



GALILEO SERVICE NOTICE #04

SERVICE NOTICE TO GALILEO USERS (SNGU): 2020002

Issue: 1.0

DATE GENERATED (UTC): 2020-11-26 08:50

SNGU TYPE: GENERAL

SNGU NUMBER: 2020002

***** GENERAL MESSAGE TO ALL GALILEO USERS *****

1. Introduction

This Service Notice informs Galileo users about the possibility to use Galileo satellites not belonging to the baseline Galileo constellation. In particular, this Service Notice relates to use of the Galileo satellites GSAT0201 and GSAT0202, after they have been declared USABLE.

2. Galileo Space Segment

The baseline Galileo constellation is defined as a 24/3/1 Walker constellation: 24 nominal Medium Earth Orbit (MEO) satellites are arranged in 3 orbital planes, with their ascending nodes uniformly distributed at intervals of 120 degrees, inclined at 56 degrees with respect to the Equator. Each orbital plane includes 8 satellites uniformly distributed within the plane, at intervals of 45 degrees of argument of latitude. The angular shift between satellites in two adjacent planes is 15 degrees. The constellation may be complemented by Galileo auxiliary satellites, placed in orbital slots not belonging to the baseline constellation and not defined *a priori*. Auxiliary satellites that are in the baseline orbital planes may be repositioned to any given nominal slot within each orbital plane, depending on maintenance or service evolution needs.

If the SIS broadcast by an auxiliary satellite is flagged Healthy, such SIS complies with the accuracy Minimum Performance Levels (MPLs) defined in the OS SDD and may be used by Galileo users, without compromising performance. The presence of healthy SIS broadcast by auxiliary satellites always improves the Dilution of Precision, allowing users who are able to exploit them to obtain a navigation solution with improved accuracy and availability, especially in urban environments.

Auxiliary satellites are not required to fulfil the OS SDD availability MPLs of the Galileo constellation. This implies that their SIS might be flagged as Marginal or Unhealthy for a higher percentage of time than the Galileo satellites belonging to the baseline constellation, without impacting the availability commitment. Moreover, the measured availability of the auxiliary satellites is not taken into account in the availability calculations of the Galileo services.



The processing by Galileo receivers of healthy SIS broadcast by auxiliary satellites is not required in order to achieve the Galileo OS Minimum Performance Levels presented in the OS SDD for the navigation solution, although their use results in an improvement of the service performance.

3. Assumptions for Galileo OS receivers

In order for the navigation solution to comply with the Minimum Performance Levels defined in the OS SDD, the user receiver has to comply with the technical requirements related to the interface between the Space Segment and Galileo OS receivers as established by the Galileo OS SIS ICD (OS SDD Annex A [1]), without the use of aiding sensors or systems.

Moreover, for each frequency or pair of frequencies used, it is assumed that the user receiver is capable of tracking the respective OS SIS from all Galileo satellites in the baseline constellation in view above a masking angle of 5 degrees over the local horizon.

As explained before, user receivers do not need to make use of the SIS broadcast by auxiliary satellites in order to achieve the navigation performance presented in the OS SDD, rather they may use them to experience a better performance.

4. Current auxiliary satellites

Currently, the Galileo constellation comprises two auxiliary satellites, GSAT0201 (SV ID E18) and GSAT0202 (SV ID E14). As per definition of auxiliary satellites, after they have been declared USABLE and whenever their broadcast SIS is Healthy, those satellites can be used by Galileo receivers to improve the quality of their navigation solution.

It should be noted that the auxiliary satellites GSAT0201 and GSAT0202 are in an orbital plane that does not belong to the baseline constellation; therefore, they cannot be repositioned to any nominal slot.

It should also be noted that the Almanac information related to these satellites is not included in the OS Navigation Message broadcast by any Galileo satellite.

Considering that GSAT0201 and GSAT0202 are the first auxiliary satellites in the Galileo constellation, and due to their particular characteristics as described above, users are invited to report through the Galileo Help Desk¹ any issue they may experience after the satellites have been declared USABLE.

Information about the auxiliary satellites is published by the European GNSS Service Centre¹.

¹ www.gsc-europa.eu