

# Using GDMA principle in UHF RFID applications

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## Abstract

In conventional RFID applications the total radiated power is constantly focussed towards a single area, where are objects expected, there are tagged with transponders. In fact, a transponder needs this energy just for a few milli – seconds of time. For all the other time the energy could be used for other reasonable purposes, which would lead to a higher energy efficiency. The solution is implementing and using the GDMA principle.

RFID  $\equiv$  Radio Frequency Identification

GDMA  $\equiv$  Geometry Domain Multiple Access

**Keywords:** GDMA, RFID, Localisation, SSA, SSMA

## Motivation and Description of Work

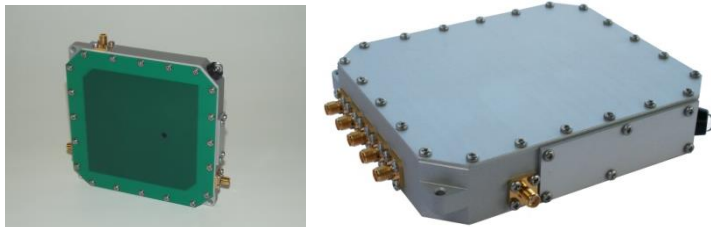
Using Geometry Domain Multiple Access principle in UHF RFID applications is somewhat equivalent with a distributed antenna system, in which every antenna is transmitting the entire power. Under such circumstances, a real time location for assets or goods in dedicated areas can be realized with high energy efficiency. There are a lot of some applications that could benefit for this assumption, like: parking places, gates for goods transport, asset localisation in hospitals, parts inventory in server rooms, and so on.

We have implemented the GDMA principle by using two different modules, SSA and SSMA, with different intrinsic characteristics. Both of them are fully programmable.

SSA  $\equiv$  Self Switching Antenna

SSMA  $\equiv$  Self Switching Multiplex Antennas

The SSA devices may be concatenated in a daisy chain. Each device has its own antenna, or an antenna output connector. The transmitted power may be adjusted with an internal attenuator that accepts 35dBm of input power, so that the transmitted EIRP may not be exceeded to respect of the used antenna.



The SSMA devices are 1 to 16 multiplexers. They may also be cascaded till to a deep of three. All functions are programmable and may be monitored via a web interface. It also accepts an input power of 35dBm.

Both devices controls and monitors in real time the antenna matching, to avoid damages.

Other features will be discussed in the presentation.