SBG Ekinox Drivers in HYPACK® and HYSWEEP®

By John Lindberg

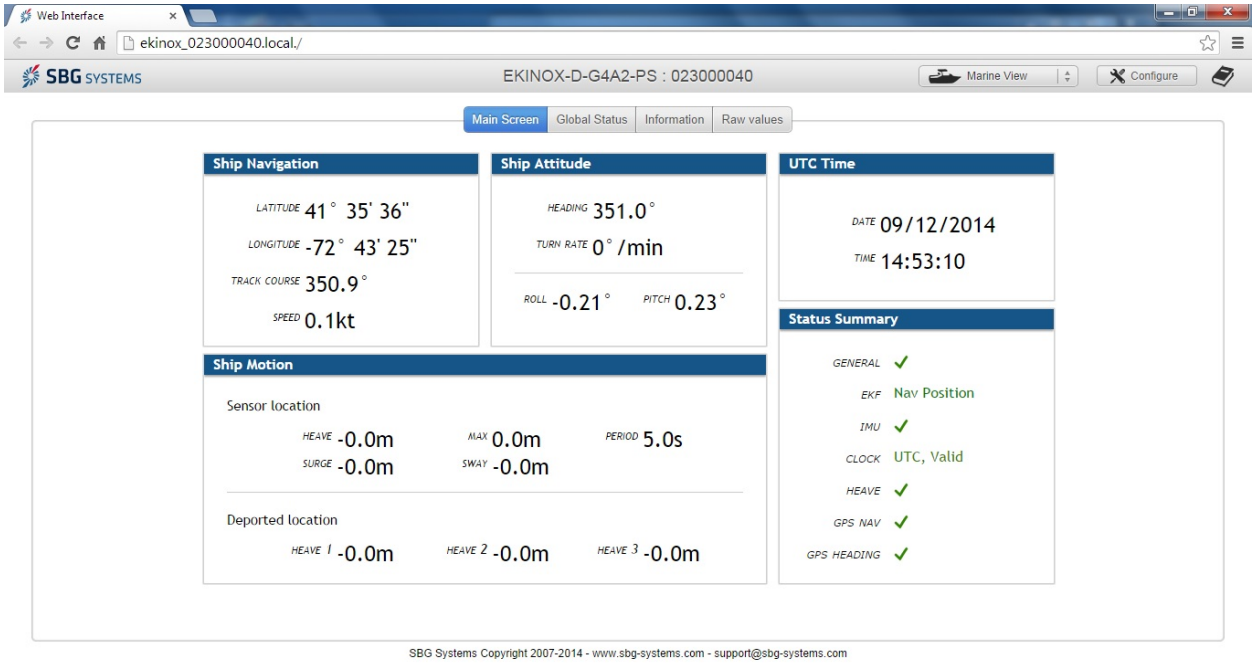
HYPACK has recently completed HYPACK® and HYSWEEP® device drivers for the SBG Systems Ekinox Inertial Navigation Systems. The drivers were developed with the Ekinox-D, a dual GPS INS system.

The sensor itself is pretty small – about the size of a coffee cup! The system we received consists of the sensor, two antennas and cables, a 120/240v power supply and a network cable, all packed into a nice, compact pelican-style case. You can also get an Ekinox "Split Box," which allows more input/output configurations via serial and Ethernet connections. There are also Ekinox models without the GPS options, if you prefer to use your own GPS receivers.

EKINOX CONFIGURATION

Configuring the Ekinox is pretty easy using a web browser. Type in the address as described in their Quick Start Guide and you should be on your way! If all is working OK you should see something like this:

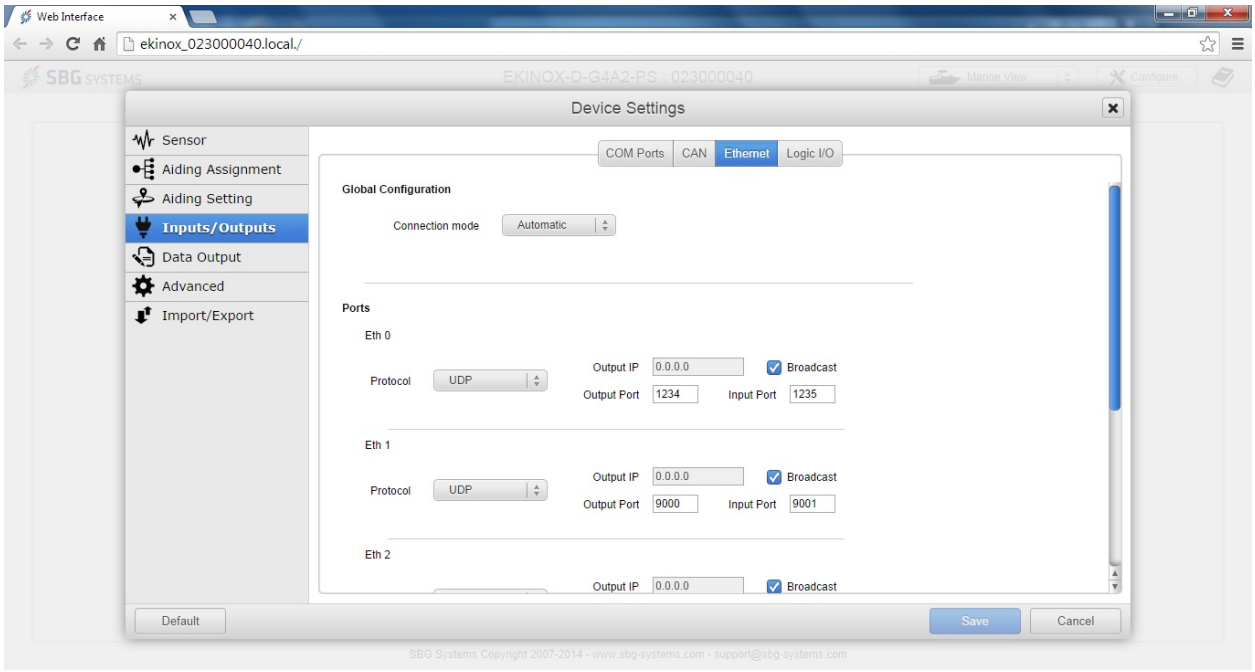
FIGURE 1. *SBG Ekinox Firmware Install Screen*



Since we configured HYPACK® and HYSWEEP® to work with their Ethernet connection, I will run through that type of setup. (The Ekinox supports a multitude of input and output formats!)

1. **Click the “Configure” button on the browser** and you will get an additional “Device Settings” window popping up in your browser. The left side of the window allows you select different setup windows.
2. Before you get started with HYPACK®, you want to be sure you **go to the Sensor button and enter your primary antenna position (relative to the IMU) and any lever arm corrections**. As most HYPACK® users know, HYPACK recommends mounting the IMU as close to the vessel COG (Center of Gravity) as possible, and entering HYPACK®/ HYSWEEP® offsets relative to the COG/IMU location).
3. To configure your Ethernet Settings, **start by click on “Inputs/Outputs” and then click the “Ethernet” button**. By default “Eth 0” is set to UDP broadcast protocol, outputting on Port 1234 and receiving on port 5678. In Figure 2, I configured “Eth 1” to work with HYPACK® and HYSWEEP®, outputting only the messages we require. In the example below we set “Eth 1” to UDP Broadcast on port 9000.

FIGURE 2. *Configuring the Ethernet Connection*



4. **Click Data Output (don’t save yet) and click the “Eth 1” button.**
5. **Under Log configuration, select the logs as shown in Figure 3**:

FIGURE 3. *Setting the Device Output Strings*

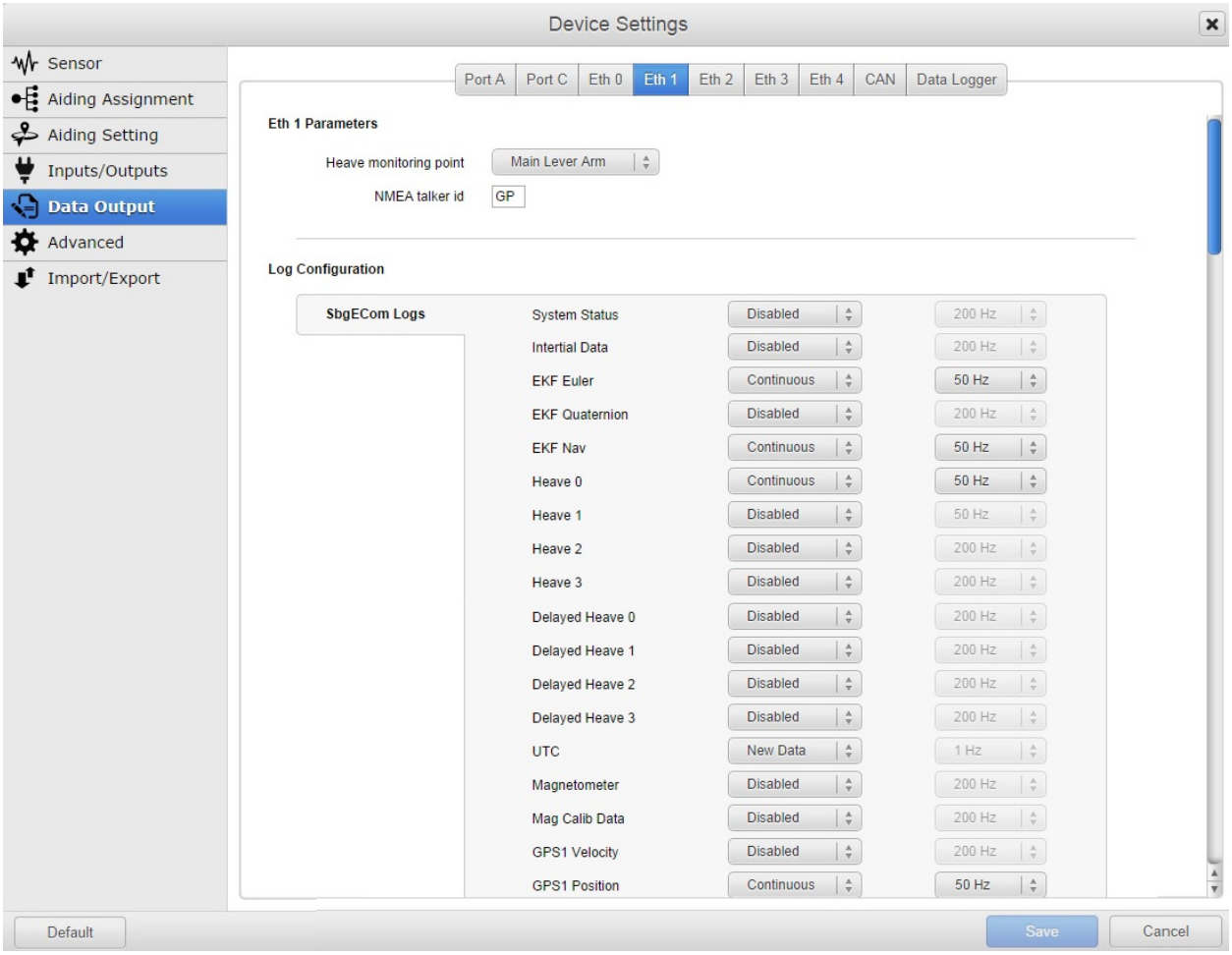


TABLE 1. *Output Strings for HYPACK® Configuration*

LOG	**OUTPUT**	**RATE**	**INFO DECODED BY** HYPACK®
EKF Euler	Continuous	50 Hz.	Heading, Pitch Roll
EKF Nav	Continuous	10-50 Hz.	Position
Heave 0	Continuous	50 Hz.	Heave
UTC	New Data	N/A	Time
GPS1 Position	Continuous	10-50 Hz.	Status Codes, Sigma Values

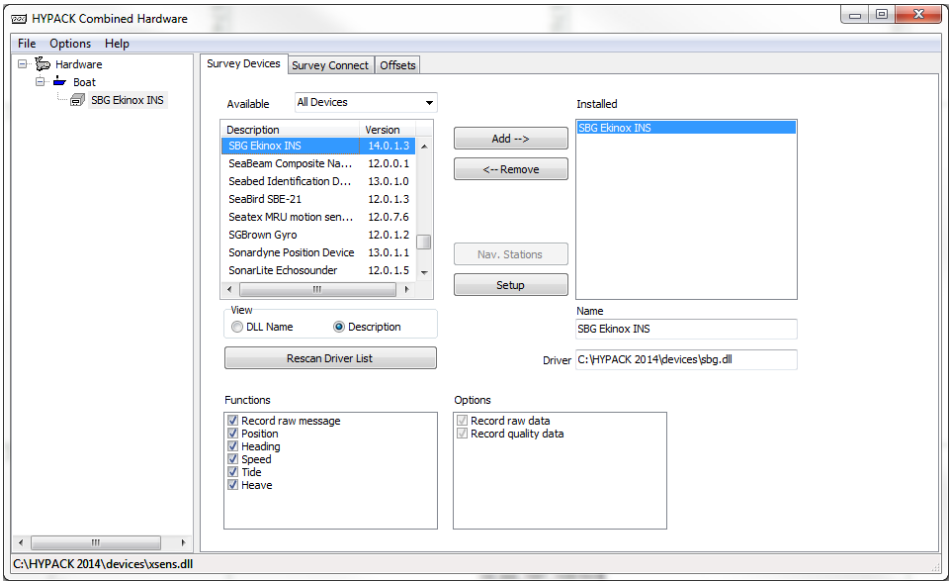
It is important to set your EKF Euler and Heave 0 Log outputs at 50 Hz. The data rates of the 2 logs are slightly different and, because we combine heave, pitch and roll in the same “HCP” record, we want to have the timing logged correctly!

EKF Nav and GPS1 Position can be set anywhere from 10 Hz to 50 Hz. Don’t use any rate faster than 50 Hz, unless you have bought a lot of stock from a hard drive manufacturer, or have decided to flush common sense down the toilet. Why bog your system down with anything faster than 50 Hz?!?

HYPACK SURVEY SETUP

- **Select the "SGB Ekinox INS" driver**.

FIGURE 4. *Configuring the SGB Ekinox INS Driver in HYPACK® HARDWARE*



- Under **Setup** there is an option to use HYPACK® Time Tags. With most navigation systems, it has become common practice to use the time stamps from the system. You can override this by checking the box in Setup.
- **Connect** to the proper Ethernet Port as shown in Figure 5:

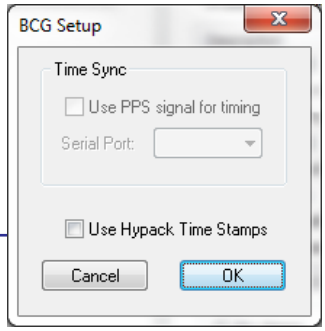
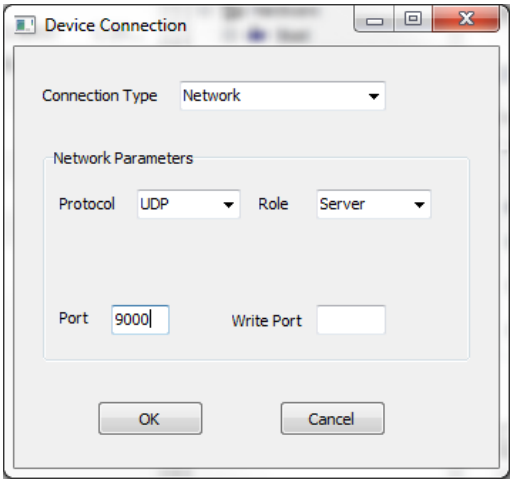
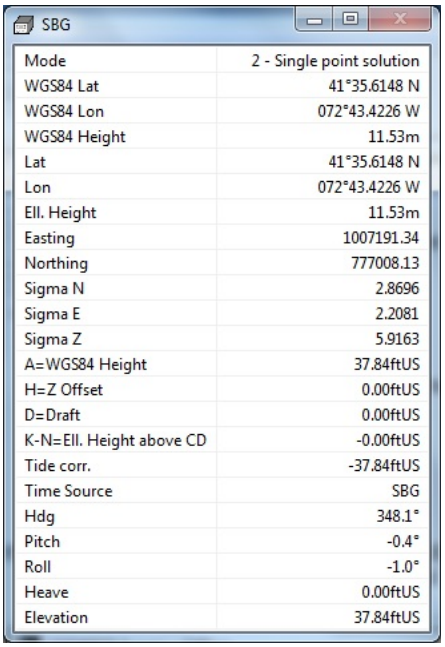


FIGURE 5. *Configuring Ethernet Device Connection*



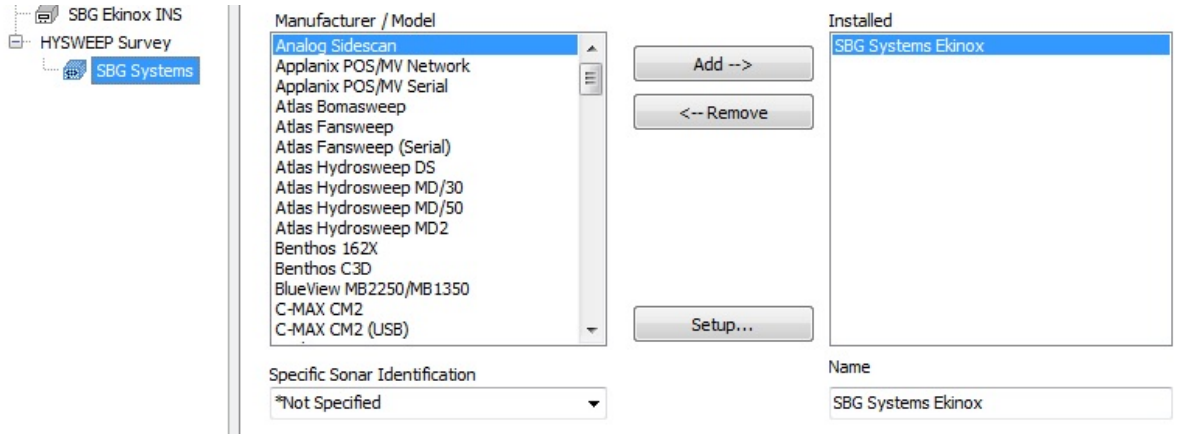
- **Offsets** should be relative to the vessel's COG.
- When testing you should see information in the **device window** similar to Figure 6:

FIGURE 6. *Device Window in HYPACK® SURVEY*



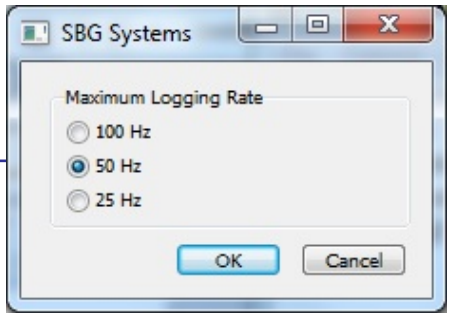
HYSWEEP® SURVEY SETUP

- **Add HYSWEEP®'s "SBG Systems" driver**.



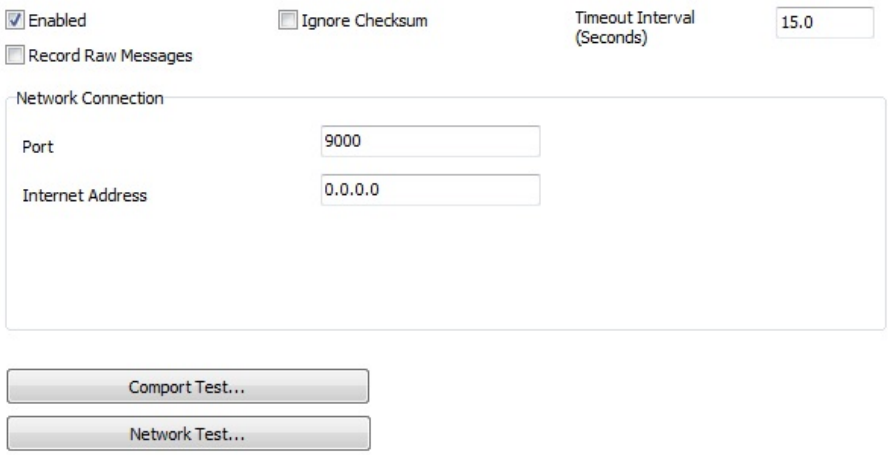
- Under **Setup** you can use one of these down sampling options. It is recommended to use the default 50 Hz logging rate.

FIGURE 7. *HYSWEEP® Setup for the SBG Systems Driver*



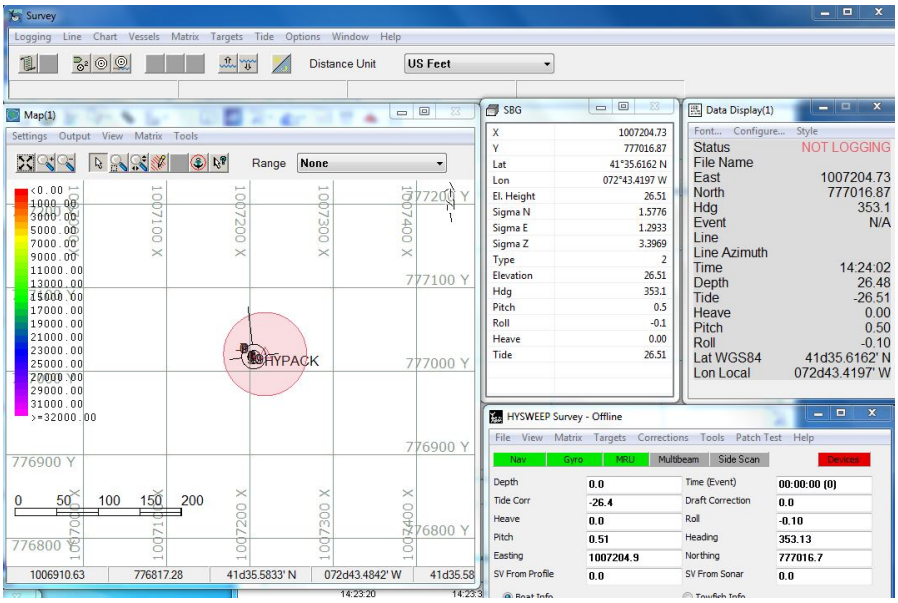
- **Connect** to the proper Ethernet Port as shown in Figure 8.

FIGURE 8. *Configuring the HYSWEEP® Connections*



- **Offsets** should be relative to the vessel's COG.

FIGURE 9. *HYPACK® and HYSWEEP® Survey Running with the SBG INS System.*



These HYPACK® and HYSWEEP® updates will be available from the HYPACK website soon!