

# **Gemini Profiler with Survey Software**

**QPS QINSy**

0695-SOM-00008, Issue: 02



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# Help & Support

First please read this manual thoroughly (particularly the Troubleshooting section, if present). If a warranty is applicable, further details can be found in a Warranty Statement at the end of the manual.

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Prior to contacting *Tritech International Ltd* please ensure that the following is available:

1. The Serial Numbers of the product and any *Tritech International Ltd* equipment connected directly or indirectly to it.
2. Software or firmware revision numbers.
3. A clear fault description.
4. Details of any remedial action implemented.



## Contamination

If the product has been used in a contaminated or hazardous environment you *must* de-contaminate the product and report any hazards *prior* to returning the unit for repair. *Under no circumstances should a product be returned that is contaminated with radioactive material.*

The name of the organisation which purchased the system is held on record at *Tritech International Ltd* and details of new software or hardware packages will be announced at regular intervals. This manual may not detail every aspect of operation and for the latest revision of the manual please refer to [www.tritech.co.uk](http://www.tritech.co.uk)

*Tritech International Ltd* can only undertake to provide software support of systems loaded with the software in accordance with the instructions given in this manual. It is the customer's responsibility to ensure the compatibility of any other package they choose to use.

# Warning Symbols

Throughout this manual the following symbols may be used where applicable to denote any particular hazards or areas which should be given special attention:



## Note

This symbol highlights anything which would be of particular interest to the reader or provides extra information outside of the current topic.



## Important

When this is shown there is potential to cause harm to the device due to static discharge. The components should not be handled without appropriate protection to prevent such a discharge occurring.



## Caution

This highlights areas where extra care is needed to ensure that certain delicate components are not damaged.



## Warning

**DANGER OF INJURY TO SELF OR OTHERS**

Where this symbol is present there is a serious risk of injury or loss of life. Care should be taken to follow the instructions correctly and also conduct a separate Risk Assessment prior to commencing work.

# 1. Introduction

In order to be used as a bathymetric survey system the Gemini Profiler will be used in conjunction with additional software. Details are presented here for the QPS QINSy software package.

The basic principle of operation is that the Gemini Software communicates with the sonar head and then sends out data in a compatible format to the survey software. Usually the survey software is installed on a separate computer and they are connected via a network link.



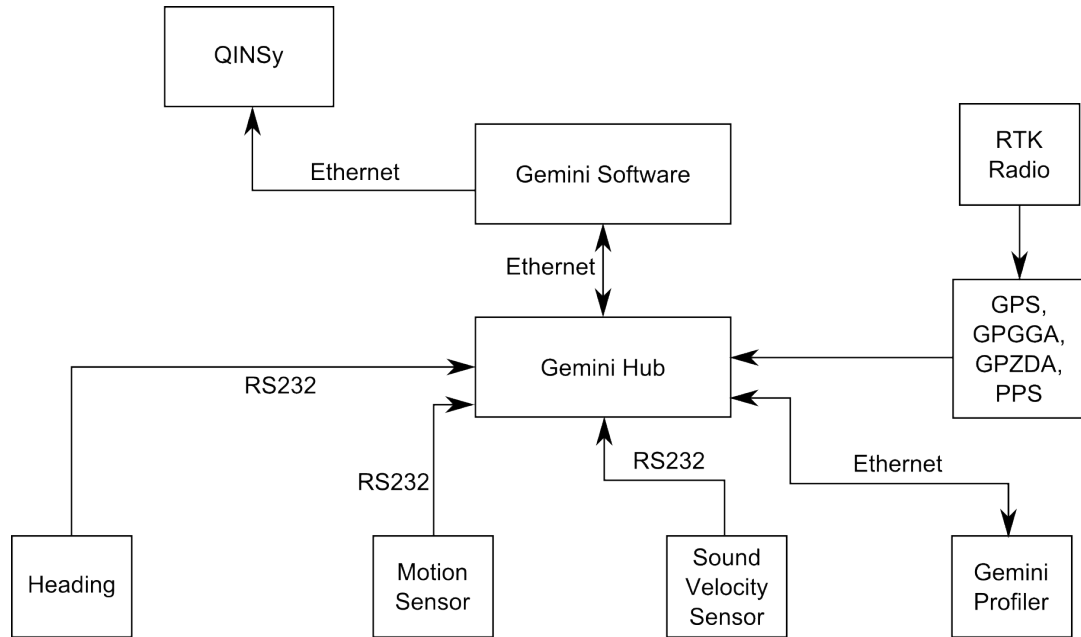
## Note

For more details of the software and after sales support for QINSy please contact your sales representative or visit the QPS website at [www.qps.nl](http://www.qps.nl).

## 2. Hardware Setup for QINSy

It will be necessary to run the Gemini Profiler off one computer and the QINSy software on another computer. The two computers will be connected through an Ethernet LAN.

The survey system should be connected as follows:



**Figure 2.1. QINSy Hardware Configuration**

### 3. Configure the Gemini Software

To set the Gemini software for use with a survey computer running QINSy it will be necessary to configure the data output over an Ethernet port. The computer running the Gemini software will essentially be connected to two LANs, one for the Gemini Profiler head(s) and the other for the connection to the survey software.



#### Note

The computer running the Gemini software and the computer running the QINSy software should be assigned IP addresses within the same subnetwork.

The network settings for the connection to QINSy are located in the section titled *Set up network data output* in the *Digitisation* section of the *Advanced* tab (as shown in Figure 3.1, “Gemini Software Digitisation Settings”). The *Format* should be set to *Tritech* and the *Hostname* set to broadcast on the subnet of the computer which is running QINSy.

Set up network data output	
Hostname	192.168.1.255
Port	52905
Format	Tritech
Sample Rate	30000

**Figure 3.1. Gemini Software Digitisation Settings**

Once the network has been properly set it will be necessary to configure the *Hub Setup* so that the data from auxiliary sensors is passed through correctly. Example settings are shown in Figure 3.2, “Gemini Software Hub Setup” where there is a gyro on Port A, an MRU on Port B and GPS on Port C.

In the *Hub Setup* tab ensure that the PPS edge is set to *Positive Edge*, the time synchronisation is set to *GPS* and the network data output is *Framed*.

Port	Mode	Sync	Baud	Decode
A	ASCII	<CR>	9600	HEHDT
B	ASCII	<CR>	9600	TSS Std 1
C	ASCII	<CR>	9600	GPGBA ZDA
D	ASCII	<CR>	9600	<none>
E	Echo Port C			
F	ASCII	<CR>	9600	<none>
G	ASCII	<CR>	9600	<none>
H	ASCII	<CR>	9600	<none>

Pulse-Per-Second (PPS) Edge	Positive edge
Time Synchronisation	GPS
Network data output	framed

Sonars   Hubs   **Hub Setup**   Serial Setup   Sensors

**Figure 3.2. Gemini Software Hub Setup**



## 4. Configure QINSy

### 4.1. Introduction

To complete these steps it will be necessary to enter the Database Setup Program in QINSy. From here the New System option should be selected each time an item is added (i.e., the Gemini Profiler, Gyro, MRU, GPS and PPS).

The New System option can be selected from the icon in the toolbar (as shown in Figure 4.1, “QINSy Database Setup Program”), or by using the menu and navigating to File→New→System. Each method will launch a blank New System dialog which should be configured as indicated in the examples.

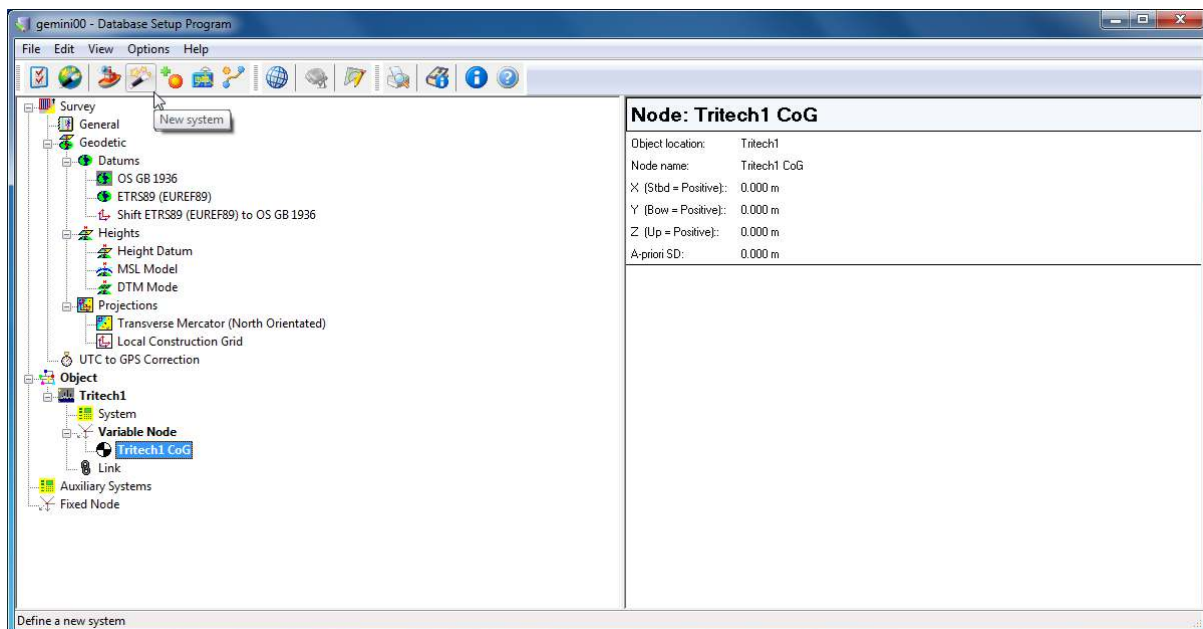


Figure 4.1. QINSy Database Setup Program

### 4.2. The Gemini Profiler

Launch the New System dialog and enter a suitable name, then select Multibeam Echosounder from the drop down Type: list.

The Driver: should be set to Tritech Gemini Sonar and the Port number: to whatever port was set in Chapter 3, *Configure the Gemini Software* (the default is 52905).

**Figure 4.2. New Gemini Profiler**

Once the Gemini has been properly selected, click **Next** to bring up the dialog shown in Figure 4.3, “Gemini Profiler Parameters”.

Here it will be necessary to ensure that the **Object** matches the vessel name, the **Transducer Setup** is set to **Assume Common Acoustic Center** and the **Transducer Node** to the centre line of the receive transducer face (refer to Gemini Profiling System Product Manual, document: 0695-SOM-00001).



### Note

Any additional parameters (such as the sensor offset) can be entered by clicking on the '+' button next to the database list. This will launch the **New Variable Node** dialog where the parameters can be configured.

Set the **Max. beams per ping:** to 256.

Make sure that the **Slot Identifier:** matches the identifier of the Gemini Profiler head in use (check the Gemini Profiler label for confirmation).

Description	Value
Object	Tritech1
Transducer Setup	Assume Common Acoustic Center
Transducer Node	Tritech1 CoG
Roll offset	0.000°
Pitch offset	0.000°
Heading offset	0.000°

Decoding

Max. beams per ping: 256

Slot Identifier: 10

Sound Velocity

☒ Use sound velocity from unit

☐ Use sound velocity: 1485.000 m/s

Echosounder Stabilization

☐ Unit is roll stabilized

☐ Unit is pitch stabilized

☐ Unit is heave compensated

< Back Next > Finish Cancel Help

**Figure 4.3. Gemini Profiler Parameters**

Accuracy and Corrections (figures Figure 4.4, “Gemini Profiler Accuracy” and Figure 4.5, “Gemini Profiler Corrections”) should be left with their default values.

Standard Deviations Sounder Data

Type: Pulse, Sampling

Pulse length: 0.150 ms

Sampling length: 0.050 m

☒ Same SD's for all transducers

☐ Different SD's per transducer

Standard Deviation Sound Velocity

SD sound velocity: 0.050 m/s

Standard Deviations Offsets (C-O's)

SD roll offset: 0.050 °

SD pitch offset: 0.050 °

SD heading offset: 0.500 °

Standard Deviations Stabilizations

SD roll stab.: 0.050 °

SD pitch stab.: 0.050 °

SD heave comp.: 0.050 m

Transducer Beam Opening Angle

Beam width along: 1.500 °

Beam width across: 1.500 °

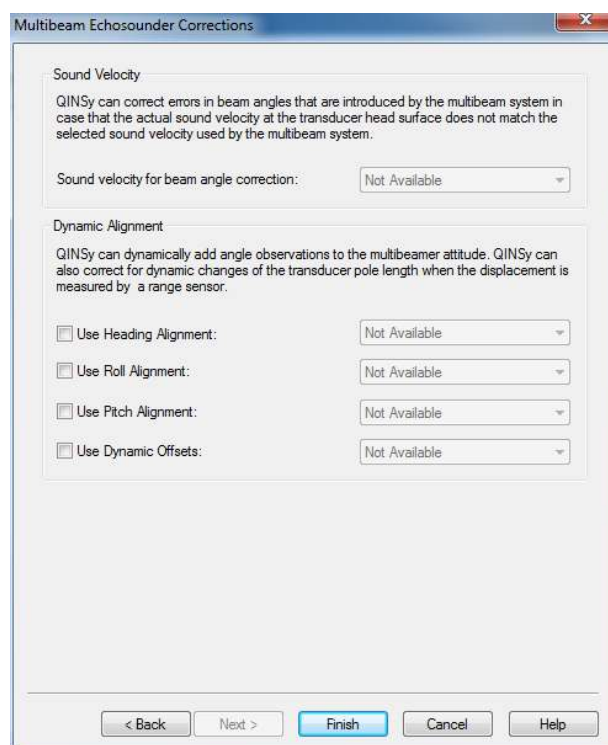
Transducer Beam Steering Angle

☐ Beam steering (flat transducer)

Min. steering angle: 180.00 °

< Back Next > Finish Cancel Help

**Figure 4.4. Gemini Profiler Accuracy**



**Figure 4.5. Gemini Profiler Corrections**

### 4.3. The Gyro Compass and MRU

The Gyro Compass and Motion Reference Unit are linked so are usually set up together (the Gyro is configured first).

To set up the Gyro Compass, launch the New System dialog, enter a suitable name and select Gyro Compass from the drop-down Type : list.

The Driver: should be set to a **Network Heading**, for example by choosing Network - HEHDT/TSS1/TSS2 Format (Heading). When chosen this will display a new option of Acquired By:.

The Acquired By: setting should be Trittech Gemini (framed message).

The Port number: should be the same as whatever port was set in Chapter 3, *Configure the Gemini Software* (the default is 52905).

The Observation time from: option should be set to 3rd Party Time tag.

**New System**

System

Name:

Type:

Socket Settings

Driver:

Acquired by:

Port number:

Observation time from:

Notes

I/O Parameters are only used in online mode and have no effect in replay mode

This driver also supports other system types [More info...](#)

< Back   Next >   Finish   Cancel   Help

**Figure 4.6. New Gyro Compass**

Once the Gyro Compass has been named and configured, click on the **Next** button to display the Gyro Observation Parameters. These values should be configured as required, but before clicking **Finish** make sure that the **Location**: matches the sensor location (add a new node if necessary by clicking the '+' button).

**Gyro Observation Parameters**

Gyro Observation

Name:

Location:

Observation Parameters

Type:

Unit:

A-priori SD:

Fixed C-O:

Variable C-O:

Scale factor:

Slot Identifiers

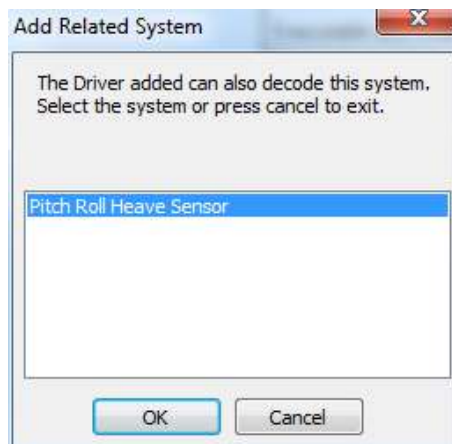
Slot number 1:

Slot number 2:

< Back   Next >   Finish   Cancel   Help

**Figure 4.7. Gyro Compass Parameters**

When the setup for the Gyro Compass is complete a prompt will appear as shown in Figure 4.8, “Add Related System Prompt”. Select the Pitch Roll Heave Sensor option (it may be the only option) and click OK.



**Figure 4.8. Add Related System Prompt**

The Add Related System prompt will open another New System dialog which should be used to configure the Motion Reference Unit (MRU).

Select a suitable name for the MRU and make sure the Type: drop-down list is set to Pitch Roll Heave Sensor.

The Driver: should be set to an option with **Network** capability, for example by choosing: Network TSS1/TSS2 Format (R-P-H). The Aquired By: setting should be set to Trittech Gemini (framed message).

The Port number: should be the same as whatever port was set in Chapter 3, *Configure the Gemini Software* (the default is 52905).

The Observation time from: option should be set to 3rd Party Time tag.

**New System - Related System [Heading [Pitch Roll Heave Sensor]]**

System

Name:

Type:

Socket Settings

Driver:

Acquired by:

Port number:

Observation time from:

Notes

I/O Parameters are only used in online mode and have no effect in replay mode

This driver also supports other system types [More info...](#)

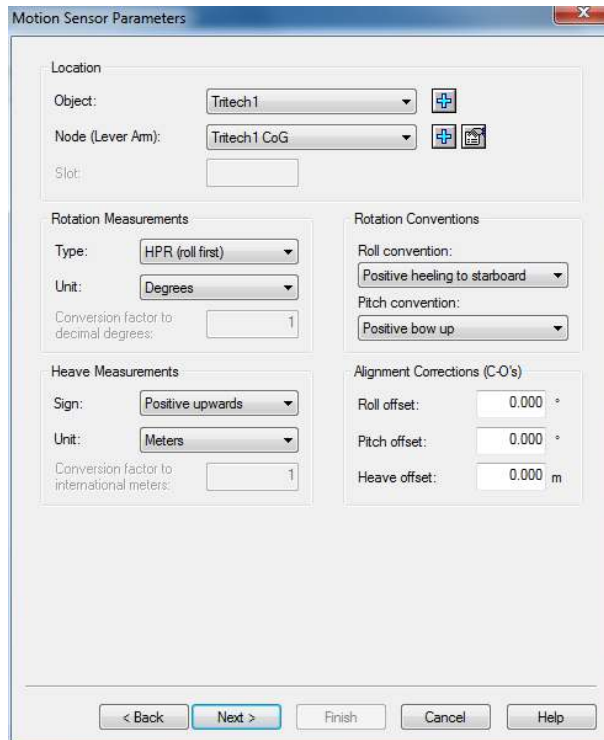
< Back   Next >   Finish   Cancel   Help

**Figure 4.9. New Motion Sensor (Related to Heading Sensor)**

Once the MRU has been named and configured, click the **Next** button to display the Motion Sensor Parameters (Figure 4.10, “Motion Sensor Parameters”).

Using this dialog make sure the **Object** : is set to the vessel and the **Node (Levar Arm)** : to the correct sensor location (additional offsets/nodes can be added by selecting the '+' button to the right of the drop-down list).

The Motion Sensor Parameters are spread over two dialogs and the second one is shown in Figure 4.11, “Motion Sensor Additional Parameters”. Enter any further configurations as required and then click **Finish** to return to the main screen of the Database Setup Program.



The 'Motion Sensor Parameters' dialog box is used to configure motion sensor settings. It includes sections for Location, Rotation Measurements, Heave Measurements, Rotation Conventions, and Alignment Corrections (C-O's).

**Location**

Object: Tritech1  
Node (Lever Arm): Tritech1 CoG  
Slot:

**Rotation Measurements**

Type: HPR (roll first)  
Unit: Degrees  
Conversion factor to decimal degrees: 1

**Rotation Conventions**

Roll convention: Positive heeling to starboard  
Pitch convention: Positive bow up

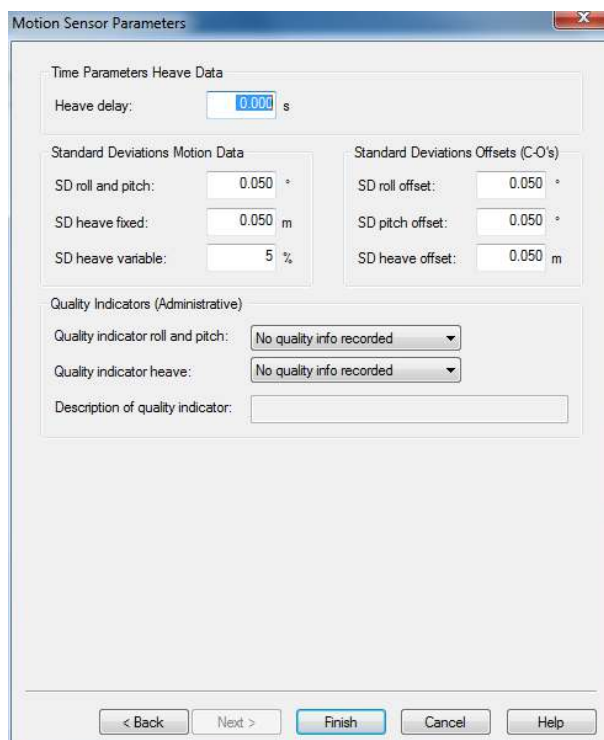
**Heave Measurements**

Sign: Positive upwards  
Unit: Meters  
Conversion factor to international meters: 1

**Alignment Corrections (C-O's)**

Roll offset: 0.000 °  
Pitch offset: 0.000 °  
Heave offset: 0.000 m

< Back   Next >   Finish   Cancel   Help

**Figure 4.10. Motion Sensor Parameters**

The 'Motion Sensor Additional Parameters' dialog box is used to configure additional motion sensor settings. It includes sections for Time Parameters Heave Data, Standard Deviations Motion Data, Standard Deviations Offsets (C-O's), and Quality Indicators (Administrative).

**Time Parameters Heave Data**

Heave delay: 0.000 s

**Standard Deviations Motion Data**

SD roll and pitch: 0.050 °  
SD heave fixed: 0.050 m  
SD heave variable: 5 %

**Standard Deviations Offsets (C-O's)**

SD roll offset: 0.050 °  
SD pitch offset: 0.050 °  
SD heave offset: 0.050 m

**Quality Indicators (Administrative)**

Quality indicator roll and pitch: No quality info recorded  
Quality indicator heave: No quality info recorded  
Description of quality indicator:

< Back   Next >   Finish   Cancel   Help

**Figure 4.11. Motion Sensor Additional Parameters**



## 4.4. The GPS

To add a GPS device, launch the **New System** dialog, choose an appropriate name and select **Position Navigation System** from the **Type :** drop-down list.

The **Driver :** should be set to **Network NMEA Position (GPGGA)** and it should be **Acquired By :** the **Gemini Sonar (framed message)**.

The **Port number :** should be the same as whatever port was set in Chapter 3, *Configure the Gemini Software* (the default is 52905).

The screenshot shows the 'New System' dialog box with the following configuration:

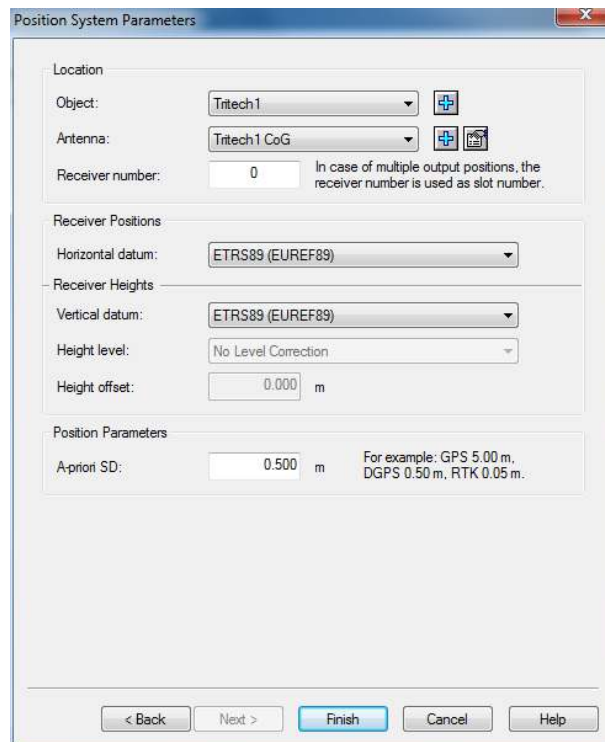
- System Name:** GPS
- Type:** Position Navigation System
- Socket Settings:**
  - Driver:** Network - NMEA Position (GPGGA)
  - Acquired by:** Tritech Gemini (framed message)
- Port number:** 52905
- Observation time from:** Decoded from data (PPS)
- Notes:** I/O Parameters are only used in online mode and have no effect in replay mode
- Buttons:** < Back, Next >, Finish, Cancel, Help

**Figure 4.12. New GPS**

Once the GPS is named and configured, click the **Next** button to open the **Position System Parameters**.

Make sure the **Object :** is set to the vessel name and the **Antenna :** to a suitable offset node (new nodes can be added if required by clicking on the '+' button).

Configure any further options as required and then click the **Finish** button.



The image shows a software dialog box titled "Position System Parameters". It is divided into three main sections: "Location", "Receiver Positions", and "Position Parameters".

- Location:** Contains a dropdown for "Object" set to "Tritech1", a dropdown for "Antenna" set to "Tritech1 CoG", and a text field for "Receiver number" set to "0". A note states: "In case of multiple output positions, the receiver number is used as slot number."
- Receiver Positions:** Contains a dropdown for "Horizontal datum" set to "ETRS89 (EUREF89)".
- Receiver Heights:** Contains a dropdown for "Vertical datum" set to "ETRS89 (EUREF89)", a dropdown for "Height level" set to "No Level Correction", and a text field for "Height offset" set to "0.000 m".
- Position Parameters:** Contains a text field for "A-priori SD:" set to "0.500 m". A note provides examples: "For example: GPS 5.00 m, DGPS 0.50 m, RTK 0.05 m."

At the bottom of the dialog are five buttons: "< Back", "Next >", "Finish" (highlighted in blue), "Cancel", and "Help".

**Figure 4.13. Position System Parameters**

## 4.5. The PPS

To add a PPS device, launch the New System dialog, choose an appropriate name and select PPS System from the Type : drop-down list.

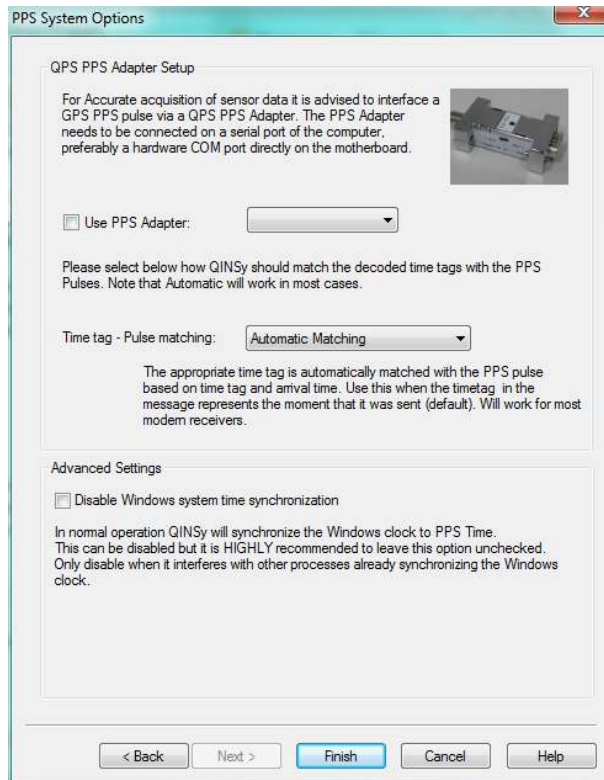
The Driver : should be set to NMEA ZDA (Network) and Acquired by : to Trittech Gemini (framed message).

Port number : should be the same as whatever port was set in Chapter 3, *Configure the Gemini Software* (the default is 52905).

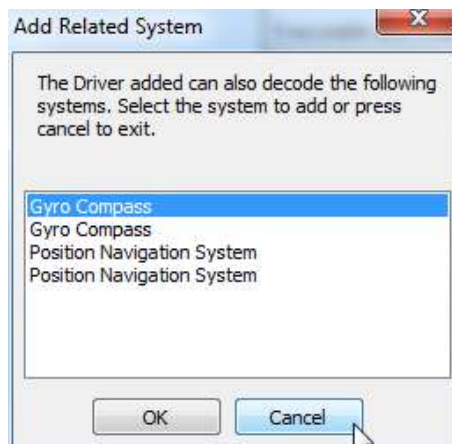
The screenshot shows the 'Edit System [PPS]' dialog box. It is divided into several sections: 'System', 'Socket Settings', 'Observation time from:', 'Notes', and a bottom navigation bar. In the 'System' section, the 'Name' field contains 'PPS' and the 'Type' dropdown menu is set to 'PPS System'. The 'Socket Settings' section has 'Driver' set to 'NMEA ZDA (Network)' and 'Acquired by' set to 'Trittech Gemini (framed message)'. The 'Port number' field is set to '52905'. The 'Observation time from:' dropdown is set to 'Decoded from data (PPS)'. The 'Notes' section contains the text 'I/O Parameters are only used in online mode and have no effect in replay mode' and 'This driver also supports other system types' with a blue link 'More info...'. The bottom navigation bar has buttons for '< Back', 'Next >', 'Finish', 'Cancel', and 'Help'.

**Figure 4.14. New PPS**

Once the PPS is named and configured, click Next to show the PPS System Options dialog.

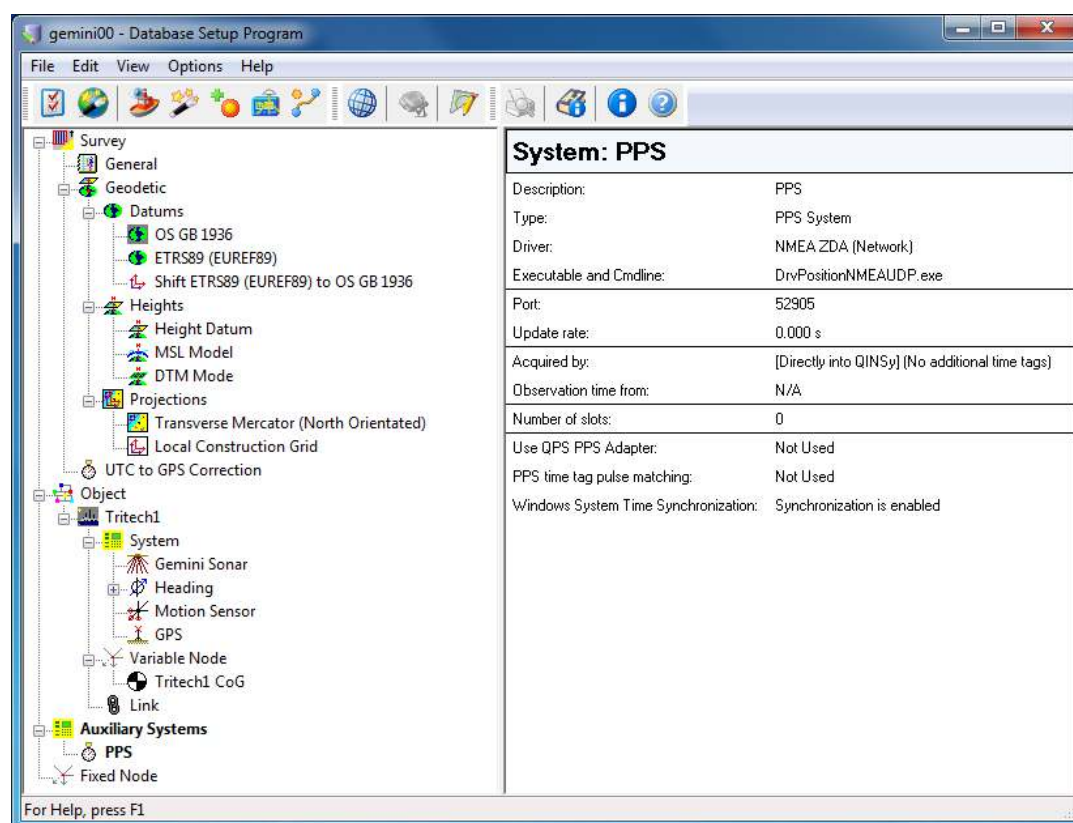
**Figure 4.15. PPS System Options**

Once the PPS is configured, click **Finish** and dismiss any **Add Related System** prompts by clicking on **Cancel** (as shown in Figure 4.16, “Add Related System Prompt”).

**Figure 4.16. Add Related System Prompt**

## 4.6. Example of Completed Setup

After the system is fully configured the Database Setup Program should appear similar to the one shown in Figure 4.17, “Configured QINSy Database Setup Program”.



**Figure 4.17. Configured QINSy Database Setup Program**

## 4.7. Dual Head Gemini Setup

If using two Gemini Profilers in tandem, repeat Section 4.2, “The Gemini Profiler” for the second head to add another Gemini system into the database.

The only requirement for the second Gemini system is that it has a new Transducer Node added which is different to the first Gemini system, i.e., referring to Figure 4.3, “Gemini Profiler Parameters” it will be necessary to add a new entry into the Transducer Node drop-down list for the second Gemini system.

# Glossary

Ethernet	A family of computer networking technologies for local area networks (LANs).
Gemini	Unless specified this can refer to any of the multibeam sonars in the Gemini range by <i>Tritech International Ltd</i> such as the Gemini Imager (720id), Narrow Beam Imager or Gemini Profiler (620pd).
Gemini Hub	A rack mountable device capable of driving 2 Gemini sonars and multiple serial sensors and outputting the data to a PC network.
GPS	Global Positioning System.
LAN	Local Area Network
MRU	Motion Reference Unit
PPS	Pulse Per Second
RS232	Traditional name for a series of standards for serial binary data control signals.