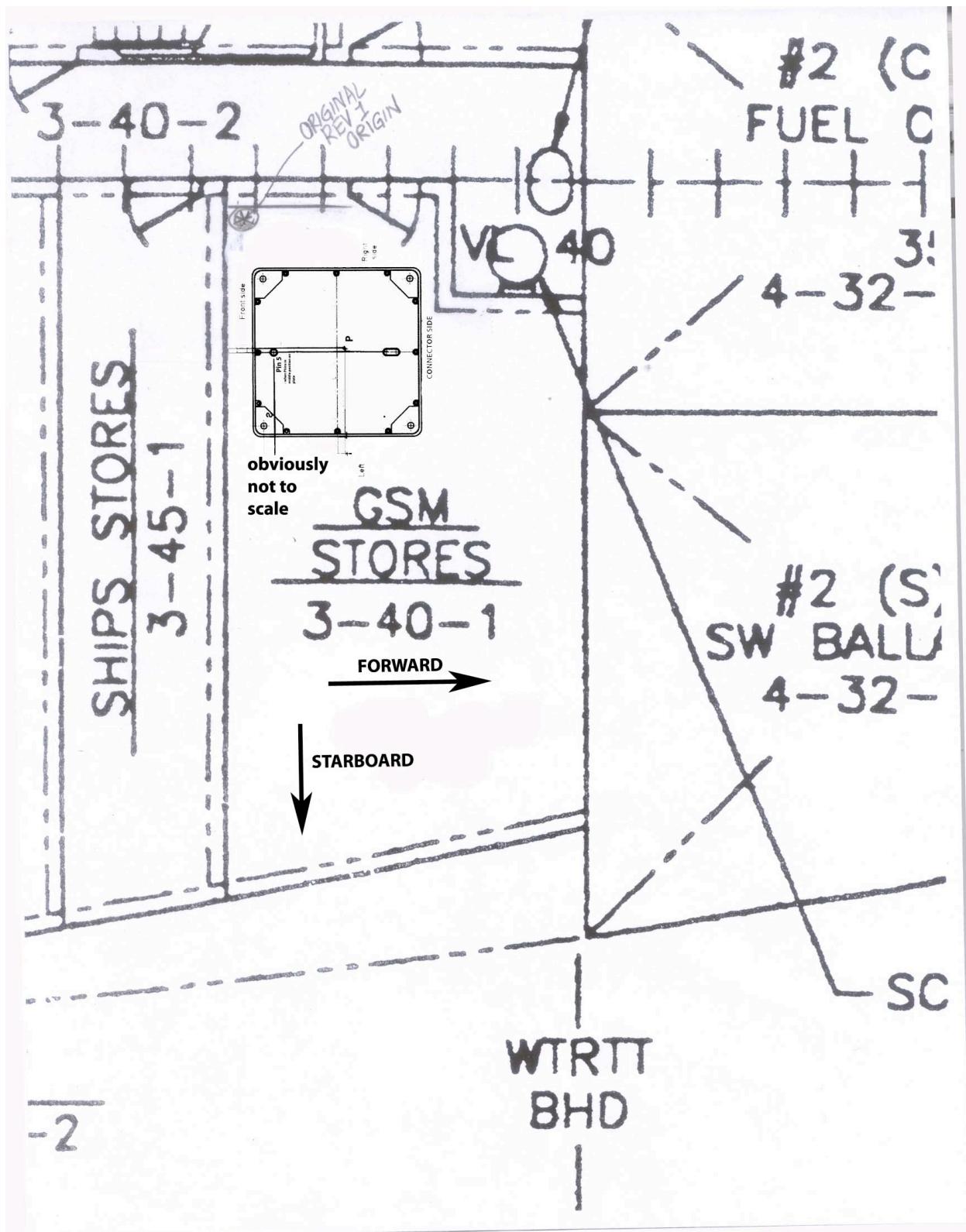


# PHINS SETTINGS

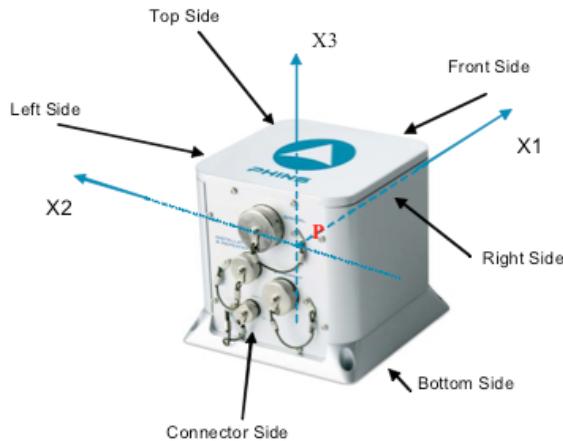
to find Phins setting screen shots look for "\*\*\*\*"

Last update: 2019-April-7 (new survey)

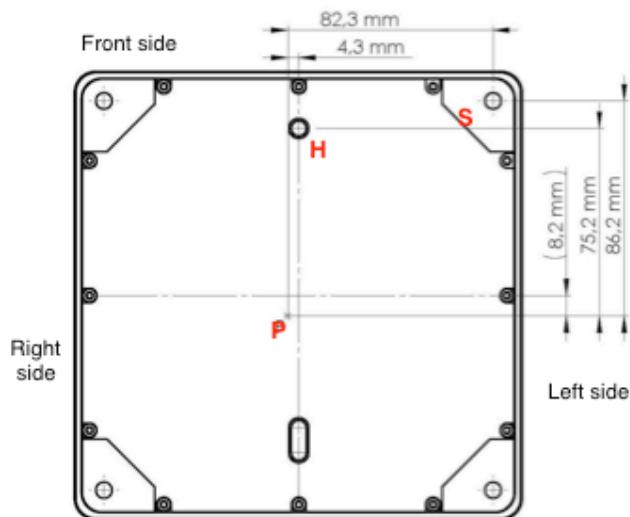
PHINS location and orientation in GSM Stores – tank top



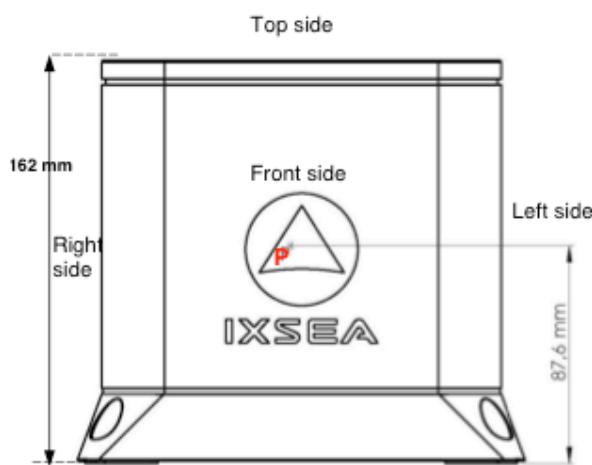
# PHINS offsets to reference, and conventions



## 5.2.2. Center of measurement position



**\*NOTE – this drawing is in a very “odd” view orientation. It is like a mirror image of the orientation in the GSM Stores.**



## Angular and linear orientation

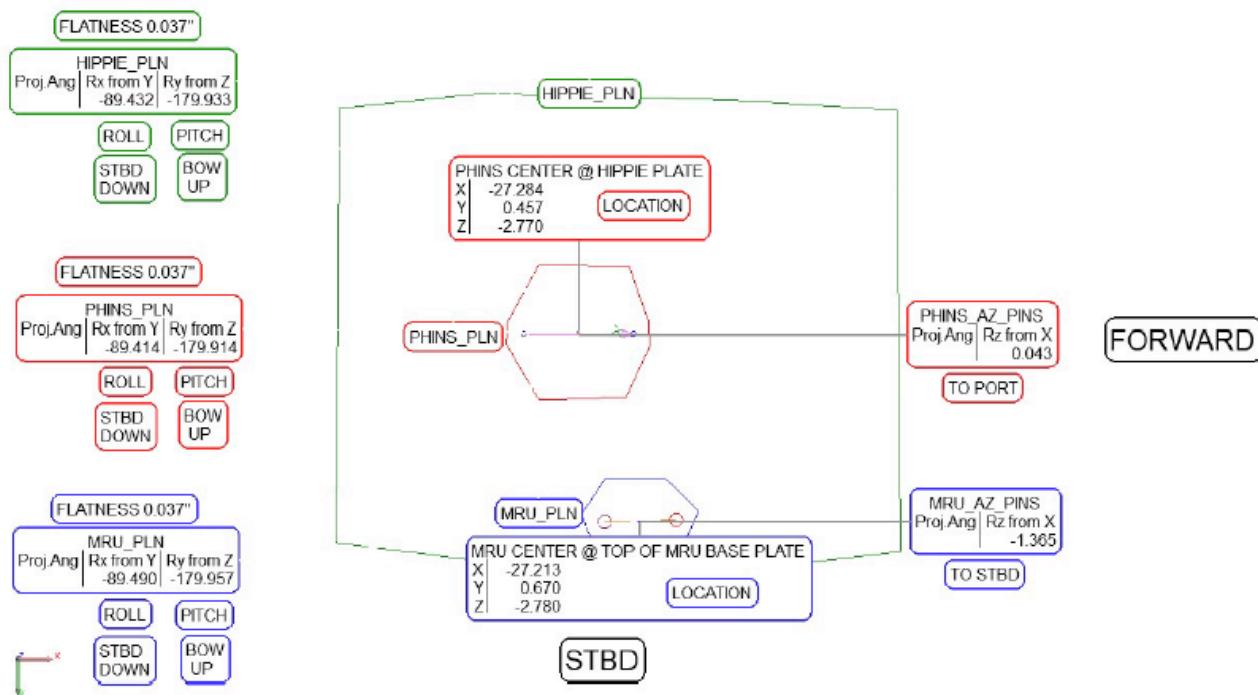
Roll, Pitch and Heading angular offsets were entered based on survey data from the Atlantis survey of February 2019.

TABLE 3- INCLINATIONS- 2019 SURVEY DECIMAL DEGREES

FEATURE	Azimuth	Rotation	Pitch	Rotation	Roll	Rotation
HIPPIE	N/A	N/A	0.067	BOW UP	0.568	STBD DOWN
PHINS	0.043	PORT	0.086	BOW UP	0.586	STBD DOWN
MRU	1.365	STBD	0.043	BOW UP	0.510	STBD DOWN
EM122 TX	0.009	PORT	0.055	BOW UP	0.140	STBD UP
EM 122RX	0.103	STBD	0.068	BOW DOWN	0.082	STBD UP



2019\_HIPPI\_PHINS\_MRU



Roll is counted positively when turning counter-clockwise around XV1 . Roll is counted positive when vehicle left side (or vessel port side) is up. Pitch is counted positively from the local horizontal plane to the XV1 axis when turning counter-clockwise around XV2 .

That means that the pitch is positive when vehicle's front (or vessel's bow) is down. Heading is the angle between the north axis XN and the projection XV h 1r of the XV1

vehicle axis in the local horizontal plane defined by the two vectors XN and XW . Heading is counted positive eastwards from XN.

Geometry of the Phins presently:

Roll: 0.586 Stbd Down / Port Up (coming from Table 3)

Pitch: 0.086 Bow Up / Aft down (coming from Table 3)

Heading : 0.043 Port (coming from Table 3)

In order to correct the geometry of the phins:

Roll: -0.586 = rotate the phins Port Down to correct

Pitch: 0.086 = rotate the phins Bow Down to correct

Heading : 0.043 misalignment is to the Port

\*\*\*see below for further description

From the PHINS – Part 2: Definitions, Conventions & Specifications Manual page II-10:

Roll misalignment bias

The roll misalignment bias is the angle of the rotation around PHINS axis X1 which brings PHINS axis X2 into the vessel horizontal plane (XV1, XV2). In the Figure II.8, the value of the roll misalignment bias to be entered in the Web-Based User Interface to configure PHINS is negative.

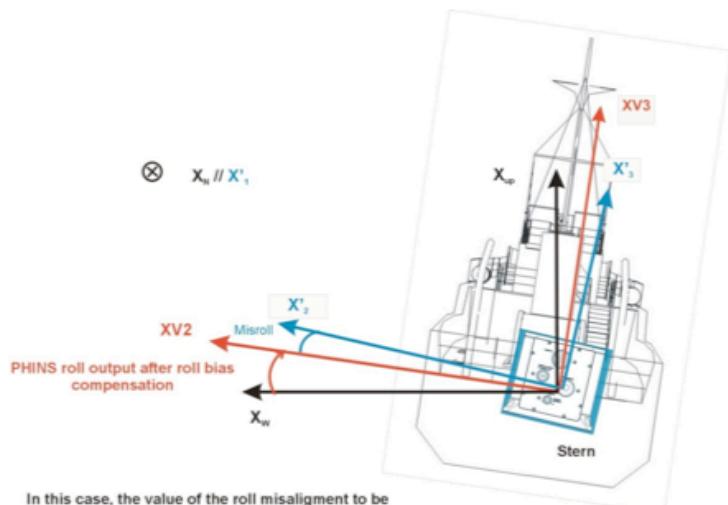


Figure II.8 - Roll misalignment bias [in case of null pitch and heading]

**Roll:** As the port edge of the hippy plate is “up” base on the surveyor’s description, it matches the example, and the sign should be negative.

#### Pitch misalignment bias

Pitch misalignment bias is the angle between PHINS axis X1 and its projection in the vessel horizontal plane (XV1, XV2). On Figure II.9, the value of the pitch misalignment bias to be entered in the Web-based User Interface to configure PHINS is negative.

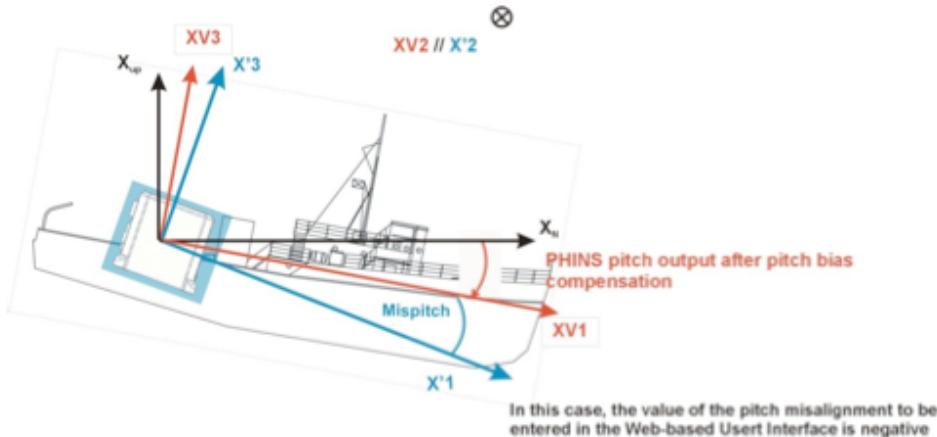


Figure II.9 - Pitch misalignment bias in case of null roll and heading

**PITCH:** As thehippy plate orientation was described as “bow up” it’s orientation does not match the example from the Phins manual. In order to correct the misalignment, one must rotate “bow down”, so the pitch misalignment is positive.

#### Heading misalignment bias

The heading misalignment bias is the angle between the projection of PHINS axis X1 into the vessel horizontal plane (XV1, XV2) and the vessel axis XV1. In the Figure II.10, the value of the heading misalignment bias to be entered in the Web-based user Interface to configure PHINS is positive.

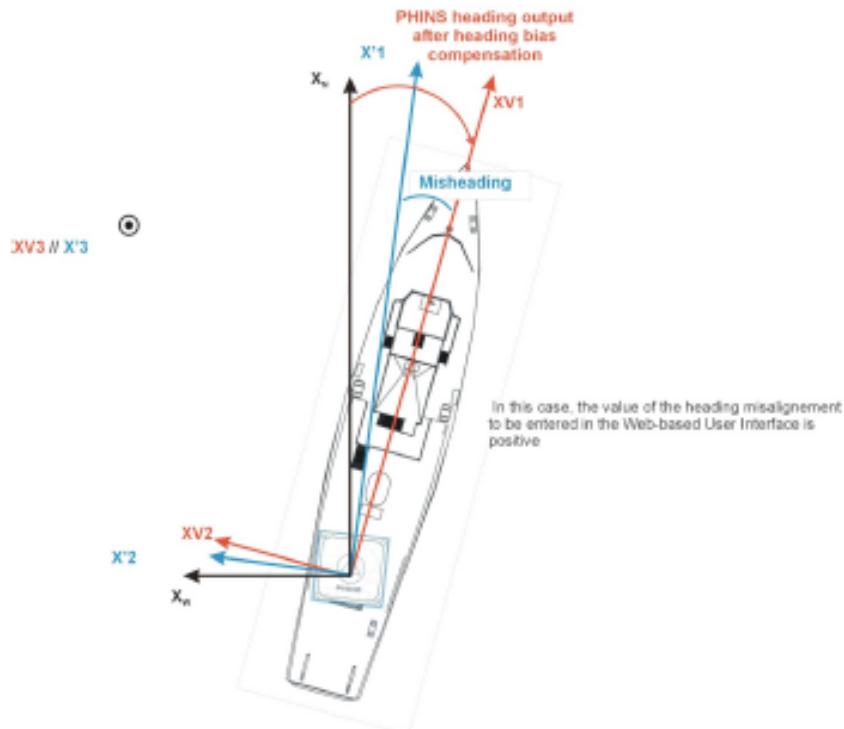


Figure II.10 - Heading bias misalignment in case of null roll and pitch

**\*\*\*ENTRY IN PHINS:**

 **Lever arm settings** 

 Angular and linear orientation

Vessel misalignment		Primary lever arm	
Heading (°)	0.043	Length XV1 (m)	0.000
Roll (°)	-0.586	Length XV2 (m)	0.000
Pitch (°)	0.086	Length XV3 (m)	0.000
Secondary lever arm			
Length XV1 (m)	A 0.000	B 0.000	C 0.000
Length XV2 (m)	0.000	0.000	0.000
Length XV3 (m)	0.000	0.000	0.000
Orientation			
Vessel XV1 (Prow)	Connectors side		
Vessel XV2 (Port)	Right side		
Vessel XV3 (Up)	Top side		

**LEVER ARMS:** (From survey results and Phins manual)

LOCATION	X(meters)	Y(meters)	Z(meters)
PHIN_CENTER @ hippy plate - from survey - assuming center is only center in X-Y axes not in Z axes (at bottom of phins)	-27.284	0.457	-2.770
values to move from center point to reference point - see phins diagram	move forward 0.00820	move Port -0.00430	move up -0.08760
P (Phins Reference Point in Unit)	-27.27580	0.45270	-2.85760
Phins Reference Point	-27.276	0.453	-2.858
to get from Phins reference to PRIMARY CNAV antenna	move aft	move port	Move up
Primary CNAV antenna - survey 2019	-37.465	-2.929	-30.246
from outer base of the antenna to get to center - use halfway between L1 & L2	0.000	0.000	-0.055
PRIMARY CNAV ANTENNA REFERENCE	-37.465	-2.929	-30.301
PRIMARY CNAV (this is the far port end of the antenna catwalk) from PHINS Reference Point (mm)	-10.189	-3.382	-27.443
PRIMARY CNAV from PHINS as per MAC	-10.189	3.382	27.443

The sign convention for the survey was different from what the phins wants:

SURVEY CONVENTION:	(X) forward + **used in calculations above
Multibeam Convention:	(X) forward + (Y) STBD + (Z) Down +
Phins Conventions: ** offsets entered into Phins must use this convention	XV1 forward + XV2 port + XV3 up +

vessel horizontal plane, pointing forward to bow  
vessel horizontal plane, pointing from Stbd to Port  
is perpendicular to the vessel horizontal plane, pointing upward

The PHINS manual – Part II – Definitions, Conventions & Specifications page 12 defines the lever arm as:

\*External sensor lever arm is the distance from PHINS center of measurement P to the center of measurement of the external sensor.  
So the offsets to enter into Phins are as follows:

	Phins Offset (meters)
PRIMARY CNAV POSITION :	XV1 -10.189 aft is negative
	XV2 3.382 port is positive
	XV3 27.443 up is positive

**\*\*BE EXTREMELY CAREFUL WITH PHINS OUTPUT DATA STRING CONVENTIONS. MANY ARE LISTED INCORRECTLY IN THE MANUALS (as of 2018-Jan-11). Example, TSS strings – when they were used it was discovered that the manual was wrong about the convention, causing the beacon to jump all over the place.**

The PHINS manual – Part II – Definitions, Conventions & Specifications page 12 defines the lever arm as:

- External sensor lever arm is the distance from PHINS center of measurement P to the center of measurement of the external sensor.

So the offsets are entered as follows:

	CNAV	
XV1	-10.189 meters	negative since moving aft to get to antenna
XV2	3.382 meters	positive since moving port to get to antenna
XV3	27.443 meters	positive since moving up to get to antenna

### \*\*\*ENTRY IN PHINS

COG lever arm

Length XV1 (m)	0.000
Length XV2 (m)	0.000
Length XV3 (m)	0.000

GPS lever arm

Length XV1 (m)	-10.190	Length XV1 – could not enter -10.189 – think the “-“ is actually taking up a decimal place
Length XV2 (m)	3.382	
Length XV3 (m)	27.443	

GPS2 lever arm

Length XV1 (m)	-10.710	These need to be corrected – the 1850 has been moved
Length XV2 (m)	2.819	
Length XV3 (m)	26.997	

Manual GPS lever arm

Length XV1 (m)	0.000
Length XV2 (m)	0.000
Length XV3 (m)	0.000

DVL lever arm and misalignment

LogEM lever arm

Depth lever arm

USBL lever arm

LBL lever arm

---

The 1850 antenna is hooked up to PHINS via port D, but the lever arm is incorrect (as of April 2019). The antenna was moved during shipyard. The feed from the 1850 is in the Chartroom (ComET j-box).

No COG lever arm values entered. We decided to compute values at the present PHINS location and allow other equipment to correct this as needed rather than move the PHINS to the COG location.

### \*\*\*ENTRY IN PHINS

**Lever arm settings**

- [Angular and linear orientation](#)
- [COG lever arm](#)
- [GPS lever arm](#)
- [GPS2 lever arm](#)
- [Manual GPS lever arm](#)

Length XV1 (m)	0.000
Length XV2 (m)	0.000
Length XV3 (m)	0.000

[DVL lever arm and misalignment](#)

Misalignment		Lever arm	
Heading (°)	0.044	Length XV1 (m)	0.000
Roll (°)	-0.998	Length XV2 (m)	0.000
Pitch (°)	-0.057	Length XV3 (m)	0.000
Scale Factor (%)	0.0		
Misalignments calibration		Offset	
Heading (°)	0.000	XV1 (m/s)	0.000
Pitch (°)	0.000	XV2 (m/s)	0.000
Scale Factor (%)	0.0	XV3 (m/s)	0.000
<input type="button" value="Calibration"/>			

[LogEM lever arm](#)

Length XV1 (m)	0.000
Length XV2 (m)	0.000
Length XV3 (m)	0.000

[Depth lever arm](#)

Lever arm		Offset	
Length XV1 (m)	0.000	Offset (m)	0.000
Length XV2 (m)	0.000		
Length XV3 (m)	0.000	<input type="button" value="Zero depth"/>	

No manual GPS lever arm entered.

Under DVL lever arm and misalignment (these values updated automatically based on the angular orientation, etc.

No other lever arms used (screen dumps illustrate this).



## Lever arm settings



- [Angular and linear orientation](#)
- [COG lever arm](#)
- [GPS lever arm](#)
- [GPS2 lever arm](#)
- [Manual GPS lever arm](#)
- [DVL lever arm and misalignment](#)
- [LogEM lever arm](#)
- [Depth lever arm](#)
- [USBL lever arm](#)

Beacon ID - TpCode n°0

Length XV1 (m)

Length XV2 (m)

Length XV3 (m)

- [LBL lever arm](#)

Length XV1 (m)

Length XV2 (m)

Length XV3 (m)

## \*\*\*ENTRY IN PHINS PHINS SETTINGS FOR EXTERNAL SENSORS COMING IN (GPS)

**External sensor settings**

**GPS settings**

Stream	In A
Rejection filter mode	Always true
Latitude	32.66984233 *
Longitude	242.77111949 *
Altitude	24.889 m
Mode	2
Reception time	16:38:35.000

**GPS2 settings**

Stream	In D
Rejection filter mode	Always false
Latitude	32.66983668 *
Longitude	242.77116166 *
Altitude	29.500 m
Mode	1
Reception time	16:38:35.000

**Manual GPS**

**DVL settings**

Stream	None
Rejection filter mode	
Bottom speed	Always false
Watermass speed	Always false
Bottom speedX	---
Bottom speedY	---
Bottom speedZ	---
Water speedX	---
Water speedY	---
Water speedZ	---
Sound speed	---
Range to bottom	---
Reception time	---

**External sensor settings**

**GPS settings**

**GPS2 settings**

**Manual GPS**

**DVL settings**

**LochEM settings**

Stream	None
Rejection filter mode	Always false
Speed norm	---
Reception time	---

**Depth settings**

Stream	None
Rejection filter mode	Always false
Depth	---
Reception time	---

**Sound speed settings**

Stream	None
Sound speed	---

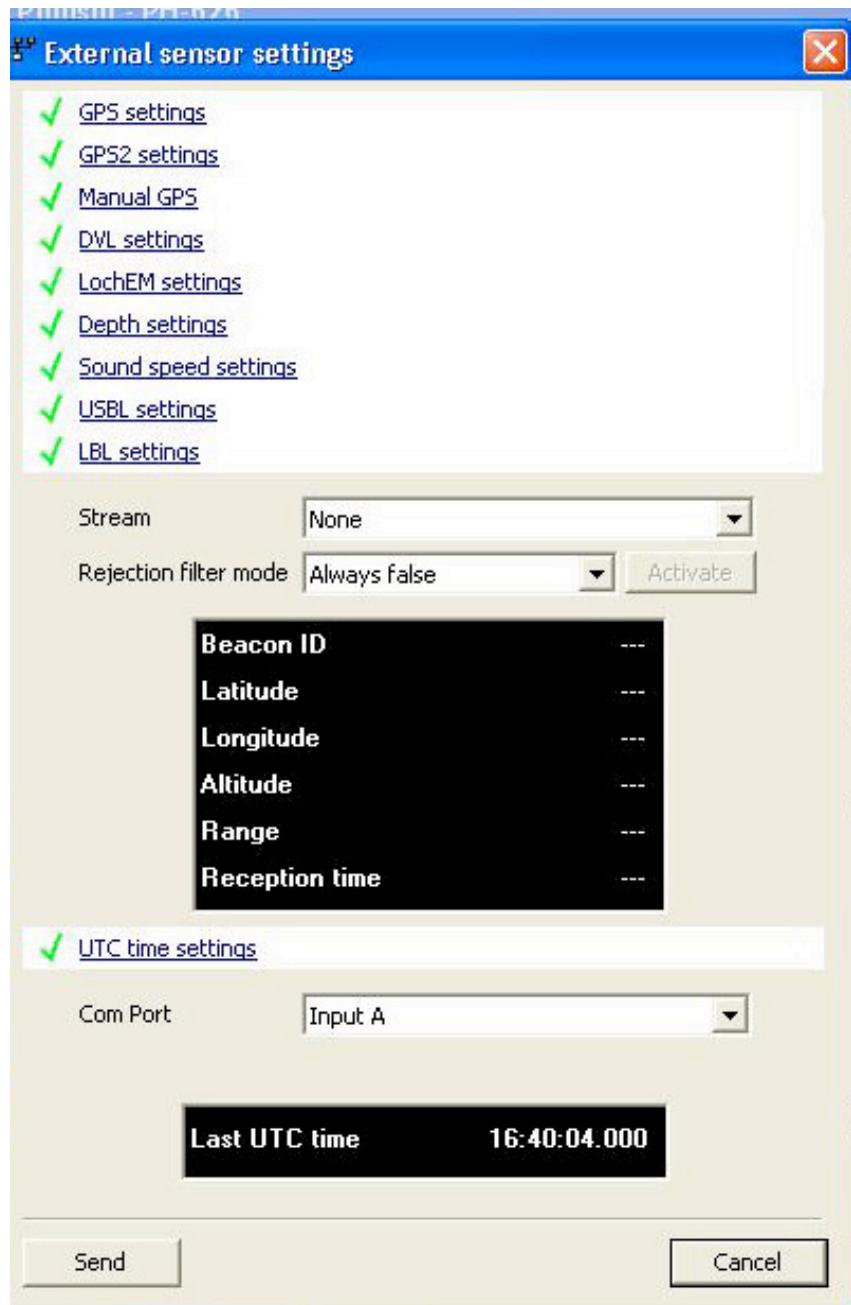
**USBL settings**

**Beacon settings**

Beacon ID - TpCode	n°0
Stream	None
Rejection filter mode	Always false

**Beacon display**

Beacon ID - TpCode	n°0
Beacon ID	---
TpCode	---
Latitude	---
Longitude	---
Altitude	---
Delay	---
Reception time	---



# PHINS PORT SETTINGS

## PORT A

**Input/output settings**

Select IO settings: Input Data

In A | In B | In C | In D | In E

**Protocol**

Protocol: GPS  
Device: Serial only

**Serial Port**

Baudrate: 9.6 kbauds  
Parity: None  
Stopbit: 1.0 bitstop  
Level: RS422

**Ethernet**

Transport: TCP Server  
IP Address: 192.168.36.102  
Port: 8117

**Send** **Cancel**

**Input/output settings**

Select IO settings: Output Data

Out A | Out B | Out C | Out D | Out E

**Protocol**

Protocol: GPS LIKE  
Rate (ms): 1000ms - 1Hz  
Device: Serial only  
GPS Altitude: Geoid (MSL)  
Lever arm: Primary Lever arm  
Heave filter: Real Time Heave

**Serial Port**

Baudrate: 19.2 kbauds  
Level: RS422  
Parity: None  
Stopbit: 1.0 bitstop

**Ethernet**

Transport: TCP Server  
IP Address: 192.168.36.102  
Port: 8112

**Send** **Cancel**

**Input/output settings**

Select IO settings: Input Pulse

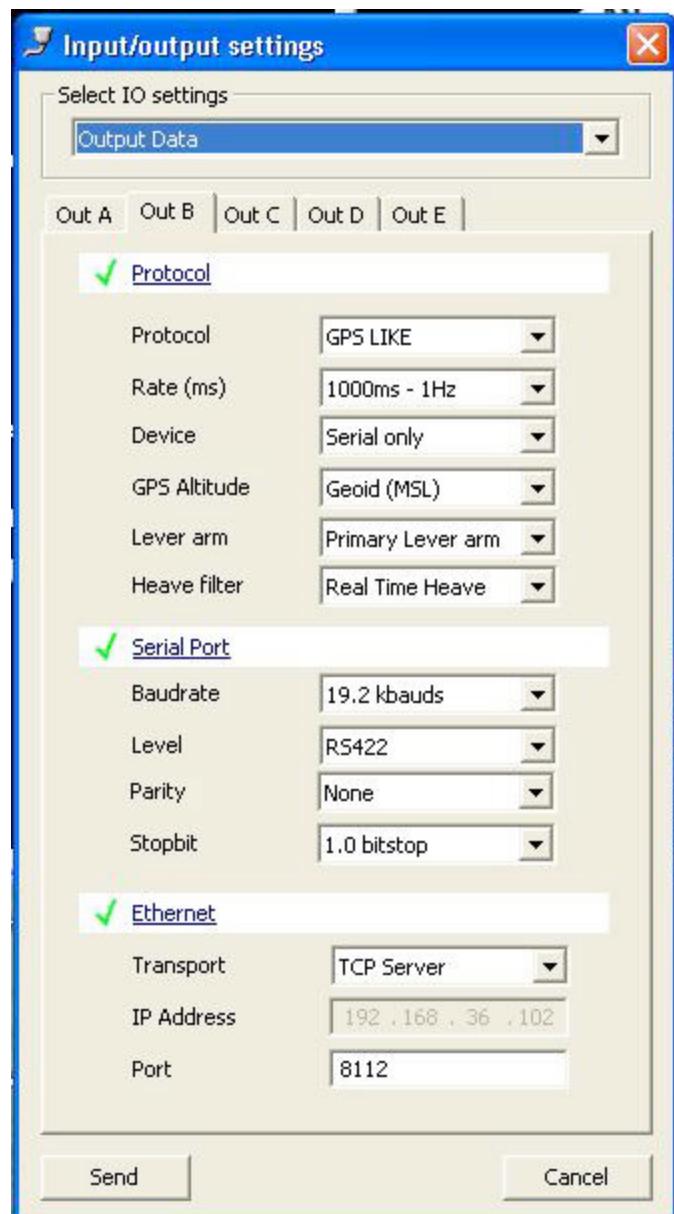
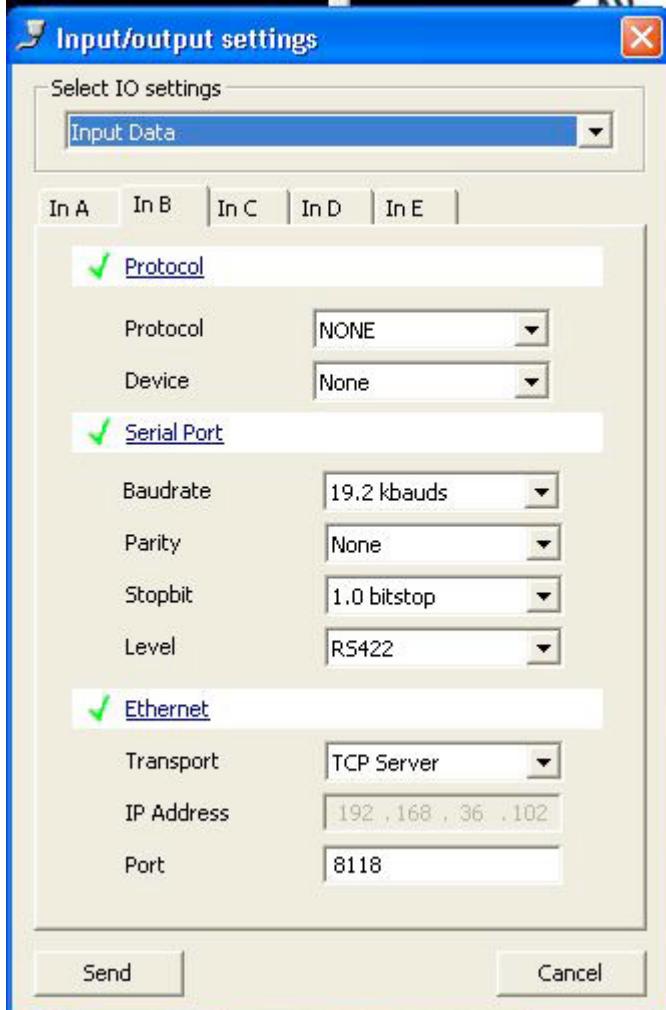
Input Pulse A | Input Pulse B | Input Pulse C | Input Pulse D

**Input**

Protocol: PPS Rising+Time  
Parameter: 0.00

**Send** **Cancel**

## PORT B



## PORT C

**Input/output settings** X

Select IO settings  
Input Data

In A | In B | In C | In D | In E |

Protocol

Protocol	NONE
Device	None

Serial Port

Baudrate	19.2 kbauds
Parity	None
Stopbit	1.0 bitstop
Level	RS232

Ethernet

Transport	TCP Server
IP Address	192 . 168 . 36 . 102
Port	8119

Send Cancel

**Input/output settings** X

Select IO settings  
Output Data

Out A | Out B | Out C | Out D | Out E |

Protocol

Protocol	SIMRAD EM
Rate (ms)	10ms - 100Hz
Device	Serial only
GPS Altitude	Geoid (MSL)
Lever arm	Primary Lever arm
Heave filter	Real Time Heave

Serial Port

Baudrate	19.2 kbauds
Level	RS232
Parity	None
Stopbit	1.0 bitstop

Ethernet

Transport	TCP Server
IP Address	192 . 168 . 36 . 102
Port	8113

Send Cancel

## PORT D

**Input/output settings**

Select IO settings  
Input Data

In A | In B | In C | In D | In E |

Protocol

Protocol: GPS  
Device: Serial only

Serial Port

Baudrate: 4.8 kbauds  
Parity: None  
Stopbit: 1.0 bitstop  
Level: RS232

Ethernet

Transport: TCP Server  
IP Address: 192 . 168 . 36 . 102  
Port: 8120

**Send** **Cancel**

**Input/output settings**

Select IO settings  
Output Data

Out A | Out B | Out C | Out D | Out E |

Protocol

Protocol: OCTANS STANDARD  
Rate (ms): 1000ms - 1Hz  
Device: Serial only  
GPS Altitude: Geoid (MSL)  
Lever arm: Primary Lever arm  
Heave filter: Real Time Heave

Serial Port

Baudrate: 4.8 kbauds  
Level: RS232  
Parity: None  
Stopbit: 1.0 bitstop

Ethernet

Transport: TCP Server  
IP Address: 192 . 168 . 36 . 102  
Port: 8114

**Send** **Cancel**

## PORT E

**Input/output settings**

Select IO settings  
Input Data

In A | In B | In C | In D | In E |

**Protocol**

Protocol: NONE  
Device: None

**Serial Port**

Baudrate: 38.4 kbauds  
Parity: None  
Stopbit: 1.0 bitstop  
Level: RS422

**Ethernet**

Transport: TCP Server  
IP Address: 192 . 168 . 36 . 102  
Port: 8121

**Send** **Cancel**

**Input/output settings**

Select IO settings  
Output Data

Out A | Out B | Out C | Out D | Out E |

**Protocol**

Protocol: TECHSAS  
Rate (ms): 100ms - 10Hz  
Device: Serial only  
GPS Altitude: Geoid (MSL)  
Lever arm: Primary Lever arm  
Heave filter: Real Time Heave

**Serial Port**

Baudrate: 38.4 kbauds  
Level: RS422  
Parity: None  
Stopbit: 1.0 bitstop

**Ethernet**

Transport: UDP  
IP Address: 192 . 168 . 36 . 101  
Port: 8115

**Send** **Cancel**

**Input/output settings**

Select IO settings  
Input Pulse

Input Pulse A | Input Pulse B | Input Pulse C | Input Pulse D |

**Input**

Protocol: PPS Rising+Time  
Parameter: 0.00

**Send** **Cancel**