



## GALILEO - OPEN SERVICE - SIGNAL-IN-SPACE INTERFACE CONTROL DOCUMENT

### INFORMATIVE NOTE

#### Scope

This note includes additional information to the published version of the document "[Galileo – Open Service – Signal-In-Space Interface Control Document \(OS SIS ICD\), Issue 1.3, December 2016](#)". The information is provided to make the user aware of a potential rare anomaly in the content of the F/NAV message, which however has negligible impact on receiver performance.

#### Applicability of the additional information

The current Open Service Signal-In-Space Interface Control Document (OS SIS ICD) v1.3 states the following in its section 4.2.3 (F/NAV Frame Layout).

*“The F/NAV E5a-I message data packet transmission sequence is according to Table 26 where a whole frame is shown. Note that the odd numbered sub-frames contain the page type 5 and the even numbered sub-frames contain the page type 6. This allows the transmission of the almanacs for three satellites within two successive sub-frames (100 seconds). The parameter  $k$  is transparent for the user. It is set by the Galileo system for each of the active satellites, such as to improve almanac transport time by exploiting source diversity.”*



	Page Type	Page Content
Subframe 1	1	SVID, clock correction, SISA, Ionospheric correction, BGD, Signal health status, GST and Data validity status
	2	Ephemeris (1/3) and GST
	3	Ephemeris (2/3) and GST
	4	Ephemeris (3/3), GST-UTC conversion, GST-GPS Conversion and TOW
	5	Almanac for satellite k and almanac for satellite (k+1) part 1
Subframe 2	1	SVID, clock correction, SISA, Ionospheric correction, BGD, Signal health status, GST and Data validity status
	2	Ephemeris (1/3) and GST
	3	Ephemeris (2/3) and GST
	4	Ephemeris (3/3), GST-UTC conversion, GST-GPS Conversion and TOW
	6	Almanac for satellite (k+1) part 2 and almanac for satellite (k+2)
me 3	1	SVID, clock correction, SISA, Ionospheric correction, BGD, Signal health status, GST and Data validity status
	2	Ephemeris (1/3) and GST

Table 26. F/NAV Frame Layout

The satellite, whose almanac is split and transmitted in consecutive pages type 5 and type 6, is identified by the parameter SVID2, which is only included in page type 5. On the other hand, in page type 6 no identification of this satellite is present, as shown in Table 31 and 32 of the Public OS SIS ICD v1.3.



Page Type 5: Almanac (SVID1 and SVID2(1/2)), Week Number and almanac reference time

Type=5	IOD <sub>a</sub>	WN <sub>a</sub>	t <sub>0a</sub>	SV <sub>SVID1</sub>										SV <sub>SVID2(1/2)</sub>				CRC	Tail	Total (bits)					
				SVID1	$\Delta(A^{1/2})$	e	$\omega$	$\delta i$	$\Omega_0$	$\dot{\Omega}$	M <sub>0</sub>	a <sub>fp</sub>	a <sub>fl</sub>	E5a <sub>HS</sub>	SVID2	$\Delta(A^{1/2})$	e				$\omega$	$\delta i$	$\Omega_0^{(1/2)}$		
6	4	2	10	6	13	11	16	11	16	11	16	11	16	16	13	2	6	13	11	16	11	4	24	6	244

Table 31. Bits Allocation for F/NAV Page Type 5

Page Type 6: Almanac (SVID2(2/2) and SVID3)

Type=6	IOD <sub>a</sub>	SV <sub>SVID2(2/2)</sub>							SV <sub>SVID3</sub>							Spare	CRC	Tail	Total (bits)					
		$\Omega_0^{(2/2)}$	$\dot{\Omega}$	M <sub>0</sub>	a <sub>fp</sub>	a <sub>fl</sub>	E5a <sub>HS</sub>	SVID3	$\Delta(A^{1/2})$	e	$\omega$	$\delta i$	$\Omega_0$	$\dot{\Omega}$	M <sub>0</sub>					a <sub>fp</sub>	a <sub>fl</sub>	E5a <sub>HS</sub>		
6	4	12	11	16	16	13	2	6	13	11	16	11	16	11	16	11	16	16	13	2	3	24	6	244

Table 32. Bits Allocation for F/NAV Page Type 6

However, in very rare (non-nominal) cases, the actual almanac transmission order currently implemented in the Galileo system might not follow this rule. Indeed, it has been observed in these cases that the second part of the split almanac contained in page type 6 refers to a different satellite than the one contained in the first part of the split almanac contained in page type 5. If this should happen, the Galileo OS user would not have any information about this disruption, which would lead to an erroneous re-assembly of the SVID2 almanac. Nevertheless, the impact at user level is almost negligible: although the receiver fails in the acquisition of the specific satellite because the information decoded is not correct, the situation gets back to nominal conditions with the next almanac update. Therefore, no modifications at receiver level to cope with this rare occurrence are expected to be needed.

It is important to remark, firstly, that there is no impact on the Galileo Open Service performance as per the published OS SDD and, secondly, that the situation will be corrected in a future version of the system build.