

A low-complexity and low-power receiver for wireless communications

A superregenerative receiver for digital phase-modulated signals has been developed and patented. The technology described herein extends for the first time the conventional superregenerative receiver to be able to detect PSK signals with a minimum of additional circuitry. Taking advantage of both the low-complexity and low-power from superregenerative receivers and the more efficient power transmission achieved by PSK modulations. Partners to further develop the system and/or to establish commercial agreements along with technical cooperation are sought.

The Challenge

The receiver plays an essential role in wireless communication systems. In many application areas the receiver power consumption has to be minimized to comply with tight power budgets. Moreover, when systems are built with an increasing number of wireless nodes, the cost of each receiver has to be strictly minimized. The superregenerative receiver is a technology that allows meeting both objectives. It is well-known for its extreme simplicity, which translates into low-cost and low-power implementations. These two key factors make this receiver a suitable choice in applications where cost and power consumption are more significant than the superior performance achievable by other structures. However, up to now, superregenerative receivers were not capable of detecting PSK signals, which are common in many current communication standards and widely used in wireless communication.

The Technology

Our technology allows taking advantage of a fundamental result of superregenerative reception theory by means of an extremely simple additional processing, which allows detecting the PSK-coded information. Compared to a traditional bit-synchronous ASK superregenerative receiver, the added complexity is extremely low and fundamentally in the digital domain. As a consequence, the essential features of low power and low complexity are preserved.

Innovative advantages

- Existing superregenerative receivers are mostly restricted to ASK modulations, with a few efforts aimed at binary PSK. This technology, allows the reception of M-ary PSK modulations.
- The resulting receiver complexity is several orders of magnitude lower than conventional PSK receiver structures.

Current stage of development

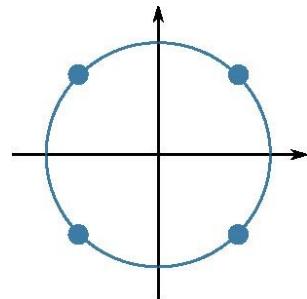
A QPSK superregenerative receiver has been demonstrated by an experimental prototype.

Applications and Target Market

This technology may be applied in any area requiring wireless connectivity with reduced cost and/or low power consumption while requiring compatibility with communication standards relying on PSK modulations. A significant application area are wireless sensor networks.

It could be of interest for companies devoted to manufacturing RF receivers.

The first QPSK superregenerative receiver



Capable to detect PSK signals preserving low power and low complexity



Usefull for wireless sensor networks and low-cost wireless data links.

Business Opportunity

Technology available for licensing with technical cooperation

Patent Status

Priority application

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