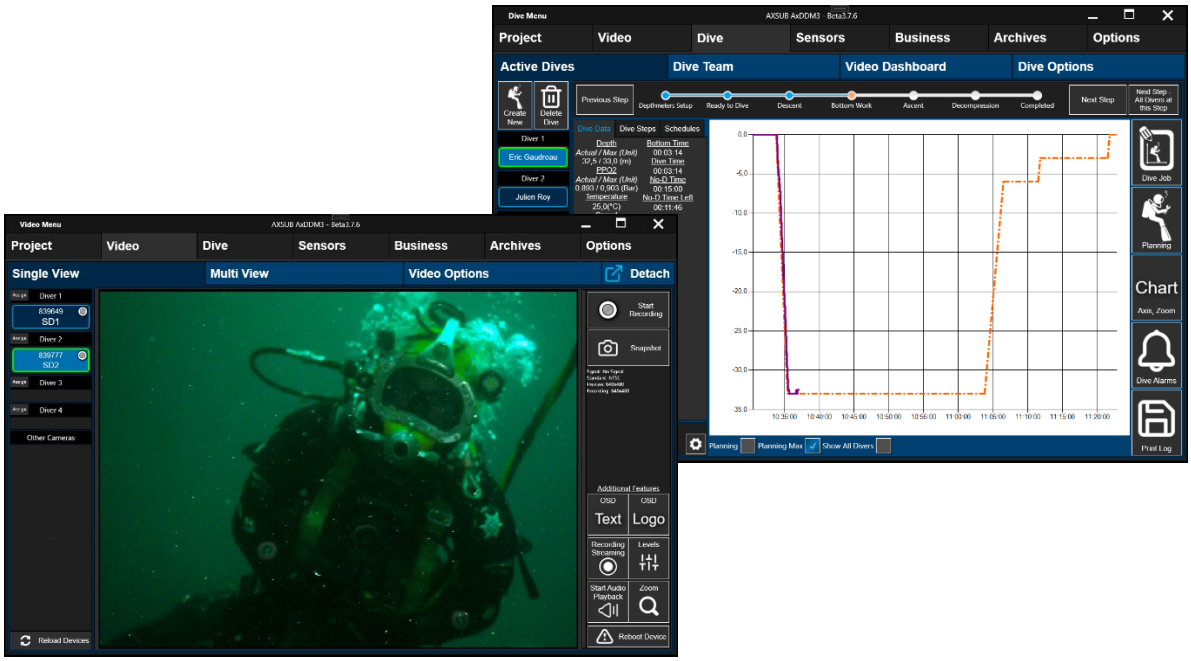
AxDDM3 - Diving Data Management Software for AxVIEW Subsea Video & Depth Recording Systems

Instruction Manual

Version 1.2

November 2024



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Only dive supervisors trained in the proper use of surface supplied diving equipment should use this software. This software is intended to work alongside an AxVIEW dive system from AXSUB and should not be used for any other purpose. No computer can replace the need for proper Supervisory and Diver training. Insufficient or improper training may cause divers to commit errors that may lead to serious injury or death. Always perform backcheck of a dive schedule from the dive manual before committing to a dive schedule computed by the software. Always use paper copy and manual tables as a backup.

Due to continuous product development, AXSUB Inc. reserves the right to change specifications without notice.

This document applies to AxDDM Software Version Beta 3.7.6 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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WARNING!

READ THIS MANUAL CAREFULLY! Read this instruction manual in its entirety paying close attention to ALL WARNINGS listed below. Make sure that you fully understand the use, displays and limitations of the digital video recorder and dive computer because any confusion resulting from neglecting to follow this instruction manual or from improper use of this device may cause a diver to commit errors that may lead to serious injury or death.

FOR PROFESSIONAL USE! AXSUB Dive Data Management (AxDDM) Software and LED Controller & Camera Viewer (AxVIEW) are intended for professional use only. Commercial or professional diving activities may expose the diver to depths and conditions that tend to increase the risk of decompression illness (DCI). Therefore, AXSUB strongly recommends that the diving supervisor use these devices in redundancy with their conventional method as a back-up solution (dive profile & decompression module).

ONLY DIVERS TRAINED IN THE PROPER USE OF Surface Supplied DIVING EQUIPMENT SHOULD USE THE AxVIEW! No computer can replace the need for proper Supervisory and Diver training. Insufficient or improper training may cause divers to commit errors that may lead to serious injury or death.

THERE IS ALWAYS A RISK OF DECOMPRESSION ILLNESS (DCI) FOR ANY DIVE PROFILE EVEN IF YOU FOLLOW THE DIVE PLAN PRESCRIBED BY DIVE TABLES OR A DIVE COMPUTER. NO PROCEDURE, DIVE COMPUTER OR DIVE TABLE WILL PREVENT THE POSSIBILITY OF DCI! An individual's physiological make up can vary from day to day. The AxDDM software cannot account for these variations. You are strongly advised to remain well within the exposure limits provided by the instrument to minimize the risk of DCI. As an added measure of safety, you should consult a physician regarding your fitness before diving.

USE BACK-UP INSTRUMENTS! Make sure that you use back-up instrumentation including a pneumo gauge, submersible pressure gauge, timer or watch, and have access to decompression tables whenever diving with the Dive Profile and Decompression modules with the AxDDM software.

PERFORM PRE-CHECKS! Always activate and conduct a functionality check of the device before diving in to ensure the pressure sensor reads atmospheric pressure, that the display works adequately and that the sensor is secured to the diver's harness. We recommend using one battery pack (Product No. 011001 – B05Ah-24VDC) per diver connected to the AxVIEW system to enable the UPS battery back-up of the system or one or high-capacity battery pack (001003 – B15Ah-24VDC). This will prevent shut down of the underwater light, computer rebooting and/or video loss (if applicable) in case a Main Power Supply shut down or voltage drop.

Although the AxVIEW systems does not count down the NO-FLYING TIME, ALWAYS REFER TO YOUR COMPANY PROCEDURES AND METHODS or follow your diving table procedures. There can never be a flying after diving rule that is guaranteed to completely prevent decompression illness!

DO NOT DIVE AT ALTITUDES GREATER THAN 300m WITH THE AxVIEW UNLESS IT IS EQUIPPED WITH ALTITUDE DIVING TABLES, Diving at altitude without compensation of the Actual and Decompression Stages Depth can increase the risk of DCI.

ALWAYS REFER TO YOUR COMPANY PROCEDURES AND METHODS! The Diving Data Management (AxDDM) Software and the AxVIEW System are intended to be a working tool for the commercial diving supervisor to crosscheck information and log information that can be referred to later. You must always maintain and keep the paper system & external stopwatch to control the dive in case of technical problems with the device and/or sensors.

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1. Safety Precautions

Do not attempt to use the AxVIEW system or AxDDM software without reading this instruction manual in its entirety, including all the warnings. Make sure that you fully understand the use, displays and limitations of the tools provided. If you have any questions about the manual or the dive computer, contact your AXSUB dealer before diving with the dive computer.

Always remember that YOU ARE RESPONSIBLE FOR THE SAFETY OF YOUR DIVES! When used properly, the AxVIEW system and AxDDM software are outstanding tool for assisting properly trained, certified divers in planning and executing commercial dives. It is NOT A SUBSTITUTE FOR CERTIFIED DIVING SUPERVISOR INSTRUCTION, including training in the principles of decompression.

1.1 Software Limitations

While the software is based on current decompression research and technology, you must realize that the software cannot monitor the actual physiological functions of an individual diver. All decompression schedules currently known to the authors, including the US Navy, DCIEM and MT92 Tables, are based on theoretical mathematical models, which are intended to serve as guidelines to reduce the probability of decompression illness.

2. Software Requirements

Supported Operating Systems:

- Windows 10 Enterprise LTSC, 64-bit (highly recommended)
  Long-term support channel that ensures 5- or 10-year of security updates, less likely to experience functionality breakdowns due to disruptive updates
- Windows 10, 32-bit/64-bit (all other editions)
- Windows 11, 64-bit
- Other operating systems might work but are not officially supported by AXSUB

Software Dependencies:

- Microsoft .NET Framework 4.8 (installed by default with Windows 10, otherwise available on Microsoft website)

Software Installation Procedure:

1. IMPORTANT: Before installation, unplug any AxVIEW or other AXSUB device (USB cables) from your computer, or it may lead to improper installation of the video encoder drivers.
2. Once equipment is unplugged, turn the equipment off to finish the power cycle.
3. At this point, you can launch the AxDDM3 installer.
4. Follow the steps on screen until installation is completed. Note that during the process, setups for Sensoray's video drivers and FTDI CDM communication drivers will start automatically. You must install those components for the software to work properly.
5. Once the installation is completed, turn on your AxVIEW system(s) and plug the USB, wait for drivers to load, and you are now ready to launch the AxDDM3 software.

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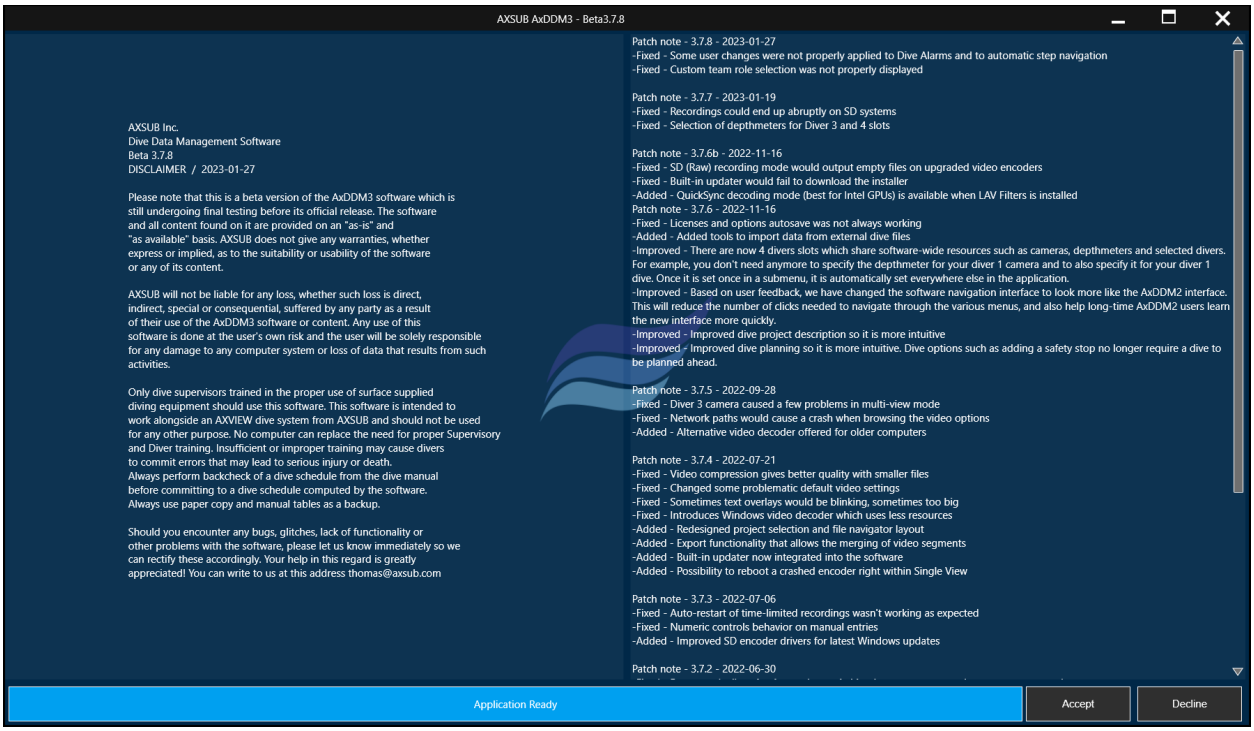
3. Getting Started

When you start the AxDDM3 software for the first time, the following steps should be followed to properly prepare for your dives.

1. Navigating around for the first time
2. Registering the software
3. Configuring the depthmeters of the smart cameras
4. Filling business data about your company and its employees (divers, supervisors, tenders, etc.)
5. Creating a new project
6. Completing the project description



When you launch the AxDDM3 software, the loading page is the first page to show up. In the left column, you can look at all the latest additions to the software, bug fixes and the changes brought since the last update. The right column shows the software disclaimer; MAKE SURE THAT YOU FULLY UNDERSTAND THE LIMITATIONS OF THE SOFTWARE BEFORE USING IT. Once all drivers and data necessary to run the software have been loaded, and once you have read and approved the Software Disclaimer, you can click on the *Accept* button to open the Main Menu.

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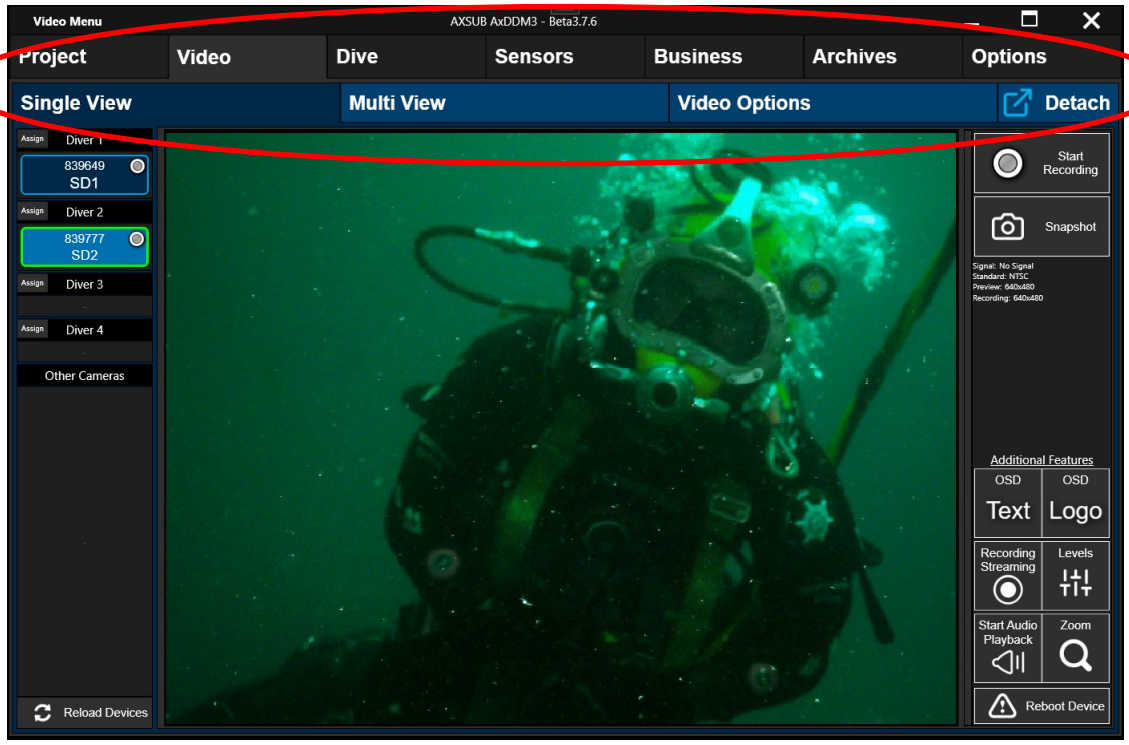
3.1 Navigation



Navigation in the software is performed by using the menu bar at the top of the screen. The topmost bar with the grey buttons is used to switch between the main menus. The colored menu bar underneath is used to switch between the submenus.

The main menus in the software are:

1. **Project Menu**. This menu is used to manage folders and files created by the software (videos, screenshots, etc.) and to give a description of your project to fill your divelogs
2. **Video Menu.** This menu is used to view video feed from cameras, start recordings, take snapshots, configure on screen displays, etc.
3. **Dive Menu.** This menu is used to create and perform dives and to manage your current dive team.
4. **Sensors Menu.** This menu is used to configure depthmeters for dive and for video overlays. A datalogger tool to store data from sensors is also available.
5. **Business Menu.** This menu is used to manage collections of your employees, clients and job sites.
6. **Archives Menu.** This menu is used to view previously performed dives, export dive data and show dive stats.
7. **Options Menu.** This menu is used to configure general settings of the software and to register licenses.

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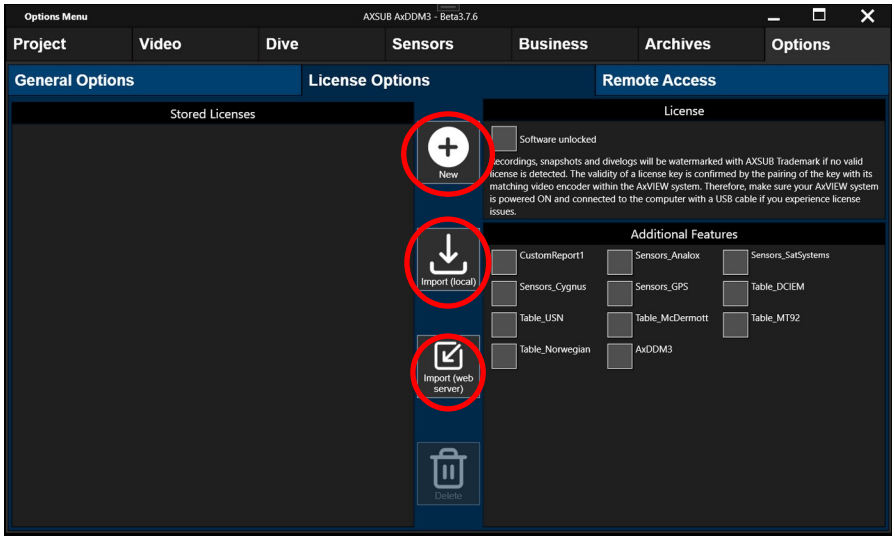
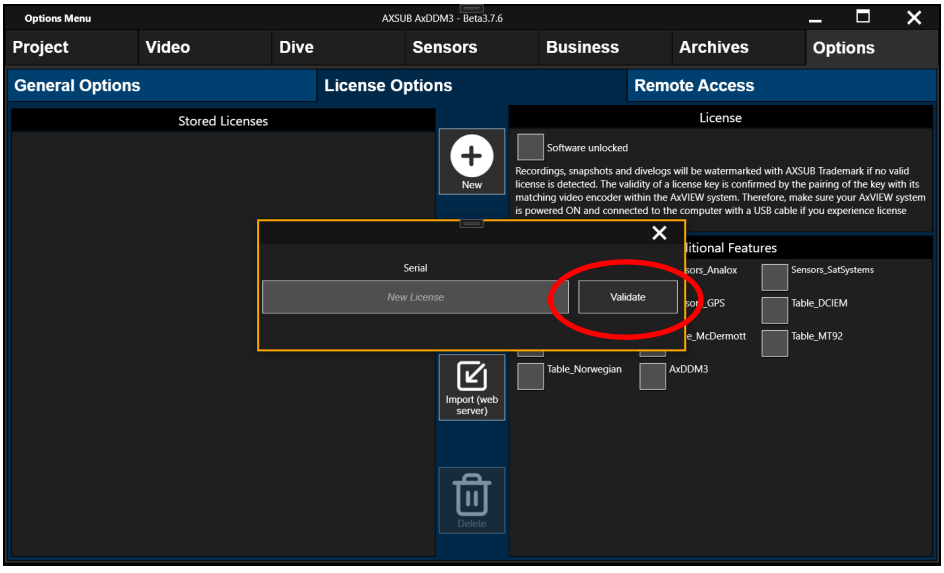
3.2 Registration



When you are in the *License Options* submenu, there are 3 ways to add a new license to the software. The first way is by manually entering the key using the *New* button. You can either type the key or cut/paste it in the designated field. To manually save a license and apply it to the software, it must first be validated by clicking on the *Validate* button. If the license is valid, it will be added to you license collection in the software.



The second way is to use *Import (local)* button to browse your computer for an AXSUB License File (*.axl) or a text file (.txt) containing one license key per row. These files may be provided on a USB stick when you purchase a system or downloaded from the licensing section of AXSUB's website at axsub.com/licenses. The third option is to use the *Import (web server)* button to try to automatically connect to and retrieve keys directly from AXSUB's web server.

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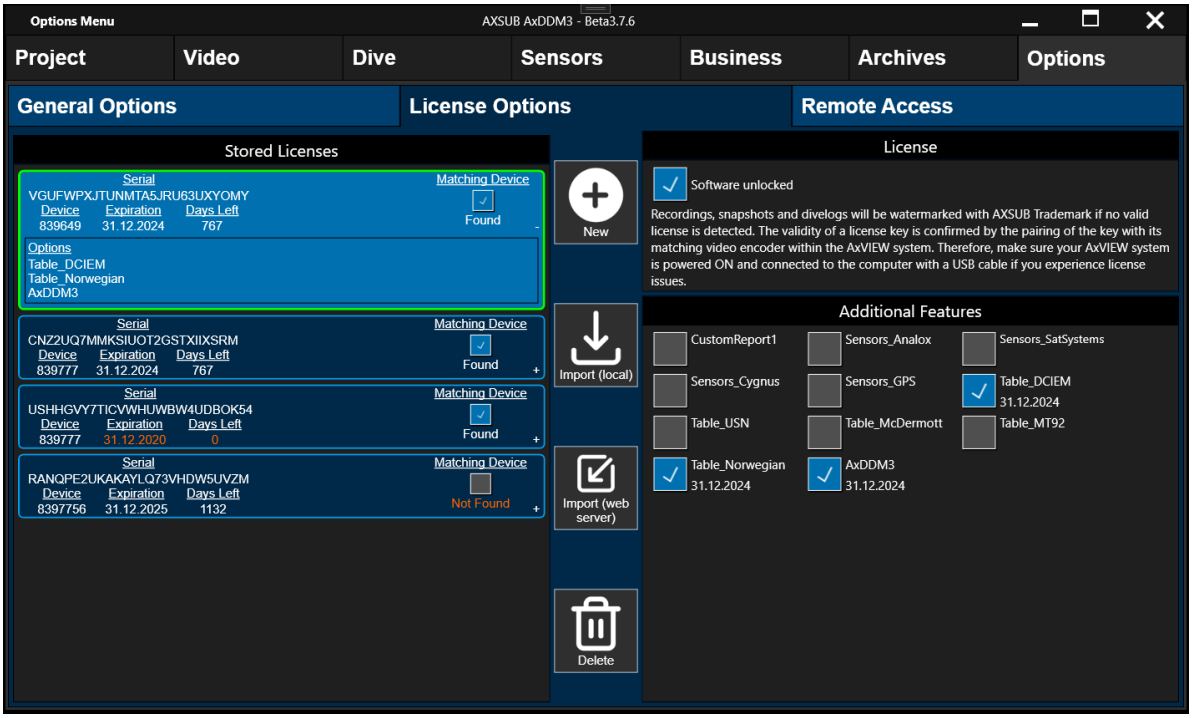

You can see all your saved licenses in the *Stored Licenses* panel. You can click on each individual license to show its unlocked options. **Note that each license is linked to a specific AxVIEW system, and that the system MUST be connected to the computer running the software to unlock the features.** When the corresponding hardware is detected and the license is applied, the *Matching Device* checkbox is checked. Licenses also have a specific lifetime and you can see how many days remain until the license is expired.

You can see the combination of all your licenses in the *Additional Features* panel. If a feature is unlocked by multiple licenses, the farthest expiration date will be applied.

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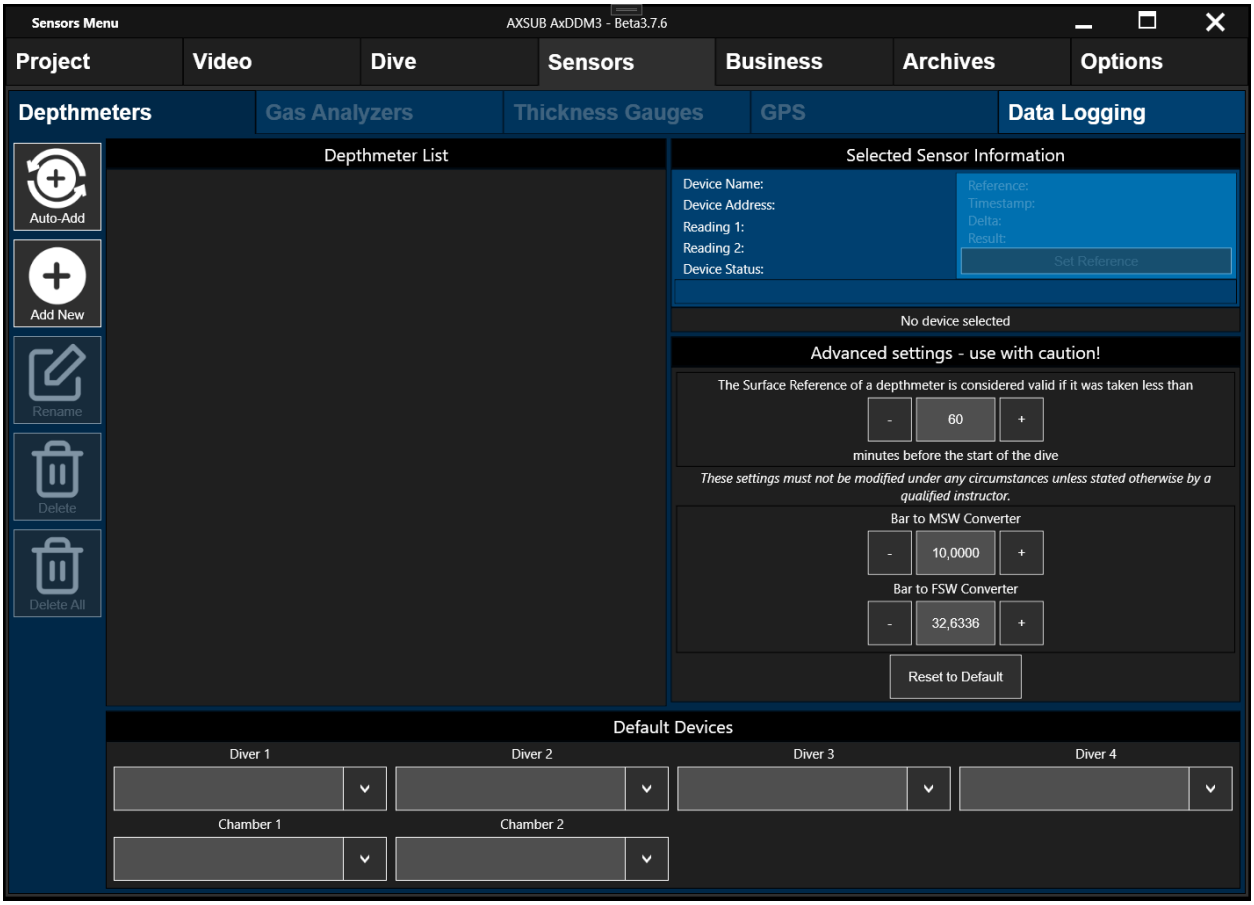
3.3 Configuration of the Depthmeters

When the software is registered, the next step should be to configure the depthmeters if your are going to monitor your dives using AXSUB SMART Cameras or AxDEPTH sensors. In order to do so, head to the *Sensors* menu, and enter the *Depthmeters* submenu.



There are two ways to add new depthmeters to the software. The first one is to use the *Auto-Add* dialog. This will automatically search for matching devices on connected AxVIEW systems. **Note that the cameras and/or depth sensors must be connected to a powered on AxVIEW to be detected.** A message box will show up to indicate the quantity of newly identified devices added. You can also add new depthmeters by clicking the *Add New* button and manually providing their communication address. In the case of AXSUB SMART Cameras, the address is composed of the last two digits of the camera's serial number. For example, if the serial is "XXX-XX05", the address will be "05".

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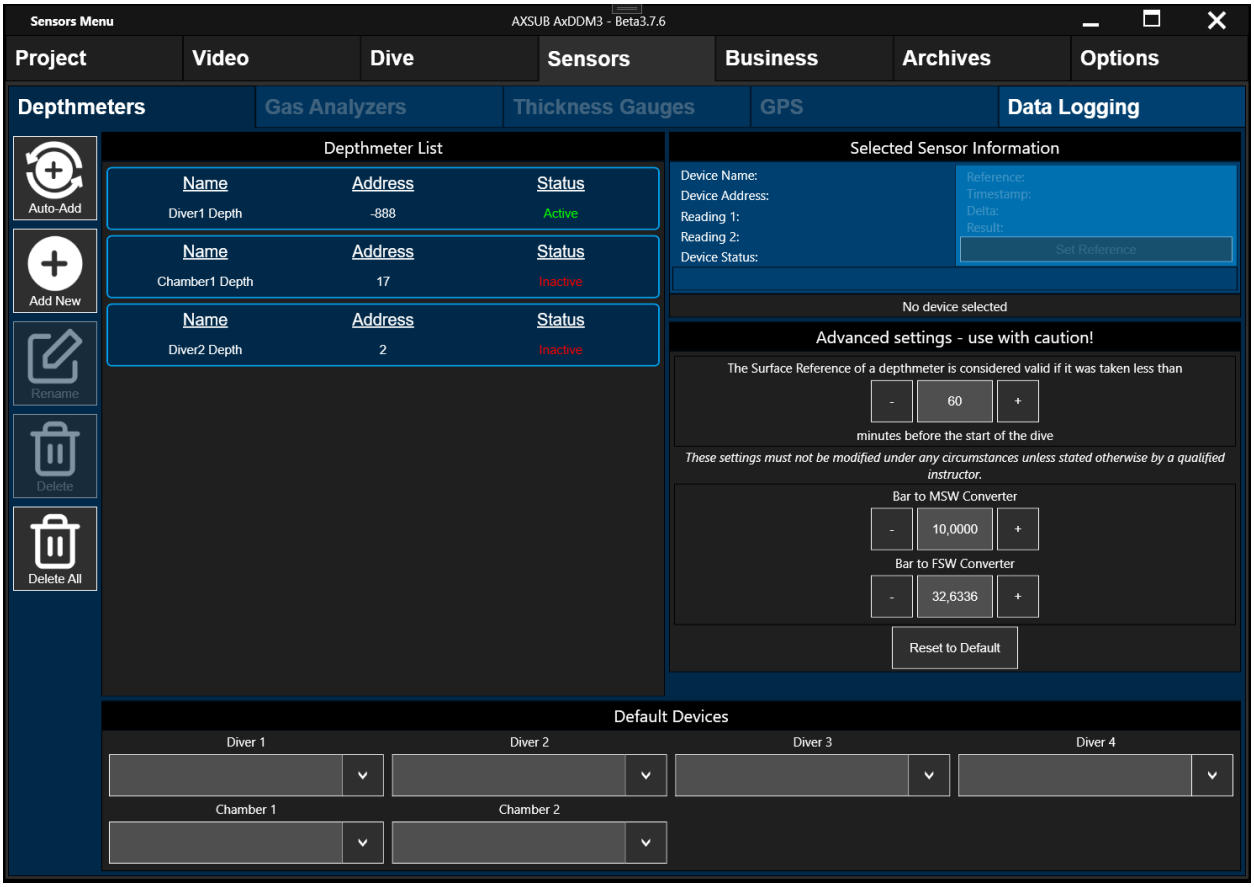

Stored devices will appear in the *Depthmeter List* panel. If the status is displayed as *Inactive*, it means the application is unable to communicate with the sensor. It could be that the AxVIEW system or the SMART Camera is not powered, that a link is missing between the AxVIEW system and the computer or else. Please verify your hardware setup before continuing.

You can select a device by clicking on it in the list. Selected device will have a colored highlight background, and they can be edited, deleted or configured. Editing a device will allow you to change its name, making it easier to remember which device is assigned where.

Depthmeters used in AXSUB systems measure depth by looking at the differential pressure between surface and water depth. **Make sure to read the surface pressure before each dive to have meaningful readings.** There are many pages in the software to allows to make surface measurements, and the *Depthmeters* submenu is one of those pages. To read the surface reference value of a device, it must first be active (the device is powered on and detected by the software). Every second, the software will poll data from the sensors and it will try to reconnect to lost or inactive devices every 5 seconds.

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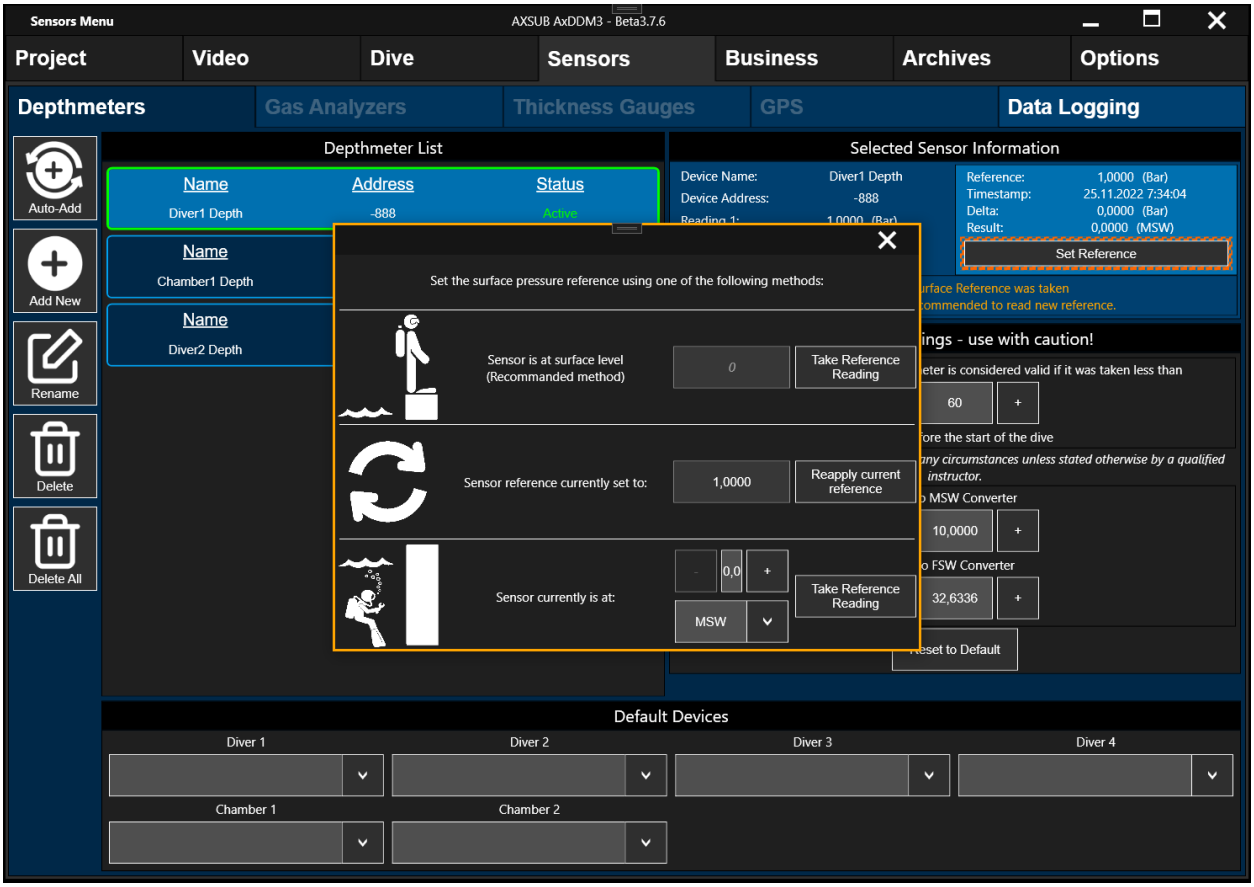

When a device is active and selected, you can see the reference status. This means you can see the absolute value of the reference, the differential value, the actual depth measurement, and the timestamp of the reference. Warnings will be showed if the reference timestamp is greater than one (1) hour, greater than twenty-four (24) hours, or if there is no reference at all. You can set the surface reference by clicking on the *Set Reference* button. When you click on the button, a popup window will appear and guide you in taking a new reference value.

- If the diver is at surface level, you can click directly on the *Read reference from surface* button, and the software will save the current state of the depthmeter as the surface reference value.
- If the diver is not at surface level, you can click on the *Reapply current reference* if there was no change in atmospheric pressure at surface since the last reference reading.
- If the diver is not at surface level but you have another reliable way to know the diver's actual depth, you can use the third option and the AxDDM3 software will interpolate the surface reference from this value. **Use this feature with extreme caution and as a last resort, it is much more reliable to surface the diver and take a reference reading directly from surface level.**

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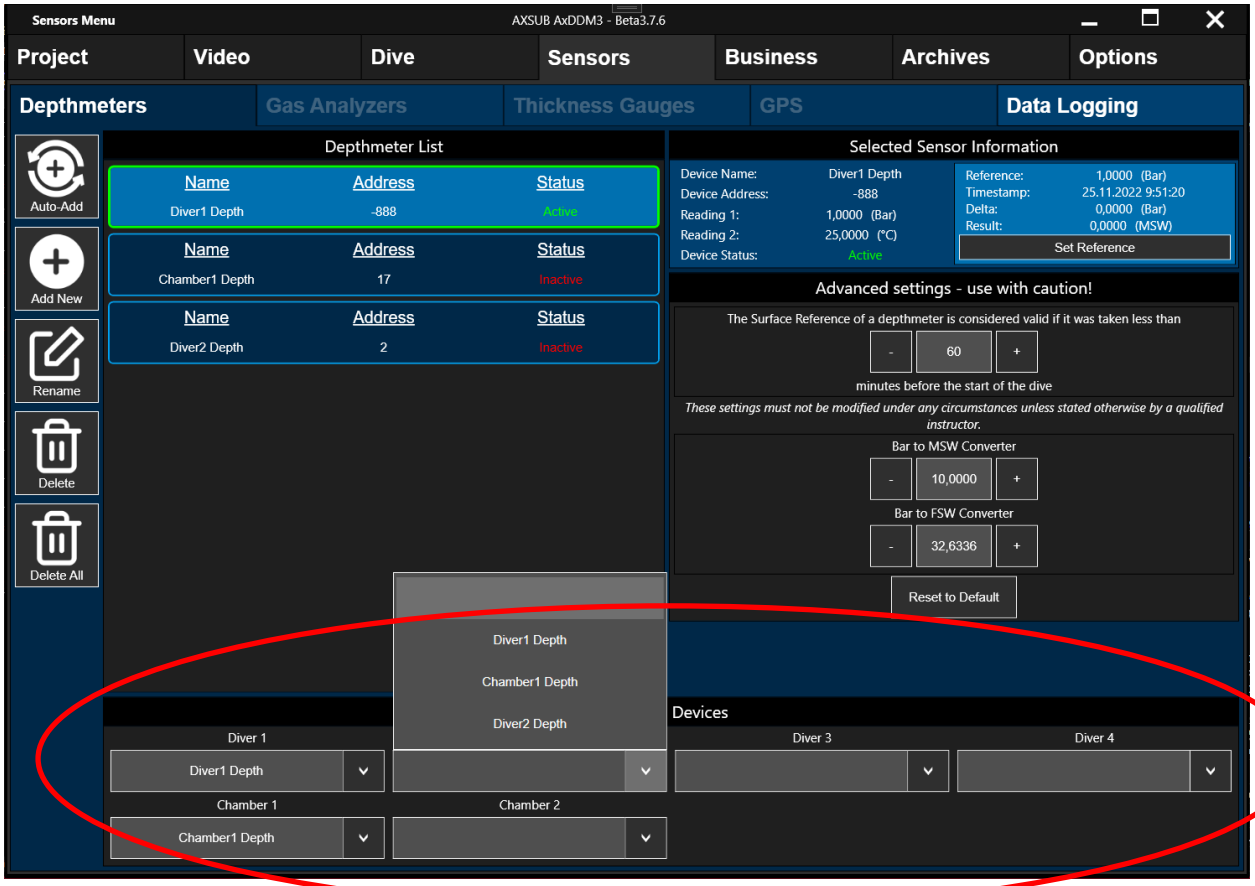

The last thing to do in the *Depthmeters* submenu to get started is to fill the *Default Devices* panel. When a device is attributed to a diver slot, it will be applied by default to this diver when creating a new dive. It will also be the device displayed on the text overlay of the video feed for this diver slot.

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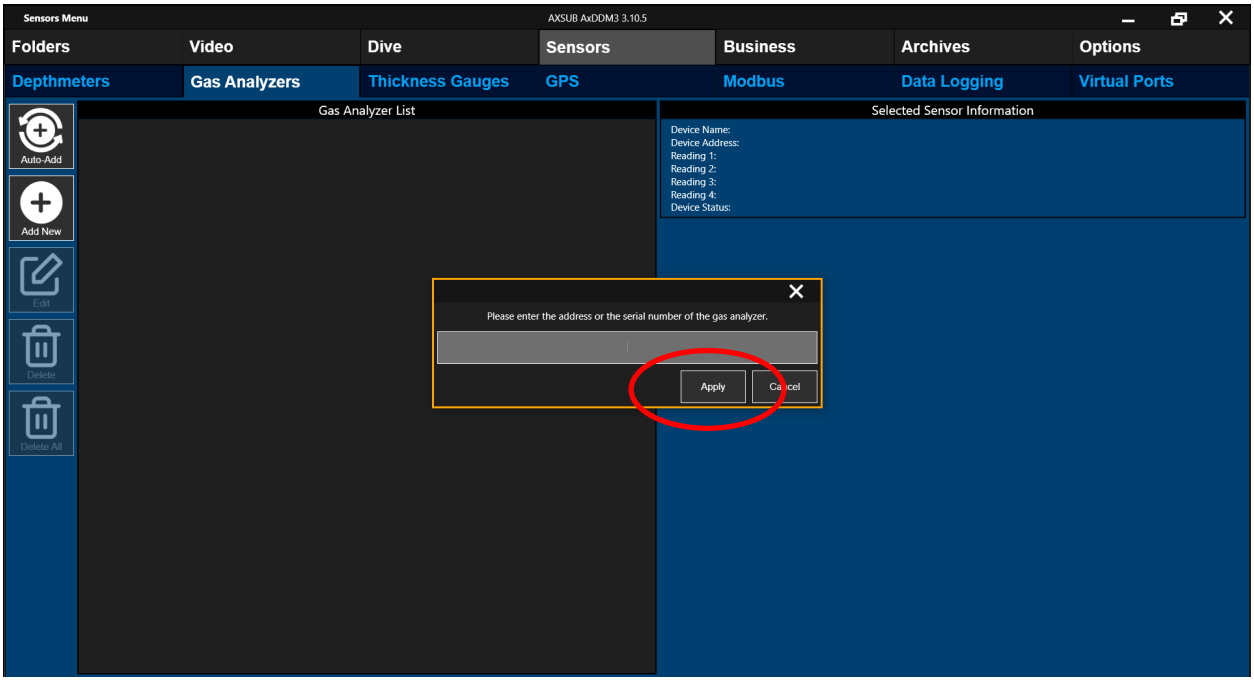
3.4 Configuration of the Gas Analyzers

The supported devices for the *Gas Analyzers* section are from Analox and Sat Systems. In both cases, you can click on *Auto-Add* to automatically search for all the compatible devices, using the RS-485 standard to communicate or Ethernet for the Analox SDA series as they are discovered, when connected to the same local network. See the appropriate sub-section to manually add each device.



3.4.1 Sat Systems

To add a new gas analyzer from Sat Systems, you need to enter the address configured for the device to connect. The address will range between 1 and 255. Once the device is added and active, it will automatically display the readings from the sensor in the information section.

3.4.2 Analox

To add a new gas analyzer from Analox, you need to enter the serial number of the device to pair. The device needs to be connected using a serial adapter that supports RS-485 signaling or an Ethernet connection.

When accessed using the network, the computer and the device need to be on the same subnet to ensure the same local broadcast address will be used for discovery. Associated ports must be left to TCP 900 and UDP 900 if they already are the default settings. These network parameters can be adjusted directly on the device, please refer to the manual provided with your equipement for more details.

Consider using the Ethernet interface instead of the RS-485 port if you use and depend on a SDA Output Module. When such a peripheral is detected by the display unit, the communication protocol will switch to a proprietary standard that is unsupported by AxDDM3 and for which the data is sufficient to serve the only purpose of driving relays and analog outputs.

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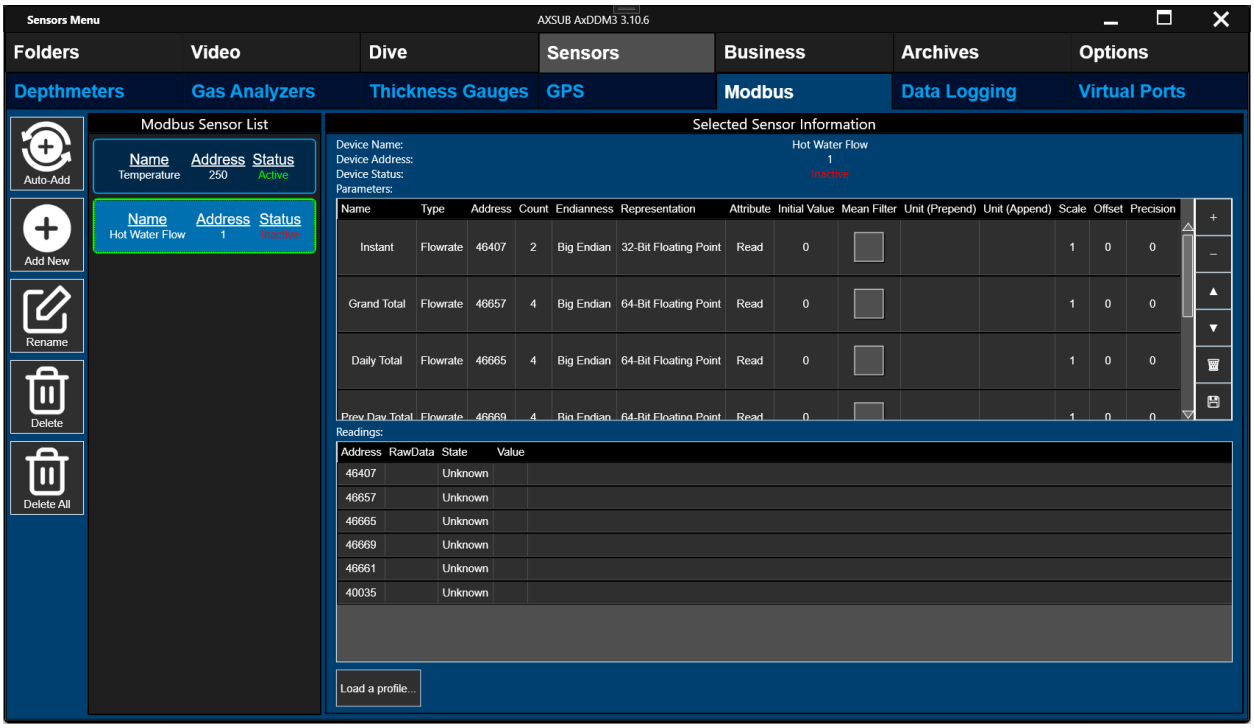
3.5 Configuration of the Modbus Sensors

Starting with AxDDM 3.10.x, an optional software module turns your diver station into a Modbus RTU master hub is now available. It possesses a list of known sensors at their given address and relies on a specific set of parameters proper for each. The *Readings* end up in the data logging charts or as OSDs.



The *Parameters* table takes a list of register address ranges to initialize, read and write to. They have a *Name* attribute that is used to facilitate the identification of a parameter internally and *Type* to logically regroup the values.

Count represents the number of registers needed to produce a symbolic value single bits or 16-bit words depending on the address type) and it usually goes alongside the *Representation*. It is almost always provided by the manufacturer in a datasheet for the given product. *Initial Value* accepts up to a 64-bit unsigned value to be written at the connection of the device, but will strip the leftmost most significant bits if required to match the selected representation.

Prepend and *Append Unit* can be used to add a label to an incoming reading or specify a measuring unit that goes in front and/or behind a numeric value. *Scale* and *Offset* are the multiplier and adder variables of an affine function and they can take floating point numbers. **If unused, they must be left at the respective values of 1 and 0.** A temperature sensor that reads Kelvin in the form of a 1000x signed integer would take a scale factor of 0.001 and an offset of -273.15 to output Celsius degrees. *Precision* keeps a certain number of decimals in the final result which we recommend to set at 3 in most cases.

Finally, the *Load a profile…* button allows loading pre-configured sensor profiles for devices we have tested and validated for use in AxDDM3. Latest profiles are available on our website at AXSUB.com.

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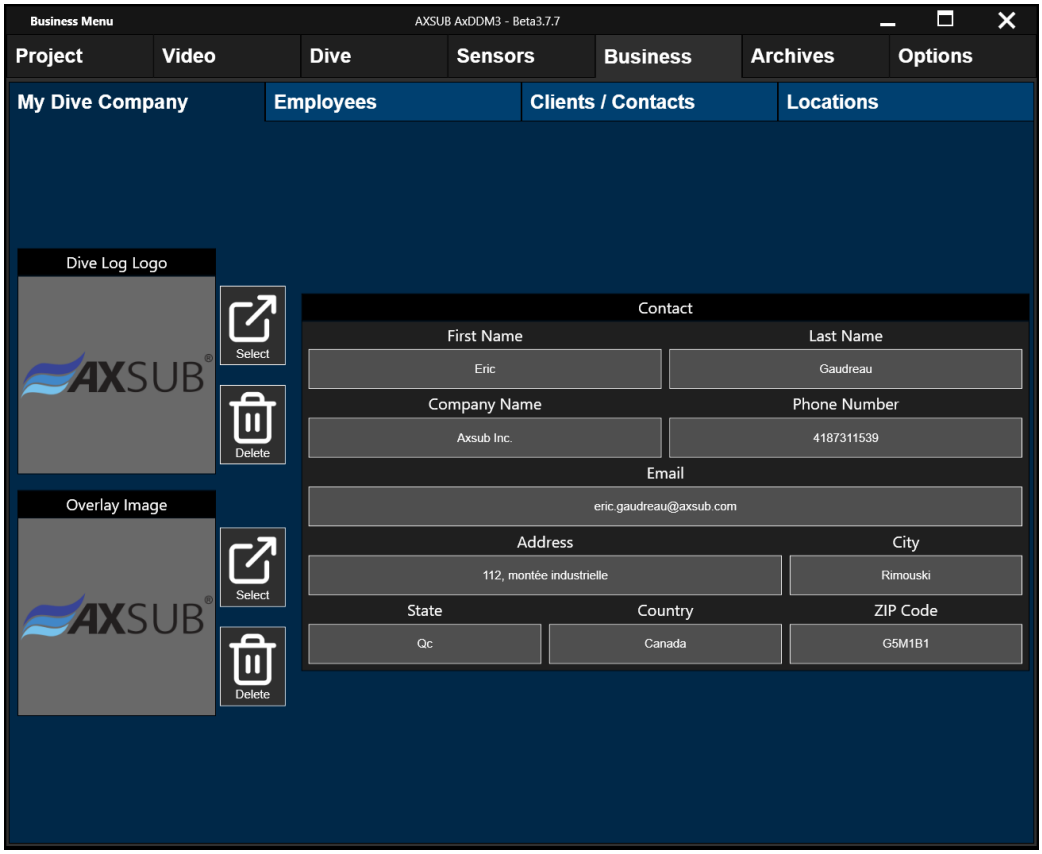
3.6 Completing the Business Profile

Once the software is registered, you should go to the *Business* menu to fill information about your dive company and your employees (supervisors, divers, tenders, etc.). This information can be used by the software in video overlays and to create dive profiles and logs.



The first business submenu is the *Dive Company* submenu. You can fill all information in the *Contact* panel about your company. The information is automatically saved when you leave the page. The *Dive Log Logo* panel is used to select the company logo that will be printed on your dive logs, while the *Overlay Image* panel is used to select which company logo can be displayed as overlay on your video feeds.

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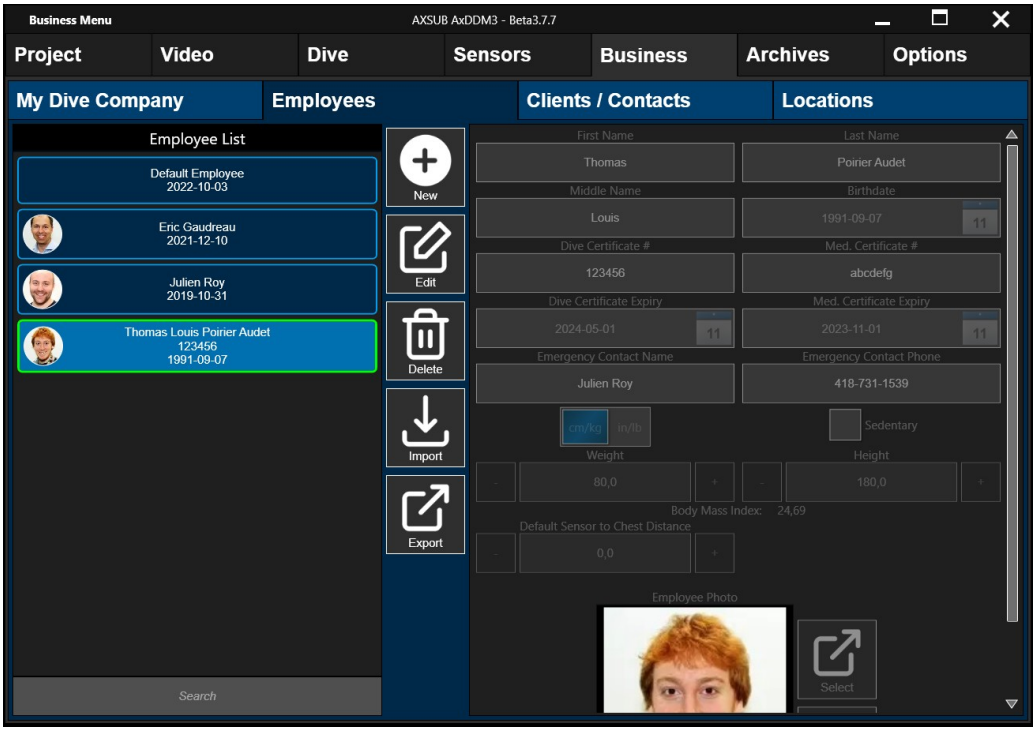

The second business submenu is the *Employees* submenu. Most data from this menu are used to create dive profiles and dive logs, although the name of the employees can also be used for video overlay data. You can look at data about your employees by selecting them in the *Employee List* panel. Selected employee will have a colored highlight background. Selected employee can be edited, deleted, or exported. **Note that employees that are currently set as active divers cannot be deleted.** When you export an employee, it will export all data shown in its employee profile, as well as all data regarding the dives he may have performed. The exported format is an AXSUB Data File (*.axdata).

When creating a new employee or editing an existing one, the *Save* button must be clicked for the changes to apply. Clicking the cancel button will lose all unsaved information. Information about the Weight, Height and Sedentary status might be used by certain dive tables (only the Norwegian Table as of update 3.7.7) to recommend specific decompression profiles, so fill this information as precisely as possible. The Default Sensor to Chest Distance is used to correct the depth read by depthmeters, as they are generally located inside AXSUB SMART Cameras fixed on the dive helmets, while decompression tables are based on diver's chest level.

The *Clients* and *Locations* submenus work the same way as the *Employees* submenu, and the data from these menus are used primarily for dive logs.

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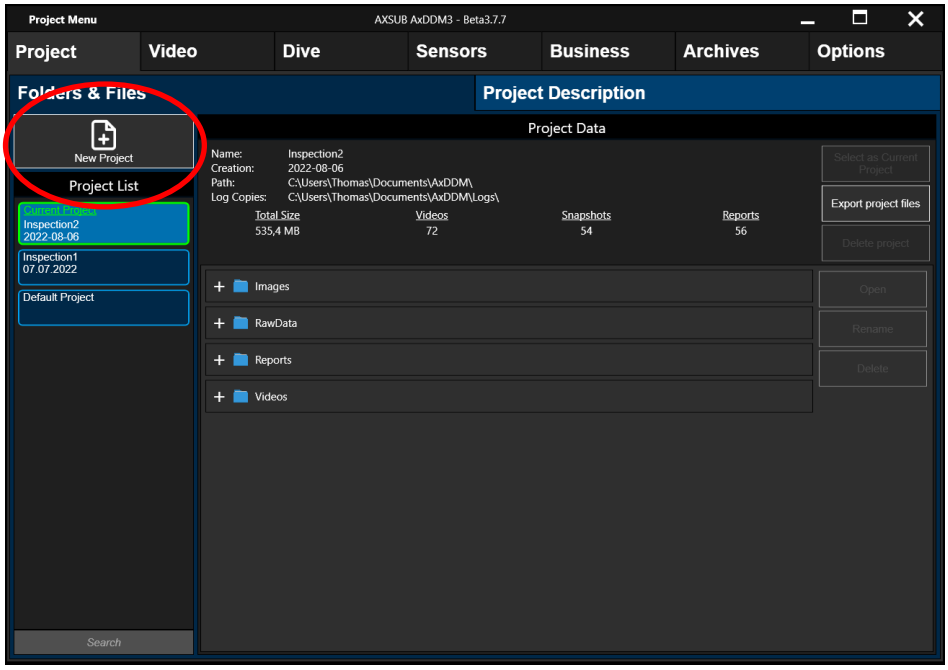
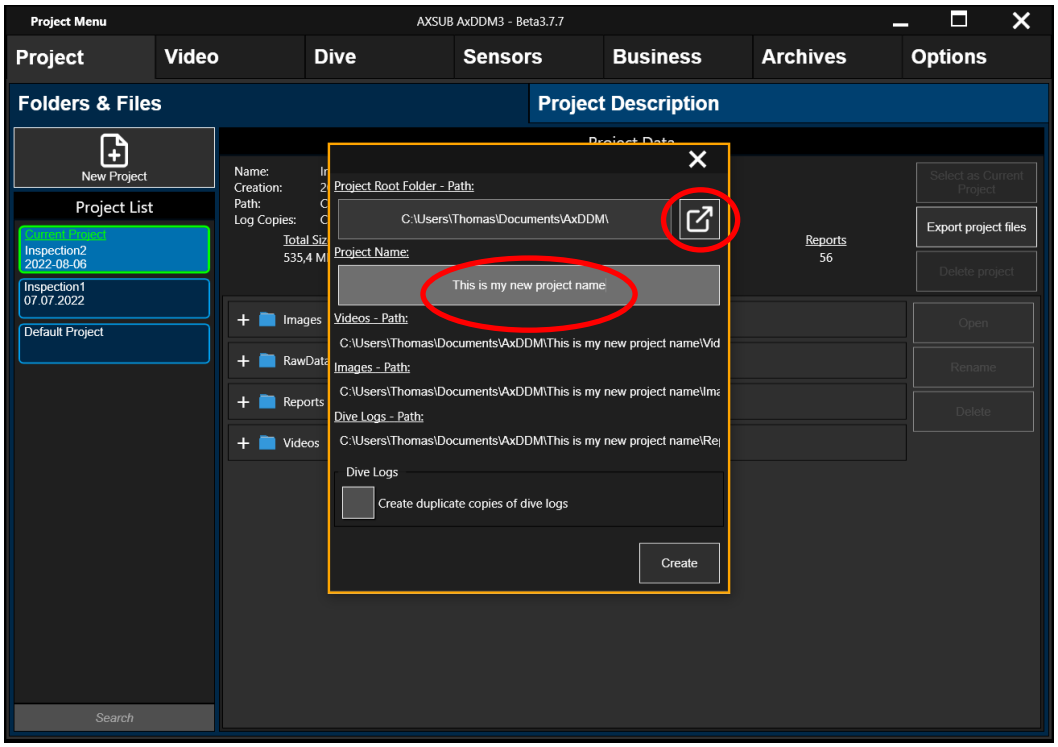
3.7 Creation of a Project

Once the software is registered, the business data is filled and the depthmeters are configured, you are ready to create a new project. A project is a common collection of video captures, image snapshots, divelogs and dive data.



To create a new project from the *Projects* submenu, click the *New Project* button.



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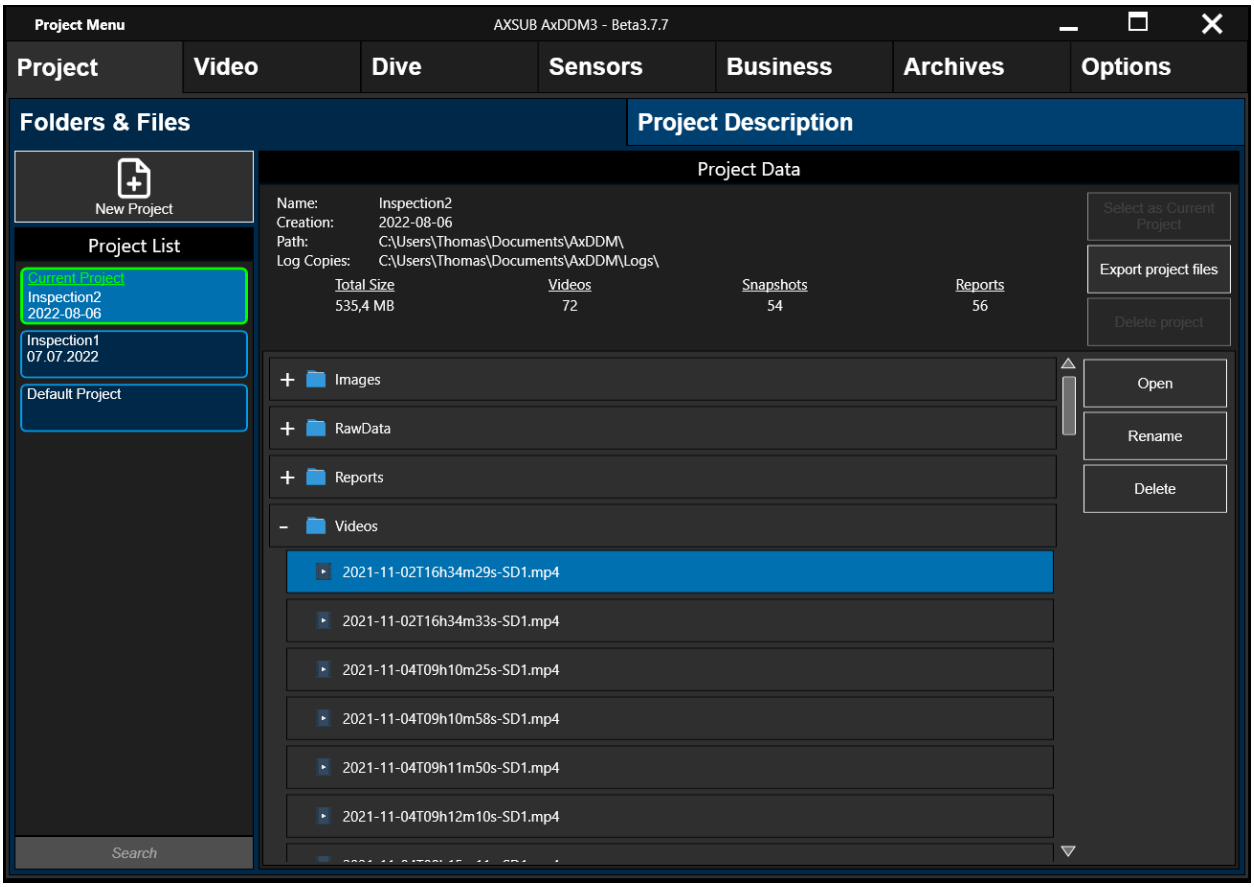
A pop-up window will show up. To create a new project, you must first select the root folder of the project using the file browser button, then you need to give you project a name. By default, all projects are created in C:\Users\[*username*]\Documents\AxDDM\. If you wish to change this default behavior, you can select a new root folder and then click on *Set as default for future projects* button.

IT IS HIGHLY RECOMMANDED FOR STABILITY TO AVOID NETWORK DRIVES OR PLUG AND PLAY DRIVES SUCH AS USB STICKS AS THE ROOT FOLDER OF A PROJECT. IF POSSIBLE, ALWAYS SELECT A LOCAL DRIVE, AND IF NEED BE, MANUALLY COPY FILES FROM YOUR PROJECT FOLDER TO A NEW LOCATION AFTER YOU FINISH YOUR WORK OR SETUP AN AUTOMATED SYNCHRONIZATION ROUTINE. This can be done directly from the application using the *Export Files* button in the *Projects* submenu, or using a dedicated tool like Duplicati (graphical), Rclone or Xcopy (scheduled task) for the second option.

Under the project name you can have a peek at the paths of the subfolders created for the project. For the dive logs, you can also specify a secondary path for the files. If a project has a secondary path for dive logs, they will be created in the project's reports folder and will also be copied to the secondary, allowing, for example, to have a common folder for all your dive logs regardless of on which project it was originally created.



In the *Projects List* Panel, you can see the list of all your projects, with the currently selected project displayed with a colored border and the *Current Project* label. You can click on any project to browse the files within, to export the files to a new location, delete the project or load it as the current project.

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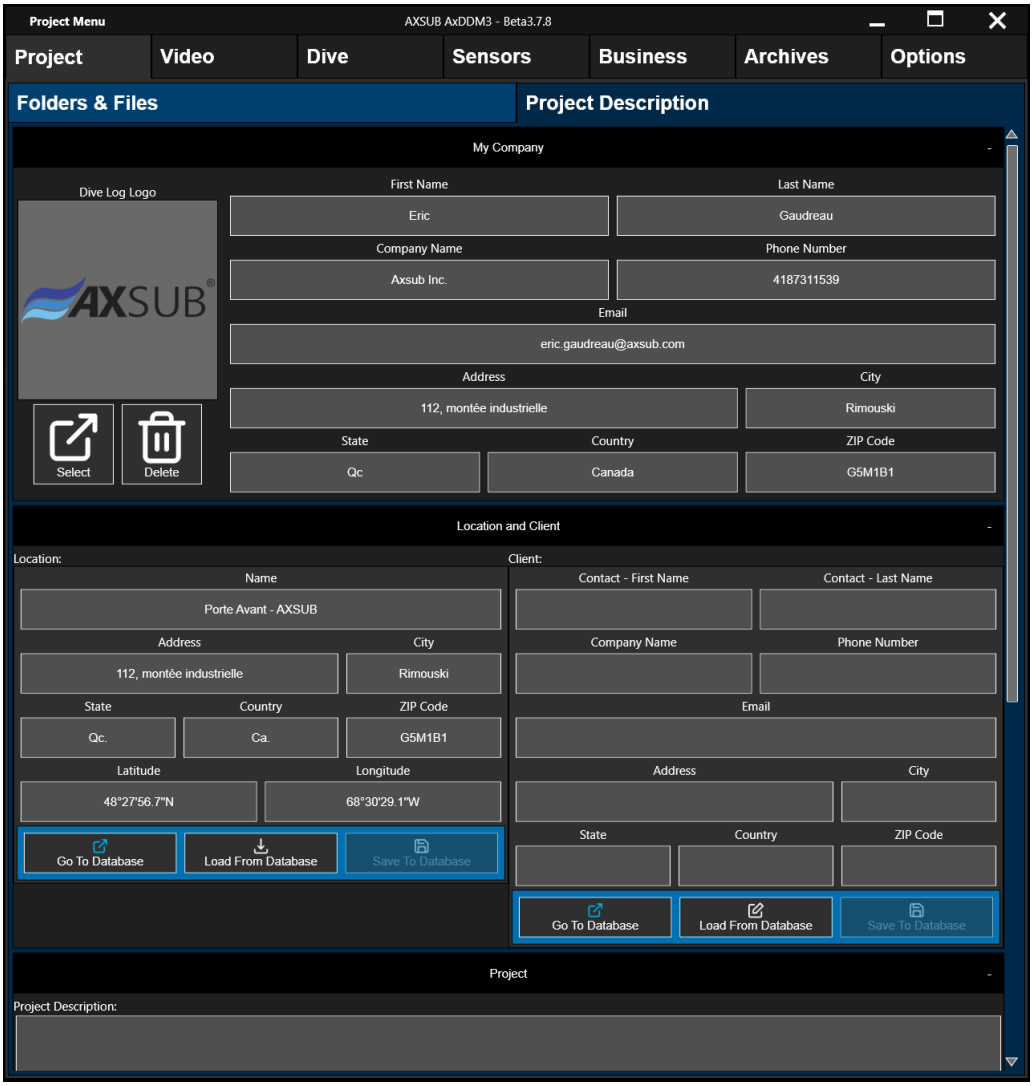
3.8 Fill Project Description

With the project folder structure created, you can now give a description to your project. If you only use AxDDM3 to record video, you can skip filling this page as it is used primarily to fill the generated dive log once a dive is performed using the *Dive* menu. The project description is split into 4 different sections: *My Company*, *Location and Client*, *Project* and *Description of Dive Job*. The company section contains duplicate information from the *My Dive Company* submenu of the *Business* menu.

You can apply modifications from any of these two pages to update the information about your company on the dive log. Locations and clients can be loaded directly from your data collections in the *Business* Menu. The *Project* section is used to describe and comment on your current project.

Finally, the *Description of Dive Job* section is used to indicate the precise nature of your dive activities on the dive log. As most dives in a project are usually alike, the information entered to describe the dive in this *Project Description* page is applied as a default template to all the dives created in the project, but each individual dive can be edited to account for the differences from the template.



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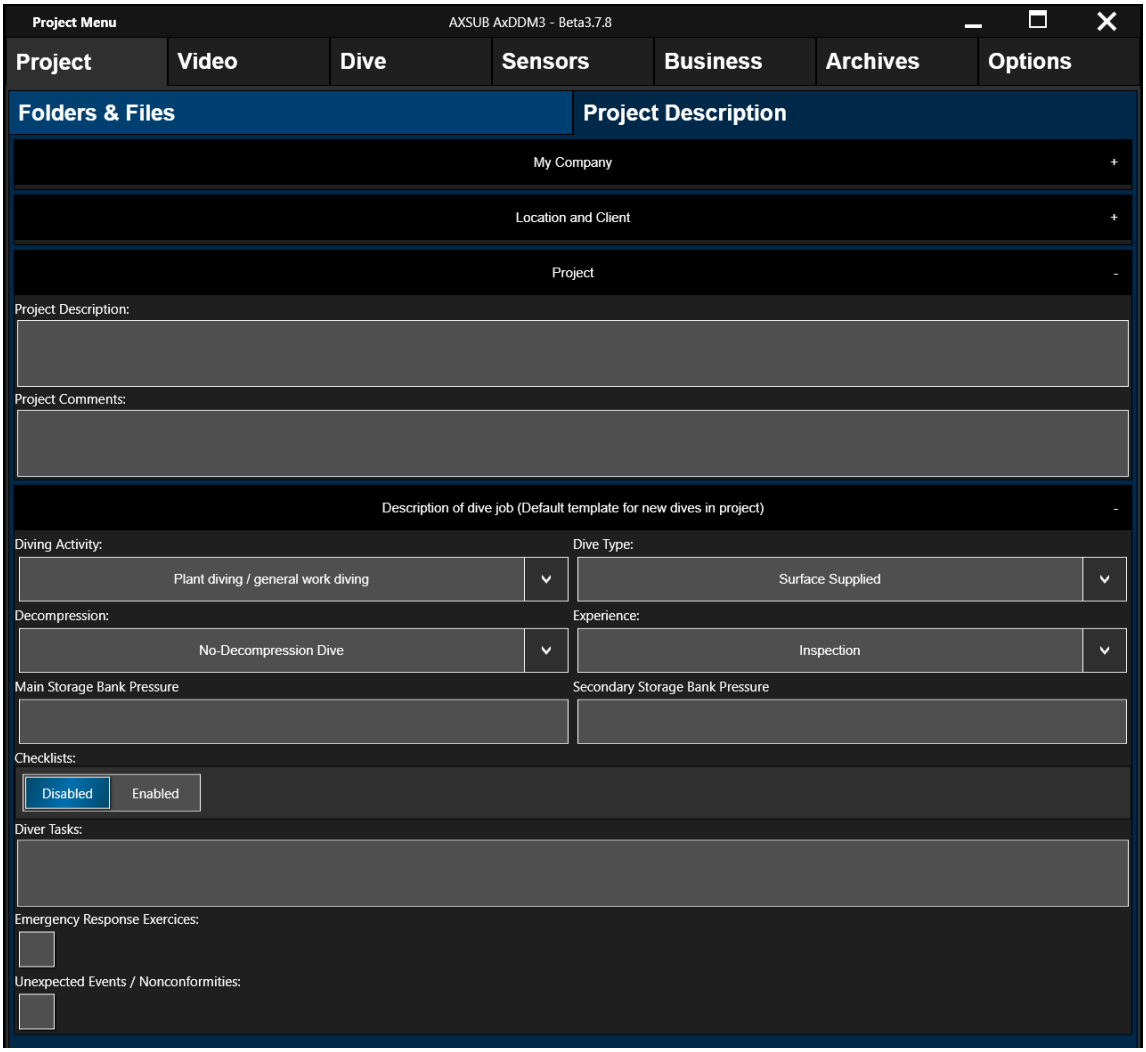
Each section can be minimized or maximized by clicking on the section title.



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4. Video in the AxDDM3 Software

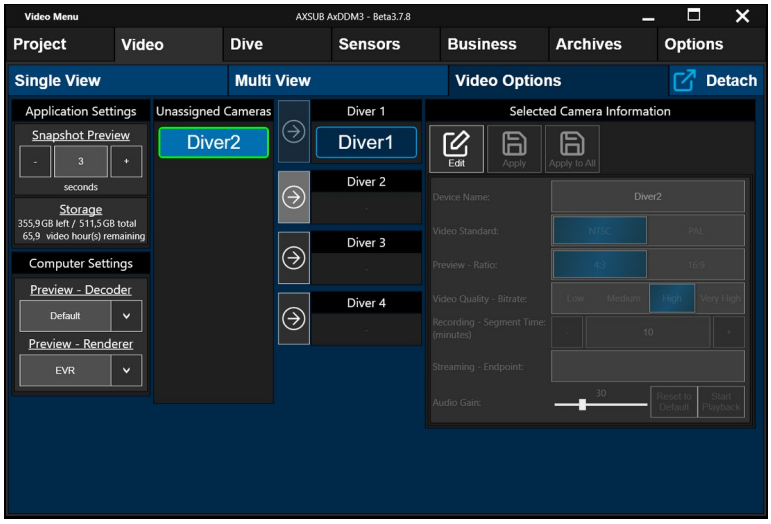
The *Video* menu in the AxDDM3 software is comprised of three submenus.
- *Single View*, which is used to display the video feed from a single camera and to access all the features of that camera
- *Multi View*, which is used to display the video feeds from multiple cameras in one shared screen
- *Video Options*, which is used to configure camera and application settings
The *Detach* button in the menu bar is used to open the *Video* menu in a separate window from the main application window. This feature can be great on computers with multiple screens to have the video menu on one of the screens and the dive menu on another for instance.

4.1 Video Options

The *Video Options* submenu is split into 4 distinct categories:

- *Application Settings* are used to configure how long a snapshot is being previewed after being taken and to show the available disk space and provide an estimate of the remaining recording time left.

- *Computer Settings* are advanced settings used to advise the operating system and graphical hardware how to use the available resources to deal with the video feeds. These settings are highly dependent on the computer specifications and best settings will vary from a system to another. If the video preview is properly displayed in the *Single View* and *Multi View* submenus, leave the settings to default values (*Default Decoder* and *EVR Renderer*). However, if the video preview feed is jittery, pixelated, displays partial frames or is completely blank, these settings can be ajusted to get the software to properly work with the computer's hardware. Please contact our service support if you need assistance with this step.



- The camera assignment settings are used to tell the software where each camera belongs. When plugging the USB cable between the computer and the AxVIEW system, the computer is not always able to detect which camera device is currently physically attached to a given diver channel on the AxVIEW system. By selecting a camera in the *Unassigned Cameras* list and using the arrow buttons, you can

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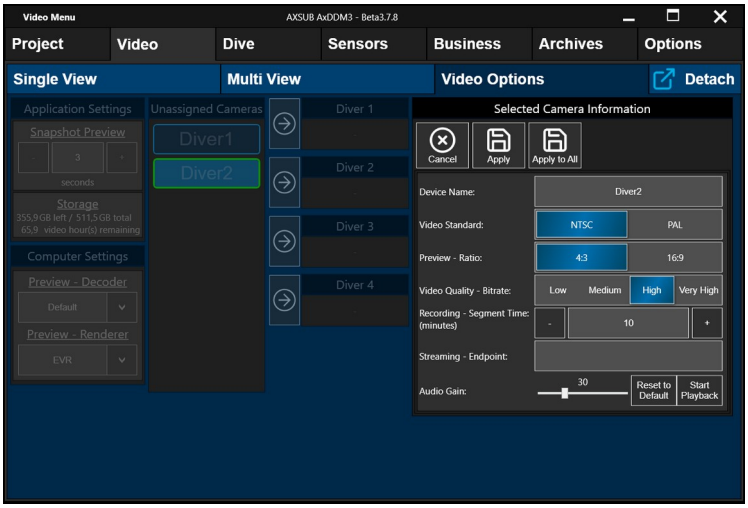
specify to which diver position on the AxVIEW system this camera is currently attached. Assigned positions are stored in software memory for future uses.

- The camera settings are used to configure each camera individually. Select the camera to configure and click the *Edit* button. Once configured, click the *Apply* button to save the settings for this camera. The *Apply to All* button will apply all the settings except the *Device Name* to all cameras of the same type (to all HD cameras or to all SD cameras).



The *Device Name* setting is used to provide a meaningful name to the camera to differentiate between each camera loaded by the software (for instance you could have “DiverCam1”, “DiverCam2” and “DeckCam”).

The *Video Standard* setting is used to tell the software what video standard is currently used by the camera. Most cameras used in North America are NTSC, while most cameras used elsewhere are PAL. If unsure, look for indication on the camera (either engraved or on the sticker) or on your camera invoice. Selecting the wrong setting for the Video Standard could lead to a missing or very distorted video signal.

The *Video Ratio* setting is used to select the width to height ratio of the video feed. The recorded feed will always use the native ratio of the camera, but sometimes a user could want to select a different ratio for its camera preview, especially for use in the *Multi View* menu where the layout could look weird if different kinds of cameras are used together.

The *Video Bitrate* setting is used to tell the amount of information that can be shared by the camera to the computer. Higher settings will result in better quality but can also lead to much larger file size. Reduce the setting if available disk space is an issue.

The *Recording Segment Time* setting is used to specify how long each video file should last. Once the recording time limit is reached, the file is saved and a new one is automatically created to keep recording.

The *Streaming Endpoint* setting is used to provide the path of your local video server if you own one.

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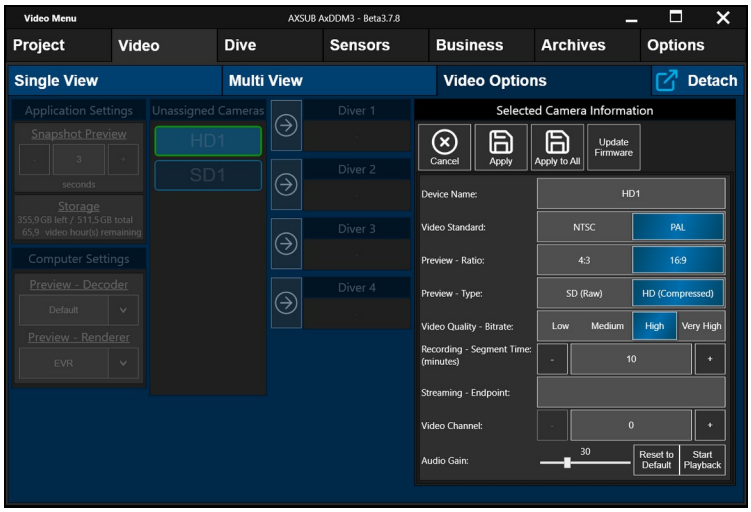
The *Audio Gain* setting is used to change the volume gain on the audio input of the AxVIEW system. If you are recording your dive communications on the video, you can change this setting to increase or decrease the volume gain of the audio feed.

For AxVIEW HD systems, the *Video Channel* setting is an advanced setting that should always be left to 0 unless advised otherwise by an AXSUB support agent. HD systems also have a button to update the firmware of the video encoders inside the AxVIEW system. Firmware update should be run at least once on each new system or if experiencing stability problems.



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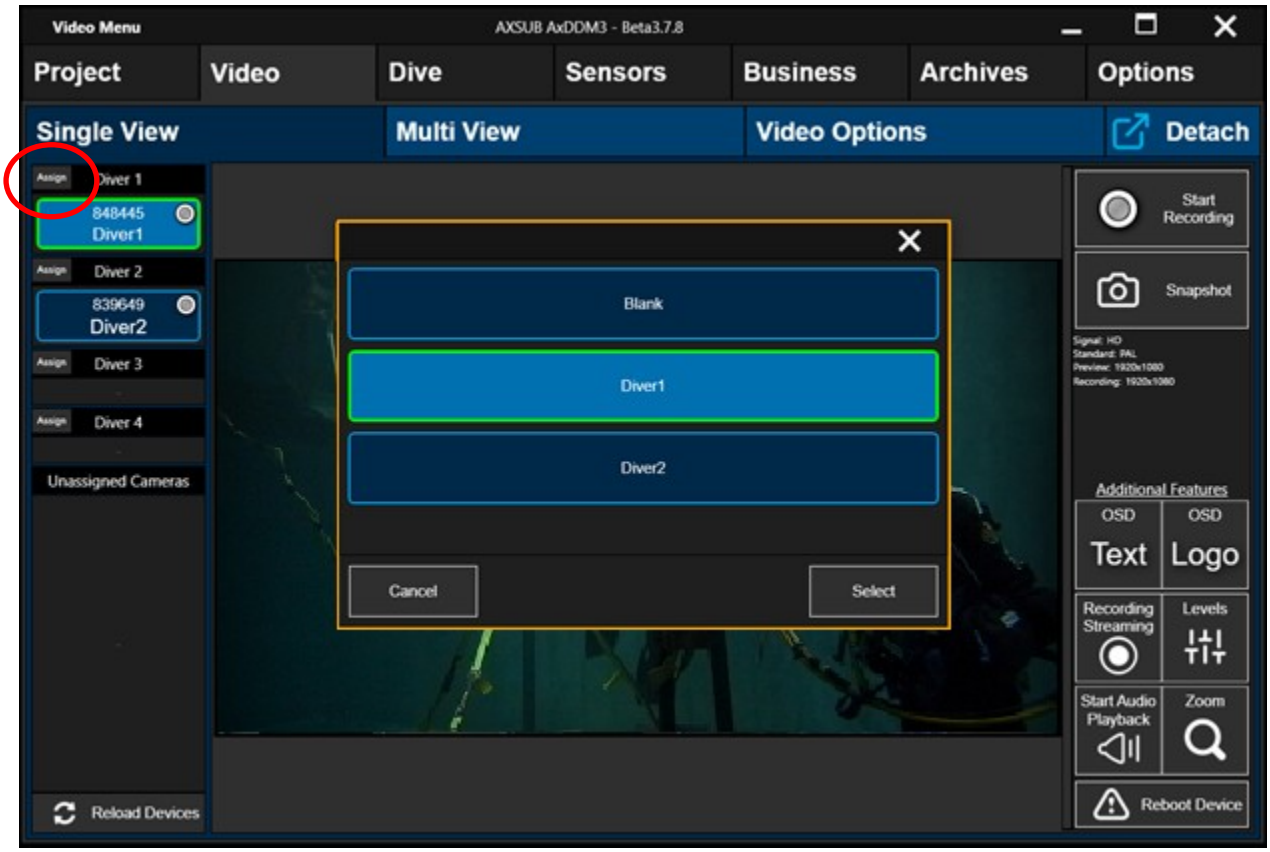
4.2 Single View

The *Single View* submenu is used to view the video feed from a camera and to access all the features of this camera.

4.2.1 Assignment of Camera Labels

When plugging the USB cable between the computer and the AxVIEW system, the computer is not always able to detect which camera device is currently physically attached to a given diver channel on the AxVIEW system. By clicking the *Assign* button you can specify which diver position on the AxVIEW system this camera is currently attached to. Assigned positions are stored in software memory for future uses and can also be changed from the *Video Options* submenu.



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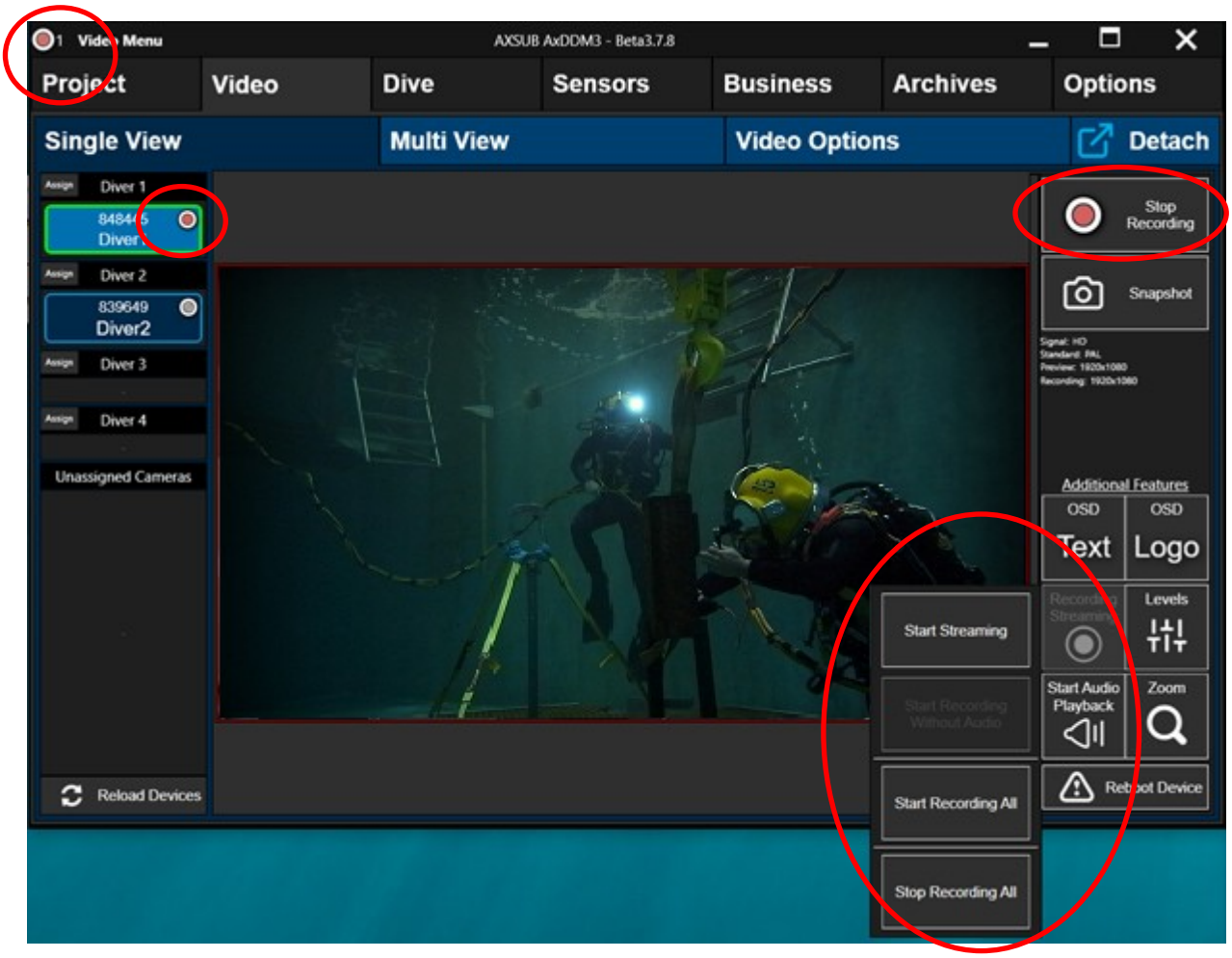
4.2.2 Recording

The button at the top of the right control bar is used to start and stop the recording for the camera. When a camera is recording, the record icon will flash on the camera selection button and the border around the video preview will flash as well. Also, wherever you are in the application, the top left corner will always show how many devices are currently recording. The default length of the recorded files can be set in the *Video Options* submenu. If the time limit is reached, the record file will be closed and a new one will automatically be created to keep recording in a new file.

The *Recording / Streaming* button has additional record features available such as starting the recording for all cameras at once, for starting a recording without audio or to start a recording while also streaming to an external video server.



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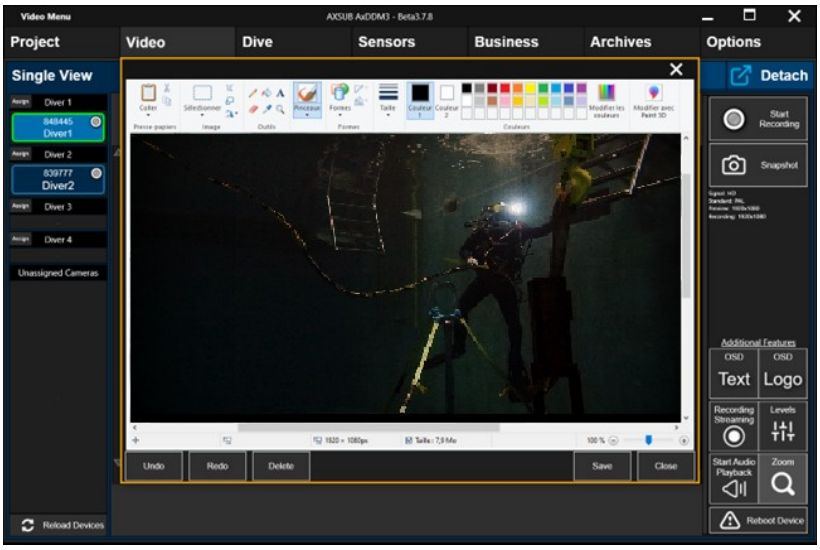
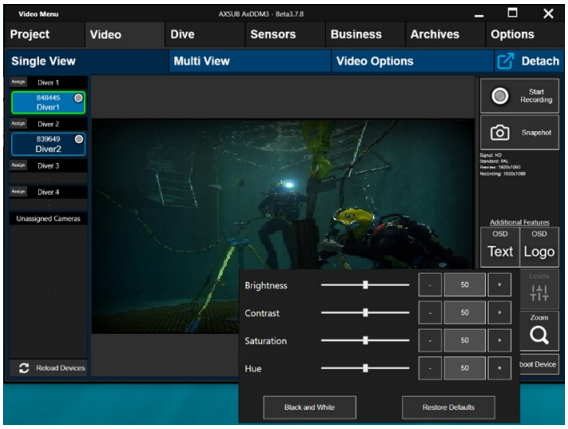
4.2.3 Snapshots

The *Snapshot* button is used to grab an image sample from the video feed and save it to the computer. The image can also be edited from the application using the built-in image editor. This can be a useful functionality to draw indications or markers on specific portions of a snapshot.



4.2.4 Levels

Levels are used to adjust the image properties of the video feed. Increasing the contrast level will result in better defined highlights and darker shadows. Brightness can enlighten or obscurify the whole image whereas saturation refers to the vividness of colors in an image to help making them more vibrant or muted as needed. Finally, hue helps correct color imbalances, ensuring that they appear as intended.



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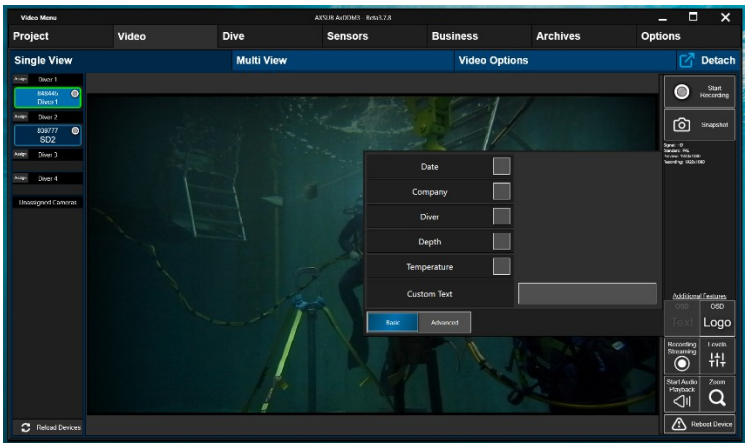
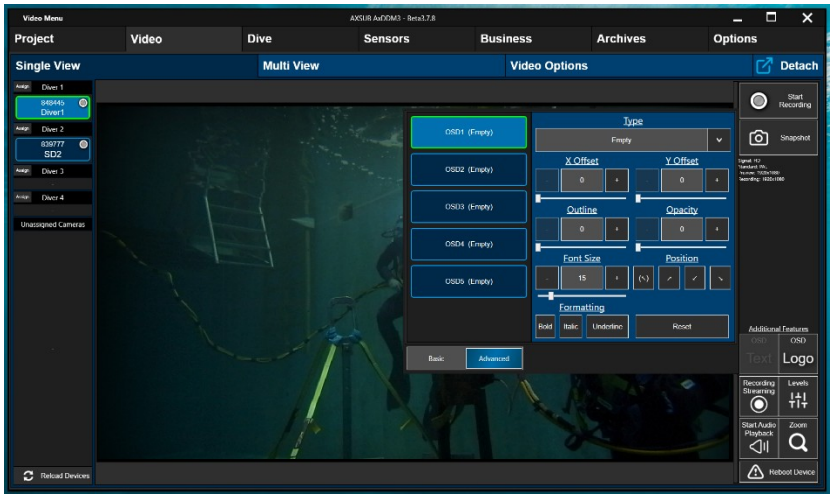
4.2.5 Text On-Screen Display

The *Text OSD* pop-up is used to apply a text overlay on top of the video signal. There are two ways to use the text overlay features being *Basic* and *Advanced*. When using the basic mode, all text strings are added with default size and font starting from the top-left corner. To select a text field to display, simply check the box associated with the text string. If the camera is unassigned (see 4.2.1), you can manually select which employee to display as the *Diver* and you can manually select the depthmeter for *Depth* and *Temperature* overlays. If the camera is assigned, the diver slot will automatically be linked to the selected employee associated with this *Diver* in the *Dive Team* submenu of the *Dive* menu. Also, if the camera is assigned, the depthmeter selected for *Depth* and *Temperature* will be automatically linked to the selected device associated with this *Diver* in the *Depthmeters* submenu of the *Sensors* menu.



When using the advanced OSD mode, up to eight strings can be customized individually with different positions, formatting, etc. The *Position* buttons are used to select which corner act as the reference for the X and Y position offsets. The *Outline* setting is used to add a black border around the white letters to increase contrast and help readability on some video backgrounds. *Opacity* setting adds a level of transparency if there is a need to preserve the content of the video behind the text.



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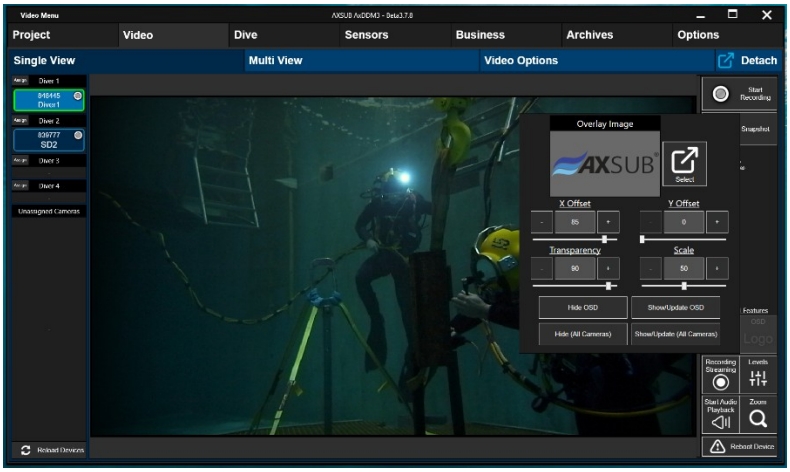
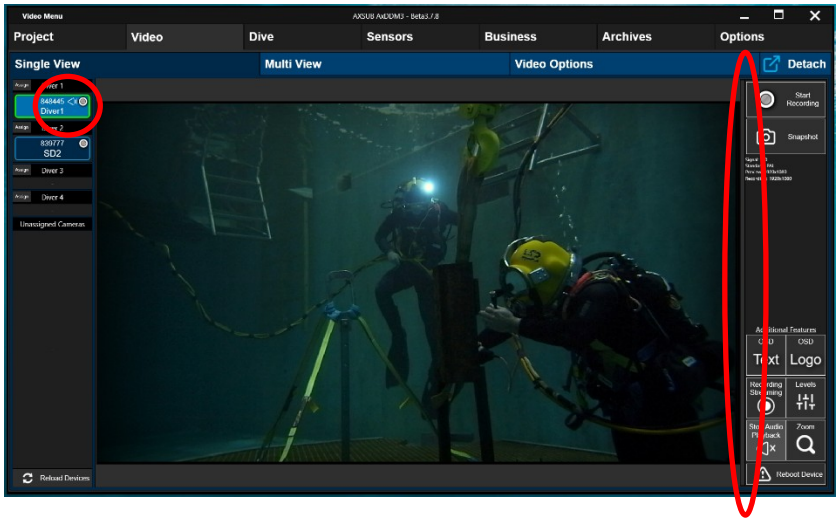
4.2.6 Image On-Screen Display

Image OSDs can be used to show your company logo or another picture over the video signal. To use this feature, you will need to provide the path to a PNG file of the image you wish to add as overlay. Try to limit the size of the picture as much as possible. The image can be moved from the top-left corner by using the X and Y offset sliders. The *Show/Update* must be clicked after changing the sliders to apply the changes otherwise they will not be accounted. The *Hide OSD* button is used to turn off the feature.



4.2.7 Audio Playback

By default, the audio signal from the audio input on the AxVIEW system is recorded in the video file but is not played at the same time on the computer speakers. The *Start Audio Playback* button can be clicked to listen to audio signal that is currently being recorded. Each camera selector will be updated with the speaker icon if audio playback is active. The audio will be recorded whether its playback is active or not. There is also a signal strength indicator on the right of the video feed that always shows a visual representation of the current audio level. Audio gain for the camera can be adjusted in the *Video Options* submenu.



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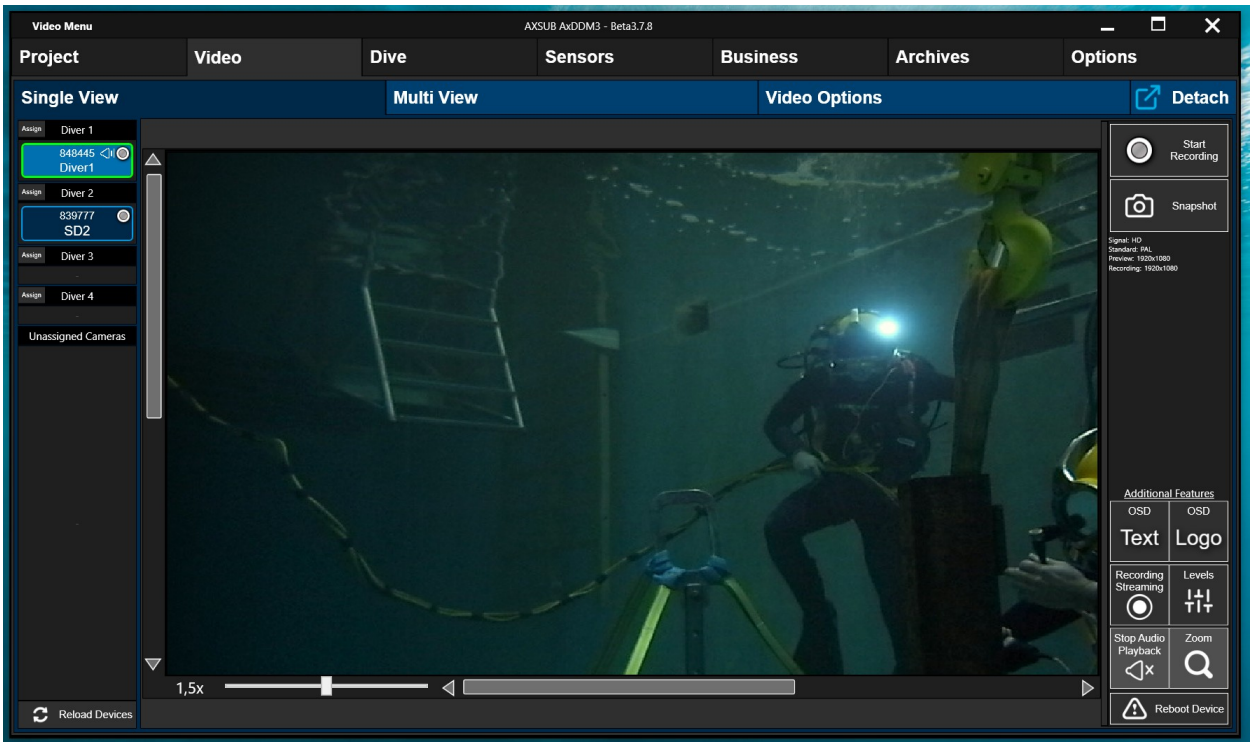
4.2.8 Zoom

The *Zoom* button can be clicked to show the Zoom slider. Image can be zoomed using the slider and the track bars on the left and bottom are used to move around the zoomed image. The zoom feature is only used on the *Video Preview* and have no effect on the recorded video signal.



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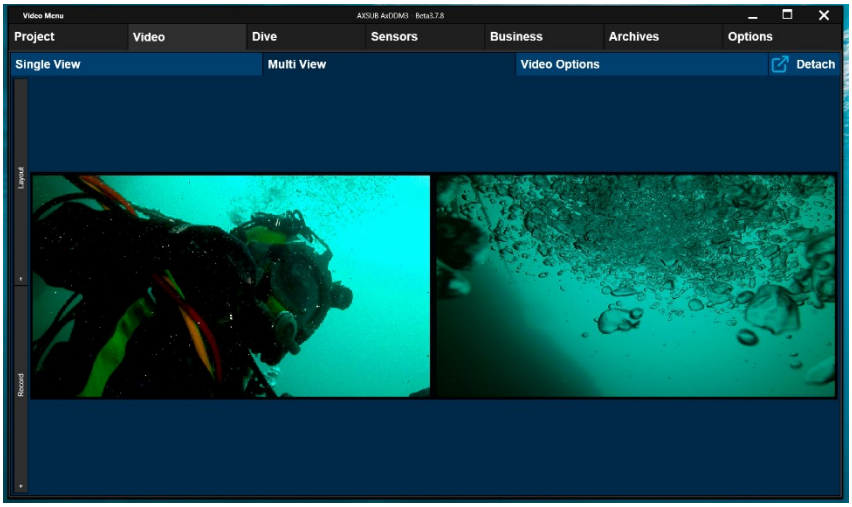
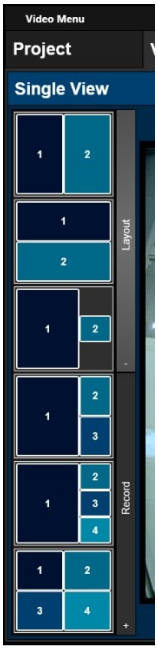
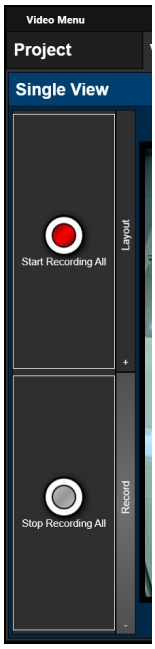
4.3 Multi View



The *Multi View* submenu is used to preview multiple video feeds at once. It uses the cameras that are assigned to *Diver 1*, *Diver 2*, *Diver 3* and *Diver 4*. The *Layout* button on the left is used to show the layout selection buttons, while the *Record* button will show the buttons to start or stop recording on all cameras at once.





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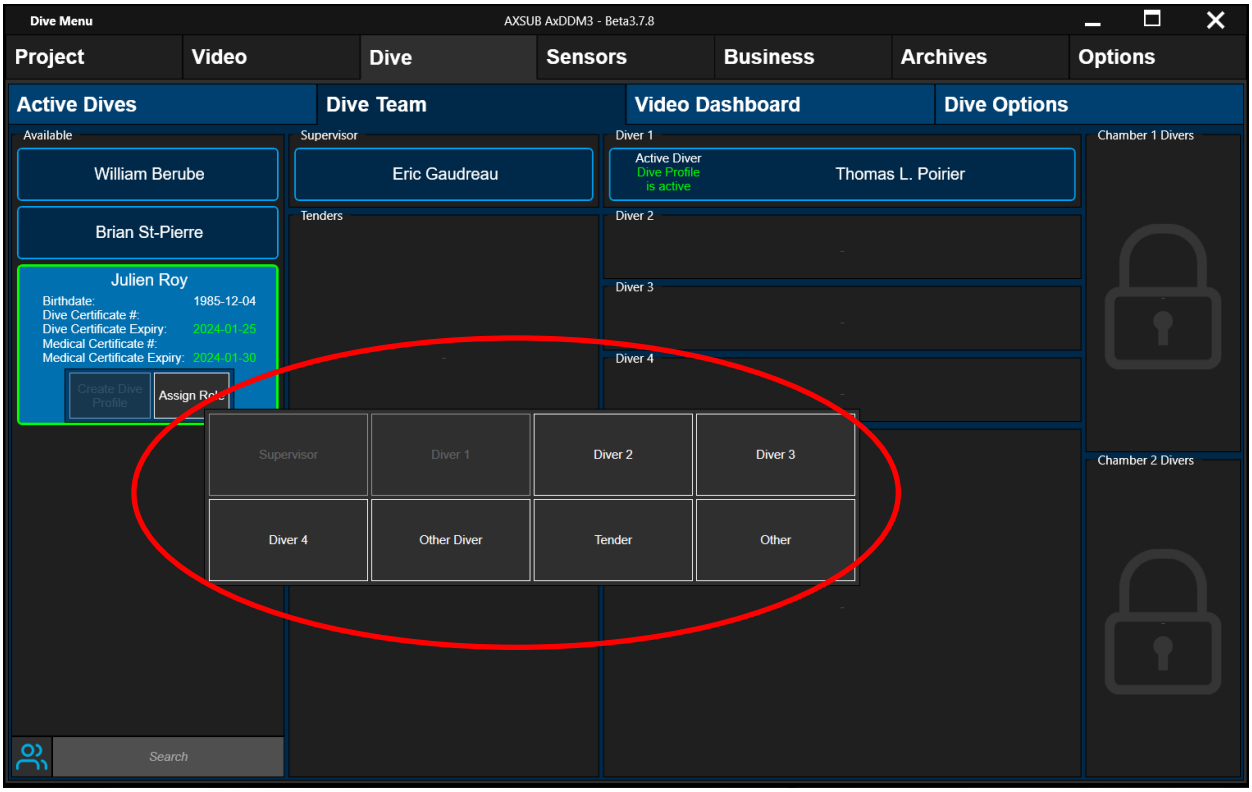
5. Diving with the AxDDM3 Software

To perform a dive with the AxDDM3 software, the *Project* submenu should first be filled to provide default information for the divelogs. This data filling can be performed once at the start of a new project and edited if needed when creating a new dive; it does not need to be fully refilled before every dive. See 3.6.

5.1 Dive Team

The *Dive Team* submenu is designed to dispatch your employees and assign them a role in the dive team to show on the divelog. Since the dive team is subject to change with teams and/or employee's rotations, for the purpose of the divelog, the team is fixed/saved to a dive profile when the diver starts its ascent to the surface. Once the diver starts to ascent, any further change to the *Dive Team* submenu will not be saved to its divelog, though it is still possible to edit this information in the *Archived Dives* menu once the dive is completed.



To assign a role to one of your team members, select the person and click the *Assign Role* button.

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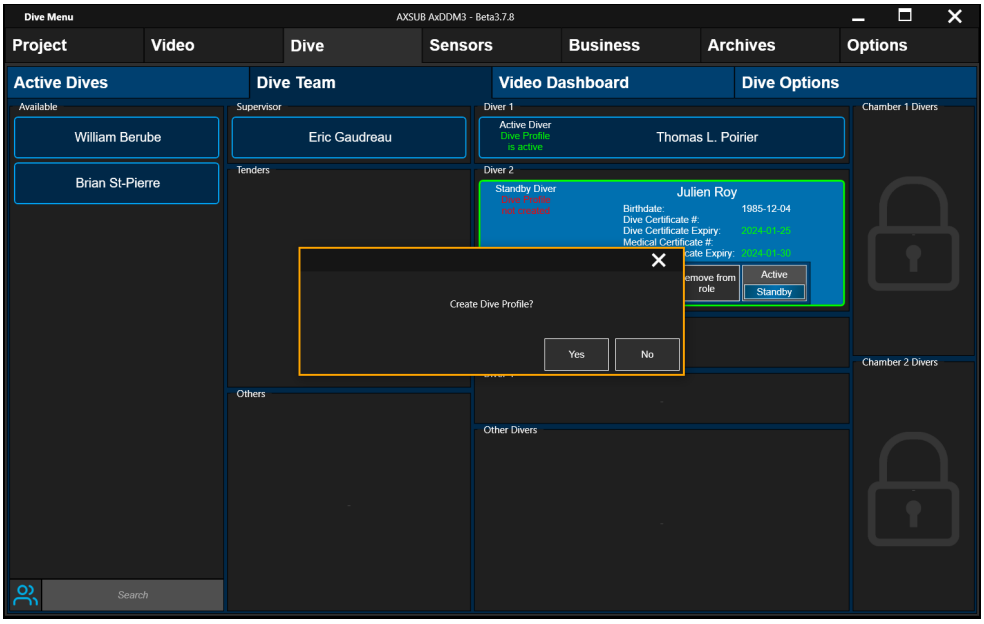
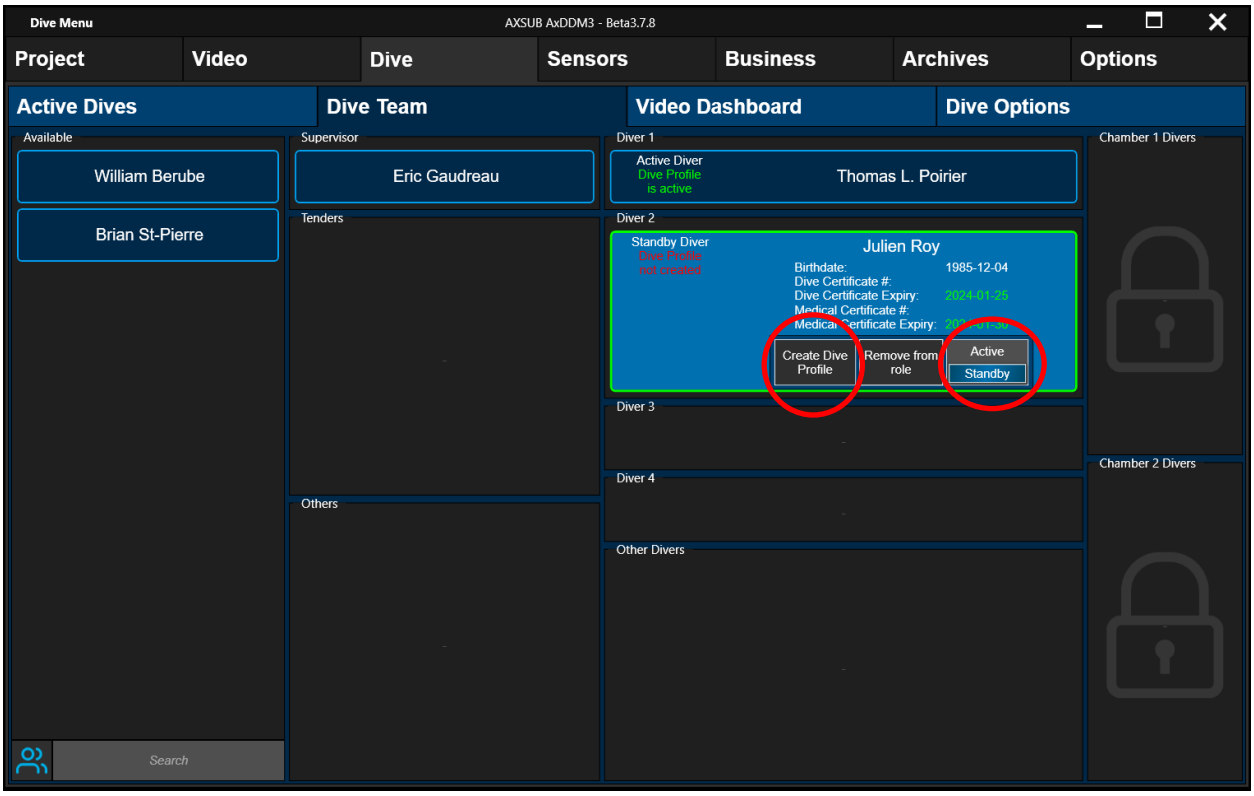


When a person is assigned to the role of a *Diver*, a prompt window will show up to create a new dive profile. It is possible to create the dive profile then or at a later timepoint.



If you chose to create the dive at a later timepoint, you can return at any time to the *Dive Team* submenu, select the diver and click on the *Create Dive Profile* button. It is also possible from this menu to switch the role of the diver between *Active* and *Standby* diver.

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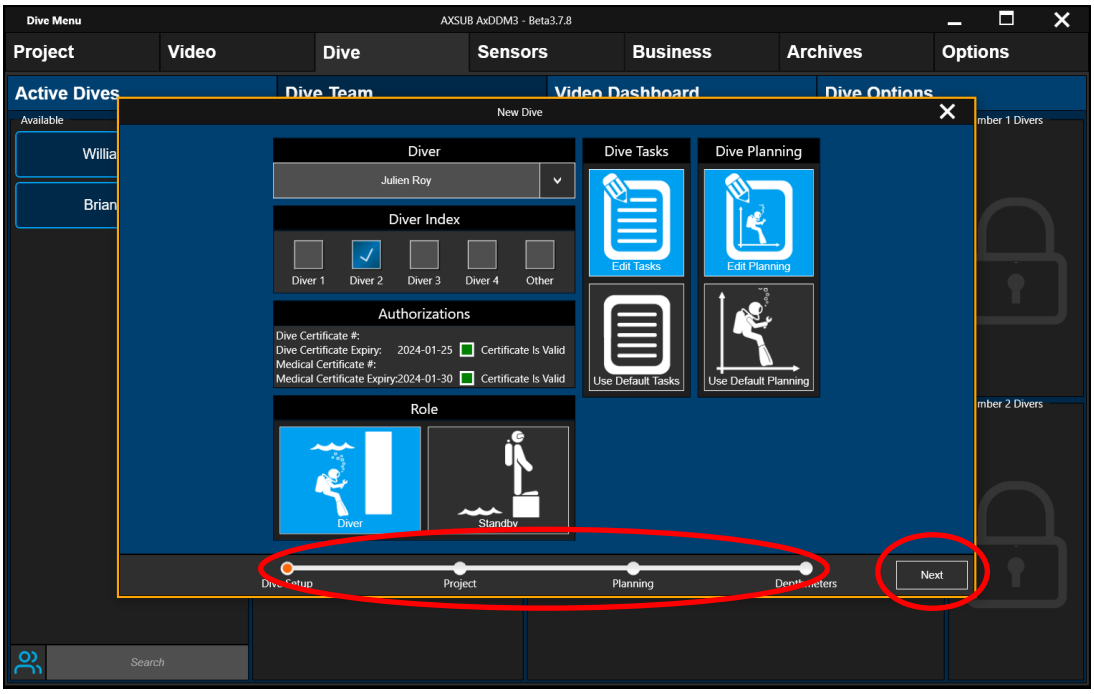
5.2 Creating a Dive

Every time you create a new dive, there are four(4) steps to follow.

1. Select Diver, Diver Index and Role
2. Edit information about Dive Project
3. Edit information about Dive Planning
4. Select and Surface Reference Depthmeters

5.2.1 Creating a Dive



When you create a new dive, select diver, diver index and role. You can keep track of the steps required to complete the dive creation at the bottom of the window. Once the role is selected, click the *Next* button.

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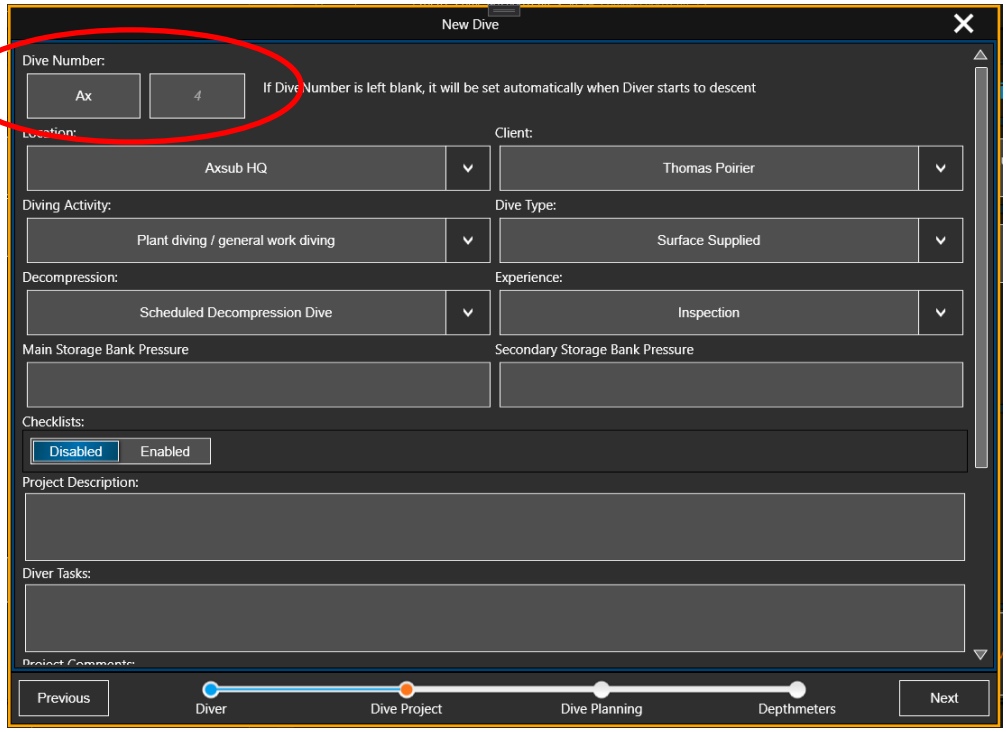

Information about the *Dive Project* is automatically filled with the data you prefilled in the *Project* submenu (refer to section 3.6). If the dive you are about to create differs from your template, you can edit the information. The changes you make will only be applied to the dive you are about to create, leaving your template unchanged and still valid for future dives. Every dive created is assigned a Dive Number, composed of a prefix and a number. If you leave the *Number* box empty, it will be set automatically for you in the dive log. You can have a preview of the expected dive number from the shadowed text in the background of the empty textbox. The automatic increment of the dive number is done when a dive is completed, not when it is created, therefor preventing from invalid increments from dives that were planned but never performed. You can manually reset the current Dive Number or set a new *Default Dive Prefix* in the *Dive Options* submenu. Once the project is edited or if the prefilled information is valid, click the *Next* button.

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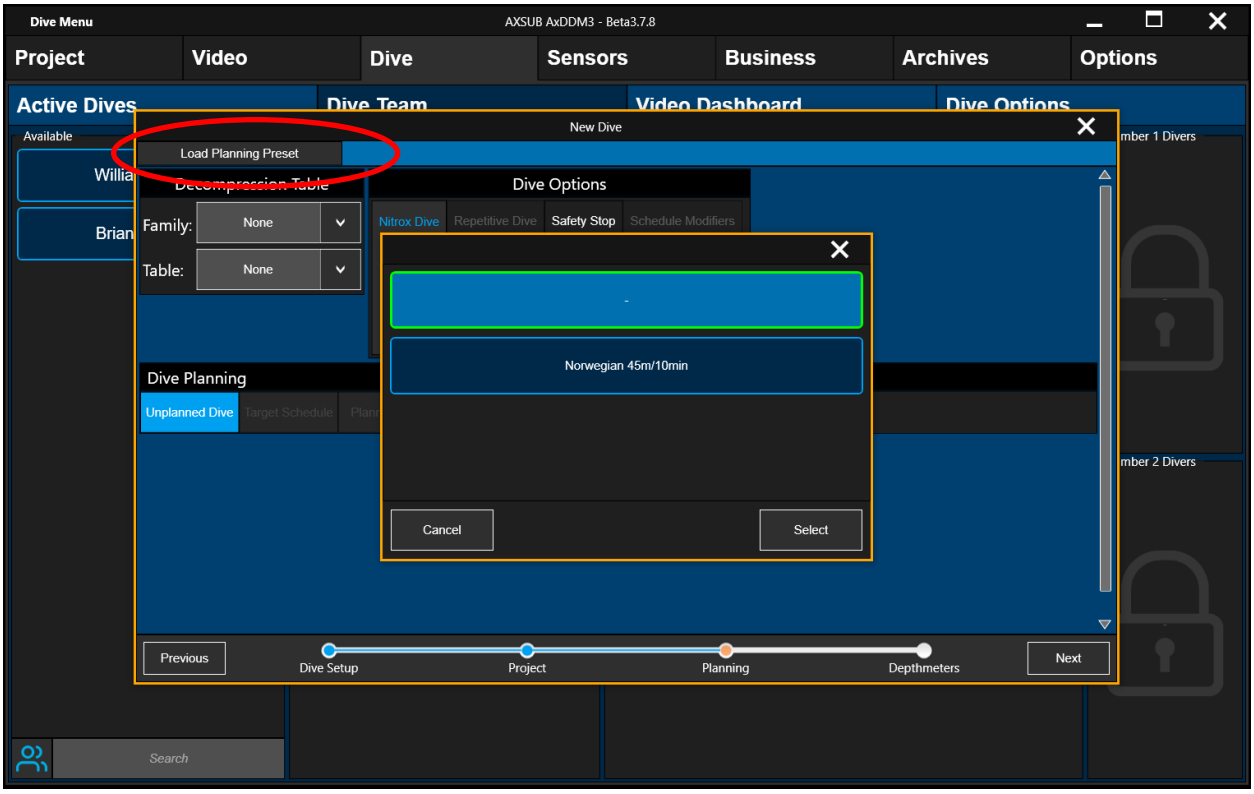

When creating a new dive, you can either create an unplanned dive or a planned dive, whether or not you know the expected depth and bottom time of your dive. You can also load any of the templates you created in the *Planning Templates* from the *Dive Options* submenu. To load a template, click on the *Load Planning Preset* button and select one of your presets from the list. If the dive you are about to create differs from your template, you can edit the information. The changes you make will only be applied to the dive you are about to create, leaving your template unchanged and still valid for future dives. Regardless of if the dive is planned or not, a decompression table should be selected to use the right measuring units for your dives according to your area's regulations.

To fill a dive planning, start by selecting the decompression table you plan to use, then fill information about planned depth, bottom time and other relevant data. The resulting decompression schedule from the table will be presented. On the chart, the blue line is the planning according to the information you entered in your dive outline, while the orange line shows the maximum value to stay within the same decompression schedule in the table. All dive steps can be listed by clicking on the *Show Steps* button.

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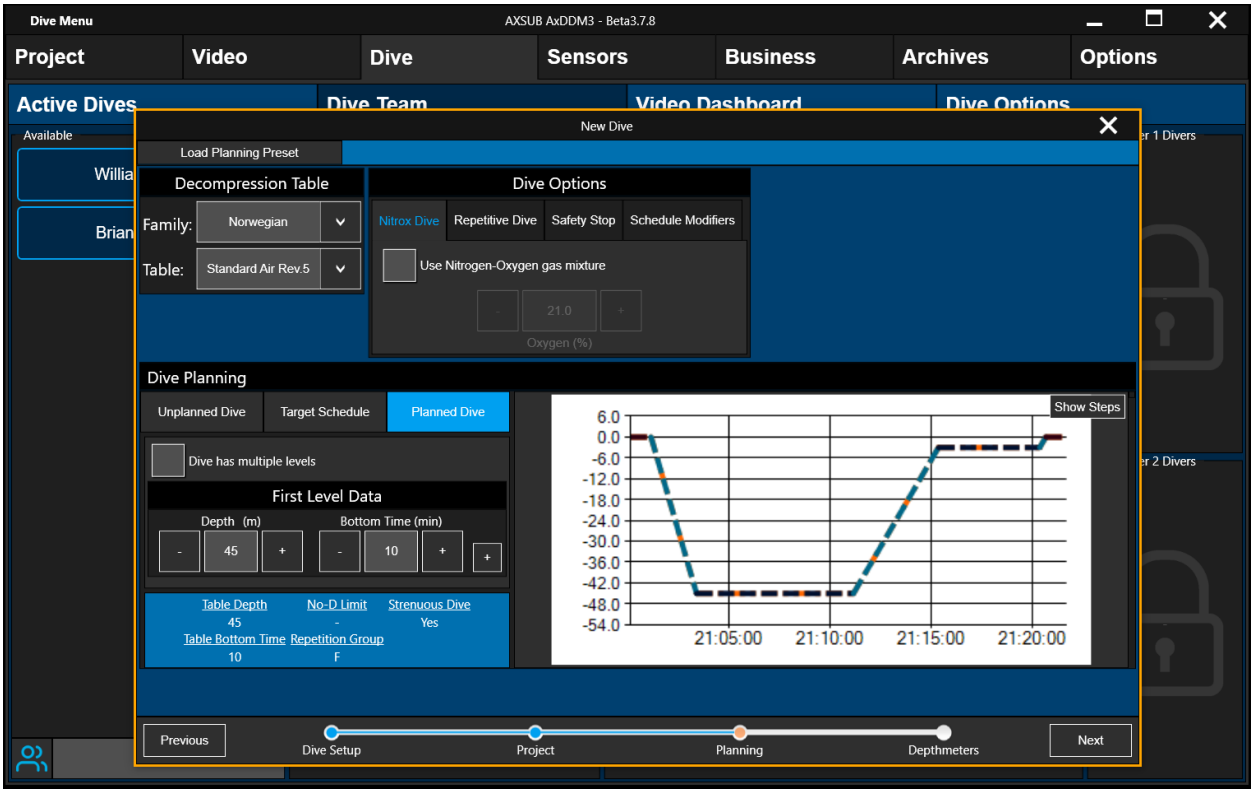
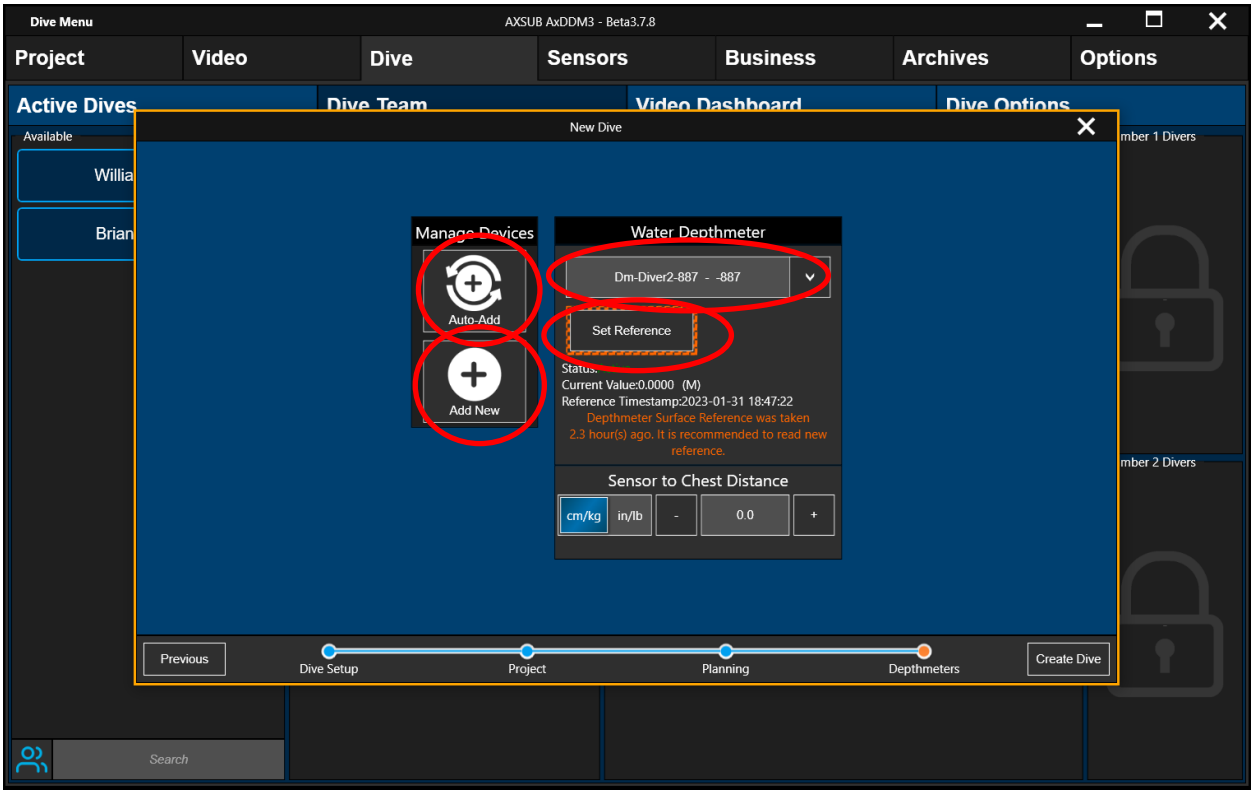


Once the planning is edited or if the prefill is valid, click the *Next* button to go to the final step of the dive creation, which is the selection of depthmeters.



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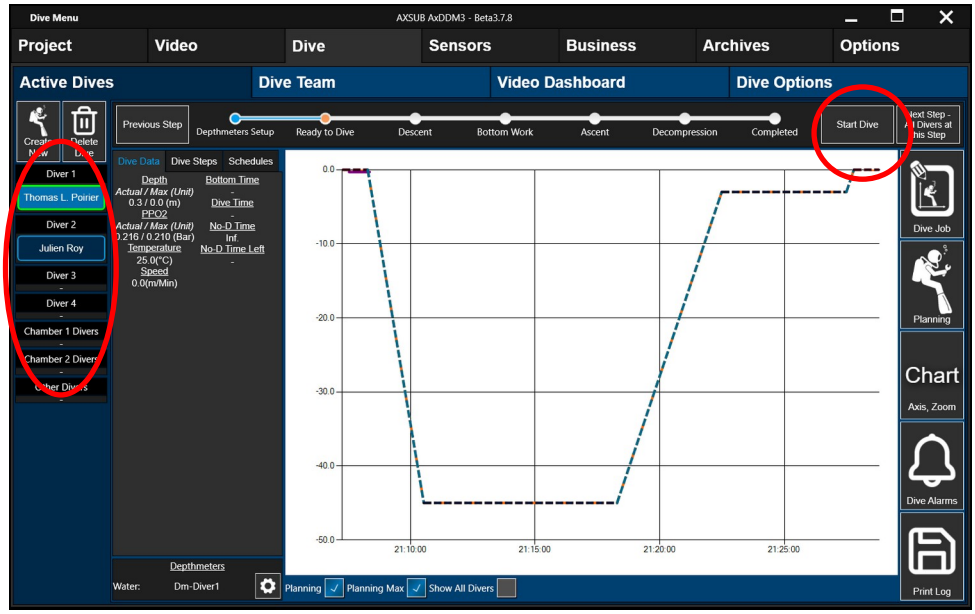
If the *Depthmeters* submenu was prefilled, the devices you selected for this diver index should be automatically selected. Otherwise, select the correct depthmeter from the drop-down list. If the device you are looking for does not show up in the list, you can try to add it manually using the *Add New* button, or if the device is plugged into the AxVIEW system and powered on, you can try to add it automatically using the *Auto Search* button. When the device is selected, you should read a new surface reference before starting your dive. You can do it by clicking on the *Set Reference* button. Finally, since most dive tables use the chest level when referring to depth in the tables and since the depthmeters are frequently installed in cameras on the helmet of the divers, you can edit the *Sensor to Chest Distance* to provide the necessary offset to match the dive tables. *Sensor to Chest Distance* is prefilled with the information about the Diver (*Business Data → Employees).* When the depthmeters are selected and the references are set. Click the *Create Dive* button to finish creating the dive.

5.3 Performing a Dive

5.3.1 Dive Navigation

The main method to perform a dive in the AxDDM3 software is by proceeding from the *Active Dives menu*. The list of dives currently active is displayed on the left, and you can switch from one dive to the other by selecting them. The classic navigation method is to start the dive by clicking on the Start Dive button when the diver is ready to descent. This will move the dive stage to descent. Then click the *Next Step* button when the diver reaches the bottom, and so on as the different dive stages are completed until the *Finish Dive* button is clicked.



You can follow the overall progress of the dive by looking at the track line at the top of the chart. If the depthmeters are not properly setup or initialized before attempting to start a dive, the trackbar will be at the *Configure Depthmeters* step, and the warning symbol next to the sensor selection will flash.

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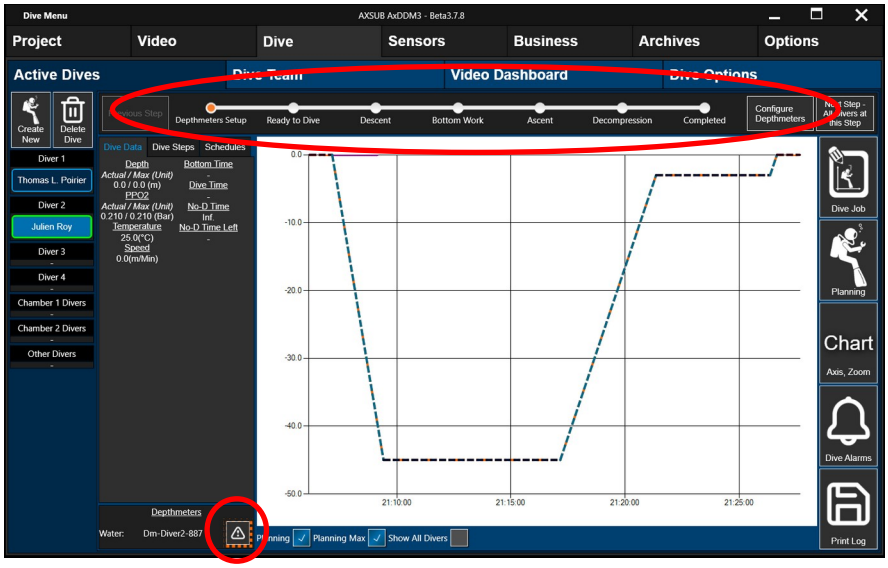
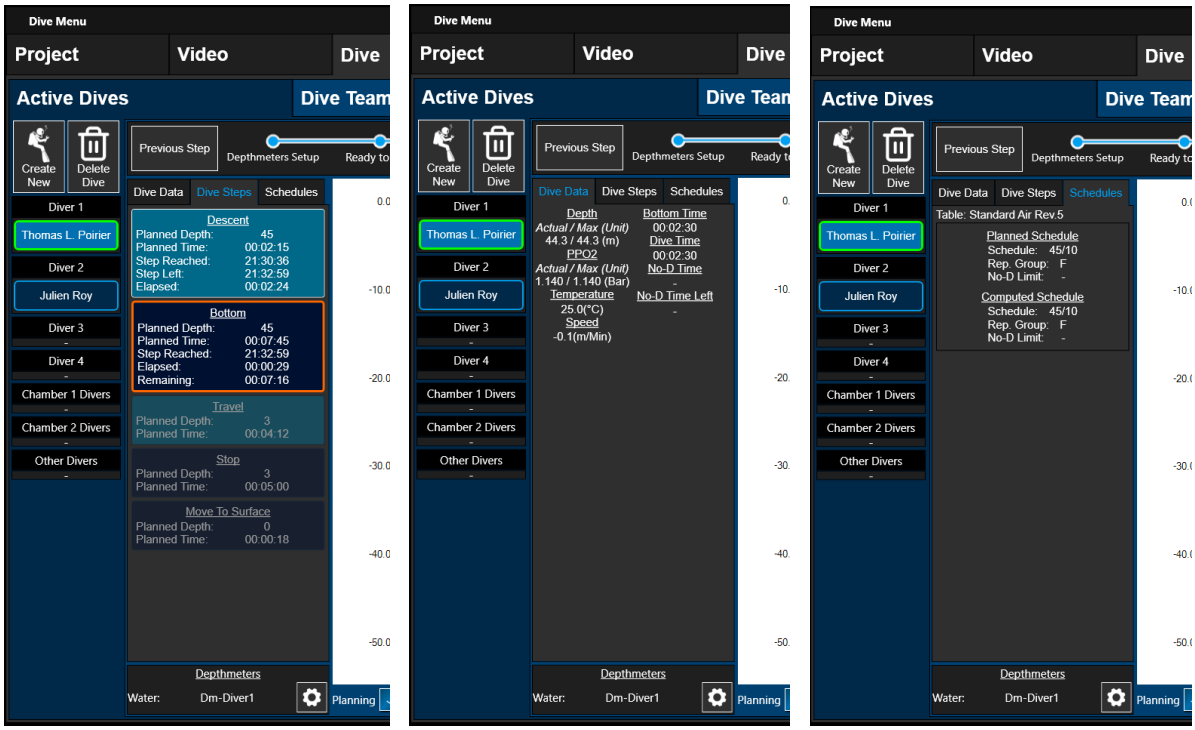


Once the depthmeters are properly set and the dive is started, you can follow the individual stages of the dive by looking at the dive steps. Also, you can see all relevant information about the dive in the Dive Data panel. The *Next Step* button is used to move from one step to the next. If multiple divers are diving at the same time, the *Next Step – All divers at this step* button will be displayed. This button will move the group of divers to the next step without having to navigate to each dive separately.



At any time during a dive, you can edit information about the project or the planning by clicking the *Dive Job* or *Planning* buttons.

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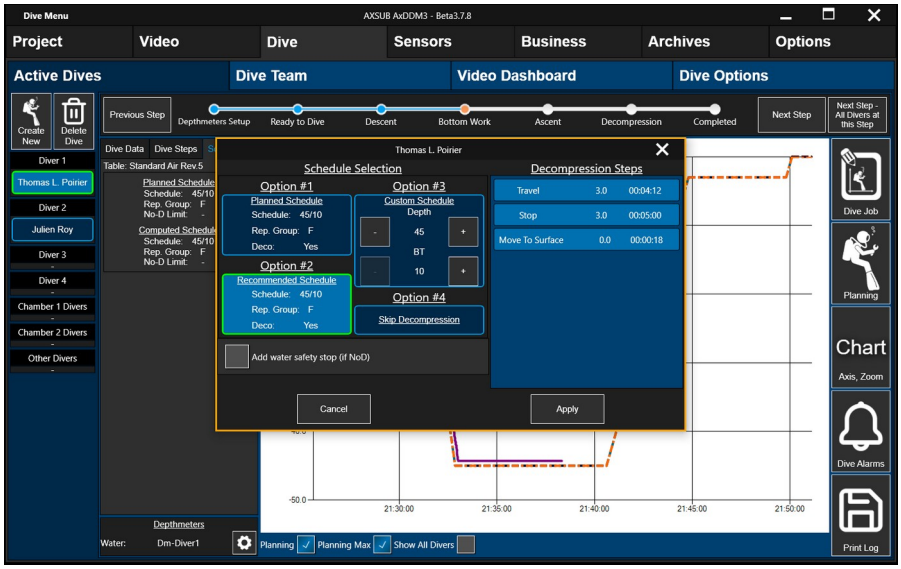
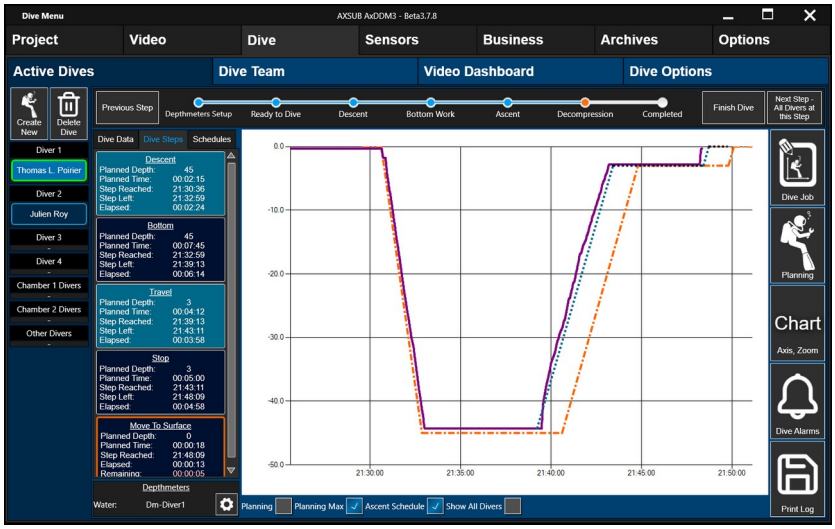
When the bottom work is completed and the *Next Step* button is hit to start the ascent, a prompt window will appear to show the various options regarding the ascent profile. The first option is to use the profile that was initially selected in the dive planning. The second option is to use the schedule that was calculated using the dive table you selected and the actual bottom time and depth of your dive. The third option is to use a custom schedule directly from the decompression table and the fourth and final option is to skip ascent schedule altogether. When you select one of the options, the resulting decompression steps can be previewed before applying the schedule.



When the last step is completed, hit the *Finish Dive* button to complete the dive. If the option is selected (*Dive Options* submenu), the dive log that is automatically generated will be opened by the default application your computer environment uses to read PDF files. The dive will be removed automatically from the *Active Dives* menu, but it can still be accessed to edit its information and/or generate new revisions of the Dive log by navigating to *Archived → Archived Dives*.



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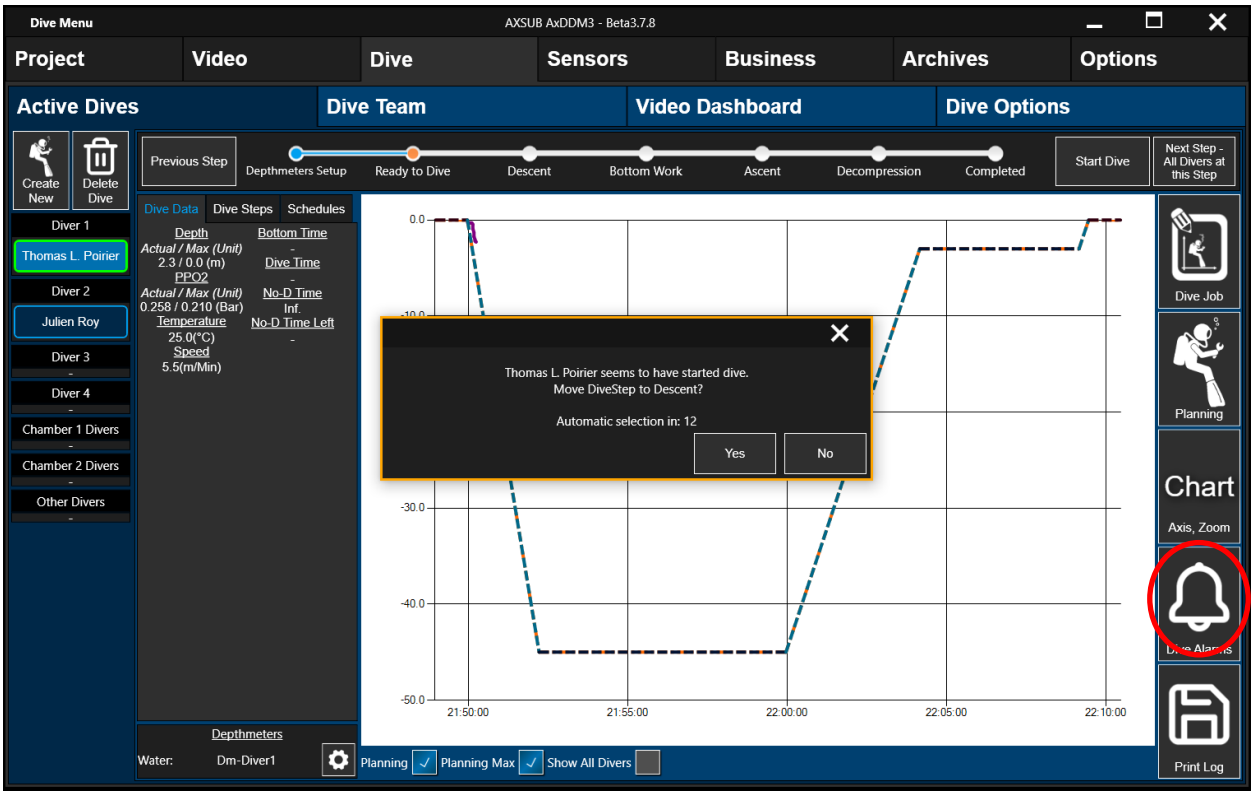
5.3.2 Dive Alarms – Automatic Dive Navigation

Dive Steps can be configured so the operator does not need to hit the *Start Dive, Next Step or Finish Dive* buttons when to steps are completed by the diver. This is done using the *Dive Alarms* prompt window, which can be accessed by clicking the *Dive Alarms* button.



The first alarms that can be configured are the main dive steps alarms (*Dive Started*, *Bottom Reached*, *Ascent Started* and *Surface Reached*). For each of these, you can set a depth threshold that will trigger the alarm when the threshold is reached.

- For the *Dive Started* alarm, you set the distance from surface that must be reached for the software to detect that the dive is started.
- For the *Bottom Reached* alarm, you set the distance from the planned depth that must be reached for the software to detect that the bottom is reached.
- For the *Ascent Started* alarm, you set how much distance must be left from the planned depth for the software to detect that the ascent is started.
- For the *Surface Reached* alarm, you set the distance from surface that must be reached for the software to detect that the dive is completed.

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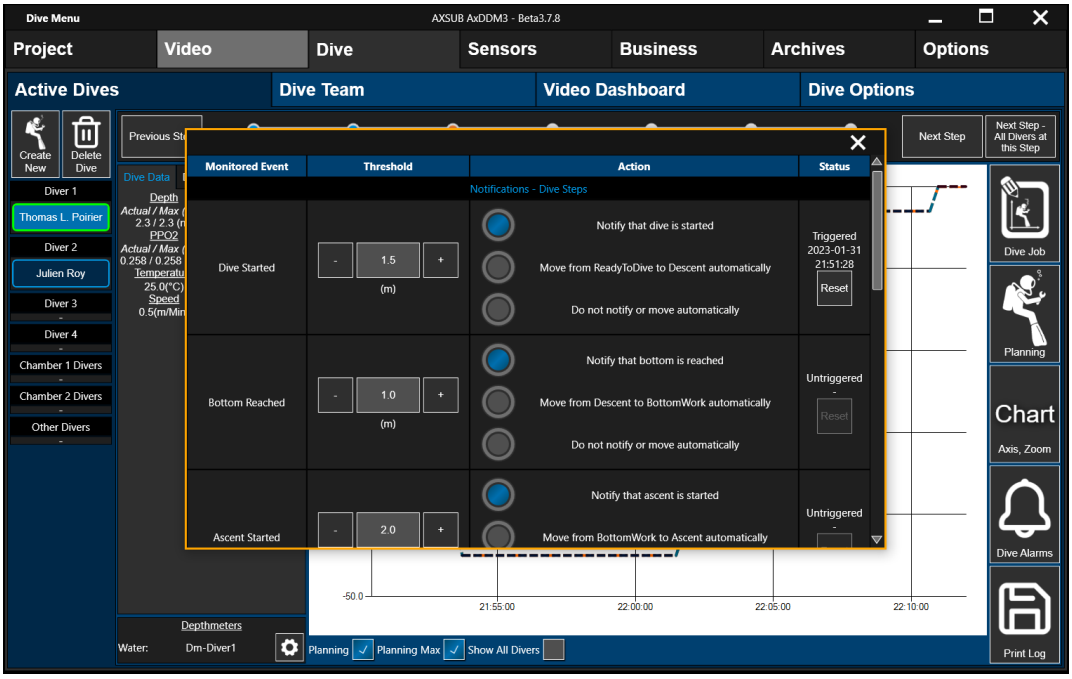
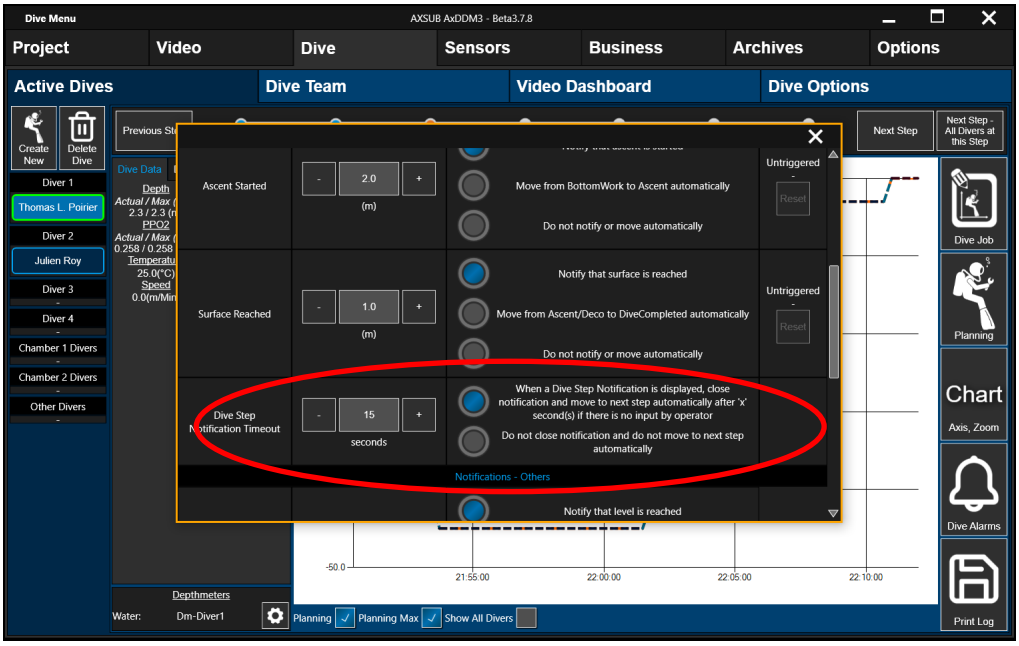


For each of these alarms, there are 3 ways to proceed with the trigger.

1- The first option is to make a pop-up window appear to notify that the event has been triggered. The operator can then choose to proceed to the next part of the dive or ignore the trigger. A timer can be set using the *Dive Step Notification Timeout* option, so that if the operator doesn't accept or cancel the event trigger after a certain amount of time, the dive will automatically proceed to the next step.
2- The second option is to make the software automatically proceed to the next step of the dive once the event is trigger, without any input from the operator or notification.
3- The third option is to disable the event trigger.



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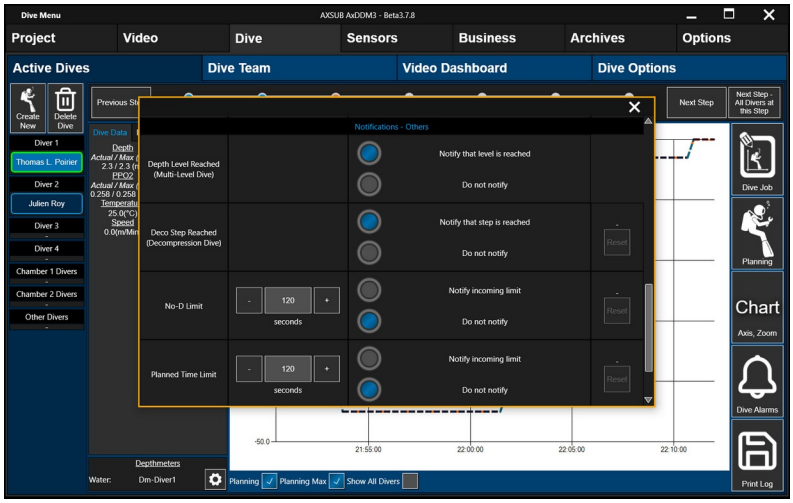
Other alarms/notifications can also be set, but they will only show a message if triggered, they don't have the option to automatically progress the dive to the next step.

Those other alarms are:

- *Depth Level Reache*d, for multi-level diving
- *Deco Step Reached*, for dives with decompression schedules
- *No-D Limit*, to indicate the table is about to require decompression
- *Planned Time Limit*, to indicate the planned time for a depth stop is about to be reached
- *Bailout Bottle*, to fetch information about the pressure in the bailout bottle to show in the dive log



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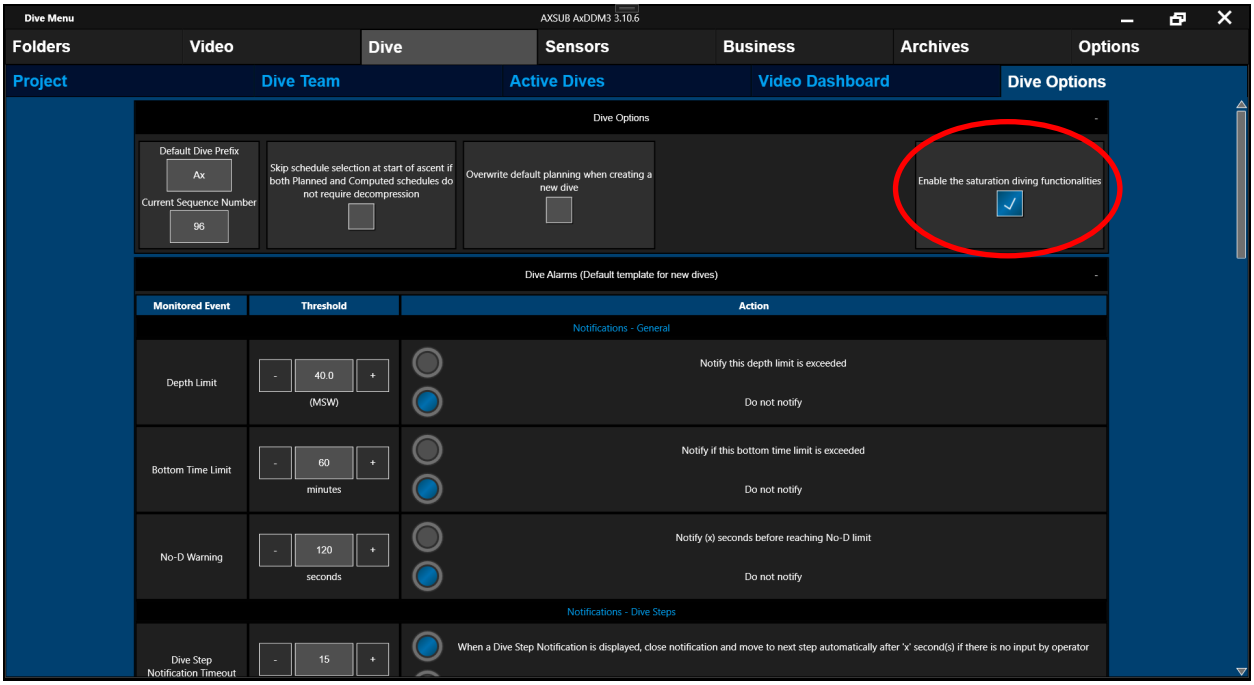
5.4 Saturation Diving

To enable the saturation diving options, you need to check the appropriate box in the *Dive Options* panel.



5.4.1 Saturation Diving – Depthmeters

At this point, the *Depthmeters* tab will now display combo boxes to represent three additional positions, one measuring the pressure inside the diving bell, and two others to provide readings for the bell's external environment.

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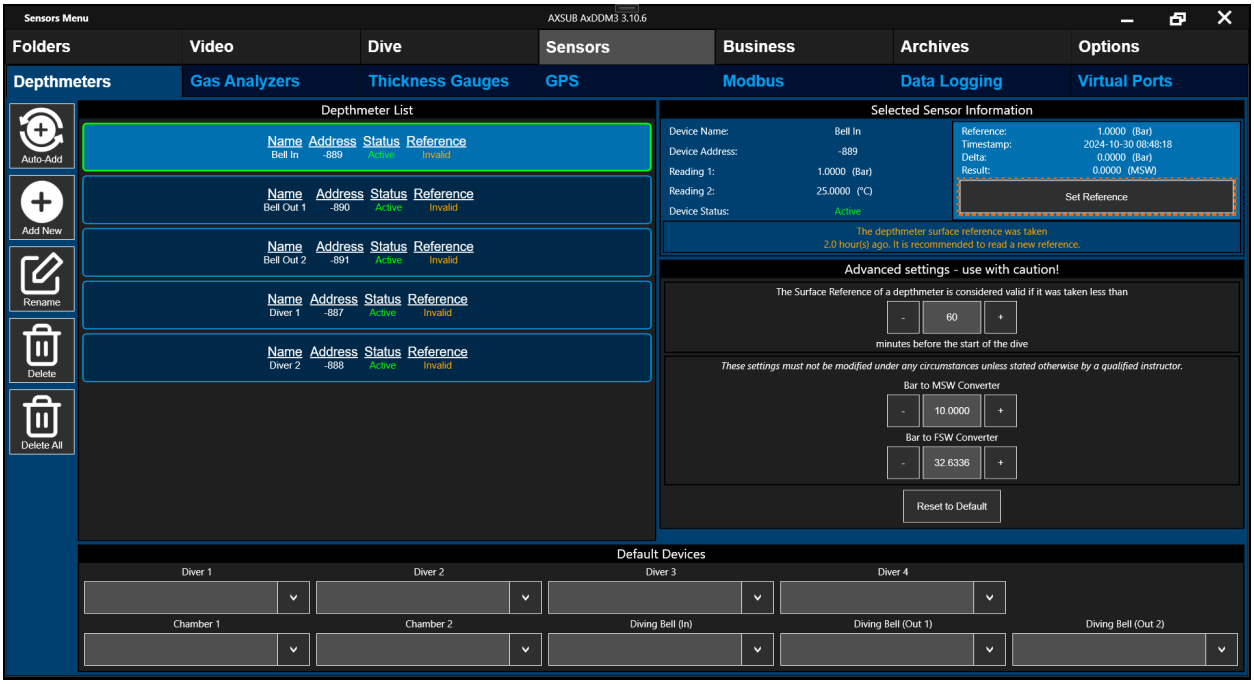
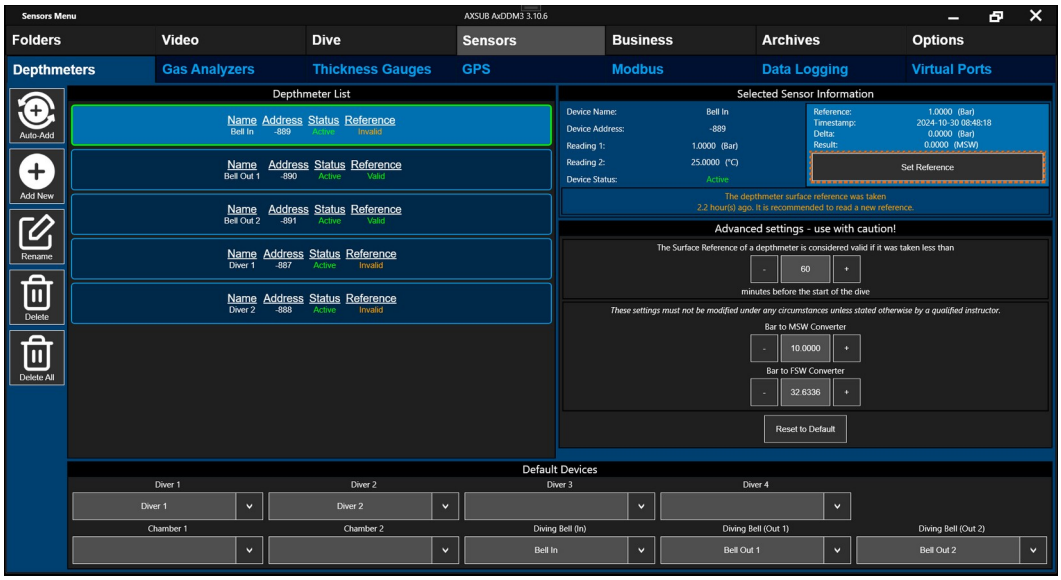


The process to add a depthmeter is the same as described in section 3.3.

Once done, each one must be assigned a role. Please be aware a configuration where the same device is assigned to a *Diver* or *Bell In* and to *Diving Bell (Out 1)* or *(Out 2)* won't allow you to reuse the reference from the diving bell's output reference value.



The reference setting will remain the same for the depthmeters associated to the *Diving Bell (Out 1)* and *(Out 2)* positions.

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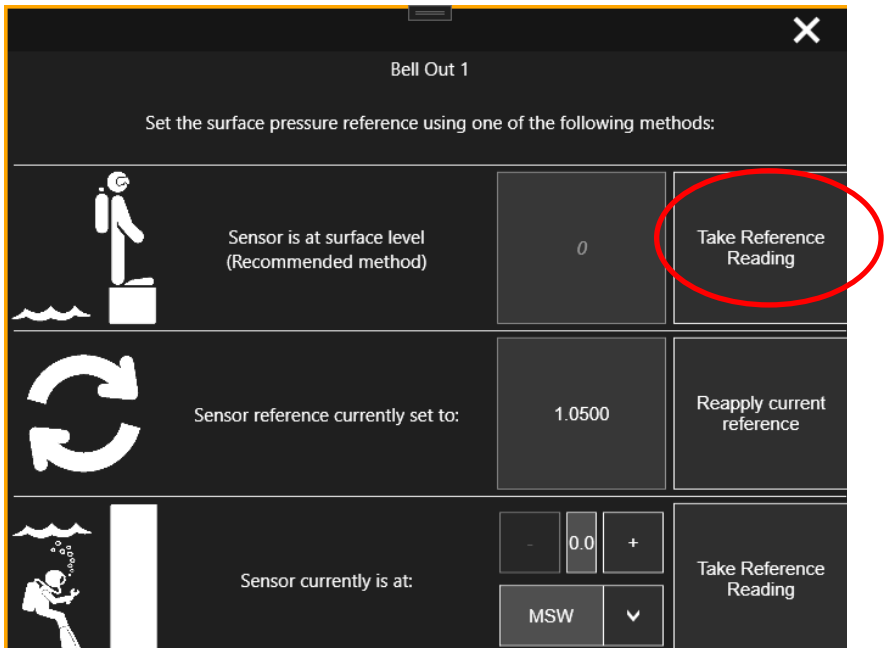

Taking a reference reading when the bell is at surface level is highly recommended.

Divers and Bell In

The reference for the *Divers* and "Bell In" should ideally be taken from the existing reference of the exterior of the bell. To have access to this option, a depthmeter needs to be assigned in *Diving Bell (Out 1)* and/or *Diving Bell (Out 2)*.

Reminder that in case a depthmeter is already assigned to a *Diver* or *Bell In*, and also assigned to *Bell Out*, the option to take a reference to *Bell Out* won't be displayed in the pop-up window.

If there is only a single depthmeter assigned, either in *Bell Out 1* or *Bell Out 2*, the value taken for the reference of the *Divers* or *Bell In* will be the reference of the *Bell Out* depthmeter. In case there are two depthmeters assigned, the reference will be an average of both.

Example: If *Bell Out 1*'s reference is 1.05 bar and *Bell Out 2* is 1.10 bar, the average value of 1,075 bar will be used when applying it to *Bell In*.

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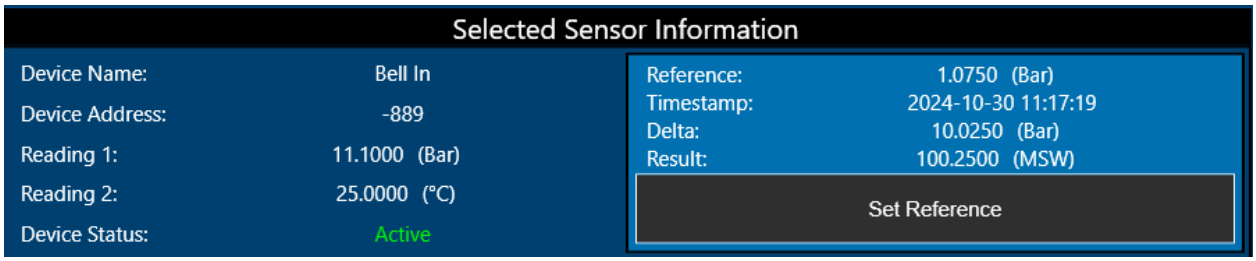
Since *Bell In* should already be at the bottom work/living pressure, the information section of the sensor will display the resulting depth:



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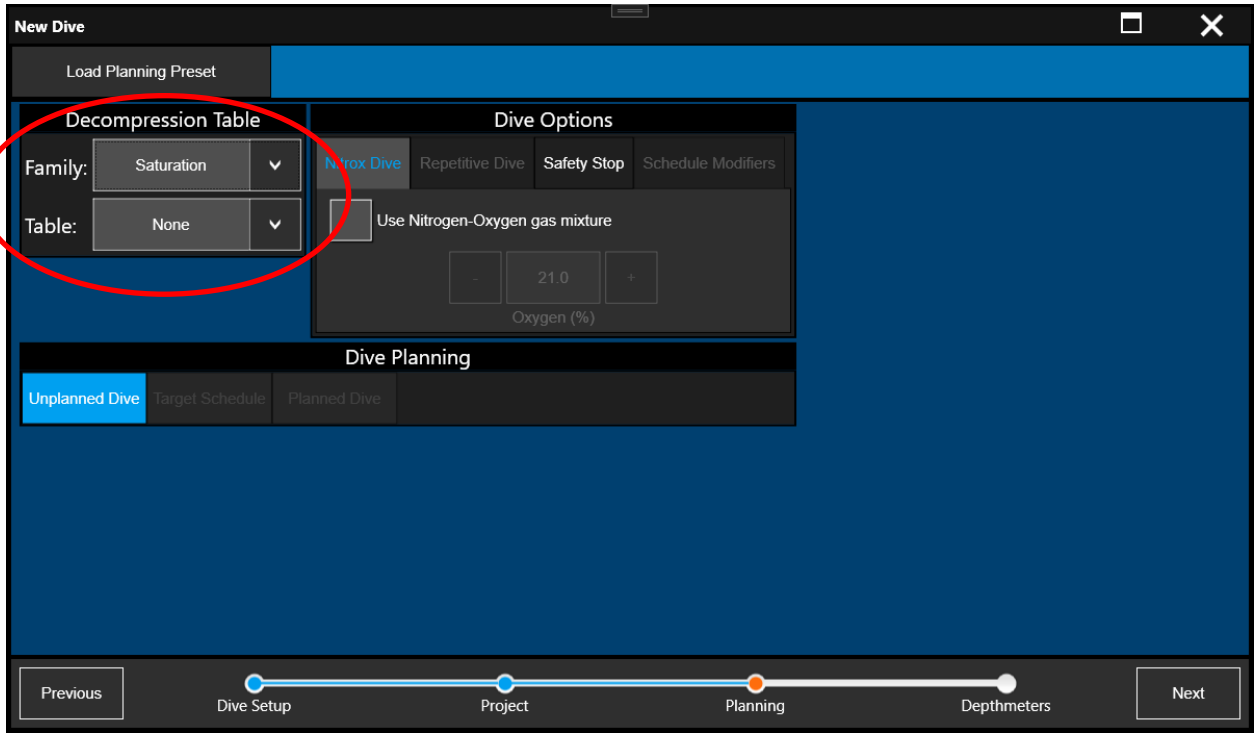
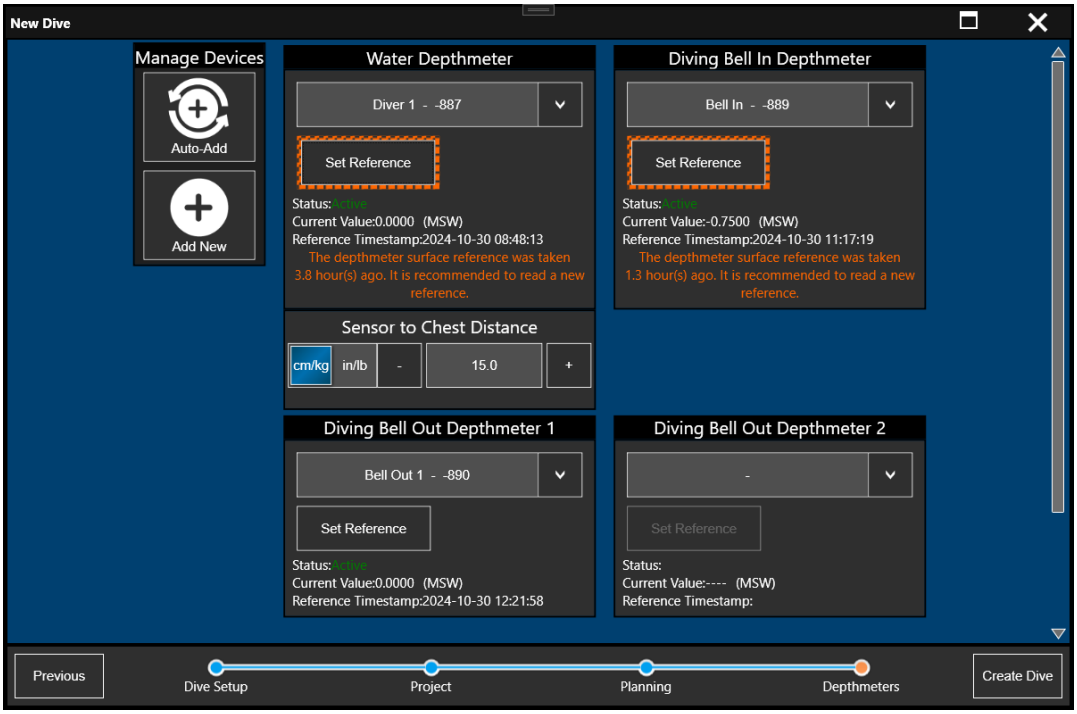
5.4.2 Saturation Diving – Dive



To create a saturation dive, the process stays the same has in the section 5.2. In the *Decompression Table* section for a *New Dive,* you are required to select *Saturation* in the *Family* field.

In the *Depthmeters* section, you will also have the option to configure and (re)take a reference reading on each sensor.



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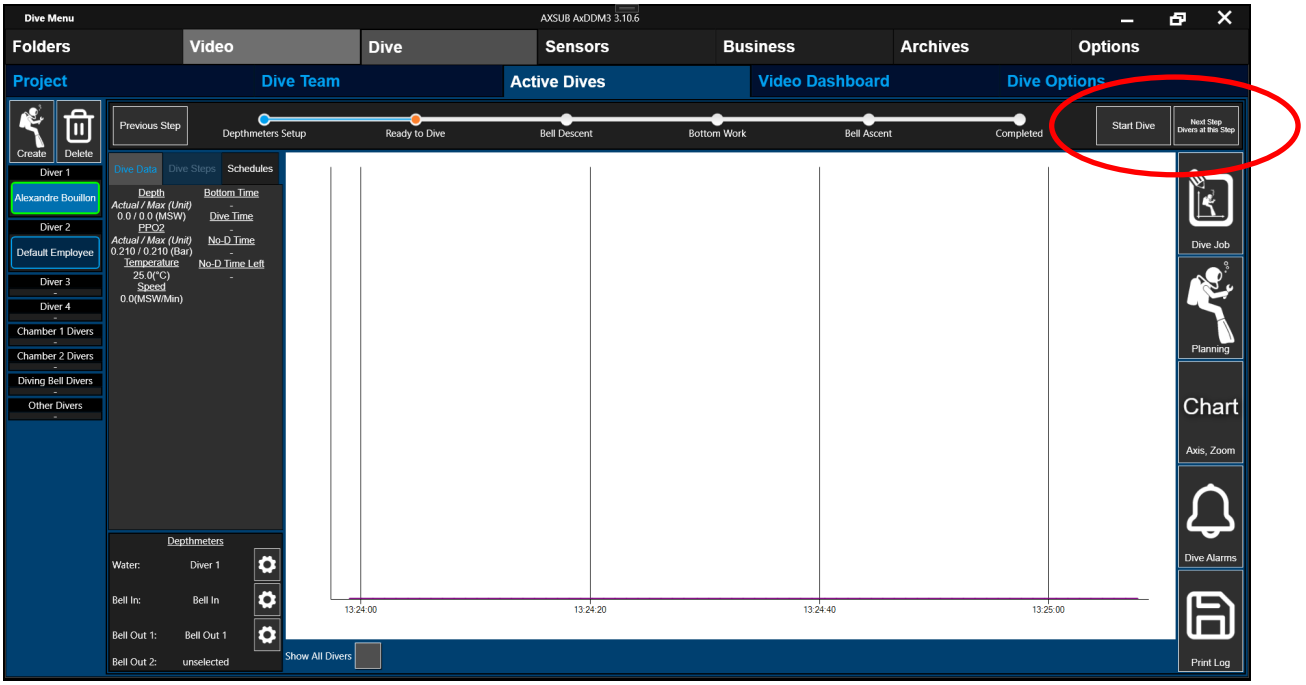
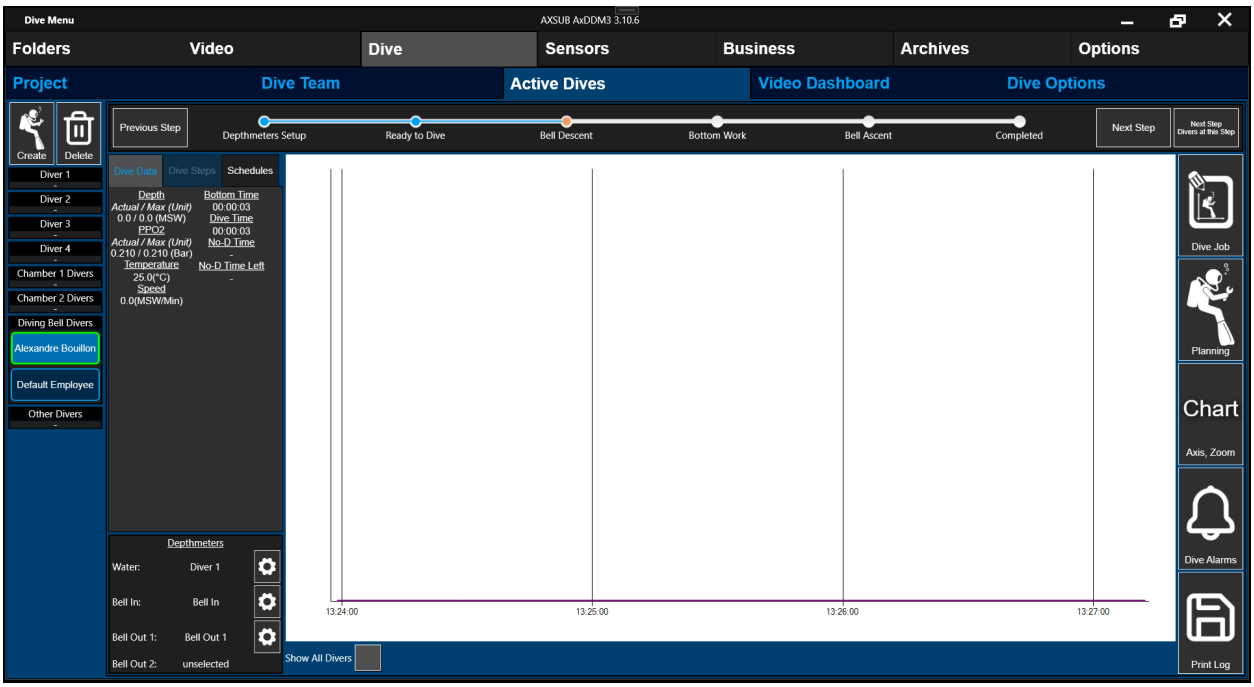
You can now proceed to do the same for each diver and once this step is completed, the *Active Dives* panel will display a dive chart for each of them.



To start the dive, you can manually hit *Start Dive* for the selected diver or hit *Next Step – Divers at this step* which will start the dive for all divers at the *Ready to Dive* state.



As one gets to the *Bell Descent* step, the chart will start drawing the series representing the diver's actual depth that is based on the value or average value of the *Bell Out* depthmeter(s).

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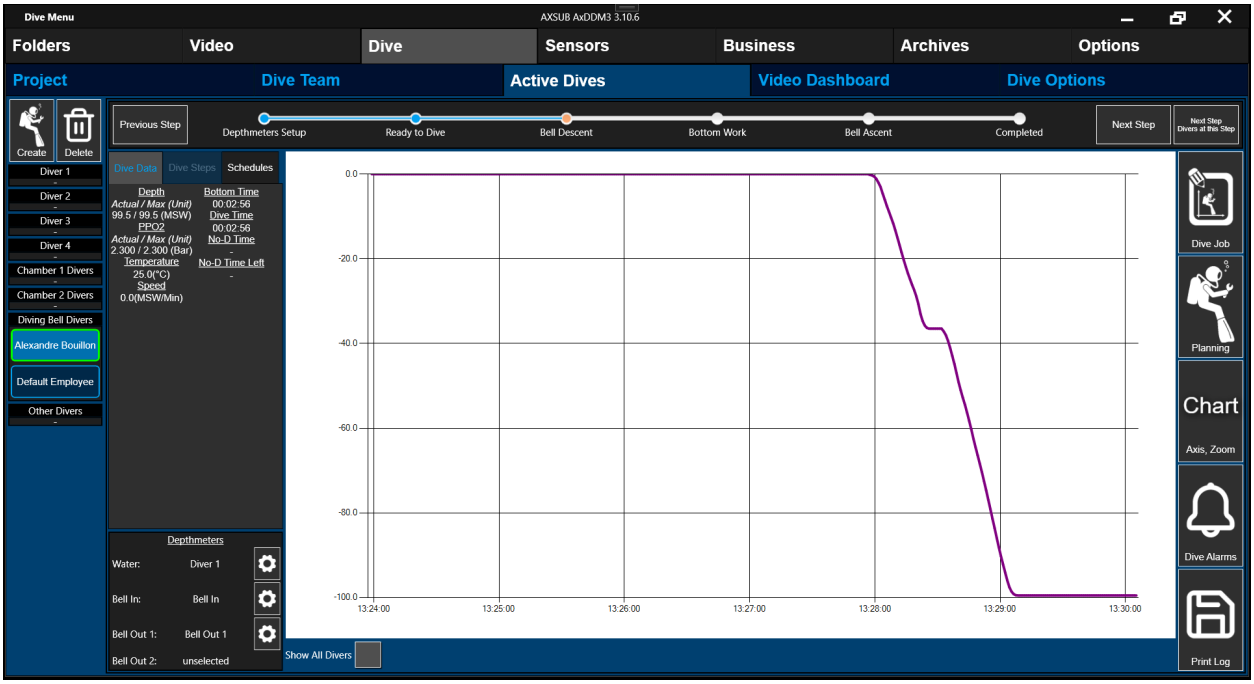
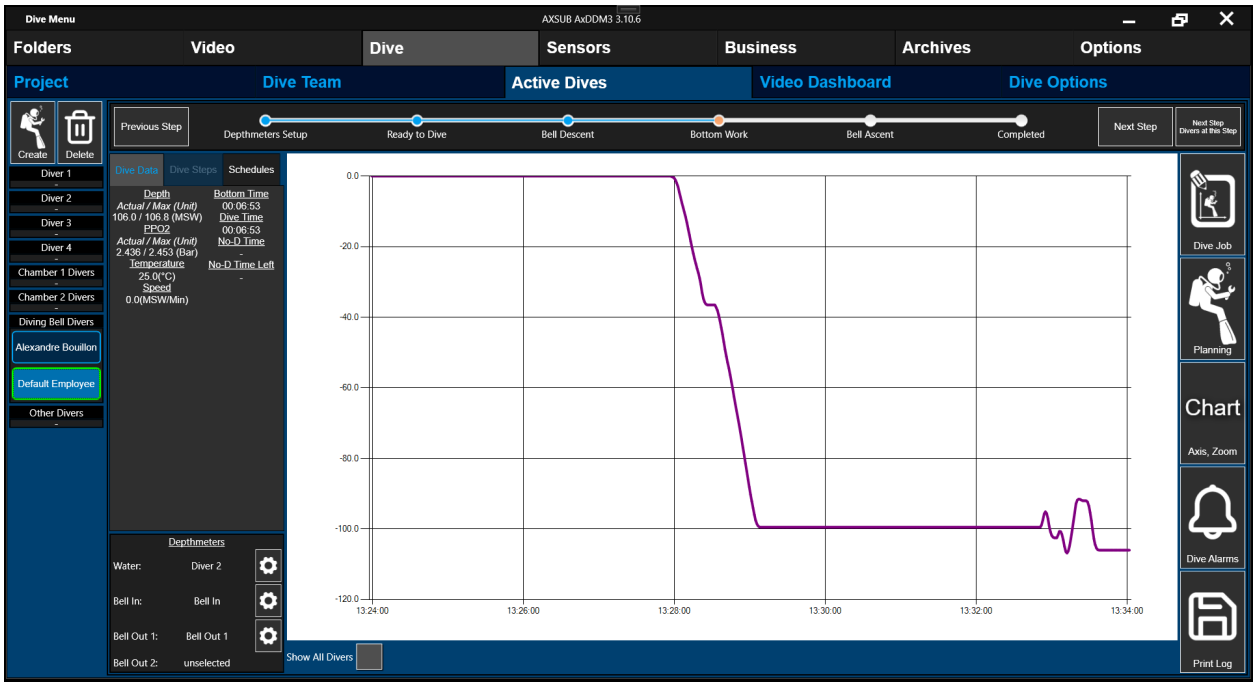
As an example, here is a curve representing the position of a bell that has just descended to 100 meters.



As the dive progresses and the desired bottom work depth is reached, we can select a diver and hit the *Next Step* or the aforementioned *Next Step Divers at this Step* buttons to make one or all of the divers switch to the *Bottom Work* state.

At this point, the values provided by the chart will directly origin from each diver's depthmeter.



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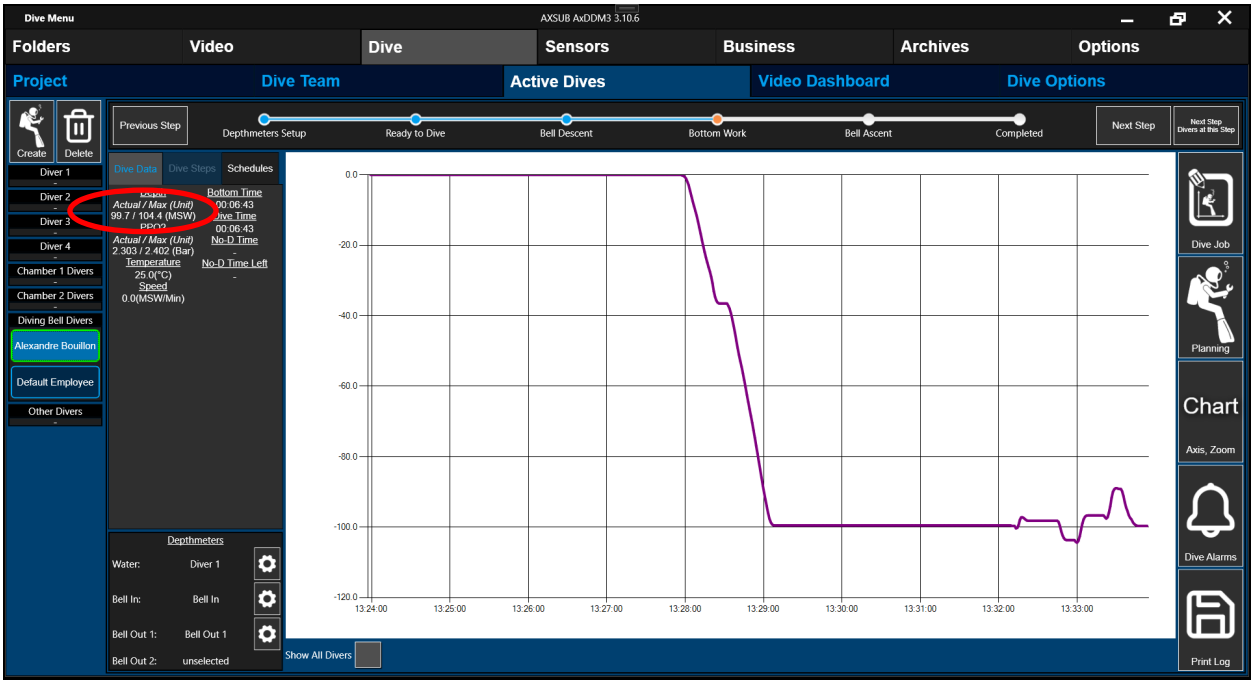
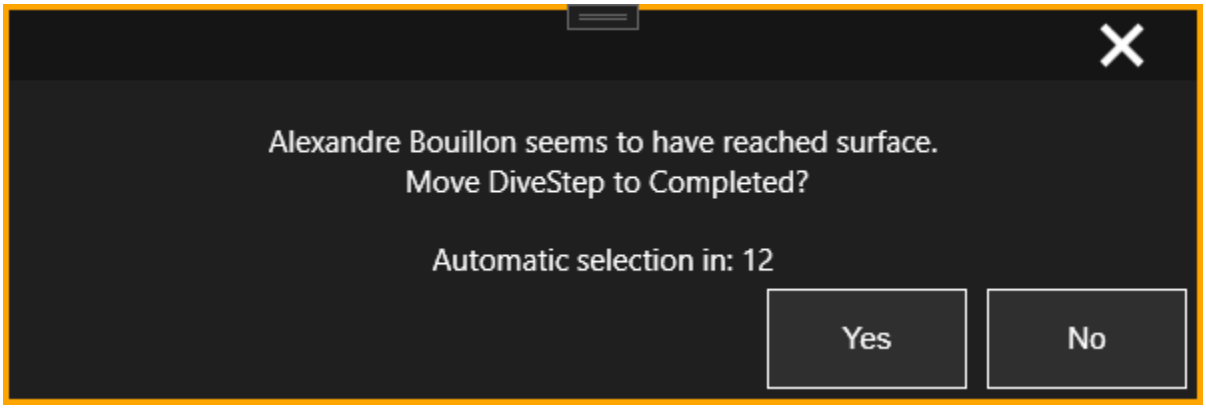


You can easily follow the excursion for each of the diver and see their current depth.

Once the work is completed for all the diver and that they are back in the bell, we can once again hit *Next Step Divers at this Step* to initiate the *Bell Ascent* step.

From now on, the chart will take the value of the *Bell Out* depthmeters. In the event you have two depthmeters producing your average reference reading and one starts showing signs of failure or spitting inconsistent data, the resulting depth showing up on screen will inevitably be affected. To work around this issue during an active dive, you have the possibily to temporarily decommissioning the malfunctioning depthmeter from the *Sensors* page by choosing the placeholder value under the corresponding *Bell Out* drop-down list.



Once the bell is back to the surface level according to *Bell Out*'s reference, you will automatically be offered to complete the *Dive* for each *Diver* that was in the bell.

If you move a *Diver* to the *Completed* step, its own *Dive Log* will be generated right away.

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5.4.3 Saturation Diving – Dive Report / Dive Log

In the *Dive Log* you can find the information you entered for the *Location*, the *Client*, the *Project* and the *Dive*.

System ID: 03a122cb

Dive Log:Default Employee

Location

Location:	
Address:	
City:	**State:**
Country:	**Zip Code:**
Latitude:	**Longitude:**

Client

First Name:	**Last Name:**
Company:	**Phone:**
Email:	
Address:	
City:	**State:**
Country:	**Zip Code:**

Project

Diving Activity

- [X] Plant diving / general work diving
- [ ] Diving in the aquaculture industry
- [ ] Leisure diving guide
- [ ] Leisure diving training
- [ ] Media Diving / UV Photo
- [ ] Rescue Diving
- [ ] Shellfish
- [ ] Scientific Diving
- [ ] Diving Training
- [ ] Other

Dive Type

- [X] Surface Supplied
- [ ] Self-sufficient
- [ ] Pressure Chamber
- [ ] Freeflow
- [ ] Other

Decompression Type

- [ ] No-Decompression Dive
- [X] Scheduled Decompression Dive
- [ ] Unscheduled Decompression Dive

Dive Team

Supervisor:

Divers:

Tenders:

Standby Divers:

Others:

Project Description:
Inspection on Mars

Experience Type: Inspection
Comments:

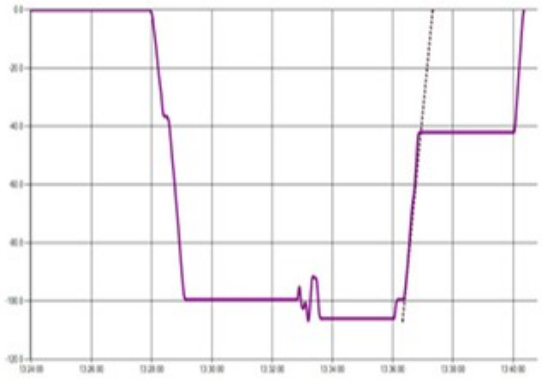
Dive

ACTUAL DIVE / *PLANNED DIVE* / (UNITS)

Table: None
Oxygen Level: 21.0
Dive Risk Factors: Low Workload, Neutral_Warm Water
Diver Risk Factors: None
Schedule: /
No Decompression Limit: - (min)
Repetition Group:

Dive Started: 2024-10-30 13:27:09
Dive Completed: 2024-10-30 13:40:39
Dive Time: 00:13:30 (min)
Bottom Time: 00:09:10 (min)
Max. Depth: 106.8 (MSW)
Max. PPO2: 2.453 (Bar)

Dive Chart:



Action	Gas	Timestamp	Planned Depth	Planned Time	Actual Time	Total Time
Dive Started		13:27:09				00:00:00
Bottom Reached		13:32:10				00:05:01
Bell Ascent Started		13:36:19				00:09:11
Dive Completed		13:40:39				

Client **Supervisor**

ImpExp - Dive Log Page 1/1

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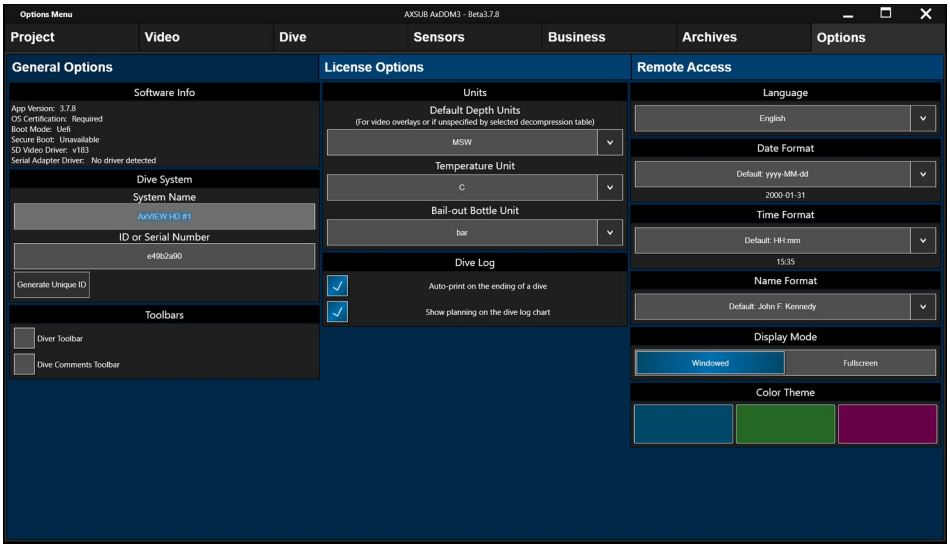
6. AxDDM3 Options

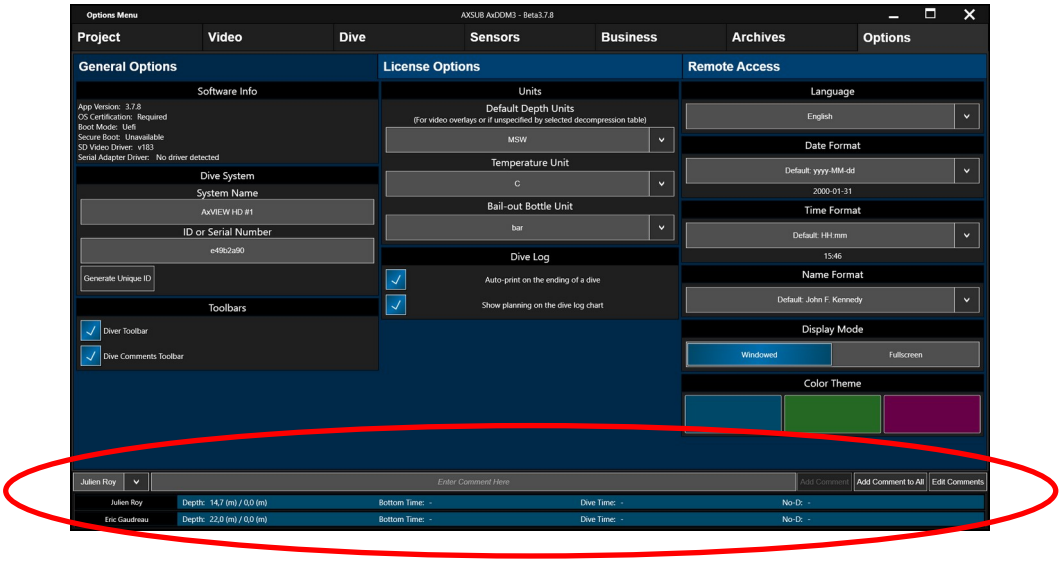
6.1 General Options



The *General Options* submenu is used to configure most application settings such as string formats, language, and units.

Please take note that when a dive is created with a specific decompression table, all data related to this dive will use the depth unit specified by the table. The *Default Depth Unit* is used if there is no decompression table selected. It is also used for the depth value provided by the text overlay that is applied on video.

The *Diver* and *Dive Comments* toolbars are used to add toolbars to the interface that can be used to monitor dives from anywhere in the application.



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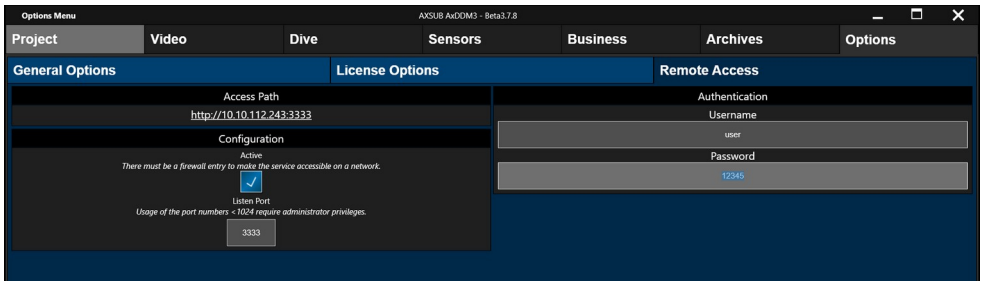
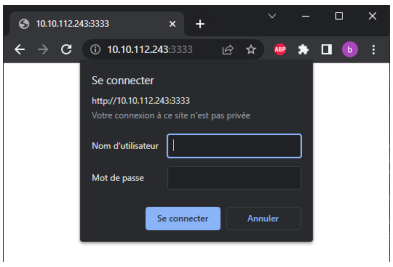
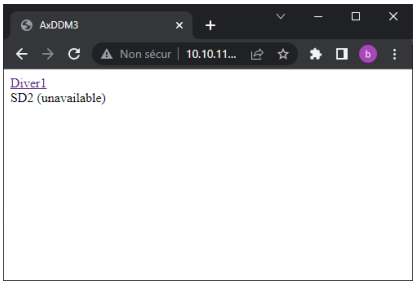
6.2 Remote Access

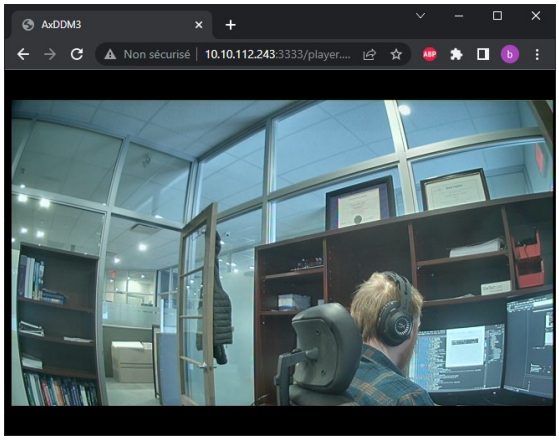
The *Remote Access* submenu is used to stream your video streams to computers and mobile devices on your local network. To enable the feature, specify a *Username*, a *Password* and a *Listen Port* in the AxDDM3 application, then click the checkbox to activate the feature. The application will then provide you with a URL leading to your local streaming server.



This address can then be typed in a browser on the device of your choice to access to video feeds, as long as they are connected to the same network or if the diver station is accessible over a VPN.







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