WinFrog Device Group:	**GYRO**
Device Name/Model:	**NMEA**
Device Manufacturer:	**Various Manufacturers use the data sentence or telegram described by the NMEA document.** **National Marine Electronics Association** PO Box 3435 New Bern NC 28564-3435, USA Tel: (252) 638-2626 Fax:(252) -638-4885 E-mail: nmea@coastalnet.com
Device Data String(s) Output to WinFrog:	NMEA strings: HDT, HDG and VHW Refer to Configuration Details for string contents.
WinFrog Data String(s) Output to Device:	Nil
WinFrog .raw Data Record Type(s):	Type 910 (Type 410 if data repeated 15 times)

DEVICE DESCRIPTION:

The NMEA 0183 Standard for Interfacing Marine Electronics Devices is a voluntary industry standard, first released in March of 1983. The NMEA 0183 Standard defines electrical signal requirements, data transmission protocol, timing and specific sentence formats for a serial data bus.

The standard has been updated several times since 1983, with the latest major release being version 3.00, July 1, 2000 followed by the minor modification version 3.01.The NMEA 0183 standard calls for data communication in the form of coded "sentences". Each sentence begins with the character "$" and ends with a carriage return and line feed (<CR><LF>). These last two characters are "control" characters and are not normally printed (for this reason they are shown enclosed in brackets). Between the beginning and end of each sentence are "fields" of data, each field separated by a comma. The first field in any sentence (field 0) begins with the two-letter talker mnemonic code ("talkers" are devices that send out information, "listeners" take it in) followed by the three-letter code for the sentence.

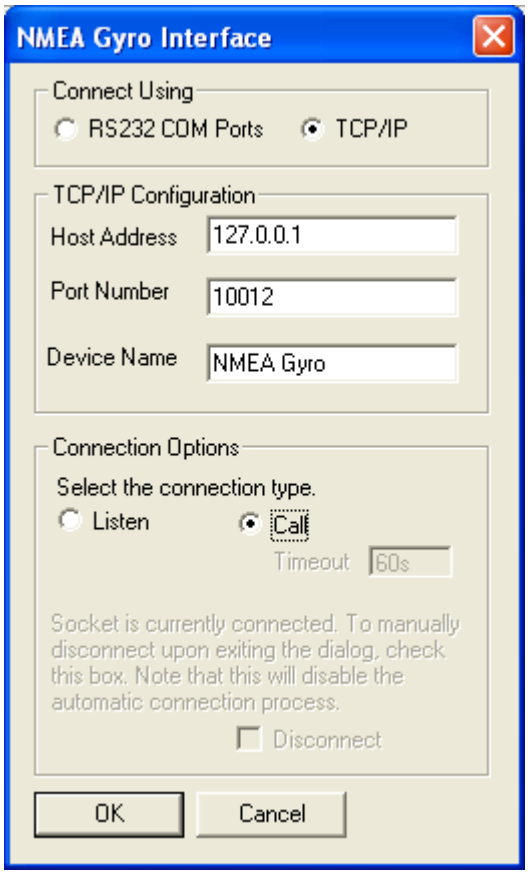
Basically any Gyro outputting the HDT, HDG or VHW NMEA strings can be input to WinFrog.

DEVICE CONFIGURATION INSTRUCTIONS

WINFROG I/O DEVICES > EDIT I/O:

This device can accept data from either a RS232 COM port or a TCP/IP port. When using the TCP/IP port this device can be configured to make the connection or listen for connections.

When adding the NMEA Gyro device, the following dialog appears in which you can select either RS232 or TCP/IP as the data communications protocol.



Connect Using:
Select either RS232 or TCP/IP as the data connection device. When you select RS232 and click OK, the standard Device I/O Parameters dialog opens in which you can select the Com port, baud rate, etc. Selecting TCP/IP enables the controls within this dialog pertaining to the connection settings.

TCP/IP Configuration:
If TCP/IP is selected, enter the IP address and port number of the gyro and the name that WinFrog is to display for this device. Select whether WinFrog is to **Listen** (default) for a connection or initiate the connection with a **Call**. If Listen is selected, upon exiting this dialog with OK, WinFrog immediately starts listening for a call from the respective

device. If Call is selected, upon exiting this dialog with OK, WinFrog immediately attempts to make the connection. In either case, WinFrog monitors the status of the connection or lack thereof, and automatically listens or calls as required. The socket connection status is displayed in the I/O Device Window.

If in Call mode and connected when this dialog is opened, an option to manually disconnect is available at the bottom of the dialog. If this is selected, upon exiting with OK, the connection is disconnected and the automatic connection process is suspended. If it is desired to re-connect, this dialog must be re-accessed and the option to re-activate the automatic connection process is available at the bottom of the dialog. Checking this option and exiting with OK causes WinFrog to immediately attempt to automatically connect. It is important to note that if the automatic call process is suspended due to exiting WinFrog, the suspended state is not saved and WinFrog will immediately start automatically attempting to connect when initialized.

Note: The incoming NMEA telegram must include a checksum when using the socket option.

Note: The Timeout option for the Call mode is not enabled for this device.

RS-232 Serial Configuration:
If the RS-232 option is selected, click OK and the configuration proceeds with the standard serial communications configuration.

The NMEA format originally stated the following communication parameters. WinFrog defaults to these settings. The serial port parameters on newer gyros are completely user configurable.

Baud Rate 4800
Data Bits: 8
Stop Bits: 1
Parity: None

Note: The incoming NMEA telegram does not require a checksum when using the RS-232 serial option.

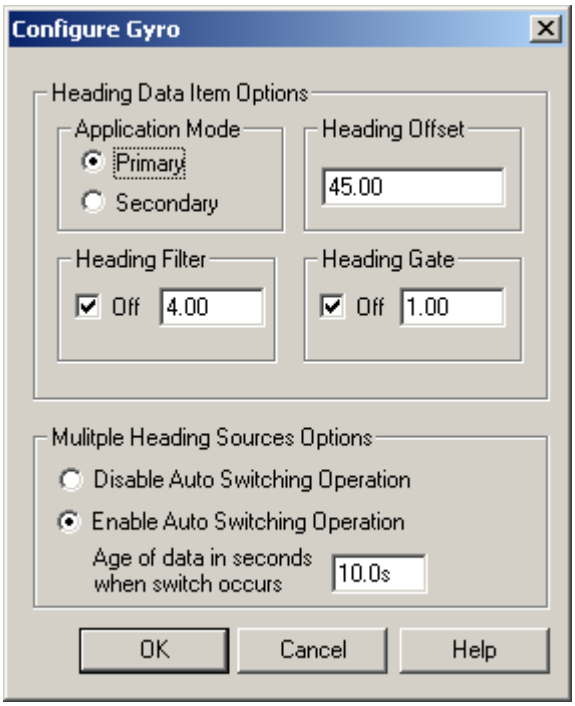
WINFROG I/O DEVICES > CONFIGURE DEVICE:

No other configuration is required or available at the I/O Device window level.

WINFROG VEHICLE > CONFIGURE VEHICLE DEVICES > DEVICE DATA ITEM > EDIT:

Adding the NMEA Gyro device creates the HEADING data item. Once the data item has been added to the vehicle, it must be edited to suit the application. In the vehicle's

device list, highlight the NMEA gyro device and click the Edit button. The Configure Gyro dialog box appears as seen below.



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.

CONFIGURATION DETAILS:

There are numerous gyrocompass, compass, and gyro-repeater heading devices that are capable of outputting NMEA format data. See the manufacturer's documentation to determine if the device is capable of outputting one of the NMEA formats required by WinFrog. The usable data strings (and their contents) are as follows:

$--HDT - Heading, True:

$--HDT,x.x,T*hh<CR><LF>

Where:

x.x	Heading in degrees
T	True North (Reference)

$--HDG - Heading, Deviation and Variation:

$--HDG,x.x,y.y,A,z.z,BT*hh<CR><LF>

Where:

x.x	Magnetic Sensor Heading in degrees
y.y	Magnetic Deviation in degrees
A	East (E) or West (W)
z.z	Magnetic Variation in degrees
B	East (E) or West (W)

$- VHW – Water Speed and Heading:

$--VHW,x.x,T,x.x,M,y.y,N,x.x,K*hh<CR><LF>

Where:

x.x	Heading in Degrees
T	True North Reference
M	Magnetic North Reference
y.y	Speed in Knots
N	Nautical miles per hour designator
K	Kilometers per hour designator