Due to the fact that more and more computers are built without serial connections, surveyors are forced to find USB-to-Serial or Ethernet-to Serial converters, to bring their sensor data into the computer. This also leads to an ever-entangled mess of wiring near the data collection computer and increases the chance for something to get disconnected, misconnected, or damaged.

Improvements have been made by both Odom and HYPACK, and it is now possible to have only one network cable connected to the HYPACK computer. All of the serial connections are made with the Odom echosounder.

**ODOM FIRMWARE UPDATE**

In order to make the single-cable connection, you need the following firmware versions on your Odom echosounder:

<table>
<thead>
<tr>
<th>Sounder</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV 100 (Single Freq)</td>
<td>415</td>
</tr>
<tr>
<td>CVM &amp; CV100 (Dual Freq)</td>
<td>416</td>
</tr>
<tr>
<td>CV200/300</td>
<td>No update needed</td>
</tr>
<tr>
<td>MK3</td>
<td>408</td>
</tr>
</tbody>
</table>

You can contact Dave Andrews or Marvin Story at Teledyne-Odom and have them send you the necessary firmware version for your CV/MK series echosounder. They can be reached at (225)769-3051.
**HYPACK® Driver Update**

You need the following updated drivers in HYPACK®:

- **GPS.dll** 15.0.12.18 or later
- **OdomCV3.dll** 15.5.0.2 or later

Once you have installed the firmware and driver updates, you are ready to make a few changes to the way you currently have your equipment connected to your HYPACK computer and the way it is interfaced in the HARDWARE program.

**Setup #1: Odom CV/MK Series & Differential or RTK GPS**

With this setup, we are going to assume that you are placing the GPS antenna directly over top of the Odom transducer, so that there are no horizontal offsets.

**TABLE 2. GPS Connections on the Odom Echosounder**

<table>
<thead>
<tr>
<th>Odom Model</th>
<th>Connection Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV100, 200/300, and MK3</td>
<td>Serial 3</td>
</tr>
<tr>
<td>CVM</td>
<td>GPS I/O (A)</td>
</tr>
</tbody>
</table>

**IMPORTANT:** In the following diagrams, the output rate of the GGA message (10-20 Hz) is necessary to use the RTK information as a heave sensor, as well as a positioning device. If you are using only a differential GPS, you can set the output rate of the GGA message to 1 to 5 Hz.

In addition to the GGA message, you must also output the ZDA message at a rate of only 1 Hz, so the HYPACK® computer clock can be synchronized with the UTC time of the GPS. This should minimize any latency issues between the GPS and echosounder to a maximum of approximately 10 to 30 milliseconds.
HARDWARE

1. Open the HARDWARE program.
2. Select the GPS NMEA-0183 (GPS.dll) driver.
3. Rename to “GPS”. (Optional. This is mainly for ease of display in the Data Display window).
4. Select the functions required for your survey (Position and Tide).
5. Click [Setup].

**FIGURE 1. Configuring the GPS in the HYPACK® HARDWARE Program**

6. Configure the GPS Setup options:
   - Set the GPS status at which you want RTK tide corrections to be calculated.

**FIGURE 2. Setting the GPS Status to Calculate RTK Tide Corrections**
In the Advanced Tab, select the GGA message and, most importantly, select the ‘CV3(Odom)’ in the ‘User Modified NMEA Messages’ drop-down list.

**FIGURE 3. Configuring the GPS Input Messages**

7. Click [OK].
8. In the Survey Connect tab, select and enter the following Device Connection information:

**FIGURE 4. Configuring the Network Connection**

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection Type</td>
<td>Network</td>
</tr>
<tr>
<td>Protocol</td>
<td>UDP</td>
</tr>
<tr>
<td>Role</td>
<td>Server</td>
</tr>
<tr>
<td>Port</td>
<td>1600</td>
</tr>
<tr>
<td>Write Port</td>
<td>1601</td>
</tr>
</tbody>
</table>

9. Click [OK] to return to the HARDWARE dialog.
10. Click on ‘Boat’ and configure your echosounder.
   a. Select the new Teledyne Odom CV Series (OdomCV3.dll) driver.
   b. Rename the driver to ‘Odom CV’ or ‘Odom MK3’. (Optional for ease of display in Data Display window.)
   c. Select the Options:
      - **Paper Annotation** sends user-defined event marks to the echosounder.
      - **Use For Matrix Update** paints the cells of a matrix in the depth colors.
   d. Select the Options:
      - **Depth** collects and stores the high and/or low frequency depths.
      - **Heave** is not used in this configuration.
- Record device specific messages collects and stores the digital echogram data from the echosounder.

**FIGURE 5. Configuring the Odom Driver**

11. Click [Setup].
12. Configure the Odom setup options:

   **FIGURE 6. Odom Setup Dialog**

   a. Select the option for each channel of the echosounder:
      - Channel 1 - Bathy = High Frequency
      - Channel 2 - Bathy = Low Frequency
   b. Select your Annotation Option.
   c. Click [OK].
13. In the Survey Connect tab, select and enter the following Device Connection information:
FIGURE 7. Configuring the Network Connection

TABLE 4. Odom Network Connections

<table>
<thead>
<tr>
<th>Option</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection Type</td>
<td>Network</td>
</tr>
<tr>
<td>Protocol</td>
<td>UDP</td>
</tr>
<tr>
<td>Role</td>
<td>Server</td>
</tr>
<tr>
<td>Port</td>
<td>1600</td>
</tr>
<tr>
<td>Write Port</td>
<td>1601</td>
</tr>
</tbody>
</table>

14. Click [OK] to return to the HARDWARE dialog.

**IMPORTANT:** If you noticed that the GPS and the Odom echosounder both have the same exact connection communication information, you are correct. These are the new updates to the GPS and Odom drivers in HYPACK®, that allow for all data to be transmitted from the Odom echosounder to HYPACK® on a single network cable.

15. Click ‘Hardware’.
16. Verify that the GPS has been selected to synchronize the computer clock.

FIGURE 8. Synchronizing the GPS to the Computer Clock

17. Save and Close your HARDWARE setup.
**SETUP #2: ODOM CV/MK SERIES, DUAL ANTENNA GPS, MRU MOTION**

With this setup, we are going to assume that you may or may not be placing the GPS Antenna directly over top of the Odom transducer so there might be horizontal offsets between them. In this case, we will need heading to properly correct for this.

We are also assuming that you may not have RTK GPS to compensate for any vertical movement that the boat might experience, so you will use an MRU to compensate for this movement.

**TABLE 5. GPS Connections on the Odom Echosounder**

<table>
<thead>
<tr>
<th>Odom Model</th>
<th>Connection Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV100, 200/300, and MK3</td>
<td>Serial 3</td>
</tr>
<tr>
<td>CVM</td>
<td>GPS I/O (A)</td>
</tr>
</tbody>
</table>

The GPS should output the **GGA** message at a rate of 1 - 5 Hz.

In addition to the GGA message, you must also output the ZDA message at a rate of only 1 Hz, so the HYPACK® computer clock can be synchronized with the UTC time of the GPS. This should minimize any latency issues between the GPS and echosounder to a maximum of approximately 10 to 30 milliseconds.

Because of a potential horizontal offset between the GPS antenna and the transducer, heading data is needed to correct for any ‘crabbing’ angle that the vessel may experience. The dual antenna GPS can provide True Heading and can output the HDT message (at a rate of 5-10 Hz) on the same Serial 3 COM Port connection as the GGA and ZDA messages.

To compensate for any Heave, Pitch, and Roll that the vessel may experience, it may be necessary to incorporate a Motion Reference Unit (MRU) sensor.

**TABLE 6. MRU Connections on the Odom Echosounder**

<table>
<thead>
<tr>
<th>Odom Model</th>
<th>Connection Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>200/300, and MK3</td>
<td>Serial 4</td>
</tr>
<tr>
<td>CVM and CV100</td>
<td>Heave</td>
</tr>
</tbody>
</table>
HARDWARE

1. Open the HARDWARE program.
2. Select the GPS NMEA-0183 (GPS.dll) driver.
3. Rename to “GPS”. (Optional. This is mainly for ease of display in the Data Display window).
4. Select the functions required for your survey (Position, Heading and Tide).
5. Click [Setup].

**FIGURE 9. Configuring the GPS in the HYPACK® HARDWARE Program**

6. **Configure the GPS Setup options**: In the Advanced Tab, select the GGA message and, most importantly, select the ‘CV3(Odom)’ in the ‘User Modified NMEA Messages’ drop-down list.
7. Click [OK].
8. In the Survey Connect tab, select and enter the following Device Connection information:

<table>
<thead>
<tr>
<th>Table 7. Network Connection Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option</strong></td>
</tr>
<tr>
<td>Connection Type</td>
</tr>
<tr>
<td>Protocol</td>
</tr>
<tr>
<td>Role</td>
</tr>
<tr>
<td>Port</td>
</tr>
<tr>
<td>Write Port</td>
</tr>
</tbody>
</table>

9. Click [OK] to return to the HARDWARE dialog.
10. In the Offsets tab, enter the offsets for the GPS antenna phase center:
   - **Starboard and Forward offsets** are measured from the Boat's Reference Point (BRP) or the boat's center of mass/center of rotation location.
   - **Vertical offset** is measured from the waterline (positive downward, negative upward).
11. **Click on ‘Boat’ and configure your echosounder.**
   a. **Select the new Teledyne Odom CV Series (OdomCV3.dll) driver.**
   b. **Rename the driver to ‘Odom CV’ or ‘Odom MK3’.** (Optional for ease of display in Data Display window.)
   c. **Select the Options:**
      - **Paper Annotation** sends user-defined event marks to the echosounder.
      - **Use For Matrix Update** paints the cells of a matrix in the depth colors.
   d. **Select the Functions:**
      - **Depth** stores the high and/or low frequency depths.
      - **Heave** stores the heave, pitch, and roll motion data being passed thru the echosounder.
      - **Record device specific messages** stores the digital echogram data from the echosounder.
12. Click [Setup].
13. Configure the Odom setup options:

FIGURE 14. Odom Setup Dialog

a. Select the option for each channel of the echosounder:
   - Channel 1 - Bathy = High Frequency
   - Channel 2 - Bathy = Low Frequency
b. Select your Annotation Option.
c. Click [OK].
14. In the Survey Connect tab, select and enter the following Device Connection information:
15. **Click [OK]** to return to the HARDWARE dialog.

**IMPORTANT:** If you noticed that the GPS and the Odom echosounder both have the same exact connection information, you are correct. These are the new updates to the GPS and Odom drivers in HYPACK®, that allow for all data to be transmitted from the Odom echosounder to HYPACK® on a single network cable.

16. **Click ‘Hardware’**.

17. **Verify that the GPS has been selected to synchronize the computer clock.**

18. **Save and Close your HARDWARE setup.**