Teledyne PDS, T20-P and POS MV Quick Setup

Teledyne PDS

Version 1.0.6

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TELEDYNE RESON

Teledyne RESON B.V.
Stuttgartstraat 42- 44
3047 AS Rotterdam
The Netherlands

Tel.: +31 (0)10 245 15 00
www.teledyne-reson.com

Amendment Record Sheet

Rev.	Date	Reason for Modifications
1.0.6	11/06/2015	Configuration: Timing text modified.
1.0.5	11/05/2015	Configuration: text modified.
1.0.4	28/04/2015	All chapters, text modified after review UBL.
1.0.3	10/04/2015	Configuration: text modified. TrueHeave.
1.0.2	28/09/2014	Added section ‘Offsets’. Modified text POS MV CMR and RTCM input. Modified text sound velocity input. Added text ‘Heave’ input. Added link PDS2000 instruction.
1.0.1	09/09/2014	Version after review.
1.0.0	22/08/2014	First version of the PDS2000 T20-P with POS MV setup Manual.

Contents

Figures

1 Introduction

1.1 T20-P with POS MV and Teledyne PDS Quick Setup

The purpose of this manual is to act as a quick guide to setup a Teledyne RESON Seabat T20-P combined with an Applanix POS MV and Teledyne PDS. The manual will not describe the components in full detail. Refer to the associated manuals for more information.

For other information about Teledyne PDS see the Teledyne PDS User Manual (the file Teledyne PDS User Manual.pdf in the folder 'Manuals')

This manual is also available as a HTML Help file and can be opened with F1 or with *Help* > *Help Topics* from the menu bar.

Teledyne PDS instruction movies are available at the Teledyne PDS YouTube channel. Watch Teledyne PDS instruction movies.

2 Interfacing

2.1 Introduction

In this section the basic setup of a RESON T20-P, a POS MV and the Teledyne PDS computer with the connections are described.

2.2 Connections

Figure 2-1 shows the rear panel with the connectors of a T20-P.

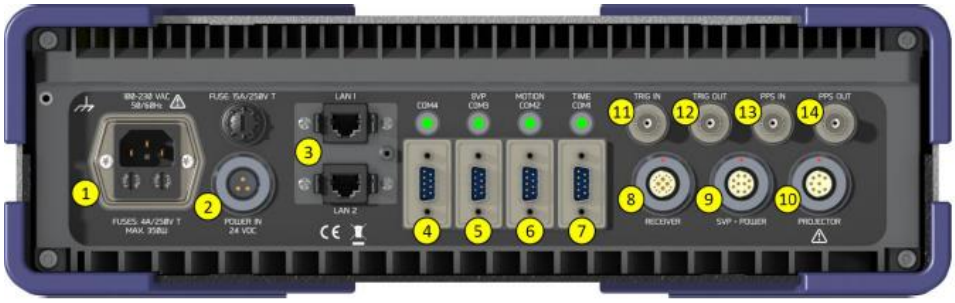


Figure 2-1 Rear panel RESON T20-P

Figure 2-2 shows the rear panel with the connectors of a POS MV.

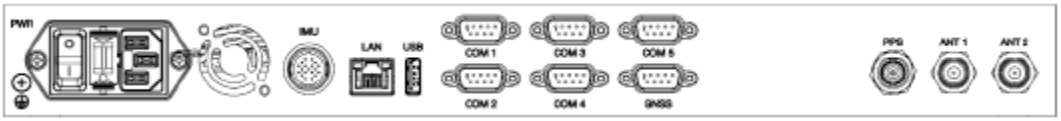


Figure 2-2 Rear panel Applanix POS MV

The Teledyne PDS software, the POS MV's POSView software and the SeaBat User Interface (SUI) are installed on a computer. The POS MV, the RESON T20-P and the computer are linked to each other by an Ethernet connection. (An Ethernet switch is used for this purpose.) The T20-P need serial motion data for its roll stabilization feature. A PPS signal with a timing message from the POS MV is needed for correct time synchronization.

Schematically a setup is represented as:

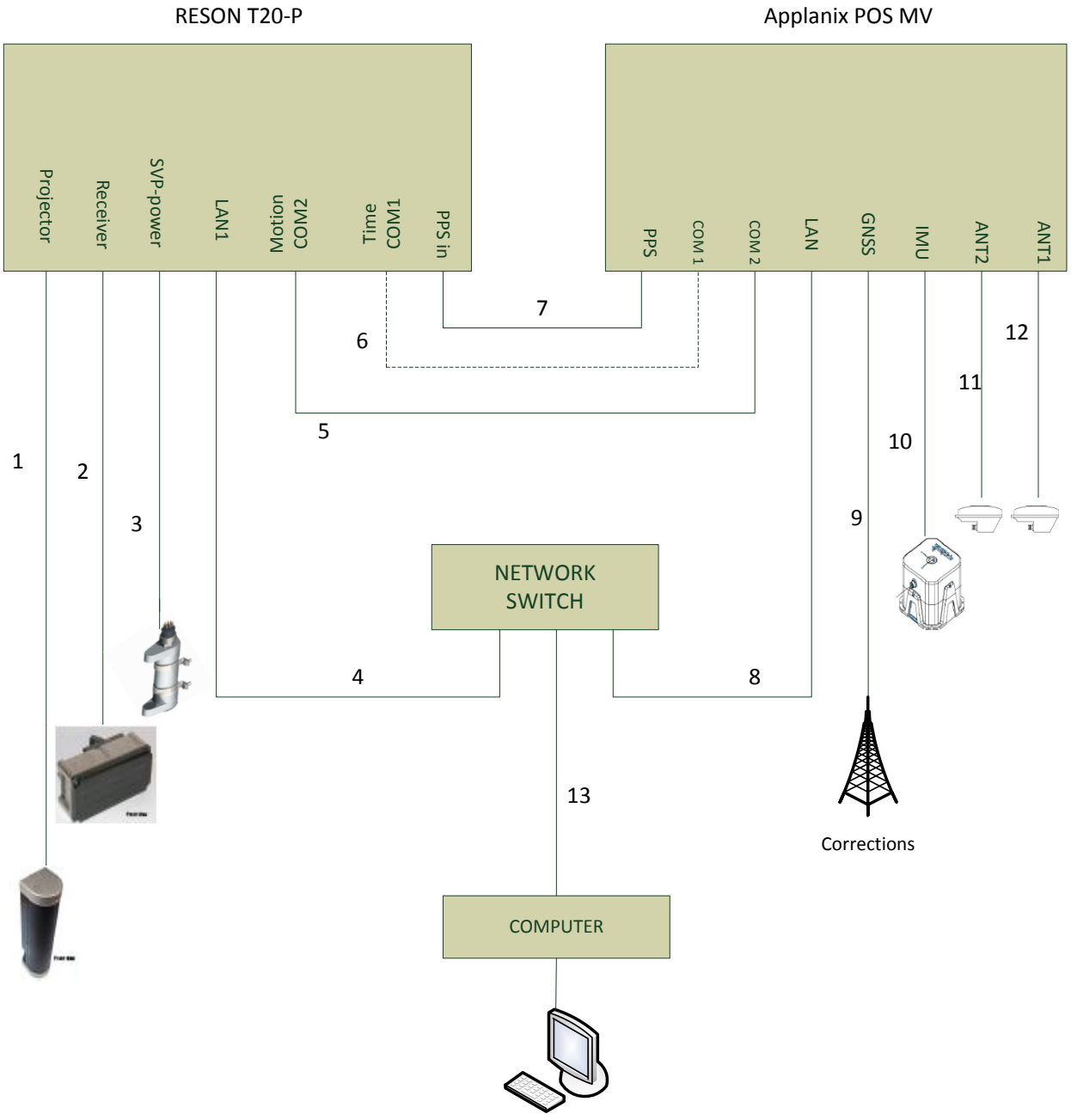


Figure 2-3 Schematic of interfacing RESON T20-P, Applanix POS MV and Teledyne PDS computer

The following table indicates the cabling. (A setup may be different depending of the customer's used configuration.)

Nr	Function	Type
1	Connect T20-P with projector	Supplied by RESON (pn 85002228)
2	Connect T20-P with receiver	Supplied by RESON (pn 1008775)
3	Connect T20-P with sound velocity probe as delivered by RESON. (SVP-70 or SVP-71). Alternatively a Sound Velocity probe could be connected to	Supplied by RESON (pn 85002223) or supplier of Sound Velocity probe.

Nr	Function	Type
	COM3 of the T20-P.	
4	Connect T20-P LAN port with Ethernet switch	Ethernet cable
5	Connect T20-P motion port with serial port POS MV	Serial cable. (Delivered with POS MV)
6	Connect T20-P time port with serial port POS MV. Alternatively with latest versions of the SUI I/O module the timing could also be added by the Ethernet connection and the correct selected (message 7) POS MV time message. In this case the serial connection is not needed.	Serial cable (Delivered with POS MV)
7	ConnectT20-P PPS in port with POS MV PPS out port	Coax 75 ohm with BNC connectors
8	Connect T20-P LAN Ethernet port with switch	Ethernet cable
9	Connect POS MV GNSS serial port with GPS correction source.	Serial cable
10	Connect POSMV with IMU	Supplied by Applanix (pn 10005142-25)
11	Connect POS MV with secondary GPS antenna	Coax 50 ohm as supplied by Applanix
12	Connect POS MV with primary GPS antenna	Coax 50 ohm as supplied by Applanix
13	Connect Ethernet switch with Teledyne PDS computer	Ethernet cable

2.3 Computer requirements

The minimum computer requirements for running Teledyne PDS are:

- CPU: modern Quad core Processor but preferred 8 core;
- Graphic card with OPENGL support and 1Gb of memory;
- 4Gb internal memory;
- 500Gb Hard disk;
- Multi serial I/O card when sensors are interfaced to the computer serially;
- 32 bits or 64 bits MS windows 7 or MS windows XP professional service pack 3 or higher (Support ends from of 1st January 2015);
- DVD/CD Drive.

Refer to the Teledyne PDS user manual for more specifications.

2.4 Installation

Refer to the RESON T20-P Operator Manual and the POS MV User Manual for a full description of installing the equipment.

Take special attention to the POS MV's GPS antennas. The distance between the primary and secondary antenna should be at least 2 meters but may not exceed 5 meters.

The primary antenna (ANT1) is the antenna used for positioning.

3 Configuration

3.1 Introduction

The configuration of the system consists of:

- Installing the software packages;
- Set the devices TCP/IP settings;
- Setup the Sonar User Interface (SUI);
- Setup the POS MV;
- Setup Teledyne PDS.

3.2 Software installation

In this document it is assumed the Teledyne PDS software, the SeaBat User Interface (SUI) software and the POS MV's POSView software is installed on the same computer.

3.2.1 Teledyne PDS Installation

Refer to appendix 'Installing Teledyne PDS' on page 57 for the procedure to install Teledyne PDS on a computer.

3.2.2 SeaBat User Interface (SUI)

The SUI setup and controls the sonar.

Refer to appendix 'Installing SeaBat User Interface (SUI)' on page xx for the procedure to install the SUI on a computer.

3.2.3 POSView

POSView setup and controls the POS MV.

Refer to appendix 'Installing POSView' on page xx for the procedure to install the POSView software on the computer.

3.3 TCP/IP Settings

The T20-P, POS MV and computer must set in the same IP range.

The follow IP settings are recommended, but other may use:

Computer: 10.11.10.100

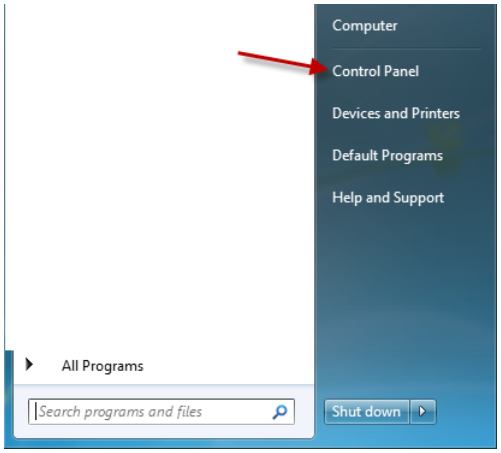
T20-P: 10.11.10.1

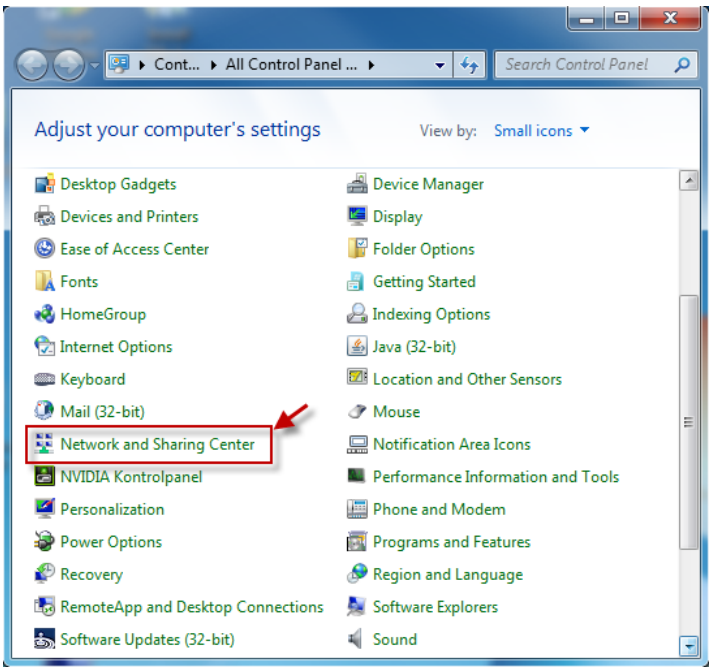
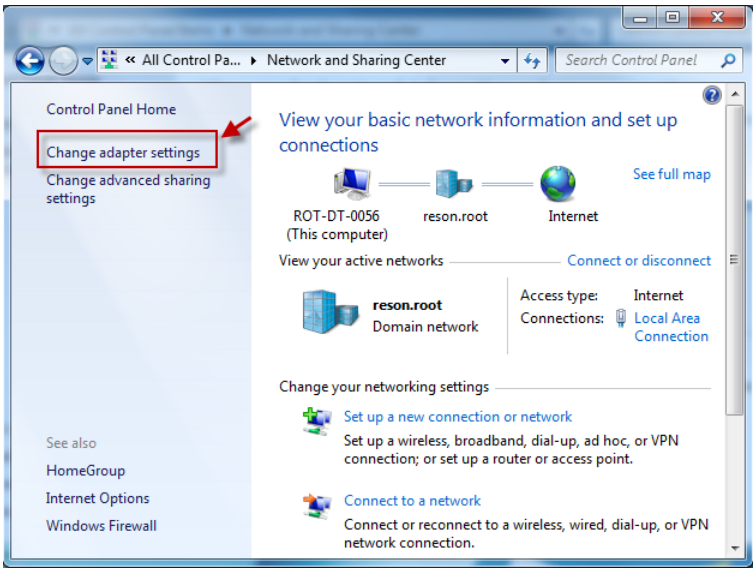
POSMV: 10.11.10.102

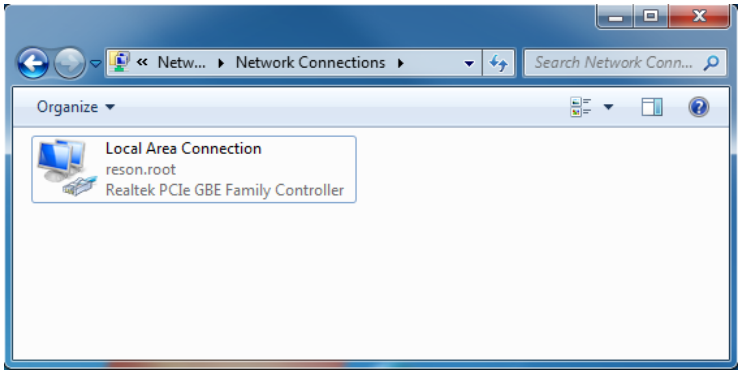
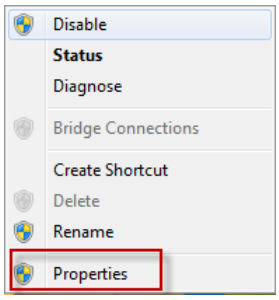
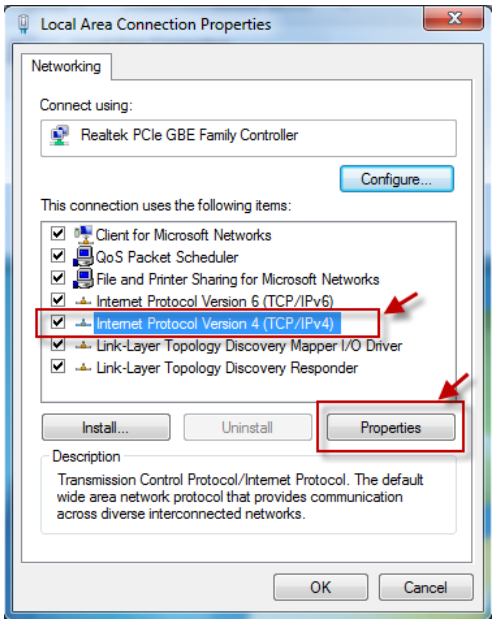
In the next sections the TC/IP configuration for the computer, the T20-P and the POS MV are described. It is recommended to disable a firewall as it could block programs as Teledyne PDS or POSView.

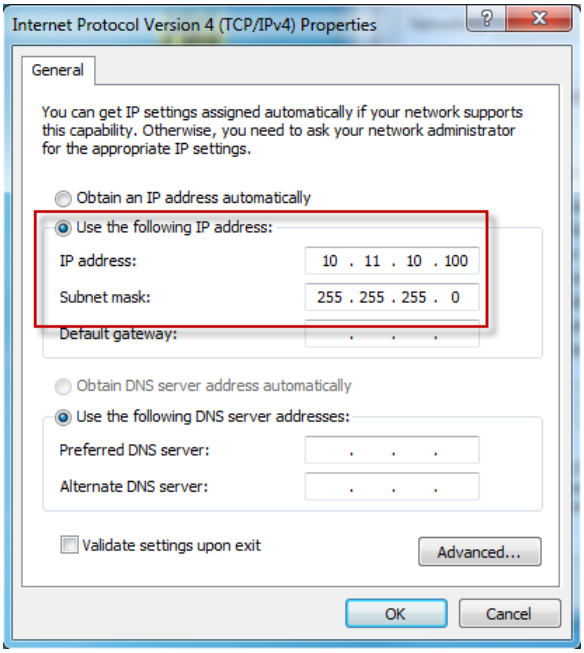
3.3.1 Configure computer TCP/IP Settings and Disable Firewall

The following table describes how to configure the computer IP address for MS Windows7. For other Windows versions the procedure is almost similar.

Step	Action
1	Press the windows '*Start*' button. 
2	Select '*Control Panel'.* 

Step	Action
3	Select '*Network and sharing Center*'. 
4	Select '*Change adapter settings*'. 

Step	Action
5	The available computer connections are listed. In this example only one, but more are possible. 
6	Right click at the LAN connection on which the sonar is connected. A context menu opens. Select '*Properties*'. 
7	In the next window select '*Internet Protocol Version 4 (TCP/IPv4)*' and press '*Properties*'. 

Step	Action
8	Check the '*Use the following IP address'* button, and fill in the required IP address. (E.g. 10.11.10.100) Set the subnet mask to 255.255.255.0 
9	Press '*OK*' to close the wizard.

When a firewall is enabled it possibly blocks Teledyne PDS or other applications.

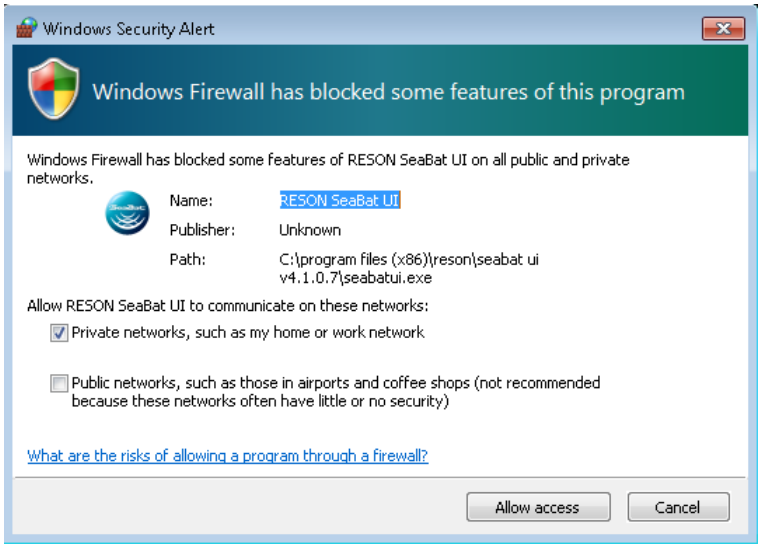
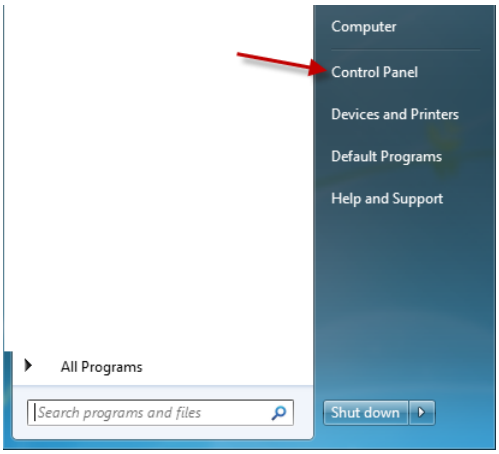
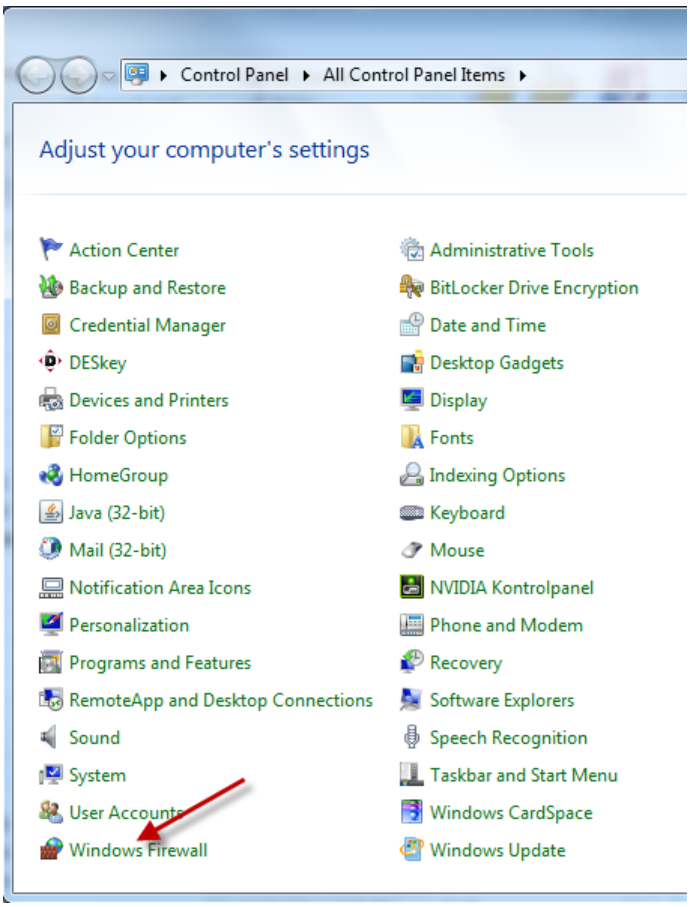
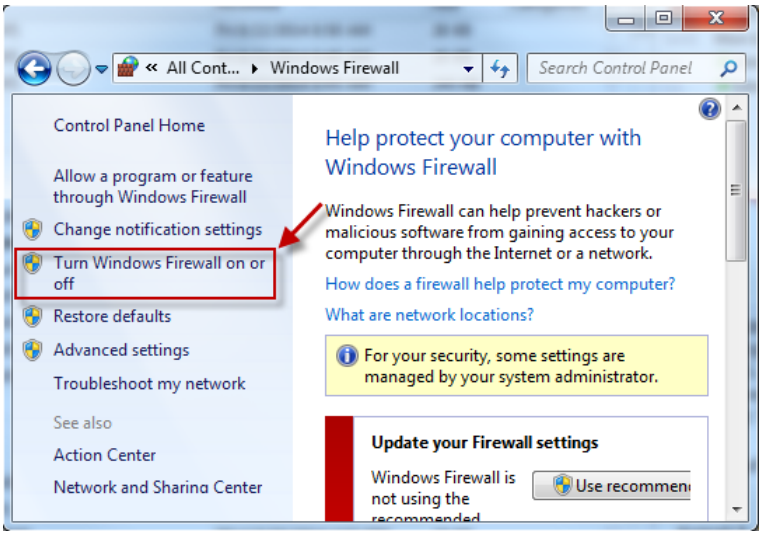


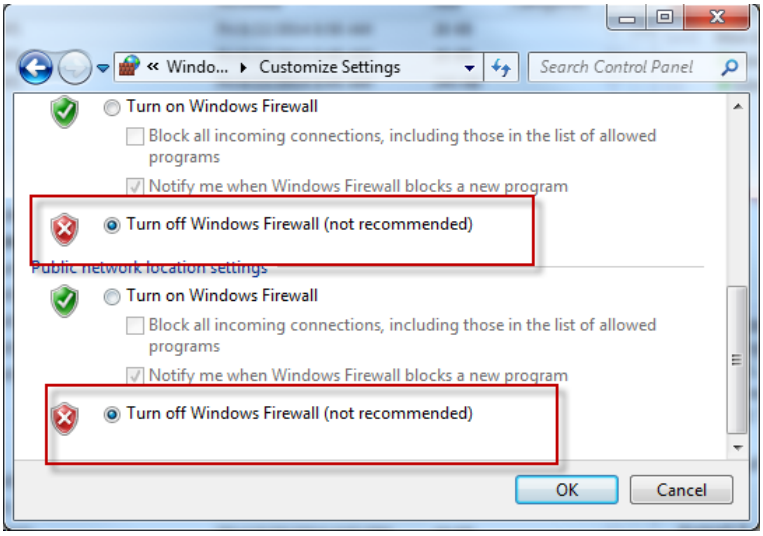
Figure 3-1 Firewall

It is recommended to disable the firewall.

The following table describes the procedure to disable a firewall for windows 7. For other windows versions the procedure is almost similar.

Step	Action
1	Press the windows *'Start' button.* 
2	Select '*Control Panel*'. 

Step	Action
3	Select '*Windows Firewall*'. 
4	Press '*Turn Windows Firewall on or off*'. 

Step	Action
5	Turn off the firewall in the dialog box and press '*Ok*' to confirm. 
6	The firewall is turned off

The computer is ready for use.

3.3.2 Configure T20-P TCP/IP Settings

The T20-P's IP address is configured with the SeaBat User Interface (SUI).

There are two options:

- Generate a IP address automatically;
- Use static IP address.

The T20-P has the follow default static IP addresses:

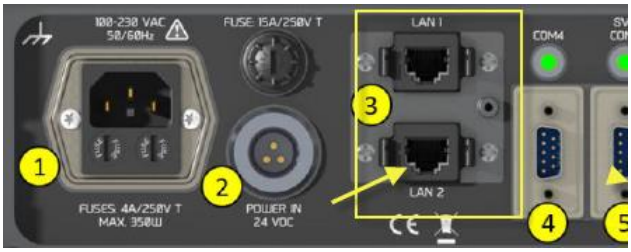
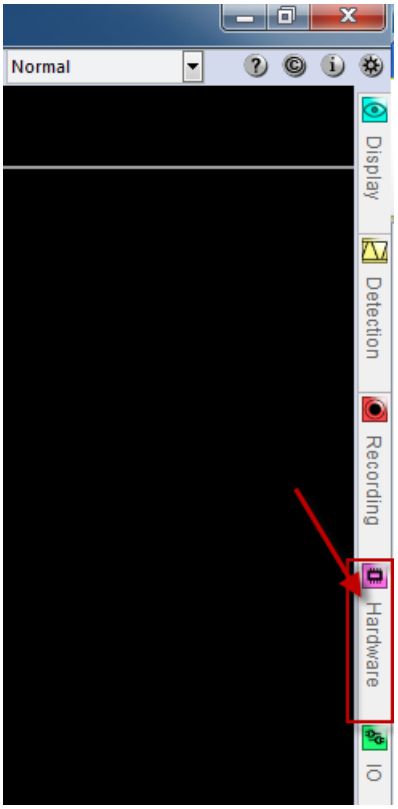
LAN1: 10.11.10.1

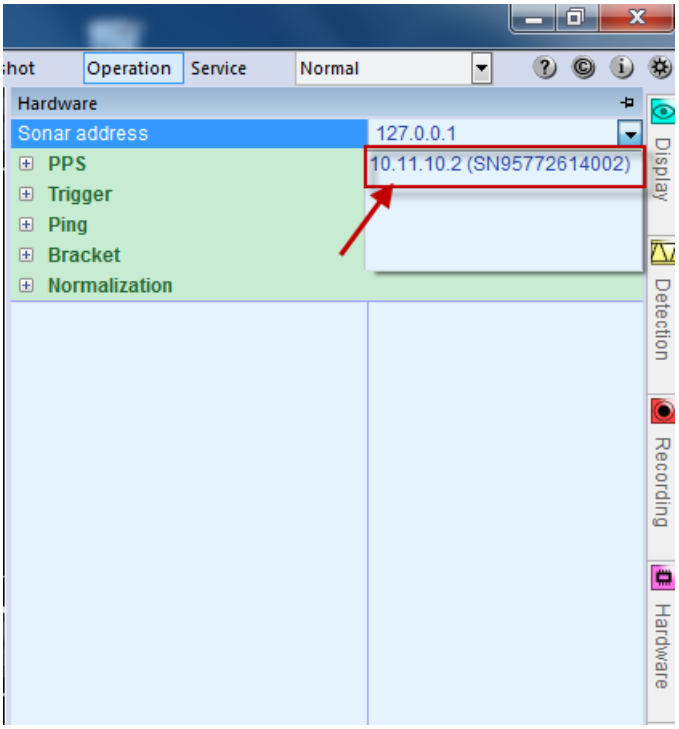
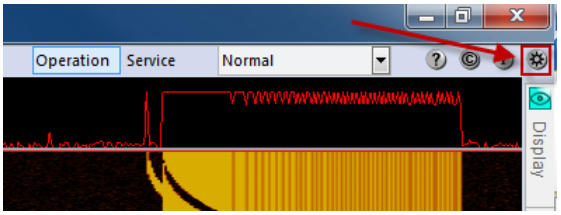
LAN2:10.11.10.2

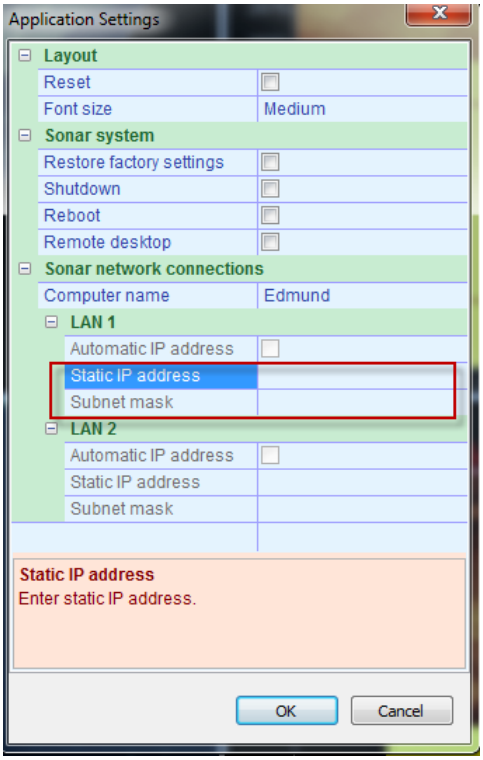
The static IP range of the T20-P's LAN2 port is between 10.11.10.2 and 10.11.10.9 On this way it is very easy to configure an IP number for the T20-P processor as you now know the range of the port.

In case of generation an IP address automatically a DHCP server must available. The processor will acquire an IP address from the DHCP server.

The following table describes the procedure to change the IP number of the T20-P.

Step	Action
1	Set the computers IP number to 10.11.10.100 with subnet mask 255.255.255.0. Refer to section 'Configure computer TCP/IP settings' on page 8.
2	Connect the Ethernet cable from the computer to the LAN2 port of the T20-P processor. 
3	Double-click the SUI shortcut on the desktop to start the SUI. 
4	Press 'Hardware' to open the hardware pane. 

Step	Action
5	Select the sonar from the hardware pane's sonar address. When clicked in the 'sonar address' field the sonar is displayed by its current IP number and serial number. Select the Sonar by selecting the associated IP address.  The Sonar is now connected with the SUI. A wedge will appear in the wedge view of the SUI when the sonar functions.
6	Press the application button. 

Step	Action
7	Enter the required Static IP address and subnet mask of the LAN1 port. 
8	Connect the Ethernet cable from the processor's LAN2 port into the LAN1 port. 
9	Configure the computer's IP number with the correct number and connect with the T20-P as described in step 4.

3.3.3 Configure POS MV TCP/IP Settings

It is possible to change the POS MV IP number with the POSView software. However before it is possible to connect with POSView to the POS MV, the computer must be in the IP range of the POS MV.

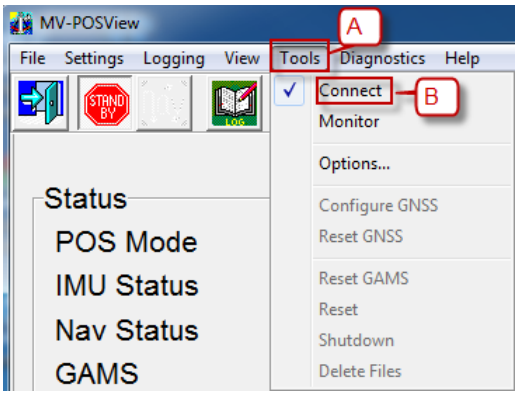
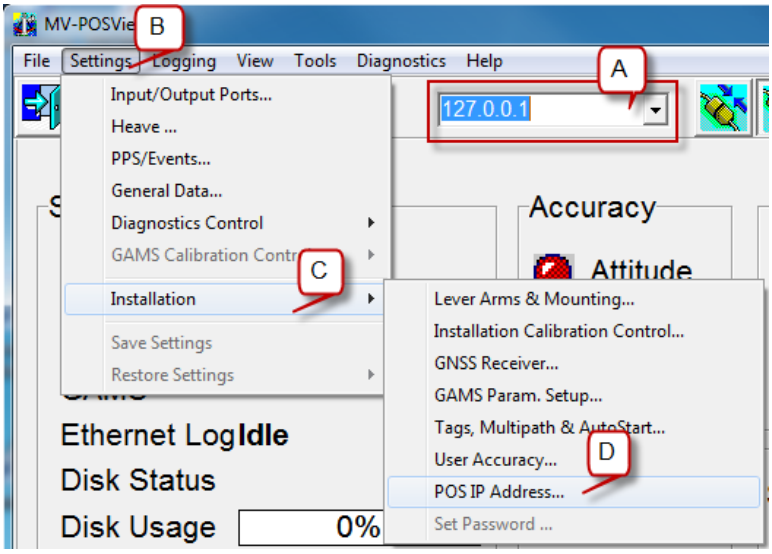
The default IP address of a new delivered POS MV is 192.168.053.100

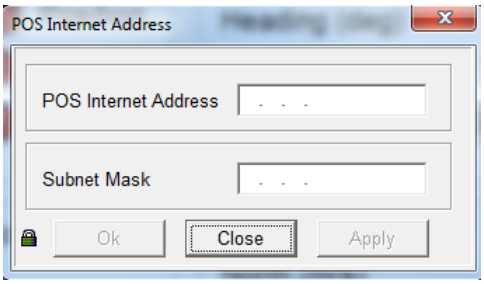
In order to change the POS MV IP address, the computer IP address should initially be changed in the same range as the current POS MV number. For example 192.168.053.101

Refer to section 'Configure computer TCP/IP settings' on page 8 to change the computer IP number.

Be cautions with configuring the POS MV IP address. A wrong IP address result in no connection with POSView. If the IP address is unknown it is difficult to find out the configured IP address. When the POS MV IP address is unknown it is possible to listen with a terminal program at Com 4/5 (the highest Com available) at 9600Bd during power up the IP address.

The following table describes the procedure to change the POS MV IP number.

Step	Action
1	Double-click the shortcut on the desktop to start POSView. 
2	See the following figure.  A Open menu *Tools*. B Select *Connect,* to connect to the POS MV.
3	See the following figure.  A: The current IP address is displayed in the toolbar.

Step	Action
	B: Open the menu '*Settings*'; C: Select *'Installation'*; D: Select *'POS IP Address…'*.
4	Enter in the appeared dialog box the required IP address (E.g. 10.11.10.102) and subnet mask (255.255.255.0).  Click 'Apply' when changed. When the new IP address has a different range as the computer the communication with the POS MV will be lost off course.
5	Change the computer's IP range in the new range of the POS MV.

3.4 SUI Configuration

This section only describes how to configure from the SUI:

- The roll stabilization feature;
- Timing;
- Sound velocity;
- And other I/O devices.

The configuration of above items is necessary for correct functionality of the sonar.

Refer to the SeaBat User Interface manual for a full description of the SUI.

3.4.1 Roll Stabilization

The roll stabilization is a feature of the T20-P to correct the swath width for Roll movements. Refer to the T20-P operate manual for more details.

See Figure 3-2. The roll stabilization is setup in the SUI's Hardware pane. Tick the checkbox and select the correct format, communication parameters and sign definition.

These settings should match with the message as received from the motion output device such as the POS MV. Normally the POS MV is set to output a TSS1 message.

An update rate of 50Hz or higher for the motion data is needed for correct roll stabilization functionality.

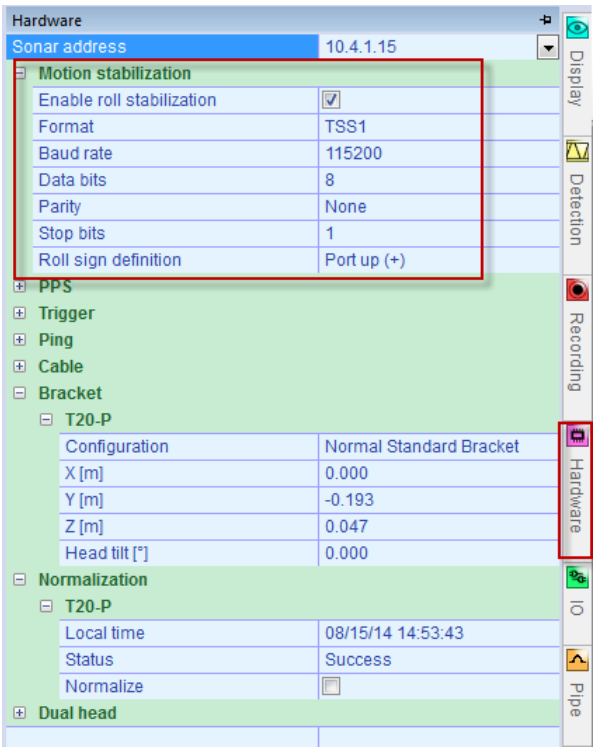


Figure 3-2 Hardware pane with motion stabilization setting

3.4.2 Time and PPS Setup

The timing is setup from the SUI's I/O pane's clock tab.

It is essential to connect and define the timing and PPS signals correctly.

The time message could be interfaced to the T20-P by two methods:

- By a serial message from the POS MV
- Or by Ethernet message 7 from the POS MV

3.4.2.1 Serial Time Message

When a serial message is used for timing:

1. Connect the serial cable from the POS MV COM1 to the T20-P COM 1 timing port. Refer to section 'Connections' on page 3.
2. Connect the POSMV *PPS* port to the *PPS in* port of the T20-P. Refer to section 'Connections' on page 3.
3. Open the SUI I/O pane and select the correct format with the correct communication settings as received from the POS MV. For the POS MV normally a NMEA ZDA message is used. COM1 is the time port. See Figure 3-3.

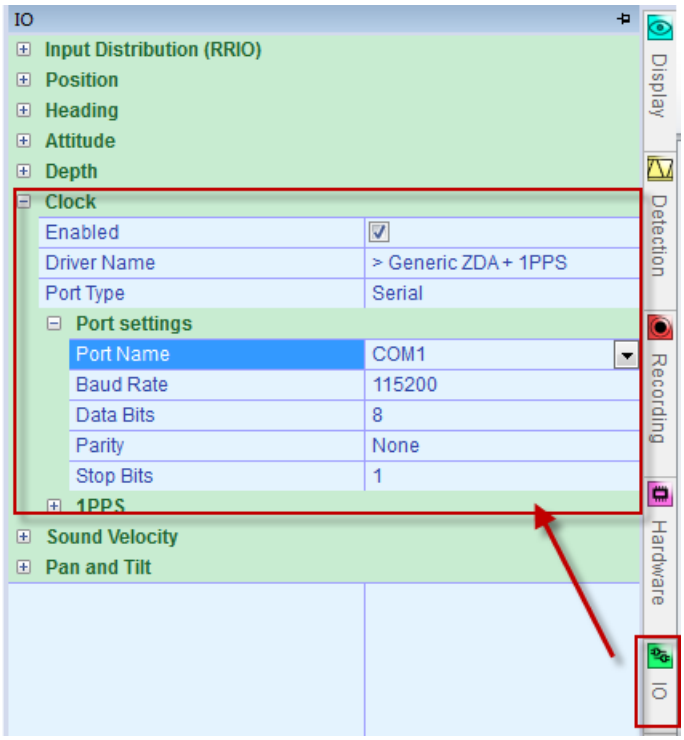


Figure 3-3 I/O pane serial clock setting

4. Set-up the POS MV to output a serial time ZDA message. Refer to the POS MV configuration's section 'Serial time message output' on page 27.

3.4.2.2 Ethernet Time Message

When a time message from the POS MV by Ethernet is used it is not necessary to connect the serial cable to the T20-P COM1 timing port. The PPS ports are still connected to each other.

Refer to section 'Connections' on page 3.

Perform the following steps:

1. Open the SUI I/O pane and select 'Network' as protocol. Settings are changed by selecting the field and selecting the value from the drop down list. See Figure 3-4.

Figure 3-4 Changing the serial protocol into network

2. Setup the settings as indicated in Figure 3-5.
   - Select port type *Network* and the POS MV Ethernet 7 message.
   - Select as protocol UDP/IP with local port 5602. Set the host address with the IP address of the POS MV. Tick the 'Check host address' checkbox.

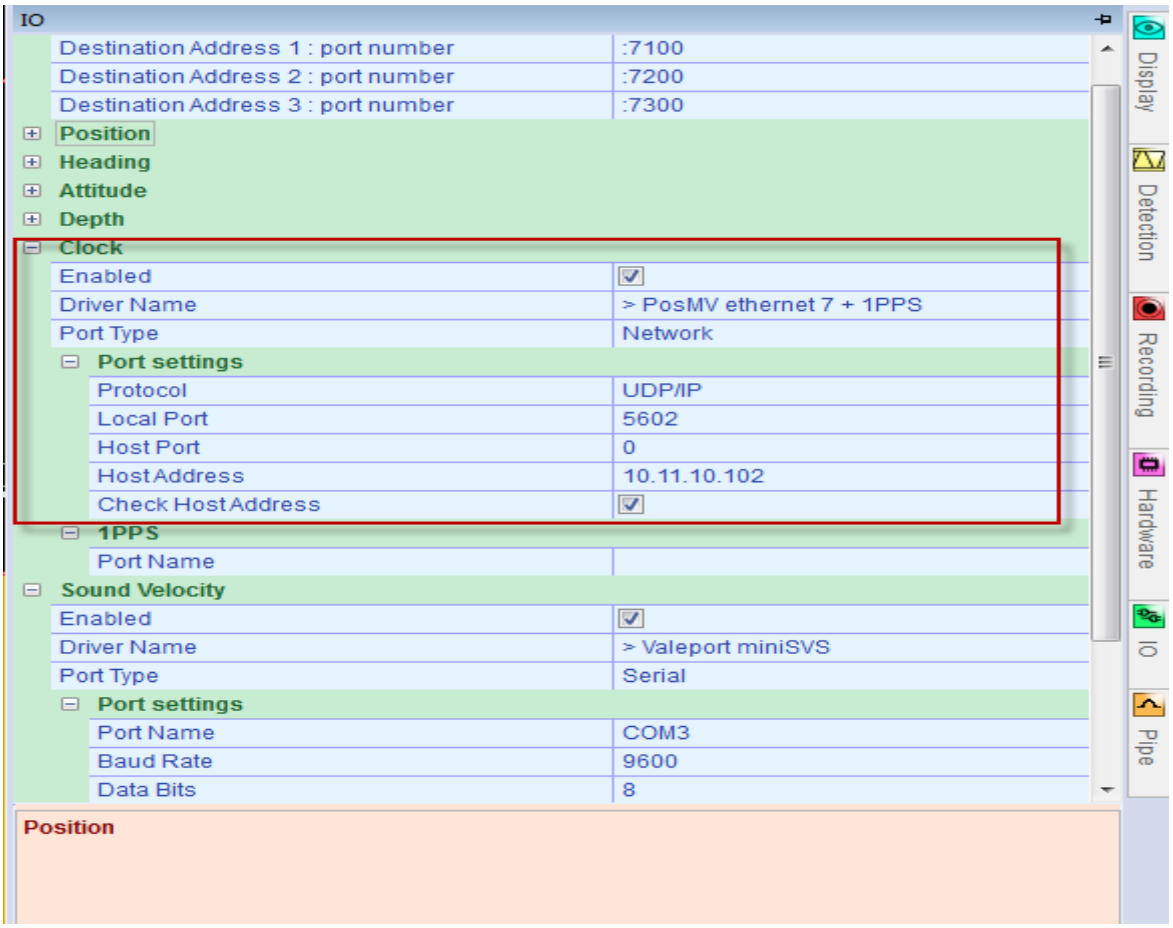


Figure 3-5 clock settings using the Ethernet.

3. Setup the POS MV to output the Ethernet 7 message. Refer to POS MV configuration section ‘Ethernet time message’ on page 29.

3.4.2.3 PPS

For accurate time stamping the PPS signal is used. When a clock driver is selected the IO module automatically detects to use the rising or falling edge of the PPS pulse. The PPS edge control is grayed out (disabled) in the SUI. When no clock device is selected it is possible to select a rising or falling PPS pulse. See Figure 3-6.

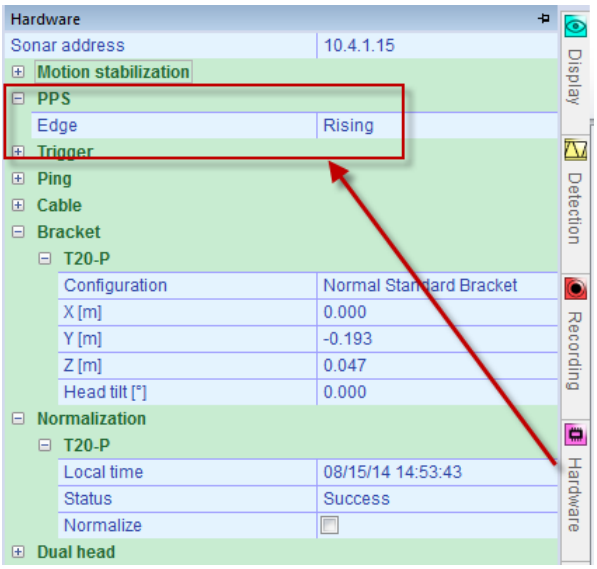


Figure 3-6 Hardware pane PPS setting

When the PPS pulse is received correctly, the status LED becomes green colored.

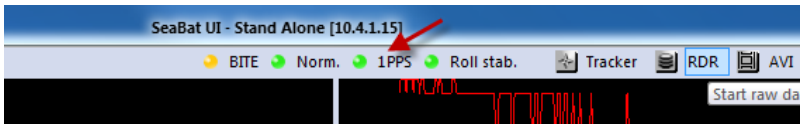


Figure 3-7 PPS status LED

3.4.3 Sound Velocity

For correct beam forming the sound velocity from the sound velocity probe is used.

Different Sound Velocity probes are used:

- The RESON SVP70 or SVP71 with the RESON supplied cable (pn 85002223). This cable is connected to the T20-P's 'SVP power' socket.
- Or alternatively a SVP probe from an external supplier is used. In this case a serial cable from the sensor is connected to COM3 of the T20-P.

The sound velocity settings are defined in the SUI I/O pane sound velocity tab. COM3 is the port used for the sound velocity. (Also when connected to the T20-P's SVP power socket.)

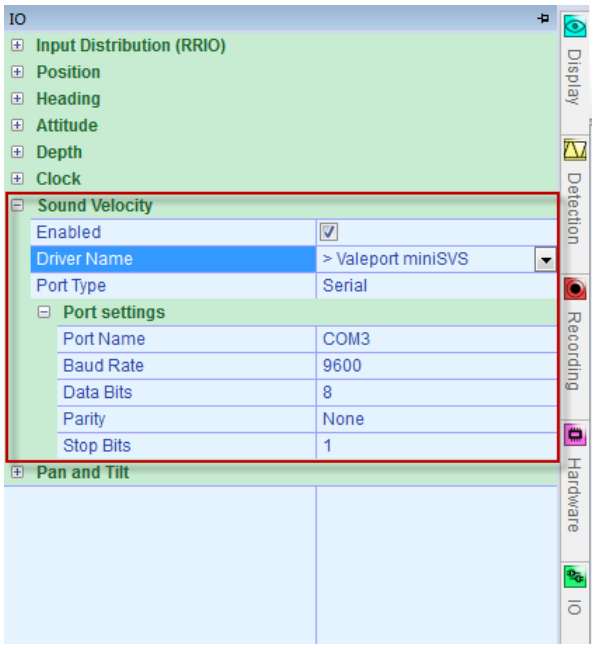


Figure 3-8 I/O pane Sound Velocity (COM3)

3.4.4 Other I/O Settings

Besides the above settings in the I/O pane also position, heading, attitude, depth and pan and tilt sensors are defined. Define these sensors when also log files (S7K files) from the SUI are created.

3.5 POS MV Configuration

This section briefly describes the setup of the POS MV. Refer to the POS MV user manual for a full description with all details.

When distances or offsets are measured the highest possible accuracy needs to be achieved for best performance. The best is to use land survey methods. Refer to the POS MV user manual for dimensions of the IMU and the phase center location of the GPS antenna.

Follow the following sections to set-up a POS MV.

3.5.1 Connect with POS MV

When the IP numbers are correctly defined as described in section ‘Configure POS MV TCP/IP settings’ on page 17, a connection is made with POSView to the POS MV.

In POSView: See Figure 3-9

A. Check the correct IP number is listed in the toolbar;

B. Press the connect button.

C. To change settings it is necessary the POS MV is set in standby mode. Press the *Standby* button.

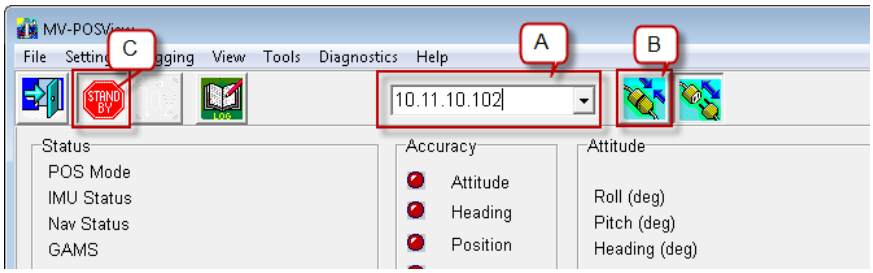


Figure 3-9 Connect with POS MV

3.5.2 Installation settings

Next step is to setup the installation parameters.

Select in POSView '*Settings*' '*Installation*' '*Lever Arms & Mounting*'

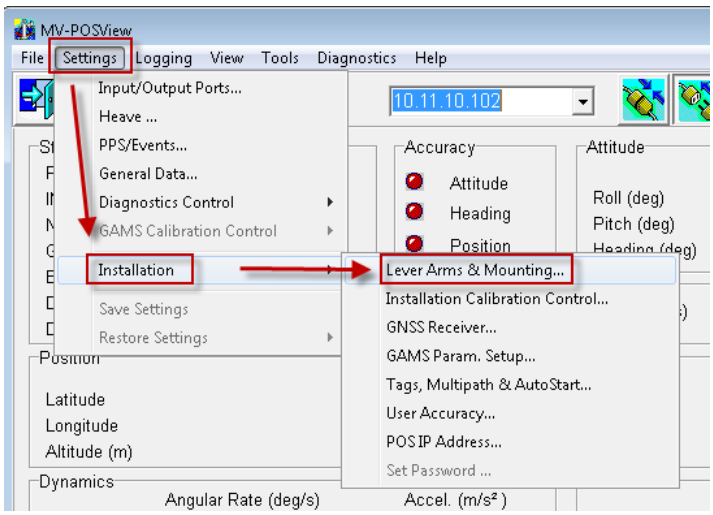


Figure 3-10 Lever Arms & Mounting

Choose a reference point on the vessel and measure the X,Y,Z offsets of the IMU and Primary GPS (ANT1 on the POS MV) to this reference point. The position as output by the POS MV is with respect to this chosen reference point. It is easy to choose the IMU as reference point. The reference point on the IMU is marked with a sticker on the IMU.

Figure 3-11 IMU reference point

BE AWARE OF THE USED CONVETION FOR THE POS MV INSTALLTION LEVER ARMS & MOUNTING. (Different convention is used as used by Teledyne PDS).

See Figure 3-12 for the convention as used POS MV. (Right hand orthogonal system.)

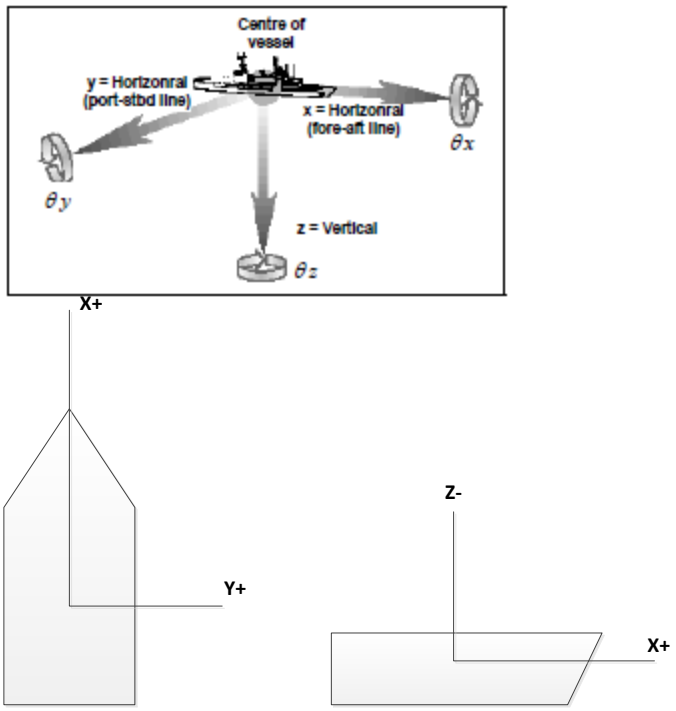


Figure 3-12 POS MV Lever arms convention

See Figure 3-13. In the Lever Arm & Mounting angle dialog box:

A. Enter the offset *Ref. to IMU Target*;

B. Enter the offset *Ref to primary GPS lever Arm*;

C. Enter the Roll/Pitch and heading offsets (C-O values) of *IMU frame with respect Reference frame.*

Leave the other fields to 0,0,0 for a standard multibeam installation.

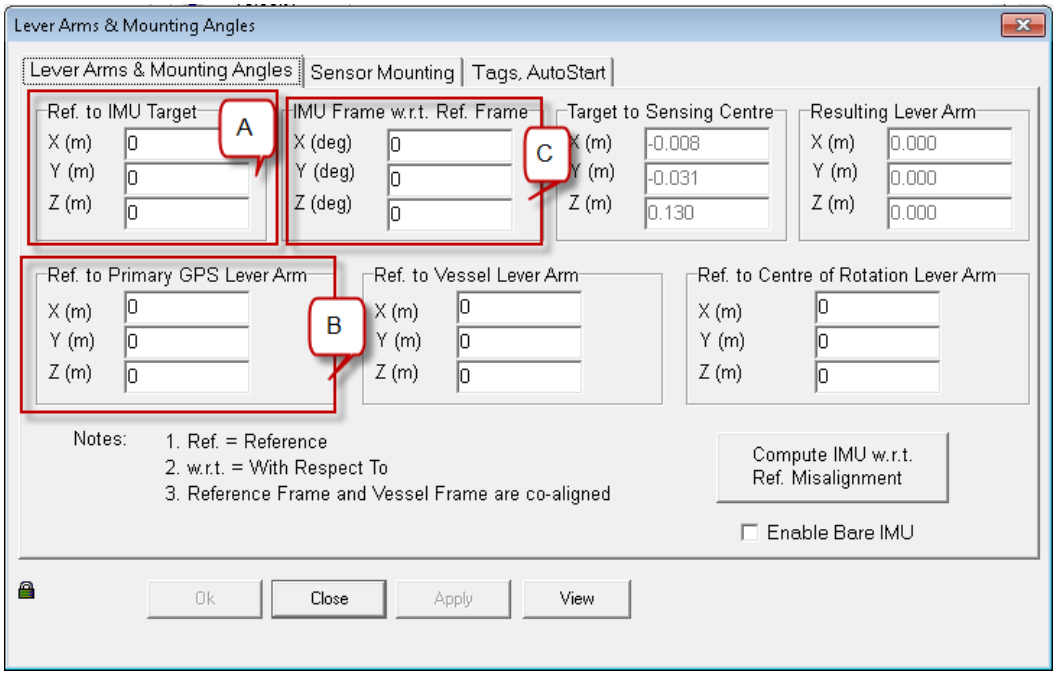


Figure 3-13 Lever Arm & Mounting Angles

The surveyor can measure the IMU roll/pitch and heading offsets in the vessel frame. When the Compute IMU w.r.t. Ref. Misalignment button is pressed the measurement is converted to the IMU frame and filled in automatically in the 'IMU Frame w.r.t. Ref. frame' box.(C)

The reference point of the POS MV Ethernet 102 output message (containing position and motion data) is the defined 'sensor 1' offset of the sensor mounting tab.

Leave the sensor 1 offset to zero (0)!! On this way the earlier chosen reference point (usually the IMU) is the reference point for the 102 Ethernet output messages. In Teledyne PDS it is possible to use this (IMU) also as reference point. (Otherwise the Sensor 1 reference must be used as reference in Teledyne PDS)

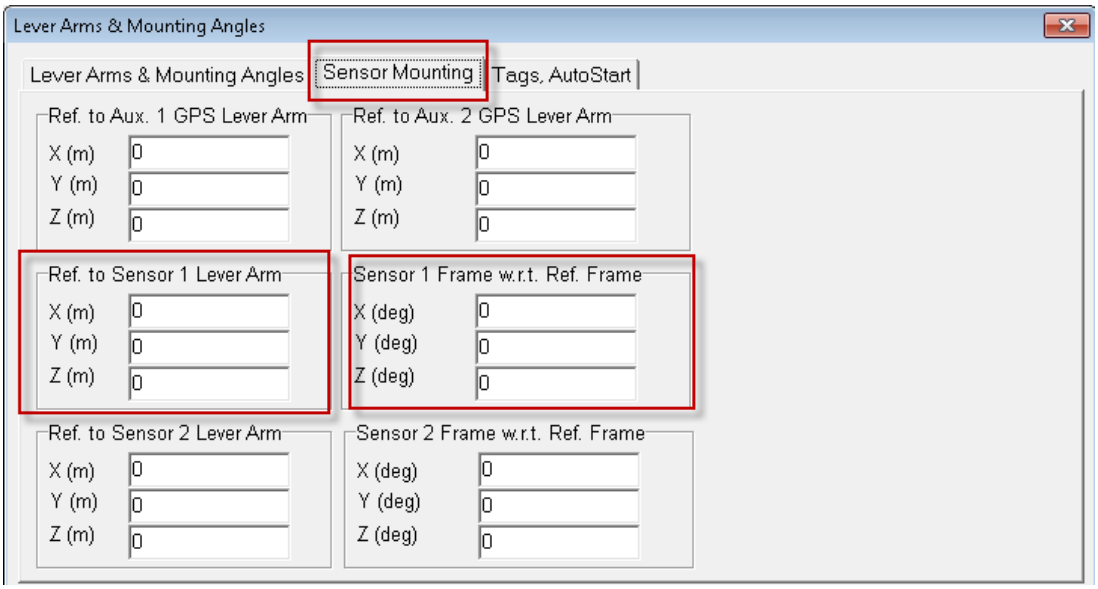


Figure 3-14 Keep Ref. to Sensor 1 values zero

3.5.3 Timing

The POS MV must be configured to output a time message.

It is possible to output a time message by Ethernet connection or serially.

3.5.3.1 Serial Time Message Output.

See Figure 3-15. Select from the POSView menu bar *Settings>Installation>Tags, Multipath & AutoStart..*

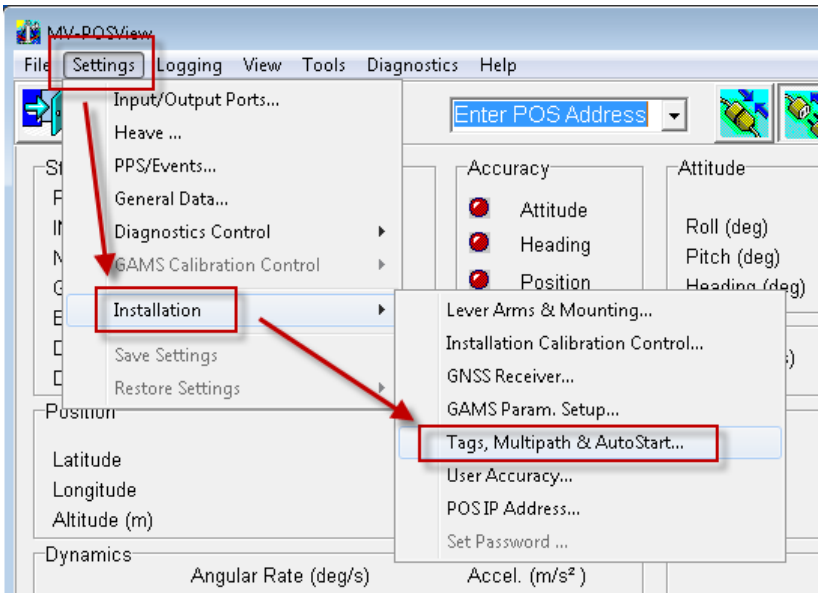


Figure 3-15 Tags, Multipath & AutoStart

The lever Arms & mounting angles window opens. Select in the *Tags, AutoStart* tab as Time Tag 1 ' *UTC Time'*.

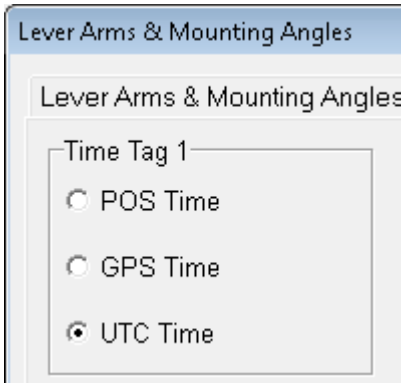


Figure 3-16 Time Tag UTC Time

Select from the POSView menu bar *Settings>Input/Output Ports…*

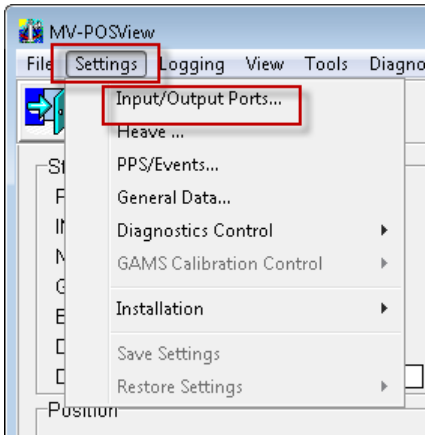


Figure 3-17 Input/Output Ports…

The Input/Output window Ports Set-up window opens. Set all the communication settings (Baud rate, parity, data bits etc.) See Figure 3-18.

The communication settings must be the same as set for the SUI time I/O settings.

Select the NMEA output message as selected in the SUI I/O time settings.

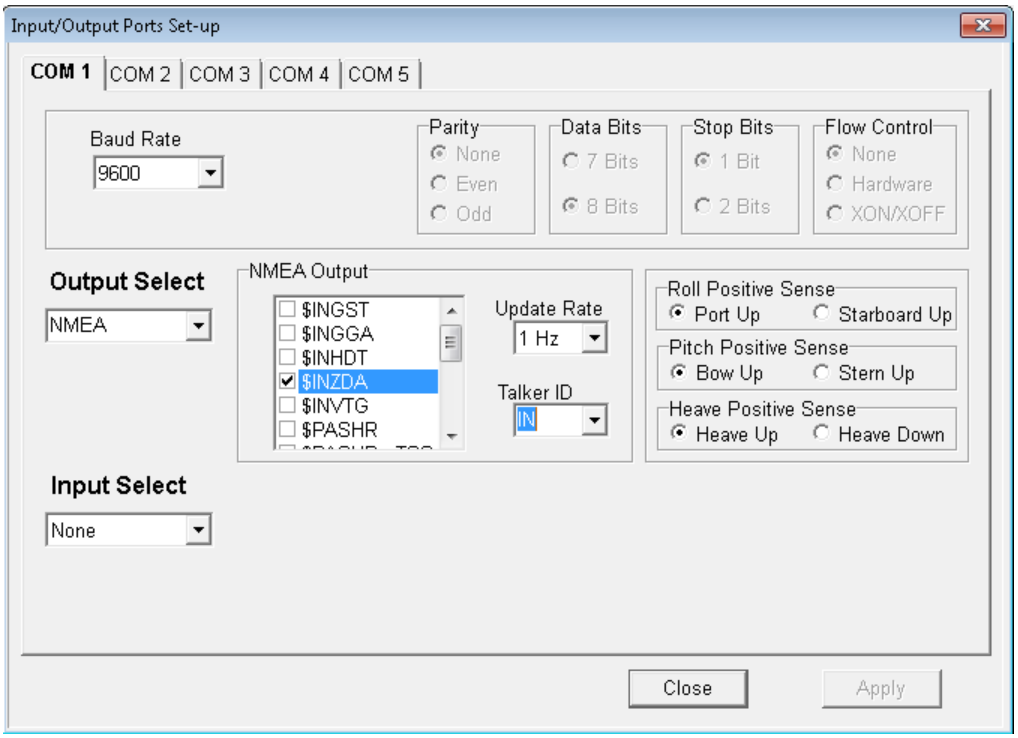


Figure 3-18 Time Input/Output Ports Set-up

The communication settings and messages as selected must also set in the SUI. Refer to the SUI's section 'Time and PPS setup' at page 20.

Time message $INZDA with a rate of 1Hz is recommended.

3.5.3.2 Ethernet Time Message

Select from the POSView menu bar *Settings>Installation>Tags, Multipath & AutoStart..*

See Figure 3-19.

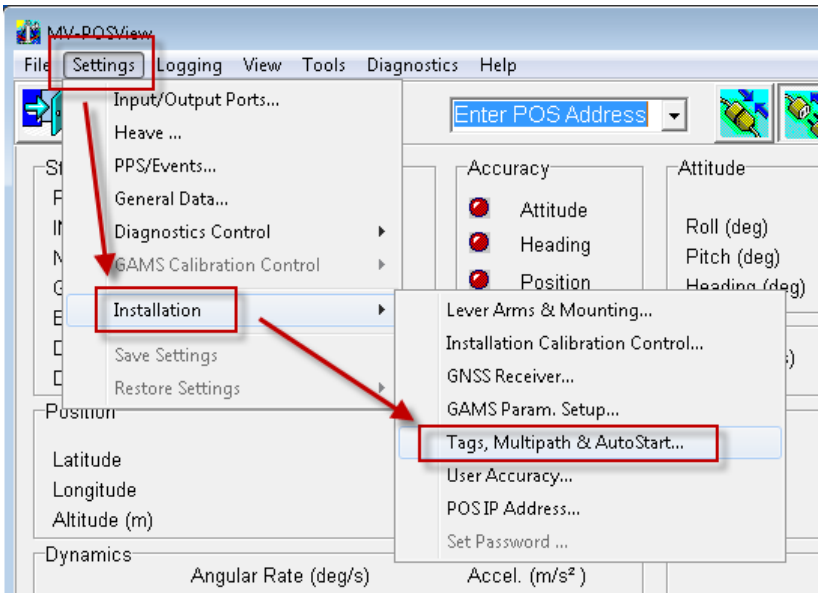


Figure 3-19 Tags, Multipath & AutoStart

The lever Arms & mounting angles window opens. Select in the *Tags, AutoStart* tab as Time Tag 1 ' *UTC Time'*.

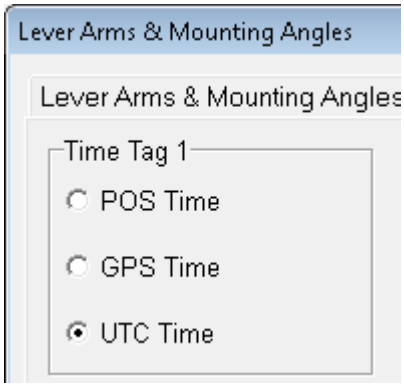


Figure 3-20 Time Tag UTC Time

In POSView select '*logging', 'Ethernet Realtime'.*

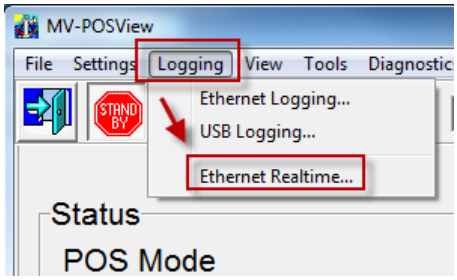


Figure 3-21 Ethernet Realtime

Select output message '*7 PPS Data'*.

Leave or set the output rate to 50Hz. (This value does not apply for message 7).

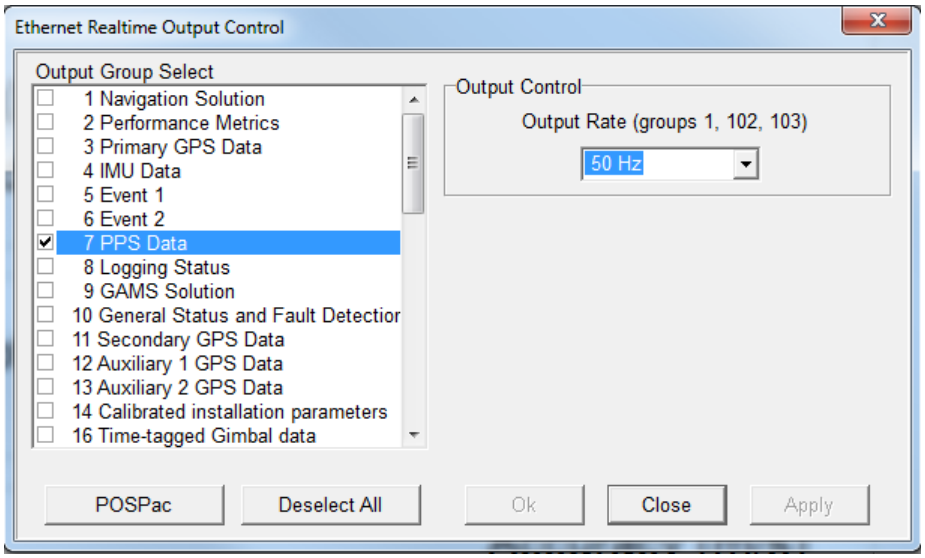


Figure 3-22 PPS Data selection

Set also time message POS MV ethernet 7 in the SUI as described in section 3.4.2.2

Beside message 7 other messages must be enabled. Refer to section 'Ethernet output' on page 32.

3.5.4 Motion

The RESON T20 Series Sonar requires serial roll correction on port COM 2 for the roll stabilization feature.

The POS MV is set to output this message.

Select from the POSView menu bar *Settings>Input/Output Ports…*

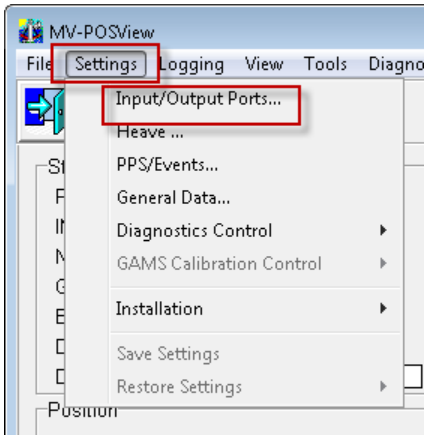


Figure 3-23 Input/Output Ports…

The Input/Output window Ports Set-up window opens.

See Figure 3-24.

Select: COM 2, output 'binary', formula select 'TSS1' with an update rate of 50Hz and a high baud rate (E.g. 115200).

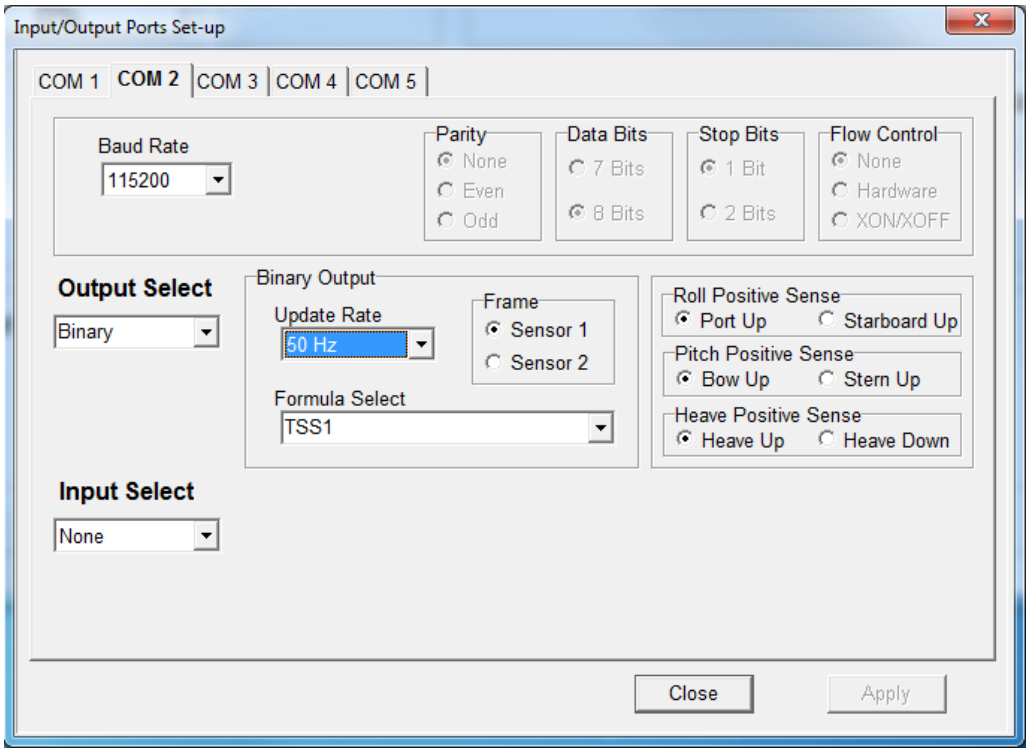


Figure 3-24 Motion Input/Output set-up

The communication settings as set must also set in the SUI. Refer to the SUI's section 'Roll Stabilization' on page 19.

3.5.5 Position

It is recommended using the Ethernet connection to output position and motion data to Teledyne PDS or the SUI instead as serial connections. (When serial connections are used COM 3, COM 4 and COM 5 port are configured to output these messages serially.)

3.5.6 Ethernet Output

To switch on the Ethernet output select from the POSView menu bar L*ogging>Ethernet Realtime…*

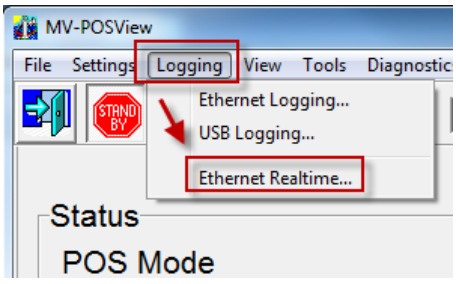


Figure 3-25 Ethernet Realtime

The following messages must be enabled:

3 - Primary GPS Data

10 - General Status and fault Detection

12 - Auxiliary 1 GPS Data

20 - In Solution status

102	-	Sensor 1 navigation solution
104	-	Sensor 1 navigation performance
111.	-	(True) Heave data
113	-	Heave data quality control

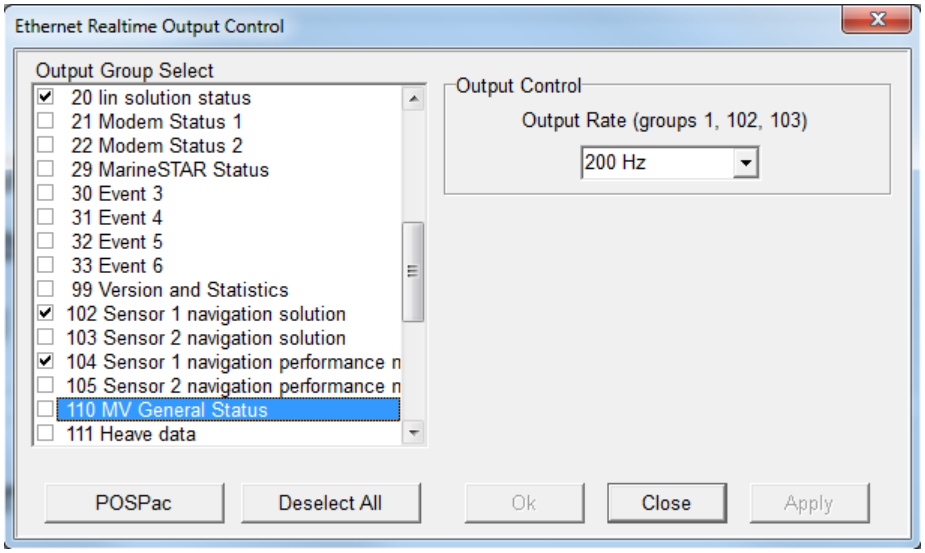


Figure 3-26 Logging Groups

Set the output rate to 50Hz.

Press '*OK*' when set.

In case of Ethernet communication between the POSMV and Teledyne PDS; the Teledyne PDS Positioning system Geogs '3+10+12+20+102+104' driver and optionally the heave driver 'PosMV Ethernet 111' are used. See section 3.6.1.2

3.5.7 RTCM / CMR input

There are two methods available to apply RTCM or CMR correction data to the POS MV:

- By COM 3 port input
- By GNSS port input

3.5.7.1 COM 3 PORT input

This method is named the 'tightly coupled mode'. Only GPS satellites are used and the RTK fix will only available when the vessel is sailing and/or GAMS is calibrated and online.

The formats RTCM v2.x and CMR/CMR+ are supported.

Select from the POSView menu bar *Settings>Input/Output Ports*.

In the opened Input/Output Ports Set-up dialog. (See Figure 3-27)

A. Set the correct communication parameters. (Depends of the communication parameters of the RTCM/CMR correction source)

B. Set an output message when the RTCM/CMR correction source needs information such as a GGA position string. Please note sometimes the GGA message output by the POS MV is not recognized as 'valid' due to a missing MSL field by some VRS. Use in this case the GNSS port method as described in section 3.5.7.2.

C. Set as input 'Base 1 GPS' and select the correct type of RTCM or CMR input messages.

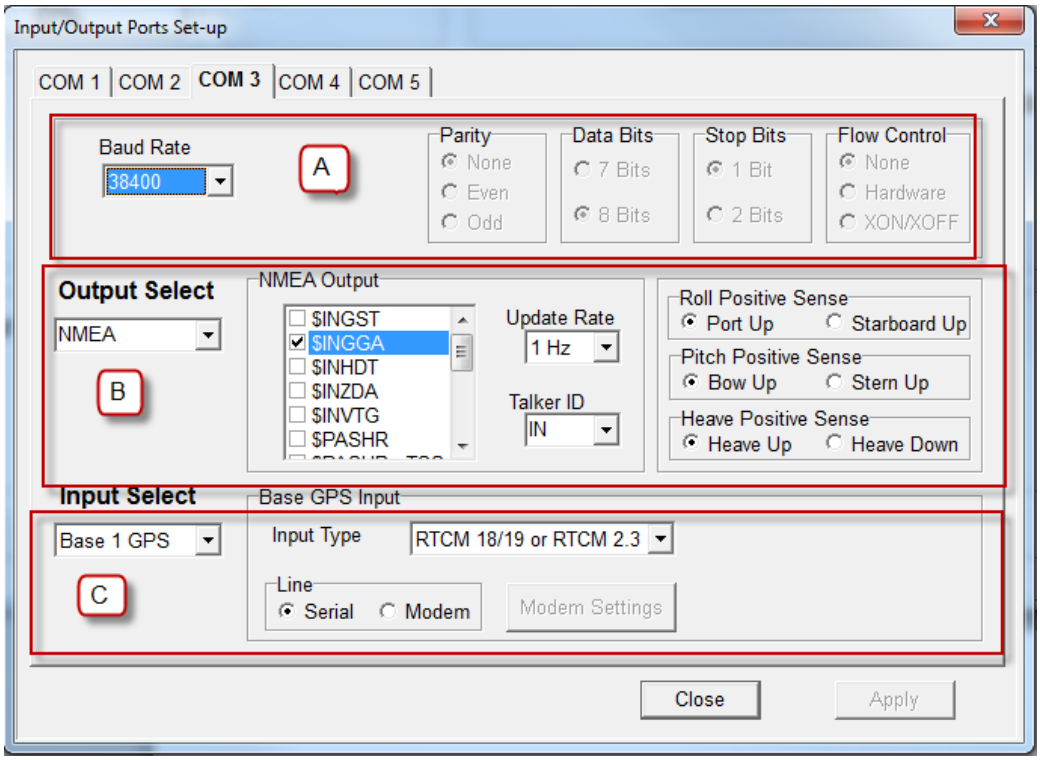


Figure 3-27 Input/Output Ports Set-up

3.5.7.2 GNSS Port

This method is named the 'closed coupled mode'. By using the POS MV GNSS port the corrections are applied straight at the POS MV's GNSS board.

The formats RTCM v2.x, RTCM v3.x, CMR/CMR+ and CMRx are supported.

Both GPS and Glonass corrections are used. RTK fix is also available when the vessel is moored.

See Figure 3-28.

Select from the POSView menu bar *Settings>Installation>GNSS Receiver'* to configure the port.

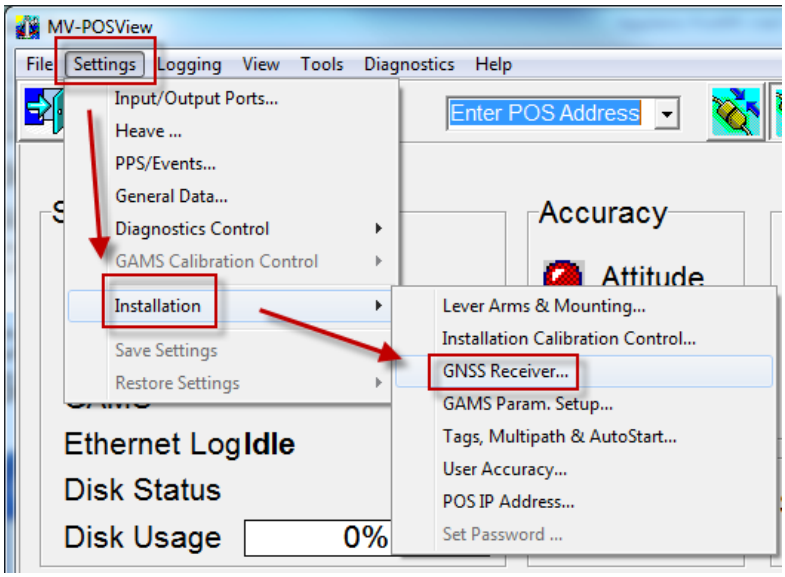


Figure 3-28 GNSS Receiver

See Figure 3-29. The GNSS receiver configuration dialog opens. Set the port baud rate to a value appropriate for the data stream coming from the correction source such as the RTK modem.

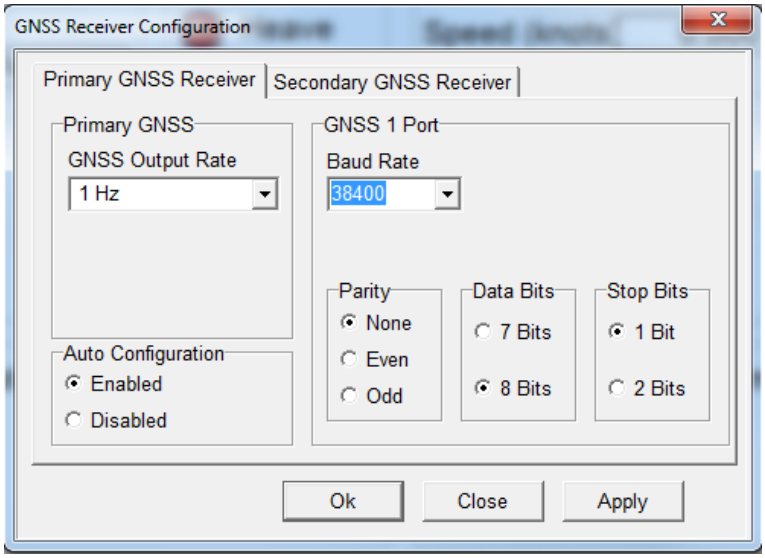


Figure 3-29 GNSS Receiver configuration

The GNSS port senses automatically the RTCM/CMR correction format and therefore doesn't need to setup.

The GNSS port is configured (not user configurable) to output standard a GGA and GST string to be used by a VRS. (Virtual reference station)

With latest versions POSMV firmware the tightly couple mode is linked to the closely coupled mode (automatically switching between the two modes).

3.5.8 Calibration

The POS MV GAMS is calibrated for correct performance.

Refer to the POS MV user manual for full details.

First the GAMS parameters are set.

In POSView click *'Settings', 'Installation', 'GAMS Param. Setup…'*

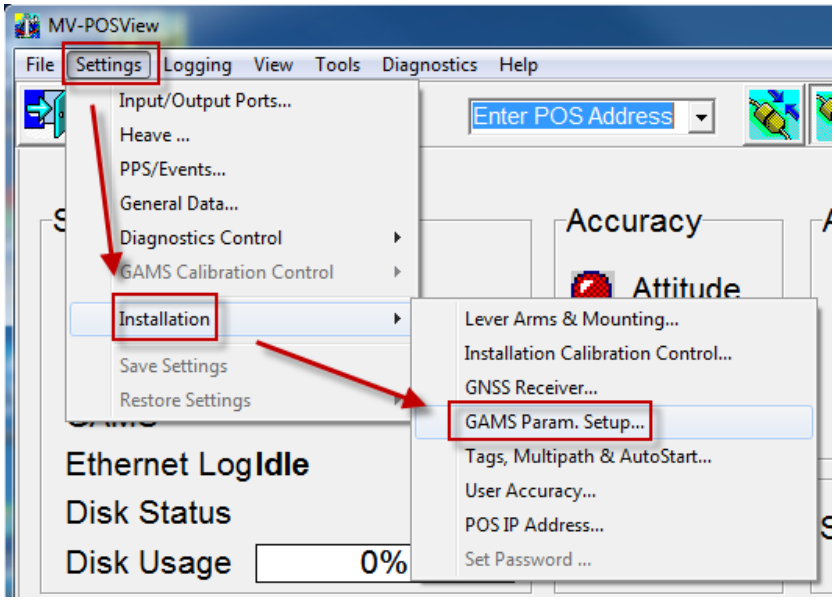


Figure 3-30 GAMS Param Setup…

In the appeared dialog enter: (See Figure 3-31)

A. The separation between the two GPS antennas. The value will be filled in by the POS MV after calibration automatically, but when already a value is entered this routine will perform faster.

B. Set the heading threshold to 0.5 degrees.

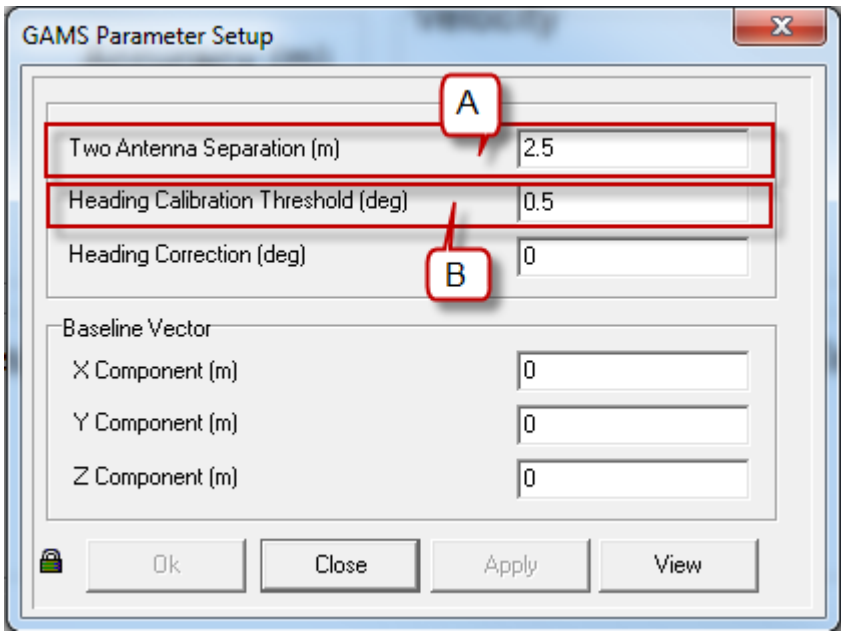


Figure 3-31 GAMS Parameter Setup

Continue with initializing the calibration.

Press from the POSView toolbar the '*Navigation*' button.

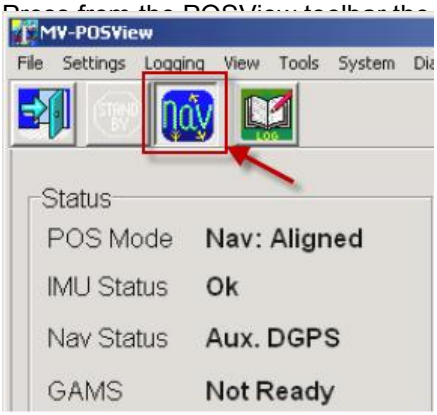


Figure 3-32 Navigation

- Sail to an area where it is possible to sail eight shape curves and straight lines.

Select from the POSView menu bar *Settings>GAMS Calibration control*.
Do <u>not</u> press '*Start*' at this stage.

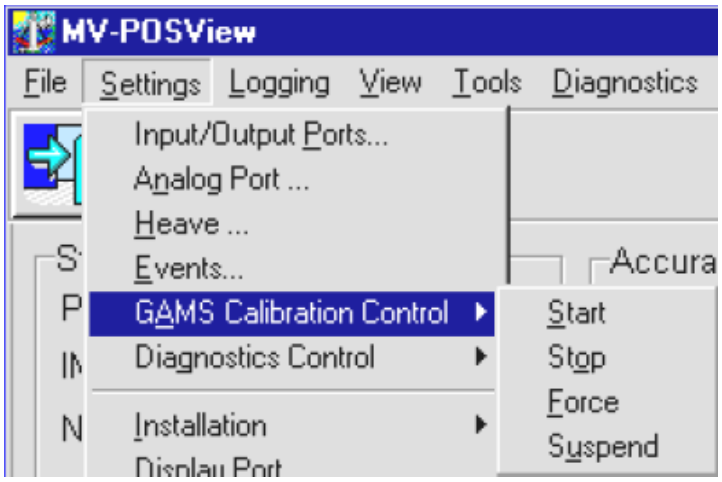


Figure 3-33 GAMS Calibration Control

- Sail S-shape or 8-shape figures each lasting approximately a minute.

  ☛*Contact Applanix or Teledyne Reson when it is not possible to sail this figures due to the vessel characteristics. The calibration must in this case achieve from other techniques such as the Applanix POSPAC software application.*

- Monitor the heading accuracy on the POSView Attitude pane and continue sailing the figures until this accuracy is lower as the set heading threshold of 0.5 degrees.

  ☛*The calibration will not start until the threshold actually reaches the 0.5 degrees (or whatever has been set). Until the threshold is reached POSView main window will display "GAMS Calib. Requested".*

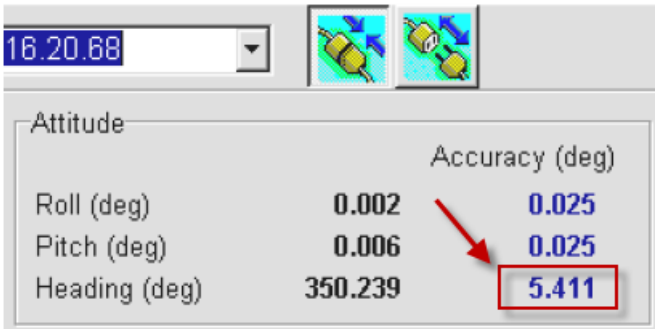


Figure 3-34 Heading accuracy

- Now press *Start* (See Figure 3-33) and sail straight out with a fixed speed until the calibration is completed, GAMS status will change to *Online.*

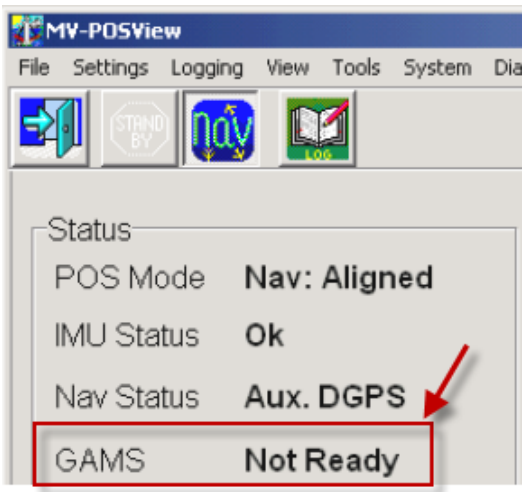


Figure 3-35 GAMS status

- Select from the POSView menu bar *Settings>Save settings*.

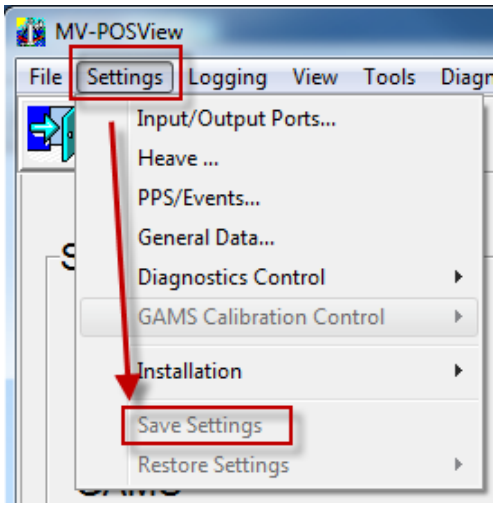


Figure 3-36 Save Settings

A successful calibration is indicated by continuous GAMS status *online* and a high heading accuracy of 0.03 degrees in a low multipath environment.

3.6 Teledyne PDS Configuration

This section describes briefly the equipment setup in Teledyne PDS:

- Equipment selection;
- I/O configuration;
- Timing.

Refer to the Teledyne PDS user manual for a full description of Teledyne PDS.

3.6.1 Equipment Selection

For this basic setup the RESON 7K Drivers as used by the T20 Series, and the POS MV drivers are selected for positioning, heading and motion. Driver selection is done during the new project configuration wizard or the configurations equipment page. Refer to the Teledyne PDS user manual for full details.

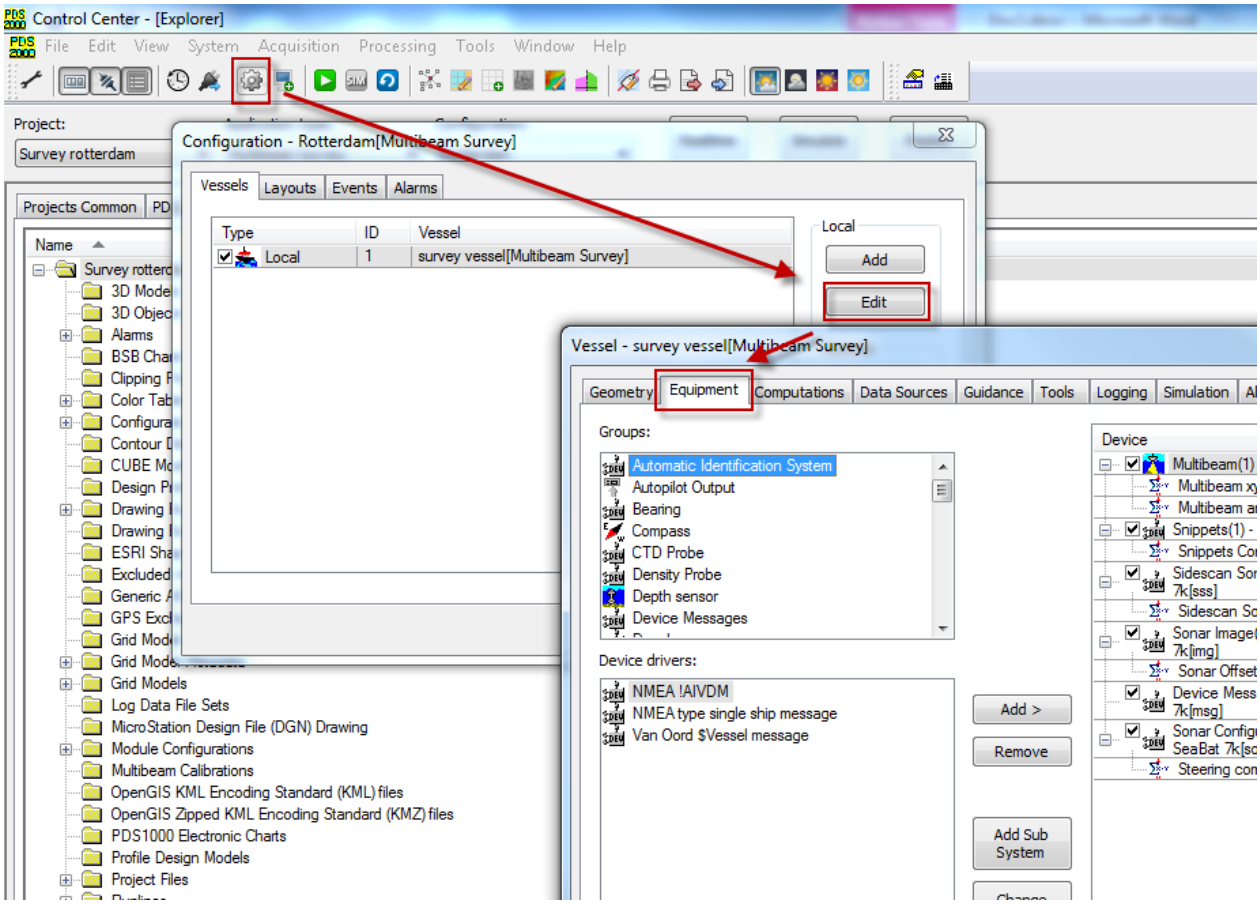


Figure 3-37 Equipment page

3.6.1.1 RESON

Select from the equipment page '*Multibeam all options'* group, the device ' *RESON SeaBat 7K'.* See Figure 3-38.

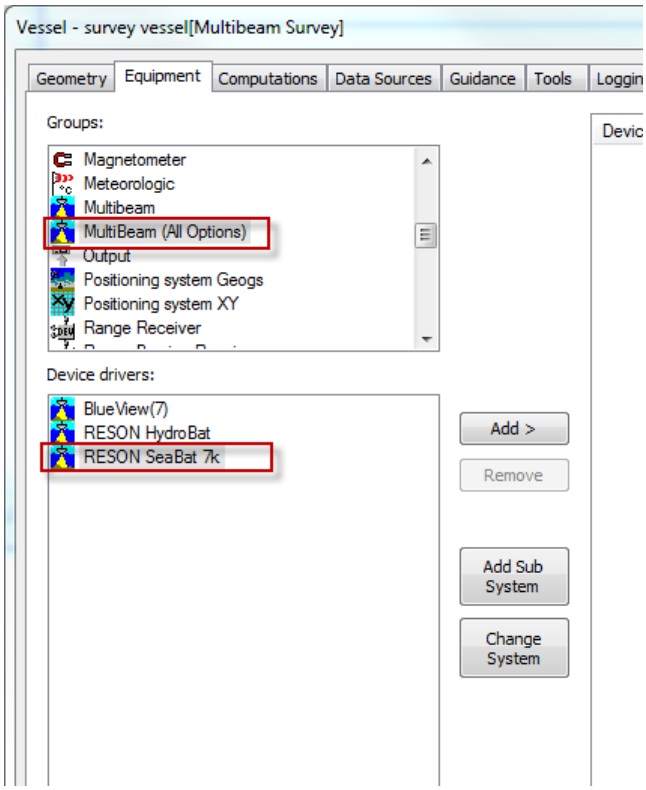


Figure 3-38 RESON SeaBat 7K

Press '*Add>*' to add the device. A dialog box opens.

In this dialog the required devices are selected by ticking the checkbox(es).

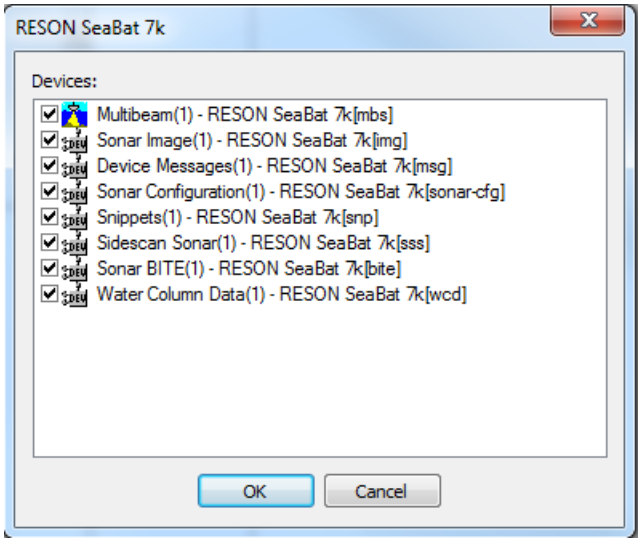


Figure 3-39 RESON SeaBat 7K devices.

- Multibeam: Bathy data.
- Sonar Image: Image data. The sonar wedge as also available in the SUI is now available in Teledyne PDS Views.
- Device messages: Sonar messages are now available in Teledyne PDS.
- Sonar configuration: This makes it possible to control the sonar (Gain, power etc.) from Teledyne PDS.

- Snippets: Snippet data.
- Sidescan Sonar: Sidescan sonar data.
- Sonar bite: Make the sonar Bite information available in Teledyne PDS.
- Water column Data: The water column data.

3.6.1.2 POS MV

Select if the Ethernet port of the POS MV is used to output data in Teledyne PDS for:

➢ **POSITIONING**

Select 'the' *PosMV all coupled modes – ethernet msg'* device, from the '*Positioning system Geogs*' group .

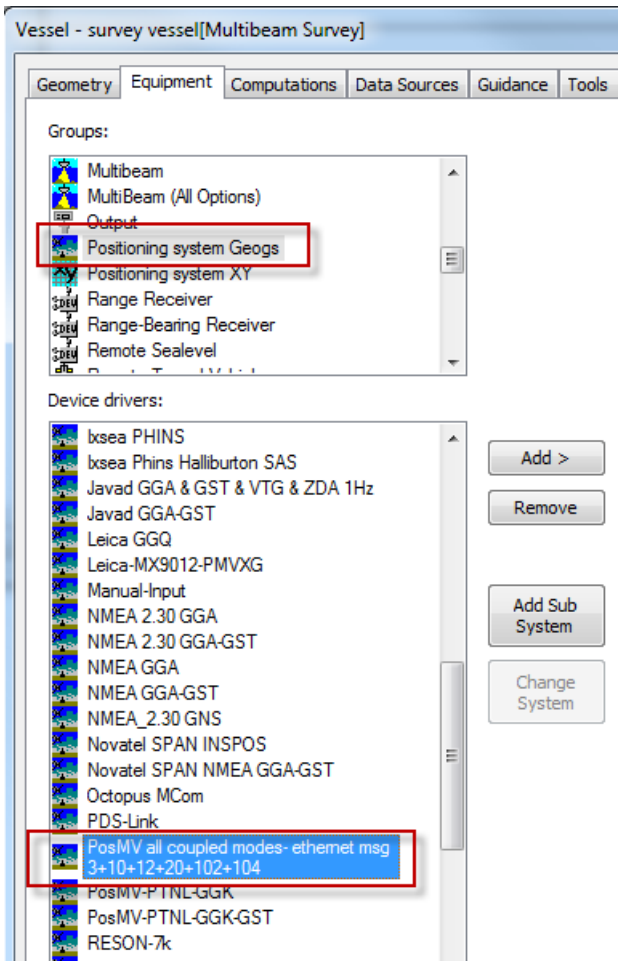


Figure 3-40 Positioning

➢ **MOTION**

Select the *'PosMV Ethernet 102'* device, from the group '*VRU*'.

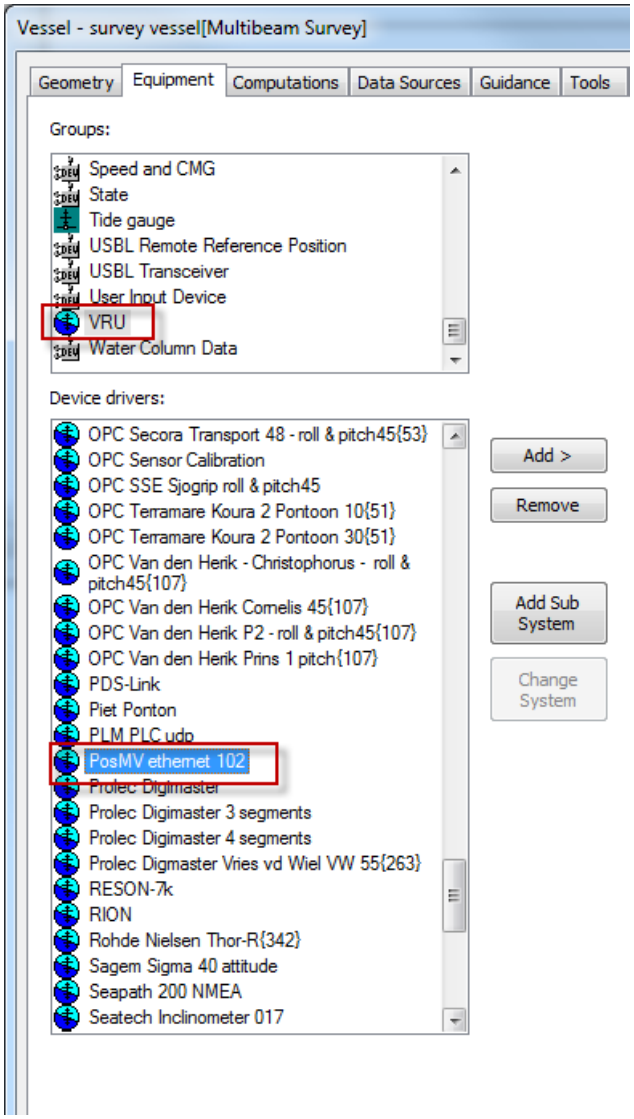


Figure 3-41 VRU

➢ **HEADING**

Select the '*PosMV Ethernet 102'* device from the group *'Compass'.*

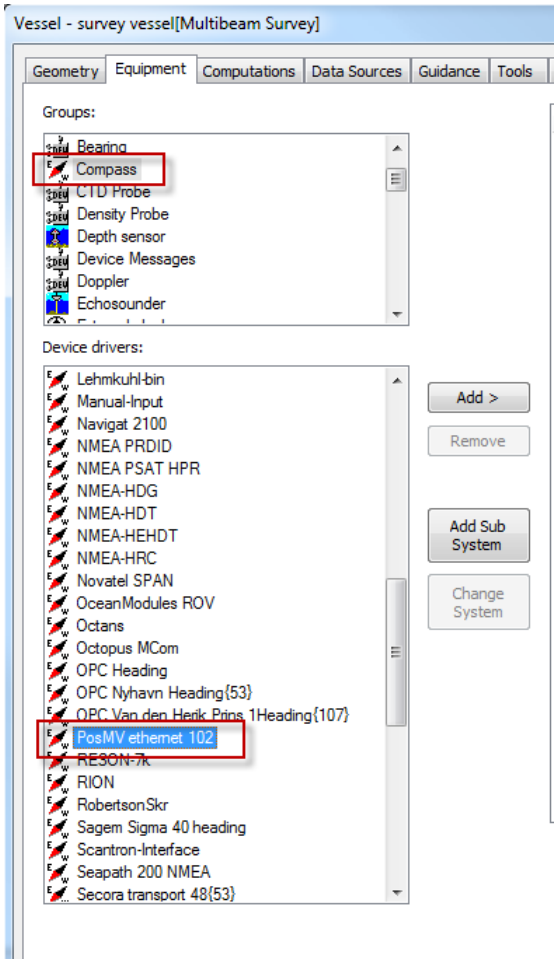


Figure 3-42 Compass

➢ **TRUE HEAVE**

True heave is only used during post processing. It is a more accurate heave then realtime heave. It might be used when RTK is not available and you notice problems with your heave.

True heave has a delay of approximately 3 minutes. When PDS logging is stopped the system continues to log the true heave device data for approximate 3 minutes. A warning opens when disabling Realtime mode during this time.

Select *the 'POSMV Ethernet 111'* device from the group *'Heave'*.

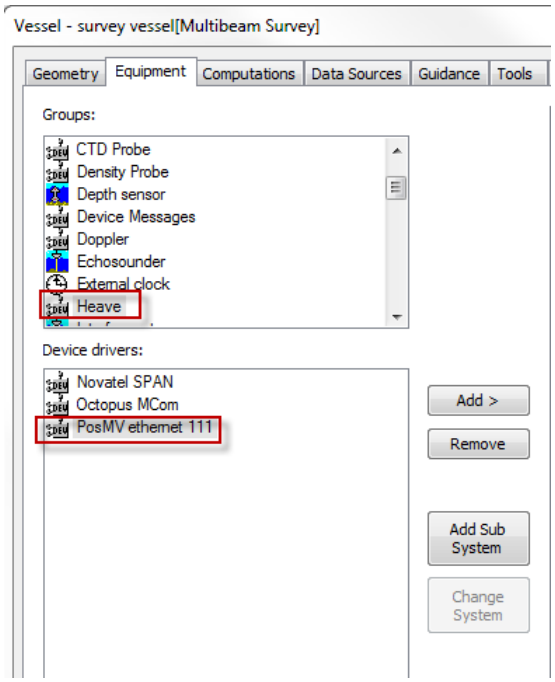


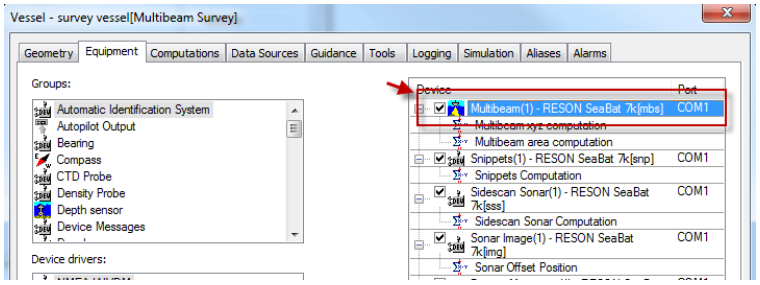
Figure 3-43 Heave

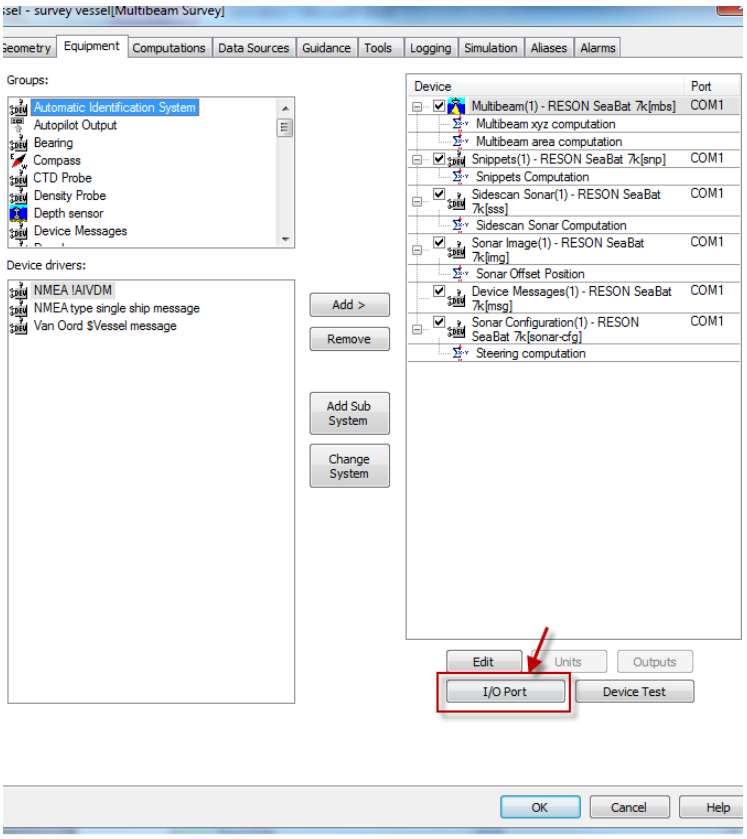
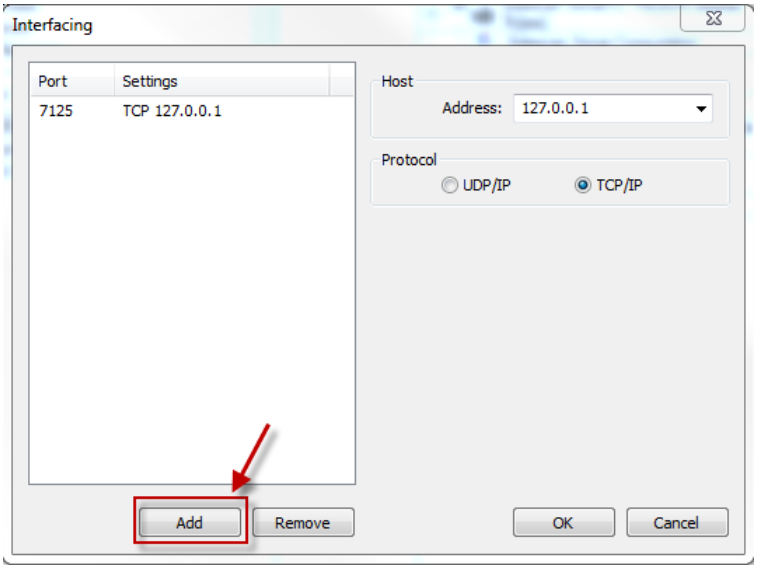
3.6.2 I/O Selection

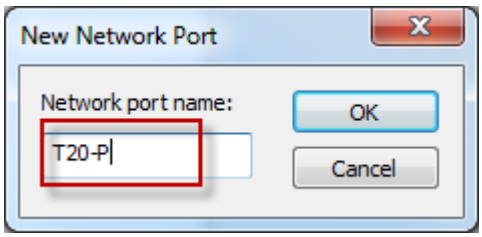
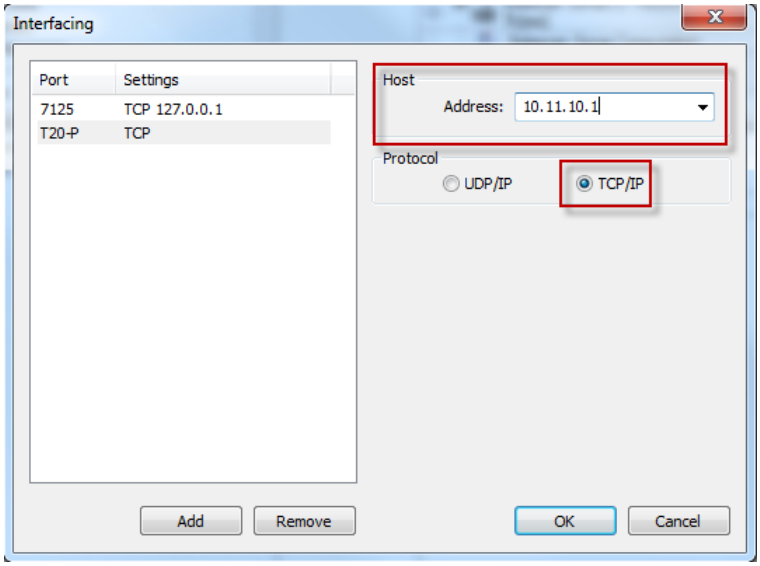
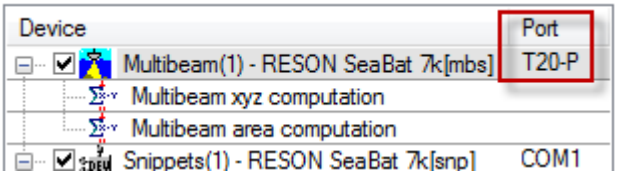
For the T20 Series sonar and the POSMV the proper I/O must be set up and selected.

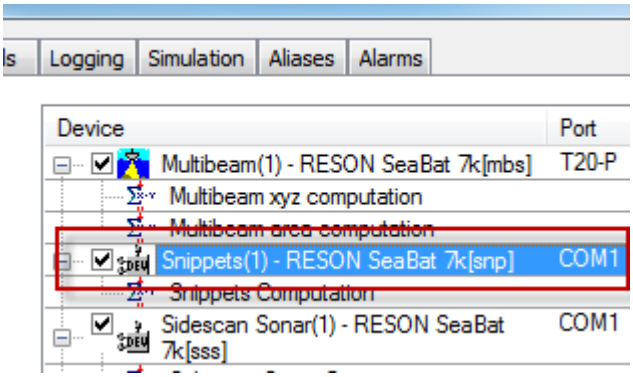
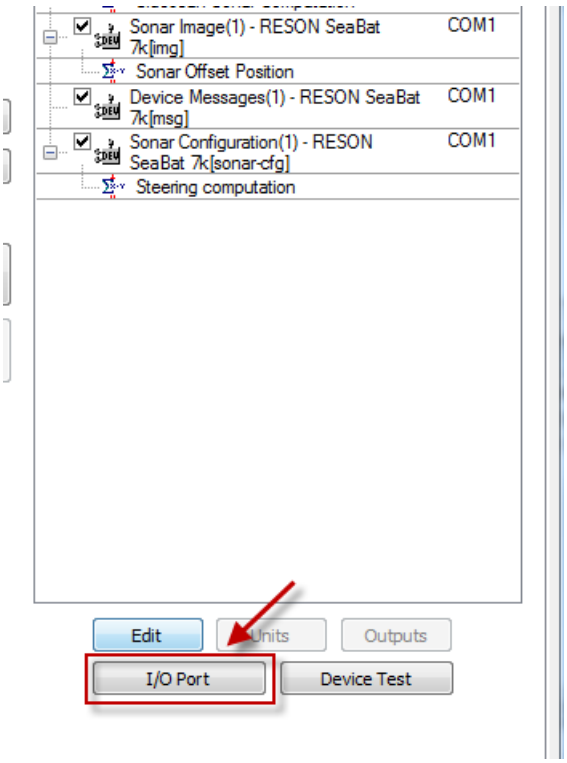
3.6.2.1 RESON I/O

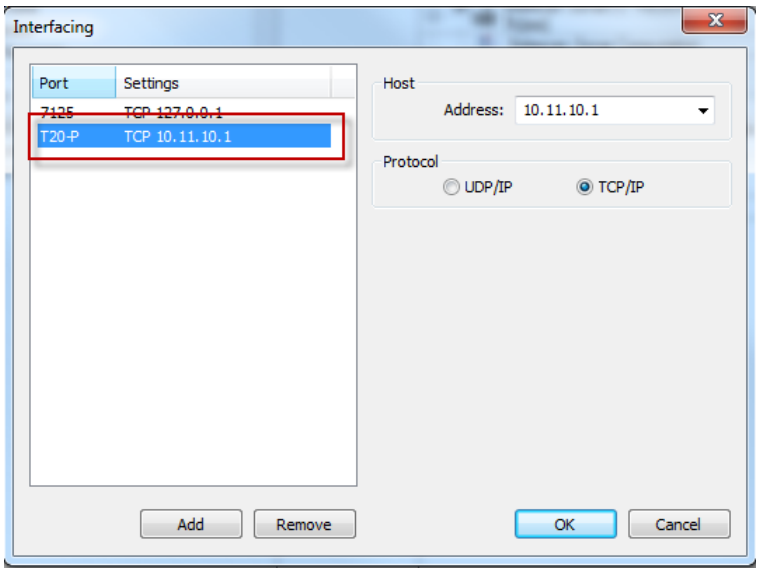
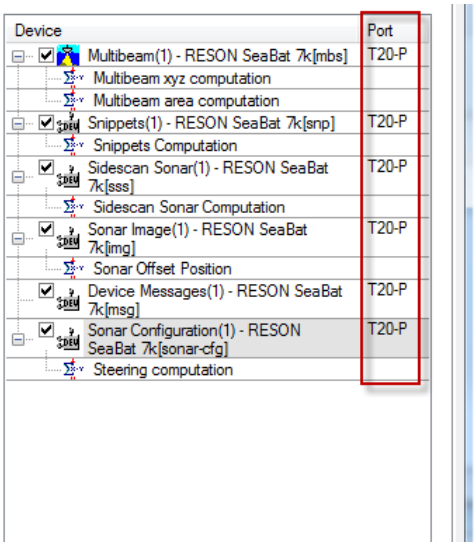
The following table describes the set-up of the I/O for the RESON multibeam.

Step	Action
1	Select in the equipment page the multibeam device. (Becomes blue colored.) 

Step	Action
2	Press the *'I/O Port'* button. 
3	Press '*Add*' 

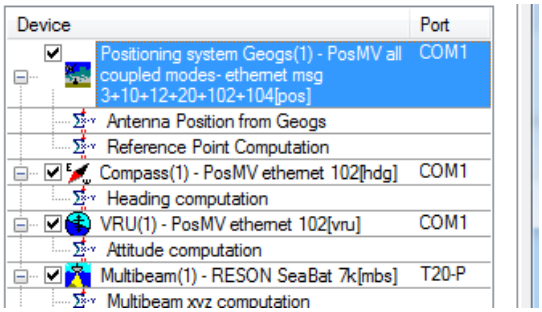
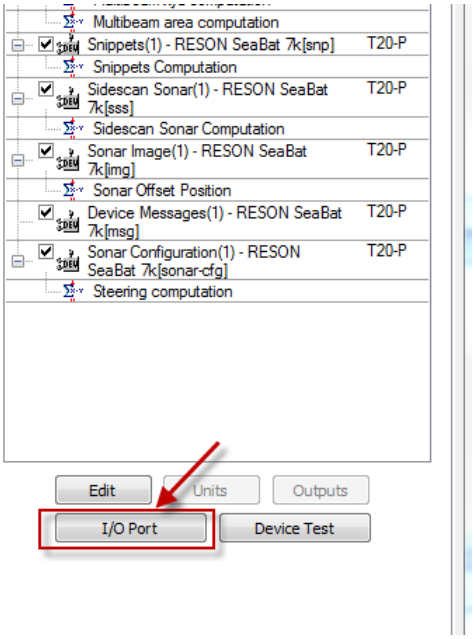
Step	Action
4	Give a name and press *'Ok'*. 
5	Enter as IP address the T20-P IP address and tick the TCP/IP radio button. Press *'Ok'*. 
6	The port is now assigned to the multibeam driver. 

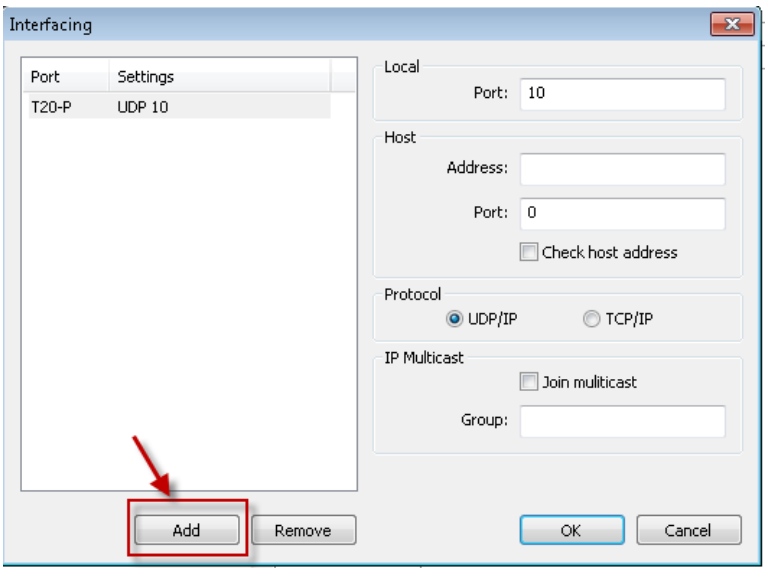
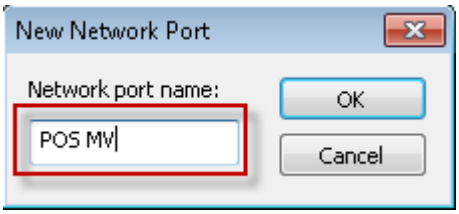
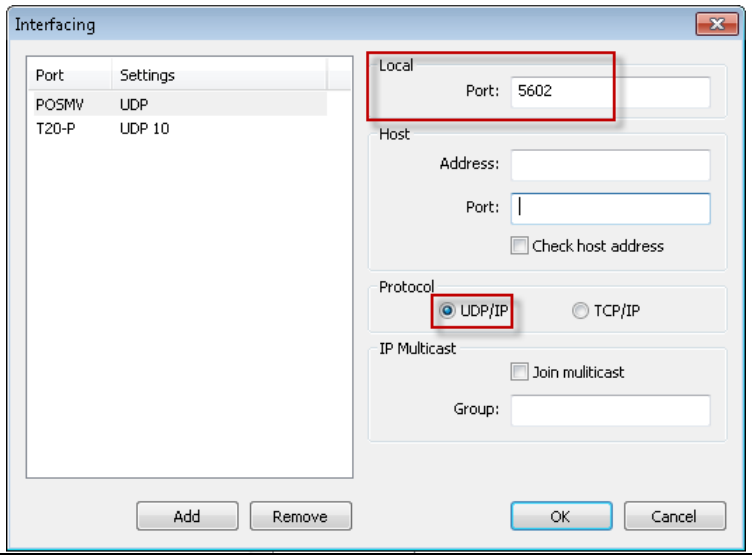
Step	Action
7	Select other multibeam devices as for example the snippets device. (Becomes blue colored.) 
8	Press the *'I/O Port'* button again. 

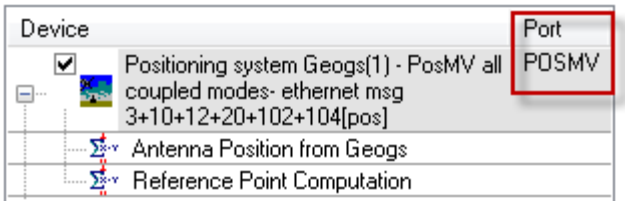
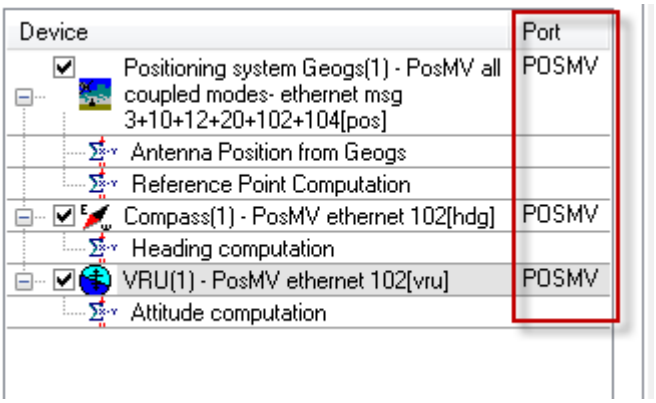
Step	Action
9	Select the just made I/O port and press '*Ok*'. 
10	The port is assigned to the driver. Do this for all the multibeam devices. When all multibeam device options were used the list looks like:. 

3.6.2.2 POSMV I/O

The following table describes the set-up of the I/O for the POS MV devices.

Step	Action
1	Select in the equipment list the appropriate POS MV device. (Becomes blue colored.) 
2	Press the *'I/O Port'* button. 

Step	Action
3	Press the '*Add*' button. 
4	Enter a name and press '*OK*.' 
5	Enter as local port 5602 and select UDP/IP as protocol. Press '*OK*'. 

Step	Action
5	The port is assigned to the POS MV driver. 
6	Repeat the procedure for other POS MV devices such as the VRU and Compass. 

3.6.3 Timing

It is not necessary for this configuration to set the clock synchronization in Teledyne PDS to synchronize the computer clock. However doing so has some advantages:

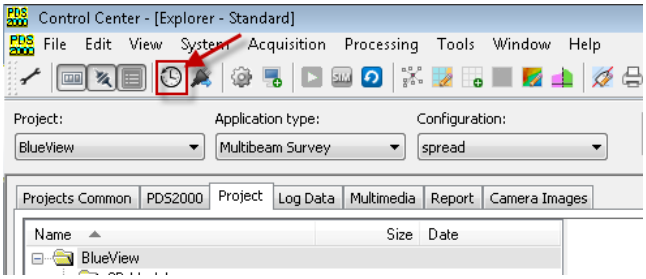
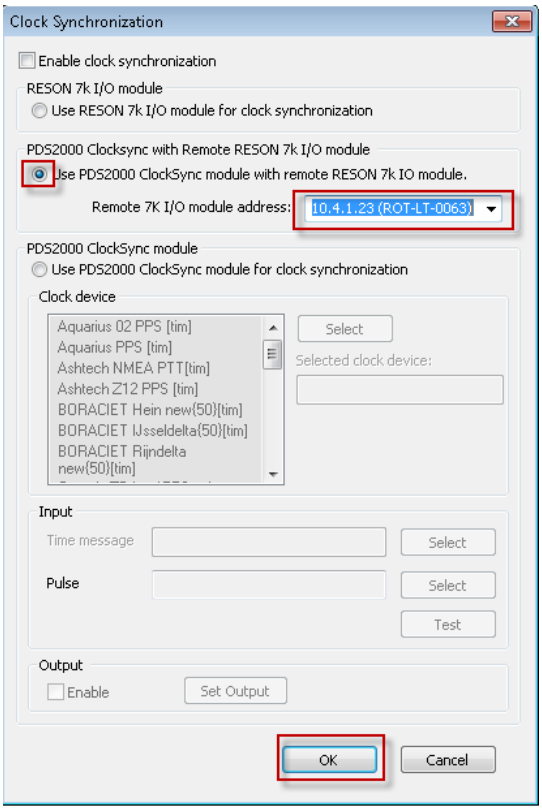
- Time delays are correctly indicated
- The log file names are corresponding with the synchronized date and time.
- The computer clock is synchronized with the correct date and time. A correct computer date and time is necessary when importing tidal data into PDS.

It is essential the correct time stamp mode is selected for the devices.

This section describes how to set-up clock synchronization and how to select the correct time stamping for the devices.

3.6.3.1 Clock synchronization set-up

The next table describes the setup of the clock synchronization in Teledyne PDS.

Step	Action
1	Press from the Teledyne PDS Control Center toolbar the clock synchronization button. 
2	Tick the '*PDS2000 ClockSync module with remote RESON 7K IO module*' radio button. Select the T20-P's IP address. Press '*OK*'. 

3.6.3.2 Timestamp Mode

When the T20-P is interfaced to the POS MV and the computer as described in chapter 'Interfacing' (see page 3) the time stamp mode is set to '**Time in message**' for all devices.

The ‘Timestamp mode’ is selected by opening the device properties (double-click on the device) and setting the timestamp mode. See Figure 3-44.

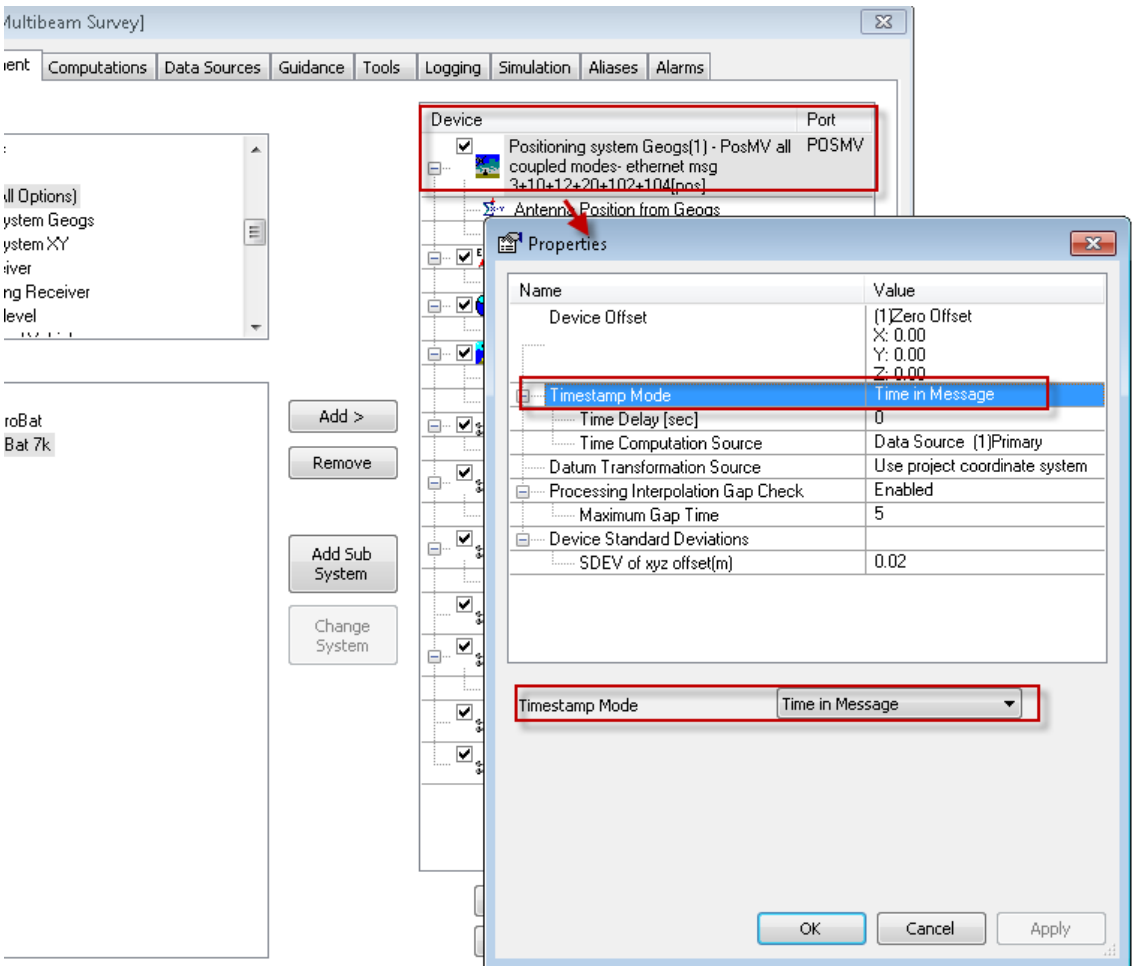


Figure 3-44 Timestamp mode 7K

Not for all drivers it is possible to set a timestamp. (E.g. sonar image needs no timestamp.)

3.6.4 Offsets and Corrections

It is essential to set for each device the proper offset and corrections (calibration values) when applicable.

The devices offsets with respect to a chosen vessel reference point should be measured and specified in the Teledyne PDS Vessel configuration – Geometry page. Refer to the Teledyne PDS user manual for more details.

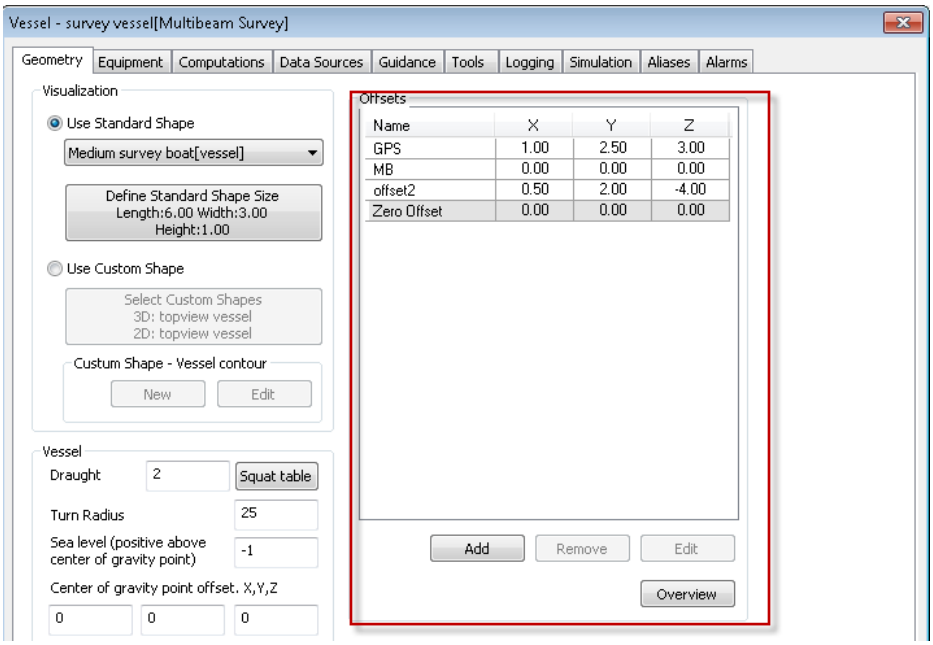


Figure 3-45 Offsets

The corrections of each device (roll, pitch and heading calibration) should also be measured prior to the survey and set.

It is essential these measurements are done as accurate as possible. Land survey techniques are recommended to use.

For the POS MV the offsets and corrections are set in the POSView Installation settings page. Refer to section 'Installation Settings' on page 25.

The following table specifies the offset and correction needed for each device.

Refer to the section 'Installation settings' on page 25' with a description of the offsets and corrections as used in the POS MV.

Device	Device offset and correction(s)
Position system Geogs – POSMV all coupled modes Ethernet msg 3+10+12+20+102+104	Device offset with respect to the (in POSView) defined sensor 1 reference point. (usually the IMU)
VRU – POSMV Ethernet 102	Device offset with respect to the (in POSView) defined sensor 1 reference point. (usually the IMU) Corrections 0 (Defined already in POSView)
Compass – POSMV Ethernet 102	Correction 0. (Defined already in POSView)
Heave – PosMV Ethernet 111	Device offset with respect to the (in POSView) defined sensor 1

Device	Device offset and correction(s)
	reference point. (usually the IMU)
Multibeam – RESON SeaBat 7K	Device offset with respect to the sonar acoustic center Roll, Pitch and Heading correction as determined during the multibeam calibration.
Snippets	None
Sidescan Sonar	None
Sonar Image	Device offset with respect to the sonar acoustic center Roll, Pitch and Heading correction as determined during the multibeam calibration.
Device Messages	None
Sonar Configuration	None
Sonar BITE	None
Water Column Data	None

4 Appendix Installing Teledyne PDS

4.1 Introduction

This section is a copy from the Teledyne PDS user manual describing the installation of the Teledyne PDS software package.

4.2 Install Teledyne PDS

The Teledyne PDS software is distributed on a CD-Rom or USB flash drive.

A new version of Teledyne PDS is always available on the ftp-site of RESON. The address is ftp.teledyne-reson.com with user name 'pds2000' and password 'getlatestversion'. See also the Help menu of the Control Center.

a. Select in Windows Explorer the correct drive and select the file 'setup.exe' to start the installation of Teledyne PDS. The welcome page of the Teledyne PDS InstallShield Wizard will appear. Click on Next > to continue.

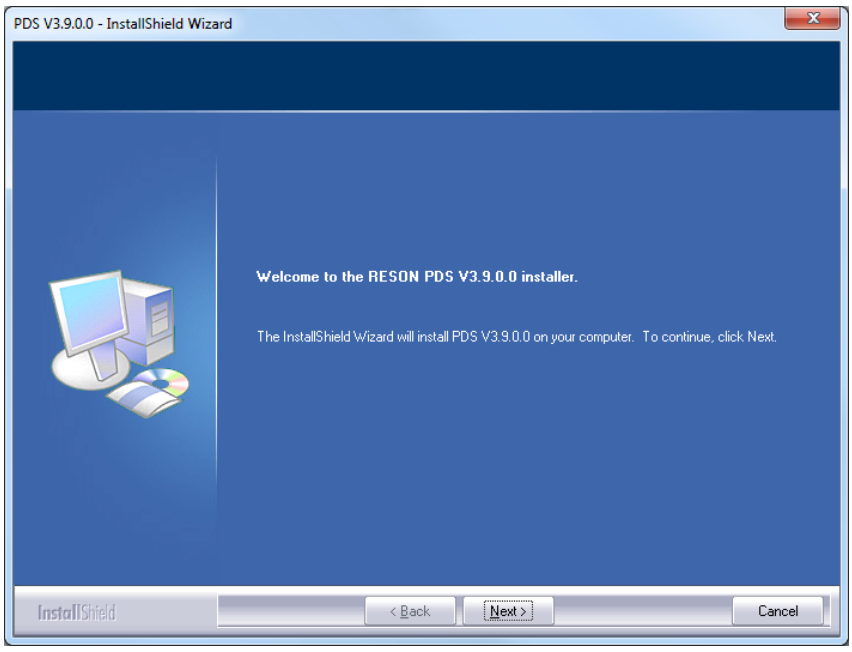


Figure 4-1 Welcome page of the Teledyne PDS InstallShield Wizard

b. Before the actual installation will start the user has to select the type of setup.

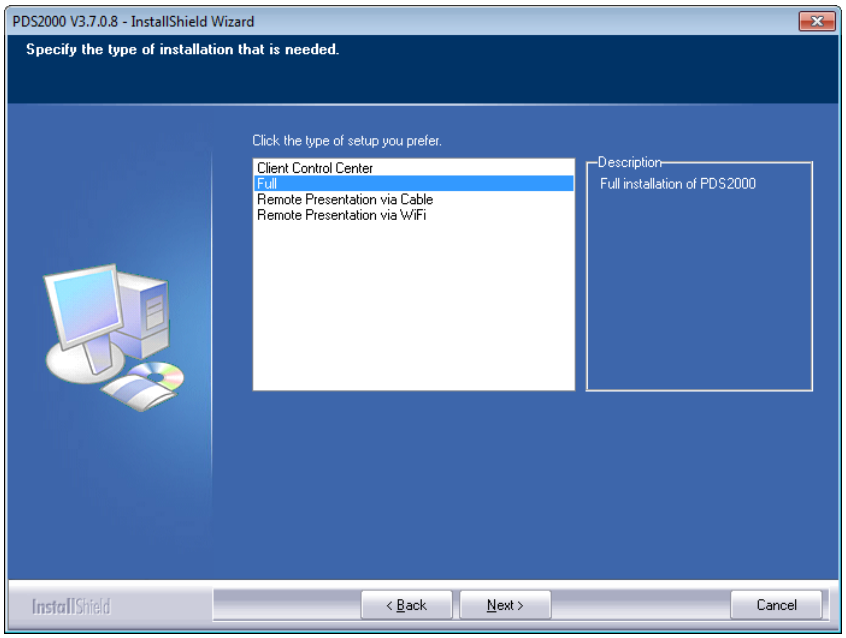


Figure 4-2 Type of setup in the Teledyne PDS InstallShield Wizard

Select 'Full'.

After the selection of the setup type click on Next > to continue.

c. The next page asks for a destination to install the program. The default directory is 'C:\Program Files\TELEDYNE\PDS Vx.x.x.x', where x.x.x.x is the version number. With the option Change... any directory name can be selected. Click on Next > to continue.

d. A window will pop up in which the ACL installer will make the Teledyne PDS Project folder accessible for each user.
ACL also makes for MS Windows 7 the folder 'C:\Program Data\RESON\PDS2000' and for MS Windows XP the folder 'C:\Documents and Settings\All Users\Application Data\RESON\PDS2000' accessible.

e. If already an older Teledyne PDS version is/was installed with not the latest C-Map software, then an Update C-Map SDK dialog will appear.

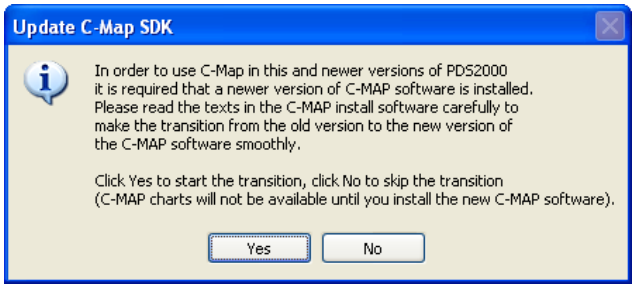


Figure 4-3 Update C-Map SDK software

From this new Teledyne PDS version onwards Teledyne PDS will only run with the new version of the C-Map software. Click on Yes to start with the installation of the new C-Map software. If the user clicks on No no C-Map software will be installed and Teledyne PDS will not run with C-Map anymore. Only when the user install later on the new C-Map software Teledyne PDS will run again with C-Map.

f. Click on Install in the next page of the install wizard to start the Teledyne PDS installation. Click on Finish to finish the installation. Installing Teledyne PDS will

place the Teledyne PDS and the Dongle software on the hard disk of the computer.

g. Click on  on the desktop to start Teledyne PDS.

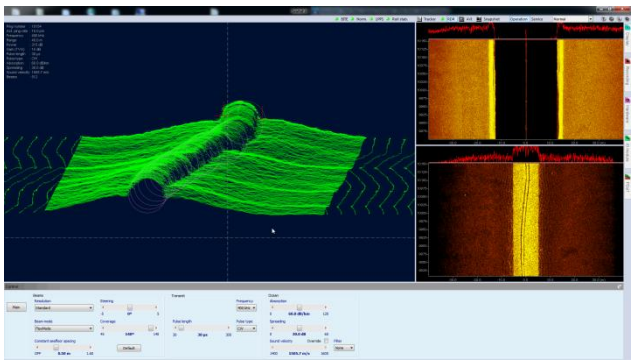
5 Appendix Installing SeaBat User Interface (SUI)

5.1 Introduction

This is a copy from the SeaBat T-Series portable Quick Installation guide.

Refer to the SeaBat T-Series Portable Operator's Manual for full details.

5.2 Vessel Configuration

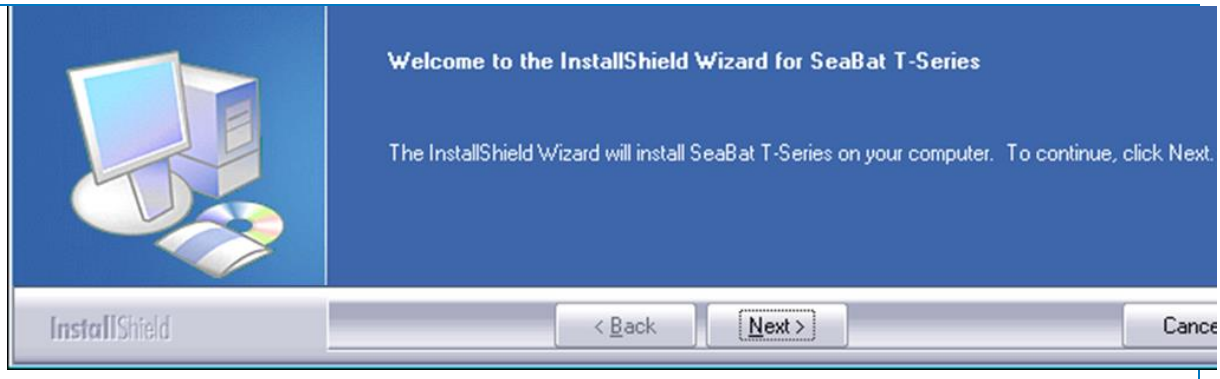


SeaBat User Interface

The SeaBat User Interface software to be run on the customer-furnished laptop/PC is provided on the USB key that's delivered with your SeaBat T-Series Portable system.

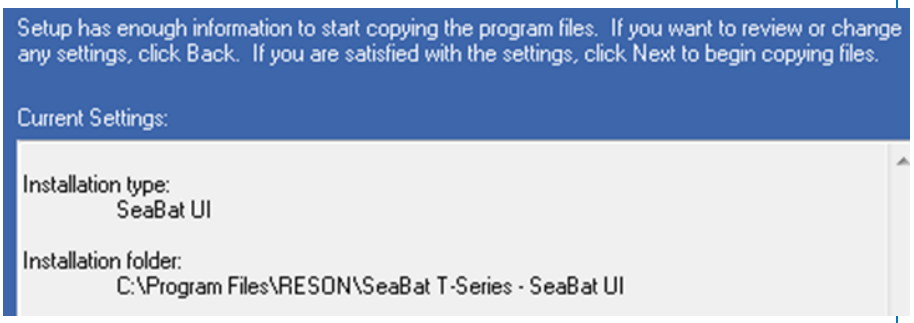
Installation

- Plug in the USB key, and select the USB in the Windows Explorer (if the system doesn't automatically open the USB folder).
- Double-click from the folder 'software installers' the SeaBat T-Series.exe to start installation of the SeaBat UI software.
  This will commence the InstallShield Wizard which will guide you through the installation process.
- Follow the instructions of the SeaBat T-Series – InstallShield Wizard, as shown here:

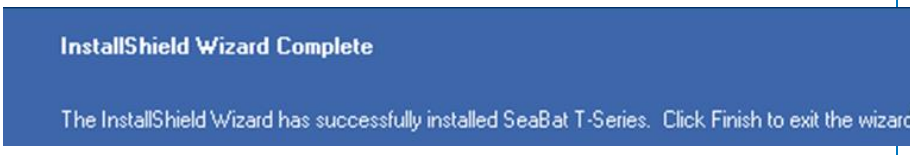


- Select SeaBat UI, and click Next.

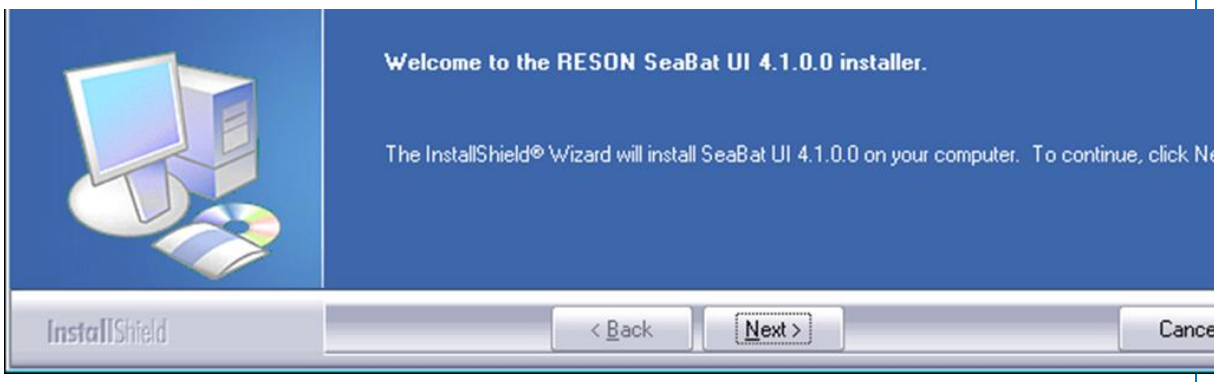
- Review settings, and click Next, if you want to continue.



- Click Finish when first part of the installation is complete.

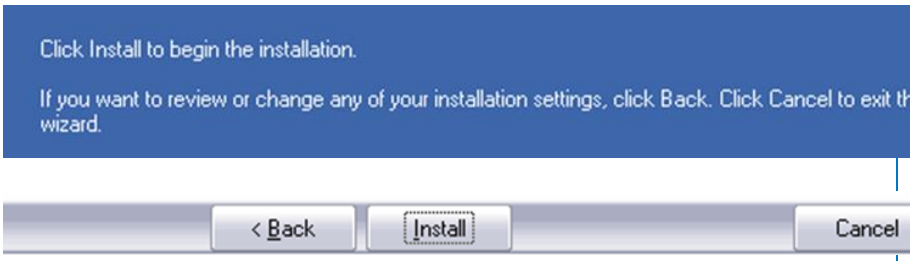


- Follow the instructions of the SeaBat UI - InstallShield Wizard to install the SeaBat User Interface, as shown here:

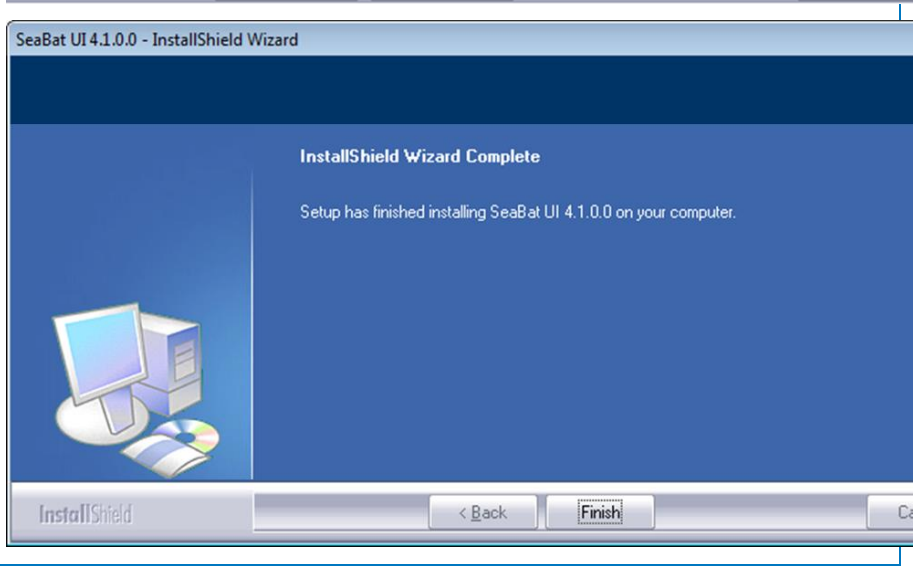


- Choose destination location, and click Next.

- Click Install to begin the installation.



- Click Finish to complete the last part of the installation and exit the InstallShield Wizard.



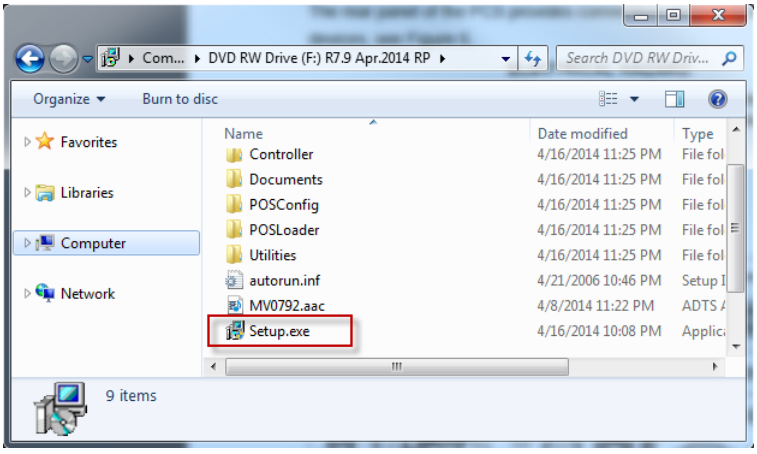
6 Appendix Installing POSView

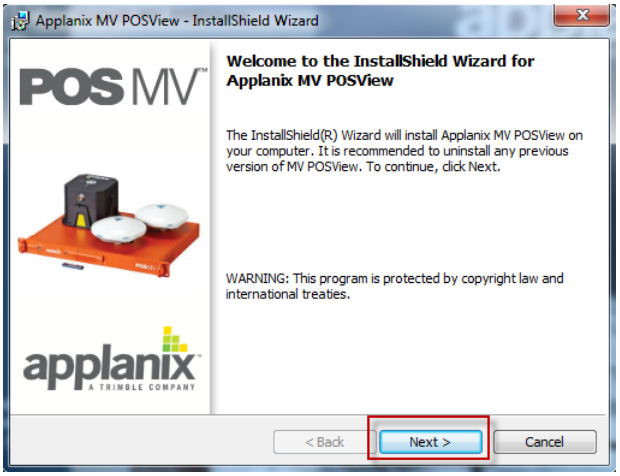
6.1 Introduction

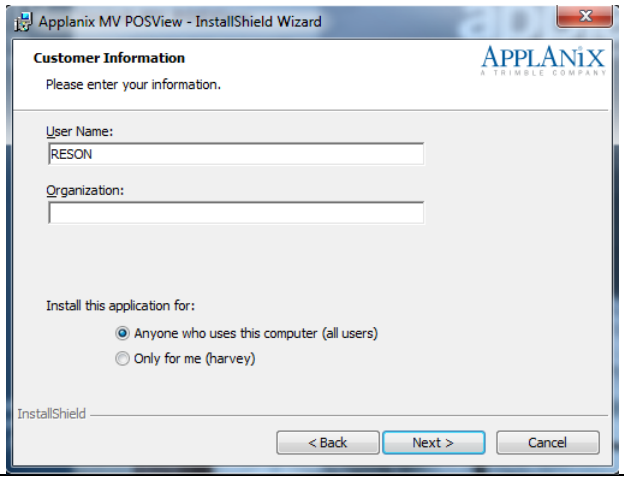
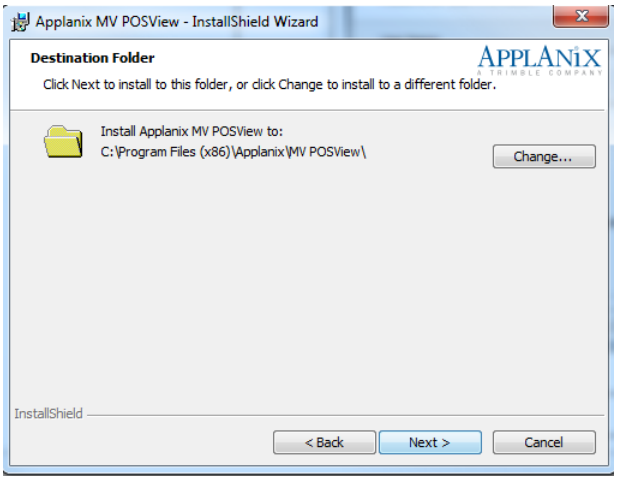
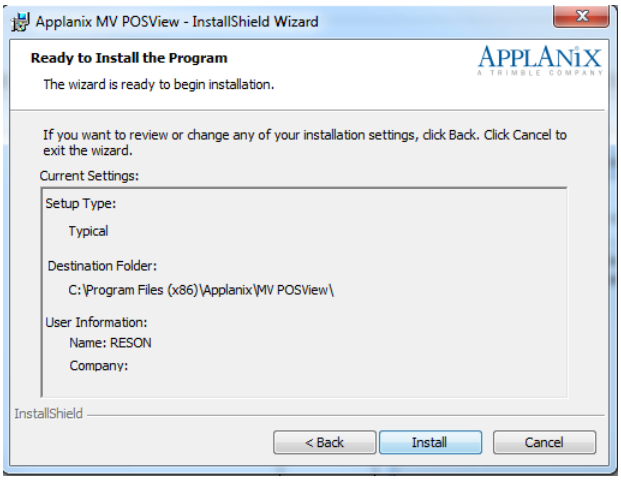
This information is from the POS MV user guide. Refer to this guide for full installation details.

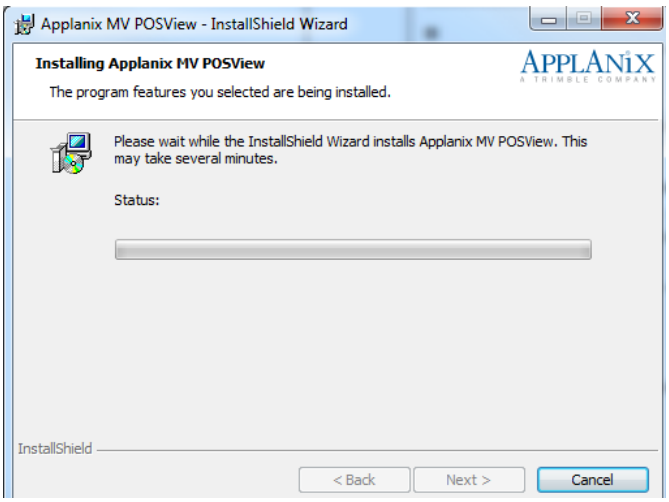
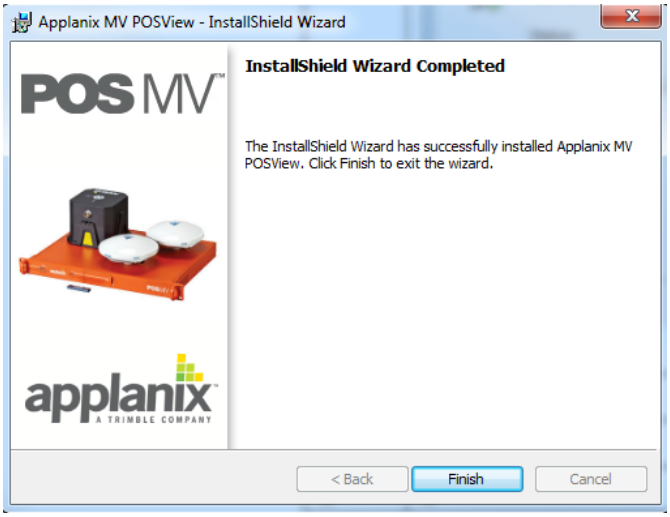
6.2 Installing POSView

The table below indicates the procedure to install the MV POSView software on the computer.

Step	Action
1	Insert the CD containing POS MV software into the PC's CD drive.
2	Browse to the Cd folder with windows explorer if the CD doesn't startup automatically and click the file 'Setup.exe'. 

Step	Action
3	Click in the appeared dialog ‘Install MV POSView’. 
4	Click ‘Next’ to start the installation wizard. 

Step	Action
5	Follow the wizard. Click ‘Next’. 
6	Clcik ‘Next’. 
7	Click ‘Install’. 

Step	Action
8	A dialog with a status bar appears during installation. 
9	Click ‘Finish’. 
10	A shortcut is created at the computer’s desktop. 

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