

Quick Start

The System 824 instrument provides simultaneous measurements of sound pressure level using Fast, Slow, Impulse, Peak and Leq detectors with A, C, and Flat weighting covering a large dynamic range of greater than 105 dB in the LOG and ISM instrument and 80 dB in SSA instrument.

With the System 824 calibrated, the desired instrument definition selected, and its associated settings properly configured, you can easily take a measurement and examine the readings from the data collected. Taking an actual measurement with the System 824 is as easy as pressing the  (RUN/STOP) key.

This chapter helps users begin using the System 824 immediately. This chapter will present the following:

- Turning on and Calibrating the System 824
- Taking Measurements and Storing Data
- Recalling Stored Data
- Deleting Stored Data
- Selecting and Modifying Instrument Definitions (IDs)

Turning On and Calibrating the System 824

This section guides you through the process of turning on and calibrating the System 824.

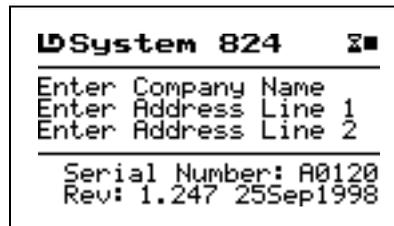
This screen displays three lines of user information which may be defined as name and address settings. You can use the 824 Utility Software to input this information. This display also shows the serial number of the instrument and the firmware version and date. The System 824 then loads the last instrument definition (ID) selected.

Pressing the  POWER key for 1 second turns the power OFF.

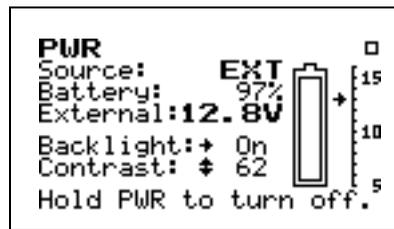
Power off prior to changing microphone or preamplifier to avoid possible damage of sensitive electronics due to high voltage spikes.

This screen shows you the current power source, battery level, and external power voltage.

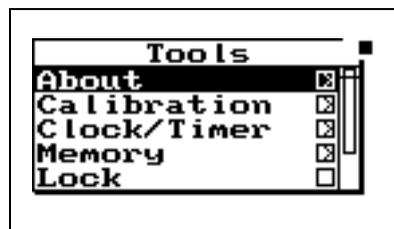
- Step 1** Turn on the System 824. To do this, press the  key (located on the left side of the key pad). By pressing this key, the Larson Davis logo appears while a number of tests are performed. The following screen then appears for a few seconds:



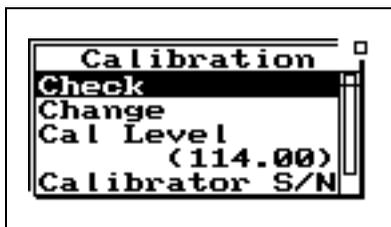
- Step 2** Check the battery level. After the System 824 is turned on, you can check the battery level. To do this, press the  POWER key momentarily. The following screen appears:



- Step 3** Calibrate the instrument. To do this, press the  TOOLS key. The following menu appears:



- Step 4** Using the \blacktriangledown key, highlight the **Calibration** menu item, then press the \odot key. The following screen appears:

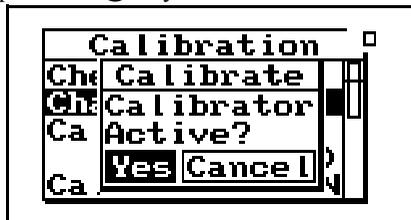


NOTE: The output level specified by the calibrator manufacturer will be at standard temperature and pressure. In practice the level is a function of temperature and static (barometric) pressure, so a corrected level should be used. Similarly, the sensitivity of the microphone itself is a function of temperature and static pressure. For directions on compensating for temperature and static pressure during calibration, see "Correction of Calibrator Output Level" on page 2-17.

- Step 5** The value of **Cal Level** (3rd item on the screen) must be set equal to the output level of the calibrator to be used for the calibration (typically 94 or 114 dB). If the value indicated is not equal to this value, use the \blacktriangledown key to highlight the **Cal Level** menu. Press the \odot key, use the horizontal and vertical arrow keys to input the correct value and press the \odot key to make the change.

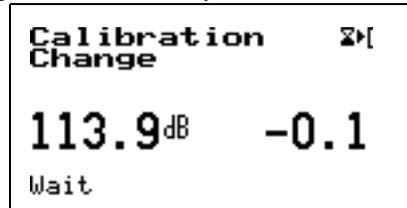
- Step 6** Place the calibrator over the microphone. Using the \blacktriangledown key again, highlight the **Change** menu item. Press the \odot key to start the **Calibration** process.

- Step 7** When prompted by the message shown below, press the \odot key to continue the **Calibration** process. If you wish to abort the calibration procedure, \blacktriangleright arrow key to select **Cancel** and press the \odot key.

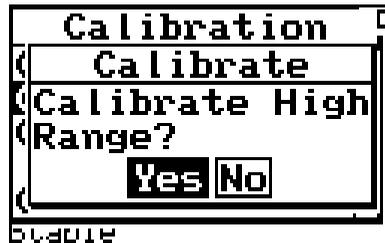


- Step 8** While the system is stabilizing, the measured level is indicated on the left of the screen and the difference between the measured level and the Cal Level Setting are show on the left and right sides

of the display, as shown below, along with the message *Wait* indicating that the calibration process is underway and should not be interrupted.



Step 9 When the calibration is complete, the message will change to Stable, after which the following display will appear to prompt the user to decide whether or not to calibrate the High Range as well. If you decide to calibrate the High range as well as the Normal range, there will be a forty second delay while the instrument stabilizes at the High range setting.



High Range Calibration

*Note: When using a prepolarized microphone, during setup **Electret** should have been selected as the **Transducer**. The High Range is not available when using a prepolarized microphone, so the prompt concerning calibration of the High Range will not appear.*

When the High Range is calibrated, the microphone bias voltage is reduced from 200 to 20 volts. This reduces the sensitivity of the microphone by 20 dB. As a result, the measured level indicated on the left of the display during the stabilization process should be 20 dB less than the Cal Level value.

Taking Measurements and Storing Data

This section provides examples of how to select an instrument ID, take a measurement, and store the resulting data.

SLM&RTA Measurements

NOTE: A solid black box indicates that the 824 is stopped with data, and a hollow box indicates that the 824 is stopped with no data present.

If the 824 is already using the SSA ID, there will be a '>' to the left of its name on the second menu line.

Whether using the SSA, ISM, or LOG instrument, the SLM is one of the most common functions used in the System 824. The following example explains how to record and store a measurement in the SLM mode of the SSA instrument.

Step 1 To activate the SLM&RTA SSA instrument, press the  SETUP key. A menu similar to the following appears:



When changing from one ID to another you will be prompted to save your data if you have not already saved it. If you do not save your data at this point, any measurement readings you have taken will be lost.

If this is your first time using the System 824 and you have not set up any ID's, or have not taken any readings that need to be saved, select "No".

The bolded **SLM** text on the SLM view screen indicates that this is the SLM view of the SSA instrument. Any of the SSA displays can be active while taking a reading.

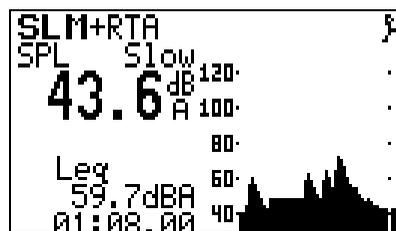
The instrument display shows a running symbol (upper right hand corner) when the instrument is actively taking measurements.

Step 2 Press the  or  arrow keys to highlight the **SLM&RTA SSA** item and press the  key to select it. The last used SLM+RTA display appears:



Step 3 At this point, if you want to view a display other than the one shown, press the  VIEW key. Use the  or  keys to highlight the desired display. For this example, highlight SLM and press the  key to select it. The SLM display of the SLM+RTA instrument shown in step 2 will appear. The Sound Level Meter with Real-Time Spectrum Analyzer is now ready to use.

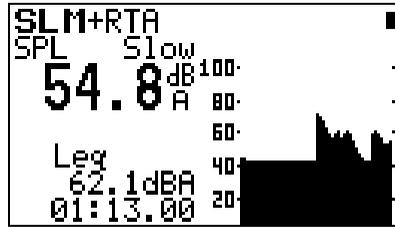
Step 4 To take a sample reading, press the  RUN/STOP key. A screen similar to the following appears:



Let the instrument continue to take measurements for about one minute. Make some noise and watch the results on the graph.

Step 5 Press the RUN/STOP key to stop the measurement.

The screen shows a black box symbol in the upper right hand corner indicating that the instrument is stopped and not taking a measurement.



If you attempt to store data while a measurement is still running a warning will be displayed, indicating that the measurement must first be stopped.

Step 6 To store the current measurement readings, press the  Data key. Select **Store File** and press the  key. This will store the measurement's data.



Step 7 To turn off the instrument, press and hold the  key until you are prompted to release it. The instrument then turns off.

NOTE: You may want to repeat the process of running a measurement, stopping, and storing its data a few times so that you will have several samples of stored data to choose from when trying this exercise.

Viewing RTA Displays during a Measurement

While taking measurements you can view the instrument's different displays. This section provides examples of viewing the SSA instrument's four RTA displays which include:

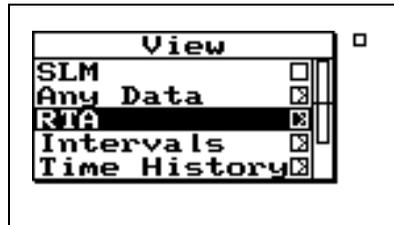
- RTA Live
- RTA L_{eq}
- RTA Max
- RTA Min

Do the following to view the RTA displays:

Step 1 Select the SLM&RTA (SSA) instrument from the *Setup* menu and press RUN/STOP S to begin taking a measurement as explained in the "SLM&RTA Measurements" section found on page 4-3.

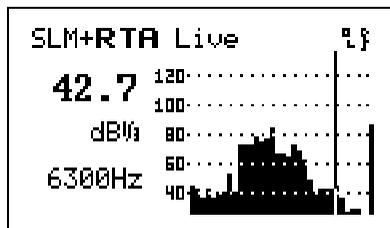
Step 2 While the measurement is running, press the  View key. The following screen appears:

If you select the RTA Live item with the  arrow key instead of the  Check key, you will be given the option to view the display in graphical or Tabular mode.



Step 3 Use the  and  arrow keys to highlight the RTA item and press the Check  key to select the RTA displays. A screen similar to the following appears:

The **RTA Live** screen shows a graphical display of the sound readings over a range of frequencies. The SPL for the selected frequency is displayed in the upper left corner. The frequency, as selected by the vertical cursor, is displayed in the lower left corner.

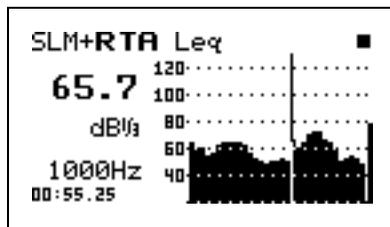


As the frequency is changed the cursor (vertical bar) will move accordingly across the graphical display, highlighting the corresponding graphical sound reading. Additionally, the digital frequency display will also change as will the digital readout of the sound measurement for the newly selected frequency.

Step 4 Use the **▶** and **◀** arrow keys to change the selected frequency. As the selected frequency is changed, the SPL for that frequency will be displayed in the upper left corner. Additionally, the cursor bar will move along the graph to the position that corresponds to the SPL graphical display for that particular frequency.

Step 5 Press the **▼** arrow key to change to the **RTA Leq** view. A screen similar to the following appears:

The **RTA Leq** view shows a graphical display of average sound exposure for the measurement time. The **LEQ** for the selected frequency is displayed in the upper left corner. The selected frequency is displayed in the lower left corner. When the cursor is moved to the far right side, the broadband **Leq** is shown numerically and the cursor is no longer displayed (as shown here).

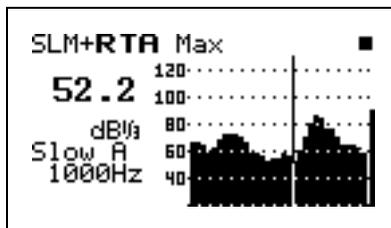


Step 6 Use the **▶** and **◀** arrow keys to change the selected frequency. As the frequency is changed, the L_{eq} for that frequency will be displayed in the upper left corner. Additionally, the cursor bar will move along the graph to the position that corresponds to the L_{eq} graphical display for that particular frequency.

Step 7 Press the **▼** arrow key to change to the **RTA Max** view. A screen similar to the following appears:

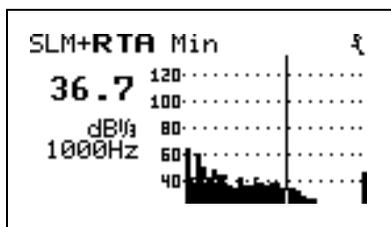
This is the minimum level obtained for each frequency since the last current reset.

The RTA Max view shows a graphical display of the Live spectrum of the maximum broadband level since the last current reset.



Step 8 Use the  and  arrow keys to change the frequency level being displayed.

Step 9 Press the  arrow key to change to the *RTA Min* view. A screen similar to the following appears



Step 10 Use the  and  arrow keys if you want to move back and forth between the different RTA screens.

Step 11 Press the RUN/STOP  key to stop the current reading.

Step 12 Press the  Data key. Select *Store Data* and press the  key to store the measurement's data.

If you attempt to store data while a measurement is still running, a warning will be displayed, indicating that the measurement must first be stopped.

Recalling Stored Data

Measurement data that has been stored can be recalled for review at any time. To recall a data file, do the following:

Step 1 Press the  Data key and a screen similar to the following appears:



When recalling a data file, the System 824 will automatically switch to the instrument that the data file was stored as (i.e. from Logging to SLM&RTA).

Step 2 Use the  up and  down arrow keys to highlight "Recall Files" and press the  check key. The following appears:



*The **Data Files** screen shows the currently selected record number, the ID used to take the measurement, the start/stop dates and times, and the total bytes used by the record.*

A summary of each data file can be viewed to determine if it is the desired measurement. To view each data file summary use the  up and  down arrow keys.

Step 3 You can recall the selected Data File by pressing the  Check key. The following screen appears:



The Data Files check menu includes the following:

Menu Items	Description
Recall Data	Recall the stored data file's measurement.
Beginning	Displays the Data File Summary of the first stored data file.
Ending	Displays the Data File Summary of the last stored data file.
Find	Allows you to find and display a Data File Summary by entering its associated Data File Number.
Purge All Data Files	Gives you the option to completely remove from memory all stored data files.

Selecting and Modifying Instrument Definitions (IDs)

As explained in the section "System 824 Setups or Instrument Definitions" on page 2-1, the way to prepare the System 824 for a measurement is to select an existing Setup or Instrument Definition (ID) from the list which appears on the display after pressing the Setup Key  and either use it as-is or modify it to suit the requirements of the measurement to be performed. In this section, we will explain in general how an ID is modified and stored using the Setup Menu of the System 824. More detailed descriptions for specific Instrument Types (e.g. ISM, LOG, or SSA) will be provided in later chapters. When a PC is available, the 824 Utility software is a very powerful tool for creating and storing new IDs and uploading them to the System 824 for use.

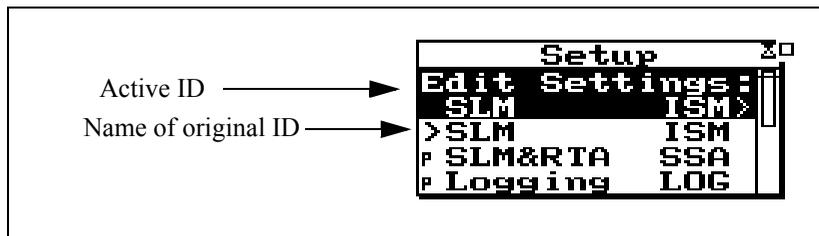
The Setup Menu

Pressing the  Setup key will produce a display similar to the following:

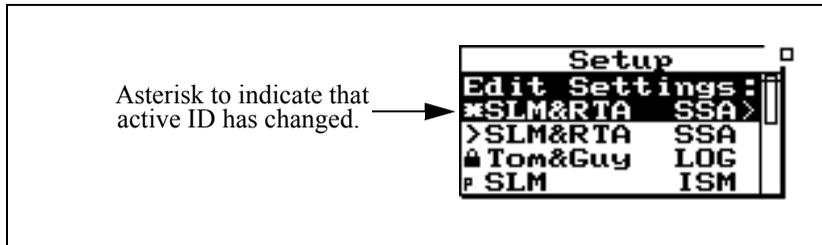


The Active ID

The first item in the list is the Active ID, which will be highlighted. If the user exits from the Setup Menu by pressing either  (a second time) or , the instrument is ready to perform a measurement as defined by that Active ID.



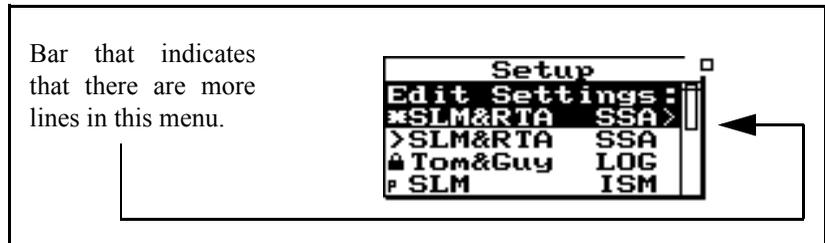
Following the Active ID is a list of the available IDs. In most cases, the first ID in the list will have the symbol “>” to the left, indicating that the Active ID was originally defined by selecting that ID. Thus, the name of the Active ID and this ID will be the same. If there is an asterisk “*” to the left of the Active ID, it indicates that modifications have been made to the Active ID since the selection of the ID below it, so they may no longer be the same. If there is no asterisk, then the Active ID and the one below remain identical.



There is one other possibility which should be mentioned. When a stored data file is recalled, then the ID stored with that file becomes the Active ID. Since the ID which was used to perform the measurement at that time may have since been modified or even deleted, a tilde “~” will appear to the left of the Active ID to indicate that it is approximately the same as another ID in the list.

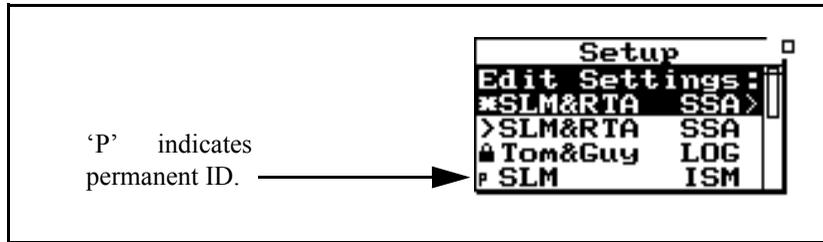
Menu Scrolling

There may be more items in a menu than can be shown in a single display. To the right of any menu window, there will be a vertical window within which there will be vertical bar. If this vertical bar extends from the top to the bottom of the vertical window, then all items in the list are shown in the display. If the vertical bar does not cover the length of the vertical window, this means that there are more items than can be displayed and that those presently being displayed fall within the portion of the vertical window covered by the vertical bar. In the example of the Setup Menu, it can be seen that there are more items than can be shown in one display and that those presently being displayed are at the top of the list. Use the up ▲ and ▼ arrows to scroll through the list and note how the vertical bar moves to indicate which portion of the list of menu items is presently being displayed.



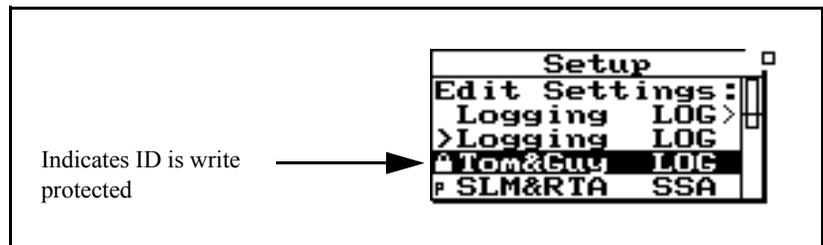
Permanent IDs

In the list of available IDs, those with a “P” to the left of the name are permanent IDs provided upon delivery. These can be selected, modified and used for a measurement, but the name must be changed when the modified ID is stored so that it does not conflict with the names of any permanent IDs.



Write-protected IDs

Those with a symbol of a padlock to the left are user-defined IDs which have been write-protected. Like the permanent IDs, these can be selected, modified and used for a measurement, but the name must be changed when stored.



Preparing for a Measurement

If data has been taken, the prompt



will be shown. Press the check (✓) key to reset data and edit the setting.

If the Active ID will provide the desired measurement, press either the Setup (⌘) key or (⏪) to exit from the Setup menu. The System 824 is now ready to perform a measurement according to the Setup represented by the Active ID.

If the Active ID is not satisfactory for the measurement, the following options are available:

- 1. Modify the Active ID as required
- 2. Select and use a different ID (make it the Active ID)

- 3. Select a different ID, make it the Active ID, and modify it as required.

Selecting a Different ID

Use the  and  keys to highlight the desired ID and make it the Active ID by pressing the  Check key. This will activate that ID, exit the Setup menu, and display the main data view. The instrument is ready to perform a measurement by pressing S Run/Stop.

Accessing the Settings Menu

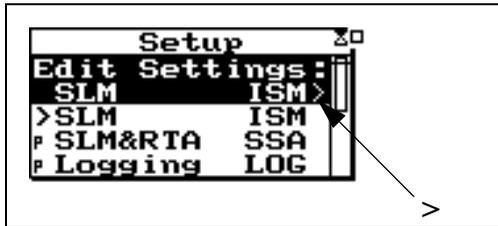
It is within the Settings menu and its associated Sub-menus, that the settings associated with the measurement are defined. Sound level measurements are made in the ISM LOG, and SSA Instrument Types, so all of these will include selections of RMS and peak detectors and broad band frequency weighting. IDs based on the LOG Instrument type will include parameters associated with automatic data storage such as Interval and Time History periods and threshold levels for triggering Exceedance Event data. Report settings are also included in the Settings menu when appropriate.

The following example will be used to illustrate the general structure and utilization of the Settings menu and sub-menus. Please follow this on your instrument. Since all versions of the System 824 include the SSA Instrument Type, we want to select the permanent ID SLM&RTA (SSA) as the Active ID. Press  to open the Setup menu.

Step 1 If the Active ID in your instrument is an unmodified version of SLM&RTA (SSA), press .

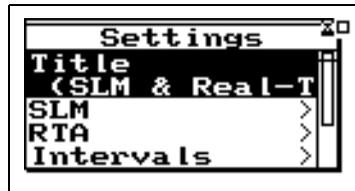
Step 2 If the Active ID in your instrument is anything other than SLM& RTA (SSA), then highlight SLM&RTA (SSA) and press  to make it the Active ID.

- Step 3** If the Active ID in your instrument is a modified version of the SLM&RTA (SSA), indicated by an asterisk to the left of the name, highlight “>SLM&RTA (SSA), press \odot , and in response to the message “Active ID has changed. Save?”, use \blacktriangleright to highlight “No” and press \odot to make it the Active ID.
- Step 4** Press \odot to display the Setup menu with SLM&RTA (SSA), unmodified, as the Active ID.



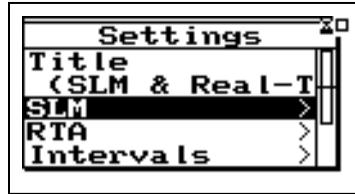
Accessing the Settings Menu to Initiate Editing or Modification

As mentioned above, the first item on the list, highlighted, is the Active ID. The message “**Edit Settings**”, along with the symbol “>” to the right, indicates that one should press \blacktriangleright in order to view or edit the Active ID. In many cases, the \odot Check key will accomplish the same result. This will produce the **Settings** menu list as shown below.



Note that all of the items in this list, with the exception of the first, Title, have the symbol “>” to the right indicating a sub-menu. In order to illustrate the Settings menu structure, please perform the following steps to set the SLM Weighting function.

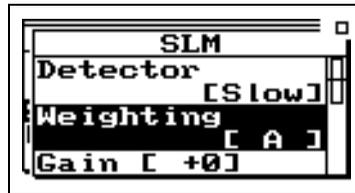
Step 1 Use  to highlight SLM



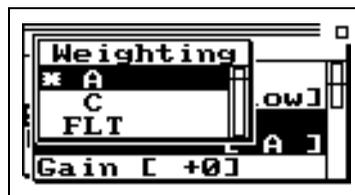
Step 2 Press  to produce the SLM sub-menu



Step 3 Use  to highlight Weighting (note that the present selection is "A")

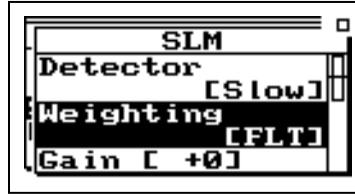


Step 4 Press  to open SLM Weighting Selections menu



Step 5 Use  to highlight "FLT"

Step 6 Press  to select FLT as the new SLM Weighting



For the purpose of continuing with this example later in this chapter, please do not press any keys.

Although we will not do this in the present example, we could highlight Detector noting that it is presently “SLOW”, press  to open a window listing the SLM Detector selections, highlight “FAST” and press  to select it as the new SLM Detector.

Regardless of the Instrument Type, one can modify any of the available parameters by selecting the proper Setup menu item, then the proper sub-menu item, then making a selection and pressing .

Once one or more modifications have been made, the user can follow one of three procedures:

- Setup  will close the menu, remembering its location the next time it is opened.
- Use the right  arrow key to step out one menu at a time.
- Press  power to close the menu and reset the menu position.

In either case, the instrument will be ready to perform a measurement. The major difference is that the second method, backing out by a sequence of  keys, possibly interspersed with  and  keys, leaves a memory of the path used to withdraw.

To better understand what happens when we back out of the Setting menu structure using repeated presses of , consider the following diagram illustrating the actions which

have been taken so far in the example above.



In this particular instance, when the **▶** key was used to move from the Settings menu to the SLM sub-menu and from the SLM sub-menu to the Selections menu, the item highlighted was not the first in the list. Observe that when **Ⓢ** was pressed to accept the selection of “FLT for the frequency weighting, upon returning to the Weighting sub-menu, the 2nd item was highlighted, just as it had been previous to entering the Selection menu using **▶** .

Continuing the example, press **◀** to exit from the SLM sub-menu to the Settings menu and note that the 2nd item is highlighted just as it had been earlier when **▶** was used to move from the Settings menu to the SLM menu.

Essentially, when the **◀** or **▶** key is used to move from a Menu, Sub-menu, or Selection menu, a pointer in the menu is set to the item which is highlighted at that time. If in the process of continuing with the editing process a Menu is accessed once again using the **◀** or **▶** keys, the item highlighted is determined by that pointer.

Continuing the example, use **◀** to exit completely from the Setup menu. Enter the Setup menu again by pressing **Ⓢ** and use three consecutive presses of **▶** to display the Settings menu, SLM sub-menu and Selection menu. In each case, the highlighted item is as it had been when previously exiting from that Menu. To the experienced user, this can be a valuable feature. Suppose, for example, one wished to use the Setup menu to quickly switch between choices of frequency weightings. Using the **◀** and **▶** keys alone one could access the desired Selection menu without the need to use **Ⓢ** to move the highlight down from the first item.

If one chooses to use the **◀** and **▶** keys to move between Menus and prefers to enter each Menu with the first item

highlighted, simply use the  key to highlight the first item in a Menu before exiting using the  or  key to exit.

If you have been using the arrow keys to move between Menus and menu items and you feel you have gotten lost, it is possible that you have entered a Menu where you do not recognize the displayed items because the highlighted item is rather far down the list. Try using the  key to move the highlight up to the first item and you may recognize where you are. In general, the items further down the list are for more advanced features and are less important for simple measurements.

Setting Control in the SLM View

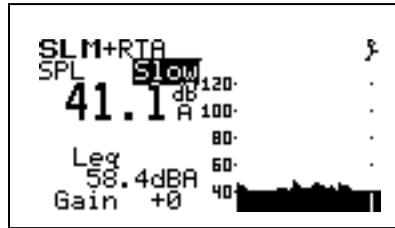
SLM settings can be adjusted from the **SLM** View screen. To activate the **SLM** view screen, turn on the System 824, press the  View key, highlight **SLM**, then press the  Check key.

While viewing simple sound level meter data, settings can be adjusted “on the fly” (without leaving the current display). The following table describes the keys that are used to change settings:

Key is used in	Action
 the ISM instrument instead of Gain.	Moves to the next setting
	Moves to the previous setting
 or 	Adjusts the current setting
	Enters the setting

The following is an example of how to select the RMS Detector within the SLM view:

Step 1 Press the ▲ or ▼ keys to highlight the current RMS detector (*Slow, Fast, Impl*).



Step 2 Press the ◀ or ▶ key to change the selection.

The table below shows how to use the arrow keys to navigate through the settings on the SLM display.

▲ ▼	Detector	Slow ▶ Fast ▶ Impulse ▶
▲ ▼	Weight	A ▶ C ▶ Flat ▶
▲ ▼	Second Value	Leq ▶ SEL ▶ Min ▶ Max ▶ Peak ▶
▲ ▼	Second Value Weight	A ▶ C ▶ Flat ▶
▲ ▼	Gain or *Range	0 ▶ +10 ▶ +20 ▶ +30 ▶ +40 ▶ +50 ▶ OR Low ▶ Normal ▶

