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Water Quality Software Vista 1.3

USER MANUAL

March 2008, Edition 1

Section 1 General information	3
1.1 WQS Vista 1.3 description	3
1.2 Communication reliability test software	3
1.3 PC requirements	3
1.4 Particle counter requirements	4
Section 2 Installation	5
2.1 Cable connections	5
2.2 Control valve setup	5
2.3 Software installation	5
2.3.1 Disable daylight savings	5
2.3.2 Remove previous Vista versions	5
2.3.3 Install Vista 1.3	6
Section 3 Operation	7
3.1 Vista 1.3 overview	7
3.1.1 Startup	7
3.1.2 Main screen	7
3.1.3 Main screen menu	8
3.2 Set up Vista to collect data	8
3.2.1 Set up locations	8
3.2.2 Set up measurements	10
3.2.2.1 Set particle sizes	10
3.2.2.2 Log removal measurements	11
3.2.2.3 Analog devices	12
3.3 Delete sensor locations	14
3.4 Advanced measurement options	14
3.4.1 Rapid sample measurements	14
3.4.1.1 Set rapid storage to on or off	15
3.4.1.2 Set criteria for rapid storage	15
3.4.1.3 Optimize the rapid storage criteria	16
3.4.2 Increase or decrease data	16
3.4.3 Respond to plant operations	17
3.4.3.1 Indicate filter cycles	17
3.4.3.2 Indicate dilutions	18
3.5 Graphs	18
3.5.1 Graph description	19
3.5.2 Set up graphs	19
3.5.2.1 Set up graph definitions	19
3.5.2.2 Edit graph definitions	21
3.5.2.3 Delete graph definitions	21
3.5.3 Display options	21
3.5.3.1 Select graphs for main screen	21
3.5.3.2 Show single or multiple graphs	22
3.5.3.3 Change the appearance of graphs	22
3.5.4 Print graphs	24
3.5.5 Advanced graph options	24
3.5.5.1 Change the maximum time span	24
3.5.5.2 Make historical graphs	25
3.5.5.3 Copy and paste to other applications	25
3.6 Reports	26
3.6.1 Types of reports	26
3.6.2 Set up reports	26
3.6.3 Print reports	28

Table of contents

3.6.4	Schedule automatic reports	29
3.6.5	Export reports	30
3.7	Alarms	30
3.7.1	Responding to alarms.....	31
3.7.2	Set high and low alarms	31
3.7.3	Change alarm parameters.....	31
3.8	Passwords.....	32
3.8.1	Sign on password	32
3.8.2	Exit password	33
3.9	Data protection	33
3.9.1	Back up data.....	33
3.9.1.1	Automatic database backup	33
3.9.1.2	Manual database backup	34
3.9.1.3	Configuration backup.....	34
3.9.1.4	Restore the database	34
3.9.2	Archive the database.....	35
3.9.2.1	Automatic archive	35
3.9.2.2	Manual archive	35
3.9.2.3	Archive backup	36
3.9.2.4	Restore the archive	36
3.10	Daylight savings change	36
3.10.1	Adjust clock forward	36
3.10.2	Adjust clock back.....	37
Section 4	Troubleshooting	39
4.1	Sensors not found	39
4.1.1	No sensors found	39
4.1.2	Some sensors not found.....	39
4.2	Communication reliability test software	39
4.2.1	Validate the RS485 converter.....	40
4.2.2	Identify particle counters.....	40
4.2.3	Find counters with the same address.....	40
4.2.4	Change the RS485 address	41
4.2.5	Set analog inputs to on.....	41
4.2.6	Change the size thresholds	41
4.2.7	Measure the network stability	42
4.3	Communication failure alarms	42
Section 5	Contact information	43

Section 1 General information

1.1 WQS Vista 1.3 description

Water Quality Software (WQS) Vista 1.3 collects data from 2200 PCX particle counters and manages the data in the following ways:

- Shows the data graphically
- Shows alerts for alarm conditions
- Generates reports
- Saves data
- Archives data

The program can be set to ignore data during maintenance operations such as filter backwash. In addition, the program can respond to operational changes such as flow rate or dilution. Passwords can be used to restrict access to the setup menu and to prevent a shutdown of the program.

Note: The database that WQS Vista 1.3 uses is SQL Server 2005 Express Edition. SQL Server 2005 does not support the Banyan VINES Sequenced Packet protocol (SPP), Multiprotocol, AppleTalk, or NWLink IPX/SPX network protocols. Clients previously connecting with these protocols must select a different protocol to connect to SQL Server 2005.

1.2 Communication reliability test software

The communication reliability test software (CRTS) is a diagnostic tool that is installed with the Vista software. The CRTS performs the following operations:

- Scans the network for problems when sensors are not found by Vista
- Changes the RS485 sensor address when two sensors have the same address
- Sets the analog inputs to on so that the analog signals can be received by Vista
- Sets the particle size thresholds to be received by Vista
- Shows calibration points
- Provides access to low level configuration

1.3 PC requirements

The PC must have the requirements that are given in [Table 1](#).

Table 1 PC requirements for Vista 1.3 software

Component	Requirement
Processor	Minimum 600-MHz Pentium III-compatible processor; 1-GHz recommended
Operating system	Windows XP with Service Pack 2 or later
	Microsoft Windows 2000 Professional with SP4
	Microsoft Windows 2000 Server with Service Pack 4 or later
	Windows Server 2003 Standard, Enterprise, or Datacenter editions with Service Pack 1 or later
	Windows Server 2003 Web Edition SP1
	Windows Small Business Server 2003 with Service Pack 1 or later
	Vista Home Basic and above (SQL Express SP1 and SQL Express Advanced SP2)
	Windows XP Embedded SP2 Feature Pack 2007
	Windows Embedded for Point of Service SP2
Memory	Minimum 192 MB of RAM; 512 MB or more recommended

Table 1 PC requirements for Vista 1.3 software (continued)

Component	Requirement
Hard disk ¹	Approximately 350 MB of available hard-disk space for the recommended installation Approximately 425 MB of additional available hard-disk space for SQL Server Books Online, SQL Server Mobile Books Online, and sample databases
Drives	CD-ROM or DVD-ROM drive
Display	Super VGA video adapter and monitor, 1024 x 768 or higher resolution
Power supply	Uninterruptable power supply (UPS)
Removable drive	Removable drive for backing up data, such as a tape drive, recordable CD or a network server that can back up the computer hard drive.
Printer	Color printer capable of printing at 300 dpi
COM port	Available serial communications port

¹ Actual requirements can vary based on the system configuration and the applications and features that are installed. Additional hard-disk space may be required.

1.4 Particle counter requirements

Each particle counter must have the following configuration:

- Unique RS485 address
- Analog inputs or outputs must be set to on
- Particle size thresholds must be programmed for the sizes to be available in Vista

Section 2 Installation

2.1 Cable connections

The particle counters communicate with Vista through an RS485 digital network. Refer to the *2200 PCX Particle Counter User Manual* to make the network connections.

2.2 Control valve setup

Vista can receive a signal from a filter control valve to indicate that the filter is in a filter-to-waste or a backwash mode. To use this feature, connect a relay to the valve and send the signal to an analog input in the 2200 PCX counter. Refer to electrical installation section of the *2200 PCX Particle Counter User Manual*. Be sure to obey any safety warnings before any wiring is installed.

2.3 Software installation

Installation of Vista 1.3 software requires the following tasks:

- [Disable daylight savings](#)
- [Remove previous Vista versions](#)
- [Install Vista 1.3](#)

2.3.1 Disable daylight savings

If the computer clock automatically changes back one hour for daylight savings, Vista will try to save two sets of data with the same time. These data sets can cause a database error. To prevent this error, disable the automatic daylight savings option in the computer.

Procedure

1. On the Windows task bar, click **START**, **Settings**, **Control Panel**.
2. Open the **Date and Time** window.
3. Click the **Time Zone** tab.
4. Clear the check box for automatic daylight savings. Click **OK**.

Refer to [Adjust clock forward](#) or [Adjust clock back](#) to adjust the time when there is a change in daylight savings.

2.3.2 Remove previous Vista versions

All previous versions of WQS Vista software must be removed before version 1.3 is installed. The database in WQS Vista version 1.3 is not compatible with previous versions. Data that was saved by a previous WQS Vista version will be lost. The settings, database and the graph information will be lost.

Procedure

1. On the Windows task bar, click **START**, **Settings**, **Control Panel**.
2. Open the **Add or Remove Programs** utility.
3. Find **Water Quality Software—Vista** and remove the program from the computer.

2.3.3 Install Vista 1.3

Before installation, be sure to [Remove previous Vista versions](#). Make sure that the utility .NET Framework 2.0 is installed on the PC.

Prerequisites

- Computer that meets the [PC requirements for Vista 1.3 software](#)
- 2200 PCX particle counters that meet the [Particle counter requirements](#)
- Vista 1.3 installation CD

Procedure

1. Close any open applications on the computer.
2. Put the CD in the computer. The installation program will start.
3. Follow the instructions in the installation program. In the Install Options dialog box, select Typical. The installation may take several minutes to complete.

Section 3 Operation

3.1 Vista 1.3 overview

3.1.1 Startup

When WQS Vista is started, the program will search for the particle counters in the network. After the sensors are shown, the main screen can be opened.

Procedure

1. On the Windows desktop, double-click the **WQS VISTA** icon. The start-up window will open. The program will search for particle counters.
2. Make sure that the window shows all of the counters in the network. If one or more of the counters is not shown, refer to [Sensors not found](#) to correct the problem.
3. Click the **MAIN SCREEN** button. The main screen will open.

3.1.2 Main screen

The [Vista Main Screen](#) shows data on the left side and graphs on the right side. The options in the setup menu must be set before data can be shown.

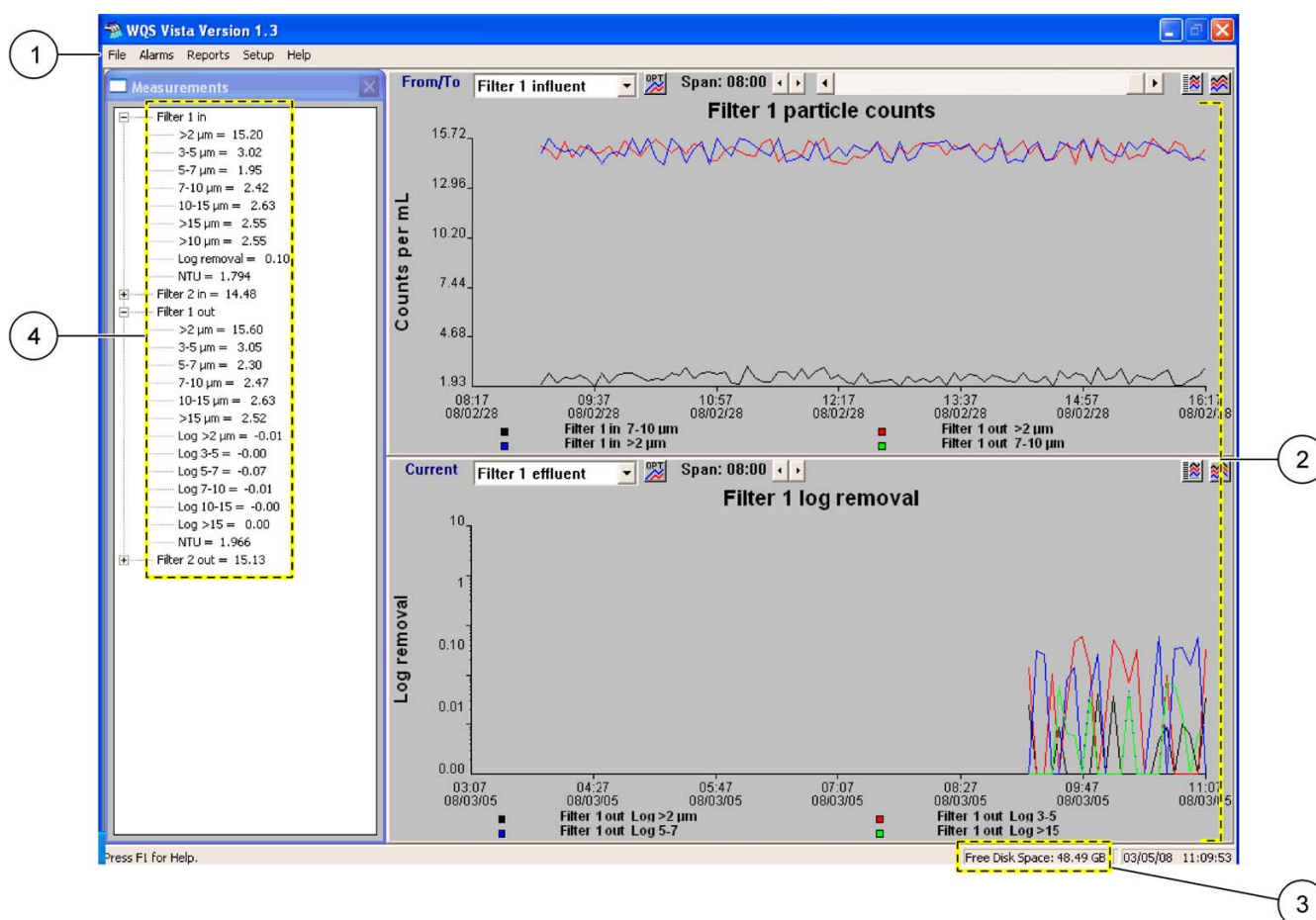


Figure 1 Vista Main Screen

1 Main screen menu	3 Free disk space indicator
2 Graphs section	4 Measurements section—current data

3.1.3 Main screen menu

File		
Sign On		Sign on to access Setup menu—password not required unless set
Sign Off		Sign off to remove access to Setup menu
Number of Graphs		Set the number of graphs to be shown on the main screen—2, 3 or 4
Print Multiple Graphs		Print graphs that are shown on the main screen (?)
Print Setup		Standard Windows print setup window
Exit		Close Vista software—data collection will stop
Alarms		
Alarm List Window		Shows list of alarms and details
Reports		
On Demand Reports Window		View and print reports for a specified time period
Setup		
General		Set sampling interval, save interval, alarm window options and rapid save criteria
Locations		Assign name to particle counter location, select size range and alarm limits
Graph		Assign name and color to graphs
Reports		Set up scheduled report times, define group reports
Database Backup/Archive		Make a backup copy of the database or remove data and store it in an external file
Passwords		Assign or change a password
	Sign On Password	Restrict access to the setup menu
	Exit Password	Prevent closing Vista
Help		
Help Topics		Open help system
About WQS		Vista software version

3.2 Set up Vista to collect data

Use the Setup menu to define the locations and measurements for data collection. First set up the location, then assign measurements for the location. Each location can have up to 8 size ranges, 8 log removal calculations and 8 analog device measurements.

3.2.1 Set up locations

The location of each particle counter must be defined. The location must be set to On to start data collection.

Procedure

1. From the main screen, select **File, Sign On**. A password window will open. Click **OK**. The Setup menu will be available.

Note: A password is not required to sign on unless a password has been set.

2. Select **Setup, Locations**. The [Location List window](#) will open.
3. Double-click on the first **Not Used** location. The [Setup Location window](#) will open.
4. Enter a name in the **Location Name** box. The name can have a maximum of 12 characters.
5. Select the particle counter from the drop-down list under **Available Sensors**.

6. Click the **Location On/Off** box to set the location to On.

7. If the **Sample Volume** is different from the default value, enter the appropriate value.

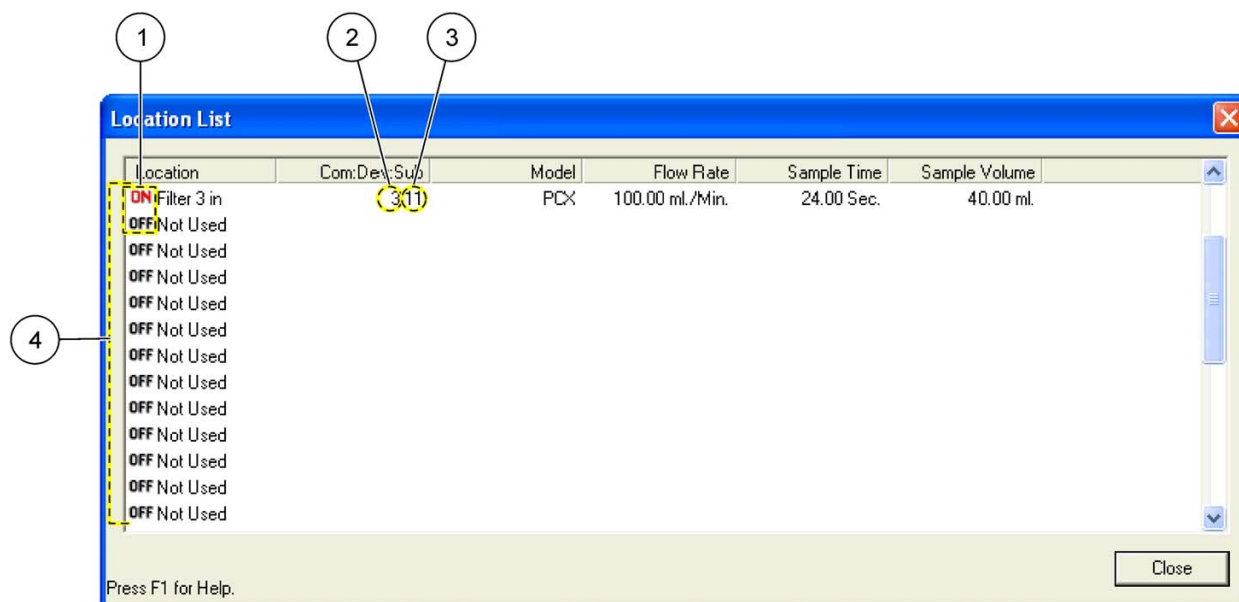


Figure 2 Location List window

1	Location on/off indicator	3	Sensor/counter number
2	COM port	4	Sensor/counter location names

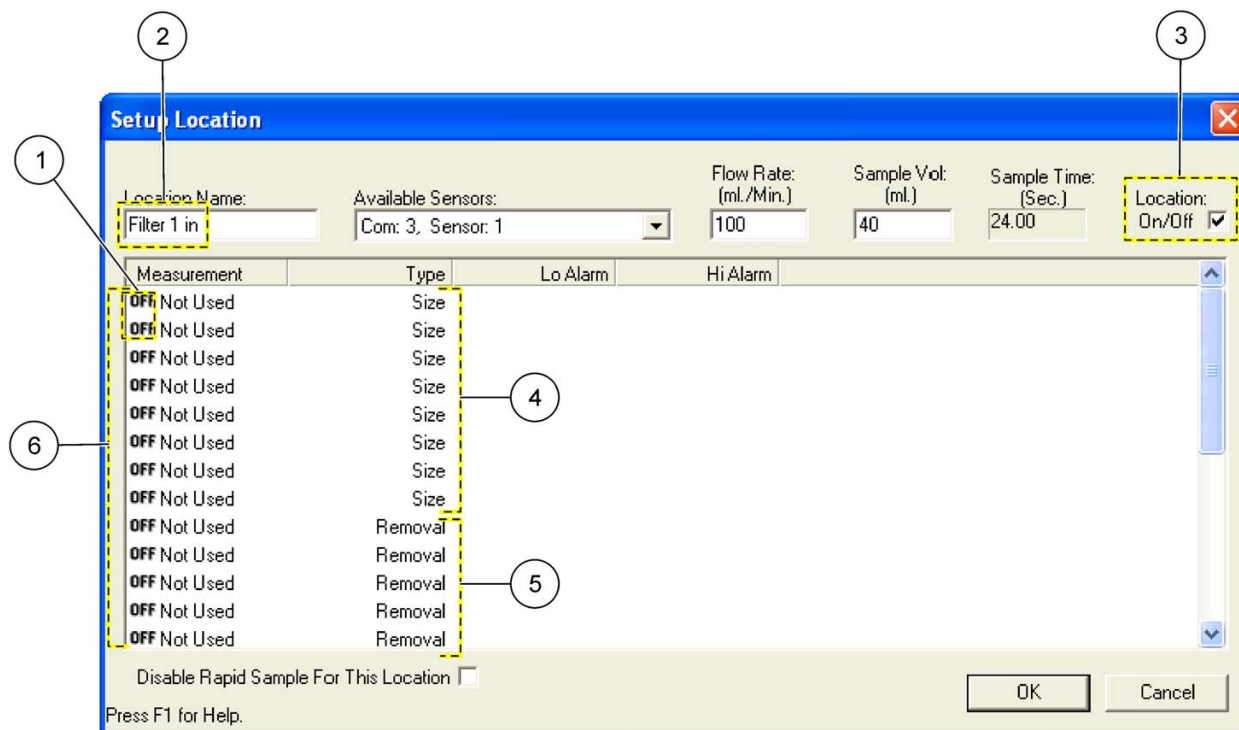


Figure 3 Setup Location window

1	Measurement on/off indicator	4	Measurement type—particle size
2	Set name of location	5	Measurement type—log removal
3	Set location to on	6	Specified measurements for the location

3.2.2 Set up measurements

The range of particle sizes to be measured must be specified before data collection begins. The size range must be set to On to start data collection.

3.2.2.1 Set particle sizes

The lowest particle size should not be less than 2 μm as that is the lowest calibration point. The highest particle size should not be more than the highest calibration point, which is typically 15 μm .

Procedure

1. In the [Setup Location window](#), double-click the first measurement labeled **Not Used**. The [Setup Sizes Measurement window](#) will open.
2. Enter a size range in the **Measurement Name** box, for example > 2 μm . The name can have a maximum of 12 characters.
*Note: To enter the letter μ for microns (μm), press and hold the **ALT** key on the PC keyboard and enter **2 3 0** on the numeric key pad. Release the **ALT** key.*
3. Select the corresponding range in the **Available Sizes** box. To select more than one range, hold down the **SHIFT** key and select the additional ranges. For example, to read all particle sizes > 2 μm , select all of the sizes.
4. Click the **Measurement On** box to set the measurement to On. Click **OK**. The new size range will be shown under Measurement in the Setup Location window.
5. Click the **Log To Database** box to store data in the database.
6. Enter limits for alarms if necessary. Refer to [Set high and low alarms](#).
7. Repeat steps 1–6 to collect data for additional size ranges.
8. When all size ranges are set, click **OK**. The new name and sensor number will be shown in the Location List window. The status will show **ON**. Click **CLOSE** to return to the main screen.

The measurement name will be shown in the main screen in the **Measurements** box. The measurement values will update every 5 minutes. The order of the locations in the [Location List window](#) determines the order in the Measurements box.

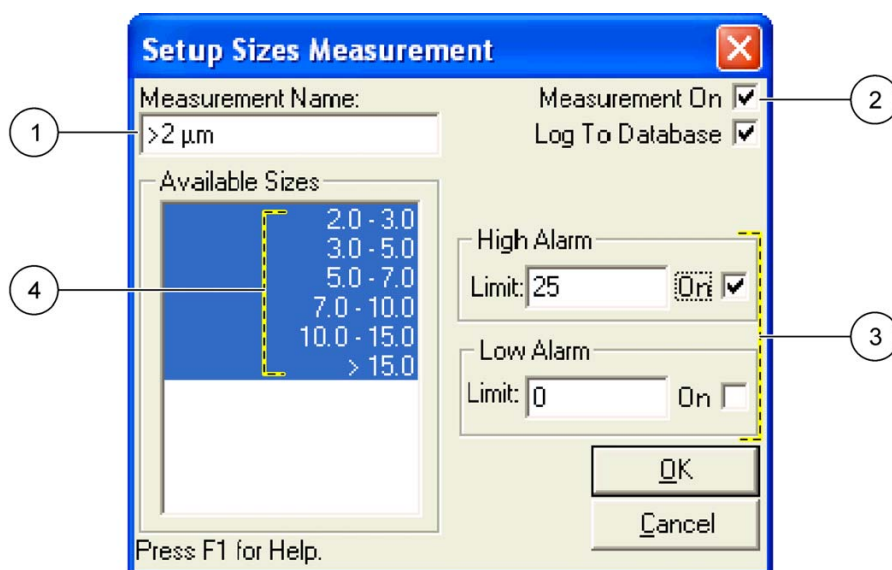


Figure 4 Setup Sizes Measurement window

1	Set name of measurement	3	Set high and low alarms
2	Set measurement to on	4	Set sizes to include in the measurement

3.2.2.2 Log removal measurements

Log removal measurements calculate the log removal efficiency or the percent removal at an effluent location relative to an influent location. Use percent removal when the effluent counts approach zero.

Procedure

1. In the [Setup Location window](#), double-click the first measurement labeled **Not Used** that includes Removal in the Type column. The [Setup Removal Measurement window for effluent location](#) will open.
2. Enter a name, for example Log >2 µm, in the **Measurement Name** box. The name can have a maximum of 12 characters.
3. Select the influent particle counter from the drop-down list under **Influent Location**.
4. Select the influent measurement from the drop-down list under **Influent Measurement**.
5. Select the effluent measurement from the drop-down list under **Effluent Measurement**.
6. Select the **Log Removal** check box to calculate the log removal. When the Log Removal box is not selected, the percent removal will be calculated.
7. Click the **Measurement On** box to set the measurement to On. Click **OK**. The new measurement will be shown in the Setup Location window.
8. Click the **Log To Database** box to store data in the database.
9. Enter limits for alarms if necessary. Refer to [Set high and low alarms](#).
10. Repeat steps 1–9 to calculate additional log removal efficiencies for this location.
11. When all log removal calculations are set for the location, click **OK**. Click **CLOSE** to return to the main screen.

The measurement name will be shown in the main screen in the **Measurements** box. The measurement values will update every 5 minutes.

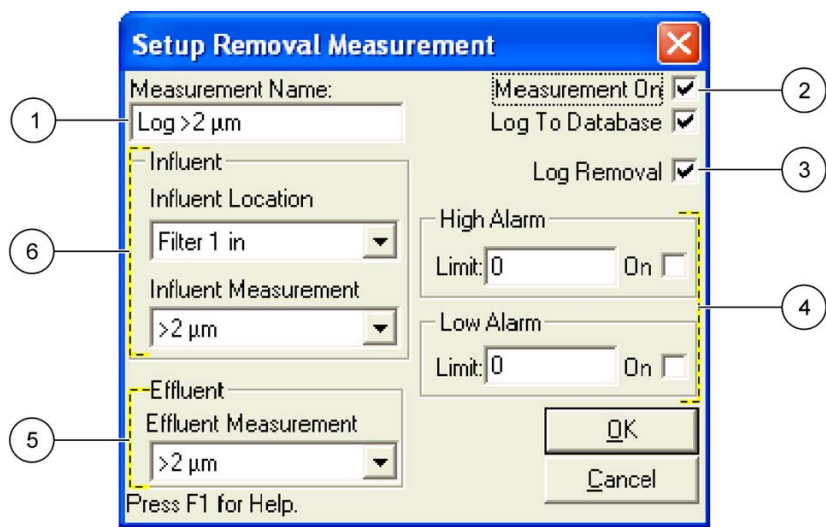


Figure 5 Setup Removal Measurement window for effluent location

1	Set name of measurement	4	Set high and low alarms
2	Set measurement to on	5	Select effluent measurement
3	Set log removal calculation on or off ¹	6	Select influent location and measurement

¹ When log removal is not selected, the value that is shown is the percent removal.

3.2.2.3 Analog devices

If a device such as a turbidimeter is connected to a particle counter, the incoming signal must be defined to show units such as NTU. It is necessary to know which analog input the device is physically connected to.

The analog measurement types that are shown in the Setup Location window correspond to the analog inputs in the particle counter in ascending order. Refer to Table 2. To have the data appear in reports in the same order as the Setup Location window, name the analog measurements in alphabetical or numerical order.

Procedure

1. In the [Setup Location window](#), double-click the measurement labeled **Not Used** that corresponds to the connected analog device. The [Setup Analog Measurement window](#) will open.
2. Enter a name, for example NTU, in the **Measurement Name** box. The name can have a maximum of 12 characters.
3. In the **Instrument Range** section, enter the minimum and maximum values for the device in the **Min** and **Max** boxes. The values should match the analog output values for the device.
4. In the **Information Type** section, select whether the data will be adjusted for changes in flow or dilution:
 - **Normal**—use for instruments other than flow meters or diluters, for example turbidimeters or pH meters.
 - **Flow rate scaling**—use when the flow rate of a particle counter is measured. Vista will correct the particle count values when the counter flow rate changes.

- **Dilution scaling**—use when a counter receives a signal from an automatic dilution system. Vista will show the count values in the water before dilution.
5. Click the **Measurement On** box to set the measurement to On. Click **OK**. The new measurement will be shown in the Setup Location window.
 6. Click the **Log To Database** box to store data in the database.
 7. Select the **Signal Type** and corresponding **Signal Range**.
*Note: For information on the **Control** signal type, refer to [Respond to plant operations](#).*
 8. Enter limits for alarms if necessary. Refer to [Set high and low alarms](#).
 9. Repeat steps 1–8 to add additional analog devices for this location.
 10. When all analog devices are set, click **OK**. Click **CLOSE** to return to the main screen.

The measurement name will be shown in the main screen in the **Measurements** box. The measurement values will update every 5 minutes.

Table 2 Analog inputs in Setup Location window and particle counter

Measurement name ¹	Measurement type	PCX input connector	Input type
Not Used	Analog	0	4–20 mA
Not Used	Analog	1	4–20 mA
Not Used	Analog	2	0–5 or 0–10 VDC ²
Not Used	Analog	3	0–5 or 0–10 VDC ²
Not Used	Analog	4	0–5 or 0–10 VDC ²
Not Used	Analog	5	0–5 or 0–10 VDC ²
Not Used	Analog	6	0–5 or 0–10 VDC ²
Not Used	Analog	7	0–5 or 0–10 VDC ²

¹ The order of the wiring on the analog input card determines the order that the analog values are shown in the software.

² The jumpers in the particle counter determine whether the signal is 0–5 or 0–10 VDC.

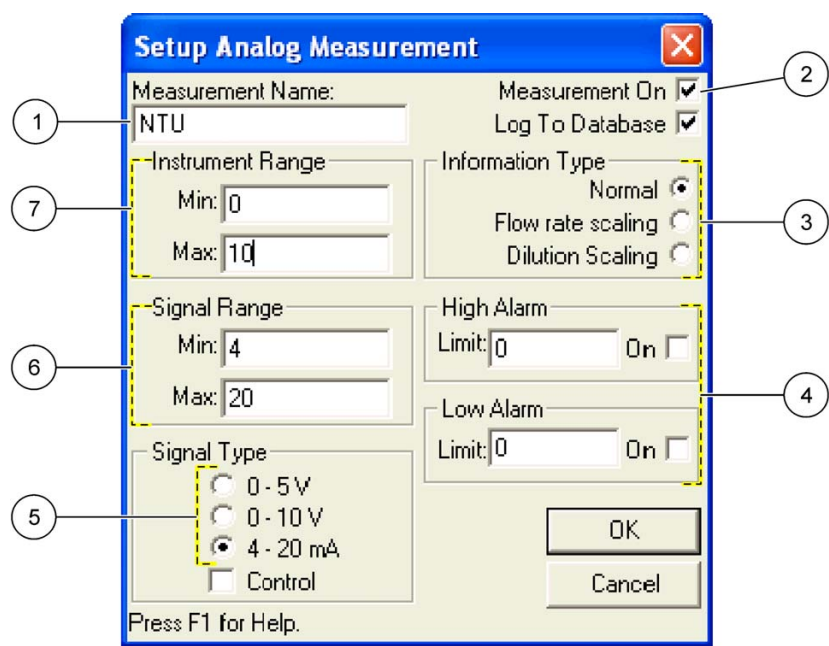


Figure 6 Setup Analog Measurement window

1	Set name of measurement	5	Set the analog signal type, mA or V ¹
2	Set measurement to on	6	Minimum and maximum output from instrument, mA or V
3	Set the type of instrument	7	Minimum and maximum measurement range of instrument
4	Enter values that will trigger high or low alarms. Set alarms to on or off.		

¹ For information on the **Control** signal type, refer to [Respond to plant operations](#).

3.3 Delete sensor locations

A location can be deleted if necessary. Any data that has been collected for the location will still be available in the database.

Procedure

- 1. In the [Location List window](#), right-click the location. A window will open.
- 2. Select **Delete Location**. A confirmation window will open. Click **YES**. The location and associated measurements will be deleted.

3.4 Advanced measurement options

Several options are available to optimize the amount and type of data that is collected:

- Set [Rapid sample measurements](#) to respond to rapid count changes
- [Increase or decrease data](#)
- [Respond to plant operations](#)

3.4.1 Rapid sample measurements

Measurements are typically monitored at a faster rate than they are stored. This prevents Vista from accumulating too much data. When a significant change occurs in the counts, log removal or analog data, the storage interval can automatically increase to capture the event. Use the rapid storage criteria to activate this option.

3.4.1.1 Set rapid storage to on or off

The rapid storage option is set to on by default. Set the rapid storage option to off for locations such as raw water where the count values are highly variable. If set to on for these locations, Vista will store data constantly and use up the free disk space on the computer.

Procedure

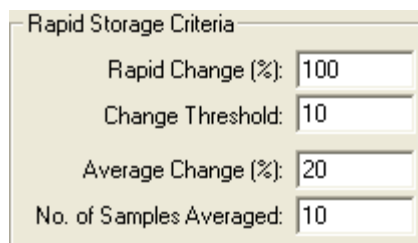
1. Complete steps 1 to 3 under [Set up locations](#) to open the [Setup Location window](#).
2. Select or deselect the **Disable Rapid Sample for this location** check box:
 - **Rapid storage off**—select the check box
 - **Rapid storage on**—deselect the check box
3. Click **OK**.

3.4.1.2 Set criteria for rapid storage

The criteria that indicates when a change in the measured value is significant enough to start rapid storage can be adjusted. It is important to balance the degree of change with the amount of data that will be collected. Refer to [Optimize the rapid storage criteria](#) for additional help in setting these values.

Procedure

1. From the main screen, select **Setup, General**. The [General setup window](#) will open.
2. In the **Rapid Storage Criteria** section, change the settings as follows:
 - **Rapid change (%)**—the percent change in two consecutive measurements. The default value is 100%. A 100% change represents a value that is either twice the previous measurement or zero. To decrease the sensitivity, increase the rapid change value. To increase the sensitivity, decrease the value. The rapid change value will not trigger rapid storage unless the change threshold is also exceeded.
 - **Change threshold**—the count, log removal or analog value that must be exceeded before rapid storage can occur. The default value is 10.
 - **Average change%**—the percent change in the average of two consecutive groups of measurements. The default value is 20%. This criteria will detect increases that occur steadily but do not meet the criteria for an increase in two consecutive measurements.
 - **Number of samples averaged**—the number of measurements that are averaged for the average change% criteria. The default value is 10. To decrease the sensitivity, decrease the number. To increase the sensitivity, increase the number.
3. Click **OK** to save the settings.



The image shows a dialog box titled "Rapid Storage Criteria". It contains four input fields with their respective labels and values:

Label	Value
Rapid Change (%):	100
Change Threshold:	10
Average Change (%):	20
No. of Samples Averaged:	10

Figure 7 Rapid storage criteria in General Setup window

3.4.1.3 Optimize the rapid storage criteria

If the rapid storage criteria is too sensitive to measurement changes, too much data will accumulate. The extra data will take up space on the hard drive and reports will take a longer time to generate. If the criteria is not sensitive enough, a plant event could be missed.

Procedure

1. Enter 999999 in the **Average Change (%)** box to disable the average change criteria.
2. Set the **Change Threshold** to meet the requirements of the plant.
3. Use reports to observe the percent of rapid store samples over time:
 - **Database information report**—find the percent of rapid store samples for a filter run. An optimum value for the rapid storage data is 10%. A value that is less than 10% indicates that some events are missed. A value that is greater than 10% indicates that too much weight is given to events, which affects the statistics and increases the size of the database.
 - **Statistical reports**—generate a report for a filter run with and without the rapid storage samples. Find how much the statistics change with the current rapid change and change threshold settings.
4. If the percent of rapid storage samples is above or below 10%, adjust the rapid change and change threshold values until the percentage is close to 10%.
5. Enter 999999 in the **Rapid Change (%)** box to disable the rapid change criteria.
6. Set the **Average Change (%)** to meet the requirements of the plant.
7. Set the **Number of Samples Averaged** to meet the requirements of the plant.
8. Generate three database information reports for a filter run and observe the percent of rapid storage values:
 - **Entire filter run**—the percent of rapid storage values should be low.
 - **Middle of the filter run**—the percent of rapid storage values should be less than 1%.
 - **End of the filter run**—the last 3 or 4 hours of the run should have a high percent, approximately 30 to 50%, of rapid storage values.
9. Adjust the average change or number of samples averaged until the percent of rapid store values are as expected for a filter run.

3.4.2 Increase or decrease data

Vista is preset to monitor data in 1-minute intervals and store the data in 5-minute intervals. The monitoring and storage intervals can be changed to optimize the amount of useful data that is collected. If set to store data less often, use [Rapid sample measurements](#) to make sure that plant events are not missed.

Procedure

1. From the main screen, select **Setup, General**. The [General setup window](#) will open.
2. Change the [Monitoring and storage rates](#) as follows:
 - **Monitoring rate**—set the rate to 2 minutes if the sample volume is greater than 40 mL/minute or if the flow rate is less than 100 mL/minute.

- **Normal storage rate**—store data at faster intervals to store more data. Store data at slower intervals to store less data. Data that is stored every 5 minutes will add more data to the database than data that is stored every 10 minutes.

Note: When the monitoring rate is changed to 2 minutes, the options for storage rate are doubled (refer to [Monitoring and storage rates](#)).

3. Click **OK** to save the settings.

Figure 8 Monitoring and storage rates

3.4.3 Respond to plant operations

Vista can use the signals from analog devices to [Indicate filter cycles](#) and to [Indicate dilutions](#).

3.4.3.1 Indicate filter cycles

Signals from filter valves can be used to indicate when a filter is in the filter-to-waste mode or backwash (out of service) mode. The filter mode is indicated as follows:

- **Filter-to-waste mode**—the measurement interval increases to 1 minute. An **FTW** icon is shown in the main screen next to the location name. Data is tagged in the database for optional exclusion from reports.
- **Backwash (out of service)**—alarms are disabled and data collection stops. An **OS** icon is shown in the main screen next to the location name.

Procedure

1. Refer to steps 1 to 3 under [Set up locations](#) to open the Setup Location window.
2. In the [Setup Location window](#), double-click the last measurement labeled **Not Used** that has Analog in the Type column. The [Setup Analog Measurement window](#) will open.
3. In the **Signal Type** section, click the **Control** check box to indicate that the signal is from a control valve.
4. Enter a name, for example Backwash, in the **Measurement Name** box. The name can have a maximum of 12 characters.
5. In the **Instrument Range** section, enter the on/off voltages for the control valve in the **Min** and **Max** boxes.
6. In the **Signal Type** section, select **0–5 V** or **0–10 V**.
7. In the **Information Type** section, select how the measurement will be tagged:
 - **Filter-to-waste mode**—the filter-to-waste valve is open. Data is collected in one minute intervals. The data can be excluded from reports.

- **Out of service**—alarms are disabled and data collection stops.
8. In the **Switching Threshold** section, enter the voltage that indicates that the valve is closed for out of service or open for filter-to-waste mode. Click the **Hi** check box if the signal is high when the filter is in the out of service or filter-to-waste mode.
 9. Click the **Measurement On** box to set the measurement to On. Click **OK**. The new measurement will be shown in the Setup Location window.
 10. Click the **Log To Database** box to store data in the database.

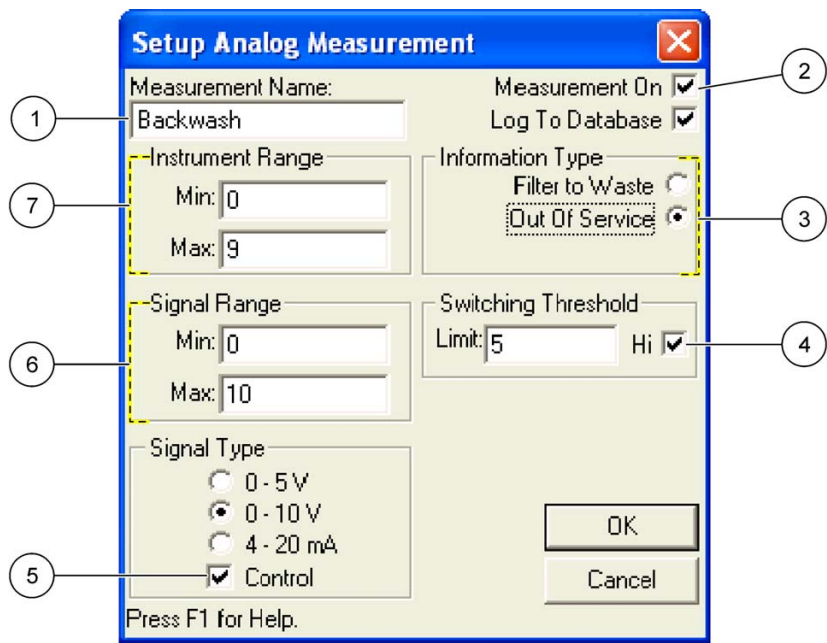


Figure 9 Control valve setup

1	Set name of measurement	5	Set signal type to control and select signal voltage range
2	Set measurement to on	6	Set minimum and maximum output from valve
3	Set tag for data when valve is open (or closed)	7	Set the on and off voltages for the valve
4	Set voltage limit to indicate valve is open (or closed)		

3.4.3.2 Indicate dilutions

A particle counter can be connected to an automatic dilution system via an analog input. A signal can be sent to Vista to indicate that the water is being diluted. Vista can then adjust the measurement values to show the values before dilution.

Refer to [Analog devices](#) to set up Vista to account for automatic dilution.

3.5 Graphs

Up to 4 graphs can be shown on the main screen. Each graph can show 4 different measurements. The measurements can be from multiple locations and data types.

Although a maximum of 4 graphs can be shown in the main screen, up to 32 graphs can be set up. The graphs will update with each new measurement even if they are not shown on the main screen.

After a graph is set up, labels can be added and [Display options](#) can be adjusted to change the appearance. The graph can be printed or copied and pasted into other applications.

3.5.1 Graph description

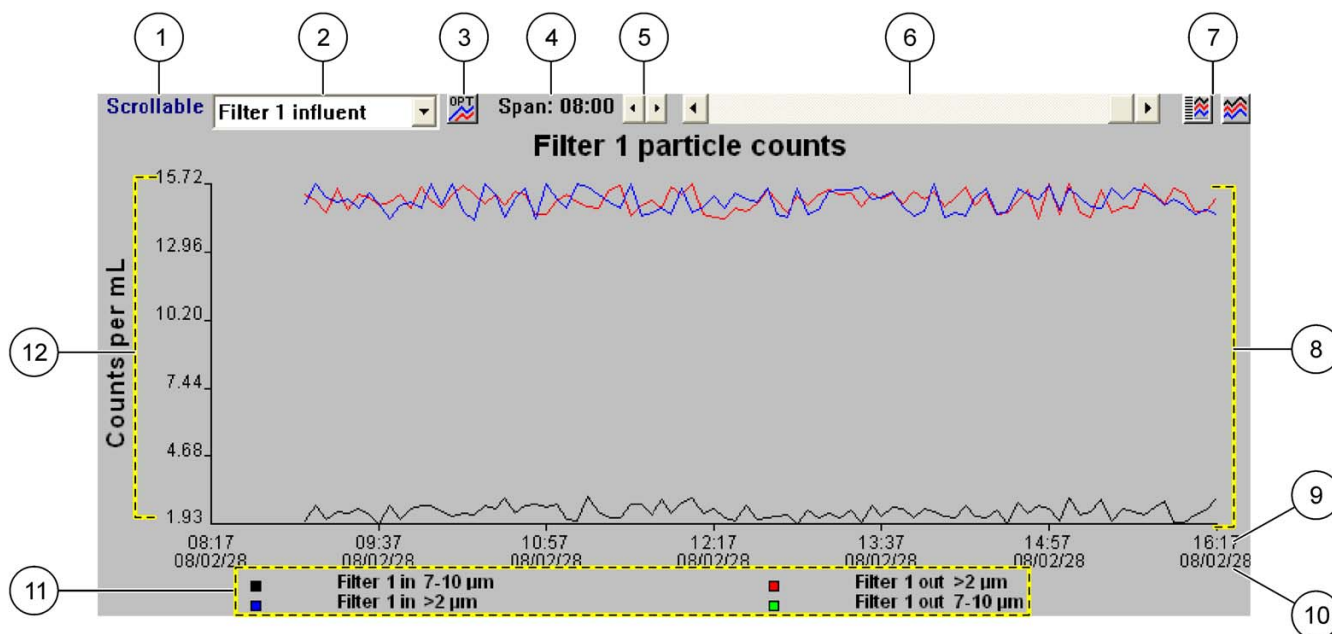


Figure 10 Graph description

1	Time mode—current, scrollable or from/to	7	Graph size buttons
2	Graph definition	8	Data lines, color-coded
3	Display options button	9	Time (HH:MM)
4	Time span (HH:MM)	10	Date (YY/MM/DD)
5	Increase/decrease buttons for time span	11	Selected measurements, color-coded
6	Scroll bar (scroll left or right)	12	Data value span

3.5.2 Set up graphs

Before a graph can be viewed in the main screen, it must be set up to define the data that will be shown.

3.5.2.1 Set up graph definitions

A graph definition contains the name of the graph and the measurement information that will be used. Before making graphs, be sure to [Set up locations](#) and [Set up measurements](#).

Procedure

1. From the main screen, select **Setup, Graph**. The [Graph List window](#) will open.
2. Double-click the first graph definition labeled **Not Used**. The [Setup Graph window](#) will open.
3. Enter a name for the graph in the **Graph Name** box. The name can have a maximum of 20 characters.
4. Click the pen color to be used for the graph, for example **Pen 1 (Black)**. The [Edit Pen window](#) will open.
5. Select the location name from the **Location** drop-down list.
6. Select the measurement name from the **Measurement** drop-down list. Click **CLOSE**. The location and measurement name will be shown in the Setup Graph window.

- 7. To specify measurements for the other three pens, repeat steps 4–6.
- 8. Click the **On** box to set the graph to On. Click **OK**. The graph name is shown in the Graph List window. The location and measurement for each pen is shown.
- 9. To set up additional graphs, repeat steps 2–8.
- 10. Click **CLOSE** to return to the main screen.

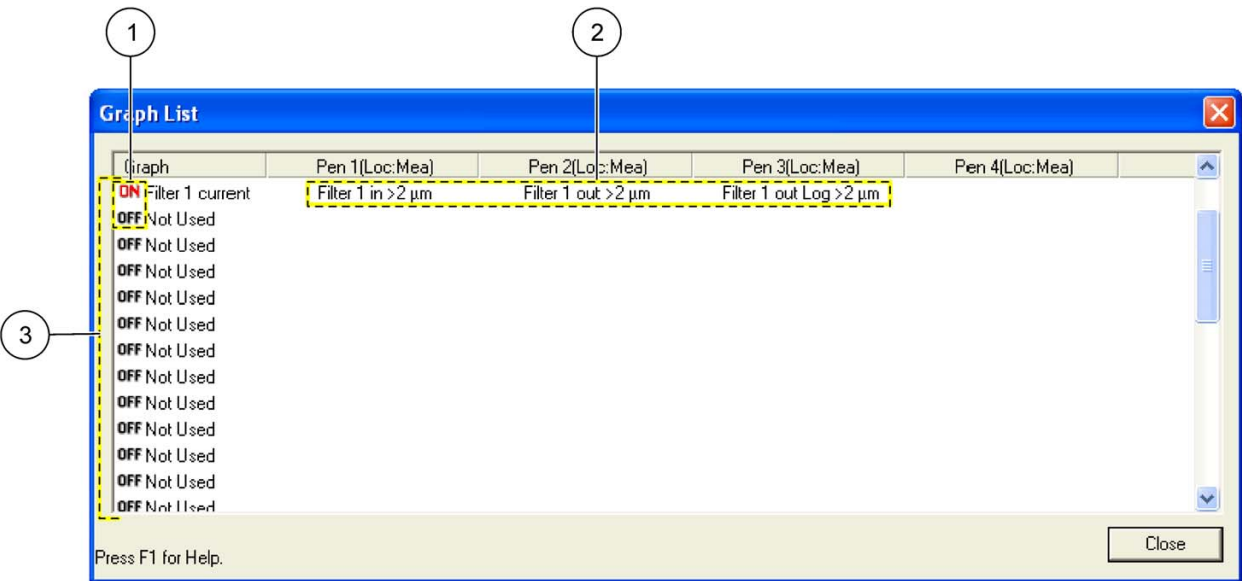


Figure 11 Graph List window

1	Graph on/off indicator	3	Graph definitions
2	Pens (data lines) assigned to graph		

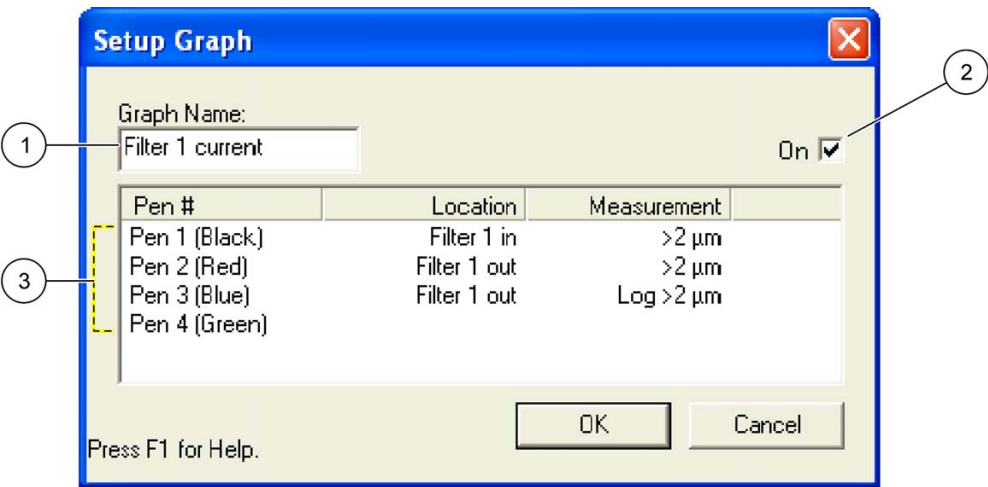


Figure 12 Setup Graph window

1	Graph definition name	3	Pen (data line) colors and associated measurements
2	Set graph to on		

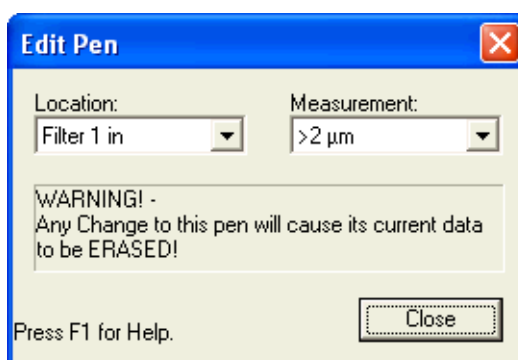


Figure 13 Edit Pen window

3.5.2.2 Edit graph definitions

The location or measurement that is specified for a graph can be changed.

Procedure

1. From the main screen, select **Setup, Graph**. The [Graph List window](#) will open.
2. Double-click the name of the graph to be edited. The [Setup Graph window](#) will open.
3. Click the pen to be changed or added. The [Edit Pen window](#) will open.
4. Select the new location and measurement to assign to the pen. Click **CLOSE** and **OK**.

To remove a pen from a graph, right-click the pen in the Setup Graph window. Select **Clear Pen** and click **OK**.

3.5.2.3 Delete graph definitions

A graph definition can be deleted if necessary.

Procedure

1. From the main screen, select **Setup, Graph**. The [Graph List window](#) will open.
2. Right-click on the graph name to be deleted.
3. Select **Delete Graph Definition**. The graph definition will be deleted.

3.5.3 Display options

The number and appearance of graphs in the main screen can be changed in a variety of ways. Graphs can show specific dates and times, grid lines and labels. Graphs can also be shown in table format.

3.5.3.1 Select graphs for main screen

The first graph in the [Graph List window](#) is automatically shown in the main screen. Complete the steps that follow to change the graph or to add more graphs.

Procedure

1. In the main screen, select a graph definition from the drop-down list on the graph.

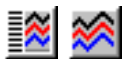
Note: Before a graph can be viewed in the main screen, it must first be defined. Refer to [Set up graphs](#). The order in which graphs appear in the list is determined by the order in which they were made.

2. Repeat step 1 to show additional graphs.

3.5.3.2 Show single or multiple graphs

A single graph or 2, 3 or 4 graphs can be shown at the same time on the main screen.

1. To show multiple graphs, select **File, Number of Graphs** from the main screen.
2. Select a number and click **OK**.
3. To show a single graph, click one of the **SIZE** buttons.



3.5.3.3 Change the appearance of graphs

Complete the steps that follow to change the appearance of graphs.

Procedure



1. Click the **GRAPH OPTIONS** button on the graph to be changed. The [Graph Options window](#) will open.
2. Change any of the available options in the [Graph Options window](#):
 - Labels—enter a title and y-axis label in the **Labels** section. To increase or decrease the size of the text, enter a larger or smaller number in the **Size** box.
 - Date range—to change the date range on the x-axis, select **From/To** in the **Mode** section. The Database [Time mode—from/to settings](#) will open. Enter the date and time in the FROM and TO boxes (date format: MM/DD/YYYY; time format: 24-hour).
 - Scroll bar—to move the graph to the left or right, select **Scrollable** in the **Mode** section.
 - Data line—to change the thickness of the data lines, click **Thin Traces** or **Thick Traces** in the **Trace Size** section. To show the data lines in a 3-dimensional style, click **3D** under **Graph Types**.

Note: The 3D option changes the line appearance only and does not include additional data.

- Y-axis scale—to change the maximum and minimum values of the y-axis, select **Manual** in the **Scaling** section. Enter the new values in the **Max** and **Min** boxes. To change to a logarithmic scale, click **Log**. Click **Lin** to change to a linear scale.
- Grid lines—in the **Grid** section, click the **Horz** box to add horizontal grid lines to the graph. Click the **Vert** box to add vertical grid lines to the graph.
- Table format—to show the graph as a text table, click **Text** in the **Display** section.

- When all changes have been made, click **SAVE SETTINGS AS DEFAULT**. Click **CLOSE** to return to the main screen.

Note: The **Current** mode must be selected to save the graph. Changes cannot be saved to graphs that are in the **From/to** or **Scrollable** mode.

Note: To discard the changes, click the graph name on the Graph drop-down list. The graph changes back to its original appearance.

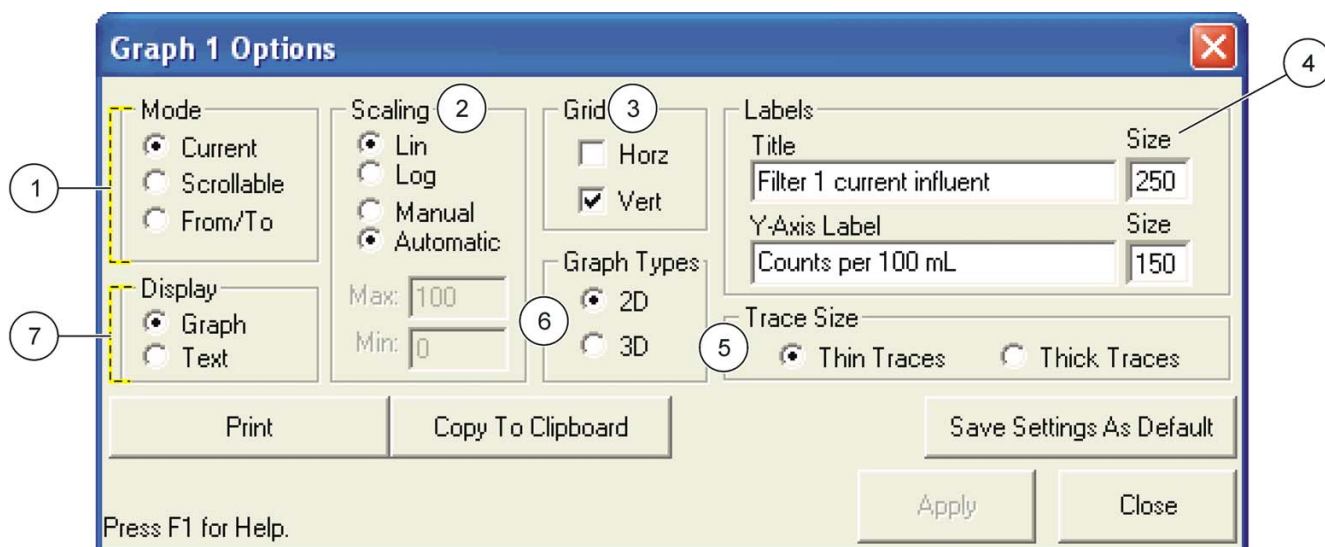


Figure 14 Graph Options window

1	Set the time mode—current, scrollable or from/to	5	Set data line style to thick or thin
2	Set the y-axis scale—linear or logarithmic, max and min	6	Set data line to show as 2 dimensional or 3 dimensional ¹
3	Add grid lines—horizontal or vertical	7	Set graph to display in table format (text)
4	Change the text size of the title or y-axis label		

¹ The 3D (3-dimensional) option changes the line appearance only and does not include additional data.

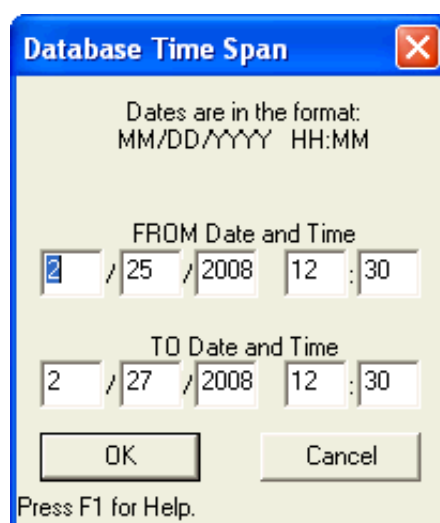


Figure 15 Time mode—from/to settings

3.5.4 Print graphs

Printed graphs will have the same size ratio as is shown on the main screen. To change the orientation of a printed graph, use the **File, Print Setup** menu from the main screen.

Procedure



1. Click the **GRAPH OPTIONS** button on the graph to be printed. The [Graph Options window](#) will open.
2. Click **PRINT**.
3. To print more than one graph at a time, select **File, Print Multiple Graphs** from the main screen menu.

3.5.5 Advanced graph options

Several additional options are available for graphs:

- [Change the maximum time span](#)
- [Make historical graphs](#)
- [Copy and paste to other applications](#)

3.5.5.1 Change the maximum time span

The amount of data that is stored affects the maximum time that can be shown on a graph ([Table 3](#)). When data is stored frequently, the time span of a graph will be shorter than when data is stored less frequently. To change the storage rate, refer to [Increase or decrease data](#).

A single data line on a graph can contain a maximum of 2000 data points. If a graph updates at the typical interval of 5 minutes, 7 days of data can be viewed at one time (12 data points per hour, 288 data points per day, 2016 data points in 7 days). The maximum number of days that a graph can show is 22 days.

When a graph contains the maximum number of 2000 data points, it stops tracing. To continue the trace, complete one of these actions:

- Adjust the rapid storage rate
- Slow the storage rate
- Export data to an application such as Microsoft Excel and make a graph in the Excel spreadsheet.

Table 3 Maximum graph span vs. data storage rate¹

Data storage rate	Graph span, hours	Graph span, days
2	67	2.7
4	133	5.5
5	167	7.0
10	333	14
15	500	21
20	545 ²	22.7 ²
30	545 ²	22.7 ²

¹ Spans will be shorter when rapid sampling is used.

² The maximum number of days that a graph can show is 22.7 days.

To make a graph that covers a longer time span:

1. Create a statistical report for the time period to be used. The report will show an average value for each interval, for example every 4 or 8 hours.
2. Export the report to an application such as Microsoft Excel.
3. Make a graph in the spreadsheet with one or more traces. Excel allows more data points per graph trace.

3.5.5.2 Make historical graphs

If the name of a measurement has been changed, a graph can still be made of the old measurements. A temporary location is set up to use the old measurement names.

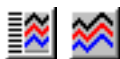
Procedure

1. If the measurements are no longer in the database, use the database archive.
2. Refer to [Set up locations](#) to open the [Location List window](#).
3. Double-click one of the last Not Used locations. The [Setup Location window](#) will open.
4. Enter the location name that was used for the older measurements and assign a sensor to the location.
5. Leave the Location On/Off box cleared to prevent storing these measurements.
6. Add the old measurements to the location. Select the Measurement On/Off box for each measurement.
7. Refer to [Set up graphs](#) to open the [Graph List window](#).
8. Double-click one of the last Not Used graphs. The [Setup Graph window](#) will open.
9. Specify a graph name and the measurements to be shown for each pen.
10. In the main screen, select the name from the drop-down list of one of the graphs.
11. Click the **GRAPH OPTIONS** button to open the [Graph Options window](#).
12. In the Mode section, select From/To.
13. Specify the time period for the archived data. Click **OK** to view the graph.
14. After viewing, printing or exporting the graph, delete the location and the graph.

3.5.5.3 Copy and paste to other applications

A graph can be copied and pasted into an application such as Microsoft Excel, Microsoft Word or PowerPoint.

Procedure



1. After a graph has been set up and is on the main screen, use the **SIZE** buttons to show the graph in full-screen mode.

Note: Graphs copy with the same aspect ratio as are shown on the main screen.



2. Click the **GRAPH OPTIONS** button to open the [Graph Options window](#).
3. Click **COPY TO CLIPBOARD**.
4. A prompt window will open for data markers. To include a mark on the graph for each data point, click **YES**. Click no to have the graph look the same way that it does on the main screen.
5. Open the application and paste the graph into the application.

3.6 Reports

Use reports to organize data into useful ways to show plant performance over time. Once a report has been created, it can be viewed in a [Report window](#), printed or exported to another software application.

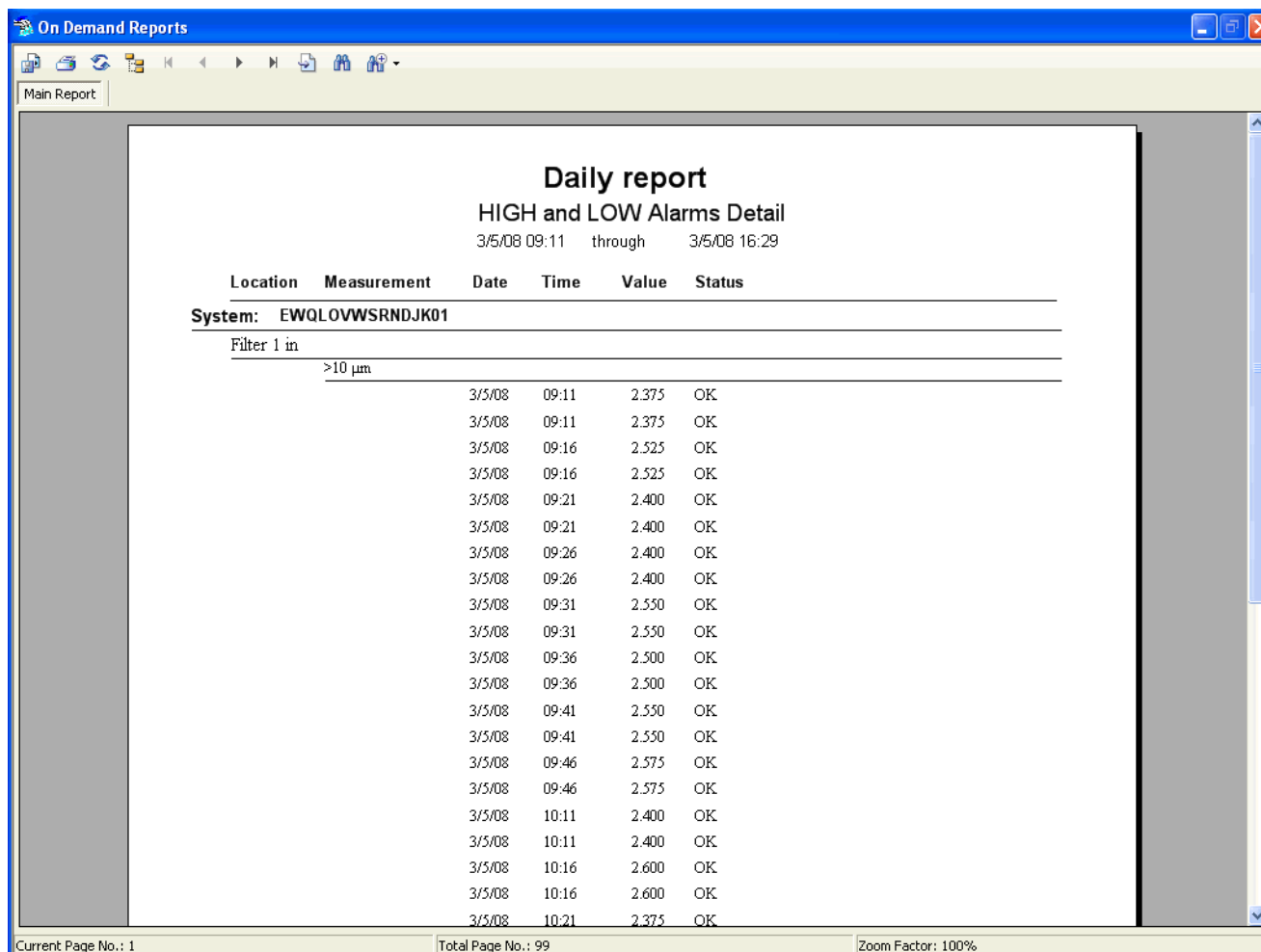


Figure 16 Report window

3.6.1 Types of reports

Reports can be made to show different types of data:

- Statistical—1, 2, 4, 6, 8, 12 or 24 hour
- Alarm—number, details or sensor
- Database information
- Raw data export—spreadsheet or csv

3.6.2 Set up reports

To make a report, first set up a report group. The report group defines the type of report and the measurements to include with the report.

Procedure

1. From the main screen, select **Setup, Reports**. The Scheduled Reports window will open.
2. Click **SETUP GROUPS**. The [Setup Report Groups window](#) will open.
3. In the **Group Name** box, enter a name for the report. The name can contain up to 50 characters. The name will be shown on all printed copies as the main title.
4. Click **ADD DEFINITION**. The new group name will be shown in the **Existing Groups** box.
5. In the Report Name drop-down list, select the type of report to add. Click **ADD REPORT**. The name of the report type is shown in the **Existing Groups** box under the new group name.
6. Repeat step 5 to add more report types to the report group.
7. Select the measurements to include from the **Location:Measurement** box. Press and hold the **SHIFT** or **CTRL** key to select multiple measurements.

***Note:** All measurements that have been set up are shown in the Location:Measurement box, even if they were later deleted. To prevent adding obsolete measurements, make sure that each measurement shows a date in the **Date of Last Use** box when selected.*

8. Click **ADD MEASUREMENT**. The measurement names will be shown in the **Existing Groups** box.
9. To exclude measurements from filter-to-waste cycles, click the **Exclude Filter to Waste** check box. Refer to [Exclusion guidelines for reports](#) for guidelines.
10. To exclude [Rapid sample measurements](#), select the **Exclude Rapid Sample** check box. Refer to [Exclusion guidelines for reports](#) for guidelines.
11. When all settings have been made, click **OK**. The new report group is available from the **Scheduled Report Group** drop-down list in the Scheduled Reports window.

Table 4 Exclusion guidelines for reports

Report type	Exclude filter-to-waste	Exclude rapid sample
Statistical	Yes	Optional
Alarm	Optional	No
Export	No	Yes
Database information	No	No
10-50-90	Yes ¹	Yes

¹ Exclude only when the plant is plumbed for filter-to-waste.

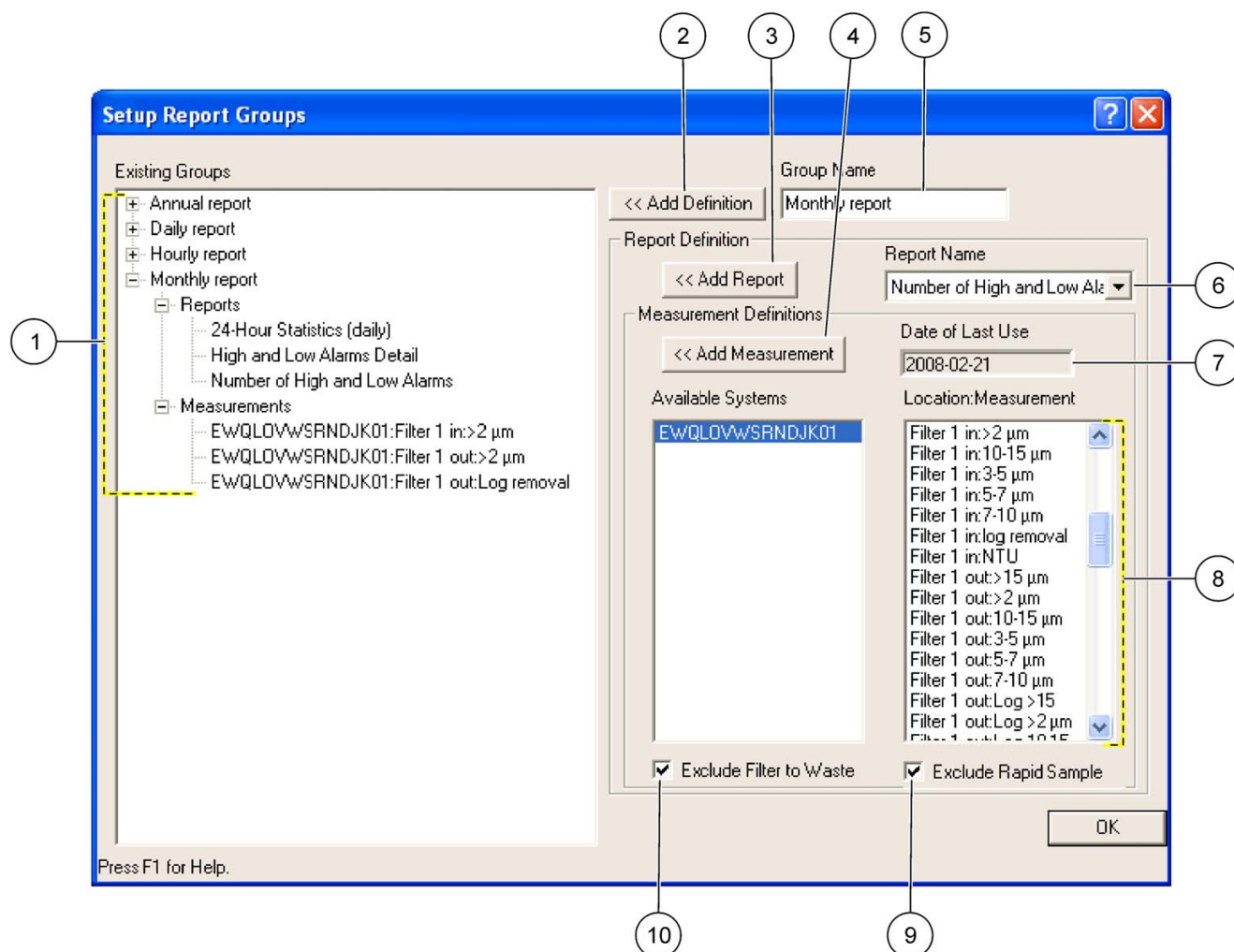


Figure 17 Setup Report Groups window

1	Report names and definitions	6	Select the report type
2	Add new report name button	7	Last date of selected measurement
3	Add report type button	8	Select measurements
4	Add measurements to report button	9	Include/exclude rapid storage samples from report
5	Report name	10	Include/exclude filter-to-waste data from report

3.6.3 Print reports

Reports can be generated and printed at any time. Be sure to [Set up reports](#) first.

Procedure

1. From the main screen, select **Reports**. The [On Demand Reports window](#) will open.
2. Select the report name from the **Report Group** drop-down list.
3. In the **Date and Time Span for Report** box, enter the dates and times to include in the report. Be sure to enter the time in 24-hour format.
Note: If the dates and times are not entered, the last 24-hour period is automatically used.
4. Click **VIEW**. A new window will open that shows the report.



5. Use the left and right arrows on the [Toolbar in the Reports window](#) to move from one page to another.
6. Click the **PRINTER** icon to print the report.

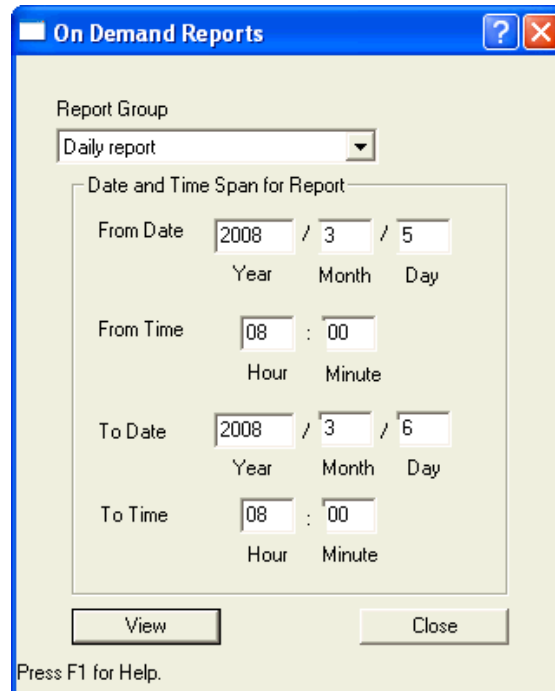


Figure 18 On Demand Reports window



Figure 19 Toolbar in the Reports window

3.6.4 Schedule automatic reports

Reports can be generated automatically at the same time each day. Up to 3 reports can be scheduled to print at the same time.

Procedure

1. From the main screen, select **Setup, Reports**. The [Scheduled Reports window](#) will open.
2. Select the report from the **Scheduled Report Group** drop-down list.
3. In the **Scheduled Daily Report Print Time** box, enter a time in 24-hour format.
4. To schedule additional reports, repeat steps 2 and 3.
5. Click **OK**. The reports will be generated and printed at the scheduled time each day.

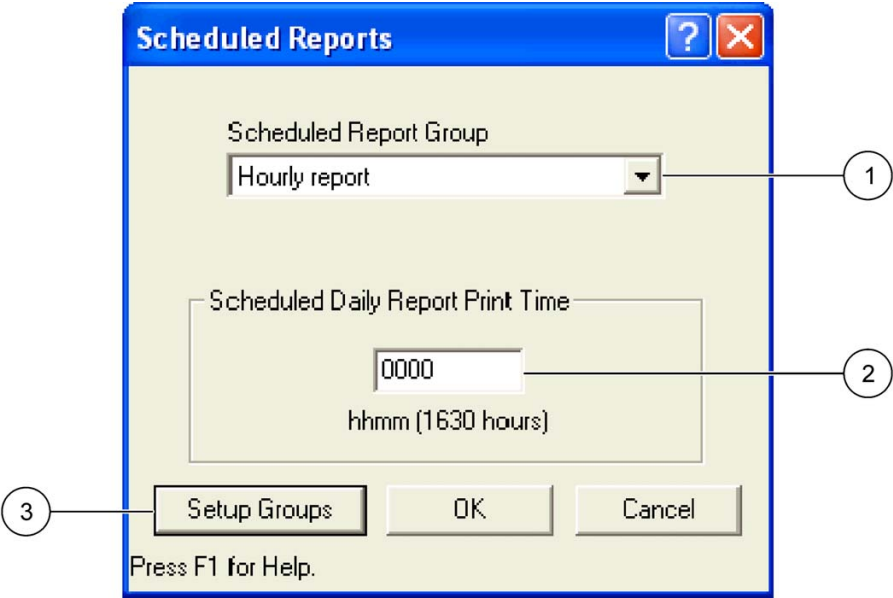


Figure 20 Scheduled Reports window

1	Select the report name for automatic printing	3	Button to Set up reports
2	Enter the time when the report will be printed		

3.6.5 Export reports

Reports can be converted to electronic files that can be exported in different file formats:

- Microsoft® Excel® spreadsheet software
- Adobe pdf
- Microsoft Word document
- Crystal Reports
- Rich text format

Procedure

1. Complete steps 1–4 under [Print reports](#) to view the report.
2. In the report window, click the **EXPORT REPORT** icon. A Save As window will open.
3. Select the folder location to save the file in.
4. Enter a report name in the **File Name** box.
5. Select a file type in the **Save as type** box.
6. Click **SAVE**. A confirmation window will open. Click **OK**.



3.7 Alarms

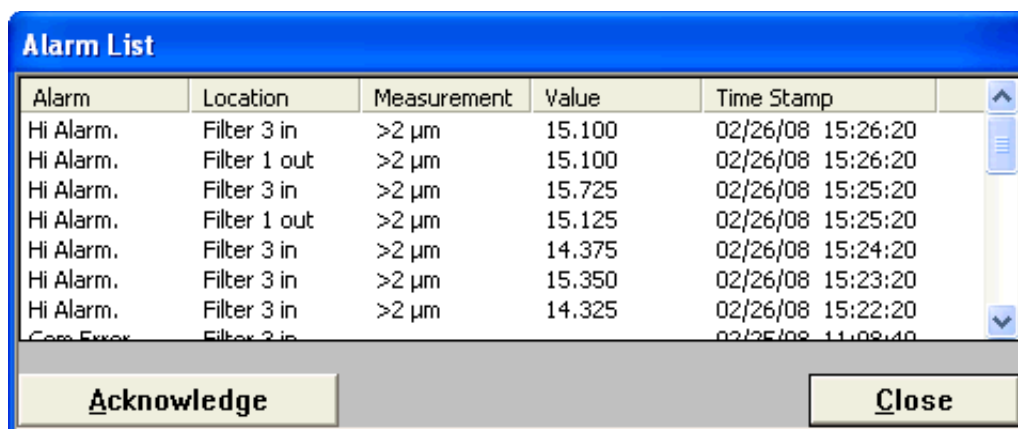
Alarms can be set to occur when a measurement exceeds an upper or lower limit. Alarms will also occur automatically when there is a communication or hardware problem such as a calibration error.

A record of all alarms is permanently stored in the database. [Reports](#) can be generated to show the alarm history.

3.7.1 Responding to alarms

When an alarm condition occurs, the computer makes a beeping sound and the [Alarm List window](#) opens and flashes. The Alarm List window shows the type of alarm, location, measurement value, date and time. A red alarm symbol will be shown next to the measurement in the main screen. The symbol remains as long as the condition occurs.

Click **ACKNOWLEDGE** in the Alarm List window to stop the beeping and flashing. To open the Alarm List window at any time, select **Alarms** from the main screen menu.



Alarm	Location	Measurement	Value	Time Stamp
Hi Alarm.	Filter 3 in	>2 µm	15.100	02/26/08 15:26:20
Hi Alarm.	Filter 1 out	>2 µm	15.100	02/26/08 15:26:20
Hi Alarm.	Filter 3 in	>2 µm	15.725	02/26/08 15:25:20
Hi Alarm.	Filter 1 out	>2 µm	15.125	02/26/08 15:25:20
Hi Alarm.	Filter 3 in	>2 µm	14.375	02/26/08 15:24:20
Hi Alarm.	Filter 3 in	>2 µm	15.350	02/26/08 15:23:20
Hi Alarm.	Filter 3 in	>2 µm	14.325	02/26/08 15:22:20
Comp Error	Filter 3 in			02/26/08 11:08:40

Acknowledge **Close**

Figure 21 Alarm List window

3.7.2 Set high and low alarms

Alarms can be set for any particle counter or analog instrument.

Procedure

1. Refer to steps 1 to 3 under [Set up locations](#) to open the [Setup Location window](#).
2. In the [Setup Location window](#), double-click the measurement to set the alarm for.
3. In the **High Alarm** or **Low Alarm** section, enter an upper or lower limit in the **Limit** box.
4. Click the **On** box to set the alarm to On. Click **OK**. The alarms will be shown in the Lo Alarm and Hi Alarm columns of the Setup Location window.
5. Repeat steps 2–4 to add additional high and low alarms. Click **OK** to return to the Location List window.

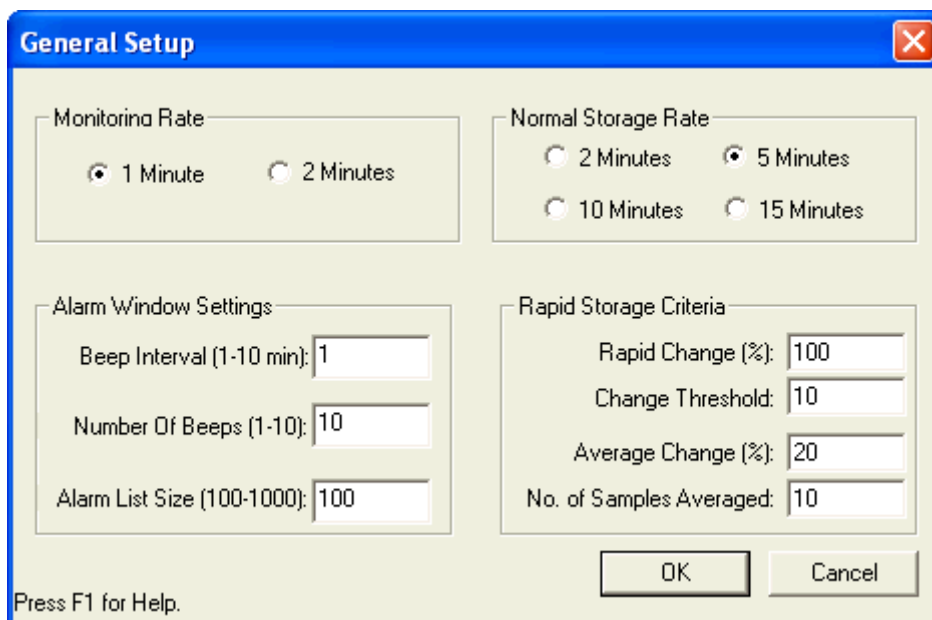
3.7.3 Change alarm parameters

The alarm interval, number of beeps per interval and the maximum number of alarms that are shown can be changed.

Procedure

1. From the main screen, select **Setup, General**. The [General setup window](#) will open.
2. In the **Alarm Window Settings** section, change the value for any of the parameters:
 - **Beep interval**—the time interval, in minutes, that an alarm makes a sound until the alarm is acknowledged.
 - **Number of beeps**—the number of beeps that sound at each beep interval.
 - **Alarm list size**—the maximum number of alarms in the Alarm List window.

3. Click **OK** to save the settings.



The General Setup window is a dialog box with a blue title bar and a close button (X) in the top right corner. It contains four main sections: Monitoring Rate, Normal Storage Rate, Alarm Window Settings, and Rapid Storage Criteria. The Monitoring Rate section has two radio buttons: 1 Minute (selected) and 2 Minutes. The Normal Storage Rate section has four radio buttons: 2 Minutes, 5 Minutes (selected), 10 Minutes, and 15 Minutes. The Alarm Window Settings section has three text input fields: Beep Interval (1-10 min): 1, Number Of Beeps (1-10): 10, and Alarm List Size (100-1000): 100. The Rapid Storage Criteria section has four text input fields: Rapid Change (%): 100, Change Threshold: 10, Average Change (%): 20, and No. of Samples Averaged: 10. At the bottom right are OK and Cancel buttons. At the bottom left is the text 'Press F1 for Help.'

Figure 22 General setup window

3.8 Passwords

Use the [Sign on password](#) to restrict access to the setup menu. Use the [Exit password](#) to prevent closing Vista and stopping data collection.

3.8.1 Sign on password

Use the [Setup](#) menu to set or change passwords.

Procedure

1. Select **File, Sign On** from the main screen to access the setup menu. The Enter Your Password window will open.
2. If a sign on password has not been set previously, click **OK**. A confirmation window will open. Click **OK**.
3. If a sign on password has been set, enter the password and click **OK**. A confirmation window will open. Click **OK**.
4. Select **Setup, Passwords, Change Sign On Password** from the main screen. The Change Sign On Password window will open.
5. If a password has not been set, enter the new password in the **Enter** and **Confirm** boxes and click **OK**.
6. If a password has been set, enter the password in the **Enter Old Password** box. Enter the new password in the **Enter** and **Confirm** boxes and click **OK**.
Note: To remove a password, enter the old password but leave the enter and confirm boxes blank.
7. Select **File, Sign Off** from the main screen. The [Setup](#) menu is not available without the sign on password.

3.8.2 Exit password

Use the [Setup](#) menu to set or change passwords.

Procedure

1. Select **File, Sign On** from the main screen to access the setup menu. The Enter Your Password window will open.
2. If a [Sign on password](#) has not been set previously, click **OK**. A confirmation window will open. Click **OK**.
3. If a sign on password has been set, enter the password and click **OK**. A confirmation window will open. Click **OK**.
4. Select **Setup, Passwords, Change Exit Password** from the main screen. The Change Exit Password window will open.
5. If a password has not been set, enter the new password in the **Enter** and **Confirm** boxes and click **OK**.
6. If a password has been set, enter the password in the **Enter Old Password** box. Enter the new password in the **Enter** and **Confirm** boxes and click **OK**.

When an attempt is made to close or exit Vista, the user will have to enter a password.

***Note:** To remove a password, enter the old password, but leave the enter and confirm boxes empty.*

3.9 Data protection

Particle counters generate a large amount of data, as much as 100 measurements per minute. Use a database backup to prevent data loss. Use an archive to remove older data from the database. To reduce the amount of data that is collected, refer to [Increase or decrease data](#).

3.9.1 Back up data

The Database Backup Utility (DBU) manages the data in the following ways:

- Makes a backup copy of the database every day
- Puts older data into an archive file once a week
- Restores the database or archive

3.9.1.1 Automatic database backup

Vista can make a backup copy of the database every day. The backup will not affect data collection, but can slow the computer response. Select a time when reports are not scheduled and when the computer is not in use.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Click in the **Backup/Restore operation** section. A backup menu will be shown.
3. Select **Start Scheduled Backup**. The Scheduled backup settings window will open.
4. Enter a name for the backup file in the **Default name of Backup file** box.

5. Select the path where the file will be stored from the **Default storage path of Backup files** box.

***Note:** The DBU automatically saves the backup file on the same hard drive where the Vista software is located. To prevent data loss in the event of a hard drive failure, save the backup copy on a different drive.*

6. Click the **Enable Scheduled backup** box to set the utility to automatically make a backup file every day.
7. Select the date when the first backup will be made from the **Start date & time** box.
8. Click on the hours and minutes and enter the new time in 24-hour format.
9. Click **OK** to save the settings. A confirmation window will open. Click **YES** and **OK**.

3.9.1.2 Manual database backup

A copy of the database can be made at any time.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Click in the **Backup/Restore operation** section. A backup menu will be shown.
3. Select **Start Manual Backup**. The Backup Utility window will open.
4. Enter a name for the backup file in the **Name of backup file** box.
5. Select the path where the file will be stored from the **Storage location** box.

***Note:** The DBU automatically saves the backup file on the same hard drive where the Vista software is located. To prevent data loss in the event of a hard drive failure, save the backup copy on a different drive.*

6. Click **START** to start the back up process. A confirmation window will open. Click **YES**. The backup copy will be made.

3.9.1.3 Configuration backup

A copy of the settings for report, locations and measurements can be made to back up the settings or to transfer the settings to another computer.

Procedure

1. Find the file named **Settings.wqs** in the Vista directory on the computer.
2. Copy and paste the file to a backup directory.
3. To transfer the settings to another computer, copy and paste the file into the Vista directory on the other computer.

3.9.1.4 Restore the database

If the database becomes damaged, use the file that was made in [Back up data](#) to restore the data.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Close Vista. Vista must be closed before the database can be restored.
3. Click in the **Backup/Restore operation** section. A backup menu will be shown.

4. Select **Restore Backup data**. The Backup—Restore Utility window will open.
5. Select the location and name of the backup database file.
6. Click **START** to begin the restore process. A confirmation window will open. Click **YES**.
7. Wait for the database to be restored. Click **OK** when the restoration is complete.

3.9.2 Archive the database

Archiving data removes data from the database and stores it in a backup location. The size of the database does not change after data is archived. The archive prevents a further increase in the size of the database.

3.9.2.1 Automatic archive

Set Vista to automatically archive the database every week to prevent the database from becoming too large.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Click in the **Archive/Restore operation** section. An archive menu will be shown.
3. Select **Start Scheduled Archive**. The Scheduled archive settings window will open.
4. Enter a name for the archive file in the **Default name of the Archive file** box.
5. Select the path where the file will be stored from the **Default storage path of Archive files** box.

***Note:** The DBU automatically saves the archive file on the same hard drive where the Vista software is located. To prevent data loss in the event of a hard drive failure, save the archive copy on a different drive.*

6. Click the **Enable Scheduled Archive** box to set the utility to automatically make a archive file once a week.
7. Select the date when the first archive will be made from the **Start date & time** box.
8. Click on the hours and minutes and enter the new time in 24-hour format.
9. Enter the maximum number of days that data will be saved in the database. Any data that is older than the maximum number of days will be removed from the database and placed in an archive file.

***Note:** To determine the maximum number of days, monitor the database size for the first 30 days. Then compare the size of the database to the amount of free disk space that is shown on the [Vista Main Screen](#). If the database size increases quickly, reduce the maximum number of days.*

10. Click **OK** to save the settings. A confirmation window will open. Click **YES** and **OK**.

3.9.2.2 Manual archive

The database can be archived at any time.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Click in the **Archive/Restore operation** section. An archive menu will be shown.

3. Select **Start Manual Archive**. The Archive Utility window will open.
4. Enter a name for the archive file in the **Name of the Archive file** box.
5. Select the path where the file will be stored from the **Storage location** box.
Note: The DBU automatically saves the archive file on the same hard drive where the Vista software is located. To prevent data loss in the event of a hard drive failure, save the archive file on a different drive.
6. Select the date when the archive will start from the **Start Date & Time** box. Click on the hours and minutes and enter the new time in 24-hour format.
7. Select the date when the archive will stop from the **End Date & Time** box. Click on the hours and minutes and enter the new time in 24-hour format.
8. Click **START** to start the archive process. A confirmation window will open. Click **YES**. The archive will be made.

3.9.2.3 Archive backup

A copy of the archive file can be made to prevent data loss.

Procedure

1. Find the file from the [Automatic archive](#) or [Manual archive](#) section in the Vista directory on the computer.
2. Copy and paste the file to a backup directory.

3.9.2.4 Restore the archive

If the archive becomes damaged, use the file that was made in [Archive backup](#) to restore the data.

Procedure

1. From the main screen, select **Setup, Database Backup/Archive**. The Database Backup Utility will open.
2. Click in the **Archive/Restore operation** section. An archive menu will be shown.
3. Select **Restore Archive data**. The Archive—Restore Utility window will open.
4. Select the location and name of the backup archive file.
5. Click **START** to begin the restore process. A confirmation window will open. Click **YES**.
6. Wait for the archive to be restored. Click **OK** when the restoration is complete.

3.10 Daylight savings change

If the time changes for daylight savings, the computer clock must be changed manually.

3.10.1 Adjust clock forward

When the computer clock is manually set ahead to adjust for a change in daylight savings, the data in Vista will show a one-hour gap.

Procedure

1. On the Windows task bar, click **START, Settings, Control Panel**.
2. Open the **Date and Time** window.
3. Set the time ahead by one hour. Click **OK**.

3.10.2 Adjust clock back

Before the computer clock can be manually set back to adjust for a change in daylight savings, Vista must be closed. If not closed, Vista will try to save two sets of data with the same time. These data sets can cause a database error.

Data will not be collected during the time that Vista is closed.

Procedure

1. Select **File, Exit** to close Vista. If an [Exit password](#) was set, enter the password.
2. On the Windows task bar, click **START, Settings, Control Panel**.
3. Open the **Date and Time** window.
4. Set the time back by one hour. Click **OK**.
5. Wait for at least one hour. After one hour has passed, start Vista.

Section 4 Troubleshooting

4.1 Sensors not found

When one or more sensors cannot be found, there are 2 main causes:

- Incorrect wiring in the RS485 communication network
- Incorrect particle counter configuration

Systems that include both old and new particle counters are the most likely to have installation problems. Make sure that all of the counters in the system meet the [Particle counter requirements](#).

4.1.1 No sensors found

If no sensors are found when Vista is started, complete the tasks that follow:

- Make sure that the RS485 converter is connected to the serial port on the computer.
- Make sure that the RS485 converter has power.
- Make sure that the particle counters have power.
- Make sure that the COM port is not in use by another program. Make sure that the COM port is working correctly.
- Make sure that the RS485 cable is wired correctly (refer to the *2200 PCX Particle Counter User Manual*). If the cable is wired correctly, change the wire position at the RS485 converter.
- If using a RS485 converter from B&B Electronics, use the [Communication reliability test software](#) to make sure that the converter is operating correctly. If the converter is operating correctly, then the problem is most likely a wiring connection between the converter and the first particle counter on the network. Check all wiring on the RS485 converter first and then go to the first particle counter and validate all wiring there. Make sure that the black (or blue) wire is on the 485B terminal on both ends. Make sure that all strands of the wire are captured. Poor wiring/crossed wiring is usually the problem.
- If the particle counters are still not found, remove one particle counter from the network and connect it directly to the RS485 converter on the computer. Use the [Communication reliability test software](#) to make sure that the counter can be found. If the counter is found, there is a problem in the main RS485 network. If the counter is not found, there may be a problem with the counter.

4.1.2 Some sensors not found

If some but not all sensors are found when Vista is started, complete the tasks that follow:

- Make sure that the missing particle counter has power.
- Make sure that the missing particle counter has the correct EEPROM version.
- Make sure that the RS485 cable to and from the missing counter is wired correctly.
- Use the CRTS utility to [Find counters with the same address](#).
- Move the missing counter to a position in the network that is occupied by a working counter. If the counter is still not found, there may be a problem with the counter.

4.2 Communication reliability test software

Important Note: Do not change the numbers in the Calibration section of the PCX Setup window. If the numbers are changed, the data that is collected in Vista will be inaccurate.

The Communication Reliability Test Software (CRTS) is a tool that can be used for the following purposes:

- [Validate the RS485 converter](#), if the converter is made by B&B Electronics
- [Identify particle counters](#) in the network
- [Find counters with the same address](#)
- [Change the RS485 address](#) of a particle counter
- [Set analog inputs to on](#) for a particle counter
- [Change the size thresholds](#) for a particle counter
- [Measure the network stability](#)

4.2.1 Validate the RS485 converter

If the RS485 converter is made by B&B Electronics, use the CRTS utility to make sure that the converter is operating correctly.

Procedure

1. Close Vista.
2. On the Windows desktop, double-click the **COMMUNICATION RELIABILITY TEST SOFTWARE** icon. The Company Name window will open.
3. Enter your company name and click **OK**. The CRTS window will open.
4. Click on the **Step 1—485 Test** tab and select the COM port that the RS485 converter is connected to. If the converter is from B&B Electronics, the light on the converter will flash and validate that the converter is operating correctly.

The light will not flash if the converter is from a different vendor. If the converter is from B&B Electronics and the light is not flashing, complete the suggestions related to the RS485 converter under [No sensors found](#).

4.2.2 Identify particle counters

The CRTS utility will scan the network and identify the particle counters that are found.

Procedure

1. Close Vista.
2. On the Windows desktop, double-click the **COMMUNICATION RELIABILITY TEST SOFTWARE** icon. The Company Name window will open.
3. Enter your company name and click **OK**. The CRTS window will open.
4. Click the **SETUP PCX** button. The PCX Setup window will open.
5. The CRTS utility will scan the network and list the particle counters that are found.

If some counters are not found, complete the steps under [Sensors not found](#).

4.2.3 Find counters with the same address

Each particle counter has a number or address that is used by Vista for communication. When two counters have the same address, there will be a communication problem. One or more counters will not be shown.

Procedure

1. Complete the steps under [Identify particle counters](#) to list the counters that are found.
2. Click one of the sensors in the list. The Alarm light on the front panel of the associated particle counter will flash.

3. Find the particle counter with the flashing Count light. Record the physical location of the counter and the associated address that is shown in the **PCX Setup** window.
4. Repeat steps 2 and 3 for each particle counter in the list.

4.2.4 Change the RS485 address

Change the address of a particle counter when two counters have the same address.

Procedure

1. Close Vista.
2. On the Windows desktop, double-click the **COMMUNICATION RELIABILITY TEST SOFTWARE** icon. The Company Name window will open.
3. Enter your company name and click **OK**. The CRTS window will open.
4. Open the **Terminal** tab. Select the appropriate COM port.
5. Remove power to all particle counters that are connected to the selected COM port.
6. Apply power to the particle counter that will receive the new address.
7. Click **SEND LOAD COMMAND**. The Load Settings window will open. Click **OK**. If done within 30 seconds of applying power, the Load command menu for configuration will be shown.

If more time is necessary between applying power and sending the load command, enter a Load Delay in the Load Settings window. Click **OK** and then apply power to the counter before the load delay counts to 0. If the Load Delay time is set too high, the utility may time out before the Load command menu is accessed.

8. Refer to the *2200 PCX Particle Counter User Manual* to change the **Unit ID** (address) in the Load command menu.

Note: Set the Unit ID to one less than the address to be shown in the CRTS or Vista. An address of 0 in the Load command will be shown as 1 in Vista, the number 1 will be shown as 2 in Vista, and so on.

9. Type Q to save the change.

4.2.5 Set analog inputs to on

If a particle counter has an analog input card but Vista does not find the connected analog devices, set the analog inputs to on.

Procedure

1. Complete steps 1—7 under [Change the RS485 address](#) to access the Load command.
2. Use option 9, SETUP ANALOG I/O, to set the analog inputs to on. Refer to the *2200 PCX Particle Counter User Manual*. Set all 8 analog inputs to on.

Note: If option 9 is not available in the Load command menu, make sure the counter has an analog input card.

3. Type Q to save the change.

4.2.6 Change the size thresholds

The particle sizes that are measured by the particle counters can be changed if necessary. A minimum of 1 and a maximum of 32 sizes can be measured. Six sizes is adequate for most uses.

The lowest particle size should not be less than 2 µm, as 2 µm is the lowest calibration point. The highest particle size should not be more than the highest calibration point, which is typically 15 µm.

Procedure

1. Complete the steps under [Identify particle counters](#) to list the counters.
2. Click on the sensor to receive the updated size thresholds. The sizes will be shown in the middle column.
3. Change one or more sizes as follows:
 - Add a new size—click **ADD** and enter the new size. Click **OK**.
 - Change a size—select a size, click **EDIT** and enter the new size. Click **OK**.
 - Delete a size—select a size and click **DELETE**.
4. When the sizes have been changed, click **SAVE SIZES TO COUNTER**.

4.2.7 Measure the network stability

If intermittent network communication problems are suspected, complete the stability test.

Procedure

1. Close Vista.
2. On the Windows desktop, double-click the **COMMUNICATION RELIABILITY TEST SOFTWARE** icon. The Company Name window will open.
3. Enter your company name and click **OK**. The CRTS window will open.
4. Open the **Step 2—Reliability Test** tab.
5. Select a time interval for the test: **5 minutes**, **1 hour**, **8 hours** or **24 hours**.
6. Click **START TEST**. The test will begin.
7. Wait for the test to be completed. Each test will take as long as the time interval that was selected.
8. When the test is complete, click **SUMMARY REPORT** or **COM FAIL REPORT**. The report window will open.
9. In the report window, click **SAVE** or **PRINT** to save or print the report.

4.3 Communication failure alarms

If a communication failure alarm occurs in Vista, complete the tasks that follow:

- Make sure that the last particle counter on the RS485 cable is terminated correctly. Refer to the *2200 PCX Particle Counter User Manual*.
- Make sure that the RS485 network is wired as one serial wire. There must not be any branches or closed loop configurations.
- If only one particle counter has a random communication failure, move the counter to another physical location on the RS485 cable. If the alarm still occurs for that particle counter, the counter is defective.
- Put a good particle counter at the cable location that sent the alarm condition. If the same problem occurs, check for incorrect wiring, ungrounded cables, or a source of electromagnetic interference such as a large pump motor.

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A		from historical data 25
alarm list window 31		overview 18
alarms		printing 24
acknowledging 31		set up graphs 19
set high and low alarms 31		show in main screen 21
analog devices, set up 12		time span 24
analog inputs		L
set to on 41		labels, graph 22
set up 12		locations
B		delete a location 14
backwash mode 17		set up 8
C		log removal set up 11
chlorine readings. See analog devices		M
computer requirements 3		main screen
control valve		description 7
connection 5		main screen menu 8
indicate filter mode 17		measurements
CRTS utility		log removal 11
change particle size thresholds 41		set up 10
change the sensor address 41		shown on main screen 7
check network stability 42		monitoring interval 16
general info 3		N
set analog inputs to on 41		network stability 42
validate RS485 converter 40		O
D		operating systems, compatible 3
data collection, increase or decrease 16		P
database 3		particle counters, set location name 8
archive 35		particle sizes
backup database 33		change size range in sensor 41
restore 34		set up 10
date range, graphs 22, 24		passwords
daylight savings		exit password 33
adjust for changes in 36		sign on password 32
disable 5		PC requirements 3
dilutions, indicate 18		pH meter. See analog devices
F		R
filter to waste mode 17		rapid sampling. See rapid storage criteria
free disk space 7		rapid storage criteria
FTW icon 17		change criteria 15
G		description 14
graph definitions 19		optimize 16
graphs		set on or off 15
change appearance 22		report groups 26
change graph definitions 21		reports
delete 21		automatic 29
description 19		export 30
export to other applications 25		

Index

print reports 28
report window 26
set up reports 26

S

sign on password 32
SQL Server 3
storage interval 16

T

troubleshooting
 change sensor address 41
 communication failures 42
 find sensors 40
 network stability 42
 RS485 converter 40
 sensors not found 39
turbidimeter. See analog devices