

# SeaBat 8150 upgrade to SeaBat 7150

# **R/V "Akademik Nicolaj Strakov"**

Prepared for:

# GINRAS

Ref No 02/1214442

Prepared by: RESON



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# **Document Review**

Author	Checked	Version	Comment
DW		V1.0	For Internal Review
RH		V2.0	Upgrade to SeaBat 7150



# 1. Introduction

This document details the upgrade of RESON SeaBat 8150 to SeaBat 7150 multibeam echosounder and related equipment onboard R/V "Akademik Nikolaj Strakhov" for the Geological Institute of the Russian Academy of Science (GINRAS). The upgrade took place in, Helsingor, Denmark. All equipment was installed in accordance with RESON's Standard Operating procedures.

The upgrade began on Sunday 15<sup>th</sup> October 2006 and was completed on Wednesday 18<sup>th</sup> October 2006.

Export License issues meant RESON were unable to upgrade the SeaBat 8111er to SeaBat 7111. This upgrade will be completed at a later date.

#### 1.1. Personnel

The RESON personnel involved in the installation are listed in the following table:

Name	Title
Richard Hill	RESON Project Surveyor
Artem Vassiliev	RESON Engineer
Jørgen Hansen	RESON Engineer
Michael Jensen	RESON Engineer
Natalia Becker	RESON Administrative Co-ordinator
Kim Khyl Jensen	RESON Sales Manager



# 2. Description of Vessel

R/V "Akademik Nikolaj Strakhov" is an academic research vessel owned by GINRAS. The main function of the vessel is for research in oceanography, geology and hydrography.

The vessel has an overall length of 75.5m, breadth of 14.7m, a design draft of 4.5m and a displacement of 2,600 GRT. The vessel is classified under the Russian Register. Normal operational crew for the vessel is 23 with 17 officers and 30 scientists. She was built in 1985 and is registered in Kaliningrad.



Figure 1: R/V "Akademik Nikolaj Strakhov"



# 3. Wet End Installation

#### 3.1. Gondola Installation

The wet end installation design incorporates a transducer mounting gondola on the hull from which cables are fed though three hull penetrations into three cable pipes. The cable pipes terminate in the survey room where all dry end equipment is installed.

The diagram below shows a general schematic of the gondola.

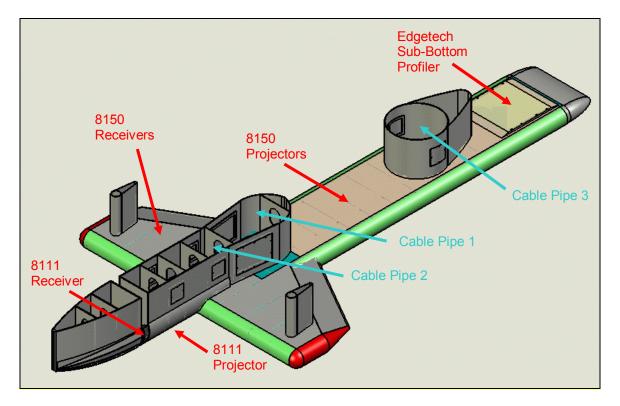


Figure 2: Gondola Schematic

The upgrade from 8150 to 7150 did not involve any changes to the wet-end. On completion of the physical installation the system the transmit section was tested using the scan test routine. The scan test verified that 48 sequential pings were audible from the transmit section from fore to aft.



# 4. Dry End Installation

#### 4.1. 19" Rack

The existing installation of the dry end equipment included changes, as follows:



#### Figure 3: **RESON 19" rack**

Changes:

- The original 7150 sonar processor (so-called G1, first generation) was replaced with a G2 unit.
- The 8150 8-P was removed.
- Some hardware interfacing changes, see later.



#### 4.2. SeaBat 7150 Transceiver

The SeaBat 8150 transceiver was upgraded to a SeaBat 7150 transceiver by replacing the following parts:

- Three backplanes
- Six Receiver cards
- Six Transmitter cards
- Two power supplies
- One Controller card.





Figure 4: Transceiver Bracket



Following the upgrade, a Scan Test verified that all but three channels were functioning. The three failed channels were present before the upgrade.

#### 4.3. Software Installed

The following software was installed on the vessel prior to departure for SeaBat 7150 sea trials:

System	Software / Firmware	Comment
SeaBat 7150	7K User Interface 3.2.6.2	All new
	7Kcentre 2.12.1.0	
	I/O Module 2.6.1.1	
SeaBat 8111	8111-E208-3F66 Dry	No changes
	8111-E101-AFAA Wet	
Acquisition PC	PDS2000 v2.6.1.5	Latest PDS2000
	AgRemote v1.22	
	TSIP Talker v2.00	
	iXRepeater Octans 3452-645	
Processing PC	PDS2000 v2.6.1.5	Latest PDS2000
	Datalog 400	

Both the Acquisition and Processing PCs have a directory called C:\Install which contains all the install files necessary to re-install any of the software listed above.



# 5. Hardware Interfacing

#### 5.1. Data Connections

	From	То	Data	Protocol
1 *	71-P processor	Survey Software	Bathy Data	Ethernet
2 *	71-P processor	Survey Software	Snippets Data	Ethernet
3	81-P processor	Survey Software	Bathy Data	Ethernet
4	81-P processor	Survey Software	Snippets Data	Ethernet
5	Trimble GPS	Acquisition DDU	Pos/Time/Speed	Serial, RS232
6	Acquisition DDU	Survey Software	Position	Serial, RS232
7	Acquisition DDU	Survey Software	Time & PPS	Serial, RS232
8 *	Survey Software	IXSEA Octans III	Position/Speed	Serial, RS232
9	IXSEA Octans III	Acquisition DDU	Heading/P/R/H	Serial, RS232
10	Acquisition DDU	Survey Software	Heading/P/R/H	Serial, RS232
11	IXSEA Octans III	Acquisition DDU	P/R/H	Serial, RS232
12	Acquisition DDU	81-P Processor P/R/H Se		Serial, RS232
13	Acquisition DDU	81-P Processor	P/R/H	Serial, RS232
14	SVP-70	Acquisition DDU	Sound Velocity	Serial, RS232
15 *	Acquisition DDU	71-P Processor	Sound Velocity	Serial, RS232
16	Acquisition DDU	81-P Processor Sound Velocity		Serial, RS232
17 *	Trimble GPS	71-P Processor Time and PPS		Serial, RS232
18	Survey Software	81-P Processor	Time	Serial, RS232
19	Survey Software	Edgetech SBP	Position	Serial, RS232
20	IXSEA Octans III	GINRAS System	Heading/P/R/H	Serial, RS232

\* denotes a change from original installation

**CAUTION:** The IXSEA Octans output A to the Acquisition DDU has been changed from Octans Standard to Simrad EM. The Simrad EM telegram is the preferred message for the Roll/Pitch data required by the SeaBat 7-P. A new PDS2000 Project template "template 7150" has been created and should be used when collecting SeaBat 7150 data.

In order to use the SeaBat 8111er, the output A will have to be changed back to the Octans Standard, and the appropriate PDS2000 Project Template used.

Changes to the Octans configuration are made using the Octans Repeater software utility on the Acquisition PC.



# 5.2. Communication Parameters

	Data	Message	From	То	I.O.	Freq.
			Port	Port	Settings	
1 *	Bathy Data	7K 7006	7000	N/A	IP 10.0.10.1	Var
2 *	Snippets Data	7K 7008	7000	N/A	IP 10.0.10.1	Var
3	Bathy Data	R Theta	1040	N/A	IP 10.0.10.2	Var
4	Snippets Data	<b>RESON Snippets</b>	1046	N/A	IP 10.0.10.2	Var
5	Pos/Time/Speed	GGA/ZDA/VTG	Port A	DDU1	9600,8,N,1	Var
6	Position	GGA	DDU2	MOXA1	9600,8,N,1	1Hz
7	Time	ZDA	DDU3	MOXA2	9600,8,N,1	1Hz
8	Position/Speed	GGA/VTG	DDU4	Octans A	9600,8,N,1	1Hz
9	Heading/P/R/H	SIMRAD EM	Octans A	DDU 6	19200,8,N,1	50Hz
10	Heading/P/R/H	SIMRAD EM	DDU6	MOXA3	19200,8,N,1	50Hz
12 *	P/R/H	SIMRAD EM	DDU10	71-P Port1	115200,8,N,1	50Hz
13	P/R/H	Octans STD 1	DDU10	81-P Port 3	115200,8,N,1	50Hz
14	Sound Velocity	AML	RS232	DDU13	115200,8,N,1	1Hz
15 *	Sound Velocity	AML	MOXA7	71-P COM2	9600,8,N,1	1Hz
16	Sound Velocity	AML	DDU15	81-P DnLk	9600,8,N,1	1Hz
17 *	Time	NMEA ZDA / PPS	MOXA2	71-P COM1	115200	1Hz
18	Time	RESON UTC	MOXA4	81-P Port 1	115200	1Hz
19	Position	GGA	MOXA5	Nav	9600,8,N,1	1Hz
20	Heading/P/R/H	GINRAS System	Octans B	MCB 0	9600,8,N,1	5Hz

\* denotes a change from original installation



#### 5.3. Power Schematic

The following diagram shows the power schematic for all systems installed by RESON onboard R/V "Akademik Nikolaj Strakhov".

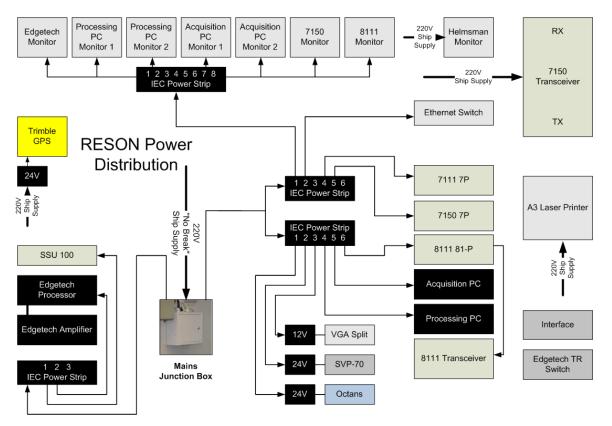


Figure 6: Power Distribution



## 5.4. Data Interfacing

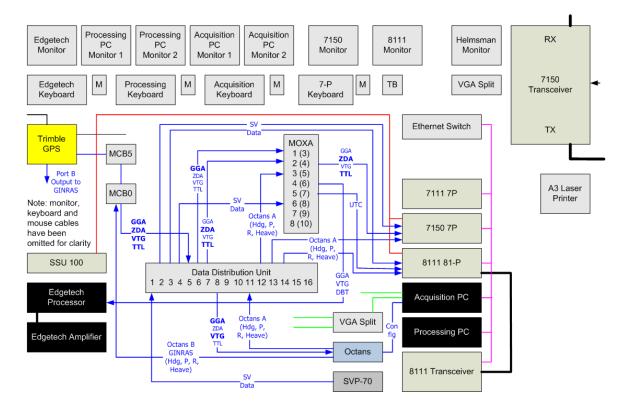


Figure 7: Data Interfacing

Known errors in Figure 7.

- The GGA / VTG to Octans, now comes from an Output of PDS2000 after it was noticed that when it was connected to the DDU the Octans reported "Serial I/O failure".
- The SVP-70 data does not go to DDU port 1, but MOXA port 6, and there is an output from PDS2000 from MOXA port 7 to DDU port 1.



#### 5.5. Data Distribution Unit

The following diagrams show the data interfacing to/from the data distribution board.



Figure 8: Data Distribution Board

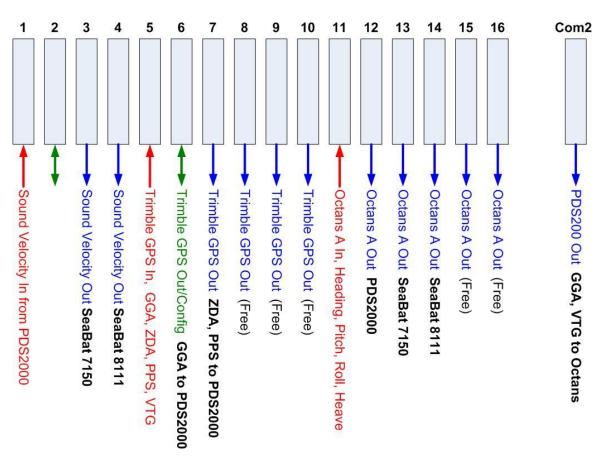


Figure 9: DDU Connections

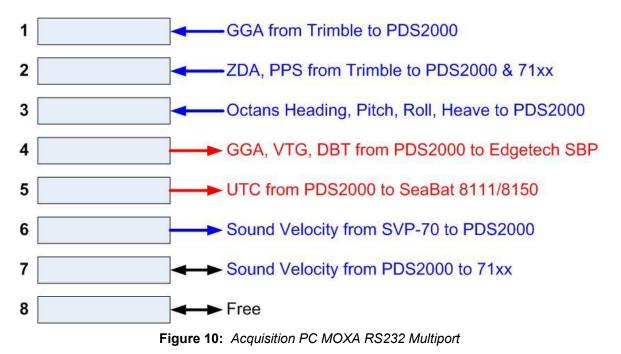


The pin wiring of the DDU is as follows:

For all outputs (female connectors) data is transmitted on pin 3 and ground is on pin 7. For the Trimble GPS outputs pin 8 is wired to carry the TTL signal. The first output in the sequence for Sound Velocity and GPS (indicated in green) has pin 2 connected in order to be used for configuring the sensors.

#### 5.6. MOXA Connections

The following diagrams show the data interfacing to/from the MOXA board.





RESON SeaBat 8150 upgrade to 7150 Installation Report R/V "Akademik Nikolaj Strakhov"



Figure 11: MOXA Multiport



# 6. Sensor Offsets and Orientations

The IXSEA Octans III was installed as close as practically possible to what is assumed to be the vessel's centre of rotation. For simplicity, the installed position of the Octans was taken to be the common reference point for sensor offsets.

The PDS2000 convention for offset measurements is adopted.

X axis is positive to Starboard Y axis is positive to Bow Z axis is positive Up

#### 6.1. Sensor Offsets

Sensor offsets from CRP (metres)							
From CRP to	X (m)	Y (m)	Z (m)				
Octans	0.00	0.00	0.00				
Trimble GPS Antenna	0.97	5.40	19.58				
SeaBat 8150	1.60	2.36	-5.78				
SeaBat 8111	1.60	6.62	-5.46				
Edgetch SBP	1.60	-0.87	-5.73				

#### 6.2. Sensor Orientations

The alignment of the vessel reference frame was determined by land survey measurements to prisms located on the centre line at the bow and stern of the vessel.

The alignment of the SeaBat 8150 with respect to the vessel centre line was determined by using land survey techniques to measure the positions in X, Y and Z of the receiver and transmitter mounting bolt holes.

The heading of the vessel reference frame was determined by computing a bearing from two known positions: the Trimble GPS for the vessel position and a lighthouse 3.5km west on the channel approaches to Kaliningrad. Confidence in the positions is considered to be  $\pm 3m$ , typical for GPS and for geographical coordinates quoted to 3 decimals in minutes i.e. dd mm.mmm. This results in confidence in the baseline orientation of 0.1° assuming the lighthouse coordinates are correct.

Sensor Orientations							
Heading Pitch Roll							
Vessel Ref Frame	88.84°	0.11º (bu)	-0.15° (su)				
SeaBat 8150	88.82°	0.32° (bu)	-0.16° (su)				
SeaBat 8111	Assumed 0°	Assumed 0°	Assumed 0°				
Octans	89.72°	0.03°	-0.15° (su)				



Sensor Misalignments with respect to Vessel Frame							
Heading Pitch Roll							
SeaBat 8150	-0.02°	0.21°	-0.01°				
SeaBat 8111	Assumed 0°	Assumed 0°	Assumed 0°				
Octans	0.86°	-0.08°	0.00°				

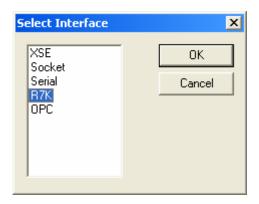
The alignment of the SeaBat 8111 was not observed due to the fact that the curved array cannot be measured accurately. As with both multibeam systems, the final misalignments will be determined by the patch tests to be carried out during the sea acceptance tests. The patch tests shall be used to verify the computed misalignment between Octans and SeaBat 7150.

# 7. PDS2000 Survey Software

The following changes were made to the PDS200 Project, for the SeaBat 7150. A new project, based on the SeaBat 8150 template and the following changes.

PDS2000 works together with the SeaBat 7150, by contacting the 7KCentre (running on the 7150 sonar processor) and requesting data records.

#### 7.1. Interfacing Ports



Four (4) new I/O Ports were created, of the type "R7K", ass opposed to "Socket" that might normally be used for sensor data received over a network connection.

- 1. 7150bathy
- 2. 7150snp
- 3. 7150sss
- 4. 7Kdist (optional, only required for realtime broadcast of 7K records)

See next pages..



nterfacing			<u>&lt;</u>
Port 7150bathy 7150snp 7150sss 8111 8111snp 8111sss 8150 8150snp COM1 COM1 COM2 COM3 COM4 COM5 COM6 COM7 COM8	Settings udp 6900 udp 6700 udp 6800 udp 1030 udp 1036 udp 1031 udp 1040 udp 1046 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 115200 8-NONE-1 115200 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1		Local Port: 6900 Host Address: 10.0.10.4 Port: 7000 Check host address Protocol Protocol O UDP/IP O TCP/IP
COM8 COM9 control sonar8111	9600 8-NONE-1 9600 8-NONE-1 udp 1032 udp 1032	-	
, condicitier in	Add	Remove	OK Cancel

Inter	facing						X
	rt 50bathy 50snp	Settings udp 6900 udp 6700	<b></b>	- Local	Port:	6700	
719 81 81 81 81 81	50sss 11 11snp 11sss	udp 6800 udp 1030 udp 1036 udp 1031 udp 1040 udp 1046		Host		10.0.10.4 7000	
C0 C0 C0	M1 M10 M2 M3 M4 M5	9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 115200 8-NONE-1		- Protocol-	I • UDP/IF	Check host address	
C0 C0 C0 C0 C0	M6 M7 M8 M9 ntrol nar8111	9600 8-NONE-1 115200 8-NONE-1 9600 8-NONE-1 9600 8-NONE-1 udp 1032 udp 1032					
		Add	Remove		[	OK Cancel	



erfacing			
Port	Settings		_ Local
7150bathy	udp 6900		Port: 6800
7150snp	udp 6700		
7150sss	udp 6800		_ Host
8111 8111snp	udp 1030 udp 1039		Address: 10.0.10.4
8111sss	udp 1036 udp 1031		
8150	udp 1031 udp 1040		Port: 7000
8150snp	udp 1046		
СОМ1	9600 8-NONE-1		Check host address
COM10	9600 8-NONE-1		
COM2	9600 8-NONE-1		Protocol
COM3	9600 8-NONE-1		O UDP/IP O TCP/IP
СОМ4 СОМ5	9600 8-NONE-1 115200 8-NONE-1		
COM6	9600 8-NONE-1		
COM7	115200 8-NONE-1		
COM8	9600 8-NONE-1		
СОМЭ	9600 8-NONE-1		
control	udp 1032		
sonar8111	udp 1032	<b>-</b>	
	Add	Remove	OK Cancel

Port Settings	
7150bathy         udp 6900         Port:         7100           7150snp         udp 6700         Uset         Uset	
7150sss udp 6800 7Kdist udp 7100 8111 udp 1030 Host Address: localhost	
8111snp udp 1036 8111sss udp 1031 Port: 7200	
8150 udp 1040 8150snp udp 1046 COM1 9600 8-NONE-1	address
COM10 9600 8-NONE-1 Protocol COM2 9600 8-NONE-1 © UDP/IP © TCF	P/IP
COM3 9600 8-NONE-1 COM4 9600 8-NONE-1 COM5 115200 8-NONE-1	
COM6 9600 8-NONE-1	
COM8 9600 8-NONE-1 COM9 9600 8-NONE-1 control udp 1032	
Add Remove OK	Cancel



## 7.2. SeaBat 7150 Equipment

Any 8150 equipment was removed from the project, and the following 7150 equipment was added.

- 1. Multibeam, RESON SeaBat 7150
- 2. Sidescan Sonar, RESON SeaBat 7150
- 3. Snippets, RESON SeaBat 7150

See following ..

Vessel - Strakhov[Multibeam Survey]						×
Geometry Equipment Computations Da	ata Sources   Guid	dance   Log	gging   Sim	ulation Aliases Ala	rms	1
Groups:		[	Device		Port	<u> </u>
😭 Depth sensor		ľ	+··· 🗹 🏪	Trimble GPS (GGA)	СОМЗ	
Echosounder	_		✔ 霄	GGA Output to SBP	COM6	
🔁 External clock			···· 🗹 🚏	DBT Output to SBP	COM6	
🕺 Multibeam				SVP-70	COM8	
🖷 Output			···· 🖌 💾	VTG Ouput to SBP	COM6	
Positioning system Geogs Y Positioning system XY				Multibeam(1) - RESON SeaBat 7150[mbs]	7150bat	
Device drivers:	▼ Add			Sidescan Sonar(1) - RESON SeaBat 7150[sss]	7150sss	
Elac-Hydrostar sb1000[mbs] Imaginex 881[mbs]	A Rem	ove	+	Compass(1) - octans EM1000 bin[hdg]	COM5	
😤 RESON SeaBat 7111[mbs]			±	VRU(1) - octans EM1000 bin[vru]	COM5	_
RESON SeaBat 7125[mbs]			🗹 🖷	Output(4) - GGA-to WGS VTG[out]	COM2	
Reson-7k[mbs]			. ⊻	Snippets(1) -	7150snp	-
Reson-Seabat deep water[mbs]	<b>*</b>		Edit	Units	Outputs	
			1/01	Port Dev	vice Test	
		-				
			OK	Cancel	Help	>



Properties	×
Name	Value 🔺
🖃 Device ID	7150
Device Enumeration	0
Device Offset	(1)SeaBat 7150 X: 1.60 Y: 2.36 Z: -5.78
Heading Correction	0.000000
Roll Correction	0.000000 °PU+
Pitch Correction	0.000000 *BU+
Flat Rx Array Correction	Disabled
Processing Interpolation Gap	Enabled
	10.000000
Device ID	7150
	OK Cancel

The "device ID and Enum" is automatically set to 7150 & 0 and should not be changed. As before, the other parameters should be configured.

P	roperties		X
	Name	Value	
	Multibeam Source	Multibeam(1) - RESON SeaBat 7150[mbs]	
	🚊 Apply Roll	Enabled	
	Roll Data Source	Data Source Roll+Pitch (1)Primary	
	🚊 Apply Pitch	Enabled	
	Pitch Data Source	Data Source Roll+Pitch (1)Primary	
	🚊 Apply Heave	Enabled	
	Heave Data Source	Data Source Heave (1)Primary	
	Sea Level	Data Source Sealevel (1)Primary	
	- Apply Sound Velocity Profile	Enabled	-
	Apply Roll	I Enabled	
		OK Cancel	



**IMPORTANT:** When ROLL or PITCH COMPENSATION is ENABLED on the SeaBat 7150 (using the SeaBat 7K User Interface menu options, then the "APPLY ROLL / PITCH" setting in PDS2000 MUST be manually DISABLED.

This will be automated in a forthcoming PDS2000 release.

Vessel - Strakhov[Multibeam Survey]					×
Vessel - Strakhov[Multibeam Survey]         Geometry       Equipment       Computations       Data So         Groups:       Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Remote Towed Vehicles       Image Bearing Receiver       Image Bearing Receiver         Remote Towed Vehicles       Image Bearing Receiver       Image Bearing Receiver         Remote Towed Vehicles       Image Bearing Receiver       Image Bearing Receiver         Sidescan Sonar       Image Bearing Sound Velocity       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Image Bearing Receiver         Image Bearing Receiver       Image Bearing Receiver       Ima	ources   Guidance   L		Frimble GPS (GGA) GGA Output to SBP DBT Output to SBP SVP-70 /TG Ouput to SBP Multibeam(1) -	ms Port COM3 COM6 COM6 COM6 COM6 COM6 7150bat	×
Sound Velocity Speed and CMG State The Device drivers: Device drivers: Elac-Hydrostar[sss] RESON SeaBat 7111[sss] RESON SeaBat 7125[sss] RESON SeaBat 7150[sss] Reson-7k[sss] Reson-Seabat deep water[sss]	Add > Remove		Autobeam(1) - RESON SeaBat 7150[mbs] Sidescan Sonar(1) - RESON SeaBat 7150[sss] Compass(1) - octans EM1000 bin[hdg] /RU(1) - octans EM1000 bin[vru] Dutput(4) - GGA-to wGS VTG[out] Snippets(1) -	7150sss COM5 COM5 COM2 7150snp	
see Reson-Seabat[sss]		Edit	Units	Outputs	
		OK	Cancel	Help	



Properties	×
Name	Value
🖃 Device ID	7150
Device Enumeration	0
Processing Interpolation Gap	Enabled
Maximum Gap Time	10.000000
Device ID	7150
μ	OK Cancel

The "device ID and Enum" is automatically set to 7150 & 0 and should not be changed. Other items are correct by default.



Vessel - Strakhov[Multibeam Survey]					×
Geometry Equipment Computations Data Sc	ources Guidance Lo	ogging   Sim	ulation Aliases Ala	ms	
Groups: Remote Towed Vehicles RemoteLogControl Gidescan Sonar Sound Velocity Speed and CMG State The State The State	Add >		Trimble GPS (GGA) GGA Output to SBP DBT Output to SBP SVP-70 VTG Ouput to SBP Multibeam(1) - RESON SeaBat 7150[mbs] Sidescan Sonar(1) - RESON SeaBat 7150[sss]	Port COM3 COM6 COM6 COM8 COM6 7150bat 7150bat	
RESON SeaBat 7111[snp] RESON SeaBat 7125[snp] RESON SeaBat 7150[snp] Reson-7k[snp] Reson-Seabat deep water[snp] Reson-Seabat[snp] Sea Simrad-EM3000[snp]			Compass(1) - octans EM1000 bin[hdg] VRU(1) - octans EM1000 bin[vru] Output(4) - GGA-to WGS VTG[out] Snippets(1) -	COM5 COM5 COM2 7150snp	•
រូវឆ្នាំ Simrad-EM3000[snp]		Edit	Units Dev	Outputs	
		OK	Cancel	Help	



Properties	X
Name	Value
🖃 Device ID	7150
Device Enumeration	0
Processing Interpolation Gap	Enabled
Maximum Gap Time	10.000000
Snippet Window Size	100
Device ID	7150
	OK Cancel

The "device ID and Enum" is automatically set to 7150 & 0 and should not be changed. Other items are correct by default.

#### 7.3. R7K Data Distribution

GINRAS requested the corrected bathymetry be available as a Network Broadcast. The PDS2000 "R7K Distribution" module allows this. Data from the SeaBat 7150 is sonar relative (launch angle and to way travel time) and it is PDS2000 that uses the GPS, motion, heading and sound velocity data, plus the SeaBat 7150 to calculate the corrected profile of seabed depths. The corrected depths are added to the "7006" Bathymetry data record and made available for distribution. The following describes the changes needed to the PDS project, and how to configure the data distribution.



	ations   Data Sources   G	uidance   Logging   Simulati	ion Aliases Alarms
Groups: Autopilot Output Bearing Compass CTD Probe Depth sensor Echosounder External clock Multibeam Device drivers: NMEA-APA[apo] NMEA-APB[apo] NMEA-XTE[apo] Radio Zeeland[apo] Robertson Robnav[apo]		dd > Out move Out Model Spectrum move Out Model Spectrum Model Spectrum	Imputation tput(2) - GGA-to COM2 GS VTG[out] ppets(1) - 7150snp SON SeaBat 50[snp] hippets pmputation tput(3) - AML COM9 eed at incducer[out] tput(4) - GGA-to COM6 GS VTG[out] to
		Edit I/O Port	Units Outputs

An output, "Reson7k-Data Distribution" was added to the project. Like other outputs, during the equipment definition the selection of suitable data sources (outputs) is important.

The I/O Port is the "7KDist" described earlier.

Once PDS2000 "Realtime" is started, besides the Windows Clock application (Windows Task Bar, lower right of screen) you can find the "R7KDistribution" application. It is started automatically. Double-click to open the application.



눤	7K Record Dist	ribution		x
	Input Connect	ions Output		
	- Local port			1
	Locarpoit			
	Port : 7200	Set Port	Save all input to 7k log file	
	Records	Time Stamp		
	1015	10/26/06 20:07:36.281		
	1016	10/26/06 20:07:36.291		
	1003	10/26/06 20:07:35.303		
	7000	10/26/06 20:07:35.958		
	7004	10/26/06 20:07:03.754		
	1010	10/26/06 20:07:03.762		
	7006	10/26/06 20:07:35.981		
	7009	10/26/06 20:07:35.990		
	7008	10/26/06 20:07:36.000		
	7007	10/26/06 20:07:35.969		
_	1			

The Application has three tabs, a) Input, b) Connections, c) Output. The Input tab shows the data received from PDS2000 by the application. Do not change the LOCAL PORT setting. It is possible to record this data to a 7K formatted file.

b) Connections. This tab is where you can add the IP Address (and port) of the computer to which you want data to be broadcast. For example..

Edit Port	×
Connection Information Computer 10.0.10.2	Port
7K Record Types	
□ 1010 □ 70 □ 1015 □ 70 □ 1016 □ 70 □ 7000 □ 70 □ 7004 □ 10 ☑ 7006	08 09 30
	Cancel OK

This example broadcast data to the PDS2000 Processing computer.

Refer to the 7K Interface Document for further information on each record. Record 7000 is Sonar Settings, 7006 is bathymetry, 7007 is sidescan, 7008 is snippets.

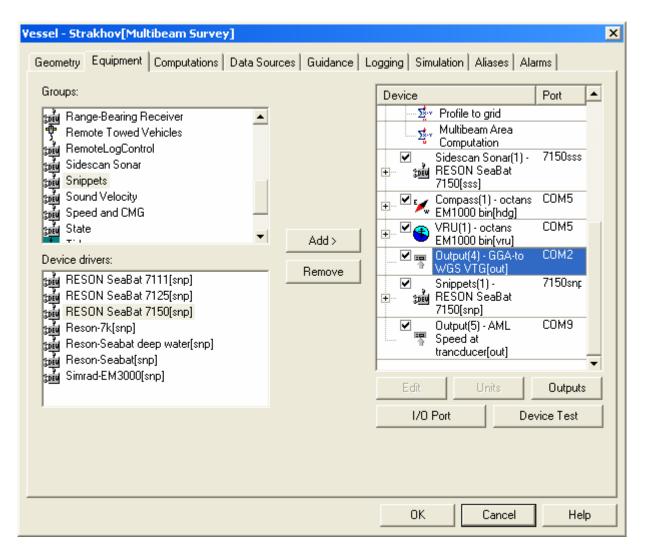


<b>2 7K Record Di</b> Input   Conne	stribution ctions Output			
Records	Connection	Port	Time Stamp	Status
7006	10.0.10.2	2000	10/26/06 20:08:31.879	Ok
4				<b>I</b> ▶
<u> </u>				

c) Output, on this tab you will the records being broadcast.



#### 7.4. IXSEA Octans – GPS Aiding



As mentioned in Chapter 5.4 and 5.5, problems were encountered during the Harbour Acceptance when it was noticed that the Octans unit was not detecting the GPS data, needed for automatic "aiding". Instead of an output of the DDU, a new NMEA GGA / VTG message output was added to the PDS2000 project.



# 8. SeaBat 7150 I/O Module

The I/O Module is installed on the 7150 Sonar Processor and is automatically started when the computer is started.

The I/O Module is responsible for:

- 1. Decoding the GPS NMEA ZDA time message and 1PPS (one pulse per second) from COM1 of the sonar processor. This is used for Windows Clock Synchronisation. Windows time is used by the Sonar Processor to time tag data packets.
- 2. Decoding the SVP-70 sound velocity data sent by PDS2000. The sound velocity (at the sonar array face) is used in the beamforming process.

The I/O Module has no settings or options. It is configured using the SeaBat 7K User Interface application.

	Serial Port Properties			×
60m	Select A Device Type	Select A Driver	Port Configuration -	4
RESON	External clock GFS receiver Heading only Sound velocity sensor Vertical Reference	Ashtech G12 PPS & ZDA Ashtech NMEA PTT Ashtech Z12 PPS Ifremer PPS Ifremer PPS & ZDA Novatel OEM4 TIMESYNC Reson-7k Sercel203pps&zda Simrad-EM950-Time Solitair Master Clock Trimble PPS Trimble PPS+ZDA Tritech Seanet	Port CDM1 Parity None Stop Bits 1 V	Baud Rate 9600  Data Bits 8  Leap Seconds To Add 0  0  0  0  0  0  0  0  0  0  0  0  0
Main Menu:7150 (12kHz)	Gates Menu: 7150 (12kHz)	Ocean Menu   Primary Display Settings	Data Recording 1/0 Module Setup	·
	, 9600 Baud,DataBits=8,Parit 9600 Baud,DataBits=8,Parity		Controls New Edit Remove	Device Status Display Connected To ID_Module leap second driver list size 4

Once the sonar is started, locate the I/O Module Setup tab in the User Interface...

The above shows the settings for the Clock Sync device (Trimble PPS + ZDA).

Each time the Sonar application is stopped, the I/O Module settings are stored. In case of problems, the existing device can be "Removed" and then a new device "Added" (for example External Clock, Trimble PPS+ZDA, COM1, 9600-8-N-1).

NOTE, the "Device Status" which is where errors are reported, and before starting any survey work, the status of the I/O Module should be checked.



Serial Port Properties			
Select A Device Type	Select A Driver	Port Configuration -	
External clock GPS receiver Heading only Sound velocity sensor Vertical Reference	MicroCAT SBE37 Reson SVP-C SBE45 Thermosalinograph Smart Probe Smart Probe with depth sensor Soundvelocity Sim Valeport miniSVS Valeport miniSVS mm Valeport miniSVS with pressure sensor	Port COM2  Parity None  Stop Bits 1	Baud Rate 9600 💌 Data Bits 8 💌
Device List	Gates Menu: 7150 (12kHz) [ Ocean Menu [ Primar 1900 Baud DataBites & Bacity Mana StarBites 1	y Display Settings   Data Rev	cording 1/0 Module Se
Valeport miniSVS,COM2,96	1600 Baud,DataBits=8,Parity None,StopBits=1 00 Baud,DataBits=8,Parity None,StopBits=1		New
			Edit
			Remove
			20

Above, the settings for the SVP-70 device.

Click "QC" to open the I/O Module using the 7K User Interface..

COM1	Driver		
	Diivei		
Baudrate: 9600 Parity: None	Trimble PPS+ZDA [tim]		
Data bits: 8 Stop bits: 1			
lessages	Data		
0x0000004AED88BCAF>\$GPZDA,085730.14,2;	10/	27/06 08:57:33	
)x0000004B82786C08> <t0+></t0+>			
)x0000004BA713EA39>\$GPGGA,085731.00,45 )x0000004BBABFBE36>\$GPVTG,81.0,T,,,012.4	UTC Time	85733.14	
x0000004BC4954A5B>\$GPZDA,085731.15,27	External Time	10/27/06 08:57:33.000	
)x0000004C590F61CB> <t0+> )x0000004C7D5EA736&gt;\$GPGGA,085732.00,49</t0+>	T Null	10/27/06 08:57:32.999	
)x0000004C9109F004>\$GPVTG,81.0,T,,,012.3;	T 1	10/27/06 08:57:32.999	
)x0000004C9ADFA31D>\$GPZDA,085732.14,2; )x0000004D2FA582B8> <t0+></t0+>	Pulse Length	0.00	
x0000004D53B9677D>\$GPGGA,085733.00,45 x0000004D67652AB5>\$GPVTG.80,5,T012.3	Difference	1.0 msec	



M2	Driver
Baudrate:     9600     Parity:     None       Data bits:     8     Stop bits:     1	Valeport miniSVS[svp]
ssages	Data
00000048EA7CE1A4> 1504.90 m 0000005018758AC4> 1504.90 m 000000544C6F015> 1504.90 m 000000587D66738C> 1504.90 m 0000005CAE5F3704> 1504.90 m 00000060DF579827> 1504.90 m 000000651050A666> 1504.90 m 0000006941490537> 1504.90 m 0000006D72415022> 1504.90 m 00000071A33A9920> 1504.90 m 00000075D43201C7> 1504.90 m	10/27/06 08:58:36 Speed of sound 1504.90

Record	
08:58:00.000 << 7k 7400, length 8400	
08:58:01.000 << 7k 7400, length 8400	
08:58:01.485 << 7k 7610, length 720	
08:58:02.000 << 7k 7400, length 840	
08:58:03.000 << 7k 7400, length 840	
08:58:04.000 << 7k 7400, length 8400	
08:58:05.000 << 7k 7400, length 8400	
08:58:06.000 << 7k 7400, length 8400	
08:58:06.485 << 7k 7610, length 7200	
08:58:07.000 << 7k 7400, length 8400	
08:58:08.000 << 7k 7400, length 840	
08:58:09.000 << 7k 7400, length 84 <b>0</b>	
08:58:10.000 << 7k 7400, length 84 <b>0</b>	
08:58:11.000 << 7k 7400, length 8400	
08:58:11.485 << 7k 7610, length 720	
08:58:12.000 << 7k 7400, length 8400	
08:58:13.000 << 7k 7400, length 8400	
08:58:14.000 << 7k 7400, length 8400	
08:58:15.000 << 7k 7400, length 840	
08:58:16.000 << 7k 7400, length 840	<b></b>



# 9. Valeport MIDAS System

The Valeport MIDAS was delivered during a visit to Helsingor, Denmark, in early 2006. The sensors comprising the MIDAS are listed as follows:

- Sound Velocity
- Turbidity
- Pressure
- Temperature
- Dissolved Oxygen
- Conductivity
- Water Bottle Sampler
- Fluorometer
- PH
- Redox



Figure 12a – Valeport MIDAS

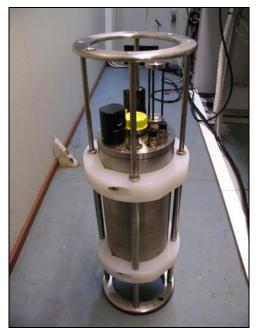


Fig 12b – Valeport MIDAS



Fig 12c – Valeport MIDAS

Normally data is recorded internally and exported to ASCII format using the Datalog 400 software installed on the processing PC. The 3m Y-splice is used to connect the sensor to a 9-way COM port.

#### 9.1. Datalog 400 Errors

During the SeaBat 7150 upgrade in October 2006, it was reported that the MIDAS unit was not working. A bench test on 18<sup>th</sup> October was able to repeat the Error



Message. With telephone support from Valeport on 19<sup>th</sup> October, the unit was again functioning. Missing parameters from the REDOX sensor setup caused "out of range" values which in turn mean the Datalog 400 error.

#### 9.2. PH Sensor

A bench test of the PH sensor on 20<sup>th</sup> October showed the unit to be faulty. On advice from Valeport, attempts were made to clean the sensor, but it failed altogether.

#### 9.3. REDOX Sensor

A bench test of the PS sensor on 20<sup>th</sup> October in which the sensor was immersed in Standard Solution, showed the unit to be working well.

#### 9.4. Water Sampler

A bench test of the water sampler and three bottles showed the unit to be working well.

#### 9.5. Deployment To 2,000m

On 25<sup>th</sup> October the complete unit was deployed to 2,000m, but on it's return it failed to allow data connection to recover the data. The unit was opened and found to be full of water.