Counter Recorder

Hardware
&
Software

Operating Manual

Version 2.00.43c

Table of Contents **Page**

Table of Contents **Page**

Table of Figures **Page**

1 INTRODUCTION

Small, simple and affordable, the SenSource Counter Recorder can measure and record data, taken at user specified reading intervals ranging from 60 per minute to 2 per day. SenSource's counter recording software is a graphical data acquisition and display software package that requires no programming skills and enables users to effortlessly select reading rate, user ID and to initiate the start of data collection within moments after receiving their counter recorder. In addition, all data can be saved in a format easily read by spreadsheet applications such as Microsoft Excel, or Lotus 1-2-3. It is our goal to bring you accurate, low-cost, easy-to-use counter recorders that integrate easily into your working environment. To better understand your needs and to better serve you, we welcome and appreciate your feedback. Thank you for choosing SenSource for your counter recording requirements.

1.1 Warranty

SenSource warrants each of our Recorders to be free from defects in material or workmanship. Our obligation under this warranty is to repair or replace, at our option, any product or part thereof which proves defective upon examination within one year of shipment. No other warranty is expressed or implied. SenSource does not warrant that its counter recorders or their associated software will operate as described in this manual.

1.2 Limitation of Liability

SenSource counter recorders and their associated software have been thoroughly tested and the documentation reviewed. However, SenSource does not warrant the performance of its products for any particular purpose. In no event is SenSource liable for any damages resulting, directly or indirectly, from the use of this or any products supplied by SenSource.

1.3 WARNING

The SenSource counter recorders contain a lithium battery. Do not cut the battery open, incinerate, heat above 85 ^{o}C or recharge. Dispose per local regulations.

2 HARDWARE

2.1 Package Inspection

Verify that the counter recorder(s) was not damaged in transit by carefully unpacking all items in the shipping carton and looking for obvious signs of physical damage. If the counter recorder is damaged, repack it in its original container and contact SenSource Customer Service at 330.792.7089. Any damage noted upon receipt must be documented to file a claim against the carrier.

2.2 System Requirements

The SenSource counter recording software requires an IBM (or compatible) PC with the following:

- Pentium or higher processor
- Windows 95/98/2000/NT/XP
- 16 MB extended RAM
- Color 800 X 600 monitor
- 10 MB free disk space
- 3.5" disk drive or CD-ROM
- Available 9 pin male serial (COM) port

2.3 Attaching the Interface cable

Plug the male jack connector of the PCDC-RS232 interface cable into the female receptacle of the counter recorder. Plug the female DB 9-pin connector into the serial (COM) port in your computer as shown in Figure 1.

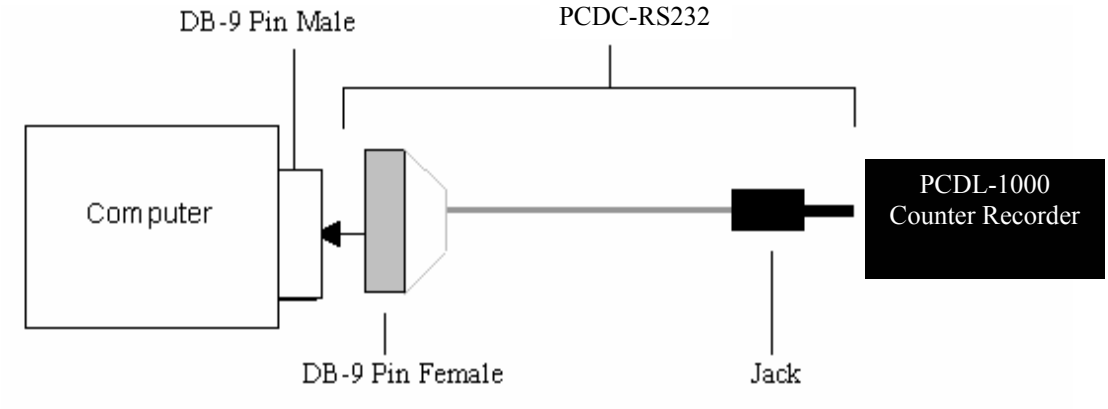

Figure 1: Counter Recorder to Computer Connection

2.4 Software Installation

If a CD is not provided please download the software from the following on-line location:
http://www.sensource.biz/people_counters.htm (click on: Download Counter Recorder Software)

Or insert the disk labeled *SenSource Data Recorder Software* into the disk drive. From the Windows Program Manager, choose the Run Command from the File menu and type *D:\setup* into the Command Line field. If you are using a disk drive other than the D drive, replace that drive letter in the command line instructions above. The installed software will be listed under the default SenSource software program group and saved under the default "C:\Program Files\SenSource 2.00\" directory.

3 SOFTWARE

All SenSource counter recorders operate similarly. Our counter recording software automatically configures itself specifically for each type of logger. It does this by reading the device type. Each Counter Recorder has a unique device ID and identifies itself when queried by the host computer. For that reason, only one software package and only one manual is required for all SenSource Counter Recorders. In certain instances where differences occur, an attempt is made to bring clarification to the user and avoid confusion.

3.1 Basic Operations

SenSource Data Recording Software is designed to be simple and easy to use. SenSource has designed its products to be simple to use by limiting the number of steps required of the user and therefore reducing errors. Our premise is that the user's time is better spent analyzing the acquired data for his/her specific application rather than spending unnecessary time trying to operate a counter recorder. SenSource has reduced the setup process to two easy steps:

1. **Starting the Device** 2. **Downloading the Data**

Beyond this, the user has the option of setting different device ID's, adjusting the reading rate, etc. The time and date is automatically taken from the host PC to save time and minimize errors.

3.2 Opening The Software

Open the software by selecting the SenSource icon in the SenSource Software program group. The software will open and is immediately ready for starting a device or downloading data. The tool bar and menu items will appear as shown in Figure 2.

Figure 2: Menu Items and Tool Bar

3.3 File Commands

The file commands can be viewed in Figure 3.

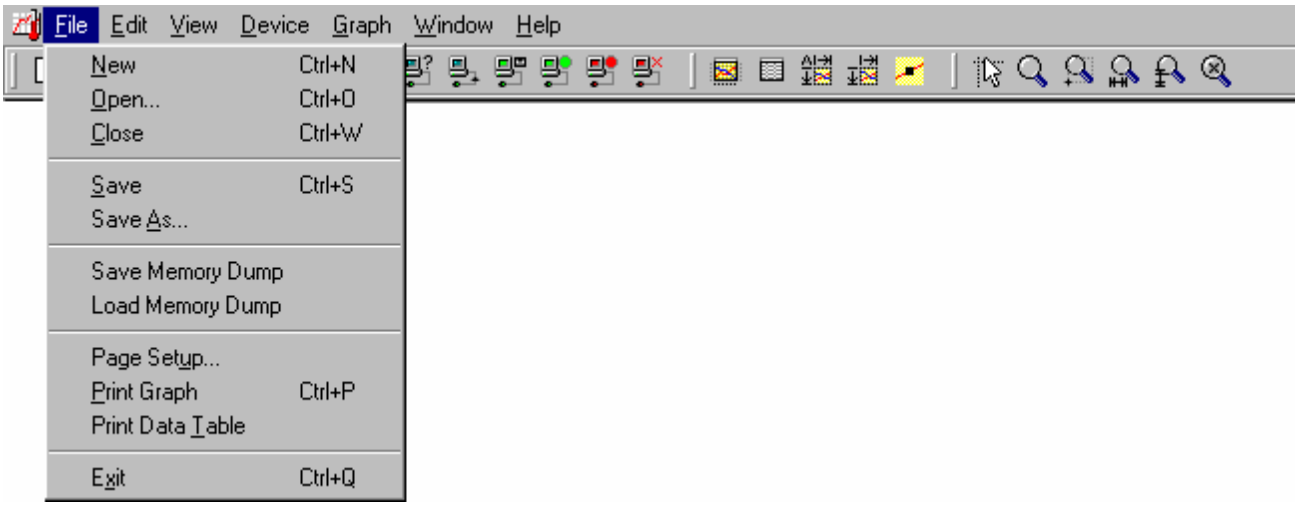

Figure 3: File Commands

3.31 New

Under the File menu, choose the New command as shown in Figure 3. This command will create a new window. It will not discard any information that is already on the screen or in existing windows. Multiple windows may be created and displayed simultaneously, and may be manipulated using the Window commands described in section 3.6 Window Command.

3.32 Open

Under the File menu, choose the Open command as shown in Figure 3. This command will open previously saved data files into the current window. If no windows are open, a new one will be created. Data in the current window will be discarded, but all other windows will be unaffected. Multiple windows may be created and displayed simultaneously, and may be manipulated using the Window commands described in section 3.6 Window Command.

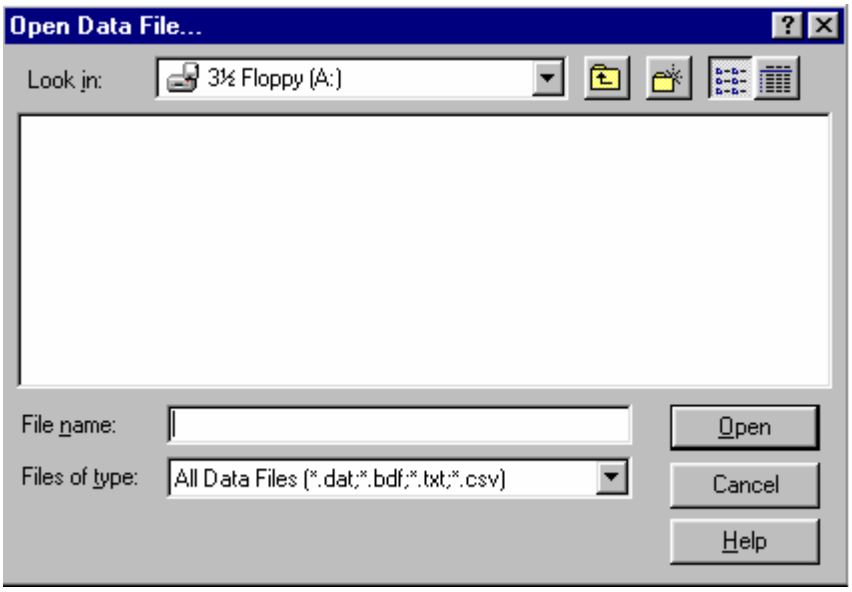

Figure 4: Open Dialog Box

Upon selection of the Open command, the Open Data File… dialog box shown in Figure 4 will appear. There are four types of files that may be opened with this software. These files formats are described in section 3.34 Save.

3.33 Close

Under the File menu, choose the Close command as shown in Figure 3. This command will close the currently selected window. If the window has not been saved, the will software will prompt the user to save. This command will not discard data from or close any other existing windows.

3.34 Save

Under the File menu, choose the Save command as shown in Figure 3. Upon activation of this screen, the dialog box shown in Figure 5 will appear. Data may be saved as any of four types of files. These files are as follows:

***.dat**	This is our own internal ASCII data format. This format can be viewed by most text editing or word processing software.
***.bdf**	This is our own internal binary format. This format can only be read by our software. Data stored in this format cannot be read or altered by other software.
***.txt**	Files stored in this format are tab delimited text and can be viewed by most word processing and spreadsheet programs.
***.csv**	Files stored in this format are comma separated values and are directly readable by Microsoft Excel and many other spreadsheet programs.

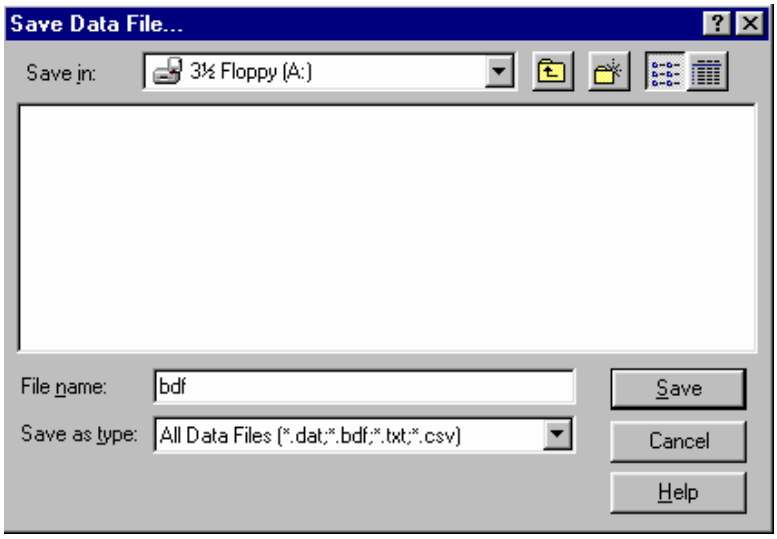

Figure 5: Save Command Dialog Box

3.35 Save As

Under the File menu, choose the Save As command as shown in Figure 3. Upon activation of this command, the dialog box shown in Figure 5 will appear. Data may be saved as any of four file types. Refer to section 3.34 Save.

3.36 Save Memory Dump

Under the File menu, choose the Save Memory Dump command as shown in Figure 3. This command is useful to the factory for troubleshooting problems in the field and recovering data from a malfunctioning device. The user will typically not use this command. It is available to the user for troubleshooting a device with an applications person from the factory. Upon activation of this command the entire contents stored in memory within a device will be downloaded. The dialog box shown in Figure 5 will then appear. The data may only be saved in our own binary *.mdf file format.

3.37 Load Memory Dump

Under the File menu, choose the Load Memory Dump command as shown in Figure 3. This command allows the user to view a file that was saved in a *.mdf file format. This command is useful to the factory for trouble shooting problems in the field and recovering data from a malfunctioning device. The user will typically not use this command. It is available to the user for troubleshooting a device with an applications person from the factory. Upon activation of this command, the dialog box shown in Figure 4 will appear. The user will select the appropriate file, and click OK. The data will then be loaded into a new window and displayed on the screen.

3.38 Print Graph

Under the File menu, choose the Print Graph command as shown in Figure 3. This command will print the graph in the currently selected window.

3.39 Print Data Table

Under the File menu, choose the Print Data Table command as shown in Figure 3. This command will print the Data Table in the currently selected window.

3.3 View Commands

The device commands can be viewed in Figure 6.

Figure 6: View Commands

3.31 Toolbar

The Toolbar option is used to enable or disable the toolbar located at the top of the screen. Disabling the toolbar allows more room for the graph being displayed.

3.32 Status Bar

The Status Bar option is used to enable or disable the status bar located at the bottom of the screen. Disabling the status bar allows more room for the graph being displayed.

3.4 Device Commands

The device commands are shown in Figure 7.

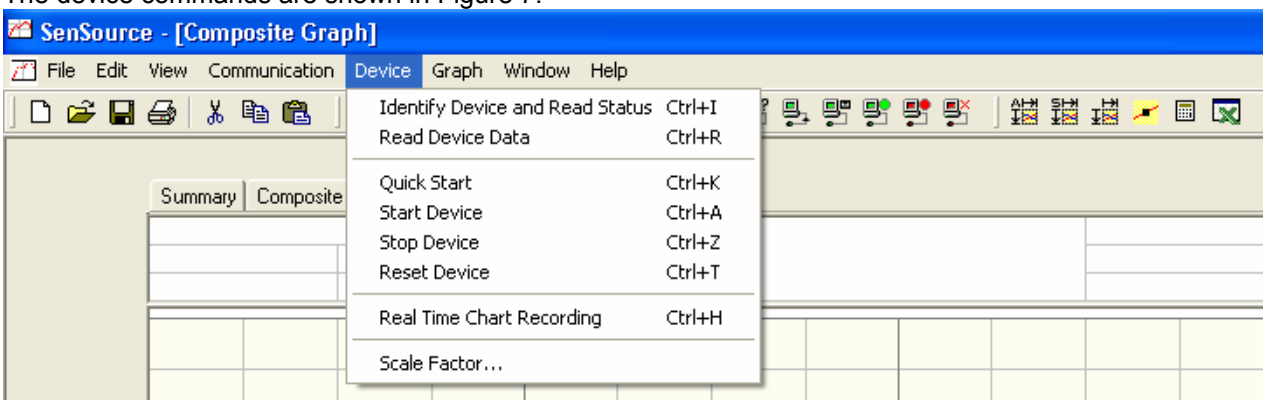

Figure 7: Device Commands

3.40 Identify Device and Read Status

Under the Device menu, choose the Identify Device and Read Status command as shown in Figure 7. This command initiates communication with the device, and displays the device type, revision number, serial number, user ID, and operating parameters of the particular device in the Device Status dialog box. The serial number is set at the factory and cannot be changed by the user. The user ID can be changed by the user when starting the device. This command will also verify that the software is able to communicate with the device and that the correct COM port has been selected. If your device does not communicate, you should verify the following:

1. Is the correct COM port and baud rate chosen?
2. Is there another device using the selected COM port, such as a modem?
3. Is the device's battery dead?
4. Is the PCDC-RS232 cable connected to the correct COM port?

In addition, this command will read and indicate the current status and all pertinent information of the device that is connected as shown.

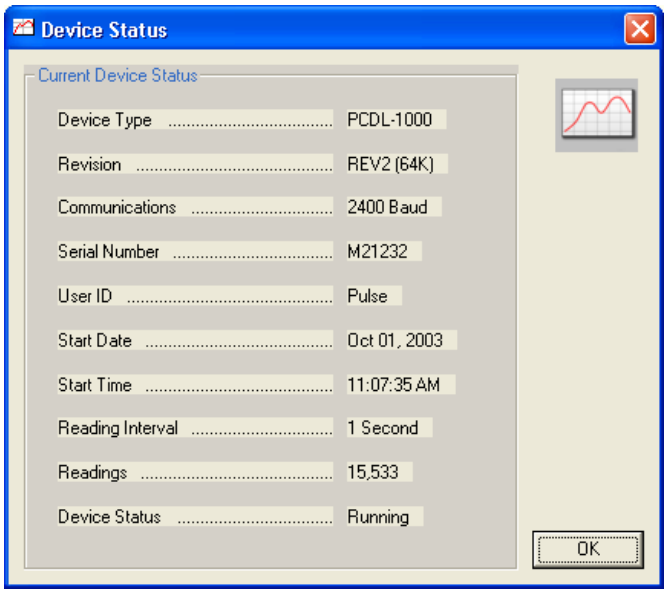

Figure 8: Current Status of Device

This provides the user with a quick method for determining the current state or status of a particular device. The above dialog box contains 10 items. In the above example, the device is stopped, the reading interval is set for 5 seconds and there are currently no readings in memory. The device was last started at 4:08:53 PM on November 8, 2000.

3.41 Read Device Data

To download the data from the device to the computer, select Read Device Data from the Device Menu as shown in Figure 7. This command automatically downloads all the stored data from the device and reads and displays it in a graphical and tabular form. The standard Temp101 will download data at approximately 120 readings per second. A progress bar located near the bottom of the screen gives the user a visual indication of how long the download will take.

3.42 Starting the Device

From the Device menu, choose Start Device. This will cause the dialog box in Figure 9 to appear. This dialog box allows the start time and reading rate to be set. The start time may be used to delay the start of data collection up to six months in the future. Alternatively the user can select the "Start Now" option to start the counter recorder immediately at the current date and time. **IT IS IMPORTANT TO NOTE THAT STARTING THE DEVICE WILL ERASE ALL READINGS CURRENTLY STORED IN MEMORY.** The reading rate can also be selected, allowing the user to change how often the device will take a reading. When a reading rate is selected, the total recording time will be calculated for the particular device and displayed. Once the device has started, it will continue to record readings until the memory is full. When the memory is full, the data recorder will stop recording any more readings and will put itself into a low power state to maximize battery life. The data already stored in the counter recorder is always preserved (even in the case of battery failure) unless the device is reset or started. When the device is started again the old readings will be overwritten.

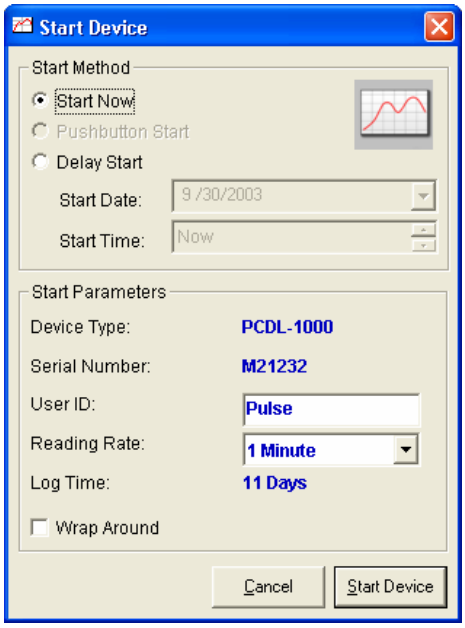

Figure 9: Starting Device

To quickly start the device with out the above dialog box appearing, the user may select the "Quick Start" command. This will start the device at the current time and with the previously set user ID and reading rate. This is useful for saving time, especially when handling more than one device.

3.43 Stopping The Device

From the Device menu, choose Stop Device as shown in Figure 7. This will stop the counter recorder from taking any further measurements and the counter recorder will enter a low power state to conserve battery life. The device will also stop and enter this mode when the memory is full. This mode is transparent to the user as the device is will immediately wake up when the host computer communicates with the logger. If the device is not going to be used for a while, it is wise to stop the device from collecting more data to conserve power. Stopping the device has no effect on the data in memory. It will be retained. It is not necessary to stop the device because it will stop automatically once it has filled its entire memory. This is just a convenient way for the user to help extend the life of the battery.

3.44 Resetting The Device

From the Device menu, choose Reset Device as shown in Figure 7. This will stop the counter recorder from taking measurements and erase all readings currently stored in memory. Resetting the device will also cause the counter recorder to enter a low power state to conserve battery life.

3.45 Real Time Chart Recording

This command will provide the user with a graphical method for acquiring and viewing data in real time. Activation of this command will cause the menu items and toolbar to appear as shown in Figure 10. This allows the user to select the reading rate and to start and stop the real time graphing. To use this feature, a logger must be connected to the interface cable. Upon activating the Start Recording button, the software will take a reading from the logger and update the screen with a real time reading at the selected reading rate.

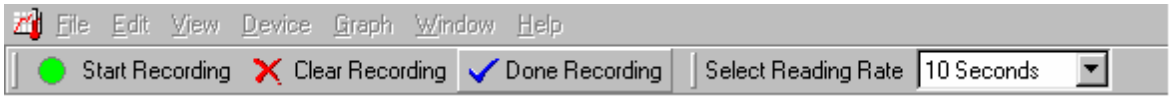

Figure 10: Real Time Menu Items

When the data has been accumulated in real time it can be saved and viewed the same as data that has been downloaded normally from a device. The data can also be viewed in tabular form while in the real time mode. The user can easily switch back and forth from graphical to tabular form. While in the real time recording mode, access to most software commands is restricted so that they will not interfere with data collection. Also, all windows except for the current window will be made inactive during data collection. To exit the real time recording mode, the user must click on the "Done Recording" button.

3.48 Device Specific Commands

3.484 Scale Factor

From the Device menu, choose Scale Factor. This command allows the user to define the type of units to be displayed on the graph as well as a Y = m*X + b type of equation to be performed on the data being downloaded. This can be useful when a predictable error in counts is expected. The equation can be stored within the device to simplify and enhance the displaying of data. Upon activation of this command, the dialog box shown in Figure 11 will appear.

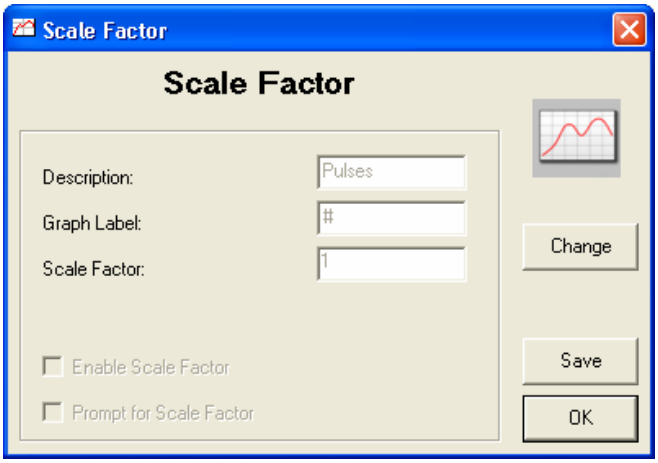

Figure 11: Scale Factor

The "Description" field is used to enter the full name of the parameter to be displayed in the software. Examples of this are COUNTS, PEOPLE, CARS, etc. This name will also be displayed on the graph and data table as the description of the data. The "Graph Label" field is used to enter the label of the parameter that is to be displayed in the software. Examples are: #, Ppl, Cr, etc. This abbreviation will be used to label the graph axes and for the units column in the data table. The total length of the description and label can be no more than ten (10) characters. The Scale Factor field is the multiplier (the number that is used to scale the actual count by. (Example: if the actual count is 100 and the scale factor is 1.2 then the recoded value will be 120. The "Enable Scale Factor" check box indicates whether the units programmed into the device should be displayed when data is downloaded. The "Prompt for Scale Factor" check box allows the user to edit the stored information each time the data is uploaded. This allows for longer than ten character descriptions and labels.

3.49 Communications

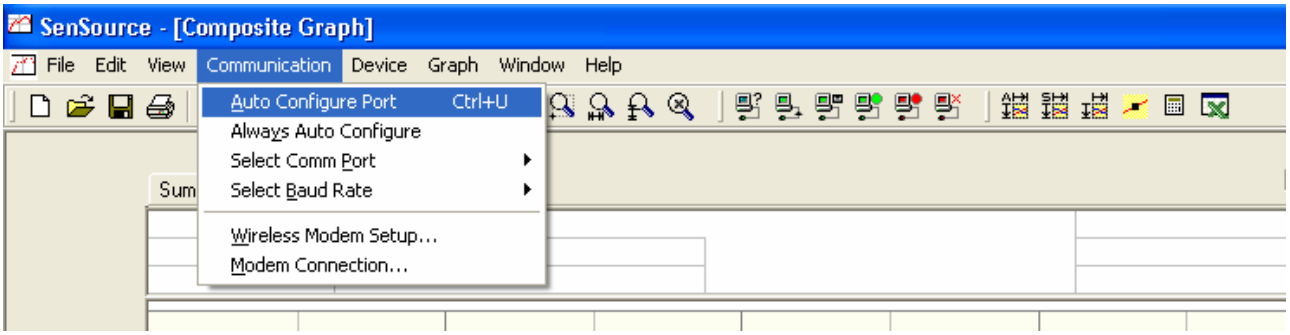

Figure: 12 Communication selections

3.491 Auto Configure Port

From the Communication menu, choose Auto Configure Port. This command provides the user with the ability to automatically determine which COM port the device is attached to as well as what baud rate the device uses to communicate. This command will only work if there is a PCDC-RS232 cable connected to an available COM port and there is a functioning counter recorder connected to the PCDC-RS232. If this command fails to find the device, then the device is not functioning properly or the PCDC-RS232 cable is not properly connected. Once the software has determined what COM port is being used and the proper baud rate, it will store this information in the configuration file. Therefore this command only needs to be activated once. If a different COM port is later used, or if a device with a different baud rate is used, then the command should be selected again.

3.492 Always Auto Configure

From the Communication menu, choose Always Auto Configure. Once checked, this command will search for an active device each time the software cannot establish communications. A disadvantage to doing this is that the communications with the device may be slower.

3.493 Select Com Port

Under the Communication menu, choose the Select Communication Port command. This command tells the software what communication port the counter recorder is connected to. Without selecting the proper COM port, the software will not be able to communicate with the counter recorder. To automatically configure this option, refer to section 3.491 Auto Configure Port.

3.494 Select Baud Rate

Under the Communication menu, choose the Select Baud Rate command. This command tells the software what communication port the counter recorder is connected to. Without selecting the proper baud rate, the software will not be able to communicate with the counter recorder. To automatically configure this option, refer to section 3.491 Auto Configure Port.

3.5 Graph Commands

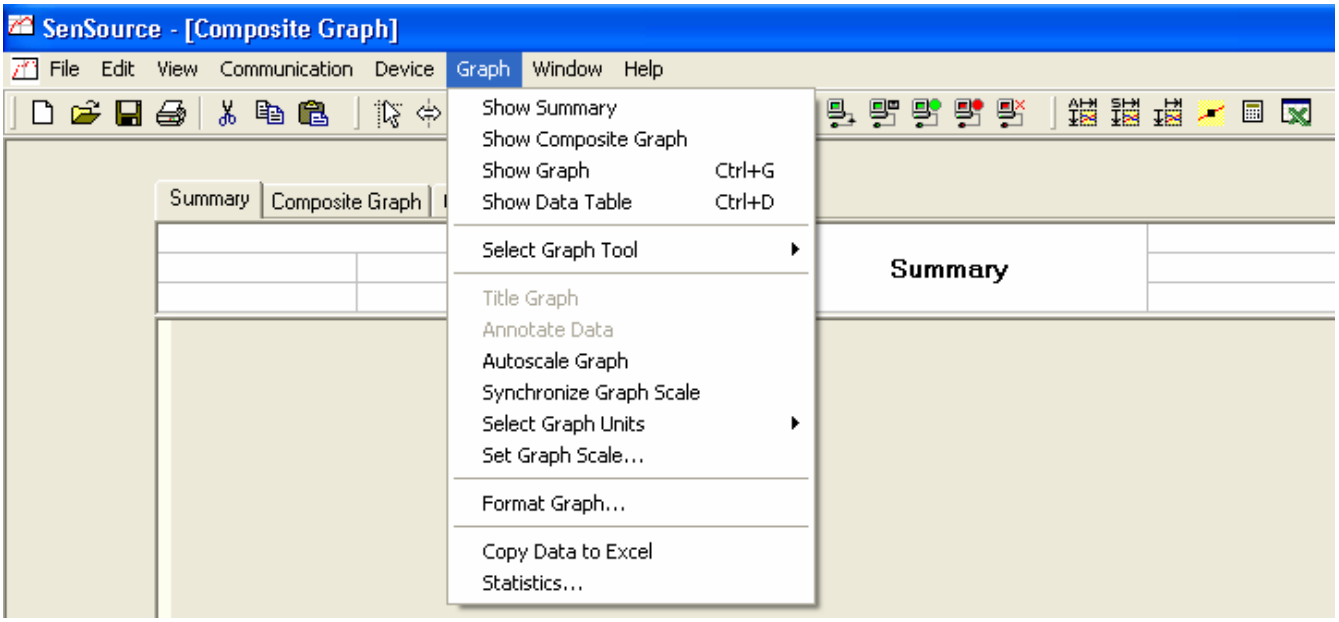

Figure 13: Graph Selections

3.51 Show Summary

Under the Graph menu, choose the Show Summary command as shown in Figure 13. This command tells the software to display a summary of the current data.

3.52 Show Composite Graph

Under the Graph menu, choose the Show Composite Graph command as shown in Figure 13. This command tells the software to display a composite view of all datasets that are open.

3.53 Show Graph

Under the Graph menu, choose the Show Graph command as shown in Figure 13. This command tells the software to display the graph in the current window.

3.54 Show Data Table

Under the Graph menu, choose the Show Data Table command as shown in Figure 13. This command tells the software to display the data table in the current window.

3.55 Select Graph Tool

Under the Graph menu, choose the Select Graph Tool as shown in Figure 13. This command enables the user to select what type of function or mode the mouse will assume when it is pointed and clicked over the graph. The options are as follows:

Cursor	This selection will set the mouse to a cursor mode where pointing and clicking on data points of the graph will cause the software to indicate the value of that data point.
Time Cursor	This selection will set the mouse to a time cursor mode where clicking and dragging the time cursor will cause the software to indicate the exact time and value of that data point.
Scroll	This selection will set the mouse to a scroll cursor mode where clicking and dragging will move the graph on the screen in the direction and amount the cursor was moved.
Zoom In/Out	This selection will set the mouse to the zoom mode to enable the user to zoom in or out to adjust the magnification of a particular area of the graph. Multiple zooms may be performed to get the best view.
Box Zoom	This selection will set the mouse to the zoom mode to enable the user to select a rectangular region of the graph to "zoom in" to get a close-up view of a particular area of the graph. Multiple zooms may be performed to get the best view.
Horizontal Zoom	This selection will set the mouse to the zoom mode to enable the user to select a horizontal region of the graph to "zoom in" to get a close-up view of a particular area of the graph. Multiple zooms may be performed to get the best view.
Vertical Zoom	This selection will set the mouse to the zoom mode to enable the user to select a vertical region of the graph to "zoom in" to get a close-up view of a particular area of the graph. Multiple zooms may be performed to get the best view.
Cancel Zoom	This command will cancel any existing zoom modes the user may be in and return the mouse to the cursor mode.

3.56 Set Graph Scale

Under the Graph menu, choose the Set Graph Scale as shown in Figure 13. This command enables the user to specify the values of the vertical and horizontal axis. An example of the dialog box is shown in Figure 14. Different counter recorders will show a slightly different dialog box depending on the number of channels and the parameters being recorded.

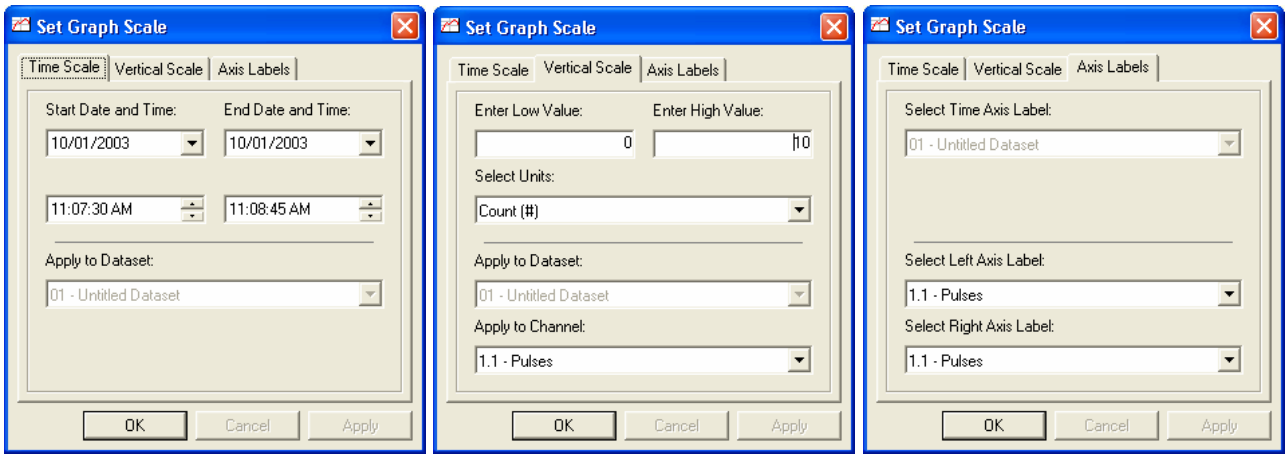

Figure 14: Set Graph Scale

Scaling of the horizontal axis is controlled by the Select Time Range section. To set the end points of the horizontal axis, the user merely selects the specified endpoints from the drop down date and time menu. The vertical axis is set using the Select Vertical Range section. The default button will set the vertical values to there maximum and minimum values that the data recorder is capable of measuring. The Autoscale button will set the vertical values to the maximum and minimum in the actual data shown on the graph.

3.57 Autoscale Graph

Under the Graph menu, choose the Auto Scale Graph as shown in Figure 13. This command will optimize the vertical scale of the graph to match the minimum and maximum data points shown on the graph. This will provide maximum resolution for viewing the graph.

3.58 Select Graph Units

Under the Graph menu, choose the Select Graph Units as shown in Figure 13. This command will allow the user to select the units to be used when displaying the graph.

3.59 Statistics

Under the Graph menu, choose Statistics as shown in Figure 13. This command will calculate some basic statistics for the counter data on each individual channel (number of readings, start time, end time, minimum value maximum value and average value) For counter recorders with more than one channel, the “Next” and “Previous” buttons will be available. This allows the user to quickly view the statistics on each channel.

3.6 Window Commands

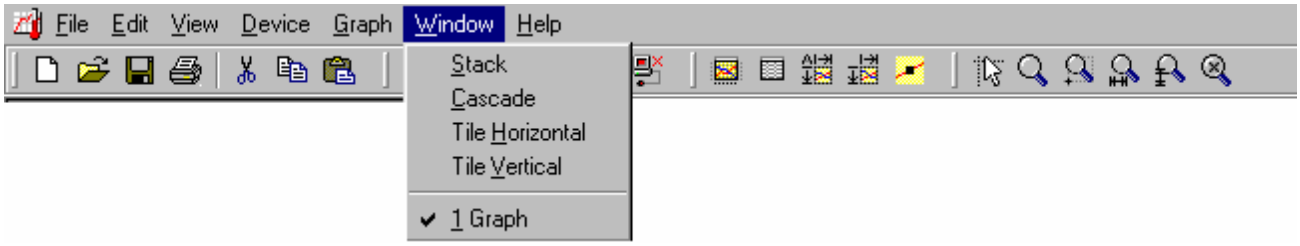

Figure 15: Window Menu

3.61 Stack

Under the Window menu, choose the Stack command as shown Figure 15. This command will resize all the graph windows on the desktop so they take up the whole main window and are overlaid on top of each other.

3.62 Cascade

Under the Window menu, choose the Cascade command as shown Figure 15. This command will resize all the graph windows and overlay them on top of each other.

3.63 Tile Horizontal

Under the Window menu, choose the Tile Horizontal command as shown Figure 15. This command will rearrange the open graphs so they are all fully visible and are aligned horizontally to each other.

3.64 Tile Vertical

Under the Window menu, choose the Tile Vertical command as shown Figure 15. This command will rearrange the open graphs so they are all fully visible and are aligned vertically to each other.

3.7 Help Commands

Figure 16: Help Command Menu

3.71 Contents

Under the Help menu, choose the Contents as shown Figure 16. This command will activate the help session and present the user with the Table of Contents for the manual.

3.72 About

Under the Help menu, choose the About command as shown Figure 16. This command will provide the user with information about the company and the software version. This screen will include our company address, phone number for technical information, e-mail address and web site. It will also include the full revision number of the software and the date it was released.

3.8 Toolbar

The Toolbar is shown in figure 17. It provides a convenient set of shortcuts to various menu items. Clicking on the any button will perform the same function as its associated menu item. The user can see a simple description of each button by positioning the mouse over the button and allowing it to remain there momentarily.

Figure 17: Toolbar

3.801 New

This command is for creating a new window. Refer to
3.31 New.

3.802 Open

This command is for opening a saved data file. Refer to 3.32 Open.

3.803 Save

This command is for saving data to a file. Refer to 3.34 Save.

3.804 Print

This command will print the currently selected graph. Refer to 3.38 Print Graph.

3.805 Cut

This command is the standard windows “Cut” command.

3.806 Copy

This command is the standard windows “Copy” command.

3.807 Paste

This command is the standard windows “Paste” command.

3.808 Identify Device and Read Status

This command will identify the device and read the status of any device that is connected to the COM port through the PCDC-RS232 interface cable. Refer to 3.40 Identify Device and Read Status.

3.809 Read Device Data

This command will read the device data of any device that is connected to the COM port through the PCDC-RS232 interface cable. Refer to 3.41 Read Device Data.

3.810 Real Time Chart Recording

This command will place the software in a mode to collect data in real time from any device that is connected to the COM port through the PCDC-RS232 interface cable.

3.811 Start Device

This command will start any device that is connected to the COM port through the PCDC-RS232 interface cable. Refer to 3.42 Starting Device

3.812 Stop Device

This command will stop any device that is connected to the COM port through the PCDC-RS232 interface cable. Refer to 3.43 Stopping The Device.

3.814 Reset Device

This command will reset any device that is connected to the COM port through the PCDC-RS232 interface cable. Refer to 3.44 Resetting The Device.

3.815 View Graph

This command will display the graph in the currently selected window.

3.816 View Data Table

This command will display the data table in the currently selected window.

3.817 Autoscale

This command will autoscale the graph of the currently selected window. Refer to 3.57 Autoscale Graph.

3.818 Set Graph Scale

This command will enable the user to set the graph scale for the currently selected window. Refer to 3.56 Set Graph Scale.

3.819 Graph Options

This command will enable the user to set graph options for the currently selected window.

3.820 Cursor

This command will set the mouse to the cursor mode. Refer to: 3.55 Select Graph Tool

3.821 Zoom

This command will set the mouse to the zoom mode. Refer to: 3.55 Select Graph Tool

3.822 Box Zoom

This command will set the mouse to the box zoom mode. Refer to: 3.55 Select Graph Tool

3.823 Horizontal Zoom

This command will set the mouse to the horizontal zoom mode. Refer to: 3.55 Select Graph Tool

3.824 Vertical Zoom

This command will set the mouse to the vertical zoom mode. Refer to: 3.55 Select Graph Tool

3.825 Cancel Zoom

This command will set the mouse to the cursor mode and set the graph to the normal scale. Refer to: 3.55 Select Graph Tool

4 Battery Replacement

The SenSource miniature counter recorder(s) contains a 3.6 volt Lithium battery. Replacement batteries may be purchased from the factory along with instructions. The customer may wish to have SenSource replace the battery. In this case, the customer should contact SenSource for an RMA number. The RMA number should be clearly visible on the outside of the box used to return the counter recorders. SenSource will replace the battery and return the counter recorder(s) within 5 working days.