Contact Information

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BoxCar®

Version 3.7+
for Windows

User's Manual

Table of Contents

System Requirements

BoxCar requires a 386 (or better) processor with at least four Megabytes of RAM running Windows 3.1 or later. It must also have at least one free Com port (serial).

BoxCar without a Mouse

This version of BoxCar allows the user access to most of BoxCar's features even if the PC does not have a mouse, or if the mouse serial port is being used for the logger interface connection.

Alt and the underlined letter
The menu bars are accessible using Alt and the underlined letter from the top of the menu bar. The commands on the individual menus are accessible by pressing the underlined character of the command while the menu is displayed.

Tab between items in dialogs
You can use the Tab key to move between the items in a dialog box. (The arrow keys can be used within a group of radio buttons in the dialog box while Tab will move between the groups.)

Use the arrow keys to change values
In dialog boxes that have drop down lists, the arrow keys can be used to scroll through the list; however, the list will not drop down.

Space bar changes the selection in check boxes
By pressing the Alt key and the underlined character in a dialog box you can toggle the check box of that item. The space bar allows you to select or deselect a check box on an active item (the active item has a small box appear around it).

Selecting part of a plot
Use the arrow keys to move the cursor to a corner of the section of the plot you want to expand. Hit Enter, and then use the arrow keys to select the opposite corner. Hitting Enter now establishes the selection. Use F7 to zoom in on this part of the plot.

DOS Utilities and H8 Pro Archive Reader

The DOS Utility was developed to allow users to perform the basic functions associated with a logger: launching, reading out, and saving files. The Utility is small enough to run on most older machines and portables with minimal memory. The Utility also allows users to open previously saved data files, view data in table format and export to a text file. For more information about this program, read the file utilhelp.txt within the LOGUTIL directory of your BoxCar Installation directory.

The Archive Reader Utility is a Windows 95/98/ME/NT/2000 application which allows you to retrieve and save data from the last eight deployments of any HOBO Pro Series data logger. Consult the HOBO Pro Series logger User's Manual for information about the archiving feature. For more information about the Archive Reader, please refer to the readme.txt file in the ARCHREAD directory of your BoxCar Installation directory.

File Management

Note: File options not described here have been covered earlier in this manual.

Open
The open option allows you to view previously offloaded BoxCar compatible files.

Close
Select Close to close the active file. It will also prompt you to save an untitled file.

Save As
Select Save As to save the active file with a new name.

Exit
Exit BoxCar, saving all untitled files.

Help

Select **Contents** on the **Help** menu to open the help file for BoxCar. Step through the help file, using the tab key or mouse. Use the return key or mouse button to select underlined blocks for additional details.

Testing Your Communications Port

Select **Test Port** on the **Help** menu to determine the reliability of your computer's communication port and/or the serial cable. Click the radio button that corresponds to the port you want to test and press the Test button. Once you are finished, press Done. The Instructions box contains more information about the test.
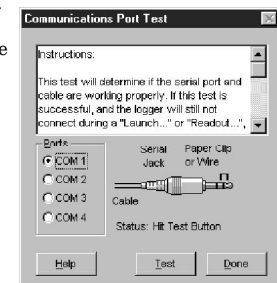
Thank you for purchasing Onset products. Our loggers and software are designed to be easy to use. For a quick start, please refer to the instructions on page 6. You can then use the BoxCar User's Manual or the on-line help feature for a complete description of software capabilities.

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Changing the User Preferences

Preferences from the **File** menu allows you to customize some aspects of the BoxCar program.

Default Serial Port
This drop box allows you to choose the default communications port that BoxCar will use when trying to readout and launch your loggers.

Change (Date/Time Format)
This area shows the currently selected date and time format. The **Change** button allows you to modify these settings. Please see the section on changing the date and time settings below.
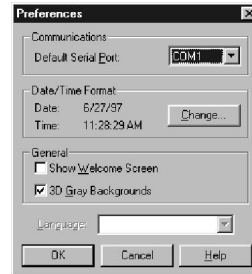
Date/Time Settings
Here you can change the date order, specify if you want leading zeros on your date, a 2 or 4 digit year format and a 12 or 24 hour time format. You can also select your date and time separators. A sample of your current selections are shown. The Use Control Panel Settings check box toggles whether or not BoxCar will use Windows' date and time settings for the date and time.
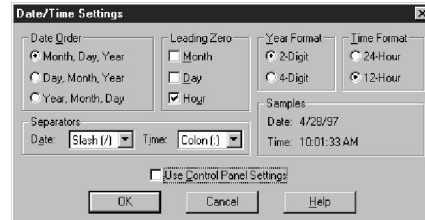
Show Welcome Screen
This checkbox toggles whether or not a welcome screen is displayed when you enter BoxCar.

3D Gray Backgrounds
This check box toggles the 3D gray backgrounds. This button only affects the appearance of windows under Windows 3.1. Under Windows 95, all the dialog boxes will automatically be shaded gray.

Language
If multiple languages are available, the language box lets you switch the language used by BoxCar. The new language will not take effect until you press the OK button.

Printing

Printing your graph
To print a graph, file information, or the tabular data itself (or any combination of the three), select **Print** under the **File** menu. Select the check boxes corresponding to the information that you would like printed. The graph will always be blown up to fit a full page, regardless of the size on the screen. The File Information option will print the same information shown in the File Information box (accessible from the **View** menu). The Logger Data option will print the date and time (in the format specified in the *Date/Time Preferences*) and the value (in the current displayed units) of each point in the file. The page orientation, Portrait or Landscape, will be the same for all the options selected (see below).
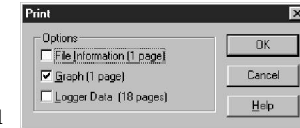
Print Setup
Selecting **Print Setup** from the **File** menu displays the Print Setup dialog box. From here you can choose the paper size, paper orientation, what printer you are using, etc. Additional options (resolution, scaling, print quality, etc.) may be available depending on the attached printer.

The Tool Bar

The buttons on the Tool Bar allow quick access to some of the functions. The Message Bar at the bottom of the window describes these when the cursor is placed on them.

Open: Allows you to view previously offloaded BoxCar compatible files.
Save As: Saves the currently displayed file using a different name.
Microsoft Excel Export Setup: Allows you to export data in Microsoft Excel format.
Lotus 1-2-3 Export Setup: Allows you to export data in Lotus 1-2-3 format.
Custom Export Setup: Allows you to export data in a customized format.
Print: Allows you to print the currently selected plot.
Copy: Copies the plot as a bitmap to the clipboard.
Launch: Displays the launch dialog box.
Readout: Offloads the data from the currently connected logger.
Optic Shuttle Readout: Offloads data files from the Optic Shuttle.
Connect Points: Draws a line between each point on the plot.
Mark Points: Displays a small circle around each data point.
Alarm Lines: Display the high and low alarm limits (if set) for StowAway plots.
File Information: Displays additional information about the current plot.
Selection Tool: This is the default general purpose selection cursor.
Zoom Tool: Allows you to select an area of a plot and magnify it.
Help: Brings you to the contents of the help file.

Installation

To install BoxCar software on your hard drive, insert the BoxCar diskette into the drive on your computer. For Windows 3.1, go to Program Manager, choose **Run** from the **File** menu, or for Windows 95/98/ME/NT/2000, click **Start** then choose **Run**; type a:\setup (or b:\setup) and select OK. The installer prompts you for the directory (BOXCAR3 is the default) and installs the program and the help file.

BoxCar is a 16-bit application. Operating systems such as Window 95, Windows 98/ME, and Windows 2000 run 16-bit programs by means of a 16 bit subsystem called Windows-on-Windows (WOW). If you experience difficulty running BoxCar in 32-bit Windows, check your system for the following files and make sure they are not corrupted:

wowexec.exe
wow32.dll

For more datails, search for WOW on the Microsoft® website at http://www.microsoft.com.

Connecting to your PC compatible

The logger is connected to your computer with a PC-3.5 interface cable. It is designed to connect directly between the PC compatible's 9-pin Com port (serial) and the data logger. (A 25-pin to 9-pin adapter may be needed if your computer does not have an available 9-pin port). For information on connecting to USB ports see our FAQ (Frequently Asked Questions) page at http://onsetcomputer.com/Support/HS_Support/4218_FAQs.html for compatible USB to serial adapters.

The interface cable must be connected to a working serial port. If the serial port was recently used for a modem or a mouse, the port might still be configured as such. After removing a mouse, reboot your system. Use the Communications Port Tester (see page 26) in BoxCar to make sure that the serial cable and serial port work correctly.

Set your clock and start BoxCar

Before starting BoxCar, make sure your computer's clock is set to the correct time because the logger will use your computer's clock to set its own internal clock. To start BoxCar for Windows, double click on the BoxCar icon.

Quick start

Follow this procedure to get your HOBO or StowAway connected and displaying data. Details on programmable options follow this section.

1. Connect the interface cable to an open Com port on the back of the computer.
2. Connect the other end of the interface cable to the logger.
3. Select **Launch** under **Logger** on the menu bar.
4. Press the **Start** button. The logger will be launched with default settings and start recording data.
5. Wait a few seconds and select **Readout** under the **Logger** menu. The data recorded by the logger will be offloaded and displayed on the screen as a plot; you will be prompted to save the file.

Launching your logger

To launch a logger, connect it to your PC as described above, then select Launch from the logger menu. BoxCar determines what type of logger is connected and displays a launch dialog box specific to the type of logger.


Though each logger type has its own specific features, all launch dialogs have the following standard features in common.

Common Features

The **Start** button loads the information in the Launch dialog box into the logger and starts it. The **Cancel** button stops the Launch and reverts to the old settings in the logger.

The first line of information in the dialog box to the right, identifies the type of logger and its **Serial Number**. The **Date** displays your computer's current date and time. If the date is not correct, consult your Windows manual on how to change your computer's date or time. The **Advanced Options** toggle arrow shows and hides additional options. For logger specific launching features, refer to the pages that follow.
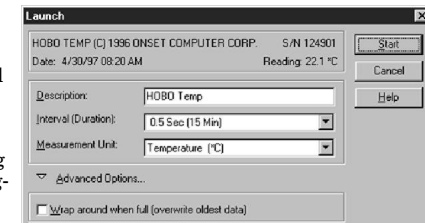
Sample

This box displays a sample of what your exported data will look like. Always be sure to look at this box before you export to make sure that it looks correct.

Export

This button will export the data to a text file of your choice. Some spreadsheets are not able to import files with more than 16,000 points. If your data file contains more than 16,000 points, BoxCar will ask you if you want to export to multiple files (see Multi-file).

Multi-file

This button will bring up a dialog that allows you to split up the data into multiple text files of a size that you specify.

To choose how many points will be placed in each file, simply type the number of points in the text box and click the OK button. To abort the operation, hit the cancel button. The files will be plain text, numbered sequentially. The file name you entered in the save dialog will have numbers appended to it. For example, if you export the file 'test.dtf' to four separate files, the files will be named 'test0000.txt,' 'test0001.txt,' 'test0002.txt,' and 'test0003.txt' automatically.

Cancel

This button will close the export dialog and revert to the previous export settings.

NOTE: Exported files cannot be read back into BoxCar.

Working with an Exported File

To work with an exported file, start the intended program, e.g. Lotus 1-2-3 or Excel, and import or open the file that was saved with the .TXT extension. (If you are having problems finding the file which was saved, please refer to the manual which came with your computer).

Custom Date Settings
From this dialog, you can choose the order of the month, day, and year, and choose the character that is used to separate them. Clicking the OK button will accept the options, while clicking the Cancel button will revert to the previous settings.
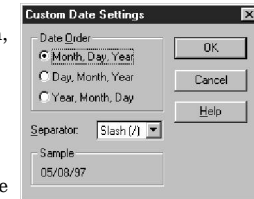

Date/Time Separator

This box allows you to select the character that will separate the date and time in the spreadsheet. If you wish to have both date and time in a single column, you should set this option to 'Space.' To separate the columns, you may (for most spreadsheets) choose any of the other options available in this box (comma, semicolon, or tab).

Time Format

This box allows you to choose the format in which the time is displayed in your exported data. For most spreadsheets, the default value of Hour:Minute:Second (with half seconds) will be acceptable. Again, for compatibility's sake, we have included a variety of other options, most of which are self-explanatory. As with the Date Format, the old Lotus and old Excel format have been included.

Change Time Settings
This button will allow you to customize the time that is displayed when you export data. The radio buttons choose between 24-hour (military time) and 12-hour formats. The separator drop box allows you to choose the character that will separate the different parts of the time. The OK button will accept the new settings, and the Cancel button will negate them.
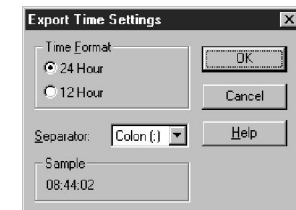
Data Separator

This drop box chooses the character that will be used to separate the columns of data points. Your choices are comma, semicolon, tab or space.

Units/All Units

This box allows you to select the units that will be exported with the current settings. If a unit is highlighted (usually blue or black), it will be exported. Again, you can check the sample box at the bottom of the dialog to see if the correct units are going to be exported. The 'All Units' check box will select all available units for exporting. For H8 family loggers, the channel number(s) will be displayed in parenthesis after the unit in the export file. A * preceding the channel number denotes the sensor was selectable during launch (see Launching).

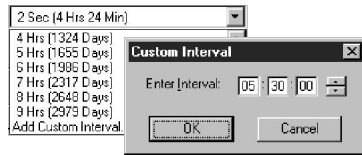# Launching HOBO 2K loggers

Reading

To check the current reading of the logger, examine the Reading field. Readings are displayed in the currently selected Measurement Unit.

Description

Enter up to forty characters of text in the Description field. This text is sent to the logger when you click Start and is displayed below the time axis on the graph.

HOBO 2K Launch Dialog Box

Interval (Duration)

Select the Interval (time between measurements) and the Duration (amount of time the logger will collect data) from the interval box.

Add Custom Interval

To create your own custom interval, select 'Add Custom Interval' at the bottom of the interval scroll box. You can designate as many custom intervals as you require (between 0.5 seconds and 9 hours). Custom Intervals are saved for the current session but disappear when you quit BoxCar.
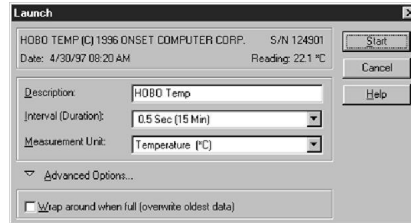
Measurement Unit

Click the Measurement Unit box to choose the units displayed in the Reading Field. The Measurement Unit you set here is also used as the default unit at readout. A temperature graph can be viewed in degrees Fahrenheit or degrees Celsius. BoxCar also lets you change the units after reading out data.
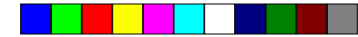
Wrap Around When Full

Click Wrap Around When Full to set the logger to record continuously, overwriting the oldest points when it is full. When full, the logger continues logging until interrupted by a readout or launch. On readout, **the most recent points are read out.** If Wrap Around When Full is not checked, the logger stops when its memory is full.

Start

Click **Start** when you are satisfied with the settings. Do not unplug the logger from the interface cable until BoxCar has indicated that the launch has been completed. *Please note: Launching your logger will overwrite the previously recorded data.* Confirm a successful launch by watching for the logger's LED to blink. Consult the logger's User's Manual for more information on the LED status signals.

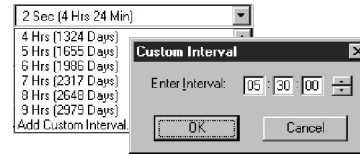# Launching StowAway loggers

Reading

To check the current reading of the logger, examine the Reading field. Readings are displayed in the currently selected Measurement Unit.

Description

Enter up to forty characters of text in the Description field. This text is sent to the logger when you click Start and is displayed below the time axis on the graph.

Interval (Duration)

Select the Interval (time between measurements) and the Duration (amount of time the logger will collect data) from the interval box.

StowAway Launch Dialog Box

Add Custom Interval

To create your own custom interval, select 'Add Custom Interval' at the bottom of the interval scroll box. You can designate as many custom intervals as you require (between 0.5 seconds and 9 hours). Custom Intervals are saved for the current session but disappear when you quit BoxCar.

Measurement Unit

Click the Measurement Unit box to choose the units displayed in the Reading Field. The Measurement Unit you set here is also used as the default unit at readout. A temperature graph can be viewed in degrees Fahrenheit or degrees Celsius. BoxCar also lets you change the units after reading out data.
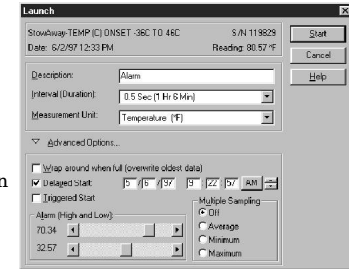
Wrap Around When Full

Click Wrap Around When Full to set the logger to record continuously, overwriting the oldest points when it is full. When full, the logger continues logging until interrupted by a readout or launch. On readout, **the most recent points are read out.**
If Wrap Around When Full is not checked, the logger stops when its memory is full.

Delayed Start

To postpone logging for up to three months after launching your logger, click Delayed Start, then enter a specific start date and time in the fields provided. The format you use to enter date and time will match the format you selected in BoxCar Date/Time preferences.

When delayed start is enabled, the logger does not start to record data immediately when you click Start. Rather, you will see the logger flash dimly (approximately every four seconds) until it reaches the start time specified, then data logging will begin.
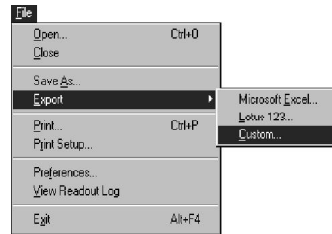
Exporting data

BoxCar exports data to a text file which can be imported by most spreadsheet programs, such as Microsoft Excel and Lotus 1-2-3. Select **Export** under the **File** menu and select one of the following options.

Microsoft Excel Format and Lotus 1-2-3 Format

If you choose the **Microsoft Excel** or **Lotus 1-2-3** options under the **Export** submenu, most of the controls in the export dialog will be un-available, and BoxCar will instead choose the most appropriate format for you. You can, however, still choose the units that you want to export. Please see the **Units/All Units** section on the next page for an explanation of choosing units.

Custom Format

You can choose your own Custom Setup by se-lecting the **Custom** option available under the **Export** submenu. The Export Setup dia-log contains a variety of options to fully cus-tomize your exported data. As you change the various options available, a sample at the bot-tom of the dialog shows a preview of the ex-ported data reflecting your current settings. The options available in this dialog are shown to the right and a detailed explanation of these options follows.
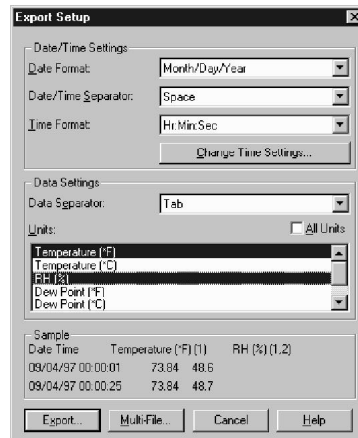
Date Format

This box allows you to choose the format in which the date will be displayed. For most spreadsheet programs, the default option will suffice. However, for compatibility's sake, there are two other options: Day Number (day of year, 0-365) and Old Lotus/Excel (for ver-sions of Lotus 123 prior to version 5 or Microsoft Excel prior to 4.0). You can also choose to have no date included in the export. In addition, you may specify your own custom date format by choosing the 'Custom' op-tion. The letters in parentheses after the word Custom indicate the current custom for-mat. When you select the custom option, a dialog will appear that will allow you to cus-tomize the date format.

Viewing multiple data files

BoxCar allows you to have a large number of files open to view at one time. The **Window** menu gives you some tools to help you man-age these windows.

Cascade Windows

Automatically aligns each window title so that the titles of each open plot are displayed. This arrangement allows you to read all of the file names and look at large plots of data by simply clicking on the name corresponding to the desired plot.
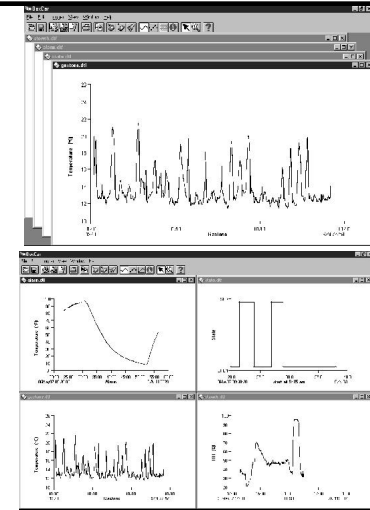
Tile Windows

Automatically reduces the size of each open plot and displays each in equal size. Tiled windows are all readable at the same time, however the more you display this way, the smaller they are.

Close All

This command closes all plot windows, prompting you to name all 'Untitled' files.

The File names below the line

The file names of all open plots are shown in a list below the line in the **Window** menu. You can bring any plot window to the front by selecting it from the list or typing Alt+W and the corresponding window number. This will only work for the first nine windows.

NOTE: Multiple copies of a file can be opened at once. If you do open multiple copies, each one will have a number after the file name.

Viewing multiple channels

BoxCar can not graph more than one channel per graph. However, there are several options for viewing multiple channels of a HOBO logger's data. The first is to open the graph and use **Display Options** under the **View** menu to switch back and forth among the different measurements. The second is to open multiple copies of the same file. This will allow you to use the **Tile Windows** option and see all open graphs at one time. Another option is to **Export** the data into a spreadsheet program and use that program's graphing capability.

Copying pictures

To copy your graph as a bitmap to the Clipboard, select **Copy** from the **Edit** Menu or use the Copy button on the toolbar. To copy just a section of your graph, use the Selection tool to select the area of interest and then select **Copy**.

Triggered Start

Select Triggered Start to postpone the launch time of your StowAway logger until triggered. After the logger has been launched, the StowAway will flash its LED dimly every six seconds until triggered. Once triggered, the LED will flash brightly four times and then continue to flash brightly every time a measurement is taken.

Delayed Start after Triggered Start

Selecting both Triggered Start and
Delayed Start causes the StowAway to
delay for a specified amount of time after the trigger has been activated but before it starts logging. The time format is displayed in the format currently specified in the *Date/Time Preferences*.

Alarm

Alarm, when selected, allows you to see if the StowAway has recorded a reading outside of a preselected range. The Alarm reads in the units shown in the Measurement Unit box. To set the Alarm, just slide the tabs to the desired High and Low values. The Alarms are off when the High tab is slid all the way to the right and the Low is slid all the way to the left (the word 'off' will replace the numeric value). You can turn the Alarms off independently of each other - you may only want a High alarm, in which case you can just turn off the Low and keep the High on. The various StowAway loggers have different ways of representing Alarm conditions. Read the individual logger's manual for details. The Alarm data can be seen on the graph after readout. Please read the section in this manual on *Alarm Lines* in the section *Viewing your Data* (see page 16).
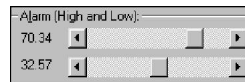
Multiple Sampling

Multiple Sampling causes the logger to take multiple measurements during an interval and store only the minimum, maximum, or average of the readings. In Multiple Sampling mode, the logger takes about 100 measurements, evenly spaced in each interval unless the interval is less than one minute. For shorter intervals, the logger will measure once every half second during the interval. Multiple Sampling increases the average current drain of the logger. To minimize current drain, this feature should not be used unless needed.
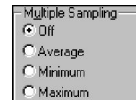
Start

Click **Start** when you are satisfied with the settings. Do not unplug the logger from the interface cable until BoxCar has indicated that the launch has been completed. *Launching your logger will overwrite the previously recorded data.* Confirm a successful launch by watching for the logger's LED to blink. Consult the logger's User's Manual for more information on the LED status signals.

Launching HOBO H8 (including Pro Series) loggers

Deployment

To view the number of times your logger has been deployed, check the Deployment field. The value in this field always includes the current deployment, and increases by one every time the logger is launched.

Description

Enter up to forty characters of text in the Description field. This text is sent to the logger when you click Start and is displayed below the time axis on the graph.
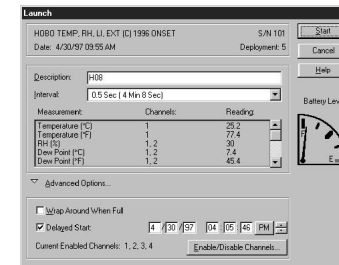
HOBO H8/Pro Series Launch Dialog Box

Interval (Duration)

Select the Interval (time between measurements) and the Duration (amount of time the logger will collect data) from the interval box.

Add Custom Interval

To create your own custom interval, select 'Add Custom Interval' at the bottom of the interval scroll box. You can designate as many custom intervals as you require (between 0.5 seconds and 9 hours). Custom Intervals are saved for the current session but disappear when you quit BoxCar.

Measurement, Channels, and Reading

The Measurement column shows the units available based on the sensors chosen from the Enable/Disable Channels button. In the example below, the HOBO RH/Temp/Light/External with all Channels enabled will measure Temperature (°C and °F), RH (%), Dew Point (°C and °F), Abs Humidity (gm/M3), Uncomp RH (%), Intensity (Lumens), and Voltage.

The Channels column shows which sensors are used to calculate the measurement. For example, Dew Point uses the temperature channel plus the humidity channel to calculate Dew Point, as there is not really a dew point sensor connected.
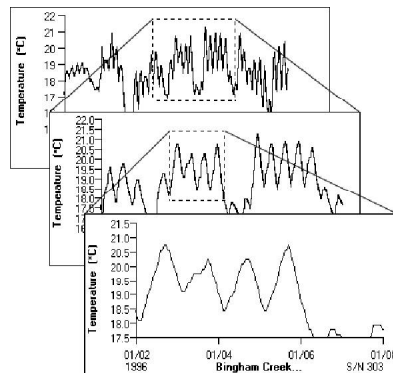
The Reading column gives the current reading, updated every second, of the connected logger.

Viewing your data

BoxCar software displays your data in a graph with the launch description and serial number of the logger shown below the time and date X-axis, and measurement units beside the Y-axis. The options described here are found on the **View** menu on the main menu bar.

Connect Points

When **Connect Points** (F4) is checked (the default), the plot is drawn with lines connecting each measured data point, yielding a continuous line for the entire graph. When Connect Points is not checked, each data point is displayed with a single dot.

Mark Points

When **Mark Points** (F6) is checked, each data point is displayed with a small circle drawn around the point. For sparse data sets, this option makes individual data points visible.

Alarm Lines

The **Alarm Lines** option is only available when viewing the graph of a StowAway logger with Alarms options set. When this option is checked, dotted lines appear on the graph to show the High and Low alarm values that were set when the logger was launched. These alarm areas will be shaded gray so you are able to tell the difference between the alarm (gray) and non-alarm (white) areas.
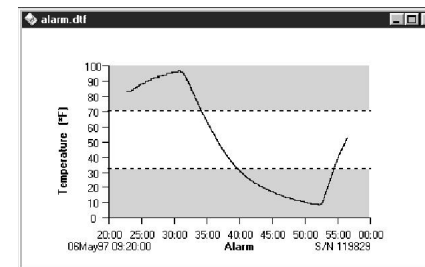
Display Options

Select **Display Options** to choose between any of the available units to display your data. For H8 loggers, an asterisk (*) preceding the channel number denotes the sensor was selectable during launch (see Launching). The HOBO Temp/External logger's data units are displayed to the right.

Zoom Selection

Zoom in on any section of a plot by using the selection tool (Arrow) to draw a box around the section of interest. To zoom, click inside the box or select **Zoom Selection** (F7) on the **View** menu. If you are using the zoom tool (magnifying glass), use the left mouse button to zoom in on a selection without clicking inside the box first.

Zoom Out

Zoom out to the previous plot by choosing **Zoom Out** (F8) on the **View** menu. If you are using the zoom tool (magnifying glass), zoom out by clicking the right mouse button within the graph area. From the original plot, an additional level of zoom is possible. If you zoom out when viewing the original plot (see Original Plot), the graph will change to reflect the logger's full measurement range.

Original Plot

To return to the original plot of your data, choose **Original Plot** (F9) from the **View** menu.

File Information

The File Information selection opens a dialog box that describes the currently active file. The description is for the entire file and does not change with a zoom. To view the data in tabular format, click the **Show Data** triangle at the bottom of the dialog. When you click on a point in the list of data, if that point is displayed in the current view, a vertical line is drawn on the graph corresponding to the point. Once the data is visible, click the **Hide Data** button to hide the data and the line, if visible. Click the close box to close the File Information dialog.
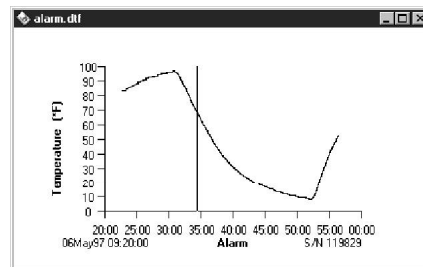
Wrap Around When Full

Click Wrap Around When Full to set the logger to record continuously, overwriting the oldest points when it is full. When full, the logger continues logging until interrupted by a readout or launch. On readout, **the most recent points are read out.**

If Wrap Around When Full is not checked, the logger stops when its memory is full.

Note: *The HOBO H8 Pro Series loggers do not support Wrap Around When Full.*

Delayed Start

To postpone logging for up to three months after launching your logger, click Delayed Start, then enter a specific start date and time in the fields provided. The format you use to enter date and time will match the format you selected in BoxCar Date/Time preferences.

When delayed start is enabled, the logger does not start to record data immediately when you click Start. Rather, you will see the logger flash dimly (approximately every four seconds) until it reaches the start time specified, then data logging will begin.

Current Enabled Channels

This shows which channels are currently activated (not available for the HOBO H8 Temp and other single channel loggers).

Enable/Disable Channels

To enable or disable channels click the Enable/Disable Channels button. The dialog box shown at right appears. Check the box next to the sensor to enable or disable that channel. If your logger has more than one channel, you will be able to enable or disable channels for each launch. Max points per channel displays the number of points that will be stored for each channel before the logger is full (data memory divided by number of enabled channels).
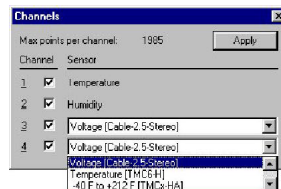
To select resolution for HOBO Pro Series loggers see the logger manual.

Note: *If your logger has one or more external sensor jacks, you must specify what type of sensor is connected to each jack or data will not be displayed correctly.*

Battery Level

Watch the Battery Level gauge to see the remaining battery capacity. When the gauge reaches one quarter remaining, we suggest you change the battery, especially if you plan a long deployment.

Start

Click **Start** when you are satisfied with the settings. Do not unplug the logger from the interface cable until BoxCar has indicated that the launch has been completed. *Launching your logger will overwrite the previously recorded data.* Confirm a successful launch by watching for the logger's LED to blink. Consult the logger's User's Manual for more information on the LED status signals.
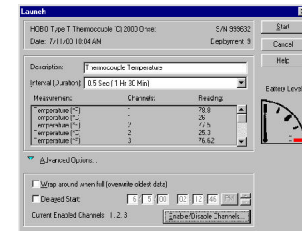
Launching HOBO Thermocouple and HOBO Carbon Monoxide (CO) Loggers

Deployment

To view the number of times your logger has been deployed, check the Deployment field. The value in this field always includes the current deployment, and increases by one every time the logger is launched.

Description

Enter up to forty characters of text in the Description field. This text is sent to the logger when you click Start and is displayed below the time axis on the graph.

Interval (Duration)

Select the Interval (time between measurements) and the Duration (amount of time the logger will collect data) from the interval box.

See the description of HOBO H8 loggers for information on adding custom intervals.

HOBO Thermocouple Loggers: Measurement, Channels, and Reading

Measurement	Channels	Reading
Temperature (°F)	1	78.8
Temperature (°C)	1	26
Temperature (°F)	2	77.5
Temperature (°C)	2	25.3
Temperature (°F)	3	75.92
Temperature (°C)	3	24.4

A unique feature of the HOBO Thermocouple logger is that it has multiple measurement ranges that can be selected. Channels 1 and 2 represent two different ranges for the attached thermocouple. The remaining channel (3) displays the measurement of the internal thermistor.

Refer to the HOBO Thermocouple logger's User's Manual for the exact measurement ranges represented by each channel.

HOBO Carbon Monoxide Loggers: Measurement, Channels, and Reading

Measurement	Channels	Reading
CO (ppm)	1	0.2
CO (ppm)	2	1
CO (ppm)	3	4

The HOBO CO logger has three measurement ranges that can be selected, each of which appears as a channel on the launch dialog.

Refer to the HOBO CO logger's User's Manual for the exact measurement ranges represented by each channel.

Wrap Around When Full

Click Wrap Around When Full to set the logger to record continuously, overwriting the oldest points when it is full. When full, the logger continues logging until interrupted by a readout or launch. On readout, **the most recent points are read out.**

If Wrap Around When Full is not checked, the logger stops when its memory is full.

Readout log

BoxCar creates an entry in the Readout Log for each saved file with the following information: file name, logger serial number, header information, start and end date/time, number of points, shuttle serial number, and deployment number (available for HOBO H6, HOBO Event, HOBO Thermocouple, HOBO CO, and HOBO H8 loggers). Choose **View Readout Log** on the **File** menu to view the log using Notepad. The Readout Log can also be viewed using another text editor.

Synchronizing a Shuttle's clock

To ensure that loggers are relaunched with accurate time parameters, synchronize the Shuttle's clock with the host computer's clock.

For the HOBO Shuttle, select **Launch** from the **Logger** menu. BoxCar connects to the HOBO Shuttle, synchronizes the HOBO Shuttle's clock, and displays the battery's percentage level.

For the Optic Shuttle, select **Optic Shuttle Readout** from the **Logger** menu. After data has been read out, BoxCar synchronizes the clock and warns you only if the battery is low.

Launch and Readout Confirmation

After a successful launch or readout, BoxCar displays the **Disconnect Logger** dialog. Simply unplug the logger from the serial cable and click OK.

The Disconnect Logger dialog ensures that the launch or readout takes place cleanly. This avoids a problem with some computers which use power management subsystems that power down the serial port, and may stop the logger. Click **More Info** for more details.

To disable this dialog box, Click the **File** menu, select **Preferences**, and uncheck the **Show Power Management Dialogs** item.
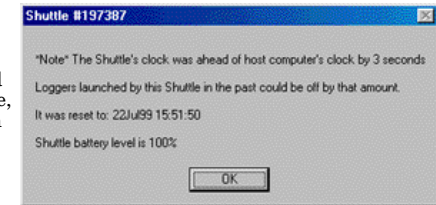
Reading out data

Reading out your logger
To offload collected data, connect the logger, click the **Logger** menu and select **Readout**. BoxCar reads out, displays the data, then prompts you to save. BoxCar displays the plot even if you choose not to save. Reading out your logger stops the logger from logging. To restart logging you'll need to click the **Logger** menu and select **Launch**.
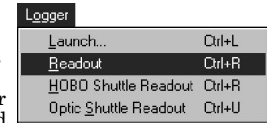
Reading out your HOBO Shuttle
To offload data from the HOBO Shuttle, select **HOBO Shuttle Readout** from the **Logger** menu. BoxCar connects to the HOBO Shuttle and begins to offload data files. When the readout is complete, BoxCar tells you the difference between the Shuttle's current time and the host computer's current time, then synchronizes the Shuttle's clock to your computer's clock. BoxCar checks the HOBO Shuttle's battery and gives you the battery level percentage. BoxCar prompts you to save each of the data files from the HOBO Shuttle. The File Information dialog is displayed so that you will know which file is being saved. To view the saved files, select **Open** from the **File** menu and select the appropriate file.

Reading out your Optic Shuttle
To offload data from the Optic Shuttle, select **Optic Shuttle Readout** from the **Logger** menu. Connect the Optic Shuttle to the displayed port and press the button on the Optic Shuttle to offload. The Optic Shuttle's orange LED light will blink and then the offload of data files will begin. When the Optic Shuttle offload is complete, BoxCar compares the Optic Shuttle's current time to the host computer's current time and tells you the difference between the Optic Shuttle's current time and the computer's clock, then BoxCar synchronizes the Optic Shuttle's clock to your computer's clock. BoxCar also checks the Optic Shuttle's battery and warns you only if it is getting low. After this, BoxCar prompts you to save each of the data files from the Optic Shuttle. The File Information dialog box will be displayed so that you will know which file is being saved.
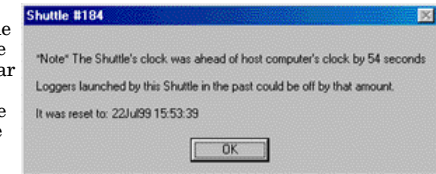
Delayed Start

To postpone logging for up to three months after launching your logger, click Delayed Start, then enter a specific start date and time in the fields provided. The format you use to enter date and time will match the format you selected in BoxCar Date/Time preferences.

When delayed start is enabled, the logger does not start to record data immediately when you click Start. Rather, you will see the logger flash dimly (approximately every four seconds) until it reaches the start time specified, then data logging will begin.
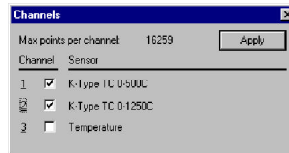
Current Enabled Channels

The Current Enabled Channels field shows the channels and measurement ranges that are currently activated.

Enable/Disable Channels

Click Enable/Disable Channels to select the desired measurement ranges and channels. A dialog box appears. Click next to a channel to enable or disable the channel corresponding to the desired measurement range. Each channel represents a different measurement range of the attached sensor. Consult the logger's hardware manual for exact details on the measurement ranges.

Max points per channel displays the number of points that will be stored for each channel before the logger is full (data memory divided by number of enabled channels).

Battery Level

Watch the Battery Level gauge to see the remaining battery capacity. When the gauge reaches one quarter remaining, we suggest you change the battery, especially if you plan a long deployment.

Start

Click **Start** when you are satisfied with the settings. Do not unplug the logger from the interface cable until BoxCar has indicated that the launch has been completed. *Launching your logger will overwrite the previously recorded data.* Confirm a successful launch by watching for the logger's LED to blink. Consult the logger's User's Manual for more information on the LED status signals.

# Launching HOBO H6 family loggers

Current State

This displays the text the user entered for the logger's present state corresponding to Closed Text or Open Text.

Close Text

The text entered in the Close Text box will be stored with the timestamp for each closing, and displayed on the graph. Up to twenty characters can be typed in this area.

Open Text

The text entered in the Open Text box will be stored with the timestamp for each opening, and displayed on the graph. Up to twenty characters can be typed in this area.
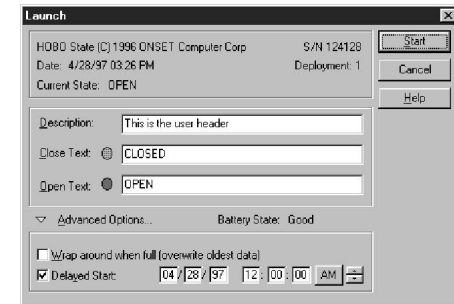
HOBO H6 Launch Dialog Box

Common HOBO H6/Event launch features

Deployment

To view the number of times your logger has been deployed, check the Deployment field. The value in this field always includes the current deployment, and increases by one every time the logger is launched.

Description

Enter up to forty characters of text in the Description field. This text is sent to the logger when you click Start and is displayed below the time axis on the graph.

Wrap AroundWhen Full

Click Wrap Around When Full to set the logger to record continuously, overwriting the oldest points when it is full. When full, the logger continues logging until interrupted by a readout or launch. On readout, **the most recent points are read out.**
If Wrap Around When Full is not checked, the logger stops when its memory is full.

Delayed Start

To postpone logging for up to three months after launching your logger, click Delayed Start, then enter a specific start date and time in the fields provided. The format you use to enter date and time will match the format you selected in BoxCar Date/Time preferences.

Launching HOBO Event loggers

Last Event At

While the Launch dialog is open, it displays the time of the last event. If an event occurs while the launch screen is shown, it will display the time.

Event Name and Event Value

Use the Event Name text box to describe the type of event being monitored. This will be displayed on the Y-axis at readout. The Event Value is the quantity associated with one event.

HOBO Event Launch Dialog Box

Lockout After Event

Select Lockout after event to tell the logger to ignore events for a programmable period after an event is recorded. This can be set for as short as one second to as long as nine hours. With tipping-bucket rain gauges, we recommend setting the lockout to one second to eliminate switch bounce.

When delayed start is enabled, the logger does not start to record data immediately when you click Start. Rather, you will see the logger flash dimly (approximately every four seconds) until it reaches the start time specified, then data logging will begin.

Battery State

This field shows the state of the battery. It displays 'Good' if battery has more than 20% of its capacity remaining, otherwise it will display 'Bad.'

Start

Click **Start** when you are satisfied with the settings. Do not unplug the logger from the interface cable until BoxCar has indicated that the launch has been completed. *Launching your logger will overwrite the previously recorded data*. Confirm a successful launch by watching for the logger's LED to blink. Consult the logger's User's Manual for more information on the LED status signals.