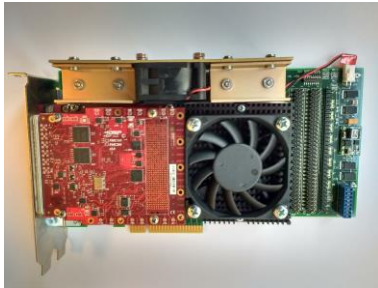


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## DirEct-sampling Signal Recording (DESIRE)



Regione Toscana



The DirEct-sampling Signal Recording (DESIRE) project, Funded by the PORCreO program of the European funding for regional development 2014-2020 of Tuscany, is aimed at the design and implementation of a recording system for an RF signal received from antenna, according to the pass band direct sampling technique. This allows the elimination of the analogue RF section of a traditional heterodyne receiver and the all-digital implementation of the receiver DSP, thus exploiting the flexibility and re-configurability of a digital system.

The recorder represents an innovative product as it paves the bridge toward the “software defined radio” (SDR), where the receiver is eventually all-software and is implemented in a CPU, sometimes aided by a front-end hardware accelerator. Compared with similar commercial products, this recorder is fully customizable and configurable, so that it can be tailored to different applications. The DESIRE recorder is hosted by a commercial PC featuring an acquisition and elaboration breadboard running the front-end filtering of the digital samples. Specifically, the latter is based on an FPGA device communicating with the SW running on the host PC in order to allow the transfer of the acquired and filtered signal, and eventually its recording on the PC hard drives.

A prototype of the recorder is customized for Global Navigation Satellite System (GNSS), including GPS (USA), GLONASS (Russia) and Galileo (Europe). Two distinct portions of the L band are processed, ranging from 1164 to 1300 MHz (lower band) and from 1559 to 1610 MHz (upper band), with extraction, filtering and recording of the channels of interest.

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