DREDGEPACK® GUIDE - BUCKET DREDGES

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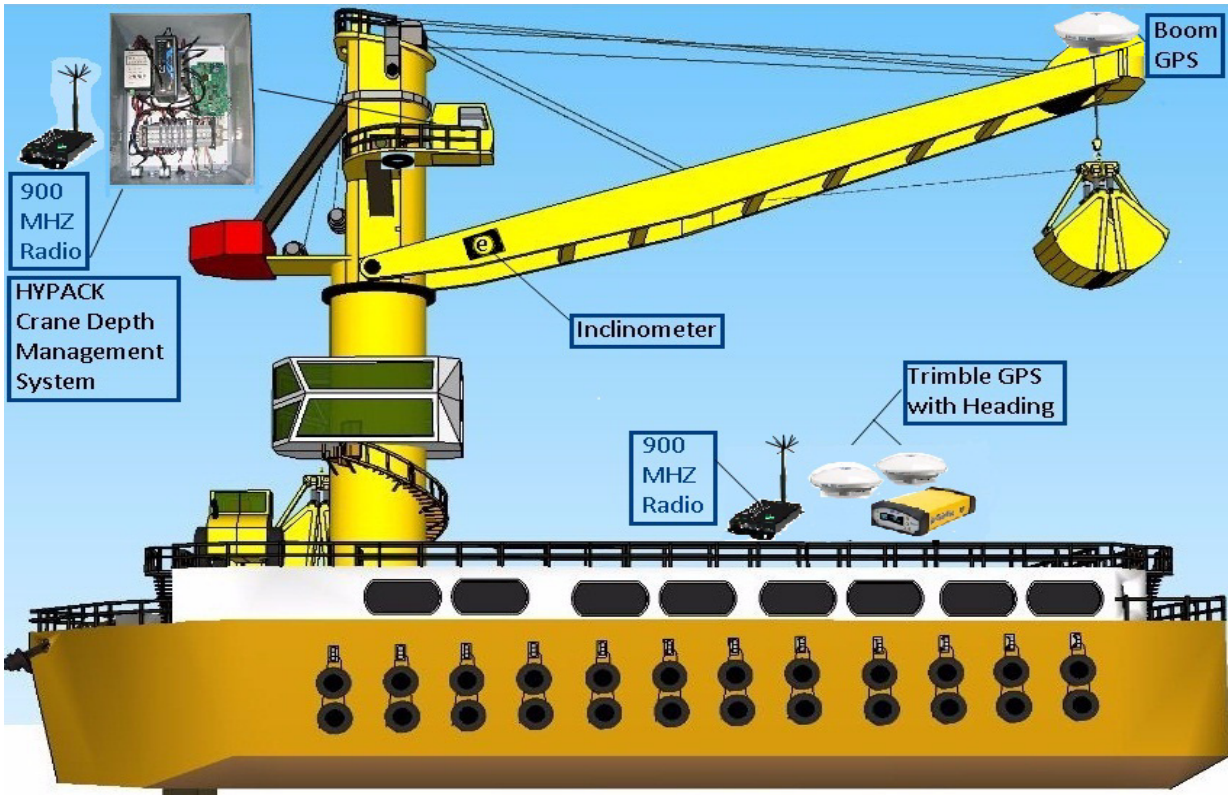
The following is a guide that is currently "in development" to aid in the installation of DREDGEPACK® on a bucket dredge.

There are two types of Bucket Dredge setups possible in HYPACK®.

- **Bucket/Barge Position *only*:** A GPS with heading is used on the barge and the boom tip is outfitted with a standard, single-antenna GPS. This will track the crane, th barge and the bucket as separate mobiles. In this setup, only the tracking of the bucket/crane/barge can take place; there is no depth information.
- **HYPACK® crane depth system** will give the depth to the operator and color the matrix file. This system is more complex and requires optical sensors on the holding wire winch drum. This is the preferred method.

FIGURE 1. *Sample Crane Barge*

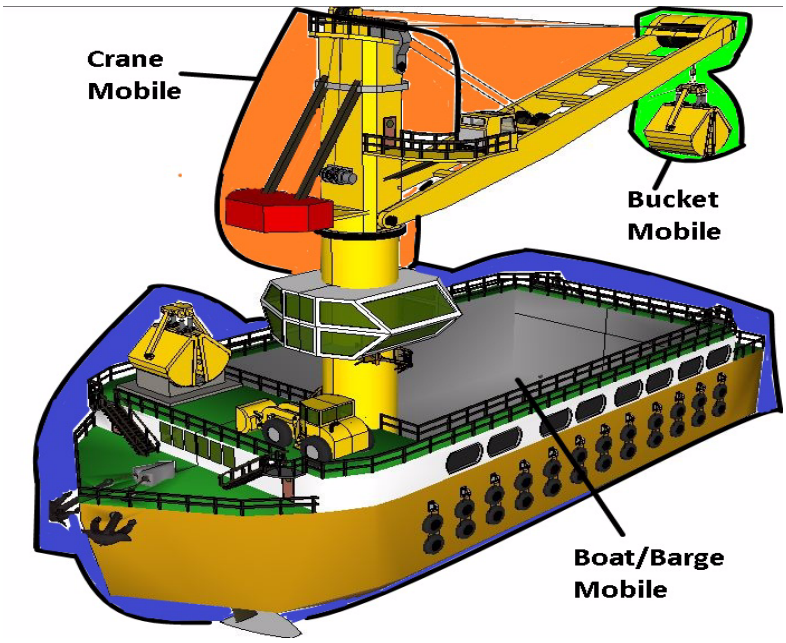


OFFSETS & HYPACK® HARDWARE SETUP

In HYPACK® HARDWARE, the crane depth configuration includes three mobiles: The barge, the crane and the bucket.

HYPACK® CONFIGURATION

FIGURE 2. *Three Mobiles in a Bucket Dredge Configuration*



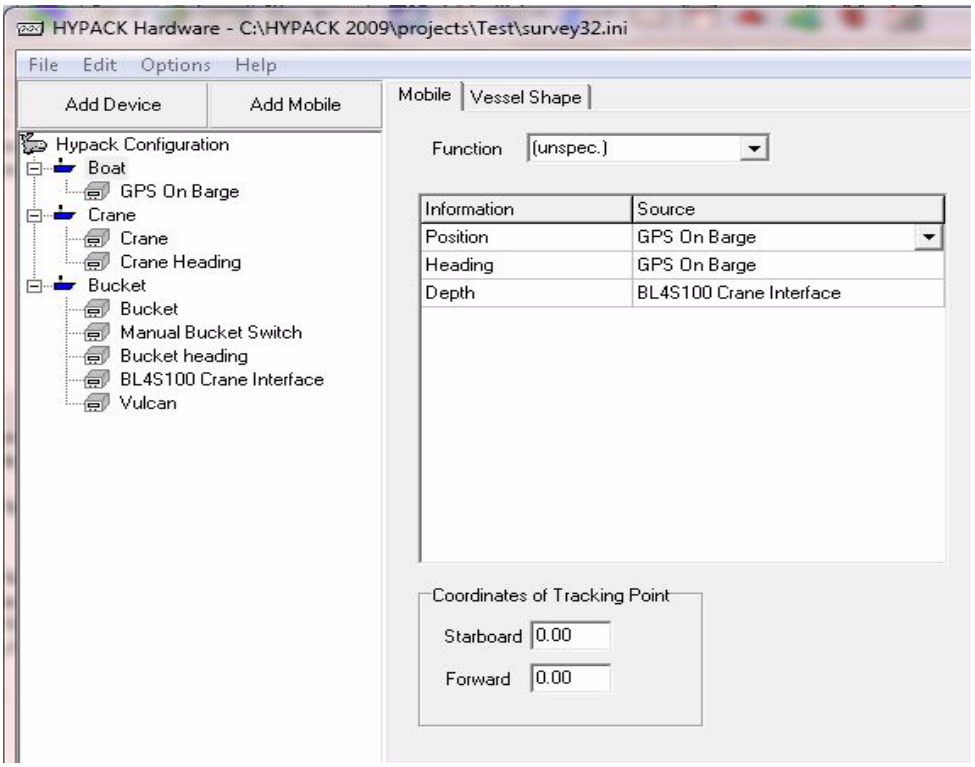
- **Boat/Barge Mobile**
  - *GPS.DLL* – This driver is used to position and set the heading orientation of the barge--the platform on which the crane house resides. The GPS is the origin for the 'barge' mobile so its port and starboard offsets remain at 0. The boat shape that depicts the shape of the barge should be made about the location of the GPS.
- **Crane Mobile**
  - *Genoffset.dll* – This positioning driver is used to offset the center pin of the Crane House from the barge-mounted GPS position. Offset measurements starboard and forward of the GPS position should be positive. *Do not enter offset measurements in the 'Offsets' fields* in HYPACK® HARDWARE; *enter your offsets in the setup dialog* for the Genoffset.dll. Set the Mobile ID to 1.
  - *RelHDG2.dll* – Sets the heading of the crane house to be relative to the bucket mobile. This will update the crane house heading based on the changing position of the bucket. The Mobile settings are from Mobile 1 to Mobile 2 in the setup for this driver.
- **Bucket Mobile**
  - *GPS.DLL* – Mounted on the boom tip, directly above the bucket, this driver is used for bucket position.
  - *Bucket.dll* – With a bucket switch attached, the bucket driver generates bucket footprints in your area map display. Attach the two pins on a momentary switch to PIN 4 and PIN 6 on the DE-9 end of an RS232 cable. When you press the switch, the pins will short each other out and create a bucket footprint.

- *Vulcan.dll* – Allows you to input bucket dimensions to paint multiple matrix cells based on the size of the bucket. For example, if you have a 1x1 matrix, a 10x10 bucket will color 100 cells according to the current bucket depth.
- *BL4S100.dll* – This driver connects via an ethernet cross-over cable to your PC. It interfaces the boom tip GPS, inclinometer and the optical depth system. Third-party software controls the board. (Details follow.)

Note: If you choose not to use a HYPACK® depth monitoring system, you can simply omit the BL4S100.dll (and Vulcan.dll) fromyour hardware configuration. And your crane positioning system will work normally; but, you cannot color the matrix file with your dredging progress because HYPACK® has no depth input.

- *RelHdg2.dll* - Sets the heading of the bucket to be relative to the crane mobile. This will align the bucket heading to the crane house. The mobile settings are from Mobile 2 to Mobile 1 in the setup for this driver.

FIGURE 3. *Final Hardware Configuration*



HARDWARE

FIGURE 4. *Installed on Barge*

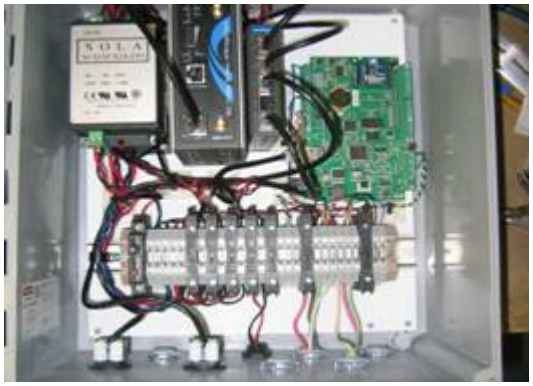
GPS Data Received in Cab

Digi 900HZ Radio

Trimble Dual Antenna GPS with Heading

FIGURE 5. *Installed In Crane/ Boom Tip:*

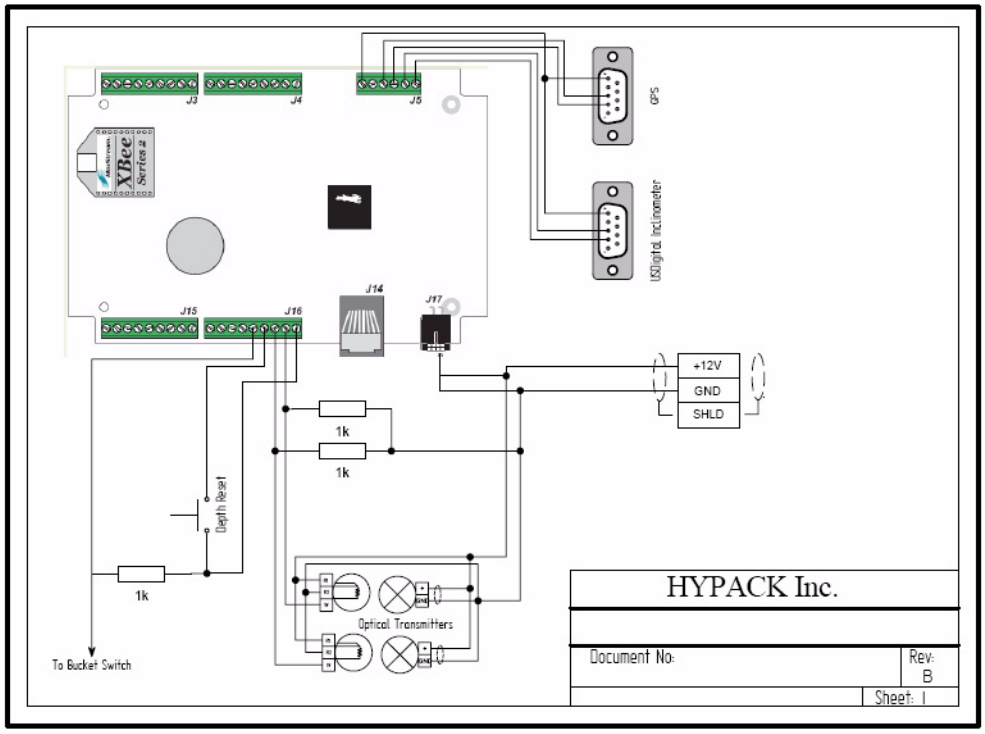
Inclinometer Mounted on Boom



HYPACK® Crane Depth Monitoring System

Single-antenna GPS on Boom Tip

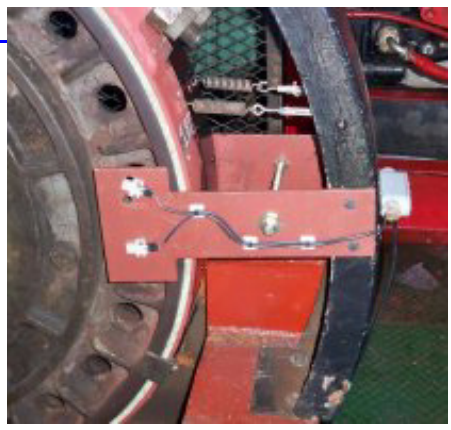
FIGURE 6. Rabbit Board Wiring Schematic



Note: The HYPACK® Dynamic C program must be installed on your computer and configuration file must be uploaded to BLS4 card. Ask help@hypack.com for this file.

DEPTH MONITORING SYSTEM CONFIGURATION/SETUP

FIGURE 7. Optical Sensor Installation



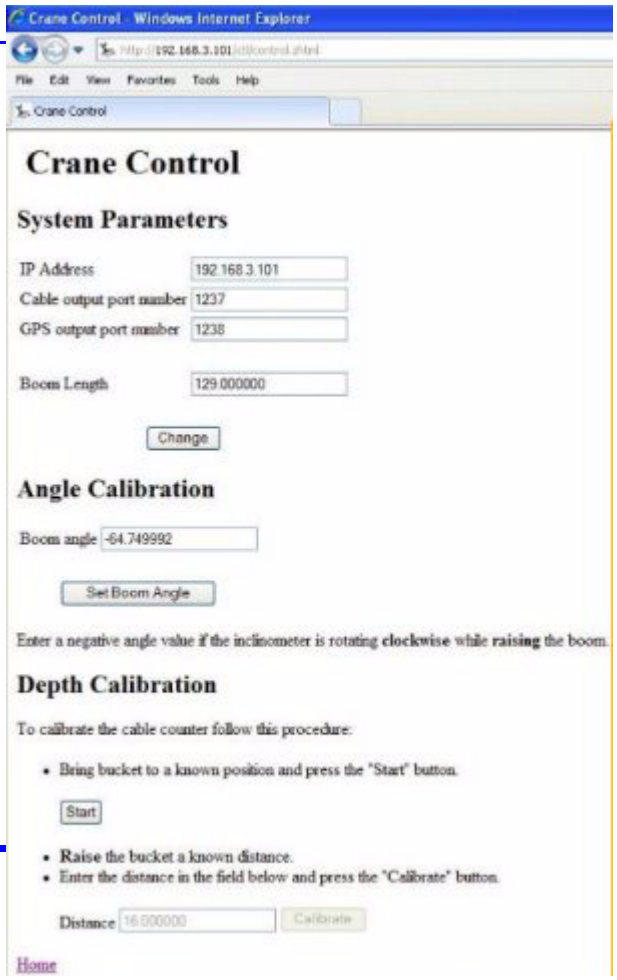
The depth monitoring system uses two optical sensors to track the rotation of the drum. The sensors are mounted so that they both shoot through a hole on the drum at the same time, but are offset from the center of the hole. This is so that one will turn on first, then the other, then the first will turn off and then the other creating a four state situation where the sensors can be used to determine the direction and speed of the drum. With this configuration the theoretical accuracy is ¼ the distance between the hole centers.

To calibrate the bucket you will first need to know the BOOM Angle. This information should be available from your crane's technical information.

The HYPACK® Rabbit board crane depth system must be calibrated a follows:

1. **Access the controls for the bucket depth system.** The interface for calibration is done through your HTML internet browser. To access controls use the following address on the LAN : 192.168.3.101 . There are two pages available: Crane control and Crane status.
2. **Go to the Crane Control page**.

FIGURE 8. Crane Control



3. Type this into the Boom Angle field and click [Set Boom Angle].
4. Place the bucket on the deck of the barge or on a known position and click [Start].
5. Raise the bucket up a measured distance.
6. Enter this distance and click [Calibrate].
7. Put the bucket back down on your known position.
8. Push the “Bucket Reset” switch.
9. Raise the bucket back up a measured distance and verify calibration in the Crane Status Screen.

The Status window displays raw values from sensors. Here you can verify and check calibration.

ADDITIONAL INFORMATION

- HYPACK® is compatible with **USACE Silent Inspector**. To find out how this interfaces, please refer to our documentation online at: http://www.hypack.com/new/portals/1/PDF/sb/01_09/DREDGEPACK%20SILENT%20INSPECTOR%20REPORT.pdf
- To use HYPACK® in Capping Mode: http://www.hypack.com/new/portals/1/pdf/sb/06_08/Bucket%20Driver%20Additions.pdf