



SEA QNX 4 Utilities

Revision date: January 25, 2016 11:08 am



SEA Photon Utilities

This book contains the instructions on operating graphical SEA utilities that the user can interact with the mouse and keyboard. These utilities include ImageView, InputOutput, Logger, ProbeGen, RawView, SeaPower, SeaTool, SeaWcm, Security, SimSPP, SoftTool, Units, and others.



SEA Command Line Utilities

This book contains instructions on using the available SEA command line utilities. These utilities are available to help the user perform different tasks.

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SEA Command Line Utilities

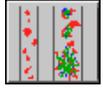
bc635	79
cnvtbls	80
e00totgt	82
halt	83
hog	84
netrcv	85
netsend	86
nettest	87
reboot	89
seadrive	90
seagpib	92
seapci	94
seaups	95
seawcm	96
sermon	98
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simcip	105
simiee	106
simint	107
simnet	108
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SEA Photon Utilities

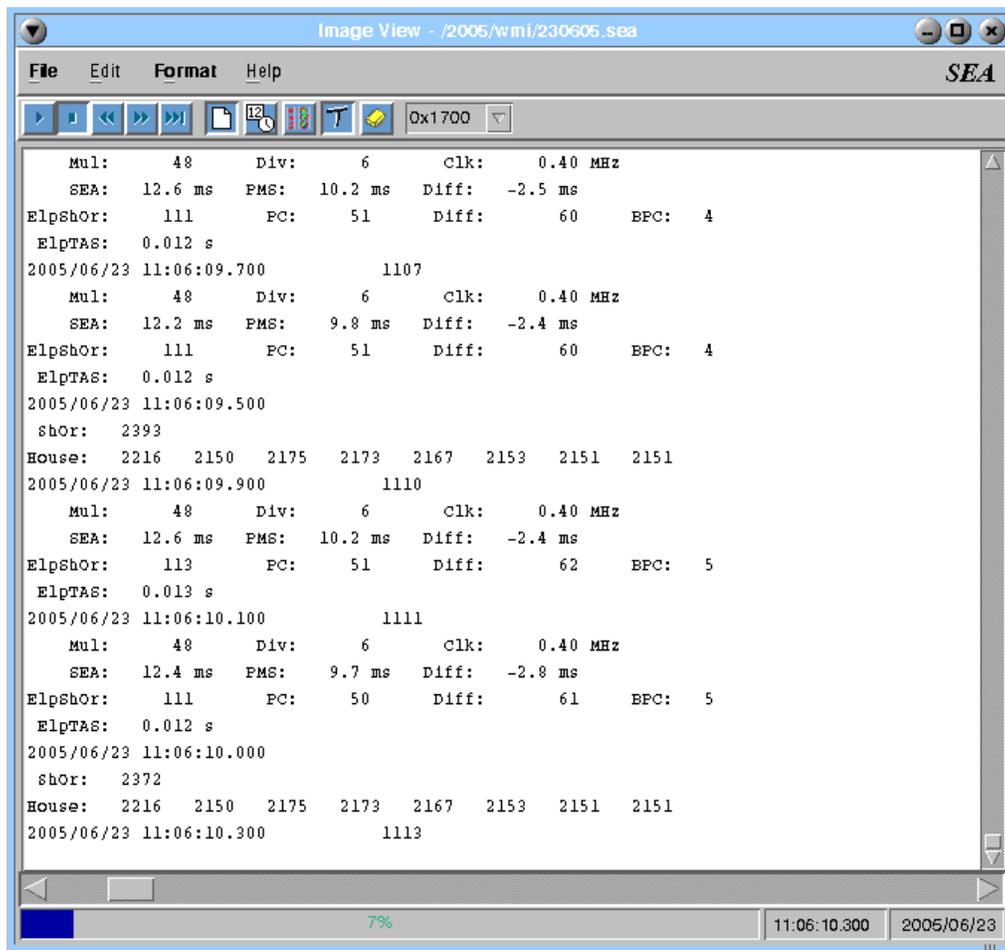
SEA Photon Utilities are a suite of applications that are available to the user to operate and maintain the M300 DAS more easily and efficiently. The following is a list of the available SEA Photon Utilities.

Utility	Description	Page
ImageView	Displays acquired images along with technical data	3
InputOutput	Reads and writes words to a specified I/O address	23
Logger	Displays error messages generated by all SEA applications	27
ProbeGen	Generates probe configuration file	31
RawView	Displays M300 binary data files in their most RAW format	35
SeaPower	Monitors and controls UPS via serial port	45
SeaTool	Tool to extract tables as well as other functions	53
SeaWsc	Wake Survey Control	55
Security	Allows the user to manage security codes	57
SimSer	Output data to serial port	61
SimSpp	Simulates the SPP probe interface to the M300	63
SoftTool	Software Tool to perform software upgrades	69
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M300 Miscellaneous Reference Index



ImageView



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Description

ImageView can be used to display particles from imaging probes. ImageView was designed to support the following imaging acquisition types: 2D Mono type, 2D Grey regular and advanced types, High Volume Particle Spectrometer (HVPS) type and the Cloud Imaging Probe (CIP) type. Users now have one software utility where they can review any of the actual images acquired by the mentioned probes and at the same time review the probe/particle specific data.

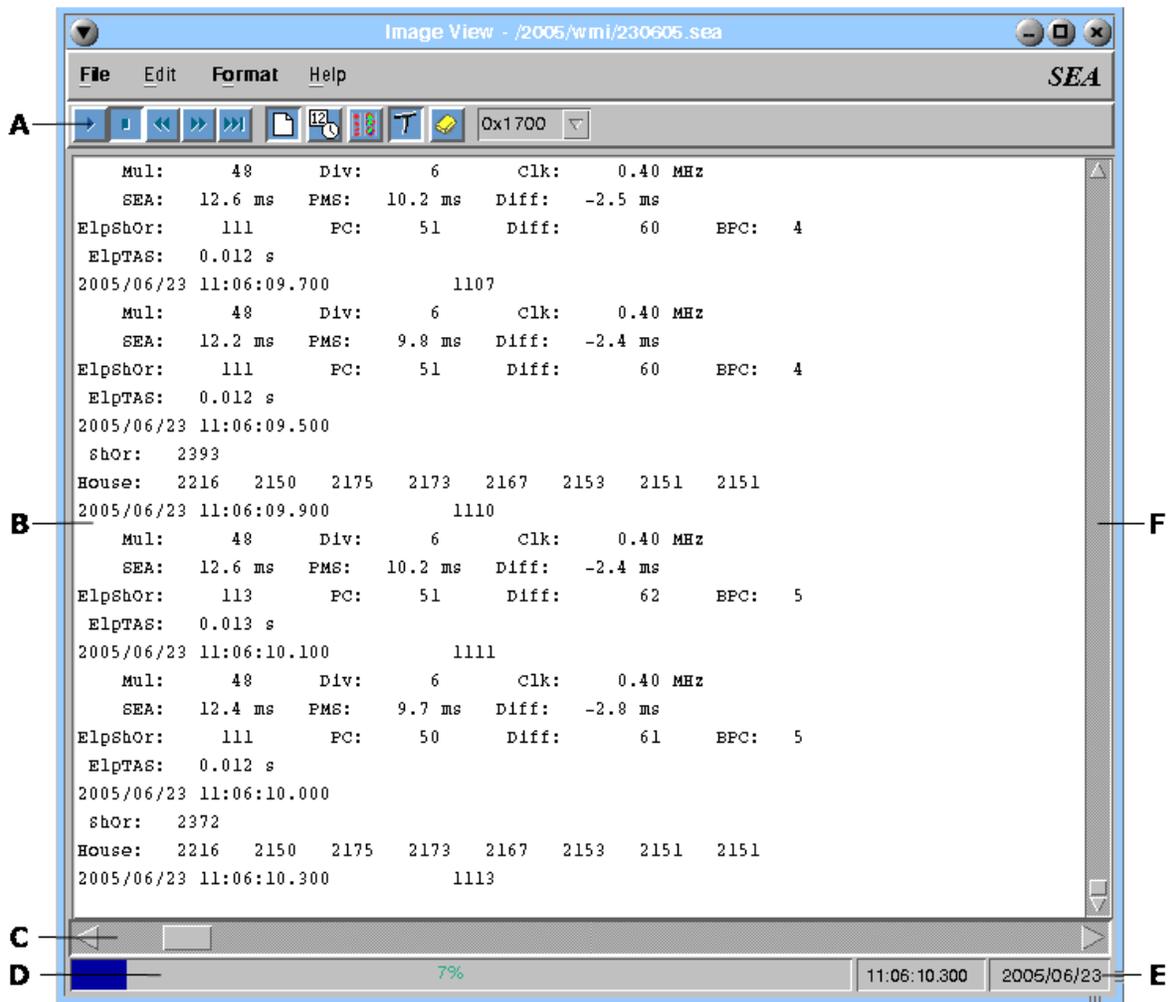
Starting ImageView

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **ImageView** icon.

In addition you can start ImageView from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**ImageView &**'.

The ImageView Window



SEA Utilities Figure 1: ImageView Window

A - Toolbar items from left to right.

Start - Begin/resume Playback.

Stop - Stop Playback (file will not rewind).

Rewind - Put file back to position zero (start of file).

Fast Forward - Rapidly advances file position (read buffers, but no action).

Next Buffer - Advances to next buffer, Playback the data and pauses.

Capture Data - Enable/disable data capturing.

Time/Date Search - Search for a time/date in current file.

Display Image Window - Open Image window.

Output Text - Enable/disable status display data.

Clean All - Erase all text inside status display.

Address Combo Box - Enter address of board for image data.

B - Status list. This display the textual output from program.

C - File position scrollbar.

D - File progress indicator.

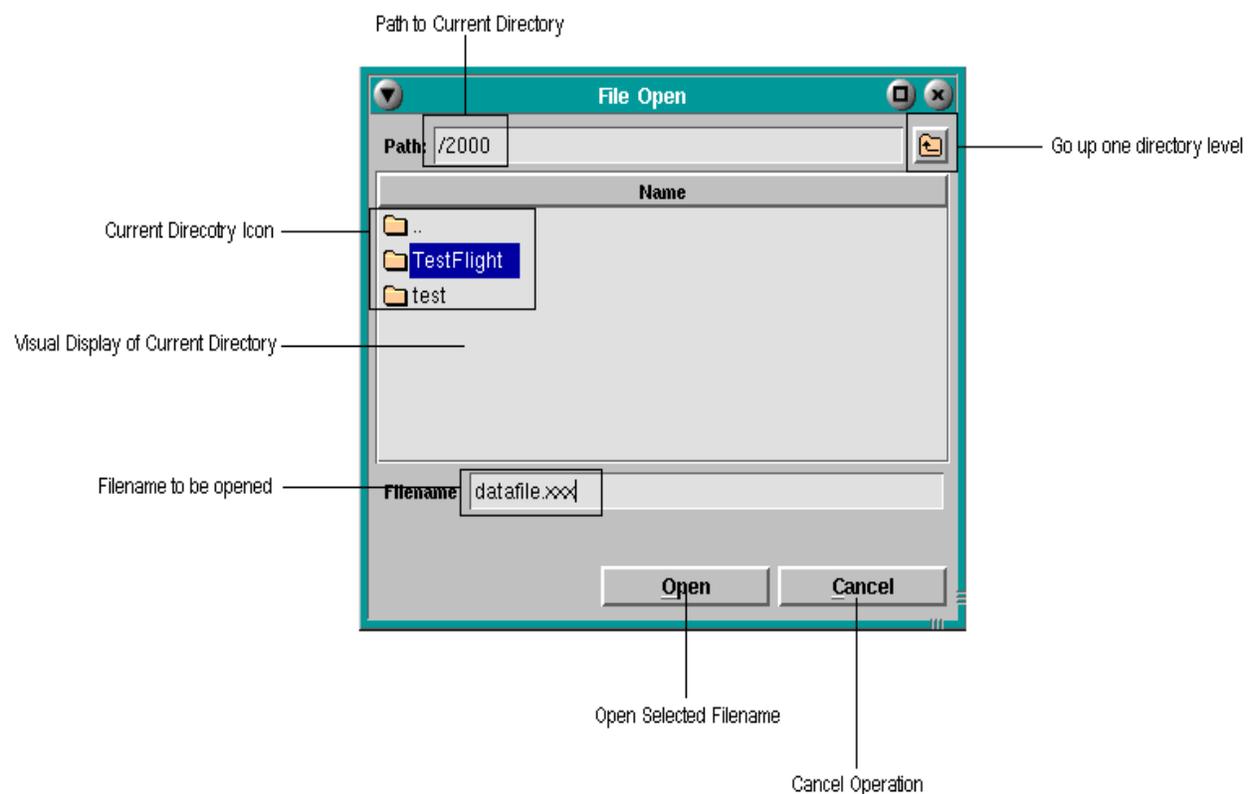
E - Current time and date.

F - Status list scrollbar.

Displaying the Image Window

1. In the toolbar, click on the **Display Image Window** button.

Opening a file



SEA Utilities Figure 2: File Open Dialog

1. In the ImageView Menu bar, click on **File**.
2. Select **Open...** (Shortcut: **Alt+F, O**).

3. In the Directory window, select which directory the file is in (if it is not already in the current directory.)
4. Select the filename you want and click on **O**pen (Alternatively, you may type in the path and the filename in the path and filename fields respectively.) If you wish to cancel this operation at any time, click on **C**ancel.

Control Data Playback

1. To begin playback, you must first ensure you open a file (See “Opening a file” on page 6). Once that is finished, playback will commence immediately if you have not pressed another button previous to opening the application.



Note: You must ensure you have selected the correct I/O address located in the Address Selection Menu (See “The ImageView Window” on page 5)

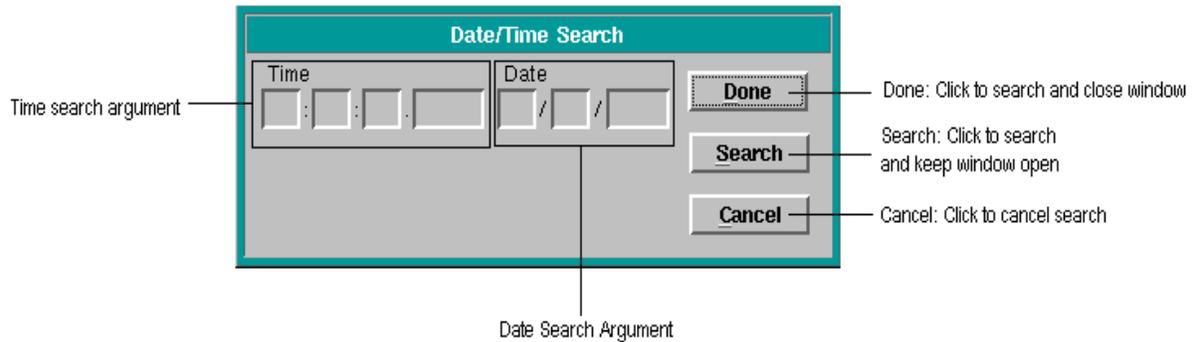
2. If **Play** is not pressed, in the **Control Group** on the toolbar, press **Play**. Again, ensure you have selected the correct I/O Address the buffer was acquired at. Below is a list of the common I/O associations:

I/O Address	Acquisition Type
0x0700...0x1F00	2D Mono
0x2300...0x2B00	2D Grey/2D Grey Advanced
0x1700...0x1F00	HVPS Data
0x7300, 0x7700	CIP Data

Table 1-1: Acquisition I/O Mappings

3. Anytime during playback, you can **Stop** the playback, **Rewind** the file to the beginning, **Fast-Forward** the file, or to advance to the next buffer immediately, press **Next-Buffer**. (See “The ImageView Window” on page 5)

Performing a Search



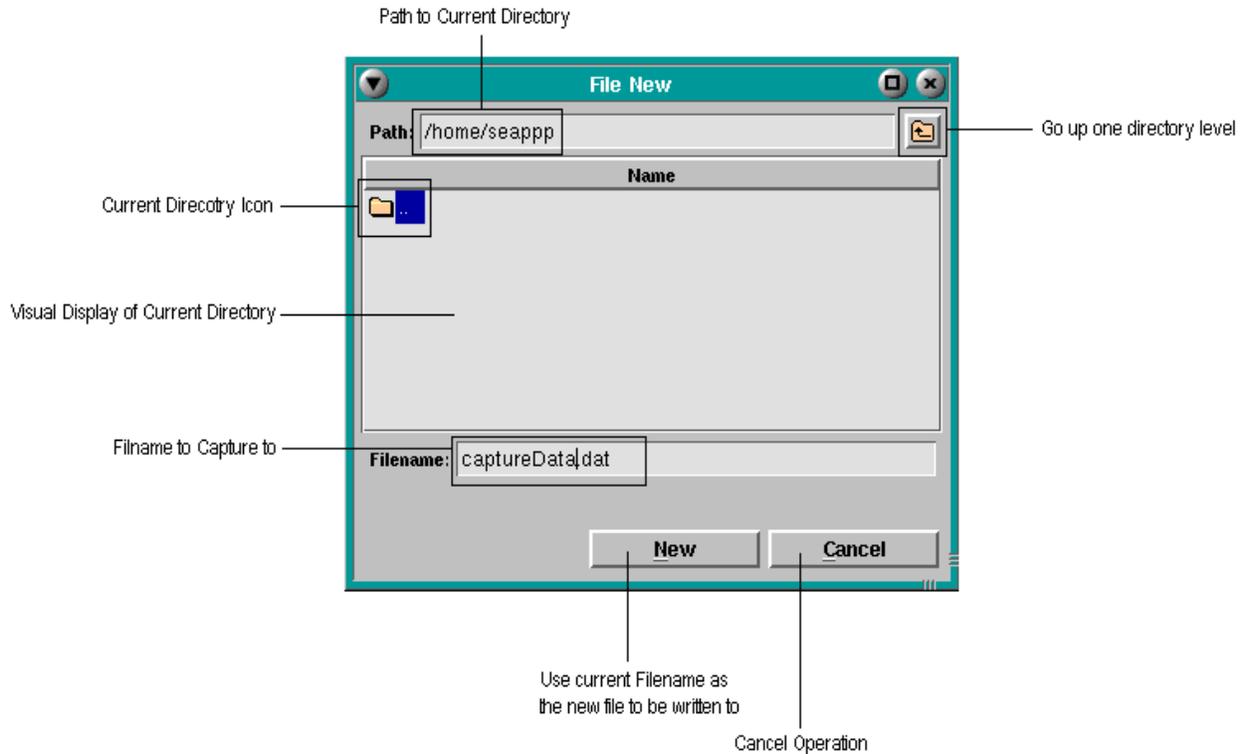
SEA Utilities Figure 2: Date/Time Search Dialog

1. In the toolbar, click on the **Search** button or in the **E**dit menu, select **F**ind Date/Time...
2. Enter either a date or time (or both) you wish to search for in the following format:
Time: hh:mm:ss.nnnn and/or **Date:** mm:dd:yyyy
3. Click on **S**earch to perform the search and keep the search dialog open. If you want to perform the search and close the dialog as well, click on **D**one.



*Note: If the time or date is not in the file, RawView will stop at the nearest location, even if the nearest location is the end of the file. Click on **C**ancel at any time to cancel the search.*

Capture acquisition data to a file



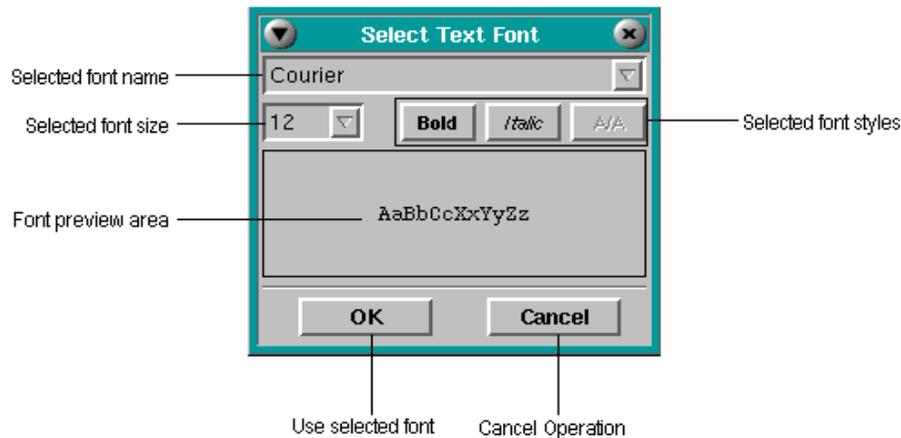
SEA Utilities Figure 3: File New Dialog

1. In the ImageView **Menu bar**, click on **F**ile
2. Select **N**ew... (Shortcut: **Alt+F, N**)
3. Select the directory and type the filename you wish to use.
4. Click on **N**ew, or to cancel the operation, click on **C**ancel.
5. Now whenever you need to capture to the file, in the RawView Toolbar, click on the **Toggle Data Capture** button.

Adjusting the File Position

1. Using the **File Position Scrollbar**, click and hold the scrollbar handle.
2. Drag the handle to the desired position and release. The file position will now be updated.
3. For more precise incrementing, use the arrows on either side of the scrollbar.

Changing the Display Font



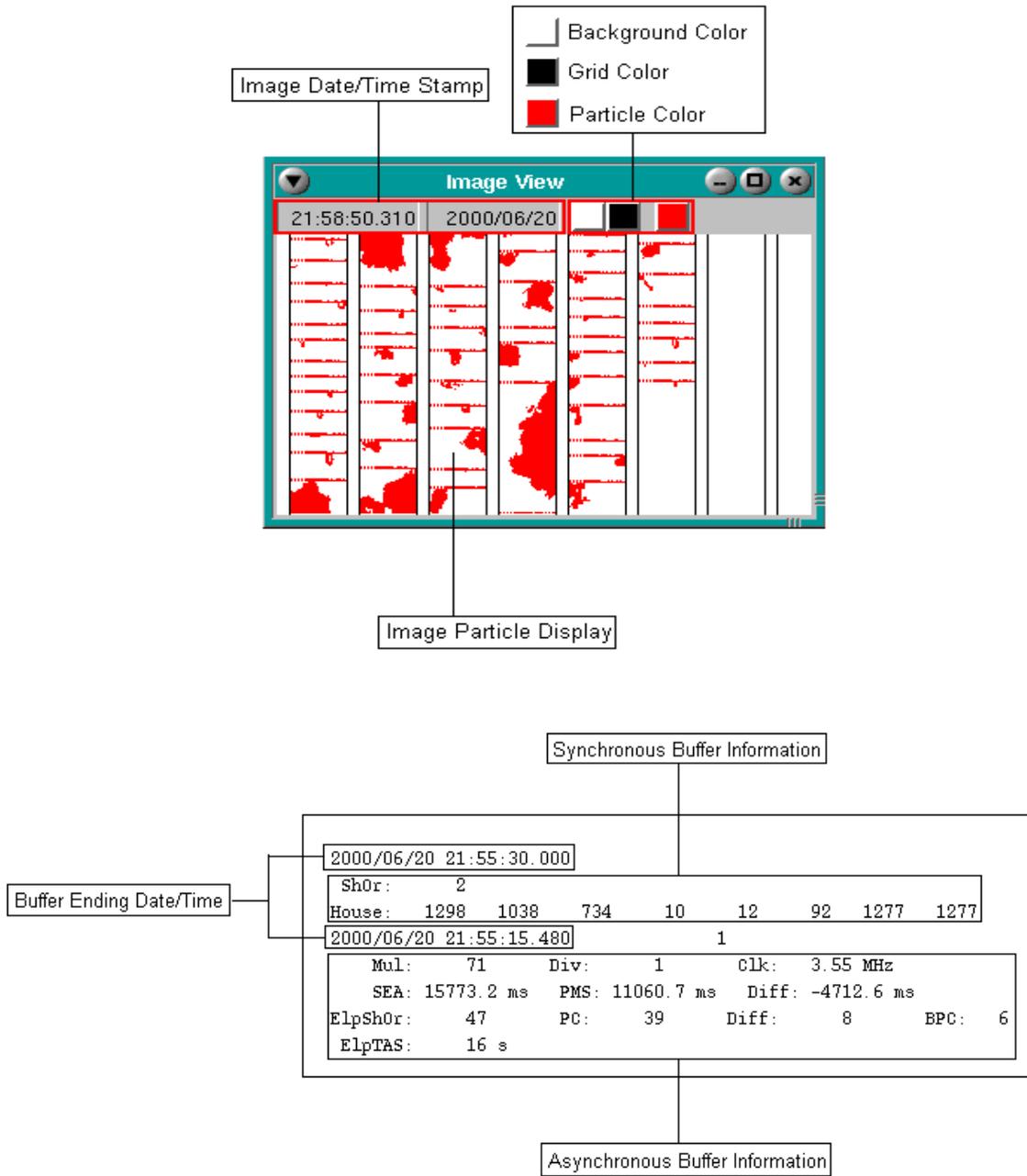
SEA Utilities Figure 4:

1. In the ImageView **Menu bar**, click on **Format**.
2. Select **Font...** (Shortcut: **Alt+O, F**)
3. From the drop down list, select the font you want.
4. From the font size list, select the size of the font.
5. Select any styles to the font (i.e. **BOLD**, *Italics*, and/or Anti-Aliasing <Only available to certain types of fonts.>)
6. Select **OK** to accept the new font or **Cancel** to cancel the font selection.

Understanding the ImageView display

ImageView is capable of displaying multiple image types. Among these are 2D Mono, 2D Grey 2D Grey Advanced, HVPS, and CIP images. We will briefly look at each image type and give a general overview of what the text based data means.

2D Mono Data



SEA Utilities Figure 5: 2D Mono Data

Time

This portion of this line is the time that acquisition stopped for this buffer. There is a beginning time and an ending time to each buffer acquired into the M300, however, only the end time is displayed. (Also see Acquisition Type 0 [Time].)

Buffer Count:

For asynchronous buffers, a count is maintained and displayed to the right of the **Time**.

ShOr

Shadow Or information. This is information from Acquisition Type 10 (2D Mono Total Shadow Or). It is the max X-dimension of the displayed particle buffer.

House

This is the house data given by Acquisition Type 11 (2D Mono House Data).

Mul

Multiply factor. This is the multiply factor given by Acquisition Type 6 (2D Mono TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to strobe image slices into the 2D Mono Probe.

Div

Divide factor. This is the divide factor given by Acquisition Type 6 (2D Mono TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to strobe image slices into the 2D Mono Probe.

Clk

True Air Speed (TAS) Clock. This is the clock frequency generated from the 2D Mono Interface card based on the Multiply and Divide factors.

SEA

This is the sum of the elapsed time of the SEA hardware.

PMS

(Particle Measuring System). This is the sum of the times in the time-bar information.

Diff

Difference between the SEA time and the PMS time.

ElpShOr

Elapsed Shadow Or. This is information from Acquisition Type 9 (2D Mono Elapsed Shadow Or). This is the number of times the shadow-or output of the probe was active while the probe was 'armed.

PC

This is the actual particle count in the displayed buffer.

Diff

This difference is between the Elapsed Shadow Or and the actual Particle Count.

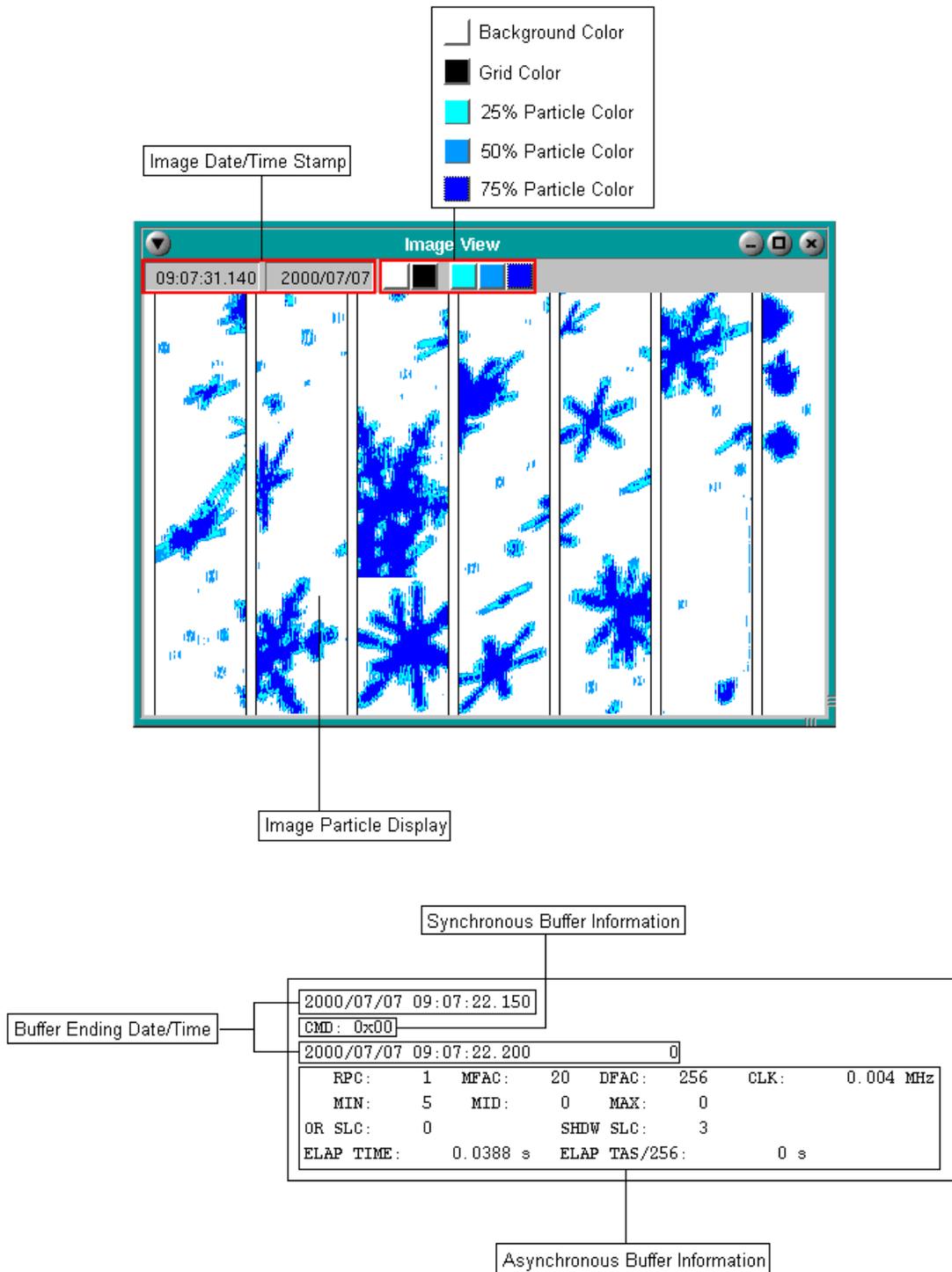
BPC

This is the actual number of blank particles (Particles with a zero slice count).

ElpTAS

This is information from Acquisition Type 8 (2D Mono Elapsed TAS/100). This is the number of true airspeed clocks divided by 100 that have passed since the time the probe was armed until the probe became full.

2D Grey Data



SEA Utilities Figure 6: 2D Grey Data

Time

This portion of this line is the time that acquisition stopped for this buffer. There is a beginning time and an ending time to each buffer acquired into the M300, however, only the end time is displayed. (Also see Acquisition Type 0 [Time].)

Buffer Count

For asynchronous buffers, a count is maintained and displayed to the right of the Time.

CMD

This is the command word sent to the 2D Grey probe during acquisition. This can be useful to determine the mode the probe was in while acquiring the data/image. Further details about the 2D Grey command word can be found at Acquisition Type 29 (Command Probe Byte).

RPC

This is the Repeated Particle Count

MFAC

Multiply factor. This is the multiply factor given by Acquisition Type 21 (2D Grey TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to strobe the 2D Grey Probe.

DFAC

Divide factor. This is the divide factor given by Acquisition Type 21 (2D Grey TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to strobe the 2D Grey Probe.

CLK

True Air Speed (TAS) Clock. This is the clock frequency generated from the 2D Grey Interface card based on the Multiply and Divide factors.

MIN

This is the number acquired by Acquisition Type 24 (2D Grey Minimum Count). This is the number of pixels that were shaded at the minimum level (corresponds to the 25% particle color in the image window) in a 2D Grey image.

MID

This is the number acquired by Acquisition Type 25 (2D Grey Middle Count). This is the number of pixels that were shaded at the middle level (corresponds to the 50% particle color in the image window) in a 2D Grey image.

MAX

This is the number acquired by Acquisition Type 26 (2D Grey Maximum Count). This is the number of pixels that were shaded at the maximum level (corresponds to the 75% particle color in the image window) in a 2D Grey image.

OR SLC

This value is given by Acquisition Type 27 (2D Grey OR Slice). This is the bit-wise 'OR' of all the slices in an image. It is a quick approximation to the horizontal (y) dimension of a variable. This also allows for a quick check whether or not the particle touches the edge.

SHDW SLC

This is the value acquired by Acquisition Type 28 (2D Grey Shadow Slice Count). It represents the number of slices that had a bit shadowed in a 2D Grey Image. It becomes useful in determining vertical dimension of an image.

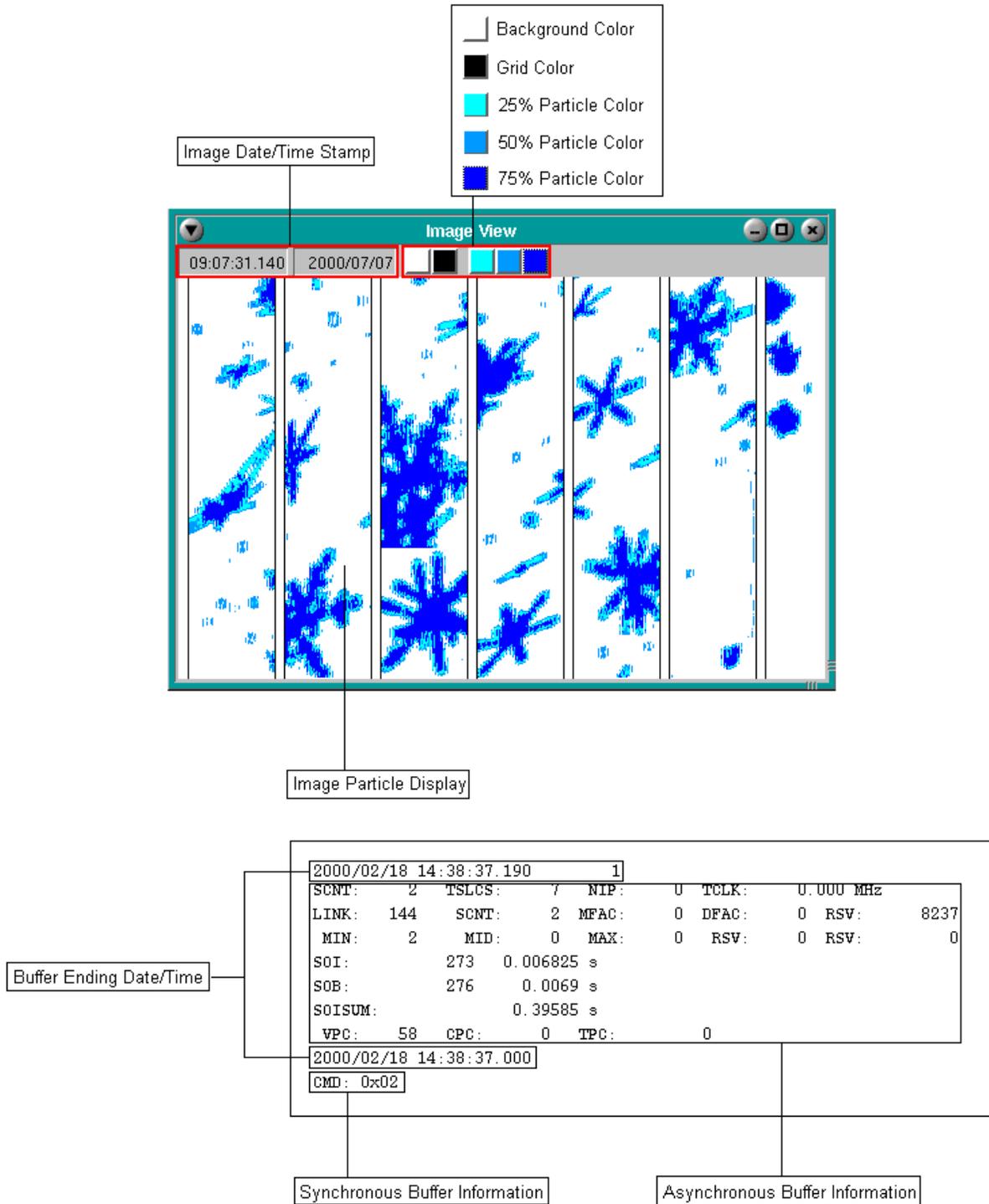
ELAP TIME

This is the number of 25 s ticks that have passed since the probe was armed and when the particle image was recorded. It is acquired by Acquisition Type 22 (2D Grey Elapsed Time)

ELAP TAS/256

This is the number of TAS clocks divided by 256 that have passed since the time the probe was armed and when the image was recorded, give in seconds. It is acquired by Acquisition Type 23 (2D Grey Elapsed TAS/256)

2D Grey Advanced Data



SEA Utilities Figure 7: 2D Grey Advanced Data

Time

This portion of this line is the time that acquisition stopped for this buffer. There is a beginning time and an ending time to each buffer acquired into the M300, however, only the end time is displayed. (Also see Acquisition Type 0 [Time].)

Buffer Count

For asynchronous buffers, a count is maintained and displayed to the right of the Time.

CMD

This is the command word sent to the 2D Grey probe during acquisition. This can be useful to determine the mode the probe was in while acquiring the data/image. Further details about the 2D Grey command word can be found at Acquisition Type 29 (Command Probe Byte).

SCNT

This is the slice count of a particular particle inside the current image.

TSLCS

This is the current amount of slices counted so far in the image.

NIP

This is the amount of non-imaged particles in the particular buffer (a particle with a slice count of zero).

TCLCK

This is the True-Airspeed Clock generated by the multiply and divide factors

LINK

This is the amount of bytes into the buffer that the next image header begins. This value represents the header size plus the image size (in bytes). (See Acquisition Type 66 for further information)

MFAC

This is the multiply factor used to generate the TCLCK frequency.

DFAC

This is the divide factor used to generate the TCLCK frequency.

RSV

These are header spaces reserved for future use.

MIN

This is the number of pixels that were shaded at the minimum level (corresponds to the 25% particle color in the image window) in a 2D Grey Advanced Image.

MID

This is the number of pixels that were shaded at the middle level (corresponds to the 50% particle color in the image window) in a 2D Grey image.

MAX

This is the number of pixels that were shaded at the maximum level (corresponds to the 75% particle color in the image window) in a 2D Grey image.

SOI

This is the elapsed time since the start of the image.

SOB

This is the elapsed time since the start of the buffer.

SOISUM

This is the sum of the elapsed image times.

VPC

This is the valid particle count of the buffer. This will be displayed with the last particle of the buffer.

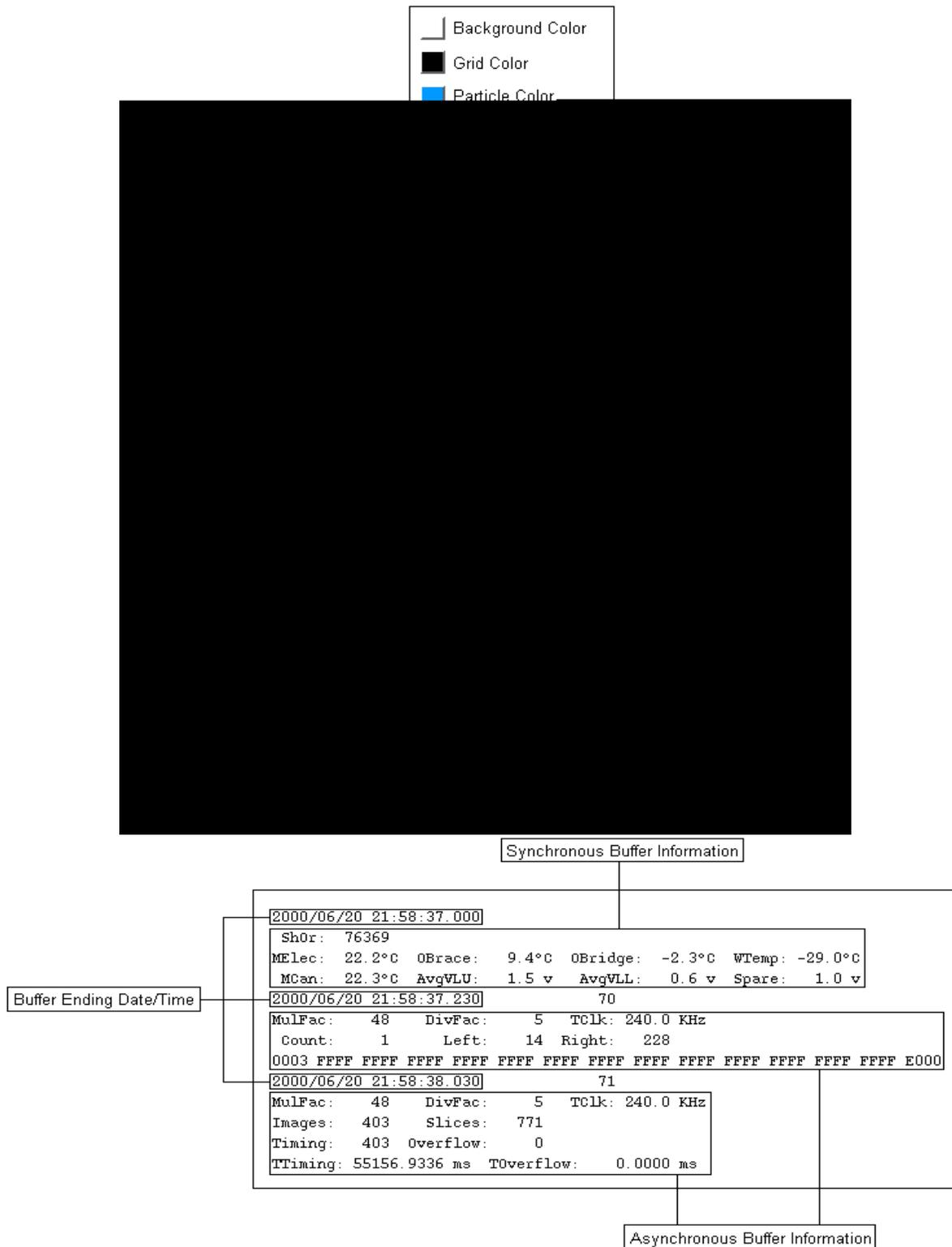
CPC

This is the corrected particle count of the buffer. This will be displayed with the last particle of the buffer.

TPC

This is the total non-imaged particle count of the buffer. This will be displayed with the last particle of the buffer.

HVPS Data



SEA Utilities Figure 8: HVPS Data

Time

This portion of this line is the time that acquisition stopped for this buffer. There is a beginning time and an ending time to each buffer acquired into the M300, however, only the end time is displayed. (Also see Acquisition Type 0 [Time].)

Buffer Count

For asynchronous buffers, a count is maintained and displayed to the right of the **Time**.

ShOr

Shadow Or information. This is information from Acquisition Type 10 (2D Mono Total Shadow Or) but is used for the HVPS probe as well. It is the max X-dimension of the displayed particle buffer.

MElec

Temperature of the main electronics inside the HVPS Probe.

OBrace

Temperature of the optical brace leading edge.

OBridge

Temperature of the receiving optics bridge

WTemp

Window temperature.

MCan

Temperature inside of the main can.

AvgVLU

Average video level - upper half of array (in volts).

AvgVLL

Average video level - lower half of array (in volts).

Spare

Spare 1 (in volts)

MulFac

Multiply factor. This is the multiply factor given by Acquisition Type 6 (2D Mono TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to control image resolution.

DivFac

Divide factor. This is the divide factor given by Acquisition Type 6 (2D Mono TAS Factors). It is used primarily in the calculation and generation of the TAS Clock needed to control image resolution.

TClk

True Air Speed (TAS) Clock (in Kilohertz). This is the clock frequency generated from the 2D Mono Interface card based on the Multiply and Divide factors.

Count (Mask Data)

Current running count of the amount of mask buffers encountered.

Left (Mask Data)

Left side pixel offset of the mask generated by the HVPS Probe.

Right (Mask Data)

Right side pixel offset of the mask generated by the HVPS Probe.

Raw Mask (*title not displayed*)

The Raw Mask is in the form of 0xn0.....0xn15 where each n is a nibble(4 bits) of a 2 byte word(16 bits). This comprises the mask generated by the HVPS probe in its raw data form.

Images

The number of images/particles in that particular buffer.

Slices

The number of slices encountered in a particular image buffer.

Timing

Actual timing count.

Overflow

Actual overflow count.

TTiming

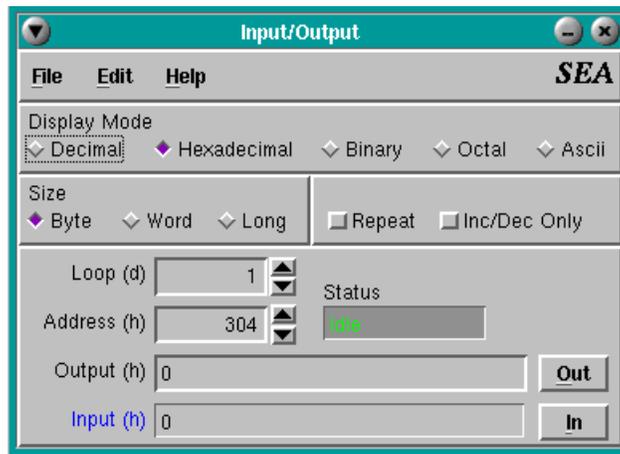
Total timing (milliseconds).

TOverflow

Total overflow (milliseconds).



InputOutput



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Description

InputOutput is another tool that was designed by SEA Engineers in order to aid in the development of the M300. Input/Output allows a user to communicate, with a memory address, individual data words, from 1 byte all the way up to 4 byte long words. The user can send or read a data word at any time. Input/Output also allows loops and repeat transmission or receive modes. Input/Output give the users the latitude to select what format the data word(s) are to be in (i.e. Decimal, Hex, Binary, Octal, and ASCII).

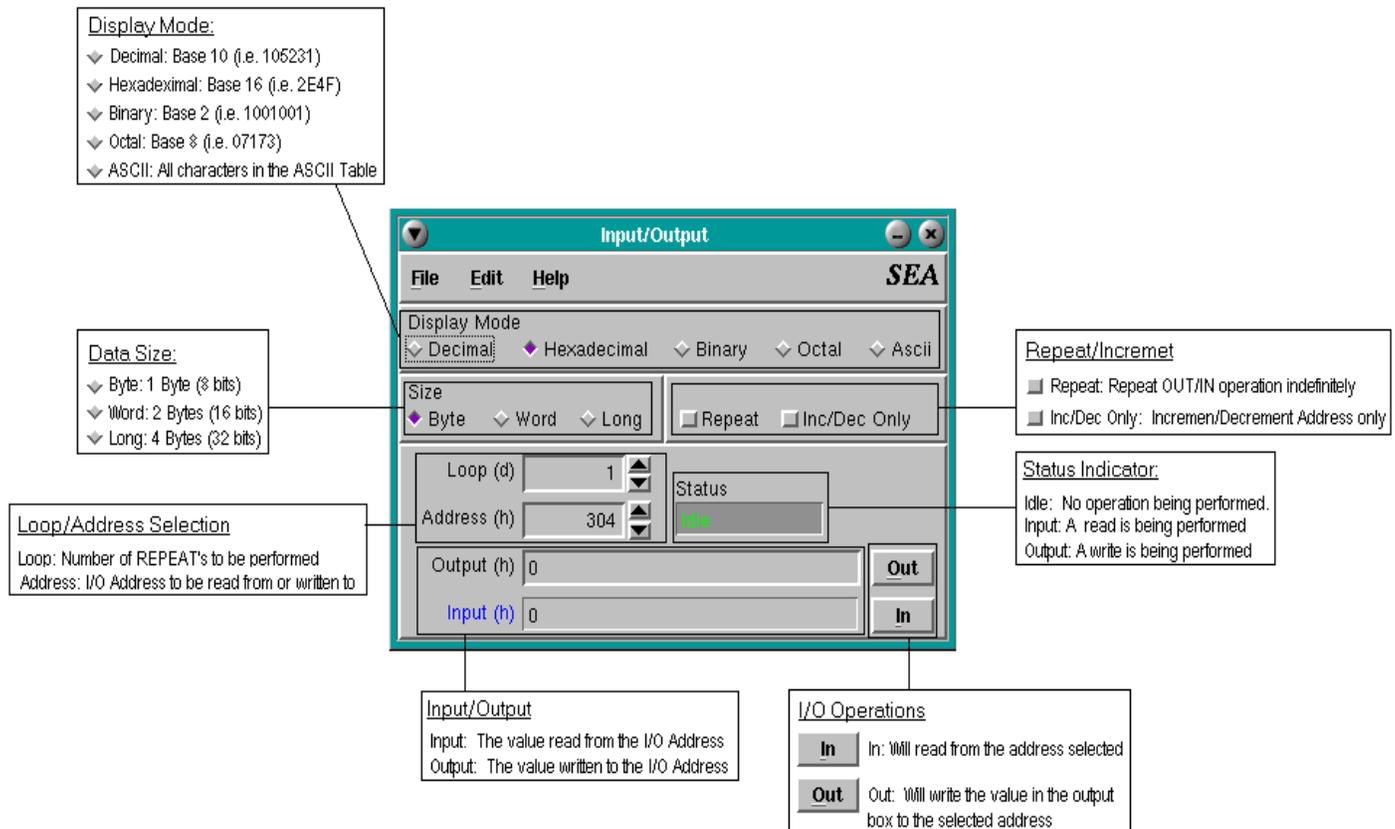
Start InputOutput

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **InputOutput** icon.

In addition you can start InputOutput from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**InputOutput &**'.

The InputOutput Window

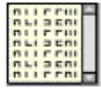


SEA Utilities Figure 9: The InputOutput Window

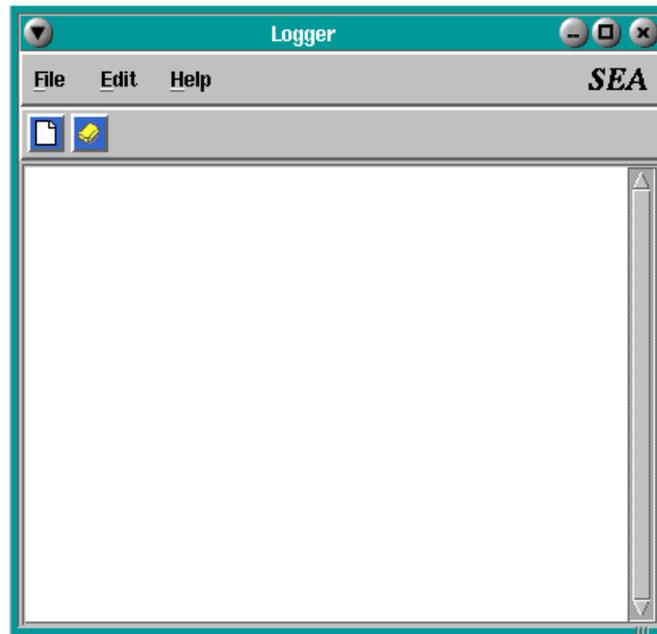
Input or Output to an address

- Select the appropriate Display Mode:
 - Decimal:** Normal base-10 (ex. 12.22) (Uses integers 0-9)
 - Hex:** Base-16 (ex. 3F2C) (Uses integers 0-9 and letters A-F for extra integers)
 - Binary:** Base-2 (ex. 1000110) (Uses integers 0-1)
 - Octal:** Base-8 (ex. 731) (Uses integers 0-7)
 - ASCII:** Text format (Allows all characters in the ASCII format)
- Select the appropriate Data Size:
 - Byte:** Normal 1-byte data. 8 Bits. (ex. 10100101)
 - Word:** 2-byte data. 16 Bits. (ex. 1001001001101110)
 - Long:** 4-byte data. 32 Bits. (ex. 11001010101110101001101101010111)
- Use the following as required:
 - Repeat:** If you need to send an output or read an input, continuously this will enable an infinite, terminable loop.

- b. **Inc/Dec Only:** Use this button if you only want to increment the addresses. By default, when the address is incremented or decremented, whatever had been selected before (In or Out) will be performed on the new address. This push button will disable that allowing you as the user to explicitly send input and output signals when you choose.
- c. **Loop:** Whatever number you select in this field will be used as a counter for all input and output operations. (Ex. Loop=15, then any Output or Input to an address will be performed 15 times)
- d. **Address:** The address you want to Input from or Output to. As default, when you change this value, whatever operation has been selected (Input or Output) and as long as Inc/Dec Only has not been selected, that operation will be performed on the new address also.
- e. **Output field:** This field is what value will be output to the address.
- f. **Input field:** This is the value that is read from the address in an input operation.
- g. **In and Out Buttons:** These buttons select which of the two operation will be performed.



Logger



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Description

Logger is a utility to monitor, in real-time, SEA Application errors as they occur, including Logger itself. While all SEA applications and utilities go through an extensive debugging and quality assurance procedure, rare errors may occur, to include user and/or configuration errors. All SEA utilities and M300 applications have been designed to communicate, with Logger, any errors they encounter. This will help you and experts at Science Engineering Associates in troubleshooting any rare errors that may be affecting your M300.

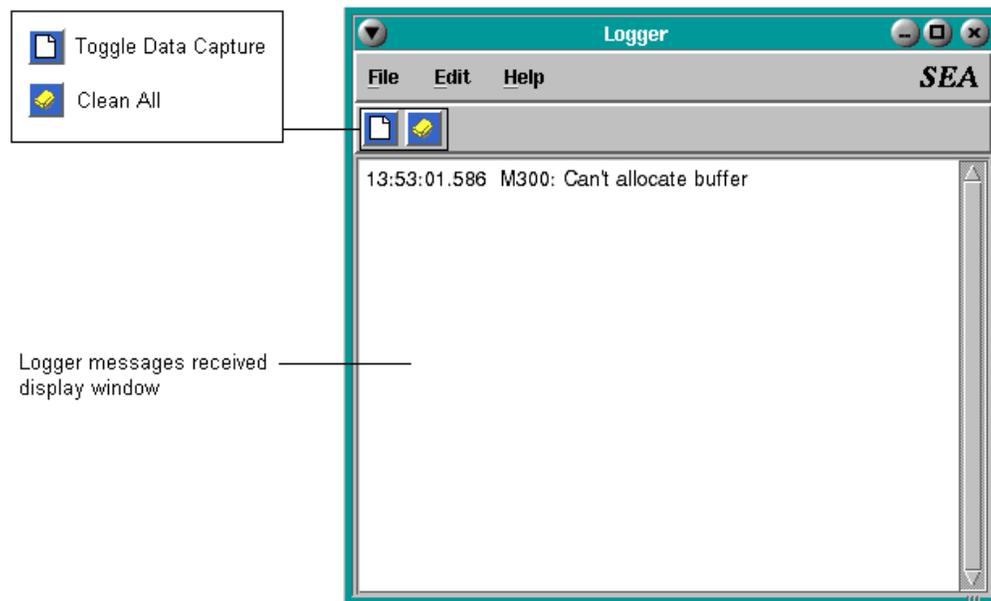
Start Logger

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **Logger** icon.

In addition you can start Logger from the command line. Here are the steps for that.

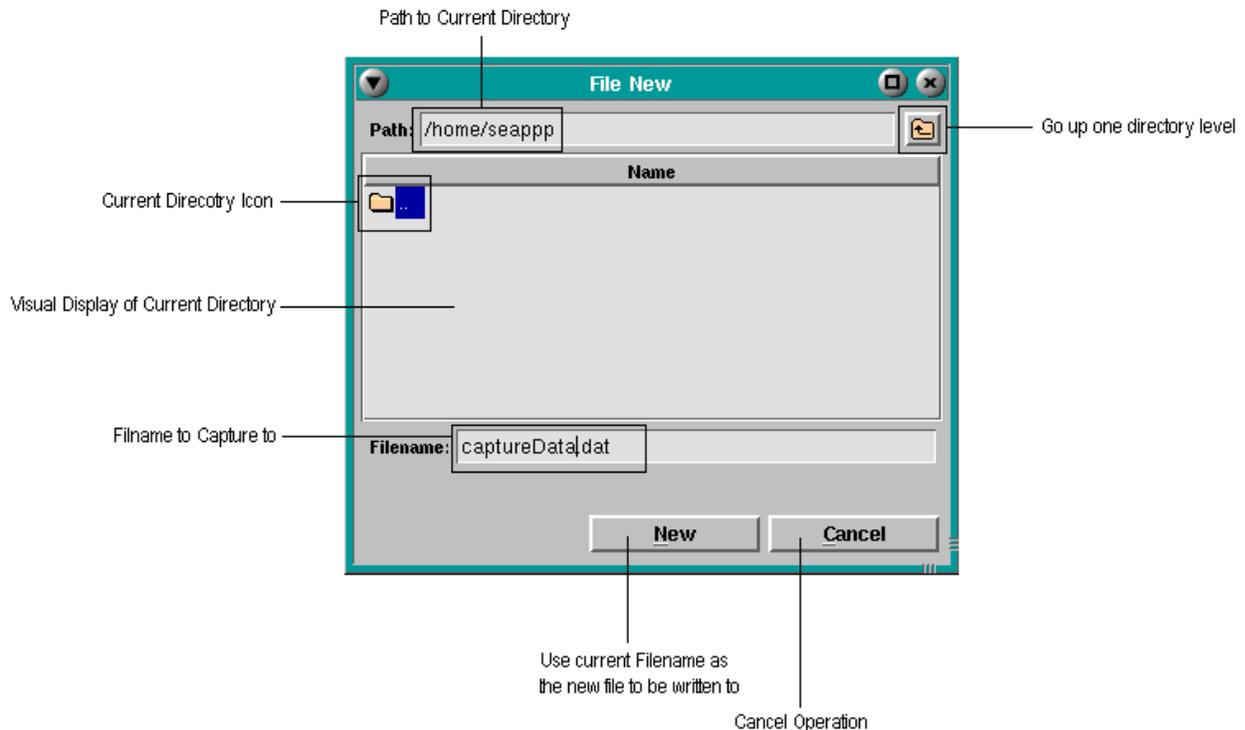
1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
Type '**Logger &**'.

The Logger Window



SEA Utilities Figure 10: The Logger Window

Capture to a file



SEA Utilities Figure 11: File New Dialog

1. In the **Logger Menu** bar, click on **File**.
2. Select **New...** (Shortcut: **Alt+F, N**)
3. Select the directory and type the filename you wish to use.
4. Now whenever you need to capture to the file, in the **Logger Toolbar**, click on the **Toggle Data Capture** button.

Clear the Logger window

1. In the **Logger Toolbar**, click on the **Clean All** button.
2. All Messages in the Logger window will be erased.

Understand Logger messages



SEA Utilities Figure 12: Logger Error Message Display



Note: The error message in the Logger window was generated by trying to execute more than one Logger application at the same time. Logger will only allow one window to run at any one time.

All Logger messages are echoed to the window in the standard form

Timestamp Application Name: Error Message

where *Timestamp* has the following form.

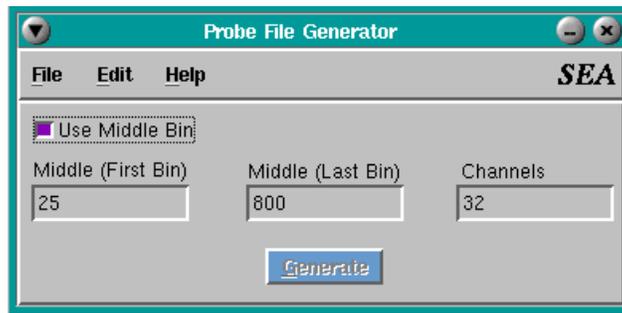
```
Timestamp -> hh:mm:ss  
            | hh:mm:ss.nnn
```



Note: Some applications have more acute timing requirements than others. Therefore, some applications may give a more detailed timestamp than others (i.e. Logger gives a timestamp with accuracy to 1 second while some M300 Applications may give timing precision up to a thousandth of a second: 1×10^{-3} s)



ProbeGen



Contents

1. Description. Page 32.
2. Start ProbeGen. Page 32.
3. The ProbeGen Window. Page 32.
4. Create a file. Page 33.
5. Generate probe data. Page 33.

Description

ProbeGen is a probe file generation utility which was designed to facilitate a convenient way of rapidly creating the necessary probe files.

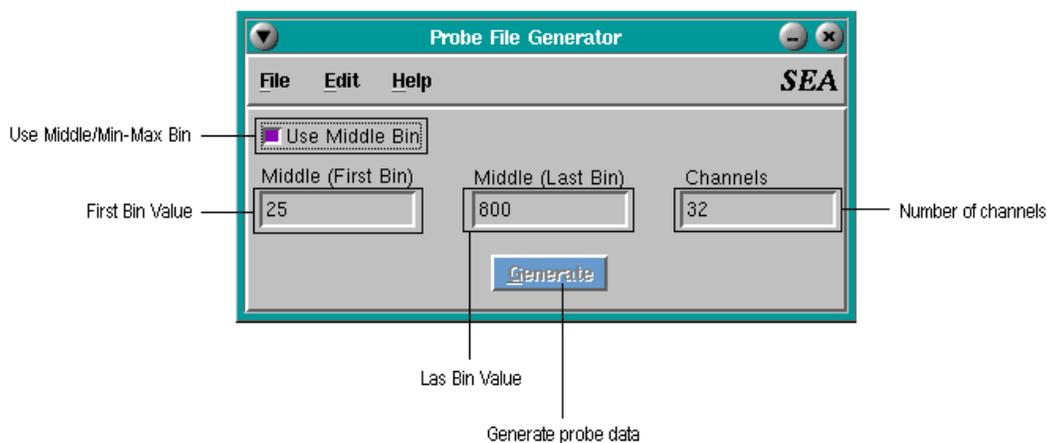
Start ProbeGen

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **ProbeGen** icon.

In addition you can start ProbeGen from the command line. Here are the steps for that.

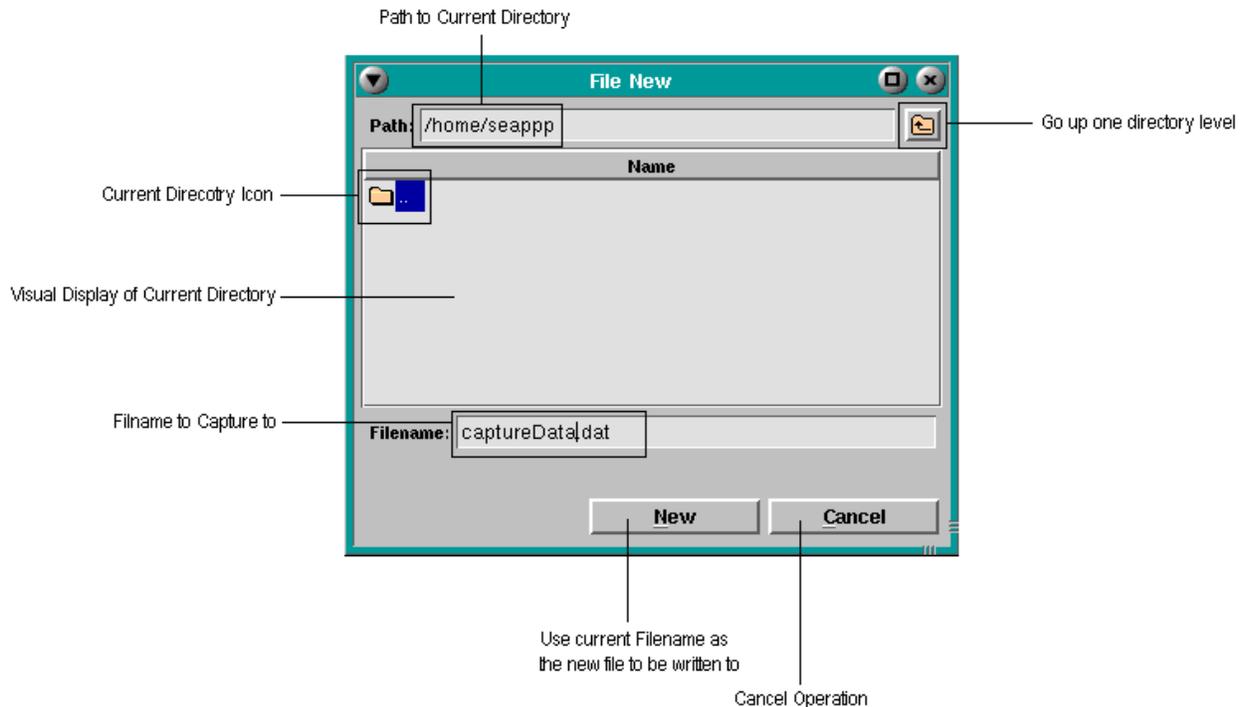
1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**ProbeGen &**'.

The ProbeGen Window



SEA Utilities Figure 13: The ProbeGen Window

Create a file



SEA Utilities Figure 14: File New Dialog

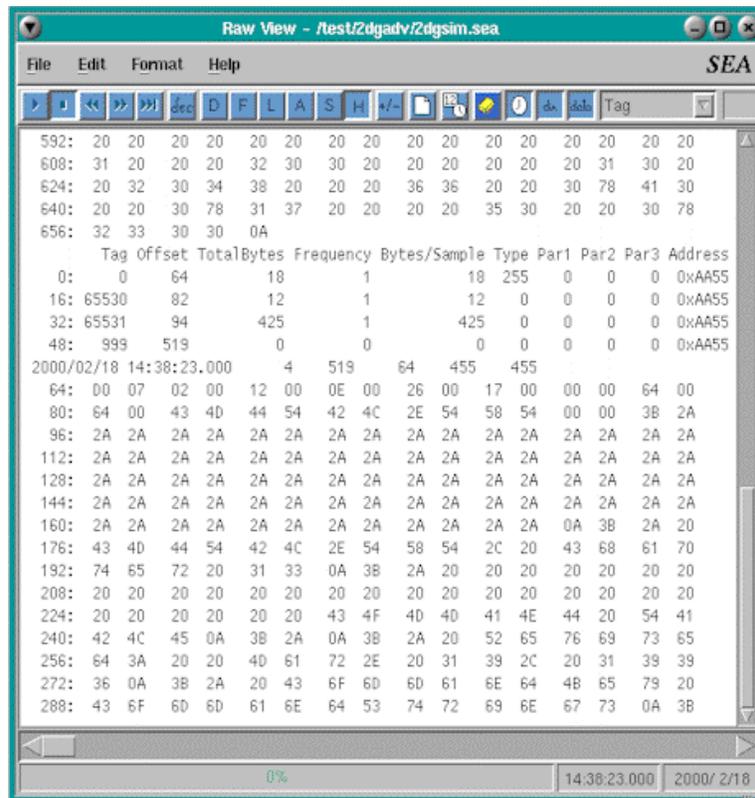
1. In the **ProbeGen** Menu bar, click on **F**ile.
2. Select **N**ew... (Shortcut: **Alt+F, N**)
3. Select the directory and type the filename you wish to use.
4. Click on **N**ew, or to cancel the operation, click on **C**ancel.

Generate probe data

1. Ensure you create ([See above](#)) a file before continuing.
2. Select which bins you choose to use. (i.e. middle bin or min-max bins) ([See “The ProbeGen Window” on page 32](#)).
3. Enter the minimum middle/min bin value.
4. Enter the maximum middle/max bin value.
5. Enter the number of channels.
6. At this time, the **Generate** buttons should be available to be pressed. If it is still locked, go back and check that you values are correct. (i.e. $\text{min} > 0$, $\text{max} > 0$, $\text{min} < \text{max}$ and $\text{channels} > 0$). Also ensure that you have created a file ([See above](#)).



RawView



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6. Filter Data. Page 39.
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8. Adjusting the file position. Page 40.
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10. Understand the RawView data. Page 41.

Description

RawView is a utility originally created to assist SEA engineers in evaluating what was happening to M300 Data Structures as they were being processed by the M300 software.

This utility proved to be an indispensable tool in troubleshooting, debugging and tracking down data at the byte level to optimize SEA's data processing algorithms. As such, SEA realized this tool would be a great benefit to its customers.

RawView accepts files of type '*.sea'. This is the standard form for all SEA M200/M200 binary data taken. Therefore, RawView can display any data taken by the M300. This allows the user to go back and see the data in it's raw form, hence the name RawView.

This is one of the most useful and important utilities that are part of the M300 system. Any issues with raw data and there fore the M300 system can and should be investigated via the RawView utility.

Start RawView

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **RawView** icon.

In addition you can start RawView from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**RawView &**'.

The RawView Window

Control Group

- ▶ Play: Begin/Resume Playback
- Stop: Stop Playback (file will not rewind)
- ◀◀ Rewind: Put file back to position zero
- ▶▶ Fast Forward: Rapidly advances file position.
- ▶▶▶ Next Buffer: Advances to next buffer and begins playback

Directory Display Mode

- dec Toggles Hex/Decimal Directory Display

Data Display Control Group

- D Double precision floating point
- F Floating Point
- L Long Integer
- A ASCII
- S Short Integer
- H Hexadecimal
- +/- Signed/Unsigned Display Toggle

Misc Controls

- 📄 Data Capture Toggle
- 🔍 Search for a time/date in current file
- 🗑️ Clean All

Display Selection Control Group

- data Toggles data display on/off
- 🕒 Toggle time display on/off
- dir Toggles directory display on/off

Display Filter

- Tag: Filters all tags except tag entered
- Data Type: Filters all data types except type entered
- Buffer Type: Filter all buffers except type entered
- Address: Filters all addresses except address entered

Raw View - /test/2dgdv/2dgsim.sea

Tag	Offset	TotalBytes	Frequency	Bytes/Sample	Type	Par1	Par2	Par3	Address
0:	0	64	18	1	18	255	0	0	0xAA55
16:	65530	82	12	1	12	0	0	0	0xAA55
32:	65531	94	425	1	425	0	0	0	0xAA55
48:	999	519	0	0	0	0	0	0	0xAA55
2000/02/18 14:38:23.000 4 539 64 455 455									
64:	00 07 02 00	12 00	0E 00	26 00	17 00	00 00	00 00	64 00	
80:	64 00 43 40	44 54	42 4C	2E 54	58 54	00 00	00 00	38 2A	
96:	2A 2A 2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	
112:	2A 2A 2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	
128:	2A 2A 2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	
144:	2A 2A 2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	
160:	2A 2A 2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	2A 2A	0A 38	2A 20	
176:	43 40 44 54	42 4C	2E 54	58 54	2C 20	43 68	61 70		
192:	74 65 72 20	31 33	0A 38	2A 20	20 20	20 20	20 20		
208:	20 20 20 20	20 20	20 20	20 20	20 20	20 20	20 20		
224:	20 20 20 20	20 20	43 4F	40 40	41 4E	44 20	54 41		
240:	42 4C 45 0A	36 2A	0A 38	2A 20	52 65	76 69	73 65		
256:	64 3A 20 20	40 61	72 2E	20 31	39 2C	20 31	39 39		
272:	36 0A 38 2A	20 43	6F 6D	6D 61	6E 64	48 65	79 20		
288:	43 6F 6D 6D	61 6E	64 53	74 72	69 6E	67 73	0A 38		

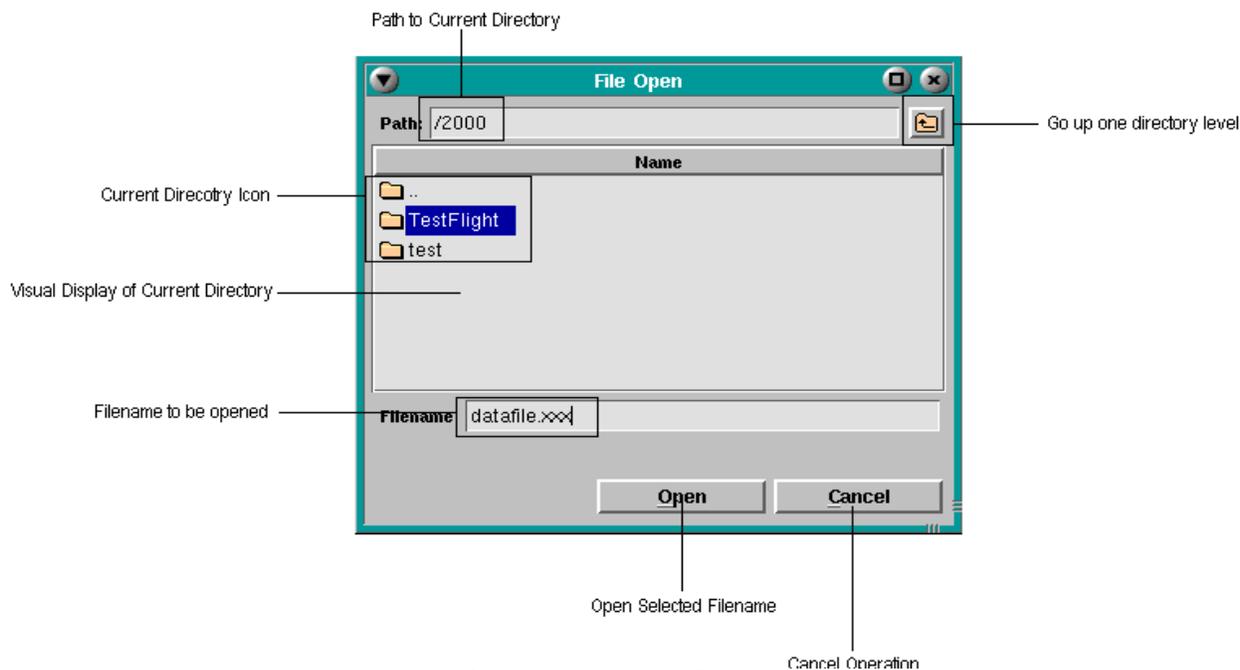
File Progress Indicator 0%

File Position Scrollbar

Current Buffer Time/Date 14:38:23.000 2000/2/18

SEA Utilities Figure 15: The RawView Window

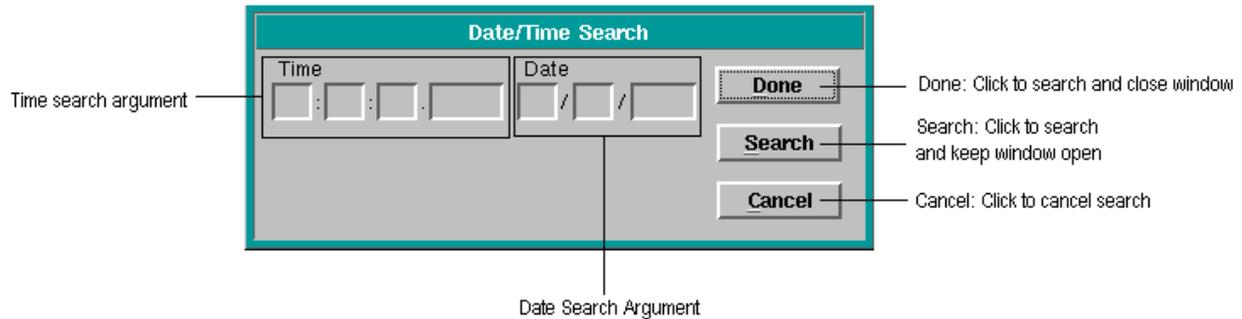
Open a file



SEA Utilities Figure 16: File Open Dialog

1. In the RawView Menu bar, click on **File**.
2. Select **Open...** (Shortcut: **Alt+F, O**).
3. In the Directory window, select which directory the file is in (if it is not already in the current directory.)
4. Select the filename you want and click on **Open** (Alternatively, you may type in the path and the filename in the path and filename fields respectively.) If you wish to cancel this operation at any time, click on **Cancel**.

Performing a search



SEA Utilities Figure 17: Date/Time Search Dialog

1. In the toolbar, click on the **Search** button or in the **E**dit menu, select **F**ind Date/Time...
2. Enter either a date or time (or both) you wish to search for in the following format:

Time: hh:mm:ss.nnnn and/or **Date:** mm:dd:YYYY
3. Click on **S**earch to perform the search and keep the search dialog open. If you want to perform the search and close the dialog as well, click on **D**one.

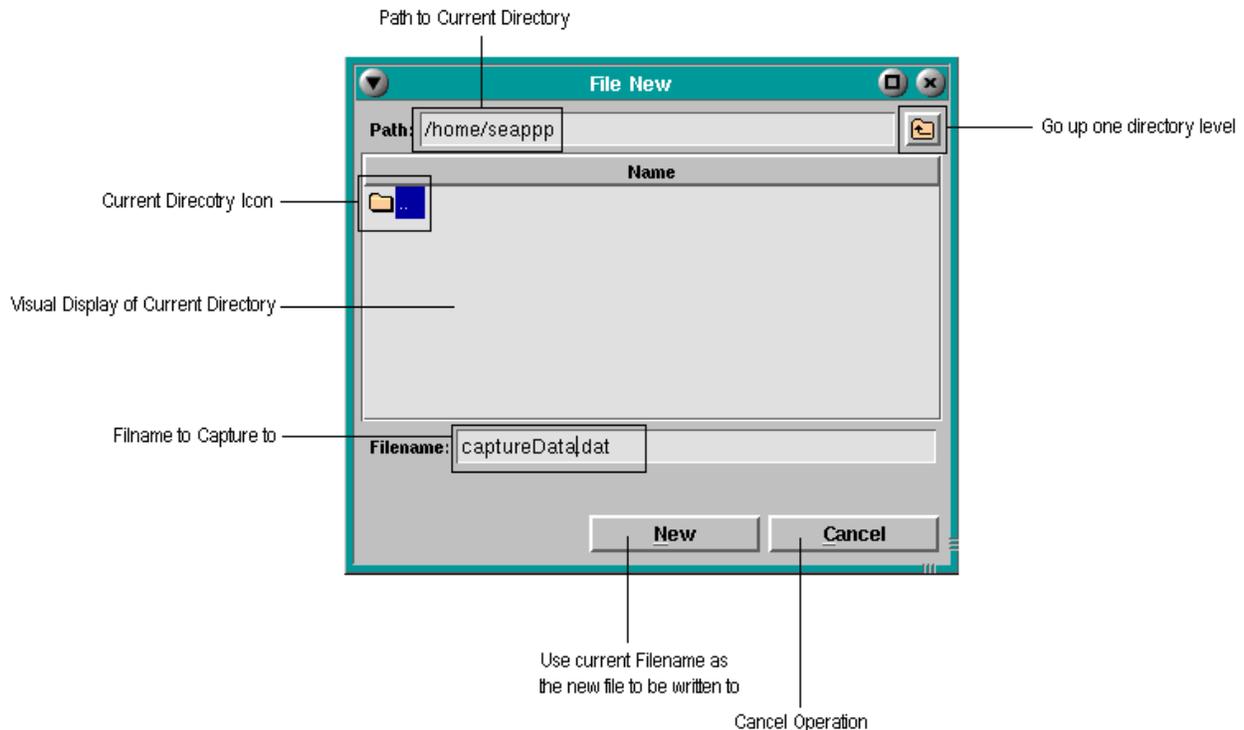


*Note: If the time or date is not in the file, RawView will stop at the nearest location, even if the nearest location is the end of the file. Click on **C**ancel at any time to cancel the search.*

Filter Data

1. In the toolbar, from the **Display Filter** drop down menu (See “The RawView Window” on [page 37](#)) select the type of filter you wish to perform. (You can choose from **Tag**, **Data Type**, **Buffer Type**, or **Address**).
2. After you have selected a type of filter, in the text box adjacent to the right, type in the data you wish to have filtered through. For example, if you were to want to only see **Tag** number **1000**, you would select **Tag** from the drop down menu and enter **1000** in the text box). Then only **Tag 1000** would be displayed out of all of the data in the file.
3. Repeat this process as many times as need, however only one filter may be used at a time.
4. To clear filter, clear the data box and hit **Enter**.

Capture acquisition data to another file



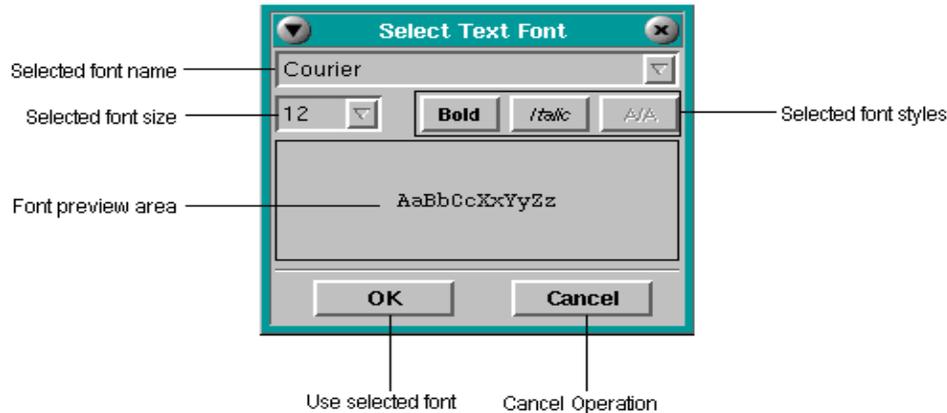
SEA Utilities Figure 18: File New Dialog

1. In the RawView Menu bar, click on **File**.
2. Select **New...** (Shortcut: **Alt+F, N**)
3. Select the directory and type the filename you wish to use.
4. Click on **New**, or to cancel the operation, click on **Cancel**.
5. Now whenever you need to capture to the file, in the RawView Toolbar, click on the **Toggle Data Capture** button.

Adjusting the file position

1. Using the **File Position Scrollbar**, click and hold the scrollbar handle.
2. Drag the handle to the desired position and release. The file position will now be updated.
3. For more precise incrementing/decrementing, use the arrows on either side of the scrollbar.

Changing the Display Font



SEA Utilities Figure 19: Font Dialog

1. In the RawView Menu bar, click on **F**ormat.
2. Select **F**ont... (Shortcut: **Alt+O, F**)
3. From the drop down list, select the font you want.
4. Select any styles to the font (i.e. **BOLD**, *Italics*, and/or Anti-Aliasing (Only available to certain types of fonts.))
5. Select **OK** to keep the new font or **Cancel** to cancel the font selection.

Understand the RawView data

Open /test/2dc/m300.sea file.

	Tag	Offset	TotalBytes	Frequency	Bytes/Sample	Type	Par1	Par2	Par3	Address
	0:	0	112	36	2	18	5	0	0	0 0xAA55
Directory contents	16:	1000	162	4096	1	4096	5	0	0	0 0x1B00
	32:	1001	148	4	1	4	6	0	0	0 0x1B00
	48:	1002	152	4	1	4	7	0	0	0 0x1B00
	64:	1003	156	4	1	4	8	0	0	0 0x1B00
	80:	1004	160	2	1	2	9	0	0	0 0x1B00
	96:	999	4258	0	0	0	0	0	0	0 0xAA55
End acquisition time of displayed buffer	2000/07/07 17:13:29.560 7 4258 112 4146 4146									
	112:	D0 07 07 00	07 00	11 00	0D 00	1D 00	35 00	64 00		
	128:	00 00 D0 07	07 00	07 00	11 00	0D 00	1D 00	38 00		
	144:	64 00 00 00	30 00	06 00	1B 00	00 00	03 00	00 00		

Data Area

SEA Utilities Figure 20: RawView Data Output

The Directory



Note: To better understand the directory structure, it is best to break it down into its functional parts. For this example, we will use the second line (starts with 16:) in the screen capture above.

Tag

Each directory entry and its associated data is given a unique tag number. This tag number is specified by the user and may be any value between 0 and 65535 (16 bits unsigned). This tag number is used to reference the data. There are some reserved tag numbers which are needed by SEA software and therefore are unavailable. In this example we are looking at Tag 1000, this is a number which has been assigned by a user. The tag we are focusing on is a 2D Mono Image Data Tag . We could have chosen any of them and the discussion would be the same.

Offset

This values specifies the byte offset into the data buffer where the data for a specific tag begins. The offset reference point is the beginning of the time directory. Since the recorded data always follows the data directory, the data offset will never be zero. In our example, the data begins at byte number 162. Our data that is using Tag 1000 starts 162 bytes from the beginning of the buffer.

Total Bytes

This value specifies the number of bytes acquired and placed into the buffer (for this tag/ acquisition type) during acquisition. This number will always be equal OR less than the $(\text{Frequency}) * (\text{Bytes/Sample})$. This number is useful in determining the actual number of bytes acquired. Some acquisition routines may acquire less than the maximum number of bytes specified by the earlier equation $(\text{Frequency}) * (\text{Bytes/Sample})$. In our example the **TotalBytes** is 4096, this happens to be commensurate with the equation $(\text{Frequency}) * (\text{Bytes/Sample})$. However, it does not have to be as we saw above.

Frequency

This value specifies the number of samples of data taken in a buffer (Frequency=number of samples). The Model 300 system allows buffers to have a life span shorter than one second, therefore one should not assume that this number is sample frequency in Hz (Hertz). In our example, the Frequency is 1, which is typical of a 2D Mono Image data buffer. This means that there is only 4096 bytes in this Tag's buffer. If the Frequency had been 2(although it never would be for a 2D Mono Image buffer) the number of bytes in this buffer would have been 8192 bytes.

Bytes/Sample

This value specifies the size of the data value being acquired. The product of the Frequency and the Bytes/Sample determines the data space allocated in a buffer for a particular Tag's data. The value Total Bytes specifies how many bytes were actually acquired. In our example, the Bytes/Sample is 4096. This is because in a 2D Mono Image there is only 1 sample in each buffer.

Type

This value specifies the acquisition routines to be used to acquire the data. A single acquisition routine may be used multiple times to acquire data for different Tag's. An example of this is that several analog channels may be acquired using the same acquisition type but with different parameters to

specify different channels or gains. The terms data type OR acquisition type may also be used in reference to this field. In our example the Type is 5 which again is the 2D Mono Image acquisition type .

Para1, Para2, Para3

These values are used to control the behavior of acquisition routines. Some acquisition types may use none, some, or all three of these parameters.

Address

This value is used by the acquisition routine to access the interface hardware. Changing the address value allows one acquisition routine to access several hardware devices of the same type but at different I/O addresses. For the reserved tags this parameter is set to 0xAA55. In our example, the Address is 0x1B00. This is a standard I/O address of a 2D Mono Interface Card.

Acquisition End Date/Time

Time

This portion of this line is the time that acquisition stopped for this buffer. There is a beginning time and an ending time to each buffer acquired into the M300, however, only the end time is displayed.

Number of Directories

This number, 7 in our example, is the total number of directories contained in this buffer, including any reserved tags , (i.e. Tag 0 - Time , Tag 999 - Next , etc.).

Buffer Length

This number, 4258 in our example, represents the size of the entire buffer currently being displayed, including directories and all Tag's

Directory Length

This number, 112 in our example, is the total length of the directory portion of the buffer. Here we see that after 112 bytes, the directory ends and the data begins. You can see this is correct if you look at the first Tag's offset.

Data Length

This number, 4146 in our example, is the total length of the data in this particular buffer. This number is computed by taking the difference between the Offset of the last directory entry and the Directory Length. Here we see $4258 - 112 = 4146$.

Data Length (computed)

This number again, 4146 in our example, is the total length of the data in this particular buffer. The difference between this number and the previous one is the manner in which they are calculated. This particular number is calculated by summing the Total Bytes for each directory. Here we see $36 + 4096 + 4 + 4 + 4 + 2 + 0 = 4146$. SEA Engineers decided that this was a good way to get a snapshot of the entire buffers integrity in one line, having two values representing the data length, computed independently to ensure accuracy.

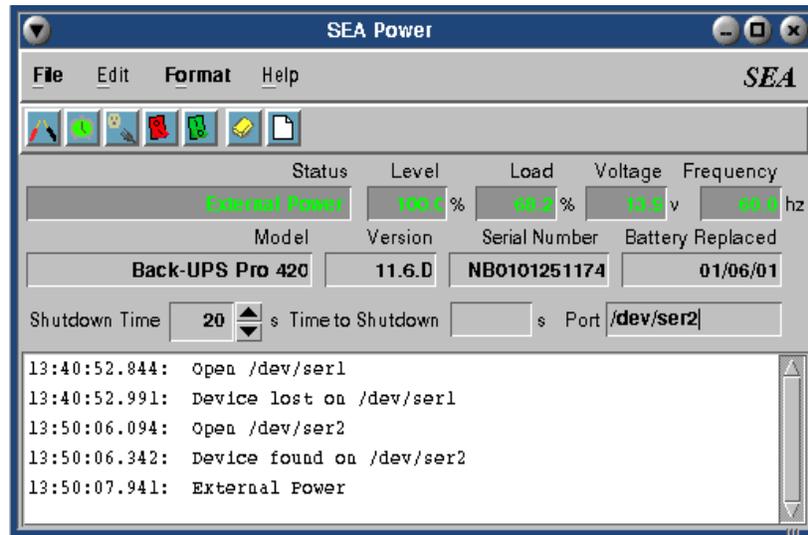
Data Area

Offset

This value, for this example 112 at the beginning of the data area, is the byte Offset that particular line of data begins at. For example, if you look at the first line in the data section, you will see 112. That means that the adjacent value, in this case D0(hex) is byte number 112 in the buffer. This structure is the same for ALL acquisition types. (Note: The data area has been clipped to fit on this screen, what you see above in the screen capture is not the end of that buffer.)



SeaPower



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4. Perform a self test. Page 49.
5. Perform an alarm test. Page 49.
6. Simulate a power failure. Page 49.
7. System shutdown. Page 49.
8. Clear message window. Page 49.
9. Change the shutdown time. Page 49.
10. Change port name. Page 49.
11. Create a log file. Page 50.
12. Changing the Display Font. Page 51.

Description

SeaPower is a tool that was designed by SEA Engineers to allow the control, setup, and monitoring of APC Backup Uninterrupted Power Supply (UPS). This utility allows the user to monitor the current status of the power supply (battery level, load on the battery, voltage, frequency and unit status) as well as relevant information about the power supply (model, version, serial number, date the battery was replaced).

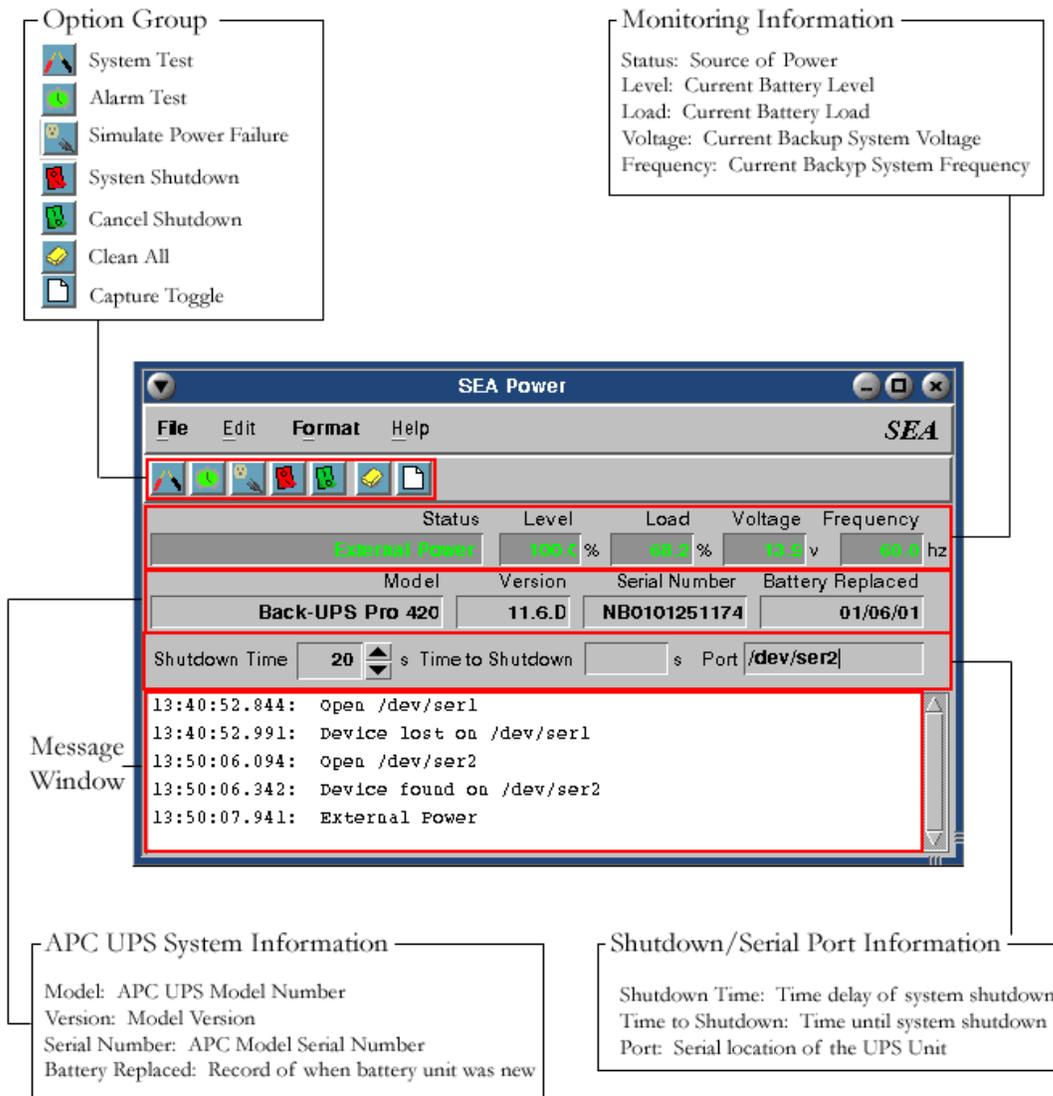
Start SeaPower

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SeaPower** icon.

In addition you can start SeaPower from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**SeaPower &**'.

The SeaPower Window



SEA Utilities Figure 21: The SeaPower Window

Status

Indicates last status message received from the APC Back-UPS. During normal operation, this message is usually “External Power” signifying that the UPS is not on battery power. The following are possible status messages that may arise.

External Power - Normal operation.

Power Off - Power is turned off.

Calibration - UPS is performing a system self-calibration.

Sleeping - UPS is in sleep mode.

On Battery - The UPS has detected a failure in utility power and has switch to battery power

Low Battery -The UPS battery is low (may be temporary) and may need to be replaced.

External Power, Battery Low - System is back on utility power, but battery needs replacement.

Battery Critical - The UPS battery is no longer able to provide power. Must be replaced.

Unknown status: *hex val* - Received an unknown response (*hex val*) from the UPS.

Level

The current battery level. This value will begin to decrease once the UPS switched to batter power. If this value fails to reach 100% while on external power, it may indicate a failing battery. As this value goes below 30%, the display will turn yellow indicating a serious situation. If the level goes below 15%, it will turn red, indicating a critical situation for the UPS. When this happens, the system will perform an orderly shutdown immediately if power fails, regardless of the time left in the **Shutdown Time** numeric changer.

Load

The current power load on the UPS. If this value goes above 75%, it will turn yellow, and then red at 90%. This indicated that the UPS is getting close to the maximum power load it can support. If this value consistently approaches 100%, consider purchasing a larger UPS.

Voltage

Total voltage being output by the UPS.

Frequency

The current frequency of the AC External Power (usually 60Hz for U.S.). This value may fluctuate slightly but should not fluctuate more than ± 5 Hz. If it goes outside of this limit, the UPS will switch to battery power until it comes back within the limits.

Shutdown Time

A numeric changer that allows the user to adjust the delay for shutdown should power fail. This value may be 1 to 3,600 seconds (1 hour).

Time to Shutdown

This value represents how much time is left before the seaups daemon begins an orderly shutdown of the system. This will value will always start at the value specified in the **Shutdown Time** numeric changer.

Port

This the name of the current serial port that the UPS is connected to. If this name is incorrect, it can be changed at any time.

Perform a self test

1. Click on the **System Test** button in the SeaPower window.
2. Once the self test begins, the UPS will temporarily switch to Battery Power and you will here an audible alarm at the midpoint of the test. The UPS will then switch back to external power and will report the results of the test in the message window.

Perform an alarm test

1. Click on the **Alarm Test** button in the SeaPower window.
2. Once the alarm test begins, the UPS will illuminate all LED's, generate an audible alarm and then return to normal operation. If you do not hear the audible alarm or see all of the LED's illuminate, there is a malfunction of the UPS.

Simulate a power failure

1. Click on the **Simulate Power Failure** button in the SeaPower window.
2. Once the simulation begins, the UPS will go through the sequence of events it normally would in the event of a power failure with the exception of actually shutting down.

System shutdown

1. Click on the **System Shutdown** button in SeaPower window.
2. The system will begin an orderly shutdown of the system. You can cancel this shutdown sequence at any time before the zero second in the **Time to Shutdown** text box by clicking on the **Cancel Shutdown** button in the SeaPower window.

Clear message window

1. Click on the **Clear All** button in SeaPower window.
2. All messages in the **Message Window** will be erased.

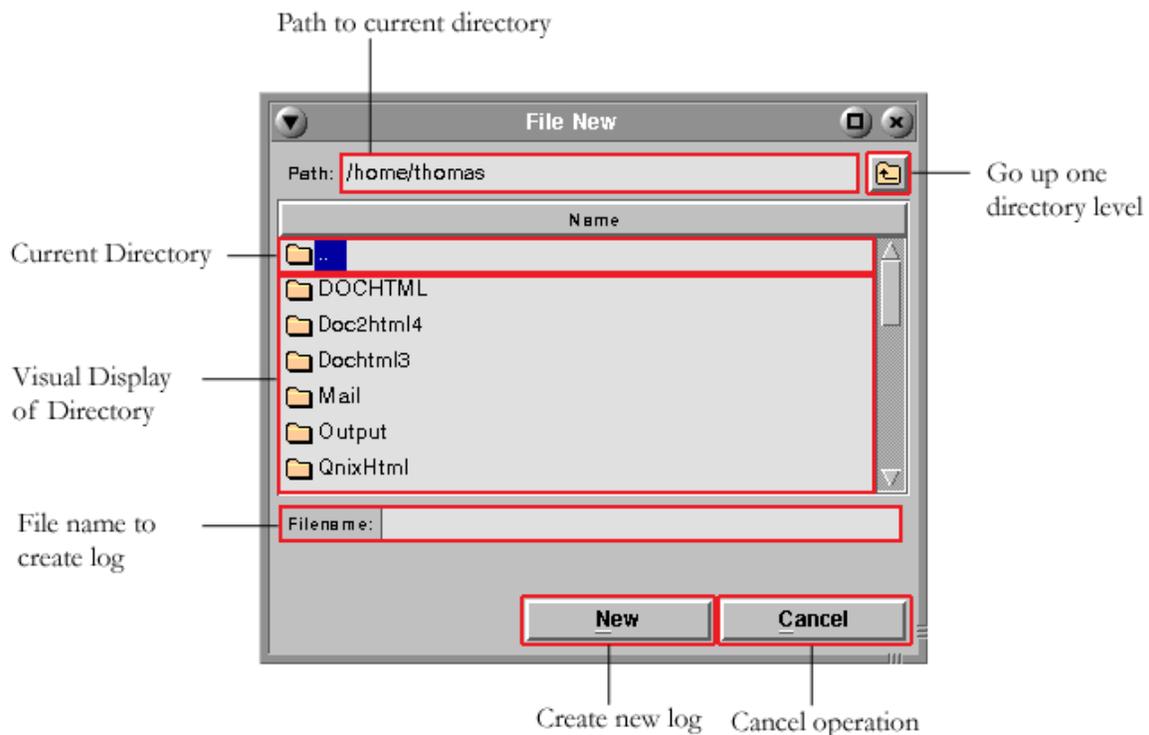
Change the shutdown time

1. Change the shutdown time by clicking down or up on the **Shutdown Time** numeric changer. Alternatively you may edit the text box directly. The **Shutdown Time** can range from 1 second to 3,600 seconds (1 hour).

Change port name

1. Change the port name by editing the **Port** text box. Whenever you change the port name, the SeaPower and seaups daemon will attempt to locate an APC Back-UPS on the new port name. If none is found, it will be indicated in the **Message Window**; otherwise the SeaPower utility will display all the applicable information for that new device.

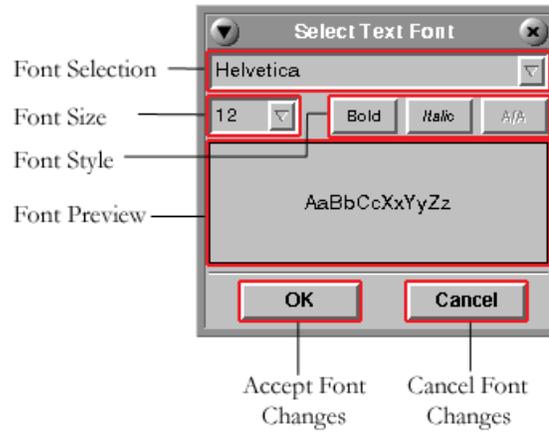
Create a log file



SEA Utilities Figure 22: File New Dialog

1. In the **F**ile menu, select **N**ew.
2. In the Directory window, select which directory you would like the file to be created in (if it is not already in the current directory.)
3. Select the filename you want and click on **N**ew (Alternatively, you may type in the path and the filename in the path and filename fields respectively). If you wish to cancel this operation at any time, click on **C**ancel.

Changing the Display Font

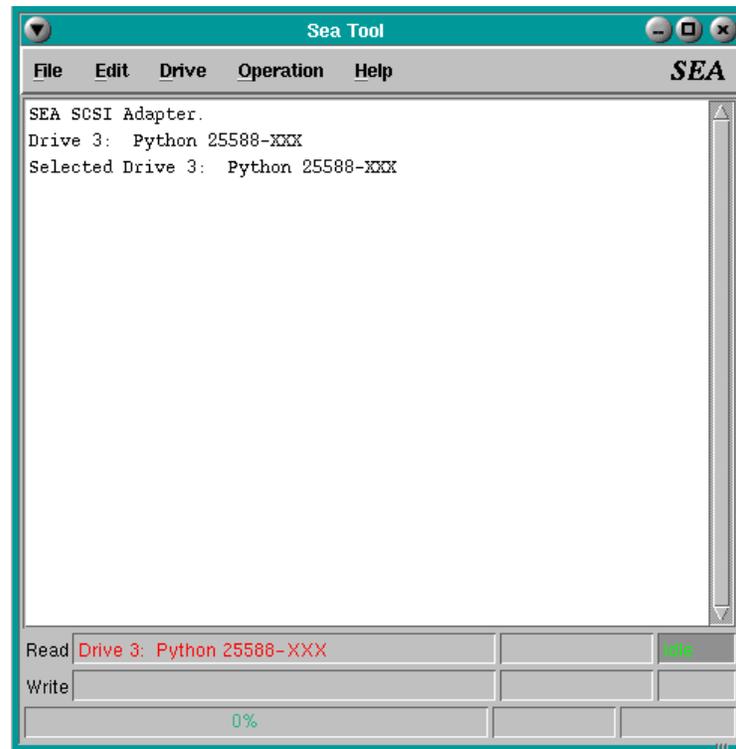


SEA Utilities Figure 23: Font Dialog

1. In the SeaPower Menu bar, click on **F**ormat.
2. Select **F**ont... (Shortcut: **Alt+O, F**)
3. From the drop down list, select the font you want.
4. Select any styles to the font (i.e. **BOLD**, *Italics*, and/or Anti-Aliasing (Only available to certain types of fonts.))
5. Select **O**K to keep the new font or **C**ancel to cancel the font selection.



SeaTool



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2. Starting SeaTool. Page 54.
3. The SeaTool Window. Page 54.

Description

The SeaTool utility is used to read only SCSI tables and place the M200/M300 files on hard disk files.

This utility can also be used to extra the project tables from the M300 binary data file '*.sea'. When this is done is recommend that you start the utility from the command prompt. Change the directory to where you would like the extracted files to be place. Once you start the extra these files will be overwritten. It is recommended that this directory is empty prior to the extra.

Starting SeaTool

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SeaTool** icon.

In addition you can start SeaTool from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
Type '**SeaTool &**'.

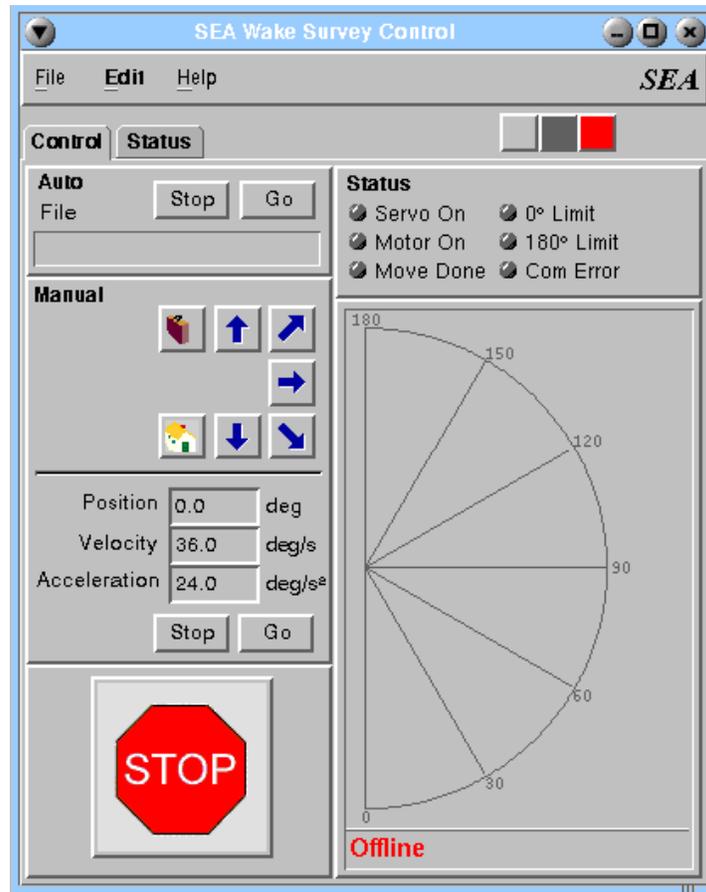
The SeaTool has a few optional parameters which can be used, if so desired.

-ox filename

If you know the name of the file (*.sea) you are trying to extra the tables from, you can use this feature to have SeaTool automatically start and extra the tables.

The SeaTool Window





Contents

1. Description. Page 56.
2. Starting SeaWsc. Page 56.
3. The SeaWsc Window. Page 56.

Description

The SeaWsc utility is used to control the Wake Survey system.

Starting SeaWsc

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SeaWsc** icon.

In addition you can start SeaWsc from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
Type 'SeaWsc &'.

The SeaWsc Window





Security



Contents

1. Description. Page 58.
2. Start Security. Page 58.
3. The Security Window. Page 58.
4. Initial security setup. Page 59.
5. Adding a security code. Page 59.

Description

Security is a tool that was developed to make the configuration of the SEA Security simple and quick. Using the security codes given by SEA, configuration of the SEA Security only takes a couple of minutes.

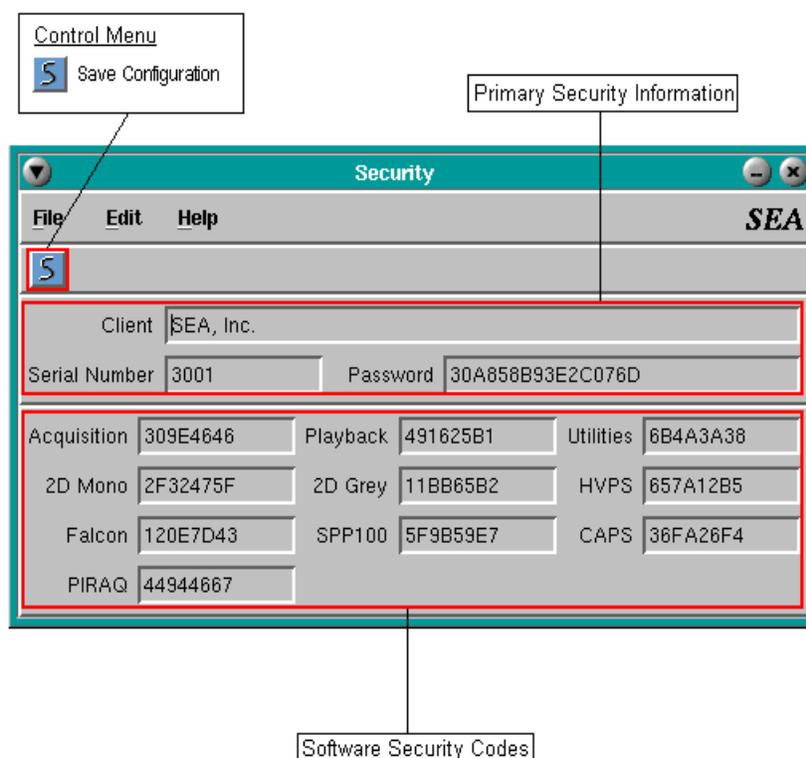
Start Security

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **Security** icon.

In addition you can start Security from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type 'Security &'.

The Security Window



SEA Utilities Figure 24: The Security Window

Initial security setup



Note: You should only need to perform the initial setup if you are setting up a new M300 system, or are reinstalling QNX 4 and M300 software.



Note: Depending on what you have purchased from SEA, some or all of the fields shown in the Security window will get filled in (See “The Security Window” on page 58). Not all fields have to be filled in order for the SEA security to function. However, all primary security information fields must be correctly filled in.

1. Start the M300 Security application (See “Start Security” on page 58).
2. Enter the primary security information from the SEA M300 Security Certificate. This primary security information is the **Client**, **Serial Number** and **Password** fields.
3. Enter the appropriate software security codes from the SEA M300 Security Certificate.



Note: This information must be entered exactly as it is printed on the SEA M300 security certificate. Failure to do so may result in the M300 software not working correctly.

4. Enter the port name that the i-Button is connected to in the **Port** field. Usually this is ‘/dev/ser1’ but may be another port.
5. After ensuring all information is correct, in the toolbar select **Save Configuration**.
6. Perform a check of security integrity by typing ‘system -check’ at the command prompt (See “system” in [Command Line Utilities on page 113](#)). If there is any configuration errors with the security setup (i.e. permissions on certain files, files missing or paths not set) they will usually be revealed using the ‘system’ utility with the appropriate fix recommended.

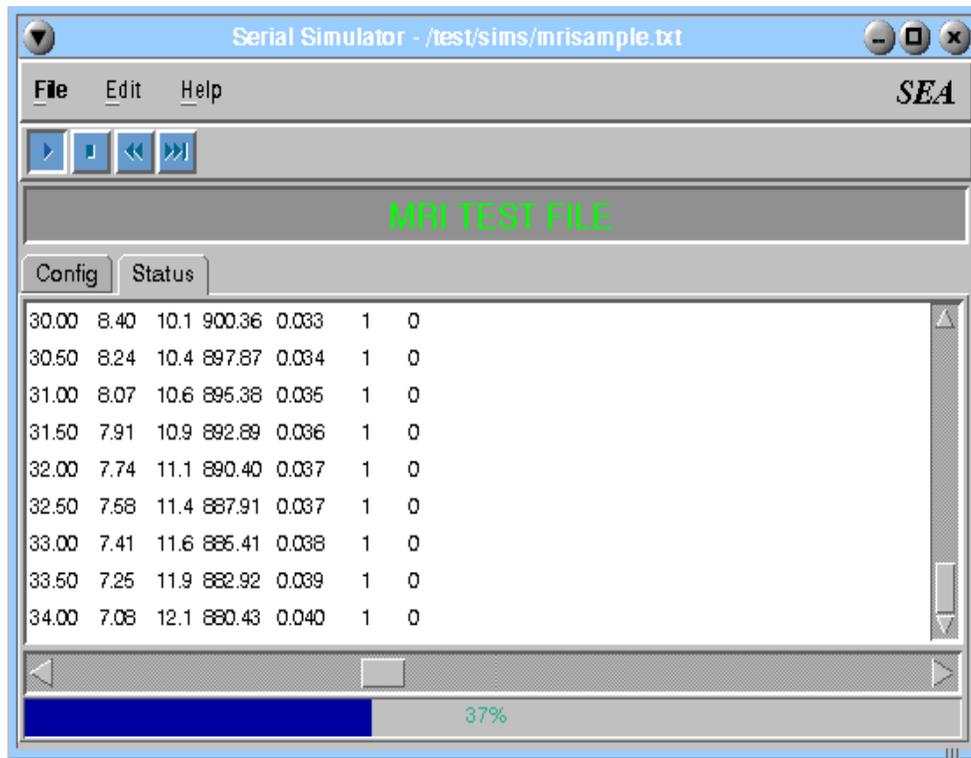
Adding a security code



Note: It is assumed that the M300 security has already been setup on the system that is to receive a new security code. If it has not, add the new security code as part of the initial setup (See “Initial security setup” on page 59).

1. Start the M300 Security application (See “Start Security” on page 58).
2. If the security information for the correct serial number is not yet displayed (i.e. client, password and security codes), enter the M300 serial number (numbers only) into the **Serial Number** text box and hit Enter. The appropriate security information should now be displayed. If it is not, perform a check of security integrity by typing `system -check` at the command prompt (See “system” in [Command Line Utilities on page 113](#)). If there is any configuration errors with the security setup (i.e. permissions on certain files, files missing or paths not set) they will usually be revealed using the ‘system’ utility with the appropriate fix recommended. If this does not resolve the problem, follow the steps in [Initial security setup](#).
3. Add or modify the appropriate security code.
4. After ensuring all information is correct, in the toolbar select **Save Configuration**.
5. Perform a check of security integrity by typing `system -check` at the command prompt (See “system” in [Command Line Utilities on page 113](#)). If there is any configuration errors with the

security setup (i.e. permissions on certain files, files missing or paths not set) they will usually be revealed using the 'system' utility with the appropriate fix recommended.



Contents

1. Description. Page 62.
2. Starting SimSer. Page 62.
3. The SimSer Window. Page 62.

Description

The SimSer utility is used to send data out the serial port.

Starting SimSer

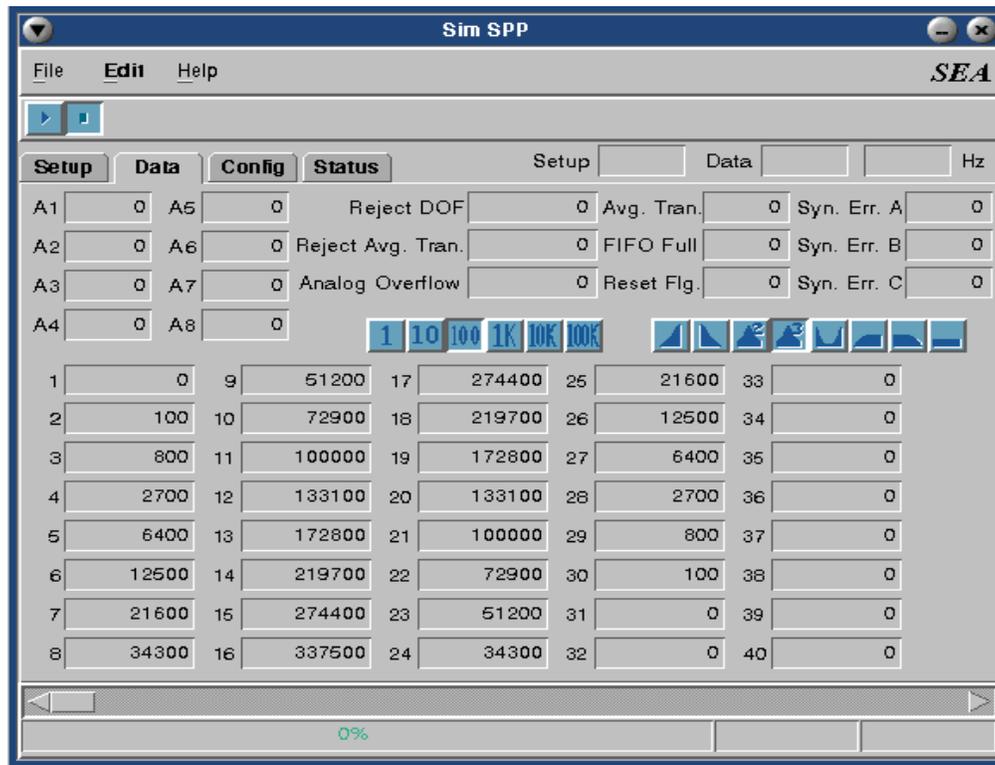
1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SimSer** icon.

In addition you can start SimSer from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
Type 'SimSer &'.

The SimSer Window





Contents

1. Description. Page 64.
2. Start SimSpp Utility. Page 64.
3. The SimSpp Window. Page 64.
4. Configure the Data Tab. Page 65.
5. Configure the Config Tab. Page 66.
6. Simulating SPP data. Page 66.

Description

SimSpp is a tool that was designed by SEA Engineers to be used with a serial card or the standard serial port to simulate the behavior and the output of an SPP probe.

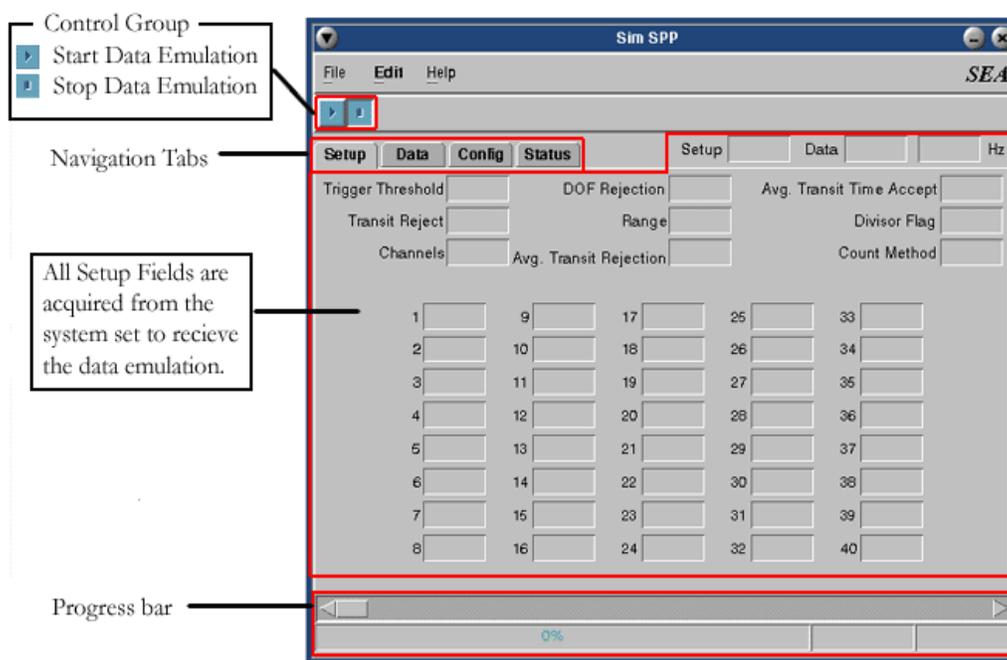
Start SimSpp Utility

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SimSpp** icon.

In addition you can start SimSpp from the command line. Here are the steps for that.

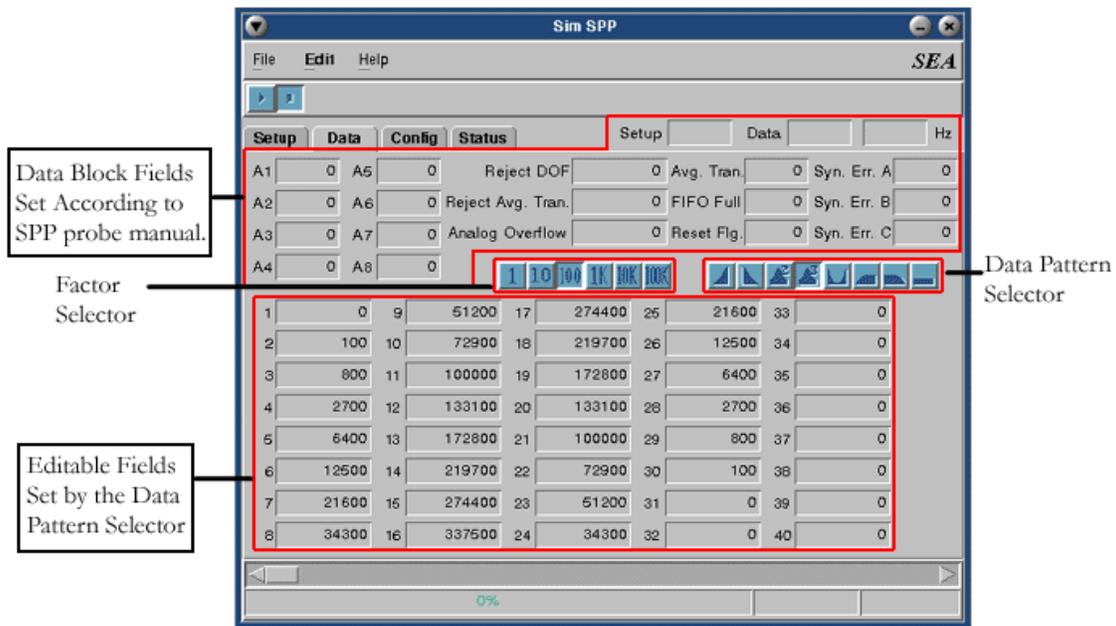
1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type '**SimSpp &**'.

The SimSpp Window



SEA Utilities Figure 25: The SimSpp Window

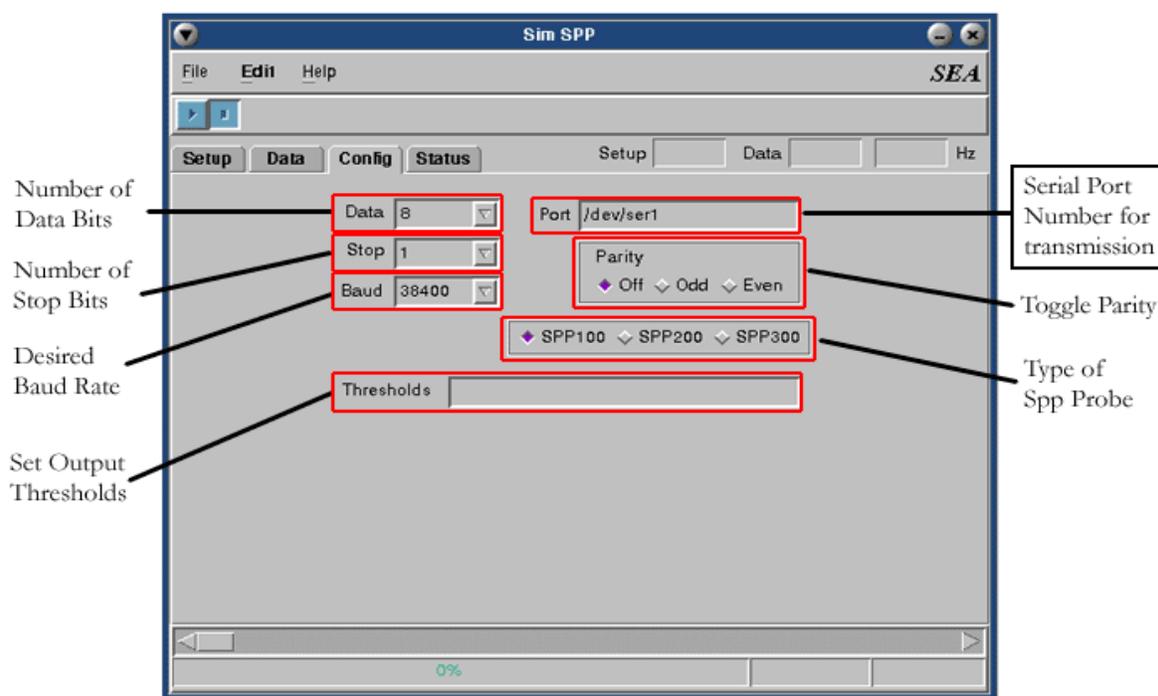
Configure the Data Tab



SEA Utilities Figure 26: SPP Data Tab

1. Configure the **Data Block** fields as necessary for desired SPP probe emulation. See SPP probe manual for details.
2. Select the **Data Pattern** you wish to emulate. The buttons have pictures of what the generated data will look like. This data is automatically loaded into the Editable Fields.
3. Select the adjustment **Factor** to quickly customize the values generated by the pattern selector. The values are multiplied by the factor selected.
4. Edit any fields necessary to achieve desired customized result.

Configure the Config Tab



SEA Utilities Figure 27: SimSpp Config Tab

1. Choose the number of **Data Bits** to be sent at a time on the serial port (default 8).
2. Select the number of **Stop Bits** your emulation requires (default 1).
3. Choose your desired **Baud Rate** (default 9600).
4. Input the path and name of a **Thresholds** file if applicable.
5. Set the **Port** name that SimSpp should output to
6. Select the appropriate **Parity** (default Off).
7. Select **SPP Probe Type** (default SPP100).

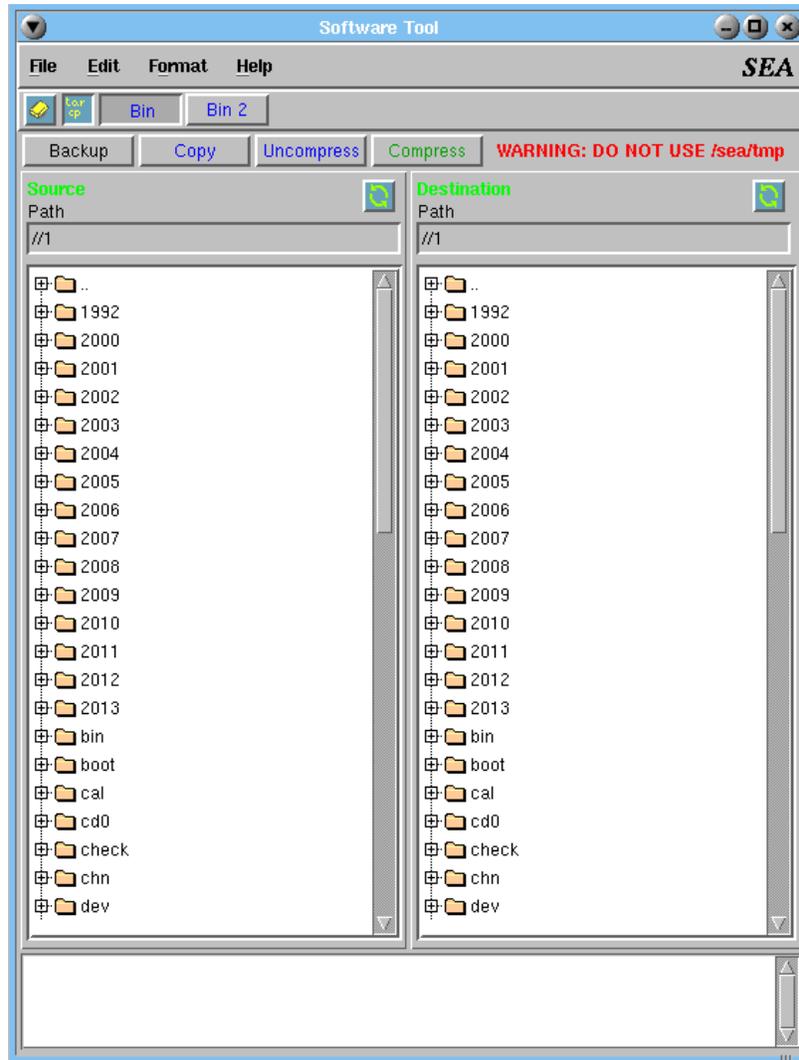
Simulating SPP data



Note: These instructions assume the user has knowledge of SPP hardware and has set up the M300 to acquire SPP data.

1. Connect the appropriate cables from the applicable serial ports/cards. The SPP simulator may be used/connected in one of two ways.
 - a. Same system configuration: A loop back hookup where the SPP simulator outputs to one serial port/card and connects back to another serial port/card that the M300 will use as the acquisition source.
 - b. Two system configuration: The SPP probe simulator resides on one M300 system and is hooked up to another M300 system that will acquire the SPP data via serial port/card.

3. Ensure that both the M300 project and SimSpp are configured to use the same serial settings. In SimSpp, this is done via the **Config** tab (See “[Configure the Config Tab](#)” on page 66).
4. Set the data to be sent to the M300 for SimSpp in the **Data** tab (See “[Configure the Data Tab](#)” on page 65). Note that these instructions assume familiarity with SPP data. For more information on the usage of each data field, consult the SPP manual.
5. Start acquisition on the M300.
6. Click **Play** on SimSpp. Data will start to be output to the M300 as soon as SimSpp receives a valid setup message from the M300. This message data can be seen in the **Setup** tab. Monitor the **Status** window for any error information generated. Fix any errors noted in the **Status** window. If for some reason the SimSpp is not sending SPP data packets to the M300, double check all settings to include serial port settings in both the M300 and SimSpp as well as M300 project setup settings. If you are still unsuccessful, contact SEA for further assistance.



Contents

1. Description. Page 70.
2. Starting SoftTool. Page 70.
3. You Should Know This Before Doing The Upgrade. Page 70.
4. Using SoftTool to Upgrade Software. Page 70.

Description

The SoftTool utility is used for SEA utilities, M300 software and WCM-2000 software upgrades.

Starting SoftTool

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **SoftTool** icon.

In addition you can start SoftTool from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
Type '**SoftTool &**'.

You Should Know This Before Doing The Upgrade

There are two directories where the software is installed, '/sea/bin' and '/sea/bin2'. These directories are added to the PATH variable. What this means is the user can run any of the utilities by their name and QNX 4 knows to search '/sea/bin' and '/sea/bin2' for our applications.

It might be wise for the user not to make changes to these directories or any files unless they are under the supervision of SEA contact person.

Usually the file names for the software are 'sea.tar.gz' (for /sea/bin) and 'sea2.tar.gz' (for /sea/bin2), but they can change. The important aspect to keep in mind is that the files must be 'tar.gz' format.

The '/sea/bin', sea.tar.gz file is the most common one used for the upgrade.

The SEA software is usually setup into a file which is a 'tar' copy compressed using the 'gzip' utility. The 'tar' utility is smart enough to keep the correct permissions for the applications which are critical in our case.

When you upgrade the software the previous version is gone. If necessary, you can use the "Backup" button from the SoftTool utility to back up the software prior to doing the upgrade.

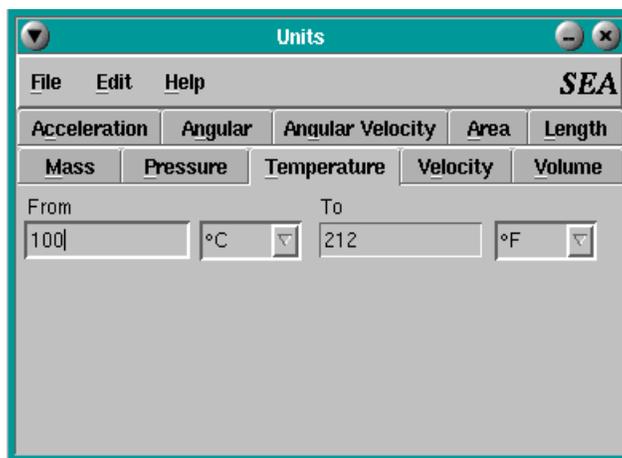
Using SoftTool to Upgrade Software

The SoftTool utility simplifies installation of the SEA Utilities, M300 and WCM-2000 software.

The steps for the installation are very simple. The following instructions assume you will be using the USB stick to pass the software file along, which is the most common way of getting the file to the QNX 4 systems.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Type '**seadrive**'. This will mount the USB stick under the /dos/c folder in QNX 4.
5. Start SoftTool.

6. The default install is for the sea.tar.gz file in the /sea/bin directory. If you are installing the sea2.tar.gz file to the /sea/bin2 directory, then click on the “Bin 2” button.
7. On the Source pane, left side, use the file tree to find the desired file, like /dos/c/sea.tar.gz.
8. The Source Path field will display the full path and file name to use.
9. Click on the ‘Uncompress’ button to start the installation process. By default, this is for /sea/bin.
10. Wait until message for un-compress done and exit SoftTool.
11. If using USB stick, type ‘seadrive’. This un-mounts the USB stick so it can be safely removed.
12. For M300 and SEA utilities, type ‘system -check’. This utility checks the software for correctness and also displays the version.
13. Optionally you can use any SEA application, Help, About menu items to check if the new version is installed.



Contents

1. Description. Page 74.
2. Start Units. Page 74.
3. The Units Window. Page 74.
4. Convert units. Page 74.

Description

Units is a utility that was designed due to the need of a quick, available conversion utility by our customers. Units is comprised of ten unit categories: Length, Velocity, Area, Volume, Mass, Temperature, Pressure, Angular, Acceleration and Angular Acceleration. Inside each of these types are the most commonly used units.

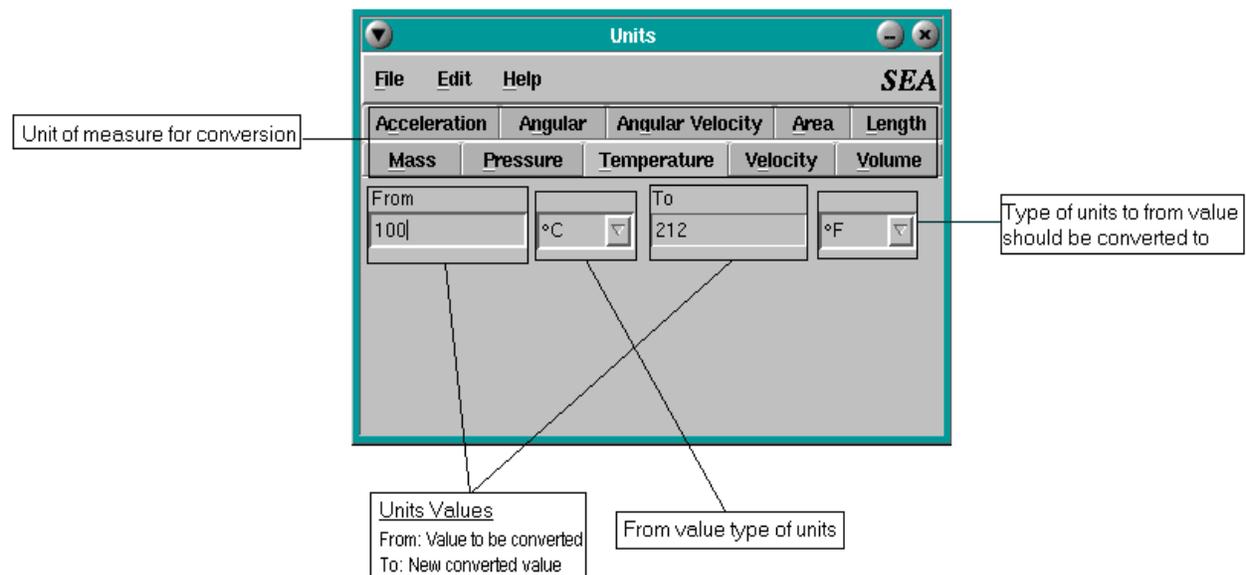
Start Units

1. Click on the **Desktop Manager** button in the task bar.
2. In the **Application Icon** bar, select the **SEA** tab.
3. Click on the **Units** icon.

In addition you can start Units from the command line. Here are the steps for that.

1. Select the **Desktop Manager** in the **task bar**.
2. Select the **Applications** tabs.
3. Click on the **Pterm** icon.
4. Click inside the newly created command window.
5. Type 'Units &'.

The Units Window



SEA Utilities Figure 28: The Units Window

Convert units

1. Select the appropriate **Unit of Measure** tab
2. In the **From** field, type the value you wish to convert.

3. In the drop down menu next to the **From** field select the unit of measurement.
4. Next to the **To** field, in the drop down menu, select the units you require.

SEA Command Line Utilities

The QNX 4 operating system contains a multitude of helpful and necessary utilities. However, there are some specific tasks and/or operations that must be done by custom utilities. These utilities can be used from a Pterm window.

Some of the utilities are used standalone while others are workers for other applications.

Utility	Description	Page
bc635	Setup the BC635/BC637 interface	79
cnvtbls	Converts M200 tables to M300 tables	80
e00totgt	Converts “e00” format map files to “tgt” format	82
halt	Shutdown QNX 4 system, prior to turning power off	83
hog	Intentionally occupies system CPU time	84
netrcv	Network receive worker	85
netsend	Network send worker	86
nettest	Network test for UDP/TCP data	87
reboot	Reboot QNX 4 system	89
seadrive	Help mount USB and kingston drives	90
seagpib	Server for IEEE 488 (GPIB) interface	92
seapci	PCI server	94
seaups	Server for APC Back-UPS	95
seawcm	Control Water Content Measurement System	96
sermon	Monitor data from serial devices	98
serread	Reads and writes to serial ports	100
sertest	Test serial device	102
simcas	Simulates the output of a CAS probe	104
simcip	Simulates the output of a CIP probe	105
simieee	Simulates serial IEEE data (type 38)	106
simint	Simulates serial integer data (type 39)	107
simnet	Outputs any data to the network socket port	108

Table 2-1: Table 1 of 2

Utility	Description	Page
simser	Outputs any data to the serial port	110
system	Checks both the system board, security and setup settings	113
timesync	Synchronize the QNX time to other time source	115
timfilt	Filter M300 data files based on time	117
udp	User Datagram Protocol read/write test	119

Table 2-1: Table 2 of 2

bc635

The bc635 utility is used to setup the BC635/BC637 PCI interface. When the interface is setup with a mode command it takes a long time (8 seconds or more at times), for the interface to report valid synchronization status from source (IRIG-B or other).

The M300 software used to do the setup each time it through the board initialization (when the user clicks play during acquisition mode). Now the bc635 utility does this and it only needs to be one once.

Care must be taken to initialize the BC635/BC637 at least once, before running M300, if the user is doing acquisition mode and using the BC635/BC637 interface.

If waiting for the status to good during boot up from /etc/config/sysinit file, care must be taken to have a valid source power up and connected to the BC635/BC637 interface. Otherwise we will wait forever.

If necessary, for standalone systems, the bc635 can be done in the /etc/config/sysinit file.

Syntax

```
bc635 [-m mode] [-ext] [-sw] [-sr] [-quiet]
```

Options

-m mode

Set the mode. Default is mode 0, time code. Check BC635/BC637 manual for valid modes.

-ext

Set clock source to external (default is internal clock source).

-sw

Wait for status to clear. If you run the utility at startup make sure you have a valid synchronization source.

-sr

Read status bits from BC635/BC637 interface.

-debug

Display debug information.

-quiet

Be quiet, don't display start message.

Examples

1. Set BC635/BC637 interface to mode 0 and wait for status to be good.

```
bc635 -m 0 -sw
```

cnvtbls

The *cnvtbls* is a utility to convert M200 tables to the new M300 table format. A set of tables or configuration files in a directory (folder) is also called a project.

You must start this command from the directory where the files reside. M300 files will be created/overwritten. Care must be taken to backup files prior to using this utility. As a general recommendation the user should create and copy the M200 files to an empty directory. This way it is ensured that no files are overwritten.

Once you are done with the conversion process and made the necessary changes to run the M300, it might be a good idea to remove all the M200 files. This way they won't be copied from project to project nor cause confusion. You can and should keep a copy of the original M200 files from your project in a different directory.

The *cnvtbls* has some known conversion issues/limitations.

1. 2D Mono ('2dm.300' table). *Cnvtbls* can't set the correct probe name entry. This feature is new to the M300 and can't be converted/guessed correctly from M200 tables.
2. Users will get an error message saying "Can't find probe...". This must be corrected manually. Looking at the 'prb.300' table and picking the name for the desired probe. This name must be placed in the probe name field in the '2dm.300' table.

Syntax

```
cnvtbls [-s scale] [-f size] [table1] [table2]... [tablen] [-nolog]
```

Options

-s scale

The unit scale used to convert each value in table (default 1.0).

-f size

The size to be used for the font (default 16).

table1

The first filename to be converted

table2

The second filename to be converted

tablen

The nth filename to be converted

-nolog

Don't generate an error log

Examples

1. Convert acqtbl.txt and hvptbl.txt to M300 format.

```
cnvtbls acqtbl.txt hvptbl.txt
```

2. Convert all tables to M300 format using scale of 1.6 and font size of 20.

```
cnvtbls -s 1.6 -f 20
```

e00totgt

E00totgt is a utility that converts *.e00 (dnnet.e00, ponet.e00, rdline.e00, pppoint.e00) map files to *.tgt map file format. The *.e00 files usually can be accessed from the digital chart of the world from Penn State University. Only one file may be done at once. Note that this utility must also be run from the directory where the *.e00 map files are stored.

Syntax

```
e00totgt fileName [-roads] [-rivers] [-places] [-nolog]
```

Options

fileName

Destination file name for map file

-roads

Use roads. Will copy any roads into the new map file.

-rivers

Use rivers. Will copy any rivers into the new map file.

-places

Use places. Will copy any places into the new map file.

-nolog

Don't generate error log

Examples

1. Convert *.e00 map files to usa.tgt, adding in all found roads and places.

```
e00totgt usa.tgt -roads -places
```

halt

The halt utility is used to shutdown the QNX 4. It is recommended to close the M300 prior to doing the halt.

Don't use this unless you are sure you want to halt. There is no way to cancel a system halt.

This safely shutdowns QNX 4.

Syntax

```
halt
```

Options

Examples

1. Halt

```
halt
```

hog

Hog is a utility to temporarily consume CPU resources for troubleshooting and/or testing purposes. Don't use this utility unless indicated by SEA.

Syntax

```
hog [-f|-r|-o] [-p priority] [busy]
```

Options

-f|-r|-o

FIFO scheduling (default), Round Robin scheduling and Other scheduling respectively (See QNX 4 documentation for a description of each type of scheduling algorithm).

-p priority

Priority (default 7) (See QNX 4 documentation for a description of the QNX 4 scheduling priority system).

busy

Percent busy (Percent of CPU time to occupy) (default 100.0).

Examples

1. Occupy CPU resources using Round-Robin Scheduling, with a priority of 8, while only using 50% of all CPU time.

```
hog -r -p 8 50.0
```

netrcv

The netrcv utility is used by the M300 to receive data to a socket. It is used so the M300 will not block receiving data from sockets. For each receiving socket active there will be a netrcv utility running.

Syntax

```
netrcv [-quiet] [-nolog]
```

Options

-quiet

Be very quiet.

-nolog

Don't generate a error log.

Examples

No sample given since User doesn't start this utility.

net send

The *net send* utility is used by the M300 to send data to a socket. It is used so the M300 will not block sending to sockets. For each sending socket active there will be a *net send* utility running.

Syntax

```
net send [-quiet] [-nolog]
```

Options

-quiet

Be very quiet.

-nolog

Don't generate a error log.

Examples

No sample given since User doesn't start this utility.

nettest

The nettest utility can be used to test data to/from a socket/port. It can send or receive data packets via either UDP/TCP.

Network ports are like serial devices (if it helps to think of them in that way). They can send/receive data in much the same way.

It might be okay to read a UDP port by more than one application. The write has to be unique. TCP is one to one no matter if you are receiving or transmitting.

You can have TCP/UDP going to multiple ports at once. You can't do the two protocols simultaneously on a port.

This utility can be used to make sure that ports and network connections are operational. This can be used prior to setting up M300 or while M300 is running (this assumes proper operation and that ports are not being used for more than one purpose).

Make sure you don't use a port for transmit, if it's already being used.

At times it's okay and allowed to have multiple UDP connections to a port. TCP is one to one, so usually this is not allow for the TCP protocol.

Syntax

```
nettest [-write] [-udp] [-a] [-t delay] [-ip address] [-port portname] [-quiet] [-nolog]
```

Options

-write

Transmit test messages (default receive mode).

-udp

Change protocol to udp (default tcp).

-a

Change format to ASCII output mode (default binary).

-t delay

Change delay in ms after transmit (default is 0, no delay).

-ip address

Set ip address (default is none).

-port portname

Set port name or port number supported (default none).

-quiet

Be very quiet.

-nolog

Don't generate a error log.

Examples

`nettest -udp -write -port wcm-primary -t 100.`

reboot

The `reboot` utility is used to QNX 4. It is recommended to close the M300 prior to doing the `reboot`.

Don't use this unless you are sure you want to reboot. There is no way to cancel a `reboot`.

This safely shutdowns QNX 4.

Syntax

```
reboot
```

Options

Examples

1. Reboot

```
reboot
```

seadrive

The seadrive utility is used to easily connect and disconnect DOS USB drives and Kingston drives.

This utility assumes that the drive names/pathspace have been setup in the form of /dev/hd0, /dev/hd1, etc. Otherwise this utility can't be used.

If you are using this utility for USB drives, make sure you have the QNX 4 USB drivers installed, tested and running properly. Invalid interrupt assignments can sometimes cause issues with 'io-usb' driver.

Since the USB drives are more common these days we will concentrate the documentation on those (but the same ideas and principals apply to the Kingston drives).

This utility can use a configuration file (seadrive.cfg) in the '.sea' directory for the user's home (/home/augie/.sea/seadrive.cfg)

The format for the seadrive.cfg file is:

```
[App]
Address = 0x170
Irq = 15
Usb =
```

This file is read by the utility and the used to set the address, irq, and usb options. Any command line options will override the file values.

The seadrive utility doesn't allow access to /dev/hd0 since this is the primary hard drive for the system. We don't want to be doing anything with /dev/hd0.



The seadrive utility runs at priority 10. This will interfere with M300 and SeaWcm. Don't run seadrive while M300 or SeaWcm are running.

Syntax

```
seadrive -mode -partition -v -quiet -nolog -d drive -l letter -a address -i
irq
```

Options

-mode

Use usb or king drive (default, usb).

-partition

Partition type dos or qnx (default, dos).

-v

Operate in verbose mode.

-quiet

Be very quiet.

-nolog

Don't generate a error log.

-d drive

Specify the drive (default, hd1).

-l letter

Specify dos drive letter (default, c).

-a address

Specify the address for Fsys.eide (default, 0x170).

-i irq

Specify the irq for Fsys.eide (default, 15).

Examples

1. If you run the seadrive utility without any parameters it would try to mount a USB DOS drive, using /dev/hd1. The mount point to access the drive would be /dos/c. If you wish to un-mount the drive, just run the seadrive utility again. If the utility notices a mount point it assumes it needs to un-mount it.

```
seadrive
```

2. Say you have a USB drive mounted using /dev/hd1 as /dos/c (as in the previous example) and you wish to mount another USB drive. We need to use /dev/hd2 for drive (since /dev/hd1 is already in use). Also we need to use drive letter 'd' since 'c' is already in use (/dos/c). The new access point would be /dos/d. If you wish to un-mount this drive use the same command line.

```
seadrive -d hd2 -l d
```

3. If you wish to mount a QNX 4 partition USB drive, then we need to run. This will mount /dev/hd1 as /hd1 access point. Again to un-mount it (after you are done and before removing the drive), just use the same command again.

```
seadrive -qnx
```

seagpib

The *seagpib* is a utility that was designed to work with the M300 and allow the interface of an IEEE 488 bus also known as the General Purpose Interface Bus (GPIB). The GPIB can be used to connect and control programmable instruments, and to provide a standard interface for communication between instruments from different sources.

The M300 will sometimes use this utility when it has to initialize the IEEE488 interface and talk to different devices on the IEEE488 bus.

Syntax

```
seagpib cmdFile capFile [logFile] [-a address] [-p dir] [-c dir] [-nolog] [-v] [-quiet]
```

Options

cmdFile

Command file. Contains the instructions to be sent to the GPIB connected device.

capFile

Capture file.

logFile

Log file.

-a address

Address *address* for gpib device (default 1).

-p dir

Project directory.

-c dir

Common directory.

-nolog

Don't generate a error log.

-v

Operate in verbose mode.

-quiet

Be very quiet.

Examples

1. Send commands out on the GPIB bus taken from the file filter.eee and capture all I/O to filter.cap. When doing so, echo all information to stdout (verbose mode)

```
seagpib filter.eee filter.cap -v
```

seapci

The *seapci* is a utility that was designed to serve all PCI interface cards for the M300 as well as other utilities. This program is not started by the User. It will be started automatically when necessary.

Syntax

```
seapci [-nolog] [-quiet]
```

Options

-nolog

Don't generate error log

-quiet

Be quiet, don't display usage

Examples

No sample given since User doesn't start this utility.

seaups

The *seaups* is a utility that acts as an APC Back-UPS™ daemon to the SEA Photon utility SeaPower or as a standalone background process that will shutdown the M300 and QNX 4 system in an orderly, safe fashion, should power fail.



Note: Note: You must have a working APC Back-UPS™ connected to the M300 serial port for this utility to function properly. Note also, that this utility/daemon will be started automatically when SeaPower is started.

Syntax

```
seaups [-b baud] [-t shutdown] [-nolog] [device]
```

Options

-b baud

Desired baud rate, (default 2400).

-t shutdown

Time in seconds to shutdown when UPS goes critical (default 20 s).

-nolog

Don't generate error log.

device

Name of serial port device (default /dev/ser1).

Examples

1. Start *seaups* with a baud rate of 9,600 on /dev/ser2, using a shutdown time of 10 seconds, while not generating an error log.

```
seaups -b 9600 -t 10 /dev/ser2 -nolog
```

seawcm

The *seawcm* utility is used to control the Water Content Measurement (WCM-2000) system.

This utility duplicates some of the functionality of the *SeaWcm* application. Please take a moment to read the *SeaWcm* documentation if you haven't already done so. The you will see an explanation of data displayed by *seawcm*.

The *seawcm* can't program nor change the settings for the 1-wire devices on the WCM-2000 system.

The *seawcm* can only control the WCM-2000 system and transmit data to a remote computer system. This is a text based utility (using *ncurses* package), and it can be used from any text terminal. The user can telnet to the WCM-2000 computer and run the *seawcm* remotely. As such *seawcm* doesn't need photon to run (no GUI necessary). The *seawcm* can be setup to auto run on system start up.

On systems where the *seawcm* and the M300 run simultaneously, it might be necessary to reduce the display frequency to 1 hz, in order to minimize CPU and video display usage.

The *seawcm* uses the same configuration file as *SeaWcm* application under the '.sea' directory, off the user home directory (*.sea/SeaWcm.cfg*).

Syntax

```
seawcm [-auto] [-expert] [-disp frequency] [-data frequency] [-quiet]
```

Options

-auto

Run in auto mode loading settings from 1-wire devices.

-quiet

Run in expert mode loading settings from files.

-disp frequency

Change the default display frequency, default is 10 hz. This parameter can be changed to reduce the data display frequency and hence the CPU time used by this utility. This is sometime necessary when running M300 and *seawcm* from the same system.

The display frequency can't be more than the data frequency.

-data frequency

Change the default data frequency, default is 10 hz.

-quiet

Be quiet, don't display start message.

Examples

1. Start seawcm re-directing output to /dev/con2 (messages appear in /dev/con2 console).

```
seawcm 2>/dev/con2
```

1. Start seawcm re-directing output to /dev/null (no message output).

```
seawcm 2>/dev/null
```

sermon

The sermon is a command line utility that will read and display data from two different serial ports. It is meant to be used as a troubleshooting tool for serial devices. The serial data stream is broken into two separate flows (input and output). These are then used by the serial monitor utility.

Data from each port will be in different colors. This way it's possible to identify input/output data easily.

The sermon utility works with two serial ports. If the user only specifies one parameter for any of the options, then the parameter applies to the first port (port 1). To apply an option to the second port (port 2), both options must be specified.

Syntax

```
sermon [-b baud] [-f filename] [-binary] [-sync] [-8|-7|-6|-5] [-2|1] [-off|-odd|-even] [-none|-soft] [-cr replace] [-lf replace] [-quiet] [-skip] [-nolog] [device]
```

Options

-b baud

Desired baud rate (default 19,200 for both ports).

-f filename

Capture filename. All received data will be written to this file (default none).

-binary

Binary display mode (default ASCII).

-sync

Sync after data output (default sync off).

-8|-7|-6|-5

8, 7, 6, or 5 data bits respectively (default 8).

-2|-1

2 or 1 stop bits respectively (default 1).

-off|-odd|-even

Parity off, odd, or even respectively (default off).

-none|-soft

Flow control, none or soft (software) (default hardware).

-cr replace

Replace CR (carriage return) with character (default 176).

-lf replace

Replace LF (line feed) with character (default 249).

-quiet

Be quiet, don't display start message.

-skip

Skip file descriptor port count.

-nolog

Don't generate error log.

device

Name of serial port device (default /dev/ser2 for port 1 and /dev/ser3 for port 2). Use NULL to monitor a single port.

Examples

1. Set the desired baud rate to 56700 for both ports, and connect to the serial device on /dev/ser5 and /dev/ser6.

```
sermon -b 56700 -b 56700 /dev/ser5 /dev/ser6
```

serread

The *serread* is a command line utility that was designed to be an interface with system serial ports. This utility allows the user to see what kind of data is being received on a serial port as well as allow the user to send serial data (using typed characters with the keyboard).

If you connect an instrument to the M300 and try to acquire data from it, it might be difficult to troubleshoot if the data is not coming in correctly.

If you run the *serread* to look at binary data use the binary option. However, if you try to store the binary data to a file, don't use the binary option (unless your intent is to capture the hexadecimal values for the binary data). If you don't wish to see the output of the *serread* utility, you can redirect to a null device. Just use '>/dev/null' at the end of the command for the *serread*.

The *serread* utility is an invaluable tool in making sure that the data connection and protocols are setup as expected.

You can use the *simser* utility to transmit data, if necessary from another port.

If there are issues with the data coming in and it looks like it should be okay, make sure you use the *sertest* utility to test the serial port to ensure it is operating properly. If the port passes this test, then check the cable or protocol parameter (baud rate, data bits, etc.).

Syntax

```
serread [-b baud] [-f filename] [-binary] [-sync] [-8|-7|-6|-5] [-2|-1] [-off|-odd|-even] [-quiet] [-skip] [-nolog] [device]
```

Options

-b baud

Desired baud rate (default 19,200).

-f filename

Capture filename. All received data will be written to this file (default none).

-binary

Binary display mode (default ASCII).

-sync

Sync after data output (default sync off).

-8|-7|-6|-5

8, 7, 6, or 5 data bits respectively (default 8).

-2|-1

2 or 1 stop bits respectively (default 1).

-off|-odd|-even

Parity off, odd, or even respectively (default off).

-quiet

Be quiet, don't display start message.

-skip

Skip file descriptor port count.

-nolog

Don't generate error log.

device

Name of serial port device (default /dev/ser1).

Examples

1. Set the desired baud rate to 9600, and connect to the serial device on the second serial port.

```
serread -b 9600 /dev/ser2
```

2. Set the baud rate to 57600, binary mode, capture data to /tmp/capture.txt file. Use /dev/ser3 port.

```
serread -b 57600 -binary -f /tmp/capture.txt /dev/ser3
```

sertest

The *sertest* is a command line utility that was designed to test serial ports. This utility tests the serial ports by using a full set of data patterns out to the port.

You must have a NULL modem cable to connect the ports together or at the very least a loop back plug. If you use serial devices it is recommended that you get a NULL modem cable for both RS232 and RS422. Any time there is an issue with getting data to/from a serial port, you must first start by testing the port and eliminating any issues related with a possible bad port (actual port bad, bad settings, driver, cable, etc.).

There are two ways to use the *sertest* utility.

The first is by using a loop back cable on the serial port. By doing this any character sent is echoed back. The utility can use this to test if the port is working properly. In this mode the utility writes a sample data buffer, reads the data back and compares if the data is the same. Very simple and basic check to see if the serial port is okay.

The second is by using two serial ports connected with a NULL modem cable (RS232 or RS422). These might be on the same machine (node) or different systems. This way the utility is started first on one of the ports in read/write mode (this simulates the loop back). Then, on the other port the utility is started normally. This in fact tests two ports at once.

The count and timeout variables are used to tweak the values used to report a failure in case the data is never read back. It might be necessary to change these based on the baud rate.

The serial test sends random data buffers out the serial port. The size of the buffers can be up to 4096. It is recommended (necessary) for the serial driver to use the '-I' and '-O' parameter to set the size of the input and output buffers to at least 4096. See the appropriate document ion for the driver to make sure the driver supports this and that it is setup correctly.

Syntax

```
sertest [-b baud] [-8|-7|-6|-5] [-2|-1] [-off|-odd|-even] [-t timeout] [-c  
count] [-rw] [-quiet] [-skip] [-nolog] [device]
```

Options

-b baud

Desired baud rate (default 19,200).

-8|-7|-6|-5

8, 7, 6, or 5 data bits respectively (default 8).

-2|-1

2 or 1 stop bits respectively (default 1).

-off|-odd|-even

Parity off, odd, or even respectively (default off).

-t timeout

Specify timeout (default 1.0 s).

-c count

Specify a count value (default 3).

-rw

Use read/write mode (default is write/read/check).

-quiet

Be quiet, don't display start message.

-skip

Skip file descriptor port count.

-nolog

Don't generate error log.

device

Name of serial port device (default /dev/ser1).

Examples

1. Set the desired baud rate to 57600, and connect to the serial device on /dev/ser2. You must either have a loopback cable on /dev/ser2. Or you must have a NULL modem connection to another port (for example, /dev/ser4) and run (`sertest -b 57600 -rw /dev/ser4`).

```
sertest -b 57600 /dev/ser2
```

2. Set the desired baud rate to 57600, use /dev/ser3 port for read/write mode. This is used (first) to allow the `sertest` utility to be used on another system. You must have a NULL modem cable connection between the two ports being tested.

```
sertest -b 57600 -rw /dev/ser3
```

simcas

The *simcas* is a simulation utility to simulate the output of a CAS probe to the M300.

If no simulator file is provided the utility generates a test pattern for the data. That test pattern is sent to the serial port when connected to the M300.

Syntax

```
simcas [-b baud] [-f fileName] [-pbp] [-nolog] [device]
```

Options

-b baud

Desired baud rate, (default 57,600)

-f fileName

Simulator data file, (default none)

-pbp

Simulate CAS PBP (Particle-by-Particle) data rather than standard CAS data.

-nolog

Don't generate error log

device

Name of serial port device, (default /dev/ser1)

Examples

1. Simulate the CAS on /dev/ser8.

```
simcas /dev/ser8
```

simcip

The *simcip* is a simulation utility to simulate the output of a Cloud Imaging Probe (CIP) to the M300. This simulates the CIP serial data only (no image support).

If no simulator file is provided the utility generates a test pattern for the data. That test pattern is sent to the serial port when connected to the M300.

Syntax

```
simcip [-b baud] [-f fileName] [-a address] [-nolog] [device]
```

Options

-b baud

Desired baud rate, (default 57,600).

-f fileName

Simulator data file, (default none).

-a address

Desired board address for the CIP data in the specified simulator file, (default 0x7300).

-nolog

Don't generate error log.

device

Name of serial port device, (default /dev/ser1).

Examples

1. Simulate the CIP on /dev/ser8.

```
simcip /dev/ser8
```

simieee

The *simieee* is a command line utility that was designed to generate serial IEEE data simulating acquisition type 39 (Serial IEEE Data, float).

This utility generates a sample buffer with incrementing values.

At the moment the filename is not used.

Syntax

```
simieee [-b baud] [-f fileName] [-p period] [-nolog] [device]
```

Options

-b *baud*

Desired baud rate, (default 57,600).

-f *fileName*

Simulator data file, (default none).

-p *period*

Time period between data blocks, (default 1.0 s).

-nolog

Don't generate error log.

device

Name of serial port device, (default /dev/ser1).

Examples

1. Generate serial IEEE data on /dev/ser2.

```
simieee /dev/ser2
```

simint

The *simint* is a command line utility that was designed to generate serial integer data simulating acquisition type 39 (Serial Integer Data).

This utility generates a sample buffer with incrementing values.

At the moment the filename is not used.

Syntax

```
simint [-b baud] [-f filename] [-p period] [device] [-nolog]
```

Options

-b baud

Desired baud rate (default 38,400).

-f filename

Simulator data file (default none).

-p period

Time period in seconds between data blocks (default 1.0 s).

device

Name of serial port device (default /dev/ser1).

Examples

1. Generate serial integer data on /dev/ser2.

```
simint /dev/ser2
```

simnet

The *simnet* is a command line utility that was designed to output data onto the socket network port.

It can be used to test socket network port functionality as well as to serve as a simulator for many different types of instruments. This is achieved via some of the simulator test files available under the */test/sims* directory.

Most of the time this utility is used in conjunction with the *nettest* utility to test socket network port/protocol functionality.

This utility can be used while the M300 is running. Just make sure you don't use any socket network ports already in use by the M300 or other applications.

Syntax

```
simnet [-udp] [-ip address] [-port portname] [-f fileName] [-c count] [-t etx] [-s stx] [-eof] [-p period] [-binary] [-format1] [-quiet] [-nolog]
```

Options

-udp

Change protocol to udp (default tcp).

-ip address

Set ip address (default is none).

-port portname

Set port name or port number supported (default none).

-f fileName

Simulator data file to be transmitted, (default */test/sims/tnl.txt*).

-c count

Number of lines to read in ascii mode (default 1).

-t etx

End of text character for binary mode (default 3).

-s stx

Start of text character for binary mode (default none).

-eof

Exit on end of file reached.

-p period

Output period (default 1.0 s). How often to output data.

-binary

Binary or ASCII mode (default ascii mode).

-format1

Output format 1 data (default off, ascii mode).

-quiet

Be quiet, don't display start message.

-nolog

Don't generate error log.

Examples

1. This example simulates output of data to the wcm-primary network port.

```
simnet -f wcm.txt -udp -port wcm-primary
```

simser

The *simser* is a command line utility that was designed to output data onto the serial port.

It can be used to test serial port functionality as well as to serve as a simulator for many different types of instruments. This is achieved via some of the simulator test files available under the `/test/sims` directory.

Most of the time this utility is used in conjunction with the *serread* utility to test serial port/protocol functionality.

This utility can be used while the M300 is running. Just make sure you don't use any serial ports already in use by the M300 or other applications.

At times it is okay to use a serial port for input from one device and output to another. This can be a little tricky, but it is possible. At this times we want to skip the file descriptor count check to make sure we allow more than one instance of an application per port. Use this feature with caution.

Syntax

```
simser [-b baud] [-8|-7|-6|-5] [-2|-1] [-off|-odd|-even] [-f fileName] [-c  
count] [-t etx] [-s stx] [-eof] [-p period] [-binary] [-format1] [-id22] [-  
quiet] [-skip] [-nolog] [device]
```

Options

-b baud

Desired baud rate, (default 19200).

-8

Set the data bits to 8 (default).

-7

Set the data bits to 7.

-6

Set the data bits to 6.

-5

Set the data bits to 5.

-2

Set 2 stop bits.

-1

Set 1 stop bits (default).

-off

Set parity off (default).

-odd

Set parity odd.

-even

Set parity even.

-f fileName

Simulator data file to be transmitted, (default /test/sims/tnl.txt).

-c count

Number of lines to read in ascii mode (default 1).

-t etx

End of text character for binary mode (default 3).

-s stx

Start of text character for binary mode (default none).

-eof

Exit on end of file reached.

-p period

Output period (default 1.0 s). How often to output data.

-binary

Binary or ASCII mode (default ascii mode).

-format1

Output format 1 data (default off, ascii mode).

-id22

Output AIMMS20 ID22 data (default off, ascii mode).

-quiet

Be quiet, don't display start message.

-skip

Skip file descriptor port count. Usually only one utility is allowed to talk to a serial port. This can be used to skip that check.

-nolog

Don't generate error log.

device

Name of serial port device, (default /dev/ser1)

Examples

1. Set the baud rate to 9600 and transmit /test/sims/nmea.txt file to /dev/ser2 serial port. This example simulates a GPS going out on /dev/ser2 port. This port can be connected to another port via a null modem cable. The M300 can acquire data at the same time.

```
simser -b 9600 -f /test/sims/nmea.txt /dev/ser2
```

system

The system is a multi-purpose command line utility to check the system board integrity, the M300 software setup settings and the M300 security system.

For systems with no system board you can ignore the error message for system board not present.

Any problems found while checking for the M300 software setup must be corrected to ensure proper operation. For the most part the system utility will identify the problem and also show which commands to run to fix the problem. If this test phase fails the M300 security test is not done.

The final check of the system utility is the M300 security. It displays all the options available for the particular serial number (iButton key).

The user should run this utility from time to time to make sure the M300 security and M300 software and utilities are setup properly.

After any changes to the M300 key, like new software codes, it is imperative to run this utility to make sure the new codes were entered properly and are active.

After any changes to the M300 software or utilities, it is imperative also to run the system check to make sure the software is setup properly.

Syntax

```
system [address] [-r] [-check] [-ks] [-nolog]
```

Options

address

System board address (default 0x300).

-r

Repeat test forever.

-check

Check M300 security for any erroneous settings or configuration.

-ks

Kill and restart security during check.

-nolog

Don't generate error log

Examples

1. Check system board at address 0x3300
system 0x3300
1. Check M300 security and recommend any fixes
system -check

timesync

The timesync utility can be used to synchronize the QNX time to another time source.

Valid time sources include GPS NMEA data sentences and AIMMS20 data format.

This utility was called gpssync, but we renamed to signify that it can be used by other sources of time data.

Syntax

```
timesync [-b baud] [-8|-7|-6|-5] [-2|-1] [-off|-odd|-even] [-aimms20] [-quiet] [-skip] [-nolog] [-i id] [-t time] [-d date] [device]
```

Options

-b baud

Desired baud rate (default 19,200).

-8|-7|-6|-5

8, 7, 6, or 5 data bits respectively (default 8).

-2|-1

2 or 1 stop bits respectively (default 1).

-off|-odd|-even

Parity off, odd, or even respectively (default off).

-aimms20

Use aimms20 type data (default is GPS NMEA format).

-quiet

Be quiet, don't display start message.

-skip

Skip file descriptor port count.

-nolog

Don't generate error log.

-i id

Change the sentence id (default is '\$GPRMC').

-t time

Change the time index (default 1).

-d date

Change the date index (default 9).

device

Name of serial port device (default /dev/ser2).

Examples

1. Use timesync using 4800 baud, change to '\$GPGGA' sentence and use /dev/ser4 port.

```
timesync -b 4800 -i $GPGGA /dev/ser4
```

2. Use timesync using 115200 baud, change to AIMMS20 data format and use /dev/ser3 port.

```
timesync -aimms20 -b 115200 /dev/ser3
```

timfilt

The *timfilt* utility is used to trim M300 binary files based on time. The user can specify a starting and ending time for limits.

When specifying end limits the user must also specify the starting limits.

A data check may be performed by the *timfilt* utility on a M300 binary file. The *timfilt* reads the entire file and checks the M300 buffers for integrity.

When using the *timfilt* utility don't confuse/switch the input and output files. If you use the input file in the output field the file will be truncated and all data lost. It is always a good idea to work on a copy of the data and have several backups of your data files.

The end time and date are used if the data file crosses midnight, otherwise they can be skipped.

Syntax

```
timfilt inFile outFile [stime] [sdate] [etime] [edate] [-nolog]
```

Options

inFile

Desired input file name (must be the first parameter to *timfilt*).

outFile

Desired output file name (must be the second parameter to *timfilt*).

stime

Start time for data limits. Format for starting time is hh:mm:ss.fff. The default time is the starting time from the file (include all data).

sdate

Start date for data limits. Format for starting date is yyyy/mm/dd. The default is the starting date from the data file.

etime

End time for data limits. Format is hh:mm:ss.fff. The default is 00:00:00.

edate

End date for data limits. Format is yyyy/mm/dd. The default is 2037/01/01.

-nolog

Don't generate error log.

Examples

1. Trim m20070419.sea file using a starting time of 12:34:40. Create a trim.sea file with the new shorter data. The original file is left unchanged.

```
timfilt m20070419.sea trim.sea 12:34:40
```

2. Check m20070419.sea file for errors

```
timfilt m20070419.sea trim.sea
```

udp

The `udp` utility can be used to test the User Datagram Protocol (UDP). You must have TCP/IP installed and running (TCP/IP 5.0 version or better recommend). This utility can be used to test basic UDP operation (receive and transmit) as well as M300 data receive.

There are three modes of operation for this utility.

The default mode is M300 receive. You must have a M300 session broadcasting data (in either acquisition or playback mode) on another machine (only one allowed per broadcast port).

Receive UDP test message. You must have a UDP transmit application running on another machine (only one allowed per broadcast port).

Transmit UDP test message. You can one or more UDP receive applications on other machines running.

Syntax

```
udp [-read|-write] [-quite] [-d delay] [-ip address] [-port portname] [-nolog]
```

Options

-read

Receive UDP test messages (default M300 receive mode).

-write

Transmit UDP test messages (default M300 receive mode).

-d delay

Change delay in ms after transmit (default is 0, no delay).

-quiet

Be quiet, don't display start message.

-ip address

Set UDP broadcast address (default is 192.9.200.255).

-port portname

Set UDP broadcast port name or port number supported (default is sea-udp).

-nolog

Don't generate error log.

Examples

1. Run M300 receive mode.
`udp`
2. Run UDP receive mode, no start message.
`udp -read -quiet`
3. Run UDP transmit mode, specify 192.9.255.255 as the broadcast IP and radar-udp as the broadcast port name.
`udp -write -ip 192.9.255.255 -port radar-udp`