Microsemi
Power Matters.™

Timing and Sychronization Systems

Leap Second Certification

November 2015

Leap Second Certification

The International Earth Rotation and Reference Systems Service (IERS), the organization responsible for measuring the relationship between UTC (Coordinated Universal Time) and the rate of Earth's rotation, sent out Bulletin C49 announcing that a positive leap second would be introduced at the end of the day on June 30, 2015.

The leap second insertion increases the length of the last minute of the UTC day to 61 seconds. The sequence of dates of the UTC second markers shall be:

- 2015 June 30, 23h 59m 59s
- 2015 June 30, 23h 59m 60s
- 2015 July 1, 0h 0m 0s.

Reason for the Leap Second

Until 1967 the base unit for time keeping, the second, was defined based on the earth's rotation around the sun: one second was equal to 1/86400 of a mean solar day. The duration of the earth's orbit around the sun varies year after year and thus the definition of a second based on the earth's rotation could also theoretically change year after year. This definition of a second was eventually found to not provide adequate precision for the scientific community.

By 1967, the world's timekeepers decided to redefine a second to be based on atomic principles, which are much more accurate than the earth's rotation around the sun and are much easier to reproduce with a high level of precision. From that point on, a second was defined as:

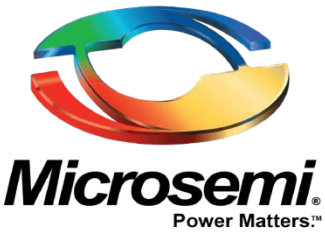
> 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the cesium 133 atom.

With the definition of a second now a function of atomic properties the world's timekeepers needed a way to add or remove seconds in order to keep the world's clocks in sync with the earth's rotation. The addition or removal of seconds is known as a leap second.

Leap seconds don't happen every year but rather only when the difference between the earth's atomic clocks (UTC) and the mean solar time (UT1) approaches 0.9 seconds. The last leap second was added on June 30, 2012.

The Handling of Leap Seconds by Microsemi

For the 2015 leap second insertion, Microsemi® will simulate the rollover event on a sample of its key products. In due course a Field Service Bulletin will be posted online with the results. Field Service Bulletins can be found in Services & Support, Online Support, under Technical Documents (you will need to use your Microsemi user ID and password to access Field Service Bulletins).



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