

VR3HS
SOFTWARE MANUAL

25-07-2012

VEMCO, a Division of AMIRIX Systems Inc.

AMIRIX Systems Inc.
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1 INTRODUCTION

1.1 ABOUT VEMCO

VEMCO, a division of AMIRIX Systems Incorporated, is a leader in the design and manufacture of oceanographic research tools and systems since 1979. Located in Halifax, Nova Scotia, VEMCO's product line ranges from miniature acoustic transmitters and data loggers to large tracking, positioning, and monitoring systems.

For more information on our products, please visit us at www.vemco.com.

1.2 SYSTEM REVIEW

The VR3 family of receivers are submersible, multi-channel acoustic receivers capable of identifying VEMCO coded transmitters. The receivers operate on 69.0 kHz, and can decode our standard coded acoustic transmitters. The VR3 family includes the VR3-UWM (Underwater modem) and the VR3-Argos.

The VR3-UWM (Underwater Modem) receiver is designed to be moored underwater. The VR3-UWM can communicate with a modem positioned under the surface to receive commands and transmit data.

The VR3 receivers detect coded tags but not continuous tags.
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The VR3-Argos receiver is designed to be moored at the surface of the water and record any VEMCO tags in the area. It uses the Argos satellite service to transmit data from anywhere in the world on a regular schedule, typically once every few days. This permits data analysis to begin almost immediately after deployment. Data can also be retrieved through a service port on the receiver when the receiver has been retrieved from deployment.

The VR3HS software functions with both the VR3-UWM and the VR3-Argos. With the VR3-UWM receiver, the software allows receiver settings to be sent to the receiver, tilt angle display for deployment, range to receiver indication, sensor tag management, data retrieval, and creating comma delimited data files. With the VR3-Argos receiver, the software allows receiver settings to be sent to the receiver (before deployment), sensor tag management, and data retrieval (after receiver is retrieved).

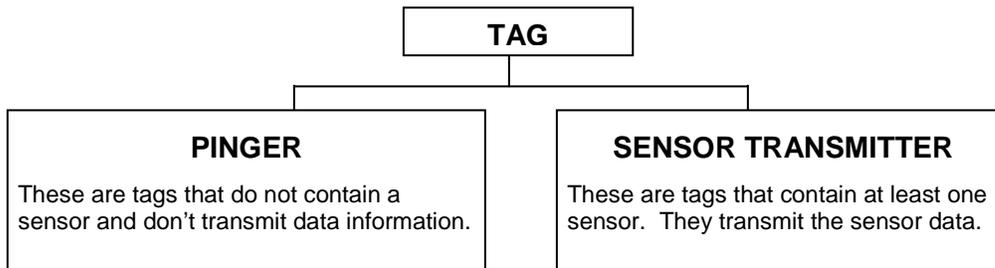
1.3 USING THIS MANUAL

This manual contains the necessary information needed to use the VR3HS software. This includes how to use the software; view the tilt while deploying a VR3-UWM receiver; locate a deployed VR3-UWM; input sensor transmitter information; and retrieve stored data.

This manual is broken into major sections for easier use of the information found in the manual. These sections, with a brief explanation, are listed in Table 1.

Section	Description
Introduction	Introduction to the VR3 receivers and this manual.
Applications	Details on how to use the VR3HS software with the receiver.
Software	Description of the software elements and the file types.
Appendix	Glossary and additional information.

The manual refers to tags, pingers, and sensor transmitters. The relationship these three terms have with each other is shown in the diagram below. Basically, a tag is a general term referring to either a pinger or a sensor transmitter.



UPDATE

(May 2008)

It's strongly suggested that sensor transmitter information (including slope and intercept) is entered in VUE software instead of in VR3HS software. Without the slope and intercept in VR3HS, the created VR3 data files are compatible with VUE and can be imported to the VUE database (see Importing "Old" VR2 and VR3-UWM Text data files in VUE manual). If desired, the sensor transmitter information can be used in the VR3HS software but the VR3 data files will not contain the proper formatting to correctly interface with the VUE database.

Don't enter sensor transmitter information in VR3HS – use **VUE** instead.

Load data from VR3-UWM and import it in VUE software.

For more information about VUE software, and to obtain a copy, see www.vemco.com/support

2 APPLICATIONS

This section of the manual explains how to use the VR3HS software with the VR3-UWM and VR3-Argos receivers by tasks, or applications. The Software section of this manual explains how to use the software by section.

2.1 QUICK SETUP

2.1.1 Quick setup for the VR3-UWM

The list below gives the order of actions needed to setup and use the VR3-UWM receiver. The steps may reference sections in this manual that contain more details about that step.

1. Install the VR3HS software on the computer, if not already installed (see section 4.1.2).
2. Set properties in software: (only needs to be done on first use and if information has changed)
 - a. Select the data directory to be used to store the files (see section 3.2.1.1).
 - b. Select the colours to be used for the software display and the times for *Status Update Period* (see section 3.2.3.4).
3. Install the battery in VR3-UWM receiver if applicable (see the VR3-UWM Operating manual). The receiver starts recording data as soon as it is powered.
4. Power the surface modem and physically connect it to the serial port on the computer (see the VR3-UWM Operating manual).
5. Perform an in-air test (see the VR3-UWM Operating manual).
6. Deploy the surface modem (see the VR3-UWM Operating manual).
7. Deploy the VR3-UWM receiver (see the VR3-UWM Operating manual).
8. Use the *UWM Tilt Display* command to watch the tilt angle of the receiver as it is deployed (see section 3.2.3.1).
9. Record the physical location of the receiver with its ID number.
10. Leave the VR3-UWM to collect data from transmitters.
11. Return to the general location of the VR3-UWM.
12. Deploy the surface modem (see the VR3-UWM Operating manual).
13. Send a “Connect” command to wake the VR3-UWM modem (see section 3.1.1). This may take a few minutes.
14. Use the *UWM Range Display* command to locate the VR3-UWM (see section 3.2.3.2).
15. Load the data from the VR3-UWM receiver with the *Upload Logs* button (see section 3.2.2.1).
16. If the study is continuing, repeat steps 11 to 16 until the study is completed.
17. When the study is complete, retrieve the VR3-UWM and remove the battery pack to stop the recording.

2.1.2 Quick setup for the VR3-Argos

1. Install the VR3HS software on the computer, if not already installed (see section 4.1.2).
2. Set properties in software: (only needs to be done on first use and if information has changed)
 - a. Select the data directory to be used to store the files (see section 3.2.1.1).
3. Enter sensor transmitter information (only necessary if using sensor transmitters):
 - a. Open the *Tag Manager* window (see section 3.3).
 - b. Setup the sensor transmitters being used with the receiver (see section 3.3.2.1.1).
 - c. Transfer the sensor transmitter information to the VR3 receiver file (see section 2.2.10).
4. Install the battery in VR3-Argos receiver if applicable (see the VR3-Argos Operating manual). The receiver starts recording data as soon as it is powered.
5. Deploy the VR3-Argos receiver (see the VR3-Argos Operating manual).
6. Leave the VR3-Argos to collect data from transmitters.
7. Use an Internet connection to retrieve compressed data via the Argos system (see the VR3-Argos Operating manual).
8. When the study is complete:
 - a. Retrieve the VR3-Argos receiver.
 - b. Connect the computer running the VR3HS software directly to the receiver's service port.
 - b. Load the raw data from the VR3-Argos receiver with the *Upload Logs* button (see section 3.2.2.1).
 - c. Deactivate the receiver (see the VR3-Argos Operating manual).
 - d. Remove the battery pack to stop the recording.

2.2 HOW DO I ...

The “How Do I ...” section of the manual lists the steps necessary to perform particular actions with the VR3 receivers and the VR3HS software. The actions are listed alphabetically for easier referencing. Use the Quick Setup (section 2.1) to use the VR3HS software in a step-by-step manner.

2.2.1 Add a coded sensor transmitter

Follow the steps listed below to enter a coded sensor transmitter in the VR3HS software (see section 3.3.2.1.1).

1. Open the *Tag Manager* window by selecting *Tag Manager* in the Tools menu, or click on the appropriate speed button.
2. Open a resource file, if desired (see section 3.3.1.2).
3. Click the “Coded256Sensor” located in *PC Managed Setup* (left side of window). The “Add Coded 256 Sensor” section will appear in the bottom left corner of the *Tag Manager* window.
4. Enter the following information in the correct boxes. The boxes are labelled and the information is found in the Transmitter Specification manual shipped with the sensor transmitter.
 - a. Serial number
 - b. Frequency in kilohertz (kHz)
 - c. Coded map – select from the default maps in the pull-down list.
 - b. ID number
 - c. Codespace (eg. A69-1105)
 - d. Sensor type – temperature or depth
 - e. Slope
 - f. Intercept
5. Verify that the information was entered correctly.
6. Click the “Update” button at the bottom of the window. The tag will appear in the list in the *PC Managed Setup* section of the window.
7. Save the resource file, if desired (see section 3.3.1.3).
8. Transfer the tag setup to the VR3 receiver (see section 2.2.10).

Do not enter slope and intercept information if data will be imported into VUE software. For the VUE software to properly post-process data, slope and intercept information must be entered into VUE and not in VR3HS software.

2.2.2 Communicate Using the Underwater Modem (VR3-UWM only)

When the underwater modem is used for communication with the VR3-UWM, the steps below must be followed (see section 3.1.1):

1. Setup the surface modem (see the VR3-UWM Operating manual).
2. Physically connect the surface modem to the serial port (com port) on the computer and make note of the serial port number.
3. Open the VR3HS software.
4. Select the com port number from the drop-down list in the bottom left corner of the software window (see picture in section 3.1.1).
5. Select “UWM” from the drop-down list to the right of the com port list (see picture in section 3.1.1).

6. Select the receiver ID number from the pull-down list. If the receiver has never been physically connected to this computer, the ID number will need to be entered in the box using the computer keyboard.
7. Enter the depth (in meters) at which the VR3-UWM will be deployed. This is necessary to identify the correct surface range to the VR3-UWM receiver (see section 3.2.3.2) but is not required for communication.
8. Add any notes as desired. This information will be stored in the log and seen in the data file (see section 3.4.1).
9. Click the “Connect” button. A window will appear asking if the modem is to be used in high power mode (see section 3.1.1).
10. Click the “Yes” button if the surface modem is in water and click “No” if the surface modem is in air (this occurs during the in-air test; details are in the VR3-UWM Operating manual).

WARNING

Always operate the surface modem in **low power** mode when used *in air*.

The software will then perform the tasks explained in the list below and will report the comments included in the quotation marks on the status line at the bottom of the software window.

- The status line at the bottom of the software window will report “Detecting UWM surface unit...” to indicate that the software is connecting with the surface modem.
- After a few seconds, the message “Connecting (attempt #1)...” appears in the status line for 10 seconds while the surface unit checks to see if the bottom modem (on the receiver) is ready to receive. If it isn’t ready, then the surface unit sends a “wake up” command for two minutes and the status line reports “Sending wakeup signal...”.
- The surface unit then makes a second attempt to connect with the receiver’s modem and the status line reports “Connecting (attempt #2)...”. The process of sending wake up messages and attempting to connect continues until connection is made with the receiver or the attempt is manually aborted.
- When the communication connection between the surface and bottom units is made, the software requests basic receiver settings from the receiver and the status line at the bottom of the window reports “Interrogating VR3 ID= ?,...”, where the ? represents the ID number. This takes approximately 20 seconds, after which the status line reports “Connected”.

Note: Connections will take longer in noisy or long-distance conditions.

2.2.3 Copy configurations from one computer to another

If more than one computer is used in a study for communicating with VR3 receivers, it may be convenient to copy configurations between computers. The VR3HS application configuration file (VR3HSSetup.xml) contains all the general application settings, receiver configurations, and sensor transmitter setups that the software uses. This configuration file may be copied from one computer to another in order to setup the VR3HS software identically on each. This will overwrite all settings on the recipient computer. Alternatively, individual receiver configurations may imported from one computer to another using the procedure in section 3.2.1.3.

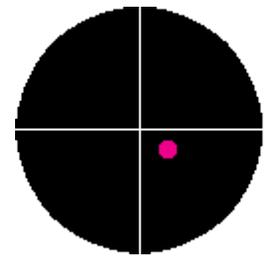
To copy the configurations, follow the steps below.

1. Make sure the VR3HS software is closed on the first computer.
2. Copy the VR3HSSetup.xml file from the first computer to the second computer and overwrite the second computer’s VR3HSSetup.xml file.
3. Open the VR3HS software on the second computer.

2.2.4 Deploy a VR3-UWM

This information is also available in section 3.2.3.1.

1. Physically connect the surface modem to the computer running the VR3HS software.
2. Suspend the VR3-UWM from ropes so it hangs vertically with the transducer pointing up.
3. Select the VR3 ID number from the list of receivers at the bottom of the software window. If the correct receiver number is not in the pull-down list, highlight an ID number in the box, enter the number on the computer keyboard, and press Enter.
4. Click the “Connect” button in the bottom left corner of the software window. The surface modem will then attempt to wake up the receiver, request its status, and will numerically report the slant range, surface distance, and receiver’s tilt angle on the right side of the window. These values will be periodically updated, at the rate selected for the *Status Update Period* (see section 3.2.3.4).
5. Select the *UWM Tilt Display* command from either the speed buttons or from the Tools menu. The software window will display the circular level display as shown here.
6. Verify that the dot (shown here as magenta) is in the center of the circle or very close to it. The center of the circle represents the vertical. Movement of the dot indicates the receiver is now at an angle and gives the general direction in which the receiver has tipped.
7. Deploy the VR3-UWM receiver (see the VR3-UWM Operating manual).
8. Watch the location of the dot in the circular level display as the receiver is lowered through the water to make sure it remains in the center of the circle. If the dot has moved drastically, then reposition the receiver until it is as close to the center as possible. This is important for communication with the receiver.
9. Place the receiver in its moored location so the dot is as close to the center of the circle as possible. If the angle is too great, then reposition the receiver so the angle decreases. This is very important for modem communication.



2.2.5 Edit a sensor transmitter

Sensor transmitters that have already been entered can be edited. Follow the steps below to edit an existing sensor transmitter (see section 3.3.2.1.1).

1. Highlight the desired tag in the *PC Managed Setup* list (left side of *Tag Manager* window). The information already entered about that tag is displayed in the bottom left corner of the window but is not accessible for editing.
2. Click the “Edit” box in the bottom left corner of the window.
3. Edit the tag information as needed.
4. Click the Update button.

2.2.6 Load data from a VR3 receiver

Data that has been received and stored in the VR3-UWM receiver's memory is loaded to the computer by following the steps below.

1. Establish a communication connection with the VR3 receiver (see section 3.1.1 for underwater communication or section 3.1.2 for serial port communication).
2. Select the Upload Logs command (see section 3.2.2.1) from either the speed buttons or from the VR3 menu. A VR3 upload report will appear with the amount of memory used and the expected time required to load the memory to the computer.
3. Select if you'd like to load the entire log stored in memory or just the new entries stored since the last upload.
4. For VR3-UWM receivers, leave the "Use Data Compression" box clicked. Compression should only be disabled as a last resort for recovering corrupted data
5. Place a check mark in the "View uploaded log" box by clicking it with the mouse arrow if you'd like to view the data as soon as it's uploaded. If this isn't selected, the data can be viewed by selecting Display Logs in the File menu (see section 3.2.1.2).
6. Click the "Upload" button in the bottom right corner of the VR3 Upload window. The VR3 Log Upload window will appear to report on the progress of the upload and to allow the upload process to be aborted.
7. View the data file by using the Display Logs command (see section 3.2.1.2), if desired.

2.2.7 Locate a deployed VR3-UWM

A deployed VR3-UWM can be located acoustically when the surface modem is within 350 meters of the VR3-UWM and within a 120 degree cone. This is performed by following the steps below.

1. Move to the general area the VR3-UWM is known to be in. The size of this general area depends on the acoustic conditions and the depth at which the receiver was deployed.
2. Deploy the surface modem, if not already deployed.
3. Select the *UWM Range Display* command (see section 3.2.3.2) from either the speed buttons or from the Tools menu. The left side of the software window will change to a target range circle (see section 3.2.3.2).
4. Select the VR3 ID number from the list of receivers. If the correct receiver number is not in the pull-down list, highlight an ID number in the box, enter the number on the computer keyboard, and press Enter.
5. Click the "Connect" button in the bottom left corner of the software window. The surface modem will then attempt to wake up the receiver, request its status, and will numerically report the slant range, surface distance, and receiver's tilt angle on the right side of the window. The "Surface Distance" value will also be represented by the "Current Location" ring on the target range circle. These values will be periodically updated, at the rate selected for the *Status Update Period* (see section 3.2.3.4).
6. Move the boat until the "Surface Distance" decreases, making the "Current Location" ring shrink, and continue to move the boat until the ring is inside the "Target Area" circle.

2.2.8 Open a Resource file

Open a resource file (see section 3.4.3) to retrieve the sensor tag setups. A resource file is opened by following the steps below.

1. Select *Tag Manager* in the Tools menu (see section 3.3), or with the speed button.
2. Select Open in the File menu of the *Tag Manager* window (see section 3.3.1.2).
3. Select the desired file in the *Open* window. It may be necessary to move to a different directory, depending on where the resource file was saved.
4. Click the “Open” button or double click the file name.

When a resource file is open, the sensor tag setups contained in that file are shown in the *PC Managed Setup* half (left side) of the *Tag Manager* window.

2.2.9 Search for a Deployed VR3-UWM

If the address (ID number) of a deployed VR3-UWM receiver is unknown, the VR3HS software is capable of searching for it within the acoustic range of the underwater modem for a deployed VR3-UWM receiver. This is accomplished by following the steps listed below.

1. Setup the surface modem (see the VR3-UWM Operating manual).
2. Physically connect the surface modem to the serial port (com port) on the computer and make note of the serial port number.
3. Open the VR3HS software.
4. Select the com port number that the surface modem is connected to from the drop-down list in the bottom left corner of the software window (see picture on previous page).
5. Select “UWM” from the drop-down list to the right of the com port list (see picture below).
6. Select “Search” from the pull-down list.
7. Click the “Connect” button. A window will appear asking if the modem is to be used in high power mode (see section 3.1.1).
8. Click the “Yes” button if the surface modem is in water and click “No” if the surface modem is in air (this occurs during the in-air test, see the VR3-UWM Operating manual). **WARNING:** Always operate the surface modem in low power mode when being used in air.
9. Enter the ID number(s) of the receivers involved in the search and click the “OK” button. Multiple ID numbers can be entered by using commas or dashes. For example, entering “3, 6, 9-12, 20” will search for ID numbers 3, 6, 9, 10, 11, 12, and 20.



The software will then perform the tasks explained in the list below and will report the comments included in the quotation marks on the status line at the bottom of the software window.

- The status line at the bottom of the software window will report “Detecting UWM surface unit...” to indicate that the software is connecting with the surface modem.
- After a few seconds, the message “Sending global wakeup signal...” will appear in the status line and will continue for two minutes.
- The software then tests for the first receiver ID in the list (see Step 10) for 10 seconds and reports “Testing VR3 ID = ?,” in the status line, where the ? represents the receiver’s ID number. If this receiver doesn’t reply to the software then the software moves on to the next receiver ID in the list and tests for 10 seconds. This continues until a receiver is found or the process is aborted.
- When a receiver id is found, the software attempts a connection and the status line reports
- “Found VR3 ID = ?. Connecting (attempt #1)...”.
- When the communication connection between the surface and bottom units is made, the software requests basic receiver settings from the receiver and the status line at the bottom of the window reports “Interrogating VR3 ID= ?,...”. This takes approximately 20 seconds, after which the status line reports “Connected”.

Note: Connections will take longer in noisy or long-distance conditions.

2.2.10 Transfer the PC Managed Setup list to the Receiver Setup list

The tag information entered in the *PC Managed Setup* half of the *Tag Manager* window (see section 3.3) must be transferred to the Receiver Setup half of the window to be used with the VR3-UWM receiver. Follow the steps listed below to perform such a transfer.

1. Open the *Tag Manager* window (see section 3.3).
2. Enter the tag information by either entering it in the window (see section 3.3.2.1.1) or by opening a previously saved resource file (see section 3.3.1.2).
3. Select the desired tag in the *PC Managed Setup* list (left half of window) by clicking it once with the mouse.
TIP: To select more than one tag at once, select the first tag then hold the Control key on the computer’s keyboard while you select the other tags with the mouse arrow. Press the Shift key instead to select blocks of tags.
4. Click the right-pointing arrow located in the middle of the *Tag Manager* window. The setup for the selected tag(s) is transferred to the Receiver Setup list (right half of window) and stored for use with the VR3-UWM.

2.2.11 Use multiple computers and multiple VR3 receivers

When several computers with installations of the VR3HS software are used for the deployment of several VR3 receivers, the receiver details are recorded in VR3HSSetup.xml files on the individual computers. The steps listed below explain one method of consolidating those files and using it with all the computers.

1. Deploy the VR3 receivers using several computers with the VR3HS software installed.
2. Make a “master” computer:

- a. Copy the VR3HSSetup.xml file from each deployment computer to a single 'master' computer.
NOTE: Change the name of the file to prevent the files from being overwritten by the next VR3HSSetup.xml file. The extension must remain “.xml”.
 - b. Make a backup copy of the VR3HSSetup.xml files.
 - c. Use *Add/Remove Receivers* (see section 3.2.1.3) to import the receiver setup from the individual files into the VR3HS software on the “master” computer.
 - d. If necessary, use the VR3HS *Tag Manager* on the master computer to add sensor transmitter information (see section 3.3.2.1.1).
 - e. Save the master VR3HSSetup.xml file by exiting the VR3HS software. The master computer's VR3HSSetup.xml file now contains configurations for all the receivers and sensor transmitters in the study.
 - f. Make a backup copy of the master VR3HSSetup.xml file.
3. Copy the master VR3HSSetup.xml file to all computers that will be used for log retrieval.
 4. NOTE: Overwrite the individual VR3HSSetup.xml files on each computer with the master VR3HSSetup.xml file.
 5. Repeat Steps 2 and 3 after each log retrieval operation to consolidate the updated status of all receivers.

2.2.12 View a data file within VR3HS software

A data file is viewed in the VR3HS software by following the steps listed below (see section 3.2.1.2).

1. Select Display Logs (see section 3.2.1.2) in the File menu.
2. Select the desired data file from the list shown in the *Open* window. The *Open* window will automatically list all log files located in the directory selected in *Choose Directory* (see section 3.2.1.1). If the data file is in another directory, then move to that directory within the *Open* window.
3. Click the “Open” button in the bottom right corner of the window.

The data file is displayed in the Log Viewer window as shown in section 3.2.1.2. No changes can be made to the data file from within the VR3HS software.

NOTE: Data files can also be viewed with a text editor or be imported into a spreadsheet program allowing comma delimited files.

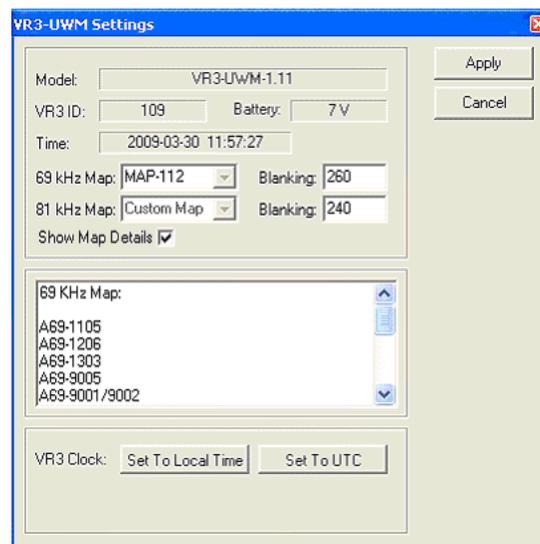
2.2.13 Update the Coded Map

To update your VR3 receiver to the new coded map, follow the instructions below.

NOTE: The user must be in Administrator mode to modify a map.

1. Establish communication between the VR3 receiver and VR3HS program (see section 3.1).
Reminder: Choose the Low Power mode if you're communicating using surface modem in air.
2. Select *VR3 Settings* from the *VR3* menu. The VR3HS software uploads the current settings from the VR3 receiver, which will take some time. The *VR3-UWM Settings* window opens after the VR3 settings have been uploaded.

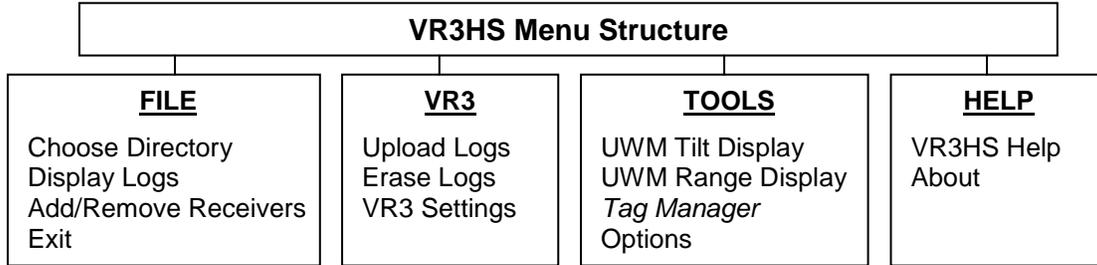
3. Click the box next to "Show Map Details" and the information identifying which map is currently loaded in the VR3 will appear in a section of the window. If this is not the desired map, then continue with this procedure as listed below.
4. To select a different map, choose the correct map in the Map drop-down list.
5. Click the "Apply" button in the *VR3 Settings* window. The *Erase Logs* window will appear (see section 3.2.2.2). Click the "Yes" box (check mark appears) and then "OK" to erase the log. The changes will then be made to the settings. If the log is not erased, then the changes to the settings will not take affect.



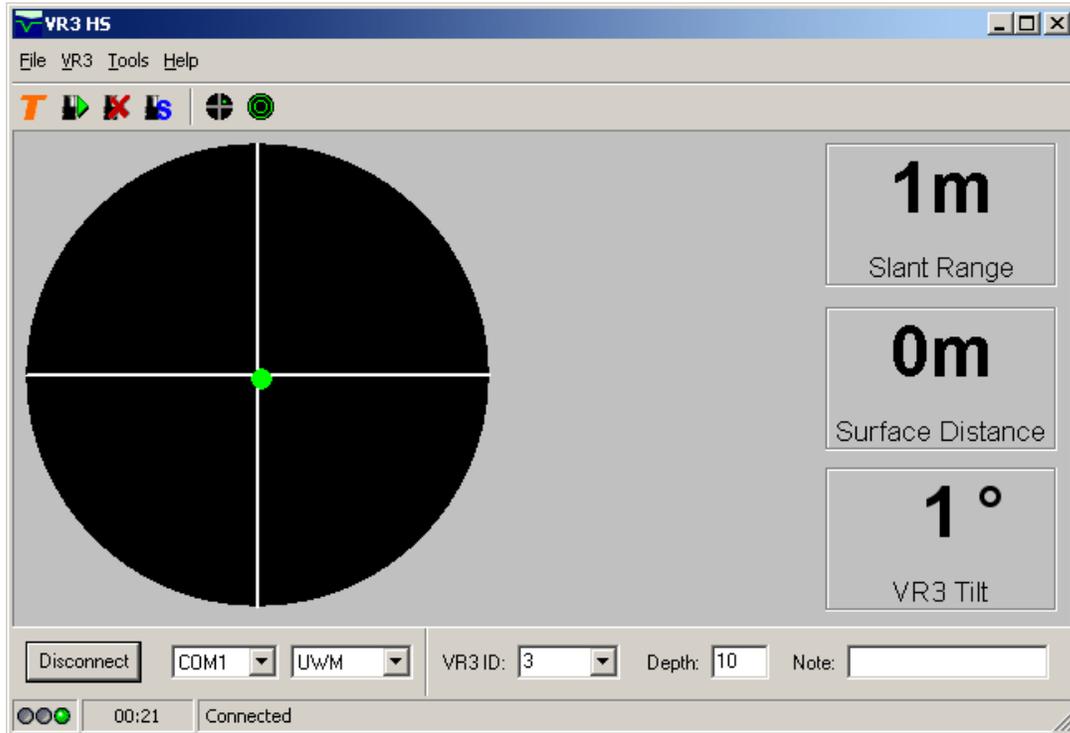
After the log is erased, the *VR3 Settings Upload* window reports "Storing VR3 settings" and the approximate time remaining in the process. When the *VR3 Settings Upload* window closes, the new coded map is active in the VR3 receiver.

3 SOFTWARE

This section of the manual explains the VR3HS software by section. The Application section of this manual explains the software by tasks. The software has four menu selections: File menu, VR3 menu, Tools menu, and Help menu. Detail about each of these menus is found in section 3.2.



This software is used with both the VR3-UWM and the VR3-Argos receivers. Most functions are similar for both receivers and will be described together. One significant difference is that the VR3-UWM has two methods of communication with the VR3HS software (through the underwater modem or through the service port) and the VR3-Argos has only one (through the service port).



3.1 COMMUNICATION

Communication between a VR3 receiver and the VR3HS software occurs through the service port. The VR3-UWM receiver can also communicate with the VR3HS software through the underwater modem, which can occur when the receiver is in air or water. Communication through the service port can only occur when the receiver is in air.

The connection status lights, located in the bottom left corner of the software window, indicate the status of communication between the software and the VR3, regardless of the method of communication (underwater modem or service port). When the software is not in communication with the receiver, and is not attempting to be in communication, the red connection status light on the far left is lit.

During attempts by the software to establish, or re-establish, communication with the receiver, the yellow connection status light flashes. When communication is established, the green connection status light on the far right flashes. For illustration purposes, all three lights are shown here, although only one light can be seen at a time in the software.



The Update Timer, immediately to the right of the connection status lights, indicates the length of time (in minutes and seconds) since the last successful VR3 status update. A status update consists of the VR3 tilt angle and the slant range measurement, and occurs approximately at the rate selected in the *Options* window (see section 3.2.3.4). When the time between status updates has been too long, the software will automatically attempt to acoustically re-connect with the VR3-UWM. The software will continue to attempt to re-connect until the “Abort” button is clicked.

The status line, to the right of the Update Timer, reports the status of the communication between the software and the receiver. For example, the status line reports the attempt number when communication is being attempted, and reports “Connected” when the attempt is successful.

3.1.1 Using the Underwater Modem

When the underwater modem is used for communication with the VR3-UWM, the steps below must be followed:

1. Setup the surface modem (see the VR3-UWM Operating manual).
2. Physically connect the surface modem to the serial port (com port) on the computer and make note of the serial port number.
3. Open the VR3HS software.
4. Select the com port number from the drop-down list in the bottom left corner of the software window (see picture in section 3.1.1).
5. Select “UWM” from the drop-down list to the right of the com port list (see picture in section 3.1.1).
6. Select the receiver ID number from the pull-down list. If the receiver has never been physically connected to this computer, the ID number will need to be entered in the box using the computer keyboard.
7. Enter the depth (in meters) at which the VR3-UWM will be deployed. This is necessary to identify the correct surface range to the VR3-UWM receiver (see section 3.2.3.2), however is it not required for communication.
8. Add any notes as desired. This information will be stored in the log and seen in the data file (see section 3.4.1).
9. Click the “Connect” button. A window will appear asking if the modem is to be used in high power mode (see section 3.1.1).

10. Click the “Yes” button if the surface modem is in water and click “No” if the surface modem is in air (this occurs during the in-air test; details are in the VR3-UWM Operating manual).

The software will then perform the tasks explained in the list below and will report the comments included in the quotation marks on the status line at the bottom of the software window.

WARNING
Always operate the surface modem in **low power** mode when used *in air*.

- The status line at the bottom of the software window will report “Detecting UWM surface unit...” to indicate that the software is connecting with the surface modem.
- After a few seconds, the message “Connecting (attempt #1)...” appears in the status line for 10 seconds while the surface unit checks to see if the bottom modem (on the receiver) is ready to receive. If it isn’t ready, then the surface unit sends a “wake up” command for two minutes and the status line reports “Sending wakeup signal...”.
- The surface unit then makes a second attempt to connect with the receiver’s modem and the status line reports “Connecting (attempt #2)...”. The process of sending wake up messages and attempting to connect continues until connection is made with the receiver or the attempt is manually aborted.
- When the communication connection between the surface and bottom units is made, the software requests basic receiver settings from the receiver and the status line at the bottom of the window reports “Interrogating VR3 ID= ?,...”, where the ? represents the ID number. This takes approximately 20 seconds, after which the status line reports “Connected”.

Note: Connections will take longer in noisy or long-distance conditions.

3.1.2 Using the Service Port

The VR3HS software can connect directly to the VR3 service port on both the VR3-UWM and the VR3-Argos. Although the location of the service port is different on the two receiver types (see the respective operating manuals), how the VR3HS software connects is the same.

To communicate with a VR3 through the service port, follow the steps below:

1. Physically connect the computer’s serial port to the service port on the receiver and make note of the serial port number (needed for step 4).
2. Power the receiver by connecting the battery to the receiver (see the Operating manual). The battery doesn’t have to be inside the receiver case for communication in air.
3. Open the VR3HS software.
4. Select the com port number from the drop-down list in the bottom left corner of the software window (see picture below).
5. Select “Service Port” from the drop-down list to the right of the com port list (see picture below).
6. Click the “Connect” button.

When the connection is made, the green communication light will be seen in the bottom left corner of the window (see section 3.1). When the VR3-Argos receiver is connected, the message “VR3-ARGOS Connected” will appear in the middle of the window.



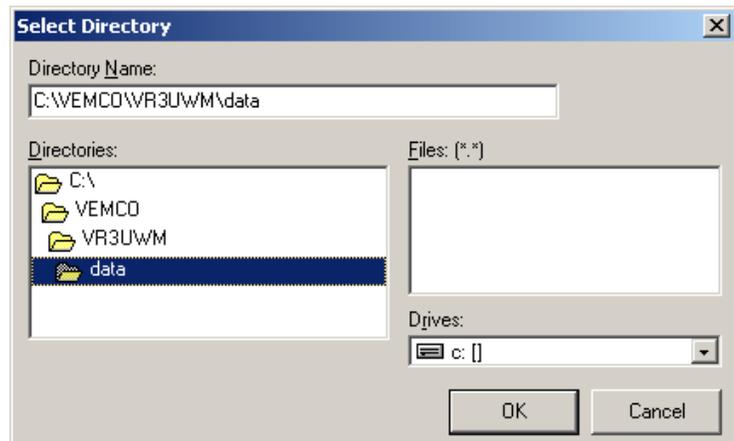
3.2 MENU SELECTIONS

3.2.1 File menu

3.2.1.1 Choose Directory

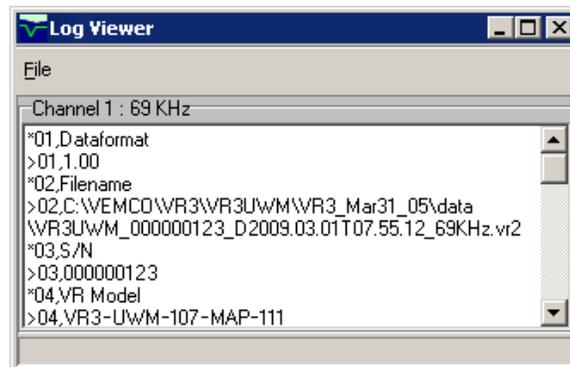
All information uploaded from the VR3 receiver through the VR3HS software will be stored in the directory selected using Choose directory. Selecting Choose directory will open the Select Directory window shown below. Select the drive from the list in the “Drives” box and the desired directory in the “Directories” box. The directory listed in the “Directory Name” box at the top of the window will be used as the data directory.

TIP: A new directory can be created within the selected directory by typing a back-slash (\) at the end of the directory location and adding the name of the new directory.



3.2.1.2 Display Logs

Select Display Logs in the File menu to reveal the *Open* window and allow the selection of a data file (see section 3.4.1). Once the desired data file has been selected, click the Open button to view the file. The selected file will open in the Log Viewer, shown below. Data files cannot be altered when viewed within the VR3HS software.



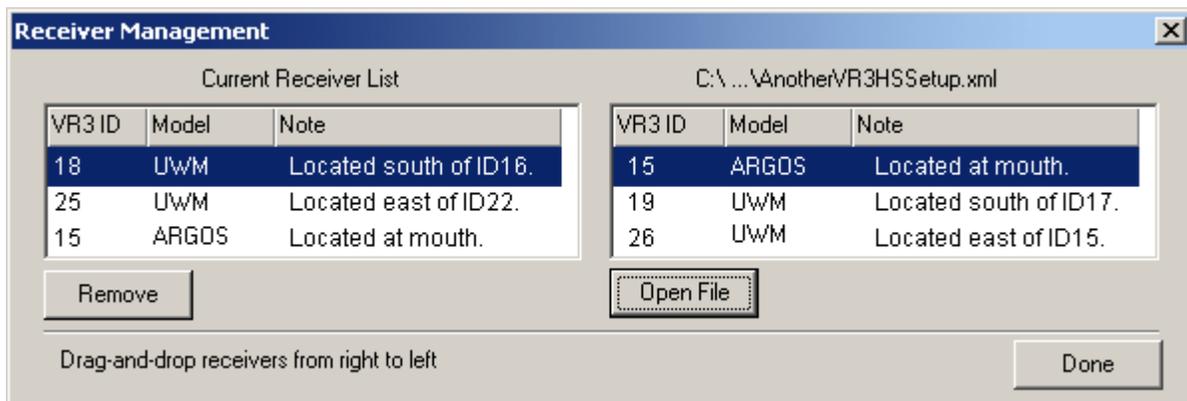
The Display Logs command is repeated in the File menu of the Log Viewer window to allow a different log file to be opened from within the Log Viewer window without having to close the window.

3.2.1.3 Add/Remove Receivers

The *Add/Remove Receivers* feature of the software is used with multiple VR3 receivers and multiple computers. If only one computer is being used to communicate with the VR3 receivers, then this feature is not needed.

The VR3HS software automatically stores all its settings in the VR3HSSetup.xml file (see section 3.4.4). The receiver configurations from this file can be imported into another VR3HSSetup.xml file on another computer by following the steps listed below.

1. Copy the VR3HSSetup.xml file containing the desired receiver configuration(s) to a temporary directory on the new computer. NOTE: Copying the file directly to the same folder as the software will overwrite the setup file on the new computer.
2. Run the VR3HS software on the new computer.
3. Select *Add/Remove Receivers* to open the Receiver Management window (see below).
4. Click the “Open File” button. The *Open* window will appear.
5. Locate the VR3HSSetup.xml file from Step 1 and open it (click the “Open” button). The receiver ID numbers and related notes will be listed in the right half of the Receiver Management window. The name of the file is shown above the list of receivers.
6. Use the left mouse button to click on the desired receiver ID number and drag it to the “Current Receiver List” half of the window. Release the mouse button when the mouse arrow is over the left half of the window. The receiver ID number and notes are now listed in the “Current Receiver List”. The receiver ID 15 was imported in the sample window below.
7. Click the “Done” button when all the desired receiver configurations have been imported.



3.2.1.4 Exit

This *Exit* command closes the VR3HS software. This is the same as clicking the X in the top right corner of the window.

3.2.2 VR3 menu

3.2.2.1 Upload Logs

When the *Upload Logs* command is selected, the software will request a report from the VR3 receiver before uploading the data. The report contains the percentage of memory used and the percentage of memory that was last uploaded. It also contains the time the last detection was received, and the number of detections, pings, and syncs for each frequency. The *VR3 Upload* window below contains a sample upload report.

A step-by-step instruction for loading data from a VR3-UWM is given in section 2.2.6).

The log can be uploaded entirely (everything in memory) or partially (everything stored since the last upload). The selection is made near the bottom left corner of the VR3 Upload window (see below). Click the “Upload entire log” radio button to load everything in the receiver’s memory. If you just want the new entries since the last upload, then click the “Upload new entries” radio. The amount of memory involved for both the entire log and the new entries is given to the right of the selections (see the sample window below). The estimated time required to upload the data based on the amount of memory being loaded is also given at the bottom of the window.

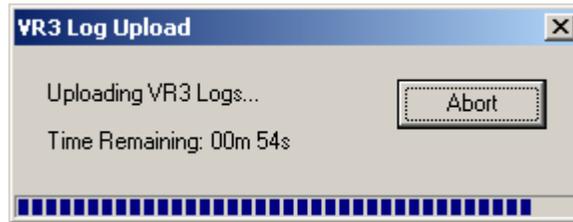
When the *Upload Logs* command is given, the VR3 receiver’s memory is uploaded to the computer, stored in a log file (see section 3.4.2), and converted to data files (see section 3.4.1).

	69 KHz	81 KHz
Last Detect:	2005-06-03 15:37	2005-05-19 10:05
Detections:	195739	20494
Pings:	1379329	172295
Syncs:	197721	22038

Data compression is available during an upload for the VR3-UWM receiver. **Always leave this enabled.** For the VR3-Argos receiver, save-by-exception data is only available through the Argos download (see the VR3-Argos Operation manual for more information).

After the “Upload” button is selected, the *VR3 Log Upload* window (shown on next page) will appear to report on the progress of the upload and to allow the upload process to be aborted. The bar graph at the bottom of the window is a visual representation of the amount of the memory that has been loaded. The colour of the bar indicates the rate at which the memory is transferred: blue indicates a conservative transfer rate, orange indicates an aggressive transfer rate, and red indicates very aggressive transfer rate. The

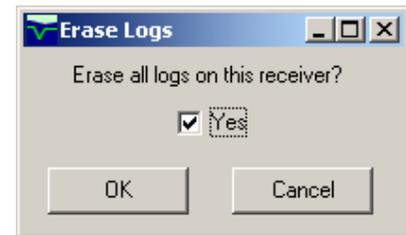
transfer rate changes as needed based on the acoustic conditions. When the VR3 is connected directly to the computer through the service port, the bar graph will be blue.



If communication is lost during an upload, the upload will continue where it left off as soon as communication is re-established. Nothing needs to be done to resume the upload processes. If an upload is aborted before all the log has been uploaded, the option is presented to save the part of the log that was uploaded. If the partial log is saved, using the "Upload new" command with the next upload will retrieve the remains of the log.

3.2.2.2 Erase Logs

Data stored in the VR3 receiver can be erased using the *Erase Logs* command. When the command is selected, the *Erase Logs* window, shown here, appears to verify that the data should be erased. The "Yes" box must contain a check mark (as shown) when the OK button is clicked or the data won't be erased. This protects the data from being accidentally erased.



NOTE: *Erase Logs* is only available in the Administrator mode (see section 3.2.4.2).

3.2.2.3 VR3 Settings...

3.2.2.3.1 VR3-UWM Settings

NOTE: The user must be in Administrator mode to modify a map.

When the *VR3-UWM Settings* command is selected, the software requests the status of the VR3-UWM. The information displayed in the *VR3-UWM Settings* window, shown below, includes the model number, ID number, battery voltage, and time from the receiver. **NOTE:** The *Erase Logs* window appears (see section 3.2.2.2) after the “Apply” button is selected to erase the log before the changes are made to the settings. If the log is not erased, then the changes to the receiver’s settings will not take affect.

The *VR3-UWM Settings* window also allows the Coded Map to be modified and the VR3-UWM clock to be set to either local time or UTC.

The VR3-UWM receiver’s **Coded Map setup** allows the receiver to correctly identify coded tags from the acoustic pings received. This setup is only changed on direction from VEMCO and with a new setup file.

To update your VR3 receiver to the new coded map, follow the instructions below.

1. Establish communication between the VR3 receiver and VR3HS program (see section 3.1).

Reminder: Choose the Low Power mode if you’re communicating using surface modem in air.

2. Select *VR3 Settings* from the *VR3* menu. The VR3HS software uploads the current settings from the VR3 receiver, which will take some time. The *VR3-UWM Settings* window opens after the VR3 settings have been uploaded.

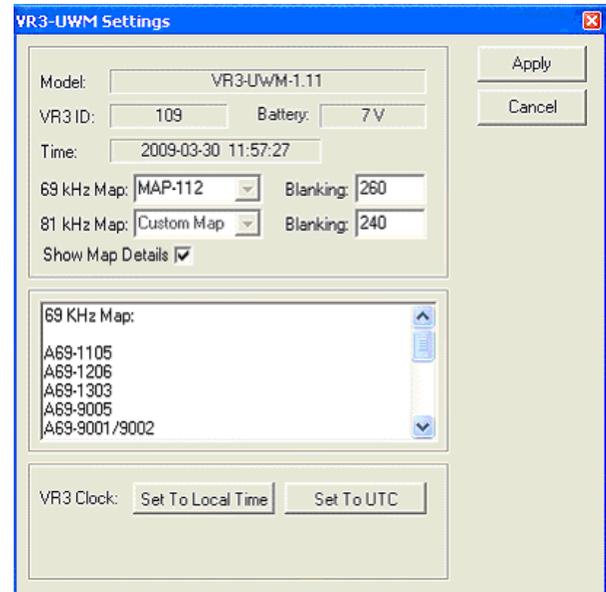
3. Click the box next to “Show Map Details” and the information identifying which map is currently loaded in the VR3 will appear in a section of the window. If this is not the desired map, then continue with this procedure as listed below.

4. To select a different map, choose the correct map in the Map drop-down list.

5. Click the “Apply” button in the *VR3 Settings* window. The *Erase Logs* window will appear (see section 3.2.2.2). Click the “Yes” box (check mark appears) and then “OK” to erase the log. The changes will then be made to the settings. If the log is not erased, then the changes to the settings will not take affect.

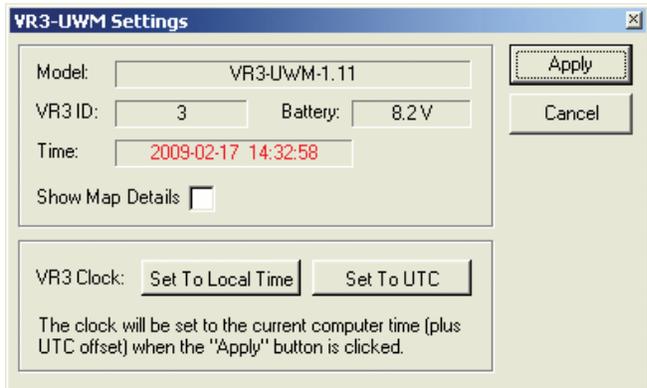
The *Erase Logs* window appears after the “Apply” button is selected to erase the log before changes are made to the receiver’s settings.

After the log is erased, the *VR3 Settings Upload* window reports “Storing VR3 settings” and the approximate time remaining in the process. When the *VR3 Settings Upload* window closes, the new coded map is active in the VR3 receiver.



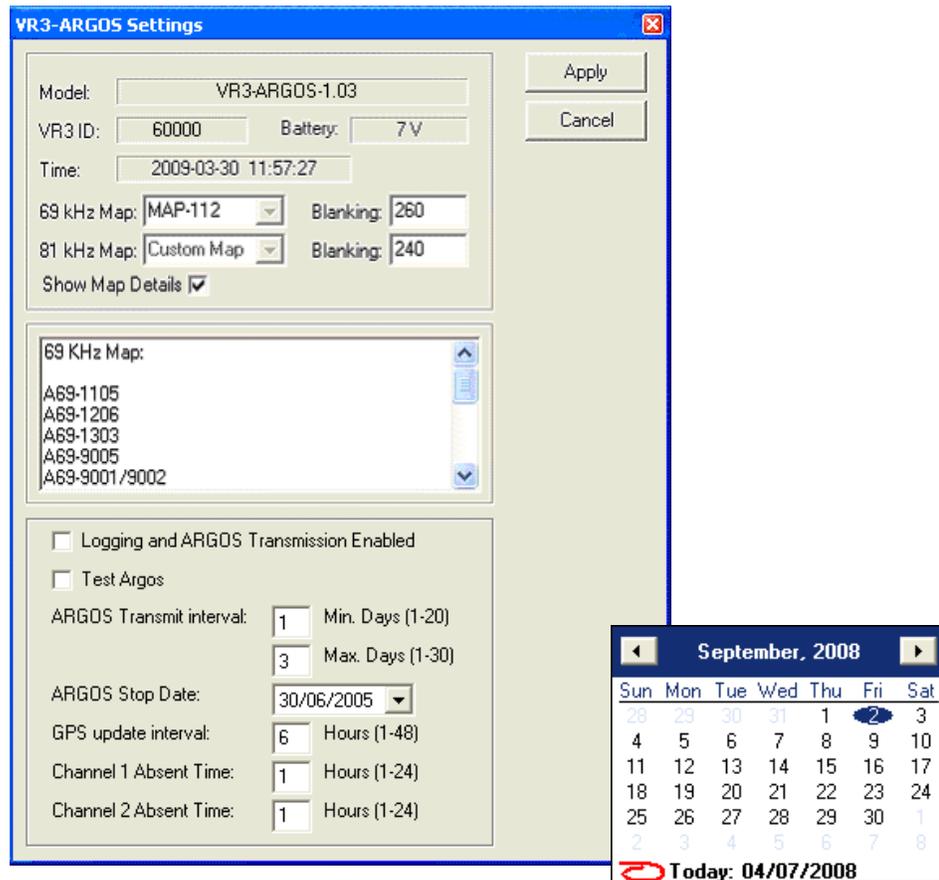
The VR3-UWM receiver's **internal time** can be set to correspond with the local time (computer's clock) or to UTC time (the computer's clock with the appropriate offset). This is done by first clicking the desired "Set To" button, either the "Set To Local Time" button or the "Set To UTC" button. The date and time in the "Time" box will change to show what the time will become. The colour of the text will also change to red (see sample window below). The change isn't made in the receiver until the "Apply" button in the top right corner of the window is clicked and the log is erased (click "Yes" and OK).

If a "Set to" button has been clicked but the date/time isn't what you want, then click the "Cancel" button the exit the *VR3-UWM Settings* window without making any changes to the receiver's settings.



3.2.2.3.2 VR3-Argos Settings

When the *VR3-ARGOS Settings* command is selected, the software requests the status of the VR3-Argos receiver. The information displayed in the *VR3-Argos Settings* window, shown below, includes the model number, ID number, battery voltage, and time from the receiver.



The VR3-UWM receiver's Coded Map setup allows the receiver to correctly identify coded tags from the acoustic pings received. This setup is only changed on direction from VEMCO and with a new setup file. Follow the steps listed below to change the coded map of the receiver.

1. Establish communication between the VR3 receiver and VR3HS program (see section 3.1).
Reminder: Choose the Low Power mode if you're communicating using surface modem in air.
2. Select *VR3 Settings* from the *VR3* menu. The VR3HS software uploads the current settings from the VR3 receiver, which will take some time. The *VR3-UWM Settings* window opens after the VR3 settings have been uploaded.
3. Click the box next to "Show Map Details" and the information identifying which map is currently loaded in the VR3 will appear in a section of the window. If this is not the same as the new map, then continue with the procedure listed below.
4. To select a different map, choose the correct map in the Map drop-down list. If you need to change the time format of the VR3 clock you must do it in this window.
5. Select "Apply" to program the VR3 with the selected map. The data in the VR3 must be erased before the receiver is programmed. The window below appears to confirm the erasing of the files. Click a checkmark in the "Yes" box and then click the OK button to proceed with the programming of the VR3-Argos.

NOTE: *VR3-Argos Settings* can only be applied (sent to the receiver) while in the Administrator mode (see section 3.2.4.2).

Logging and ARGOS Transmission Enabled

When the Logging and ARGOS Transmission Enabled box contains a check mark, the VR3-Argos will log data and will transmit it to the Argos system when enough data is present for transmission (see "Argos Transmit Interval" below). This must be selected before the VR3-Argos is deployed.

NOTE: If you want to log data without transmitting it to the Argos system, set the "Argos Stop Date" to the current date.

Test Argos

The "Test Argos" box, when selected, starts Argos transmissions for testing purposes, regardless of the programmed schedule.

It takes a few minutes before the first transmission takes place. Transmissions will continue until the end of the current UTC day, stopping a few minutes before midnight UTC. Once the VR3-Argos stops the test transmissions, it reverts to the previously programmed schedule. The test transmissions can be stopped at any time by deactivating the unit (leave it deactivated for at least one repetition period to ensure it actually turns off).

Argos Transmit Interval

The Argos Transmit Interval is the minimum and maximum number of days between Argos transmissions.

The minimum number of days limits data cost. For example, a setting of 1 allows Argos transmissions every day, if necessary. A setting of 2 limits Argos transmissions to every second day, and so on. If cost is not critical, set minimum to 1.

The maximum number of days ensures you receive a transmission every so often. For example, setting the maximum to 5 will cause the unit to transmit at least every 5 days, even if there is not enough data to warrant it.

Within the minimum and maximum limits, the VR3-Argos will only transmit as often as necessary to transfer the accumulated data.

Argos Stop Date

The Argos Stop Date is the date when the unit will stop sending Argos transmissions. The purpose of this function is to accommodate studies where funding for the Argos data service is no longer available after a certain date. The VR3-Argos will continue to collect and store data internally after the date has elapsed, but it will no longer transmit.

Clicking the down-arrow next to the date will open the calendar (see previous page) to allow the desired stop date to be selected. Using the two arrows in the top corners of the calendar will move the calendar from month to month.

GPS Update Interval

The GPS Update Interval is the desired time interval between GPS updates. Each time a GPS update is performed, the internal clock is resynchronized to GPS time, and the location is stored as a data record.

A setting of 12 to 24 hours is recommended. A short time will provide more frequent GPS location records but has no significant impact on timing (the VR3-Argos can go many days without an update and still maintain adequate time synchronization). The additional location records will occupy space in the Argos data transmissions, so you should not set the interval shorter than necessary.

The VR3-Argos has a weekly GPS "power budget" to limit power consumption. If you update too frequently (depends on how long the updates take to detect satellites), the budget may be used up and the GPS will not be used at all for the rest of the week.

Absent Time

The Absent Time controls the data compression algorithm. When a given tag is first detected, a new data record is opened. As long as the VR3-Argos continues to detect that tag, the record remains open (up to a limit). If the tag is not detected for more than the Absent Time, the VR3-Argos assumes that tag has left the area, closes the data record, and stores it. A longer Absent Time results in less data records being generated, but brief absences are ignored.

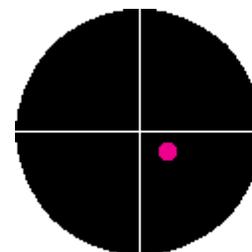
The VR3-Argos will automatically close records that have been open for more than a predetermined period, or when it is necessary for internal reasons.

3.2.3 Tools Menu

3.2.3.1 UWM Tilt Display (VR3-UWM only)

The VR3-UWM must be deployed vertically with the bottom transducer pointing up so the bottom underwater modem can communicate with the surface modem. To ensure the VR3-UWM is deployed in the correct position, the vertical angle of the receiver is displayed on the computer screen. The deployment process is listed below with the deployment screen.

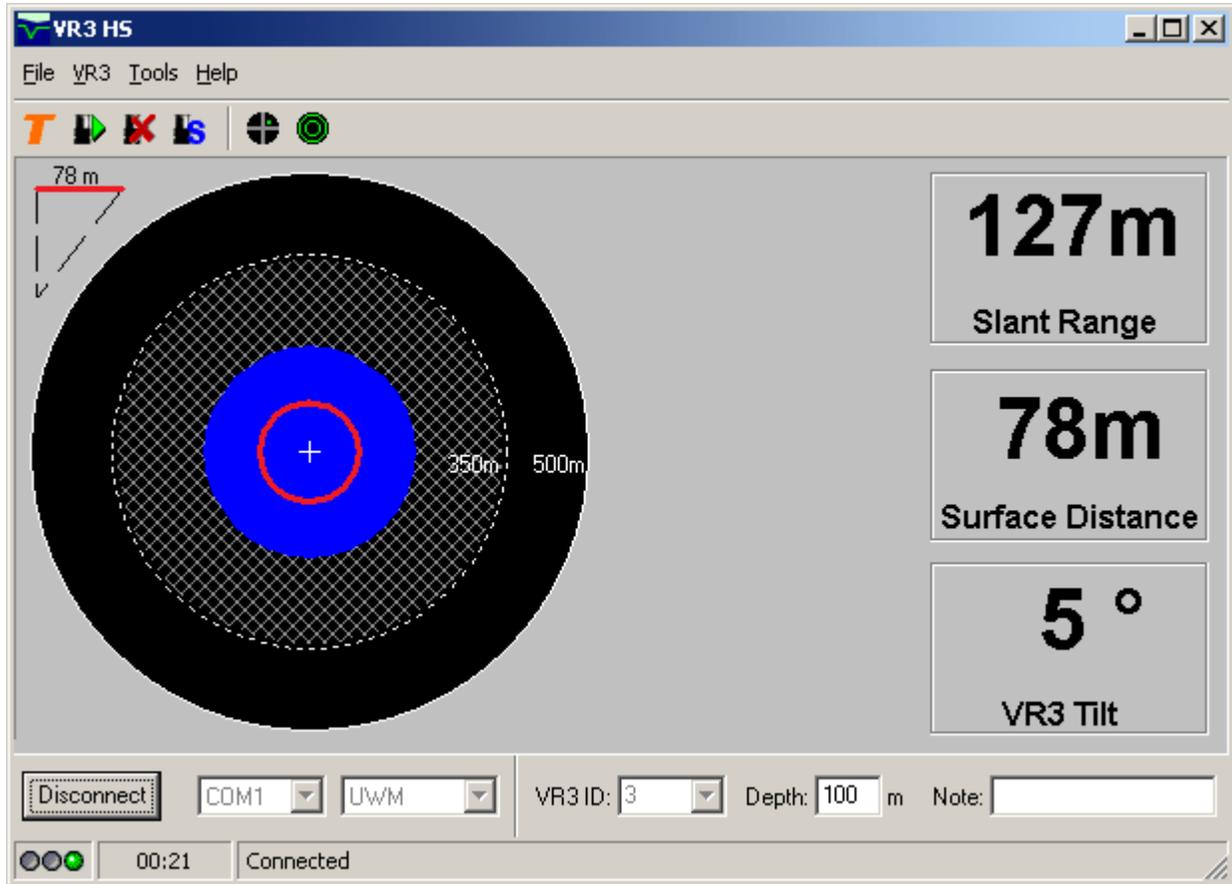
1. Physically connect the surface modem to the computer running the VR3HS software.
2. Suspend the VR3-UWM from ropes so it hangs vertically with the transducer pointing up.
3. Select the VR3 ID number from the list of receivers at the bottom of the software window. If the correct receiver number is not in the pull-down list, highlight an ID number in the box, enter the number on the computer keyboard, and press Enter.
4. Click the “Connect” button in the bottom left corner of the software window. The surface modem will then attempt to wake up the receiver, request its status and will numerically report the slant range, surface distance, and receiver’s tilt angle on the right side of the window. These values will be periodically updated, at the rate selected for the *Status Update Period* (see section 3.2.3.4).
5. Select the *UWM Tilt Display* command from either the speed buttons or from the Tools menu. The software window will display the circular level display as shown here.
6. Verify that the dot (shown here as magenta) is in the center of the circle or very close to it. The center of the circle represents the vertical. Movement of the dot indicates the receiver is now at an angle and gives the general direction in which the receiver has tipped.
7. Deploy the VR3-UWM receiver (see the VR3-UWM Operating manual).
8. Watch the location of the dot in of the receiver in the software as the receiver is lowered through the water to make sure it remains in the center of the circle. If the dot has moved drastically, then reposition the receiver until it is in the center again. This is important for communication with the receiver.
9. Place the receiver in its moored location so the dot is in the center of the circle. If the angle is too great, then reposition the receiver so the angle decreases. This is very important for modem communication.



3.2.3.2 UWM Range Display (VR3-UWM only)

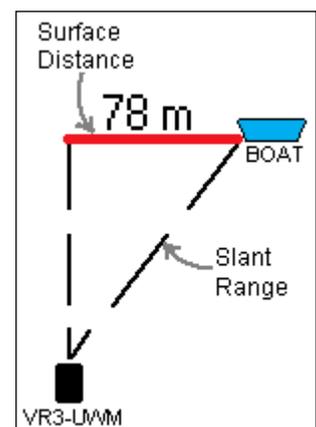
The *UWM Range Display* feature is used to locate a deployed VR3-UWM receiver, and help stay within communications range while performing VR3 operations. When the feature is selected, the software window changes to show a target range circle on the left side of the window (see below). The location of the VR3-UWM is in the center of the target circle and marked by the small cross-hair.

The “Target Area”, which is blue in the picture below, represents the area in which the surface modem needs to be for communication with the VR3-UWM to be optimal (the colours are selected in *Options* - see section 3.2.3.4).



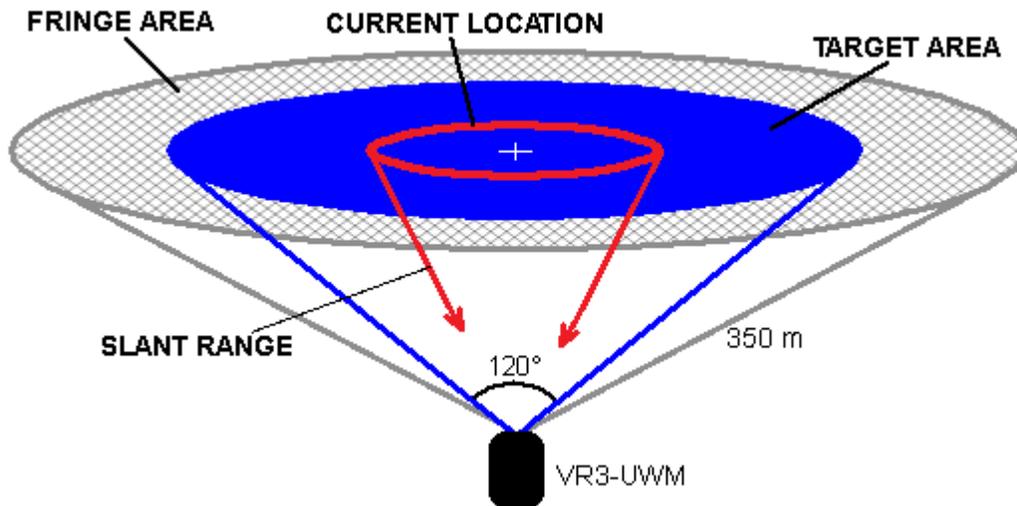
The surface distance of the surface modem from the receiver is represented by the ring in the same colour as that selected for “Current Location” in the *Options* window. In the window below, this is the red ring. The numeric version of this distance is shown in the “Surface Distance” box in the right side of the window. It’s also shown in the triangle to the top-left of the target range circle (see sketch to right). For reliable communication with the bottom modem on the VR3-UWM, the “Current Location” circle must be inside the “Target Area” circle.

Two “Current Location” rings of the same colour are displayed in the target circle when the surface distance changes rapidly between two consecutive measurements. The wider ring reflects the most recent range measurement and the narrow ring shows a previous measurement. This is intended to help determine whether the boat is moving towards or away from the VR3-UWM.



The circle filled with the grid is the “Fringe Area” (the colour in the *Options* window and shown here is grey), and is a representation of the surface distance that matches the maximum range (350m) of the under water modem. The “Fringe Area” will be close to 350 meters when the VR3-UWM is deployed in shallow water and much smaller when the receiver is deployed in deep water.

A three dimensional representation of the finding process is shown in the picture below. The colours in this picture match the colours in the software picture on the previous page.



NOTE: If *UWM Range Display* is selected when the receiver is connected through the service port, a large grey circle will appear instead of the target display announcing that the feature is only available with the modem. Change the setting at the bottom of the window to “UWM”.

The *UWM Range Display* feature is helpful to keep the surface modem as close as possible to the receiver while data is being uploaded (see section 3.2.2.1) from the VR3 to the computer.

3.2.3.2.1 Find Deployed VR3-UWM

To locate a deployed VR3-UWM, following the steps listed below.

1. Move to the general area the VR3-UWM is known to be in. This size of this general area depends on the acoustic conditions and the depth at which the receiver was deployed.
2. Deploy the surface modem, if not already deployed.
3. Select the *UWM Range Display* command from either the speed buttons or from the Tools menu. The left side of the software window will change to a target range circle, as shown above.
4. Select the VR3 ID number from the list of receivers. If the correct receiver number is not in the pull-down list, highlight an ID number in the box, enter the number on the computer keyboard, and press Enter.
5. Click the “Connect” button in the bottom left corner of the software window. The surface modem will then attempt to wake up the receiver, request its status and will numerically report the slant range,

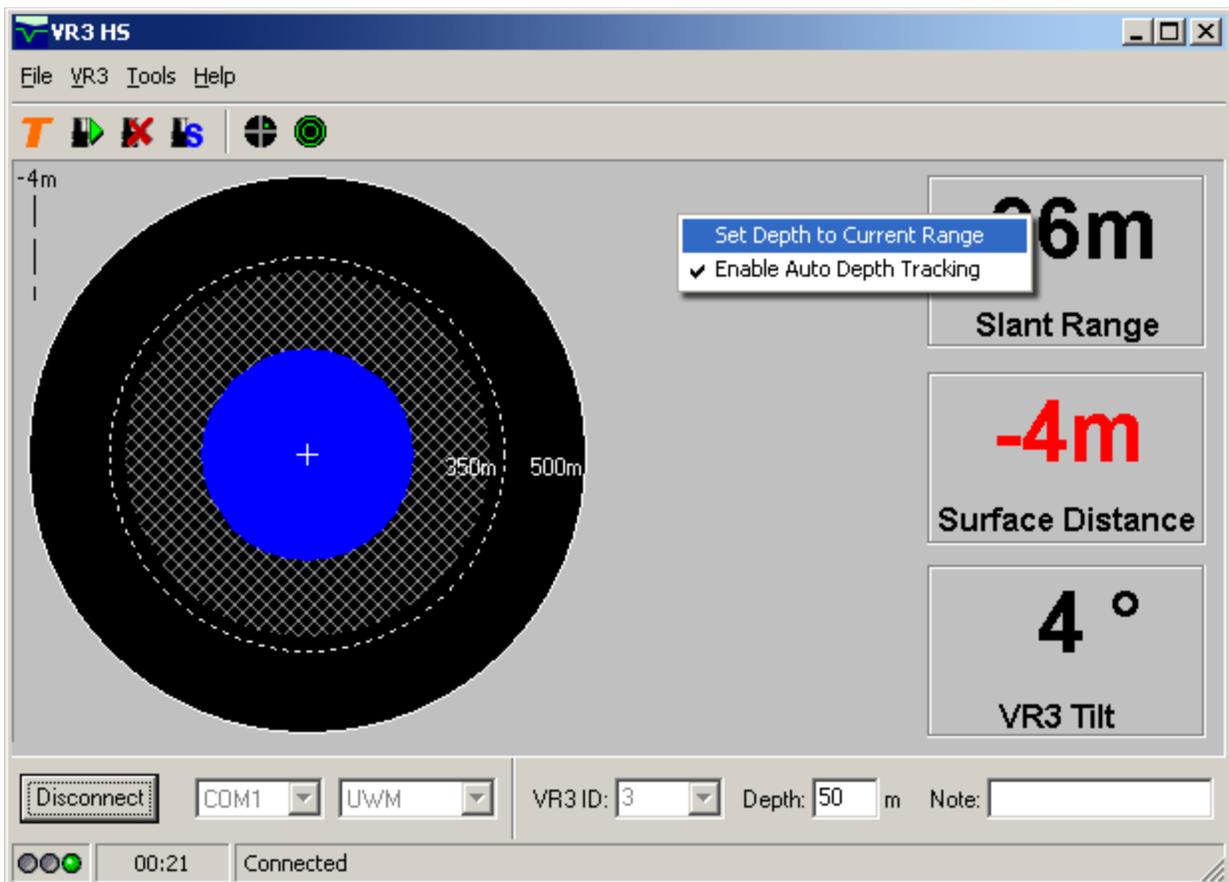
surface distance, and receiver's tilt angle on the right side of the window. These values will be periodically updated, at the rate selected for the *Status Update Period* (see section 3.2.3.4).

6. Move the boat until the "Surface Distance" decreases, making the "Current Location" ring shrink, and continue to move the boat until the ring is inside the "Target Area" circle.

3.2.3.2.2 Negative Surface Range

A negative surface range shown in the UWM Range display indicates that depth value for this receiver is greater than the current slant range. This means that the depth value entered for this receiver is incorrect, or the ship is sinking. Since it's unlikely that the ship is sinking, the depth value needs to be changed. This can be done in one of three ways:

1. Manually enter a larger value in the "Depth" box at the bottom of the window.
2. Right-click on the "Slant Range" value on the right side of the window (actually, anywhere in the box surrounding the value) and select "Set Depth to Current Range" from the list that appears (see picture below). This will change the depth value to match the slant range.
3. Right-click on the "Slant Range" value on the right side of the window (actually, anywhere in the box surrounding the value) and select "Enable Auto Depth Tracking" (see picture below). This will automatically change the depth value to match the Slant Range value whenever it becomes less than the current setting. This auto tracking is useful if you don't know the depth at which your receiver was deployed. As you move closer and closer to a position directly above the receiver, the depth will follow the slant range down to the minimum measurement. Auto depth tracking is disabled by default and it will be disabled again after you disconnect from a receiver.

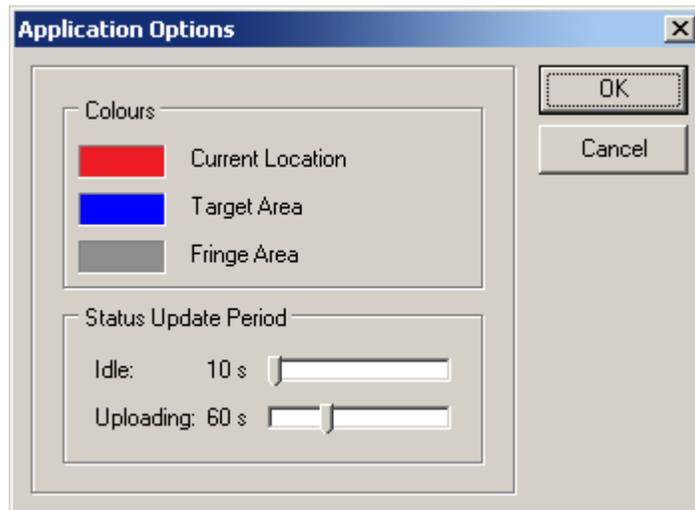


3.2.3.3 Tag Manager

The *Tag Manager* window allows sensor tag information to be entered or edited and stored for data uploads. A group of sensor tags can be saved as a setup file and opened at a future time. The *Tag Manager* window is explained in detail in section 3.3.

3.2.3.4 Options...

The options that can be set in the *Options* window, shown here, are the colours used with the *UWM Range Display* feature (see section 3.2.3.2) and times for the status update period. The status update period is the length of time between status updates from the receiver. There are two time settings, one for when the modem is idle (Idle) and the other for when the modem is uploading a log file (Upload). These times can be changed at any time, even while the modem is busy. The time settings have no effect when the receiver is connected through the service port.



3.2.4 Help menu

The Help menu contains the sub-menus described below for your assistance.

3.2.4.1 VR3HS Help

The Content and Index command opens the Help Topics window to allow access to help information. The Help Topics window contains the tabs Contents, Index, and Find which are explained below.

Contents

To select a general topic for overall help, use the Contents feature. Open a topic by double clicking on the book symbol next to the name, or on the name itself. A list of sub-topics will appear to choose from. Double clicking on one of these sub-topics will open the help topics related to that general topic.

Index

To select a specific topic, use the Index feature, which will display the complete list of topics in the help file. To select a topic, either move through the list (using the arrow keys or the scroll bar) until the desired topic is highlighted, or type the name in the box at the top of the window. As the name is entered, the list will reflect the letter being entered. For example, if the letter “t” is entered, the list will alter so the “t” section is shown. Once the topic is highlighted, either select Display at the bottom of the window, or double click on the topic name.

Find

To search for a specific word within a topic use the Find feature. A word list must be created if Find has not been previously used. Simply follow the on-screen instructions to setup Find. If Find is not desired, select Cancel. A list of topics containing the desired word is listed in the third box from the top. Select a topic and click the Display button at the bottom of the window.

3.2.4.2 About

Information about the VR3HS software is shown in the About window. This information includes software version number.

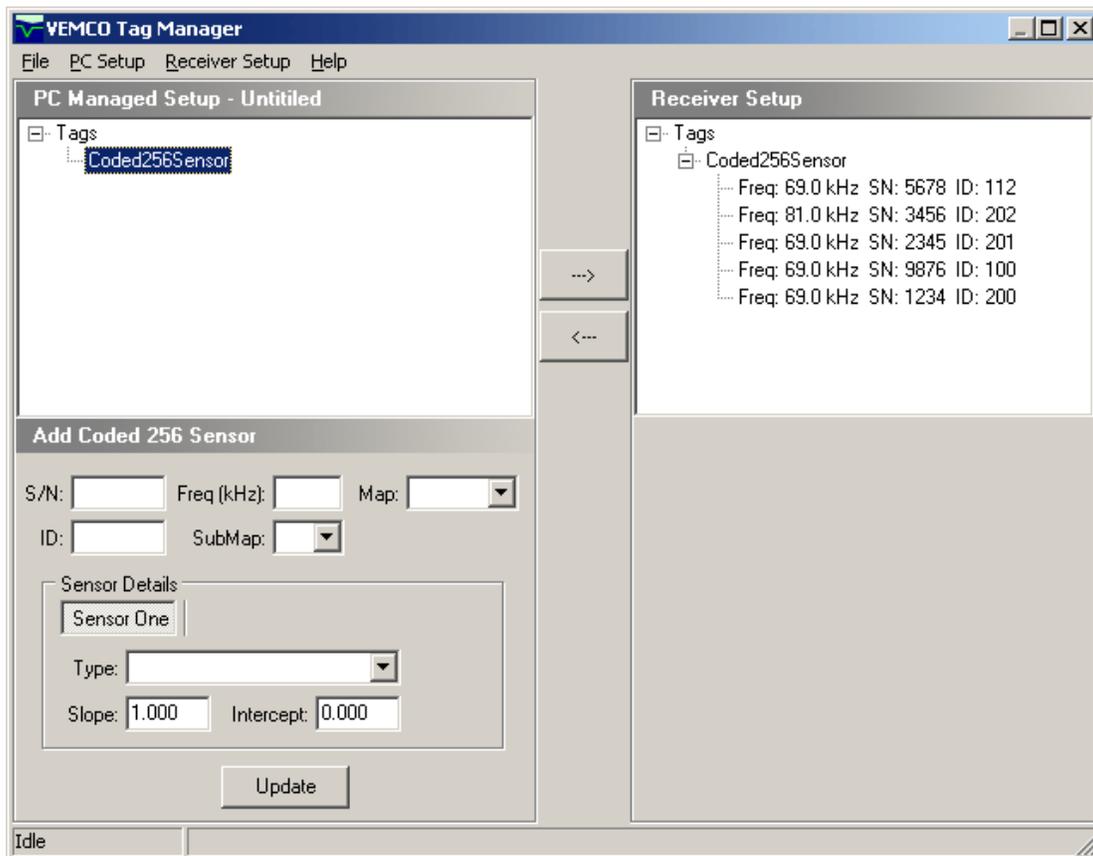
A special sequence of keystrokes while the About window is open will put the software in Administrator mode. The title bar at the top of the About window will indicate when Administrator mode is activated.

3.3 TAG MANAGER

The *Tag Manager* window is the place to enter or edit sensor transmitter information. Only tags with sensors need to be entered in this section. Pingers (non sensor tags) do not need to be entered in the TAG MANAGER section. *Tag Manager* is opened in the Tools menu or by clicking the orange T speed button. How to add or edit information is explained in section 3.3.2.

Do not enter slope and intercept information if data will be imported into VUE software. For the VUE software to properly post-process data, slope and intercept information must be entered into VUE and not in VR3HS software.

The left half of the *Tag Manager* window is called the *PC Managed Setup* and is used to enter and edit sensor tag information. The information seen in the *PC Managed Setup* list is the tag setup contained in the PC software. The right half of the window is called the Receiver Setup and is the actual tag setup used by the VR3 receiver. When the *Tag Manager* window is opened, the software automatically requests the current setup being used with the receiver and displays it in the Receiver Setup half of the *Tag Manager* window.



The setup for tags can be passed between the two halves of the *Tag Manager* window by using the arrow buttons in the middle of the window. To copy a sensor transmitter from the *PC Managed Setup* list (on the left) to the Receiver Setup (on the right), select the desired tag by clicking it once with the mouse and then click the right pointing arrow in the middle of the window. The tag now also appears on the right half of the window and will be used to decode the sensor data when the logs are retrieved from a VR3 receiver.

TIP: To select more than one tag at once, select the first tag then hold the Control key on the computer's keyboard while you select the other tags with the mouse arrow. Press the Shift key instead to select blocks of tags.

3.3.1 File

The File menu in the *Tag Manager* window is separate from the File menu in the main software window (see section 3.2) and contains the sub-menus described below.

3.3.1.1 New

The *New* command clears the *PC Managed Setup* (left half of window) to allow a new setup to be entered. If changes had been made and not saved when the *New* command is given, a prompt appears asking if the changes are to be saved before the information is cleared.

3.3.1.2 Open

The *Open* command in the *Tag Manager* window allows a previously saved resource file to be opened (see section 3.4.3 for more information on resource files). Only the resource files located in the directory are displayed in the *Open* window to make file identification simpler.

3.3.1.3 Save

The *Save* command allows changes made to a resource file to be saved. What a resource file is named is determined by the user, but the extension must remain .xres or the file can't be read by the software.

3.3.1.4 Save As...

The *Save As...* command allows the resource file name or location to be changed.

3.3.1.5 Exit

This *Exit* command closes the *Tag Manager* window but won't close the software. This is the same as clicking the X in the top right corner of the window.

3.3.2 PC Setup

The *PC Setup* menu allows sensor transmitter information to be setup. It's also used to combine separate resource files.

3.3.2.1 Add

The Add sub-menu contains two options, one to add a sensor tag and the other to add a map. Adding a tag refers to entering a sensor transmitter's information so the received data can be displayed in the correct units, which must be done for each sensor transmitter being used with the VR3 receiver. The ability to add a map is not applicable to the VR3 receiver but is listed for future compatibility with the VR100 receiver.

3.3.2.1.1 Add Tag

Do not enter slope and intercept information if data will be imported into VUE software.

A sensor transmitter's information must be entered in the VR3HS software for the data to be displayed in the VR3-UWM data file correctly. NOTE: If the VR3-UWM data will be imported into VUE software, then do not enter the sensor transmitter's slope and intercept information. This is important for maintaining the necessary file formatting for the VUE database.

A new sensor transmitter can be added by following the steps listed below.

1. Select "Coded256Sensor" by either using the *PC Setup* menu or by clicking the sensor type in the *PC Managed Setup* on the left half of the screen. In either case, the bottom left corner of the *Tag Manager* window will display data entry boxes similar to the two samples shown below. Initially the boxes are empty, as seen in the *Tag Manager* window in section 3.3.
2. Enter the information as identified in the window. The information needed is listed below. The information is found in the Transmitter Specification manual shipped with the sensor transmitters.
 - a. Serial number
 - b. Frequency in kilohertz (kHz)
 - c. Coded map – select from the default maps in the pull-down list
 - d. ID number
 - e. Submap – either A, B, C, or D
 - f. Sensor type – temperature or depth
 - g. Slope
 - h. Intercept
3. Click the "Update" button. The tag is now added to the list shown in the *PC Managed Setup* half of the window (on left).

NOTE:

Only tags with sensors need to be entered in the software. Pingers don't need to be entered.

NOTE: The tag information must be transferred to the Receiver Setup list (see section 2.2.10) for use with the VR3 receiver.

Sensor transmitters that have already been entered can be edited. Follow the steps below to **edit an existing sensor transmitter**.

1. Highlight the desired tag in the *PC Managed Setup* list (left side of *Tag Manager* window). The information already entered is displayed in the bottom left corner of the window but is not accessible for editing.
2. Click the "Edit" box in the bottom left corner of the window to allow access to the information.
3. Edit the tag information as needed and click the Update button.

3.3.2.2 Import

The *Import* feature in the *Tag Manager* window allows multiple resource files to be combined into one file. Follow the steps listed below to merge resource files.

1. Open one of the files to be merged (see 3.3.1.2).
2. Select *Import* from the *PC Setup* menu in the *Tag Manager* window. The *Import* window will open.
3. Select the second resource file to be merged and click the “Open” button.
4. Repeat steps 2 and 3 until all the desired resource files are merged.
5. If desired, save the merged file using the *Save As...* feature (see section 3.3.1.4)

The merged file will not contain any duplication of information. For example, if the sensor transmitter with the serial number 6739 is setup in two different resource files, it will only appear in the merged file once.

3.3.2.3 Show All Items

The *Show All Items* menu selection will show all the VEMCO tag types, including those that are not compatible with the VR3 receiver. The non-compatible tag types will be hidden when the Show VR3 Items menu option is selected (it was the *Show All Items* option).

3.3.3 Receiver Setup

3.3.3.1 Refresh

The *Refresh* command retrieves the current sensor tag setups relate to the receiver and displays those setups in the right side of the *Tag Manager* window (called Receiver Setup). The *Refresh* command is automatically executed each time the *Tag Manager* window is opened.

3.4 FILE TYPES

3.4.1 Data File

Data files are automatically created from the VR3 log file (see section 3.4.2) when the *Upload Logs* command is used (see section 3.2.2.1). These data files are automatically saved in the directory selected using *Choose Directory* (see section 3.2.1.1) using the naming convention shown below. A data file is stored in ASCII text format with a comma as a delimiter, very similar to VR2 data files. The data file can be viewed either within the VR3HS software (see section 3.2.1.2), or with a text editor, or be imported into a spreadsheet program. Recent versions of the VR2 PC software are also capable of displaying these files.

The data files are saved using a standard file naming system. A sample file name is shown below. The ID number in the file name is the ID number of the receiver the data was loaded from, and the date and time are when the data file was created on your computer.

VR3-UWM_00003_D2005.04.20T14.09.42_69kHz.vr2
 ↑ ┌───┬───┐
 ID Date Time
 Number

A line in the data file beginning with an asterisk (*) is a text header line and is usually used to identify the information contained in the next line. Text header lines contain information such as:

- data format (firmware version number)
- file name
- receiver serial number
- model information
- blanking interval
- percentage of memory used
- total number of sync pulses
- number of pulses received
- number of total detections
- computer time at download
- the sub-map name (A, B, C, or D), sync, bin, and transmitter type assigned to each of the four receiver channels

The end of the text header section of the data file is marked with the line "*100,EOH" which stands for "End Of Header". The last four header lines identify the contents of the data lines that follow the EOH line. Data lines begin with the "greater than" symbol (>).

3.4.2 Log files

The log file, which has the extension `.zlog`, is a compressed binary file containing logs uploaded by the *Upload Logs* (see section 3.2.2.1) command. It contains the same information as data files, written in an alternative format that has been specifically designed so it can only be opened by VEMCO data analysis applications. The log file is automatically saved in the directory selected with the *Choose Directory* command (see section 3.2.1.1). NOTE: Although these files cannot easily be edited, they are not encrypted and should not be considered secure.

3.4.3 Resource files

A resource file, which has the extension `.xres`, contains the setup information for sensor transmitters that have been entered in the software. These files must be manually saved (see section 3.3.1.3) as they aren't automatically created by the software. Resource files are beneficial because they eliminate the need to manually re-enter the sensor transmitter information. They can also be merged together using the *Import* function (see section 3.3.2.2).

3.4.4 Setup files

The VR3HS software automatically stores all its settings in a file called `VR3HSSetup.xml` that is located in the same directory that the software is installed in. This file stores all the software settings (e.g. colour), all the global receiver settings (e.g. sensor transmitter information) and all the receiver-specific settings (e.g. depth, user comment, etc). The file is updated each time the software program is closed. The setup file is used with the *Add/Remove Receivers* function (see section 3.2.1.3) to import receiver configurations. It can also be copied to another computer.

NOTE: If a `VR3HSSetup.xml` file is replaced with a `VR3HSSetup.xml` from another computer, the configurations in the old `VR3HSSetup.xml` file have been overwritten by the configurations in the new `VR3HSSetup.xml` file.

4 APPENDICES

4.1 SOFTWARE REQUIREMENTS AND INSTALLATION

4.1.1 System Requirements

The VR3HS software is a Windows©2000/XP based software application that can be executed on any IBM compatible personal or mobile computer with the following configuration:

Minimum Pentium II Processor, 366MHz

Minimum 4 MB Video RAM

128 MB RAM

Minimum SVGA Monitor 256 Colour

CD drive for program installation

One 9-pin RS-232 serial port (Note: USB serial adapters are not recommended for use with the VR3 because of the inconsistent quality of these devices)

4.1.2 Software Installation

The VR3HS software is a Windows© application. VEMCO assumes customer familiarity with Windows terminology.

To install the VR3HS software, follow the steps listed below.

1. Insert the Install compact disk (CD) into the CD drive.
2. From the Start menu in Windows, select Run.
3. Type "X:\VR3HS Setup.exe" where the "X" represents the letter associated with your CD drive.
4. Follow the on-screen instructions.

4.2 TROUBLE-SHOOTING

The following tips may help if problems are encountered. If the problem you're experiencing isn't included in this section, please contact VEMCO.

4.2.1 Communication Problems

Problem	Possible Solution
Can't communicate with a deployed VR3-UWM receiver.	<ol style="list-style-type: none">1. Check that the correct receiver address is being used. Use the <i>New</i> button in the Configuration tab to check which receivers are within communication range of the surface modem.2. Make sure the surface modem is within communication range of the bottom modem.3. Check the serial port number in the software is correct (see section 3.1.1).
Can't communicate with a VR3-UWM receiver during in-air test.	<ol style="list-style-type: none">1. Check that the correct receiver address is being used. Use the <i>New</i> button in the Configuration tab to check which receivers are within communication range of the surface modem.2. Connect directly to the service port (see section 3.1.2).3. Check the serial port number in the software is correct (see section 3.1.1).

4.3 GLOSSARY

Blanking Interval: The Blanking Interval is the length of time (in milliseconds) after an acoustic signal has been received in which the VR3 will ignore any subsequent signals. This is to eliminate the reception of echoes by the receiver.

Channel: A channel in the VR3 is a group of configuration settings used to listen to VEMCO tags.

Coded Map: A coded map is a collection of code space labels (for example A69-1105, A69-1303) operating on the same frequency. There are standard maps for use with VEMCO's coded tags.

The receiver must be set to the same coded map as the tags for the tags to be detected and identified correctly. The coded map for tags is set at the time a tag is ordered and can not be changed after the tag is built.

Coded tags: Coded tags transmit a series of acoustic pings to form an ID (identity) number recognized by the receiver. The pings form a "ping train" that is usually followed by either a fix or random delay. The type and length of the delay is set at the time the tag is ordered and can't be changed once the tag is built.

Continuous tags: Continuous tags transmit the acoustic pings continuously, without long delays between transmissions. Continuous tags are available with or without sensors.

Coordinated Universal Time (UTC): UTC is the international time standard. It is the current term for what was commonly referred to as Greenwich Mean Time (GMT). Zero (0) hours UTC is midnight in Greenwich, England, which lies on the zero longitudinal meridian.

Pinger: A VEMCO tag that contains no sensors. It can have either a coded or continuous transmission schedule.

Tag: A VEMCO tag is an acoustic transmitter that is attached to a marine creature and transmits an acoustic signal. The acoustic signal is received by a VEMCO receiver. VEMCO tags can transmit either a coded or continuous signal, with or without sensor data. After a tag is powered, it will continue to broadcast according to factory setup until powered down.

Sensor transmitter: A VEMCO tag that has at least one sensor. The type of sensor is usually included in the transmitter's name. For example, a V16P has a pressure (depth) sensor and the V16T has a temperature sensor. A sensor transmitter can also have either a coded or continuous transmission schedule.

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