# A3LA-DGS v3 A3LA-TSS v103 GPS Report Format

**Introduction**
The following explains the format for the A3LA-DGS version 3 gps report format. The format for the A3LA-TSS version 103 is similar and the differences are described in the notes following the AL3A-DGS format description. All gps reports with a 3 as the report type will follow this format. The 3 is the decimal value rather than the ASCII character for '3'. This format is accurate for A3LA-DGS modems version 3.2 and greater. The version 3 SBD format will also be used in the 9601-DGS.

**Notation Notes:**
- A 0x before a number means a base 16 number (example 0x10). Otherwise the numbers are base 10.
- Characters in <>s are definitions that are defined later.
- Characters in []s are optional
- % is the modulus operator
- & is the bitwise AND operator
- This definition may include the null value 0

**Components of Array**
Below each number represents a byte.

<Header> in bytes

| | |
|---|---|
| 1 | Report Type (Value is always 3 for this version) |
| 2 | Number of Reports |

<GPS_Information> in bytes

| | |
|---|---|
| 1 | UTC Time/Date - Hours (hh) is value / 10, decade is value % 10 |
| 2 | UTC Time - Minutes (mm) |
| 3 | UTC Time/Vertical Velocity – Seconds (ss) is value % 64 s, Decimal place for vertical velocity / 64 |
| 4 | UTC Time/Emergency - Fraction Seconds (xx) is lower 7 bits, Bit for emergency is value & 0x80 |
| 5 | UTC Date – Month and digit year - (mm) is value / 10 and digit year is value % 10 |
| 6 | UTC Date – Day (dd) |
| 7 | Latitude – Degrees (dd) |
| 8 | Latitude – Minutes (mm) |
| 9 | Longitude – Degrees (ddd) |
| 10 | Longitude – Minutes (mm) |
| 11 | Longitude – Fraction Minutes part 1 (nn) first 2 digits for latitude |
| 12 | Longitude – Fraction Minutes part 2 (nn) next 2 digits for latitude |
| 13 | Longitude – Fraction Minutes part 3 (nn) final digit latitude first digit longitude |
| 14 | Longitude – Fraction Minutes part 4 (nn) next 2 digits longitude |
| 15 | Longitude – Fraction Minutes part 5 (nn) final 2 digits longitude |
| 16 | Satellites Used and Vertical Velocity – Number of satellites used is value / 10 first digit vertical velocity is value % 10 |
| 17 | Altitude – Part 1 value / 10 is decimal place value % 10 is first digit of altitude |
| 18 | Altitude – Part 2 next 2 digits of altitude |
| 19 | Altitude – Part 3 next 2 digits of altitude |
| 20 | Altitude – Part 4 final 2 digits of altitude |
| 21 | Ground Speed – Part 1 value / 10 is decimal place value % 10 is first digit of speed |
| 22 | Ground Speed – Part 2 next 2 digits of speed |
| 23 | Ground Speed – Part 3 next 2 digits of speed |
| 24 | Vertical Velocity – Part 3 next 2 digits of vertical velocity |

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25 Vertical Velocity – Part 4 next 2 digits of vertical velocity
26 Heading Part 1
27 Heading Part 2
28 <Indicators> (Byte where the different bits have meaning)

<Indicators> in bits where if bit place 1 is a 1 the value would be $1_{16}$
1 2-D Fix - value & 0x01
2 Dead Reckoning - value & 0x02
3 ID Included in SBD - value & 0x04
4 Positive or Negative Vertical Velocity - value 0x08
5 Positive or Negative Altitude - value 0x10
6 North or South – value & 0x20
7 East or West - value & 0x40
8 Position Fix - value & 0x80

Notes:

- The SBD attachment is an array of bytes. The standard attachment with one report is 30 bytes long. The unit has the ability to buffer up to 3 missed reports in which case the length is 114 byes. The A3LA-DGS will only include 3 missed reports. Future modems using the same format may specify that more reports are included. The format of the attachment is:

<Header><GPS_Information> [<GPS_Information>][<GPS_Information>][<GPS_Information>]

- Where there is always a header and at least one packet of information. Three additional packets may also be attached.
- NAL Unit Number is located in the subject line. A text identification may be located after the report if the ID Included in SBD bit is true.
- The heading is a 2 byte number computed as Heading Part 2 * 0x100 + Heading Part 1. The main part of the heading is heading / 100 and the fractional part is heading % 100.
- Altitude is in meters
- Ground Speed is in km/h
- Vertical Velocity is in m/s
- For the A3LA-TSS SMS messages the Report type is 103 instead of 3 and the number or reports is always ‘1’ (Note ASCII digit rather than decimal value as for SBD). Also the <GPS_Information> is displayed as an uppercase hexadecimal string where every 2 characters represent 1 byte. A 50 character ID may be added after the report which is not as a hexadecimal string. Care needs to be taken for the characters in the ID field so they will not be lost in the ASCII -> SMS character [-> ASCII] conversions underdone while sending SMS messages.

For future version of the format the Report Type in the Header will be different so that the same program can parse all of the types of reports.