**GGA** - essential fix data which provide 3D location and accuracy data.

 $GPGGA,123519,4807.038,N,01131.000,E,1,08,0.9,545.4,M,46.9,M,,\*47

Where:

     GGA          Global Positioning System Fix Data

     123519       Fix taken at 12:35:19 UTC

     4807.038,N   Latitude 48 deg 07.038' N

     01131.000,E  Longitude 11 deg 31.000' E

     1            Fix quality: 0 = invalid

                               1 = GPS fix (SPS)

                               2 = DGPS fix

                               3 = PPS fix

                              4 = Real Time Kinematic

                              5 = Float RTK

                               6 = estimated (dead reckoning) (2.3 feature)

                              7 = Manual input mode

                              8 = Simulation mode

     08           Number of satellites being tracked

     0.9          Horizontal dilution of position

     545.4,M      Altitude, Meters, above mean sea level

     46.9,M       Height of geoid (mean sea level) above WGS84

                      ellipsoid

     (empty field) time in seconds since last DGPS update

     (empty field) DGPS station ID number

     \*47          the checksum data, always begins with \*

Eg 3723.2475 >> 37.

23.2475 / 60 = 0.38745833333333

Thyen 37 + the # above = 37. 38745833333333

split your GPS values into (d)dd and mm.mmmm.

Divide the mm.mmmm by 60 and add it to the ddd.

Then multiply the result by -1 if the direction is S or W.

Good link for conversion:

<http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html>

<http://en.wikipedia.org/wiki/Geographic_coordinate_conversion>

Don’t forget to do neg for W and S

Longitude

 180 W   = -180

 180 E   =  180

Latitude

  90 N   =   90

  90 S   =  -90

|  |  |
| --- | --- |
| Latitude | Latitude of point.  Google Earth uses the WGS84 geodetic datum.  Valid formats include:   N43°38'19.39"   43°38'19.39"N   43 38 19.39   43.63871944444445  If expressed in decimal form, northern latitudes are positive, southern latitudes are negative. |
| Longitude | Longitude of point.  Valid formats include:   W116°14'28.86"   116°14'28.86"W   -116 14 28.86   -116.2413513485235  If expressed in decimal form, eastern longitudes are positive, western longitudes are negative. |

NMEA Sentence:

Table 1-3 contains the values for the following example:

$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000\*18

Table 1-3 GGA Data Format

Name Example Units Description

Message ID $GPGGA GGA protocol header

UTC Time 161229.487 hhmmss.sss

Latitude 3723.2475 ddmm.mmmm

N/S Indicator N N=north or S=south

Longitude  12158.3416 dddmm.mmmm

E/W Indicator W E=east or W=west

Position Fix Indicator 1 See Table 1-4

Satellites Used 07 Range 0 to 12

HDOP  1.0 Horizontal Dilution of Precision

MSL Altitude 9.0 meters

Units M meters

Geoid Separation meters

Units M meters

Age of Diff. Corr. second Null fields when DGPS is not used

Diff. Ref. Station ID 0000

Checksum \*18

<CR> <LF> End of message termination

Pharos iGPS-360 Pinouts:

Here is the pin out for the GPS-360 receiver….

Pin #1: RX

Pin #2,4,6:       GND

Pin #3: TX (NMEA signal from receiver sent out thru this pin)

Pin #5: 5V

For other NMEA commands please refer to the NMEA manual.

Thank you in advance for your time.