	Document	version: v1.00
RF-Embedded GmbH		status:
	Technical Specification	date: 2012-02-10
project title: **Application Note 001**		**org**

PUR - APPLICATION NOTE 001:

COMMAND SEQUENCES FOR FAST READ AND WRITE OPERATIONS WITH PUR
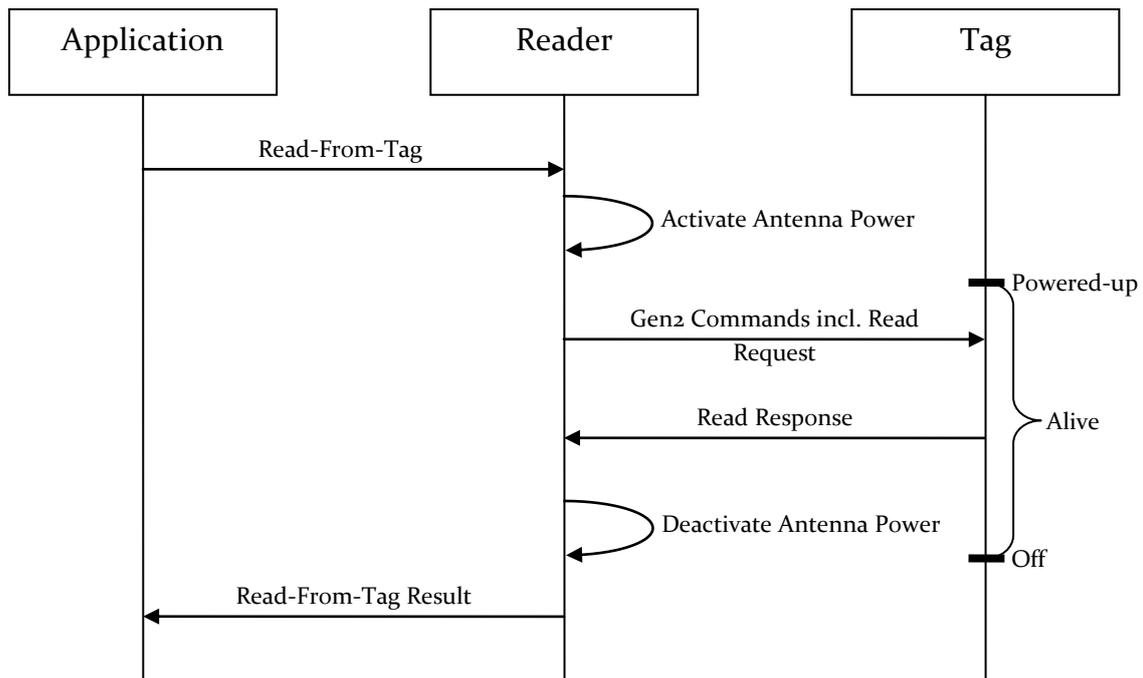
1 Introduction

The RF-Embedded Reader-Host-Protocol is built up very simple and convenient. The user does not have to care about the antenna power the flow of the commands that are sent to the tag.

But in some use cases it is necessary to read or write data from a tag in a very fast way. To do this with the convenient protocol, the programmer should know and understand the operations done in the reader, so he can get the best performance.

2 Problem Description

In normal circumstances the programmer does not have to think about the antenna power of the reader. If he calls a commando that performs a communication with the tag, like Cyclic-Inventory or Read-From-Tag, where the antenna power is needed, the reader autonomously controls the antenna power. If there is no antenna power active when it is needed, the reader activates the antenna power and performs the desired operation. After the operation the reader also deactivates the antenna power autonomous.

The flow diagram for the commands then looks like this:

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So if there is a use case to read data from the first tag which is detected by the reader, by using the commands in a sequent manner the flow would look like this:
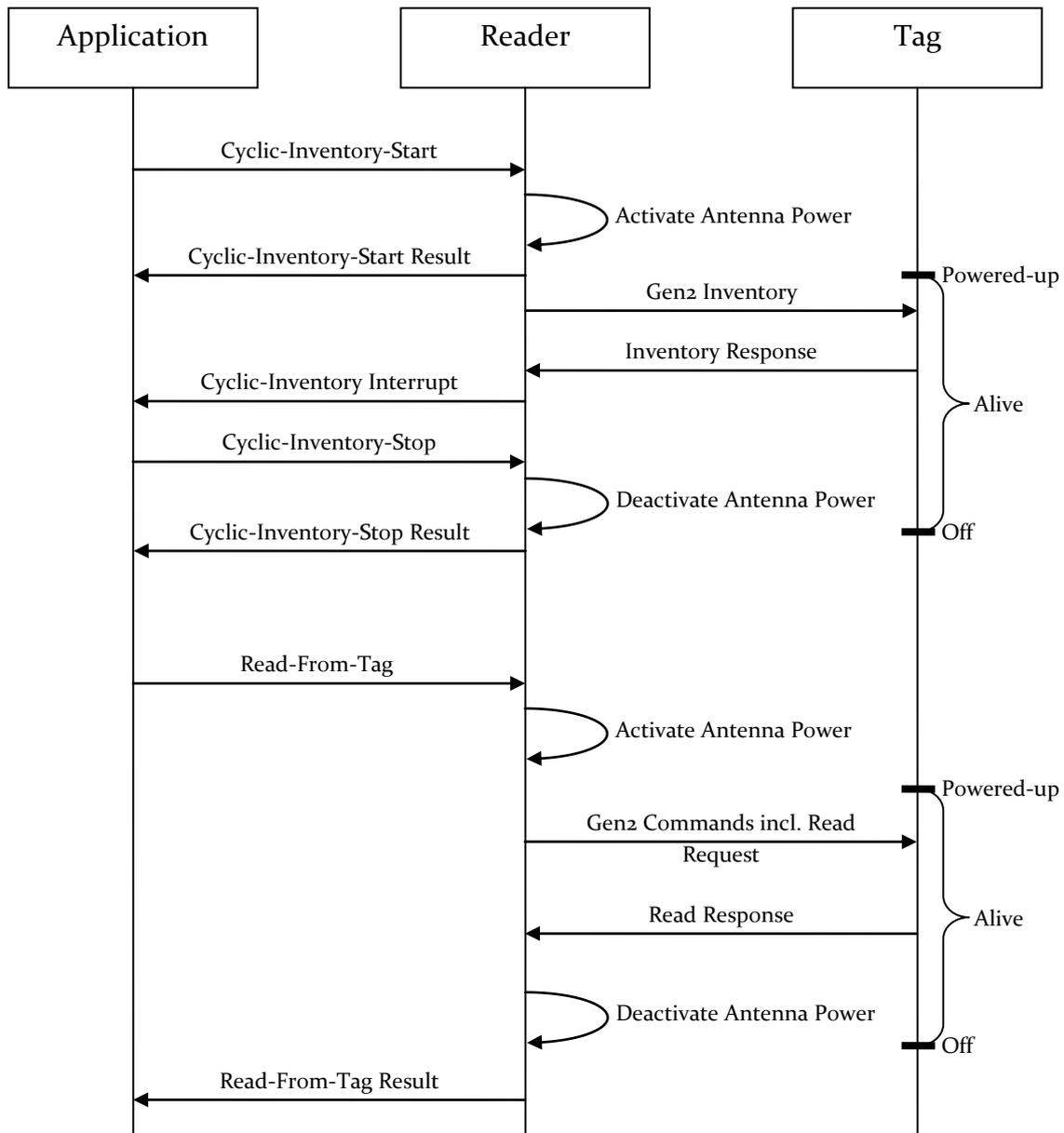

This sequence works very well to read data from the tag. But with use cases in which the time performance is critical, this sequence is not the best solution. There are a few circumstances that can cause problems with the time critical performance. One such circumstance is that there are a few commands and operations in-between the detection of the tag and the read command which are not needed. Another issue is that the tag is powered off while the operation, so it first needs to get sufficient power to come back to life. The third possible problem with this sequence can be, if the tag is detected for example only at a certain frequency, with activated frequency hopping it could be that the read command is performed at another frequency like the tag was detected.

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3 Approach For Time Critical Applications

There are two facts which should be considered to achieve a more performant application.

1. The firmware of the reader is designed to control the antenna power autonomous. If the antenna power was active before, the antenna is not switched off after an operation.
2. There is also the possibility to send commands to the reader during a cyclic inventory.

If these two facts are considered, the sequence can be changed to look like this:
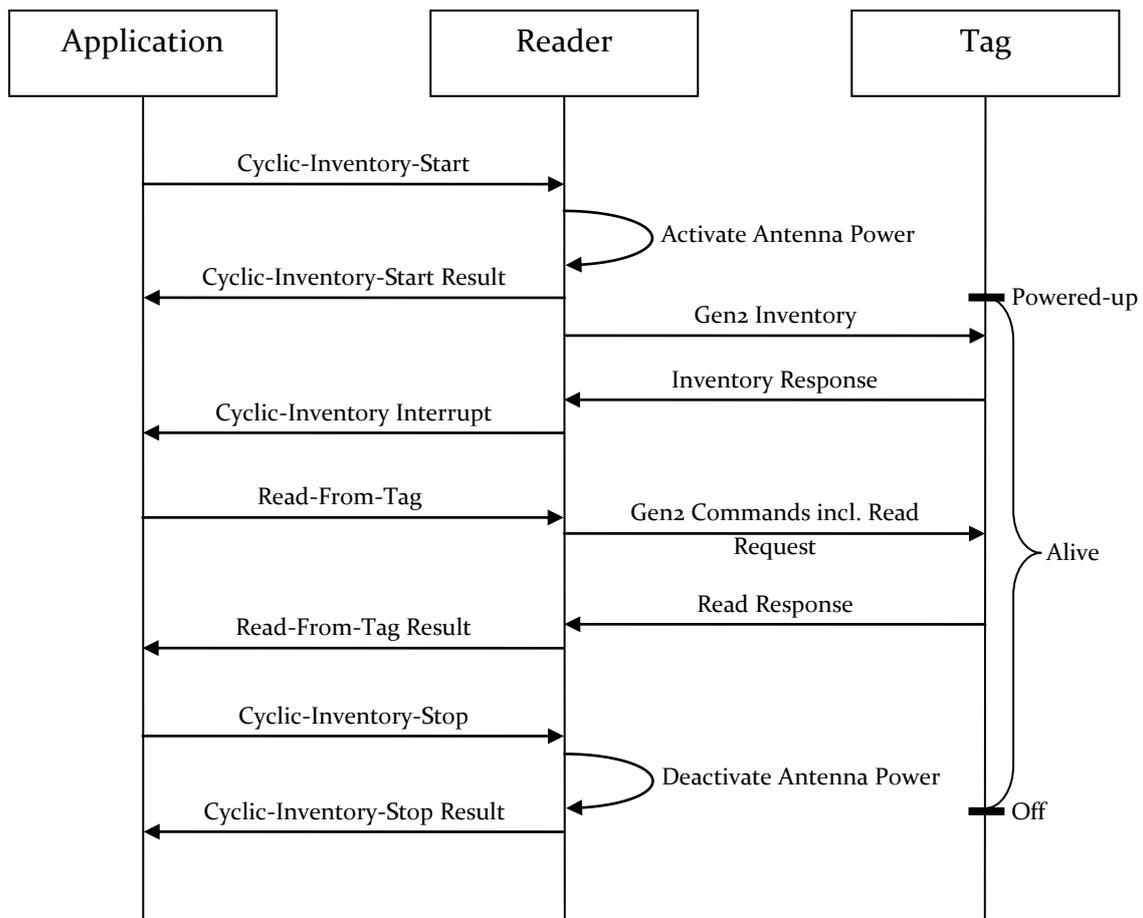
In this sequence the tag is not powered twice and is immediately operated when it is detected. This means that the tag gets the read command in exactly the same circumstances (frequency, distance, etc.) like it was detected.

This change of the command sequence can save up to two third and more of the needed time and is so the right sequence for time critical solutions.

The changed sequence is analog for write operations.

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