Time

^KPreset Time

#SK Preset Integral



Set Integral

To set an integral count it is necessary to first establish a ROI and then position the marker within the region.

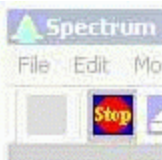
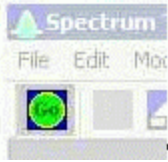
Selecting an ROI and setting a value other than 0 in preset integral will cause the system to STOP counting when the total of all the channels within the ROI reaches that value.

#IDH_OPPRESETINTEGRAL

\$Preset Integral

^KPreset Integral

#SK Go, Stop and Erase



Go, **Stop** and **Erase** functions are accessed with the Tool Bar buttons. Clicking on Start begins data collection. Clicking on Stop ends data collection. Clicking on Erase sets each channel's data to zero. Additionally, three 'hot key' combinations are defined as shortcuts for data acquisition functions. Pressing the appropriate action key while pressing the 'Ctrl' and 'Shift' keys will provide Go, Stop and Erase action. To Go press '*Ctrl+Shift+A*'; to Stop press '*Ctrl+Shift+S*'; and to Erase press '*Ctrl+Shift+E*'.

#IDH_OPSTARTETC

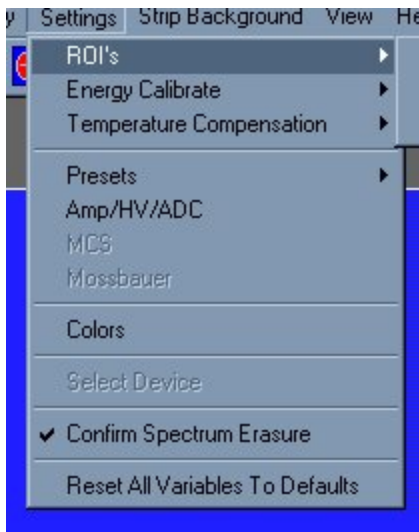
\$Go, Stop, and Erase

^KGo, Stop, and Erase

#SK Region of Interest (ROI)



Region of interest (ROI) selection is an advanced feature which provides instantaneous computation of peak gross and net counts. These values may be used along with isotope decay tables and detection efficiency to calculate absolute or relative isotopic activities. ROI's must not overlap and need to be separated by at least one channel for correct area calculation. Up to 16 different ROI's are possible using the color selector from the pull down **Settings** menu.



Set ROI

To set an ROI around a peak, click the ROI button on the Tool Bar. Click the left mouse button at the beginning of the ROI, hold down the left mouse button and drag the marker to the other side of the peak, release mouse button.

Clear ROI

Move marker to the **ROI** to be cleared. Open the Setting Menu, open ROI and select Clear ROI.

Gross and Net Count

When the marker is positioned in a region of interest (ROI), the UCS-30 software automatically calculates the **Gross** and **Net** area of the region. In order to minimize statistical effects at the **ROI** endpoints, a 3-point averaging technique is applied. The contents of channels $(n-1)$, (n) , and $(n+1)$ are summed and averaged to derive the content

#IDH_OPROI

\$Region Of Interest

^KRegion Of Interest

of the endpoint channel for the net area computation. A linear interpolation is performed between these averaged endpoint values and counts below this interpolation are subtracted to arrive at the **Net** area of the peak. Gross counts is the sum of all channels in the **ROI**.

Position the marker in the peak of interest. The **Gross** and **Net** areas are automatically computed and displayed on the spectrum screen.

See also:

[Preset Integral](#)

#SK Functions

[EnergyCalibrate](#)

[AutoCalibrate](#)

[Temperature Compensation](#)

[Isotope Matching](#)

[Strip Background](#)

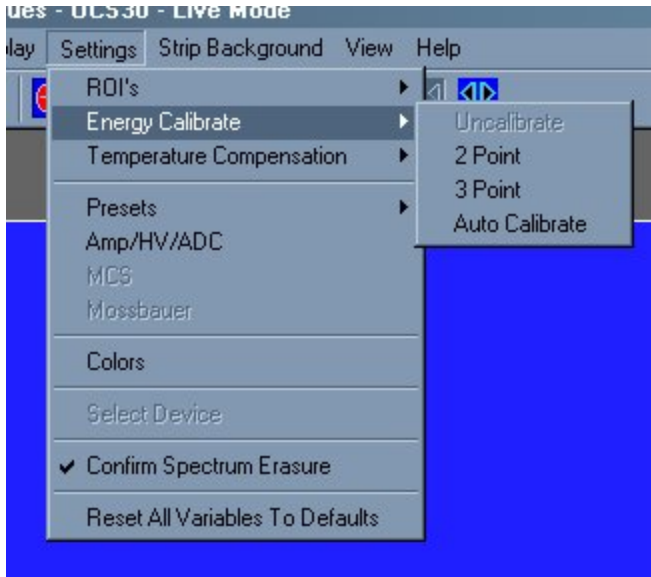
[Data Smoothing](#)

#IDH_FUNCTIONS

\$Functions

^KFunctions

#SK Energy Calibration



The energy calibration feature allows the marker to read directly in energy units. Two calibration functions are possible, a 2-point linear, or a 3-point quadratic fit.

In order to perform an energy calibration, it is first necessary to acquire a spectrum using known isotopes. Cs-137 together with Co-60 works well for many applications, producing gamma lines at 32 keV, 662 keV, 1173 keV and 1332 keV.

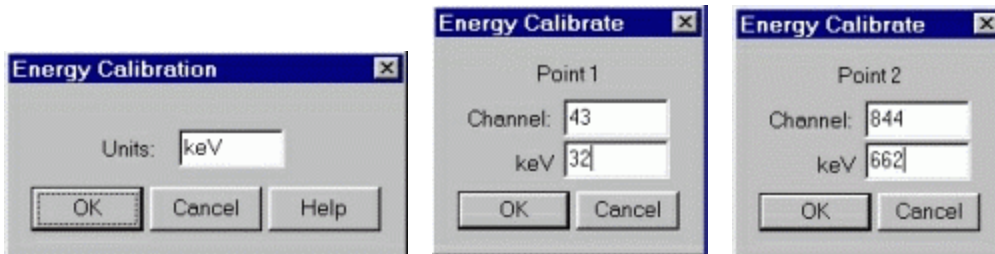
Select **2-point** or **3-point** mode and enter the calibration units to be used, (keV or MeV). Position the marker at the highest channel of the first peak and enter the peak energy value. Move the marker to the high point on the second peak to be used for the calibration, enter energy number. If a 3-point calibration is required, continue by moving the marker to the peak channel of the third peak, enter its energy and click OK. The system will now be calibrated and the marker position will read directly in energy.

To return to the channel number mode, click on **Settings**, click on **Uncalibrate**. Energy Calibration may also be selected using the right mouse button.

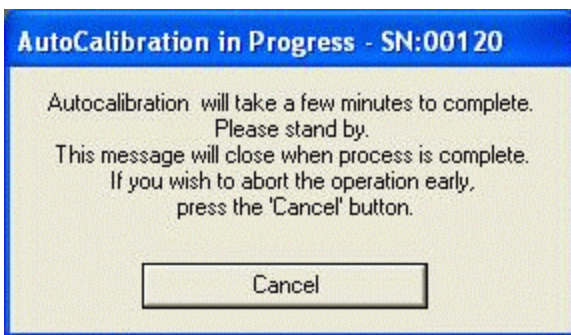
#IDH_FUNCENERCAL

\$Energy Calibration

^KEnergy Calibration

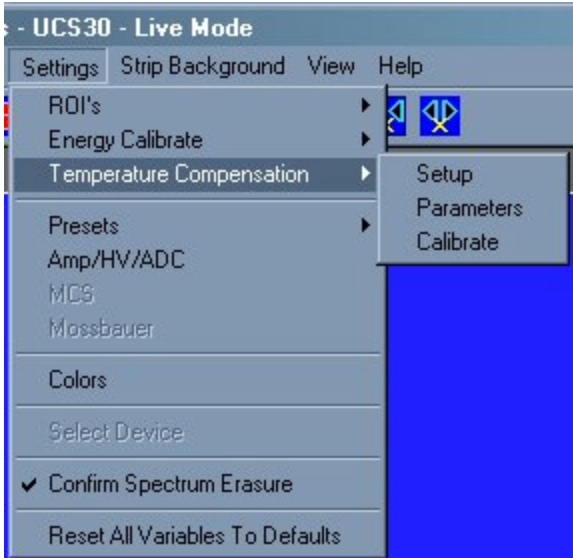


Auto Calibrate is a convenience provided for users working in the under 1000 keV energy range. Selecting **Auto Calibrate** will initiate an acquisition sequence that attempts to determine optimum detector voltage and gain settings for a calibrated energy spectrum display. This calibration is specifically designed to place the primary peak of a Cesium-137 source at a point approximately 65% of the x-axis scale. Once located, the energy calibration coefficients are calculated to provide a two point calibration (32 and 662 keV). Use of other sources will result in erroneous calibration.



The calibration sequence can require a few minutes to complete. In the absence of an adequate source or improper cable connection, the process may not succeed. Once **Auto Calibrate** begins, an information dialog box is displayed which advises to wait for completion and provides an opportunity to cancel the calibration. Pressing of the Cancel button will result in the auto-calibration process being aborted and the high voltage setting being reset to zero. If allowed to work to completion, the gains and voltage will be left at the determined calibration settings and the spectrum scale will be displayed in energy.

#SK Temperature Compensation

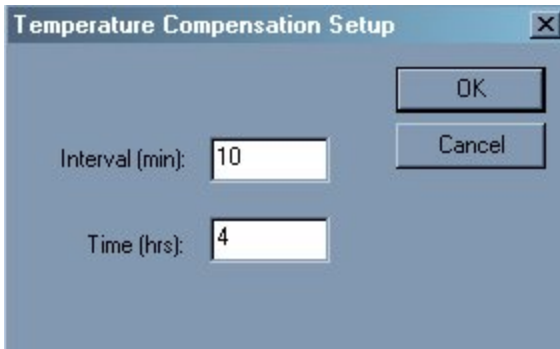


---THIS FUNCTION IS NOT CURRENTLY AVAILABLE ---

The temperature compensation feature allows the UCS 30 to automatically adjust the fine high voltage to correct for temperature variation.

In order to perform temperature compensation, the fine high voltage factor (measured in channels/step) and temperature coefficient (measured in channels / degree celsius) must be known. These can be provided by the use in the **Parameters** menu, or found by allowing the UCS-30 to **calibrate** for temperature compensation using a cesium source.

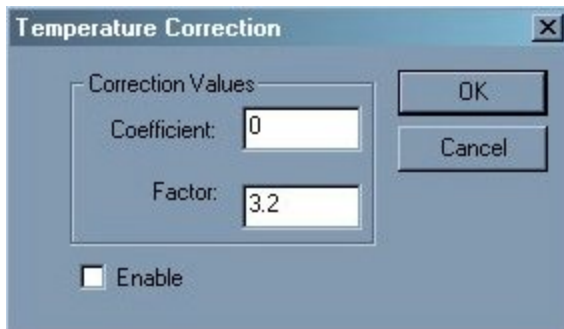
Setup



#IDH_FUNCTEMPCOMP
\$Temperature Compensation
KTemperature Compensation

The setup menu provides the UCS 30 with the length of time it should monitor temperature variations to calculate the temperature coefficient. The interval, which must be set to 5~60 minutes, is how often the UCS 30 measures the temperature and cesium peak. The time, which must be set to 4~24 hours, is how long the UCS 30 will stay in calibration mode.

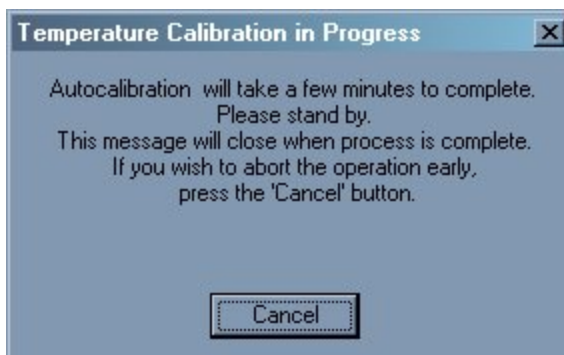
Parameters



The fine high voltage factor (measured in channels/step) and temperature coefficient (measured in channels / degree celsius) can be entered in the parameters menu. Also, temperature compensation may be enabled in this dialog box by clicking the enable checkbox.

The parameters are automatically changed and temperature compensation is enabled after calibrating for temperature compensation.

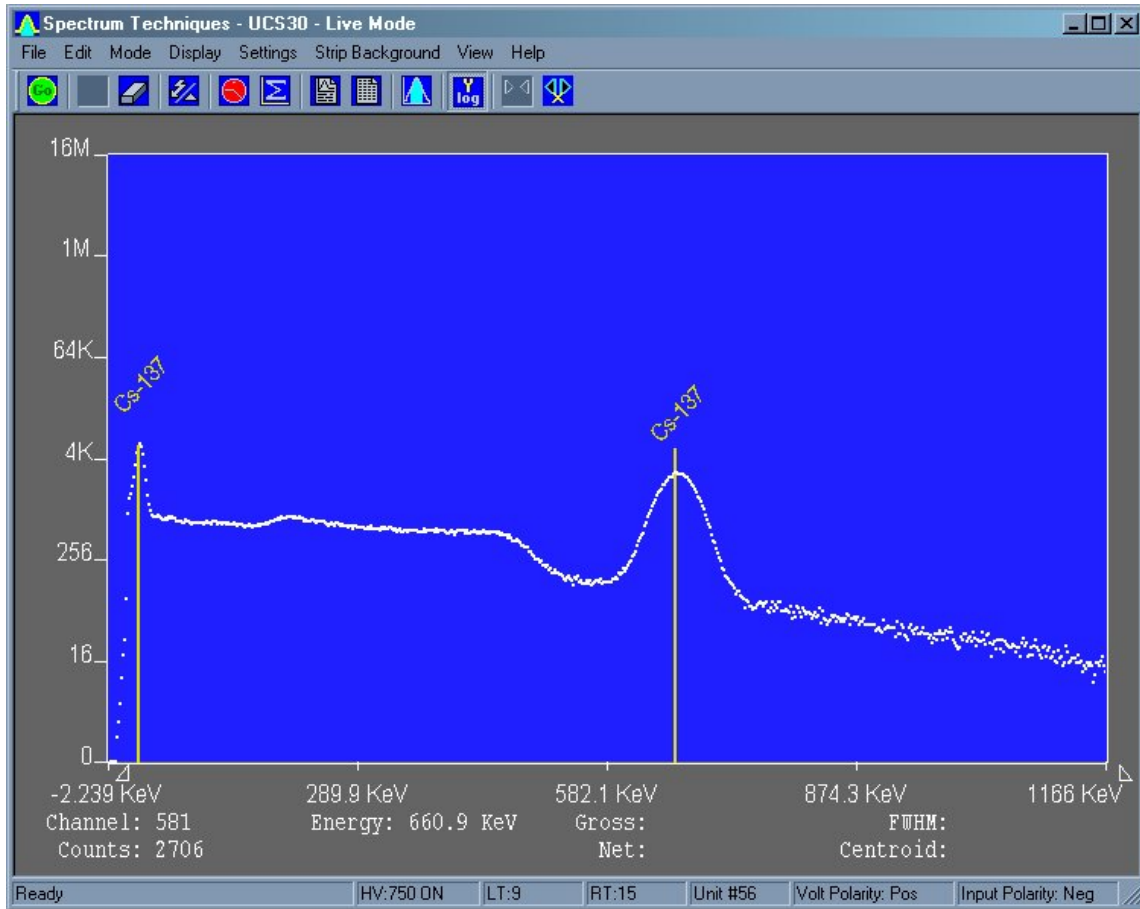
Selecting **calibrate** will initiate an acquisition sequence that attempts to determine the compensation parameters. First it attempts to **AutoCalibrate** the system. Once energy calibrated, the UCS 30 will attempt to find the temperature compensation parameters by finding the cesium peak at the specified interval over the specified time.



Since the calibration will take several hours, an information dialog box is displayed which advises to wait for completion and provides an opportunity to cancel the

calibration. Pressing of the Cancel button will result in the temperature compensation calibration process being aborted.

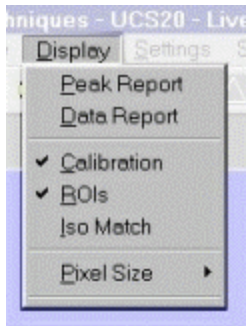
#SK Isotope Matching



Displaying Isotope Peaks

Isotope peaks may be indicated on calibrated spectra. These peaks are selected from a list provided by selecting the **Display** menu and clicking on **Iso Match**. The following dialog box will be displayed:

```
#IDH_FUNCISOMATCH
$Isotope Matching
^KIsotope Matching
```



Click the isotopes peaks in the window that you want to display. These will be highlighted to indicate selection. When your list is complete, click Okay to display them.

Editing the Iso Match list

Select the **Edit** menu and click **Iso Match**. The following dialog box will be displayed:





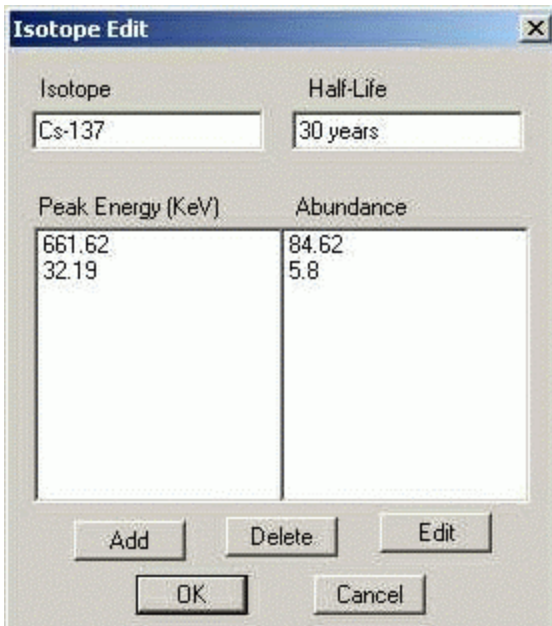
IsoMatch Library NOT loaded.



IsoMatch Library IS loaded

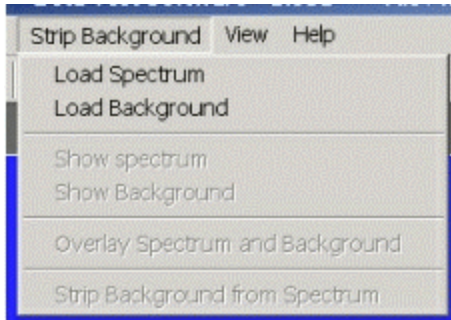
The dialog box top window labeled 'Select an existing isotope' will be empty unless an Iso Match library has been loaded. If a library has been loaded, you can select one of the entries from the window, if a library has not been loaded, or you want to add an entry to the list, enter the name in the second window titled 'or enter an isotope name'. Enter the number of peaks you want to add for this isotope in the third box labeled 'Enter number of peaks [10 max]' and click on Edit.

Further dialog boxes will appear that allow you to enter peak(s) for the isotope.



If you want to save the Iso Match to a disk file, open the File Menu and click on Save Library.

#SK Strip Background



The Strip Background option is available only in the File Mode. The user may load two files (Spectrum and Background) and subtract the second file from the first. The portion subtracted is based on a time adjustment to the data in the second file. For example if the first file was measured with 100 seconds live time and the second file was measured with 200 seconds live time, then the data in the second file is divided by 2 (200 seconds / 100 seconds) before it is subtracted.

[Load Spectrum](#)

[Load Background](#)

[Show Spectrum](#)

[Show Background](#)

[Overlay Spectra](#)

[Strip Background from Spectrum](#)

Background Subtraction

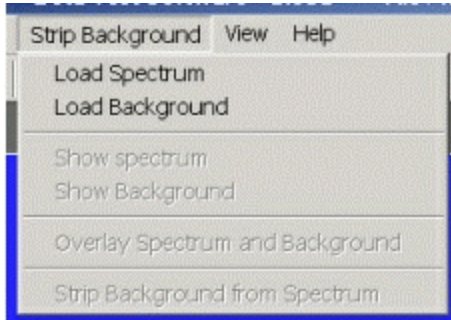
This is a special case of spectrum stripping. Collect a background sample spectrum, usually for a long collection time. Load this spectrum as Background and click on 'Strip Background from Spectrum.' The live time fraction of the background is subtracted from spectrum. This provides a convenient method of removing naturally occurring background from a sample spectrum and can be very useful when working with low level environmental samples.

#IDH_STRIP

\$Strip Background

^KStrip Background

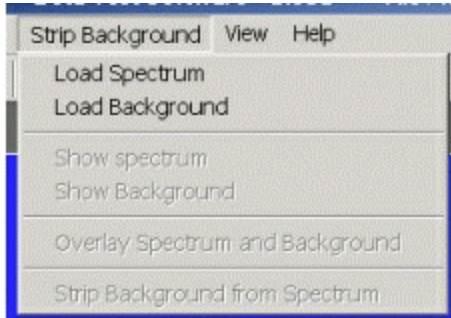
#SK Load Spectrum



Click on **Load Spectrum** and in the **File Dialog Box** that opens, select the spectrum you intend to have the background stripped from. For example, the spectrum may be taken for an isotope, the background may be the readings with no isotope present.

#IDH_LOADSPECTRUM1
\$Load Spectrum
^KLoad Spectrum

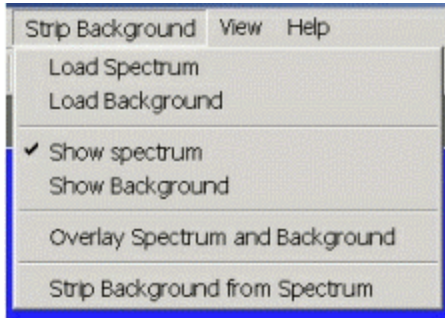
#SK Load Background



Click on **Load background** and in the **File Dialog Box** that opens, select the background you intend to strip from the first. For example, the spectrum may be taken for an isotope, the background may be readings with no isotope present.

#IDH_LOADSPECTRUM2
\$Load Background
^KLoad Background

#^SK Show Spectrum



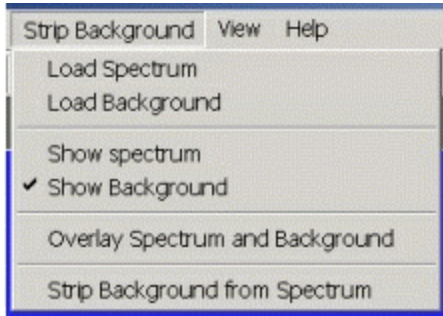
Click **Show Spectrum** to view spectrum.

#IDH_SHOWSPECTRUM1

^SShow Spectrum

^KShow Spectrum

#^SK Show Background



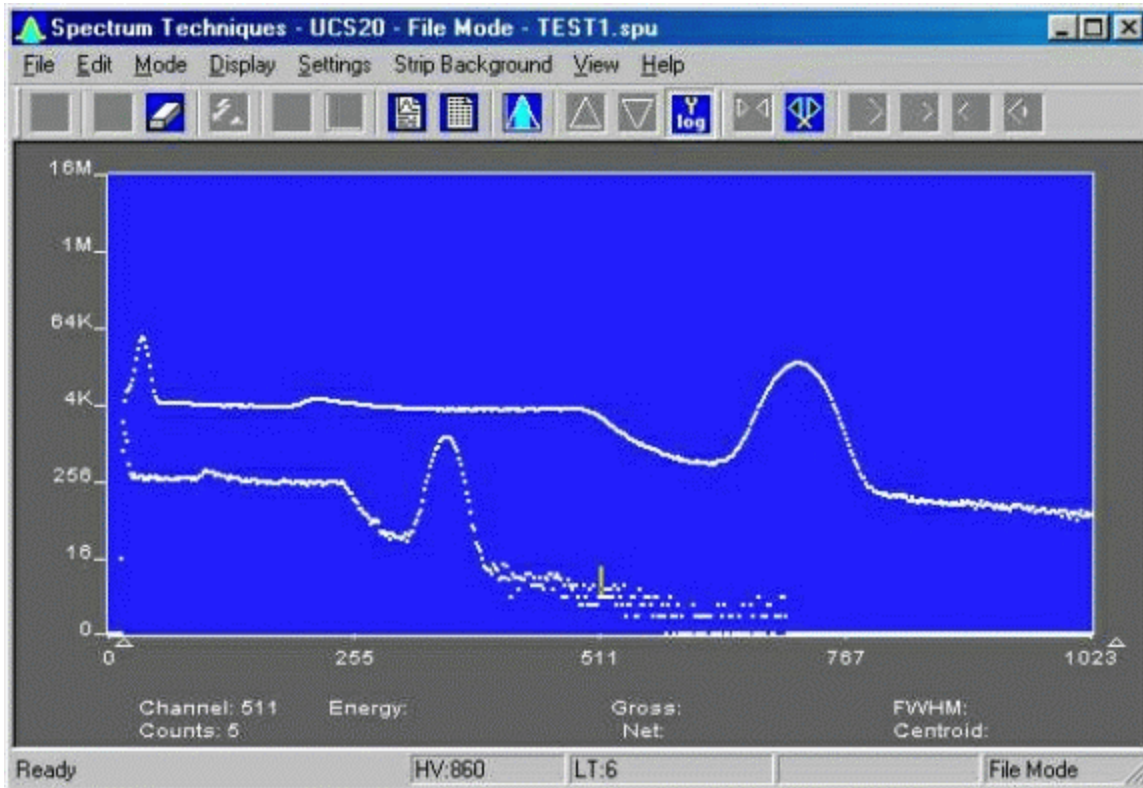
Click **Show Background** to view background.

#IDH_SHOWSPECTRUM2

\$Show Background

^KShow Background

#^SK Overlay Spectra



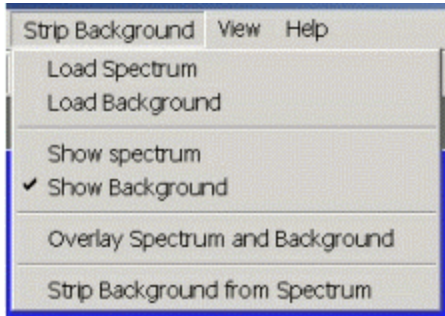
Click **Overlay Spectra** to view the spectrum and the background at the same time.

#IDH_OVERLAYSPECTRA

^SOverlay Spectra

^KOverlay Spectra

#^{\$}^KStrip Background from Spectrum



Click **Strip Background from Spectrum** to subtract the two spectra, where the background is corrected for the difference in the data collection time to give a correct proportion.

#IDH_STRIPSPECTRUM2FROM1
\$Strip Background from Spectrum
^KStrip Background from Spectrum

#SK Data Smoothing



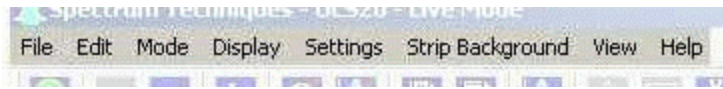
Click **Smooth Data** to perform a 3-point averaging of the data currently being displayed. The function uses the following algorithm to average data in each channel, where 'n' is the channel number.

$$\frac{(n-1)+(n)+(n+1)}{3}$$

#IDH_FUNCSMOOTH
\$Data Smoothing
KData Smoothing

#SK Menu Bar

Many advanced functions are possible via the pulldown menus. This section describes each operation in the sequence they appear. Black letters indicate the function is operational, gray indicates not-operational, highlighted indicates the function the be be activated.



For details:

[File](#)

[Edit](#)

[Mode](#)

[Display](#)

[Settings](#)

[Strip Background](#)

[View](#)

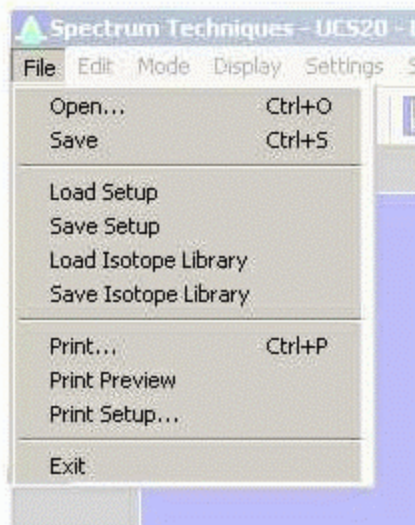
[Help](#)

#IDH_MENU

\$Menu Bar

^KMenu Bar

#SK File



For details:

[File Open](#)

[File Save](#)

[File Load Setup](#)

[File Save Setup](#)

[File Load Library](#)

[File Save Library](#)

[File Print](#)

[File Print Preview](#)

[File Print Setup](#)

[File Exit](#)

#IDH_MENUEFILE

\$File Menu

^KFile Menu

#^{\$}^KFile Open

File Open allows the user to open data files. A new instance of the UCS-30 application in the **File Mode** is generated.

See Also:

[Live Mode](#)

[File Mode](#)

#IDH_MENUFILEROEN

^{\$}File Open

^KFile Open

#^{\$}^KFile Save

The spectrum data and the associated setup and experiment data are saved to a *.spu file.

#IDH_MENUFILSAVE
\$File Save
^KFile Save

#^{\$}^KFile Load Setup

Once the UCS-30 has been setup and calibrated, all operating parameters may be stored (**Save Setup**) as a disk file for subsequent retrieval. If power has been turned off, it is a simple and convenient process to reload the setup file and quickly restore (**Load Setup**) the analyzer to its previous operating condition.

High Voltage must be turned on after loading setup !

#IDH_MENUEFILELOADSETUP

^{\$}File Load Setup

^KFile Load Setup

#^{\$}^KFile Save Setup

Once the UCS-30 has been setup and calibrated, all operating parameters may be stored (**Save Setup**) as a disk file for subsequent retrieval. If power has been turned off, it is a simple and convenient process to reload the setup file and quickly restore (**Load Setup**) the analyzer to its previous operating condition.

#IDH_MENUFILSAVESETUP
\$File Save Setup
^KFile Save Setup

#^{\$K}File Load Library

Allows loading of an Iso Match library file (*.itm).

See also:

[Isotope Matching](#)

#IDH_MENUFILELOADLIBRARY
\$File Load Library
^KFile Load Library

#^{\$}^KFile Save Library

Allows saving of an Iso Match library file (*.itm).

See also:

[Isotope Matching](#)

#IDH_MENUFILSAVELIBRARY

^{\$}File Save Library

^KFile Save Library

#^{\$}^KFile Print

Allows the user to print the displayed spectrum.

#IDH_MENUFILEPRINT
\$File Print
^KFile Print

#^{\$}^KFile Print Preview

Allows the user to preview the spectrum as it will be printed.

#IDH_MENUFLEPRINTPREVIEW
\$File Print Preview
^KFile Print Preview

#^{\$}^KFile Print Setup

Allows the user to adjust the printer parameters before printing.

IDH_MENUFILPRINTSETUP
\$ File Print Setup
^K File Print Setup

#^{\$}^KFile Exit

Closes the application.

#IDH_MENUFILEEXIT
\$File Exit
^KFile Exit

#SK **Edit**



For details see:

[Edit Experiment](#)

[Edit Iso Match](#)

[Edit Smooth Data](#)

#IDH_MENUEEDIT

\$Edit Menu

^KEdit Menu

#^{\$}K Edit Experiment

The image shows a standard Windows-style dialog box titled "Experiment". It contains five text input fields, each with a label above it. The labels and their corresponding values are: "Spectrum Name" (Lab Test 234-432), "Description" (Determine the unknown isotope), "Student ID" (Solly 123-45-678), "Detector Used" (Acme 98765-a), and "Comments" (Peaks indicate that this is Cs-137). At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Help".

Edit Experiment provides a means of inserting text into spectral file headers for referencing specific measurements. This text is saved along with data and parameter information in .SPE and .TSV files, and it is used for the Peak Report and the Data Report. The comments field saves a maximum of 50 characters.

Enter the desired text into the dialog box and click OK when finished.

IDH_EDITEXPERIMENT

\$ Edit Experiment

^K Edit Experiment

#SK Edit Iso Match

Editing the Iso Match list

Select the **Edit** menu and click **Iso Match**. The following dialog box will be displayed:



IsoMatch Library NOT loaded.



IsoMatch Library IS loaded

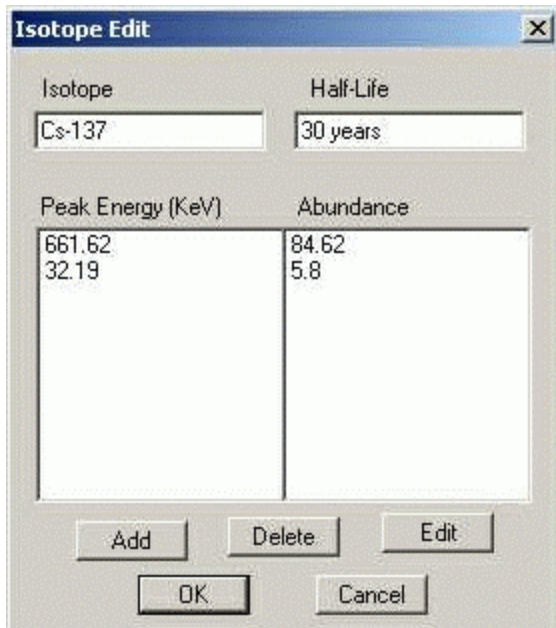
The dialog box top window labeled 'Select an existing isotope' will be empty unless an Iso Match library has been loaded. If a library has been loaded, you can select one of the entries from the window, if a library has not been loaded, or you want to add an entry to the list, enter the name in the second window titled 'or enter and isotope name'. Enter the number of peaks you want to add for this isotope in the third box labeled 'Enter number of peaks [10 max]' and click on Edit.

Further dialog boxes will appear that allow you to enter peak(s) for the isotope.

#IDH_EDITISOMATCH

\$Edit Iso Match

^KEdit Iso Match



If you want to save the Iso Match to a disk file, open the File Menu and click on Save Library.

See also:

[Isotope Matching](#)

#^{\$}^KEdit Smooth Data

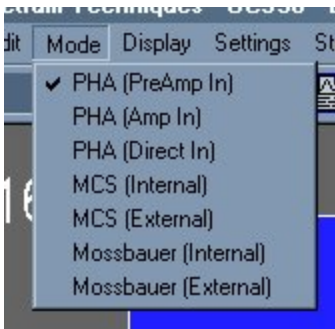
Edit Smooth Data allows the user to apply a three-point smoothing algorithm to the displayed data.

For details see:

[Data Smoothing](#)

#IDH_EDITSMOOTHDATA
\$Edit Smooth Data
^KEdit Smooth Data

#SK Mode



For details see:

[Pulse Height Analysis \(PreAmp In\)](#)

[Pulse Height Analysis \(Amp In\)](#)

[Pulse Height Analysis \(Direct In\)](#)

[Multi Channel Scaling \(Internal\)](#)

[Multi Channel Scaling \(External\)](#)

[Mossbauer \(Internal\)](#)

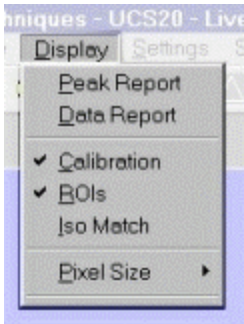
[Mossbauer \(External\)](#)

#IDH_MENUMODE

\$Mode

^KMode

#SK Display



For details see:

[Display Peak Report](#)

[Display Data Report](#)

[Display Calibration](#)

[Display ROIs](#)

[Display Iso Match](#)

[Display Pixel Size](#)

#IDH_MENUDISPLAY

\$Display

^KDisplay

#\$K Display Peak Report

If regions of interest have been set around peaks in a spectrum, the **Peak Report** provides a convenient method of displaying peak information in tabular form. Readout will be in energy units if the energy calibration is active.

#IDH_MENUDISPLAYPEAKREPORT
\$Display Peak Report
KDisplay Peak Report

#\$K Display Data Report

The **Data Report** includes all hardware setting, counting parameters and spectrum data. ROI data is reported by lower and upper channels set, gross, net, FWHM, centroid, all channels and corresponding counts.

#IDH_MENUDISPLAYDATAREPORT
\$Display Data Report
KDisplay Data Report

#^{\$K} Display Calibration

Display Calibration allows the user to switch between on/off in calibration mode and channel numbers or energy is displayed on the horizontal line.

IDH_MENUDISPLAYCALIBRATION
\$ Display Calibration
^K Display Calibration

#^{\$K}Display ROIs

Display ROIs lets the user toggle between displaying and not displaying the ROIs.

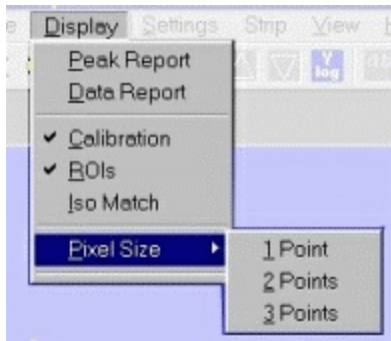
#IDH_MENUDISPLAYROIS
\$Display ROIs
^KDisplay ROIs

#^{\$}^KDisplay Iso Match

Display Iso Match lets the user toggle between displaying and not displaying the Iso Match peaks.

#IDH_MENUDISPLAYISOMATCH
\$Display Iso Match
^KDisplay Iso Match

#^{\$K}Display Pixel Sizes



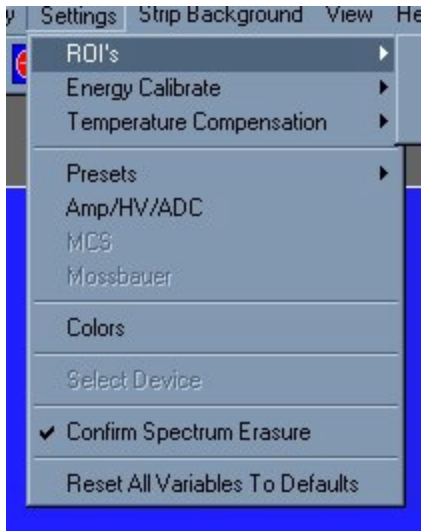
Allows the user to choose between 1, 2, and 3 pixels per data point displayed. The default is 2.

#IDH_MENUDISPLAYPIXELSIZE

\$Display Pixel Sizes

^KDisplay Pixel Sizes

#SK Settings



ROIs

[Clear ROI](#)

[Set ROI](#)

Presets

[Preset Time](#)

[Preset Integral](#)

Amp/HV/ADC

[High Voltage](#)

[Amplifier Coarse Gain](#)

[Amplifier Fine Gain](#)

[ADC Conversion Gain](#)

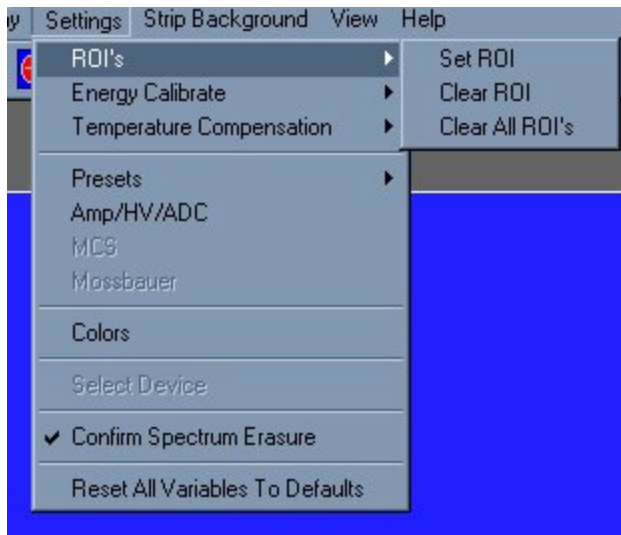
[Lower and Upper Level Discriminators](#)

#IDH_MENUSETTINGS

\$Settings Menu

^KSettings Menu

#^{\$}^KSettings ROIs



Allows the user to select the option to set or clear an ROI.

See:

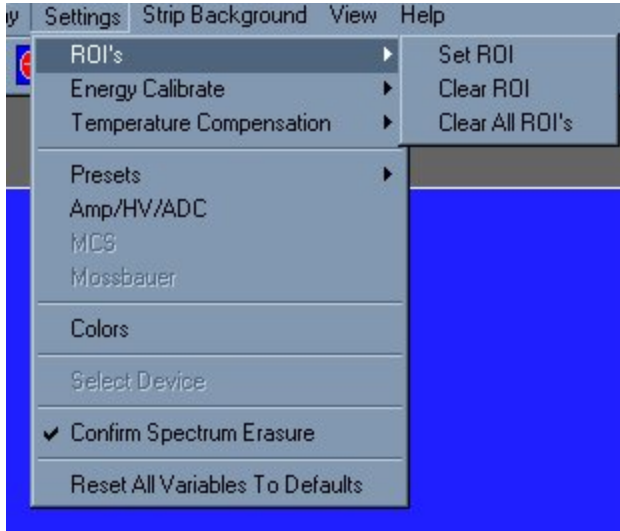
[Clear ROI](#)
[Set ROI](#)

#IDH_MENUSETTINGSROIS

^{\$}Settings ROIs

^KSettings ROIs

#SK **Clear ROI**



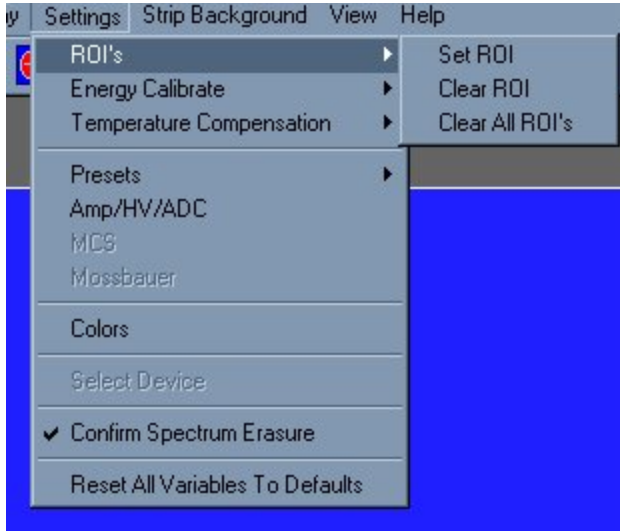
Clicking on **Clear ROI** will clear the ROI indicated by the marker.

#IDH_MENUSETTINGSROICLEARROI

\$Clear ROI

^KClear ROI

#SK Set ROI



Clicking on **Set ROI** allows the user to set the ROI.

See also:

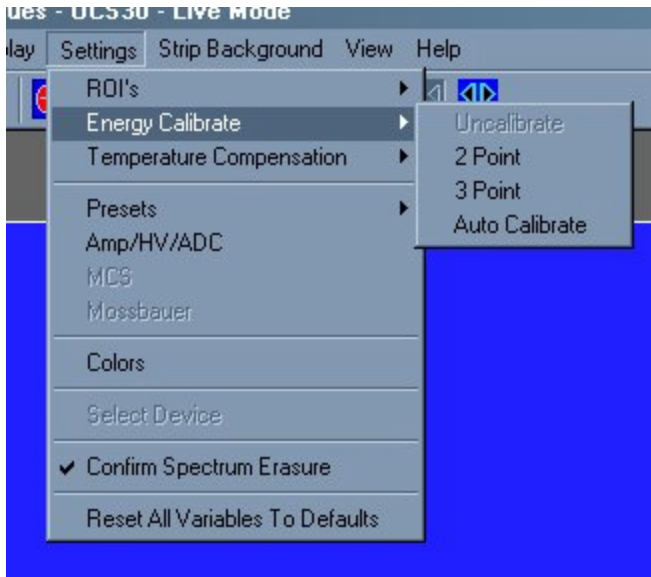
[Region of Interest \(ROI\)](#)

#IDH_MENUSETTINGSROISETROI

\$Set ROI

^KSet ROI

#SK Settings Energy Calibrate



Opens a submenu for calibrating and uncalibrating the spectrum.

See:

[Settings Energy Uncalibration](#)

[Settings Energy Calibrate 2 Point](#)

[Settings Energy Calibrate 3 Point](#)

[Settings Energy Auto Calibrate](#)

#IDH_MENUSETTINGSENERGYCALIBRATE

\$Settings Energy Calibrate

^KSettings Energy Calibrate

Settings Energy Uncalibrate

Clicking **Energy Uncalibrate** will undo energy calibration and return the spectrum to the channel mode of data display.

See:

[Energy Calibration](#)

#IDH_MENUSETTINGSENERGYUNCALIBRATE
\$Settings Energy Uncalibrate
#Settings Energy Uncalibrate

[#]^{\$}^KSettings Energy Calibrate 2 Point

Clicking **2-Point** allows the user to calibrate the data using two points.

See:

[Energy Calibration](#)

[#]IDH_MENUSETTINGSENERGY2POINT

^{\$}Settings Energy Calibrate 2 Point

^KSettings Energy Calibrate 2 Point

[#]^{\$}^K**Settings Energy Calibrate 3 Point**

Clicking **3-Point** allows the user to calibrate the data using three points.

See:

[Energy Calibration](#)

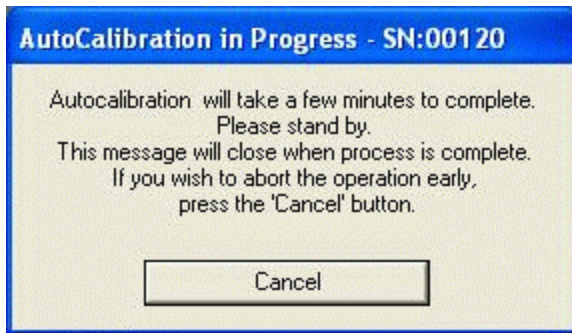
[#]IDH_MENUSETTINGSENERGY3POINT

^{\$}Settings Energy Calibrate 3 Point

^KSettings Energy Calibrate 3 Point

#^{\$}^K **Settings Energy Auto Calibrate**

Clicking **Auto Calibrate** initiates a calibration sequence. During Auto Calibration, high voltage and gain settings are automatically adjusted in sequence to determine optimum settings for energy calibration assuming detection of Cs-137 source. Once started, the operator is given an opportunity to cancel. A cancelled autocalibration does not revert to prior settings.



See:

[Energy Calibration](#)

#IDH_MENUSETTINGSENERGYAUTOCAL

^{\$}Settings Energy Auto Calibrate

^KSettings Energy Auto Calibrate

#^{\$}^KSettings Preset

Clicking **Presets** allows the user to select the Presets Dialog box.

See:

[Preset Time](#)

[Preset Integral](#)

#IDH_MENUSETTINGSPRESET

^{\$}Settings Preset

^KSettings Preset

#^{\$}^KSettings Amp/HV/ADC

Clicking **Amp/HV/ADC** allows the user to select the Amp/HV/ADC Dialog box.

See:

[High Voltage](#)

[Amplifier Coarse Gain](#)

[Amplifier Fine Gain](#)

[ADC Conversion Gain](#)

[Lower and Upper Level Discriminators](#)

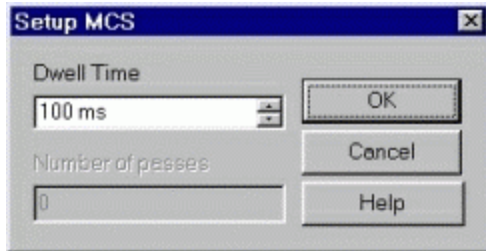
#IDH_MENUSETTINGSAMP/HV/ADC

^{\$}Settings Amp/HV/ADC

^KSettings Amp/HV/ADC

#^KSettings MCS

Clicking **MCS** allows the user to access the MCS Dwell Time dialog box, if the Mode is set to MCS.



Scroll to the desired Dwell Time then highlight the value selected then press OK.

See:

[Multi Channel Scaling](#)

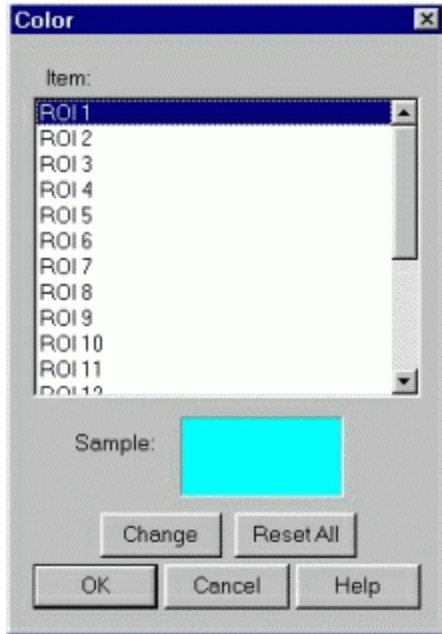
#IDH_MENUSETTINGSMCS

\$Settings MCS

^KSettings MCS

#^{\$}K Settings Color

Clicking **Color** allows the user to select the **Colors Dialog Box** to set or change the colors for the ROIs, Background, .



The **Color Dialog Box** allows the user to select custom colors for ROIs, Plot Background, Plot Border and Text.

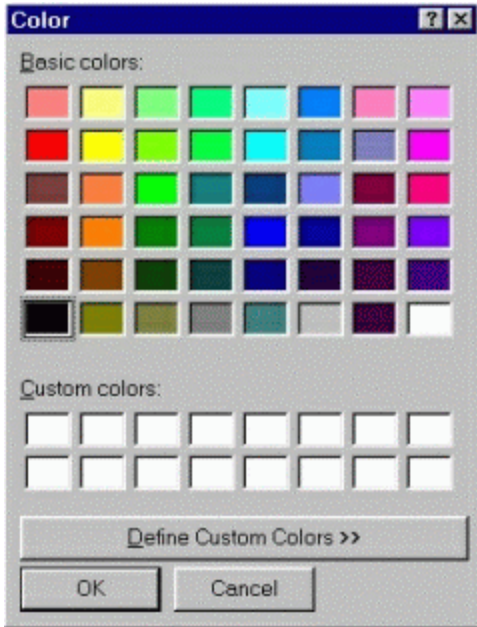
Select the item to change, click on **Change**, select the desire color, click on **OK**, returns to the **Color** screen, make additional color changes, when all color changes have been made, click on **OK**, enters data and returns to spectrum screen.

Color allows the user to select a range of **Basic Colors** or create **Custom Colors**.

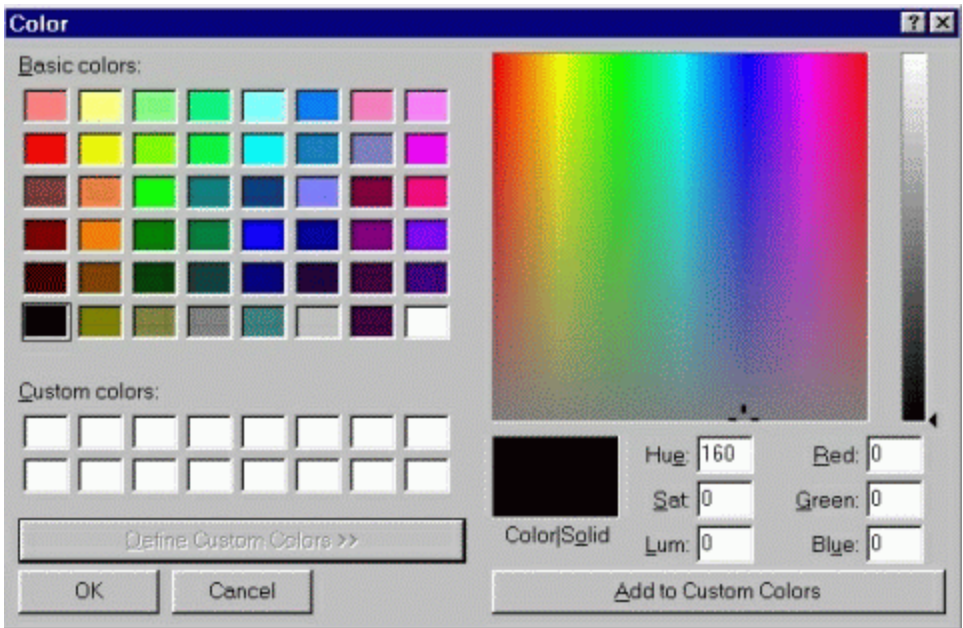
#IDH_MENUSETTINGSCOLOR

^{\$}Settings Color

^KSettings Color



Dialog Box with standard Colors.



Dialog Box expanded for custom colors.

Note:

Setup of computer graphic may affect the true color of the color selected.

#^{\$}^K Settings Confirm Spectrum Erasure

Unchecking **Confirm Spectrum Erasure** allows the user to bypass the confirmation of erasing current spectrum data. This option is checked each time the application is started. If the setting is unchecked, erasure of the current spectrum is immediate and cannot be undone, use it wisely. When the setting is checked, a request to erase is followed by the display of a confirmation dialog box to give an opportunity to cancel the request.

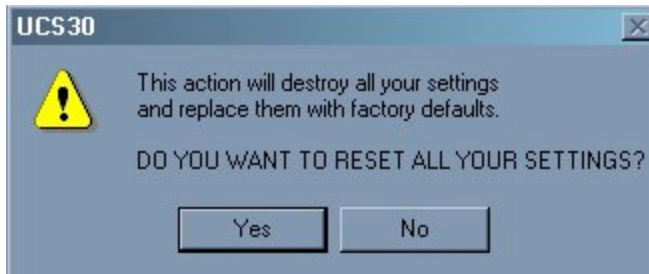
IDH_CONFIRM_ERASE

\$ Settings Confirm Spectrum Erasure

^K Settings Confirm Spectrum Erasure

#^{\$K}Settings Reset All Variables To Defaults

Clicking **Reset All Variables To Defaults** can result in configuration settings being reset to the initialized state.



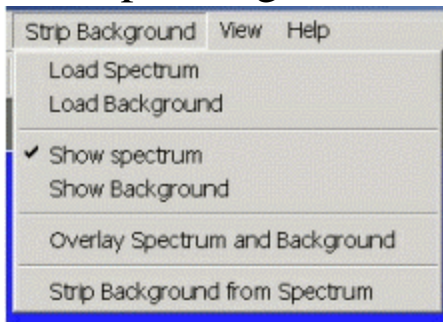
A confirmation dialog box will be presented to give an opportunity to cancel the request. Once accepted, the changes are made and cannot be undone. Click on 'Yes' to reset defaults, or on 'No' to cancel the operation.

#IDH_RESET_TO_DEFAULTS

\$Settings Reset All Variables To Defaults

^KSettings Reset All Variables To Defaults

#^{\$}K Strip Background



Allows the user to load a spectrum and a background and then strip the background from the spectrum.

See:

[Strip Background](#)

#IDH_MENUSTRIP
\$Strip Background
^KStrip Background

#^{\$}^KStrip Background - Load Spectrum

See:

[Load Spectrum](#)

#IDH_STRIPLOADSPECTRUM1

^{\$}Strip Background – Load Spectrum

^KStrip Background – Load Spectrum

#^{\$}^KStrip Background - Load Background

See:

[Load Background](#)

#IDH_STRIPLOADSPECTRUM2

^{\$}Strip Background – Load Background

^KStrip Background – Load Background

#\$^KStrip Background - Show Spectrum

See:

[Show Spectrum](#)

#IDH_STRIPSHOWSPECTRUM1
\$Strip Background – Show Spectrum
^KStrip Background – Show Spectrum

#^{\$K}Strip Background - Show Background

See:

[Show Background](#)

#IDH_STRIPSHOWSPECTRUM2

^{\$}Strip Background – Show Background

^KStrip Background – Show Background

#^KStrip Background – Overlay Spectra

See:

[Overlay Spectra](#)

#IDH_STRIPOVERLAYSPECTRA
\$Strip Background – Overlay Spectra
^KStrip Background – Overlay Spectra

#^KStrip Background – Strip Background from Spectrum

See:

[Strip Background from Spectrum](#)

#IDH_ASTRIPSPECTRUM2FROM1

^SStrip Background – Strip Background from Spectrum

^KStrip Background – Strip Background from Spectrum

#SK View



Allows the user to display or not display the Tool Bar and/or the Status Bar.

[Tool Bar](#)
[Status Bar](#)

#IDH_MENUVIEW
\$View
^View

#^KTool Bar

Allows the user to display or not display the Tool Bar.

See:

[Tool Bar](#)

#IDH_MENUVIEWTOOLBAR

^STool Bar

^KTool Bar

#^{\$}^KStatus Bar

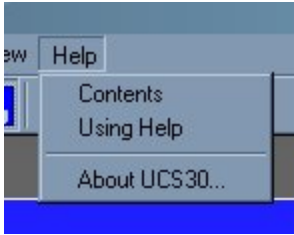
Allows the user to display or not display the Status Bar.

See:

[Status Bar](#)

#IDH_MENUVIEWSTATUSBAR
\$Status Bar
^KStatus Bar

#SK Help



The **Help** menu provides a convenient operator reference for the UCS-30 in the standard Windows Help format.

#IDH_MENUHELP
\$Help Menu
^Help Menu

#^S^KContents

The **Help** menu provides a convenient operator reference for the UCS-30 in the standard Windows Help format.

#IDH_MENUHELPCONTENTS
\$Contents
^KContents

#^KUsing Help

The **Using Help** item provides the standard Windows Help on using the Windows Help system.

#IDH_MENUEHELPUSINGHELP

^{\$}Using Help

^KUsing Help

#\$K About

Displays a splash screen with the Application name and version number.



#IDH_MENUHELPABOUT
\$About
KAbout

#SK Tool Bar



[Go](#)

[Stop](#)

[Erase](#)

[Show Peak Report](#)

[Show Data Report](#)

[Amp/HV/ADC](#)

[Presets](#)

[ROI](#)

[Spectrum Window Sizing](#)

[Y axis Log](#)

[X axis expand](#)

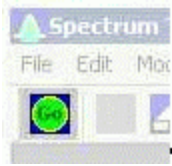
[X axis contract](#)

#IDH_TOOLBAR

\$Toolbar

^Toolbar

#SK **Go**



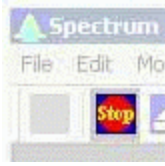
Go allows the user to start the acquire mode of a spectrum. This can also be accomplished by clicking on the green start icon on the display screen. Optionally, pressing 'A' while pressing and holding 'Ctrl' and 'Shift' keys will start acquisition.

See:

[Go, Stop and Erase](#)

#IDH_TBGO
\$ Go Button
K Go Button

#SK Stop



Stop allows the user to stop the acquire mode of a spectrum. This can also be accomplished by clicking on the red stop icon on the display. Optionally, pressing 'S' while pressing and holding the 'Ctrl' and 'Shift' keys will stop acquisition.

See:

[Go, Stop and Erase](#)

#IDH_TBSTOP
\$ Stop Button
K Stop Button

#SK Erase



Erase allows the user to erase the spectrum when in stop mode. This can also be accomplished by clicking on the Eraser Icon on the display screen. Optionally, pressing 'E' while pressing and holding the 'Ctrl' and 'Shift' keys will initiate an erase request.

Caution: If Settings-Confirm Spectrum Erasure is unchecked, erasure is immediate and final.

See:

[Go, Stop and Erase](#)
[Settings – Confirm Spectrum Erasure](#)

#IDH_TBERASE

\$Erase Button

^KErase Button

#SK Show Peak Report



If regions of interest have been set around peaks in a spectrum, the **Peak Report** provides a convenient method of displaying peak information in tabular form. Readout will be in energy units if the energy calibration is active.

#IDH_TBSHOWPEAK

\$ Show Peak Button

^K Show Peak Button

#SK Show Data Report



Data Report includes all hardware setting, counting parameters and spectrum data. ROI data is reported by lower and upper channels set, gross, net, FWHM, centroid, all channels and corresponding counts.

#IDH_TBSHOWDATA
\$ Show Data Button
K Show Data Button

#SK Amp/HV/ADC



Allows the user to select the **Amp/HV/ADC** Dialog box.

See:

[High Voltage](#)

[Amplifier Coarse Gain](#)

[Amplifier Fine Gain](#)

[ADC Conversion Gain](#)

[Lower and Upper Level Discriminators](#)

#IDH_TBAMPHVADC
\$ AMP/HV/ADC Button
K AMP/HV/ADC Button

#SK Presets



Allows the user to select the **Presets** Dialog box.

See:

[Preset Time](#)

[Preset Integral](#)

#IDH_TBPRESSETS

\$Presets Button

^KPresets Button

#^SK ROI



Allows the user to set an ROI.

See:

[Region Of Interest](#)

IDH_TBROI

^S Region Of Interest Button

^K Region Of Interest Button

#^KSpectrum Window Sizing



These buttons allow the user to set the size of the X and Y axes.

If a button is grayed, its function is not available for use. Scroll bars will appear when a spectrum is zoomed in on or when it is being viewed in linear mode to provide further control.

#IDH_SPECTRUMWINDOW
\$Spectrum Window
^KSpectrum Window

#^{\$}K Y axis Log



Clicking the Y axis Log button sets the Y axis to a logarithmic scale with a maximum of 16 meg.

#IDH_TBYLOG
\$Y axis Log Button
^KY axis Log Button

#^SK X axis expand



Clicking the X axis expand button increases the span of the X axis, up to the maximum set by the Conversion Gain.

#IDH_TBXEXP

^SX axis expands Button

^KX axis expands Button

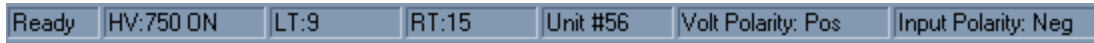
#^{\$K}X axis contract



Clicking the X axis contract button decreases the span of the X axis.

#IDH_TBXCNT
^{\$}X axis contract Button
^KX axis contract Button

####\$^KStatus Bar



The status bar at the bottom of the window displays a context sensitive help message on the left side, the high voltage, live time, real time, the selected device, high voltage and input polarities on the right side.

#IDH_STATUSBAR
#IDH_SBVH
#IDH_SBLT
#IDH_SVRT
\$Status Bar Button
^KStatus Bar Button

#^S^KSpecifications

[Hardware](#)
[Software](#)

#IDH_SPECIFICATIONS
\$Specifications
^KSpecifications

#SK Hardware

- Physical:** Single instrument includes preamplifier, amplifier, detector high voltage, 4096-channel multichannel analyzer with data memory, LLD and ULD. Fully compatible with many scintillation detectors and commercial tube bases.
- Amplifier:** On-board combination preamplifier/amplifier for use with scintillation detectors and PMT's. Computer controlled coarse and fine gain from (x) 1 to (x) 160.
- ADC:** Wilkinson type with 80 MHz clock and computer selected conversion gain of 4096, 2048, 1024, 512, or 256 channels. Direct input accepts pulse peaking times of 1 μ sec. to 10 μ sec. Includes dead-time correction when used in Live-time mode.
- LLD & ULD:** Independently computer controlled in 4-channel increments over entire input range. Operates prior to ADC for reduced system dead time.
- Modes:** MCA for pulse height analysis, or MCS for half-life decay or other time related studies.
- Timers:** Real-time or Live-time operation selectable in 1-second increments for PHA, or dwell times from 10 msec. to 600 seconds per channel in MCS mode.
- Data Memory:** On-board static RAM, 4096 channel (x) 3 Bytes for data, plus region-of-interest flag.
- Deadtime:** System dead-time is computed and displayed on screen during acquisition.
- Power:** AC line powered with an auto sensing power supply for 100 – 250 VAC, 10 watts total.

Connections On Rear Panel:

[Connections On Rear Panel](#)

IDH_SPECHW

\$ Hardware Button

K Hardware Button

#SK Software

- System:** Operates under Windows® 2000, Windows® XP with 600 kb for the executable and 6 meg for the optional help file available disk space, 64 meg RAM (128 recommended), and compatible mouse.
- Display:** VGA or SVGA color graphics (800x600 recommended. Linear vertical scale adjusts from 64 to 16M and full range logarithmic display. Horizontal 4096 channels with reduction down to 128 channels.
- Time Mode:** Preset live-time or preset real-time selection. Both times are recorded and displayed.
- ROI'S:** Multiple Regions-of Interest using color coding.
- Integral:** When cursor is in ROI, computes gross area, net area with end point averaging, centroid and FWHM.
- Energy Cal:** 2-point linear or 3-point quadratic converts cursor position reading directly to energy units. (Time units in MCS mode.)
- Temp Comp:** Temperature compensation adjusts high voltage to compensate for fluxuations in temperature.
- Strip:** Subtracts channel-by-channel time normalized data stored in File Mode. Overlays two saved spectra in File Mode
- Smooth:** 3-point smoothing of selected displayed data.
- Control:** Software control of High Voltage, Amplifier Gain, Lower and Upper level discriminators, and ADC Conversion Gain.
- File:** Save or load data file and header information in binary, or spreadsheet compatible formats.
- Print:** Prints current screen display to Windows printer.
- ROI File:** Saves ROI data, centroid, FWHM, gross and net integrals, and header information in spreadsheet compatible format.
- IsoMatch:** Isotope library text file with peak markers and labeling for overlaying on spectrum for quick isotope identification. Library may be edited from Edit, IsoMatch pull down menu.

IDH_SPECSW

§ Software Button

^ Software Button

#^{\$}^KSpectrum Techniques Contact

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#IDH_SPECTECHCONTACT

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^KSpectrum Techniques Contact