

New Cutter Suction Driver: CutterSuction.dll

by Cristhian Bermudez

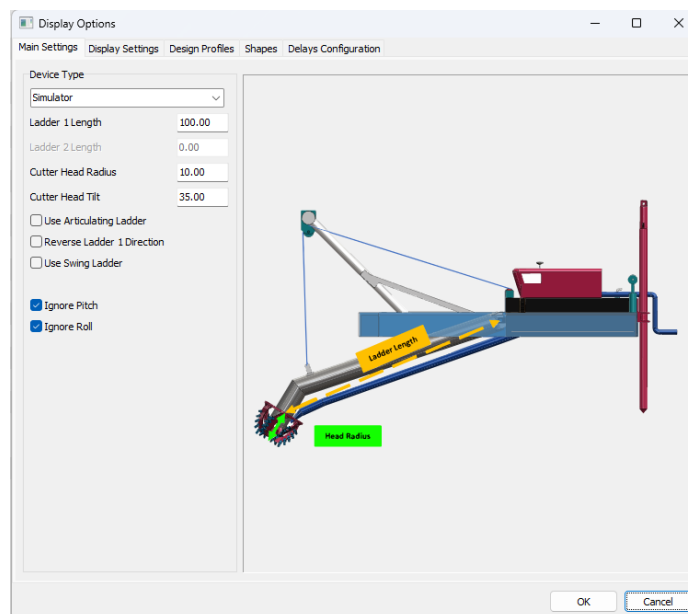
Listening to user feedback, we identified several of our existing tools that require enhancements to deliver better, more intuitive information to operators. These insights led to the development of a completely re-imagined version of the **Cutter Suction driver (CutterSuction.dll)**. It was designed not only to fix limitations of the Inclinator.dll, which was the previous driver used for cutter suction, but to elevate the entire operating experience. However, the Inclinator.dll will remain available to users in this software update. In this article, I'll highlight the key features and improvements that define this new release such as:

- Improved user experience
- Operation Performance and Downtime Management
- Operational Intelligence and Continuous Improvement

Improved User Experience

One of the main priorities in this new driver version was **simplifying the user experience**, particularly during hardware configuration and sensor integration. Now, when a user selects a specific type of sensor, such as a pitch sensor, inclinometer, or ladder sensor, the interface dynamically updates to show only the relevant parameters. This context-sensitive design ensures that the user is not overwhelmed with unnecessary fields, making setup faster and reducing the likelihood of configuration errors.

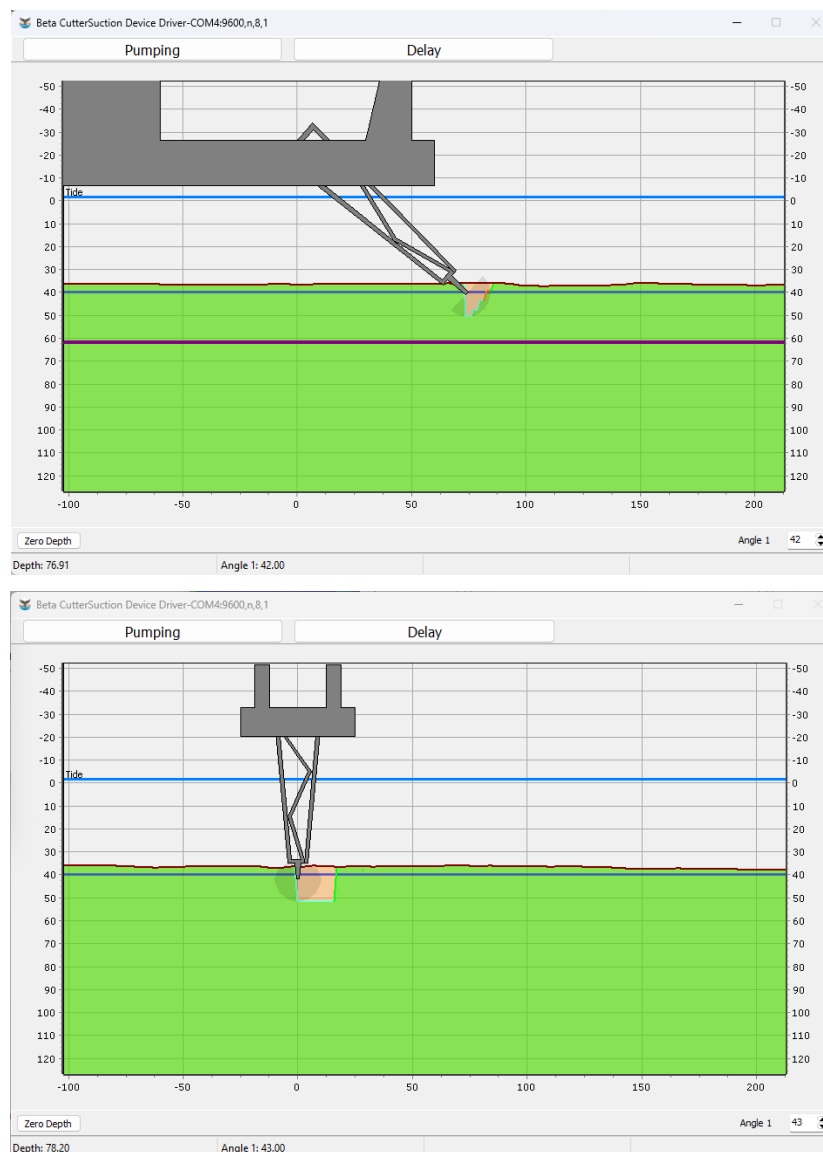
The image below shows the **built-in visual guidance** that is included in the new driver. This implementation aims to reduce confusion with images and instructional cues explaining exactly where and how to take measurements on the cutter suction dredge. This is especially critical when calibrating ladders or cutter heads, eliminating guesswork and ensuring measurements are made consistently and accurately, which in return improves data integrity and operational safety.



We also introduced a **multi-layer dredge shape viewer**, allowing operators to display the cutter body, ladder, trunnion, and other structural parts overlaid with survey information. The improved **profile window** gives users a rich visualization environment to better understand the interaction between the dredge and the surveyed environment. It supports:

- A layered display of survey data, dredge plan, design profiles, and real-time dredging activity.
- Adjustable color, thickness, and transparency for each layer, allowing operators to tailor the view based on specific operational needs.
- **Rear (aft) view support**, offering a new visual angle to help operators interpret performance and cutter location more intuitively.

These enhancements are especially useful in complex projects where spatial awareness and fine adjustments are critical to meeting dredging specifications. Shown below are some sample images of the dredge shape viewer displayed from both a side profile (top) and rear profile (bottom) views.



Operation Performance and Downtime Management

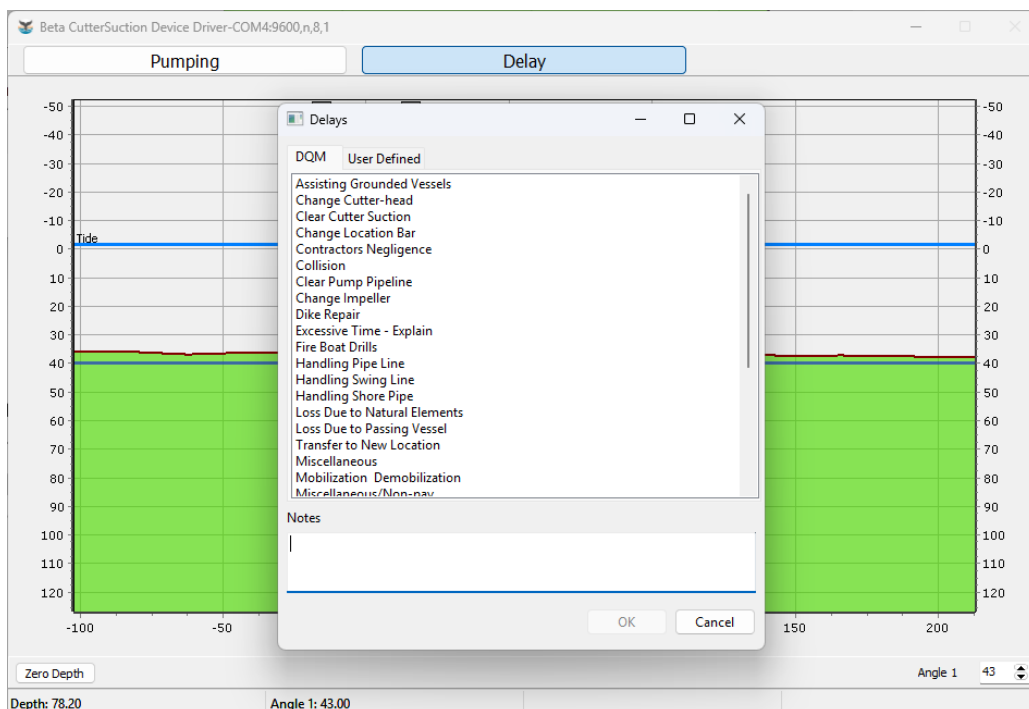
Beyond visualization, the new driver also improves **operational intelligence and performance tracking**. We've embedded new tools directly into the interface to help operators and managers log and analyze the dredging status in real time.

One of the standout additions is the **digital logbook system**, which is a tool that allows operators to manually or automatically record activity while the dredge is pumping, on standby, or facing an operational issue. This provides a detailed, timestamped record throughout the shift.

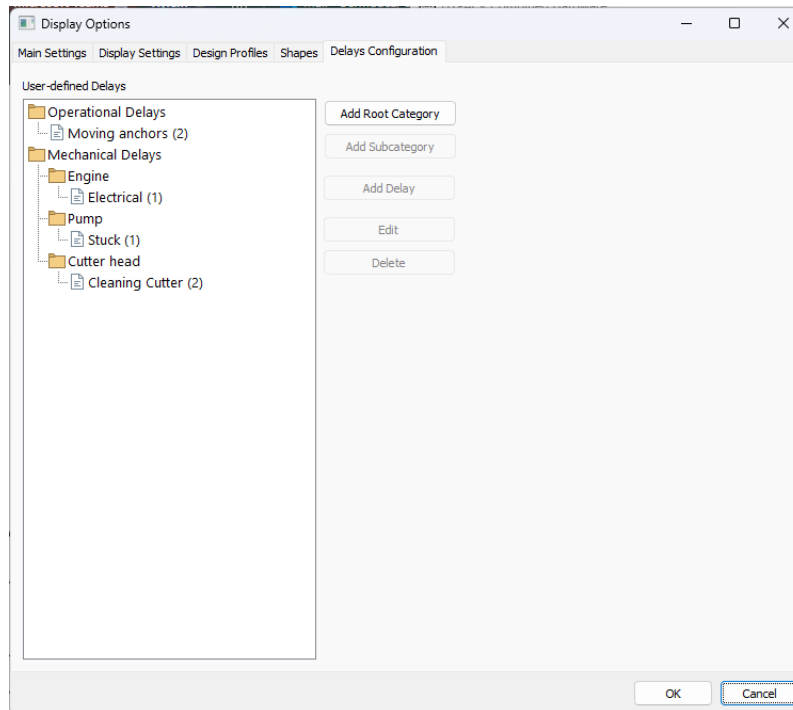
To support root cause analysis, the new configuration panel enables companies to define a **hierarchical structure for downtime causes**, allowing operators to quickly select from predefined categories such as:

- Mechanical failure
- Weather delay
- Crew change
- Environmental issues
- Navigation or obstruction problems

These selections are saved in a structured database, enabling detailed reporting and trend analysis later. What makes this powerful is the ability to **correlate downtime logs with performance metrics**. This data can be exported or visualized in dashboards, helping project managers identify bottlenecks, estimate operational efficiency, and determine the impact of specific delays on production targets. Below is a sample image of the list of downtime causes that the operator can select from. Notice that within the image the user is under the DQM tab of the Delays window. The DQM tab contains the standard structure for downtime as defined by the Army Corps. If the operator needs a more personalized categorization of their delays, then the User Defined tab next to the DQM tab is where those user-created categories can be accessed.



The operator can configure the User Defined tab from the Delays Configuration tab in the driver's Display Options setting window as shown below. Within the Delays Configuration tab, the user can create their own structured list of downtime causes to cater to their specific use cases.



Operational Intelligence and Continuous Improvement

This release is part of a broader initiative to integrate **operational intelligence** directly into the tools used by dredge crews. By capturing downtime data, sensor inputs, and production metrics in a single system, companies can start leveraging that data to answer critical questions such as:

- What are the recurring causes of downtime?
- Are we meeting daily and weekly dredging targets?
- Is a specific operator, shift, or project location underperforming?
- Can we optimize dredging routes or ladder angles based on past performance?

In the upcoming releases, we plan to expand on these insights by offering **automated reports**, trend visualizations, and integration with cloud-based dashboards. These will help organizations not only monitor operations in real time, but also take strategic actions to improve performance, reduce cost, and expand equipment lifespan.