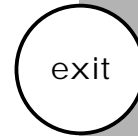
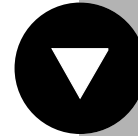


accumet®  
RESEARCHAR50  
Dual Channel pH/Ion/Conductivity Meter

## Ion Setup (channel 1)

## ION SETUP OPTIONS

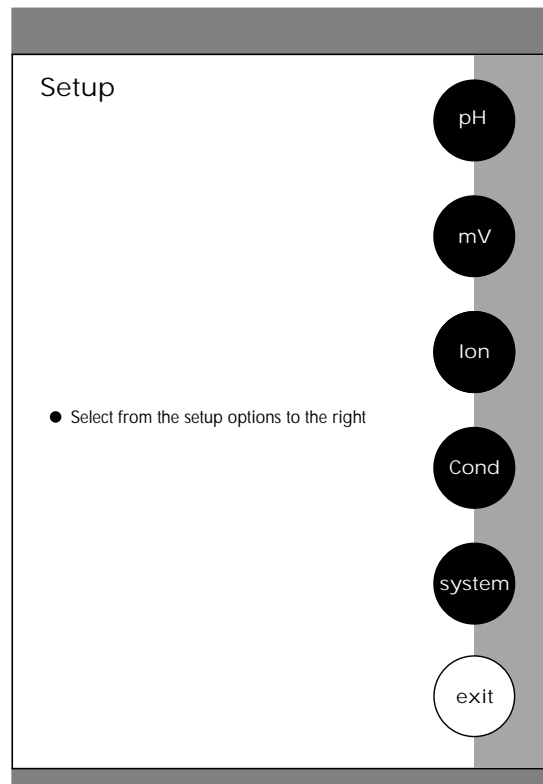
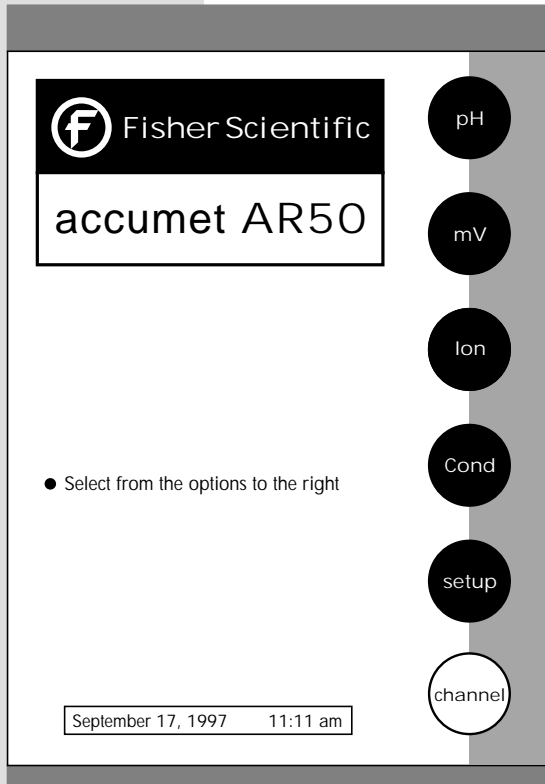
- Set Sample ID#
- Select Ion Method
- Select Measurement Units
- Select Auto Read Mode
- Set Ion Stability Criteria
- Set Default Temperature
- Select Electrode Type
- Set Isopotential Point
- Set Alarm Limits
- Set Print Criteria
- Set Print Interval
- Set Data Storage Criteria
- Set Significant Digits
- Set Display Configuration
- View Stored Data



Fisher Scientific

The operating parameters of the ion mode can be set and controlled from the Ion Setup screen. The following sections will guide you through the various options available for the ion setup mode.

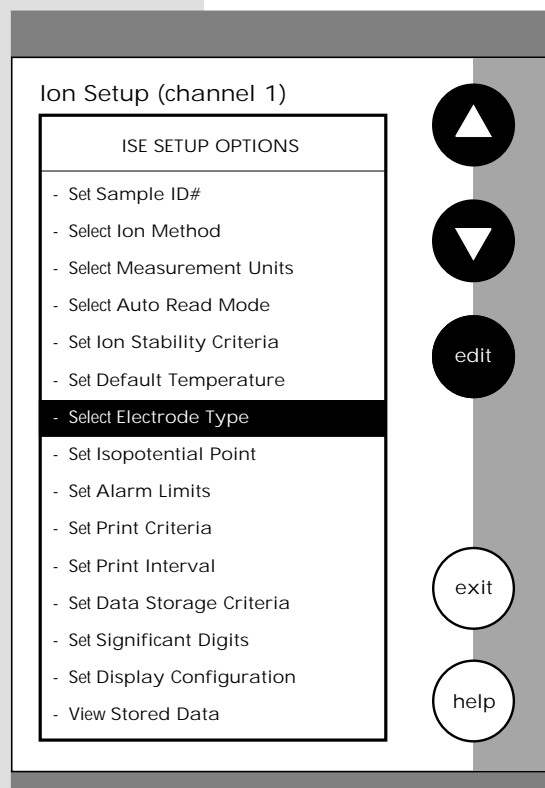
Access ION SETUP	92
Set SAMPLE ID#	94
Select ION METHOD	94
Select MEASUREMENT UNITS	96
Select AUTO READ MODE	97
Set ION STABILITY CRITERIA	97
Set DEFAULT TEMPERATURE	97
Select ELECTRODE TYPE	98
Set ISOPOTENTIAL POINT	100
Set ALARM LIMITS	100
Set PRINT CRITERIA	100
Set PRINT INTERVAL	101
Set DATA STORAGE CRITERIA	101
Set SIGNIFICANT DIGITS	102
Set DISPLAY CONFIGURATION	103
View STORED DATA	103

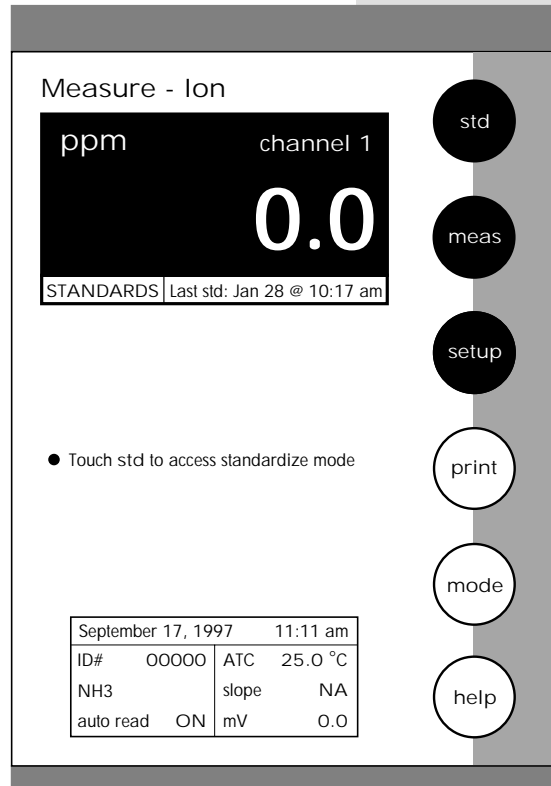
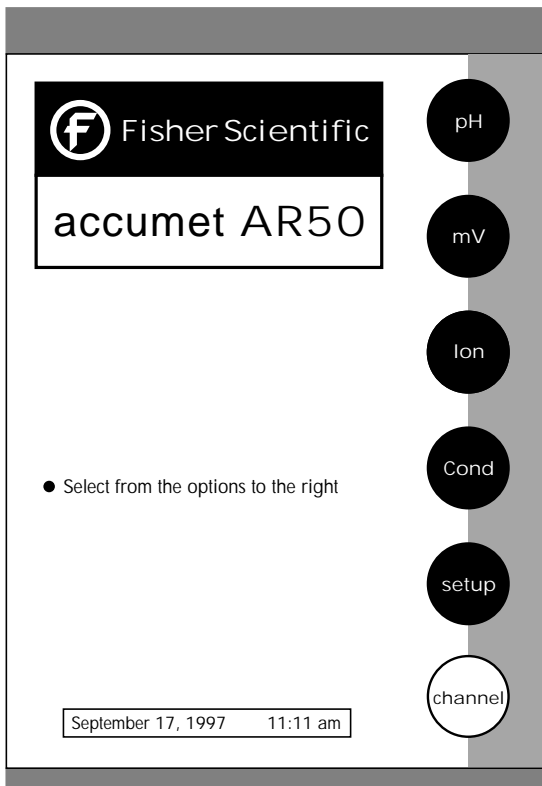


There are two ways to access the Ion Setup screen.

*From the Setup screen*

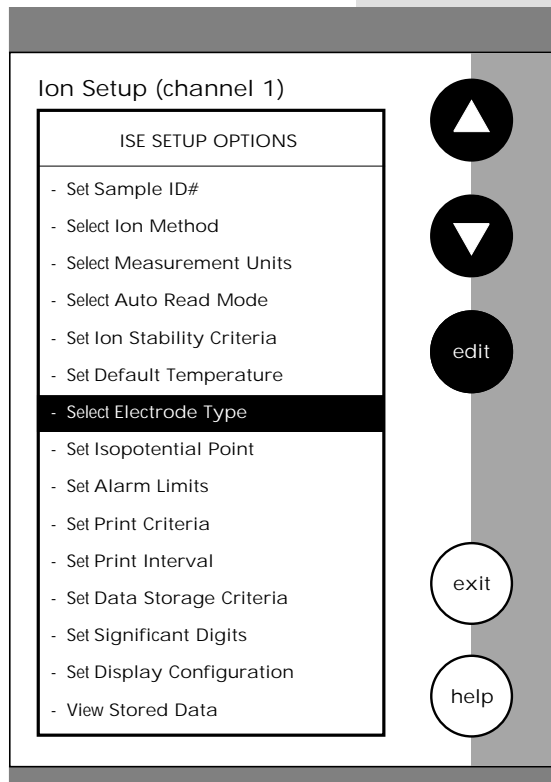
- 1** Touch setup on the main screen. Then touch Ion to access the Ion Setup screen.
- 2** Use the arrow keys to highlight the setup option that you would like to review.
- 3** Touch edit to access the selected option screen.





From the Ion Measure screen

- 1 Touch Ion on the main screen to access the Ion mode. Touch setup on the Ion Measure screen. The Ion Setup screen is now displayed.
- 2 Use the arrow keys to highlight the setup option that you would like to review.
- 3 Touch edit to access the selected option screen.



To Set Sample ID#

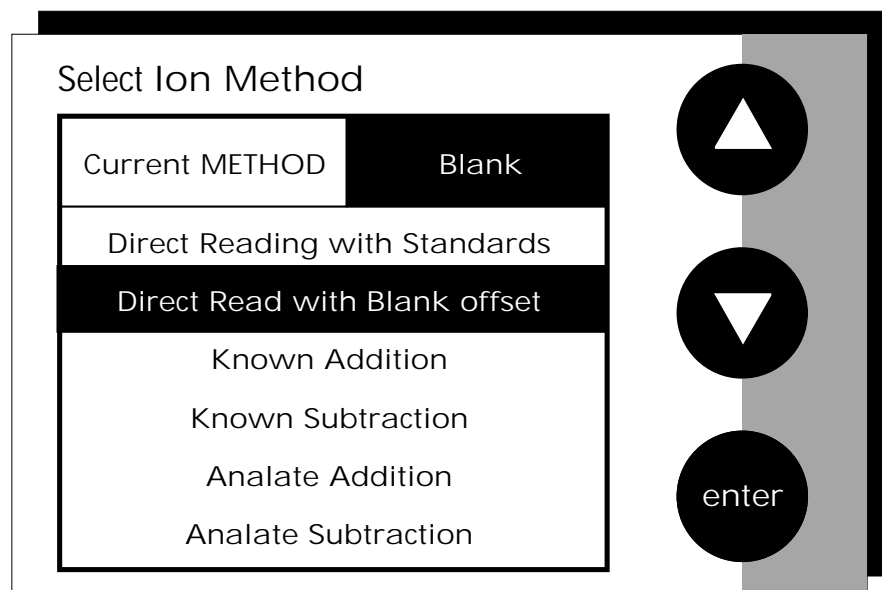
When this option is active, each time you touch print on the Measure screen the ion concentration value along with the date/time/channel and the sample ID# will be sent to data storage. You can manually enter an alphanumeric identification number of up to 10 characters for any sample or you can have the meter sequentially number your samples beginning at the number of your choice. You may also choose to deactivate the sample ID#.

*The Ion Sample ID# is set the same way as previously described in pH Setup. See page 50 for instructions.*

To Select Ion Method

Remember, HELP is always just a touch of the button away.

- 1** Use the arrow keys to highlight the method you want to use.
  - 2** Touch enter to accept the method and return to the Ion Setup screen.
- OR
- Touch exit to return to the Ion Setup screen, without making any changes.



#### Direct Reading with Standards

The direct reading method is the most common method of ion measurement. When using this method, you will use standards of known values to standardize the meter in the ion mode. An ionic strength adjuster (ISA) is added to both the standards and the sample. Then 2 to 5 standards are used to standardize the meter. The standards should bracket the expected value of the sample. The ion specific electrode is immersed in a stirring sample and the ion concentration is read directly from the meter.

#### Direct Reading with Blank offset

The blank method is a method commonly used for determination of ion concentration in a sample with a very low level of ions present. Because of background interference at low concentration levels, a blank is used and the value of the ion concentration in the blank is subtracted from the value of the measured sample.

#### Known Addition

The known addition method is an incremental method used for samples with a complex matrix. A standard with a known concentration of the ion species of interest is added to the sample. The difference in mV potential is then used to calculate the concentration of the ion of interest.

#### Known Subtraction

The known subtraction method is also an incremental method. The ion of interest in the sample is not identical to the ion in the standard solution. The standard of known ion concentration that is added to the sample quantitatively reacts in the sample with the ion of interest. This reaction removes a fixed amount of the ion of interest from the sample solution. The ion concentration is then calculated based upon the difference in the mV potential.

#### Analate Addition

The analate addition method is a modification of the known addition method. In the Analate Addition method, the initial mV measurement is recorded in a standard solution. The ion in the standard solution is the ion of interest and is detected by the ion selective electrode in use. A sample containing the ion of interest is then added to the standard solution. The difference in the mV potential is then used in the calculation of the concentration of the ion of interest. This method is useful if the sample temperature is significantly different than that of the standard. When the small volume of hot sample is added to the larger volume, the temperature impact becomes negligible.

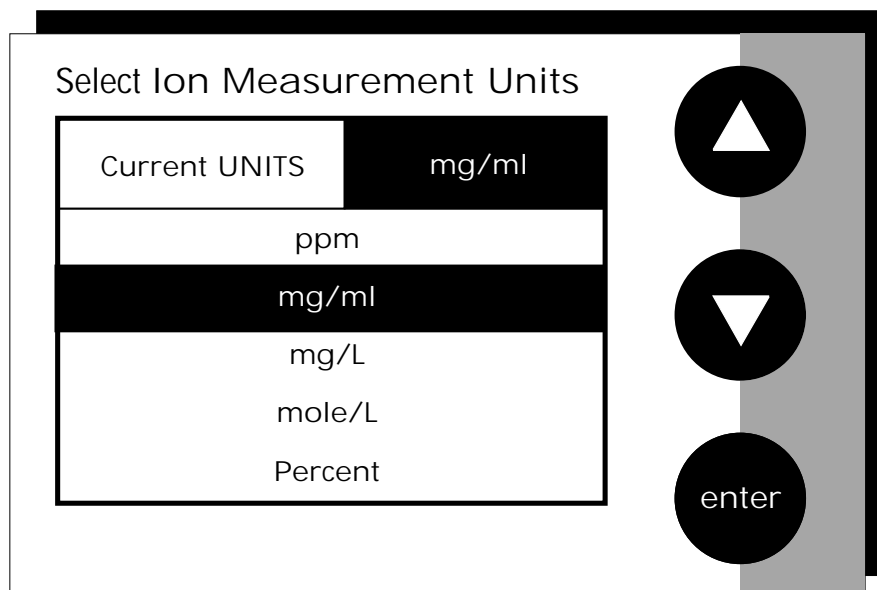
#### Analate Subtraction

The Analate Subtraction method is particularly useful in the event that there is no ion specific electrode available to directly measure the concentration of the ion of interest. This particular method employs the addition of a sample of the ion of interest to a standard containing a different ion of known concentration. The ion of interest will quantitatively react with the ion in the standard, creating a complex and removing the ion from the standard solution. The ion specific electrode is specific for the ion in the standard and not for the ion of interest. The difference in mV potential is used to calculate the concentration of the ion of interest based upon this quantitative reaction.

This screen allows you to select the units in which the meter will report the concentration of the ion of interest. The current units are displayed on the screen.

To Select Measurement Units

- 1** Access the Select Measurement Units screen from the Ion Setup screen. The current units are displayed on the screen.
  - 2** Use the arrow keys to highlight the desired units.
  - 3** Touch enter to accept these units and return to the Ion Setup screen.
- OR
- Touch exit to return to the Ion Setup screen, without making any changes.



### To Select Auto Read Mode

You can use this meter when the Auto Read function is active or when it is inactive. When the Auto Read function is active, the meter will lock onto a reading when the meter recognizes it as stable. The meter will not deviate from this reading until meas is touched. If the Auto Read function is inactive, then the meter will continuously monitor the concentration of the ion of interest. The display on the measure screen will indicate any fluctuation in the ion concentration.

*The Ion Auto Read Mode is set the same way as previously described in pH Setup. See page 59 for instructions.*

### To Set Ion Stability Criteria

This setup screen allows you to determine how quickly the meter will respond to electrode drift. There are 3 speed settings.

*The Ion Stability Criteria is set the same way as previously described in pH Setup. See page 60 for instructions.*

### To Set Default Temperature

Ion concentration is a temperature dependent measurement. The default temperature option allows you to select the temperature that will be used by the meter to calculate the correct ion concentration. The factory default setting is 25°C. You should enter the temperature value of that solution as the default temperature in order to get the correct concentration value. The current default temperature setting will be displayed when the Set Default Temperature screen is displayed.

*The Ion Default Temperature is set the same way as previously described in pH Setup. See page 62 for instructions.*



Regardless of the status of the Auto Read Mode, STABLE will be displayed as the meter recognizes the measurement as stable.



Stability criteria are more stringent at the slower setting. Therefore, if the highest precision is required, then a slow setting would be desired. The medium or slow setting is recommended for Ion work.








Best results are obtained when the standards and the samples are at the same temperature.



Remember, HELP is always just a touch of the button away.

Select Ion Electrode Type

Current	CHLORIDE
	AMMONIA
	BROMIDE
	CALCIUM
	CARBON DIOXIDE
	<b>CHLORIDE</b>
	CYANIDE
	FLUORIDE
	NITRATE
	POTASSIUM
	SODIUM
	MONOVALENT CATION
	MONOVALENT ANION
	DIVALENT CATION
	DIVALENT ANION

- Use arrow keys to highlight desired electrode type and then touch enter to accept

This screen allows you to select the type of electrode that is specific for your ion of interest. Your choice of electrode informs the meter which default slope to use in the calculations made for electrode efficiency and sample concentration. Once you have selected an electrode, you will not be required to enter the default slope numerically.

Note: The default slope value specific for the electrode that you choose is a theoretical slope value that is used in the calculations to determine the efficiency of your electrode. This slope value is not the slope value that is displayed in the data box of the measurement screen. You will still need to standardize the meter using ion standards to determine the actual efficiency of your electrode.

To Select Electrode Type

- 1** Access the Select Electrode Type screen from the Ion Setup screen. The current electrode type is displayed on the screen.
  - 2** Use the arrow keys to highlight the electrode type specific for the Ion of interest.
  - 3** Touch enter to accept the electrode type and return to the Ion Setup screen.
- OR
- Touch exit to return to the Ion Setup screen, without making any changes.

### To Set Isopotential Point

The Isopotential Point is the millivolt reading for an electrode at which temperature has no effect on the measurement. Ion selective electrodes, unlike pH electrodes, are not designed to achieve any particular isopotential point. If samples and standards are at different temperatures when performing ISE experiments, it will be necessary to experimentally determine the isopotential point of your Ion Specific Electrode. (see Appendix: Determining Isopotential Point Experimentally page 165.)

*The Ion Isopotential Point is set the same way as previously described in pH Setup. See page 64 for instructions.*

### To Set Alarm Limits

This option allows you to set alarm limits for the Ion measuring mode. If the ion concentration measurement is outside of the boundaries set by the upper and lower limits, an audible alarm and/or a visual warning will appear to let you know that your sample measurement was outside of the set limits.

*The Ion Alarm Limits are set the same way as previously described in pH Setup. See page 66 for instructions.*

### To Set Print Criteria

This screen allows you to select what criteria are printed with the measurement when you print the data or send it to a computer. The status of the current print criteria is displayed on the screen. The criteria option is active if "ON" appears to the right of the option. It is inactive if "OFF" appears to the right of the option. Any active criteria will be printed on demand.

*The Ion Print Criteria are set the same way as previously described in pH Setup. See page 68 for instructions.*

### To Set Print Interval

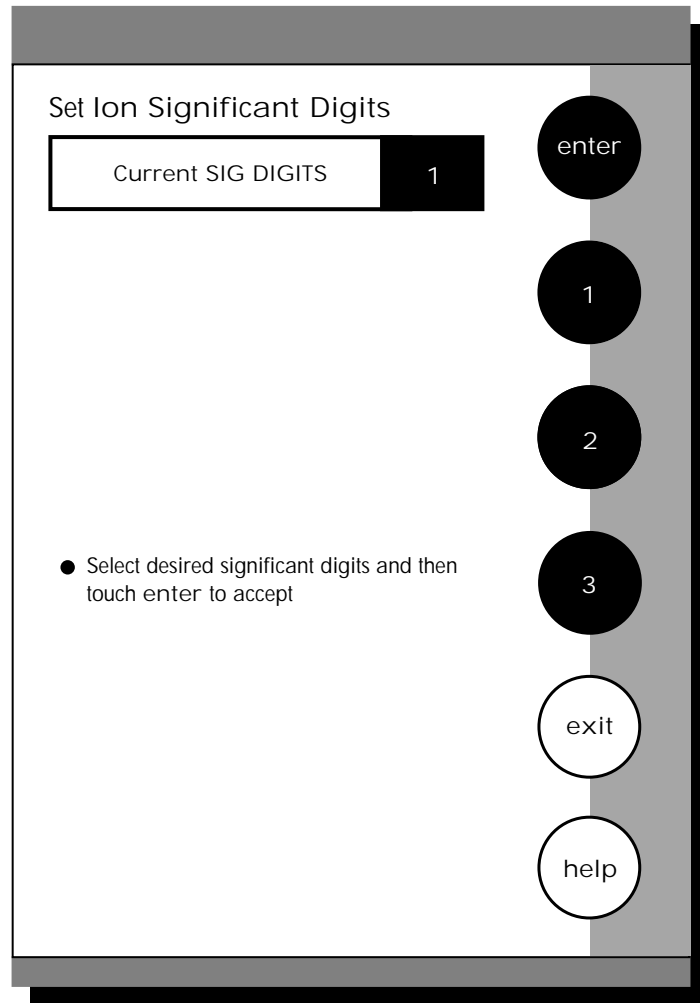
You have three options for setting the print interval: manual printing, stable reading printing, and timed interval printing.

*The Ion Print Interval is set the same way as previously described in pH Setup. See page 70 for instructions.*

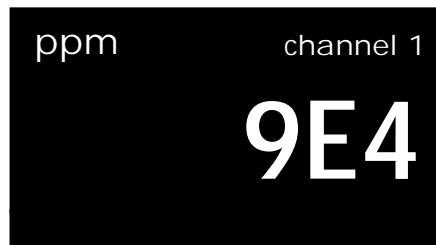
### To Set Data Storage Criteria

This screen allows you to select what criteria are stored in the meter's memory with the measurement when you save the data. The status of the current data storage criteria is displayed on the screen. The criteria option is active if "ON" appears to the right of the option. It is inactive if "OFF" appears to the right of the option. Any active criteria will be stored with the measurement. All storage criteria will be stored in the meter's memory with the measurement. However, only active items will appear on the View Stored Data screens. Changing the status of the storage criteria to active from inactive will allow the criteria to be displayed with the previously stored data.

*The Ion Data Storage Criteria are set the same way as previously described in pH Setup. See page 72 for instructions.*



*Example of 1 significant digit*



*Example of 2 significant digits*



*Example of 3 significant digits*



This option allows you to select the number of significant figures that will be used when reporting your ion measurement. You have the choice of one, two or three significant digits.

To Set significant digits

- 1** Access the Set Significant Digits screen from the Ion Setup screen. The current Significant digits are displayed on the screen.
  - 2** Touch 1, 2, or 3 to select the desired significant digits.
  - 3** Touch enter to accept the number of significant digits and return to the Ion Setup screen.
- OR
- Touch exit to return to the Ion Setup screen, without making any changes.

To Set Display Configuration

This function will allow you to choose what information you would like to be displayed on the Ion Measure screen, particularly the information contained in the data box at the bottom of that screen.

*The Ion Display Configuration is set the same way as previously described in pH Setup. See page 76 for instructions.*

To View Stored Data

This meter has memory capacity for up to 250 data points. The View Stored Data screen allows you to sort and look at specific data points. The stored data can be sorted by sample identification number, date or operator identification number.

*The Ion Stored Data is viewed the same way as previously described in pH Setup. See page 78 for instructions.*