# *VR100 HOST*

# *SOFTWARE MANUAL*

Software Version 3.0          June 25, 2010

**VEMCO,** *a Division of AMIRIX Systems Inc.*

# AMIRIX Systems Inc.
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### NEGOTIATED AGREEMENT

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# ATTENTION

It has come to VEMCO's attention that in rare instances it is possible for the USB interface chips in certain computers to experience permanent component failure when connected to a USB device. These failures, which may relate to electric static discharge damage, are not related to the specific USB device connected to the computer and have been reported to occur with cameras, scanners, printers, pocket PC handheld devices, and MP3 players.

To reduce the risk of damage to the computer, some computer manufacturers have recommended connecting USB devices through a powered hub, rather than directly to the computer.  We have confirmed that the Dlink DUB-H4 USB 2.0 powered hub will allow the VR100 to operate correctly.

We hope this information is helpful.

# TABLE OF CONTENTS

# 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. VEMCO's product line ranges from miniature acoustic transmitters and data loggers to large tracking, positioning, and monitoring systems. Data communication methods include acoustic telemetry, radio modem, and under-water modem.

Please contact us at:     **www.vemco.com**

## 1.2  SYSTEM REVIEW

The VR100 is a general-purpose ultrasonic, splash-resistant, receiver designed for manual tracking of aquatic animals from small boats or for recording laboratory data.  Its hardware architecture has been developed to support a wide range of applications and transmitter types.  It replaces the VR60 receiver.

The VR100 software augments the VR100 receiver with the following features: sensor tag management, code map management, data retrieval, and comma separated variable file export.  It can also store a copy of the receiver's tag information on the computer, and that copy can be loaded to another VR100 or re-loaded to the same VR100 if necessary.

## 1.3  USING THIS MANUAL

This manual, the VR100 Software Manual, contains the necessary information to use the VR100 software with the VR100 receiver to input sensor transmitter information and retrieve event data.  Event data can be data about a tag detection, GPS locations, and functions performed by the VR100.  The receiver can be used as a stand-alone unit (without software) and the necessary details are contained in the VR100 Operating manual.  Using the VR100 software with the receiver allows information to be entered and retrieved in a much faster manner.

This manual is broken into major sections for easier use of the information found in the manual.  These sections, and a brief explanation, are listed in Table 1.3-1.

| Table 1.3-1:  Sections contained in this manual. | |
| --- | --- |
| **Section** | **Description** |
| Introduction | Introduction to the VR100 and this manual. |
| Applications | Details on how to use the VR100 software with the receiver. |
| Software | Description of the software elements. |
| File Types | Information on log files, CSV files, and resource files. |
| 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.  A tag can be either a pinger or a sensor transmitter.

```
                          ┌─────────────────┐
                          │       TAG       │
                          └─────────────────┘
                  ┌───────────────┴───────────────┐
  ┌───────────────────────────┐   ┌───────────────────────────┐
  │          PINGER           │   │    SENSOR TRANSMITTER      │
  │                           │   │                           │
  │ These are tags that do    │   │ These are tags that       │
  │ not contain a sensor and  │   │ contain at least one      │
  │ don't transmit data       │   │ sensor.  They transmit    │
  │ information.              │   │ the sensor data.          │
  │                           │   │                           │
  │ Pinger information is not  │   │ Sensor transmitter        │
  │ entered in the receiver.  │   │ information must be        │
  │                           │   │ entered in the receiver.  │
  └───────────────────────────┘   └───────────────────────────┘
```
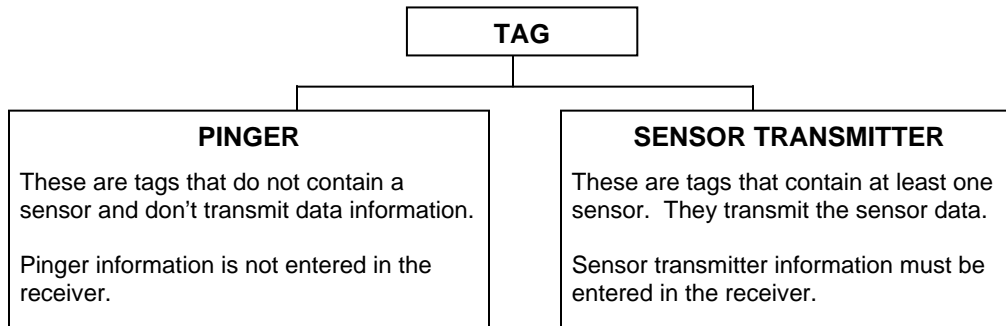
# 2  APPLICATIONS

This section of the manual explains the VR100 software by tasks.  The Software section of the manual explains the software by section.


## 2.1  QUICK SETUP

Follow the steps listed below to setup the VR100 software and begin using it with the VR100 receiver.

1.  Connect VR100 to computer:
    a.  Install the VR100 software on the computer, if not already installed (see section 5.1.2).
    b.  Run the VR100 software.  This will open the *Receiver Control and Management Interface* window (see section 3.1).
    c.  Connect the VR100 to the computer using the supplied USB cable (see the VR100 Receiver Operating manual for details).
    d.  Turn on the VR100.  If you are using Windows©XP or Windows©Vista, a "new hardware" wizard will appear the first time a VR100 is connected to the computer.  Follow the instructions in the wizard to add the VR100.
2.  Open a VR100 window:
    a.  Verify that the desired receiver is highlighted in the *Receiver Control and Management Interface* window (see section 3.1).  If you can't find the receiver in the list, then make sure the receiver is on and that the USB connector is properly connected.
    b.  Click the "Open" button in the *Receiver Control and Management Interface* window to open the *VR100 Receiver* window for the selected receiver (see section 3.2).
3.  Set properties in software:  (only needs to be done on first use and if information has changed)
    a.  Open the *Options* window (see section 3.2.3.2) in the *Settings* menu.
    b.  Select the units to be used for the sensor information.
    c.  Select the data directory to be used for the log files.
4.  Enter sensor transmitter information:
    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).
5.  Transfer the sensor transmitter information to the VR100 receiver (see section 2.2.10).
6.  Transfer any needed code maps to the VR100 receiver (see section 2.2.10).  Most users will never need to change the default maps loaded in the receiver.
7.  Turn off the VR100 receiver.
8.  Disconnect the VR100 receiver from the computer.
9.  Use the receiver in the field as explained in the VR100 Hardware manual.
10. Repeat steps 1 and 2.
11. Copy the collected data to the computer using *Get All Data* (see section 3.2.2.1).
12. Save the data as a Comma Separated Variable file (.csv) for viewing in a spreadsheet program (see section 3.2.1.3).

## *2.2  HOW DO I …*

The "How Do I …" section of the manual lists the steps necessary to perform particular actions in the VR100 software.  The actions are listed alphabetically for easier referencing.  Use the Quick Setup (section 2.1) to use the VR100 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 VR100 software (see section 3.3.2.1.1).

From the *VR100 Receiver* window (see section 3.2):

1.  Open the *Tag Manager* window by selecting *Tag Manager* in the *Settings* menu.
2.  Open a resource file, if desired (see section 2.2.9).
3.  Click "CodedSensor" located in *PC Managed Setup* (left side of window).  The Add Coded 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.  ID number
    d.  Code Space – select the correct one from the pull-down list.
    e.  Sensor type – temperature, depth or acceleration
    f.  Slope
    g.  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.  Transfer the tag setup to the VR100 receiver (see section 2.2.10).


NOTE: For coded two-sensor tags, two separate sensor tag entries are required – one for each tag ID (sensor). Since the VR100 does not allow duplicate serial numbers in the sensor database, the serial number for the second sensor entry must be different than the first sensor entry. We recommend that you use the serial number provided on the specification sheet for the first sensor entry, and the same serial number with a prefix for the second sensor entry. For example, using "20" as the prefix:
> Sensor 1 SN:    1034857
> Sensor 2 SN: 201034857

## 2.2.2  Add a continuous one sensor transmitter

Follow the steps listed below to enter a one sensor transmitter in the VR100 software (see section 3.3.2.1.1).

From the *VR100 Receiver* window (see section 3.2):

1. Open the *Tag Manager* window by selecting *Tag Manager* in the *Settings* menu.
2. Open a resource file, if desired (see section 2.2.9).
3. Click "ContinuousOneSensor" located in *PC Managed Setup* (left side of window).  The Add Continuous 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. Number of sensors – One
   d. Minimum period possible, in milliseconds (ms)
   e. Maximum period possible, in milliseconds (ms)
   f. Sensor type –  temperature or depth
   g. Slope
   h. 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. Transfer the tag setup to the VR100 receiver (see section 2.2.10).


## 2.2.3  Add a continuous two sensor transmitter

Follow the steps listed below to enter a two sensor transmitter in the VR100 software (see section 3.3.2.1.1).

From the *VR100 Receiver* window (see section 3.2):

1. Open the *Tag Manager* window by selecting *Tag Manager* in the *Settings* menu.
2. Open a resource file, if desired (see section 2.2.9).
3. Click "ContinuousTwoSensor" located in *PC Managed Setup* (left side of window).  The Add Continuous 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. Number of sensors – Two
   d. Minimum period possible in milliseconds (ms)
   e. Maximum period possible in milliseconds (ms)
   f. In Sensor Details, click "Sensor One"
   g. Sensor type – usually temperature
   h. Slope
   i. Intercept

        j.    In Sensor Details, click "Sensor Two"
        k.    Sensor type – usually pressure
        l.    Slope
        m.   Intercept
        n.    Sync – default value is 1150 ms

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.   Transfer the tag setup to the VR100 receiver (see section 2.2.10).

## 2.2.4  Create a comma delimited file from data

Create a comma delimited file from data by following the steps below (see section 3.2.1.3).

1.   Open the *VR100 Receiver* window (see section 3.1.1) for the receiver containing the data.
2.   Select *Get All Data* (see section 3.2.2.1) or *Get Recent Data* (see section 3.2.2.2), depending on how much data you want.  The data will load to the computer in less than four minutes.
3.   Select *Export* in the *File* menu (see section 3.2.1.3).
4.   Enter the desired file name in the "File name" box of the *Export Current Log* window and click "Save".  The comma delimited file is created and located in the directory selected.
5.   Once receiver log data has been saved, you may erase the data from the receiver (see section 3.2.2.3).

The comma delimited file, or Comma Separated Variables file (see section 4.2), is now ready to be opened using a .csv supporting spreadsheet program of your choice.  Examples of spreadsheet programs that will support a .csv file are Excel and Quattro Pro.

## 2.2.5  Create a comma delimitated file from a log file

Create a comma delimited file from a log file by following the steps below (see section 3.2.1.2).

1.   Open a *VR100 Receiver* window (see section 3.1.1).  This can be any receiver window, including the Virtual receiver.
2.   Open the desired log file (see section 3.2.1.1).
3.   Select *Export* in the *File* menu (see section 3.2.1.3).
4.   Enter the desired file name in the "File name" box of the *Export Current Log* window and click "Save".  The comma delimited file is created and located in the directory selected.

The comma delimited file, or Comma Separated Variables file (see section 4.2), is now ready to be opened using a .csv supporting spreadsheet program of your choice.  Examples of spreadsheet programs that will support a .csv file are Excel and Quattro Pro.

## 2.2.6  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.


## 2.2.7  Load data from VR100

Data that has been received and stored in the VR100 receiver can be loaded to the computer (see section 3.2.2).

1. Open the *VR100 Receiver* window (see section 3.1.1) for the receiver containing the data.
2. Select *Get All Data* (see section 3.2.2.1) or *Get Recent Data* (see section 3.2.2.2), depending on how much data you want.  The data will load to the computer in less than four minutes.
3. Save or export log data to file (see section 3.2.1.2 and 3.2.1.3).
4. Once receiver log data has been saved, you may erase the data from the receiver (see section 3.2.2.3).


## 2.2.8  Load the receiver's setup to the computer

The sensor tags and code maps stored in the receiver are listed in the *Receiver Setup* half of the *Tag Manager* window (right side).  This list is updated automatically, but can be manually updated by following the steps listed below.

1. Open the *Tag Manager* window (see section 3.3).
2. Select *Refresh* in the *Receiver Setup* menu.


## 2.2.9  Open a Resource file

Open a resource file (see section 4.3) to retrieve sensor tag setups.  A resource file is opened by following the steps below while in the *VR100 Receiver* window.

1. Select *Tag Manager* in the *Settings* menu of the *VR100 Receiver* window (see section 3.2).
2. Select *Open* in the *File* menu of the *Tag Manager* window (see section 3.3).
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.

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

The tag and map information listed 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 downloaded to the VR100 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(s) or map(s) 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 or drag and drop the selected tag(s) to the *Receiver Setup*. The selected tag setup is transferred to the *Receiver Setup* list (right half of window) and automatically transferred to the VR100.

### 2.2.11 View a comma delimited file

Comma Separated Variable files (.csv), also known as Comma Delimited Files, can be viewed using any spreadsheet program that supports .csv files. For example, Microsoft Excel and Corel Quattro Pro are both programs that support .csv files.

> NOTE: Detection times are output to the CSV file with three extra digits of precision. These values are correctly read by Excel, however the default display formatting (mm:ss.0) is incorrect. Change the formatting to "hh:mm:ss.000" to properly display these times.

### 2.2.12 View a log file

Log files contain data received by the VR100 receiver (see section 4.1 for more information). Log files can not be edited but can be viewed by following the steps listed below.

1. Open a *VR100 Receiver* window. It doesn't matter which receiver is selected, including the Virtual receiver.
2. Select "Open" in the *File* menu of the *VR100 Receiver* window (see section 3.2.1.1).
3. Select the log file from the list shown in the Open window.

The log file is displayed in the *VR100 Receiver* window, as shown in section 4.1. Comments added to the "comments" column of the file are saved when the log file is saved as a comma delimited file (see section 3.2.1.3). No changes can be made to the log file in .zlog format.

# 3 SOFTWARE

This section of the manual explains the VR100 software by section. The Application section of the manual explains the software by tasks. The software has three main sections: *Receiver Control and Management Interface*, *VR100 Receiver*, and *Tag Manager*.

## 3.1 RECEIVER CONTROL AND MANAGEMENT INTERFACE

VR100 receivers that are currently powered and connected to the VR100 software through a USB port are listed in the *Receiver Control and Management Interface* window, shown below. More than one receiver can be connected to the software through the computer's USB connection at the same time. A USB hub increases the number of connections available for receivers. The receiver that was most recently connected to the software is highlighted in blue in the VR100 list (see picture below).
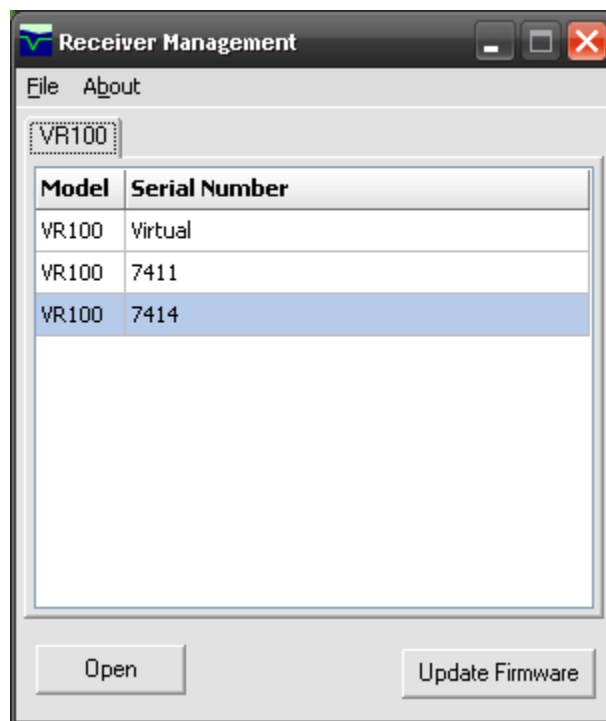


The VR100 software can be used without a VR100 connected to the computer by selecting the serial number "Virtual". This allows sensor transmitter information to be entered and saved (see section 3.3) without the receiver being physically connected.

### 3.1.1 Open a VR100 Receiver window

The quickest method to open a *VR100 Receiver* window (see section 3.2) is to double-click the desired receiver's serial number in the list. A receiver window can also be opened by highlighting the desired serial number and clicking the "Open" button at the bottom of the window.

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## 3.1.2  Update Firmware

The firmware operating inside the VR100 can be updated without having to send the receiver to the factory.  The firmware is updated in several steps, which are listed and explained below.

> **IMPORTANT:**
>
> - **It is recommended that you download and save any important data from the receiver prior to updating the firmware.**
>
> - **Connect the receiver to an AC power supply**
>
> - **Do not disconnect the USB communications cable during firmware update**
>
> - **Do not turn receiver power off during firmware update**

To begin the firmware update process select a receiver in the *Receiver Management* window and click the "Update Firmware" button. A series of windows described below will be presented to the user to complete the firmware update procedure. Note that the "Virtual" receiver cannot be updated.

Step 1:  Verify that the VR100 is ready for a firmware update. The wizard will not allow you to proceed until you check the box confirming that you have read the instructions.

Step 2:  Sensor Database Backup. The sensor tag database in the VR100 receiver will be cleared during the firmware update. Click the "Browse" button to select a location and filename for the sensor database backup file. By default, the file is stored in the user data directory, normally *\My Documents\Vemco\VR100HS\Backup*. If the sensor database is reported as empty, select "Next". Once the firmware update is complete the sensor tag information can be restored to the receiver by following the steps in section 2.2.10.

Step 3:  Current configuration. The current firmware and hardware versions of the VR100 receiver are checked and displayed.

Step 4:  Select Image file. Use the "Browse" button to choose the new firmware file on your computer. The window will automatically open the "Firmware" subdirectory under the VR100HS program install location where you will find the firmware image bundled with the VR100HS software. Only files with the correct extension will be shown.

Step 5:  Compatibility Check. The VR100 software tests the new firmware file before it is sent to the VR100 receiver.

Step 6:  Update Firmware. Do not turn off receiver, disconnect USB cable or close VR100 Software during the update process. The user will be notified when the firmware update has been completed successfully.

## 3.2  VR100 RECEIVER

When a receiver is opened from within the *Receiver Control and Management Interface* window (see section 3.1), it opens a *VR100 Receiver* window like the one shown below.  The receiver's serial number is displayed in the top left corner to identify which receiver is associated with this window.

When more than one receiver is open, then more than one *VR100 Receiver* window is open.  One *VR100 Receiver* window is assigned to each receiver opened in the *Receiver Control and Management Interface* window.  Commands performed in the *VR100 Receiver* window affect only the receiver associated with that window.
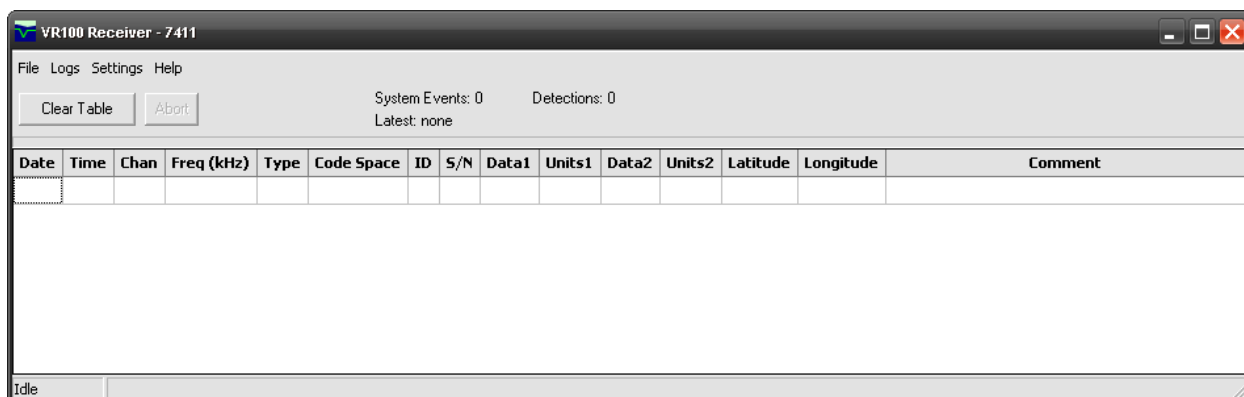


When data has been loaded from the receiver to the computer (see section 3.2.2), the number of system events and the number of detections in the loaded data are displayed the *VR100 Receiver* window.  The date and time of the latest detection or system event is also displayed.

Selecting the "Clear Table" button in the *VR100 Receiver* window will clear the log file displayed in the *VR100 Receiver* window without clearing the log file (see section 4.1 for more information on log files).  Clicking the "Abort" button will stop the data loading process (see section 3.2.2).

### 3.2.1  File

The *File* menu in the *VR100 Receiver* window is separate from the *File* menu in the *Tag Manager* window (see section 3.3.1).

#### 3.2.1.1  Open
The *Open* command in the *VR100 Receiver* window allows a log file (see section 4.1) to be opened and viewed in the *VR100 Receiver* window.  Log files are saved when the *Save As...* command is used (see section 3.2.1.2).  A log file can be opened within any *VR100 Receiver* window, including the Virtual *VR100 Receiver* window.

#### 3.2.1.2  Save As…
The data retrieved from the VR100 receiver can be saved as a ZLOG file (see section 4.1).  The *Save As...* feature opens the *Save Current Log As* window to allow the log file to be named.  The file is saved with the ".zlog" extension to distinguish it as a log file.

---

### *3.2.1.3 Export*
The data retrieved from the VR100 receiver can be exported as a CSV file (see section 4.2). The *Export* feature opens the *Export Current Log* window to allow the comma delimited file to be named. The file is saved with the ".csv" extension to distinguish it as a Comma Separated Variables file.

### *3.2.1.4 Exit*
This *Exit* command closes the *VR100 Receiver* window but not the *Receiver Control and Management Interface* window. This allows another receiver to be selected in the *Receiver Control and Management Interface* window.

## 3.2.2 Logs

The *Logs* menu is used to load, or copy, the data stored on the VR100 receiver to a log file on the computer. There are two options in loading data, to retrieve all the data stored in the VR100 (*Get All Data*) or to retrieve the data stored since the last upload (*Get Recent Data*).

When data is loaded to the computer, it's actually copied to the computer. The original copy is still in the receiver's memory. Once receiver log data has been saved, you may erase the data from the receiver.

### *3.2.2.1 Get All Data*
The *Get All Data* command loads all data from the VR100 receiver to the computer. This could take up to four minutes, depending on how much information is stored in the receiver's memory. The loaded data is stored as a log file (see section 4.1).

### *3.2.2.2 Get Recent Data*
The *Get Recent Data* command loads any new data stored in the VR100 receiver since the last command was given to load data. If the *Get All Data* has never been given to this receiver, or if a different computer is being used since the last *Get Recent Data* command, then the computer will get all the stored data.

NOTE: The method used to mark which data has been loaded to the computer is stored on the computer. If the *Get Recent Data* command is sent from a different computer, then the computer doesn't have a record of a previous upload and will load <u>all</u> the data from theVR100.

### 3.2.2.3 *Erase VR100 Log*

The *Erase VR100 Log* command will erase the event log in the VR100 receiver. This is the same command that is seen after data is loaded from the receiver to the computer (see section 3.2.2).

When the command is given, a verification screen is displayed to confirm that the receiver's log should be erased. The screen also indicates that some of the stored data may not have been loaded to the PC. This is a reminder to upload the data from the VR100, if you want to keep the data, before erasing the memory.
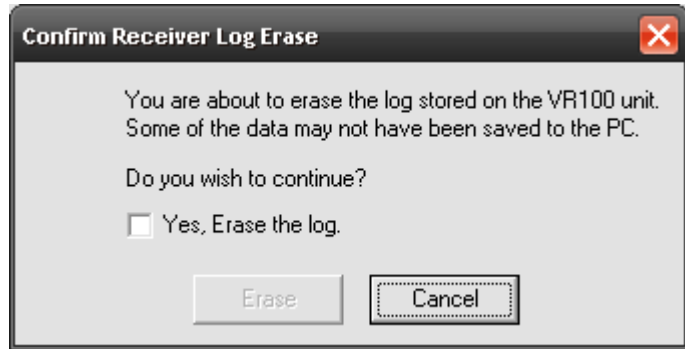
To continue, click the "Yes, Erase the log" box and then the Erase button. The Erase button isn't enabled until the Yes box is checked.

When the memory is being erased, the Information window shown below is displayed on the screen to indicate the erase command is being executed. It also indicates that some residual data may be retained in the receiver's memory.

Data is initially stored in a small, volatile memory buffer. When the buffer is full, that data is moved to non-volatile long-term memory. The *Erase VR100 Log* command erases all data in the long-term memory but not data in the buffer memory. This feature allows the VR100 to continue to record new data during the erase process.

The data in the buffer, which is the most recent data, continues to be stored until the buffer is full and is then moved to the long-term memory. This means that the data in the buffer will be loaded to the computer with the next upload and may appear as duplicated data. This can be avoided by using the *Get Recent Data* command (see section 3.2.2.2).

---

## 3.2.3  Settings

The *Settings* menu contains the sub-menus *Tag Manager* and *Options*.

### 3.2.3.1  Tag Manager
The *Tag Manager* window allows sensor tag setups to be created or edited, and transferred to VR100 receiver.  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.

### 3.2.3.2  Options…
There are four options that are set in the Options window, shown here.  Three of these options relate to the units used to display temperature, depth and acceleration data.  These settings are global.  For example, if °C is selected for temperature units, then all the temperature data displayed by the software is in degrees Celsius (°C).

VEMCO publishes sensor calibration data in SI units (°C, meters, m/s$^2$). Slope and intercept values for sensor tags should always be entered directly from the tag data sheet in SI units. The PC software will automatically convert from the base SI units to the units configured in this dialog for all displayed tag data.

The default location for saving log and sensor data files is also selected in the Options window.
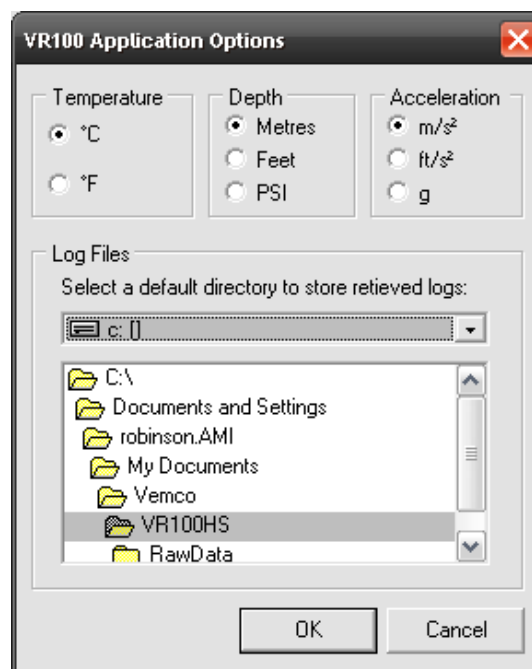
## 3.2.4  Help

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

### 3.2.4.1  Documentation…
The *Documentation...* command opens this manual.

### 3.2.4.2  Support…
The *Support...* command provides a link to the VEMCO VR100 Support website.

### 3.2.4.3  About VR100…
Information about the VR100 associated with the selected *VR100 Receiver* window is shown in the Information window.  This information includes the serial number of the receiver, its hardware version, and firmware version.  If the VR100 was disconnected from the computer after the *VR100 Receiver* window was opened, then the *About VR100...* feature reports that the VR100 is disconnected.

## 3.3  TAG MANAGER

The *Tag Manager* window is the place to enter or edit sensor transmitter information.  It's opened by selecting *Tag Manager* in the *Settings* menu of the *VR100 Receiver* window.  How to add or edit information is explained in section 3.3.2.

The left half of the *Tag Manager* window is called the *PC Managed Setup* and is used to enter and edit sensor tags.  The information seen in the *PC Managed Setup* list is the tag/map setup contained in the PC software.  The right half of the window is called the *Receiver Setup* and is the actual tag/map setup contained in the VR100 receiver.  When the *Tag Manager* window is opened, the software automatically requests the current setup from the receiver and displays it in the *Receiver Setup* half of the *Tag Manager* window.
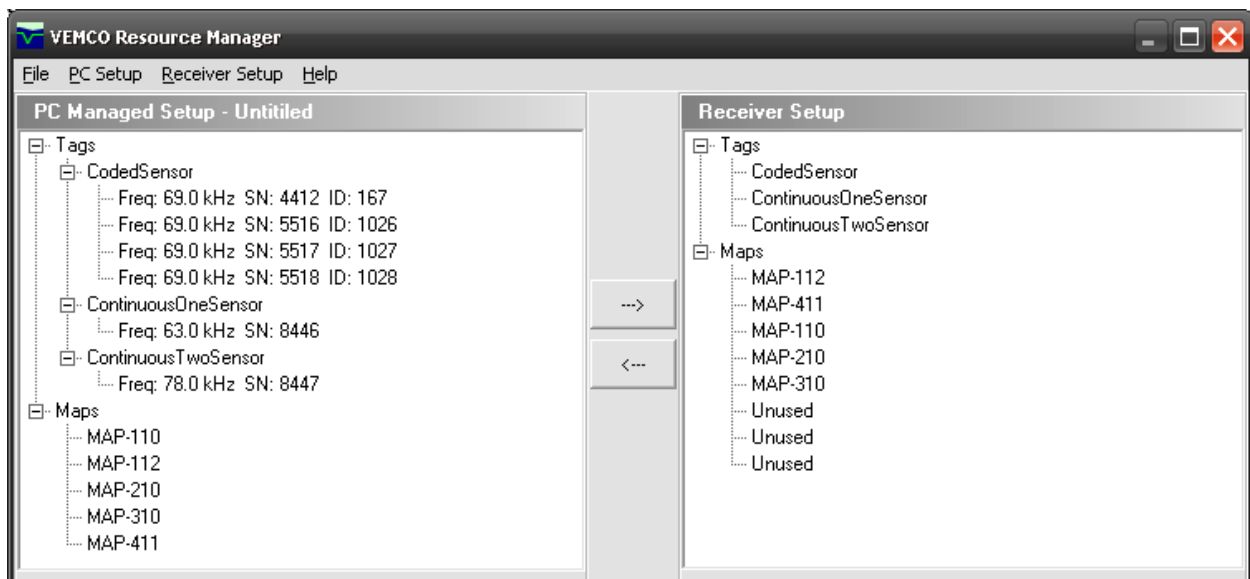


The setup for tags and code maps can be passed between the PC and the receiver by using the arrow buttons in the middle of the window or by dragging and dropping items from one pane to another.  To copy a sensor transmitter from the *PC Managed Setup* list (on the left) to the *Receiver Setup* (on the 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 has been automatically sent to the VR100.

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 *VR100 Receiver* window (see section 3.2.1) 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 settings are 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 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.

Using the *Open* command will overwrite any tags in the current *PC Managed Setup* with those contained in the resource file. To combine several resource files into one *PC Managed Setup* use the *Import* command (see section 3.3.2.2).

#### 3.3.1.3  Save
The *Save* command allows changes made to a resource file to be saved.  The resource file name 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 *VR100 Receiver* window or the *Receiver Control and Management Interface* window.  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 edited.  It's also used to combine separate resource files.

#### 3.3.2.1  Add
The *Add* sub-menu allows a sensor tag to be added.  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 VR100.

##### 3.3.2.1.1  Add Tag
A sensor transmitter's information must be entered in the VR100 for the data to be displayed correctly.  A new sensor transmitter can be added by doing the following the steps.

1.  Select the tag type (coded sensor, continuous one sensor, or continuous two sensor) by either using the *PC Setup* menu or by clicking the desired 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 sample window on the left.  The sample window on the right has the information entered and is ready for the Update button to be clicked.



2.  Enter the information as identified in the window (see example above on the right).  The information needed is listed below by tag type.  The information can be found in the Transmitter Specification manual shipped with the sensor transmitters.

    a.  Coded Sensor:
        i.  Serial number
        ii.  Frequency in kilohertz (kHz)
        iii.  ID number
        iv.  Code Space – select from the pull-down list
        v.  Sensor type – temperature, depth or acceleration
        vi.  Slope
        vii.  Intercept

> **NOTE**
> Only tags with sensors need to be entered in the receiver. Pingers don't need to be entered.

    b.  Continuous One Sensor:
        i.  Serial number
        ii.  Frequency in kilohertz (kHz)
        iii.  Number of sensors – One
        iv.  Minimum period possible, in milliseconds (ms)
        v.  Maximum period possible, in milliseconds (ms)
        vi.  Sensor type –  temperature or depth
        vii.  Slope
        viii.  Intercept

    c.  Continuous Two Sensor:
        i.  Serial number
        ii.  Frequency in kilohertz
        iii.  Number of sensors (Two)
        iv.  Minimum period possible in milliseconds
        v.  Maximum period possible in milliseconds

vi. In Sensor Details, click "Sensor One"
vii. Sensor type (typically temperature)
viii. Slope
ix. Intercept
x. In Sensor Details, click "Sensor Two"
xi. Sensor type (typically pressure)
xii. Slope
xiii. Intercept
xiv. Sync in milliseconds

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:  The tag just setup has not yet been entered in the VR100 receiver.  It must be transferred to the *Receiver Setup* list (see section 2.2.10).

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.

## 3.3.3  Receiver Setup

### 3.3.3.1 Refresh
The *Refresh* command retrieves the current setup (sensor tags and maps) from the receiver and displays that setup 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.

# 4 FILE TYPES

## 4.1 LOG FILES

Log files are saved when the *Save As...* command is used (see section 3.2.1.2). The *Open* command in the *VR100 Receiver* window allows a log file to be opened and viewed in the *VR100 Receiver* window. A log file can be opened within any *VR100 Receiver* window, including the Virtual *VR100 Receiver* window, but can only be viewed in the VR100 software. The log file has been specifically designed so it can only be opened in the VR100 software.

The log files are usually saved using a standard file naming system and with the extension .zlog but a unique name can be assigned when the file is saved. A sample of the standard file name is shown below. The serial number in the file name is the serial number of the receiver the data was loaded from, and the date and time are when the log file was created on your computer.

<div align="center">

VR100_007493_D2005.01.20T14.09.42.zlog

Serial     Date     Time
Number

</div>

The data displayed in the log file contains the following information for tag detections: date, local time, channel, frequency (in kHz), tag type, code space (if coded), ID (if coded), serial number (sensor tags only), data (see section 4.1.1), latitude, and longitude. The signal strength and receiver gain levels can be viewed by "hovering" the mouse arrow over the cell in the Channel column. Likewise, the slope(s) and intercept(s) can been viewed by "hovering" the mouse over Data1 or Data2. Comments can be typed in the Comments column of the log file to be saved in the Comma Separated Variable file (see section 4.2).

Manual GPS readings are identified in the Type column of the log file as "GPS" and columns that don't relate, such as frequency and data, are blank.



| Date | Time | Chan | Freq (kHz) | Type | Code Space | ID | S/N | Data1 | Units1 | Data2 | Units2 | Latitude | Longitude | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009-05-28 | 14:51:14.730 | 3 | 78 | Cont Two Sensor | | | 8447 | 9.0 | °C | 88.0 | m | 44.64111 | -63.67071 | |
| 2009-05-28 | 14:50:27.970 | 2 | 180 | Coded Pinger | A180-1701 | 2 | | | | | | 44.64108 | -63.67076 | |
| 2009-05-28 | 14:49:36.059 | 1 | 69 | Coded Sensor | A69-9002 | 1026 | 5516 | 35.0 | °C | | | 44.64099 | -63.67094 | |
| 2009-05-28 | 14:48:47.836 | 1 | 69 | Coded Sensor | A69-9002 | 1026 | 5516 | 35.0 | °C | | | 44.64109 | -63.67076 | |
| 2009-05-28 | 14:48:44.910 | 4 | 60 | Cont Pinger | | | | 1450 | ms | | | 44.64107 | -63.67078 | |
| 2009-05-28 | 14:48:43.459 | 4 | 60 | Cont Pinger | | | | 301807 | ms | | | 44.64106 | -63.67079 | |
| 2009-05-28 | 14:48:19.026 | 1 | 69 | Coded Sensor | A69-1105 | 167 | 4412 | 6.8 | °C | | | 44.64115 | -63.67071 | |
| 2009-05-28 | 14:48:09.470 | 1 | 69 | Coded Sensor | A69-9002 | 1029 | 0 | 60.0 | | | | 44.64115 | -63.67071 | |
| 2009-05-28 | 14:47:54.511 | 1 | 69 | Coded Sensor | A69-9002 | 1028 | 5518 | 0.818 | m/s² | | | 44.64115 | -63.67072 | |
| 2009-05-28 | 14:47:39.211 | 1 | 69 | Coded Sensor | A69-9002 | 1027 | 5517 | 60.0 | m | | | 44.64114 | -63.67072 | |
| 2009-05-28 | 14:47:15.424 | 1 | 69 | Coded Pinger | A69-9001 | 181549 | | | | | | 44.64111 | -63.67086 | |
| 2009-05-28 | 14:47:03.664 | 1 | 69 | Coded Pinger | A69-1303 | 5612 | | | | | | 44.64104 | -63.67101 | |
| 2009-05-28 | 14:45:49.789 | 5 | 63 | Cont One Sensor | | | 8446 | 8.6 | °C | | | 44.64109 | -63.67067 | |

Log files can be converted to Comma Separated Variable (.csv) files using the *Export* command in the *VR100 Receiver* window (see section 3.2.1.3).

### 4.1.1 Data in Log files

The sensor data is listed in either the "Data1" column or the "Data2" column of the log file. If there is only one sensor in the sensor transmitter then data is only shown in the "Data1" column. The unit for the data is given in the adjoining "Units" column. The slope and intercept associated with this data can be viewed by "hovering" the mouse arrow over the Data column. The slope and intercept will appear for a few seconds in a small view box. Continuous pingers without a sensor display the period in the "Data1" column with the units listed as "ms" (milliseconds).

## 4.2 COMMA SEPARATED VARIABLE FILES

A Comma Separated Variable (CSV) file is a data file in which the variables are separated by commas. This allows the file to be opened in a spreadsheet package that is CSV compatible, such as Excel or Quattro Pro. These files are created using the *Export* command (see section 3.2.1.3).



NOTE: Detection times are output to the CSV file with three extra digits of precision. These values are correctly read by Excel, however the default display formatting (mm:ss.0) is incorrect. Change the formatting to "hh:mm:ss.000" to properly display these times.

## 4.3 RESOURCE FILES

Resource files, which have the extension .xres, contain the setup information for the 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 extremely beneficial because they eliminate the need to manually re-enter the sensor transmitter information. This saves time and allows the information to be loaded to other VR100 receivers very quickly and easily.

## 4.4 RAW FILES

RAW files are automatically saved in the Raw Data Directory (see section 3.2.3.2) when data is loaded from the VR100 receiver. These files, named VRDxxx.zraw where each x represents an integer, are not user-readable and are solely used by VEMCO for diagnostic or data recovery purposes. The raw files can be deleted without affecting the operation of the VR100 if disk space is required on the computer but deletion is not necessary. It's suggested that the files are not erased until after data has been successfully recorded.

# 5 APPENDICES

## 5.1 SOFTWARE INSTALLATION

The VR100 PC Software requires:
- A PC running Windows XP or Windows VISTA
- At least one available USB port.

Before installing the VR100 PC Software ensure that all VR100 Receivers are disconnected from the PC.

Run the VR100 PC Software setup file from the supplied CD or download it from the VEMCO website: http://www.vemco.com/support/vr100_support.php. Follow the instructions in the installation wizard.

After the software is installed connect a VR100 receiver to the PC using the supplied USB cable and turn the receiver on. Windows will automatically detect the receiver and prompt you to setup the device. Follow the on-screen instructions. When prompted, choose to install the software automatically. Windows will repeat this process each time a VR100 is connected to a different USB port.

## 5.2 CODE MAPS

There are two default code maps used with VEMCO coded tags, MAP-112 for 69 kHz and MAP-411 for 180 kHz. Three legacy maps (MAP-110, MAP-210, MAP-310) are also included, but should only be used if directed by Vemco Customer Support.  The current map definitions are listed in Table 5.2-1.

| TABLE 5.2-1: Current VEMCO Code Maps | | |
|---|---|---|
| **Map Name** | **Code Spaces[1]** | **Notes** |
| MAP-112 | A69-1105, A69-1206, A69-1303, A69-1601, A69-9001, A69-9002, A69-9003, A69-9004, A69-9005 | Default Map for 69 kHz Coded Tags |
| MAP-411 | A180-1701 | Default Map for 180 kHz Coded Tags |
| MAP-110 | A69-1008, A69-1105, A69-1206, A69-1303 | *Deprecated – use only if directed by Vemco* |
| MAP-210 | A69-1105, A69-1204, A69-1206, A69-1303 | *Deprecated – use only if directed by Vemco* |
| MAP-310 | A69-1105, A69-1107, A69-1206, A69-1303 | *Deprecated – use only if directed by Vemco* |

**IMPORTANT:**  VEMCO tag datasheets will contain a Code Space name which fully defines the tag parameters necessary for the receiver. Ensure that you select a Code Map that contains all the code spaces required for your tags.

---

[1] *Code Space is new nomenclature for VEMCO tag types. It has been introduced to remove ambiguity over tag parameters. VEMCO tag datasheets will contain a code space name.*

## 5.3 TROUBLESHOOTING

| PROBLEM | POSSIBLE SOLUTION |
|---------|-------------------|
| I connected my VR100 to the computer with the VR100HS software but my VR100 isn't listed in the *Receiver Control and Management Interface* window. | Try cycling power on VR100 receiver.<br><br>If the VR100 receiver is connected via a USB hub, disconnect and the reconnect the USB hub from the computer.<br><br>If you received your VR100 after March 2006, either new or upgraded, then you must use VR100HS software version 2.0 or higher for the software to communicate with the VR100. |
| I connected my VR100 to the computer with the VR100HS software but I get a message saying the software is not compatible. | You are running firmware on the VR100 receiver that is not compatible with the PC Software. Ensure that you are using the latest version of the PC Sofware.<br><br>*http://www.vemco.com/support/vr100_support.php*<br><br>If you received your VR100 before March 2006 and it hasn't been upgraded, then the VR100HS software version 2.0 or higher won't be able to communicate with the receiver. An older version of software must be used until the VR100 is sent to VEMCO for upgrade. |

## 5.4  GLOSSARY

**Blanking Interval:**  The Blanking Interval is the length of time (in milliseconds) after an acoustic signal has been received on a given channel in which the VR100 will ignore any subsequent signals on that same channel.  This is to eliminate the reception of echoes by the receiver.

**Channel:**  A channel in the VR100 is a group of configuration settings used to listen to VEMCO tags.  For example, a channel can be configured to listen for continuous pingers that operate at 60 kHz.  Another channel can be configured to listen for coded tags operating at 69 kHz. Up to eight channels can be monitored simultaneously.

**Code Map:**  A Code Map describes a collection of Code Spaces. When a receiver is configured with a particular Code Map, it can detect and decode all the types of transmitters in that map. See Table 5.2-1 for a list of supported maps. MAP-112 is the current default map for 69kHz transmitters and allows the VR100 to properly detect and decode all currently supported VEMCO Tags.

**Code Space:**  Code Space describes all the parameters that a receiver needs to properly decode each tag.  These parameters include the numbers of pulses, the coding technique, the length of the first interval etc. Tag specification sheets will always include a Code Space value. Users must ensure that they select a code map that contains the code space(s) of the tags they are detecting.

A69-1303 is an example of a valid Code Space label. The "A69" indicates an Acoustic Tag operating at a frequency of 69 kHz. The "1303" is a unique number that is understood by the receiver firmware to determine how to detect and decode the tags. The VR100 PC Software will report tag detections as **Code space-ID#** by default. It is important to note that a tag that transmits a Code space-ID#, e.g., A69-1303-2056, is a different transmitter then one with a label of A69-1206-2056. The ID codes are the same but the Code Space is different and uniquely identified by the VR100!

**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 a fixed or random delay.  The type and length of the delay is set at the time the tag is ordered and cannot 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.

**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.

# 6 INDEX