

Metrology & Hallmark

<https://www.gum.gov.pl/wye/content/archives-of-biuletyn-metrologi/volume-23/5316,The-consequences-of-the-GPS-week-number-rollover-event-in-synchronization-of-tim.html>
13.03.2026, 23:45

The consequences of the „GPS week number rollover” event in synchronization of time for the needs of economy and society, and for time and frequency metrology

Authors Maciej Gruszczyński, Albin Czubla - Central Office of Measures (Główny Urząd Miar), Marcin Szofucha - Military University of Technology (Wojskowa Akademia Techniczna)

Abstract

At the night from 6 to 7 April 2019 at 2:00am (UTC), the GPS (Global Positioning System) experienced a 10-bits week counter roll over to zero (data storage overflow). This counter is included in the satellite-transmitted navigation message. In view of the above, week number "1023" (2 to the power of 10 minus 1), calculated in the GPS system continuously from 22 August 1999, is followed by the number "0", which corresponds to the first week counted from 7 April 2019. This event is called "GPS week number rollover" and was preceded by concerns manifested among representatives of the industry associated time and frequency synchronization. Some of these fears were confirmed in reality.

Bibliography

- [1] Interface Specification IS-GPS-200, Navstar GPS Space Segment/Navigation User Interfaces, Global Positioning Systems Directorate Systems Engineering & Integration, Latest version incorporating all applicable Interface Revision Notices (IRNs).
- [2] Memorandum for U.S. owners and operators using GPS to obtain UTC time. Upcoming Global Positioning System Week Number Rollover Event. US Department of Homeland Security, National Cybersecurity & Communications Integration Center, National Coordinating Center for Communications.
- [3] GPS Week Rollover Issue, Edward Powers, USNO, Sept 26, 2017, CGSIC.
- [4] The GPS End-of-Week Rollover. Richard B. Langley, University of New Brunswick. GPS WORLD, November 1998.
- [5] GNSS Market Report Issue 6, European GNSS Agency, October 2019.

ISSN 2300-8806

Year 2019

Volume 2

Application generates the quote in the selected format.

[Generate quote from this publication](#)

Generate the quote

Download

[Next Page](#)