

# Testbed for Dense UHF RFID Systems

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## I. Motivation

- Radio Frequency Identification (RFID) systems have been widely deployed for various applications such as supply chain management and logistics.
- There are various new RFID systems proposed in the market. However, the customers need to evaluate the performance of these systems.

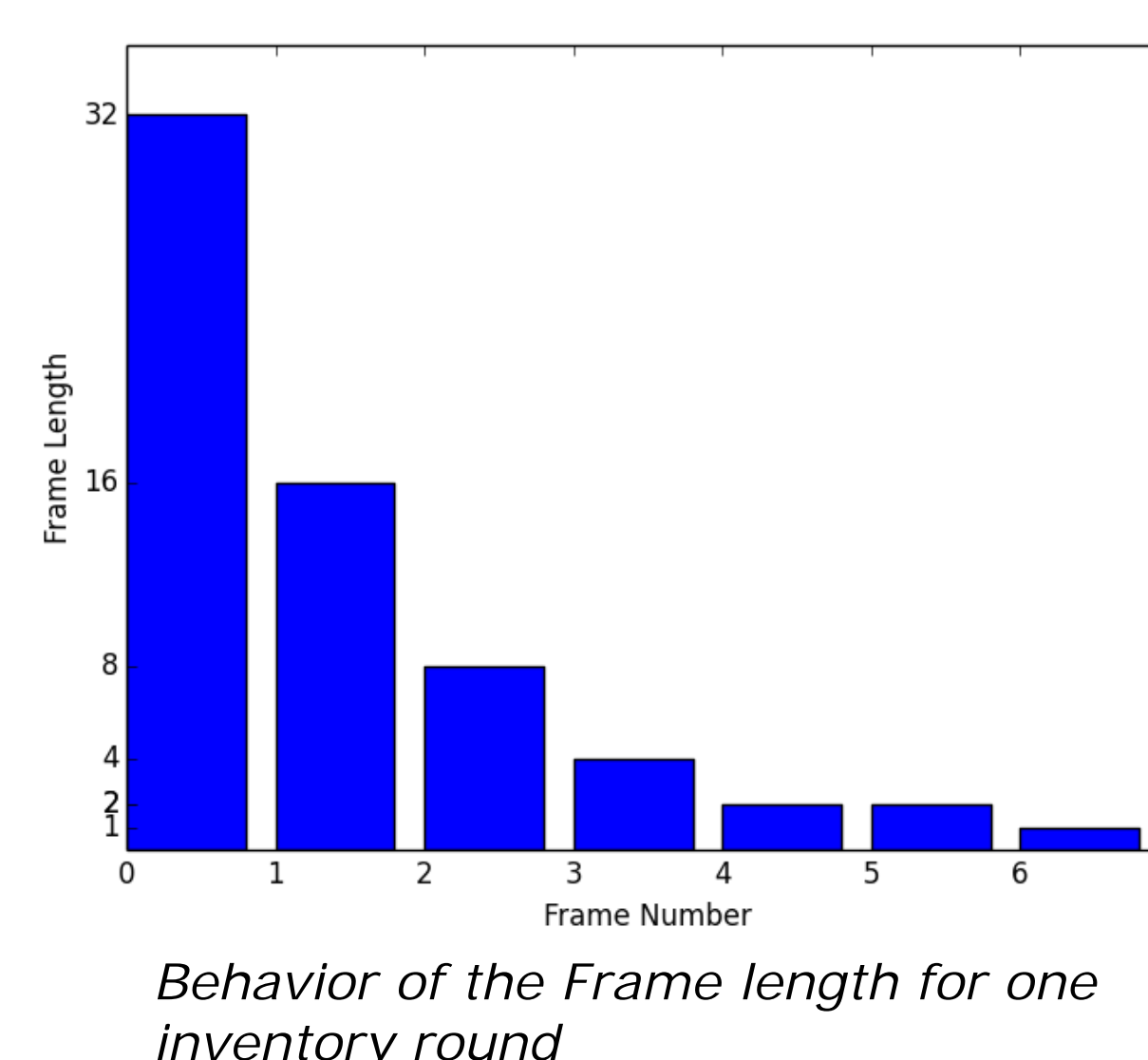


[http://bin95.com/BarCode\\_RFID.htm](http://bin95.com/BarCode_RFID.htm)

### Properties of the RFID network:

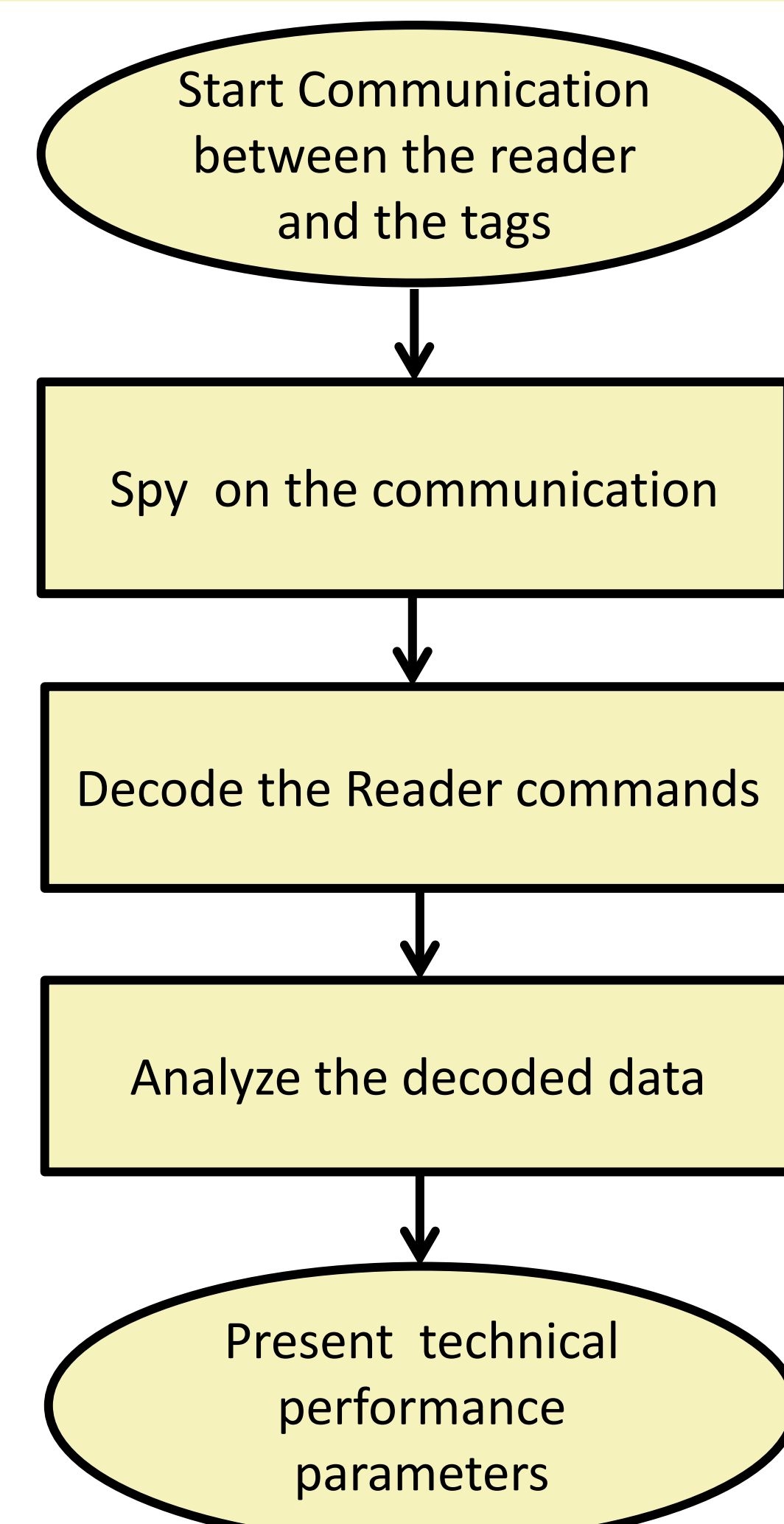
- Dense network >200 tags.
- Fast Identification process (few seconds).
- UHF band is used 868-872 MHz with frequency hopping.
- The identified items are muted until the end of the inventory round (reading process).

## III. Performance Analysis

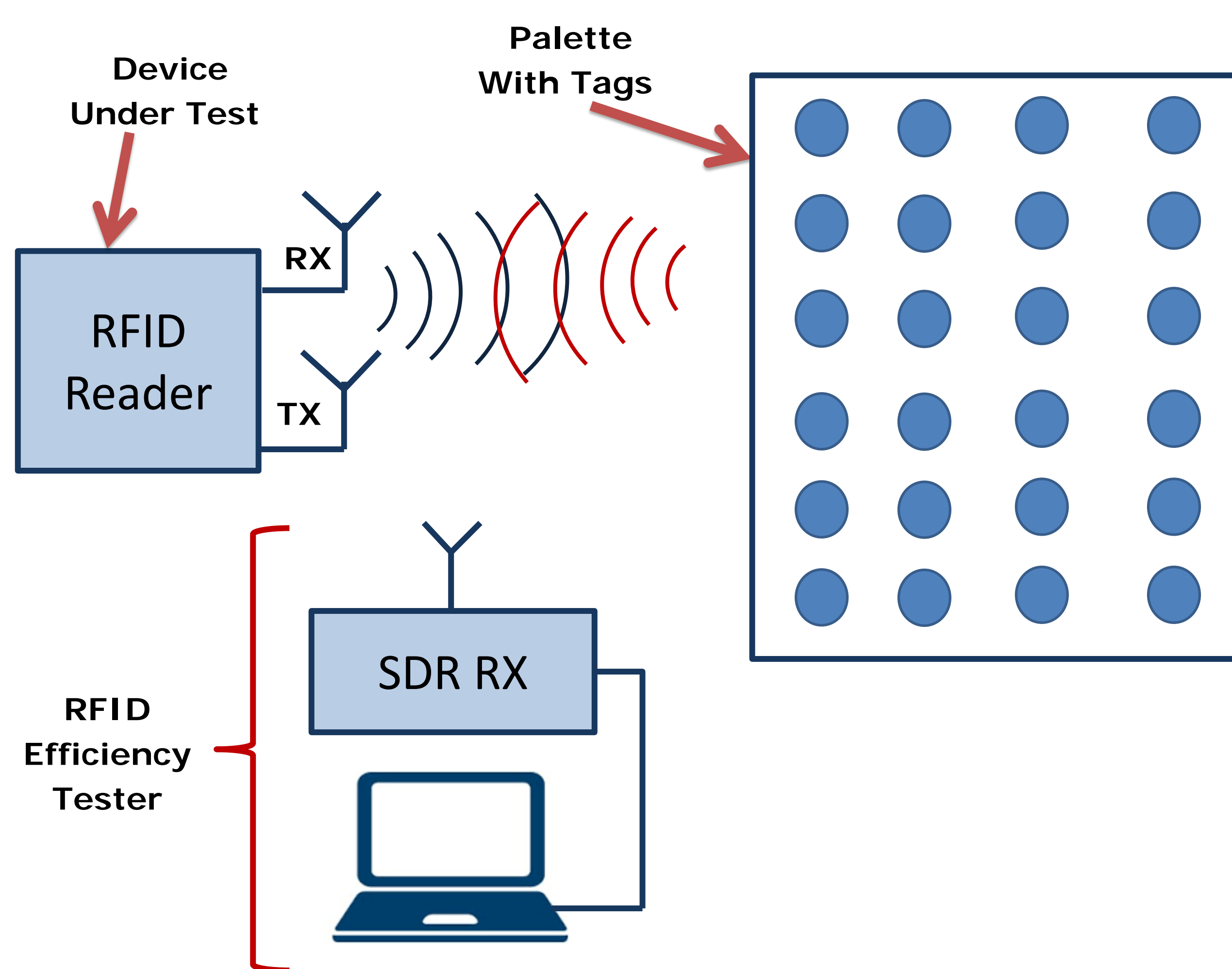


### Technical and performance parameters:

- Average identification efficiency
- Packet error rate
- Encoding scheme
- Center frequency
- Rate of the tag reply
- Total time of the inventory round



## II. Testbed Description



Measurements setup of the proposed testbed

- The proposed testbed has the ability to spy on the UHF RFID communication channel.
- It contains SDR kit (USRP b210) used to decode the commands and transfer the data to be analyzed and presented live on a powerful PC.
- A graphical user interface is integrated to the system showing all the technical and performance parameters for each inventory round.
- The system evaluate the performance of each inventory round done by the device under test.

## IV. Other RFID Research Activities

### LIKE RFID reader:

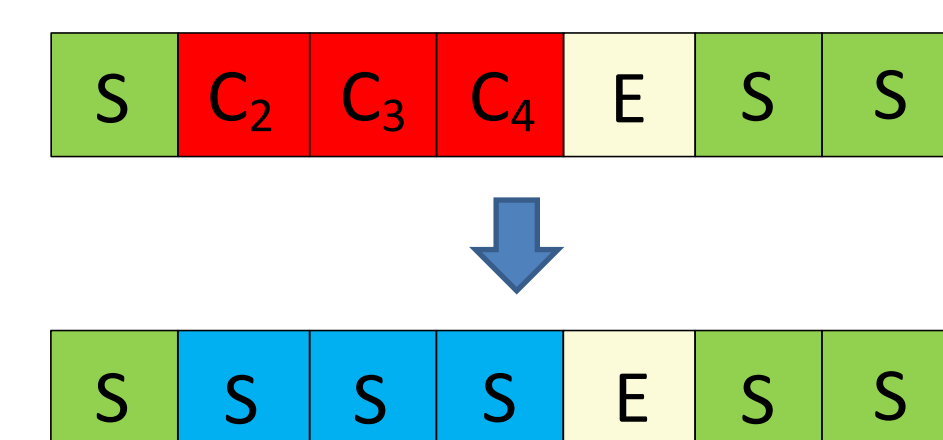
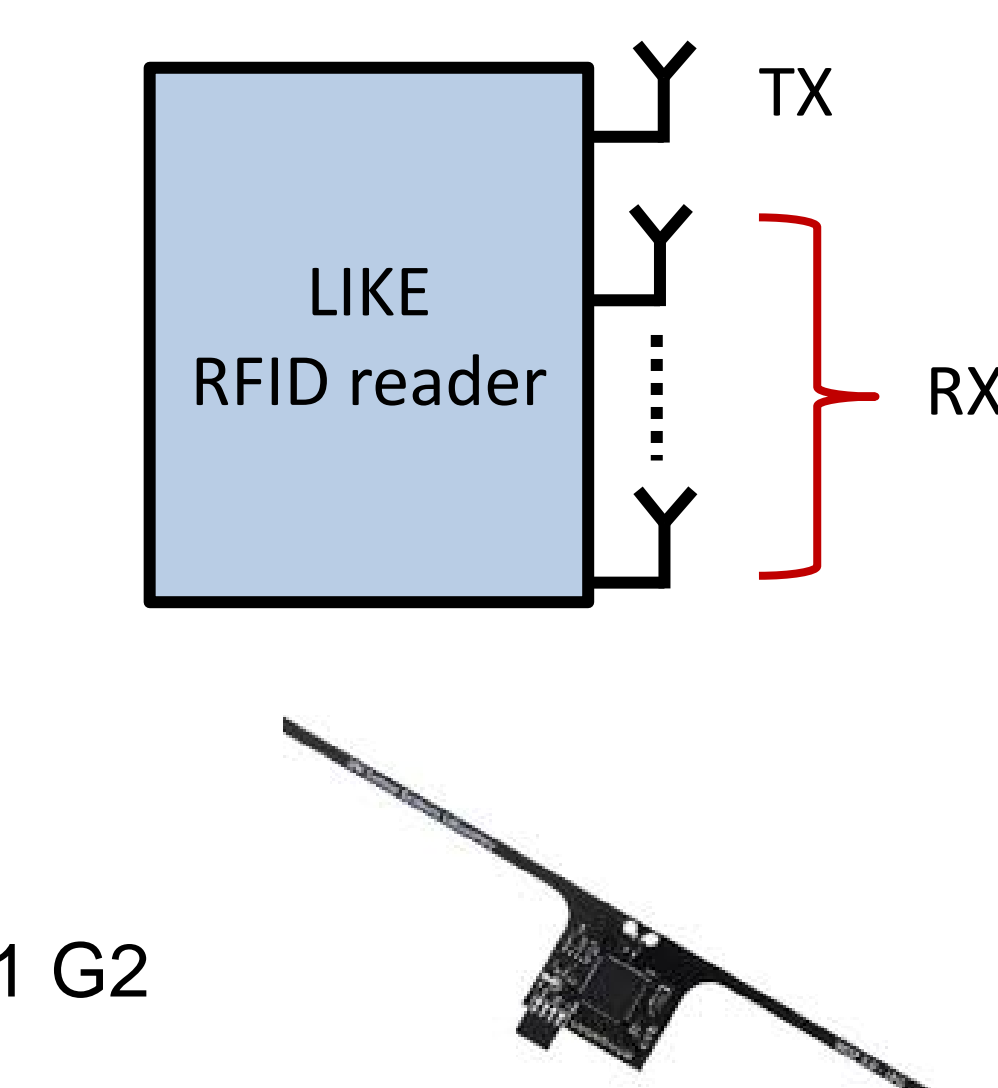
- Follow EPCglobal C1 G2 standard
- Different Anti-collision algorithms are under construction.

### LIKE RFID Tags:

- Higher performance new tags are implemented.
- The new tags are compatible with the EPC global C1 G2 standard

### Advanced anti-collision algorithms (PHY-MAC):

- Collision Recovery Algorithms
- Frame length Adaptation



## V. Conclusions

- An online testbed is presented for UHF RFID system performance evaluation.
- The testbed can show the average performance and the detailed parameters.
- The proposed testbed can be used for the UHF RFID frequency ranges.

