Classification:
Troubleshooting

Question

How to solve the offset issue when mapping GPS data on Google Maps?

Answer

Applies to:

Platform	Module
PC, NB, HMI and other control devices.	I-87211W, GPS-721 and GPS-721-MRTU

ICP DAS Remote I/O modules/Units list:
http://www.icpdas.com/en/product/p02.php?root=537&kind=538

Problem phenomenon:
1. There is a map offset when using GPS data on Google Maps.
2. How to transform NEMA format to Google Maps format.

The ICP DAS GPS modules like I-87211W, GPS-721 and GPS-721-MRTU use NMEA format, not Google Maps format. And Google Maps doesn't support NMEA format. If a user wants to show position on Google Maps correctly, the GPS data in NMEA format needs be transformed to Google Maps format by the following formula.

For more detailed information, please refer to:
http://en.wikipedia.org/wiki/NMEA_0183
http://en.wikipedia.org/wiki/Decimal_degrees

A DMS value is converted to decimal degrees using the formula:

$$DD = D + \frac{M}{60} + \frac{S}{3600}$$

For instance, the decimal degree representation for
38° 53′ 23″ N, 77° 00′ 32″ W (United States Capitol) is 38.889722°, -77.008889°

In most systems such as Google Maps, the degree symbols are omitted, reducing the representation to 38.889722, -77.008889

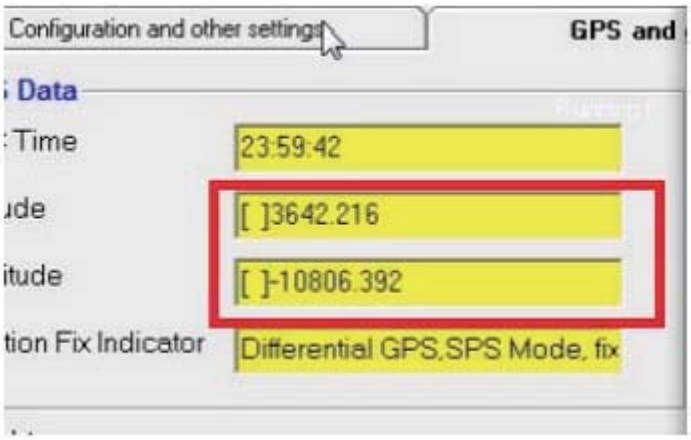
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To calculate the D, M and S components, the following formulas can be used:

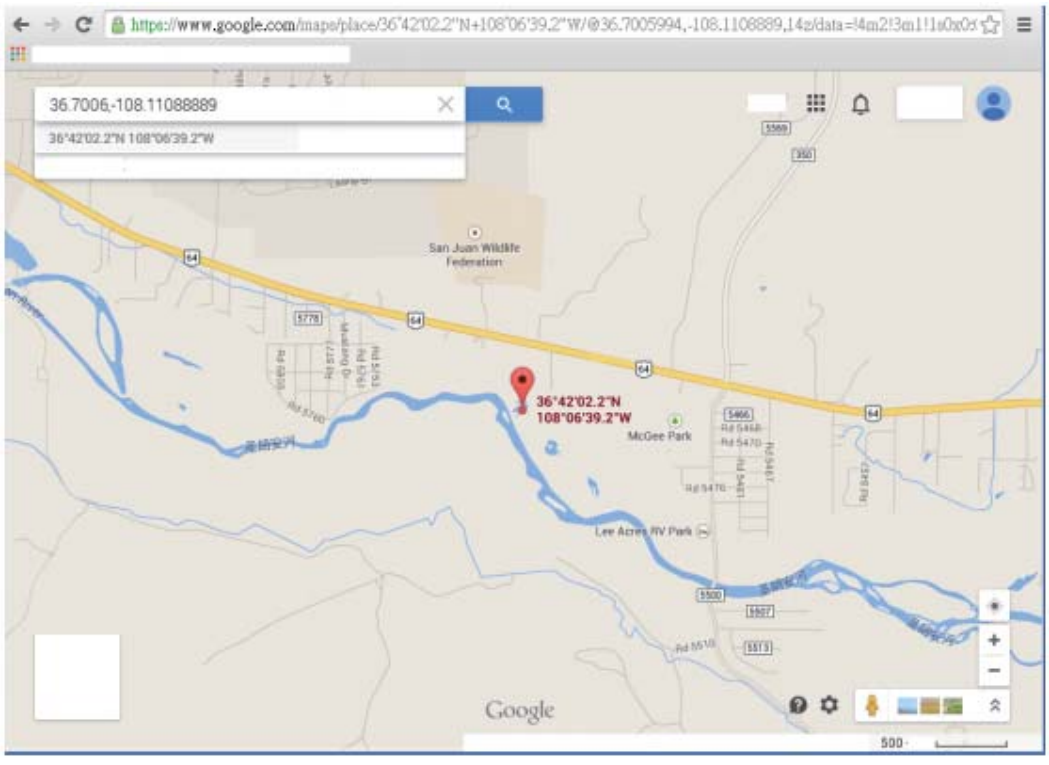
$$DD = \begin{cases} D & = \text{trunc}(DD) \\ M & = \text{trunc}(|DD| * 60) \bmod 60 \\ S & = (|DD| * 3600) \bmod 60 \end{cases}$$

For example,
The GPS data in NMEA format:

Latitude: 3642.216
Longitude: -10806.392



Converting to Google Maps format:
Latitude =
36+42/60+21.6/3600=36+0.7+0.006=36.7006
Longitude= -(108+6/60+39.2/3600=108+0.1+0.01088889)=-108.11088889
The correct position shows as below:



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