National Marine Electronics Association

International Marine Electronics Alliance

Technical Bulletin

Amendment to NMEA0183 Version 4.11

 # AT 0183 20190627GDC

NMEA 0183 Amendment
An amendment is a technical specification that is publically available.
This amendment applies to the NMEA Version 4.11 that was published in November 2018.
This amendment will remain in force until the contents are incorporated into the next version of the NMEA 0183 standard.

This document contains the final approved NMEA 0183 sentence for:

GDC - GNSS Differential Correction

This Amendment had been reviewed and approved in collaboration with NMEA, RTCM and IEC.

GDC – GNSS Differential Correction

This sentence is used to report GNSS differential correction data.

The GDC sentence provides the Satellite ID, GNSS System ID, GNSS Signal ID, Pseudorange correction, Issue of data, epoch time of GNSS, Modified Z-Count, as well as UDRE. The GDC sentence contains information for one satellite's differential correction per transmission. The total number of sentences being transmitted and the sentence number being transmitted are indicated in the first two fields.

If the GNSS receiver is using differentially corrected data for one or more GNSS systems, use GDC sentences with corresponding Talker ID:

GP to show GPS satellites and their differential corrections,

GL to show GLONASS satellites and their differential corrections,

GA to show Galileo satellites and their differential corrections,

GB to show the BDS satellites and their differential corrections,

GQ to show the QZSS satellites and their differential corrections,

GI to show the NavIC (IRNSS) satellites and their differential corrections.

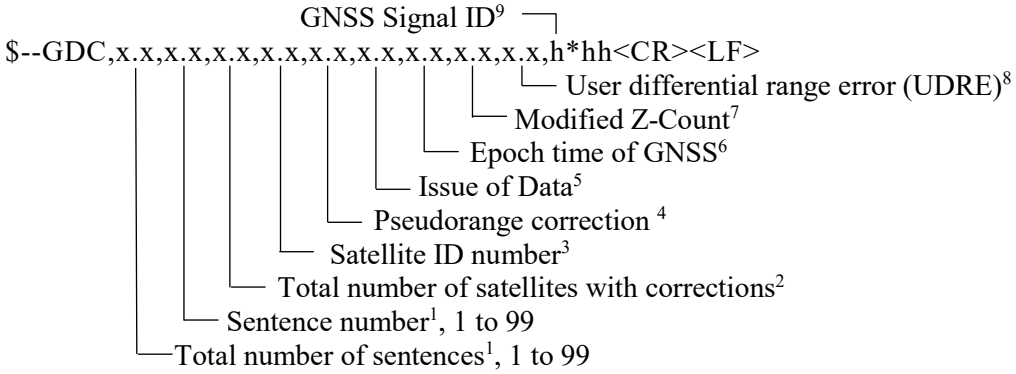
The sentence Talker ID and Signal ID fields identify the GNSS and satellite signal being corrected.

Talker ID GN shall not be used.

When multiple GDC sentences are necessary, use of the NMEA TAG Block structure (§ 7) and the TAG Block Sentence-grouping Parameter (§ 7.9.3) reliably links the related sentences together over any transport medium.

When GDC sentences are provided with related GRS and/or GSA sentences, use of the NMEA TAG Block structure (§ 7) and the TAG Block Sentence-grouping Parameter (§ 7.9.3) reliably links the related (different sentence formatters) sentences together over any transport medium.

This sentence shall be transmitted in reply to a standard query sentence (See NMEA 0183 4.20 Section titled "Query Sentences" or IEC 61162-1 Section titled "Query Sentences"), with a response for each satellite's differential correction in use, resulting in one or more GDC sentences. If there are no existing differential corrections, then the response shall be a NAK sentence with reason code 49 and the descriptive text "no differential corrections".



Notes:

1) Satellite differential corrections may require the transmission of multiple sentences all containing identical field formats when sending a complete message. The first field specifies the total number of sentences, minimum value 1. The second field identifies the order of this sentence (sentence number), minimum value 1. These fields shall not be null.

2) The "Total number of satellites with corrections" data field identifies how many satellites and their differential corrections will be reported. This includes all GNSS systems in use with differential corrections. For example, if there a differential corrections for 6 GPS satellites and for 4 Galileo satellites, then this "Total number of satellites with corrections" will set to 10, and will be included in all GDC sentences.

3) Satellite ID numbers. To avoid possible confusion caused by repetition of satellite ID numbers when using multiple satellite systems, the satellite number and associated GNSS system is identified with the GDC sentence Talker ID in Table 19 - GNSS Identification Table.

3) Pseudorange correction – This provides DGNSS Pseudorange correction data. This is a variable length floating numeric field where the decimal point and associated decimal-fraction are optional if full resolution is not required. The units are in meters. The Signal ID will indicate the observation type (frequency, code range or carrier phase).

4) Issue of data – This is the Issue of DGNSS correction data. This is a variable length data field with no units. See RTCM 10402 MT 41 for more information.

5) Epoch time of GNSS –This is a variable length integer field. Each GNSS may have different start date/times that the time of week is based upon. The GDC Sentence's Talker ID identifies the GNSS. Time of week (for all GNSS except for GLONASS) in units of seconds. Time of day (for GLONASS) in units of seconds. The GNSS system starting time epoch is defined below:

   GP : (GPS) The start epoch is 0 hour UTC (midnight) of January 5th to 6th, 1980.

   GL : (GLONASS) "Time of day" is natural unit of time measurement for GLONASS. Since GLONASS system time is based on UTC that includes positive leap seconds, specifying the beginning of week will not define continuous time scale for GLONASS.

   GA : (Galileo) The start epoch is 0 hour UTC on Sunday, 22 August 1999 (midnight between 21 and 22 August).

   GB : (BDS) The start epoch is 0 hour UTC on January 1st, 2006.

   GI: (NavIC) The start epoch is 23:59:47 UTC on August 21st, 1999.

6) Modified Z-Count – This is a variable length numeri field with a range from 0 to 3599.4, in units of seconds. See RTCM 10402 for more information.

7) User differential range error (UDRE) – Thus is a variable length numeric field with a range from 0-150, in units of meter. See RTCM 10402 MT41 for more information.

8) The GNSS Signal ID is in Table 19 - GNSS Identification Table. The Talker ID of the sentence identifies the GNSS System and the GNSS Signal ID identifies the type of GNSS signal being corrected. This field shall not be null.