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HYCAT SeaRobotics Driver

By Connor MacDonald

Xylem has partnered up with SeaRobotics to create the HYCAT, an Autonomous Surface Vehicle (ASV), which will be using HYPACK® Max for data acquisition. The SeaRobotics.dll will be used to control the HYCAT and change settings.

The SeaRobotics driver requires a mission plan in HYPACK® LNW format, and a target named ERP (Emergency Retrieval Point) where you can safely recover the ASV when there is a communication failure or when the end of the mission occurs.

You can make the mission plan in the LINE EDITOR. (See "New Mission Planning Interface")

DEFINING THE EMERGENCY RECOVERY POSITION

The position is set by creating a target named ERP in the TARGET EDITOR (accessed in the HYPACK® Shell):

1. **Select PREPARATION-EDITORS-TARGET EDITOR**.
2. **Click [Add]**. The Add Target dialog appears.
3. **Set the Name to ERP, provide the retrieval location** and click [OK]. The target appears in the Default group. (The ERP target can be in any group.)

   FIGURE 1. *Defining the ERP Target in the TARGET EDITOR*
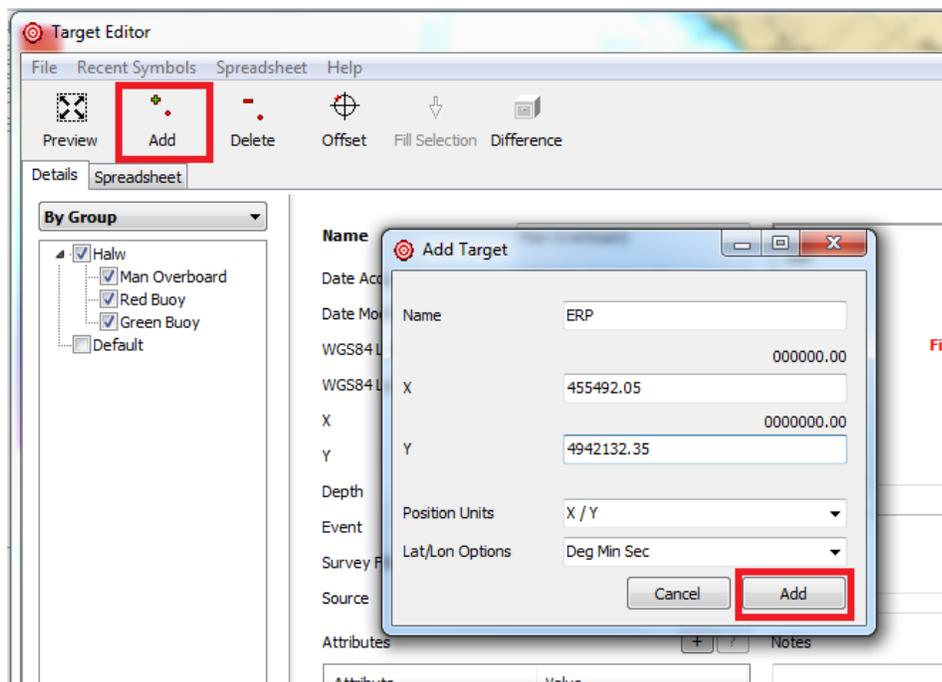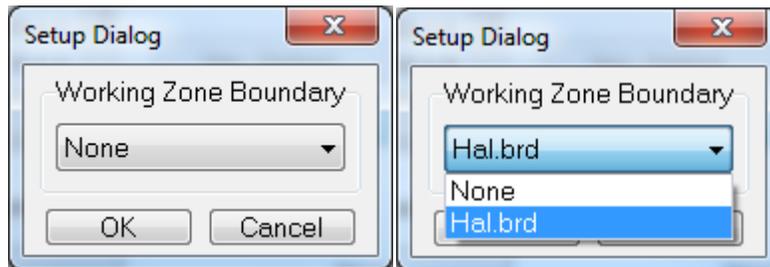
THE DRIVER

1. **In HARDWARE, click [Setup].** The driver opens a dialog asking for a Working Zone Boundary.

   FIGURE 2. *SeaRobotics Driver Setup Dialog*

   This lets you choose a border file (*.BRD) that you can use to make sure the HYCAT stays within a specified area. The drop-down will show all available BRD files in your current project directory.

2. **Launch SURVEY.**

   If you see a "No LNW Loaded message", you have forgotten to load the mission file (*.LNW) for the HYCAT to follow. You can load it from SURVEY by selecting LINE – SELECT FILE… in the main SURVEY toolbar.
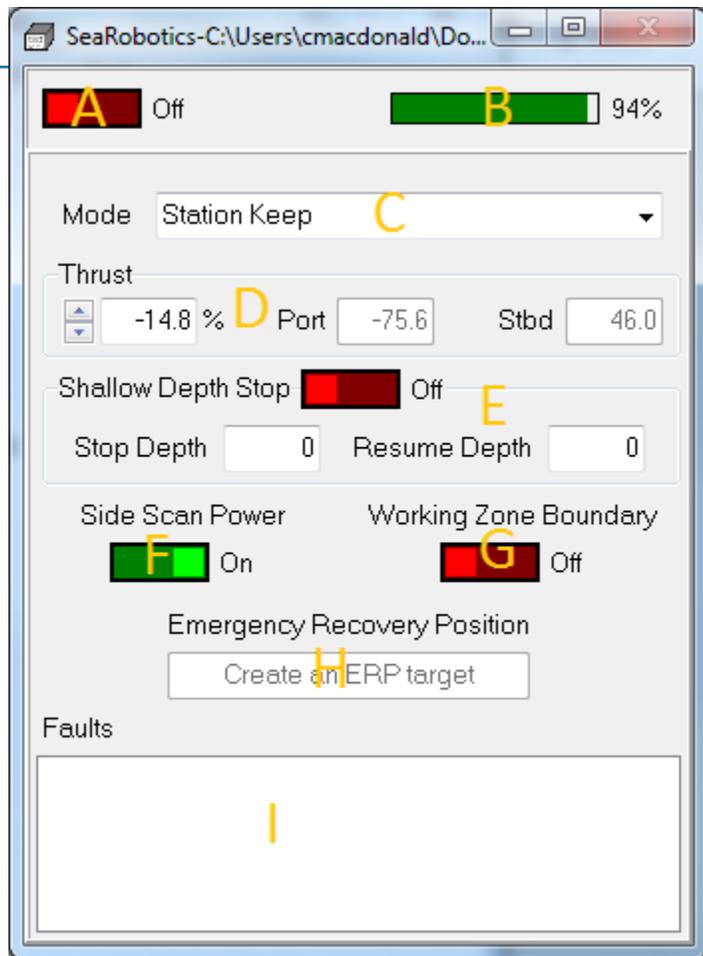
   FIGURE 3. *Loading the Mission File in SURVEY*
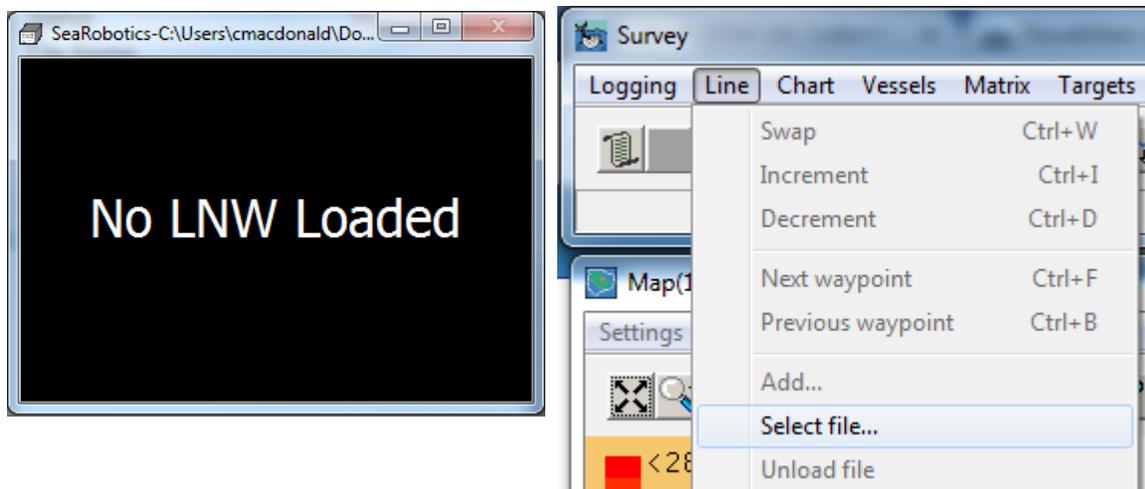
   Once this is done the device window will change appearance:

FIGURE 4. *SeaRobotics Device Window*

A. **Turn on/off driver output** to the HYCAT
B. **Battery percentage**
C. **HYCAT control mode**
D. **Thrust control**
   a. The leftmost box is the total thrust percentage and this can be changed by the user.
   b. Port describes the port thruster and Stbd describes the Starboard thruster. These are controlled by the HYCAT itself to turn.
E. **Shallow Depth Stop** will prevent the HYCAT from moving into unsafe water depths.
   a. Use the toggle to turn this feature on/off .
   b. **Stop Depth** is the depth where the HYCAT should stop moving in that direction.
   c. **Resume Depth** is the depth where the HYCAT should resume its mission.
F. **Side Scan Power:** Turns power to the side scan on/off.
G. **Working Zone Boundary:** Turn on/off the Working Zone Boundary which confines the HYCAT to the area defined by the border file specified in the HARDWARE Setup.
H. The **Emergency Recovery Position** defined in the ERP target where the HYCAT returns for retrieval when there is a communication failure or at the end of the mission.

   If the project doesn't contain a target named ERP, the device window says "Create an ERP Target" (Figure 4). You must exit SURVEY to do so.

   When there is an ERP target, the Emergency Recovery Position will look like this:

I. The **Faults ListBox** will print out any faults from the HYCAT. This gives specific warnings about issues the HYCAT is having, helping you figure out a more clear course of action to correct any problems.

These are the basics of the new driver. There are sure to be many updates to come, and as-of-yet the HYCAT is not yet released. If you are looking for an all-in-one solution for autonomous data acquisition and processing, check out the HYCAT project <u>here</u>.