



Excellence in Compliance Testing

Certification Exhibit

**FCC ID: JIAAWR1
IC: 6041A-AWR1**

**FCC Rule Part: 15.209
IC Radio Standards Specification: RSS-210**

ACS Report Number 08-0085 - 15C

**Manufacturer: Mini Mitter Company, Inc.
Model(s): ActiReader**

Manual
(Part 2 of 3)

2

GETTING STARTED

WARNING! *Actiware / Actiware-CT is for use only in a clinical, research, or home care provider setting.*

The workspace of the Actiware program is similar to many software applications. Dockable windows give the user direct access to the Actiwatch or subject data stored in the selected database. They also provide control over analysis viewing and exports.

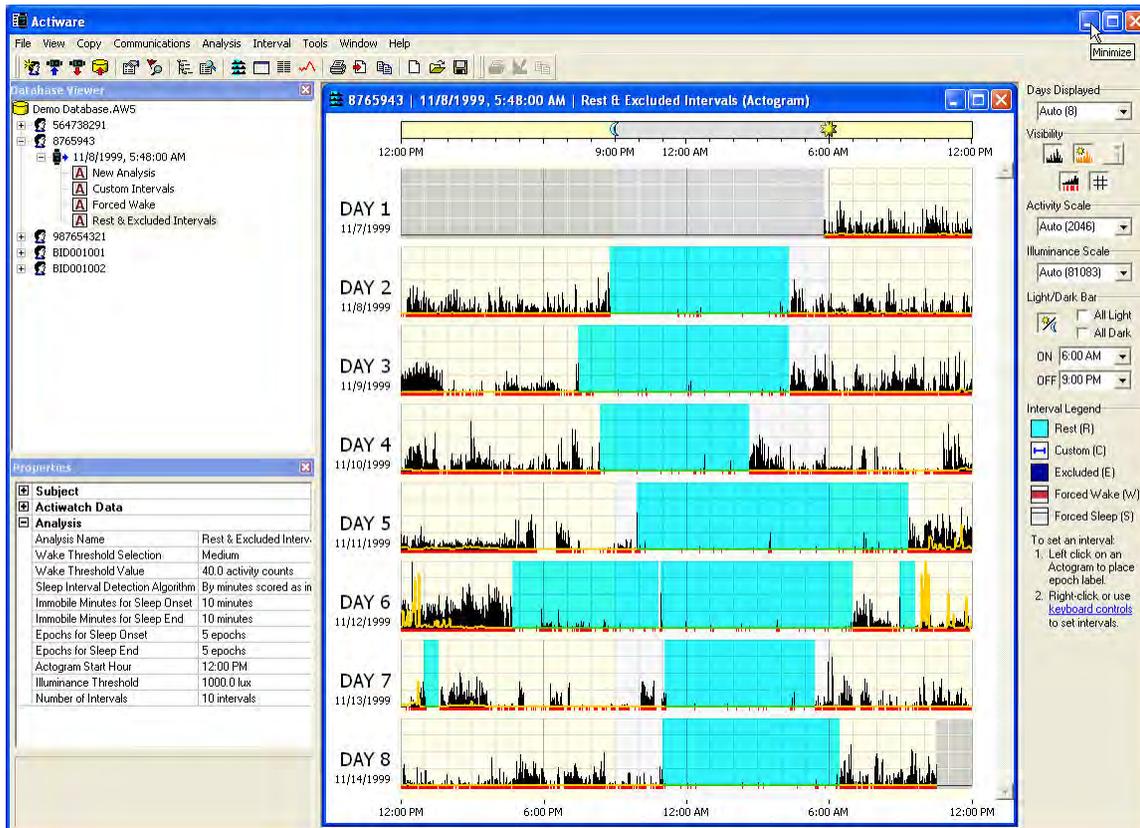
The Database Viewer and the Properties Viewer are docked at the left side of the main Actiware window by default. The Actogram View toolbar is shown on the right side of the main Actiware window.

Actiware databases are organized in a hierarchical fashion. The top level is the subject level. The second level is the Actiwatch data for that subject. The third level is for saved analyses of the Actiwatch data. You can navigate through this hierarchy by clicking on the + (plus sign) or – (minus sign) buttons to the left of the subject or Actiwatch data icons.

- Subjects are sorted by subject ID.
- Actiwatch Data entries are sorted by data collection start time.
- Analyses are sorted by saved name.

Main Window

Actiware workspace, full-window



The main Actiware window can be broken into three main sections:

- Toolbars
- Database Viewer
- Properties viewer

Toolbars



The Menu Bar is similar to most software applications. Keyboard shortcuts, actuated by pressing the **ALT** key plus the hotkey letter, (identified by an underscore) can be used to navigate through the toolbar menus.

The Standard toolbar, just below the Menu Bar, includes shortcuts to associated functions within the Actiware software program. Hover your mouse over the icon for a short text description.

Standard Toolbar Icons

	Create A New Subject		Edit Subject, Data, or Analysis
	Configure My Actiwatch		Show Audit Trail
	Retrieve Data from My Actiwatch		Open the Database Viewer
	Import an .awd File		Open the Properties Viewer

The following four icons determine how the data are shown in the **Analysis** window.

	Display Data as an Actogram		Display the Data List
	Display Statistics within an Interval		Display Data as a Graph

	Print an Actiware Report		Create a New Analysis File
	Export a Data File		Open an Analysis File
	Copy Export Text to the Clipboard		Save an Analysis File

The **Graph** toolbar provides access to functions that are available only when viewing a graph.

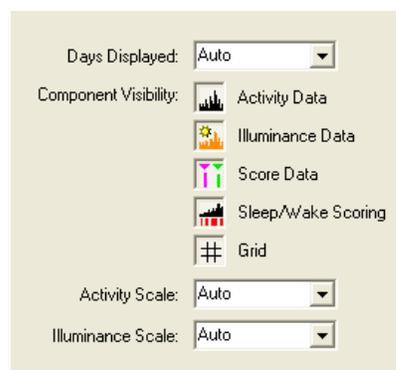
	Print a Graph		Copy Graph to the Clipboard
	Edit the Graph Display Properties		

The Actogram View toolbar is used for adjusting the viewing properties of an Actogram, and is available only when an Actogram is present. Changes made to this toolbar are immediately visible in the currently selected Actogram.

Actogram View Toolbar



- Days Displayed: controls how many days are displayed in the visible part of the Actogram window. Use the scroll bar on the right of the Actogram to see the remaining days. Pull down or type directly into this control to set the number of days.
- Visibility: these buttons hide and show the data items in the Actogram:



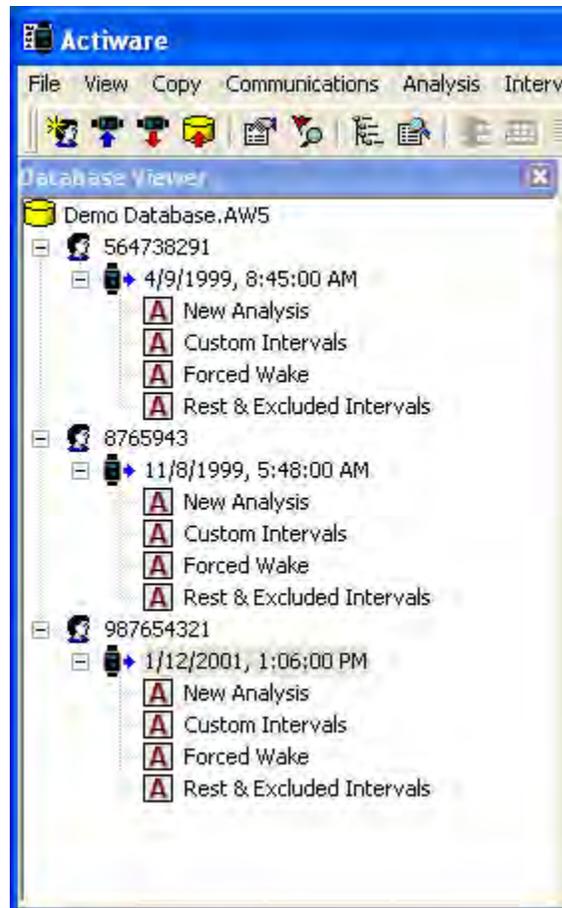
- Activity Scale: adjusts the maximum value of activity counts displayed on the Actogram. Pull down or type directly into this control to set the activity scale.
- Illuminance Scale: adjusts the maximum illuminance value displayed on the Actogram. Pull down or type directly into this control to set the scale.
- Light/Dark Bar: use these controls to show or hide the bar at the top of the Actogram, to set the light on/light off time, or to set the light to all on (24 hours of light) or all off (24 hours of dark).
- Interval Legend: provides a convenient reminder of the color scheme used for displayed intervals. Click the keyboard controls link to display quick reminders on how to set intervals. See Setting Intervals later in this section.

To save your current Actogram View settings as default settings, click **View > Save Current Actogram View as My Default View**. Or, to restore your default view settings, click **View > Restore My Default Actogram View**.

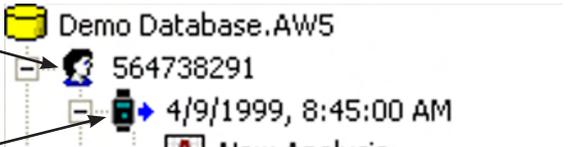
Database Viewer

The Database Viewer is used to provide a hierarchical tree view of the data in your currently selected database. Below is an example view from the Demonstration Database that is provided with Actiware.

Database Viewer



Subjects, Actiwatch data, and Analyses are shown as indicated below:

Level		Content
1st Level (Subject)		Subject Identity (Sorted Alphabetically or Numerically)
2nd Level (Actiwatch Data)		Local Start Time (Sorted by Date)
3rd Level (Analysis)		Analysis Name (Sorted Alphabetically)

Commonly used functions can be accessed by right-clicking on an item in the Database Viewer and using the popup menu.

Actiware automatically loads the last used database or when run for the first time, the Demonstration Database. To create a new database, click **File > Database > New** and use the Windows file selection to select a filename and location. Other database functions (such as Open, Save As, Backup, and Export) can be accessed from the **File > Database** menu.

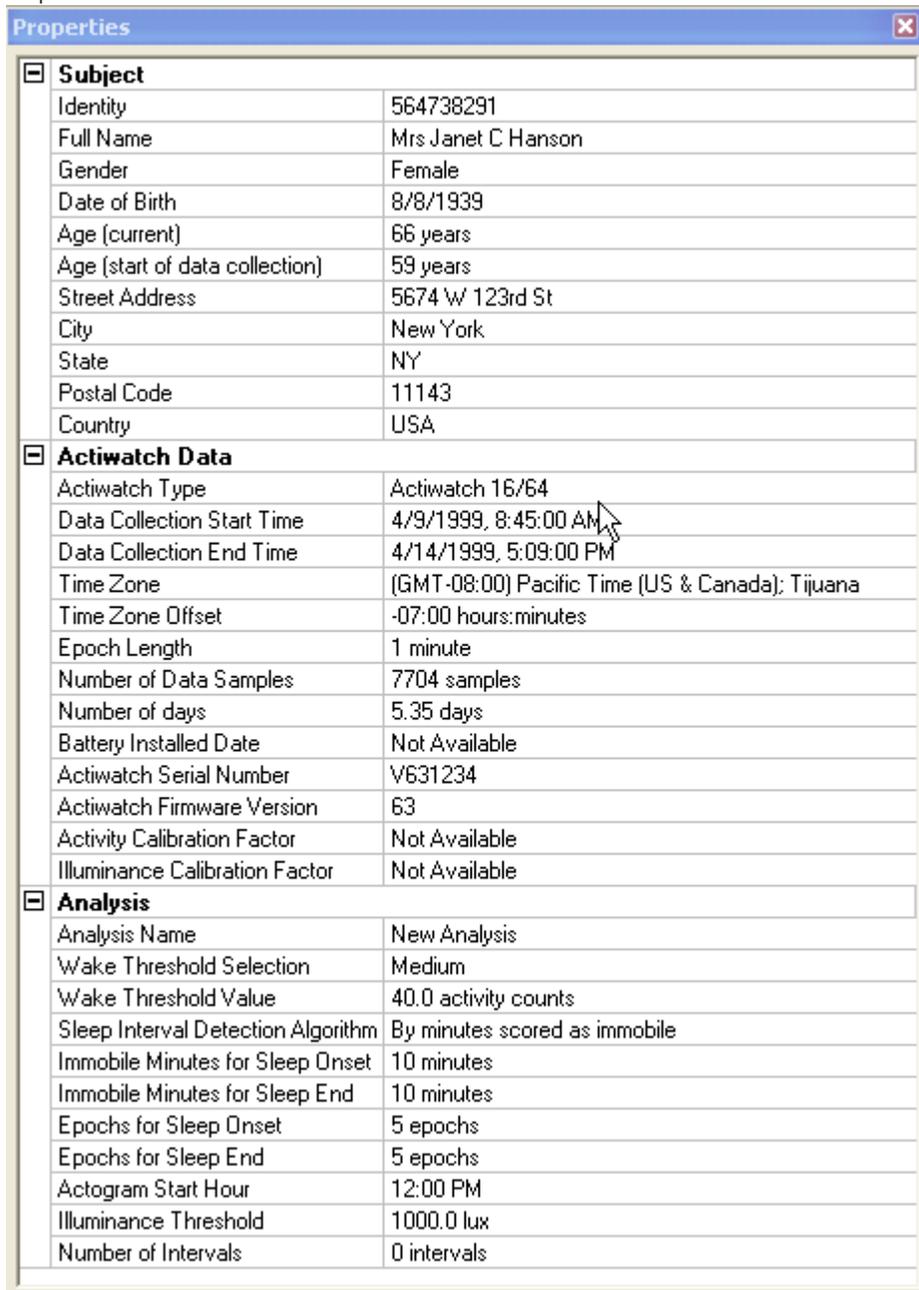
The Database Viewer can be undocked or docked by clicking and dragging the window title bar. In addition, it can be resized or closed. To show again, use the **View > Database Viewer** menu.

Properties Viewer

The Properties Viewer displays information for the database item that is currently selected in the Database Viewer; hence the Database Viewer and Properties Viewer are linked.

Click the + or – next to the Subject, Actiwatch Data, or Analysis to expand or collapse the properties related to that database item. Left-click on an item to see a description of the property in the notes area at the bottom of the window. For instance, the properties related to the *Rest & Excluded Intervals* analysis are displayed. Note that the Subject and Actiwatch data properties are also displayed.

Properties Viewer window



Subject	
Identity	564738291
Full Name	Mrs Janet C Hanson
Gender	Female
Date of Birth	8/8/1939
Age (current)	66 years
Age (start of data collection)	59 years
Street Address	5674 W 123rd St
City	New York
State	NY
Postal Code	11143
Country	USA
Actiwatch Data	
Actiwatch Type	Actiwatch 16/64
Data Collection Start Time	4/9/1999, 8:45:00 AM
Data Collection End Time	4/14/1999, 5:09:00 PM
Time Zone	(GMT-08:00) Pacific Time (US & Canada); Tijuana
Time Zone Offset	-07:00 hours:minutes
Epoch Length	1 minute
Number of Data Samples	7704 samples
Number of days	5.35 days
Battery Installed Date	Not Available
Actiwatch Serial Number	V631234
Actiwatch Firmware Version	63
Activity Calibration Factor	Not Available
Illuminance Calibration Factor	Not Available
Analysis	
Analysis Name	New Analysis
Wake Threshold Selection	Medium
Wake Threshold Value	40.0 activity counts
Sleep Interval Detection Algorithm	By minutes scored as immobile
Immobile Minutes for Sleep Onset	10 minutes
Immobile Minutes for Sleep End	10 minutes
Epochs for Sleep Onset	5 epochs
Epochs for Sleep End	5 epochs
Actogram Start Hour	12:00 PM
Illuminance Threshold	1000.0 lux
Number of Intervals	0 intervals

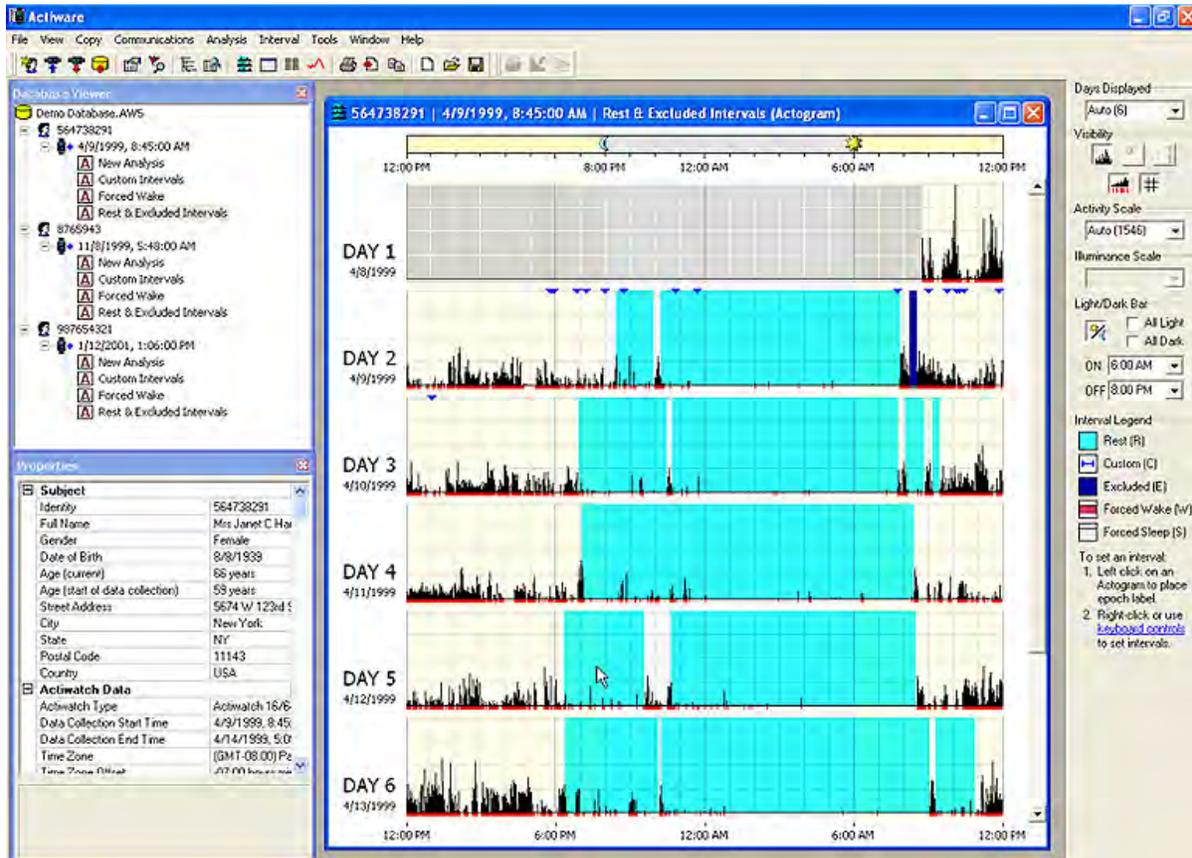
Items in the Properties Viewer can be edited by double-clicking the item.

The Properties Viewer can be undocked or docked by clicking and dragging the window title bar. In addition, it can be resized or closed. To show again, use the **View > Properties Viewer** menu.

Actogram

An Actogram is a graphic view of the rest/activity history of a subject. Data are displayed in stackable 24-hour periods which allow the user to immediately determine sleep/wake patterns.

The Actogram provides the ability to select periods of time, known as intervals, and to provide statistics for these times of interest. (See Setting Intervals later in this section.)



There are multiple ways to open an Actogram. The most direct way is:

1. In the Database Viewer, click the + sign next to a Subject to expand.
2. Click the + sign next to the Actiwatch Data record to expand.
3. Double-click on New Analysis. An Actogram will be displayed.

This process can be repeated for any analysis (such as Custom Intervals) shown in the Database Viewer.

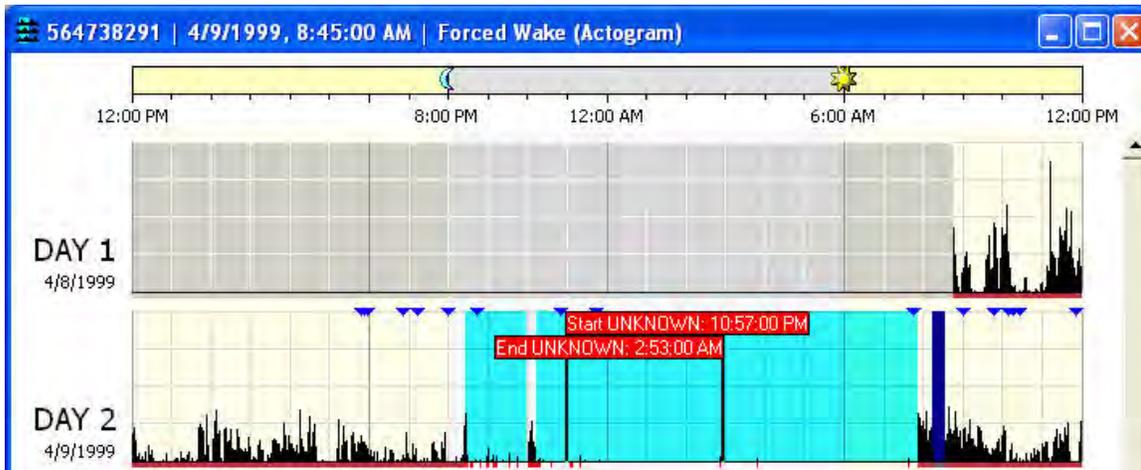
You can also open an Actogram by clicking the **View > Actogram** menu, or by clicking the icon on  the Standard toolbar at the top of the window.

Use the Actogram View toolbar (displayed on the right side of the window) to adjust the view settings for the Actogram.

***Note:** The sleep/wake scoring algorithm is applied automatically to the activity in the entire data set. Epochs scored as wake are indicated by a red mark below the X axis, whereas epochs scored as sleep have no mark below the X axis.*

Setting Intervals

Adding an Interval Selection to an Actogram



An interval is a user-defined selection of time that allows you to graphically select and analyze data for statistical calculations. For calculation of statistics for specific periods of time, it is necessary to select intervals and assign an interval type to them. The Interval feature in Actiware provides a robust data selection, exclusion and quantitative tool. The interval types that are available:

- Rest – user defined
- Sleep – automatically determined from Rest intervals
- Active – automatically determined from Rest intervals
- Excluded – user defined
- Forced Wake Score – user defined
- Forced Sleep Score – user defined

Rest intervals

These are intervals of data that contain periods of time when the subject activity is low and the subject is likely to be at rest. They must be set by the user and are indicated on the Actogram by light blue shading. Typically this will be used for the In Bed Period. By setting a Rest Interval you are directing the program to apply the Sleep Interval Detection algorithm for generating Sleep Periods.

This algorithm will use the first data point in the rest interval as the Bed Time and the last data point as the Get up Time. From these points, the Sleep Onset and Sleep End will be set using the Analysis parameter values that are indicated on the Analysis tab of the **Tools > Options** window. Once you have set a Rest Interval, a Sleep Interval will automatically be created within it.

Sleep Intervals

Data in these intervals represent periods of time in which the subject is likely to be asleep. These intervals are created automatically by the program once a Rest Interval has been set. They represent the period of time between Sleep Onset and Sleep End but are not indicated by any shading.

Active Intervals

Data in these intervals represent periods of time in which subject activity indicates that they are alert and engaged in physical activity. These intervals contain all those data that are outside of Rest Intervals. Active Intervals are created automatically when Rest Intervals are set. No shading is used to indicate these intervals.

Excluded Intervals

Data in these intervals are excluded from all analytical calculations. These intervals are designed for use when subjects remove the Actiwatch or for other invalid periods of data. These must be set by the user and are indicated by dark blue shading.

Custom Intervals

These are intervals of data that are of some interest for any reason. Typically these are used for illuminance calculations when using an Actiwatch-L or numerical rating scale values when using the Actiwatch Score. They may also be used for assessing activity during specific periods of the day. They are indicated on the Actogram by a blue bar above the activity data, and must be set by the user.

Forced Wake

These intervals are periods of time for which the Sleep/Wake score has been forced by the user to Wake. This is typically used if the subject is known to be awake, but very inactive, or as an alternative to excluding data. Epochs included in this type of interval are indicated by a magenta mark below the X axis of the Actogram.

Forced Sleep

These intervals are periods of time for which the Sleep/Wake score has been forced by the user to Sleep. This typically is used if the subject is known to be sleeping but there is significant movement. Epochs included in this type of interval are indicated by a gray mark below the X axis of the Actogram.

***Note:** Custom, Excluded, Forced Wake and Forced Sleep intervals can be overlapped. However, due to the automatic creation of Sleep intervals, Rest intervals **cannot** be overlapped. If you attempt to overlap Rest intervals, they will be combined into one interval.*

There are three ways to set intervals. The quick method uses the mouse and hotkey combinations:

Quick Method

1. Hold down the **CTRL** key on the keyboard.
2. Click the *left* mouse button where you want the start of the interval to be.

Interval Start Time



3. While still holding down the **CTRL** key, click the *right* mouse button where you want the end of the interval.

Interval End Time



If you set an interval flag in the wrong location and want to move it, repeat the above process. Also, by holding down the **CTRL** key and the mouse button, you can drag the flag to the precise location you want.

4. Using one of the following hotkey combinations, set the type of interval you want:

CTRL + R	Insert REST interval
CTRL + C	Insert CUSTOM interval
CTRL + E	Insert EXCLUDED interval
CTRL + W	Insert Forced WAKE interval
CTRL + S	Insert Forced SLEEP interval

The new interval will be automatically drawn in the Actogram display. See the legend on the right side of the window (on the Actogram View toolbar) to see how the intervals are indicated on the Actogram.

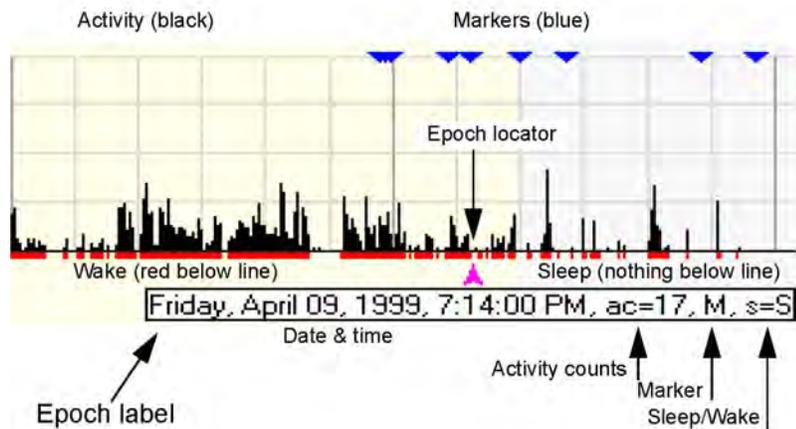
Note: During the interval creation process you can press the keyboard *Escape* key to clear the markers.

Fine Control Method

To set your intervals graphically to the nearest epoch, use the following procedure:

1. Click the left mouse button on the Actogram to place the epoch label.
2. Use the keyboard arrow keys (←, →, ↑, ↓) to move the epoch label to the desired interval start time.

Close-up of Interval Markers on Actogram



3. To place the interval start marker, press one of the following keys based on the interval type you want to create:

R	Set REST interval start
C	Set CUSTOM interval start
E	Set EXCLUDED interval start
W	Set Forced WAKE interval start
S	Set Forced SLEEP interval start

4. Once again, click the *left* mouse button on the Actogram to place the epoch label, and use the arrow keys to place the epoch label at the desired interval end time.

5. To place the interval end marker, press one of the following hotkey combinations based on the interval type you're creating:

SHIFT + R	Set REST interval end
SHIFT + C	Set CUSTOM interval end
SHIFT + E	Set EXCLUDED interval end
SHIFT + W	Set Forced WAKE interval end
SHIFT + S	Set Forced SLEEP interval end

If you set an interval flag in the wrong location and want to move it, repeat the above process.

6. As with the Quick Method above, use one of the following hotkey combinations to set the type of interval you want:

CTRL + R	Insert REST interval
CTRL + C	Insert CUSTOM interval
CTRL + E	Insert EXCLUDED interval
CTRL + W	Insert Forced WAKE interval
CTRL + S	Insert Forced SLEEP interval

*Note: During the interval creation process you can press the keyboard **Escape** key to clear the markers.*

Menu and Sleep Diary Methods

If you prefer to type in the date and time values for the interval start and end times, such as if you have a patient sleep diary, use the following procedure:

1. Click **Interval > Add Interval**.

This will launch the Add Interval window.

2. Select the Interval Type

- Rest
- Excluded
- Custom
- Forced Sleep
- Forced Wake

3. Set the Interval Start Time (date and time).

You can type in the date or use the interactive calendar to select the date. You can type in the time or use the arrows to scroll to the appropriate time

4. Set the Interval End Time (date and time).

Note: If you want to create this interval for all days, check the Repeat for all days check box. This will create an interval every 24 hours starting with the interval start time, with the duration equal to the configured interval.

5. Click the Add Interval(s) button to add the interval, or Close to cancel.

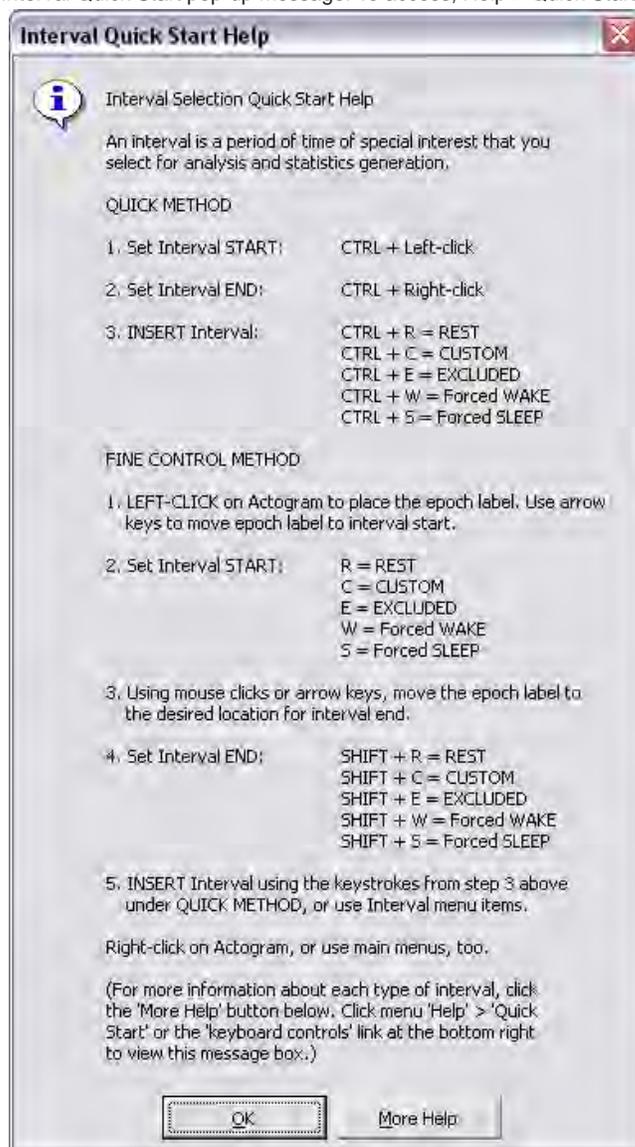
You can repeat steps 2 through 5 for each interval without closing the Add Interval window.

Note: You can also click the right mouse button in the Actogram, or use other sub-menus under the Interval main menu to set interval markers or insert intervals.

Interval Quick Start Help

The Interval Quick Start Help message provides an overview of the interval functions. To display this message, click the keyboard controls link on the bottom of the Actogram View toolbar, or click **Help > Quick Start > Interval Selection**.

Interval Quick Start pop-up message. To access, Help > Quick Start > Interval Selection



Removing Intervals

To remove a single interval simply click the left mouse button in the interval you want to delete, then press the Delete key.

To remove all intervals, right click on the Actogram and select Clear All Intervals (also accessible from the Interval menu)

To remove all intervals of a specific interval type, use the Interval menu, or the corresponding keyboard shortcuts (such as CTRL + ALT + C to clear all custom intervals).

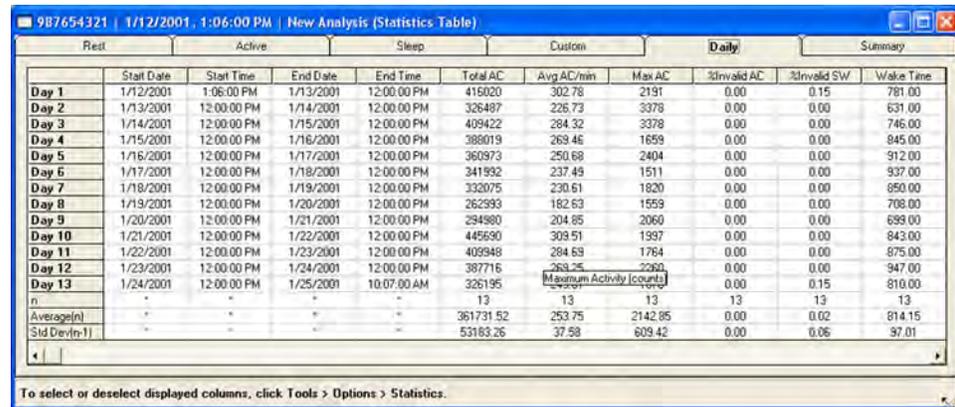
Viewing Statistics

The Statistics Table is one of two main ways to display the calculated sleep/wake output. Interval, activity, mobility, sleep, illuminance, and score statistics are automatically calculated for intervals that are set by the user.

1. View > Statistics Table

Click on the tabs at the top of the window to view calculated statistics for different types of intervals. Use the scrolling tools to move through the list of intervals or to view different columns of statistics.

Statistics Table



The screenshot shows a software window titled "987654321 | 1/12/2001, 1:06:00 PM | New Analysis (Statistics Table)". The window has several tabs: Rest, Active, Sleep, Custom, Daily (selected), and Summary. Below the tabs is a table with the following data:

	Start Date	Start Time	End Date	End Time	Total AC	Avg AC/min	Max AC	%Invalid AC	%Invalid SW	Wake Time
Day 1	1/12/2001	1:06:00 PM	1/13/2001	12:00:00 PM	416020	302.78	2191	0.00	0.15	781.00
Day 2	1/13/2001	12:00:00 PM	1/14/2001	12:00:00 PM	326487	226.73	3378	0.00	0.00	631.00
Day 3	1/14/2001	12:00:00 PM	1/15/2001	12:00:00 PM	409422	284.32	3378	0.00	0.00	746.00
Day 4	1/15/2001	12:00:00 PM	1/16/2001	12:00:00 PM	388019	269.46	1659	0.00	0.00	945.00
Day 5	1/16/2001	12:00:00 PM	1/17/2001	12:00:00 PM	360973	250.68	2404	0.00	0.00	912.00
Day 6	1/17/2001	12:00:00 PM	1/18/2001	12:00:00 PM	341992	237.45	1511	0.00	0.00	937.00
Day 7	1/18/2001	12:00:00 PM	1/19/2001	12:00:00 PM	332075	230.61	1820	0.00	0.00	850.00
Day 8	1/19/2001	12:00:00 PM	1/20/2001	12:00:00 PM	262993	182.63	1559	0.00	0.00	708.00
Day 9	1/20/2001	12:00:00 PM	1/21/2001	12:00:00 PM	294980	204.85	2060	0.00	0.00	699.00
Day 10	1/21/2001	12:00:00 PM	1/22/2001	12:00:00 PM	445690	309.51	1997	0.00	0.00	843.00
Day 11	1/22/2001	12:00:00 PM	1/23/2001	12:00:00 PM	409948	284.63	1764	0.00	0.00	875.00
Day 12	1/23/2001	12:00:00 PM	1/24/2001	12:00:00 PM	387716	269.25	2260	0.00	0.00	947.00
Day 13	1/24/2001	12:00:00 PM	1/25/2001	10:07:00 AM	326195	236.95	1764	0.00	0.15	810.00
n	-	-	-	-	13	13	13	13	13	13
Average(n)	-	-	-	-	361731.52	253.75	2142.85	0.00	0.02	814.15
Std Dev(n)	-	-	-	-	53163.26	37.58	609.42	0.00	0.06	97.01

At the bottom of the window, there is a note: "To select or deselect displayed columns, click Tools > Options > Statistics."

Controlling the Content of the Statistics Table

1. Tools > Options

This will launch the Options pop-up window.

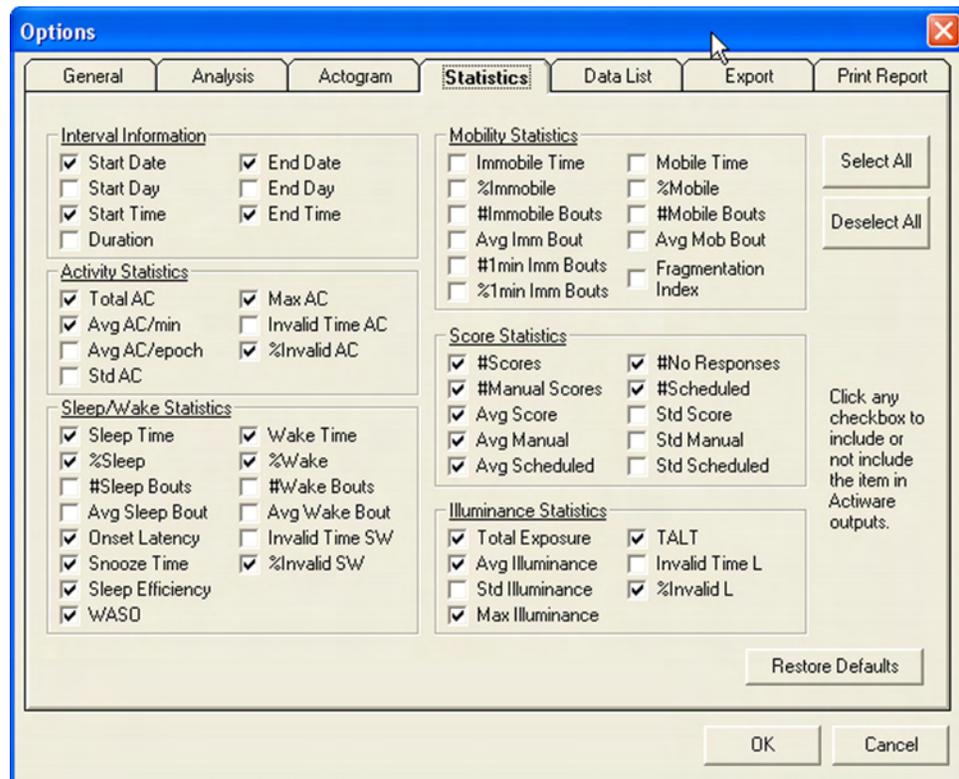
2. Statistics

Select the **Statistics** tab (mouse-click) to view the available statistic properties. Check those statistics that you want to include. Actiware includes **Select All**, **Deselect All**, and **Restore Defaults** buttons for ease of use.

3. Click **OK** to save your selections or **Cancel** to unaccept.

Your selections will appear in the Statistics Table and be included in exported and printed data.

Tools > Options > Statistics



See *Advanced Usage* in Section 4 for statistic definitions.

Note: The selections that you make here will impact the content of exported files and printed reports.

Exporting Data

Once you have added intervals and analyzed your data, you can export the retrieved raw data or statistical results to a text file that can be easily loaded into Microsoft Excel, FAST, or a database program of your choice.

There are three types of export files that can be created using Actiware:

Standard Individual Export File

This is a comma delimited ASCII text file (.csv) that can be opened directly by Microsoft Excel. It contains the data and analysis results for one analysis.

To create this file, click **File > Export** menu or click the  button on the Standard toolbar. You will be prompted for a file name using the standard Windows dialog box.

***Note:** The contents of the export file can be customized using the **Tools > Options** window. Use the **Statistics, Data List and Export** tabs to select what content you would like in the export file.*

Instead of creating a file, you can copy the file contents directly to the Windows clipboard by clicking **Copy > Export Text**. Then paste into your program of choice using the Clipboard paste function (commonly CTRL + V keyboard hotkey).

FAST™ Export File¹

This is a tab delimited ASCII text file (.txt) designed specifically for importing into the Fatigue Avoidance Scheduling Tool™ Software. A short header, sleep/wake scores, and per epoch time stamps for the currently selected analysis are included in this export file.

To create this file, click **File > FAST Export**. You will be prompted for a file name using the standard Windows dialog box.

¹ FAST™ is a trademark of NTI, Inc.

Combined Export File

This is a comma delimited ASCII text file (.csv) that can be opened directly by Microsoft Excel. It contains the data and analysis results for intervals from *multiple* analyses. These analyses can be from any number of subjects or Actiwatch data records in the currently opened database.

Use the Text File Export Batch Wizard, accessible from the **Tools > Text File Export Batch** menu to create this file (or many Standard Individual Export Files).

See *Batch Export* in *Advanced Usage*, Section 4, for details.

Note: *Actiware-CT does not allow Copy > Export Text or File > FAST Export because these are unsecured outputs that do not contain an electronic or digital signature.*

Print Report

You can generate a printed report of your Actogram and statistical results for the currently selected analysis.

To generate the report, click **File > Print Report**, or click the  button on the Standard toolbar. You will be presented with a Windows printer dialog where you can select the printer, number of copies, and paper orientation (such as Portrait or Landscape).

***Note:** The contents of the printed report can be customized using the **Tools > Options** window. Use the **Statistics** and **Print Report** tabs to select what content you would like for the printed report.*

New Subject

Once a database exists it can be populated with subjects and subject collected data. To add or edit a subject, first open the database. **Select File > Database > Open**, as described on the previous page.

To add a new subject to a database, do the following:

1. Click **File > New Subject**.

This will open a New Subject window to allow for the capture of demographic data.

2. Fill in the three required fields: **Identity, Date of Birth** and **Gender**

For Identity, we suggest using a blind descriptor or nickname of the subject. Notice that Age is automatically computed.

***Important!** Because you can import subjects from other databases, Actiware allows more than one subject with the same ID. Therefore, you need to be sure you choose a subject ID that does not already exist in the currently open database.*

3. If you desire, fill in the remaining fields.

For HIPAA considerations, these fields are optional.

When USA or Canada is entered into the Country field, a dropdown list for the State/Province area will become available. Additionally, the Phone field will be optimized for the (###) ###-#### format. To enter a non-US or non-Canadian state code or phone number, enter the Country first.

Deleting/Hiding Subjects

For purposes of data tracking, you cannot delete subjects from a database. You can hide them by checking the **Hide Subject** box. Once hidden, a subject will not appear in the Database Viewer. Hidden subjects may be revealed by right clicking in the Database Viewer and selecting **View Hidden Subjects**.

3

COMMUNICATIONS

The Actiware software is used to configure the Actiwatch device and retrieve data from the Actiwatch through the use of the ActiReader.

To set up the ActiReader, see *Installation and Setup* in Section 1 of this manual.

Configure Actiwatch

Overview

This wizard will configure an Actiwatch for data collection. This wizard assumes that the ActiReader or Actiwatch Reader is connected to the computer and the appropriate COM port is selected. Please refer to *Section 1* of this manual for setting up the ActiReader and selecting a COM port.

The **Configure Actiwatch Wizard** will guide you through several windows. As with other Actiware wizards, you can make changes at each window. You can also travel between windows using the **Back** and **Next** buttons, or **Cancel** to close the wizard.

Use the **Show/Hide Actiwatch Details** button to view additional information associated with the watch.

CAUTION! *The Configure Actiwatch wizard will delete all setup information and data stored in the Actiwatch. To stop this wizard, select the **Cancel** button. To retrieve data, proceed to **Retrieve Data from Actiwatch** later in this section.*



Configure Actiwatch

Configure Actiwatch

1. Communications > Configure Actiwatch

This will launch the Configure Actiwatch Wizard.

2. Remove the wrist/foot bands from the Actiwatch (optional).

The bands may interfere with proper Actiwatch placement.

3. Place the Actiwatch on the reader.

The green dot on the metal side of the Actiwatch must align with the green dot on the ActiReader. Verify that the metal side is facing up, the green dots are adjacent and the green LED 'ALIGNED' light is on.

4. Click **Next** to continue.

The wizard will check the Actiwatch serial number and battery life. If a **Low Battery Warning** appears, please choose one of the three options from the pop-up window. If the warning does not appear, proceed to step 6.

- Change Battery—wizard will guide you through the battery replacement process (see *Actiwatch Battery Replacement* later in this manual).
- Changed Battery, update—wizard will update the database with the new battery information.
- Ignore—wizard will ignore the Low Battery Warning.

5. Click **Next** to continue.

Edit Subject Information

Select subject from the dropdown list or use the 'New Subject' button to add a new subject to the database.

Configure Actiwatch Wizard - Edit Subject Information

Please select the subject who will be wearing the Actiwatch device:

Subject Identity:

Subject Name:

Subject DOB: Age: Gender:

Each Actiware database can contain many subjects. Select a subject identity from the list above, or click 'New Subject' to create a new subject.

(This information will be stored onboard the Actiwatch. Consequently if the Actiwatch is later downloaded on another computer, the software will be able to associate the physiological data with a subject.)

Once you have selected a subject, click the 'Next>' button to proceed.

6. Select a current subject from the dropdown list and then click **Edit Subject** to make updates.

When an existing subject is selected from the dropdown menu, the areas below (Subject Name, Subject DOB, Age, and Gender) will pre-populate with the information stored in the database.

***Note:** The subject must be in the current data file to be accessible from the dropdown menu.*

Click **New Subject** to configure Actiwatch for a new subject.

7. Click **Next** when you have completed editing/adding subject information.

Data Collection Setup

During the Data Collection Setup, you can configure the Actiwatch setup items, including start time, epoch length, and time zone with a simple mouse click.

Expanded window displaying the Actiwatch Details.

Configure Actiwatch Wizard - Data Collection Setup

Please adjust the following Actiwatch setup items. Adjust the Start Time and Time Zone to reflect the location where the data will be collected:

Start Time: Friday, May 20, 2005 1:12 PM

Epoch Length: 1 minute Maximum Recording Time (approx): 45.4 days

Actual Recording Time (approx): 45.4 days ?

Time Zone: (GMT-05:00) Eastern Time (US & Canada) Edit...

This is your PC's current time zone, to change click 'Edit'.

NOTE: The Start Time and Time Zone above should reflect WHERE the data will be collected. To ensure accurate Actiwatch timing, please also verify your computer's date, time, and time zone.

< Hide Actiwatch Details

Actiwatch Type:	Actiwatch 64	Battery Installed Date:	4/6/2005
Serial Number:	V636630	Battery Life (approx.):	136 days
Firmware Version:	63	Activity Calibration:	132
Memory Size:	64 KB	Illuminance Calibration:	NA

Help Cancel < Back Next > Finish

Epoch length

The period of time Actiwatch will accumulate activity counts before saving the sample to memory. Select the epoch length by clicking in this field. The choices will appear sequentially.

When selecting epoch length:

- If actual recording time is in red, then the battery may need to be changed.
- Time zone selection should be where the data will be collected, not the current time zone of the computer location.
- When configuring the Actiwatch for sleep analysis, use an epoch length of 2 minutes or less, otherwise sleep analysis statistics will not be calculated.

Epoch Length	Number of Epochs per Day	Maximum Delay in Start Time
15 seconds	5760	5 days
30 seconds	2880	11 days
1 minute	1440	22 days
2 minutes	670	49 days
5 minutes	288	114 days
10 minutes	144	228 days
15 minutes	96	342 days

Note: For sleep analysis it is recommended you select an interval of one minute or less. Data with sampling epochs of greater than two minutes cannot be analyzed using Actiware-Sleep analysis.

Recording Time

Displays the time at which the activity monitor will fill its memory with samples based on the epoch length selected.

Recording Time Table (for epochs > 0.25 minutes)

Memory	0.25 min	0.5 min	1 min	2 min	5 min	10 min	15 min
AW-16K	2.8	5.6	11.2	22.5	56.4	112.8	169.3
AW-64K	11.3	22.7	45.4	90.8	227	454	681
AW-L	3.7	7.5	15.1	30.2	75.7	151	225
AW-Score	5.6	11.2	22.4	44.9	112	224	336

NOTE: AW-L devices manufactured before July 1st, 1999 have 32K memory and shorter recording times.

NOTE: Maximum battery life is 180 days for AW16, AW64, and AW-L, and 90 days for AW-Score.

- Click **Next** when you have completed editing/adding data collection information.

If you are configuring an Actiwatch-Score, continue below. If configuring an Actiwatch-16/64 or Actiwatch-L, skip ahead to step 10.

Actiwatch-Score

If you are configuring an Actiwatch-Score, a Score Range window will appear and you will now be required to set the minimum and maximum score ranges.

Set the ranges by typing in the numeric value (0-15) or use the scroll arrows.

- Click **Next** to continue.

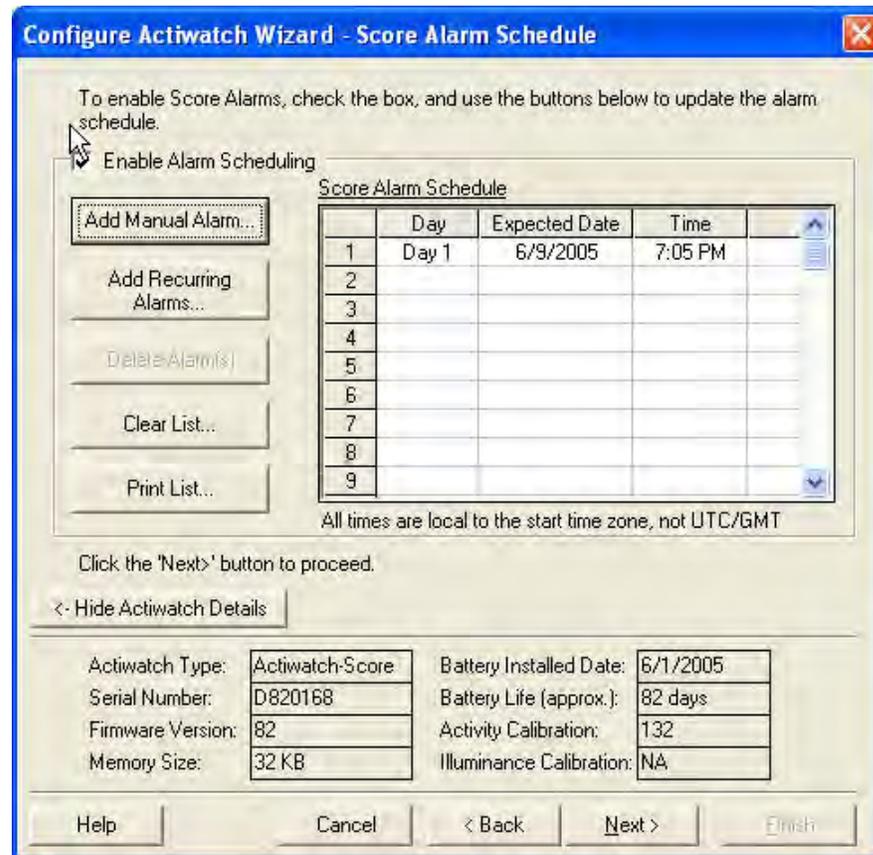
Actiwatch-Score Alarm

Click the **Enable Alarm Scheduling** box and format the Score Alarms with the following actions.

- Add Manual Alarm
- Add Recurring Alarm
- Delete Alarms (select item in list)
- Clear List
- Print List

After establishing the Actiwatch-Score Alarm schedule, you can print a listing.

Actiwatch-Score Alarm window



CAUTION! Do not remove the Actiwatch from the ActiReader during the Configure Actiwatch Wizard process until instructed to do so.

10. Click **Next** to continue.

The Configure Actiwatch process is in operation. When prompted, remove the Actiwatch.

11. Click **Finish** to complete the Configure Actiwatch Wizard.

Retrieve Data from Actiwatch

Overview

This wizard will assist you in retrieving the physiological data from an Actiwatch device. When the retrieval process is complete, the resulting data will be written to your selected database for analysis and export.

This wizard assumes that the ActiReader or Actiwatch Reader is connected to the computer and the appropriate COM port is selected. Please refer to *Installation and Setup* in Section 1 of this manual.

CAUTION! *The Actiwatch cannot collect data while on the reader. Consequently, do not put the Actiwatch on the reader until you are ready to stop data collection and retrieve the data from the Actiwatch.*

Retrieve Data from Actiwatch Wizard Welcome window



Retrieve Data from Actiwatch

Retrieve Data from Actiwatch

1. Communications > Retrieve Data from Actiwatch.

Start the Retrieve Data from Actiwatch Wizard. Click **Next** to continue.

2. Remove the wrist/foot bands from the Actiwatch (optional).

The bands may interfere with proper Actiwatch placement.

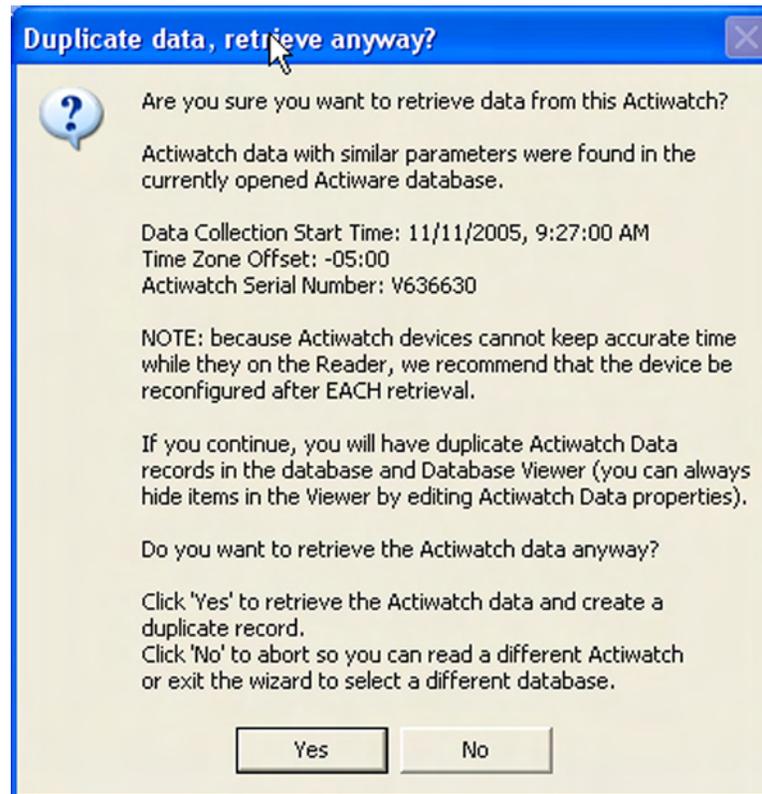
3. Place the Actiwatch on the reader.

The green dot on the metal side of the Actiwatch must align with the green dot on the ActiReader. Verify that the metal side is facing up, the green dots are adjacent and the green LED 'ALIGNED' light is on.

4. Click **Next** to continue.

Actiware will communicate with the Actiwatch device and retrieve the data. If you receive a **Duplicate data, retrieve anyway** message, you have the option to abort the retrieve process by selecting the **No** button, or create a duplicate record by selecting the **Yes** button and continue retrieving the data.

Duplicate data window



5. When the **Retrieval Successful!** message appears, click the **OK** button.
6. Check the **Launch Actogram when the wizard finishes** box to view the Actogram data immediately.
7. Click the **Finish** button to exit the wizard.

Retrieve Data Complete window

Retrieve Data from Actiwatch Wizard - Retrieve Data Completed

Finished!
Read Data has successfully been completed!
MINI MITTER

Retrieve Data Summary:

Subject Identity: 564738291

Start Time (Local): Friday, November 11, 2005, 9:27:00 AM

Epoch Length: 30 seconds Time Zone Details...

Number of Data Samples: 2 (0.0 days)

The Actiwatch data has been successfully retrieved. The data will be saved to the currently open database once you click the 'Finish' button. To automatically view your data in Actogram form, check the following box.

Launch Actogram when wizard finishes

Click 'Finish' to save the data and exit the wizard.

Show Actiwatch Details ->

Help Cancel < Back Next > Finish

Note: Actiware-CT requires the user to 'Sign and Save' the data by using a Windows or Network username and password. Please contact your local administrator with any issues or questions.

Note: Actiwatch-Score may occasionally make a short "chirping" sound during communications. This is normal. DO NOT remove the device from the reader until instructed.

4

ADVANCED USAGE

Actiware provides greater flexibility to researchers and clinicians when viewing and analyzing data. Advanced users can take advantage of the Actiware Toolbars to manipulate how the data is viewed and exported.

Items covered in this section:

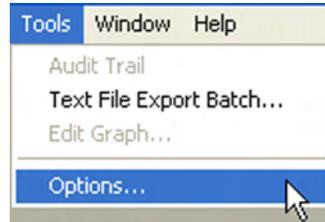
- Program Options (Tools > Options)
- Data List
- Batch Export
- Import AWD files
- Graph

Your input is vital to us. Please explore the program fully and give us your feedback. Please feel free to contact us with any questions or comments on this software.

Program Options

Customize the Actiware software and data properties through the program options window. Select **Tools > Options** from the main menu bar to access the option tabs.

Tools > Options

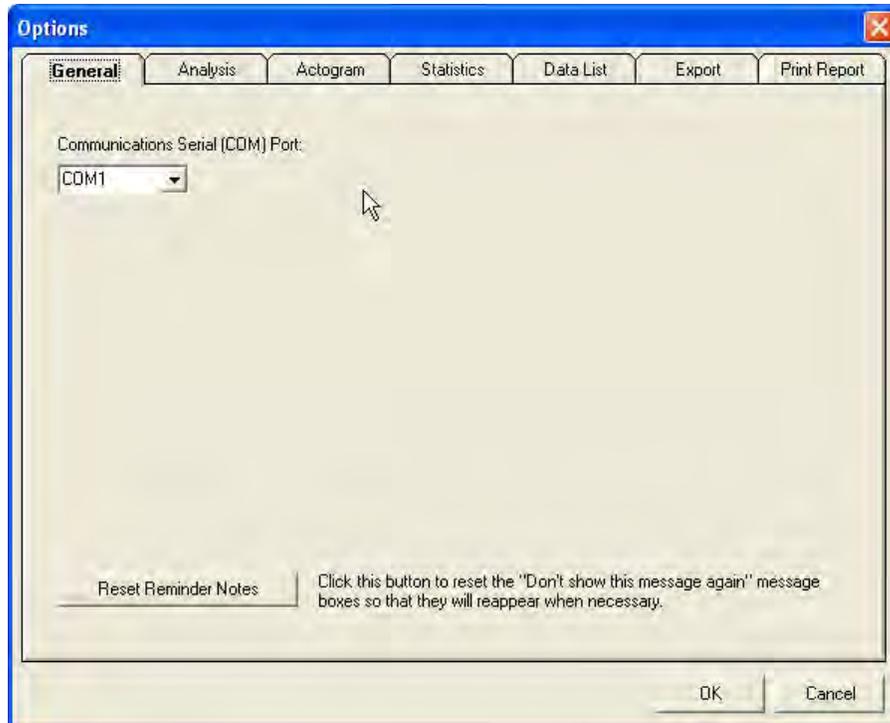


Note: After you have finished making all of your changes in the options window, click **OK** to accept or **Cancel** to not accept.

General Tab (Tools > Options > General)

Select the COM port from the dropdown menu. To reset all Help Window reminders, check the **Reset Reminder Notes** button.

Tools > Options > General



Analysis Tab (Tools > Options > Analysis)

An *analysis* includes *parameter settings* and *interval settings* as inputs. Use the Analysis tab for setting parameter values (see Section 2 for how to set intervals). Definitions of each analysis parameter are given on the next few pages. You can also see the definitions of each parameter on screen when running the Actiware software by holding your mouse cursor over the parameter names on the left side of the Analysis tab.

Active Analysis refers to the currently selected analysis, so the analysis parameter settings shown in the Active Analysis frame are those of the currently selected analysis.

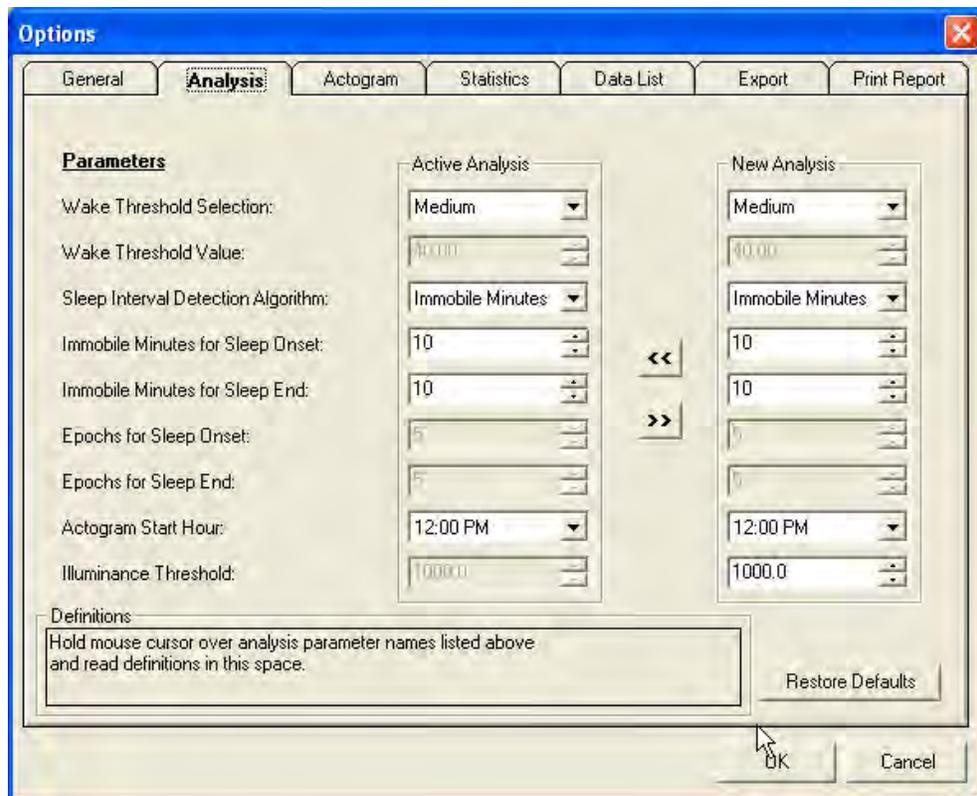
New Analysis refers to a newly created analysis, so the analysis parameter settings shown in the New Analysis frame are default values. These default values are unique to each Windows logon username and are used each time a New Analysis window is opened.

Click the << button to set Active Analysis parameter settings equal to New Analysis parameter settings.

Click the >> button to set New Analysis parameter settings equal to those of the Active Analysis.

Click the **Restore Defaults** button to reset to the factory released parameter settings.

Tools > Options > Analysis



Analysis Parameter Definitions

Wake Threshold Selection

Selected level or method of setting the Wake Threshold. If *Automatic* is selected, the Wake Threshold will be computed automatically based on activity data.

Wake Threshold Value

The number of activity counts used to define wake. Detail: Level of activity that is compared to a value (x) generated by the Actiware sleep algorithm for each epoch. If (x) is above the Wake Threshold, then the epoch is scored as wake. The higher the Wake Threshold, the fewer the number of epochs scored as wake (See *Appendix A* for further information).

Sleep Interval Detection Algorithm

This determines the basis for calculating sleep onset and sleep end. The first option uses the number of minutes scored as immobile. By selecting this option, the parameter settings for epochs for sleep onset and sleep end can be edited. The second option uses a number of epochs scored as sleep. By selecting this option, the parameter settings for immobile minutes for sleep onset and epochs for sleep end can be edited. Note: This is a means of automatically setting sleep onset and sleep end intervals, not rest intervals.

Immobile Minutes for Sleep Onset

After the start of each rest interval, the start of each sleep interval will be automatically set to the first epoch of the first section of consecutive epochs “THIS” many minutes long with all but one epoch in the section scored as immobile. Note: This parameter is only applied if the Immobile Minutes option is selected as the sleep interval detection algorithm.

Immobile Minutes for Sleep End

Prior to the end of each rest interval, the end of each sleep interval will be automatically set to the last epoch of the last section of consecutive epochs “THIS” many minutes long with all but one epoch in the section scored as immobile. Note: This parameter is only applied if the Immobile Minutes option is selected as the sleep interval detection algorithm.

Epochs for Sleep Onset

After the start of each rest interval, the start of each sleep interval will be automatically set to the first epoch of the first section of consecutive epochs scored as sleep “THIS” many epochs long. Note: This parameter is only applied if the Sleep Epochs option is selected as the sleep interval detection algorithm.

Epochs for Sleep End

Prior to the end of each rest interval, the end of each sleep interval will be automatically set to the last epoch of the last section of consecutive epochs scored as sleep “THIS” many epochs long. Note: This parameter is only applied if the Sleep Epochs option is selected as the sleep interval detection algorithm.

Actogram Start Hour

The hour at which Actogram rows and daily intervals begin. This setting affects daily interval statistics.

Illuminance Threshold

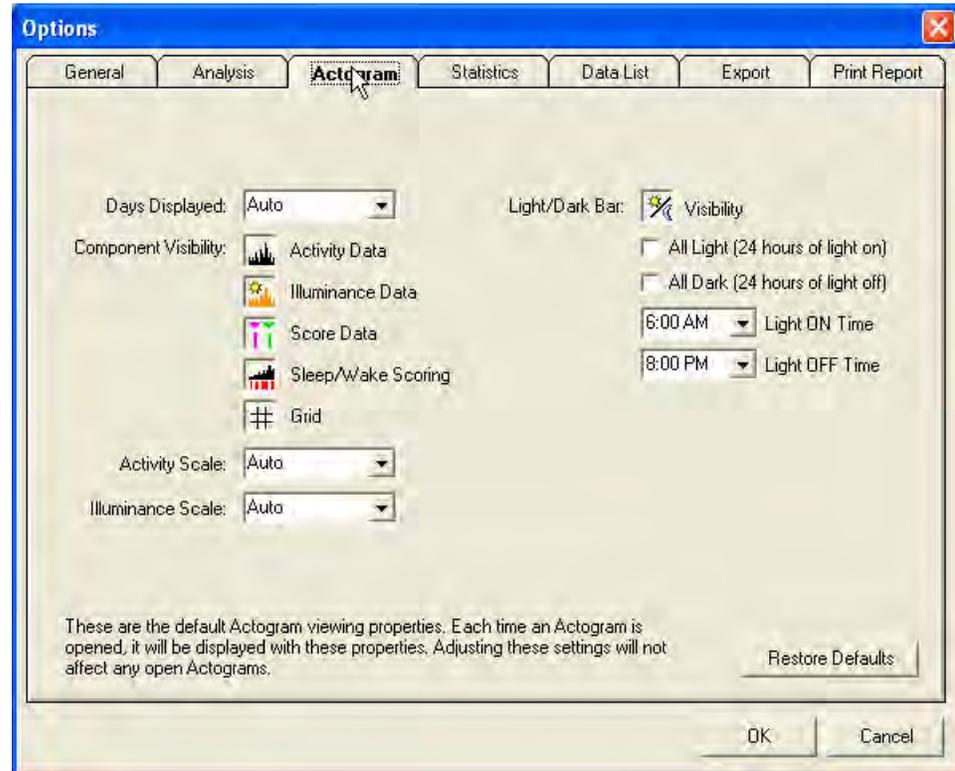
Level of illuminance, in lux, that is compared to the intensity of illumination the Actiwatch-L is exposed to, for the purpose of calculating the Time Above Illuminance Threshold statistic for given time intervals (Actiwatch-L only).

Actogram Tab (Tools > Options > Actogram)

These are the default Actogram viewing properties. Each time an Actogram is opened, it will be displayed with these properties. Adjusting these properties will not affect any open Actograms. To view the changes, close and reopen the Actogram.

Click the **Restore Defaults** button to reset to the factory released settings.

Tools > Options > Actogram

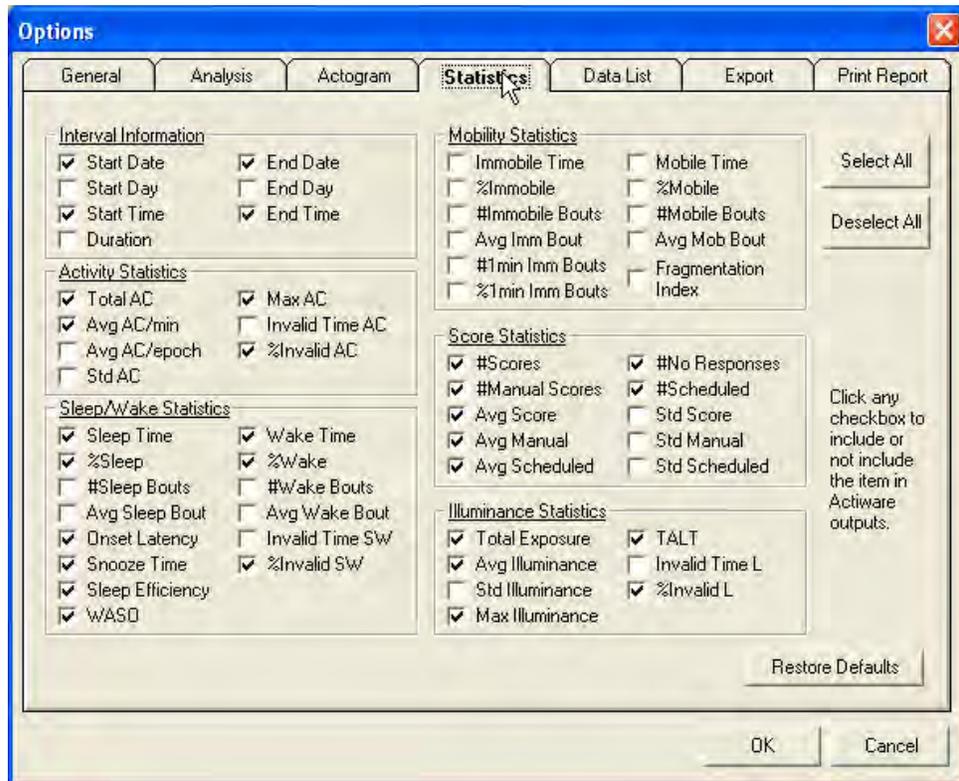


Statistics Tab (Tools > Options > Statistics)

Select the items of data displayed from the analysis. Changes made here will impact exported and printed data, and the statistics table window contents. Place your cursor over an item to get a brief definition of that item.

Click **Select All** to include all items in your statistical analysis. Click **Deselect All** to remove all items from your statistical analysis. Click the **Restore Defaults** button to reset to the factory released settings.

Tools > Options > Statistics



See *Appendix B* for a definition of each statistic.

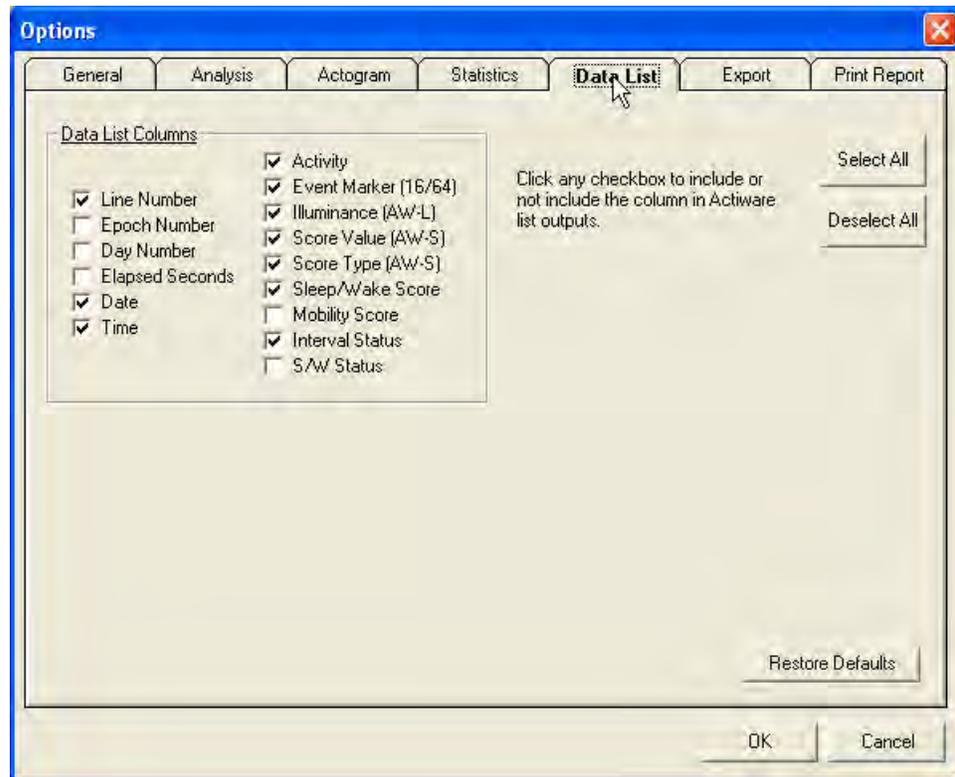
Data List Tab (Tools > Options > Data List)

Select the columns to be displayed in the Data List window. Changes made on this tab will impact the content of exported files and printed reports.

Click **Select All** to include all items in the Data List. Click **Deselect All** to remove all items from the Data List. Click **Restore Defaults** to return the settings to the factory presets.

Changes made in the **Tools > Options > Data List** window will be immediately displayed in the **View > Data List** window.

Tools > Options > Data List

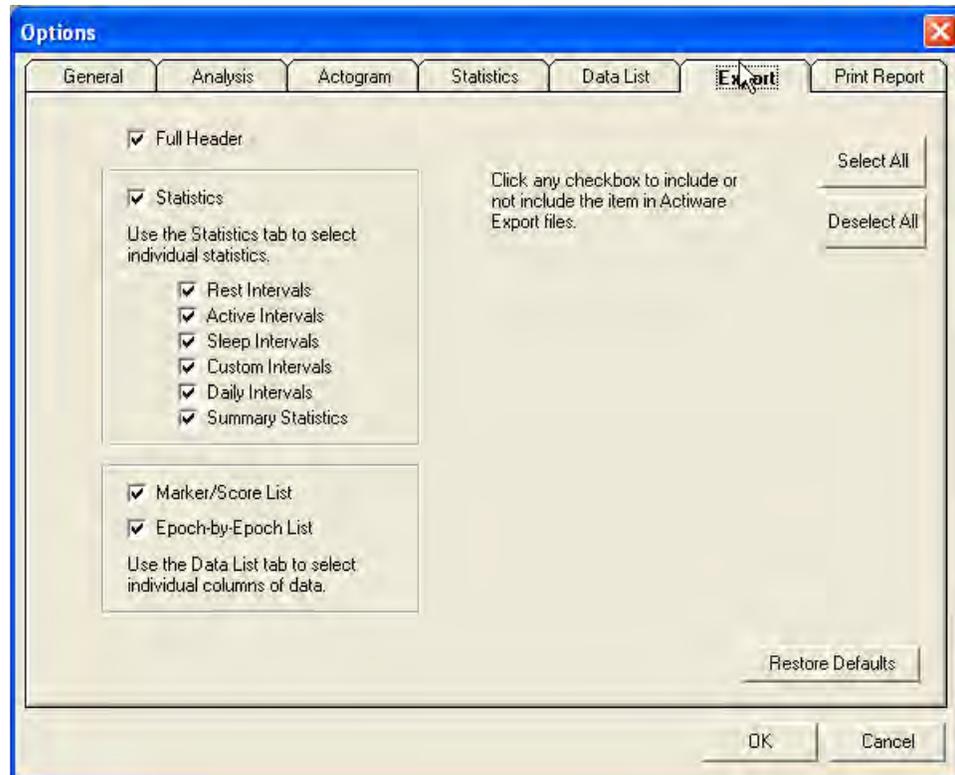


Export Tab (Tools > Options > Export)

Select the items you want to include in your export file (also applies to the Copy > Export Text to windows clipboard function in the non-CT version of Actiware). Use the **Statistics** tab to select individual statistics. Use the **Data List** tab to select individual columns of data.

Click **Select All** to select all of the types of data. Click **Deselect All** to uncheck all of the types of data. Click **Restore Defaults** to return the settings to the factory presets.

Tools > Options > Export

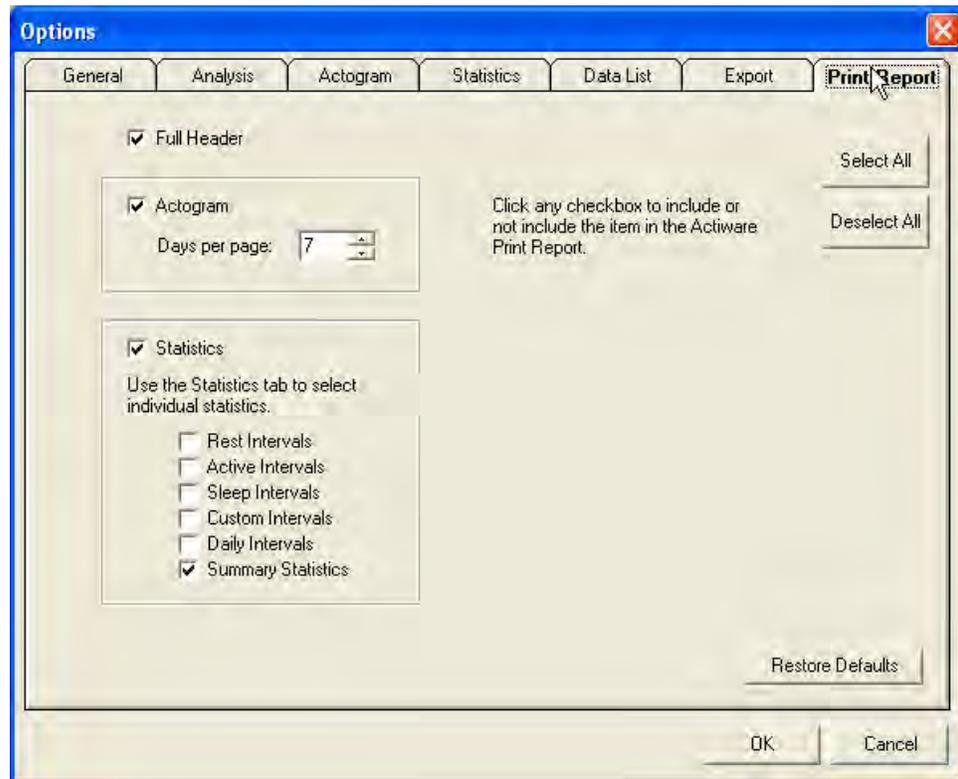


Print Report Tab (Tools > Options > Print Report)

Select the items you want to include in your printed report. Click the **Full Header** box to include a first page of header information (recommended). Click the **Actogram** box to include the Actogram graphic in the report. You can select the number of Actogram days to print per page. Click the **Statistics** box (and sub-boxes) to include statistics for various types of intervals (by default the report will include Summary Statistics only). Use the **Statistics** tab to select individual statistics.

Click **Select All** to select all of the types of data. Click **Deselect All** to uncheck all of the types of data. Click **Restore Defaults** to return the settings to the factory presets.

Tools > Options > Print Report



Data List

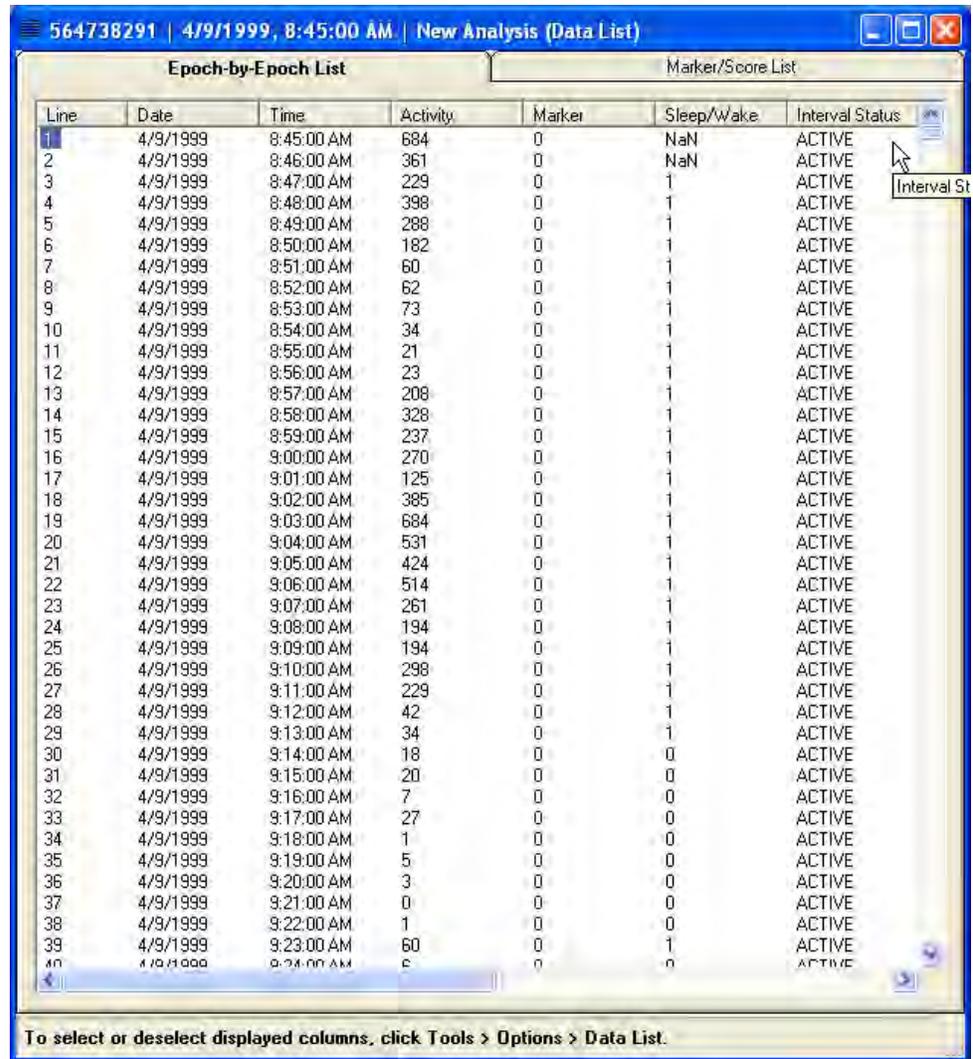
1. View > Data List

You have selected to view a listing of the currently active data as a function of time (epoch-by-epoch).

2. Click the **Epoch-by-Epoch List** tab or the **Marker/Score List** tab to view the data list for that type.

Use the scroll bars to move up and down each List and to pan across data columns as necessary. You may want to maximize the window size by clicking the 'Maximize' button in the upper right corner.

View > Data List



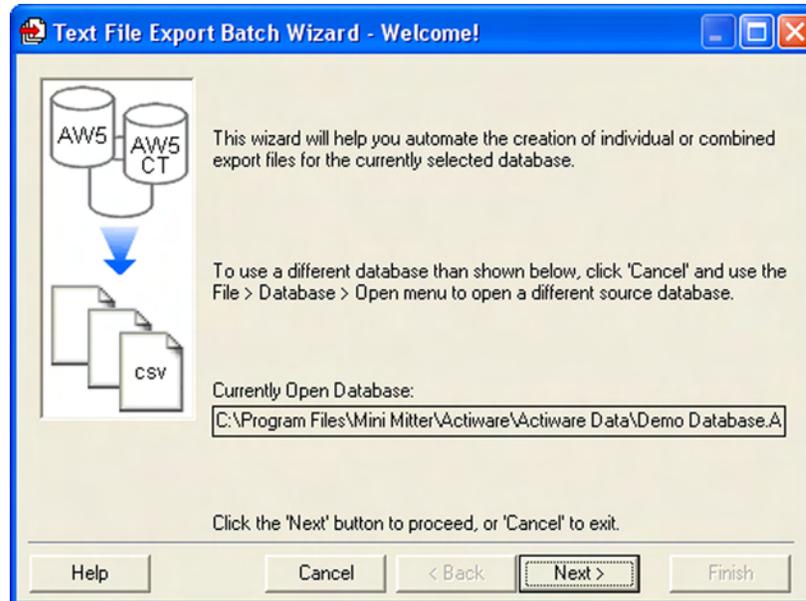
Line	Date	Time	Activity	Marker	Sleep/Wake	Interval Status
1	4/9/1999	8:45:00 AM	684	0	NaN	ACTIVE
2	4/9/1999	8:46:00 AM	361	0	NaN	ACTIVE
3	4/9/1999	8:47:00 AM	229	0	1	ACTIVE
4	4/9/1999	8:48:00 AM	398	0	1	ACTIVE
5	4/9/1999	8:49:00 AM	288	0	1	ACTIVE
6	4/9/1999	8:50:00 AM	182	0	1	ACTIVE
7	4/9/1999	8:51:00 AM	60	0	1	ACTIVE
8	4/9/1999	8:52:00 AM	62	0	1	ACTIVE
9	4/9/1999	8:53:00 AM	73	0	1	ACTIVE
10	4/9/1999	8:54:00 AM	34	0	1	ACTIVE
11	4/9/1999	8:55:00 AM	21	0	1	ACTIVE
12	4/9/1999	8:56:00 AM	23	0	1	ACTIVE
13	4/9/1999	8:57:00 AM	208	0	1	ACTIVE
14	4/9/1999	8:58:00 AM	328	0	1	ACTIVE
15	4/9/1999	8:59:00 AM	237	0	1	ACTIVE
16	4/9/1999	9:00:00 AM	270	0	1	ACTIVE
17	4/9/1999	9:01:00 AM	125	0	1	ACTIVE
18	4/9/1999	9:02:00 AM	385	0	1	ACTIVE
19	4/9/1999	9:03:00 AM	684	0	1	ACTIVE
20	4/9/1999	9:04:00 AM	531	0	1	ACTIVE
21	4/9/1999	9:05:00 AM	424	0	1	ACTIVE
22	4/9/1999	9:06:00 AM	514	0	1	ACTIVE
23	4/9/1999	9:07:00 AM	261	0	1	ACTIVE
24	4/9/1999	9:08:00 AM	194	0	1	ACTIVE
25	4/9/1999	9:09:00 AM	194	0	1	ACTIVE
26	4/9/1999	9:10:00 AM	298	0	1	ACTIVE
27	4/9/1999	9:11:00 AM	229	0	1	ACTIVE
28	4/9/1999	9:12:00 AM	42	0	1	ACTIVE
29	4/9/1999	9:13:00 AM	34	0	1	ACTIVE
30	4/9/1999	9:14:00 AM	18	0	0	ACTIVE
31	4/9/1999	9:15:00 AM	20	0	0	ACTIVE
32	4/9/1999	9:16:00 AM	7	0	0	ACTIVE
33	4/9/1999	9:17:00 AM	27	0	0	ACTIVE
34	4/9/1999	9:18:00 AM	1	0	0	ACTIVE
35	4/9/1999	9:19:00 AM	5	0	0	ACTIVE
36	4/9/1999	9:20:00 AM	3	0	0	ACTIVE
37	4/9/1999	9:21:00 AM	0	0	0	ACTIVE
38	4/9/1999	9:22:00 AM	1	0	0	ACTIVE
39	4/9/1999	9:23:00 AM	60	0	1	ACTIVE
40	4/9/1999	9:24:00 AM	6	0	0	ACTIVE

To select or deselect displayed columns, click Tools > Options > Data List.

Text File Batch Export

This option is used when you want to export data from multiple analyses for the currently open database. You can elect to send these data to individual text files or to the same composite file.

Text File Export Batch Wizard Welcome window



1. Tools > Text File Export Batch

This will launch the Export Batch Wizard. Confirm that the currently active database is the one you want to export from.

2. Click **Next**.

Select the type of output you require (individual files for each analysis, or a combined file for multiple analyses).

Select destination of the exported data



3. Click **Browse**.

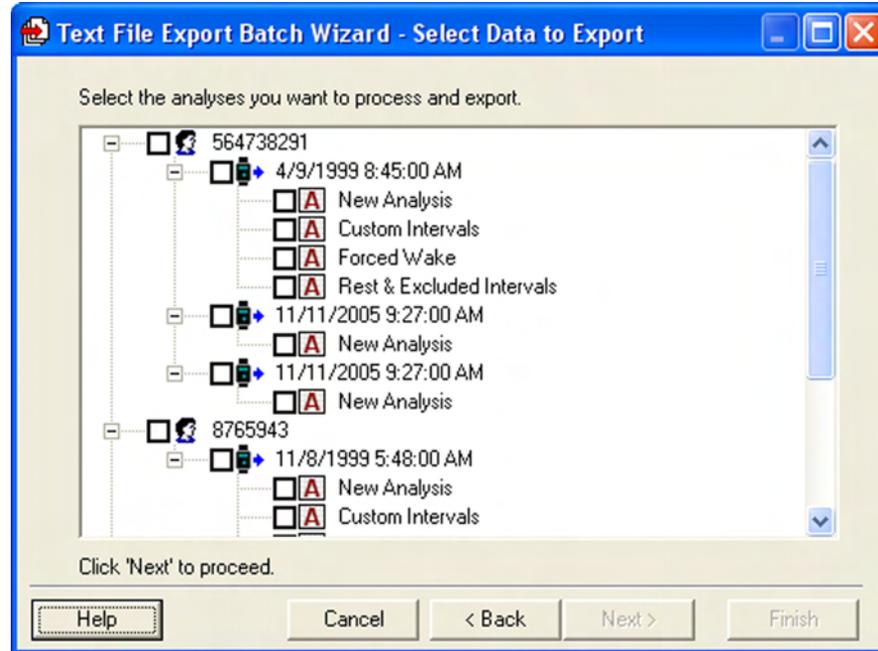
Use this button to determine the destination for any export output using the **Browse** button and the Windows File Dialog.

4. Click the **Options** button to make any changes.

5. Click **Next**.

6. Select the data that you want to include in the export file by checking the boxes.

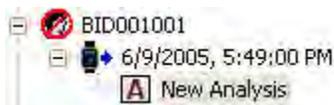
Select data to export



***Note:** The controls for this window are hierarchical. If you select a subject, or Actiwatch data entry all analyses associated with that subject or Actiwatch data set will be included in the export file.*

***Note:** Hidden subjects are shown in the display.*

Hidden data is indicated by the red circle and the diagonal line.



7. Suppress Errors Messages box.

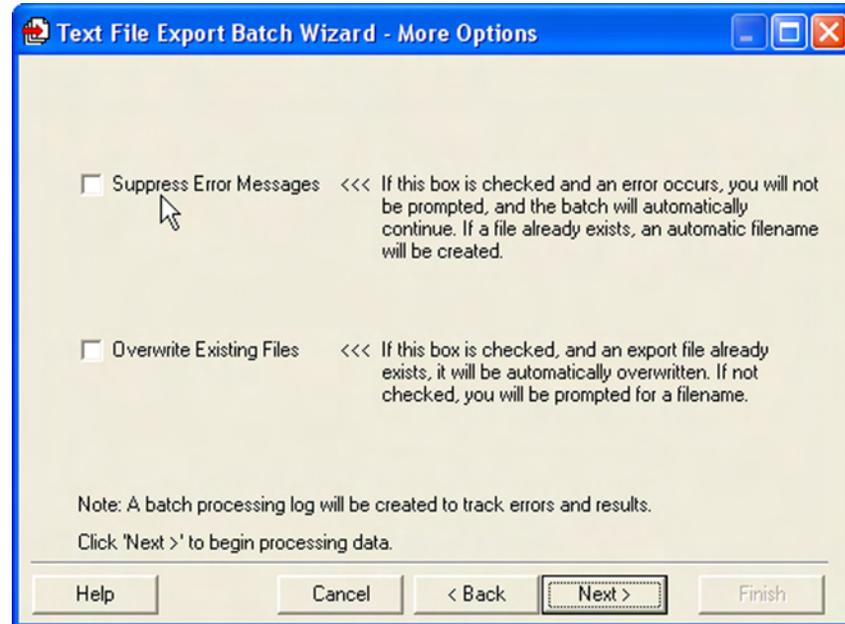
When this box is checked, you will not be prompted if an error occurs during the batch process. If a file already exists, an automatic filename will be created.

8. Overwrite Existing Files box.

Indicate if you want to overwrite existing export file(s) without being prompted.

9. Click **Next** to process your data and create the export.

More options are available when using the Text File Export Batch Wizard

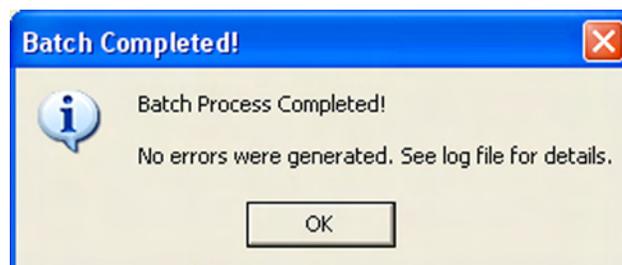


10. Click **OK** when the batch process is completed.

If any errors occur, you have the option to view the log file for details. You can also **Restart** the batch process. If you restart the process you may choose to overwrite the existing file or rename the file.

11. Click **Finish** to complete the Export Batch Wizard.

Batch Completed! pop-up window



Import AWD Files

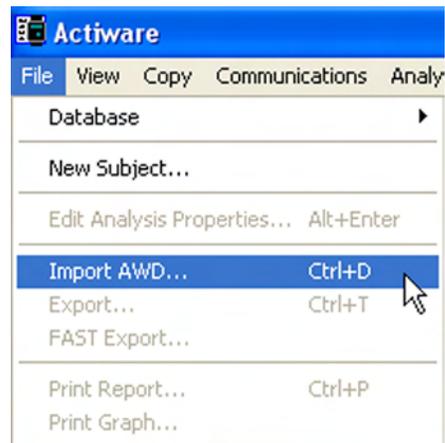
Note: .AWS files cannot be imported. Only .AWD (Actiwatch) files can be imported.

Import AWD

You can import data files collected with previous versions of Actiware (Actiware-Sleep/Rhythm v3.4 and earlier).

1. *Left* mouse click to highlight the subject you want to import the AWD file to. If you do not already have a subject created, use **File > New Subject** menu.
2. Click File > Import AWD.

File > Import AWD

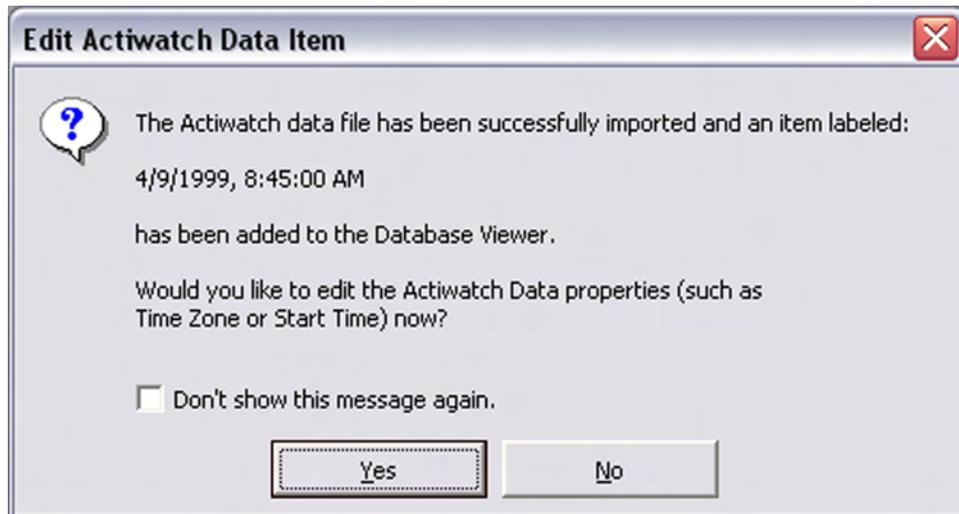


3. Use Windows File Dialog to Browse to the location of the AWD files. Select the file and click **OK** to import. When the file is successfully imported a pop-up window will appear.

Note: The identity from the AWD file is not imported. You must select or create the correct subject when importing.

4. Click **Yes** to edit the Actiwatch Data properties or click **No** to bypass.
5. The data is ready for analysis.

Edit Actiware Data



Graph

View View

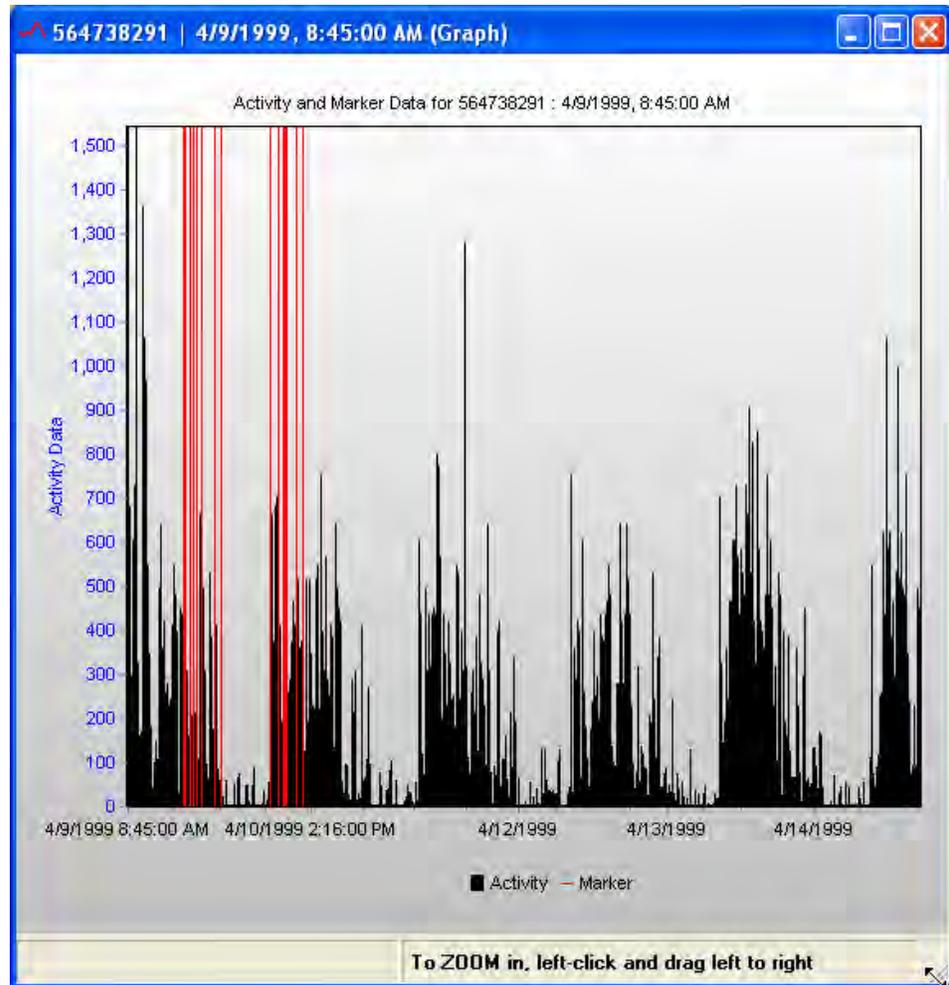
The Actiware toolbars provide many new features to assist you with the data.

Graph

1. View > Graph 

This is the Graph window for viewing Actiwatch data along a single axis.

View > Graph



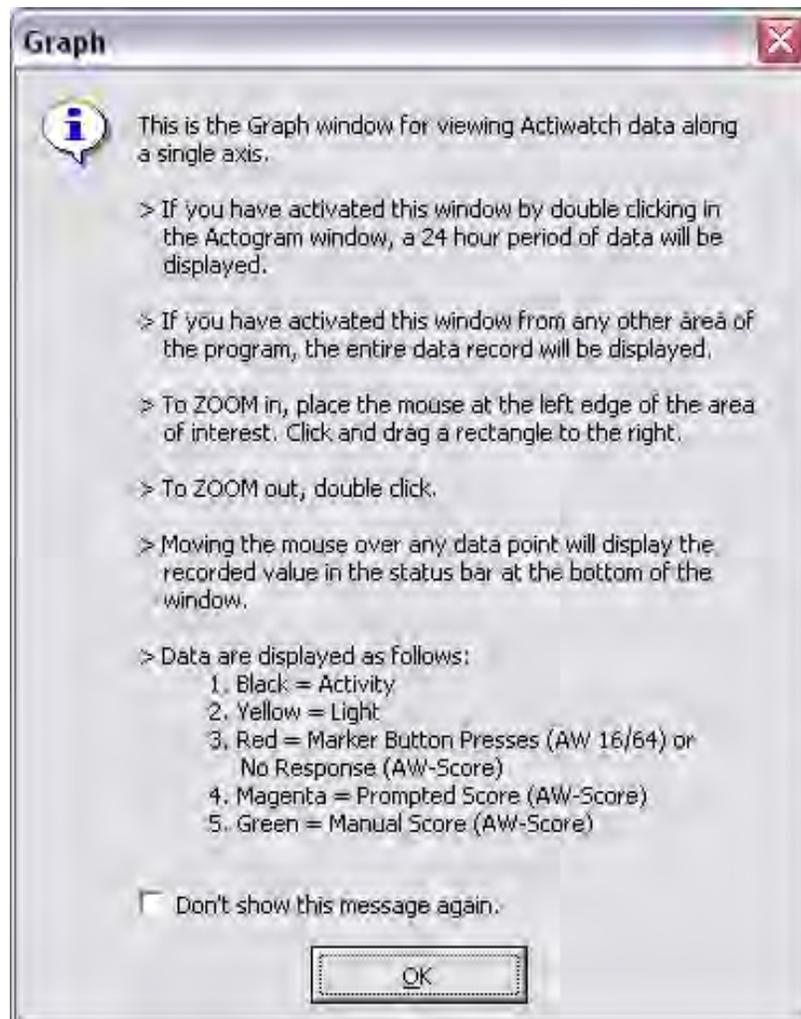
Graph Icons

2. View > Toolbars > Graph 

When viewing a graph, the Graph Icons are available in the standard toolbar.

These icons allow you to

1. Print the graph.
2. Edit Graph Display Properties.
3. Copy a picture of the graph to the Windows Clipboard.



The Graph Help window provides useful information when using the Graph view.

Edit Graph Display Properties

1. Tools > Edit Graph



This more advanced feature allows you to edit the Graph GUI, display and printing features, and plotting parameters of the graph.

