

Pos-MV Network Connections in HYPACK® and HYSWEEP®

By Judy Bragg

The POS MV is a Position and Orientation System that outputs position, heave, pitch, roll and heading data. Data output may be through network (ethernet) or serial connection to the survey computer.

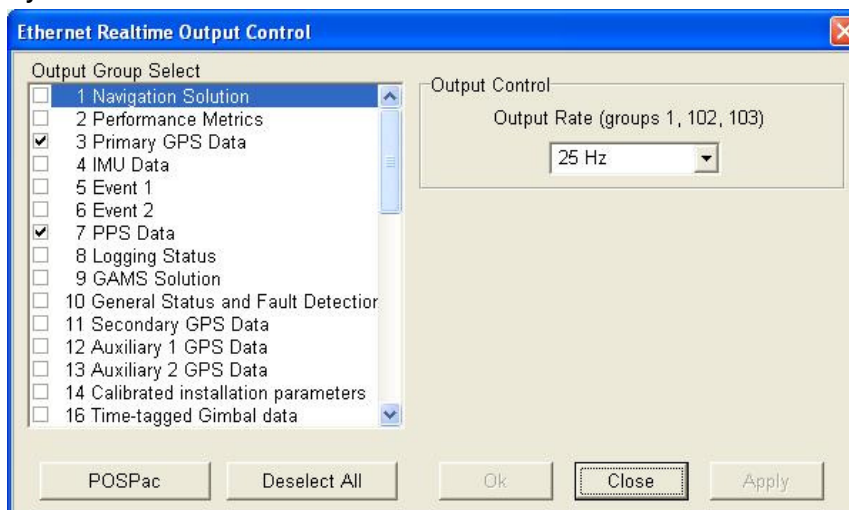
Recently, we have been developing network drivers for the POS MV. Though there is still discussion and testing of various configurations in the POS MV controller as well as HYPACK® Hardware in progress, there is at least 1 configuration, with which Mike Kalmbach has had consistently good results in the field.

The information in this document describes his findings. It pertains *only to the network devices*.

Configuring the Device Output in MV-POSView

Use the MV-POSView program (in the POS MV device) to configure the device output message groups required by HYPACK®.

1. **Put the POS MV in 'Connect Mode'** by clicking the icon on the toolbar.
2. **Select LOGGING-ETHERNET REAL TIME.** The output realtime control dialog will appear.
3. **Select only the following output groups at 25 Hz.**



Function	Output Group
Navigation + POS MV ver 3 solution status	Group 3
Time Synchronization	Group 7
POS MV ver 4 solution status	Group 20
Heave, pitch, roll, heading	Group 102

Note: Additional selected groups will cause system failure.

Interfacing the POS MV with HYPACK®

There are drivers for the POS MV in both HYPACK® Hardware and HYSWEEP® Hardware. The following sections describe how to configure your system for each type of survey.

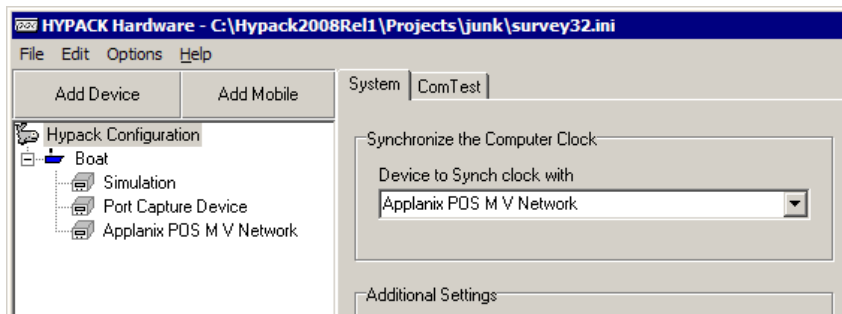
Synchronizing to the POS MV Time

In any survey, accurate time-tagging is of paramount importance.

Because of the excellent accuracy of the UTC time-tagging in the POS MV, there is typically no need for a 1PPS box and we synchronize the system to the POS MV time output. HYPACK® converts the time tags to local time and synchronizes the computer time clock based on your Windows™ settings. Data from additional devices are then time-tagged based on the computer time so all should be synchronized based on the POS MV.

To synchronize the survey computer clock with the POS MV:

- Select the POS MV under 'Synchronize the Computer Clock' on the System tab of HYPACK® Hardware.
- Select 'Use UTC time even when not synchronizing' in your POS MV driver setup.



HYPACK® Hardware – Synchronizing your survey computer to the POS MV

Single Beam Projects

The single beam configuration is simple. All data from the POS MV is recorded using the Applanix POS MV Network driver (posmv.dll). Other devices are configured normally.

HYPACK® Hardware Configuration:

- 1) **Add the posmv.dll to your hardware configuration.**
- 2) **Check all data types you wish to record from the POS MV.**

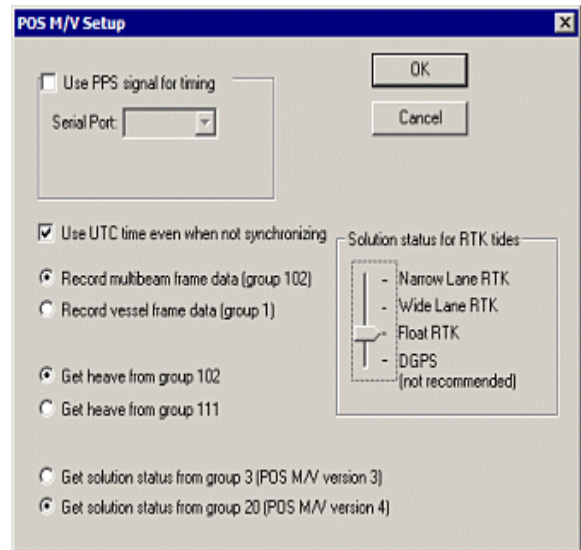
Note: While the POS MV is very good with horizontal position, some users are less comfortable with the vertical positioning. If you are doing RTK tide corrections, you should run some tests and make this decision for yourself.

- 3) **Enter other settings as follows:**

- **Offsets:** The starboard, forward and vertical offsets are measured relative to your boat reference. All other offsets are zero.
- **Connect Settings:**
 - **Connect:** Network Port
 - **Protocol:** UDP
 - **Role:** Client
 - **Host:** Enter the IP address for the POS MV
 - **Port:** 5602

4. Click [Setup] to access the Driver Setup dialog and click [OK].

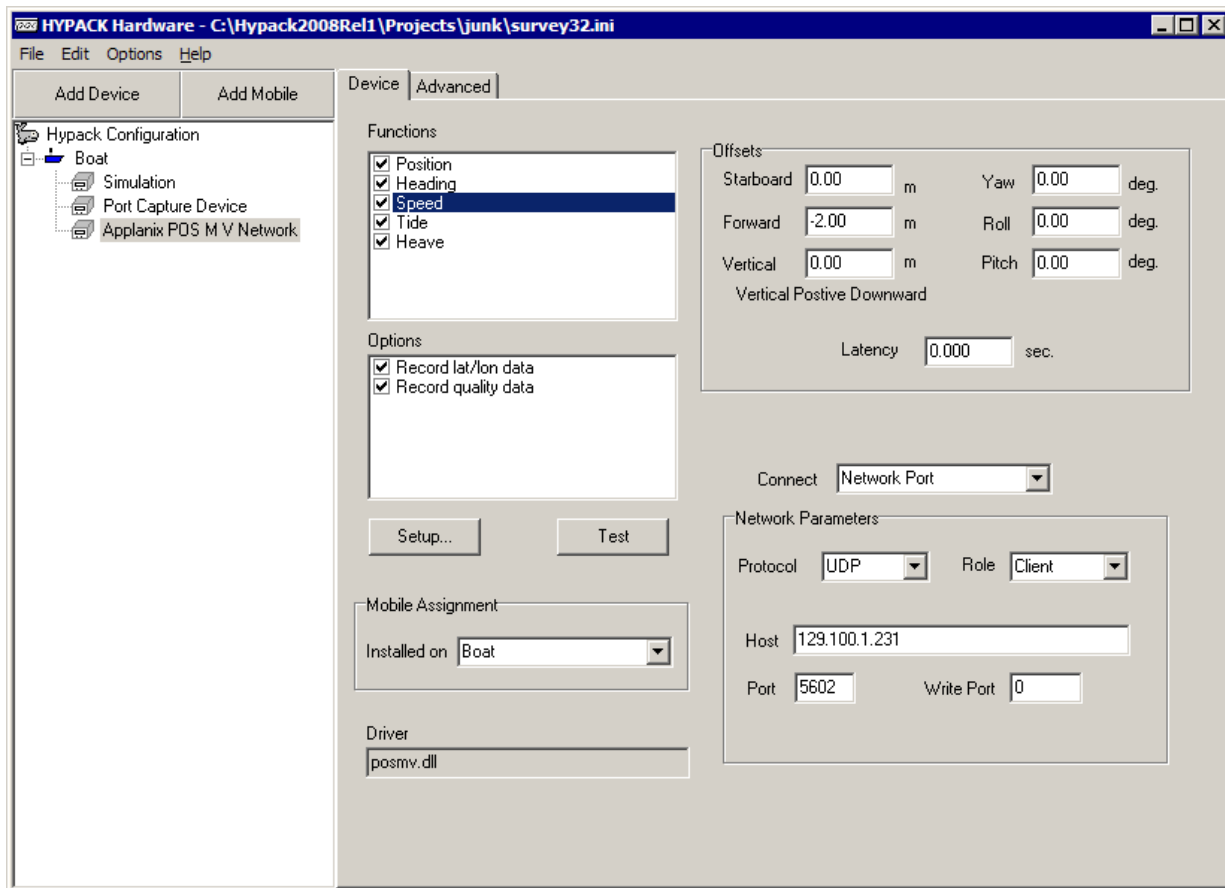
- **Use PPS signal for timing:** Only required when you apply delayed heave processing in the Single Beam Editor program. See "[Delayed Heave Processing](#)" below.
- **Use UTC time even when not synchronizing:** Check this option (and select the POS MV on the System tab in HYPACK® Hardware) to keep all time tags synchronized to the POS MV output.
- **Select the Record multibeam frame data. (Group 102).** This returns position data at a location called "sensor 1" in Applanix documentation. This is normally the multibeam sensor head, but it can be any user-specified point. (It's does the same thing as group 1 with all '0' offsets.)



Posmv.dll Driver Setup Dialog

Note: We have not yet seen a successful configuration using Group 1. If you have and are willing to share your project, we would love to see it!

- **Select 'Get heave from group 102'.**
- **Select the solution option according to the version of the POS MV you are using.** (Hint: If you have a Group 20 in your menu, you have a version 4 device.)
- **Solution status for RTK tides:** The slider only controls the calculation of the tide value (If you do not have RTK, it does not calculate tide.). Enter Float RTK to record the most data. You can filter the lower settings in post-processing if you want to.



Posmv.dll Device Setup

5. **Save your configuration and exit Hardware.**

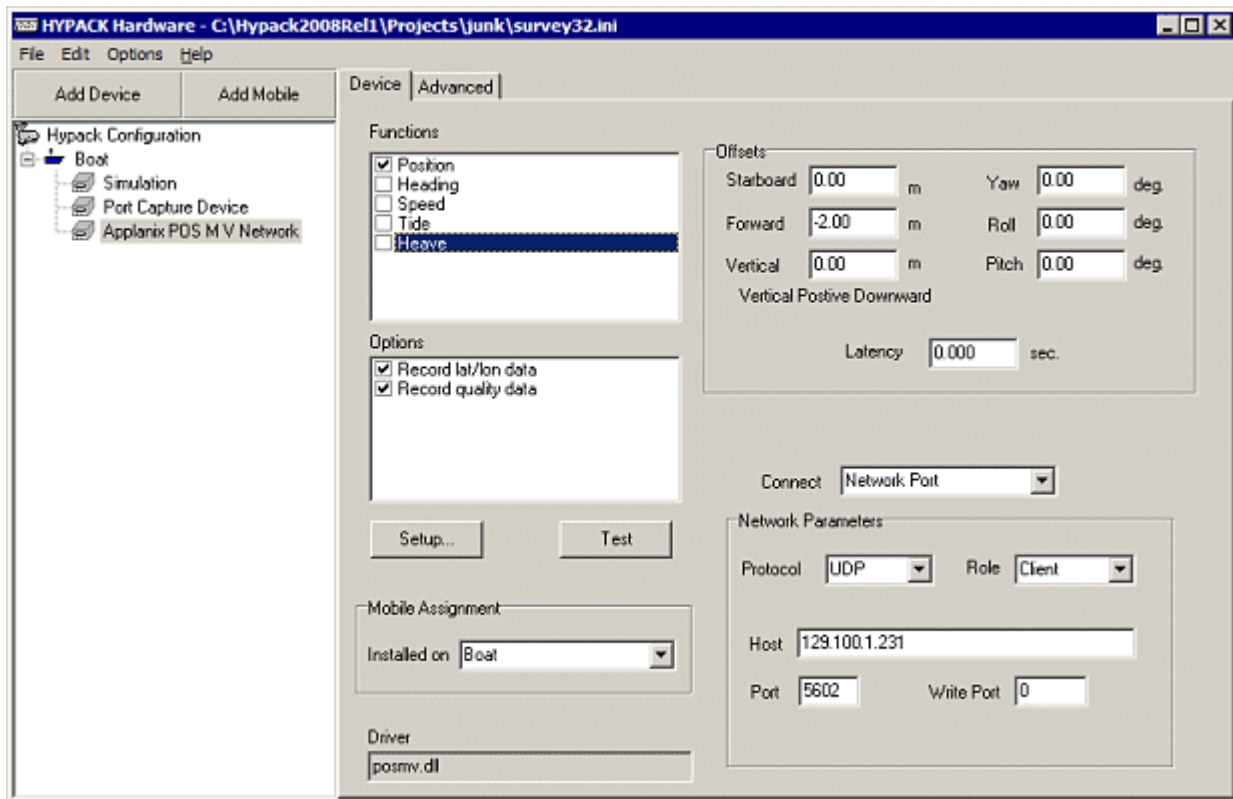
Multibeam Projects

In all HYPACK® surveys, position comes from the HYPACK® Survey program. For multibeam surveys, the POS MV must, therefore, be configured in both HYPACK® Hardware and HYSWEEP® Hardware.

HYPACK® Hardware Configuration:

Record position using posmv.dll. The settings in HYPACK® Hardware are shown in the following dialogs.

The starboard, forward and vertical offsets are measured relative to your boat reference. All other offsets are zero.



Posmv.dll Device Setup

The settings in the Driver Setup dialog are the same as in the single beam configuration.

HYSWEEP® Hardware Configuration

HYSWEEP's Applanix POS/MV Network driver records the heave, pitch, roll and heading. This provides the data to HYSWEEP Survey at the required 25Hz. (It will not work to record all POS MV data in HYPACK® Survey and pass the heave, pitch, roll and heading through shared memory because shared memory is not capable of this speed.)

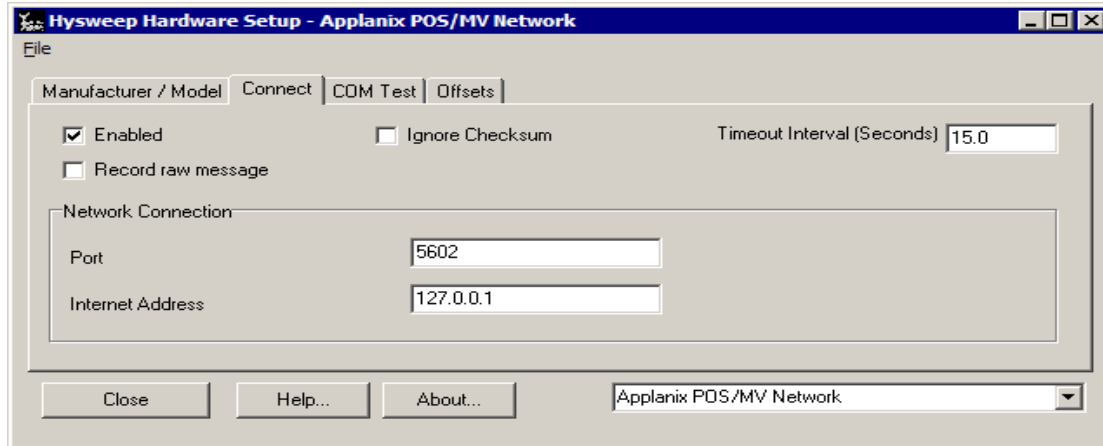
Offsets:

- Select the MRU at the top of the Offsets tab and set the offsets as follows:
 - **Starboard:** POS/MV IMU location starboard of **boat reference**.
 - **Forward:** POS/MV IMU location forward of **boat reference**.
 - **Vertical:** POS/MV IMU location relative to waterline (positive below).
 - **Yaw:** Enter 0.
 - **Pitch, Roll:** Enter 0 (MRU pitch/roll offsets are typically zeroed within the MRU itself).
 - **Latency:** Enter 0.
- Select the Gyro at the top of the Offsets tab and set the offsets as follows:
 - Enter 0 for all offsets and latency.

Setup Options: None

Connection Information:

- Check the **Enabled** option.
- **Port:** 5602
- **Internet Address:** Enter the IP address for the POS MV



POS MV Connect settings.

Delayed Heave Processing

Delayed heave processing can be applied to POS/MV Version 4 data in the HYSWEEP® EDITOR to smooth the effects to smooth the heave in areas where it was affected by such things as turning, acceleration and deceleration.

If you want the option to use this editing feature, you will need to think ahead. Be sure the time stamps on all of your data are synchronized. This is not an issue when you are using the POS MV Network driver; all time tags are based on the POS UTC time.

When you are logging your data, it is important to adhere to the following sequence. Otherwise, you may not have the data required by the Delayed Heave calculations.

1. **Start the POS/MV logging 'Group 111' Heave data.**
2. **Start HYPACK® and HYSWEEP® SURVEY'.**
3. **Log your survey data.**
4. **End logging with HYPACK® and HYSWEEP® SURVEY only.**
5. **Continue to log data with the POS/MV for at least 5 minutes.**
6. **Stop logging with the POS/MV.**

Delayed Heave corrections may now be smoothed in the Heave Window of Phase 1 in the HYSWEEP® EDITOR. (Detailed instructions may be found in the HYSWEEP® Manual.)