

Software for the PC 2400 D Particle Counter

Tracware 2001



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Chapter 1: Introduction

Chapter 1 gives an overview of the manual and explains how to setup and install the software. A guide for quickly setting up and using the software is included.

1.1 About the Manual

This manual is subdivided into eight sections. Each section describes a particular feature of the Tracware software. A section number is used for each chapter and within each section are sub-level sections. The table of contents can be used to find particular areas of interest in the manual by using a sub-section or a page number.

At the end of each chapter is a How-To section. These sections contain solutions to some of the most commonly asked questions.

1.2 Tracware Overview

Tracware is the operator interface to the Chemtrac particle counting system. It is used to collect, display, and store data from the particle counters and auxiliary devices connected to them. Tracware performs removal calculations between sensors, provides alarm and diagnostic information, and generates instantaneous and scheduled daily reports.

Tracware provides several options for viewing the data, providing flexibility in configuration, so that the user can tailor the program to suit the requirements of the application.

Particle counters produce a lot of data and it requires an efficient system to handle the information. In order to accommodate this requirement while maintaining ease of use, some limits have been placed on the configuration. For example, data is collected every minute; while this may be more data than necessary in some instances, it allows for streamlining the data handling routines. The report routines are used to pare down the data to every ten of fifteen minutes if so desired. The amount of data produced by the Tracware software is not enough to cause problems on computers meeting the specifications for the system. Data compression and routine purging of past data are built into the software. Just as an instrument must be maintained for proper performance, routine archiving and file backup must be performed.

1.3 System Requirements

The computer recommended for the Tracware software is an IBM compatible Pentium II or better, with at least 32 Megs of RAM. A hard disk of at least 250 Megabytes available free space and a CD-Rom drive is needed as well. Tracware is designed to operate on Windows Version 98/ME/NT/2000/XP or later. A serial port is necessary, as well as a printer for reports.

A note about Windows:

The Windows operating system is designed to allow multiple applications to be run on the same computer at the same time. This does not mean that all applications will run together or that an unlimited number of applications will run. This is especially true of programs that are collecting data from external devices on a time schedule. If another application ties up too much of the machine, data may be missed. Likewise, accessory boards, CD ROM drives, and other devices may cause conflicts or delays on the system.

1.4 Installing the Software

There are typically two ways to install the software. Please follow the instructions below for the different types of installations.

CD Installation

- 1) Insert the CD into your CD drive.
- 2) A Welcome window should start automatically.
- 3) If the Welcome window does not open automatically, click START..Run from the taskbar and enter d:\welcome.exe where d: is your CD drive letter. Click the OK button to start the Welcome window.
- 4) Click on the Tracware 2001 title to start the installation.
 - 1) Follow the on-screen instructions to complete the installation.
 - 2) Restart the computer when the installation is complete.

File Download Installation

If the installation file was downloaded from the Chemtrac web page, use these installation instructions to complete the Tracware setup.

- 3) Open the downloaded file to start the installation.
- 4) Follow the on-screen instructions to complete the installation.
- 5) Restart the computer when the installation is complete.

1.5 Tracware Features

- Operating Systems: Windows 95/98/ME/NT/2000/XP
- Communication Protocol: Modified Optomux Opto 22
- Viewable Windows: 8
- Size Channels: Up to 8 configurable
- Composite Size Channels: Up to 4 configurable - Total of 8 (size + composite)
- Sample Period: 15 seconds/minute
- Sample Frequency: 60 seconds
- Number of Sensors: Up to 96
- Alarms: Particle Counts, Auxiliary Inputs, Flow, Cell Condition, Removal
- Configurable Charts: Unlimited
- Auxiliary Inputs: 4 Inputs per Particle Counter (4-20 mA)

- Trends: Up to 8 per chart/list
- Export Types: Up to 15 different file formats
- Chart Formats: 2D/3D
- Report Types: List, Summary, Chart

1.6 Quick Start

Follow these instructions to configure and run the Tracware program:

To setup communication:

1. Click Edit..Particle Counter Configuration from the menu bar to setup communication.
2. A new setup window will open.
3. Under the System Setup tab select the appropriate communication port (COM1, COM2, etc..).

To setup sensors:

1. Open the Sensor Setup tab to configure the sensors.
2. Determine the total number of particle counters on the system and enter as the total number of sensors.

Note: Each particle counter should have a unique ADDRESS. The Tracware software will initially try to communicate with the particle counter configured with address one, then the particle counter with address two, and so on. The software will only work with the particle counters setup in this way. If you need to change the address for a particular particle counter see the *Traccomm Utility* section of this manual.

3. Enter a tagname for each particle counter.

To configure auxiliary inputs:

1. Open the Auxiliary Inputs tab to configure up to four 4-20 auxiliary inputs.
2. Enter a tagname for any attached inputs.
3. Determine and enter the min and max setting for each input.

To setup size ranges:

1. From the Size Setup tab change the total number of desired size ranges.
2. Use the up-down arrows to configure size and composite ranges.

To setup graph/list configuration:

1. Click the Graph/List tab to setup graph/list configuration.
2. Click the Edit button to change the name of the default configuration.
3. Select a tagname and size range for one of the pens.
4. Check a Visible box under Show Tag to show or hide a trend on the chart.

Select Edit..Graph/List from the main menu to view the configured graph.

Chapter 2: User Interface

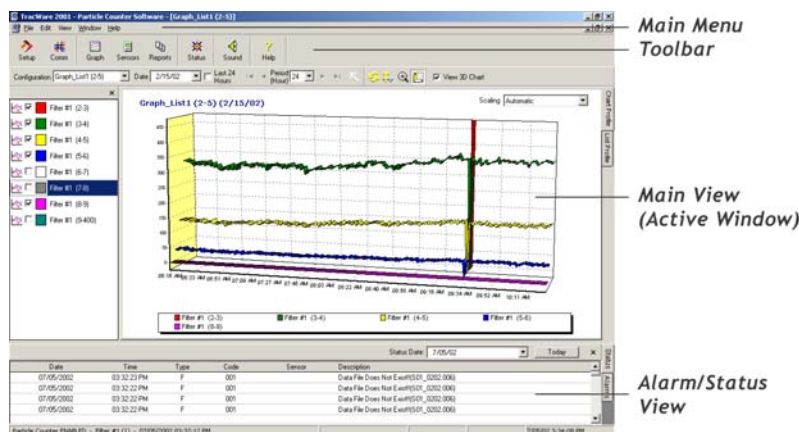
Chapter 2 gives a detailed description of the Tracware user interface.

2.1 Main Window

When Tracware is first opened after installation, the main window displays a Menu Bar, a Toolbar, and a Status/Alarm view on the lower part of the screen.

The menu bar and the toolbar are used to open windows and control system properties. The menu bar contains many more options than the toolbar and can be used to navigate to almost any feature in the software. The toolbar is used to quickly open or control many of the main features of the Tracware software.

The opening screen should be similar to the following window:



The **Alarm & Status** window, displayed on the bottom of the screen, show application event conditions and warnings.

2.1.1 Status View

The Status View shows application event conditions as they occur. Each event is recorded with the current date, current time, type of event, event code, sensor that was involved in the event condition, and a description of the event.

Date	Time	Type	Code	Sensor	Description
07/05/2002	03:30:58 PM	F	001		Data File Does Not Exist!!(c00_0202.008)
07/05/2002	03:30:58 PM	F	001		Data File Does Not Exist!!(c00_0202.008)
07/05/2002	03:30:58 PM	F	001		Data File Does Not Exist!!(c00_0202.008)
07/05/2002	03:30:43 PM	S	001		System Startup.
07/05/2002	03:30:43 PM	I	001	scott (1)	Particle Counter ENABLED
07/05/2002	02:32:34 PM	S	002		System Shutdown.
07/05/2002	02:23:13 PM	I	001	scott (1)	Particle Counter ENABLED

A status date drop-down box allows the user to select any date, for viewing previous or current status conditions. Clicking the Today button will automatically change the status date to the current date.

All status values are inserted, from the top down, into the current date status view. Therefore, the most recent status will always be displayed on the top.

2.1.2 Alarms View

When a process alarm occurs a new record is inserted into the alarms view. To view the Alarms View click the Alarms tab on the right side of the Status/Alarm pane. Alarms will be displayed for high particle counts, high/low auxiliary values, backwash/flow alarms, and removal alarms. Each alarm record contains an alarm date, time, acknowledge field, sensor, alarm value, value when alarm occurred, and alarm description.

Date	Time	Acknowledge	Sensor	Alarm Value	Value	Description
07/05/2002	04:25:01 PM	ALM	Filter #1 (1)	50	67.2	Channel 7 - High Count Alarm
07/05/2002	04:25:01 PM	ALM	Filter #1 (1)	50	213.6	Channel 6 - High Count Alarm
07/05/2002	04:25:00 PM	ALM	Filter #1 (1)	50	112.8	Channel 5 - High Count Alarm
07/05/2002	04:25:00 PM	ALM	Filter #1 (1)	50	84.93	Channel 4 - High Count Alarm
07/05/2002	04:24:00 PM	ACK	Filter #1 (1)	200	204.93	Channel 6 - High Count Alarm

An acknowledge button in the upper left corner of the view will blink when an alarm occurs. This button can be clicked to acknowledge all unacked alarms. The acknowledge button and a panel in the status bar will blink until the alarm(s) are acknowledged.

A drop-down box with alarm date can be changed to view previous day's alarms.

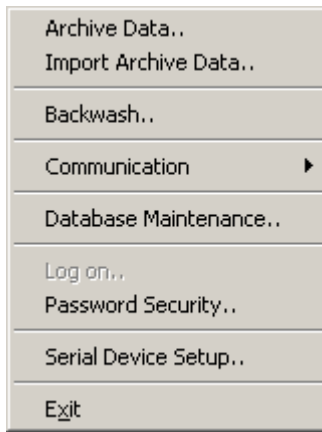
2.2 Menu Bar

File Edit View Window Help

The Tracware Menu Bar contains five main menu items.

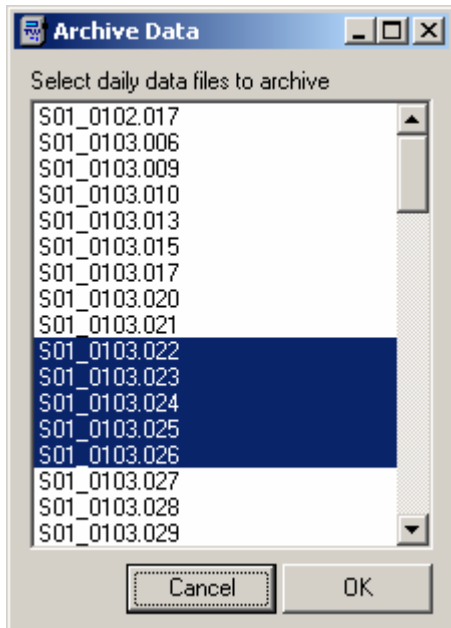
2.2.1 File

The file menu consists of various options for manipulating data and setting up user options.



Archive Data

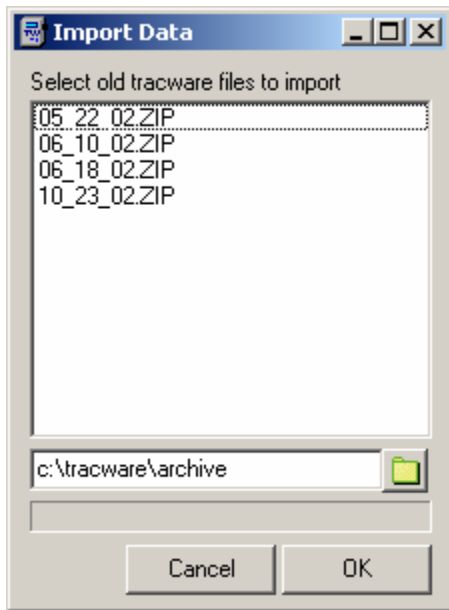
The Archive Data.. option allows the user to manually create archive data files from existing daily data files. An archive file is a compressed zipped file that is stored in the Tracware's archive directory. This compressed file contains all of the data files for a particular day. Archive files are automatically created at midnight. If the archive file does not exist the Archive Data.. feature can be used to create one.



Select an individual or group of daily files from the Archive Data window and click OK to create the archive file(s).

Import Archive Data..

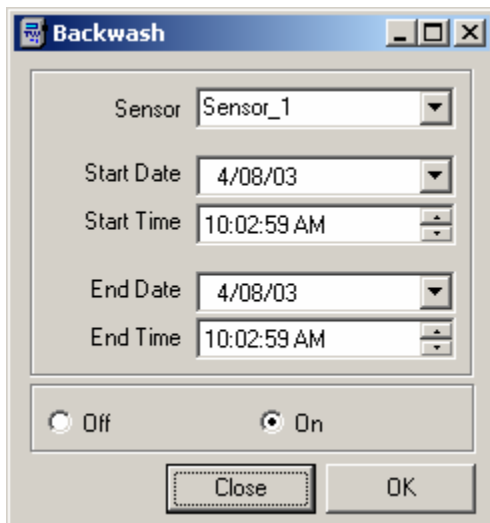
If the user is upgrading from an older version of the Tracware software the user might want to upgrade older archive data files as well. The Import Archive Data option will allow the user to select older individual archive file(s) and import them into the new version.



Select an individual or group of older archive files from the Import Data window and click OK to create the new daily file(s).

Backwash

If a backwash condition occurs the PC2400D Particle Counter can automatically tag the data using a backwash signal. If the signal is not connected, then the user can manually tag the data using the Backwash window.



Select which particle counter, start and end data and time, and whether the data should be tagged off or on to manually set a backwash condition. The tagged backwash data is used in the reporting section of the software.

Communication

The communication option allows the user to select whether serial communication will be used or whether the Chemtrac OPC Server will be used. If serial communication is selected then the Tracware

software will handle all of the serial communication. If the OPC option is selected the Chemtrac OPC server will handle all of the communication.

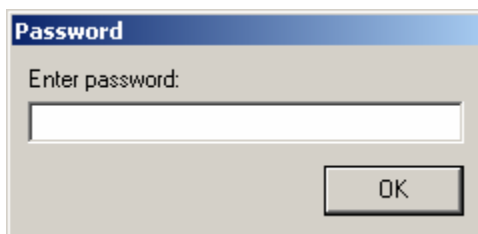
Database Maintenance

If a problem occurs or exists with one of the included database files then the database maintenance option can be used to restore any corrupted files and fix the problem. This option is rarely used and will only fix a certain number of problems. Please be aware that this option should only be used if a problem already exists.

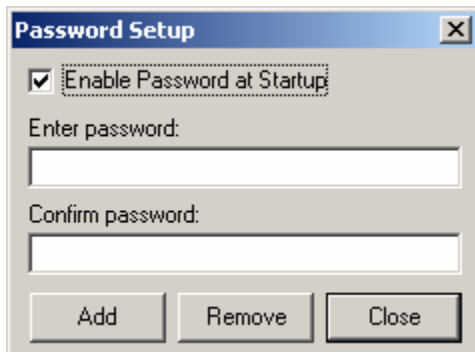
Log on.. and Password security..

The Log on.. and Password security.. features are used together to handle security with the software.

The Log on.. feature allows the user to enter a password and make changes to the software configuration. Logging on is only required if *Enable password at startup* is enabled in the Password security window.



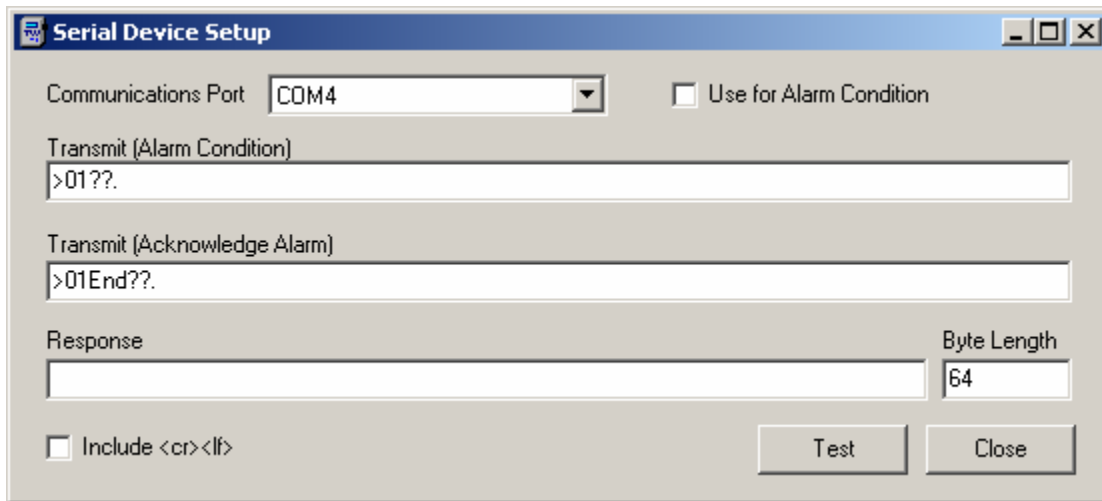
The Password Security window gives the user options for adding a password, deleting a password, and enabling password security.



Enabling Password at Startup will require a password be entered when the software starts. If a correct password is not given the user can still open the software. Configuration items will be disabled if this is the case. Also, exiting the program will not be possible without first logging on.

Serial Device Setup..

The serial device setup option can be used to configure communication for an external device. The device would receive this string of data when any alarm condition occurs in the software. An auto-dialer is an example of a device that could be used with this feature.

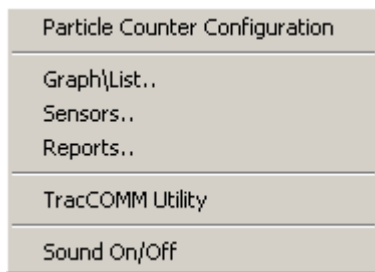


Exit

The exit feature under the file menu will close the Tracware software.

2.2.2 Edit

The edit menu is used to open the main Tracware windows.



Particle Counter Configuration

Selecting Particle Counter Configuration will open the Tracware settings window. *Please see the Configuration section (Chapter 3) of this manual.*

Graph/List..

The Graph/List window shows current and historical data in trend and list views. *Please see the Graph/List section (Chapter 5) of this manual.*

Sensors..

The Sensors window shows current minute data for individual particle counter sensors. *Please see the Sensors section (Chapter 6) of this manual.*

Reports..

Selecting Reports will open the Reports window where data can be extracted, viewed, exported, and printed. *Please see the Reporting section (Chapter 7) of this manual.*

TracComm Utility

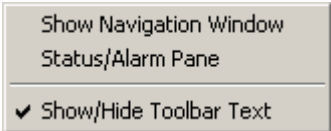
The TracComm Utility is a communication utility used to verify communication and monitor the particle counters one at a time. *Please see the TracComm section (Chapter 4) of this manual.*

Sound On/Off

Selecting this option will turn off/on all of the audible announcements in the software. If this menu option is checked the sound will be set on. If the menu option is not checked the sound will be set off. This option is more easily accessible on the toolbar.

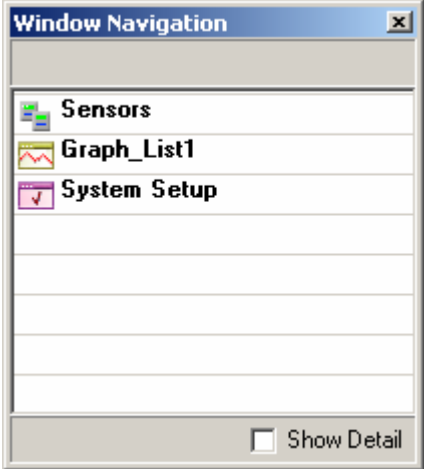
2.2.3 View

The view menu is used to control how certain items are viewed in the software.



Show Navigation Window

The Navigation Window shows a list of all open and available windows. This window is viewed on top of all other open windows. Double clicking on one of the available items will immediately bring the selected window to the front, making it viewable over all others.



When the Show Detail checkbox is checked a short description of each item will appear under the name.

Status/Alarm Pane

Selecting this menu item will open the status view on the lower part of the Tracware window. If the status view is already visible then selecting this item will not do anything.

Show/Hide Toolbar Text

The Show/Hide Toolbar Text option when checked will display a one word description under each

toolbar item. The width and height of each item will increase as well. When this item is unchecked the description will be hidden and size of the toolbar items will decrease.

Checked

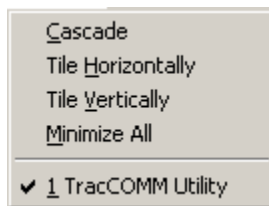


Unchecked



2.2.4 Window

The window menu is used to control the view of the available windows.



Cascade

Cascading windows arranges them from the upper left to the lower right. Each window is placed slightly to the right and down from the previous.

Tile Horizontally

Tile Horizontally places each open window on top of the next. The width of the window is extended across the viewable area of the main window.

Tile Vertically

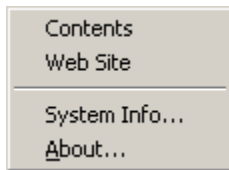
Tile Vertically places each open window next to each other. The height of each window is extended across the viewable area of the main window.

Minimize All

Minimize all reduces all of the available windows to the height of the windows title bar. It places all windows in the lower left hand corner of the viewable area of the main window.

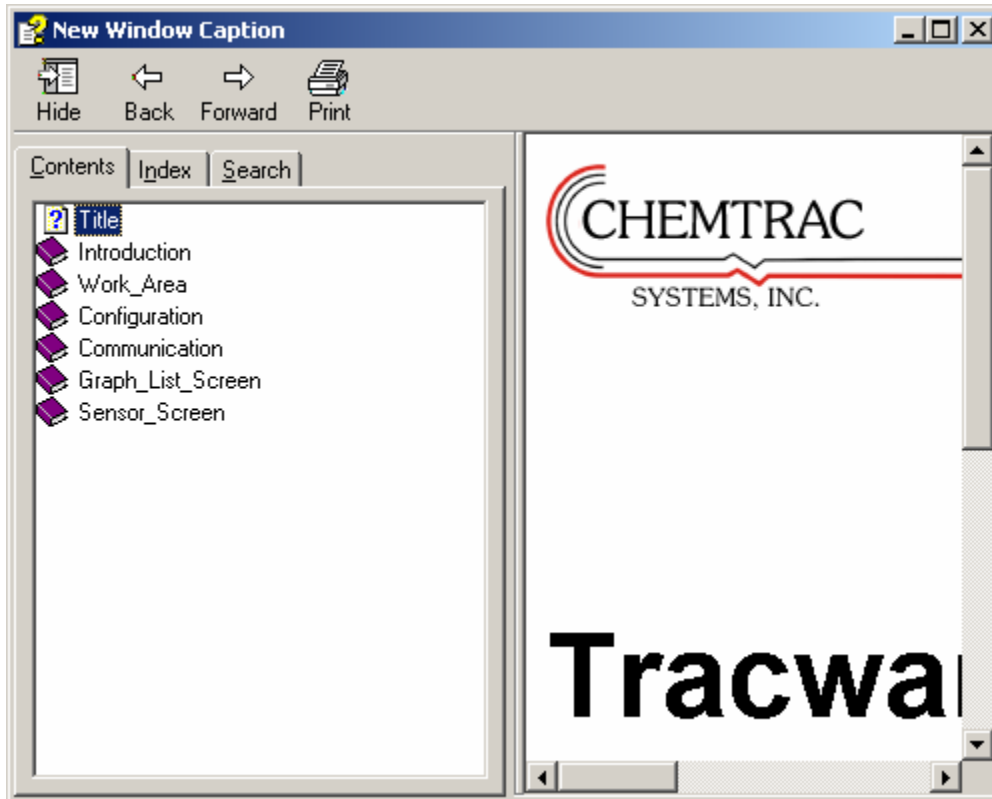
2.2.5 Help

The help menu gives access to the about window and all support documentation.



Contents

The contents option opens a standard windows help screen containing support documentation.

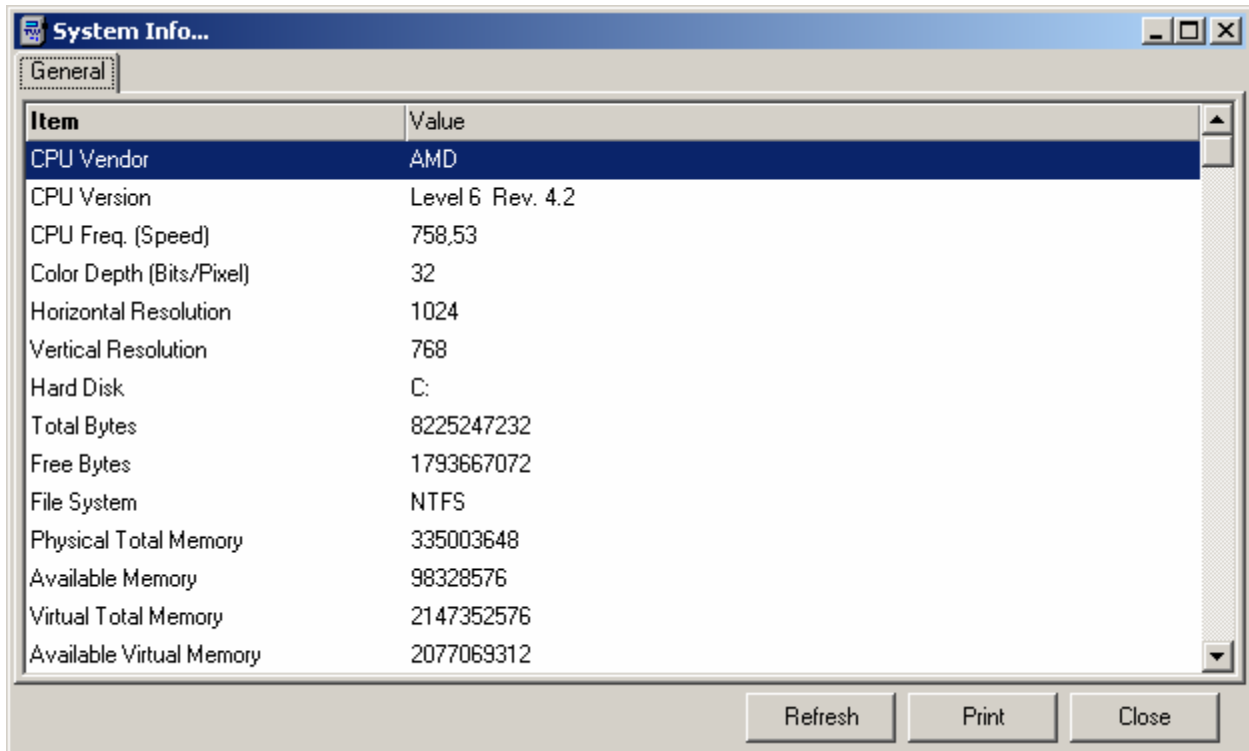


Web Site

If an Internet connection is available, selecting the web site option will open the default browser to show the main Chemtrac web site.

System Info

System info can be used to get information about your computer system, such as processor information, memory size, and available com ports. A window will open showing all of the current systems information.



About

The about screen shows contact information for Chemtrac as well as the current version of the software. Click anywhere inside the window to close the about screen.



2.3 Toolbar

The toolbar is available for quickly gaining access to some of the main features of the Tracware software.

Setup



Selecting the Setup button will open the Tracware settings window. *Please see the Configuration section (Chapter 3) of this manual.*

COMM



Selecting the COMM button will open the TracComm utility. The TracComm Utility is a communication utility used to verify communication and monitor the particle counters one at a time. *Please see the TracComm section (Chapter 4) of this manual.*

Graph



The Graph/List window shows current and historical data in trend and list views. *Please see the Graph/List section (Chapter 5) of this manual.*

Sensors



The Sensors window shows current minute data for individual particle counter sensors. *Please see the Sensors section (Chapter 6) of this manual.*

Reports



Selecting Reports will open the Reports window where data can be extracted, viewed, exported, and printed. *Please see the Reporting section (Chapter 7) of this manual.*

Status



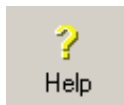
The Status button can be used to open the status view. If the status view is already visible, clicking this toolbar button will not do anything.

Sound



Selecting this toolbar button will turn on or off all audible conditions.

Help



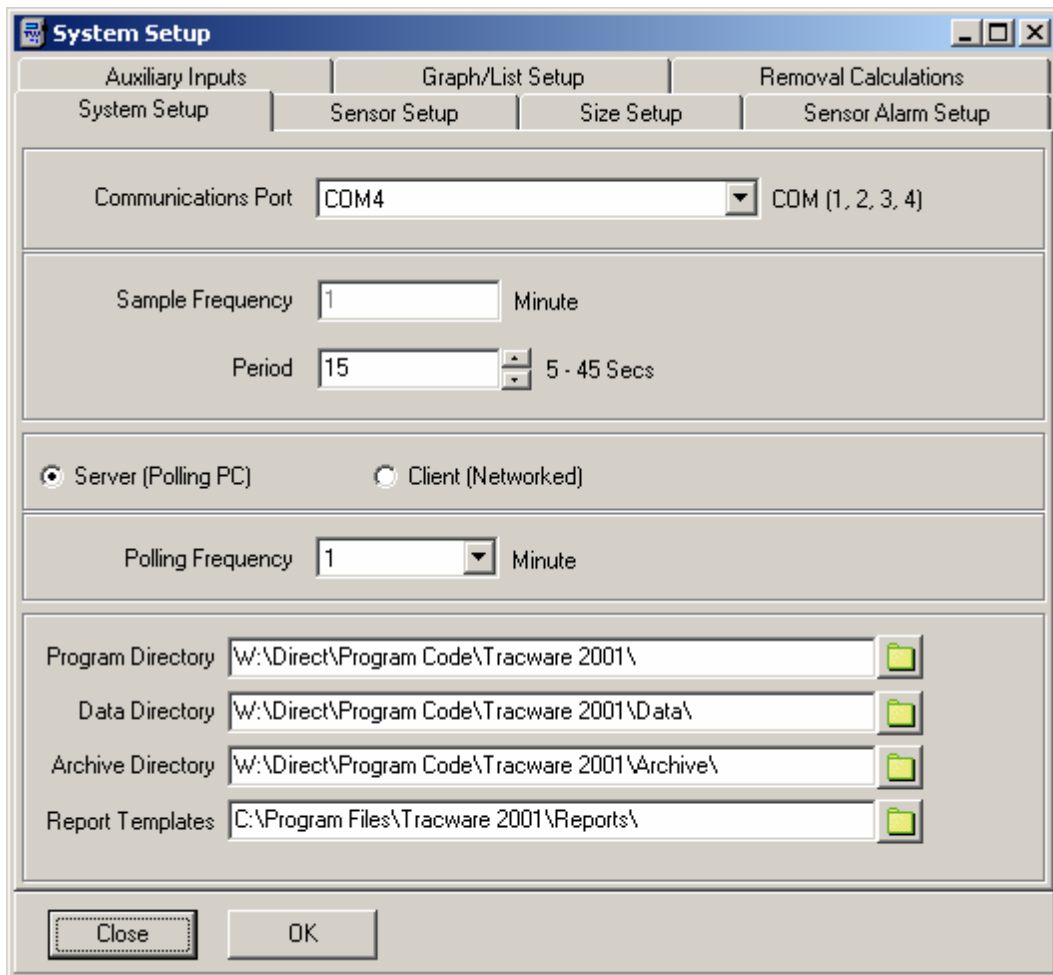
This button will open the about window, showing contact information and software version.

Chapter 3: Configuration

Chapter 3 describes how to setup the Tracware software using the Tracware configuration window.

3.1 System Setup

When the Configuration option is selected a window will open showing 7 tabs. The System Setup tab will always be selected and showing first.



Communications Port

The Tracware software requires at least one available serial port. Each serial port is referenced in the software by a com port number. The communications port number needs to be determined and manually selected by the user. The software will be able to communicate with the PC2400D Particle Counters until

the com port is set.

Sample Frequency

The Sample Frequency is a Particle Counter setting that determines how often a sample is taken. This setting is READ-ONLY in the software. This value is written to the PC2400D Particle Counter when the configuration window is closed.

Period

The Period Setting is a Particle Counter setting that determines how long a sample is taken. In this case, every minute a 5 to 45 second sample is taken. The default value is 15 seconds. This value is written to the PC2400D Particle Counter when the configuration window is closed.

Server/Client

This option gives the user the ability to determine whether to use the software for communication or just for monitoring. If Server(Polling PC) is selected the software will handle all communication and data collection. If Client(Networked) is selected the software can only be used to view data from a location selected in the Data Directory. This setup could be used in a network environment where one workstation is handling the communication, while another is used to view the data.

Polling Frequency

Polling Frequency is a software option for determining how often a reading is taken from the particle counter network. The default value is once a minute. This option is useful if a large number of particle counters are on the network, or if data does not need to be collected quite as often.

Directories

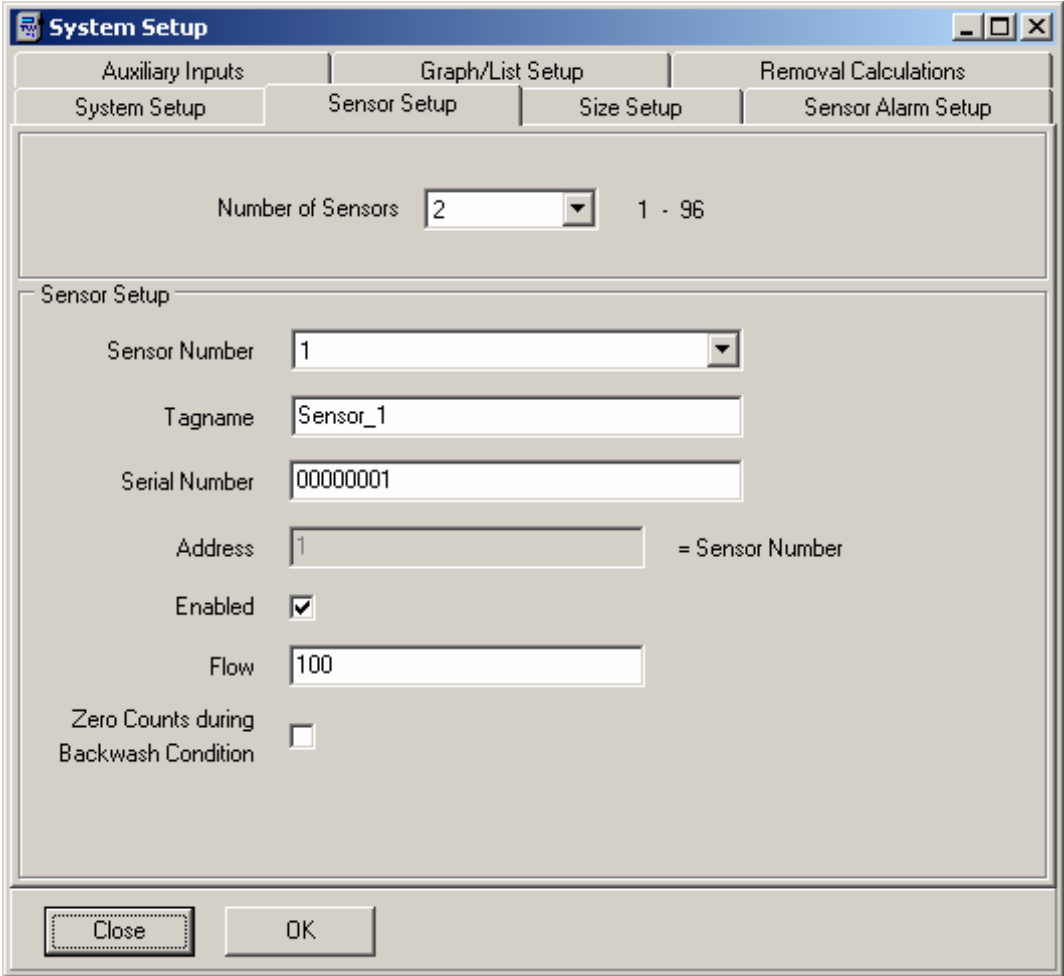
Program Directory – This is the location where the Tracware.exe file is located. This directory is used by the software as a reference point.

Data Directory – This directory is where all daily data files are stored. This data files are used by the software for current and historical reporting.

Archive Directory – This location is where all daily compressed files are stored. These files are created automatically at midnight or manually using the Archive Data feature.

Report Templates – This directory is where report template files are located.

3.2 Sensor Setup



Number of Sensors

This option is used for selecting the number of Sensors(Particle Counters) on the network. The default value is one.

Sensor Number

Once the number of sensors value is set the user can change value settings for each of the individual particle counters. Use the sensor number option to determine which sensor to work with. After selecting this value the other options will update.

Tagname

The tagname is a software value that is used to describe the selected particle counter. This value is used in other locations in the software, such as in the graph/list and the reporting.

Serial Number

This number can be used to store the serial number for a particular particle counter. This is a manually entered value.

Address

Every particle counter has an address associated with it. Each address should be unique. The address corresponds to the selected sensor number. This value is a read only value in the software. To change the address for a particular particle counter please see the TracComm section of this manual(Chapter 4).

Enabled

Check this box to enable the selected sensor. If the sensor is not enabled the software will not try to communicate with the particle counter at the start of each minute.

Flow

The flow value is a setting that is stored in each particle counter. The default value is 100. This value is used by the particle counter to calculate particle counts.

Zero Counts during Backwash

If a backwash condition occurs for a particular sensor the data will be tagged. During this time particle count data will spike or increase in number. These values will be included in reporting which may or may not be useful for the user. Zero counts during backwash is a feature that allows the user to place zeros in the data, instead of actual particle counts, to eliminate the spiking seen in reporting.

3.3 Size Setup

System Setup

Auxiliary Inputs | Graph/List Setup | Removal Calculations

System Setup | Sensor Setup | **Size Setup** | Sensor Alarm Setup

Size Configuration

Number of Size Ranges: 6

1. 2 4 4. 14 20 7. 100 9

2. 4 7 5. 20 25 8. 9 10

3. 7 14 6. 25 100

Composite Configuration

Number of Composite Size Ranges: 2

1. 4 25 2. 2 100 3. 4.

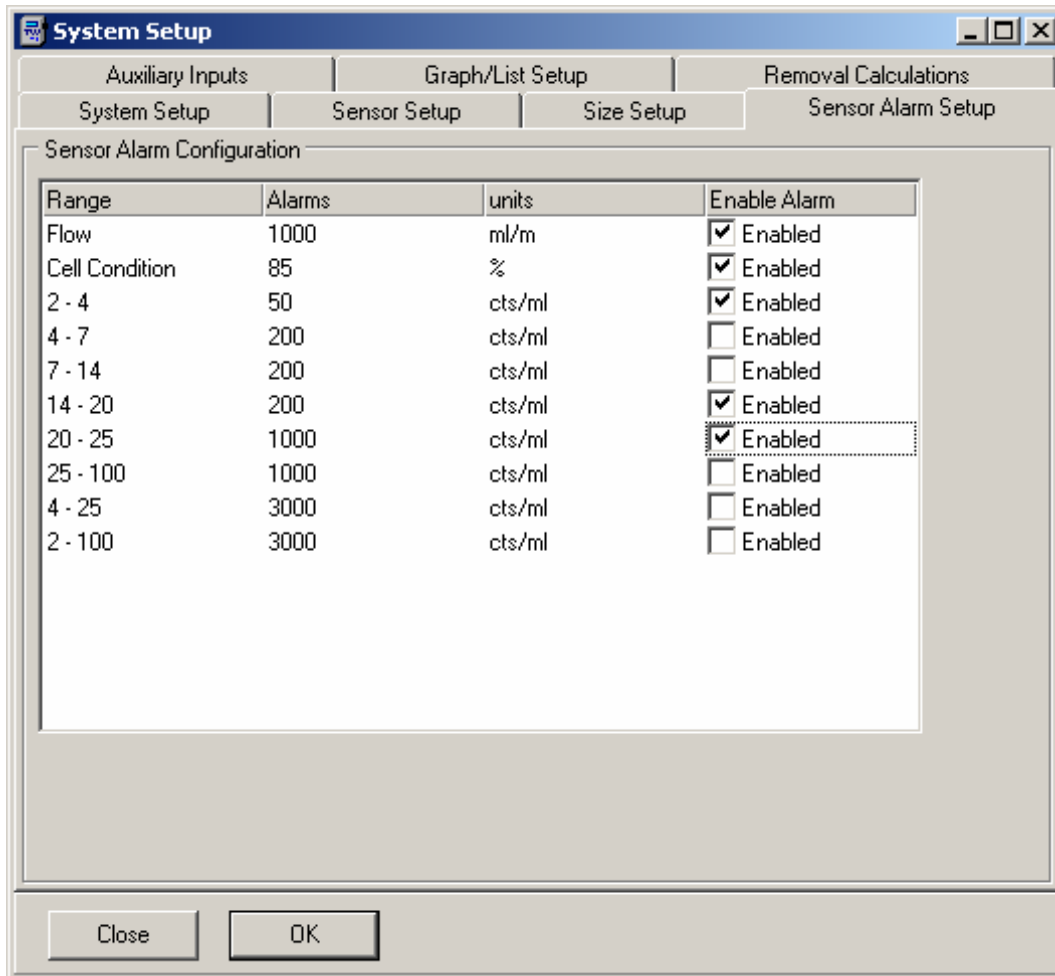
Close OK

Size Ranges

There are two types of size ranges configurable in the Tracware software. The actual size ranges configured under size configuration are the sizes that will be written to each particle counter. The composite size ranges are the sum of actual size ranges. Composite size ranges are calculate and used by the software only. These values are NOT written to the particle counter. The number of size ranges plus composite are limited to 8.

- 1) Select the actual number of size ranges.
- 2) Select sizes for each individual size range. The largest size is 400 micron.
- 3) Select the number of composite size ranges. The available number is determined by the number of actual size ranges. Actual + Comp can not be greater than 8.
- 4) Select the sizes for composite size ranges.
- 5) Click OK to exit the configuration window and store the size range values.

3.4 Sensor Alarm Setup



Sensor Alarm Configuration

Sensor alarms can be configured for flow, cell condition, and high counts. A low alarm value can be set for flow and cell condition, while high alarm values can be set for each individual size range. Each alarm can be enabled or disabled. To change these values select the number or check the enable box in the Sensor Alarm Configuration window.

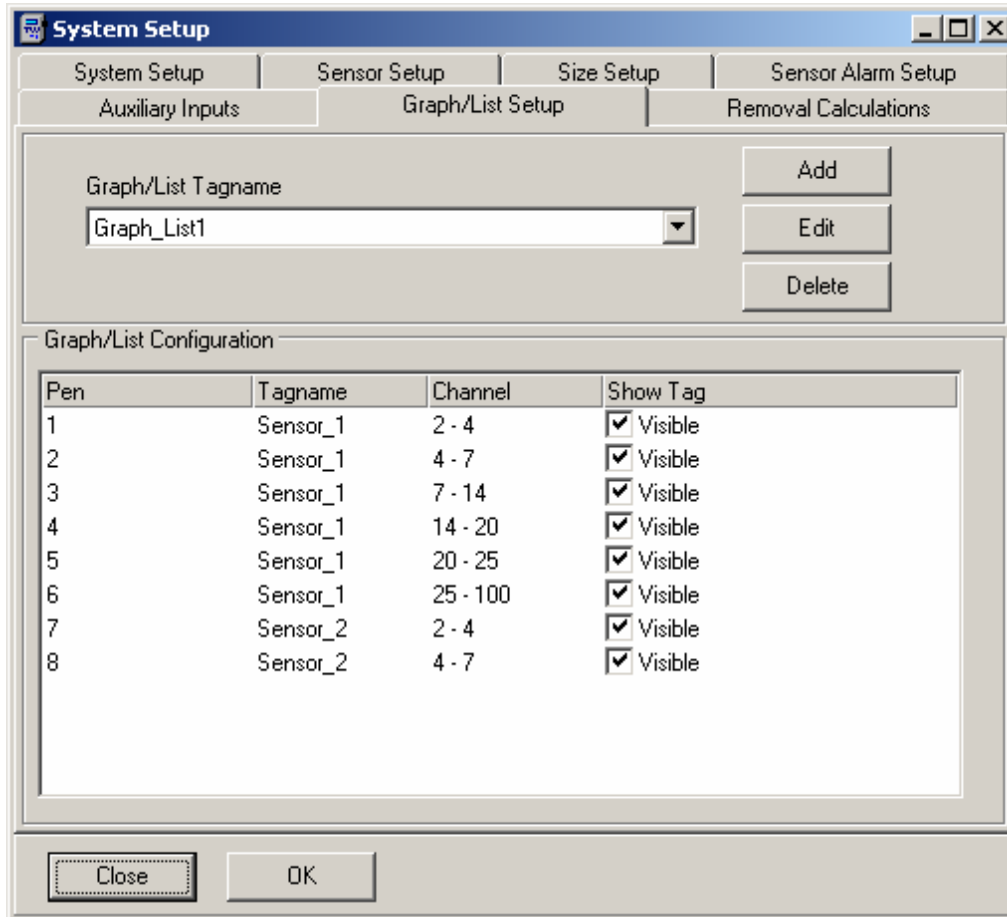
3.5 Auxiliary Inputs

The screenshot shows the 'System Setup' dialog box with the 'Auxiliary Inputs' tab selected. The dialog has a title bar with 'System Setup' and standard window controls. Below the title bar are four tabs: 'System Setup', 'Sensor Setup', 'Size Setup', and 'Sensor Alarm Setup'. The 'Auxiliary Inputs' tab is active, showing a configuration form for an auxiliary device. The form includes a 'Sensor' dropdown menu, an 'Auxiliary Input' spinner box set to '1' (with '1 - 4' to its right), a 'Tagname' text box containing 'Aux 1', a 'Units' text box containing 'mL', 'Max' and 'Min' text boxes containing '1000' and '0' respectively, an 'Enabled' checkbox which is checked, and 'High Alarm' and 'Low Alarm' text boxes containing '100' and '50' respectively, each with an 'Enabled' checkbox that is unchecked. At the bottom of the dialog are 'Close' and 'OK' buttons.

Auxiliary Inputs

Each particle counter can have up to four auxiliary devices connected to it. Each device can be configured separately using the Auxiliary Inputs configuration window. To configure a device, first select the associated sensor (particle counter) that is connected to the device. Second, select the device input location (1-4). Using the Tagname box create a description for the device. Enter a units value for the device. Determine and enter the Min and Max input values. Next, check the enabled box to enable the device with the software. Enter and enable high and low alarm values for the device. Click OK to save the values.

3.6 Graph/List Setup



Graph/List Setup

Each Graph/List window is tied to a Graph/List configuration that contains up to eight series of data. These data series can be particle counter size ranges, auxiliary inputs, or calculations.

When the Graph/List setup screen window is first opened a configuration is selected. The tagname can be found in the dropdown box near the top of the window. This tagname is associated with the selected items in the lower part of the window. Each item can be selected by clicking on the name itself (inside the white area under each column).

Clicking below the tagname, over one of the eight items, will open a dropdown box that can be used to select a sensor, an auxiliary input, or a calculation. If a sensor is selected the user can select a size value in the channel column. Show tag allows the user to select whether the item will be visible in the graph/list or not. Each configuration is automatically saved and applied once the configuration window is closed.

To Add a new configuration click the Add button. A new dialog box will open allowing the user to select a tagname for the item. To rename the tagname click the Edit button. To delete an item click the Delete button.

3.7 Removal Calculations

The screenshot shows the 'System Setup' dialog box with the 'Removal Calculations' tab selected. The 'Calculation Tagname' is 'Calc_1 (log)'. The 'Removal Calculation Setup' section is expanded, showing the following configuration:

Calculation No.	1
UpStream	Sensor_1
UpStream Channel	2 - 4
DownStream	Sensor_2
DownStream Channel	2 - 4
Calculation	Log Removal
Low Alarm	5
Enabled	<input checked="" type="checkbox"/>

Removal Calculations

The next item is the Removal Calculations. Removal calculations are either logarithmic or percentage calculations used to determine the amount of particles removed across a filter. A tagname and size range must be supplied for each calculation. It is helpful to name the tag so that it can easily be recognized throughout the software.

A calculation is always performed on the data collected from two sensors, one upstream and one downstream. The upstream sensor is usually the particle counter located at the beginning of the process or just before the filter. The downstream sensor is usually located after the sensor. These sensors and size ranges are selected from the Upstream and Downstream drop-down boxes. The type of calculation can be selected from the Calculation drop-down box. A low-alarm value and alarm enabled are provided as well. Each tag is stored automatically. Use the Add, Edit, and Delete buttons to change a tag configuration.

Chapter 4: Communication

Chapter 4 describes how to use the TracComm utility to verify the operation of the particle counters, set addresses, and modify other parameters.

4.1 TracComm Utility

This utility is a new addition to this version of the software. It was added to assist in technical support issues and to verify communication with individual particle counters. Using this utility the user can change particle counter settings, find any available sensors on the network, view current particle counts, view auxiliary values, and change certain particle counter settings for testing.

The Traccomm program should be used to verify the particle counters are communicating properly, as well as for checking individual parameters. The particle counters are programmed with certain default values which are stored in non-volatile memory.

TracCOMM Utility

Address (1-255) **Polling Frequency** (3-300 secs)

Scan Found: 255, 2 **Com Port** (1-4)

Status

Particle Counts

2-4u	4-7u	7-14u	14-20u	20-25u	25-100u	100u -->	N/A
2422.1	5823	1233	60.18	25.45	14.9	0	0

Auxiliary Inputs

AuxInA	AuxInB	AuxInC	AuxInD	Alarms	Cell	Backwash	Flow
4.00	4.00	4.00	4.00	96%	Off	Off	On

Particle Counter Settings

Period	Freq	Noise	Flow	Address
15	60	150	100	1

- Change setting then press the Enter Key to write value to the Particle Counter -

When this window is opened, all data-logging and system communication is halted. This is required as the Traccomm utility needs to take control of all communication. Any setting changes are not saved after closing Traccomm, as this utility is only meant to be used for testing and support. Each particle counter

on the network will revert back to and use the settings found in the Tracware configuration portion of the software. It is important that the user be aware that this portion of the software should only stay open when begin used.

After opening the utility first make sure to select the proper com port. Enter 1, 2, 3, or 4 to select the port for the computer being used.

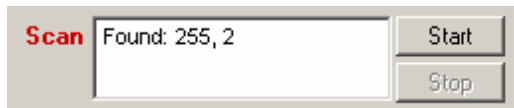
4.1.1 Scanning for Counters

The first step is to establish communications with the particle counter.

Click on the button marked **Start**. The computer will scan for the particle counter by searching through all the possible addresses for the unit, from 1 to 255. 255 is the default address for the particle counter. The address for the particle counter is displayed in the upper left-hand corner of the display on the front of the PC2400 D.



When the proper address is found, and communications is made with the unit, the display will change as shown below. In this example TracComm found two units at addresses 255 and address 2.



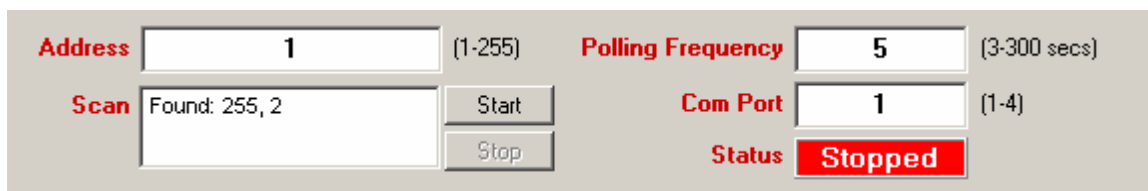
Scanning for addresses is not required to communicate with the particle counter units in this software. This feature is useful for determining which units are available.

One common problem is not finding all of the units on a network. One reason might be that two units are configured with the same address. If two units have the same address only one response will be received. It is important to make sure that every particle counter has a unique address. **Section 4.5** explains how to change counter settings using TracComm. As mentioned earlier changing settings will not be saved after Traccomm is closed. This is *not* the case when changing the particle counter address. As a matter of fact, this is the only setting that will be saved when changed using Traccomm.

4.1.2 Polling

To view data settings and parameters from a particular unit perform the following instructions.

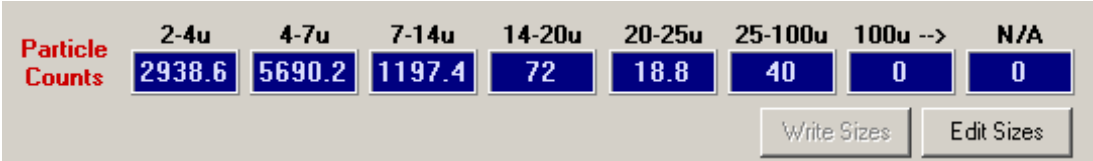
Set the proper **Address** of the unit to be polled in the box at the upper left of the screen. Click **Poll** at the bottom of the screen. Immediately Particle Counts, Auxiliary Input values, Alarms, and Particle Counter Settings values should appear on the screen. If values do not immediately appear, a problem exists with communication. Verify that the address and the com port are set correctly.



Address is the address of the particle counter. It should be set to match the address shown on the particle counter display.

Polling Frequency is a software setting. It is used when **Poll** is running to determine how often to communicate with the particle counter. This is not the same as the **Freq** displayed at the bottom of the window.

Status shows the current polling status. In the above screen view polling is *Stopped* or not currently running. *Polling* or *Sampling* will be shown when polling is enabled. When the manual button is clicked *Manual* will temporarily be visible in the **Status** box.



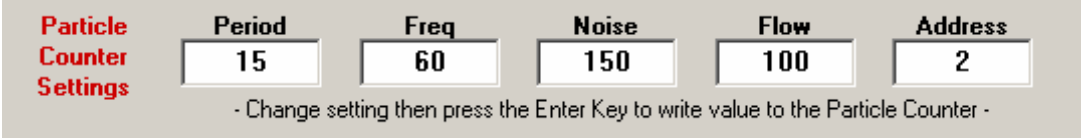
Particle Counts display the particle counts for the eight size channels. The size channels are displayed above each bin. Both the particle counts and size channels are values stored in the particle counter. These values are read from the unit during polling.



Aux's displays data from the other system parameters. AuxInX displays up to four analog input values from the four 4-20mA auxiliary inputs. These values are represented as values ranging from 4 to 20. If an auxiliary device is not connected the values are displayed as 4.00, as in the above example.

Cell is the voltage reading for the sensor cell condition. This percentage value is stored in the daily data file, and on the sensor display.

Status provides indication of various states of operation for the unit. **Backwash** is a logical value that shows when a backwash condition is currently active. This value is read from the unit. **Flow Alarm** is also a hardware condition to show when a flow alarm has been triggered.



Period is the **Sample Period** (in seconds) programmed into the unit. The period value determines how long the particle counter takes a sample. This value should never be longer than the **Freq** value.

Freq is the **Sample Frequency** (in seconds) programmed into the unit. This value is used by the particle counter to determine how often to take a sample.

Noise (default value of 180) is an internal value that is used for diagnostic purposes.

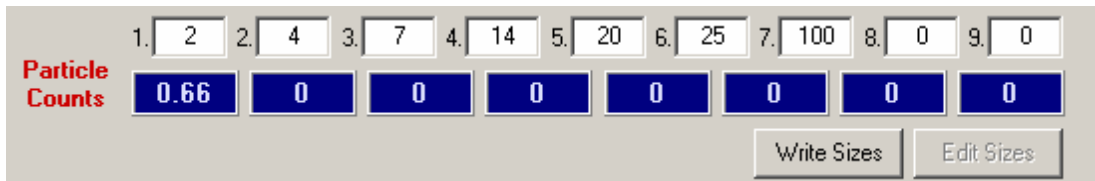
Flow is the flow read by the flow meters. With no flow meters attached, the default is 100.

Address should be the same as the address entered at the top of the screen.



The buttons on the bottom of the window are used for polling and closing the TracComm utility. As described above, the **Poll** button is used to start continuous polling of the selected particle counter. The **Stop** button will stop all polling or communication. **Manual** is used for one time communication. Each time the manual button is clicked the computer will read from the particle counter. The **Close** button will exit TracComm.

4.1.3 Changing Size Ranges



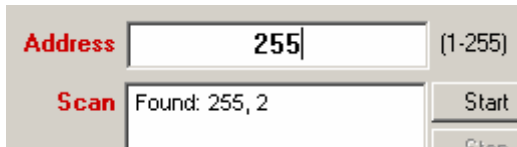
To change size channel values first click the **Edit Sizes** button. Nine edit boxes will appear above each particle count bin.

The particle counter supports eight particle size ranges. Channel one is set to the lowest size range, and the remaining channels filled in ascending order. The data is counted in ranges between the settings for each channel. In the above example, the first size range covers 2 to 4 microns, the second 4 to 7, then 7 to 14, etc.

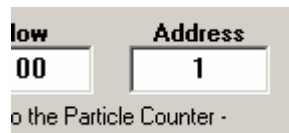
All eight ranges do not have to be used. A zero should be entered into all unused ranges. Do not skip any channels, but fill in all the desired channels starting with channel one. Click the **Write Sizes** button when finished. These values will be written to the particle counter.

4.1.4 Changing Counter Address

Sometimes a unit does not have the correct particle counter address. Use TracComm to change the particle counter address. First, enter the current value in the upper-left **Address** box. This is the current address value of the particle counter you want to change.



Next, enter the new value into lower-right **Address** box. This is the address value you want the particle counter to end up with. Hit the Enter key to write this new address to the unit.



The unit may take up to a minute to change addresses. The **Scan** routine can be run until the new address shows up, or the front panel can be observed. If the address does not change, repeat the steps above.

4.1.5 Changing Counter Settings

Along with the Particle Counter Address and Size Channels it is also possible to change some other particle settings.

Particle Counter Settings	Period	Freq	Noise	Flow
	15	60	150	100

- Change setting then press the Enter Key to write value to the Partic

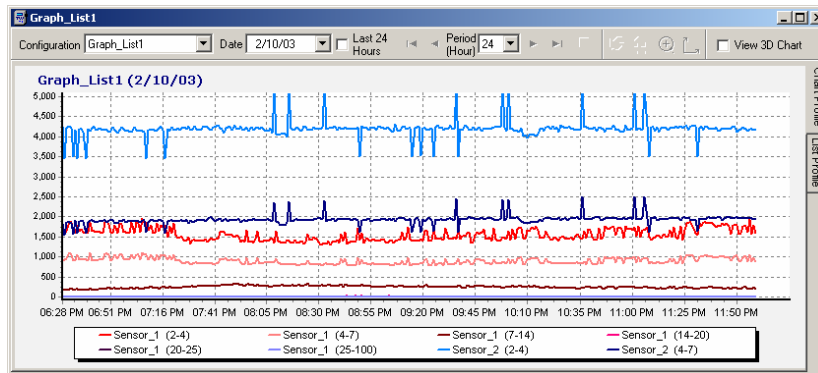
Period, Freq, Noise, Flow are all values that can be viewed and changed using TracComm. After clicking the **Poll** or **Manual** buttons, values will be read and displayed in the Particle Counter Settings section of the TracComm window. These values can be used for debugging problems with a particular particle counter.

Enter the edit box, change the value, and hit the Enter key to write the value. These values will only be used while in TracComm.

Chapter 5: Graph/List Window

Chapter 5 explains how to view, control, and extract data from a graph/list configuration in a graph/list window.

5.1 Graph View

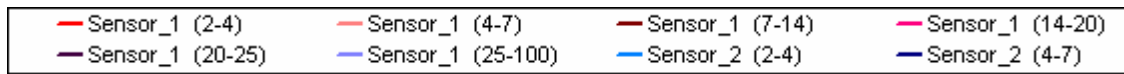


The Graph view provides display of eight trends. These values can be particle counts, removal calculations, or auxiliary inputs, in any combination. When a graph/list window is opened select the **Chart Profile** tab on the right side of the window to select Graph view.

A toolbar exists on each graph/list window. This toolbar is used to control which data is selected and how the data is viewed for the graph that is shown in the window.

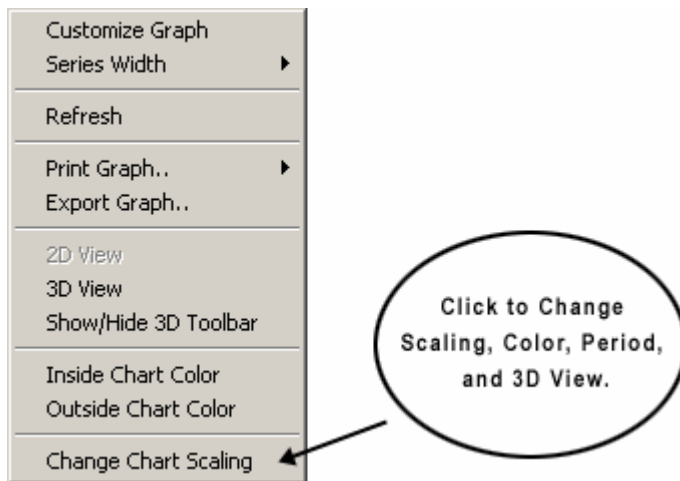


The graph legend is located below the graph. The legend shows the color, the tagname, and the channel for each series.

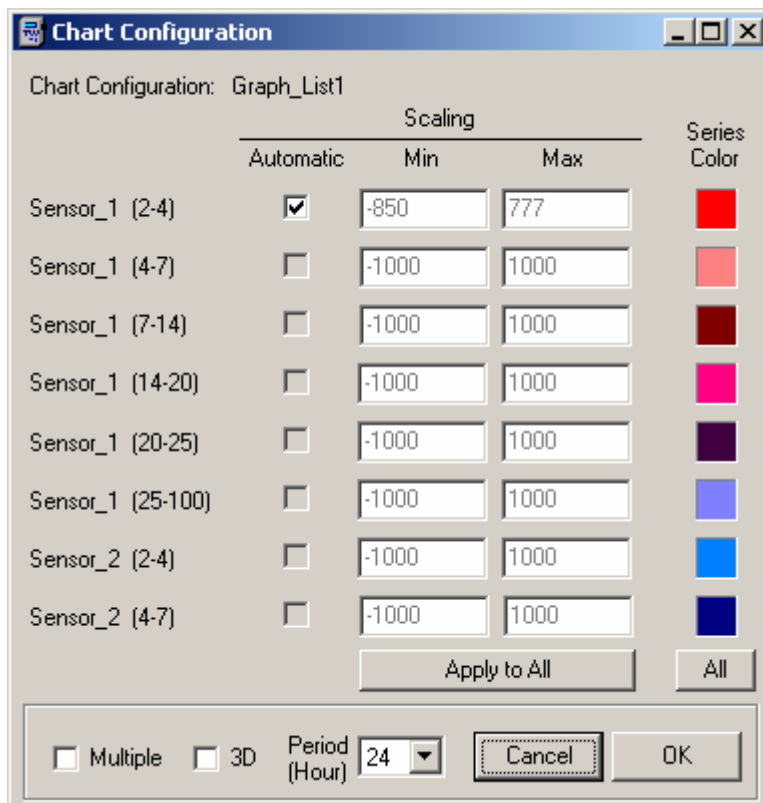


5.1.1 Axis Scaling

Right-click over the graph to open the chart popup menu. Select the **Change Chart Scaling** option to open the *Chart Configuration* window.

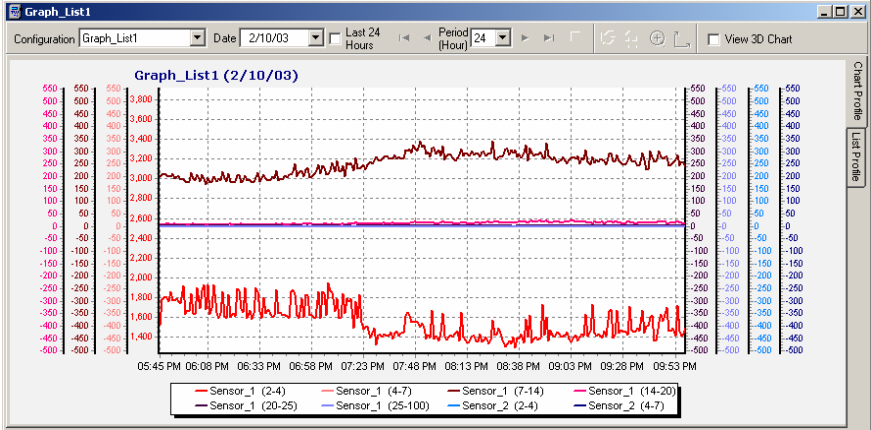


The *Chart Configuration* window gives the operator the option to change scaling, series color, multiple scaling, 3D/2D, and period(see below).

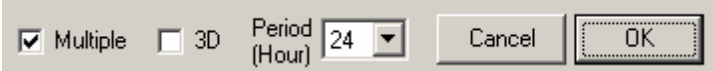


Scaling allows the user to select how each series is displayed. Customizing these values can help to give the user a better view of the data. Under the **Scaling** section there are three columns. Selecting the **Automatic** option will calculate the maximum and minimum values using the data in the associated trend.

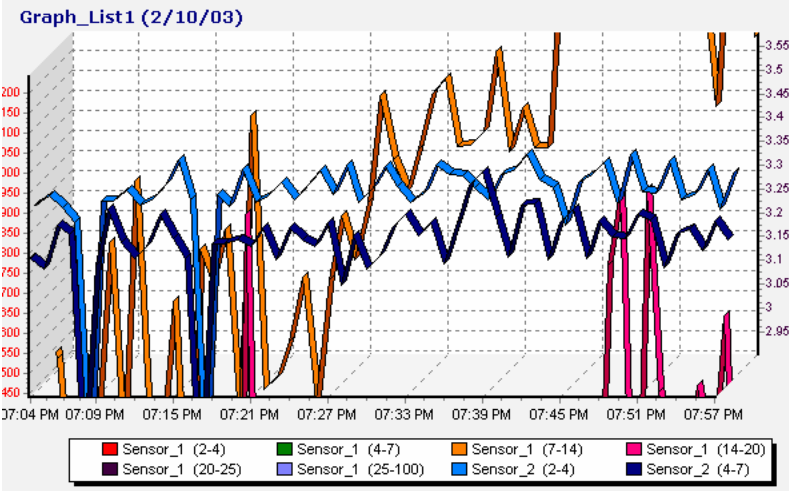
If **Multiple** is *not* selected, the automatic option is only enabled next to the first series. In this case, one scale will be used for all trends. The scale will use the selection from this first tag to determine how the graph is scaled. If **Multiple** is selected, all scaling options are enabled. This will allow each tag to be scaled differently. When multiple is selected, up to eight scales will be visible on the graph after the *Chart Configuration* window is closed (see below).



Use the Min and Max settings to enter static values for the minimum and maximum scales.



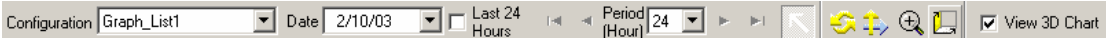
On the bottom portion of the *Chart Configuration* window is an option for showing the chart as 2D versus 3D. Check this box to show the chart in 3D (see below). This option can also be selected from the toolbar.



The **Period/Hour** option is used to show the span in hours on the horizontal axis. For instance, if 2 hours is selected the entire graph space will only show values in a 2 hour time range. This value can also be changed from the Graph toolbar.

Any of the *Chart Configuration* settings will be saved for the selected Chart Configuration.

5.2 Graph Toolbar



The Graph Toolbar gives the operator the ability to immediately change graph configurations, date ranges, and graph views.

5.2.1 Configuration

The first item on the toolbar is the **Configuration** drop-down box. This option allows the user to select a graph tagname that was configured in the setup portion of the software. After selecting the configuration, the chart will update using the tags found in the chart setup.

5.2.2 Historical Date Selection

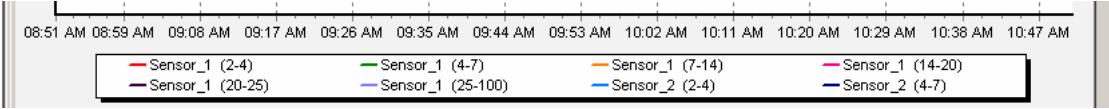
The next item is the **Date** selection box. This drop-down calendar allows the user to select a calendar date. After selecting the date, the chart will update showing the data, if it exists, for the selected day. If data does not exist for the day the chart will not update. The data range for the chart will span the entire day from 12:00 AM to 11:59 PM. Please note that the current viewable data is limited to the **Period(Hour)** selection which is explained below.

5.2.3 Last 24 Hours

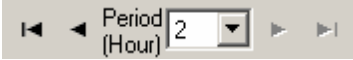
The **Last 24 Hours** checkbox allows the user to always view the last 24 hours of data. Selecting this option will disable the **Date** selection. This option is useful as current data is available to be viewed in the chart. If Last 24 Hours was not selected, at midnight the date would change only showing data for that day.

5.2.4 Graph Navigation

The **Period(Hour)** selection box allows the user to select an hour value that corresponds with the chart horizontal axis. For example, if two is selected for the period(hour) and the last 24 hours box was checked the span would range from the previous 2 hours to the current time (see below).



The four navigation arrows are used to scroll back and forth on the chart. The first button, the arrow pointing left with the vertical line, will move to the beginning, showing data for the currently selected day. The range on the horizontal axis will correspond to the selected **Period(Hour)**. The next arrow, the one pointing left, will move one period at a time and show the corresponding data for the selected period. When the beginning is reached, both arrows pointing left will be disabled.



The next two arrows, the ones to the right of Period(Hour), are used in the same way. Clicking the last arrow, the arrow pointing right with the vertical line, will move to the end, showing data over the currently selected period for the currently selected day. The arrow pointing right with no vertical line will

move the chart data one period at time until the end is reached. These arrows are also disabled when the end of the chart is showing.

5.2.5 3D vs. 2D

Click the **View 3D Chart** to show the chart as 3D. The series, background of the chart, and the legend will all change in some way to show the chart as 3-Dimensional. Uncheck the View 3D Chart box to show the chart as 2D (flat).



Use the other five buttons to the left of **View 3D Chart** to change the 3D appearance. These buttons are disabled if View 3D is unchecked.

The arrow button is used to zoom in on the chart or move the chart. This will change the appearance of the 3D chart, but will allow the user to change the data is viewed. This is default 3D button.

The next button, the two swirling arrows, when selected will allow the user to spin and flip the entire graph. This option is useful if it is difficult to see the data in each series.

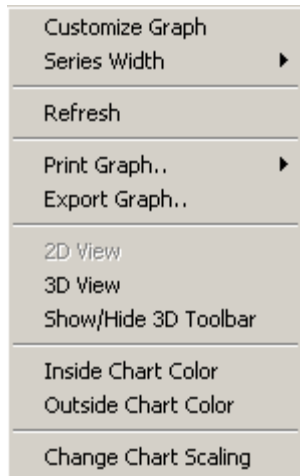
The two crossing arrows will move the chart up or down.

The magnifying glass button will zoom in or out on the entire graph. Do not use this for zooming in on data series. This option will zoom in or out on everything, including the background.

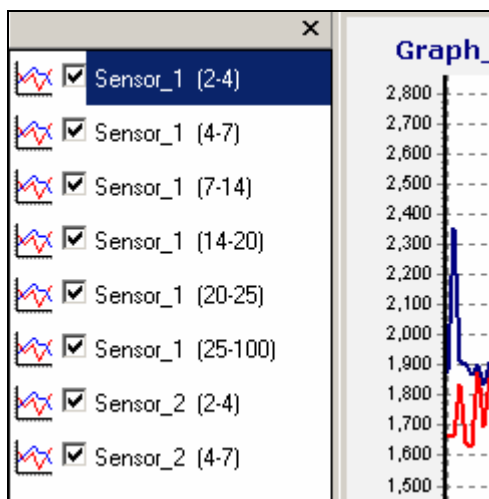
The last button, small chart with arrows, can be used to increase or decrease the depth of the chart.

5.3 Drop-Down Menu

Right-clicking over the graph will open a pop-up window.

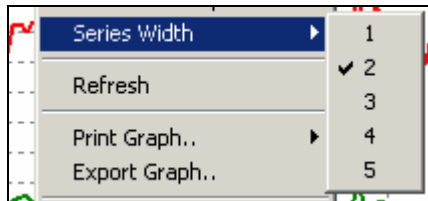


The first option is **Customize Graph**. Use this option to open a sidebar view on the left side of the graph.



The user can use this view to hide a series on the graph. Uncheck or check next to desired tagname to hide/unhide the corresponding series. Click the X button to hide this view.

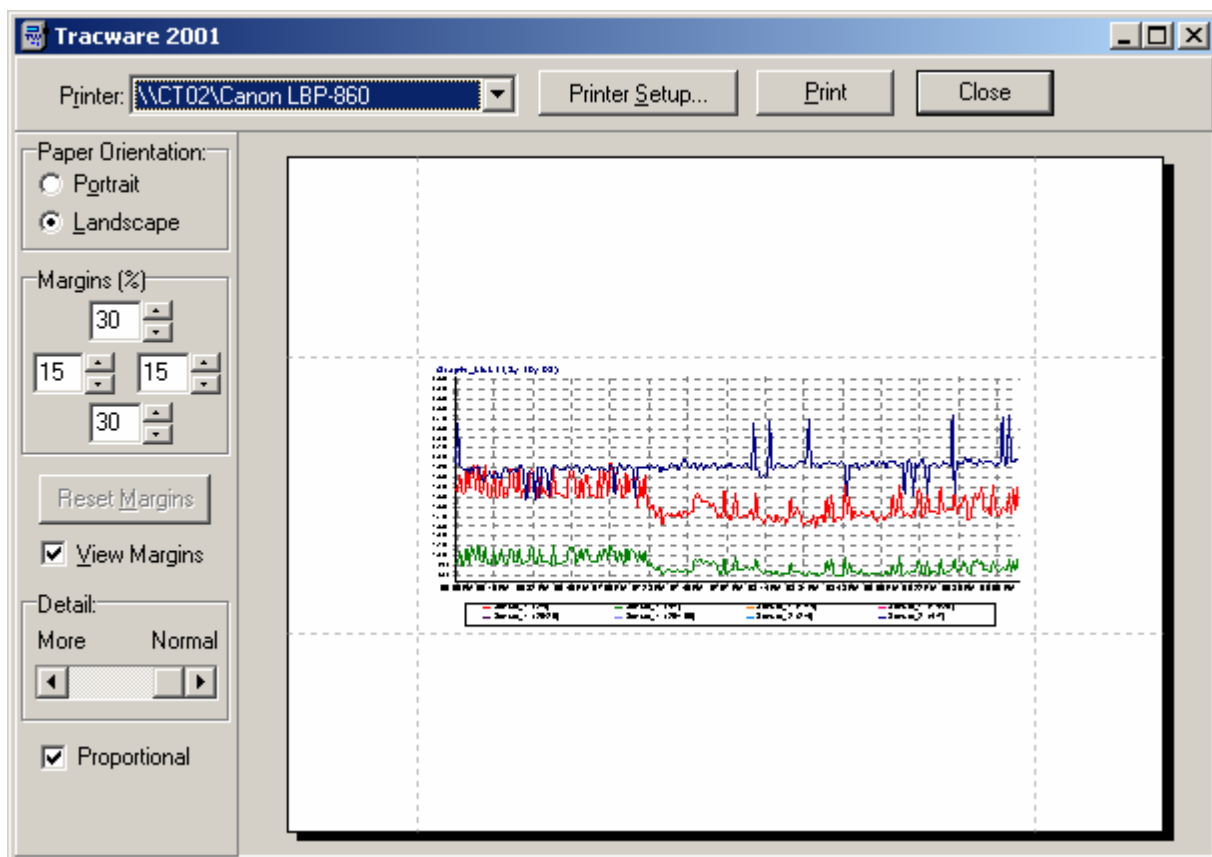
The next option on the menu is **Series Width**. Use Series Width to change the width of the series line. There are five widths available for this option. A series width value of one(1) is very narrow and sometimes difficult to see, while a value of five(5) is very broad and can cause overlapping problems. The default value is two(2).



Select the **Refresh** menu item to redraw the graph using the current time, configuration, and period.



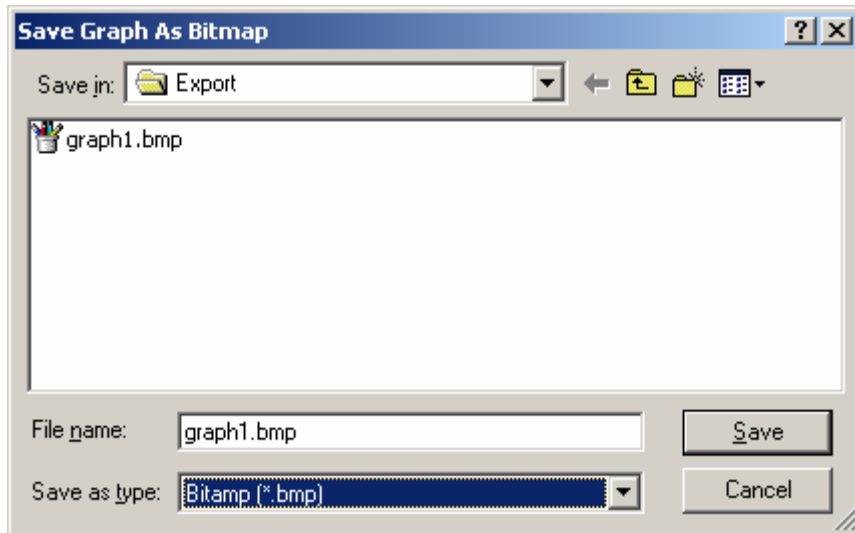
Use **Print Graph** to print the graph to hardcopy. Select **Print Color Graph** to print to a color printer and **Print B&W Graph** to print to a black and white printer.



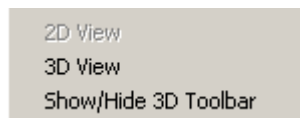
A new printer dialog window will open showing a print preview of the graph. Use this box to select print layout of graph. Select **Print** to print to selected printer.

The next menu option is **Export Graph**. This option will allow the user to export the graph image as a bitmap, metafile, or enhanced metafile graphic type. A dialog window will open giving the user the

option to name a graphic file as well as select the format type. Clicking the Save button will save the file to disk. The default directory location is *.\Program Files\Tracware 2001\Export*.

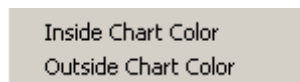


The next few menu options relate to how the chart is viewed. There are three options for viewing a 2D chart or a 3D chart. If the current view is 2D, the menu option for **2D View** is disabled and the menu option for **3D View** is enabled. Select the option that is enabled to change the view from one option to another.



Select **Show/Hide 3D Toolbar** to hide or show the 3D toolbar options. This option is useful if screen resolution is low.

The next two options control the background colors for the graph window and chart. Select **Inside Chart Color** to change the chart background color. Select **Outside Chart Color** to change the background color outside of the chart in the current window.



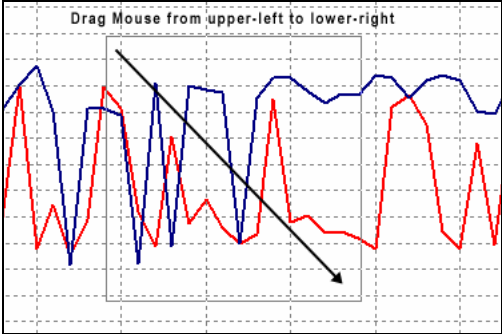
A color dialog window will open after selecting either of these options (see below). Select a color and click the OK button to change the color.



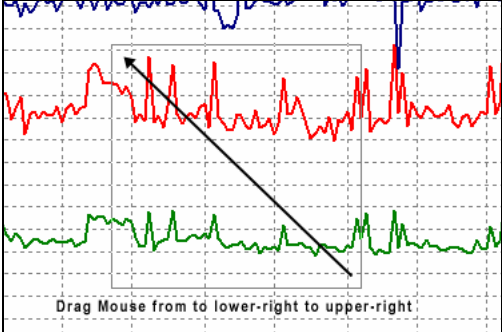
The last option is **Change Chart Scaling**. Please see section 5.1.1 to learn how to use this feature.

5.4 Zooming

Zooming in on a series(s) is as easy as dragging the mouse over an area on the chart. Move the mouse over the chart to zoom in on an area. Left-click and drag over the area from the upper-left to the lower-right. Release the left button to zoom in on the selected area. A light-gray box will appear as the mouse is dragged then released.



Zooming out requires dragging the mouse in the opposite direction as zooming in. Left-click and drag anywhere on the chart from the lower-right to the upper-left. The chart will zoom out to its original view.



5.5 List View

On the left side of the Graph/List window are two vertical tabs. To view the data that corresponds with the data on the chart, select **List Profile**.

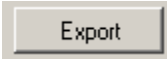
List Profile will open a new view showing a table of data values. The table has up to eight columns showing time and configuration tag. These tags represent the saved values found in the Graph/List Configuration. The visible data is extracted from the selected date or last 24 hours.

The most recent data is listed from the top down. If the current day is selected, the new values will be inserted at the top of the list.

Time	Sensor_1 (2-4)	Sensor_1 (4-7)	Sensor_1 (7-14)	Sensor_1 (14-20)	Sensor_1 (20-25)	Sensor_1 (25-100)	Sensor_2 (2-4)	Sensor_2 (4-7)
11:59 PM	1595.5	880.2	206.5	7.5	1	0	4196.4	1951.6
11:58 PM	1803.4	996	246.85	12.28	2	0	4164	1927.2
11:57 PM	1574.2	882.5	199.25	11	1.25	0	4177.2	1954.4
11:56 PM	1931.4	1056.5	208.85	12.28	2.57	0	4191.6	1958.4
11:55 PM	1631	893	194.25	11.25	0.75	0	4140.8	1953.6
11:54 PM	1775.7	1033.4	250.57	12	1.71	0	4176.8	1957.6
11:53 PM	1756.8	996.5	248	11.71	2	0	4223.2	1957.2
11:52 PM	1584.7	877	214.5	11	1.75	0	4184.8	1967.6
11:51 PM	1579.7	903.2	196.75	12.5	0.5	0	4164.4	1956.4
11:50 PM	1788.5	1040.2	226.57	12.85	1.71	0	4112.8	1987.6
11:49 PM	1786	1029.7	224.57	14.57	2	0	4235.6	1976.8
11:48 PM	1795.4	988.2	247.71	9.14	2	0	4253.2	1968.4
11:47 PM	1560.2	910	211.25	14.5	2	0	4201.6	1960
11:46 PM	1756	1016.2	228.85	12.85	1.71	0	4192.4	2005.6
11:45 PM	1843.4	996.5	216.28	12.57	0.85	0	4192.8	1976
11:44 PM	1803.1	1007.1	213.14	10.85	2.28	0	4197.2	1956.8

5.5.1 Exporting

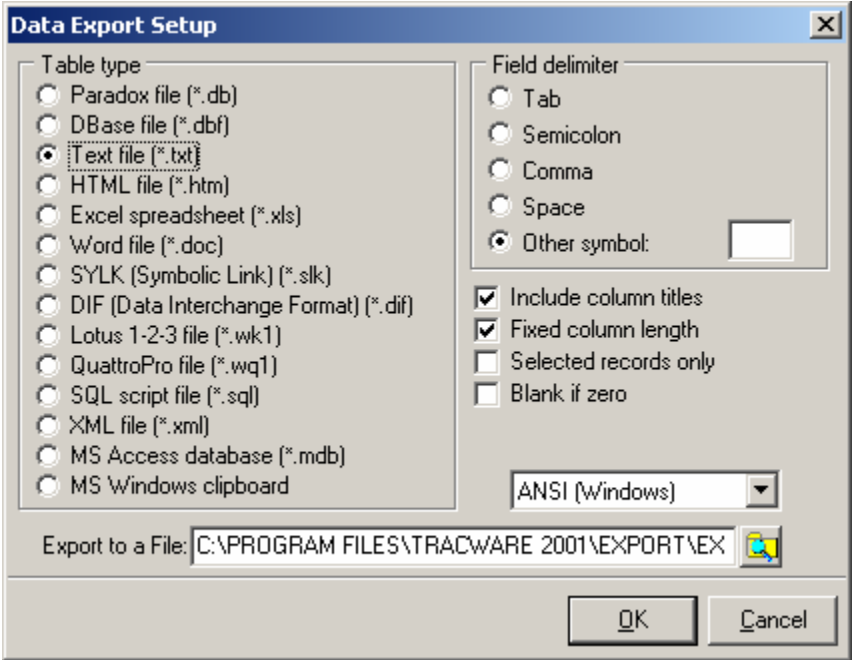
Click the **Export** button to open the export window.



The Data Export Setup window gives the user the ability to export to 17+ file types. To select and export the current table to a file, first select the Table (file) type. If Text file (*.txt) is selected, the user has the option to select Tab, Semicolon, Comma, and Space as a field delimiter. A field delimiter places the selected character between each column of data in the final output file. A custom symbol can also be selected by clicking Other symbol and entering a character in the edit box.

Select **Include column titles** to include each column title with the output. Select **Fixed column length** to force every column of data to be the same length. Select **Blank if zero** to exclude any data that is equal to zero from being included in the output file. **Selected records only** is not applicable with this software as it is only possible to select one record. This checkbox should always be left unchecked. Leave the drop-down box selected as ANSI (Windows) for windows export or ASCII (MS-Dos) for MS-Dos applications.

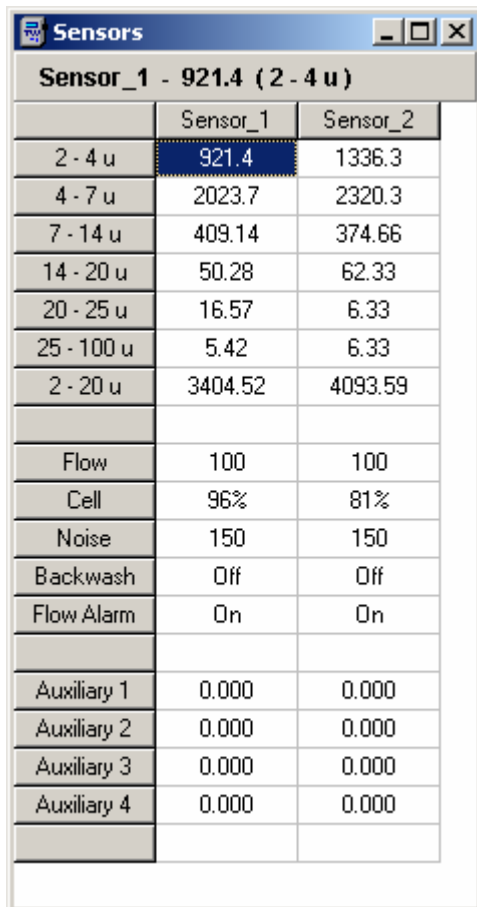
Finally, select a location for saving the export file then click the OK button. Click Cancel to close the window without exporting.




During export a progress window will open showing the export progress. This window sometimes opens and closes very fast if the export time is short.

Chapter 6: Sensor Screen

Chapter 6 describes how to use the Sensor Screen to view current minute data and status information for each Particle Counter.



Sensor_1 - 921.4 (2 - 4 u)		
	Sensor_1	Sensor_2
2 - 4 u	921.4	1336.3
4 - 7 u	2023.7	2320.3
7 - 14 u	409.14	374.66
14 - 20 u	50.28	62.33
20 - 25 u	16.57	6.33
25 - 100 u	5.42	6.33
2 - 20 u	3404.52	4093.59
Flow	100	100
Cell	96%	81%
Noise	150	150
Backwash	Off	Off
Flow Alarm	On	On
Auxiliary 1	0.000	0.000
Auxiliary 2	0.000	0.000
Auxiliary 3	0.000	0.000
Auxiliary 4	0.000	0.000

Open the Sensor Status window using the toolbar button , or click Edit..Sensor from the menu bar. The Sensor Status window will open with a table showing all of the currently configured Particle Counters.

Under each column is a list of data showing particle counts, flow rate, cell condition, noise level, backwash condition, flow alarm, and auxiliary input values. The row labels on the far right of the window show all of the currently configured size ranges, labels for status conditions, and Auxiliary 1 thru 4. These values are updated every minute when new values are available.

The **Particle Count Values** are the number of particles per ml for each of the selected size ranges. They are updated each minute on the minute.

Flow is used to indicate the status of the sample flow through the particle counter.

Cell is the condition of the flow cell window of the particle sensor. 99% indicates a very clean cell. A drop in this value indicates that the cell is getting dirty.

Backwash indicates the particle counter is in backwash mode. During standard operation, backwash is enabled by a contact closure connected to the particle counter. This value indicates whether a backwash condition exists or not.

Flow Alarm indicates that a flow alarm exists. This is also a hardware input connected to the particle counter. A value of On or Off will be shown in this field.

At the bottom of the display are the **Auxiliary Input Values**. The current value is displayed.

In the top left corner of the status window is a description of the currently selected item. Click in a cell that contains a value and the status label will show the sensor tagname, the value, and the label.

Sensor_1 - 0 (2 - 4 u)

If a cell value next to one of Auxiliary items is selected, the status label will show the auxiliary device tagname and value.

Chapter 7: Reporting

Chapter 6 explains how to use the Tracware Reports window to extract data for analysis and reporting.

The screenshot shows the 'Reports' window with the 'Report Setup' tab selected. The 'Settings' section is expanded to show the following configuration:

Item	Value
Report	Filter #2 total
Report Title	Report Setup No. 1
Type	List
Output to..	Printer
Period	5 minutes
Start Date	2/10/03
Start Time	1:03:35 PM
End Date	2/12/03
End Time	1:03:35 PM
Include Chart/List	<input type="checkbox"/> Include
Daily Report	<input type="checkbox"/> Enabled
Daily Time	12:00:00 AM
Exclude Backwash	<input checked="" type="checkbox"/> Exclude

The 'Preview' tab is active, displaying a table titled 'Report Setup No. 1' with the following data:

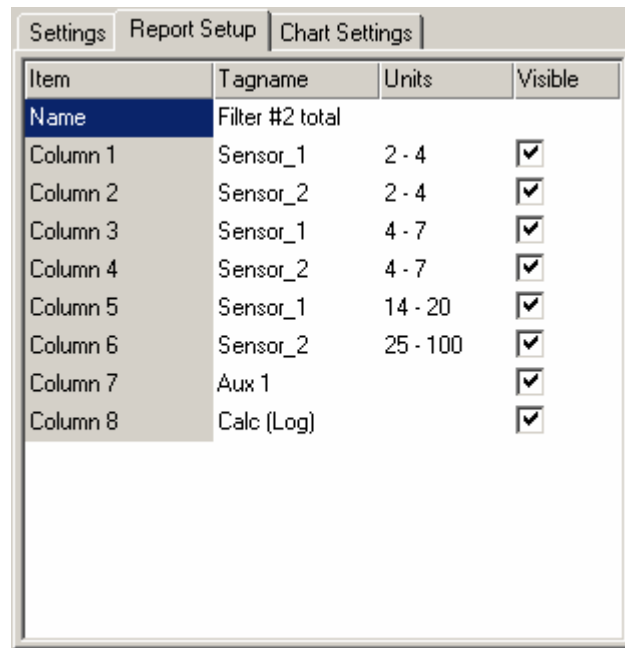
Date	Time	Sensor_1 (4-7)	Se
02/10/2003	01:05 PM	1,682.40 ^{BW}	1,
02/10/2003	01:10 PM	1,672.80 ^{BW}	1,
02/10/2003	01:15 PM	2,133.50 ^{BW}	1,
02/10/2003	01:20 PM	1,715.60 ^{BW}	1,
02/10/2003	01:25 PM	1,685.20 ^{BW}	1,
02/10/2003	01:30 PM	1,708.00 ^{BW}	1,
02/10/2003	01:35 PM	1,717.60 ^{BW}	1,
02/10/2003	01:40 PM	0.00 ^{BW}	
02/10/2003	01:45 PM	0.00 ^{BW}	
02/10/2003	01:50 PM	0.00 ^{BW}	

At the bottom of the window, there are four buttons: 'Create Report', 'Save Report Setup', 'Add Setup', and 'Delete Setup'.

Click the Report toolbar button , or click Edit..Reports on the menu bar to open the Reports window.

7.1 Report Configuration

To create a report configuration, or a list of data items that will be visible in the report, select the **Report Setup** tab (see figure 1). The Report Setup tab is on the left side of the window next to the Settings tab. When the Report Setup tab is selected the Quick Reports view under the Quick Report tab will change. The icons shown in this view will represent all of the currently configured Report Configurations (see figure 2). When a Report Configuration icon is selected, the Report Setup items will update showing the saved configuration values.



Item	Tagname	Units	Visible
Name	Filter #2 total		
Column 1	Sensor_1	2 - 4	<input checked="" type="checkbox"/>
Column 2	Sensor_2	2 - 4	<input checked="" type="checkbox"/>
Column 3	Sensor_1	4 - 7	<input checked="" type="checkbox"/>
Column 4	Sensor_2	4 - 7	<input checked="" type="checkbox"/>
Column 5	Sensor_1	14 - 20	<input checked="" type="checkbox"/>
Column 6	Sensor_2	25 - 100	<input checked="" type="checkbox"/>
Column 7	Aux 1		<input checked="" type="checkbox"/>
Column 8	Calc (Log)		<input checked="" type="checkbox"/>

FIGURE 1 – Report Configuration Selection

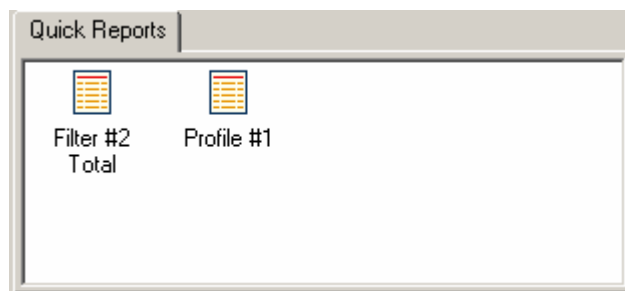
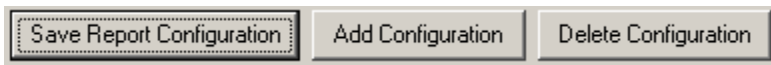


FIGURE 2 – Quick Report Configuration List

There are three buttons on the bottom of the report window that will also appear when the Report Setup tab is selected. The first button is **Save Report Configuration**. After making changes in the Report Setup view, click this button to save new values.



The next button is the **Add Configuration** button. When the user clicks this button, a new icon will appear under the Quick Report view. The new icon will be selected and default configuration values will appear under the Report Setup view.

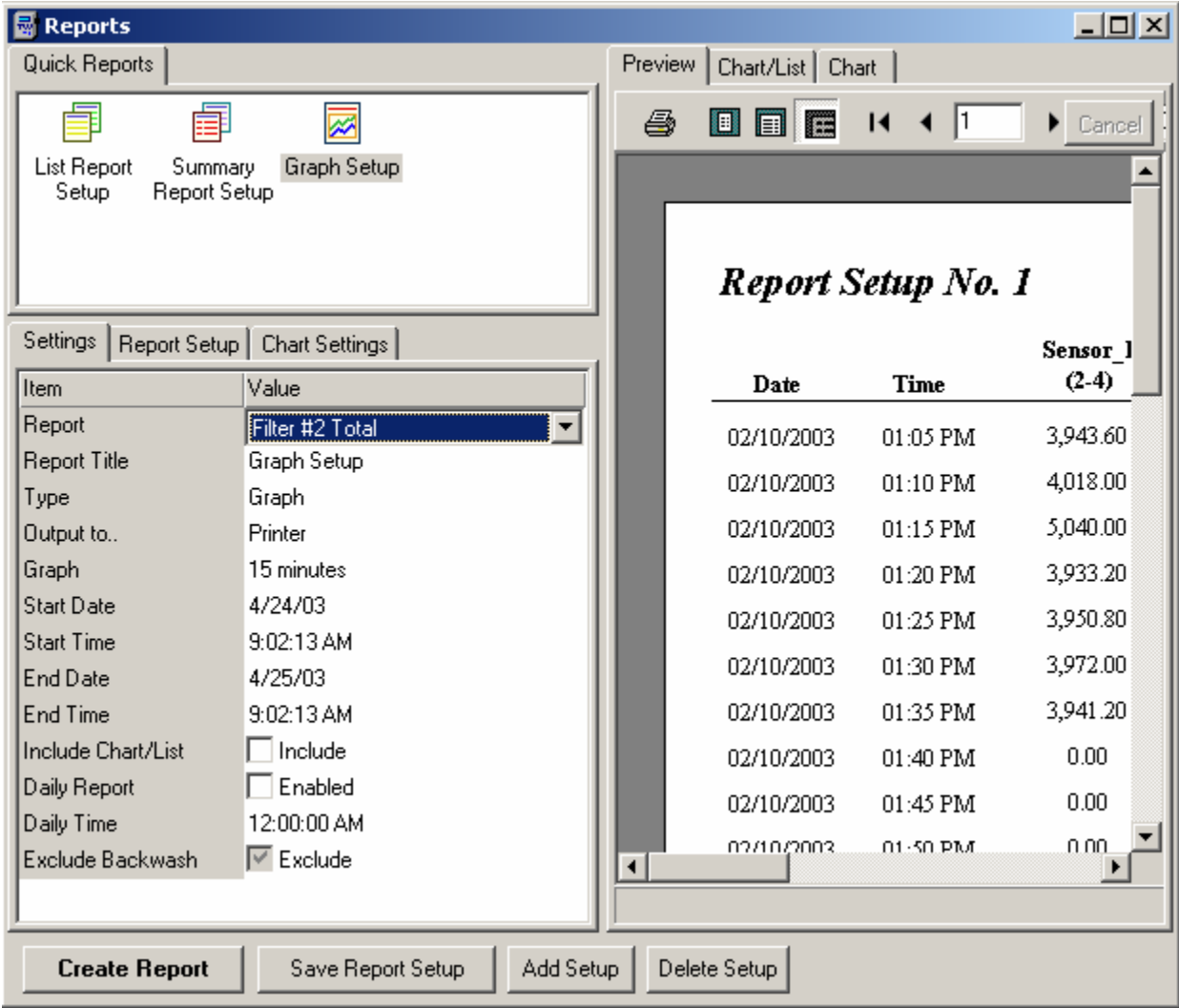
The last button is the **Delete Configuration** button. Click this button to delete the currently selected Report Configuration. The icon will disappear when Yes is selected in the confirmation dialog box.

There are nine(9) rows in the Report Setup view. The first row is the configuration name. This name is used under the Settings view selections. This name should be a descriptive name to represent the selected configuration items. The next eight(8) rows represent the columns of data in the report.

Change each value by clicking on the currently selected item. Click under Tagname to select a sensor name, an auxiliary input, or a calculation. If a particle counter was selected, click under the units column to select a size range. Click the visible checkbox to include the item in the report. Make sure to click **Save Report Configuration** to save the setup.

7.2 Settings

Click the **Settings** tab to display the settings for a report setup. The Quick Reports view will change when the Settings tab is selected. One or more icons will appear showing one of three setup types.



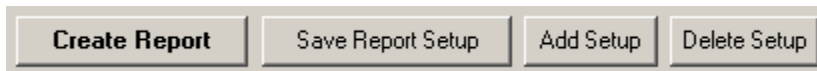
Four new buttons will also be visible on the bottom of the window.

The **Create Report** button will generate a preview or export file using the current settings found in the selected report setup. See sections 7.3, 7.4, and 7.5 for a more specific description of how this button is used.

Click the **Add Setup** button to add a new report setup. An icon will appear under the Quick Reports view. Default settings for this setup will also appear under the Settings view.

Click the **Delete Setup** button to delete the currently selected setup.

The **Save Report Setup** button will save the current settings for the setup. Click this button after making any setting changes.



The first item under the Settings tab view is **Report**. Click on the item under the Value column to open the drop-down box. Select one of the available report configurations. A configuration is defined and setup from the Report Setup. See section 7.1 for a detailed description on how to setup a report configuration. The items assigned to the selected configuration will be used to create the report.

Item	Value
Report	Filter #2 Total
Report Title	Graph Setup
Type	Graph
Output to..	Printer
Graph	15 minutes
Start Date	4/24/03
Start Time	9:02:13 AM
End Date	4/25/03
End Time	9:02:13 AM
Include Chart/List	<input type="checkbox"/> Include
Daily Report	<input type="checkbox"/> Enabled
Daily Time	12:00:00 AM
Exclude Backwash	<input checked="" type="checkbox"/> Exclude


The next item is the **Report Title**. The Report Title is the heading displayed on the finished report. Click this item and enter a descriptive title for the report setup.

7.2.1 Report Types

There are three report types.

The first type is **List**. A list report shows actual values for the specified times. For instance, if a created report is showing data every five(5) minutes for a selected time period, the data that exists for each time will be displayed. See Figure 1 for an example of the list report.




When List is selected as a report type, the icon under Quick Reports will change. It will appear as a yellow paper overlapping a green paper. 

<i>Report Setup No. 1</i>									
Date	Time	Sensor_1 (2-4)	Sensor_2 (2-4)	Sensor_1 (4-7)	Sensor_2 (4-7)	Sensor_1 (14-20)	Sensor_2 (25-100)	Aux1	Calc (Log)
02/10/2003	01:05 PM	3,943.60 ^{SP}	4,232.80	1,682.40 ^{SP}	1,761.20	4.40 ^{SP}	0.00	0.00	-44.31
02/10/2003	01:10 PM	4,018.00 ^{SP}	4,233.60	1,672.80 ^{SP}	1,736.40	4.00 ^{SP}	0.00	0.00	-43.06
02/10/2003	01:15 PM	5,040.00 ^{SP}	4,279.60	2,133.50 ^{SP}	1,739.60	7.00 ^{SP}	0.00	0.00	-43.88
02/10/2003	01:20 PM	3,933.20 ^{SP}	4,320.00	1,715.60 ^{SP}	1,734.40	6.80 ^{SP}	0.00	0.00	-45.42
02/10/2003	01:25 PM	3,950.80 ^{SP}	4,288.80	1,685.20 ^{SP}	1,744.80	3.20 ^{SP}	0.00	0.00	-44.19
02/10/2003	01:30 PM	3,972.00 ^{SP}	4,285.20	1,708.00 ^{SP}	1,748.40	6.00 ^{SP}	0.00	0.00	-44.40
02/10/2003	01:35 PM	3,941.20 ^{SP}	4,270.00	1,717.60 ^{SP}	1,735.20	4.40 ^{SP}	0.00	0.00	-45.12
02/10/2003	01:40 PM	0.00 ^{SP}	0.00	0.00 ^{SP}	0.00	0.00 ^{SP}	0.00	0.00	0.00
02/10/2003	01:45 PM	0.00 ^{SP}	0.00	0.00 ^{SP}	0.00	0.00 ^{SP}	0.00	0.00	0.00

FIGURE 3 – List Report


The next report type is **Summary**. The summary report shows the minimum, average, and maximum values for each period. For example, if fifteen(15) minutes is selected for a summary report, the output would show the minimum, average, and maximum values over each fifteen(15) minute period over the entire time range of the report. See figure 4 to see an example of a summary report.

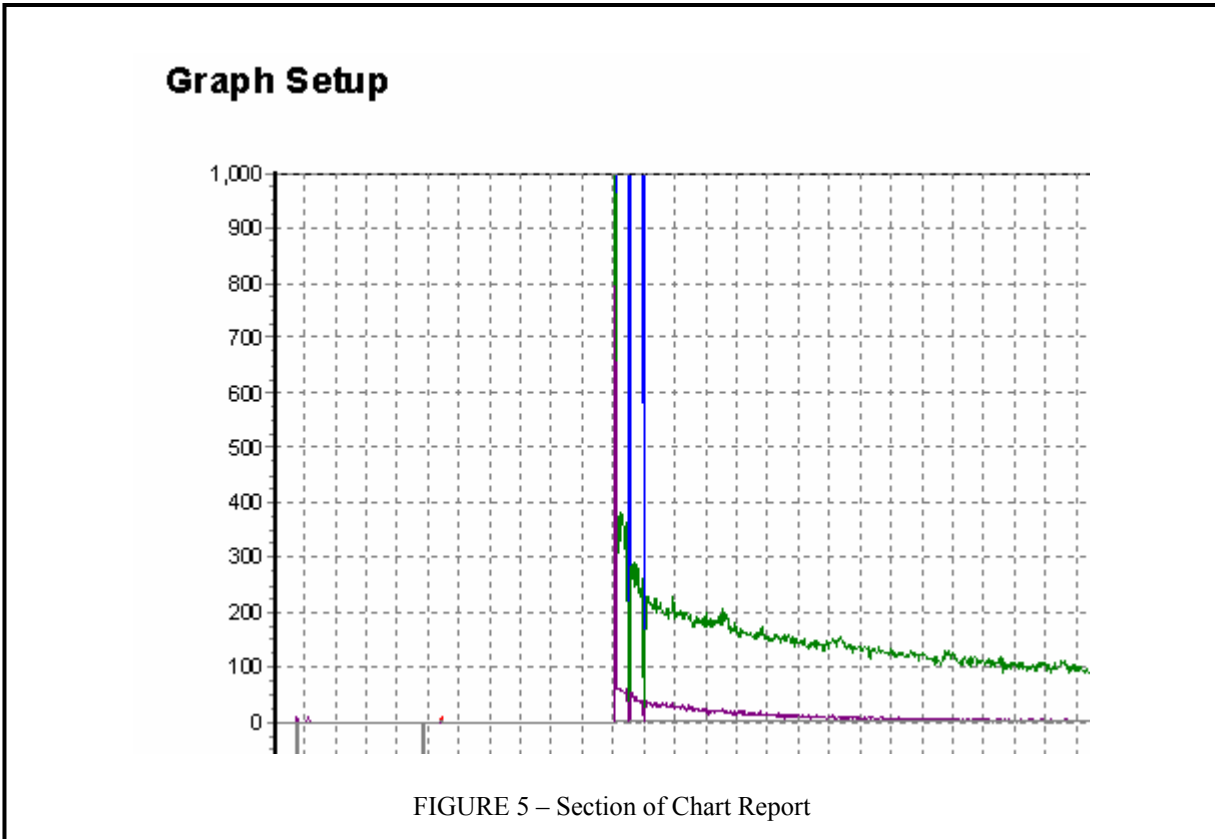
When Summary is selected as report type, the icon under Quick Reports will change. It will appear as a red paper overlapping a blue paper. 

<i>Summary Report</i>									
Date	Time	Sensor_1 (2-4)	Sensor_1 (4-7)	Sensor_1 (7-14)	Sensor_1 (14-20)	Sensor_1 (20-25)	Sensor_1 (25-100)	Sensor_1 (100-9)	Sensor_1 (9-10)
04/24/2003	05:00 PM								
Minimum:		771.70	1,650.00	275.50	26.25	7.75	0.75	0.00	0.00
Average:		800.08	1,682.87	289.00	31.47	9.90	1.90	0.00	0.00
Maximum:		833.50	1,708.50	300.75	36.25	12.50	3.75	0.00	0.00
04/24/2003	05:15 PM								
Minimum:		786.00	1,650.20	257.50	22.50	5.50	0.75	0.00	0.00
Average:		808.79	1,672.36	269.07	27.92	8.55	1.77	0.00	0.00
Maximum:		837.50	1,714.70	282.50	31.25	11.50	4.00	0.00	0.00
04/24/2003	05:30 PM								
Minimum:		777.00	1,650.00	240.50	22.00	3.75	0.50	0.00	0.00
Average:		798.32	1,671.77	258.95	25.50	7.48	1.32	0.00	0.00
Maximum:		817.70	1,702.00	272.50	33.00	11.75	3.00	0.00	0.00

FIGURE 4 – Summary Report

The last report type is **Graph**. The graph report type shows a graph under the chart tab after the **Create Report** button is clicked. The data is See section 7.5 for a further explanation of the Chart Report. See figure 5 to see an example of this report.

When Graph is selected as report type, the icon under Quick Reports will change. It will appear as a small chart inside a window. 

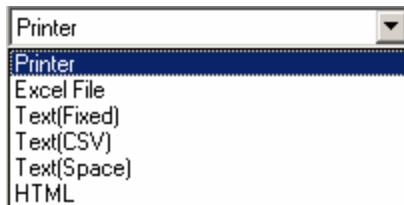


7.2.2 Output

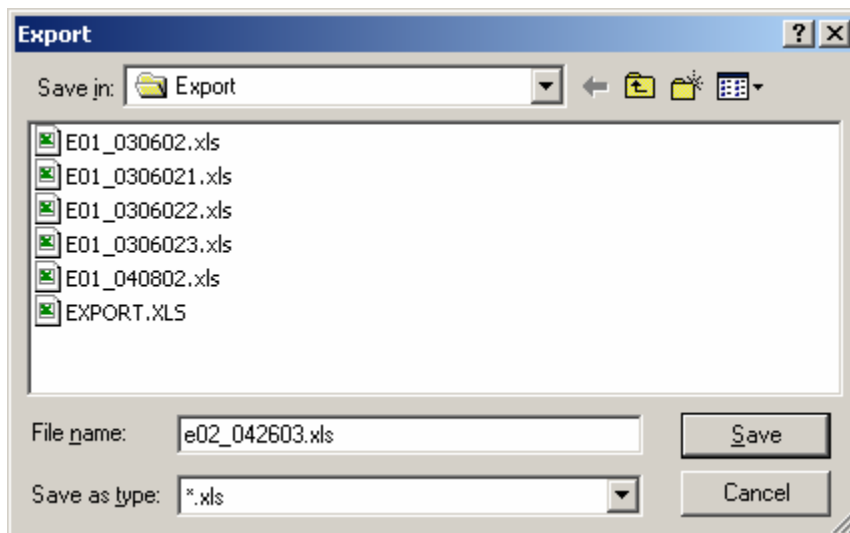
There are five output choices for a report.

The first choice is **Printer**. Select this option to create a report to preview. Once the report is created and is displayed in the preview pane, the report can be printed.

The next five choices are for exporting the report data to a file. Instead of sending the final output to a report, the extracted data will be sent to an output file.



After the report is created, a dialog window will open allowing the user to select a filename and location for the exported file. The default location for these files is in an export directory. The export folder is found under the main Tracware directory (c:\program files\tracware 2001\export).

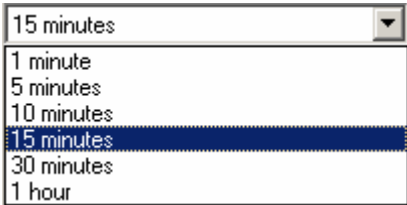


7.2.3 Period

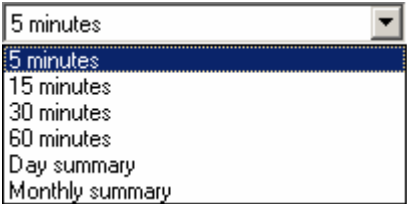
The **Period** setting may appear as **Period, Summary, or Graph**. The column label for a list type appears as Period. The column label for a summary type appears as Summary (see below). The column label for a graph type appears as graph.



The periods for a List type and Graph type appear below.



The summary periods for Summary type are listed below.



The Day summary shows minimum, average, and maximum values for each of the selected days. The Monthly summary shows minimum, average, and maximum values for the selected month. It only includes data for the selected days and times.

7.2.4 Date/Time

Use the next four settings to set the Start and End times for the report. Click on the dates to open a drop-down calendar. Click on the time to expose an up-down arrow. Use the arrows to change the time.

Start Date	3/02/03
Start Time	12:00:02 PM
End Date	3/05/03
End Time	5:00:02 PM

The times selected by these settings will be used for the report. Only the data between the beginning and ending times will be included in the report.

7.2.5 Daily Reports

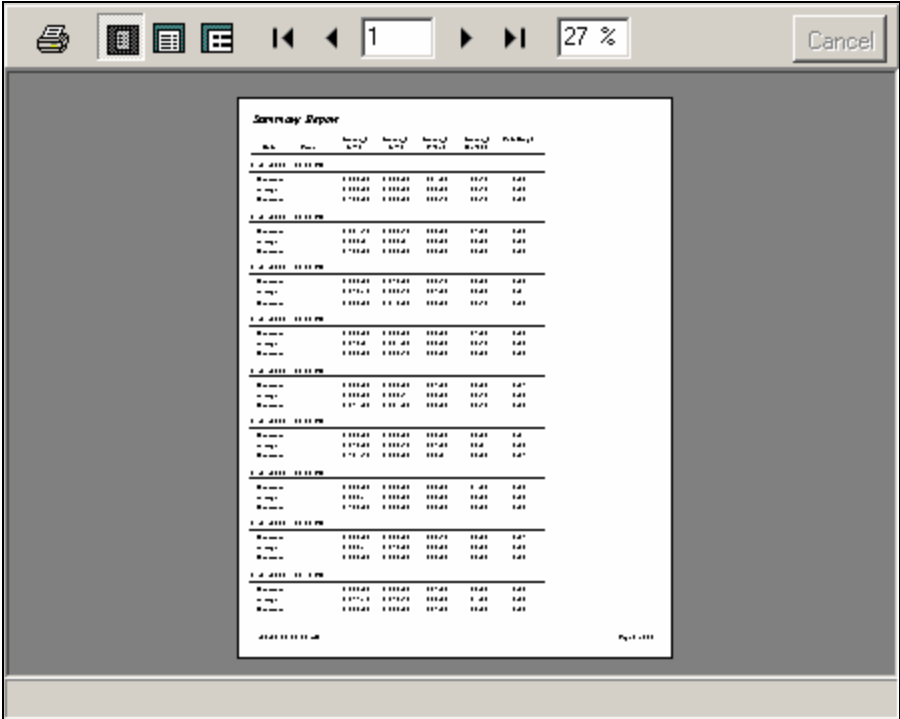
Daily Reports are reports configurations that can automatically be set to print or export at the same time everyday. Click the Enabled button next to **Daily Report** to enable daily printing of a report for the currently selected Report Setup. Change the Daily Time to a time when you want the report printed.

Daily Report	<input type="checkbox"/> Enabled
Daily Time	12:00:00 AM

Select printer for the Output settings to have the report print to the default printer automatically. Select one of the file types for print to have the report export the extracted data to a file automatically. The exported file will be placed in the Export directory. The filename will start with E then the number of the daily report. For instance, if more than one setup was configured for daily report, the filename would start with E01, E02, E03, etc. The next character would be an under-score(_) followed by the date. The date format would be in the format mmddyy. The extension would correspond to the output file type. For example, a html file exported on the 5th of July, 2003 would have a filename of E01_070503.htm.


7.3 Preview

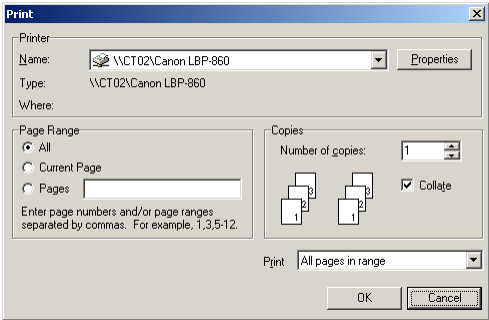
After creating a configuration and selecting preview as the output type click the **Create Report** button to preview the report in the Preview pane on the right side of the screen.



At the top of the window is a toolbar. This toolbar allows the user to print the previewed report, control the size of the report, and navigate to different pages in the report.



Click the printer button  on the toolbar to open a printer dialog box. Use these settings to configure the output then click the OK button to print the document.



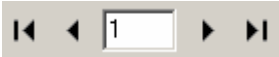
Use the next three buttons to resize the preview page. The first button will shrink the page to show the whole image in the preview pane. The next button will resize the page to fill the preview pane using the width of the document. The last button will resize the page to 100% of the entire document.



To manually change the size of the preview, enter a percentage value in the box to the right of the navigation arrows.



Use the navigation buttons and edit box to move to the different report pages. Click the arrows with vertical lines to move to the first and last documents. Use the other two arrows to move back and forth one page at a time. Enter a page value in the edit box to jump directly to a page.



Backwash Condition

If List is selected as the report type, a BW label will be visible next to each value where a backwash condition has occurred.

List Report Setup

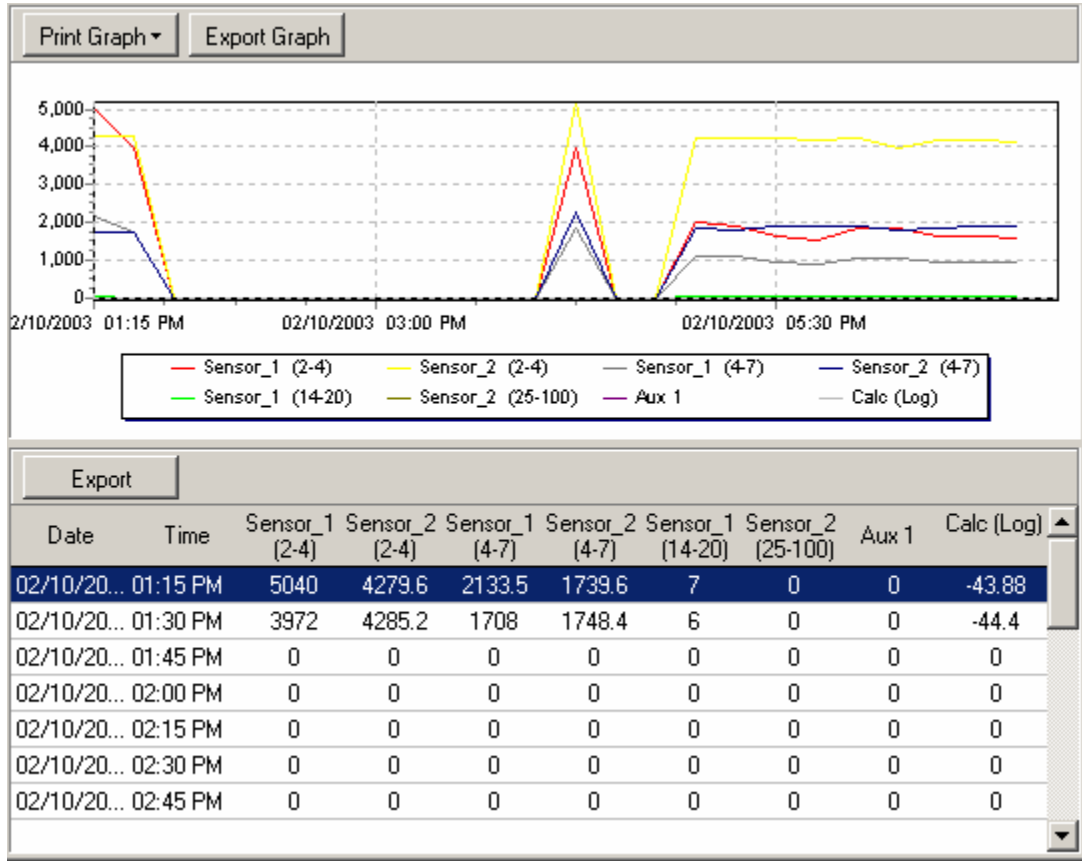
Date	Time	Sensor_1 (2-4)	Sensor_2 (2-4)	Sensor_1 (4-7)
02/10/2003	01:15 PM	5,040.00 BW	4,279.60	2,133.50 BW
02/10/2003	01:30 PM	3,972.00 BW	4,285.20	1,708.00 BW
02/10/2003	01:45 PM	0.00 BW	0.00	0.00 BW
02/10/2003	02:00 PM	0.00 BW	0.00	0.00 BW
02/10/2003	02:15 PM	0.00 BW	0.00	0.00 BW
02/10/2003	02:30 PM	0.00 BW	0.00	0.00 BW
02/10/2003	02:45 PM	0.00 BW	0.00	0.00 BW
02/10/2003	03:00 PM	0.00 BW	0.00	0.00 BW
02/10/2003	03:15 PM	0.00 BW	0.00	0.00 BW

At the end of every hard copy report are summary values for minimum, average, and maximum. These summary values do not use backwash data for there respective calculations.

02/10/2003	06:45 PM	1,622.70 ^{gpd}	4,187.20	933.20 ^{gpd}	1,885.20	8.25
02/10/2003	07:00 PM	1,590.20 ^{gpd}	4,116.40	942.20 ^{gpd}	1,910.40	7.25
Minimum:		0.00	0.00	0.00	0.00	0.00
Average:		0.00	2,136.87	0.00	936.75	0.00
Maximum:		0.00	5,186.00	0.00	2,237.50	0.00

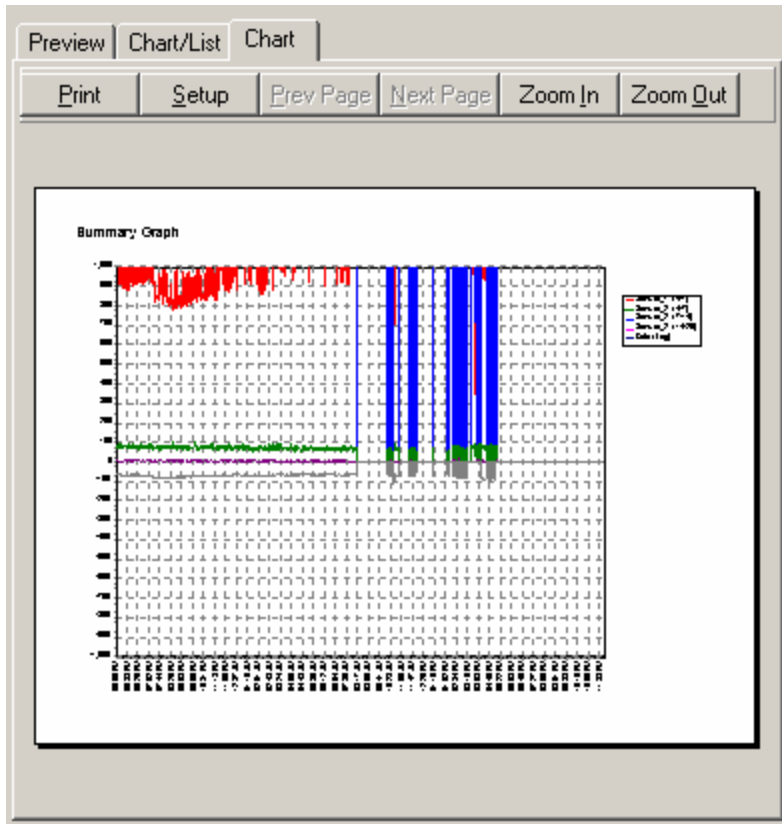
7.4 Chart/List

Selecting Include Chart/List under Report Settings will create a graph and table of the extracted data as well as the report preview. This data can be viewed, printed, and exported.



Click the Print Graph, Export Graph, and Export buttons to print or export the graph or data values. Each of these features uses the same components from the Chart/List view. Please see chapter 5 to get a detailed explanation of these features.

7.5 Chart View



The Graph Report gives the user a large printable output of the extracted report data. Use the Print button to print the report. Use the Setup button to setup the printer. Use Zoom In and Zoom Out buttons to resize the preview.

Chapter 8: Support

Use the following information to contact Chemtrac Systems for customer or technical support.

Chemtrac Systems, Inc.
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Bldg. 600
Norcross, GA 30092
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770-449-6233
Fax: 770-447-0889
chemtrac@chemtrac.com
<http://www.chemtrac.com>