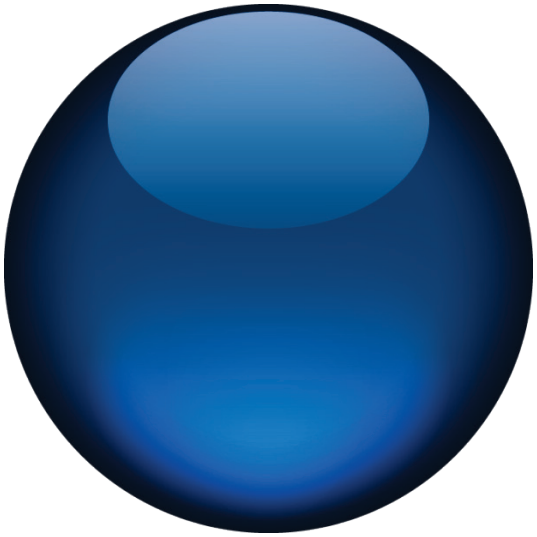


INS

Advanced Configuration

User Guide

IXBLUE
DEEP INSIGHT. SHARPER SENSES.

Document Revision History

Edition	Date	Comments
A	09/2011	First Edition
B	02/2012	iXBlue graphical chart applied to the document
C	03/2012	ATLANS & QUADRANS products added
D	02/2013	New colors applied to the document
E	10/2013	Firmware versions updated VBW replaced by EMLOG VBW in table 10 Appendix B added
F	11/2014	OCTANS NANO product added
G	05/2015	Command availability, General system configuration and external sensors chapters updated
H	07/2015	Chapter 5 updated
I	12/2015	Set system run time since manufacturing and USBL interface command updated.
J	01/2016	Chapter 4.11 updated. Appendix “Orientation and Sign Conventions Recall” deleted.
K	05/2016	PHINS COMPACT C7 product added. EM Log 2 configuration added. Port mapping & ID chapter added.
L	10/2016	PHINS COMPACT C3 and ROVINS NANO product added. Chapters 2, 6.1.2 & 6.1.3 updated. Travelled distance Reset, Static convergence selection, Go to navigation, DVL command chapters added.
M	11/2016	Chapters 6.4 & 6.2.3 updated. Chapter “DVL triggered by Pulse Out” added.

Copyright

Disclaimer

iXBlue specifically disclaims all warranties, either expressed or implied, included but not limited to implied warranties of merchantability and fitness for a particular purpose with respect to this product and documentation. iXBlue reserves the right to revise or make changes or improvements to this product or documentation at any time without notify any person of such revision or improvements.

In no event shall iXBlue be liable for any consequential or incidental damages, including but not limited to loss of business profits or any commercial damages, arising out of the use of this product.

Trademarks

Microsoft, MS-DOS and Windows are registered trademarks of Microsoft Corporation.

Intel and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation.

Text Usage

Bold	Bold text is used for items you must select or click in the software. It is also used for the field names used into the dialog box.
`Courier`	Text in this font denotes text or characters that you should enter from the keyboard, the proper names of disk Drives, paths, directories, programs, functions, filenames and extensions.
Italic	Italic text is the result of an action in the procedures. It is also used for referencing to other document titles.

Icons

The **Note** icon indicates that the following information is of particular interest and should be read with care.

Important

The **Important** mention indicates that the following information should be read to forbid or prevent a product dysfunction or a faulty operation of the equipment.

The **Caution** icon indicates that the following information should be read to forbid or prevent product damage.

The **Warning** icon indicates that possible personal injury or death could result from failure to follow the provided recommendation.

Abbreviations and Acronyms

Abbreviations and acronyms are described in document *Inertial Products - Principle & Conventions (Ref.: MU-INS&AHRS-AN-003).*

Table of Contents

1 INTRODUCTION

This document describes the Inertial Navigation Systems (INS) configuration and monitoring commands which can be used during operation. These commands are sent directly through the repeater port to check settings and modify INS or external sensors configuration (depending of the external sensor and of the INS capabilities), to reset the unit, and save the configuration to PROM.

However, commands described below are exactly equivalent to the ones which are sent by the Web-based User Interface. They may be useful when launching and using the Web-based User Interface during operation is not possible.

2 VERSION AND PRODUCTS CONCERNED

The current edition of this document is applicable to the following INS:

Table 1 – List of products and firmware

Product	Firmware version
PHINS	CINT 6.50 version
PHINS COMPACT C3	
PHINS COMPACT C7	
ROVINS	
ROVINS NANO	
PHINS 6000	
HYDRINS	
MARINS	
LANDINS	
QUADRANS	
AIRINS	
ATLANS	

Refer to section 7.1.1 to check the firmware version currently downloaded into your unit.

Several commands described in this manual are associated with specific external sensors that may not be available on your product. Please, refer to *your Product User Manual* to check which external sensors are available.

Contact iXBlue customer support to check if your system is eligible to a firmware update (see document: *Inertial Products - General Information (Ref.: MU-INS&AHRS-AN-007)* for contact information).

3 GENERAL CONVENTIONS

3.1 Command Syntax

All frames are compatible with NMEA 0183 standard and are formatted as follows:
$PIXSE,CONFIG,NAME[,xxx,…,..y]*hh<CR><LF> for generic configuration commands
$PIXSE,TEXT__,NAME[,xxx,…,..y]*hh<CR><LF> for generic configuration text retrieve commands
$PHCNF,NAME[,xxx,…,..y]*hh<CR><LF> for INS III specific configuration commands
$PHTXT,NAME[,xxx,…,..y]*hh<CR><LF> for INS III specific configuration text retrieve commands

$ is a header and "NAME" depends on the command

Brackets **[ ]** indicates optional parameters, depending on the command. Most commands can be used either to send configuration parameters "**xxx,…,..y**" to the system, or to ask for the current value for the parameter. In such case, the "**xxx,…,..y**" should be replaced by "**,,**".

"**hh**" is the checksum of the sentence, and allows for a control during the transmission. It is calculated by exclusive-OR'ing (XOR) the 8 bits (no start bits or stop bits) of each character in the sentence, excluding "**$**" and "*****". The hexadecimal values of the most significant and least significant 4 bits of the result are converted to two ASCII (0-9, A-F) for transmission. The most significant character is transmitted first.
The checksum field is required in all transmitted sentences. All frames should be ended by the two characters **<CR><LF>** (0D 0A hexadecimal).

A web based NMEA calculator can be found in Annex A to help computing checksums.

3.2 How to Send and Receive Commands

The INS will listen for COMMAND protocol on repeater flow, which is available on repeater connector, digital connector and Ethernet.

Repeater serial configuration is fixed and set to 57 600 bauds, odd parity bit, 2 stop bits.
Repeater Ethernet configuration is fixed to TCP IP port 8110 in server mode.

Repeater flow will also output PHINS STANDARD protocol.

Answers to commands sent to this port will thus be mixed in PHINS STANDARD output frames (refer to INS Library Interface for detail).

If a command is not correctly formatted, the INS will ignore it and no answer will be sent.
If a parameter is out of allowed range, it will be ignored by the INS and set to default value (0 or none).
Thus, to confirm that a command was correctly handled by the INS, the control application should systematically send the command to change a parameter, and then send the read back command to check stored value.
After all changes are made, the application can send a SAVE command to store parameters in non-volatile memory inside the INS.

3.3 Command Availability

Following table details command availability depending on system type:

Table 2 – General system configuration

Command	PHINS PHINS COMPACT C7 PHINS COMPACT C3 ROVINS NANO	ROVINS	PHINS 6000	HYDRINS	MARINS	QUADRANS	AIRINS	ATLANS	LANDINS
General System Configuration									
Communication mode	✓	✓	✓	✓	✓	✓	✓	✓	✓
Save to eeprom	✓	✓	✓	✓	✓	✓	✓	✓	✓
Software system reboot	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reset to factory DSP parameters	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reset to factory MPC parameters	✓	✓	✓	✓	✓	✓	✓	✓	✓
Web MMI password reset	✓	✓	✓	✓	✓	✓	✓	✓	
Initial position	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manual UTM position	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heading, roll, pitch biases	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heading, roll, pitch biases ref					✓				
Axis orientation	✓	✓	✓	✓	✓	✓	✓	✓	✓
Main Lever Arms	✓	✓	✓	✓	✓		✓	✓	✓
Secondary Lever Arms	✓	✓	✓	✓	✓		✓	✓	✓
Position of the vessel center of gravity	✓	✓	✓	✓	✓				
Zero velocity update mode	✓	✓	✓	✓	✓		✓	✓	✓
Turn ON/OFF DVL/odometer calibration mode	✓	✓	✓		✓		✓	✓	✓

Command	PHINS PHINS COMPACT C7 PHINS COMPACT C3 ROVINS NANO	ROVINS	PHINS 6000	HYDRINS	MARINS	QUADRANS	AIRINS	ATLANS	LANDINS
Starting mode configuration	✓	✓	✓	✓	✓		✓	✓	✓
Altitude Calculation mode configuration	✓	✓	✓	✓	✓		✓	✓	✓
Heave parameters	✓	✓	✓	✓	✓				
External Sensor Configuration									
DVL Configuration	✓	✓	✓		✓				✓
Odometer Configuration								✓	✓
EM Log configuration	✓				✓	✓			✓
GPS Configuration	✓	✓	✓	✓	✓	✓	✓	✓	✓
GPS2 Configuration	✓	✓	✓		✓				✓
Manual GPS Configuration	✓	✓	✓		✓		✓	✓	✓
Depth sensor configuration	✓	✓	✓		✓				✓
USBL configuration	✓	✓	✓						✓
LBL configuration	✓	✓	✓						✓
UTC interface configuration	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interfaces Configuration									
Serial and Ethernet commands	✓	✓	✓	✓	✓	✓	✓	✓	✓
Network Setup Command	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pulses Interfaces	✓	✓	✓	✓	✓	✓	✓	✓	✓

4 GENERAL SYSTEM CONFIGURATION

4.1 Communication Mode

To start the communication with INS in User Mode:

Message	$PIXSE,CONFIG,WAKEUP*40<CR><LF>
Title	Starting Communication with the INS in User Mode

This command exists for compatibility with previous INS generation, but is not required on INS generation III. Commands can be sent directly without having to call WAKEUP before.

4.2 Save to EEPROM

To save all parameters into EEPROM:

Message	$PIXSE,CONFIG,SAVE__*5C<CR><LF>
Title	Save Configuration to EEPROM

Please note the 2 underscores (''_'') characters at the end of this frame.

4.3 Software System Reboot

To reboot the system by software, following command can be used:

Message	$PIXSE,CONFIG,RESET_*57<CR><LF>
Title	Restart INS algorithm

Warning

The unit will restart with the configuration saved into EEPROM. It is recommended to perform a save to PROM command (see section 4.2) before resetting if you changed the settings and want to keep them.

4.4 Reset to Factory DSP Parameters

To reset DSP parameters to factory defaults, following command can be used:

Message	$PIXSE,CONFIG,RSTDSP*4F<CR><LF>
Title	Reset DSP parameters to factory defaults

Important

This command resets only DSP parameters (lever arms, system orientation, algorithm modes, initial position, etc.). Default parameters will only apply at next reboot.
To completely reset system settings, use RSTMPC command as well.

Refer to Appendix B for details on factory configuration.

4.5 Reset to Factory MPC Parameters

To reset MPC parameters to factory defaults, following command can be used:

Message	$PIXSE,CONFIG,RSTMPC*56<CR><LF>
Title	Reset MPC parameters to factory defaults

Important

This command resets only MPC parameters (lever arms, system orientation, algorithm modes, initial position, etc.). Default parameters will only apply at next reboot.
To completely reset system settings, use RSTDSP command as well.

Refer to Appendix B for details on factory configuration.

4.6 Web MMI Passwords Reset

To reset Web MMI passwords, following command can be used:

Message	$PIXSE,CONFIG,PWDRST*4B<CR><LF>
Title	Reset Web MMI Passwords

There is no password any more once this command is used.

4.7 System Errors Log Reset

To reset System Error Log, following command can be used:

Message	$PIXSE,CONFIG,ERRRST*4D<CR><LF>
Title	Reset System Errors log

4.8 Initial Position

To enter the initial position for the static alignment process:

Message	$PIXSE,CONFIG,MANPOS,x.x,y.y,z.z*hh<CR><LF>		
Title	Manual Position		
Data Field	Semantics	Unit	Type
x.x	Latitude, positive north	Degree	float
y.y	Longitude, positive east	Degree	float
z.z	Altitude, positive up	m	float

To retrieve current initial position:

$PIXSE,CONFIG,MANPOS,,*53<CR><LF>

4.9 Manual UTM Position

To enter initial UTM position used in static alignment process:

Message	$PIXSE,CONFIG,UTMWGS,c,i,x.x,y.y,z.z*hh<CR><LF>		
Title	Manual UTM Position		
Data Field	Semantics	Unit	Type
c	Northing area letter	N/A	char
i	Easting area index	N/A	int
x.x	Easting offset in area	m	float
y.y	Northing offset in area	m	float
z.z	Altitude	m	float

To retrieve current UTM initial position:

$PIXSE,CONFIG,UTMWGS,,*52<CR><LF>

Important

Internally, the INS only stores one initial position in latitude/longitude and converts UTM initial position to/from latitude/longitude.

4.10 Heading, Roll and Pitch Fine Misalignments

To configure user attitude biases:

Message	$PIXSE,CONFIG,BIAS__,x.x,y.y,z.z *hh<CR><LF>		
Title	Bias Configuration		
Data Field	Semantics	Unit	Type
x.x	Heading misalignment	Degree	float
y.y	Roll misalignment	Degree	float
z.z	Pitch misalignment	Degree	float

To retrieve the biases:

$PIXSE,CONFIG,BIAS__,,*44<CR><LF>

4.11 Heading, Roll And Pitch Bias Reference

To configure user attitude biases reference (fine misalignment):

Message	$PIXSE,CONFIG,BIASRF,i *hh<CR><LF>		
Title	Bias Configuration		
Data Field	Semantics	Unit	Type
i	Bias reference 0: Use Pins reference 1: Use Mirror reference	None	Integer

To retrieve the biases reference:

$PIXSE,CONFIG,BIAS__,,*44<CR><LF>

Answer is given by:

Data Field	Semantics	Unit	Type
i	Bias reference usabled 0: None 1: Pins only 2: Mirror only 3: Both	None	Integer
j	Bias reference used 0: Pins reference 1: Mirror reference	None	Integer

4.12 Axis Orientation

To enter an axis orientation (rough misalignment):

Message	$PIXSE,CONFIG,AXISOR,i*hh<CR><LF>		
Title	Axis Orientation		
Data Field	**Semantics**	**Unit**	**Type**
i	Index of the rough misalignment	Table 3 for index/orientation correspondence and checksums	int

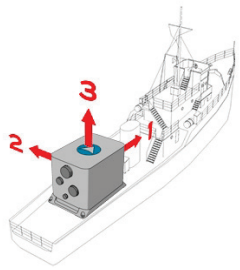
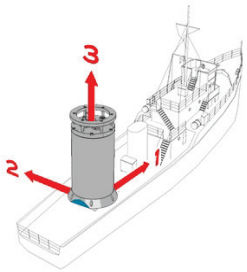
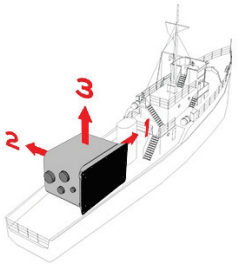
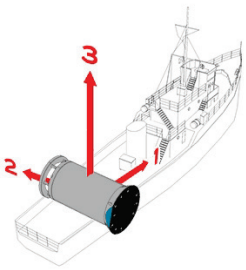
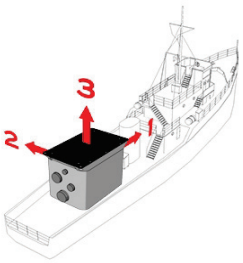
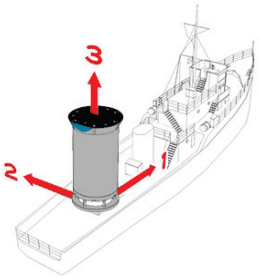
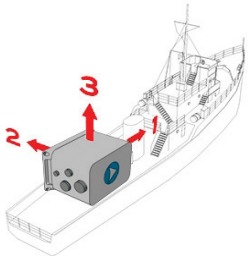
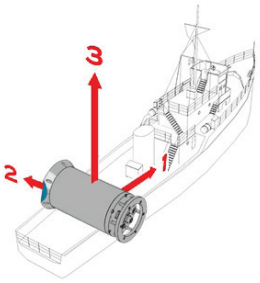
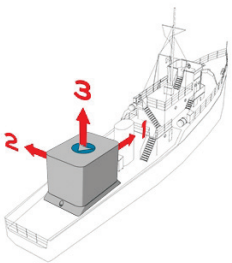
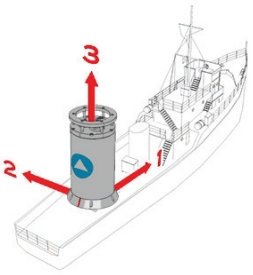
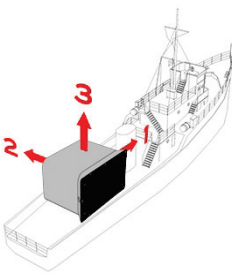
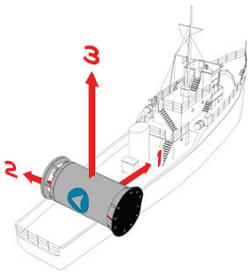
To retrieve the axis orientation, also called the rough misalignment:

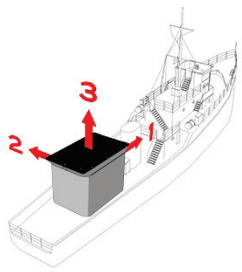
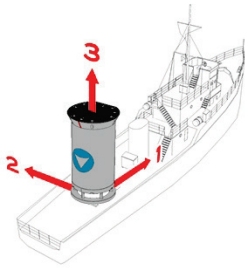
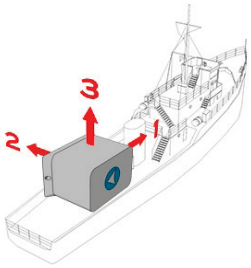
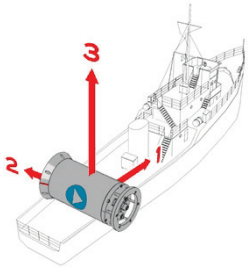
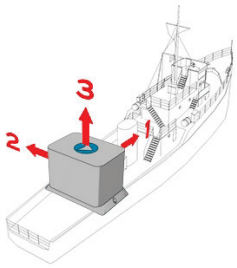
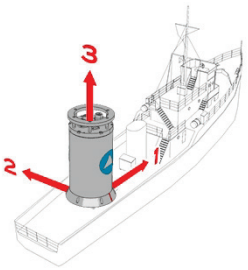
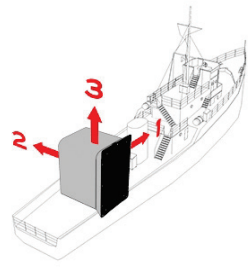
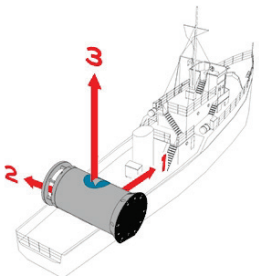
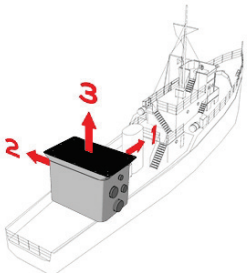
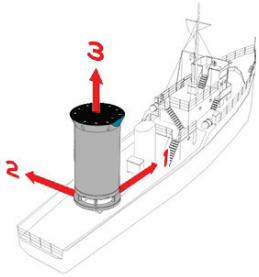
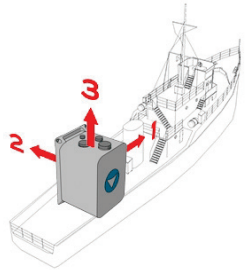
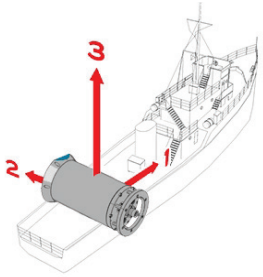
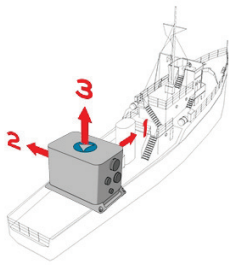
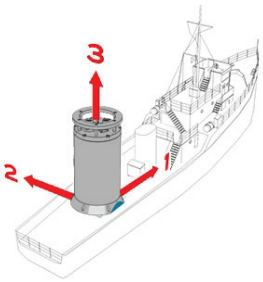
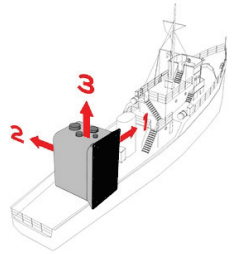
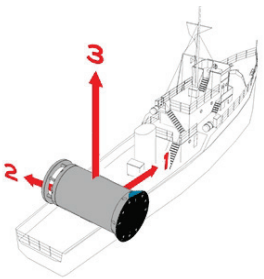
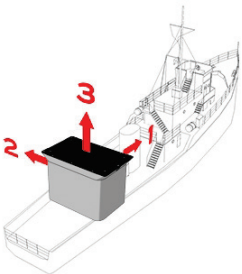
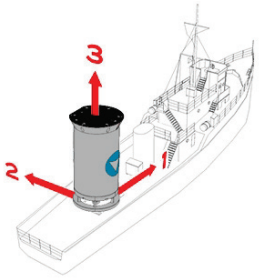
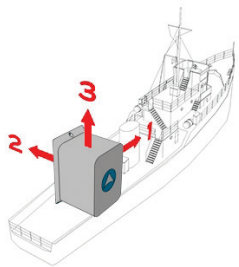
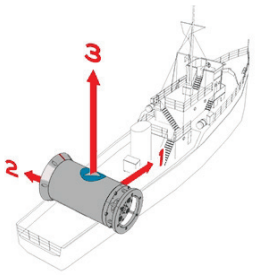
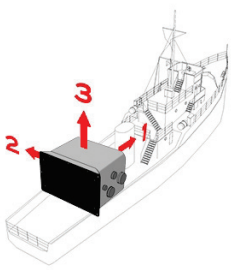
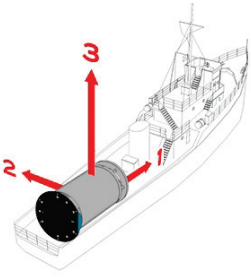
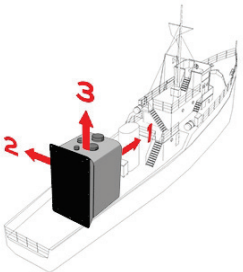
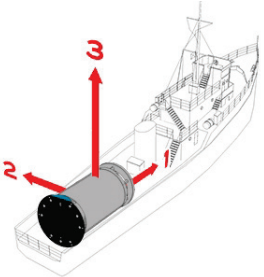
$PIXSE,CONFIG,AXISOR,,*43<CR><LF>

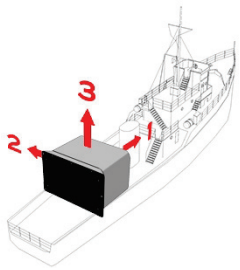
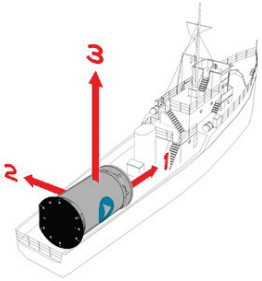
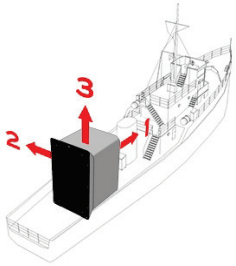
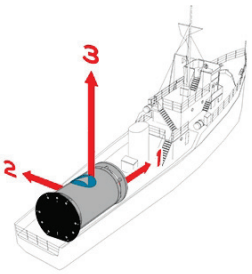
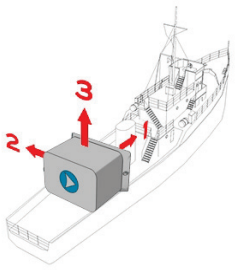
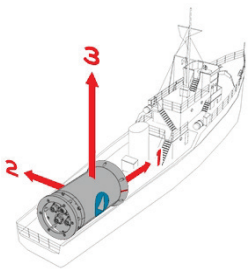
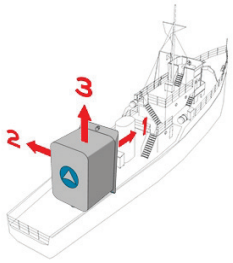
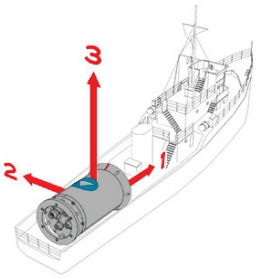
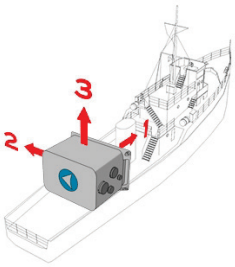
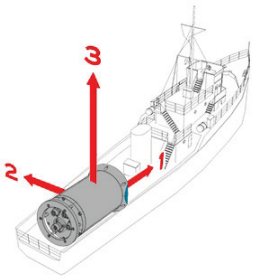
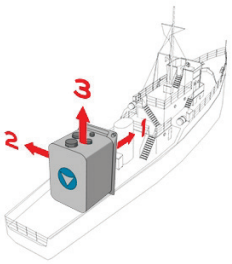
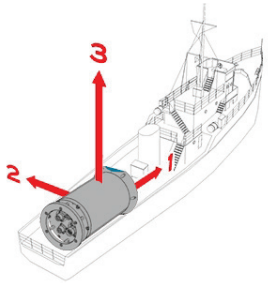
Important

Please: check logo and connector positions in the following table.

Table 3 - Matching between index i and INS axes orientation with associated checksum (hh)

i	Orientation (Surface)	Orientation (Subsea)	i	Orientation (Surface)	Orientation (Subsea)
0 (5F)			1 (5E)		
2 (5D)			3 (5C)		
4 (5B)			5 (5A)		

i	Orientation (Surface)	Orientation (Subsea)	i	Orientation (Surface)	Orientation (Subsea)
6 (59)			7 (58)		
8 (57)			9 (56)		
10 (6E)			11 (6F)		
12 (6C)			13 (6D)		
14 (6A)			15 (6B)		
16 (68)			17 (69)		

i	Orientation (Surface)	Orientation (Subsea)	i	Orientation (Surface)	Orientation (Subsea)
18 (66)			19 (67)		
20 (6D)			21 (6C)		
22 (6F)			23 (6E)		

4.13 Main Lever Arms

To configure main monitoring point lever arms from the INS:

Message	$PIXSE,CONFIG,LEVARM,x.x,y.y,z.z*hh<CR><LF>		
Title	Lever Arms Configuration		
Data Field	**Semantics**	**Unit**	**Type**
x.x	XV1 lever arm	m	Float
y.y	XV2 lever arm	m	Float
z.z	XV3 lever arm	m	Float

To retrieve main monitoring point lever arms from the INS:

$PIXSE,CONFIG,LEVARM,,*5C<CR><LF>

4.14 Secondary Lever Arms

To configure secondary monitoring point lever arms from the INS:

Message	$PIXSE,CONFIG,SECLVX,x.x,y.y,z.z*hh<CR><LF>		
Title	Lever Arms Configuration		
Data Field	Semantics	Unit	Type
X	Lever arm (‘A’, ‘B’ or ‘C’)	N/A	Char
x.x	XV1 lever arm	m	Float
y.y	XV2 lever arm	m	Float
z.z	XV3 lever arm	m	Float

To retrieve secondary monitoring point lever arms from the INS:

$PIXSE,CONFIG,SECLVA,,*53<CR><LF>

$PIXSE,CONFIG,SECLVB,,*50<CR><LF>

$PIXSE,CONFIG,SECLVC,,*51<CR><LF>

4.15 Center of Gravity Position

To configure center of gravity position relative to the INS:

Message	$PIXSE,CONFIG,COG___,x.x,y.y,z.z*hh<CR><LF>		
Title	Lever Arms Configuration		
Data Field	Semantics	Unit	Type
x.x	XV1 cog	m	Float
y.y	XV2 cog	m	Float
z.z	XV3 cog	m	Float

Please note the 3 underscore (’’_’’) characters after COG header.

To retrieve center of gravity from the INS:

$PIXSE,CONFIG,COG___,,*49<CR><LF>

4.16 Zero Velocity Update

Enabling a ZUPT mode is equivalent to sending a speed sensor forced to 0m/s in the INS.
Following modes are available:

- Static 10m/s : this mode sends a 0m/s speed input with 10m/s standard deviation
- Static 0.1m/s: this mode sends a 0m/s speed input with 0.1m/s standard deviation
- Autostatic 0.01m/s: this mode detects system movements and when no rotation larger than 10°/h is detected, it enables a null speed entry with 0.01m/s standard deviation.
- Autostatic bench: this mode detects movements and when no rotation larger than 10°/h is detected, it enables a null speed entry with 0.01m/s standard deviation and a null rotation of 10°/h standard deviation.
- ANC: this mode is a combination of a null transverse speed input with 0.2m/s standard deviation together with autostatic 0.01m/s mode as detailed above. This mode is only available on LAND products.
- Position: in this mode, the manual GPS position input is repeated before each Kalman observation with current standard deviations of the manual GPS.

To retrieve the Zero Velocity Update Mode:

$PIXSE,CONFIG,ZUP___,,*5D<CR><LF>

To configure the Zero Velocity Update Mode:

Message	$PIXSE,CONFIG,ZUP___,i*hh<CR><LF>		
Title	Zero Velocity Update Mode		
Data Field	Semantics	Unit	Type
i	Index of ZUP mode	See tables below	int

Please note the 3 underscore (''_'') characters after ZUP header.

Table 4 - ZUPT mode index for PHINS, PHINS COMPACT C7, MARINS, HYDRINS, AIRINS, PHINS COMPACT C3, ROVINS and ROVINS NANO

i	ZUPT mode
0	None
1	Static 10 m/s
2	Static 0.1 m/s
3	Auto static 0.01 m/s
4	Autostatic bench 0.01 m/s
5	Fixed position

Table 5 - ZUPT mode index for LANDINS and ATLANS

i	ZUPT mode
0	None
1	Static 10 m/s
2	Static 0.1 m/s
3	Auto static 0.01 m/s
4	Autostatic bench 0.01 m/s
5	ANC
6	Fixed position

4.17 Turn On/Off DVL/Odometer Calibration Mode

To control the DVL (PHINS) or odometer (LANDINS, ATLANS) calibration process:

Message	$PIXSE,CONFIG,DDRECK,i*hh<CR><LF>		
Title	Dead Reckoning Configuration		
Data Field	Semantics	Unit	Type
i	Index of Dead Reckoning Mode	0: Stop calibration and ignore estimated calibration values 1: Start calibration mode and reset estimations 2: Stop calibration and save estimated calibration values	int

Comments:

- When calibration (Dead Reckoning) is started (index set to 1), the $PIXSE,DDRECK frame is output from the PHINS Standard protocol, to provide for estimated misalignment (heading and pitch) and scale factor during calibration. For more details refer to PHINS STANDARD protocol description in the INS-Interface Library document (ref.: MU-INSIII-AN-001). These data should be checked for, and calibration can be stopped when these parameters are stabilized (+/-0.01°).
- When calibration is stopped (index set to 0), the misalignments and scale factor estimations are not accounted for, and the misalignment parameters are kept unchanged.
- When calibration is stopped (index set to 2), current DVL / odometer misalignments and scale factor parameters are automatically corrected with new calibration estimation. A “Save to PROM” command is required afterwards to permanently save these values.

To retrieve current calibration mode:

$PIXSE,CONFIG,DDRECK,,*42<CR><LF>

4.18 Turn On/Off DVL/Odometer Calibration Check Mode

To control the DVL (PHINS) or odometer (LANDINS, ATLANS) calibration check process:

Message	**$PIXSE,CONFIG,CALCHK,i*hh<CR><LF>**		
Title	Calibration Check		
Data Field	Semantics	Unit	Type
i	Calibration Check State	0: ON 1: OFF	int

To retrieve current calibration check mode:

$PIXSE,CONFIG,CALCHK,,*53<CR><LF>

4.19 Configuration Starting Mode

The frame used to define the starting mode is:

Message	$PIXSE,CONFIG,START_,i*hh<CR><LF>		
Title	Starting Mode		
Data Field	Semantics	Unit	Type
i	Index for Starting Mode	0 : Immediate run after power on 1 : Wait for Position 2 : Restore Position 3 : Restore Attitude 4 : Emulation mode	int

To retrieve the starting mode:

$PIXSE,CONFIG,START_,,*42<CR><LF>

4.20 Altitude Calculation Mode

To define the mode to compute the altitude:

Message	$PIXSE,CONFIG,ALTMDE,i*hh<CR><LF>		
Title	Altitude Calculation Mode		
Data Field	Semantics	Unit	Type
i	Index	See tables below	int

To retrieve the altitude computation mode:

$PIXSE,CONFIG,ALTMDE,,*48<CR><LF>

Table 6 - Altitude mode index for PHINS, PHINS COMPACT C7, MARINS, ROVINS, PHINS 6000, ROVINS NANO and PHINS COMPACT C3

i	Altitude mode
0	None
1	GPS
2	Depth
3	Hydro

Table 7 - Altitude mode index for AIRINS, LANDINS and ATLANS

i	Altitude mode
0	None
1	GPS

Table 8 - Altitude mode index for HYDRINS

i	Altitude mode
0	None
1	GPS
2	Hydro

4.21 Heave Parameters

The frame used to define the sea state is:

Message	$PIXSE,HVECNF,i*hh<CR><LF>		
Title	Heave Parameters		
Data Field	Semantics	Unit	Type
I	Index	0: Slight Sea (<1.2m) 1: Moderate Sea (<2.5m) 2: Rough Sea (>2.5m) 3: Harbors and Channels	int

To retrieve the current sea state mode:

$PIXSE,CONFIG,HVECNF,,*4D<CR><LF>

This command is deprecated for CINT firmware >=6.50.

4.22 Static convergence selection

The Frame used to enable/disable static convergence algorithm:

Message	$PIXSE,CONFIG,CVSTAT,i*hh<CR><LF>		
Title	Static convergence selection		
Data Field	Semantics	Syntax	Type
I	Start	0: Disable static convergence algorithm 1: Enable static convergence algorithm	int

To retrieve current convergence mode:

$PIXSE,CONFIG,CVSTAT,,*5A<CR><LF>

4.23 Go to navigation

The Frame used to switch to navigation mode:

Message	$PIXSE,CONFIG,GONAV_*53<CR><LF>
Title	Switch to navigation mode

4.24 UTM Zone Mode

The frame used to define the UTM Zone mode is:

Message	$PIXSE,CONFIG,UTMEXT_,i*hh<CR><LF>		
Title	UTM Zone		
Data Field	Semantics	Unit	Type
i	UTM Zone Mode	0 : Standard Mode 1 : Extended Mode	int

To retrieve the UTM Zone mode:

$PIXSE,CONFIG,UTMEXT,,*58<CR><LF>

4.25 Travelled Distance Reset

The frame used to Reset the Travelled Distance is:

Message	$PIXSE,CONFIG,DSTRST*4B<CR><LF>
Title	Distance Travelled Reset

5 EXTERNAL SENSORS CONFIGURATION

This section describes commands to configure external sensors connected to INS.
See section 2 to check the availability of the command depending of the INS used.

5.1 DVL Configuration

5.1.1 DVL LEVER ARM

To configure the lever arm from the INS to the DVL:

Message	$PIXSE,CONFIG,LOGLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	DVL Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the DVL:

$PIXSE,CONFIG,LOGLV_,,*5C<CR><LF>

5.1.2 DVL CALIBRATION (MISALIGNMENTS AND SCALE FACTOR)

To manually configure the DVL calibration:

Message	$PIXSE,CONFIG,LOGCAL,x.x,y.y,z.z,s.s*hh<CR><LF>		
Title	DVL Calibration		
Data Field	Semantics	Unit	Type
x.x	Misalignment / unit around XV1 (roll)	Deg	float
y.y	Misalignment / unit around XV2 (pitch)	Deg	float
z.z	Misalignment /unit around XV3 (heading)	Deg	float
s.s	Scale factor correction percentage		float

To retrieve the DVL calibration:

$PIXSE,CONFIG,LOGCAL,,*57<CR><LF>

Important

This command only retrieves the values set for DVL calibration. It does not output the misalignment and scale factor estimations when in Dead Reckoning mode during the DVL calibration. These estimations are only available through the PHINS STANDARD output frame (see section 0).

5.1.3 DVL INTERFACE

To configure the DVL interface (INS interface to receive data from log):

Message	$PIXSE,CONFIG,LOGINT,i*hh<CR><LF>		
Title	DVL Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface for DVL data reception:

$PIXSE,CONFIG,LOGINT,,*4A<CR><LF>

5.1.4 SOUND VELOCITY COMPENSATION

The INS can compensate the DVL measurement with the velocity of sound received from an external sensor.

To configure the interface to get the real time velocity of sound:

Message	$PIXSE,CONFIG,LOGSND,i*hh<CR><LF>		
Title	Sound Velocity compensation		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface to which the sound velocity sensor is connected:

$PIXSE,CONFIG,LOGSND,,*40<CR><LF>

5.1.5 REJECTION FILTER CONFIGURATION FOR BOTTOM TRACK

To configure the Rejection Filter mode for DVL data in Bottom Track mode:

Message	$PIXSE,CONFIG,LOGKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for Bottom Track		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the Rejection Filter mode for DVL data in Bottom Track mode:

$PIXSE,CONFIG,LOGKFM,,*59<CR><LF>

5.1.6 REJECTION FILTER CONFIGURATION FOR WATER TRACK

To configure the DVL Rejection Filter mode for Water track data:

Message	$PIXSE,CONFIG,LOGWTM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for Water Track		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the DVL Rejection Filter mode for Water track data:

$PIXSE,CONFIG,LOGWTM,,*57<CR><LF>

5.1.7 COUPLING MODE

To configure the DVL coupling mode:

Message	$PIXSE,CONFIG,LOGCPL,i*hh<CR><LF>		
Title	DVL Coupling mode		
Data Field	Semantics	Unit	Type
i	Coupling Mode	0: DVL not coupled to the system 1: DVL coupled to the system	int

To retrieve the DVL coupling mode:

$PIXSE,CONFIG,LOGCPL,,*46<CR><LF>

5.2 DVL2 configuration

5.2.1 LEVER ARM

To configure the lever arm from the INS to the DVL2:

Message	$PIXSE,CONFIG,LG2LV_,x.x,y.y,z.z*hh<CR><LF>		
Title	DVL2 Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the DVL2:

$PIXSE,CONFIG,LG2LV_,,*21<CR><LF>

5.2.2 DVL2 CALIBRATION (MISALIGNMENTS AND SCALE FACTOR)

To manually configure the DVL2 calibration:

Message	$PIXSE,CONFIG,LG2CAL,x.x,y.y,z.z,s.s*hh<CR><LF>		
Title	DVL2 Calibration		
Data Field	Semantics	Unit	Type
x.x	Misalignment / unit around XV1 (roll)	Deg	float
y.y	Misalignment / unit around XV2 (pitch)	Deg	float
z.z	Misalignment /unit around XV3 (heading)	Deg	float
s.s	Scale factor correction percentage		float

To retrieve the DVL2 calibration:

$PIXSE,CONFIG,LG2CAL,,*2A<CR><LF>

Important

Note: this command only retrieves the values set for DVL calibration. It does not output the misalignment and scale factor estimations when in Dead Reckoning mode during the DVL calibration. These estimations are only available through the PHINS STANDARD output frame (see section 0).

5.2.3 DVL2 INTERFACE

To configure the DVL interface (INS interface to receive data from log):

Message	$PIXSE,CONFIG,LG2INT,i*hh<CR><LF>		
Title	DVL 2 Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface for DVL data reception:

$PIXSE,CONFIG,LG2INT,,*37<CR><LF>

5.2.4 REJECTION FILTER CONFIGURATION FOR BOTTOM TRACK

To configure the Rejection Filter mode for DVL2 data in Bottom Track mode:

Message	**$PIXSE,CONFIG,LG2KFM,i*hh<CR><LF>**		
Title	Rejection Filter Configuration for Bottom Track		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the Rejection Filter mode for DVL2 data in Bottom Track mode:

$PIXSE,CONFIG,LG2KFM,,*24<CR><LF>

5.2.5 REJECTION FILTER CONFIGURATION FOR WATER TRACK

To configure the DVL2 Rejection Filter mode for Water track data:

Message	$PIXSE,CONFIG,LG2WTM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for Water Track		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the DVL2 Rejection Filter mode for Water track data:

$PIXSE,CONFIG,LG2WTM,,*2A<CR><LF>

5.2.6 COUPLING MODE

To configure the DVL2 coupling mode:

Message	**$PIXSE,CONFIG,LG2CPL,i*hh<CR><LF>**		
Title	DVL2 Coupling mode		
Data Field	Semantics	Unit	Type
i	Coupling Mode	0: DVL not coupled to the system 1: DVL coupled to the system	int

To retrieve the DVL2 coupling mode:

$PIXSE,CONFIG,LG2CPL,,*3B<CR><LF>

5.2.7 DVL COMMAND

To send command to DVL:

Message	$PIXSE,CONFIG,DVLCMD,x*hh<CR><LF>		
Title	DVL command		
Data Field	Semantics	Unit	Type
x	ID command Or Sub Command	ID command: 0 : DVL Stop pinging 1 : DVL Start pinging 2 : DVL Single Ping Sub command: String: sub ASCII command (256 chars max)	Int or String

Frame examples:

DVL Stop pinging:

$PIXSE,CONFIG,DVLCMD,0*71<CR><LF>

Sending a sub ASCII command to DVL:

$PIXSE,CONFIG,DVLCMD,CS*75<CR><LF>

5.2.8 DVL TRIGGERED BY PULSE OUT

To configure which pulse out will be trig DVL x:

Message	$PIXSE,CONFIG,DVLTRG,x,y*hh<CR><LF>		
Title	DVL command		
Data Field	Semantics	Unit	Type
x	DVL ID	x : DVL x	Int
y	Pulse Out ID	0 : No pulse association 1 : Pulse Out A (see note 1) 2 : Pulse Out B (see note 2)	int

To retrieve which pulse out is configured with DVL x (checksum hh depends on x):

$PIXSE,CONFIG,DVLTRG,x,*hh<CR><LF>

Note 1: No pulse out available for OCTANS NANO and ROVINS NANO

Note 2: No pulse out B available for PHINS C3

5.3 Odometer Configuration (LANDINS & ATLANS)

5.3.1 Odometer Lever Arm

To configure the lever arm from the INS to the odometer:

Message	$PIXSE,CONFIG,ODOLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	Odometer Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the odometer:

$PIXSE,CONFIG,ODOLV_,,*5C<CR><LF>

5.3.2 Odometer Calibration

To manually configure the odometer calibration:

Message	$PIXSE,CONFIG,ODOCAL,x.x,y.y,z.z,s.s*hh<CR><LF>		
Title	Odometer calibration		
Data Field	Semantics	Unit	Type
x.x	Misalignment / unit around XV1 (roll)	Deg	float
y.y	Misalignment / unit around XV2 (pitch)	Deg	float
z.z	Misalignment /unit around XV3 (heading)	Deg	float
s.s	Scale factor correction percentage		float

To retrieve the odometer calibration:

$PIXSE,CONFIG,ODOCAL,,*57<CR><LF>

Important

This command only retrieves the values set for odometer calibration. It does not output the misalignment and scale factor estimations when in Dead Reckoning mode during the odometer calibration process. These estimations are only available through the PHINS STANDARD output frame (see section 0).

5.3.3 ODOMETER INTERFACE

To configure the odometer interface:

Message	$PIXSE,CONFIG,ODOINT,i*hh<CR><LF>		
Title	Odometer Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface for odometer data reception:

$PIXSE,CONFIG,ODOINT,,*4A<CR><LF>

5.3.4 REJECTION FILTER CONFIGURATION FOR ODOMETER

To configure the Rejection Filter mode for odometer:

Message	$PIXSE,CONFIG,ODOKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for odometer		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the Rejection Filter mode for odometer:

$PIXSE,CONFIG,ODOKFM,,*59<CR><LF>

5.4 EM Log Configuration

5.4.1 EM Log Lever Arm

To configure the lever arm from the INS to the EM log sensor:

Message	$PIXSE,CONFIG,LMNLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	EM Log Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the EM log sensor:

$PIXSE,CONFIG,LMNLV_,,*57<CR><LF>

5.4.2 EM Log Interface

To configure the EM Log interface (INS interface to receive data from EM Log):

Message	$PIXSE,CONFIG,LMNINT,i*hh<CR><LF>		
Title	EM Log Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface to which EM Log should be connected:

$PIXSE,CONFIG,LMNINT,,*41<CR><LF>

5.4.3 EM LOG REJECTION FILTER

To configure the EM Log Rejection Filter mode:

Message	$PIXSE,CONFIG,LMNKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for EM Log		
Data Field	**Semantics**	**Unit**	**Type**
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the EM Log Rejection Filter mode:

$PIXSE,CONFIG,LMNKFM,,*52<CR><LF>

5.5 EM Log 2 configuration

5.5.1 EM LOG 2 LEVER ARM

To configure the lever arm from the INS to the EmLog 2 sensor:

Message	$PIXSE,CONFIG,LM2LV_,x.x,y.y,z.z*hh<CR><LF>		
Title	EM Log 2 Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the EmLog 2 sensor:

$PIXSE,CONFIG,LM2LV_,,*2B<CR><LF>

5.5.2 EM LOG 2 INTERFACE

To configure the EM Log 2 interface (INS interface to receive data from EM Log 2):

Message	$PIXSE,CONFIG,LM2INT,i*hh<CR><LF>		
Title	EM Log 2 Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface to which EM Log 2 should be connected:

$PIXSE,CONFIG,LM2INT,,*3D<CR><LF>

5.5.3 EM LOG 2 REJECTION FILTER

To configure the EM Log 2 Rejection Filter mode:

Message	$PIXSE,CONFIG,LM2KFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for EM Log 2		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the EM Log 2 Rejection Filter mode:

$PIXSE,CONFIG,LM2KFM,,*2E<CR><LF>

5.6 GPS Configuration

5.6.1 GPS Lever Arm

To configure the lever arm from the INS to the GPS:

Message	$PIXSE,CONFIG,GPSLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	GPS Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the GPS:

$PIXSE,CONFIG,GPSLV_,,*5C<CR><LF>

5.6.2 GPS Interface

To configure the GPS interface (INS interface to receive data from GPS):

Message	$PIXSE,CONFIG,GPSINT,i*hh<CR><LF>		
Title	GPS Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the INS interface to which GPS should be connected:

$PIXSE,CONFIG,GPSINT,,*4A<CR><LF>

5.6.3 GPS REJECTION FILTER

To configure the GPS Rejection Filter mode:

Message	$PIXSE,CONFIG,GPSKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for GPS		
Data Field	**Semantics**	**Unit**	**Type**
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the GPS Rejection Filter mode:

$PIXSE,CONFIG,GPSKFM,,*59<CR><LF>

5.7 GPS2 Configuration

5.7.1 GPS2 Lever Arm

To configure the lever arm from the INS to the GPS2:

Message	$PIXSE,CONFIG,GP2LV_,x.x,y.y,z.z*hh<CR><LF>		
Title	GPS2 Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the GPS2:

$PIXSE,CONFIG,GP2LV_,,*3D<CR><LF>

5.7.2 GPS2 Interface

To configure the GPS2 interface (INS interface to receive data from GPS2):

Message	$PIXSE,CONFIG,GP2INT,i*hh<CR><LF>		
Title	GPS2 Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None1: Port A2: Port B 3: Port C 4: Port D5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the GPS2 interface (INS interface to receive data from GPS2):

$PIXSE,CONFIG,GP2INT,,*2B<CR><LF>

5.7.3 GPS2 REJECTION FILTER

To configure the GPS2 Rejection Filter mode:

Message	$PIXSE,CONFIG,GP2KFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for GPS2		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the GPS2 Rejection Filter mode:

$PIXSE,CONFIG,GP2KFM,,*38<CR><LF>

5.8 Manual GPS Configuration

5.8.1 Manual GPS Lever Arm

To configure the lever arm from INS to the manual GPS:

Message	$PIXSE,CONFIG,GPMLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	Manual GPS Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the manual GPS:

$PIXSE,CONFIG,GPMLV_,,*42<CR><LF>

5.8.2 Manual GPS Rejection Filter

To configure the Manual GPS Rejection Filter mode:

Message	$PIXSE,CONFIG,GPMKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for manual GPS		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the Manual GPS Rejection Filter mode:

$PIXSE,CONFIG,GPMKFM,,*47<CR><LF>

5.8.3 MANUAL GPS POSITION FIX

To send a manual position fix:

Message	$PIXSE,CONFIG,MANGPS,a.a,b.b,c.c,d.d,e.e,f.f*hh<CR><LF>		
Title	Manual GPS position fix		
Data Field	Semantics	Unit	Type
a.a	Latitude	degree	float
b.b	Longitude	degree	float
c.c	Altitude (mean sea level)	m	float
d.d	Latitude standard deviation	m	float
e.e	Longitude standard deviation	m	float
f.f	Altitude standard deviation	m	float

To retrieve the last manual position sent:

$PIXSE,CONFIG,MANGPS,,*5B<CR><LF>

5.9 Depth Sensor Configuration

5.9.1 Depth Sensor Lever Arm

To configure the lever arm from the INS to the Depth sensor:

Message	$PIXSE,CONFIG,DEPLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	Depth Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To configure the lever arm from the INS to the Depth sensor:

$PIXSE,CONFIG,DEPLV_,,*49<CR><LF>

5.9.2 Depth Sensor Offset

To configure the offset that will be subtracted from depth sensor input value:

Message	$PIXSE,CONFIG,DEPOFS,x.x*hh<CR><LF>		
Title	Depth offset		
Data Field	Semantics	Unit	Type
x.x	Offset	m	float

To retrieve current depth offset:

$PIXSE,CONFIG,DEPOFS,,*56<CR><LF>

5.9.3 Zero Depth Sensor

To use current raw depth input as depth offset (calibrate the depth sensor):

Message	$PIXSE,CONFIG,DEPZER,,*41<CR><LF>
Title	Zero depth

5.9.4 DEPTH SENSOR INTERFACE

To configure the Depth Sensor interface (INS interface to receive data from depth sensor):

Message	$PIXSE,CONFIG,DEPINT,i*hh<CR><LF>		
Title	Depth Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

The interface should be configured in accordance with the instrument.

To retrieve the Depth Sensor interface (INS interface to receive data from depth sensor):

$PIXSE,CONFIG,DEPINT,,*5F<CR><LF>

5.9.5 REJECTION FILTER MODE FOR DEPTH SENSOR

To configure the Rejection Filter mode for Depth Sensor:

Message	$PIXSE,CONFIG,DEPKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for Depth Sensor		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the Rejection Filter mode for Depth Sensor:

$PIXSE,CONFIG,DEPKFM,,*4C<CR><LF>

5.10 USBL Configuration

5.10.1 USBL Lever Arm

To configure the lever arm from the INS to the specified USBL beacon:

Message	$PIXSE,CONFIG,USBLV_,x.x,y.y,z.z,i*hh<CR><LF>		
Title	USBL Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float
i	USBL beacon index (0, 1 or 2)	N/A	int

To retrieve the lever arm from the INS to the specified USBL beacon (i is the beacon index):

$PIXSE,CONFIG,USBLV_,,i*hh<CR><LF>

5.10.2 USBL Interface

To configure the USBL interface (INS interface to receive data from specified USBL beacon):

Message	$PIXSE,CONFIG,USBINT,i,ttt,j*hh<CR><LF>		
Title	USBL Interface		
Data Field	Semantics	Unit	Type
I	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	Int
ttt	Tp Code	8 char max	String
j	Index	USBL beacon index (0, 1 or 2)	int

To retrieve the specified USBL beacon interface (j is the beacon index):

$PIXSE,CONFIG,USBINT,,j*hh<CR><LF>

5.10.3 USBL REJECTION FILTER MODE

To configure the Rejection Filter mode for specified USBL beacon:

Message	$PIXSE,CONFIG,USBKFM,i,j*hh<CR><LF>		
Title	Rejection Filter Configuration for USBL		
Data Field	Semantics	Unit	Type
i	Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int
j	USBL index	USBL beacon index (0, 1 or 2)	int

To retrieve the Rejection Filter mode for a specified USBL beacon index j:

$PIXSE,CONFIG,USBKFM,,j*hh<CR><LF>

5.10.4 USBL BEACON WATCH SELECTION

In PHINS STANDARD protocol, only one USBL beacon will be reported at a time. To configure the USBL beacon to watch in PHINS STANDARD protocol:

Message	**$PIXSE,CONFIG,USBVIE,i*hh<CR><LF>**		
Title	USBL beacon watch selection		
Data Field	Semantics	Unit	Type
i	Beacon index	USBL beacon index (0, 1 or 2)	int

To retrieve currently selected beacon:

$PIXSE,CONFIG,USBVIE,,*43<CR><LF>

5.10.5 MAXIMUM NUMBER OF USBL BEACONS

To retrieve maximum number of beacons that the firmware can manage:

Message	**$PIXSE,CONFIG,USBNBB,,*57<CR><LF**
Title	Maximum Number of USBL Beacons

For a maximum number of 3 beacons, this command will return:

$PIXSE,CONFIG,USBNBB,3*48<CR><LF>

5.11 LBL Configuration

5.11.1 LBL Lever Arm

To configure the lever arm from the INS to the LBL computing point:

Message	$PIXSE,CONFIG,LBLLV_,x.x,y.y,z.z*hh<CR><LF>		
Title	LBL Lever Arm		
Data Field	Semantics	Unit	Type
x.x	XV1 lever arm	m	float
y.y	XV2 lever arm	m	float
z.z	XV3 lever arm	m	float

To retrieve the lever arm from the INS to the LBL computing point:

$PIXSE,CONFIG,LBLLV_,,*5A<CR><LF>

5.11.2 LBL Interface

To configure the LBL interface (INS interface to receive data from LBL):

Message	$PIXSE,CONFIG,LBLINT,i*hh<CR><LF>		
Title	LBL Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None 1: Port A 2: Port B 3: Port C 4: Port D 5: Port E	int

To retrieve the LBL interface (INS interface to receive data from LBL):

$PIXSE,CONFIG,LBLINT,,*4C<CR><LF>

5.11.3 LBL REJECTION FILTER

To configure the LBL Rejection Filter mode:

Message	$PIXSE,CONFIG,LBLKFM,i*hh<CR><LF>		
Title	Rejection Filter Configuration for LBL		
Data Field	Semantics	Unit	Type
i	Rejection Mode Index	0 : Not Active Always True 1 : Not Active Always False 2 : Active Automatic reacquisition 3 : Active Manual reacquisition	int

To retrieve the LBL Rejection Filter mode:

$PIXSE,CONFIG,LBLKFM,,*5F<CR><LF>

5.12 UTC (Time Synchronization) Interface

To configure the UTC interface (the INS interface to receive data from UTC):

Message	$PIXSE,CONFIG,UTCINT,i*hh<CR><LF>		
Title	UTC Interface		
Data Field	Semantics	Unit	Type
i	Interface	0: None1: Port A2: Port B 3: Port C 4: Port D5: Port E	int

To retrieve the UTC interface (the INS interface to receive data from UTC):

$PIXSE,CONFIG,UTCINT,,*4C<CR><LF>

6 INTERFACES CONFIGURATION

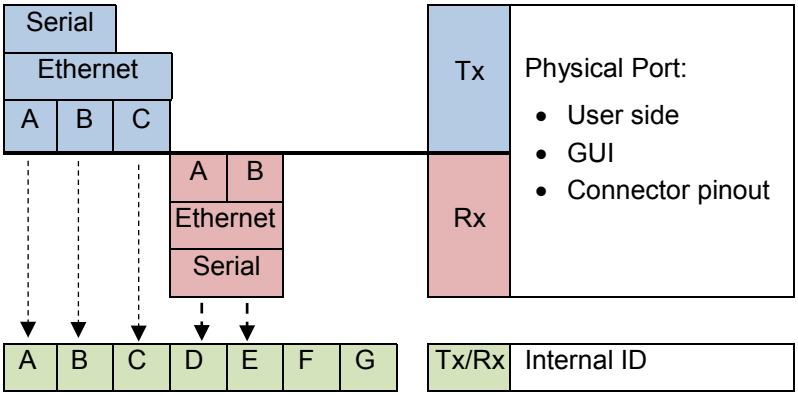
This section describes commands to configure serial or Ethernet ports and analog I/O.

6.1 Port mapping and ID

The ports mapping from software port identification to physical port identification may differ for certain product:

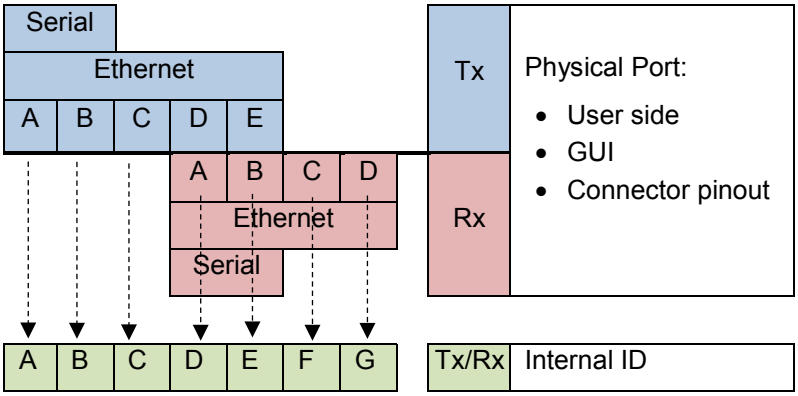
For ATLANS-C

- to configure the physical **serial input ports** A and B use configuration commands with respectively ID D and E instead.
- to configure the physical **Ethernet input ports** A to B use configuration commands with respectively ID D to E instead.
- to configure **output ports** use the physical port ID.



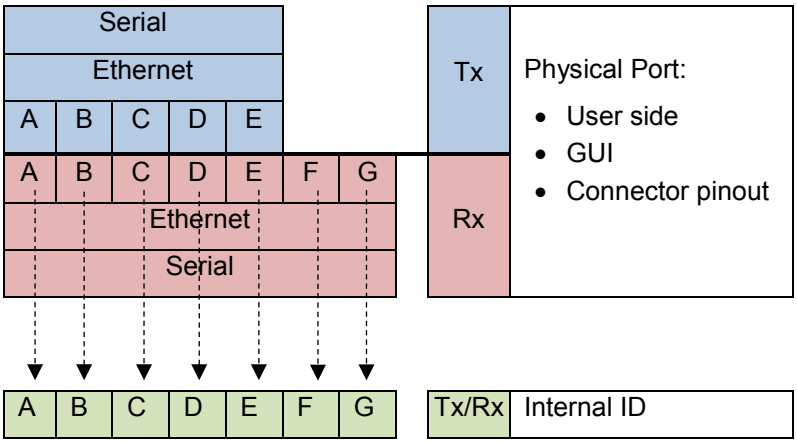
For PHINS COMPACT C7

- to configure the physical **serial input ports** A and B use configuration commands with respectively ID D and E instead.
- to configure the physical **Ethernet input ports** A to D use configuration commands with respectively ID D to G instead.
- to configure **output ports** use the physical port ID.



For other products

- to configure an **input port** use the physical port ID: A up to G.
- to configure **output ports** use the physical port ID.



6.2 Serial and Ethernet Commands

6.2.1 Serial I/O General Parameters (Parity and Stop Bit)

To configure the parity and stop bit for serial port X:

Message	$PIXSE,CONFIG,RSCM_X,i,j[,k][,l]*hh<CR><LF>		
Title	Serial interface configuration		
Data Field	Semantics	Unit	Type
X	Port	**ATLANS**: set A to B to configure output ports A to B* Set D to E to configure input ports A to B* **PHINS COMPACT C7**: Set A to E to configure output ports A to E* Set D to G to configure input ports A to D* **OTHERS**: set A to E to configure input/output port A to E	int
i	parity	0: None 1: Even 2: Odd	int
j	number of stop bits	0: 0.5 stop bit 1: 1 stop bit 2: 1.5 stop bit 3: 2 stop bits	int
k	RFU	0	int
l	RFU	0	int

*: refer to 6.1 to explanation about the product port mapping.

To retrieve parity and stop bit for serial port X (checksum hh depends on port X):

$PIXSE,CONFIG,RSCM_X,,*hh<CR><LF>

6.2.2 SERIAL/ETHERNET INPUT PORT CONFIGURATION

To configure the serial input port X:

Message	$PIXSE,CONFIG,RSIN_X,i,j[,k][,l]*hh<CR><LF>		
Title	Input port configuration		
Data Field	Semantics	Unit	Type
X	Port	**ATLANS** : set D to E to configure ports A to B* **PHINS COMPACT C7**: set D to G to configure ports A to D* **Other products**: set A to E to configure ports A to E*	char
i	Baud rate	See Table 9	int
j	protocol	See Table 10 and Table 11	int
k	RFU	0	int
l	RFU	0	int

*: refer to 6.1 to explanation about the product port mapping.

The RSIN command must be used to select input protocol in Ethernet mode too.

Changing input port baud rate will affect corresponding output port baud rate as baud rate generator is common to both input and output serial transceiver.

To retrieve configuration of serial input port x (checksum hh depends on port x):

$PIXSE,CONFIG,RSIN_X,,*hh<CR><LF>

Table 9 - Baud rate index

i	Baud rate	i	Baud rate
0	600 bps	6	38 400 bps
1	1 200 bps	7	57 600 bps
2	2 400 bps	8	115 200 bps
3	4 800 bps	9	230 400 bps
4	9 600 bps	10	460 800 bps
5	19 200 bps		

Table 10 - List and index of input protocols for serial/Ethernet ports

(part1)

Id	PHINS / PHINS 6000 ROVINS PHINS COMPACT C7	HYDRINS	MARINS BK-A	MARINS BKB	ROVINS NANO PHINS COMPACT C3
0	NONE	NONE	NONE	NONE	NONE
1	RDI PD6	GPS	GPS	GPS	APOS PSIM LBP
2	RDI PD4	STD_NMEA	EMLOG VBW	EMLOG VBW	APOS PSIM SSB
3	GPS		SKIPPER DL850	SENIN	EIVA
4	MICRO IN		SENIN	MICRO IN	EM LOG VHW
5	SVP 70		RDI PD6	SVP 70	VBW
6	EMLOG VBW		RDI PD4	PAROSCIENTIFIC	GAPS
7	PAROSCIENTIFIC		MICRO IN	SOC AUTOSUB	GPS
8	APOS PSIM SSB		SVP 70	EXT SENSOR BIN	HALLIBURTON
9	HALLIBURTON		PAROSCIENTIFIC	SEAKING 700	MICRO SVT-P
10	USBL LBL CTD		SOC AUTOSUB	EMLOG VHW	MINISVS
11	SOC AUTOSUB		EXT SENSOR BIN	MINISVS	PAROSCIENTIFIC
12	EXT SENSOR BIN		SEAKING 700	CTD SBE	PRESSURE SENSOR
13	POSIDONIA		EMLOG VHW	SVX2	RDI PD6
14	USBL INPUT		VBW	DCN STD LOCH	SBE 37SI
15	SEAKING 700		MINISVS	*RESERVED*	SEAKING 700
16	EMLOG VHW		CTD SBE	IXBLUE STD BIN	SENIN
17	LOG VBW		RDI PD0		SVP70
18	AUVG 3000		SVX2		SVX2
19	SENIN		DCN STD LOCH		USBL LBL CTD
20	MINI SVS		PDS		EM LOG VBW
21	CTD SBE		GRAVIMETRY		AUVG3000
22	GAPS STD		*RESERVED*		EXT SENSOR BIN
23	RDI PD0		IXBLUE STD BIN		IXBLUE STD BIN
24	SVX2				POSIDONIA
25	EIVA				RAMSES POSTPRO
26	DCN LOCH				RDI PD0
27	IXSEA AUV				RDI PD3
28	APOS PSIM LBP				RDI PD3 RT
29	RAMSES PP				RDI PD4
30	USBLBOX PP				SOCAUTOSUB
31	RDI PD3				USBL BOX POSTPRO
32	RDI PD3 RT				
33	PRESSURE SENSOR				
34	SBF_SIX				
35	STD_NMEA				
36	STDBIN				
37	SBE49				

Table 11 - List and index of input protocols for serial/Ethernet ports (part 2)

Id	LANDINS	AIRINS	ATLANS	QUADRANS
0	NONE	NONE	NONE	NONE
1	GPS	GPS	GPS	GPS
2	ODOMETER	GSM 3000	ODOMETER	EMLOG VBW
3	STD_NMEA	STD_NMEA	SBF SIX	EMLOG VHW
4			STD_NMEA	DCN LOCH
5			STDBIN	LOCH VBW
6			HEXAPOD	STD_NMEA

6.2.3 SERIAL/ETHERNET OUTPUT PORT CONFIGURATION

To configure the serial/Ethernet output on port X:

Message	$PIXSE,CONFIG,RSOUTX,i,j,k,l,m[,n][,o]*hh<CR><LF>		
Title	Output port configuration		
Data Field	**Semantics**	**Unit**	**Type**
X	Port	ATLANS: A to C Other products: A to E	char
i	baud rate	See Table 9	int
j	protocol	See Table 12 and Table 13	int
k	rate	Output rate in ms (100 = 100 ms = 10 Hz) Minimum value is 5 ms (200 Hz)	int
l	RS level	0: RS232 1: RS422 (not available for PHINS COMPACT C3	int
m	Lever arm	0: Main lever arm, standard heave filter 1: Secondary lever arm 1, standard heave filter 2: Secondary lever arm 2, standard heave filter 3: Secondary lever arm 3, standard heave filter	int
n	Heave	0: Real Time Heave 1: Smart Heave (100s delayed)	int
o	Altitude reference	0: Mean sea level Geoidal (default) 1: WGS84 Ellipsoidal	int

To retrieve configuration of serial output port x (checksum hh depends on port X):

$PIXSE,CONFIG,RSOUTX,,*hh<CR><LF>

Table 12 - list and index of output protocols for serial ports on inertial units (part 1)

Id	PHINS / PHINS 6000 HYDRINS / ROVINS / PHINS COMPACT C7	MARINS BKA	MARINS BKB	PHINS COMPACT C3 / ROVINS NANO
0	NONE	NONE	NONE	NONE
1	PHINS STANDARD	PHINS STANDARD	PHINS STANDARD	PHINS STANDARD
2	POST PROCESSING	POST PROCESSING	POST PROCESSING	POSTPROCESSING
3	HALLIBURTON SAS	NAVIGATION SHORT	NAVIGATION SHORT	AIPOV
4	DORADO	NAVIGATION LONG	NAVIGATION LONG	GPS LIKE
5	CONTROL NO G	GPS LIKE	GPS LIKE	GYROCOMPASS
6	NAVIGATION SHORT	BINARY NAV	BINARY NAV	GYROCOMPASS 2
7	NAVIGATION LONG	VTG GGA	VTG GGA	HALLIBURTON SAS
8	GPS LIKE	HEHDT	HEHDT	HEHDT HEROT

Id	PHINS / PHINS 6000 HYDRINS / ROVINS / PHINS COMPACT C7	MARINS BKA	MARINS BKB	PHINS COMPACT C3 / ROVINS NANO
9	IMU ASCII	SPAWAR NAV	SPAWAR NAV	HETHS HEROT
10	IMU BINARY	NAVIGATION	NAVIGATION	HYDROGRAPHY
11	BINARY NAV	DCN STD NAV 1	DCN STD NAV 1	IXSEA TAH
12	VTG GGA	DCN STD NAV 10	DCN STD NAV 10	KVH EXTENDED
13	HEHDT	SPERRY ATT	SPERRY ATT	NAV BHO
14	HEHDT FIXED	SENIN	SENIN	NAV BHO LONG
15	OCTANS STANDARD	BROADCAST A	BROADCAST A	NAVIGATION
16	GYROCOMPASS	BROADCAST B	BROADCAST B	OCTANS STANDARD
17	GYROCOMPASS II	BROADCAST C	BROADCAST C	POSIDONIA
18	SOC AUTOSUB	BROADCAST D	BROADCAST D	PRDID
19	SEAPATH	BROADCAST E	BROADCAST E	PRDID TSS
20	SPAWAR NAV	HEHDT_HEROT	HEHDT_HEROT	PRECISE ZDA
21	BUC	VTGGGU	VTGGGU	RDI PD11
22	EMT SDV GCS	LONG BIN NAV HR	LONG BIN NAV HR	RDI PING
23	HDMS	IXSEA ICCB1	IXSEA ICCB1	RDI SYNC
24	SIMRAD EM	NAV BINARY HR	NAV BINARY HR	SUBMERGENCE A
25	SIMRAD EM TSS	NAVIGATION HDLC	NAVIGATION HDLC	SUBMERGENCE B
26	SIMRAD EM TSSH2	DCN NAV1 FLF	DCN NAV1 FLF	TECHSAS
27	HYDROGRAPHY	SER OUT A RTC	SER OUT A RTC	TECHSAS TSS
28	TECHSAS	SER OUT B RTC	SER OUT B RTC	TOKIMEC PTVF
29	TECHSAS TSS	SER OUT C RTC	SER OUT C RTC	TSS335B
30	PRDID	SER OUT D RTC	SER OUT D RTC	TSS1 DMS
31	PRDID TSS	SER OUT E RTC	SER OUT E RTC	AUVG3000
32	NAVIGATION	SUBMERGENCE A	SUBMERGENCE A	CONTROL
33	TSS1 DMS	SUBMERGENCE B	SUBMERGENCE B	CONTROL NO G
34	TSS335B	PTNL GGK	PTNL GGK	DORADO
35	TMC CCV IMBAT	NAV BINARY 1	NAV BINARY 1	DORADO 2
36	POSIDONIA	INHDT	INHDT	EMT SDV CGS
37	NAV BHO	S40 NAV 10	S40 NAV 10	EXT SENSOR BIN
38	NAV BHO LONG	S40 NAV 100	S40 NAV 100	GAPS BIN
39	INDYN	ANSCHUTZ STD 20	ANSCHUTZ STD 20	IXBLUE STD BIN V2
40	DOLOG HRP	DCN NAV1 FAA	DCN NAV1 FAA	IXBLUE STD BIN V3
41	SENSOR RD	DCN FAA	DCN FAA	KINETIC SCIENTIFIC
42	NAV AND CTD	LRS 10 78 IIC	LRS 10 78 IIC	LONG BIN NAV SM
43	EXT SENSOR BIN	LRS 10 78 IC	LRS 10 78 IC	LONG BINARY NAV
44	DCN STD NAV 1	LRS 100 32 IIC	LRS 100 32 IIC	NAV AND CTD
45	DCN STD NAV 10	LRS 100 32 IC	LRS 100 32 IC	NAV BINARY
46	SPERRY ATT	LRS 100 35 IIC	LRS 100 35 IIC	NAV BINARY 1
47	RIEGL	LRS 100 35 IC	LRS 100 35 IC	NAVIGATION LONG

Id	PHINS / PHINS 6000 HYDRINS / ROVINS / PHINS COMPACT C7	MARINS BKA	MARINS BKB	PHINS COMPACT C3 / ROVINS NANO
48	AUVG 3000	LONG BIN NAV SM	LONG BIN NAV SM	POLAR NAV
49	IXSEA TAH	HEAVE POSTPRO	HEAVE POSTPRO	SEAPATH
50	SENIN	POLAR NAV	POLAR NAV	SEATEX DHEAVE
51	BROADCAST A	GRAVITY DOV CORR	HETHS HEROT	SENSOR RD
52	BROADCAST B	IMU ASCII	SPERRY_ATT_STANAG	SIMRAD EM
53	BROADCAST C	IMU BIN	STDBIN_V2	SIMRAD EM TSS
54	BROADCAST D	IMU RAW DATA	STDBIN_V3	SIMRAD EM HEAVE2
55	BROADCAST E	HETHS HEROT		SOC AUTOSUB
56	HEHDT HEROT	SPERRY_ATT_STANAG		TMS CCV IMBAT
57	RDI SYNC	STDBIN_V2		TUS
58	VTG GGU	STDBIN_V3		BROADCAST A
59	LONG BINARY NAV HR			BROADCAST B
60	IXSEA ICCB1			BROADCAST C
61	RDI PD11			BROADCAST D
62	NAV BINARY HR			BROADCAST E
63	TUS			SER OUT A RTC
64	STOLT OFFSHORE 2			SER OUT B RTC
65	SHORT GPS LIKE			SER OUT C RTC
66	POS MV GRP 111			SER OUT D RTC
67	SEATEX DHEAVE			SER OUT E RTC
68	HEAVE POST PRO			LODESTAR CTAG
69	CONTROL			IMU ASCII
70	GAPS BIN			IMU BINARY
71	NAVIGATION HDLC			IMU RAW DATA
72	DCN NAV 1 FLF			
73	SER OUT A RTC			
74	SER OUT B RTC			
75	SER OUT C RTC			
76	SER OUT D RTC			
77	SER OUT E RTC			
78	SUBMERGENCE A			
79	SUBMERGENCE B			
80	PTNL GGK			
81	NAV BINARY 1			
82	KVH EXTENDED			
83	POLAR NAV			
84	INHDT			
85	S40 NAV 10			
86	S40 NAV 100			

Id	PHINS / PHINS 6000 HYDRINS / ROVINS / PHINS COMPACT C7	MARINS BKA	MARINS BKB	PHINS COMPACT C3 / ROVINS NANO
87	ANSCHUTZ STD 20			
88	DCN NAV1 FAA			
89	DCN FAA			
90	LRS 10 78 IIC			
91	LRS 10 78 IC			
92	LRS 100 32 IIC			
93	LRS 100 32 IC			
94	LRS 100 35 IIC			
95	LRS 100 35 IC			
96	SAS 2			
97	MDL			
98	PEGASE NAV			
99	PEGASE CMS			
100	PRECISE ZDA			
101	LONG BIN NAV SM			
102	SAS2B			
103	SEANAV ID1			
104	TOKIMEC PTVF			
105	RDI_PING			
106	IMU RAW DATA			
107	AIPOV			
108	LONG BIN NAV HR 2			
109	HETHS HEROT			
110	RTCM_SIX			
111	KINETIC_SCIENTIFIC			
112	STDBIN_V2			
113	SPERRY_ATT_STANAG			
114	STOLT_OFFSHORE			
115	STDBIN_V3			
116	STANDARD2			

Table 13 - list and index of output protocols for serial ports (part 2)

Index	AIRINS	ATLANS	LANDINS	QUADRANS
0	NONE	NONE	NONE	NONE
1	PHINS STANDARD	PHINS STANDARD	PHINS STANDARD	PHINS STANDARD
2	POST PROCESSING	POST PROCESSING	POST PROCESSING	POST PROCESSING
3	HALLIBURTON SAS	HALLIBURTON SAS	HALLIBURTON SAS	CONTROL NO G
4	DORADO	DORADO	DORADO	HEHDT
5	CONTROL NO G	CONTROL NO G	CONTROL NO G	HEHDT FIXED
6	NAVIGATION SHORT	NAVIGATION SHORT	NAVIGATION SHORT	OCTANS STD
7	NAVIGATION LONG	NAVIGATION LONG	NAVIGATION LONG	GYROCOMPASS
8	GPS LIKE	GPS LIKE	GPS LIKE	GYROCOMPASS 2
9	IMU ASCII	IMU ASCII	IMU ASCII	BUC
10	IMU BINARY	IMU BINARY	IMU BINARY	HDMS
11	BINARY NAV	BINARY NAV	BINARY NAV	SIMRAD EM
12	GYROCOMPASS	GYROCOMPASS	GYROCOMPASS	SIMRAD EM TSS
13	INDYN	INDYN	INDYN	SIMRAD EM TSS H2
14	NAVIGATION	NAVIGATION	NAVIGATION	PRDID
15	HEHDT	HEHDT	HEHDT	PRDID TSS
16	HEHDT FIXED	HEHDT FIXED	HEHDT FIXED	TSS1 DMS
17	OCTANS STANDARD	OCTANS STANDARD	OCTANS STANDARD	TSS 335B
18	PRDID	PRDID	PRDID	TMS CCV IMBAT
19	PRDID TSS	PRDID TSS	PRDID TSS	INDYN
20	SEAPATH	SEAPATH	SEAPATH	DOLOG HRP
21	VTG GGA	VTG GGA	VTG GGA	SPERRY ATT
22	EVENT MARKER	RIEGL	RIEGL	BROADCAST A
23	IXSEA TAH	EVENT MARKER	EVENT MARKER	BROADCAST B
24	BROADCAST A	IXSEA TAH	IXSEA TAH	BROADCAST C
25	BROADCAST B	GEO 3D	GEO 3D	BROADCAST D
26	BROADCAST C	LANDINS STD	LANDINS STD	BROADCAST E

Index	AIRINS	ATLANS	LANDINS	QUADRANS
27	BROADCAST D	DIST TRAVELED	DIST TRAVELED	HEHDT HEROT
28	BROADCAST E	GPS LIKE SHORT	GPS LIKE SHORT	LONG BIN NAV HR
29	CONTROL	BROADCAST A	BROADCAST A	IXSEA ICCB1
30	AIPOV	BROADCAST B	BROADCAST B	STOLT OFFSHORE
31	SHORT GPS LIKE ZZZ	BROADCAST GPS RAW	BROADCAST C	CONTROL
32	PRECISE ZDA	CONTROL	BROADCAST D	ANSCHUTZ STD 20
33	IMU RAW	AIPOV	BROADCAST E	INSITU
34		SHORT GPS LIKE ZZZ	CONTROL	IMU ASCII
35		DORADO2	AIPOV	IMU BINARY
36		PRECISE ZDA	SHORT GPS LIKE ZZZ	PRECISE ZDA
37		RTCM SIX	DORADO2	IMU RAW DATA
38		IMU RAW	PRECISE ZDA	KVH EXTENDED
39		STDBIN_V2		HETHS HEROT
40		STDBIN_V3		SPERRY_ATT_STAN AG
41				STOLT_OFFSHORE
42				STDBIN_V2
43				STDBIN_V3

6.2.4 OUTPUT DEVICE SELECTION

To select the device that will be used for data output on selected port:

Message	$PHCNF,EDIROX,i*hh<CR><LF>		
Title	Output device selection		
Data Field	Semantics	Unit	Type
X	Port	ATLANS: A to D Other products: A to E	char
i	Device	0: No device selected 1: Serial output on selected port 2: Ethernet output on selected port 3: Ethernet and serial output on selected port	int

To retrieve network configuration (where X is the port letter):

$PHCNF,EDIROX,,*hh<CR><LF>

6.2.5 INPUT DEVICE SELECTION

To select the device that will be used for data input on selected port:

Message	$PHCNF,EDIRIX,i*hh<CR><LF>		
Title	Input device selection		
Data Field	Semantics	Unit	Type
X	Port	**ATLANS**: set D to E to configure A to B **PHINS COMPACT C7** : set D to G to configure ports A to D **Other products**: A to E	char
i	Device	0: No device selected 1: Serial input on selected port 2: Ethernet input on selected port	int

To retrieve network configuration (where X is the port letter):

$PHCNF,EDIRIX,,*hh<CR><LF>

6.2.6 PORT FORWARDING COMMAND

To send frames from repeater port to another port (useful to configure external sensors through the INS):

Message	$PIXSE,CONFIG,TXx,D*hh<CR><LF>		
Title	Port forwarding		
Data Field	Semantics	Unit	Type
x	Port	A: Port A B: Port B … E : Port E	char
D	Forwarded data	String to forward to selected port. The system will add <CR><LF> to the string and forward it to port X. End of string is detected by '*' character before checksum.	string

To send a break on selected output port, use "BREAK,t" as D string. This will generate a break of t milliseconds to selected port.

Example: To send frame 'TEST' to port A:

$PIXSE,CONFIG, TXA,TEST*0A<CR><LF>

6.3 Ethernet Configuration

6.3.1 Network Setup Command

To configure Ethernet network settings (Settings will be effective after next reboot only):

Message	$PHCNF,ETHIP,D,I,N[,G][,H]*hh<CR><LF>		
Title	Ethernet configuration		
Data Field	Semantics	Unit	Type
D	DHCP	0: disable DHCP at boot time, 1: enable DHCP	Int
I	IP address	System IP address (i.e.: 192.168.36.100)	IP address
N	Netmask	Network mask (i.e.: 255.255.255.0)	IP address
G	Gateway	Gateway (i.e.: 192.168.36.254)	IP address
H	DNS	DNS (i.e.: 192.168.36.1)	IP address

To retrieve network configuration:

$PHCNF,ETHIP,,*3F<CR><LF>

6.3.2 IP Output Configuration

To configure the IP output settings on selected port:

Message	$PHCNF,ELCFOX,m,i,p*hh<CR><LF>		
Title	IP output settings		
Data Field	Semantics	Unit	Type
X	Port	ATLANS: A to D Other products : A to E	Char
M	Mode	IP output mode: 0: TCP server 1: TCP client 2: UDP point to point 3: UDP broadcast 4: UDP multicast	Int
I	Destination IP	IP address to connect to. This field is ignored in TCP server and UDP broadcast modes.	IP address
P	IP Port	Port to connect/listen to	Int

To retrieve IP output settings on port x, use following command:

$PHCNF,ELCFOX,,*hh<CR><LF>

6.3.3 IP INPUT CONFIGURATION

To configure the IP input settings on selected port:

Message	$PHCNF,ELCFIX,m,i,p*hh<CR><LF>		
Title	IP input settings		
Data Field	**Semantics**	**Unit**	**Type**
X	Port	**ATLANS**: Use D to E to configure A to B **PHINS COMPACT C7**: Use D to G to configure ports A to D **Other products**: A to E	Char
m	Mode	IP input mode: 0: TCP server 1: TCP client 2: UDP point to point 3: UDP broadcast 4: UDP multicast	int
i	Destination IP	IP address to connect to. This field is ignored in TCP server and UDP broadcast modes.	IP address
p	IP Port	Port to connect/listen to	int

To retrieve IP input settings on port x, use following command:

$PHCNF,ELCFIX,,*hh<CR><LF>

6.4 Pulses Interfaces

6.4.1 PULSES INPUT

To configure pulse input X:

Message	$PIXSE,CONFIG,IOIN_X,x.x,i*hh<CR><LF>		
Title	Pulse Input		
Data Field	**Semantics**	**Unit**	**Type**
X	Pulse index	A: Pulse A B: Pulse B C: Pulse C(1) D: Pulse D(2)	char
x.x	Parameter(3)	Pulse protocol parameter	float
i	Protocol	See Table 14	int

(1) Pulse input C is not available on PHINS COMPACT C3 and ROVINS NANO

(2) Pulse input D is not available on ROVINS, PHINS 6000, PHINS COMPACT C3 and ROVINS NANO.

(3) The protocol parameter is only used on factory protocols for now (heading, roll, pitch trigger). When not used, this parameter can be set to 0.0.

To retrieve configuration of input pulse port X (checksum hh depends on port X):

$PIXSE,CONFIG,IOIN_X,,*hh<CR><LF>

Table 14 - list and index of input protocols for pulse ports

Index	PHINS/MARINS/ HYDRINS/ ROVINS/PHINS 6000/PHINS COMPACT C7/PHINS COMPACT C3/ ROVINS NANO	LANDINS/AIRINS/ ATLANS
0	NONE	NONE
1	PPS RISING + ZDA EDGE	PPS RISING + ZDA EDGE
2	PPS FALLING + ZDA EDGE	PPS FALLING + ZDA EDGE
3	ZDA + PPS RISING EDGE	ZDA + PPS RISING EDGE
4	ZDA + PPS FALLING EDGE	ZDA + PPS FALLING EDGE
5	SERIAL OUT SYNC A	SERIAL OUT SYNC A
6	SERIAL OUT SYNC B	SERIAL OUT SYNC B
7	SERIAL OUT SYNC C	SERIAL OUT SYNC C
8	SERIAL OUT SYNC D	SERIAL OUT SYNC D
9	SERIAL OUT SYNC E	SERIAL OUT SYNC E
10		EVENT MARKER RISING
11		EVENT MARKER FALLING
12		EVENT MARKER RISING PP
13		EVENT MARKER FALLING PP

6.4.2 PULSES OUTPUT

To configure pulse output X:

Message	$PIXSE,CONFIG,IOOUTX,x.x,i*hh<CR><LF>		
Title	Pulse Output		
Data Field	Semantics	Unit	Type
X	Port	A: Port A(1) B: Port B(2)	char
x.x	Parameter(3)	Parameter for the pulse protocol	float
i	Protocol	See Table 15	int

(1) No Pulse Out are available on ROVINS NANO.

(2) Pulse Out B is not available on PHINS C3.

(3) The protocol parameter is only used on factory protocols for now (heading, roll, pitch trigger). When not used, this parameter can be set to 0.0.

To retrieve configuration of pulse output port X (checksum hh depends on port X):

$PIXSE,CONFIG,IOOUTX,,*hh<CR><LF>

Table 15 - List and index of output protocols for pulse ports

Index	OUTPUT PULSE TYPE	PHINS COMPACT C3	Others
0	NONE	OK	OK
1	SER OUT A RTC	OK	OK
2	SER OUT B RTC	OK	OK
3	SER OUT C RTC	OK	OK
4	SER OUT D RTC	OK	OK
5	SER OUT E RTC	OK	OK
6	TRAVELED DISTANCE RISING	OK	OK
7	TRAVELED DISTANCE FALLING	OK	OK
8	PPS LIKE	OK	OK
9	TIMER RISING	OK	OK
10	TIMER FALLING	OK	OK
11	BROADCAST PULSE A	OK	--
12	BROADCAST PULSE B	OK	--

7 DYNAMIC STRING RETRIEVE COMMANDS

This section describes commands to retrieve all configuration strings in order to dynamically get the firmware feature list.

7.1.1 GENERIC TEXT RETRIEVE COMMAND

To retrieve a specific text for a command:

Message	$PIXSE,TEXT__,list,i,j,c*hh<CR><LF>		
Title	Text list retrieve		
Data Field	**Semantics**	**Unit**	**Type**
list	List name	Name of command associated to the list	string
i	Section index	Index of list to retrieve for this command	int
j	String index	Index of string in the list	int
c	Language	Only english 'E' is supported	char

Example:

To retrieve first serial output protocol name, you should send:

$PIXSE,TEXT__,RSOUTX,1,0,E*35<CR><LF>

The INS will then answer:

$PIXSE,TEXT__,RSOUTX,1,0,NONE*7A<CR><LF>

When no string is available, the INS returns "_____" (16 x '_' character). Thus, to retrieve all available output protocol names, you should send **$PIXSE,TEXT__,RSOUT** command and increment string index until the firmware answers no string available. The Following table details all string retrieve functions and their parameters:

Table 16 - List name table

List name	Section index	Retrieved list description
RSOUTX	0	Port output baud rate strings
	1	Port output protocol names
	2	Port output lever arm names
	3	Port output level names
	4	Port output heave filter names

List name	Section index	Retrieved list description
RSCM_X	0	Port input/output parity strings
	1	Port input/output stop bits strings
RSIN_X	0	Port input/output baud rate strings
	1	Port input protocol names
IOIN_X	0	Input pulse protocol names
IOOUTX	0	Output pulse protocol names
STATUS	0	System status word bit names and attributes
ALGSTS	0	Algorithm status word bit names and attributes
HT_STS	0	High-level status word bit names and attributes
LOGINT	0	DVL bottom track sensor interface names
LOGSND	0	Sound velocity sensor interface names
LOGKFM	0	DVL bottom track rejection filter mode names
LOGWTM	0	DVL water track sensor interface names
GPSINT	0	GPS sensor interface names
GPSKFM	0	GPS sensor rejection filter mode names
GP2INT	0	GPS2 sensor interface names
GP2KFM	0	GPS2 sensor rejection filter mode names
DEPINT	0	Depth sensor interface names
DEPKFM	0	Depth sensor rejection filter mode names
USBINT	0	USBL sensor interface names
USBKFM	0	USBL sensor rejection filter mode names
LBLINT	0	LBL sensor interface names
LBLKFM	0	LBL sensor rejection filter mode names
UTCINT	0	UTC synchronization interface names
START_	0	Starting mode selection strings
ZUP__	0	ZUPT mode selection strings
ALTMDE	0	Altitude stabilization mode selection strings
SERNUM	0	INS Serial number (i and j parameters not used)
VERFRM	0	INS firmware version (i and j parameters not used)
VERLDR	0	INS loader version (i and j parameters not used)
EQP__	0	INS type name (i and j parameters not used)

7.1.2 INS III SPECIFIC TEXT RETRIEVE COMMAND

To retrieve a specific text for a command:

Message	$PHTXT,list,c,i,j*hh<CR><LF>		
Title	Text list retrieve		
Data Field	Semantics	Unit	Type
list	List name	Name of command associated to the list	string
c	Language	Only english 'E' is supported	Char
i	Section index	Index of list to retrieve for this command	int
j	String index	Index of string in the list	int

Example:

To retrieve first input interface selection name, you should send:

$PHTXT,EDIRIX,0,0,E*0E<CR><LF>

The INS will then answer:

$PIXSE,TEXT__,EDIRIX,0,0,Serial_only___*59<CR><LF>

When no string is available, the INS returns "_____" (16 x '_' character). Thus, to retrieve all available input interface names, you should send **$PHTXT,EDIRIX** command and increment string index until the firmware answers no string available. The Following table details all string retrieve functions and their parameters (see Table 17):

Table 17 - List name table

List name	Section index	Retrieved list description
EDIRIX	0	Port input interface selection name
EDIROX	0	Port output interface selection name
ELCFIX	0	IP input mode selection name
ELCFOX	0	IP output mode selection name

Appendices

A NMEA CHECKSUM WEB PAGE

To get a simple NMEA computation tool, copy following code into a new file (nmea.html) and save it, and open this file with your internet navigator:

```
<html><head><title>NMEA MTK checksum calculator</title>
<script><!--
function updateChecksum(cmd)
{
  var checksum = 0;
  for(var i = 0; i < cmd.length; i++) checksum = checksum ^
cmd.charCodeAt(i);

  var hexsum = Number(checksum).toString(16).toUpperCase();
  if (hexsum.length < 2) hexsum = ("00" + hexsum).slice(-2);
  settext(document.getElementById("output"), "$" + cmd + "*" + hexsum);
}

function settext(span, text)
{
  if (!span.hasChildNodes()) {
    span.appendChild(span.ownerDocument.createTextNode(text));
    return;
  } else span.firstChild.nodeValue = text;
}

--></script></head><body>
<h1>MTK NMEA checksum calculator</h1>
<p>This is a simple calculator to compute the checksum field of NMEA
frames.</p>
<p> The checksum is simple, just an XOR of all the bytes between the
<tt>$</tt> and the <tt>*</tt> (not including the delimiters themselves),
and written in hexadecimal.</p>
<p>For this to work you'll need to be using a browser that supports
JavaScript and DHTML
(most modern browsers do).</p>
<div style="margin:1em; padding: 2em; background: #ddddff;">
<form onsubmit="document.getElementById('commandfld').select(); return
false;">
<table>
<tr><th align=right>Command:</th><td><tt>$<input id="commandfld" size=80
type="text" onchange="updateChecksum(this.value);"
value="PIXSE,CONFIG,WAKEUP">*</tt></td></tr>
<tr><th align=right>With checksum:</th><td><span id="output" style="font-
family: monospace;"></span></td></tr>
</table></form></div>
<script>updateChecksum(document.getElementById("commandfld").value);</scri
pt>
<hr></body></html>
```

B FACTORY SETTING DETAILS

This page details factory default settings:

- DSP settings:
  - System orientation is set to 0.
  - All system and sensors lever arms and misalignments are set to 0
  - All sensors rejection filter is set to ‘Always false’. Manual GPS is set to “Automatic reacquisition”.
  - Altitude mode is set according to system type:
    - GPS for AIRINS, LANDINS
    - Hydro for HYDRINS
    - Depth for ROVINS and PHINS 6000
    - Stabilization for PHINS and MARINS
  - Starting mode is set to ‘Wait for position’
  - Heave filter is set to ‘Medium’
  - Manual position is set to 48.87°N latitude, 2°E longitude, 0 m altitude
  - ZUPT mode is set to ‘None’

- MPC settings:
  - All input and output port protocols are set to ‘NONE’, on primary lever arm, with geoidal altitude
  - All output port protocols rate are set to 0 Hz
  - Ethernet output ports are set from 8111 to 8115 for port A to E
  - Ethernet input ports are set from 8117 to 8121 for port A to E
  - Ethernet input and output target IP is set to 192.168.36.102 and mode is set to ”TCP server”
  - Serial settings for all ports are set to 9 600 bps, none, 1 stop bit in RS232
  - All sensor interface are set to ‘0’ (disabled)
  - All pulse in and out protocols are disabled (set to ‘0’)