WinFrog Device Group:	**GPS**
Device Name/Model:	**INTUICOM SLAVE**
Device Manufacturer:	Intuicom, Inc. 1880 South Flatiron Ct., Suite R BOULDER CO 80301 USA Tel. 303-449-4330 ext223 Fax. 303-449-4346 Email: tfoley@intuicom.com
Device Data String(s) Output to WinFrog:	A GGA message prefixed with a code and heading. The code is used to identify the source of the message.
WinFrog Data String(s) Output to Device:	$--HDT
WinFrog Data Item(s) and their RAW record:	POSITION 303 HEADING 408, 409, 410 DATA OUTPUT

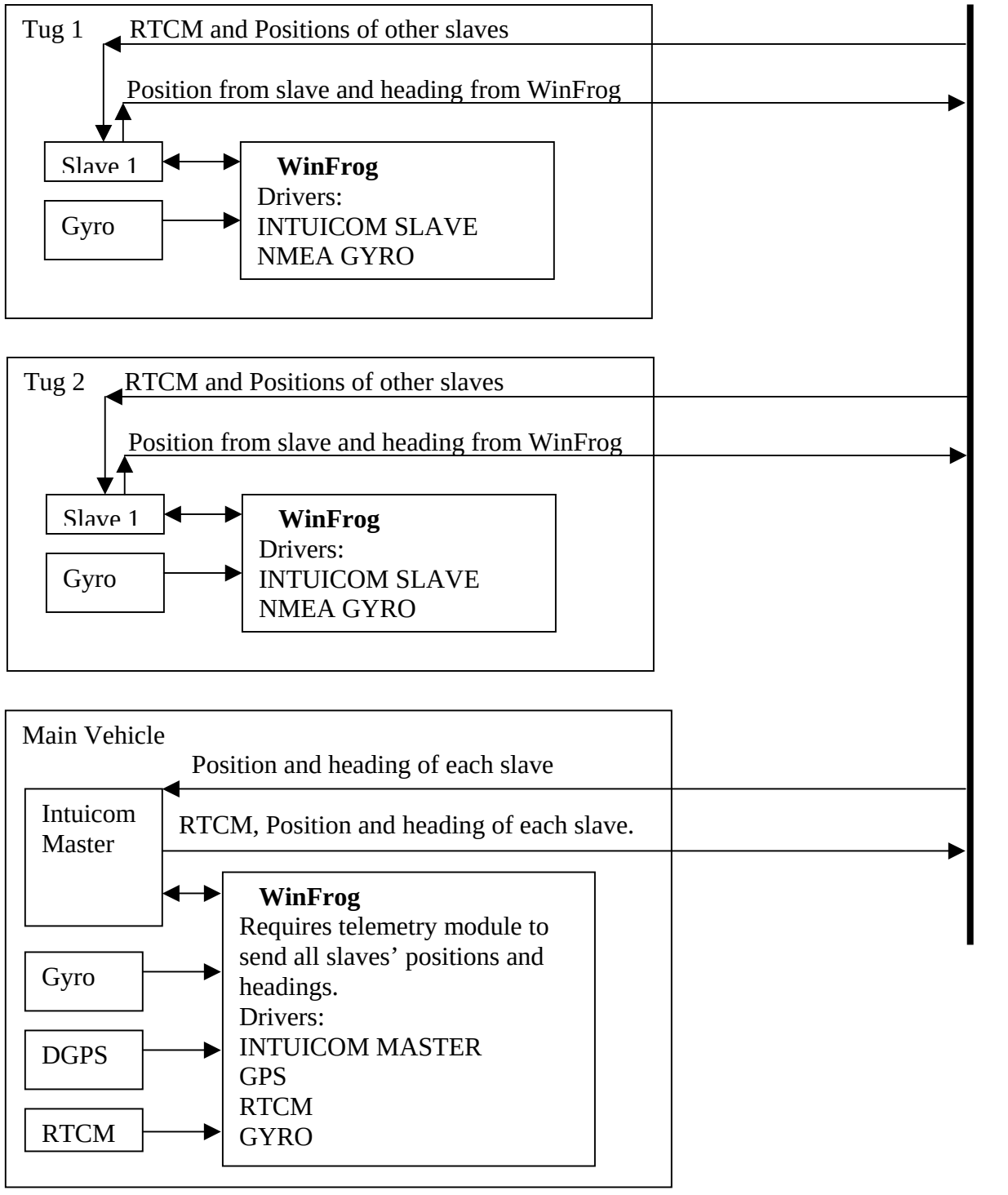
DEVICE DESCRIPTION:

CAUTION: WinFrog was tested with a system that had built in GPS cards at the slaves. These cards were model Allstar manufactured by BAE. Although a different internal card should behave the same and thus be compatible with this device driver, the use of different GPS receivers in the slaves require testing and may require special configuration or a driver modification.

This device is to be used at the slave or remote end of the Intuicom telemetry system. Use this device to display your own position, as well as the position of other slaves and the master. This device will only handle up to ten vehicles (all the slaves and the master). The heading of this vehicle can also be sent to the master for distribution to other slaves. Normally you cannot obtain the coordinates of this slave directly from the slave unit. This slaves coordinates are automatically sent to the master. WinFrog then broadcasts all the slave's positions and headings for all the slave units.

See the device descriptions: INTUICOM MASTER.

Example Layout



WINFROG I/O DEVICES > EDIT I/O:

INTUICOM SLAVE is added to WinFrog from the GPS device category. Typically the port B (2) cable will be connected to the WinFrog computer and the baud rate will be 19200.

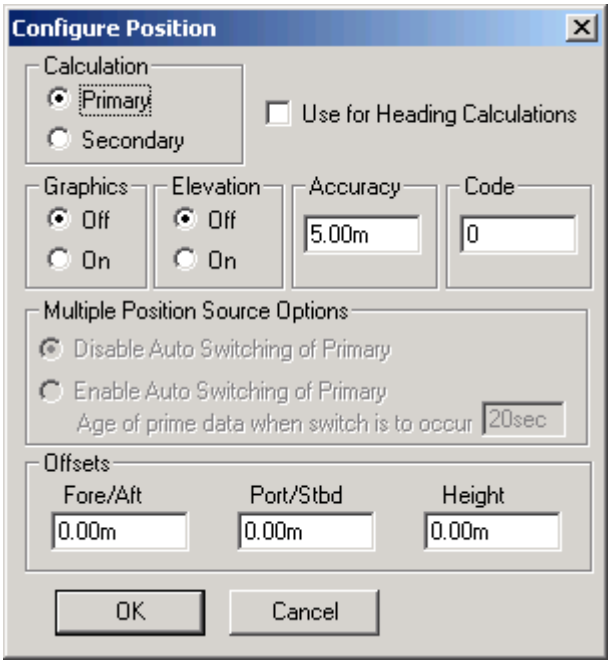
Baud Rate 19200
Data Bits: 8
Stop Bits: 1
Parity: None

WINFROG I/O DEVICES > CONFIG OPTIONS:

There is no configuration for this device.

Data item: GPS, NMEAGPS1, POSITION

The POSITION data item must be edited once it is added to a vehicle's device list. Highlight the data item in the vehicle's device list and click the Edit button. The Configure Position dialog box appears as seen below.



Calculation:
Set the Calculation selection to Primary or Secondary. Devices set to Primary calculation are used to provide a vessel position. Note that more than one Primary positioning device can be added to a vehicle's device list; data from these devices will be combined in a weighted mean solution. (See the paragraph on Accuracy below for more on the weighting of Primary calculation device data).

If the Calculation type is set to Secondary, WinFrog will simply monitor the device's data. WinFrog will not use the data from a secondary device in the final solution of the vehicle's position.

If auto switching is enabled (see below) a secondary may automatically become a primary should all the primaries fail.

Use For Heading Calculations:
Select this checkbox if the device is to be used in conjunction with another GPS device for determination of the heading of the vessel.

Graphics:
If On is selected, a labeled square will show the raw (offset but unfiltered) location of the GPS antenna in the Graphics and Bird's Eye windows. This provides a means of comparing raw device and filtered vehicle positions.

Elevation:
Setting the Elevation option to On will result in the elevation found in the GGA message to be used as the elevation of this vehicle. The sounder data recorded in WinFrog's RAW data files will not be affected.

Accuracy:
The Accuracy value entered provides WinFrog with the expected accuracy of the position from this device. This value is used in the weighting of this device compared to other positioning devices that may be added to the vehicle's device list. The smaller the value entered, the more accurate it is considered to be, and hence the more weight that will be applied to the device's data. The Accuracy parameter can be changed from the suggested values. Changes should be made with caution, however, as they will affect the final filtered position of the vehicle.

Code:
Several messages can be present on this port. The number is determined by the setup of WinFrog at the master using the INTUICOM MASTER device driver. A code is entered into WinFrog to determine which vehicle each message belongs to. (See INTUICOM MASTER device document TX-POSITION.) Enter the code for this slave. It is recommended that each slave's serial number be used as the codes throughout the network. The Intuicom automatically uses the serial number when transmitting its position to the master.

Multiple Position Source Options:
This group box allows you to enable automatic switching of a secondary to primary should the data from all POSITION and PSEUDORANGE data items set to primary timeout. The **Age** entered is the length of time that the secondary will wait in the absence of data from all primaries, before taking over as primary. This age is only entered for the secondary.

For example, if the POSITION or PSEUDORANGE data items associated with two GPS receivers were set to primary and the POSITION or PSEUDORANGE data item of a third GPS receiver was set to secondary, both primary GPS receivers must time out before the secondary will become the primary. Upon the recovery of either of the original primary data items, the original primary will be reset to primary and the original secondary will be reset to secondary.

Note for the auto switching feature to work, there must be at least one primary and one secondary enabled. For example, given two data items, one set to primary with the auto switching disabled and the other set to secondary with the auto switching enabled, if the primary fails the secondary is not set to primary and the vehicle positioning stops until the primary data item recovers.

Disable Auto Switching of Primary:
If this data item is not to be involved in the auto switching process, check this box. As stated above, this data item is then not involved in the auto switching process in any way.

Enable Auto Switching of Primary:
If this data item is to be involved in the auto switching process, either as a primary or a secondary, check this box. If set to secondary, enter the Age of data the primary data items must reach before this secondary is switched to act as the primary.

In order for this option to be effective you must have at least one primary and one secondary. If there are multiple secondary data items that are enabled for switching, the first one to receive data will become primary.

Note: This option is not enabled unless WinFrog determines that there is more than one POSITION and/or PSEUDORANGE data item associated with the respective vehicle. The exception to this is the case of a WinFrog with the Remote module operating as a Controlled Remote being configured remotely from the Controller. In this case, the option is always enabled even though it may not be applicable. The operator must be aware of what is available on the Remote and configure the data item accordingly.

Note: This option is not available in the WinFrog Remote package.

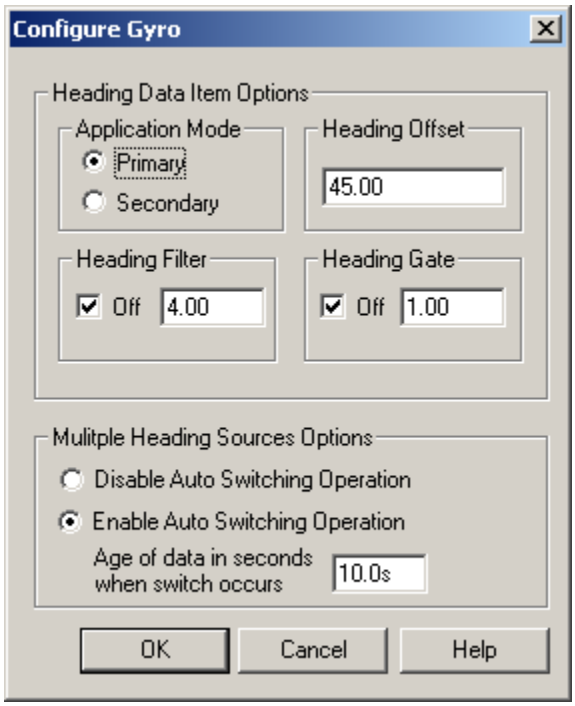
Note: This option is not available for USBL based POSITION data items.

Offsets:
Offsets are required to associate the GPS antenna position with the vessel's Common Reference Point (CRP). The offsets are applied *from* CRP (of the vehicle) *to* the GPS antenna location.
Forward Offsets are entered as positive values.

Aft Offsets are entered as negative values.
Starboard Offsets are entered as positive values.
Port Offsets are entered as negative values.
Height Offsets are positive upwards. (It is suggested that the vessel's Height origin should be at the water line.

Data item: GPS, INTUICOM SLAVE, HEADING

Add the HEADING data item to those vehicles whose positions are in the telegram except this one. This is because this vehicle must be the source for its own heading, but the heading of the other vehicles will come from the messages.



Heading Data Item Options:
Application Mode(Primary/Secondary):
Set the type of calculation to Primary or Secondary by selecting the appropriate radio button. Devices set to Primary are used to provide the vehicle heading information. Devices set to Secondary are simply monitored, and are not used in the vehicle's calculations.

Note that WinFrog supports automatic switching from a designated Primary to a Secondary in the event that data from the Primary fails (see Multiple Heading Sources Options).

Heading Offset:
A correction value (as determined from a gyro calibration) can be input in the Heading Offset box. This value is added to the heading value from the NMEA Gyro

to provide a corrected heading for the vehicle. Note that positive or negative values can be entered.

Heading Filter/Heading Gate:
The Heading Filter is used to “smooth” heading values used by the vehicle. The value entered in the Heading Filter indicates the number of headings that will be used to predict the next heading value. The larger the value entered, the “heavier” the filter will be – i.e. the slower the vehicle’s heading will respond to changes.

The Heading Gate defines a tolerance value to limit the use of anomalies in gyro readings. If the next observed gyro value received falls outside the specified range of predicted values (i.e. plus or minus the entered value), the value will not be used.

Multiple Heading Sources Options:
WinFrog supports automatic switching from a designated Primary source to an alternate Secondary source in the event that the Primary fails. The first Secondary source to receive data after the Primary has failed becomes the alternate Primary providing the heading for the vehicle. When the designated Primary is detected as active again, the alternate Primary source reverts to Secondary and the designated Primary provides the heading data to the vehicle.

If an alternate Secondary fails and there are additional Secondary sources, it in turn is detected by the first of the remaining operational Secondary sources to receive data after the failure, at which time this Secondary becomes the alternate Primary.

Note that this option is only available if more than one HEADING source is associated with the respective vehicle. Changes made to the Auto Switching options for any one of the HEADING data items are automatically assigned to the others upon exiting this dialog with OK. If the Auto Switching option is enabled and the respective HEADING source has been set to Primary, all others are automatically set to Secondary. The exception to this is when configuring a WinFrog Controlled Remote (WinFrog with a Remote module) from a Controller. In this case, changes made to one HEADING source are not automatically made to other HEADING sources. The operator must explicitly make them for each HEADING source.

This option is not available in the WinFrog Remote package.

Disable/Enable Auto Switching Operation:
Select the mode you wish to operate WinFrog.

Age of data in seconds when switch occurs:
Enter the age of data that is permitted before the source is considered to have failed.

Data item: GPS, INTUICOM SLAVE, DATA OUTPUT

Add this data item to your own vehicle only (the vehicle that this slave is actually on). The only item output to the Intuicom is this vehicle's heading. The master will find this value on the TCP/IP port associated with this slave. This information is found in the XML file as described in the Intuicom Master document.

Troubleshooting and Diagnostics

To check if a slave is receiving RTCM corrections, run Hyperterminal connected to cable Port B and set the baud rate to 19200. Attach the provided pickle switch to the third cable and press the button to enter the setup mode. Set the differential (DGPS) to Off or False then escape. This should cause any RTCM corrections being received by the slave to be output on the cable Port A. The RTCM corrections are binary, but still may be viewed in Hyperterminal. To check the RTCM values more thoroughly, connect port A to WinFrog, add an RTCM device and see if the data can be decoded. To determine the baud rate, run the setup again to find the value (see the Intuicom manual). Refer to the Intuicom manual for complete details.

The GGA message from the GPS card can be redirected from the radio modem to port B. Run the setup again and select the appropriate option (see Intuicom manual for details).