Smart Talk Software

User's Manual

Version 1.30
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1. General Overview

SmartTalk is a comprehensive Microsoft Windows 95™ based program, which allows the user to communicate to an AML instrument through the computer's serial port. The user can identify the instrumentation, select and modify the instrument's configuration file, view data from the instrument, set the logging parameters and transfer data to the computer's hard drive.

2. Installation

2.1 System Requirements

To use the SmartTalk software the following computer requirements must be met:

- Pentium compatible computer or higher
- Microsoft Windows 95 operating system or higher
- 2 Mbytes of free hard drive space
- a serial communications port

2.2 Installing Smart Talk

Smart Talk should be installed on the computer's hard disk. This can be accomplished in Windows ™ by performing the following steps:

Start "Windows ™"
Insert the "Smart Talk" floppy disk into drive A:
Open the Start menu
Select the Run option in the pull-up menu
Specify the path for the Smart Talk install program, A:\setup.exe
Select OK to start the installation program
Follow the prompts in the installation program

The default directory setting is 'Program Files\SmartTalk'. The Smart Talk icon will be set up in the Start menu under Programs. The program is now installed and can be launched by double clicking on the program icon.

2.3 Connecting the Sensor to the Computer

Using the data cable supplied with each instrument, connect the sensor to a free serial port on the computer. Connect the instrument's power connections to an appropriate power supply, if required.

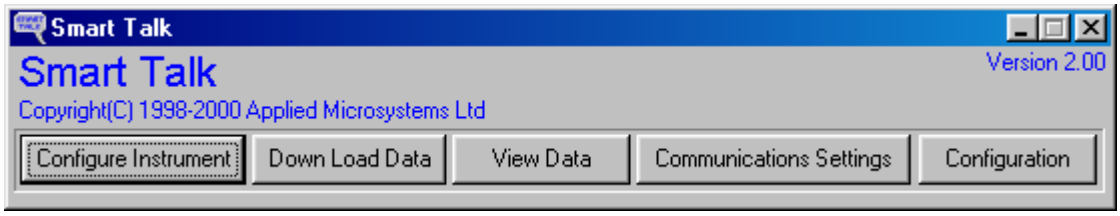
The COM port should be configured using the communications settings button on the main menu, refer to section 3.5.

3. Using Smart Talk

Before using Smart Talk for the first time follow the installation procedures in section 2.

The Smart Talk main screen has five buttons. These buttons give you access to all the major commands of Smart Talk. These commands are detailed in the following sections.

Smart Talk opens with the following window.



3.1 Main Screen

3.1.1 Configure Instrument

This command allows you to configure an instrument's settings. The settings control the behavior of an instrument while logging data and viewing data in real-time. This command only applies to instruments that log data.

3.1.2 Down Load Data

This command allows you to transfer data that has been logged on an instrument. Transferring data only applies to instruments that contain an internal file system. This command also allows you to delete files contained within an instrument.

3.1.3 View Data

This command allows you to view data. This data can either be from a file that has been logged by an instrument or real-time data from the instrument.

3.1.4 Communications Settings

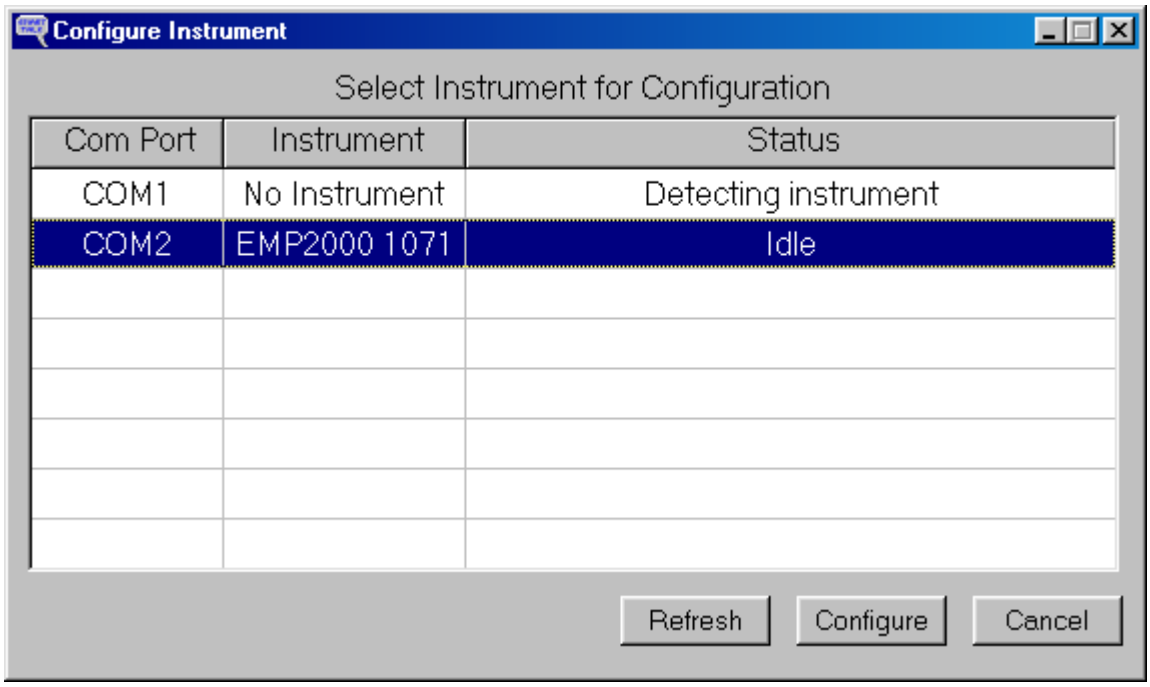
This command allows you to configure, monitor and control the communications ports that are being used by Smart Talk.

3.1.5 Configuration

This command allows you to view and modify an instrument's configuration files. These configuration files contain information that describes the type of instrument you have.

3.2 Configuring an Instrument

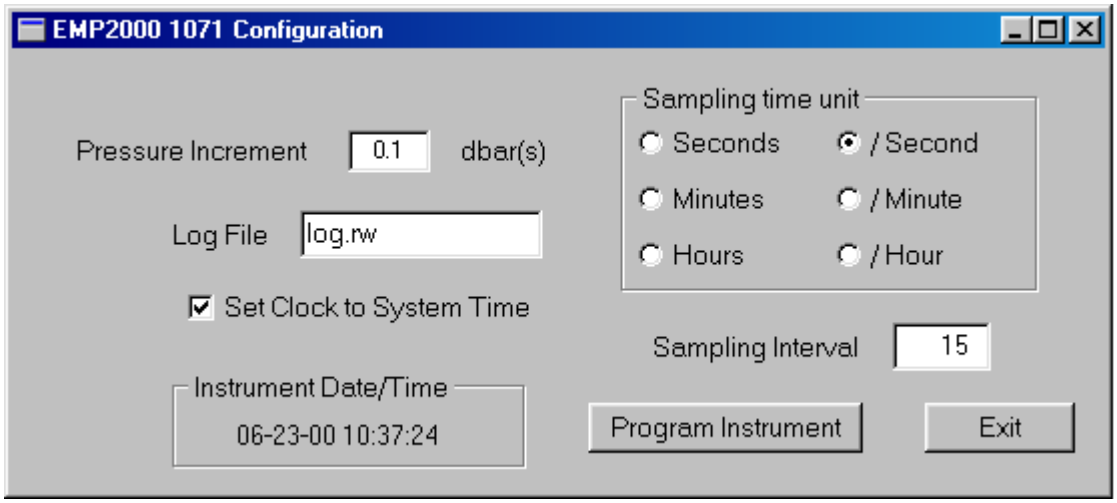
When activated this option will display a list of the instruments that are currently connected and communicating with Smart Talk. Select the instrument you wish to configure and push the Configure button.



The display above shows that Smart Talk is using two communications ports and that EMP2000 serial number 1071 is connected to communications port two. This window has three buttons. They are as follows:

- Refresh will force Smart Talk to interrogate each communications port and verify its status.
- Cancel will close this window.
- Configure will interrogate the instrument and display the instrument's configuration settings as show below.

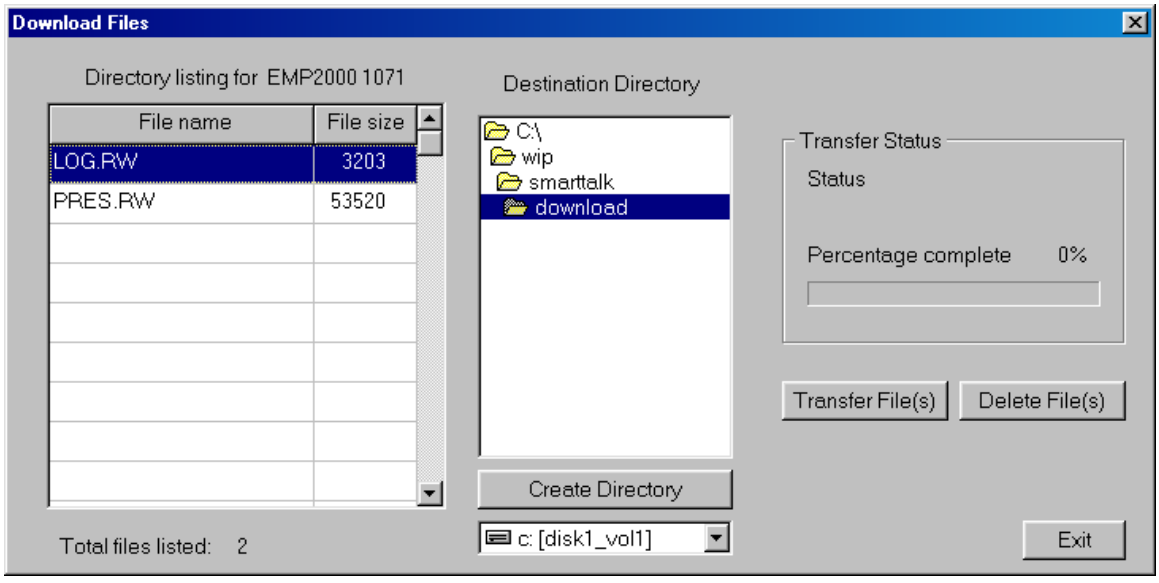
Note: The Configure button will only be enabled when the appropriate instrument is selected. If you do not see an instrument, exit this window and go to the communications setting to check the communications settings of your instrument. Verify that you are communicating at the appropriate baud rate. You can also try cycling the power off and then on to the instrument. Allow a minimum of 5 seconds between turning the power off and then on.



The example shown is for an EMP2000 instrument. This displayed configuration will vary based on the instrument type. To configure your instrument, change the settings to the desired values and click the Program Instrument button. Smart Talk will program your instrument and reload the settings for you to verify.

3.3 Down Loading Data

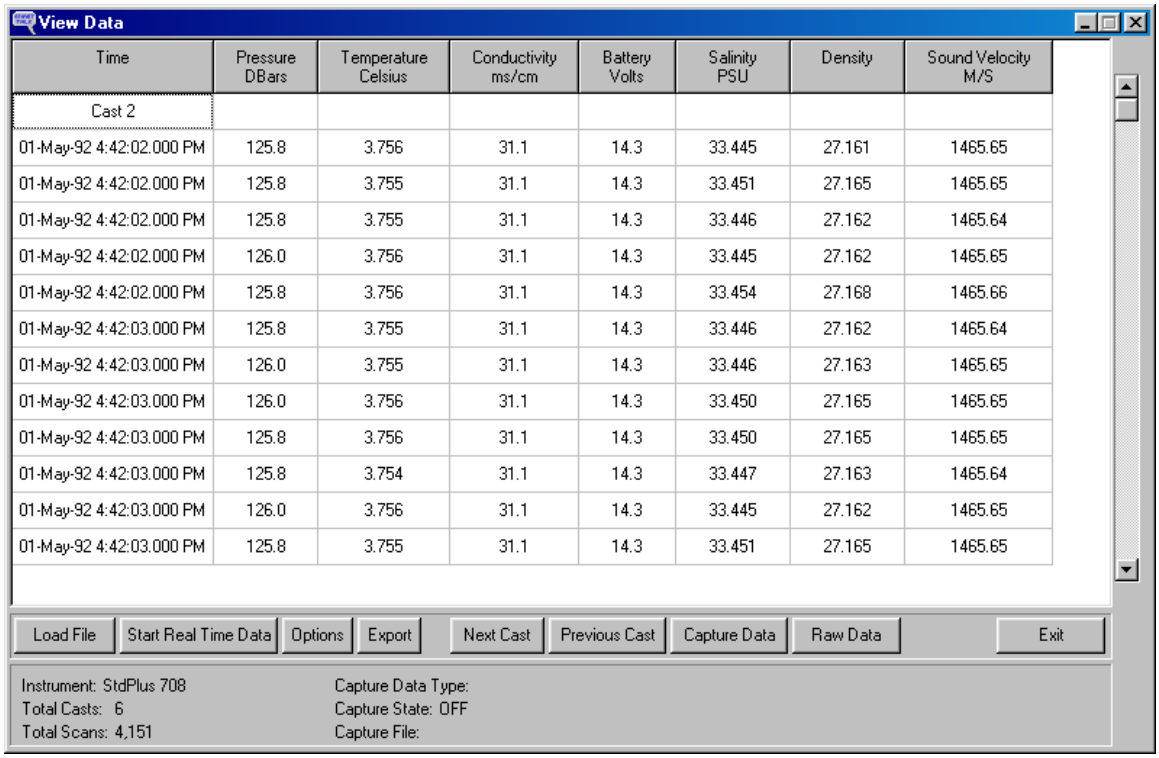
When activated this option will display a list of the instruments that are currently connected and communicating with Smart Talk. Select the instrument you wish transfer files from and click the Transfer File(s) button. Smart Talk with extract a directory listing from your instrument and display it as shown in the following window.



To download, select the appropriate file or files and push the Transfer File(s) button. Smart Talk will display the progress of the transfer. To delete files select the appropriate files and click the Delete File button. Browsing your hard drive will change the destination directory. The currently displayed directory will be your destination. Clicking the exit button will close this window.

3.4 Viewing Data

This command allows you to view data that has been logged by an instrument or view data from an instrument in real-time. An example of a loaded data file is shown.



Data is displayed in a tabular form with each channel in a separate column. Each new cast is marked with a blank row containing the caption identifying the cast number. The scroll bar on the right-hand side allows scrolling to any section of the data file. The buttons on the lower task bar have the following functions.

3.4.1 Load File

This function allows you to select a data file for viewing. Any file that is logged by an instrument can be viewed.

3.4.2 Start Real Time Data

This function allows you to view data in real-time. You will be prompted to select the instrument you wish to view in real-time. Once selected, data will be displayed at the programmed sample rate.

3.4.3 Options

This function allows you to configure the following options. The rate at which data scans are displayed on the screen, the rate at which data is captured and the filename of the capture file. The format of the window will vary based on the instrument your are communicating with.

3.4.4 Export

This function allows you to export the current view of the data to a text file. The text file will be formatted using comma-separated values (.CSV). This file can be easily imported into any standard spreadsheet program.

3.4.5 Next and Previous Cast

These functions allow you to jump to the next or previous cast for data files that contain multiple casts. These buttons have no function when viewing data in real time.

3.4.6 Capture Data

The Capture Data function stores real time data to a text file. If the file exists the new data will be appended to the file. The file will be in the format of comma separated values (.CSV). Each time the capture is enabled a new header will be stored in the file. This header will contain the sensor's name and units. The captured data will be stored in the currently displayed format. The options button allows you to change the destination directory and capture file name.

3.4.7 Real or Raw Displayed Format

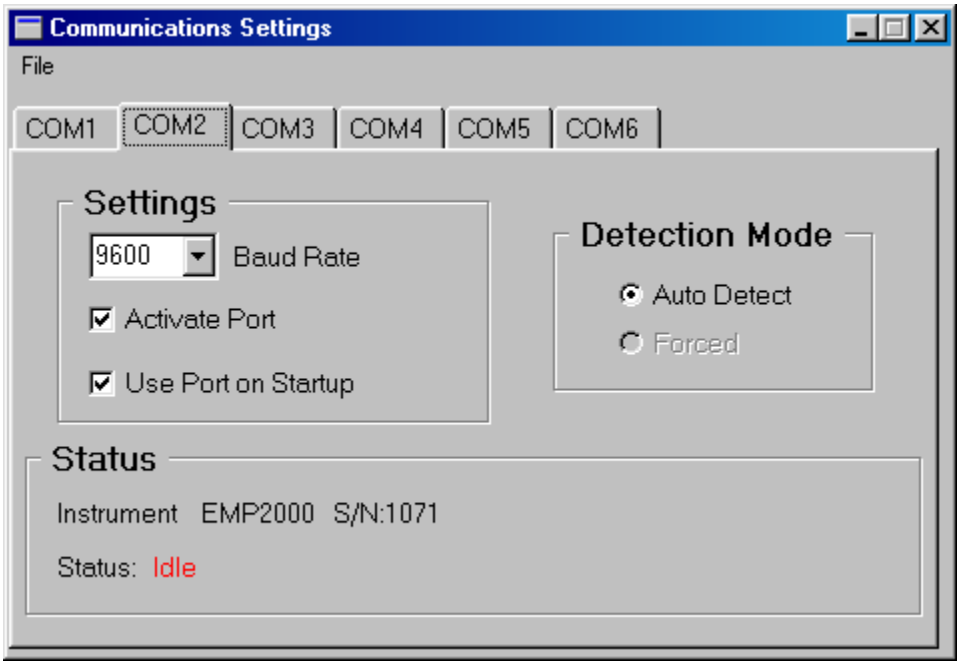
This option will allow you display the real data, which is in the form of computed engineering units, or raw data, which is uncompensated data.

3.4.8 Exit

Leave the View Data window.

3.5 Communications Settings

This command allows you modify and examine the settings of the communications ports that are being used by Smart Talk. Each communications port is on a separate tab. Clicking on the appropriate tab will display the current state of that COM port. The Settings section will allow you to configure the initial state of the COM port. To allow Smart Talk to use the COM port put a check mark in the Activate
Port box. To have Smart Talk automatically start interrogating the COM port when the program first starts put a check mark in the Use Port on Startup box. When Smart Talk is given control of an instrument it will automatically interrogate the communications port for an instrument. If no instrument is present Smart Talk will retry every five seconds.



3.6 Configuration

Selecting the configuration command opens the load configuration file window. This window allows you to view a configuration file for an instrument that you have. Clicking the open button will display the configuration window for that instrument.

The main configuration window displays the instrument serial number in the title bar. There are a series of tabs along the bottom of the window, which correspond to each parameter that the instrument is capable of measuring. If the instrument has a large number of parameters, the arrow buttons to the right of the tabs can be used to scroll through the various parameters. Selecting a tab displays the coefficients, the precision, and channel numbers for that parameter. Calculated parameters also have configuration tabs, which allow the user to specify equations and dependant variables.

Note: The latitude should be entered in the pressure configuration window to compensate for gravity.

For most sensors changes to the coefficients can be made easily by copying a column of coefficients from a spreadsheet and pasting the coefficients into the configuration window via the paste button.

Also located in the configuration window are the settings for the raw data channel positions. This position corresponds to the raw data stream coming from the instrument. These values should not be changed unless the instrument's firmware has been modified. An example of this would be the addition of another sensor to the instrument.

3.7 Supported Sensors and Instruments

Smart Talk supports the following Sensors.

- Time
- Pressure
- Temperature
- Conductivity
- pH
- Dissolved Oxygen (Do2)
- OBS
- Transmissometer
- Fluorometer
- Licor
- Battery Voltage
- Sound Velocity
- Wave and Tide
- Current Speed
- Heading
- Redox
- Computed Sound Velocity
- Computed Salinity
- Computed Density

Smart Talk supports the following Instruments.

- Smart Sound Velocity & Pressure Sensor
- Smart Sound Velocity & Temperature Sensor
- Smart Sound Velocity Sensor
- Smart Pressure Sensor
- Smart Temperature Sensor
- Smart Conductivity and Temperature Sensor
- Smart Conductivity, Temperature and Pressure Sensor
- EMP2000 Environmental Monitoring Probe
- STD-12 Plus
- SVPlus
- Tide and Wave Guage
- SVP-16

4. Creating a configuration file in Smart Talk

4.1 Creating a Standard Instrument

To communicate with an Applied Microsystems Ltd. Instrument, Smart Talk will require a configuration file. This file contains all the information describing the type of sensors that your instrumentation has. You will need to know the following information to create a configuration file.

- The serial number of the instrument
- The type of instrument you have (IE. SvPlus, Smart Pressure Sensor)
- A copy of the DOS Total System Software instrument's configuration file or printout showing the coefficients

Note: If Smart Talk is shipped with your instrument the instrument's configuration file will be included with your software.

To create a configuration file do the following:

- Start the Smart Talk Software
- Click the communications setting button to display the Communications Setting Dialog Box
- Click on the File menu and select create configuration file option. You should see the following dialog box as shown in Figure 4.1

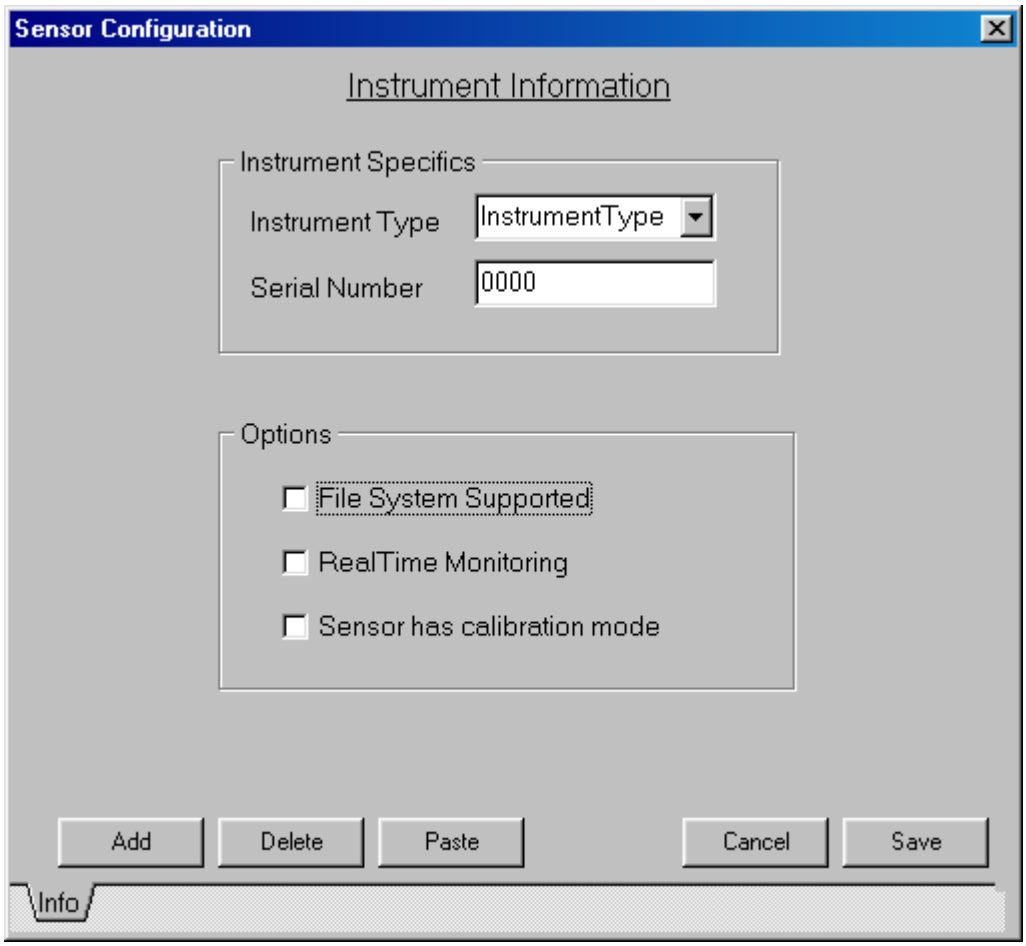


Figure 4.1 Blank Configuration File

- Select the instrument type in the Instrument Type selection box
- Enter the instrument's serial number in the Serial Number edit field
- Click the Add button and select Create Default Sensors. This will add all the sensors that standard instruments have. It will also configure all the appropriate options for proper operation. Now enter in the coefficients for each sensor. Figure 4.2 shows what you would expect to see at this point.

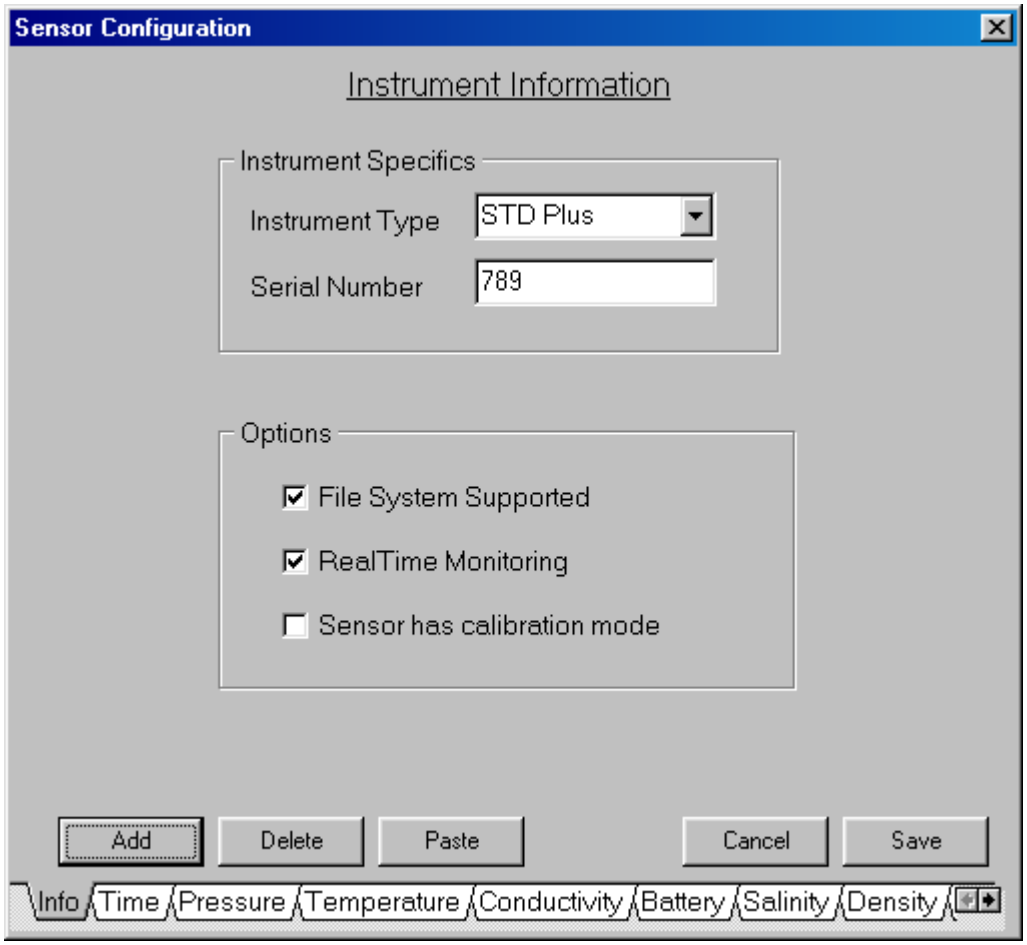


Figure 4.2 Standard Sensors installed for a STD Plus

- Clicking on the appropriate tab will display coefficients and options for that specific sensor. Figure 4.3 shows an example of the setting for a STD Plus's pressure sensor. Notice that not all the coefficients are enabled. This is due to the fact that the STD Plus does not have temperature compensated pressure.
- After you have entered all your coefficients you can save the configuration file by clicking the save button. In Figure 4.2 the configuration file will be saved in the file STDPlus_789.cfg.

Very Important: When you create or change a configuration file you must restart Smart Talk before the changes will take affect.

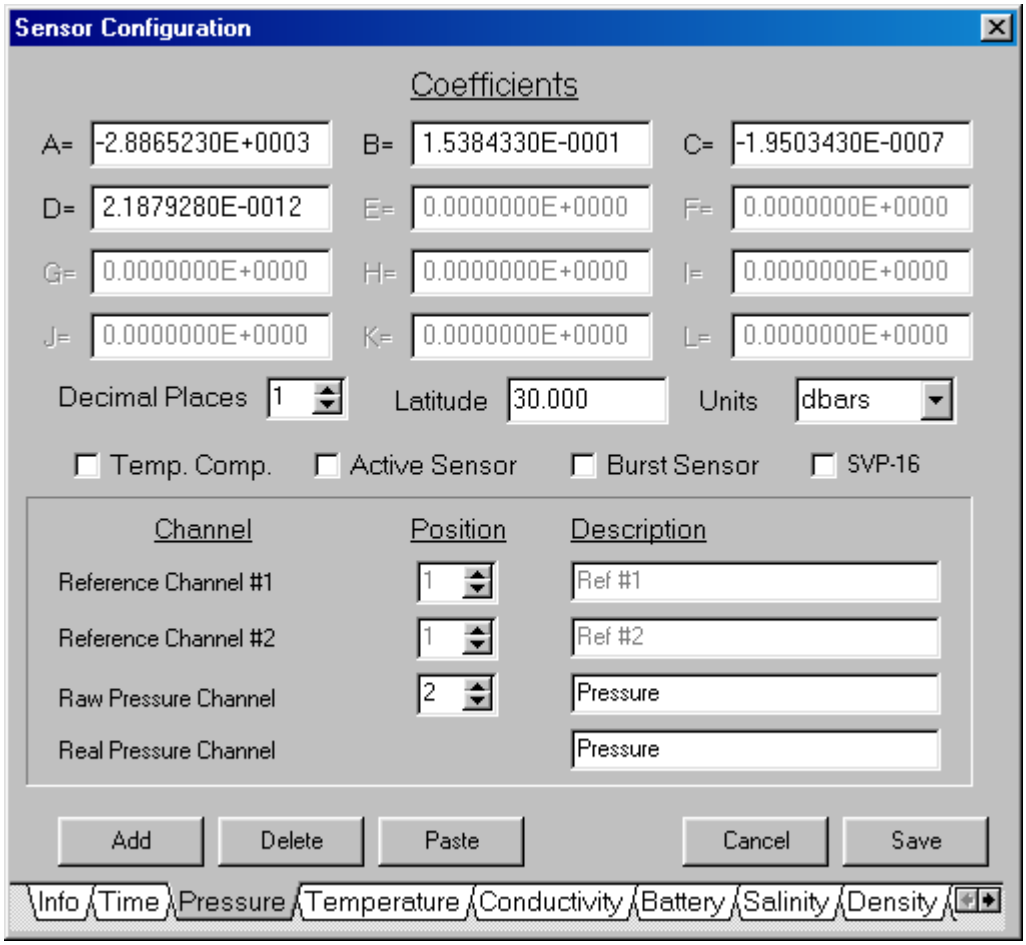


Figure 4.3 Example of a STD Plus's pressure coefficients

4.2 Adding Extra Sensors

On standard instruments or a new instrument supplied with Smarttalk no addition work is required to create a configuration file. If your instrument is non standard or has extra sensors, then these sensors must be added. There are a few points that are very import and you should consider them when you are adding extra channels.

- The position the sensor is insert must match the same position in the configuration file for the DOS Total System Software.
- The raw channel position must be changed to reflect the extra data and the channels that follow the newly inserted channels must also have their raw channel positions changed.
- The TSS configuration file must be checked to see if the instrument has any active or burst Sensors and if it does then these channels must be marked accordingly.
- The time channel now counts as a channel position. In TSS the time channel was not counted in the raw channel position. The first channel was the first analog channel. In most cases it was the pressure channel.

4.3 Example of Adding an Extra Channel

Lets assume you have a STD Plus Serial Number 789 and besides the standard channels it has an additional pH sensor. The pH sensor is positioned after the Conductivity channel in the instrument's channel order

```
set S/N 789
c n .Pressure. t 1 c 3
set Pressure units .dbars.
set Pressure A=-1.851104E+03 B=+9.628581E-02 C=+3.931410E-08 D=+0.000000E+00 Pl 1
set Pressure off +0.000000E+00 lat +0.000000E+00
c n .Temperature. t 2 c 2
set Temperature units .øC.
set Temperature A=+3.514706E+01 B=-1.133370E-03 C=+1.035552E-08 D=-1.459713E-13 Pl 3
c n .Conductivity. t 3 c 1
set Conductivity units .mS/cm.
set Conductivity salt A=-1.681522E+00 B=+8.446103E-05 Pl 3
set Conductivity fresh A=-2.952406E-02 B=+1.503436E-06
c n .Ph. t 15 c 4
set Ph A=+1.395570E+01 B=-3.589723E-04 C=+8.817452E-10 D=-6.595923E-15 Pl 2
set Ph Lastcal .08-Feb-99 11:24:44.
c n .Battery. t 14 c 5
set Battery units .Volts.
set Battery A=-1.873496E+01 B=+9.844468E-04 C=+0.000000E+00 D=+0.000000E+00 Pl 2
c n .Salinity. t 5 c 0
set Salinity units .ppt.
set Salinity display on
c n .Specific_Gravity. t 6 c 0
set Specific Gravity display on
c n .Sound_velocity. t 12 c 0
set Sound velocity units .m/s.
set Sound velocity display on Chen millero
```

Figure 4.4 A Dos Total System Software Configuration File

Figure 4.4 shows a standard Total System Software configuration file for STD Plus serial number 789. The file contains multiple lines that define each sensor and assign specific values that are unique to that sensor. The pH sensor it is defined with the following line.

C n .Ph. t 15 c 4

This line causes TSS to create a pH sensor. The information that is important to Smart Talk is the C 4. This specifies that the pH channel is the 4th channel position in the raw data scan. For Smart Talk you will have to add 1 to the channel position. The raw channel position is now 5. If the sensor was either an active or burst sensor , you would see the words active and burst in this line. The next line sets the coefficients for the pH sensor.

Set Ph A=+1.395570E+1 B=-3.589723E-4 C=+8.817452E-10 D=-6.595923E-15 PL 2

The PL 2 portion sets the displayed number of decimal places to 2. With this information you would do the following to add the pH sensor.

- Click on the Conductivity tab.
- Push the add button and select the pH sensor
- Enter the coefficients (IE. A,B,C,D)
- Change the displayed decimal places to 2

- Select the Temperature channel in the Dependant Channels box. This channel is used to temperature compensate the pH channel.
- The Total System Software configuration file did not show the pH sensor as being an active or burst sensor so these options are not enabled.
- The raw channel position has to be changed to 5
- Click on the battery sensor tab
- Change raw battery channel position to 6

If all these changes are made the pH channel should look as in Figure 4.5.

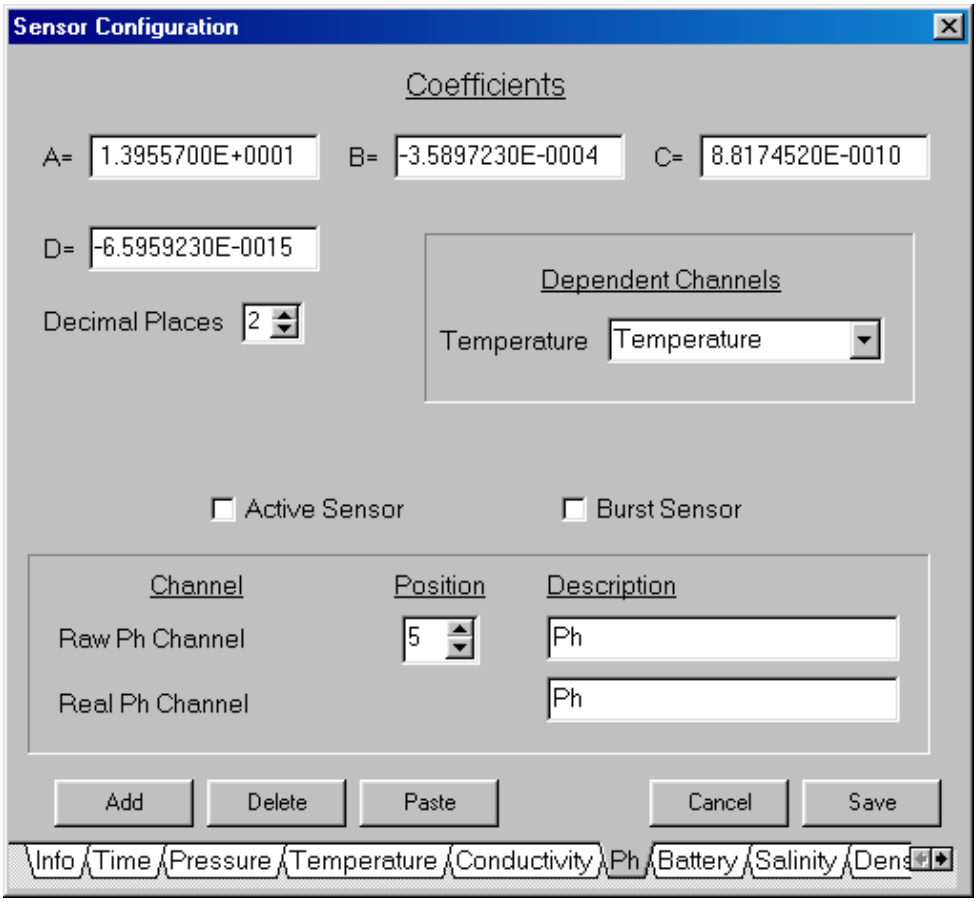


Figure 4.5 STD Plus 789 with the addition of a pH Channel

These steps would be repeated for all extra channels your instrument contains.