



# DREDGEPACK®

INSTALLATION MANUAL FOR CUTTER SUCTION DREDGES

Revision B, May 2025



**HYPACK**  
a xylem brand

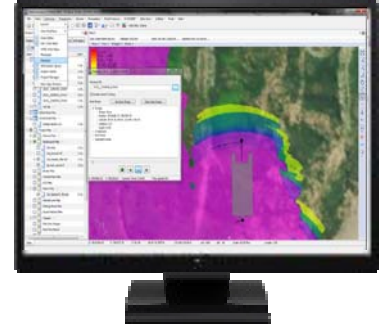
# INSTALLATION MANUAL FOR CUTTER SUCTION DREDGES

Thank you for your purchase of this Cutter Suction System. Every effort has been made to ensure this system is ready for installation directly from the case in which it has been shipped to you. All components have been bench tested for complete functionality of the system. It is our desire to provide you with the best system possible and to fully support all aspects of your new HYPACK Cutter Suction System.

The purpose of this manual is to guide you in the installation of the DREDGE-PACK® system for cutter suction dredges. Due to the complexity of the installation, please follow the steps described in this guide. If you have questions, please contact HYPACK Technical Support at [help@hypack.com](mailto:help@hypack.com) or +1 (860) 635-1500.

The installation of all equipment is the sole responsibility of the client or the reseller if the arrangements have been made for this. HYPACK personnel may recommend device placement for the best configuration but it is up to the installer to make sure that the sensors and interface boxes are set up in a safe and effective manner.

Best Regards,  
 HYPACK Technical Support Team  
[help@hypack.com](mailto:help@hypack.com)  
 +1 (860) 635-1500



## TABLE OF CONTENTS

- I. Precautions
- II. Equipment Overview
- III. Installation Instructions
  - A. Dual Antenna GNSS Receiver
  - B. Ladder Inclinator
  - C. Swing Rotation Sensor (Optional)
- IV. Maintenance and Care
- V. FAQ and Troubleshooting

## Revision History

DATE	REVISION	CHANGE DESCRIPTION
March-05-2024	N/A	Initial release
August-07-2024	A	Updated formatting for consistency with other manuals
May 28, 2025	B	Added Minimum Installation Required Checklist

# Minimum Installation Required Checklist

Use this checklist to ensure your equipment has been installed prior to the arrival of the HYPACK On-site Support Technician to help maximize the time available for interfacing, calibration, and training.

## Cutter Suction Dredges - Minimum Installation Required:

NOTE: The HYPACK On-site Support Technician will be in charge of the final connection of the cables.

- Screws welded on top of the cabin for installing the antennas in accordance with the installation manual.
- GNSS cables run properly inside the cabin with proper cable pass through or isolation.
- Welded plate for the inclinometer in accordance with the installation manual.
- Inclinometer cable run from the inclinometer to the cabin.
- Power supply ready for connecting the sensors, GNSS, and computer.

## Sonar Systems - Minimum Installation Required:

- Transducer Installation:
  - Sonar system installed (single beam, multibeam, sub-bottom, side scan, magnetometer).
  - Installed locations: Sea chest, moon pool, side/bow mount, towed.
  - Ensure proper cable routing.
- Positioning Device Installation:
  - GPS or inertial system installed.
  - Antennas and IMU mounted securely.
  - Ensure proper cable routing.
- Motion and Heading Device Installation:
  - MRU, IMU, or AHRS installed.
  - Antennas and motion device mounted securely.
  - Ensure proper cable routing.
- LiDAR Installation:
  - Mounting bracket securely installed.
  - Ensure proper cable routing.
- Offsets Measured: Pre-measure offsets from the Boat Reference Point, if possible.
- Photo Documentation: If assistance is needed, please provide pictures taken inside and outside of the boat so we can provide our recommendations prior to arrival.

# I. Safety Precautions

## General Safety Precautions:

- Conduct a thorough risk assessment before starting the installation.
- Ensure that all personnel involved are properly trained in handling equipment and working at heights.
- Use appropriate personal protective equipment (PPE) such as helmets, gloves, safety goggles, and harnesses.
- Communicate clearly with all team members about their roles, the potential hazards, and the safety protocols to be followed.

## Working at Heights:

- Use appropriate fall protection equipment such as safety harnesses, lanyards, and anchor points.

## Running Cables:

- Plan cable routes to avoid trip hazards.
- Use cable trays, conduits, or cable ties to secure and organize cables.
- Ensure that cables are properly labeled for easy identification and maintenance in the future.
- Follow electrical safety standards and regulations when working with power cables.

## Welding Metal Plates:

- Provide proper ventilation in the welding area to prevent exposure to fumes and gases. Use welding screens or curtains to shield nearby workers from the welding arc.
- Train personnel in safe welding practices and the proper use of welding equipment.
- Inspect all ladders, scaffolds, and elevated work platforms before use.
- Secure tools and materials to prevent them from falling and causing injuries to workers below.

## II. Equipment Overview

Each DREDGEPACK® system for cutter suction dredges is individually designed to fit the customer's needs. The following sensors are required for the correct operation of the Cutter Suction System with DREDGEPACK®. There are some optional sensors presented that are needed only in special cases. When you receive the equipment please verify it is complete, if you have any questions please let us know.

**A. Dual Antenna GNSS Receiver:** This device is used to determine the position and heading of the dredge. The main antenna is used to calculate positions and elevations (RTK tides). The receiver uses the secondary antenna to calculate the dredge heading. The solution includes two antennas, the GNSS receiver, and the cables.



**B. Ladder Inclinator:** This device is used to calculate the inclination angle of the ladder in order to calculate the position and depth of the cutting tool. The solution includes the inclinometer, the interface box and the cables.

**C. Swing Rotation Sensor (Optional):** Some dredgers can horizontally position the ladder. In this case, a rotation sensor is necessary to measure the swing. The solution includes the sensor, cables and interface box.



After checking your equipment, put everything back in the box to avoid losing cables.

## III. Installation Instructions

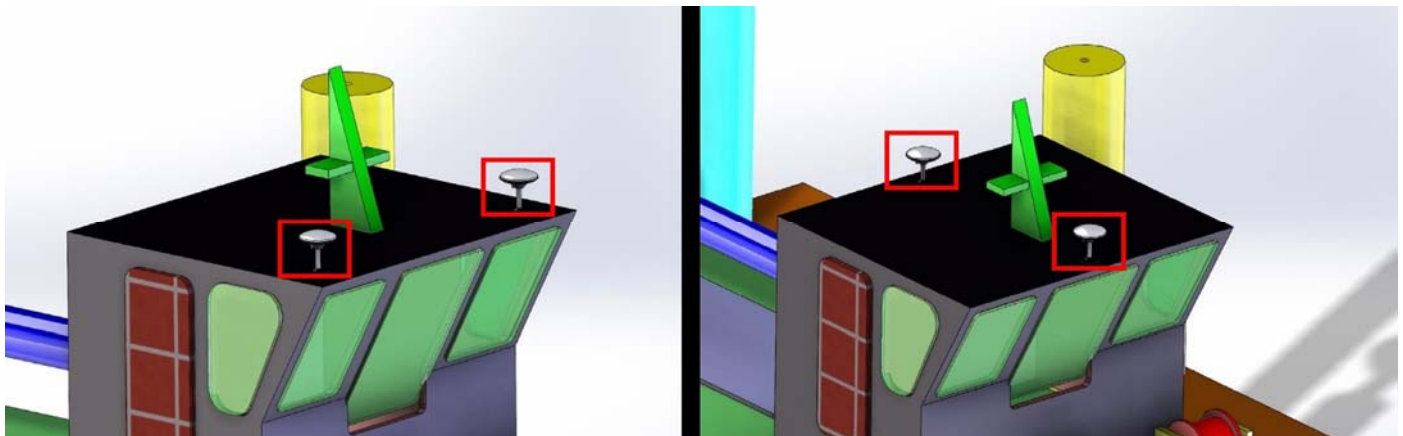
### A. Dual Antenna GNSS Receiver

DREDGEPACK® requires dredge position and dredge heading. The best method to obtain this data is using a dual antenna GNSS receiver.

- **Dredge Position:** The main antenna can be used for calculating the position and elevation of the dredge. For better performance, the GNSS receiver can be upgraded to have a low uncertainty using RTK (Real time Kinematic) calculations and should be combined with a source of corrections (RTCM or CMR). The GNSS receiver is provided with all of the accessories (i.e. antennas, cables and interfaces). We can also provide a radio modem and RTK base station upon request.

- **Dredge Heading:** We offer a GNSS receiver that can calculate the heading using the secondary antenna.

For better satellite coverage, we recommend installing the GNSS antennas on top of the cabin free of obstacles. To avoid measuring complicated offsets, install the antennas parallel or perpendicular to the center axis of the dredge, as shown in the following images. The antennas can be installed from aft to forward or port to starboard.



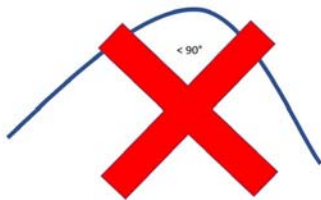
The antennas require a 5/8-11 UNC bolt. They can be installed directly on top of the cabin or at the end of a pipe.

**WARNING: DO NOT WELD THE SCREW WHILE THE ANTENNA IS SCREWED IN. THIS COULD DAMAGE THE ANTENNA SERIOUSLY.**



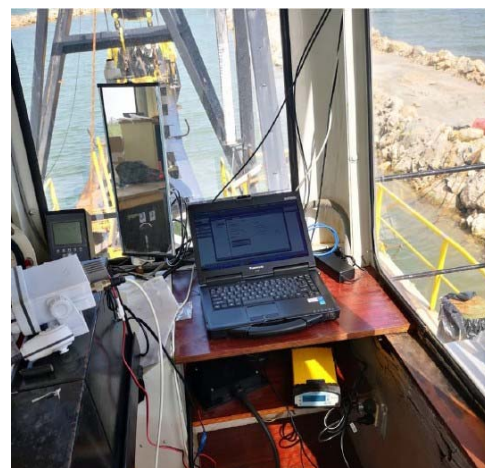
Either antenna can be assigned as the main antenna. It is very important to identify the cable of the main antenna because it must be connected in the Port 1 of the GNSS receiver. When measuring the offsets we need to know the distance from the trunnion to the main antenna.

You will need to run the cables inside the cabin. The installation could last longer if a proper pass through and insulation is installed before running the antennas to the cabin.



**WARNING: AVOID BENDING THE ANTENNA CABLES MORE THAN 90 DEGREES DURING THE INSTALLATION. THIS COULD BREAK THE INTERNAL CORES IN THE CABLE.**

The GNSS receiver can be placed anywhere in the cabin because the connection to the computer uses a network cable (UTP CAT5E or CAT6), however, we recommend placing the GNSS receiver as close as possible to the PC.



It could be useful having an area in the cabin for placing the computer and the GNSS receiver. It is beneficial to determine this before the integration to avoid moving the equipment in the future. In some cases a stand for the PC is necessary to provide a better view for the operator.

The GNSS receiver, inclinometers, and computer come with power adapters that transform from AC to DC voltage. It is necessary to have an outlet that delivers 110VAC~120VAC or 220VAC~240VAC. We recommend installing a UPS (Universal Power Supply) to prevent damage to the equipment.



## B. Ladder Inclinator

There are several options when installing the inclinometer, however, the key factor is the rotation direction, what it is labeled in the case. The inclinometer is fully water and dust proof as long as the cable is properly connected. The life span of the inclinometer and cable can be increased by installing it above water and not submerged all the time. On certain dredges there are some parts of the ladder that rotate at the same rate.



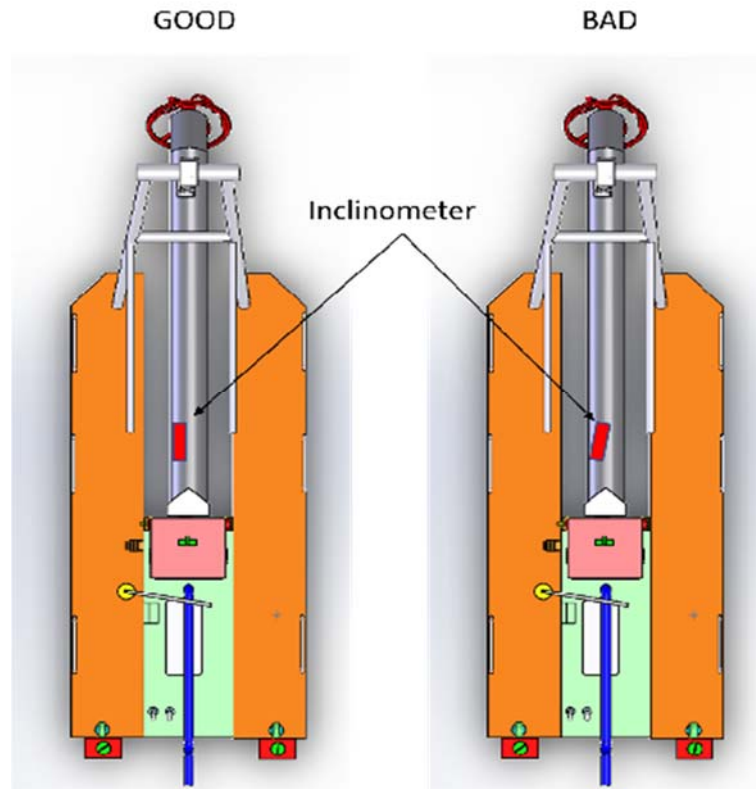
As long as the inclinometer is properly oriented, it is going to measure the angle of the ladder whether it is located close to the trunnion or at the cutter head. It is recommended to install the sensor close to the trunnion to keep the cable more protected.

The kit includes plates and bolts for placing and tightening the inclinometers.

These plates are usually welded to the arm.  
Plate dimensions are: 11.25" X 7" (28.57 cm X 17.78 cm).

**WARNING: DO NOT WELD THE PLATE WHILE THE INCLINOMETER IS ATTACHED. THIS CAN BURN THE SENSOR OR DAMAGE THE CASE.**

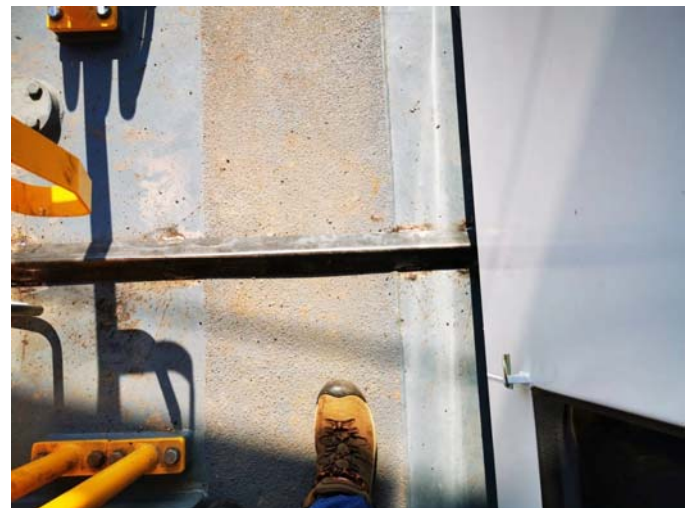
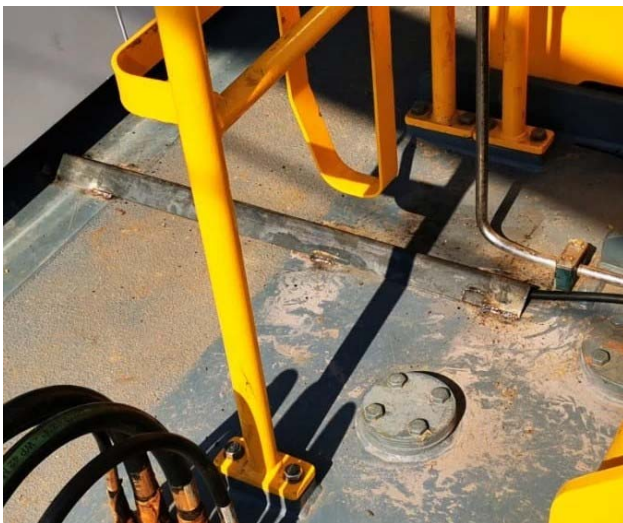




Once the inclinometer is properly installed, it is necessary to run the cable to where the main interface box is going to be located. It is not necessary to finish the ends in the cabin, that work is performed during the integration and training.

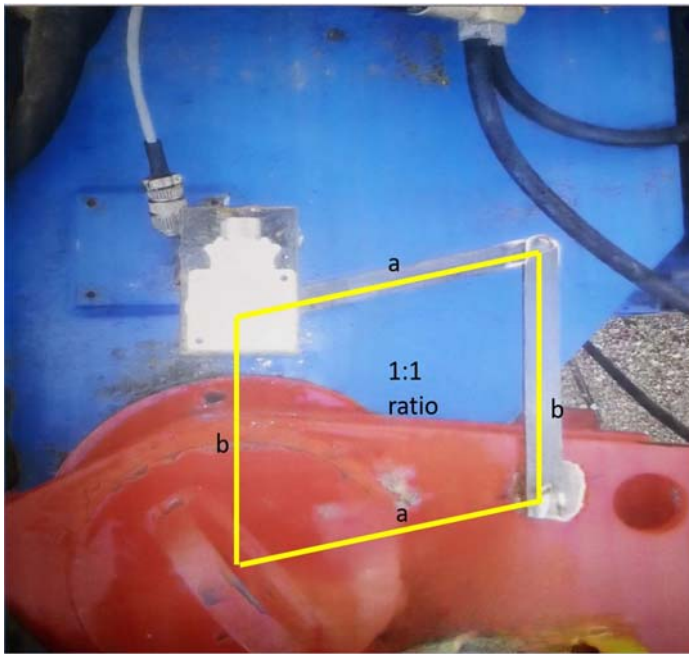
The cable could last longer if a proper pass through and insulation is installed before running the inclinometer cable to the cabin. Adding some labels to the cable could be beneficial when doing repairs.

**SUGGESTION:** If the cable runs over the dredge deck, it is recommended to install a pipe around 3/4 inch size or something that protects the cable and prevents a tripping hazard.



## C. Swing Rotation Sensor (Optional)

The swing rotation sensor used to measure the horizontal movement could require some pieces to transfer the movement to the sensor. It should be installed close to the ladder rotation pin. The pieces used to transfer the movement will need certain dimensions in order to have a rotation ratio 1:1. The following images show an example where the rotation sensor was installed next to a parallel metal plate with a length that matches the distance between the pin and the sensor.



## IV. Maintenance and Care

- **Regular cleaning:** Wipe down the GNSS receiver, cables, and antennas with a soft, dry cloth to remove dust, dirt, and debris. This can help prevent damage and ensure proper functionality.
- **Cable inspection:** Check the cables for any signs of wear, fraying, or damage. Replace any damaged cables to prevent signal loss or data errors.
- **Antenna alignment:** Periodically check the alignment of the GPS antennas to ensure they are oriented correctly for optimal signal reception.
- **Environmental protection:** Protect the GPS receiver, cables, and antennas from extreme temperatures, moisture, and physical impact to prevent damage.
- **Performance testing:** Periodically test the GPS receiver to ensure it provides accurate positioning and navigation data.

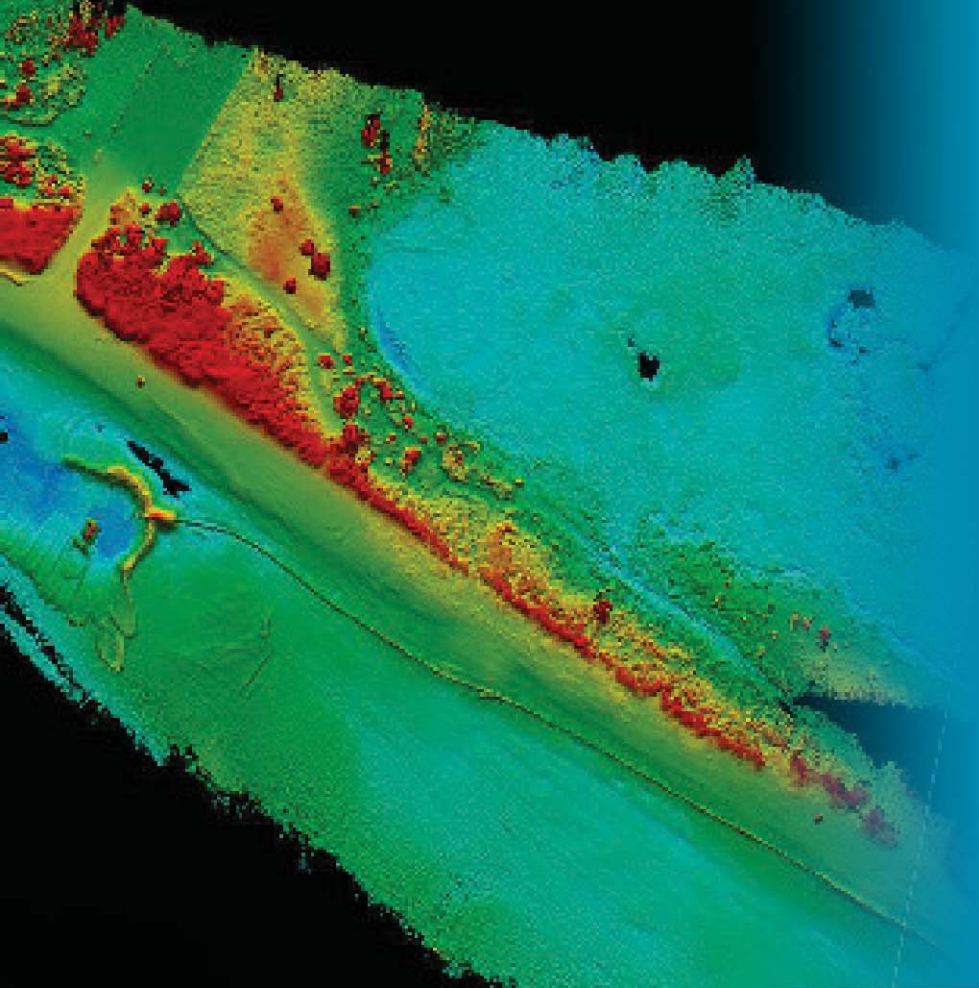
## V. FAQ

**Q: Does the user need to open the boxes when they are delivered?**

**A:** Yes. Verify that all the equipment was received by checking if everything requested was included in the box. We also recommend carefully putting all accessories and cables back in the box to avoid any issues during the installation and integration.

**Q: Can the installer call support for additional instructions?**

**A:** Yes. HYPACK can provide additional details in order to perform the best installation possible. Call +1 (860) 635-1500 or send an email to [help@hypack.com](mailto:help@hypack.com).



## Why Choose HYPACK

- Simple and intuitive to use
- Industry-leading software solutions
- Interfaces with a variety of sensors
- Unparalleled technical support

HYPACK – A Xylem brand has been a world leader in software development for the hydrographic and dredging industry since 1984. Our software is one of the most widely used hydrographic software packages in the world, with more than 10,000 users in over 140 countries.

Our commitment to the industry, and partnership with manufacturers, allows us to provide a solution for all your surveying needs; from a simple area to the most complex project, our software solution can help.

Our suite of software packages will provide you the tools needed to design your survey or dredging operation, collect your data, apply corrections to soundings, remove outliers and invalid points, plot field sheets, and export data to CAD. It also allows you to compute volume quantities, generate contours, create side-scan mosaics and create/update electronic charts. Our hundreds of sensor inputs provide the connection for positioning GNSS and inertial systems, single beam and multibeam echosounders, side scan and sub-bottom sonars, magnetometers, velocity sensors, and more. Whether you are collecting hydrographic survey data, environmental data, or just positioning your vessel in an engineering project, the software will provide the tools needed.

Our mission is not just to provide the tools needed for surveying applications, but to educate and train folks that need to do survey work.



56 Bradley Street  
Middletown, CT 06457

+1 860-635-1500  
sales@hypack.com  
www.hypack.com

