

# RuBee Demo Kit and Visibility Questions and Answers

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Visible Assets provides RuBee demo kits at a discount to customers with focused applications who want an introduction to RuBee physics and capabilities. These kits are technology demonstration kits, not software development kits (SDK).

They are not for software or systems development and do not include the latest, greatest performance options. For example, they do not include Rotating Phase Multiplexing (RPM), CLIP, or PSS, they do not include ferrite antennas, or high-powered loop antenna options. They do not include ferrite tag options, or any sensor capabilities. An RPM system provides extended range (30-40 feet) with almost no angle sensitivity and in most cases the base station antenna may be placed on steel with little or no detuning. A CLIP system allows many adjacent antennas to work together. A PSS base station provides extended range at close quarters. Several whitepaper links to these options are included in this folder.

## 1. What Can I Do With The Demo Kit:

You can do simple board-room introductory demonstrations and see RuBee's ability to work under water and inside a steel can. You can see tag ping rates, as well as do discovery.

## 2. What Can't I Do With The Demo Kit

You can not develop a new application, or write new code to implement that application. Again, this is not a SDK. You can see how the demonstration tags work on new things like a gun, tools or guided missiles. We have other, specialized tags and antennas that can do amazing things, but no one size fits all. We may have different firmware in the tag to do special things, or special antennas matched to the asset (ferrites or loops). We may have specialized designs (loops vs. PC board), or antennas designed to optimize range. Again, this is a simple introduction to RuBee, not a test bed solution for new applications.

## 3. Can I Buy a Software Development Kit

Yes you can. New applications often require modified or custom tags, custom antennas and special firmware. *One size does not fit all.* We offer a discounted RuBee Pilot Kit (RPK) that focuses development on a well-defined application pilot. To support

any software development we have to understand your application and understand tag requirements, as well as the RuBee appliance (antennas) requirements. So, the RPK is customized to your application needs. In many cases we may have everything you need ready to go, in other cases there may be all new requirements. We need a budget to help you design what you need, and you will also need a RuBee 1902.1 license. The package is described in this folder.

We also offer a RuBee developers course we include sample agenda in this folder.

#### **4. Can you give me some examples of a new RPK application?**

**First Example:** We have a customer that wanted to provide wine visibility to restaurants. Wine is a specialized, high valued asset. They purchased an RPK, and we designed a special wine tag that goes on bottom of wine bottle. It has the option to data log temperature and jog. We created a smart wine rack with special antennas that read both the tag and ID of a person near the shelf. We created a protocol to read these tags on the wine rack. The company hired us to write a prototypical Wine Visibility application. We did that and provided all the source code back to the company.

**Second Example:** A gun manufacturer asked us to build an armory with full visibility, and wanted special tags to detect shots fired (shot counting). We worked with the company created special tags that work on guns (manufactured with the gun) and developed new algorithms for detecting and counting shots. We also developed new racks and portals for detecting entry and exits, and a handheld that could read everything. This was a major undertaking, but we are now designing RuBee tags for each of the major weapons manufacturers one by one, and again each gun is a semi-custom new tag. In one case, we have even had to design a new chip.

**Third Example:** A medical device company asked us to create smart shelves in hospitals to provide product visibility. The tags on the medical device boxes were simple, and the shelves we not difficult. But after everything worked, they wanted to read the boxes in the OR and link items to a physician and a patient. We developed special new tags that could be used on patients and the physicians, as well as special antennas that would work safely in the OR, and link assets and people. This was a major R&D project with many complex, moving parts.

#### **5. My application is simple - why can't I buy what you have and do it myself?**

You can. However, in all cases your probably re-inventing what we have working at some level already, and in always ends up costing us both more and takes more time for you to “roll your own package” over the RPK and contract to do a quick working application for you.

A “War Story”: A very competent government software group wanted a special asset tracking system, and hired us at \$180/hr to support their development effort. After

about 1,000 hours of support and 18 months of work we took the project over. It took us about 4 weeks to produce the final system. That is typical experience – it’s “death by a thousand cuts”, or simply wait for a realistic budget and commitment to the project from senior management.

## **6. I have middleware and RFID application code working why can’t I take RuBee tags base stations and just use my code?**

You can, but RFID is really a tracking technology not a visibility technology. RFID becomes line-of-sight in harsh environments. Most of the RFID software systems were built assuming items are read as they pass by a portal or reader window. You must infer that asset is going into or on something or leaving. These events are converted into “assumed” static location.

Visibility is different, it actually provides real-time physical inventory of the asset at its storage location (shelf, truck, room or rack). So, the software is actually much simpler. For example, if you want to provide a Sarbanes-Oxley (SOX) log using tracking technology (Bar-codes or RFID) it will probably be very complex code, take many months to develop write and test, and probably end up requiring many manual checks. A Visibility system can do a daily SOX log with few lines of code and no manual labor. A Tracking system can also do a SOX log with many complicated assumptions, many complex business rules, and complex software that ends up being a major project. Visibility systems usually have simple business rules compared to tracking systems and the code is many times simpler, and not same as tracking code.

In other words, by designing and optimizing the tags and readers (appliances) to match the application so you have a legitimate Visibility system, you also end up with very simple Visibility software systems.

## **7. Is Asset Visibility really new?**

The answer is yes - it is new, different and not what you expect. We often find new customers with experienced and competent IT departments who have worked on RFID or bar-code tracking projects. Near 100% begin assuming they understand visibility and problems associated with visibility and IT. Over time it becomes clear that asset visibility really is a new thing, and we start to get buried in daily questions along the lines of “can I do \_\_\_\_\_ with a RuBee tag?” In most cases the answer is, “Yes, but may we suggest a better way?”

We almost always converge over the course of months to a simple solution, one that usually requires special tags and special antennas and it turns into a true Visibility Network. It is new and different from everyone’s original idea of a visibility system at the start. We could have executed the same final system in few weeks or months at much lower cost -- we at Visible Assets have already paid our dues and learned from our own

many mistakes how visibility is different and new.... We can help you not make the same mistakes we have already made.

### **8. Why can Visible Assets make a visibility network work quickly and it takes others so long?**

Visible Assets is vertically integrated - we have engineers who design chips, base stations, routers, we do all of our own system software using Linux open source tools, and we have a talented, experienced application team who can write web enabled visibility code quickly. Most importantly, we have been doing this for five years and understand RuBee, and Visibility, and the limits.

Visibility Networks represent a disruptive new industry that combines things in new unexpected ways. Making tools smart, or guns smart, or assets visible with integrated software combines steel products that have been around for 100+ years with visibility IT systems that are fresh and new. It is always filled with new and unexpected problems, and keeps you humble. Visible Assets has the skills and experience to combine systems and steel to rapidly create prototype visibility networks.

Most customers start by assuming the existing IT resources that have been working on tracking systems can be just switched on and have an instant solution. That has yet to happen in our five years of experience.

### **9. What about the RFID atoms to bits dream?**

We all had a dream that a standardized, one size fits all wireless tag, and a base station with an on-switch could transform asset location status into a real-time database. We could virtualize real-world assets so everything is just a coding problem. RFID was going to convert atoms to bits, and with 30 billion competitively produced tags each year each tag would cost 5 cents.

Bottom line, we will never have a single tag that works on everything, and we will not see 30 billion tags per year @ 5 cents per tag in our lifetime. Visibility is not just about IT and software. Visibility is about design and integration of real-world wireless asset tags and readers into IT systems. Real-world asset visibility always includes steel, liquids and people that may change performance of any wireless system. This is Physics 101 that we can never change.

The visibility dream is alive and well as long as we understand the physics of wireless systems and plan for that in the overall design. We can and do turn atoms into bits as long as we work together to understand the visibility application with integrated IT systems, tags and readers.