BLINC

Host Software
for UBAT

User's Guide

The user's guide is an evolving document. If you find sections that are unclear, or missing information, please let us know. Please check our website periodically for updates.

WET Labs, Inc.
P.O. Box 518
Philomath, OR 97370
Tel: 541-929-5650
fax: 541-929-5277
www.wetlabs.com

Table of Contents

1. Introduction

The BioLumINescence Controller software (BLINC) is the graphic user interface and control software for the Underwater Bioluminescence Assessment Tool (UBAT).

Required components for testing the UBAT meter:
1. UBAT
2. CD with BLINC software and UBAT Characterization sheet
3. Host PC with serial adapter (if using a computer without a serial port)
4. Power supply capable of providing 1.5 amps at 12V
5. Factory-supplied test cable.

2. System Requirements

Almost any computer capable of running Windows XP or Vista should be able to run BLINC. You will need about 3MB of disk space for the UBAT software; however, more is required for the data you gather. The amount of memory and the speed of your processor limit how much real-time graphing and collecting can be done without data loss.

BLINC is a single executable that can be installed by dragging it from the factory-supplied CD to a desired location on your computer's hard disk.

3. Setup and Operation

UBAT meters are designed to work with the BLINC host software and are easily configured for a variety of applications. We strongly recommend you read through this section to get your meter up and running **before** deployment.

1. Connect the UBAT to a regulated power supply at 9–18V and a host PC. WET Labs recommends using the test cable for pre-deployment checkout.

2. Start the program by double-clicking BLINC.exe.

3. Turn the meter power supply on.

4. Once BLINC has started, use the up/down buttons to identify the serial port, or type in the serial port number, and click Connect To Instrument (or F1).

5. There is a 15-second delay while the PMT warms up. UBAT will start in the least sensitive PMT gain and increase its sensitivity according to light conditions. Following this, the UBAT PMT and pump turn on automatically and the sensor begins transmitting data.

6. Turn the pump off. It won't hurt the meter to run with it on but it is not designed to run in air and is annoying during bench-top operation.
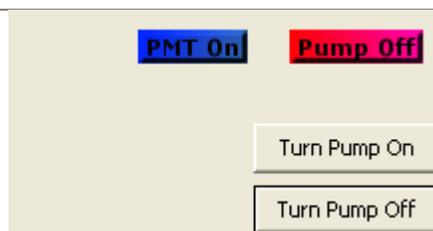
7. View the incoming data (see BLINC output below):
   - The top plot is the 1–60 raw A/D counts, sampled and updated per second.
   - The bottom is a plot of time (s) from start of the program, using the computer time, versus the 1Hz calibrated bioluminescence data (photons s^{-1}).
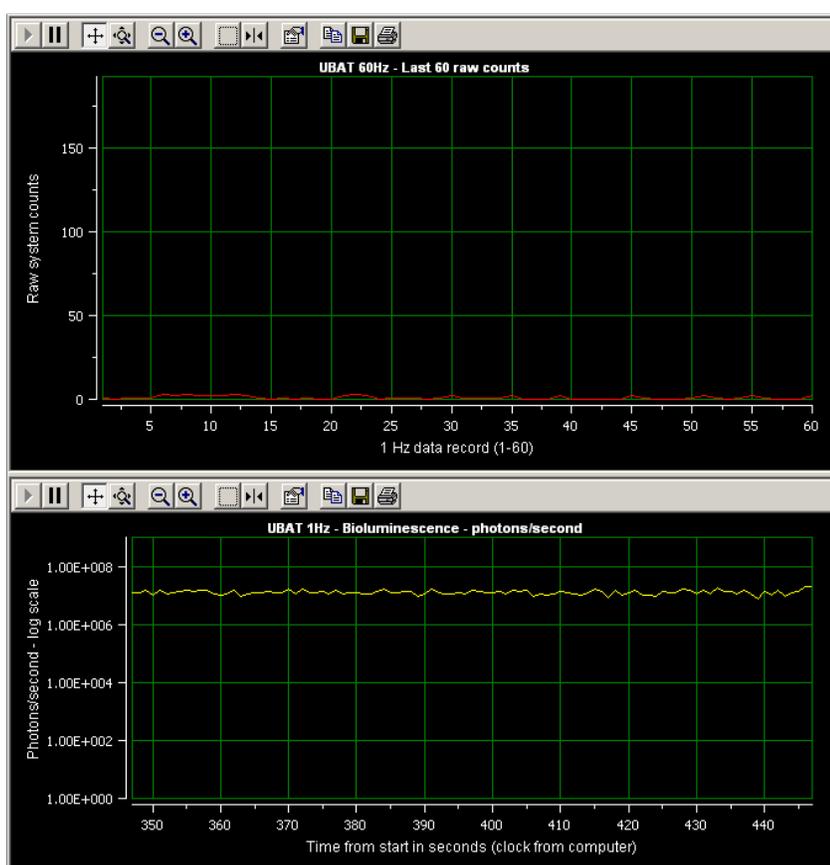
8. Click the Start Recording button (or F3) to start data acquisition. A dialog box prompting you to save the file will appear. A default file name is automatically generated. It indicates meter type, meter serial number, date, and time. When you are recording, the Start Recording button becomes Stop Recording.

   The auto-generated file name convention is ubatSSS_yyyyMMddhhmmss.dat on the host PC in Documents and Settings/user/My Documents. Alternatively, you may specify the filename and its location.

where

SSS is meter serial number
yyyy is year
MM is month
hh is hour
dd is day
mm is minute
ss is second

For example: ubat007_20081114124319 is UBAT serial number 007; data collection started 2008, November 14th, at 12:43:19pm.

The UBAT will record one file for up to one hour (default). See section 4.3.1 for details on recording options.

|	

If there are communication issues, a window will pop up with a possible source of the problem. Verify:
 	
  • the correct Comm Port;
  • the meter is properly plugged in and turned on.
 	
Click OK and Connect To Device again to the get the meter running.
	Comm Error ✕
	
	Could Not Open COM4
	
	OK
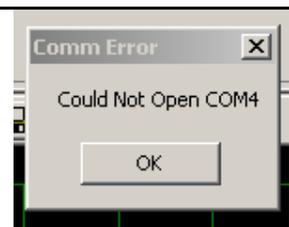
10. Allow the meter to run a minute or two. When you click Stop (F4), the file is saved with the filename and location previously specified.

4. BLINC Reference

This section contains details about the various controls and options available in BLINC. Since many of these are discussed in the previous section, there is some overlap. This section is intended as a reference for specific controls and options.

4.1   Setup
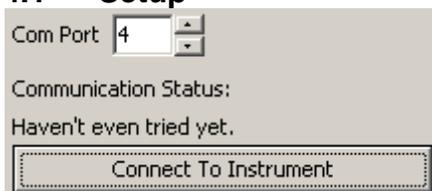
Com Port: Select the appropriate port for PC-to-meter communication.

Communication Status: This tells whether or not the software is communicating with the device.

Connect To Instrument (F1): Connects to the instrument, plots data, enables Record button, and becomes Disconnect (F2) when BLINC is successfully communicating with the UBAT.

4.2   Information and Statistics
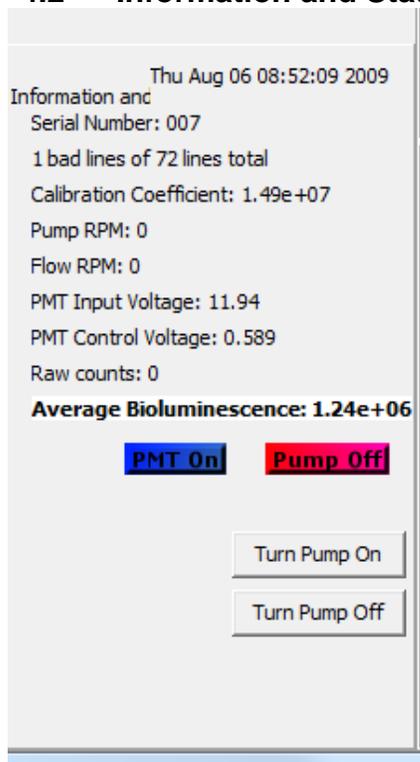
- Date and time according to the host computer.
- Serial Number: The serial number of the UBAT.
- (#) Bad lines of (#) lines total The number of bad records discarded, and the total number of records read (including discarded records).
- Calibration Coefficient: Reports the calibration coefficient for the current High Voltage (HV) step (photons s^{-1}).
- Pump RPM: The rate of the UBAT pump.
- Flow RPM: The rate of the flow of water through the UBAT.
- PMT Input Voltage: The voltage the Photomultiplier Tube (PMT) receives (on/off control).
- PMT Control Voltage: Voltage that controls the PMT sensitivity and is associated with the 1–3 HV steps.
- Raw counts: the first column from the 1–60 raw A/D counts.
- Average Bioluminescence: Bioluminescence potential, reported at 1Hz (photons s^{-1}).
- PMT and Pump indicators: These are blue when the PMT and pump are on, and red when they are turned off. You can control the pump behavior with the buttons here, and the PMT behavior in the Control Device menu. Note that these indicators can take a few seconds to catch up with the actual status of the UBAT.

4.3 Instrument Control Menus

Connect To Instrument/ Disconnect	Opens a connection on the serial port and attempts communication with the UBAT. Turns into Disconnect when connected.	
	Closes the communication on the serial port. Turns into Connect To Instrument when disconnected.	
Start Recording/ Stop Recording	Opens a save as dialog box, generates a filename but also allows you to input one. After the save is accepted, starts recording data. Turns into Stop Recording when recording.	
Exit	Quits the BLINC program.	

Turn Pump Off	Turns UBAT pump off.	
Turn Pump On	Turns UBAT pump on.	
Turn PMT Off	Turns UBAT PMT off.	
Turn PMT On	Turns UBAT PMT on.	
Set Schedule	Brings up a dialog to set up a schedule for recording data from the UBAT See section 4.3.1 for details.	

4.3.1 Set Schedule

Schedule Single Sample is the default setting. The UBAT will record one file for one hour in an automatically generated filename on the host PC in Documents and Settings/user/My Documents.
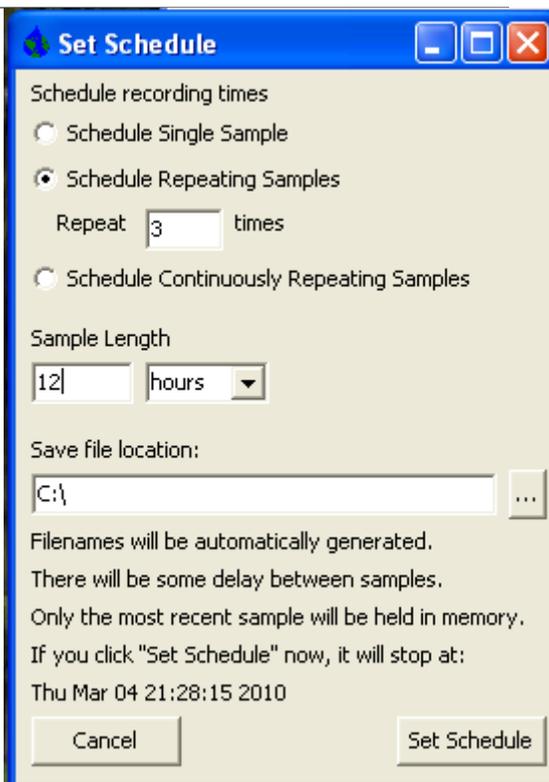
Note that you can specify both the filename and its location.
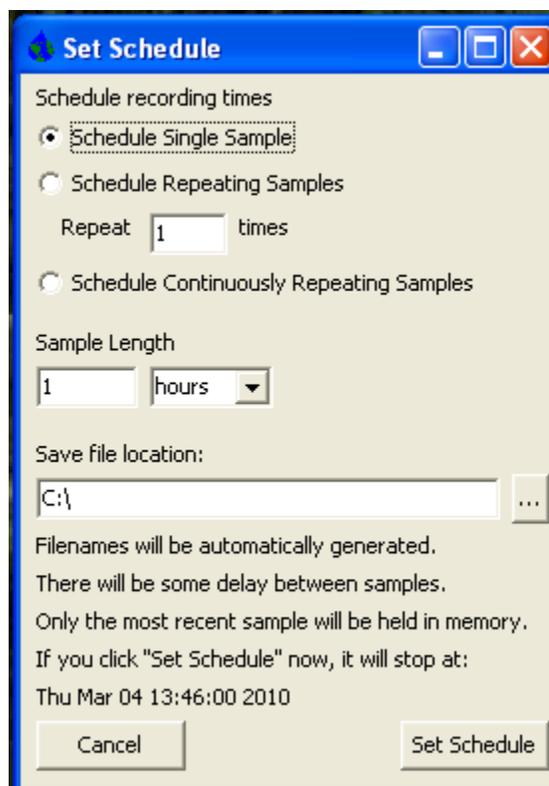
Schedule Repeating Samples allows you select the duration of the sample, in hours or minutes, and the number of times you'd like that sample length to repeat.

For example (see right): The UBAT will record three separately named sample files each comprised of 12-hour samples.

The counter at the bottom of the window will indicate when recording will be complete.

Set Schedule

Schedule recording times
- ○ Schedule Single Sample
- ● Schedule Repeating Samples
   Repeat `3` times
- ○ Schedule Continuously Repeating Samples

Sample Length
`12` `hours ▼`

Save file location:
`C:\` `...`

Filenames will be automatically generated.
There will be some delay between samples.
Only the most recent sample will be held in memory.
If you click "Set Schedule" now, it will stop at:
Thu Mar 04 21:28:15 2010

Cancel   Set Schedule

Schedule Continuously Repeated Samples is especially important for long-term moored or towed applications.

For example (see right): The UBAT will record data continuously for 6 hours, generating one file and begin a new file immediately following this period for an additional 6 hours. This sequence will repeat until it is terminated by the user.

Note that you can specify both the filename and its location.

Set Schedule

Schedule recording times
- ○ Schedule Single Sample
- ○ Schedule Repeating Samples
   Repeat `  ` times
- ● Schedule Continuously Repeating Samples

Sample Length
`6` `hours ▼`

Save file location:
`C:\` `...`

Filenames will be automatically generated.
There will be some delay between samples.
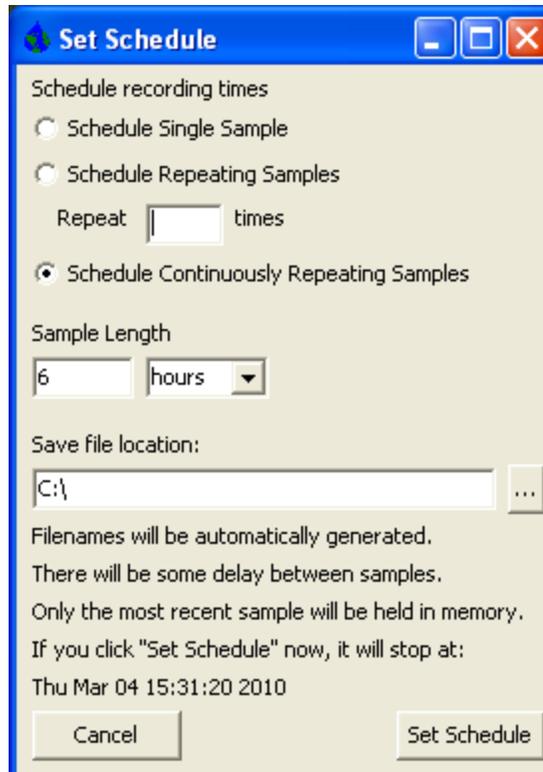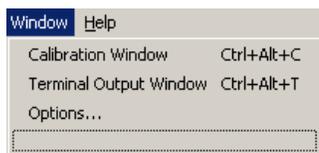Only the most recent sample will be held in memory.
If you click "Set Schedule" now, it will stop at:
Thu Mar 04 15:31:20 2010

Cancel   Set Schedule

Calibration Window	Provides an interface for calibrating the instrument.
Terminal Output Window	Provides an interface to see the raw output of the UBAT, and to send commands.
Options	Brings up the options window; allows user to apply time stamp using the control computer time.

4.3.2 Calibration Window

The calibration window provides an interface to track changes in the response of the UBAT to a validation light source, relative to the factory calibration values. Should the instrument deviate by more than 10 percent from its original calibration after being cleaned, you may need to send it back to WET Labs for a full service and re-calibration.
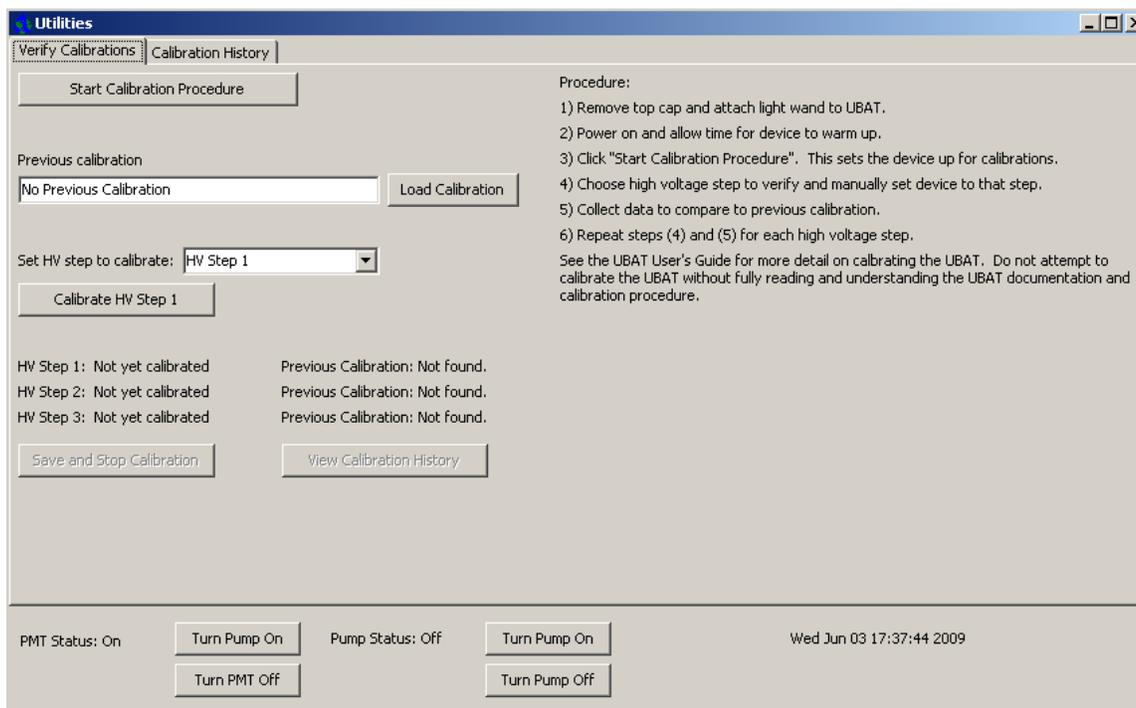
If you have an existing calibration/validation history file, make sure it is properly loaded before continuing. BLINC will store, in the registry, the last used calibration/validation history file. However, if you use a different UBAT or host PC, make sure the appropriate validation tracking file is loaded before continuing. Create a validation file using the validation LED light source that arrived with your UBAT (UBAT###.VAL) prior to deployment.

To start, click **Start Calibration Procedure**. This puts the UBAT in a mode where it is no longer recording data. Use the pulldown menu to select the appropriate gain settings to calibrate. Start with the first and least sensitive gain setting, HV Step 1. Select **Calibrate HV Step 1** and let BLINC acquire the data. Following this, the software will report the value. Repeat this for HV steps 2 and 3 (increasing level of sensitivity).

After you have acquired data from all three HV steps, select **Save and Stop Calibration**. If you have loaded a validation/calibration file, this data will be appended to the existing file. If there is no previous validation file, you will be prompted to create a validation tracking file. Following this, UBAT will be back in its operational mode and is ready for deployment again.

You can view the calibration history by selecting the **View Calibration History** button or the **Calibration History** tab. This plot will show how the instrument has changed over time.

4.3.3 Terminal Output Window

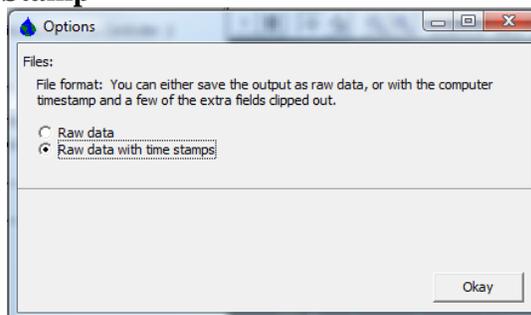This window provides an interface to the raw data coming from the UBAT.
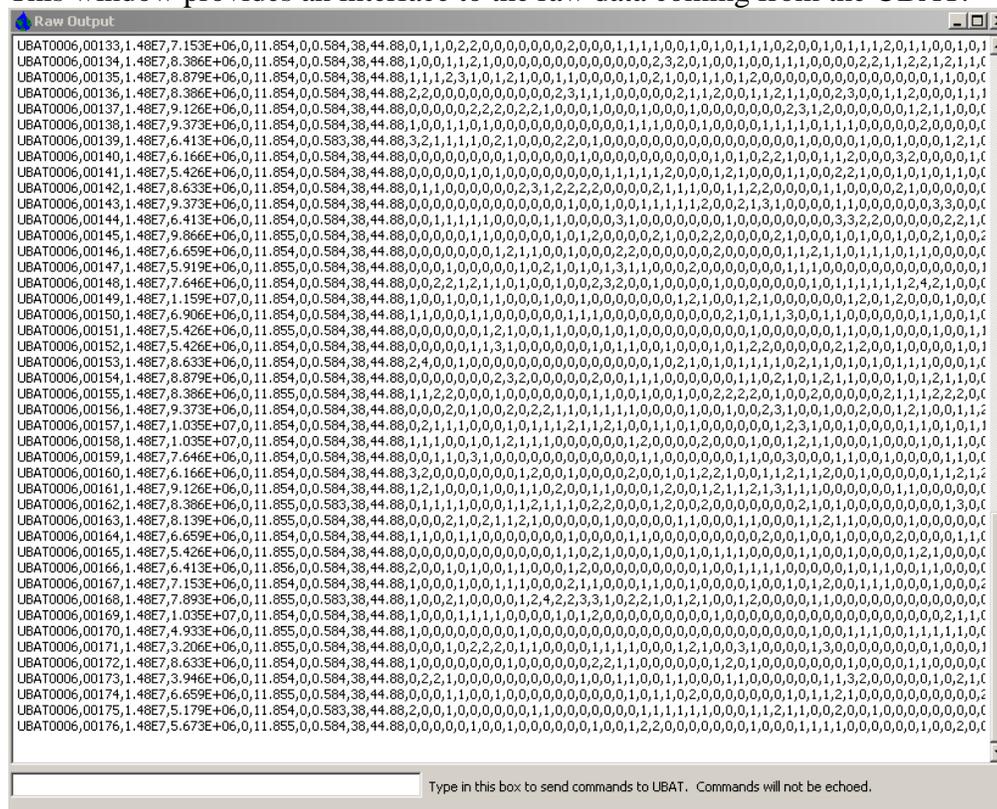
Send commands to the UBAT by typing them in the box at the bottom of the window. Commands are not echoed. Refer to Control Commands section in the Hardware User's Guide for terminal command list.

Caution
Sending unrecognized commands may damage the UBAT firmware.

4.4.4 Options Window: Data Time Stamp

Although UBAT does not output time, the BLINC software allows you to append a time stamp from the host PC to the UBAT data from the Options window.

Options

Files:
File format: You can either save the output as raw data, or with the computer timestamp and a few of the extra fields clipped out.

○ Raw data
◉ Raw data with time stamps

Okay

4.4.5 Plot Window Controls

Each plot window has a toolbar that allows for a variety of changes to the way data is plotted. Changes to the plot will not affect the data recording. In addition to the toolbar options, you can click on the numbers of either axis and change the values by dragging.

▶	**Resume**	Resume tracking. If the triangle is green, this button may be used to pressed to resume tracking.
❚❚	**Pause**	Pause tracking. This stops the scrolling of the X-axis.
⊹	**Axes Scroll**	Drag either axis up or down, right or left.
⟳	**Axes Zoom**	Zoom the axis up or down, right or left. Allows user to scale the axes for coarser or finer plotting.
🔍	**Zoom Out**	Decrease the zoom by 2x.
🔍	**Zoom In**	Increase the zoom by 2x.
▢	**Zoom Box**	Draw a box on the plotting area and zoom all axes around selected area.
►◄	**Grab Range**	Allows you to click on a single point to view that spectrum.
📝	**Properties**	Displays numerous properties of plot window.
📋	**Copy to Clipboard**	Copies the current plot to the host PC's clipboard.
💾	**Save**	Saves an image of the current plot as a bmp, jpg, or png file.
🖨	**Print**	Send a snapshot of the data plot to a printer.

Revision History

Revision	Date	Revision Description	Originator
A	5/27/10	New Document (DCR 694)	J. Bell, C. Orrico, H. Van Zee