GPS Receiver with Enhanced User Positioning Time


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ABSTRACT

This paper introduces a Global Positioning System (GPS) Receiver that locates user’s position instantly. Recently, many mobile devices require location information to add user position into their contents, and some applications require quick positioning when the device is initially switched on.

In order to reduce the time to fix user’s position, we propose the Instant-On GPS receiver system which is implemented on an ARM based FPGA board, and operates under a very low power mode. We’ve developed a repeated sleep mode by periods to control the GPS receiver’s main power in order to achieve reduced power consumption. By using a high resolution Real Time Clock (RTC), we can estimate frame sync timing without receiving the current frame sync preamble data from a satellite when GPS turns back on. However, the navigation solution needs to be calculated once in advance.

The performance results of the proposed GPS receiver in both real world and simulation environment are presented.