SatCon

Data Conversion Program
Users Guide

Version 1.5

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1.0   Introduction

Welcome to *SatCon*, Satlantic's log file data conversion software for Microsoft® Windows 98/ME/NT/2000/XP/Vista.

SatCon is for converting raw binary log files, from instruments made by Satlantic, into readable ASCII text files. The log files generally contain binary data that is formatted into frames or records. Each frame in a log file will contain one sample from each sensor within the instrument. The raw telemetry of most instruments made by Satlantic falls into a fixed format that conforms to Satlantic's data format standard. This program allows data analysts to extract the samples in a form suitable for use with applications such as spreadsheets or Matlab®. The analyst can optionally retrieve calibrated or raw digital data in ASCII form.

The data format information required for the conversion is obtained from a *Calibration file* or *Telemetry definition file*, depending on whether a Satlantic instrument or other data source's telemetry is to be converted. These files define the format of the data and contain the coefficients for converting raw digital samples into calibrated physical units. *SatCon* will work for any instrument or data source that conforms to Satlantic's data format standard, including new instruments that have not been developed.

2.0   Installation

SatCon is available as a Microsoft® Windows® application and is supplied either on two floppy diskettes or as a single self-extracting install program on CD-ROM or it can be downloaded directly from Satlantic's Internet site. Before installing this program, make sure that there are no other versions of *SatCon* installed. If there are any, first uninstall the previous version.

To install *SatCon* from diskette, Insert Disk 1 into the floppy drive and start the setup program. This can be done in Windows Explorer, or by selecting "**Run...**" in the "**Start**" menu and typing "**A:\setup**" <ENTER>. Follow the instructions on the screen. To install *SatCon* from the self-extracting install program, open the file in Windows Explorer or through the Start menu as described above.

Because *SatCon* can be run from the command line, the installation program will add a path line to your "autoexec.bat" file, which is located in your computer's main root directory. This line will allow you to run *SatCon* from any directory on your computer, so you will not have to copy your Log and *Instrument files* to the *SatCon* executable directory. If for some reason you need to reinstate this change in the future, you can manually add the following lines to the end of your "autoexec.bat" file:

```
rem   The following line was added for Satlantic SatCon's
rem   command line processing
set path=%path%;c:\progra~1\satlan~1\satcon
```

Of course, if you installed *SatCon* to another directory from the one specified above, that directory should be used. Make sure you follow the short file naming convention for the path as shown. Once you've made these changes, reboot your computer.

3.0   Glossary of terms

Glossary terms are indicated in *Italics* throughout this manual.

Browse dialog box   This dialog can be used to select a directory (or folder) from anywhere on your computer or network. Use the dialog box's **context sensitive help** for more information.

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Calibration file   A text file that specifies the make up of the telemetry that is transmitted from an instrument. The telemetry specified by a *Calibration file* follows a fixed frame size format. Moreover, *Calibration files* themselves follow a format standard specified by Satlantic. Every instrument produced by Satlantic has an associated *Calibration file*. Periodically, an instrument will need to be recalibrated, which means a new *Calibration file* must be made. These updated files are usually indicated by a letter at the end of the file title specifying the file version. *Calibration files* use the ".cal" file extension.

Header conversion   A conversion of the *Log file header* information found at the beginning of a Satlantic Log File. The conversion output is an ASCII text file containing the header information formatted in a similar manner to that of an *Instrument conversion*. A *Header conversion* does not normally contain *Output headings*.

InsFile   The *Instrument file* to be used in an *Instrument conversion*. If the application window is visible, the *InsFile* will be the file selected in the "**Instrument Files**" list of the main display. If *SatCon* is doing a command line conversion, the *InsFile* will be the last file name parameter of the command line.

Instrument conversion   A telemetry conversion for a specified instrument found in a Satlantic Log File. The conversion output is an ASCII text file containing all the sensor information for the instrument. The first part of this file contains *Output headings*. These headings indicate the names of the sensors found in the instrument file, creating column headings for the *Output values*. The rest of the file contains the sensor *Output values*. Each instrument frame found from the log file corresponds to a row in the output file.

Instrument file   A *Calibration file* or *Telemetry definition file*

Instrument Package File: A binary file in zip format that contains a set of *Calibration* and/or *Telemetry Definition* files and the text file "Properties.txt" for a specific Instrument Package. A physical instrument package is a set of instruments that can be attached to a single serial port. Instrument Package files use the ".sip" file extension.

LogFile   The Satlantic Log File to be converted. These log files contain records of instrument telemetry logged over a period of time. The beginning of a log file contains the *Log file header*. Log files normally have a ".raw" file extension. If the application window is visible, the *LogFile* will be the file selected in the "**Log Files**" list of the main display. If *SatCon* is doing a command line conversion, the *LogFile* will be the first file name parameter of the command line.

Log file header   A series of pseudo frames at the beginning of a log file. Each header record begins with the character string "SATHDR" and has a specific length. Information pertinent to the log file, such as when and where it was recorded, is stored in these headers.

OutFile   The output file to be generated by the conversion. The format of the output file depends on whether an Instrument or *Header conversion* will be made. Output files contain a series of *Output headings* and *values*. If the application window is visible, the *OutFile* will be the file named in the "**Next**" edit box of the main

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display. If *SatCon* is doing a command line conversion, the *OutFile* will be the second file name parameter of the command line.

Output heading
A delimited output field at the beginning of an output file. There is normally a series of *Output headings* written to an output file. A series of *Output headings* will contain information pertinent to the conversion, including column headings indicating the name of the sensors converted in an *Instrument conversion*. If a **SN** sensor was defined for the frame header, a **SN** heading will appear. **SN** *Output values* are not affected by the **[s]** switch.

Output value
A delimited output field containing a sensor value in an output file. *Output values* always appear after any *Output headings*. Normally, one row of *Output values* corresponds to one frame of telemetry from a Satlantic Log File.

SatCon Conversion window
A status window displayed while a conversion is either in progress, aborted, or completed. This window has a progress indicator showing a percentage of the conversion completed. A count of the number of frames processed, frame resynchronizations required, and errors encountered are also displayed. You can use this window to manually abort a conversion.

Telemetry definition file
A special subset of the *Calibration file* that normally specifies a variable length ascii frame format for instrument or other data source telemetry. *Telemetry definition files* use the ".tdf" file extension.

4.0   Getting Started

When you first start *SatCon*, you should see an application window similar to the one below.
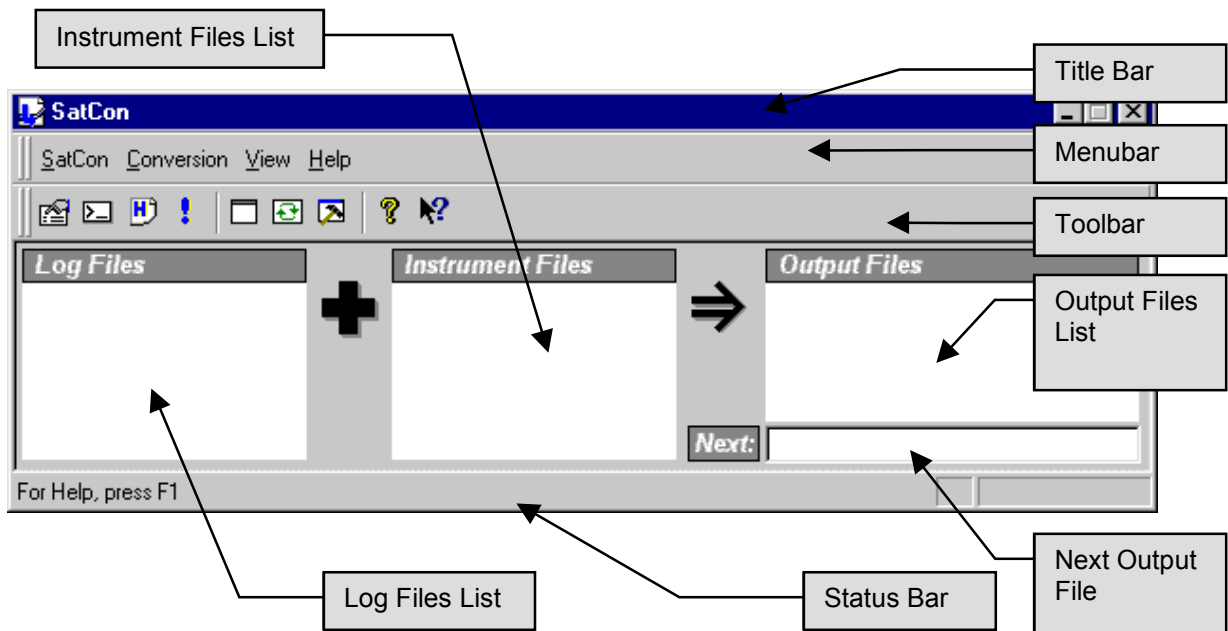

Figure 1

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The application window shown above is just one of two ways in which *SatCon* can be operated. This window's easy to use interface provides a convenient way of processing your Satlantic Log Files. However, it may be necessary to process these files beyond the scope of this application. For this reason, *SatCon* can also perform conversions directly from the command line. This gives you the ability to integrate *SatCon* conversions with other applications.

For more information on using *SatCon*, see section ***9.0 Using SatCon with the application window***. If you want to perform a conversion from the command line, see section ***11.0 Using SatCon from the command line***.

4.1 Title Bar

The title bar is located along the top of the application window. It contains the name of the application. The application's control menu can be accessed using the keyboard with the ALT+SPACEBAR keys from anywhere in the application window. You can also left click the *SatCon* icon or right click anywhere in the title bar to get this menu.

During a *SatCon* conversion, the application name is appended with "Conversion in Progress - x/y (z%)". The *x* of *y* portion appears only if multiple conversions are taking place. This indicates which conversion out of the total to be converted *SatCon* is currently processing. This indicator also appears in the *SatCon conversion window* under the same circumstances. The *z* portion is a percentage complete of the current conversion.

To move the application window, drag the title bar. You can also move dialog boxes by dragging their title bars.

The application title bar contains the following elements:

- Application control menu button (*SatCon* icon)

- Name of the application (*SatCon*)

- Minimize button

- Close button

4.2 Menubar

The menubar is normally displayed across the top of the application window, above the toolbar. The menubar must be available at all times, so it cannot be hidden.

To get help on individual menu commands, use your mouse or keyboard to select the menu item, then press the F1 key.

The menubar is a dockable window. This means that you can drag the menubar to any position on the screen. *SatCon* will automatically dock the menubar to the application window if possible. You can prevent *SatCon* from docking by holding down the CTRL key while the window is being dragged.

4.3 Toolbar

The toolbar is normally displayed across the top of the application window, below the menubar. The toolbar provides quick mouse access to many tools used in *SatCon*. To hide or display the toolbar, use the Toolbar command from the View menu.

The toolbar is a dockable window. This means that you can drag the toolbar to any position on the screen. *SatCon* will automatically dock the toolbar to the application window if possible. You

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can prevent *SatCon* from docking by holding down the CTRL key while the window is being dragged.

Click	To
	Open the Conversion Parameters dialog box.
	Open the Output File Naming dialog box.
	Enable/Disable *Header conversion*.
	Begin conversion.
	Open the File List Properties dialog box.
	Refresh the File lists.
	Show or hide the Conversion Log Output window.
	Display the copyright notice and version number of your copy of *SatCon*.
	Display help for clicked on buttons, menus and windows.

4.4   File Lists

File Lists are small windows in the main display showing lists of files. The files selected in these windows will be used in the next conversion. You can specify the contents of a File list with the File List Properties dialog box. You can refresh the contents of the File lists with the Refresh command. See section *19.0 File List Properties dialog box* for more information.

To select a file, you can either single click the file name with your mouse, or use the UP/DOWN arrow keys of your keyboard if the File list has the input focus. Pressing the ENTER key from anywhere in the main display will begin the conversion.

You can also drag and drop files directly onto a File list. When a file is dropped anywhere on the list window, the **Working Directory** and **File Filter** of the File List Properties will automatically be updated to reflect the new file name. The file name will then automatically be selected. The Instrument File list only accepts Instrument Package and Instrument files.

4.4.1 Log Files List

The file selected in the Log Files list will be the *LogFile* for the next conversion. If the File Naming Mode of the Output File Naming dialog box is <u>not</u> **User Defined**, you can select multiple files by dragging the selection with your mouse. You can also use the SHIFT and CTRL keys together with the mouse to select and deselect files, select groups of files, or select non-adjacent files. See section *10.0 Batch processing with the application window* for more information.

4.4.2 Instrument Files List

The file selected in the Instrument Files list will be the *InsFile* for the next conversion. If the File Naming Mode of the Output File Naming dialog box is <u>not</u> **User Defined**, you can select multiple files by dragging the selection with your mouse. You can also use the SHIFT and CTRL keys together with the mouse to select and deselect files, select groups of files, or select non-adjacent files. See section *10.0 Batch processing with the application window* for more information.

4.4.3 Output Files List

The Output Files list contains a list of previously converted output files. If the File Naming Mode of the Output File Naming dialog box is **User Defined**, the file selected will appear in the Next Output File edit box.

4.5   Next Output File

This edit box displays the *OutFile* for the next conversion. If the File Naming Mode of the Output File Naming dialog box is **User Defined**, you will be able to manually edit the name of the file displayed. You can temporarily override the default Output Files **Working Directory** of the File List Properties dialog box by typing a full pathname for the *OutFile* in this edit box.

If the File Naming Mode is not **User Defined**, the edit box will be read-only and *SatCon* will determine the name of the next output file.

Pressing the ENTER key from anywhere in the main display will begin the conversion.

4.6   Status Bar

The status bar is displayed at the bottom of the application window. To display or hide the status bar, use the Status Bar command from the View menu.

The left area of the status bar describes actions of menu items as you use your mouse pointer or arrow keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you depress them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the pointer is off the toolbar button.

The right area of the status bar gives conversion status information. The first, or leftmost area, indicates the current conversion mode. If *SatCon* is in the *Instrument conversion* mode, this area will appear blank. If *SatCon* is in the *Header conversion* mode, an "**H**" will appear. The next area indicates that the *SatCon Conversion window* is currently displayed and a conversion is either in progress, aborted, or completed.

5.0   SatCon menu

5.1   Properties command

Use this command to open the SatCon Properties dialog box. See section *16.0 SatCon Properties dialog box* for more information.

5.2   Exit command

Use this command to exit the application. If the **Save all application settings on exit** property was specified in the SatCon Properties dialog box, *SatCon's* current configuration will be saved automatically.

Shortcuts

Mouse: Double-click the application's control menu button (*SatCon* icon).

Click the close button ⊠ on the Title bar.

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6.0   Conversion menu

6.1   Parameters command

Use this command to open the Conversion Parameters dialog box. See section **17.0 Conversion Parameters dialog box** for more information.

Shortcuts

Toolbar:

Keys: CTRL+P

6.2   File Naming command

Use this command to open the Output File Naming dialog box. See section **18.0 Output File Naming dialog box** for more information.

Shortcuts

Toolbar:

Keys: CTRL+F

6.3   Header command

Use this command to change *SatCon's* conversion mode. When this menu item is selected, *SatCon* is in the *Header conversion* mode. When it is deselected, *SatCon* reverts to the *Instrument conversion* mode. The active mode determines the type of information to convert from the *LogFile* when the next Convert command is issued.

When the *Header conversion* mode is active, The Instrument Files List of the main display will be disabled. This is done because no *InsFile* is needed for a *Header conversion*.

Shortcuts

Toolbar:

Keys: CTRL+H

6.4   Convert command

Use this command to start a *SatCon* conversion. Before issuing this command, be sure that the Conversion Parameters have been properly set, the conversion mode has been selected with the Header command, and the *LogFile(s)*, *InsFile(s)*, and *OutFile* have been properly selected.

During a conversion, the *SatCon Conversion window* will be displayed. This window will keep you updated on the conversion's progress. Also, *SatCon* will make conversion log entries during the conversion process. This provides you with a written record of the conversion events.

Shortcuts

Toolbar:

Keys: CTRL+C or ENTER

7.0   View menu

7.1   Properties command

Use this command to open the File List Properties dialog box. See section **19.0 File List Properties dialog box** for more information.

Shortcuts

Toolbar: ▢

Keys: CTRL+O

7.2   Refresh command

Use this command to refresh the File lists of the main display. This would normally be done if the contents of their working directories have changed and you want the lists to reflect these changes.

Shortcuts

Toolbar: 🔃

Keys: CTRL+R

7.3   Conversion Log command

Use this command to show or hide the Conversion Log Output window. This window shows all entries made by *SatCon* to the conversion log as they occur.

```
Conversion Log Output                                                      ×
1999-11-25  11:00:09> Begin instrument conversion.
         Log File: "C:\WINDOWS\DESKTOP\test1.raw"
         Output File: "C:\WINDOWS\DESKTOP\test1-pro001f.dat"
         Instrument File: "C:\WINDOWS\DESKTOP\pro001f.cal"
         Calibration coefficients applied.
         Immersion coefficients applied.
         Time Tag output enabled.
         Frame error checking enabled.
```

Figure 2

Shortcuts

Toolbar: ▨

7.4   Toolbar command

Use this command to show or hide the toolbar, which includes buttons for some of the most common commands in *SatCon*. A check mark appears next to the menu item when the toolbar is displayed.

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7.5   Status Bar command

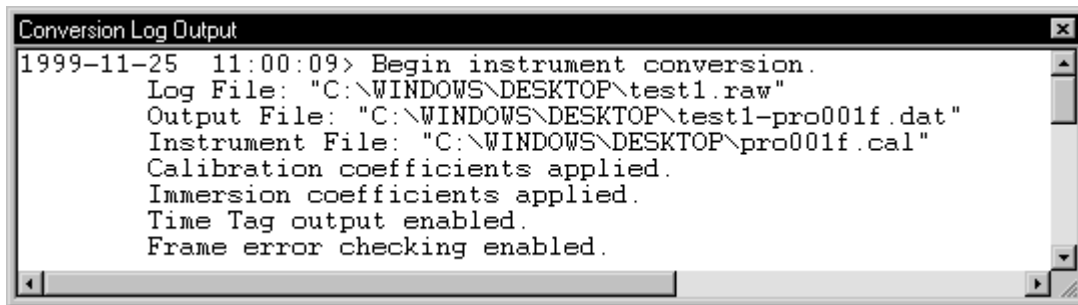Use this command to display and hide the Status Bar, which describes the action to be executed by the selected menu item or depressed toolbar button. A check mark appears next to the menu item when the Status Bar is displayed.

8.0   Help menu

8.1   Help Topics command

Use this command to open the *SatCon* Help Contents window. This window will enable you to navigate through all of *SatCon's* help topics. Press the F1 key to get help on this or any other help window.

To get help on individual menu commands, use your mouse or keyboard to select the menu item, then press the F1 key.

8.2   About command

Use this command to display the copyright notice and version number of your copy of *SatCon*.

9.0   Using SatCon with the application window

Because *SatCon* is a Windows® program, the application provides an easy to use interface for performing *SatCon* conversions on your Satlantic Log Files. Although a *SatCon* conversion can be invoked directly from the command line, using the application window is much easier.

The first step in making a conversion is to choose the conversion mode. You have two choices, an *Instrument conversion* or *Header conversion*. You can select the mode with the Header command.

Next, you must select your conversion files. If you are making a *Header conversion*, you must select a *LogFile* and *OutFile*. If you are making an *Instrument conversion*, you will need to select an *InsFile* as well. To do this, you will have to set the File List Properties for each of the File Lists in the main display. *SatCon* works on the premise that you have assigned directories on your computer to hold these conversion files. Some or all of these files may be held in the same directory. The way you organize these files is up to you. Assign appropriate **Working Directories** and **File Filters** for each of the File lists.

If you have used Satlantic SatView to record your *LogFile*, you should make the **Working Directory** for the Log Files List the same as the **Log Directory** Logging Option used in SatView. If both SatView and *SatCon* are installed on your computer, you will be able to launch *SatCon* directly from the context menu of a Satlantic Log File. This would be the same as using *SatCon* from the command line with one file name parameter.

You can also change the Output File Naming convention for your *OutFile*. If you are using the **User Defined** File Naming Mode for your conversion, you can manually edit the output file name with the Next Output File edit box of the main display. If the File Naming Mode is not **User Defined**, you can perform multiple *SatCon* conversions with one Convert command. See section *10.0 Batch processing with the application window* for more information.

You must now select the Conversion Parameters. These parameters are important in determining the format of the *OutFile*. Once this is done, use the Convert command to begin the *SatCon* conversion.

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SatCon offers a few application properties that affect *SatCon's* behavior with the application window displayed and when used from the command line. You can set these properties with the SatCon Properties dialog box.

10.0   Batch processing with the application window

Another feature of operating *SatCon* with the main application window is the ability to batch process several files in one conversion. If you have a large number of files to process with *SatCon*, you can select multiple Log and Instrument files from their corresponding lists before you issue the Convert command. The File Naming Mode of the Output File Naming dialog box must not be **User Defined** to perform batch conversions. This is necessary because *SatCon* needs the ability to name all batch processed output files for uninterrupted conversions. The *SatCon Conversion window* will be displayed continuously until all conversions have completed or the process has been aborted.

Conversion files are matched in the order that they appear in the File lists. The first *LogFile* will be the top file in its File list. The first *InsFile* is also the top file in its list. The next conversion will match the following *InsFile* with the first *LogFile*. This continues until each *InsFile* has been processed with the first *LogFile*. The next *LogFile* is then matched with each *InsFile* in the same manner as before, starting with the file at the top of the list.

You have some degree of control over this ordering by modifying how each list is sorted. To do this, adjust the File List Properties for the Log and Instrument File lists. This will affect which files are listed in each list, as well as the order in which they appear.

During a conversion, most of the user interface is disabled. You can therefore not change any parameters or properties during batch processing. However, you still have access to the application window, so you can minimize the application or access on line help.

11.0   Using SatCon from the command line

Although *SatCon* is a Windows® program, you can perform a *SatCon* conversion directly from the command line, avoiding the use of the application window. This means that you can open a Command Prompt window and invoke a *SatCon* conversion from there. Make sure *SatCon* has been properly installed, so you can execute the program from any directory on your computer. *SatCon* takes several command line parameters. The format is as follows:

```
> satcon LogFile OutFile InsFile [switches]
```

LogFile   Specifies the full or relative path to the Satlantic Log File to be converted. If the file is in the current directory, the file name will be sufficient.

OutFile   Specifies the full or relative path to the ASCII output text file to be generated. If the file is to be created in the current directory, the file name will be sufficient.

InsFile   Specifies the full or relative path to the *Instrument file* of a specific instrument or data source that generated the raw telemetry. If the file is in the current directory, the file name will be sufficient.

[switches]   Switches are used to specify conversion parameters. See section *12.0 Command Line Switches* for more information.

Although the command line must be structured as shown above, i.e. switches cannot come before file names, *SatCon* will run with any number of command line parameters. If no parameters have been specified, *SatCon* will run normally, opening the application window. This would be the same as running *SatCon* from Windows Explorer. If a *LogFile* is specified with no *OutFile* or *InsFile*, *SatCon* will also run normally, except the Log Files List of the main display will

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contain the selected *LogFile*. Any switches will be ignored. This would be the same as selecting "**Convert**" from the context menu of a Satlantic Log File.

If at least the first two file names are specified, *SatCon* will directly perform a conversion, avoiding the use of the application window. If the only file name parameters are the *LogFile* and *OutFile*, *SatCon* will perform a *Header conversion*. The only switches *SatCon* can use with a *Header conversion* are the **[da]**, **[x]**, and **[w#]** switches. If all three file names are specified, *SatCon* will perform an *Instrument conversion*.

During a conversion, the *SatCon Conversion window* will be displayed. This window will keep you updated on the conversion's progress. Also, *SatCon* will make conversion log entries during the conversion process that can be output to a conversion log file. This provides you with a written record of the conversion events.

12.0   Command Line Switches

Command line switches are used to specify conversion parameters when a *SatCon* conversion is invoked from the command line. Parameters specified on the command line cannot be saved, so they must be specified each time the command line is used. If *SatCon* displays the application window, i.e. the command line is not used for a conversion, parameters can be saved between conversions by using the Conversion Parameters dialog box.

Command line switches can also be used to override the application properties of the SatCon Properties dialog box. See section **13.0 SatCon Properties Override Switches** for more information.

There are three sections to a conversion parameter switch. The first section is the switch designator. This section denotes a switch on the command line and is one character only. The two valid characters are "**/**" or "**-**". The next section is the switch name. This section is also one character and is defined by the first character inside the **[ ]** brackets of the switch definition. The rest of the characters inside the **[ ]** brackets define the switch arguments. These arguments can be text ("**a**") or numeric ("**#**") based characters. Any other characters in the argument section of the switch definition must be written as is. Switches must be separated by spaces on the command line cannot contain spaces themselves. Command line switches are not case sensitive and can be written in any order. See section **11.0 Using SatCon from the command line** for more information on the placement of command line switches.

Here are a few examples of how switches would be written on the command line:

```
-d* /x /p4 -w15 /l10-2
```

Output Field Delimiter:

[da]   This switch defines the field spacing delimiter used to separate all *Output headings* and *values* in the *OutFile*. If the argument value is a "**t**", TAB characters will be used. By default, all generated fields are delimited by TAB characters. If the argument value is an "**s**", a SPACE character will be used. Otherwise, *SatCon* will use the argument value as the delimiter. Care should be taken not to use delimiter character(s) that would appear in an output field. For example, if you plan to use the **[w#]** switch, avoid using the SPACE character for a delimiter.

Conversion Type:

[x]   This switch enables extra *Output heading* information to be added to the *OutFile*. This information may be useful for future reference or if further processing is to be done to the file beyond *SatCon*. The following example shows this extra information for an *Instrument conversion*, which appears at the beginning of the *OutFile*:

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```
Instrument       InsFile        LogFile         Fitted...
SATPRO0001   pro001f.cal     test.raw               NO...

    Index         Lu(406)        Lu(412)         Lu(435)...
              uW/cm2/nm/sr  uW/cm2/nm/sr  uW/cm2/nm/sr...
```

The first row indicates heading names for a number of significant parameters specified for the conversion. The second row indicates the values for these headings. During a *Header conversion*, **Instrument** will be replaced with **Header** and the only other heading will be **LogFile** as shown below:

```
Header          LogFile
SATHDR      test.raw
```

Instrument/Header	The name of the instrument or data source that to be converted or, if **Header** appears, the type of header records.
InsFile	The *InsFile* used in the conversion. Only the file name without the path will appear.
LogFile	The *LogFile* used in the conversion. Only the file name without the path will appear.
Fitted	Specifies whether or not the calibration coefficients are applied to the conversion (**[ca]** switch).
Immersed	Specifies whether or not the immersion coefficients are applied to the conversion (**[ca]** switch with "**i**" argument).
Hex	Specifies whether or not the *Output values* are in hexadecimal format (**[h]** switch).
CheckSum	Specifies whether or not Check Sum error checking is enabled for the conversion (**[ea]** switch).
TimeTags	Specifies whether or not time tag processing is enabled for the conversion (**[ta]** switch).
F-TimeTags	Specifies whether or not time tags are processed into a readable form (**[ta]** switch with "**f**" argument).

The third row indicates the names of all the sensors converted. If this switch were not specified, this row would be the only one that appears. However, when this switch is specified, an "**Index**" heading is added to the beginning of the row. The "**Index**" column indexes each frame that is processed. If conversion subsampling is enabled (**[l#-#]** switch), the indexes will reflect what frames are skipped.

The next row gives the units for each sensor listed in the row above. The first value is always blank for the "**Index**" column. The units field will also be blank if a sensor does not have any units specified.

[ca]   This switch will cause *SatCon* to process (or fit) all *Output values* into their calibrated (or physical) form. Otherwise, *SatCon* will only output the raw data values of each sensor. If you use the "**i**" argument value, *SatCon* will apply the immersion coefficient to each optical sensor. Optical sensors are defined in the *InsFile* by OPTICX Fit Types. Applying the immersion coefficient means that the instrument's optical sensors were immersed in water. Otherwise, it is assumed that the instrument was operated in air.

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[ta]   If you specified the **Append Time Tag** Logging Option in Satlantic SatView for the *LogFile*, use this switch to process the appended time tag information for each frame.

When this switch is used, two additional *Output headings* (columns) will be added to the *OutFile* labeled "**DATETAG**" and "**TIMETAG2**". *SatCon* will assume that an additional seven bytes have been appended to each frame by the logging software. These seven bytes indicate when the frame was read by the logging computer. If you use the "**f**" argument value, the time tag outputs will be formatted into a readable form. However, time tag formatting will be ignored if the **[s]** switch is specified.

The "**DATETAG**" column will show the date the frame was logged in one of the following formats:

```
YYYYDDD
   or
YYYY-DDD
```

The first format is without the "**f**" argument value. The "YYYY" section represents the year. The next section, "DDD", represents the Julian Day, where January 1 is day 001.

The "**TIMETAG2**"column will show the time of day the frame was logged in one of the following formats:

```
HH.H
   or
HH:MM:SS.mmm
```

The first format is without the "**f**" argument value. The output will be in decimal hours if the "**f**" argument value is not used. The "HH", represents hours, "MM" for minutes, and "SS" for seconds. The "mmm" section gives millisecond resolution for the time tag.

Output Format:

[fa]   This switch can be used to specify the format for floating point *Output values*. Floating point values appear in the *OutFile* as numbers with a decimal point somewhere in the field. There are three choices available, defined by the switch argument.

The "**Decimal**" type, designated by the "**f**" argument value, uses the decimal form **[-]dddd.dddd**, where **dddd** is one or more decimal digits. The number of digits before the decimal point depends on the magnitude of the number, and the number of digits after the decimal point depends on the requested precision (**[p#]** switch). This type is the default.

The "**Exponential**" type, designated by the "**e**" argument value, uses the exponential form **[-]d.dddd e [sign]ddd** where **d** is a single decimal digit, **dddd** is one or more decimal digits, **ddd** is exactly three decimal digits, and **sign** is + or -.

The "**Best Fit**" type, designated by the "**g**" argument value, uses whichever one of the first two types that is more compact for the given value and precision (the **[p#]** switch). The exponential format is used only when the exponent of the value is less than -4 or greater than or equal to the precision. Trailing zeros are truncated.

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[p#]   This switch can be used to specify the precision for floating point *Output values*. Floating point values appear in the *OutFile* as numbers with a decimal point somewhere in the field. The meaning of the precision specification depends on the **[fa]** switch. The argument value that specifies the precision must be a nonnegative decimal integer from 1 to 32767.

If the "**Decimal**" or "**Exponential**" output format has been specified, the precision value specifies the number of digits after the decimal point. One digit will always appears before the decimal point. The value is rounded to the appropriate number of digits. If the **[fa]** switch is used with the "**g**" argument (or "**Best Fit**" type), the precision specifies the maximum number of significant digits. The default precision is 10.

[w#]   This switch enables width specifications for all *Output headings* and *values* in the *OutFile*. By using this switch, the output fields of the *OutFile* should be uniformly distributed. The width argument is a nonnegative decimal integer from 1 to 32767 that controls the minimum number of characters printed. If the number of characters in the output field is less than the specified width, blanks (SPACE characters) are added until the minimum width is reached. If the **[h]** switch is used, zeros are added to the left of the *Output values* until the minimum width is reached. If a *Header conversion* was specified, blanks will be added on the right side, left aligning all *Output headings* and *values*. Otherwise, blanks will be added on the left side, right aligning all *Output headings* and *values*.

The width specification will never cause an output field to be truncated. If the number of characters in the field is greater than the specified width, or if this switch is not used, all characters will be output (subject to the precision **[p#]** switch).

[n]   This switch can be used to **not include** frames in the *OutFile* that have sensor conversion errors that would normally be output as a Sensor Error String for the sensor value.

[s]   This switch can be used to suppress non-numerical *Output values*. If a converted sensor value is a non-numerical character string, the *Output value* for the sensor will be blank. This includes possible Sensor Error Strings as well. This switch ensures that any processing software used on *SatCon's OutFile* will only have to deal with numerical data.

[h]   If the **[ca]** and **[s]** switches are not specified, this switch will enable hexadecimal formatted *Output values* for all converted numerical sensor data. If a sensor's Fit Type is OPTIC1, the gain range bit will be separated by a "**:**" character.

Error Checking:

[ea]   This switch enables error checking for all processed frames during a conversion. There are two types of error checking available, which are defined by the switch argument.

The "**Frame Counter**" type is specified by "**f**" argument value to enable Frame Counter error checking. If a FRAME COUNTER sensor is found in the *InsFile*, *SatCon* will monitor for any jumps is the counter value.

The "**Check Sum**" type is specified by the "**c**" argument value to enable Check Sum error checking. If a CHECK SUM sensor is found in the *InsFile*, *SatCon* will perform a checksum calculation on the frame and output the resultant value to the *OutFile*. The *Output value* should be "0" to indicate no error. Check Sum error checking does not apply to NMEA_CHECKSUM sensors.

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You can combine the "**f**" and "**c**" argument values in any order to enable both types of error checking. The number of errors encountered during the conversion will be written to the Conversion Log. By default, no error checking is performed.

Conversion Limit:

[l#-#]   This switch applies conversion limits on the number of frames *SatCon* can process from the *LogFile*. The argument values must specify a nonnegative decimal integer from 1 to 32767. The first argument specifies a "**Conversion Limit**" on the maximum number of frames to process. *SatCon* will process the whole *LogFile* if this value is too large or this argument is not used. The second argument specifies a "**Subsampling Rate**". *SatCon* will process one out of every X amount of frames, where X is the value of this argument. By default, *SatCon* will not subsample the *LogFile* (or the subsampling rate is 1). Both of these argument values are optional. For example, if you only want to specify a subsampling rate, leave out the first argument.

Other:

[b#]   This switch specifies the size of the data buffer used when reading from the *LogFile*. The argument value must specify a nonnegative decimal integer from 1024 to 65535, representing the size of the buffer in bytes. The default buffer size is 8KB or 8192 bytes.

13.0   SatCon Properties Override Switches

Override switches are command line switches used to override the application properties of the SatCon Properties dialog box. Although override switches are used in much the same manner as conversion parameter switches, these switches differ slightly in functionality and appearance from their conversion parameter counterparts. See section *12.0 Command Line Switches* for more information on conversion parameter switches.

If an override switch is used, the corresponding *SatCon* property is overridden. An overridden property is only applicable to the current conversion and is not saved to your system registry. If an override switch is not specified, the *SatCon* property last saved to the registry is used. See section *16.0 SatCon Properties dialog box* for more information on *SatCon* properties.

As with conversion parameter switches, there are three sections to an override switch. The first section is the switch designator. This section denotes a switch on the command line and is one character only. The two valid characters are "**/**" or "**-**". The next section is the switch name. This section is the series of characters inside the **[ ]** brackets of the switch definition. Override switches also have argument values. These arguments are always preceded by a "**=**" character and are always text based characters. Switches must be separated by spaces on the command line but cannot contain spaces themselves. Command line switches are not case sensitive and can be written in any order. This means that conversion parameter and override switches can be mixed together on the command line. See section *11.0 Using SatCon from the command line* for more information on the placement of command line switches.

Here are a few examples of how override switches would be written on the command line:

```
-OverWrite=yes /EW=n /cl=nul
```

[OverWrite]   If desired, the short form of the switch name, **[OW]**, is also acceptable. This switch overrides the state of the **Prompt to overwrite existing output files** property. If the switch argument is "**yes**" or "**y**", *SatCon* will overwrite the next *OutFile* if it already exists for the next conversion. If the switch argument is "**no**" or "**n**", a dialog box will appear asking

permission to overwrite the next *OutFile* if it already exists. Any other argument values will invalidate the switch.

[EndWindow]   If desired, the short form of the switch name, **[EW]**, is also acceptable. This switch overrides the state of the **Dismiss Conversion Progress window after conversion complete** property. If the switch argument is "**yes**" or "**y**", *SatCon* will automatically dismiss the *SatCon Conversion window* after the conversion has completed. If the conversion is aborted, the window will not automatically dismiss itself, regardless of this property. If the switch argument is "**no**" or "**n**", the *SatCon Conversion window* will not be automatically dismissed. Any other argument values will invalidate the switch.

[ConversionLog]   If desired, the short form of the switch name, **[CL]**, is also acceptable. This switch overrides the state of the **Maintain a conversion log file** property. The switch argument must specify the full or relative path to the conversion log file. This file will be a text record of the current conversion log. If no conversion log file is to be maintained, the switch argument must be "**nul**". See section *15.0 The Conversion Log* for more information.

14.0   Sensor Error Strings

If *SatCon* encounters an error while converting a sensor value, the *Output value* of the *OutFile* will contain an Error string. An Error string refers to an error number identifying the type of error that occurred. Error string output is suppressed if the **[s]** command line switch is used. The error descriptions are as follows:

Error 0   Unknown sensor error.

Error 1   The sensor's Data Type is incompatible with the type of output requested.

Error 2   The sensor's Field Length extends beyond the boundaries of the frame.

Error 3   The sensor's gain range bit is invalid. This error only applies to OPTIC1 Fit Types.

Error 4   The sensor's Fit Type is incompatible with the type of output requested.

Error 5   An invalid frame was used for the sensor value.

Error 6   The sensor's character string based output could not be retrieved.

Error 7   The sensor's floating point number conversion was invalid or not finite.

Error 8   The sensor's value was not delimited in the frame. This error only applies to variable length frames.

15.0   The Conversion Log

During every *SatCon* conversion, an event log is maintained. If more than one conversion takes place in a session, the conversion log will be continually appended. This log contains information on when significant events occurred and why. Important statistical information about the conversion is also maintained. If a problem occurs during a conversion, the conversion log is a good place to look to find out what happened. If you are familiar with Satlantic SatView, you will notice that the conversion log is very similar to SatView's session log.

Each entry follows a specific format. An event time stamp is inserted at the beginning of the entry using the following template:

```
YYYY-MM-DD  HH:MM.SS>
```

The "YYYY" section represents the year. The next section, "MM", represents the month, and "DD" the day. The rest of the time stamp represents hours, minutes, and seconds respectively. Following the time stamp is the text description of the event. Some events have more than one line of text. In that case, the additional lines are indented to show that they are all part of the same event.

If you are using *SatCon* from the application window, you can view conversion log events as they occur by opening the Conversion Log Output window. You can also have *SatCon* save the conversion log to a file with the **Maintain a conversion log file** option of the SatCon Properties dialog box.

16.0   SatCon Properties dialog box

SatCon properties are application settings that can be saved to your system registry when the application exits. Most of these properties are applicable when *SatCon* is used with the application window and when a *SatCon* conversion is invoked from the command line.
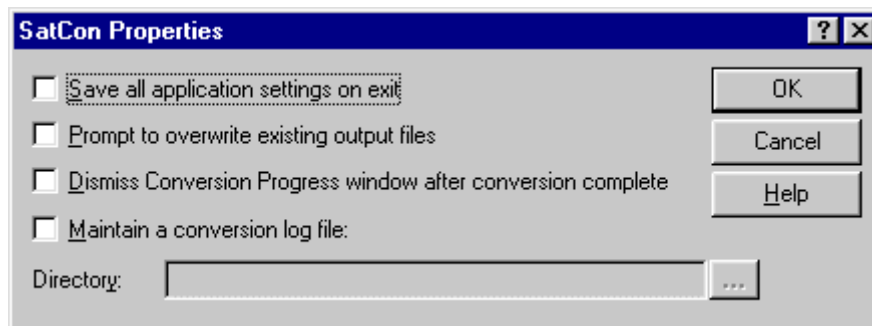

Figure 3

The **Save all application settings on exit** property applies only when *SatCon* displays the application window. If this property is set, all settings relevant to the application window will be saved to your system registry when *SatCon* is closed. This includes the Conversion Parameters, File List Properties, and Output File Naming settings. When *SatCon* first opens, the most recently saved settings will be retrieved.

Enable the **Prompt to overwrite existing output files** option to make *SatCon* check if the next *OutFile* exists when a conversion begins. If it does, a dialog box will appear asking permission to overwrite the file. Otherwise, *SatCon* will always overwrite the output file if it already exists.

If the **Dismiss Conversion Progress window after conversion complete** option is enabled, *SatCon* will automatically dismiss the *SatCon Conversion window* after the conversion has completed. If the conversion is aborted, the window will not automatically dismiss itself, regardless of this property.

Enable the **Maintain a conversion log file** option if you want *SatCon* to maintain a copy of the conversion log in a text file for the current session. The file name will be "SatCon.log". If there is more than one instance of *SatCon* running, the file names will be " SatCon2.log", " SatCon3.log", up to the maximum " SatCon9.log". These files are only valid for the current session, so once you start another session, these files will be overwritten. See section *15.0 The Conversion Log* for more information.

Most of these properties can be overridden for a *SatCon* conversion invoked from the command line. See section *13.0 SatCon Properties Override Switches* for more information.

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17.0   Conversion Parameters dialog box

Every conversion parameter has a command line switch counterpart. See section *12.0 Command Line Switches* for more detailed descriptions of all the parameters found in this dialog box. The descriptions provided below are brief but they all refer to the appropriate switch if further information is needed.
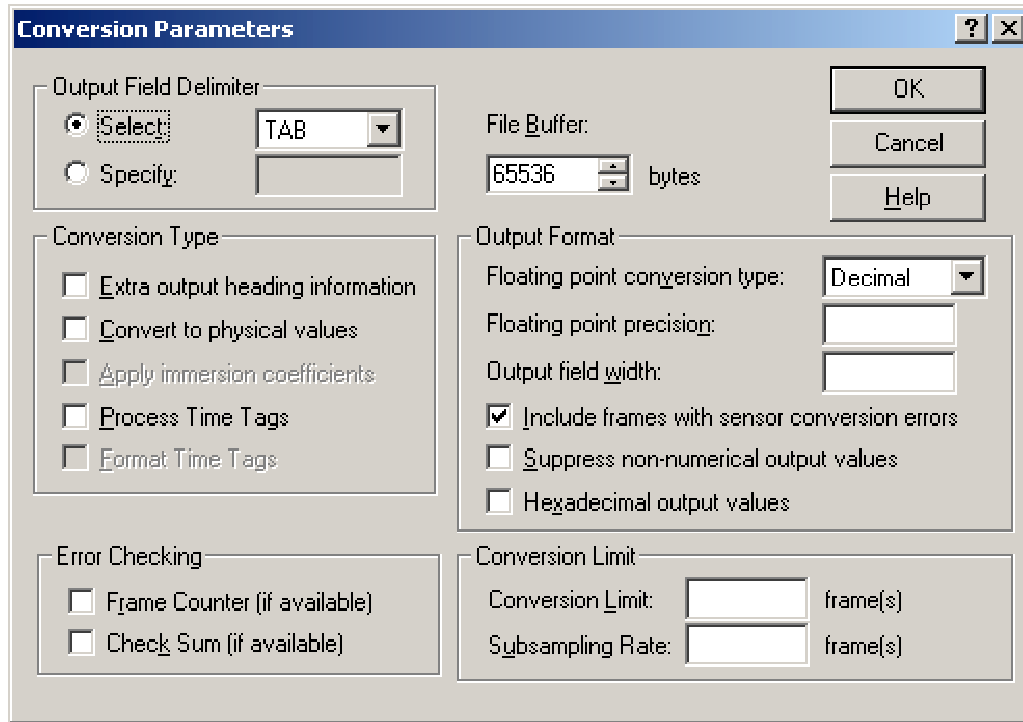

Figure 4

SatCon's conversion parameters are used during the conversion process to format the *OutFile*. These parameters are numerous and can affect nearly every aspect of the conversion. It is important that you set them correctly before the conversion begins. To make this process easier, most parameters have been grouped together according to their behavior. Each grouping is labeled appropriately for easy reference. They are:

- Output Field Delimiter
- Conversion Type
- Output Format
- Error Checking
- Conversion Limit

The **File Buffer** parameter, which is not part of any grouping, specifies the size of the data buffer used when reading from the *LogFile*. See the **[b#]** command line switch for more information.

If you have enabled the *Header conversion* mode with the Header command, most of the conversion parameters will be disabled. This is done because only a limited number of parameters can be used during a *Header conversion*.

If the **Save all application settings on exit** property was specified in the SatCon Properties dialog box, the conversion parameters displayed in this dialog box will all be saved to your system registry. Any parameters specified with the command line, however, cannot be saved.

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17.1   Output Field Delimiter

The Output Field Delimiter section specifies the character(s) to be used in the *OutFile* to separate each *Output heading* and *value*. You can **Select** a delimiter from the drop down list or **Specify** a delimiter string using the edit box.

For more information, see the **[da]** command line switch.

17.2   Conversion Type

The Conversion Type section specifies how *SatCon* will convert the *LogFile*. You can also use this section to adjust the *Output heading* information to be generated for the *OutFile*. By enabling the **Extra output heading information** parameter, *SatCon* will write additional *Output headings* to the beginning of the *OutFile*. See the **[x]** command line switch for more information.

The **Convert to physical values** parameter will cause *SatCon* to convert all *Output values* to their calibrated (or physical) format. See the **[ca]** command line switch for more information. If the **Apply immersion coefficients** parameter is also enabled, the immersion coefficient for each optical sensor will be used in the conversion. This is the same as using the **[ca]** switch with an "i" argument value.

If Time Tags were appended to the end of the instrument frames recorded in the *LogFile*, use the **Process Time Tags** parameter to process this information. See the **[ta]** command line switch for more information. If you want to format the Time Tag information to a more readable form, enable the **Format Time Tags** parameter. This is the same as using the **[ta]** switch with an "f" argument value.

17.3   Output Format

The Output Format section specifies the format *SatCon* will use when creating *Output values* for the *OutFile*. You can specify the **Floating point conversion type** with the drop down list. The three choices available control whether a floating point *Output value* will be written in decimal or exponential form. See the **[fa]** command line switch for more information. You can specify the precision of these floating point *Output values* with the **Floating point precision** edit box. See the **[p#]** switch for more information.

You can also specify the width of all *Output headings* and *values* with the **Output field width** edit box. This should keep the columns of the *OutFile* evenly distributed. See the **[w#]** switch for more information.

If you want all frames that have sensor errors during conversion to not be output, disable the **Include frames with sensor conversion errors** parameter. See the **[n]** command line switch for more information. If you want all *Output values* to only be numerical in nature, i.e. no text based information, enable the **Suppress non-numerical output values** parameter. See the **[s]** command line switch for more information. If you want all *Output values* to be in hexadecimal form, enable the **Hexadecimal output values** parameter. See the **[h]** command line switch for more information.

17.4   Error Checking

The Error Checking section allows *SatCon* to perform error checking on the *LogFile* in much the same way as Satlantic SatView performs error checking on incoming instrument telemetry. You can specify **Frame Counter** and **Check Sum** error checking. See the **[ea]** command line switch for more information.

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17.5   Conversion Limit

The Conversion Limit section allows *SatCon* to limit the number of frames to convert from the *LogFile*. You can specify a **Conversion Limit** and a **Subsampling Rate**. See the **[l#-#]** command line switch for more information.

18.0   Output File Naming dialog box

The File Naming Modes defined by this dialog box make the process of naming your *OutFile* easier. You can specify a File Naming Mode for each conversion mode with the **File Naming for** drop down list. The file names specified here do not include the full path. When the *OutFile* is generated, the file is placed in the directory specified for the Output Files List. If a file name does not contain a file extension, the file extension specified by this dialog box will be appended.
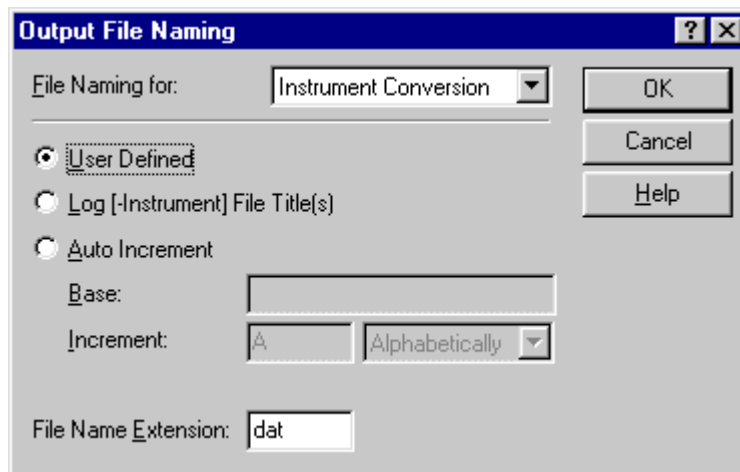

Figure 5

There are three File Naming Modes available:

User Defined:

> This mode allows you to name your *OutFile* manually. Simply write the name of file in the Next Output File edit box of the main display.

Log [-Instrument] File Title(s):

> With this mode, *SatCon* automatically names your *OutFile* for you. The format is based on the *LogFile* name and, if an *Instrument conversion* is to be made, the name of the *InsFile* as well. The output file title is the *LogFile* title plus the *InsFile* title, separated by a "-" character. File titles are the relative file names without the file extension. The *OutFile* will be displayed in a read-only format in the Next Output File edit box of the main display.

> For example, let the *LogFile* be "c:\LogFiles\Log1.raw" and your *InsFile* be "c:\InsFiles\Ins.cal". The *OutFile* title will then be "Log1-Ins".

Auto Increment:

> This File Naming Mode will automatically name your *OutFile* based on a template of your design. This is similar to the Auto Cast feature in Satlantic SatView. The template format is the file Base plus the Increment. The Base is simply any character sequence of your

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choice designating a conversion series. The Increment depends on the Increment type. Use a single letter if the Increment type is **Alphabetically** or a nonnegative decimal integer from 0 to 999 if the Increment type is **Numerically**.

For example, let the Base be "Conv1" and the Increment be "A". The Increment type would then have to be **Alphabetically**. The first *OutFile* title will then be "Conv1A", the next will be Conv1B", and so on until the letter "Z" is used. If the Increment type is **Numerically**, the last three letters of the file name will be incremented until "999" is reached.

If the **Save all application settings on exit** property was specified in the SatCon Properties dialog box, the Output File Naming settings displayed in this dialog box will all be saved to your system registry.

19.0   File List Properties dialog box

This dialog box is used to define the behavior of the File lists in the main display. The purpose of using File lists is to make the conversion file selection process easier. To perform a conversion, two to three files are needed. Rather than type the full path name for each file out manually, as is done with a command line conversion, File lists make file selection as easy as clicking your mouse.
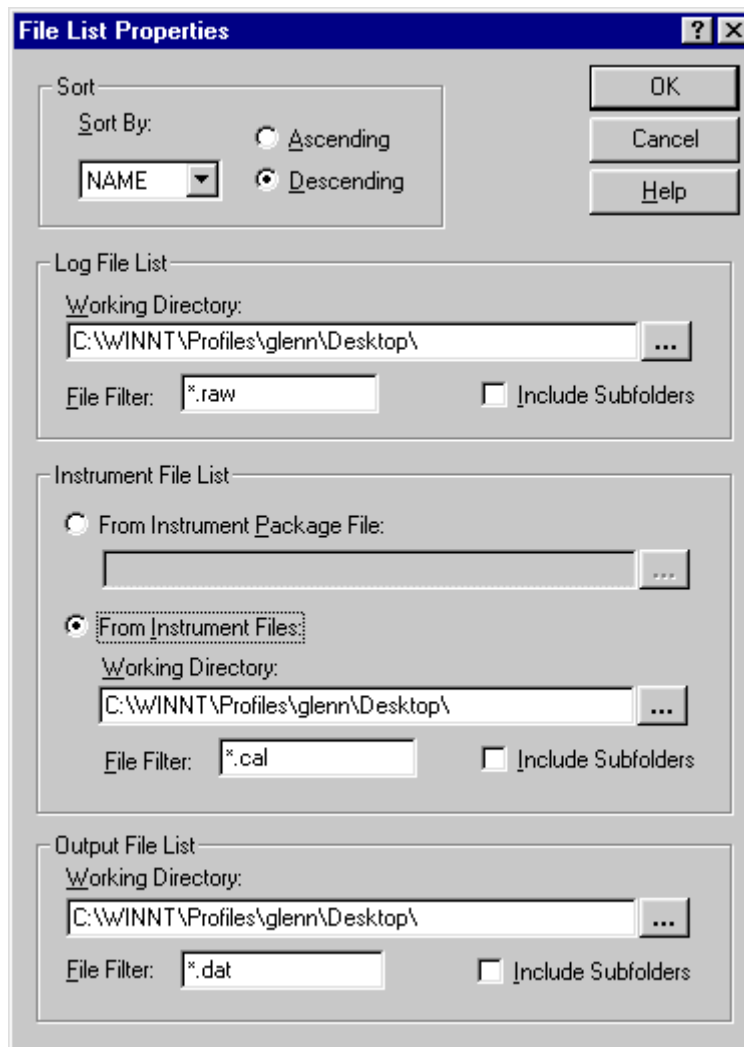
Figure 6

From this dialog box, you can specify properties for each File List. These properties specify where to look for files (**Working Directory** and **Include Subfolders**) and what files to list (**File Filter**). For the Instrument File List, there is the option to select an Instrument Package file as the source of the Instrument files instead of using a directory containing Instrument Files. The method used to sort the files (**Sort By** and **Ascending/Descending**) for all File Lists can also be specified.

If the **Save all application settings on exit** property was specified in the SatCon Properties dialog box, the File List Properties displayed in this dialog box will all be saved to your system registry.