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Introduction

Welcome to the SonarWiz Fundamentals module. In this module, you will be introduced to the basic features and commands of SonarWiz by creating a sidescan project in a few easy steps. All you will need to get started is a working computer. We'll cover everything else as we go along.

In this module you will learn how to:

• download and install SonarWiz
• activate your SonarWiz license
• the basic SonarWiz user interface
• create a new project
• load basemaps and overlays
• import sonar data
• color your sonar data and add map decorations
• create a sonar mosaic

Download Demo Sidescan Data

The demo data can be downloaded here. Extract the data into any folder of your choice. For the purpose of this guide, we will assume that it is saved to the /Downloads/ folder of your system.
Download and Install SonarWiz

Required Time: 5 Minutes

Experience Level: Beginner

Instructions

1. Go to https://chesapeaketech.com/free-trial/ and follow the instructions to request a free trial of SonarWiz. You will be contacted by our sales team and provided with a trial license. If you have purchased SonarWiz, you will be provided with a physical dongle or credentials to activate.

2. Download the latest version of SonarWiz at https://chesapeaketech.com/download-sonarwiz/.

3. Once downloaded, run the setup program and follow the instructions.

4. Once the installation finished, SonarWiz will start and you will see the following dialog:
License Not Found

NO SONARWIZ LICENSE FILE, LICENSE KEY, OR VALID EVALUATION NUMBER WAS FOUND.

If you have a license key (dongle), please plug it into any USB port and restart the program.

If you have recently purchased Sonarwiz and have a LicenseID number, please run the CTI License manager utility to activate your license.

If you wish to request an Evaluation number, or have already received one, please press the button below.

OK - Enter Evaluation number  Exit program
Activating Your License

Required Time: 5 Minutes
Experience Level: Beginner

SonarWiz is commercial software and requires license activation or a physical key to unlock and run the software on your computer. There are currently four licensing options:

1. USB Dongle
2. Dongle-Free License (DFL)
3. Network Floating License
4. Evaluation License

The steps required to unlock SonarWiz are different depending on which license you have purchased and there are certain restrictions and limitations to each license type. Please see the following section for the license type you are activating.

Internet Access Requirements
Evaluation licenses and Dongle Free Licenses (DFL) both require internet access to Activate. An Evaluation license must maintain internet connection to CTI throughout the evaluation process. DFL licenses must be refreshed on the internet about once every 3 weeks and whenever the license is transferred to a new work station. USB Dongles do not ever require internet access.
Evaluation License

Evaluation Licenses are short term licenses provided to potential customers to verify that SonarWiz meets your requirements before purchase. Evaluation Licenses are restricted to office functionality and cannot be used for data collection.

Internet Access Requirements
Evaluation Licenses require constant internet access to remain activate.

Instructions

1. Launch SonarWiz from the **Window Start Menu**. SonarWiz will search for a license and not find one. **Click the OK - Evaluation number** button.

2. **Enter** the Evaluation Code provided to you by CTI and click the **Begin Evaluation** button.
Evaluation License

If the Evaluation License activation is successful, SonarWiz will open:
USB Dongle License

USB Dongles are a physical USB device (key) which must be inserted into the computer on which SonarWiz will run. There is no activation process for USB Dongles and no internet connection is ever required to use SonarWiz with a USB Dongle. The major limitation to USB Dongles is that if the key is ever lost or stolen CTI will not replace the license. Damaged USB dongles must be returned to CTI for replacement for a fee. In short, treat USB Dongles like valuable property and purchase insurance to protect against loss, theft or damage.

Instructions

1. To activate SonarWiz with a USB Dongle, insert the dongle into your computer.
2. Launch SonarWiz. If the dongle is properly detected, SonarWiz will open:
Dongle-Free License (DFL)

A Dongle-Free License (DLF) is a software lock that has many advantages over physical USB dongles. A DFL license cannot be lost or damaged and transferring a DFL license between machines requires only an internet connection. They are an excellent choice for most survey companies so long as the SonarWiz computer has periodic access to the internet to refresh and transfer the license.

Internet Access Requirements
Dongle Free Licenses (DFL) require internet access to Activate and DeActivate. DFLs are designed to go offline for short duration surveys, but they do require periodic access to the internet to refresh their license or they will time out.

Instructions

1. To Activate a Dongle Free License (DFL). Run the CTI License Manager utility program from the Window Start Menu. Click the Activate button
Click to Accept the privacy notice.
3 Enter the **License ID** and **License Key** code provided to you by the CTI Sales office when you purchased your license. Click the OK button to continue.

4 If Activation is successful, you will see a message in the Manager window saying: "License activation successful...." Click OK to close the CTI License Manager.
SonarWiz should now open from the Start Menu:
Dongle-Free License (DFL)
Network License

Network licenses provide a bank of floating licenses to an organization over their LAN. Installing a Network Dongle is beyond the scope of this guide and is described in the Network Dongle Reference guide available from CTI Support.
The SonarWiz User Interface

**Required Time:** 5 Minutes

**Experience Level:** Beginner

The SonarWiz screen consists of a main window, menus, toolbars, and docking areas for optional windows. The main window, known as the Map Window, is used for the display of georeferenced data. Basemap images and survey lines may be added to the map display to provide visual reference. For more detailed information about working with the SonarWiz windows see the Users Guide sections Screen Anatomy and Docking Windows.

The Command Ribbon is a collection of useful buttons and controls divided into 7 pages or tabs. The tabs are organized by the task you are performing such as Data Acquisition or Post Processing. Most of the functionality of SonarWiz can be accessed directly from the command ribbon. Note that some tabs may not be present if you do not have the required license for those commands.
The SonarWiz User Interface

2 **Map Toolbar**

The **Mapping Toolbar** provides basic controls for manipulating the Map Display including pan and zoom functions, selection tools and controls for plotting contacts and features on the map.

3 **Project Explorer**

The **Project Explorer** lists every object loaded into a SonarWiz project and groups them according to object type. You can enable or disable objects here, and by right-clicking objects, access the object-specific context menus that provide actions that you can perform on these objects.

4 **Properties Window**

When an object is selected in the Project Explorer, the **Properties Window** displays detailed information about the selected object. Many properties such as the color pallet of an object can be manipulated directly in the dialog.

5 **Color Window**
The SonarWiz User Interface

The Color Window controls the color palette display for global data types such as sidescan, bathymetry and sub-bottom displays.

Output Message Log

The Output Message Log window displays ongoing status information generated by SonarWiz as it runs. The complete log can be opened from the Tools Menu.

Status Bar

The connection status area of the Status Bar indicates the up or down status of real-time navigation and sonar connections. It also provides a direct link to the CTI Support site and a refresh command to redraw the screen.

Main Map Display
The main display window provides an interactive 2D map view of all of the sonar data loaded into the project along with any basemaps, features, contacts and map decorations selected for display.
Creating a New Project

In this section, we will create a new project. A **SonarWiz Project** is the container or context in which all data collection and post processing is performed. Physically, it is a collection of folders and files on the hard disk. Together, these folders and files store the settings and parameters for the projects (e.g. the geographic location and coordinate system) as well as the processed sonar data and other ancillary data such as targets, digitized features and reports. All project files and folders are located under a root folder – **the Project folder**.

Download Demo Sidescan Data

The demo data can be downloaded here **SonarWiz Demo Data**. Extract the data into any folder of your choice. For the purpose of this guide, we will assume that it is saved to the /Downloads/ folder of your system.

Instructions

1. **Launch** SonarWiz
2. Click the **New Project Icon** in the upper left corner of the screen

![New Project Icon in SonarWiz](image)

3. In the **Create New Project...** window:
Creating a New Project

Enter the **Project Name** and **Project Folder** as *Sidescan_Demo*

Note it is important that the Project Folder be empty. If the Project Folder does not yet exist, SonarWiz will create it for you automatically.

4. Enter the **Approximate Project Position**. If you know the latitude and longitude, enter it in the boxes provided. Otherwise, you can use the **Get From File** button and select one of your sonar files. SonarWiz will open the file and search for a good position to use and fill in the latitude and longitude for you.
The Approximate Project Position is only used to suggest an appropriate coordinate system for the project, an approximate position is good enough.

Select the **Coordinate Source**.

Sidescan, Sub-bottom and Magnetometer sensors are typically towed behind the vessel. Depending on the configuration of the acquisition system and the data fields available in the data record, a sonar file may contain position values for both the ship and the tow fish. The demonstration files we are working with contain only ship position information, so we select **Always Use Ship Position**.
Set the **Time Constant for Course Smoothing**.

Towed sidescan and sub-bottom profilers typically do not have high precision navigation systems on board and usually benefit from automatic filtering and interpolation of the navigation track. The default value of 300 pings works well in open water, values down to 3 can be used for pole mounted systems. Entering a value of 0 turns filtering and interpolation off. Accept the default value of 300.
Select a **Coordinate System** for the project.

Check the box next to **Automatically Select Coordinate System**. SonarWiz will automatically select the coordinate system for the project based on the Approximate Project Position information you entered above. You can override the default coordinate system by unchecking the Automatically Select Coordinate System box and clicking the **Browse Coordinate System** button.
Click **OK** to create the Project
SonarWiz provides the ability to display multiple reference maps and images in the main view in addition to the sonar mosaic. These maps can be used to provide a visual reference during and after a survey, and also to enhance the quality of the data prior to incorporation into reports and presentations. A Basemap is typically a nautical chart or bathymetry Digital Elevation Model (DEM). Basemaps go under (behind) the sonar data display layer. Overlays are usually vector layers (lines and polygons) that are typically presented over (on top of) the sonar data display layer.

For More Information
SonarWiz supports hundreds of map formats for display in the program. Read more about Basemaps and Overlays in the User Guide.
Click on the **Maps tab** in the Ribbon Command Menu.

Click the **Add Basemap** icon if you want to add a map layer behind the sonar data; Click the **Add Overlay** icon if you would like to add a map layer on top of the sonar data.

Select the Image or Layer you want to load.

If the data layer contains coordinate system information in a format that SonarWiz understands, the data will reprojected (if necessary) and imported into the current project automatically. You may be asked to identify the coordinate system of the data if the type does not contain this information.

Your map layer should appear in the Maps branch of the **Project Explorer**.
Importing Sonar Data

Required Time: 10 Minutes

Experience Level: Beginner

SonarWiz currently supports 6 major data types: Sidescan, Sub-Bottom, Magnetometer, Bathymetry, Laser Scanners, and Single Beam Bathymetry. Each of these data types is licensed separately and you will only be able to import data types for which you are currently licensed. Regardless of the data type, the Import... command found on the Post Processing tab of the Command Ribbon is used to import the raw data sets into SonarWiz. The import process reads the native sonar files and converts them into SonarWiz format. If the import process is successful, the files are stored in the SonarWiz project folder. Your original sonar files are never modified.

Instructions

1. Select Post Processing | Import | Sidescan Files...

2. Navigate to the XTF folder in the \Sidescan\Klein3000+MAG-SanFranciscoBay\ data set and select all the files:
### Importing Sonar Data

Select **Channels 1 and 2** for import.
Double-check that the import Geodesy settings for these files is **UTM-WGS 1984, Zone 10 North, Meter.**
The import geodesy setting is used to convert the raw sonar navigation data into the current project—reprojecting the data if necessary. The default assumes the raw sonar data is in the same coordinate system as the project.

Click **Open** to import the files. The importing dialog will indicate progress as SonarWiz imports the data into your project.
If there are any errors importing data into the program, look at the Output Message Log found at the bottom of the SonarWiz main window. This will usually tell you what the problem is.

Your sidedscan files should display in the main window and you will see each file listed in the Project Explorer.
Importing Sonar Data
SonarWiz gives you control over how your data is displayed. Choose the colors that best suite your sonar data and add map decorations like a map scale and a graticule to turn your mosaic into a proper map.

Instructions

1. Display the **Color window** by clicking on the Color window icon in the Mapping toolbar:

2. In the Color window, set the data type to **Sidescan (ch. 1 and 2)**. Then pick a color palette Palette Options drop down that suites your data.

3. Add a map scale by toggling the Map Scale check box in the **View menu**.
Click **View | SSS Overlap Mode | Average** to blend the edges of overlapping sonar data sets together.

Click the **Fit View to Sonar** button in the **Mapping toolbar** to expand the view to completely display your all of your sonar data sets.

Your sonar mosaic should now look something like this:

You are ready to export the mosaic.
Exporting a Mosaic

**Required Time:** 5 Minutes

**Experience Level:** Beginner

The data mosaic is one of the most important products you create from a sonar survey. SonarWiz makes it easy to export your data mosaic into a variety of georeferenced formats such as GeoTiffs and GeoJPEGs. When creating a mosaic in SonarWiz, whatever is displayed in the Main Display will be exported. So, you should adjust the Main display to look exactly like you want the mosaic to look before you create your export. This includes zooming into the area you want to export and turning on and basemaps and map decorations you want to export with the image.

**Instructions**

1. Set up the Main Display exactly how you want it to look in the exported image.
2. Select **Post Processing | Export | Save Project As Geolmage** to open the Save As Image File dialog.
Exporting a Mosaic

- Note the **Name and Location** of the GeoTiff export.
- Set the **Output Color Resolution** to 32-bit
- Specify the **Image Resolution** as 1.0 Meters/pixel.

Click the OK button to start the image export
Select **Tools | Open Project Folder** to open the project folder in Windows File Explorer. You’ll find the new image in the GeoTiff folder of your project.
Along with the exported image (Sidescan_Demo.tif in this case) you will also find a number of sidecar files that are useful in various applications such as the world file (TFW) and the map projection file (PRJ).
Congratulations! You've taken your first steps to learning SonarWiz. The SonarWiz User Guide contains detailed information about each of the commands used in this module. Visit www.chesapeakeitech.com for additional training modules and webinars.

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