APOS Survey Installation Manual

APOS Survey

Precedence of documents

In case of conflicting requirements/instructions in this document and Purchase Order (PO) including specifications referenced in PO, the PO and PO Specifications shall have the highest priority.

The reader

This manual is intended for use by engineers, planning and performing the system installation at the shipyard or on board the vessel and assumes that the personnel concerned have relevant experience in installing such systems.

The manual must be used in conjunction with the instructions and drawings designed for the specific vessel and should remain with the vessel on completion of the installation.

Notes

This manual holds sections that may be revised individually. In the event of changes to this manual, this Cover and Contents document will be replaced.

Unless stated otherwise, all installation work described in this document is to be performed by yard/customer personnel.
It is the responsibility of the yard/customer to assure that their installation personnel are sufficiently qualified, and that proper caution is taken to avoid injuries or damage to life, health, environment, equipment and property.

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Document History

| Revision	Description of Change
A	First Issue
B	Minor updates to procedures. New screen dumps with revised UI.
C	Updated the name from Survey APOS to APOS Survey.

TABLE OF CONTENTS

Introduction

This manual describes how to connect and configure APOS Survey to an existing onboard APOS/HiPAP system.

NOTE! APOS Survey requires HiPAP mk II transceivers running HiPAP SW version 2 or newer on the onboard system. The onboard system must run APOS version 4 or newer.
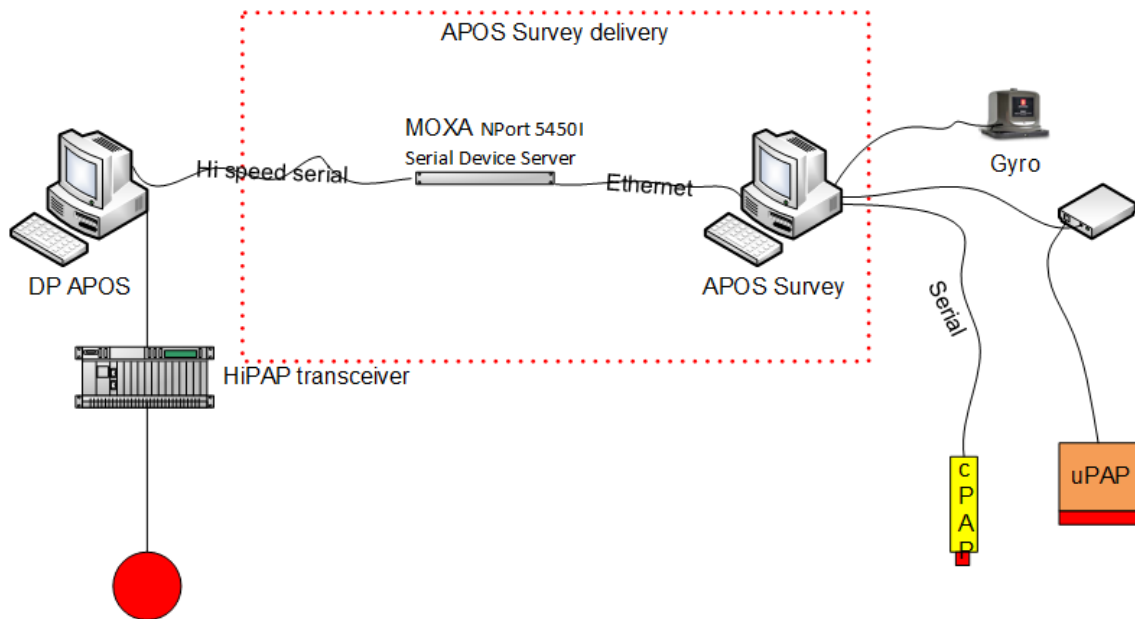
The interface between APOS Survey and onboard APOS is normally a high speed serial line with a galvanic isolated connection.

APOS Survey is delivered with a MOXA Ethernet to 4 port serial unit for this purpose. In order to transfer data between the two systems, a small program called ASI (APOS Survey Interface) has to be installed on the existing vessels APOS system. This program must be kept running at all times in order to keep the communication between the two systems. The ASI program will transfer settings from the onboard vessel system to the APOS Survey, but not the other way. In addition it will enable the APOS Survey to communicate with the on board transceivers.

Hardware installation

1. Connect the MOXA unit to the Ethernet RJ45 connector marked MOXA on the survey computer. Serial ports on the MOXA unit can individually be configured as RS-232 or RS-422.
2. Connect one of the RS-232/422 ports on the MOXA unit to a free serial port on the onboard APOS computer. Use one of the ports from on the 8 port serial card. Normally ports 1 to 4 on this card are RS-232 and port 5 to 8 are RS-422.
3. Two cables are supplied, one for RS-232 and the other for RS-422 connection. Use the correct cable for the connection. If RS-422 connection is used, the cable must be connected the correct way as the pinout on the MOXA is different from the 8 port serial in the APOS computer.
4. The APOS Survey comes with a short Ethernet STP cable. This cable MUST be connected between the Net A and Net B sockets on the survey computer if these are unused. Alternatively the computer may be configured with a loopback adapter. In the latter case, the cable between net A and B should not be used.

Software installation

The on board system must have an additional program installed in order to enable the communication with the APOS Survey. This program is called ASI (APOS Survey Interface) and can be installed while the current APOS/HIPAP is running. It can be installed on any of the APOS computers, but it is recommended to install it on the computer that is normally used as the main APOS computer (and where the serial line to the APOS Survey is connected). The program will not alter the current APOS/HiPAP installation. The program is supplied on a USB memory stick.

1. Insert the memory stick. The installer should start automatically. If not, open Windows explorer, locate the file called AsiBootstrapper.exe on the memory stick and run it.
2. When the program is installed, it will add a Start ASI entry to the menu. It will also be added to the list of programs that starts automatically when the system is turned on.
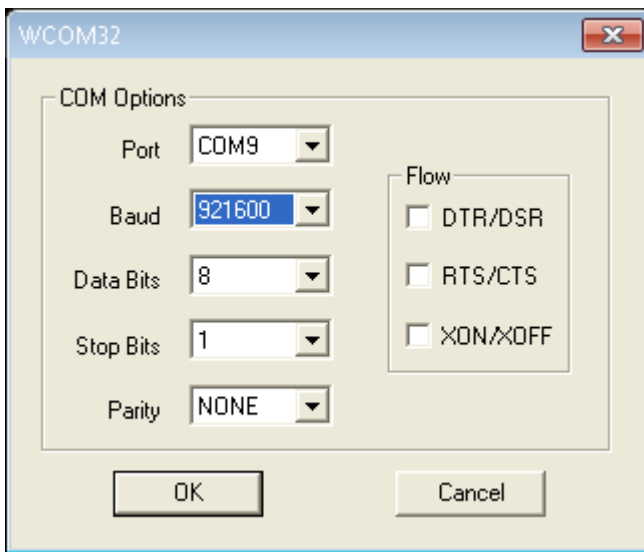
Software configuration

The ASI program must be configured on both the on board system and at the APOS Survey system.

1. Start the ASI program on the on board APOS system if not already running.
2. Open the Configure menu and select Configure Net Card. The following dialog will be displayed.
3. From the pull down list, select the item with the IP address that matches the Net A address on the computer. This address normally starts with 157.237.x.x or 172.21.x.x.
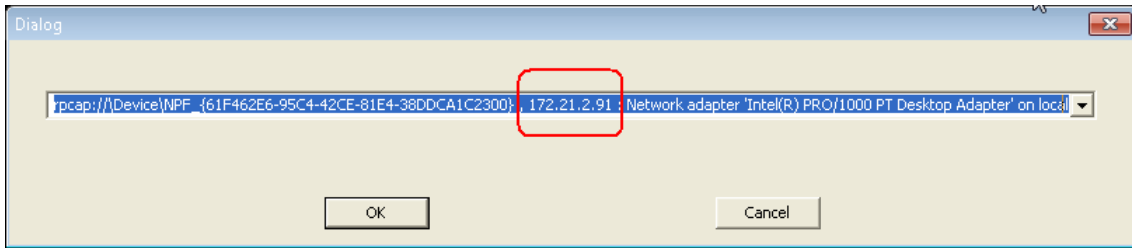
4. Press OK.
5. Select the configure menu again and choose Configure serial Port.
6. Select the COM port that is connected to the APOS Survey.
7. Select the highest baud rate that is available;

This concludes the configuration of the on board APOS system.

On the APOS Survey, the ASI program must be configured with correct serial line also.

1. Select the COM port that is connected to the on board APOS via the MOXA Ethernet to serial unit. The COM port number will possibly not be the same as on the other system.
2. Select the same baud rate as selected on the on board system;
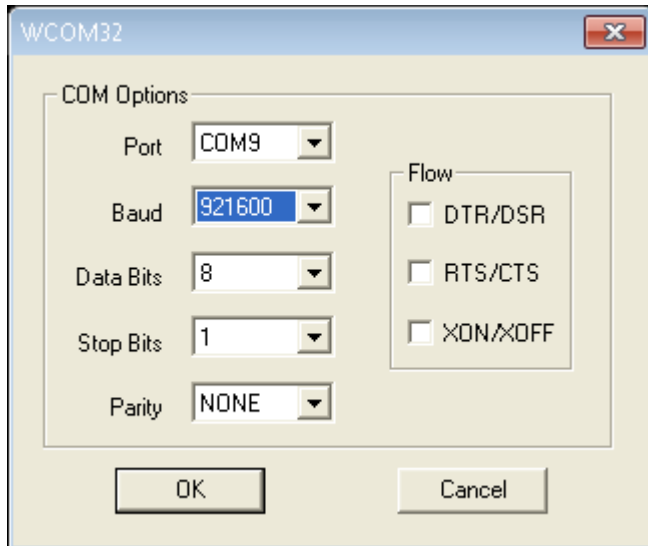
The two systems should now be able to communicate. The state indicators show the state of the local APOS (green when running), the communication link (green when communication is OK) and the remote APOS (green when running).

The Synch Time indicator indicates how well the clocks are synchronized between the APOS Survey and the main system.

- Green means better than 100 ms

- Yellow means better than 1 sec.

- Red means that the clock difference between the main system and the APOS Survey is more than one second. **(NOTE! This currently works only with HiPAP mk II transceivers.)**
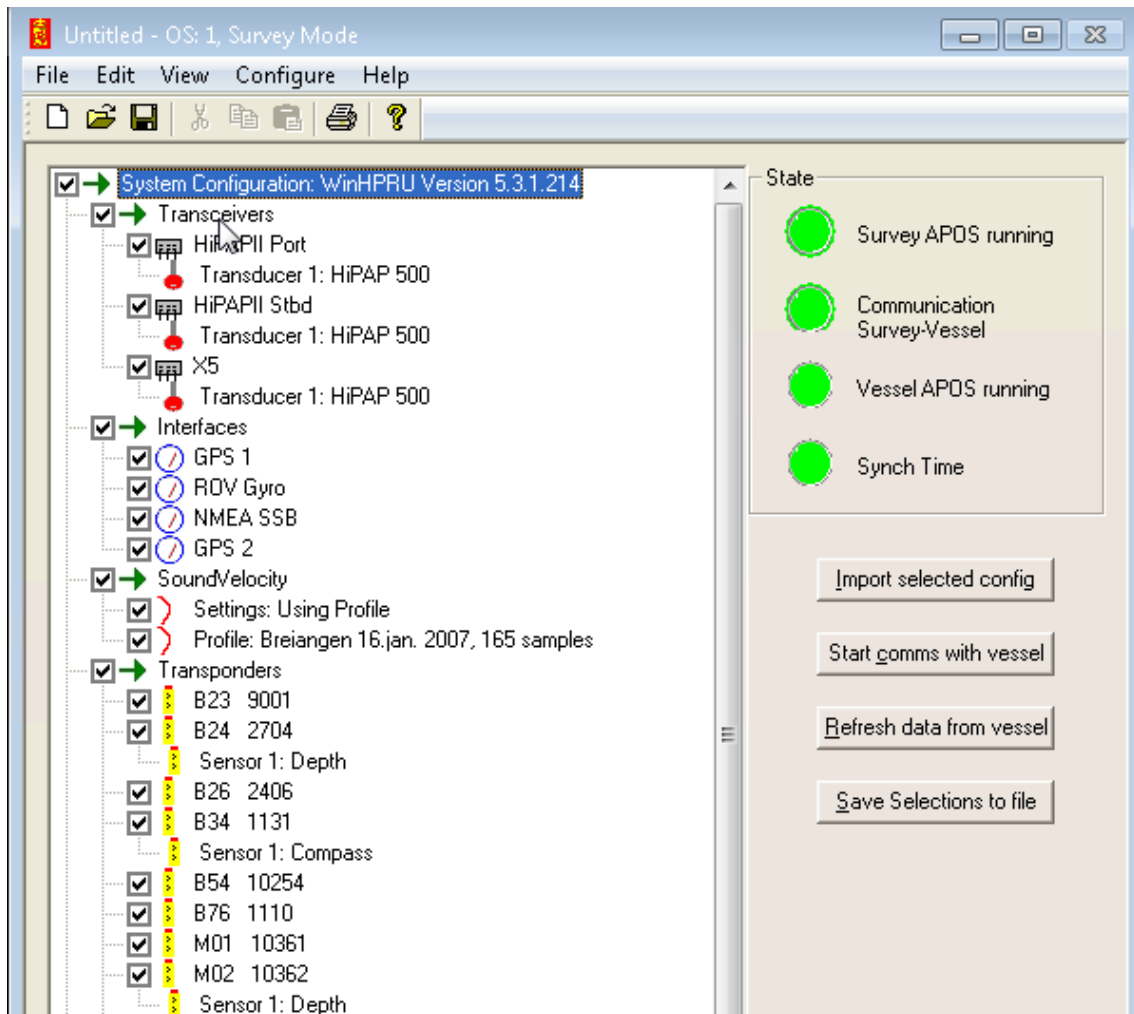
System setup

Selected settings are transferred from the on board system to the APOS Survey when setting up the APOS Survey on a new vessel and connecting it to the existing APOS/HiPAP system, After transfer of settings from the onboard APOS, the APOS Survey may be modified without settings being copied back to the vessel system.

The ASI program will show a list of items available on the vessel APOS. The operator via the APOS Survey selects which items are required for access and to transferred to the APOS Survey. The items that are available are:

- Transceivers including VRU and Gyro.

- External interfaces such as GNSS, depth sensors etc.

- Sound velocity settings, including current sound profile.

- Transponders.

- Positioning items, both SSBL and LBL.

- LBL calibration data.

It is advisable to exclude the transponders/positioning items used for dynamic positioning in the transfer. If the onboard system has two or more HiPAP transceivers, one transceiver could be excluded from Survey access and be reserved for DP usage only.

Before transferring data to the APOS Survey, it should be agreed which transceivers and transponders are reserved for DP usage only.

On the APOS Survey select which items to transfer and press the "Import selected config" button. A warning dialog will pop up and warn about erasing and overwriting your current settings. If you answer yes, the selected settings will be copied into the settings database of the APOS Survey.

Communication will start to/from the selected transceivers and from selected interfaces of the onboard system. This operation is normally a onetime operation when starting a new job on a new vessel.

After the synchronisation is complete, settings can be changed on the APOS Survey. None of these setting changes will be transferred back to the on board system.

The APOS Survey may use its own setting for sound velocity, lever arm offsets etc. The APOS Survey may also use a separate GNSS/Gyro/VRU/attitude sensor and additional transceivers.

Start procedure for APOS Survey

The current version of APOS Survey and the ASI program works best if operated using the following procedure;

1. On the main system, start APOS if not running.
2. Start ASI on the main system.
3. Start only the ASI program on the APOS Survey.
4. Select which settings to be transferred from the on board APOS.
5. Press the Import selected config button.
6. Start APOS.

If the transceiver status on the APOS Survey stays red or activating transponder fails, try the following procedure;
1. Stop the ASI program on both systems by selecting File-> Exit in the menu.
2. Start ASI again.
3. Repeat the selections on the Survey ASI.
4. Press Start comms with vessel.

The "Start comms with vessel" button transfers the current selections to the remote (on board) APOS. This will enable and start communication. This has to be done every time the ASI program has been stopped and restarted on either side.

If the settings of the onboard APOS is changed, it is possible to resynchronize the APOS Survey with the onboard APOS.

1. Press the "Refresh data from vessel" button. The ASI program on the onboard APOS will read the settings again and transfer them to the ASI on the survey system.
2. The operator must reselect which items that shall be transferred into the survey system. **(NOTE! This will possibly overwrite local setting changes on the APOS Survey).**

Autostart of the ASI program.

It is possible to configure APOS so that the ASI program is started automatically. Enter the Configure -> User options menu in APOS. Enable the option "Start the APOS Survey Interface (ASI)".
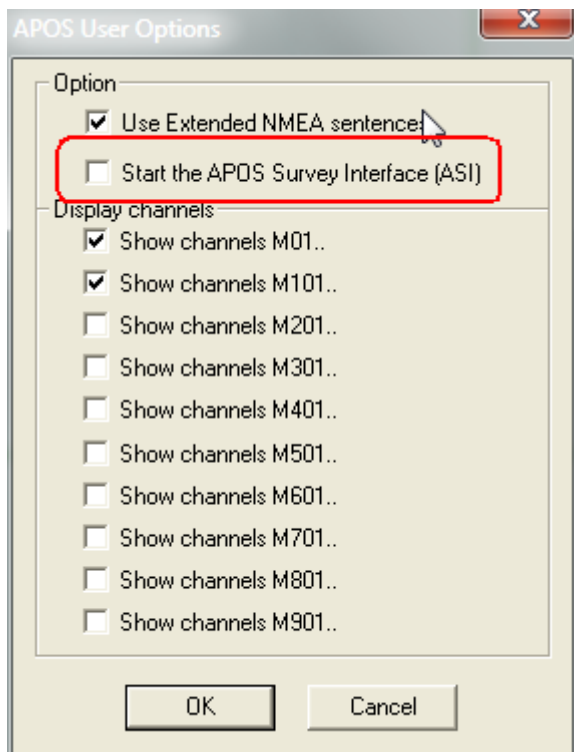
Local offsets and inclinations on APOS Survey

1. Enter the Configure → Transceiver menu and select the transceiver to change.
2. Enter required offset and inclinations values for the transducers if different from the onboard system.
3. The ASI program will automatically remove any offsets/inclinations applied by the onboard system and apply the new local offsets/inclinations. The operator may also choose a different attitude sensor than the vessel system.
4. The attitude dialog has a "Local" selection on the APOS Survey;

5. When this local check box is selected, one or more local attitude inputs can be configured.

These can be used as replacement for the attitude sensor that the onboard APOS is using. The range of sensor types is the same as for the HiPAP. You can select between serial port and Ethernet UDP input. NOTE! **A local Gyro/VRS should always be added after data transfer from the on board system has taken place. The data transfer will overwrite any local configured Gyro/VRS settings.**

6. The status of the local attitude inputs can be monitored by selecting View and then Local Attitude Status in the ASI program.
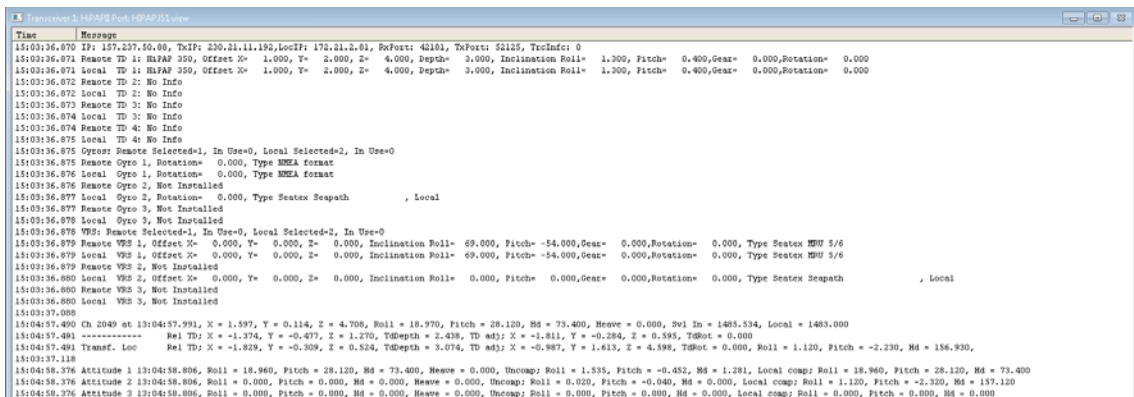
This window displays the current data from local attitudes and the measured update rate. The window is similar to the attitude window in the HiPAP program.
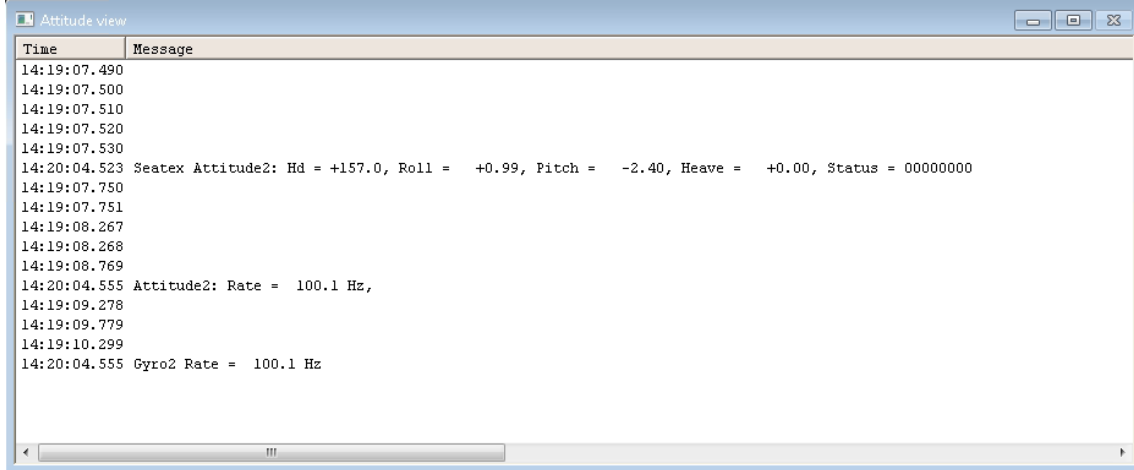
Double click on the transceiver in the ASI program to monitor of the data messages from the onboard APOS/HiPAP to the APOS Survey.
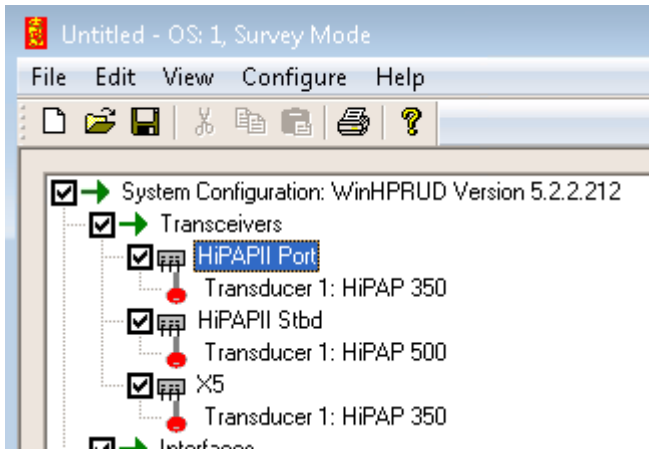

A new window is displayed;

This window displays the settings on the local system (APOS Survey) and the remote APOS. You can also monitor conversion from one set of inclinations/offsets to local settings and replacement of onboard attitude values with data from a local attitude source
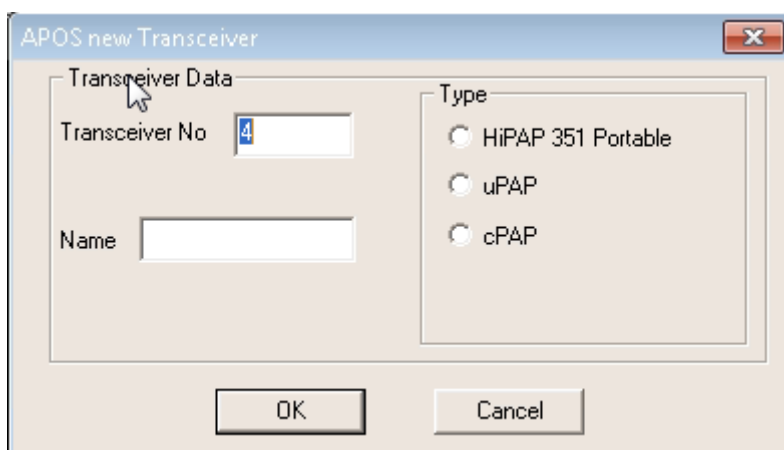
Local transceivers

Portable transceivers (HiPAP351P, µPAP or cPAP) can be added.

1. Enter the Configure and then Transceiver menu.
2. Press the Edit button and the following dialog will be displayed;
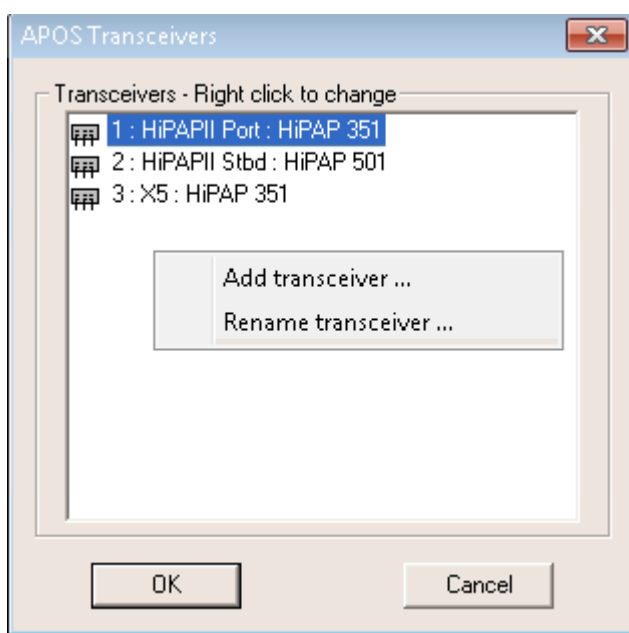
3. Right click in the view for adding a local transceiver.

Portable transceivers can be selected between the types shown in the previous dialog box. A local transceiver can also be removed by selecting it and choose Remove transceiver from the menu. **NOTE! A local transceiver should always be added after data transfer from the on board system has taken place. The data transfer may overwrite any local transceivers.**

NOTE! The current version requires that the HiPAP SW must be installed and configured manually on the survey system if a HiPAP 351 portable or a uPAP system is being used.

Operation

The APOS Survey may be operated as any other APOS. See the online help for more information.

However operators should be aware of the following:

- The same transponder can be used by both the onboard system and the APOS Survey at the same time. This is convenient for example when calibrating a transducer and monitoring the ROV position etc.

- The transponder has to be activated on both APOS systems. HiPAP will use the parameters from the last activation. This means that if the on board APOS is used for activation of a transponder with 3 second update rate, HiPAP will start using that. If the APOS Survey then activates the same transponder with 2 second update rate, the HiPAP will switch to use this rate. It will still be active on the onboard APOS, but the update rate will be higher and it will not be shown in the settings.

- The first operator that deactivates a transponder will stop positioning of the transponder. Again, this will not be shown on the other system, except for one will lose positioning and get an alarm after some time. (This behaviour may be changed in a future version of the software).

Automatic stop

The ASI program keeps track of all positioning activated from the APOS Survey. When the ASI program is stopped on the vessel APOS, it will automatically disable all positioning activated from the APOS Survey. The same will happen if the communication between the vessel APOS and the APOS Survey stops. This means that a quick way to disable/stop all APOS Survey activity is to stop the ASI program on the vessel system. This could be used as an "emergency" stop for a DPO to block all APOS Survey operations on the vessel system.